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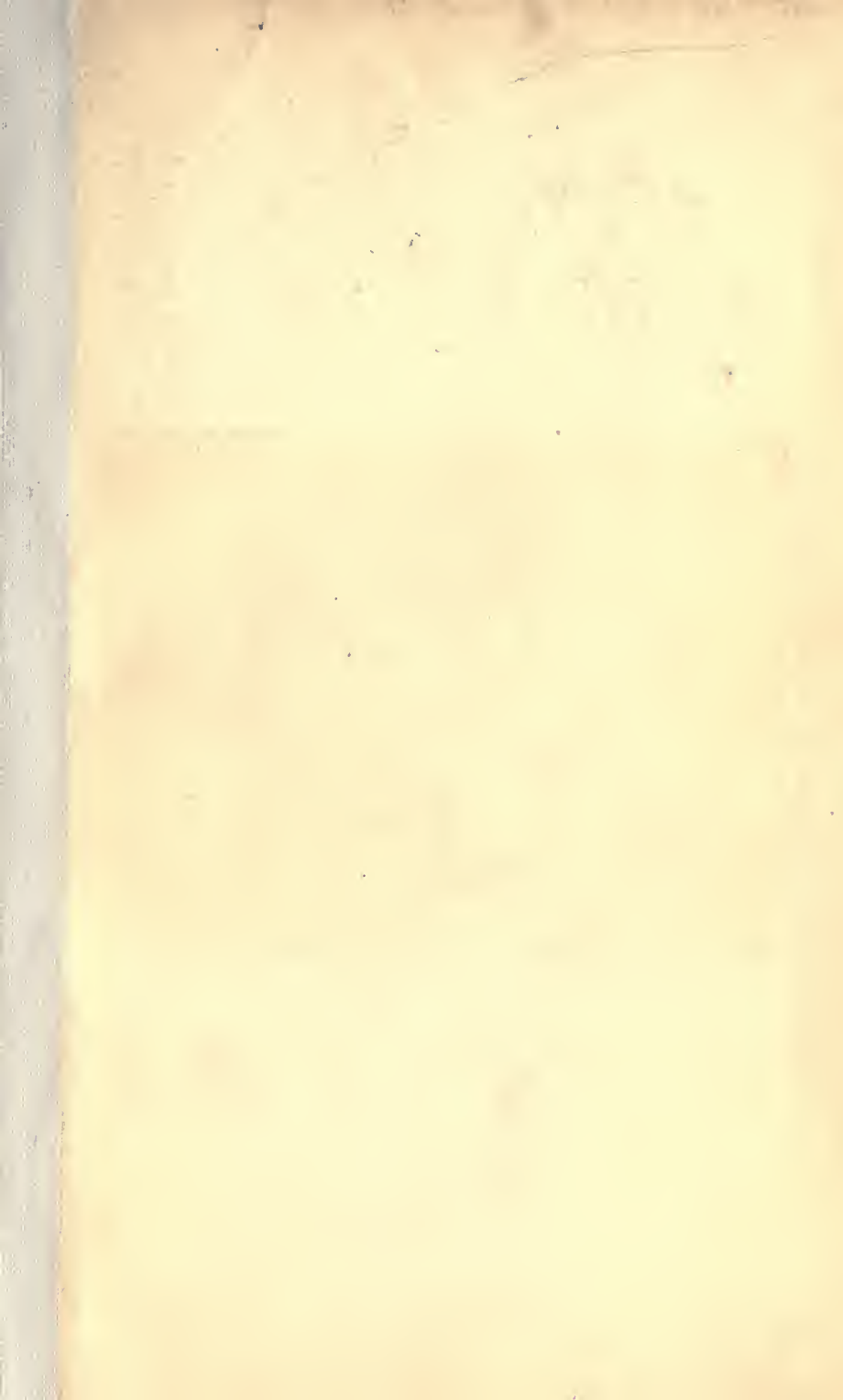


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FLORA OF JAMAICA

VOL. V.

DICOTYLEDONS

FAMILIES BUXACEÆ TO UMBELLIFERÆ

FLORA OF JAMAICA

CONTAINING DESCRIPTIONS OF
THE FLOWERING PLANTS KNOWN
FROM THE ISLAND

BY

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VOL. V.

DICOTYLEDONS

FAMILIES BUXACEÆ TO UMBELLIFERÆ

WITH 156 TEXT ILLUSTRATIONS

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PREFACE

THE present volume continues the systematic account of the flowering plants of Jamaica to the end of the free-petaled Dicotyledons. The description of the Garryaceæ is appended, with a reference to the position which it should occupy in the light of more recent knowledge of its floral structure. Volume VI., in course of preparation, will contain the account of the sympetalous families.

As in the case of the previous volume, the printing has been spread over several years.

We are again indebted for the loan of specimens to the Government of Jamaica, and to various institutions and individuals, especially to the Directors of the Royal Botanic Gardens, Kew and Edinburgh, the Bristol Museum, the Naturhistoriska Riks-Museum at Stockholm, and the New York Botanical Garden. Special thanks are due to Mr. Cecil Norman, who made a short collecting trip to Jamaica, and also helped in the elaboration of the families Turneraceæ, Combretaceæ, Onagraceæ, Araliaceæ and Umbelliferae.

As in the previous volumes, the drawings for illustrations have been made under our supervision by Mr. Percy Highley.

A. B. RENDLE.

DEPARTMENT OF BOTANY,
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WORKS REFERRED TO IN THE TEXT

(In addition to those already enumerated in Vols. III. and IV.)

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MAXON, W. (1904–).	WATERS, Rev. J. (1826–47).

CORRECTIONS AND ADDITIONS

p. 71. **Rhamnidium.** We followed Urban in assigning these two doubtful species, which he had described, on incomplete material, to the genus *Rhamnidium*. More recently (*Symb. Ant. ix.* 228, 1924) Urban removed *R. jamaicense* to a new genus *Auerodendron*. The two genera are distinguished as follows:—

Ovary 2-celled. Endosperm wanting. Cotyledons very convex	6. <i>Rhamnidium</i> .
Ovary imperfectly 2-celled. Endosperm present. Cotyledons flat	6A. <i>Auerodendron</i> .

6A. AUERODENDRON Urb.

Trees or shrubs, with the younger branches glabrous or puberulous. Leaves opposite or subopposite, stalked, pinnately nerved, entire, persistent. Stipules united in the axil of the leaf. Inflorescences axillary. Flowers hermaphrodite, parts in fives. Calyx: tube hemispherical, lobes valvate, triangular to lanceolate-acuminate. Petals folded together, roundish above with emarginate apex, below broadly clawed. Disk lining the calyx-tube. Stamens inserted under the bays of the disk; anthers ovoid or globose-ovoid, opening at the sides inwards. Ovary superior, free, globulose, in appearance 2-celled, placenta only one developed, prolonged almost to the opposite wall; ovules erect, 2 in the ovary; style subentire at the apex. Drupe enclosed by the whole persistent calyx, or by the tube only, crowned by the style, 2-celled. Seed compressed; coat thin, with black dots; endosperm adhering to the coat, moderately fleshy. Embryo flattened; cotyledons obovate, flat, cordate at base; radicle very short.

Species 7, natives of Bahamas, Cuba, and Jamaica.

A. jamaicense Urb. *Symb. Ant. ix.* 228 (1924). *Rhamnidium jamaicense* Urb. *Symb. Ant. v.* 409 (1908).

Page 4, line 3 from bottom, for Rottb. read L.

„ 19, heading, for Anacardiaceæ read Cyrillaceæ.

„ 24, line 23, after Aug.; insert McNab!

„ „ lines 3 and 4 from bottom, for 3-5 read 2-5.

„ 77, after line 19 insert *Viscum ramulis et foliis &c. Sloane Cat.* 168 & *Hist. i.* 93, t. 201.

- Page 77, line 27, *after* 90! *insert* vi. 110 (in part)!
- „ 112, „ 33, *for* *C. ovata* *read* *S. ovata*.
- „ 163, „ 10, *for* *venosa* *read* *pilosa*.
- „ „ „ 14, *for* *hirsuta* *read* *villosa*.
- „ 177, „ 3. *for* *MS. ex* *read* in Linden & Planch.
- „ 181, „ 5 from bottom, *for* *Camellia* *read* *Thea*.
- „ 188, „ 23, *for* *Hist.* *read* *Syst.*
- „ 219, „ 10 from bottom, *after* 5726 *insert* 5729.
- „ 226, „ 14, *before* (Fig. 90) *insert* *Ilex nitida Maxim. forma* δ *ovatifolia Loes. in Nov. Act. Nat. Cur. lxxxix. 285 (1908).*
- „ „ „ 18, *before* below *insert* near Morse's Gap.
- „ „ „ 19, *before* 10,034 *insert* 6737.
- „ 230, „ 10, *for* *Bohadsehia* *read* *Bohadschia*.
- „ 238, „ 20, *for* *L.* *read* *P.*
- „ 244, „ 2, *before* inflorescence *insert* male.
- „ 325, „ 3 from bottom, *for* *Lond.* *read* *Loud.*
- „ 327, „ 2, *after* *Bot.* *insert* ed. 3.
- „ 395, „ 21, *omit* “Type from Browne in *Herb. Linn.*”

NOTES

MELASTOMA SESSILIFOLIA L.

Melastoma sessilifolia L. is described in *Systema Naturæ*, ed. 10, 1022, with a reference to Browne *Nat. Hist. Jamaica*, t. 24, f. 2. Linnæus, in his copy of Browne's *History*, has written on t. 24 “*M. sessilifolia*,” but he has also given the same name to a specimen from Browne in his herbarium of *Melastoma impetiolearis* Sw. (*Miconia impetiolearis* D. Don). As Browne's plate includes inflorescence as well as leaves, and the specimen has only leaves, it appears right to consider the plate as the type of *M. sessilifolia* L., which species is now known as *Henriettella sessilifolia* Triana. The words “Type from Browne in *Herb. Linn.*” should be omitted on page 395, line 21, of this volume.

MACFADYEN, Flora of Jamaica, Vol. ii.

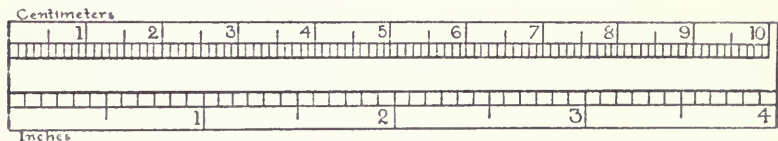
References to this volume have been included in the text, but it must be borne in mind that the volume was never published. The following note has been written by Mr. William Carruthers in the copy in the Library of the Botanical Department, British Museum: "The sheets of this second volume were printed in Jamaica. The printing was stopped because of the sudden death of Dr. Macfadyen. Only a few copies exist. Dr. Macfadyen's son informed me that the sheets were used as waste paper by the executor of his father's will."

We know only of five copies. One is in the Museum, two are in Jamaica, and one is stated by Mr. Carruthers to be in the possession of the Macfadyen family. These are apparently similar and include pp. 1-216, that is as far as *Portlandia* in the beginning of Rubiaceæ. The copy in the Kew Herbarium ends at p. 192. A transcription of one of the copies in Jamaica was made for the Berlin Herbarium. Pritzel saw the volume in the Kew Herbarium. We note that the *Index Kewensis* includes new species described by Macfadyen as though they had been published (e.g. *Passiflora regalis* & *P. villosa*).

SWARTZ, Prodrromus Descript. Veg. &c.

For the close association between this work and the Banksian Herbarium see note in Journal of Botany, lxiv. 103 (1926).

For the convenience of workers a comparative scale showing centimeters and inches is given below.



CONSPECTUS OF THE FAMILIES CONTAINED IN
THIS VOLUME

DICOTYLEDONS (*continued*)

Stems with open bundles. Leaves net-veined. Floral parts generally in fours or fives, sometimes in threes. Embryo with two cotyledons.

FAMILIES *BUXACEÆ* TO *UMBELLIFERÆ*.*

(Unless stated otherwise Flowers are regular, 2-sexual ; Petals and Stamens are free and hypogynous ; Anthers open longitudinally ; Ovary is superior ; Leaves are simple, entire, alternate.)

Fam. 52. *Buxaceæ* (*Buxus*). *Fls. unisexual, monœcious, in racemes. Perianth of 4-6 imbricate (overlapping) sepals. Stamens 4, free, opposite the sepals. Ovary 3-celled. Capsule 3-horned, opening loculicidally ; valves 2-horned. Shrubs or small trees. Leaves opposite, without stipules. (Page 1.)*

Fam. 53. *Anacardiaceæ*. *Fls. 2-sexual or polygamous or unisexual, in panicles. Calyx 4-5-lobed (3 in Comocladia), or of 5 sepals (Mosquitoxylum), imbricate. Petals 4-5 (3 in Comocladia), imbricate, subvalvate in Spondias. Stamens as many as or twice as many as petals, sometimes only one or a few fertile. Ovary 1-celled (2-5-celled in Spondias). Fruit a drupe, a capsule in Mosquitoxylum, a nut on top of a fleshy fruit-like stalk in Anacardium. Trees or shrubs containing resin. Leaves simple or pinnately compound, without stipules. (Page 4.)*

Fam. 54. *Cyrillaceæ* (*Cyrilla*). *Fls. in long spike-like racemes. Calyx 5-parted, imbricate. Petals, same number as sepals, slightly convolute. Stamens 5, hypogynous. Ovary 2-celled. Fruit fleshy, 2-celled, 2-valved. Trees or shrubs. Leaves without stipules. (Page 18.)*

* The descriptions of the Families are drawn up with a view to the determination of Jamaican specimens, and therefore are not always generally applicable. Contractions : *Fls.* = Flowers ; *usu.* = usually.

Fam. 55. **Aquifoliaceæ (Ilex).** Fls. in cymes; flower-parts in fours, fives, or sixes. Calyx and petals imbricate. *Stamens adhering to base of the short corolla-tube.* Ovary 4-6(8)-celled. *Fruit drupaceous with 4-8 pyrenes.* Trees or shrubs, glabrous. Leaves with minute stipules. (Page 19.)

Fam. 56. **Celastraceæ.** Fls. 2-sexual, polygamous or uni-sexual, in cymes; flower-parts in fours or fives. Calyx with imbricate lobes. Petals imbricate. Stamens 4-5. *Ovary 2-4(5)-celled.* Fruit a capsule or drupe. Shrubs or trees. Leaves alternate or opposite; stipules, when present, minute. (Page 24.)

Fam. 57. **Hippocrateaceæ (Hippocratea).** Fls. in panicles. Calyx with 5 imbricate segments. *Petals 5, imbricate, sometimes valvate. Stamens generally 3, inserted within a disk. Ovary 3-celled,* with 3 protuberances from its angles, which continue to grow, so that the 3 ripe carpels are united at the base only. Trees or climbing shrubs. Leaves opposite; stipules small, sometimes wanting. (Page 35.)

Fam. 58. **Staphyleaceæ (Turpinia).** Fls. in panicles. Calyx with 5 imbricate lobes. *Petals 5, imbricate. Stamens 5, inserted outside a disk. Ovary 3-celled.* Fruit not opening; seeds with a thick hard coat. Glabrous trees or shrubs. *Leaves opposite, pinnate, with stipules and stipellæ.* (Page 37.)

Fam. 59. **Icacinaceæ (Mappia).** Fls. minute, polygamous, in paniculate cymes; parts in fives. Calyx toothed. Petals valvate. *Stamens inserted alternately with the petals outside the disk.* Ovary 1-celled. Fruit a drupe. Trees or shrubs. Leaves without stipules. (Page 39.)

Fam. 60. **Sapindaceæ.** Fls. polygamo-dioecious, regular or irregular, in racemes or panicles. Sepals 4 or 5, usually imbricate. Petals 4 or 5, sometimes wanting or rudimentary, often with scales on the inside, imbricate. Disk complete in regular fls., represented by 2 or 4 glands in the irregular fls., wanting or inconspicuous in *Dodonæa*. *Stamens, usu. 8, hypogynous, inserted within the disk, sometimes unilateral. Ovary 3-celled (2-3-celled in Melicocca, 2-celled in Allophylus).* Fruit various. Trees or shrubs, rarely shrubby herbs, sometimes climbing by tendrils. *Leaves pinnate, or twice 3-foliolate, or 3- or 1-foliolate.* (Page 40.)

Fam. 61. **Rhamnaceæ.** Fls. in cymes. Calyx: tube persistent; lobes 4-5, valvate, falling off. Petals 4, 5, or wanting, inserted at the calyx-throat, hooded or infolded. *Stamens 4-5, inserted with the petals, opposite to them, and generally enclosed by them.* Disk perigynous. *Ovary 3(2-4)-celled.* Fruit various. Trees or shrubs. Leaves alternate (opposite in *Rhamnidium*), penninerved (3-nerved in *Zizyphus*); stipules small. (Page 62.)

Fam. 62. **Vitaceæ.** *Fls.* 2-sexual or unisexual, in *panicles opposite the leaves*. Calyx 4–5-lobed. Petals 4 or 5, valvate. *Stamens as many as the petals and opposite to them*, inserted outside at base of disk or between its lobes. *Ovary usu. 2-celled*. Fruit a berry. Woody vines with watery sap, with swollen jointed nodes, and *tendrils*. Leaves simple or 3-foliolate, with stipules. (Page 73.)

Fam. 63. **Tiliaceæ.** *Fls. usu. cymulose*, cymules sometimes solitary, few-flowered, sometimes in corymbs or panicles. Sepals 5 (4–7), free, or more or less united, usu. valvate. Petals usu. as many as sepals, sometimes wanting. *Stamens indefinite, usu. on a development of the receptacle, free*. Ovary 2–10-celled. Fruit various. Trees, shrubs, or herbs. Leaves usu. stipulate. (Page 80.)

Fam. 64. **Malvaceæ.** *Fls. axillary, solitary or in racemes, clusters, or panicles*. Sepals 5 (3, 4), more or less united, lobes usu. valvate. *Petals 5, usu. adhering to the base of the staminal column, twisted and imbricate in bud*. *Stamens indefinite or 5 or 10, more or less united; anthers one-celled, pollen large, spiny*. *Carpels in a whorl*. Ovary with 2 or more cells. Style with as many branches as ovary-cells. *Ripe carpels sometimes separating as cocci, sometimes united into a capsule*. Herbs, shrubs, or trees. *Leaves usu. palmatinerved; stipules free*. (Page 92.)

Fam. 65. **Bombacaceæ.** *Fls. axillary or subterminal, solitary or in clusters; peduncles 1-flowered*. Calyx closed in bud, bursting irregularly at apex or sometimes 5-cleft, persistent. Petals 5, often adherent at base to the staminal column. *Stamens generally indefinite and united into one or several bundles; pollen not spiny*. Ovary 5(1)-celled. *Capsule splitting loculicidally by 5 valves*. Trees. Leaves digitate or simple; stipules free. (Page 149.)

Fam. 66. **Sterculiaceæ.** *Fls. usu. 2-sexual, but unisexual in Sterculia and Cola*, axillary or sometimes terminal, solitary or in racemes or paniculate cymes. Calyx valvate, 5-lobed or 5-toothed (2–3-parted in *Guazuma*). Petals 5, twisted-imbricate in bud, wanting in *Sterculia* and *Cola*. *Stamens usu. more or less united into a tube divided above into 5 tooth-like staminodes, alternating with one or several anthers; in Sterculia the tube bears 15 (10) anthers crowded together above; sometimes stamens 5, opposite the petals, united at the base or higher (Melochia, Waltheria)*. Ovary 2–5-celled, or of a single carpel (*Waltheria*). Fruit various. Seeds not woolly. Herbs, shrubs, or trees, *usu. with stellate hairs*. Leaves usu. simple, sometimes lobed, usu. stipulate. (Page 154.)

Fam. 67. **Dilleniaceæ**. Fls. 2-sexual or polygamous; panicles terminal or in the upper axils. Sepals 5, imbricate, persistent. Petals as many as sepals, imbricate. *Stamens indefinite, filaments thickened at apex. Carpels one to indefinite, distinct.* Climbing shrubs or trees. Leaves entire or obscurely toothed. (Page 171.)

Fam. 68. **Ochnaceæ**. Fls. solitary or clustered in axils, or in terminal or axillary panicles or racemes. Sepals 5 (4-10), free, imbricate. Petals as many as sepals, free, imbricate or convolute. *Stamens 5 or 10. Ovary 2-10-lobed, or entire and one-celled. Fruit: drupes on a receptacle (Ouratea) or a capsule (Sauragesia).* Herbs, shrubs, or trees. Leaves entire or serrulate, stipulate. (Page 173.)

Fam. 69. **Marcgraviaceæ (Marcgravia)**. *Racemes contracted, umbel-like, pendulous, terminal. Bracts usu. attached to pedicel and transformed into nectar-bearing organs.* Sepals 4-5, imbricate. *Petals united to form a lid. Stamens 12-40. Ovary incompletely 4-12-celled. Fruit globose, leathery, not opening or only after some time. Shrubs, climbing by means of rootlets. Leaves usu. without stipules.* (Page 178.)

Fam. 70. **Ternstroëmiaceæ**. Fls. 2-sexual, polygamous, or unisexual, *one or few in leaf-axils.* Sepals usu. 5 and free, imbricate. Petals usu. 5, hypogynous, free or *united at base into a ring or short tube*, imbricate. Stamens usu. indefinite, hypogynous, *generally united at base and adhering to petals, falling off with them.* Ovary with 2-10, or indefinite cells. Fruit not opening or capsular. Trees or shrubs. Leaves usu. simple, without stipules. (Page 181.)

Fam. 71. **Guttiferæ**. Fls. diœcious, polygamous, or 2-sexual (in *Symphonia*), terminal or axillary, sometimes solitary or clustered, sometimes in few-flowered cymes or in panicles. *Sepals 2-6, imbricate or decussate. Petals 2-8 or wanting, rarely indefinite, contorted or sometimes imbricate. Male fls.: Stamens numerous, hypogynous; filaments free, or united only at base, or forming a tube (Symphonia). Female or 2-sexual fls.: Staminodes or stamens often definite, or fewer in number than stamens of male fl. Ovary with 3-10 cells, or 2-celled in Mammea, 1-celled in Calophyllum. Fruit berry-like or drupaceous, or sometimes opening septicidally. Trees or shrubs with resinous sap. Leaves opposite, generally decussate, without stipules.* (Page 190.)

Fam. 72. **Hypericaceæ (Ascyrum)**. Fls. usu. terminal. *Sepals 4, imbricate. Petals 4, hypogynous, imbricate. Stamens indefinite, hypogynous. Ovary 1-celled. Ovules indefinite. Shrubs or herbs. Leaves opposite, gland-dotted, without stipules.* (Page 202.)

Fam. 73. **Quiinaceæ (Quiina)**. Fls. usu. polygamous, in short axillary or terminal panicles, raceme-like or clustered. *Sepals 4, imbricate. Petals 4, hypogynous, imbricate or twisted. Stamens 15-30, free or united at base and with petals, hypogynous; anthers small, globose. Ovary 2-3-celled; styles 2-3; stigmas peltate; ovules 2 in each cell. Fruit berry-like, 1-celled, with 1-4 seeds. Seeds with reddish-brown velvety hairs. Trees or shrubs. Leaves opposite, with narrow stipules.* (Page 203.)

Fam. 74. **Bixaceæ (Bixa)**. *Fls. large, in a terminal panicle; pedicels 5-glandular. Sepals and petals 5, imbricate. Stamens indefinite, inserted on a thick receptacle; anthers horseshoe-shaped, opening at apex by 2 short chinks becoming at length a single pore. Ovary 1-celled; placentas 2 on ovary-walls; ovules indefinite. Capsule 2-valved, spiny. Seeds covered with a reddish-orange pulp. Shrub or small tree. Leaves ample, palmately-nerved.* (Page 205.)

Fam. 75. **Canellaceæ**. Fls. in axillary or terminal cymes. *Sepals 3, imbricate, persistent. Petals 5. Stamens united, tubular, hypogynous; anthers outside tube in a close ring. Ovary 1-celled; placentas 2-5, on ovary-walls, with 2 or more ovules; style short, with 2-6 stigmas. Fruit a berry. Trees with aromatic bark. Leaves with pellucid dots, without stipules.* (Page 207.)

[Fam. **Violaceæ (Viola)**. *Fls. irregular, 1 or 2 together in leaf-axils. Sepals 5, imbricate. Petals 5, unequal, the lower petal larger or unlike and often spurred, imbricate or twisted. Stamens 5, hypogynous or slightly perigynous; anthers erect, in a ring round the ovary, sessile or subsessile; connective often flattened or prolonged beyond the cells into a membranous appendage. Ovary 1-celled; placentas 3 on ovary-walls, each with indefinite ovules. Fruit a capsule with 3 valves. Herbs.* (Page 210.)]

Fam. 76. **Flacourtiaceæ**. Fls. 2-sexual (in *Xylosma* diœcious). *Sepals or calyx-lobes imbricate or valvate. Petals wanting, except in Homalium. Stamens definite or indefinite. Ovary superior or (in Homalium) more or less half-inferior, 1-celled; placentas 2-6 on ovary-walls; ovules indefinite. Fruit fleshy, berry-like, at length opening by valves, or a capsule, or a berry. Trees or shrubs. Stipules small or wanting.* (Page 211.)

Fam. 77. **Turneraceæ**. Fls. axillary, solitary or few, sometimes racemose; peduncles free or united with the petiole. Flower-parts in fives. *Sepals imbricate, soon dropping off, united below into a tube (receptacle). Petals perigynous, twisted in bud, soon dropping off. Stamens inserted at middle or base of calyx-tube. Ovary 1-celled. Styles simple or divided; stigmas brush-like. Carpels 1-celled, 3-valved. Herbs or shrubs. Stipules small or wanting.* (Page 227.)

Fam. 78. **Passifloraceæ (Passiflora)**. Fls. axillary; flower-parts in fives. Calyx-tube saucer-like or bell-shaped; sepals and petals imbricate. *Corona rising from the throat or walls of the calyx-tube, of one or several series, cut into radiating or erect filaments or membranous. Stamens and ovary raised above the petals by an elongation of the axis.* Ovary 1-celled. Styles 3, or sometimes a simple style with 3 or 4 branches. Fruit more or less berry-like or sometimes capsular opening by 3 valves at apex. Herbs or shrubs, erect or climbing by axillary tendrils. Leaves entire or lobed; petiole usu. glandular; stipules 2. Bract and bracteoles 3, small and distant from flower, or large, leafy, close to flower. (Page 231.)

Fam. 79. **Caricaceæ (Carica)**. Fls. unisexual or a few 2-sexual; corolla of male and female unlike. *Male inflorescence paniculate. Calyx usu. 5-lobed. Corolla with a long slender tube and a flat limb. Stamens 10. Female fls. solitary or crowded in a few-flowered panicle. Calyx as in male fl. Petals 5, soon falling. Ovary 1-celled. Fruit a berry. Trees or shrubs, with terminal crown of leaves with milky juice. Leaves usu. palmate; stipules wanting.* (Page 243.)

Fam. 80. **Loasaceæ (Mentzelia)**. Fls. terminal, cymose. Calyx-lobes 5, persistent. Petals 5. Stamens indefinite. *Ovary inferior, 1-celled. Fruit a capsule. Herbs, rough with barbed hairs. Stipules wanting.* (Page 247.)

Fam. 81. **Begoniaceæ (Begonia)**. Fls. monœcious, not symmetrical, in axillary unisexual or 2-sexual cymes. Male fls.: perianth-segments free; outer usu. 2, opposite, valvate, inner 2 or wanting. Stamens indefinite. Female fls.: perianth-segments 2-5, imbricate. *Ovary inferior, 3-celled, 3-winged or 3-cornered. Fruit a capsule, 3-cornered, unequally winged. Herbs or shrubs. Leaves stipulate.* (Page 249.)

Fam. 82. **Cucurbitaceæ**. Fls. monœcious or dioecious, solitary, racemose, or paniculate. Sepals 5, imbricate, united below into a tube. Petals 5, distinct or united. *Stamens free or variously united, usu. 3, of which one has a 1-celled anther, the others 2-celled anthers. Anthers distinct or cohering or confluent, cells usu. flexuose. Ovary inferior, usu. 3-celled, placentas usu. meeting in axis. Fruit usu. fleshy or corky, usu. not opening. Herbs or undershrubs, annual or with a perennial root, rarely shrubs, stems climbing or prostrate. Leaves simple or palmately lobed or pedate, usu. cordate and membranous.* (Page 253.)

Fam. 83. **Cactaceæ**. Fls. often showy, usu. solitary, axillary, terminal, or inserted on the ribs or in the notches of the stem. *Sepals, petals, and stamens indefinite in number, often numerous*

and in many series, the inner sepals gradually passing into the outer petals. Ovary inferior, sometimes sunk in the stem, 1-celled with placentas on the walls; ovules numerous. Berry pulpy. *Herbs, shrub^s, or trees, usu. succulent, with distinct cushion-like, spine-bearing areas ("areoles").* Stem long, branching, or reduced to a column or cone or globe. Leaves (when present) minute, scale-like, soon falling (large in *Pereskia*); stipules wanting. (Page 271.)

Fam. 84. **Thymelæaceæ.** Fls. 2-sexual or unisexual, in racemes, spikes, or heads. *Perianth-tube (receptacle) enclosing the superior ovary; perianth-lobes 4 or 5, imbricate in bud. Stamens as many or twice as many as the lobes, attached above the middle of the tube or at the throat, those opposite the lobes higher.* Ovary 1(2)-celled. Fruit not opening. Trees or shrubs, with net-like inner bark. (Page 286.)

Fam. 85. **Lythraceæ.** Fls. *irregular in Cuphea, usu. solitary or cymose, rarely paniculate. Calyx usu. tubular or bell-shaped with 6-4 valvate primary teeth or lobes, sometimes with as many accessory teeth or lobes. Petals as many as the primary teeth of calyx, sometimes wanting, clawed, imbricate.* Stamens varying in number, 2 smaller in *Cuphea*. Ovary 2-6-celled, sometimes becoming 1-celled. Ovules indefinite; placentas on axis. Capsule more or less enclosed by the persistent calyx-tube, with 2 or more cells or 1-celled, with many seeds. Herbs, shrubs, or trees. Leaves usu. decussate; stipules minute or wanting. (Page 290.)

Fam. 86. **Leechthidaceæ (Grias).** Fls. *in clusters on trunk and branches. Calyx cup-like, at length bursting into 2-4 persistent lobes. Petals 4-6, imbricate, springing from a ring-like disk round the top of the ovary. Stamens numerous, in several whorls, on the disk above the petals. Ovary inferior.* Trees. Stipules wanting. (Page 297.)

Fam. 87. **Rhizophoraceæ.** Fls. axillary in 2- or 3-forked cymes, or in clusters, or solitary. Calyx 4-5-lobed, valvate, persistent. *Petals as many as the sepals, inserted at the base of a disk, embracing stamens in Rhizophora, fringed above in Cassipourea.* Stamens inserted on the disk. Ovary superior or more or less inferior, 2-4-celled. Ovules 2 in each cell, pendulous from the axis. Fruit leathery, 1-5-celled, with one seed in each cell. Trees or shrubs, glabrous. *Leaves opposite, stipulate.* (Page 299.)

Fam. 88. **Combretaceæ.** Fls. 2-sexual, sometimes polygamodiceous or unisexual, in spikes, racemes, or heads, rarely paniculate. Calyx with 5 or 4 valvate lobes. Petals wanting, or 4-5, small. *Stamens as many or twice as many as the calyx-lobes, usu. inserted on the calyx-tube (receptacle). Ovary inferior, 1-celled.*

Ovules 2-3(-6), hanging from apex of cell. Fruit leathery or drupe-like, angled or winged, 1-celled, 1-seeded, usu. not opening. Trees or shrubs often climbing. Leaves alternate, or opposite in Laguncularia and Combretum, without stipules. (Page 303.)

Fam. 89. Myrtaceæ. Fls. occasionally subregular, 2-sexual or polygamous, in axillary or subterminal racemes or panicles, rarely cymes. Calyx 4-5-lobed, sometimes undivided in bud and opening irregularly in the flower or falling off like a lid. Petals 4, 5 (6) or fewer or wanting, spreading and distinct, or converging and more or less united to form a cap. *Stamens numerous, distinct. Ovary more or less inferior, 2-3-celled, or 4-5(-7)-celled. Fruit a berry, sometimes drupaceous. Trees or shrubs. Leaves opposite, with resinous or pellucid dots; stipules usu. wanting. (Page 313.)*

Fam. 90. Melastomaceæ. Calyx: tube free or partly or wholly adherent; limb truncate, lobed, or lid-like, lobes usu. imbricate. Petals as many as the calyx-lobes, imbricate. *Stamens usu. twice as many as petals; anthers bent down parallel to the filaments in the bud and lying in niches between calyx and ovary, 2-celled, usu. with a pore (rarely 2 or 4) at apex, connective often with appendages. Ovary with 2 or more cells; ovules usu. indefinite. Fruit enclosed by calyx-tube, capsular or berry-like, bursting irregularly or opening loculicidally. Seeds without endosperm, usu. minute. Herbs, shrubs, or trees. Leaves opposite, with 3-9 nerves curving from base to apex with parallel transverse veins at right angles; stipules wanting. (Page 353.)*

Fam. 91. Onagraceæ. Calyx: tube prolonged above the ovary, often with deeply cleft valvate lobes. *Petals usu. 2-4, twisted in bud. Stamens usu. twice as many as petals; anthers opening towards the centre. Ovary inferior, usu. 4-celled; ovules usu. numerous in the cells. Fruit a capsule or berry. Herbs, rarely shrubs. Leaves opposite or alternate; stipules very small or wanting. (Page 403.)*

Fam. 92. Araliaceæ. Fls. 2-sexual, or polygamous, or rarely diœcious. *Calyx inconspicuous, superior. Petals usu. 5 (3 or more), usu. valvate with apex thick, bent in. Stamens as many as petals. Ovary inferior, with one or more cells. Styles as many as ovary-cells; ovules solitary in cell. Fruit fleshy outside, with one or more distinct pyrenes, sometimes berry-like. Trees or shrubs. Leaves simple or compound, usu. stipulate. (Page 413.)*

Fam. 93. Umbelliferæ. Fls. regular or subirregular, 2-sexual, umbellate. *Sepals free, superior. Petals 5, equal or the outer larger. Stamens 5. Ovary inferior 2-celled. Disk on ovary,*

distinct from petals and stamens, 2-lobed. Styles 2. Ovules one in each cell, pendulous. Fruit inferior, dry, disk and styles usu. persistent, with ribs alternating with essential oil canals, separating septically into 2 one-seeded parts. Seeds adherent to the pericarp. Herbs. Leaves compound or simple. (Page 423.)

Fam. 3A. **Garryaceæ (Garrya).** *Fls. without petals, unisexual, dioecious, in spikes, within decussate united bracts. Male fls. stalked. Calyx with 4 valvate segments. Stamens 4, alternate to calyx-segments. Female fls. sessile or subsessile, without calyx. Ovary 1-celled, superior; ovules 2; styles 2, persistent. Berry ovoid. Seeds 1 or 2. Trees or shrubs. Leaves opposite, without stipules. (Page 429.)*

KEY TO FAMILIES

The figures before the names refer to the number of the family, those
after the names to the page.]

A. Perianth wanting or of a single series—the calyx.

Flowers unisexual.* Leaves simple or unifoliolate.

Leaves opposite.

Flowers in racemes 52. *Buxaceæ*1

Flowers in spikes within decussate united

bracts 3A. *Garryaceæ*429

Leaves alternate.

Sepals free.

Leaves unequal-sided 81. *Begoniaceæ*249

Leaves equal-sided.

Flowers racemose or paniculate 60. *Sapindaceæ*40

Flowers in clusters 76. *Flacourtiaceæ*.....211

Sepals continuous with calyx-tube.

Flowers in loose heads or spikes. Sepals

imbricate (overlapping) 84. *Thymelæaceæ*.....286

Flowers in dense heads or spikes. Sepals

valvate 88. *Combretaceæ*303

Flowers 2-sexual. Leaves simple.

Leaves opposite.

Ovary 2-celled. Sepals 5 61. *Rhamnaceæ*62

Ovary 4-celled. Sepals 4 91. *Onagraceæ*403

Leaves alternate.

Sepals valvate.

Sepals free.

Ovary 3-cornered. Fruit a 3-winged

capsule..... 60. *Sapindaceæ*40

Ovary not 3-cornered.

Fruit a drupe..... 61. *Rhamnaceæ* 62

Fruit globose, dry..... 63. *Tiliaceæ*80

Sepals united or continuous with calyx-
tube.

Stamens united..... 66. *Sterculiaceæ*154

Stamens free.

Ovary superior.

Fruit a drupe 61. *Rhamnaceæ*62

Fruit a capsule.

Flowers solitary 63. *Tiliaceæ*80

Flowers in racemes or panicles... 76. *Flacourtiaceæ*.....211

Ovary inferior 88. *Combretaceæ*303

* Polygamous flowers are referred to both unisexual and 2-sexua
flowers.

Sepals imbricate.

Sepals free.

Ovary 3-cornered. Fruit a 3-winged capsule 60. *Sapindaceæ*40

Ovary rounded. Fruit a berry..... 76. *Flacourtiaceæ*.....211

Sepals continuous with calyx-tube.

Stamens free.

Flowers with a corona..... 78. *Passifloraceæ*231

Flowers without a corona.

Ovules indefinite. Fruit with several seeds 76. *Flacourtiaceæ*.....211

Ovules solitary. Fruit one-seeded. 84. *Thymelæaceæ*.....286

Stamens united..... 76. *Flacourtiaceæ*.....211

B. Perianth of a double series—calyx and petals.

Flowers unisexual.

Leaves simple.

Leaves opposite.

Sepals united below.

Sepals imbricate. Stamens 4-5. Ovary superior 56. *Celastraceæ*24

Sepals valvate. Stamens 8-10. Ovary inferior 88. *Combretaceæ*303

Sepals free.

Stipules wanting. Seeds not hairy..... 71. *Guttifera*190

Stipules 2, narrow. Seeds hairy 73. *Quinacææ*203

Leaves alternate.

Sepals imbricate.

Leaves entire, crenate, or toothed.

Ovary superior.

Stamens definite.

Inflorescence terminal 53. *Anacardiaceæ*.....4

Inflorescence axillary.

Ovary superior.

Petals united at base with stamens adhering 55. *AQUIFOLIACEÆ*19

Petals and stamens free 56. *Celastraceæ*24

Ovary inferior 82. *Cucurbitaceæ*253

Stamens indefinite 70. *Ternstroemiaceæ*181

Leaves lobed or angled. Stamens 3 (5).

Ovary inferior 82. *Cucurbitaceæ*253

Sepals valvate, or minute, or wanting—the calyx being represented by a rim.

Leaves entire, crenate, or toothed.

Inflorescence axillary, a paniculate

cyme 59. *ICACINACEÆ*39

Inflorescences axillary and terminal,

racemose or spicate 61. *Rhamnaceæ*62

Inflorescences opposite leaves 62. *Vitaceæ*73

Inflorescences axillary, umbels or

heads 92. *Araliaceæ*413

Leaves lobed.

Inflorescences opposite leaves 62. *Vitaceæ*73

Inflorescences axillary..... 79. *Caricaceæ*243

Leaves compound.

Leaves alternate.

Sepals imbricate.

Leaves pinnate with odd leaflet. Fruit

drupaceous..... 53. *Anacardiaceæ*.....4

Leaves biternate or 3-foliolate or pin-

nate. Fruit usually capsular 60. *Sapindaceæ*40

Sepals valvate, or minute, or wanting—the

calyx being represented by a rim.

Leaves with 3 leaflets 62. *Vitaceæ*73

Leaves with 6 or more leaflets.

Petals not cohering 79. *Caricaceæ*243

Petals cohering..... 92. *Araliaceæ*413

Leaves subopposite 60. *Sapindaceæ*40

Flowers 2-sexual.

Leaves simple.

Leaves opposite.

Sepals continuous with calyx-tube.

Sepals imbricate.

Stamens 3 57. *Hippocrateaceæ*35

Stamens 4 56. *Celastraceæ*24

Stamens numerous 89. *Myrtaceæ*313

Stamens twice as many as petals 90. *Melastomaceæ*353

Sepals valvate or minute.

Stamens definite.

Ovary superior.

Leaves not decussate.

Nerves of leaves pinnate..... 61. *Rhamnaceæ*62

Nerves curved from base to apex 90. *Melastomaceæ*.....353

Leaves decussate 85. *Lythraceæ*290

Ovary inferior or half-inferior.

Trees or shrubs.

Ovary wholly inferior 88. *Combretaceæ*303

Ovary half inferior 87. *Rhizophoraceæ*299

Herbs 91. *Onagraceæ*403

Stamens indefinite.

Leaves without glandular dots 87. *Rhizophoraceæ*299

Leaves with glandular dots 89. *Myrtaceæ*.....313

Sepals free.

Sepals imbricate.

Leaves without stipules. Seeds not hairy.

Leaves leathery..... 71. *Guttifereæ*190

Leaves not leathery..... 72. *Hypericaceæ*202

Leaves with stipules. Seeds hairy ... 73. *Quinaceæ*203

Sepals valvate 87. *Rhizophoraceæ* ...299

Leaves alternate.

Sepals more or less united or continuous

with calyx-tube.

Sepals imbricate.

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Flowers in axillary spike-like racemes.

Racemes in clusters..... 54. *Cyrillaceæ*18

Racemes solitary 76. *Flacourtiaceæ* ...211

Flowers in axillary and terminal

cymes 55. *Aquifoliaceæ*19

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- Ovary superior.
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- Sepals valvate, or minute, or wanting—the calyx being represented by a rim.
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- Inflorescence axillary.
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- Flowers irregular [*Violaceæ*]210
- Stamens indefinite.
- Stamens free.
- Petals free.
- Pedicels not glandular.
- Ovary superior 67. *Dilleniaceæ*171
- Ovary inferior 83. *Cactaceæ*271
- Pedicels 5-glandular below calyx 74. *Bixaceæ*205
- Petals united to form a lid..... 69. *Marcgraviaceæ*178
- Stamens united at base, free from petals 69. *Marcgraviaceæ*178
- Stamens, outer united at base, adhering to petals..... 70. *Ternstræmiaceæ*181
- Stamens: filaments united into a tube 75. *Canellaceæ*207
- Sepals valvate.
- Petals hooded 61. *Rhamnaceæ*62
- Petals not hooded 63. *Tiliaceæ*80
- Leaves compound.
- Leaves opposite.
- Stamens 5 58. *Staphyleaceæ*37
- Stamens 8 60. *Sapindaceæ*40

Leaves alternate.

Inflorescence not umbellate nor in heads.

Inflorescence axillary or terminal.

Leaves pinnate with an odd leaflet.

Fruit fleshy 53. *Anacardiaceæ*.....4

Fruit a capsule 60. *Sapindaceæ*40

Leaves abruptly pinnate, or 3-foliolate 60. *Sapindaceæ*40

Leaves digitate 65. *Bombacaceæ*149

Inflorescence opposite the leaves 62. *Vitaceæ*73

Inflorescence umbellate.

Ovary 3-5-celled. Fruit fleshy outside 92. *Araliaceæ*413

Ovary 2-celled. Fruit dry, breaking up
into 2 parts..... 93. *Umbellifereæ*423

Inflorescence in dense heads 93. *Umbellifereæ*423

Leaves wanting, or minute and soon falling 83. *Cactaceæ*271

DICOTYLEDONS

FAMILY LII. BUXACEÆ.

TREES, shrubs, or rarely herbs. Leaves opposite (in *Buxus*) or alternate, usually entire, leathery, without stipules. Racemes or spikes axillary or sometimes above the axils, lax or dense. Flowers unisexual, monœcious, rarely diœcious, without petals, solitary in the axils of the bracts, terminal often female, the rest male. Perianth of 4-6 imbricate sepals or wanting. Male flowers: Stamens free, opposite to the sepals or indefinite. Rudiment of ovary present or absent. Female flowers: Ovary 3-(2)-celled; styles undivided; ovules 2 in each cell (rarely 1), pendulous, with dorsal raphe. Fruit a capsule loculicidally dehiscent, or more or less drupaceous, usually crowned by 2 or 3 persistent styles. Seeds: Endosperm more or less fleshy, or very rarely small or wanting.

Species nearly 60, found all over the world except in Australasia.

BUXUS L.

Shrubs or small trees, much branched; glabrous. Leaves opposite, subsessile, usually net-veined with the arch of the veins forming a continuous marginal nerve. Flowers monœcious. Bracts often numerous, similar to the perianth-segments but smaller, several often without flowers. Male flowers usually stalked in New World species. Sepals 4, in two series. Stamens 4, opposite the sepals. Rudiment of ovary truncate or obtusely 3-4-lobed. Female flowers sessile. Sepals 6, in two series, the outer smaller. Ovary 3-celled; styles, in Jamaican species, distant from one another, furrowed on the stigmatic portion, which does not reach to the base, slightly bent outwards. Capsule 3-horned with the persistent styles, dehiscing loculicidally, the undivided valves 2-horned with the split styles. Seeds

oblong, 3-cornered, with a small strophiole; endosperm somewhat fleshy; cotyledons oblong, scarcely broader than the radicle.

Species about 44, of which 6 are natives of temperate and mountainous regions of the northern hemisphere of the Old World, 3 or 4 from tropical Africa, one each from Madagascar and South Africa, the rest West Indian.

Leaves less than 10 cm. l.

Leaves elliptical to narrowly elliptical, usually tapering to both ends, often subacuminate, 4-8.5 cm. l.

Filaments broad 1. *B. laevigata*.

Leaves usually broadest above the middle, generally mucronate, 1.5-5 cm. l. Filaments linear.

Venation faintly seen on upper surface only 2. *B. bahamensis*.

Venation evident on both sides..... 3. *B. Vahlia*.

Leaves more than 15 cm. l. 4. *B. macrophylla*.

1. *B. laevigata* Spreng. *Syst. iii*, 847 (1826); leaves 4-8.5 cm. l., narrowly elliptical, oblong-elliptical, or elliptical, tapering to both ends, often subacuminate; male sepals 2-3 mm. l., lanceolate to

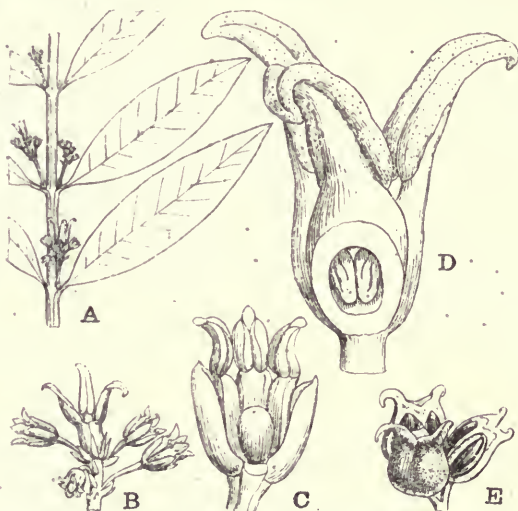


Fig. 1.—*Buxus laevigata* Spreng.

A, Portion of flowering branch $\times \frac{3}{4}$.

B, Inflorescence $\times 2$.

C, Male flower $\times 7$.

D, Female flower $\times 7$.

E, Fruit $\times 1\frac{1}{4}$.

oblong; filaments flat, broad.—*Baill. Monogr. Bux.* 66; *Muell. Arg. in DC. Prodr. xvi. pt. 1*, 16. *B. Purdiana* *Baill. op. cit.* 70 (1859); *Muell. Arg. tom. cit.* 15; *Urb. Symb. Ant. v.* 401. *B. pulchella* *Baill. op. cit.* 68 (1859). *Crantzia laevigata* *Sw. Prodr.* 38 (1788). *Tricera laevigata* *Sw. Fl. Ind. Occ.* 333, t. 7

(1797); *Juss. Euphorb. Tent. t. 1, 3 B*; *Griseb. Fl. Br. W. Ind. 31*. *T. fasciculata Griseb. loc. cit.* (Fig. 1.) Specimen from Swartz named by himself in *Herb. Mus. Brit.* Purdie's specimen in *Herb. Kew.*, named by Grisebach *T. fasciculata*.

In fl. Mar.-Dec.; in fr. Oct.-Dec.; Mts. of the west, *Swartz*! *Wright*! on the coffee ridge, St. Ann, *Purdie*! Battersea woods, near Christiana, 3000 ft.; Holly Mount, Mt. Diablo, 2500 ft.; Tyre, near Troy, 2000 ft.; *Harris*! John Crow (Blake) Mts., *Harris & Britton*! Fl. Jam. 8265, 8964, 9492, 10,755.

Shrub 3-10 ft. high. *Leaves*, venation slightly prominent on both sides, but not so evident beneath, papery. *Racemes* subsessile or peduncled. *Bracts* 1 mm. l., ovate, acute, at base of peduncle or a little above, with sterile bracts below the peduncle. *Flowers* whitish or greenish-yellow. *Male flowers*: *Pedicels* 2-4 mm. l. *Bracteoles* 2-3 mm. l. *Sepals* 2-3 mm. l., lanceolate to oblong. *Stamens* longer than the sepals; filaments flat, broad, 2-2.5 mm. l., to 1 mm. br.; anthers about 1.5 mm. l. Rudiment of ovary very small or wanting. *Female flowers*: *Sepals* like those of male. *Styles* with stigmas longer than ovary, even to twice as long. *Capsule* about 5 mm. l., about as long or a little longer than capsule.

The wood is very hard, yellow.

2. *B. bahamensis Baker in Hook. Ic. Pl. t. 1806 (1889)*; leaves 1.5-3 cm. l., oblanceolate to narrowly elliptical, apex usually acute, sometimes obtuse, mucronulate; veins faintly seen on upper surface only; filaments much narrower than the anther.—*Tricera bahamensis Britton in Bull. N.Y. Bot. Gard. iv. 139 (1906)* and in *Bull. Torr. Bot. Cl. xlii. 501*; *Britt. & Millsp. Bah. Fl. 243*.

In fl. July; Long Mt., south side, 300 ft., *Harris*! Fl. Jam. 9607.—Bahamas, Cuba.

Shrub or small tree, 4-15 ft. high. *Leaves* rigid, leathery. *Bracteoles* 1-2 mm. l., ovate with an acute brownish apex. *Flowers* greenish-white. *Male flowers*: *Pedicels* 2-3 mm. l. *Sepals* 1.5-2 mm. l. *Stamens* longer than the sepals. *Female flowers* sessile. *Sepals* 1-2 mm. l., oblong-ovate. *Styles* about as long as the ovary. *Capsule* 5 mm. l.

3. *B. VahlII Baill. Monogr. Bux. 67 (1859) (excl. syn. Juss.)*; leaves 2-5 cm. l., obovate or oblanceolate, apex rounded to somewhat obtuse, mucronulate; venation net-veined on both sides; filaments much narrower than the anther.—*Muell. Arg. tom. cit. 16*; *Urb. Symb. Ant. iv. 358*. *Tricera VahlII Britton in Brooklyn Bot. Gard. Mem. i. 19 (1918)*.

Specimen from Jamaica in *Herb. Mus. Paris* according to *Mueller*.—Porto Rico, S. Cruz.

Shrub 6-9 ft. *Leaves* leathery; petioles 1-2 mm. l. *Racemes* axillary, sessile. *Bracts* almost equalling the short pedicels, sterile below the flowers usually 6. *Male flowers*: *Sepals* scarcely 2 mm. l., oblong-ovate, acute, greenish. *Stamens* longer than the calyx. *Ovary* glabrous, shorter than the styles. *Capsules* 5-6 mm. l.

4. *B. macrophylla comb. nov.*; leaves 15-27 cm. l., 5-8 cm. br., lanceolate-elliptical or narrowly elliptical, acute at both ends.—

Tricera macrophylla Britton in Bull. Torr. Bot. Cl. xxxvii. 354 (1910).

In fr. Mar.; John Crow (Blake) Mts., 1500 ft., Harries & Britton. Fl. Jam. 10,770. Type in New-York Bot. Gard. Herb. and in Jam. Herb.

Shrub, sparingly branched or simple, 3-6 ft. high; bark rough. Leaves very large for the genus, venation slightly prominent and conspicuous on both sides; petiole 1 cm. or less. Raceme (in fruit) slightly above the axils; peduncle 5 cm. l. Bracts at base of peduncle, 1-2 mm. l., ovate. Male flowers (persisting at base of capsule): Pedicels about 2 mm. l., clustered. Bracteoles about 2 mm. l., lanceolate. Capsule 7-8 mm. l., brownish, minutely puberulous; horns much shorter than capsule. Seeds shining black, 5 mm. l.

FAMILY LIII. ANACARDIACEÆ.

Trees or shrubs, containing resin. Leaves alternate, simple, or pinnate with an odd leaflet (or 1-3-foliate) without stipules, or the lowest leaflets stipule-like. Flowers hermaphrodite or polygamo-dioecious, or unisexual, regular. Calyx divided into 3-5 segments or consisting of 5 free sepals. Petals 3-5, free. Disk generally ring-like. Stamens usually twice as many as the petals, sometimes of equal number, inserted at the base of the disk. Anthers opening towards the centre. Ovary in the female flower 1-celled, in *Spondias* 2-5-celled; styles 1-5. Ovules solitary in the cells, pendulous or broadly attached to the partition of the cell or pendulous from a stalk which rises from the base of the cell. Fruit superior, free or surrounded either by the base of the calyx or disk, sometimes at the top of a fleshy body formed out of the base of the calyx and the top of the flower-stalk, 1-5-celled, usually drupaceous, indehiscent or the stone of *Mangifera* dehiscent. Seeds: endosperm wanting or scanty; cotyledons flat-convex, fleshy.

Species 500, natives of the tropics and subtropics, rare in temperate regions.

Ovary 1-celled.

Leaves simple.

Nut at the top of a fruit-like body..... 1. *Anacardium*.

[Fruit a drupe *Mangifera*.]

Leaves pinnate.

Parts of flowers usually in fives.

Calyx 5-cleft..... 2. *Rhus*.

Calyx of free sepals..... 3. *Mosquitoxylum*.

Parts of flowers usually in threes 4. *Comocladia*.

Ovary 3-5-celled, Leaves pinnate..... 5. *Spondias*.

1. ANACARDIUM Rottb.

Shrubs or trees. Leaves simple, entire. Panicles terminal. Flowers polygamous. Calyx 5-parted, deciduous, imbricate.

Petals 5; linear, recurved, imbricate. Stamens 8-10, unequal, all, or a few, fertile; filaments united more or less into a tube, but only at the base in *A. occidentale*. Ovary free; style thread-like, lateral, with the apical point stigmatic; ovule lateral, ascending. Nut kidney-shaped, at the top of a very large pear-shaped fleshy fruit-like body, composed of the enlarged receptacle and stalk, indehiscent, the shell with a middle layer of numerous cavities containing an acrid oil. Seed kidney-shaped, ascending; cotyledons curved, flat-convex.

Species 8, natives of tropical America, chiefly of Brazil.

A. occidentale L. *Sp. Pl.* 383 (1753); *Jacq. Sel. Stirp. Amer.* 124, t. 181, f. 35 & *Ed. pict.* t. 121; *Wright Mem.* 186; *Descourt. Fl. Ant.* vii. 233, t. 507; *Macf. Jam.* 219; *Griseb. Fl. Br. W.*

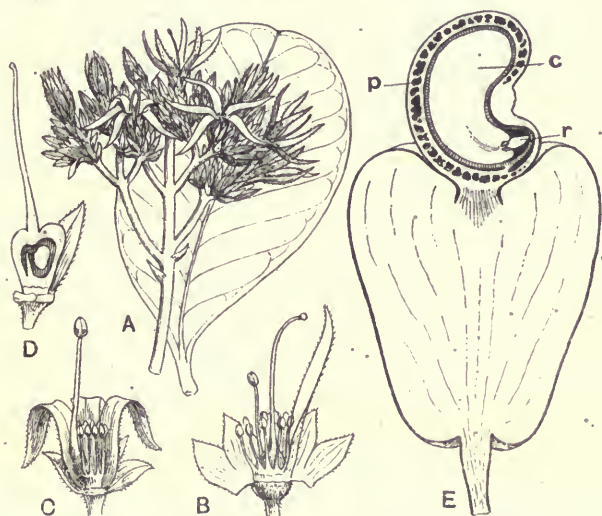


Fig. 2.—*Anacardium occidentale* L.

A, Leaf and portion of inflorescence $\times \frac{3}{8}$.
B, Hermaphrodite flower, calyx opened
and 4 petals removed $\times 2$.
C, Male flower with 1 sepal and 2 petals
removed $\times 2$.

D, Pistil cut lengthwise $\times 3$.
E, Nut on the top of the enlarged recep-
tacle and stalk cut lengthwise $\times \frac{3}{8}$;
p, pericarp with layer of oil-contain-
ing cavities; c, cotyledon; r, radicle.

(E after Engler.)

Ind. 176; *Baill. Hist.* v. 274, 275, f. 321-324; *Hook. f. Fl. Brit. Ind.* ii. 20; *Engl. in Fl. Bras.* xii. pt. 2, 409 & in *DC. Monogr.* iv. 219, t. 4; *Cook & Coll. in Contrib. U.S. Nat. Herb.* viii. 75; *Urb. Symb. Ant.* iv. 359. *Anacardi* sp. *Rheede Hort. Mal.* iii. t. 54. *Cassuvium* *Rumph. Amboin.* i. 177, t. 69. *Pomifera* seu *potius* & c. *Sloane Cat.* 187 & *Hist.* ii. 136. *Anacardium* L. *Fl. Zeyl.* 73.

Anacardium fructu &c. *Browne Hist. Jam.* 226. *Cassuvium pomiferum* *Lam. Encyc. i.* 22 (1783); *Tussac Fl. Ant. iii.* 54, t. 13. (Fig. 2.) Type in Herb. Hermann in Herb. Mus. Brit. A specimen also in Herb. Linn. named by Linnaeus.

Cashew Tree.

In fl. after the rains in summer; *Sloane* Herb. vii. 76! *McNab! Hitchcock; Harris!* *Fl. Jam.* 7633, 8511, 11,899.—Indigenous and cultivated in tropical America (incl. W. Indies); cultivated in tropics of Old World.

Tree to 40 ft. high, precocious to an extraordinary degree, as it has been known to blossom and bear fruit in one year from the time of sowing. *Leaves* 1-1.5 dm. l., obovate-elliptical, apex rounded or emarginate, base wedge-shaped or rounded, glabrous; petiole 1-1.5 cm. l. *Panicles* longer than the leaves, 1.5-2.5 dm. l. *Flowers* crowded towards the ends of the panicle-branches, pink or yellow with pink stripes, fragrant. *Calyx* 4-5 mm. l. *Petals* 7-13 mm. l. *Filaments*: one much longer than the rest, 8-11 mm. l., the rest 2-3 mm. l.; anthers (all with pollen) of long filament about 1 mm. l., the rest barely .5 mm. l. *Ovary* in male flower rudimentary, in female flower nearly 2 mm. long; style awl-shaped, 4-8 mm. l. *Fruit-like body*, "cashew-apple," crimson, yellow, or white, 6-10 cm. l. *Nut* 2 to nearly 3.5 cm. l. *Seed* 1.5 to nearly 3 cm. l. The "apple" is but little developed until the nut is of full size, then it completes its growth in a few days.

The milky juice of the tree is used as an indelible marking-ink. The gum exuding from old trees is transparent, and not inferior to gum arabic; it is used by bookbinders, as it is obnoxious to insects. A decoction of the bark is used as an astringent remedy for diarrhoea. The timber is close-grained, strong, and durable; a cub. ft. weighs 30 to 40 lbs.; it is used for boat-building, yokes, hubs, charcoal, &c. The cashew apple is edible, tasting agreeably rough, sweet, and juicy, and forms an excellent preserve. "It is considered wholesome, and to be of service in cases where the tone of the stomach is impaired, and especially in the disease known by the name of dirt-eating" (*Macfadyen*). Wine can be made, and a spirit distilled, from it. The kernels of the roasted nuts are considered equal to almonds; they yield a light yellow oil equal to almond oil. The oil (cardole) in the shell of the nut is thick, black, and very acrid, efficacious for preserving bindings of books, carved wood, &c., from white ants. See *Barham, Hortus Americanus*; *Watt, Dict. Econ. Products of India*.

[MANGIFERA L.

Trees. Leaves alternate, simple, entire. Panicles terminal. Flowers polygamo-dioecious. Calyx 4-5-cleft, imbricate. Petals 4-5, imbricate. Disk: 5 fleshy lobes, alternate with the petals. Stamens 1 or 4-5, inserted within or on the disk, 1, rarely more, fertile and much larger than the others. Ovary free, 1-celled; style lateral; ovule above the base of the cell, ascending. Drupe ellipsoidal or somewhat kidney-shaped, fleshy; endocarp more or less fibrous outside. Seed compressed; cotyledons often lobed.

Species about 27, natives of tropical Asia.

M. indica *L. Sp. Pl.* 200 (1753); *Jacq. Ic. Pl. Rar. t.* 337; *Tussac Fl. Ant. ii.* 57, t. 15; *Descourt. Fl. Ant. i.* 121, t. 25; *Macf. Jam. i.* 221; *Bot. Mag. t.* 4510; *Griseb. Fl. Br. W. Ind.* 176; *Hook. f. Fl. Brit. Ind. ii.* 13; *Engl. in DC. Monogr. Phan.*

iv. 198, t. 4; Watt, *Dict. Econ. Prod. Ind. & Com. Prod. Ind.*; *Urb. Symb. Ant.* iv. 358. *M. domestica* Gaertn. *Fruct.* ii. 95, t. 100. (1791). (Fig. 3.) Type in Herb. Linn.

Mango.

In fl. Jan., Feb.; in fr. from end of May to middle of Aug.; native in India; cultivated and spontaneous in the tropics.

Tree 30-40 ft. high. Leaves 1-2(-4) dm. l.; 5-8 cm. br.; oblong, tapering at both ends, or lanceolate-elliptical. Panicles 1.5-2(-3) dm. l.; branches and flowers puberulous. Flowers yellow, very fragrant in the early morning, male and hermaphrodite on the same panicle. Sepals

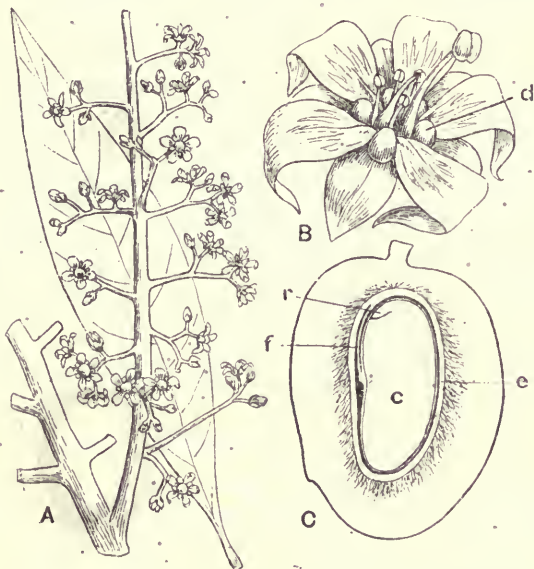


Fig. 3.—*Mangifera indica* L.

A, Small leaf and portion of inflorescence.
× $\frac{2}{3}$.

B, Hermaphrodite flower × 5; d, disk.

C, Fruit cut lengthwise × $\frac{1}{2}$; e, endocarp;
f, funicle; c, cotyledon; r, radicle.

about 2.5 mm. l. Petals longer than the sepals, 5, with 3-5 ridges. Stamens: fertile stamen 3-5 mm. l., sterile stamens 4, about 1 mm. l. *Drupe* .5-1.5 dm. l.

The Mango is not mentioned by Sloane, Browne, or Swartz, as it was only introduced into Jamaica in 1782. Capt. Marshall of H.M. frigate "Flora," one of Rodney's squadron, captured a French frigate bound from Mauritius to the French West Indies, with a consignment of plants and seeds of economic value for naturalization. The plants were transferred from the "Flora" to the botanical garden of Mr. Hinton East. The Mango, of an excellent variety, had the number 11 attached to it. Hence the progeny of this Mango, with fruit of the quality of the parent, is known as the No. 11 Mango. The Mango has spread abundantly in Jamaica from sea-level up to 3000 or 4000 ft. To a stranger ignorant of

its history it would seem to form an important and prominent part of the indigenous flora. The fruit has varied much, and the different kinds have received local names. The No. 11 Mango was the finest in quality until the Bombay Mango and other kinds were introduced of late years. The wild trees are being grafted with the best kinds. See *Bull. Bot. Dept. Jam. n.s. viii. 161 (1901)*; *Bull. Dept. Agric. i. 253, 262 (1903).*]

2. RHUS L.

Trees or shrubs. Leaves pinnate with an odd leaflet (in Jamaican species), 1-3-foliolate, or simple. Panicles axillary or



Fig. 4.—*Rhus Metopium* L.

- A, Panicle of male flowers with leaf $\times \frac{1}{2}$. C, Female flower ditto $\times 4$.
 B, Male flower cut lengthwise $\times 4$. D, Drupe ditto $\times 2$.
 (After Sargent.)

terminal. Flowers small, polygamous. Calyx 5-(4-6)-cleft, persistent; usually imbricate. Petals 5 (4-6), imbricate. Disk ring-like. Stamens 5 (4-6 or 10), inserted at the base of the disk, free; anthers without pollen in the female flower. Ovary subglobose; styles 3, united or free, short or long, stigmas simple or capitate—in West Indian species the styles are united into one very short style crowned by a 3-lobed stigma; ovule hanging at end of a long stalk arising from the base of the ovary. Drupe small, the outer covering is resinous enclosing a stone.

Species about 120, of which a few are tropical, the rest natives of the warmer parts of regions outside the tropics.

R. Metopium *L. Syst. ed.* 10, 964 (1759) & *Amæn. v.* 395, 377; *Lun. Hort. Jam. i.* 375; *Macf. Jam. i.* 225; *Griseb. Fl. Br. W. Ind.* 175; *Sarg. Silv. iii.* 13 (in part), *tt.* 100, 101. *Terebinthus maxima* &c. *Sloane Cat.* 167 & *Hist. ii.* 90, *t.* 199, *f.* 3. *Metopium foliis* &c. *Browne Hist. Jam.* 177, *t.* 13, *f.* 3. *Borbonia fructu corallino* &c. *Plum. Pl. Amer. (Burm.)* 51, *t.* 61. *Terebinthus Brownii* *Jacq. Enum. Pl. Carib.* 18 (1760). *Metopium* *Linnæi Engl. in DC. Monogr. iv.* 367 (1883) (in part). *M. Brownei Urb. Symb. Ant. v.* 402 (1908). (Fig. 4.) Type in Herb. Linn.

Jamaica Sumach, Burn Wood.

Sloane Herb. vi. 106! *Browne!* *Wright!* *Broughton!* *Macfadyen!* near Savanna la Mar, *Purdie!* *March!* *Prior!* *Liguanæa plain, Campbell!* *Watson's Hill, Manchester, 800 ft.; Long Mt., 300 ft.; Great Goat Is.; Lititz Savanna, 300-900 ft.; Harris!* *Fl. Jam.* 5753, 6195, 6416, 9224, 9317, 11,766; *Pigeon Is., Mazon & Killip!*—Cuba, *Hispaniola, Yucatan.*

Tree 15-25 ft. high. Leaves at the end of the branches, 2-paired with an odd leaflet; leaflets roundish, sometimes somewhat obovate, rarely ovate, apex rounded or shortly and abruptly acuminate with obtuse acumen, sometimes emarginate, base roundish or somewhat wedge-shaped, often unequal, papery to leathery, 4-9 cm. l. Panicles about as long as the leaves or a little longer. Calyx 1.2-1.5 mm. l., cup-shaped; lobes semicircular, not imbricate in flowering. Petals nearly 4 mm. l., elliptical, pale yellow. Drupe ellipsoidal, scarlet, about 1.5 cm. l.

Sloane gives the name Doctor Tree or Boar Tree to this tree, and *Browne* calls it Hog Gum Tree, but *Macfadyen* (*Jam. i.* 139) shows that these names belong to *Symphonia globulifera* *Linn. f. (Moronebea coccinea).*

3. MOSQUITOXYLUM Kr. & Urb.

Tree. Leaves pinnate with an odd leaflet; leaflets entire. Flowers small, sessile, spicate on branches of lateral panicles, dioecious, regular, parts in fives, each with a bract and two bracteoles. Sepals 5, free, imbricate, persistent. Petals 5, equal, imbricate. Stamens 5; inserted on the margin of a fleshy disk, very small and sterile in female flower; filaments awl shaped; anthers attached at the back, opening towards the centre. Ovule attached laterally above the base of the cell, suspended from a stalk-like appendage; micropyle sublateral. Style central, short, 3-cleft at the apex, lobes bearing stigmas on the outside. Capsule shortly obliquely oval, compressed, exocarp, thin, not resinous, endocarp thin, bony, opening a little. Seed not seen.

Species 1, native of Jamaica and Panama.

M. jamaicense *Kr. & Urb. in Notizbl. Berl. Bot. Gard. i.* 78 (1895) & *Symb. Ant. i.* 344. (Fig. 5.)

Mosquito Wood.

In fl. Feb.; in fr. Aug.-Feb.; Hanover, J.P. 1287, *Morris!* *Chilton, Westmoreland, Mennell!* *Ipswich, Palache!* *Lapland, near Catadupa,*

1750-2000 ft.; near Darliston, 1500 ft.; *Harris!* Fl. Jam. 9173, 9185, 9828.—Panama.

Tree 30-50 ft. high, with a straight smooth trunk. *Leaves* 1.5-2 dm. l., 5-8-paired; petiole 3-4 cm. l.; leaflets in 8 pairs, 5-13 cm. l., oblong-elliptical, broadest above the middle, apex obtuse or very shortly and obtusely acuminate, base very unequal-sided; tapering into the short



Fig. 5.—*Mosquitoxylum jamaicense* Kr. & Urb.

A, Leaf and inflorescence $\times \frac{1}{2}$.

B, Portion of inflorescence with flower-buds $\times 3$.

C, Fruit with part of exocarp cut away to show the endocarp $\times 2$.

petiolule. *Bracts* at base of branches of panicle, 1.5-2 mm. l., triangular; floral bracts and bracteoles similar, smaller. *Flowers* white. *Sepals* roundish-triangular, outer 1.5 mm. l., 1.2 mm. br., inner smaller. *Capsules* scarlet, 7-8 mm. l.

Timber good for building purposes, but not so good for posts in the ground.

4. COMOCLADIA L.

Trees, small; trunk slender, usually not branching; with glutinous sap which turns blackish, and makes an indelible stain. Leaves crowded at top of trunk, alternate, pinnate with an odd leaflet; leaflets more or less opposite, entire or toothed, reduced

in size towards base of leaf. Panicles axillary, usually shorter than the leaves. Flowers minute, crowded, polygamous, sessile or subsessile; parts of flowers (in Jamaican species) in threes, rarely in fours. Calyx 3-cleft, coloured a lighter tint than the petals, persistent, imbricate. Petals imbricate, red. Disk with three broad lobes. Stamens inserted at the notches of the disk, free. Ovary free, 1-celled, with 3 stigmas; ovule at the end of a long stalk springing from the base. Drupe oblong-ellipsoidal, fleshy. Seed oblong; cotyledons fleshy, plano-convex.

Maiden Plum.

Species 20, of which two are natives of Mexico, the rest natives of the West Indies, seven being found only in Jamaica, one in Jamaica and Hispaniola.

Leaflets entire, not undulate, nor toothed.

Plants glabrous, or more or less hairy.

Leaflets in 6-9 pairs, upper usually more than 5 cm. l.

Leaves to 6 or 7 dm. l., glabrous or pubescent.

Leaflets with truncate or rounded base 1. *C. pinnatifolia*.

Leaflets with cordate or subtruncate base ... 2. *C. pilosa*.

Leaves to 3 dm. l., glabrous. Leaflets with cordate base 3. *C. cordata*.

Leaflets in 3-5 pairs, upper usually less than 5 cm. l. 4. *C. parvifolia*.

Panicle, twigs, and leaves brown-velvety 5. *C. velutina*.

Leaflets toothed or undulate.

Leaflets with large coarse teeth.

Leaflets in 8-10 pairs, apex acute to shortly acuminate 6. *C. Hollickii*.

Leaflets in about 14 pairs, apex ending in a long slender acumen 7. *C. grandidentata*.

Leaflets with small shallow teeth.

Leaflets in 10-11 pairs, base subequal 8. *C. jamaicensis*.

Leaflets in 6-8 pairs, base unequal 9. *C. troyensis*.

§ 1. Leaflets entire, not undulate, nor toothed.

1. *C. pinnatifolia* L. *Syst. ed.* 10, 861 (1759) & *Amœn. v.* 375; glabrous, or panicles minutely puberulous, and twigs, petiole, and rhachis of leaves, also midrib and nerves, more or less covered with brownish hairs, or glabrescent; leaves 2-6 dm. l.; leaflets in 6-11 pairs, largest 5.5-13(-17) cm. l., 2.5-5(-7) cm. br., base truncate, rounded, or subcordate, equal or sometimes slightly unequal. — *Britton in Bull. Torr. Bot. Cl. xxxvii.* 345 & *ali.* 9. *C. caudice* & c. *Browne Hist. Jam.* 124. *C. integrifolia* Jacq. *Enum. Pl. Carib.* 12 (1760) & *Sel. Stirp. Amer.* 12; *L. Sp. Pl. ed.* 2, 49; *Lam. Encyc. ii.* 69 & *Illustr. t.* 27, f. 1; *Sw. Obs. Bot.* 26; *Macf. Jam. i.* 223; *Griseb. Fl. Br. W. Ind.* 175. *C. pubescens* Engl. *Bot. Jahrb. i.* 420 (1881) & in *DC. Monogr. iv.* 362; *Britton op. cit. xxxvii.* 347. *Prunus*

racemosa caudice &c. *Sloane Cat.* 184 & *Hist.* ii. 131, t. 222, f. 1. (Fig. 6.)

In fl. Nov. to April; near St. Jago de la Vega, *Sloane Herb.* vii. 74! *Robins!* *Shakspear!* *Masson!* *Distin!* *Martin's Hill,* Manchester, *Purdie!* *Wulfschlaegel!* *March!* Moneague, *Prior!* Potsdam, *Britton,* 1231! near Troy, 2500 ft.; wooded hill near north-east of Dolphin Head; Leicesterfield, Clarendon, 1800 ft.; Soho, St. Ann, 1400 ft.; *Harris!* John Crow (Blake) Mts., 1000 ft.; near Bull Bay; *Harris & Britton!* Fl. Jam. 9079, 10,814, 10,710, 10,786, 10,839, 11,994. Halberstadt, *Gosset!*—Hispaniola.

Tree 12-25 ft. high, sometimes flowering on a sucker even at the height of two feet. *Leaves:* intervals between leaflets 2.5-5 cm. l.; petiole and rhachis rounded; leaflets, lowest 1.5-3 cm. l., 1.2-2 cm. br. ovate, obtuse; upper ovate-oblong or oblong, apex acuminate, acute, or apiculate; nerves prominent beneath. *Bracts* .8 mm. l., triangular,

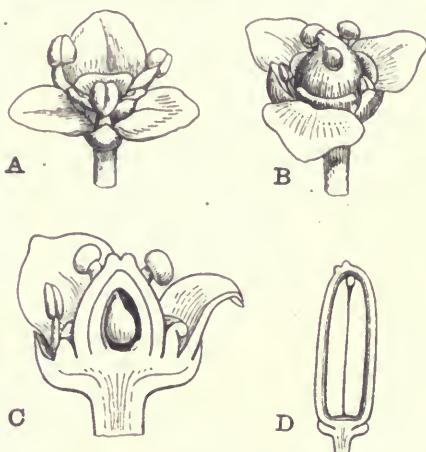


Fig. 6.—*Comocladia pinnatifolia* L.

A, Male flower $\times 10$.
B, Female flower $\times 10$.

C, Ditto cut lengthwise $\times 20$.
D, Drupe cut lengthwise $\times 2$.

tapering to apex; margin with a few hairs. *Flowers* sessile or subsessile, dark crimson. *Calyx:* segments .4-.7 mm. l., .6-.7 mm. br. *Petals* ovate-elliptical or roundish-elliptical, 1-1.3 mm. l., .9 mm. br. *Drupe* slightly incurved, reddish, oblong-ellipsoidal, 7-13 mm. l.

This and other species of *Comocladia* are sometimes used for growing fence-posts, as they readily take root. The larger trees have a dark red heart-wood, and are used by the peasantry for house-posts, as they are very durable in the ground.

2. *C. pilosa* Britton in *Bull. Torr. Bot. Cl.* xxxvii. 348 (1910); young twigs, leaves, and inflorescence densely pilose pubescent, leaflets pubescent on both sides including the veins, rhachis of inflorescence densely tomentellous; leaves about 7 dm. l.; leaflets in about 9 pairs, largest 9-14 cm. l., 4-5 cm. br.; base cordate or subtruncate.

In fl. Apr.; wooded hill, Union Hill, near Moneague, *Britton & Hollick*, 2762!

Tree about 20 ft. high. *Leaflets*, lowest pair 4-5 cm. l., suborbicular, second and third pairs 5-8 cm. l.; ovate-orbicular, upper oblong or ovate-oblong, apex obtuse, acutish, or abruptly short acuminate. *Panicles* 2.5 dm. l. or less. *Sepals* rounded, with a few scattered hairs. *Petals* a little longer than the sepals, rounded. *Filaments* twice as long as anthers. *Drupe* not known.

A leaflet, and small portion of the inflorescence in bud, of the type have been received from Dr. Britton. The species is evidently closely allied to *C. pinnatifolia* L.

3. *C. cordata* *Britton in Torreya*, vii. 6 (1907); glabrous plants; leaves 2-3 dm. l.; leaflets in 6-7-pairs; sessile, largest about 10 cm. l., 3.5 cm. br.; base cordate, equal.

In fl. Sept.; rocky wooded hill, Troy, *Britton*, 640! near Troy, 2000 ft., near Troy, *Harris!* Fl. Jam. 9416.

Tree 40 ft. high. *Leaves*: intervals between leaflets about 4 cm.; petiole roundish, somewhat flattened on the upper side; leaflets ovate-oblong to oblong, shortly acuminate, nerves prominent beneath, nearly at right angles with midrib. *Flowers* crimson. *Calyx*: segments .8 mm. l., 1.2 mm. br., roundish. *Petals* broadly ovate, 1.2 mm. l. and br. at base. *Drupe* not seen.

4. *C. parvifoliola* *Britton in Bull. Torr. Bot. Cl. xxxvii*, 346 (1910); glabrous plant; leaves 1-2 dm. l.; leaflets in 3-5-pairs; upper 4-5.5(-7) cm. l., base subcordate or rounded, subequal.

In fl. Mar.; woodlands, Dolphin Head, *Britton*, 2473; Dolphin Head, 1800 ft., *Harris!* Fl. Jam. 10,267.

Tree to 30 ft. high. *Leaves*: intervals between leaflets 1.6-1.8 cm.; petiole angular, more or less 2-edged in the basal node; leaflets sessile or subsessile, lowest pair often broadly ovate, 2-3 cm. l., upper, oblong to oblong-lanceolate, apex blunt, often very shortly acuminate, sometimes somewhat unequal-sided, leathery; nerves prominent on both sides; a hollow gland in axils of nerves beneath, showing as a slight swelling above. *Panicle* as long as the leaves or longer, slender, to 2 dm. l. *Flowers* crimson. *Calyx*: segments about .5 mm. l. and br., roundish. *Petals* ovate-elliptical, .8-.9 mm. l. *Drupe* not seen.

5. *C. velutina* *Britton in Torreya*, vii. 6 (1907); panicle, with young twigs and leaves rusty-brown velvety; leaves 1.5-3 dm. l.; leaflets in 5-8-pairs, largest 4-7.5 cm. l., 2.5-3.5 cm. br., base truncate or subcordate, equal, sometimes subequal.—*C. propinqua* *Griseb. Fl. Br. W. Ind.* 175 (1859) (non *Kunth*).

In fl. Mar., Apr., Sept.; in fr. Mar., Apr.; *Broughton! March!* Great Goat Is., 150 ft.; Healthshire Hills; Great Pedro Bay; dry rocky hills, Fort Henderson; *Harris!* Fl. Jam. 9208, 9519, 9713, 10,153.

Tree, 15-40 ft., branching into a spreading head about six feet from the ground. *Leaves*: intervals between the pairs 1.5-3 cm.; leaflets elliptical to oblong-elliptical, apex rounded or obtuse; nerves conspicuous beneath; petiolules 1-2 mm. l. *Flowers* dull crimson, pedicel extremely short, pubescent. *Calyx*: segments roundish, .7-.8 mm. in diam. *Petals*

roundish to broadly ovate, 1-1.2 mm. in diam. *Drupe* ellipsoidal, 1 cm. l., 6-7 mm. in diam.

6. *C. Hollickii* Britton in *Bull. Torr. Bot. Cl. xxxvii.* 346 (1910); glabrous plant; leaves 3-4 dm. l., leaflets in 8-10-pairs, upper 6-10 cm. l., margin coarsely toothed, apex acute to shortly acuminate.

In fl. Mar.; Rocky hillside, Bluefields Mt., 1650 ft., Britton & Hollick, 2000; wooded hill, Potsdam, Britton, 1271!

Low, flowering when not more than 3 ft. high, to 10 ft. high. *Leaves*: intervals between the pairs about 3-4 cm.; leaflets: lowest 3-5 cm. l., ovate, upper ovate-lanceolate to oblong, base obtuse or subtruncate, usually equal-sided, papery; nerves prominent beneath, slightly prominent above; petiolule 1.5-3 mm. l. *Panicle* short, about 8 cm. l., sparingly branched, narrow. *Corolla* (in bud) .5 mm. in diam., purple. *Sepals* and *petals* obtuse, rounded. *Filaments* twice as long as the anthers.

We have not seen the inflorescence, but give description from Britton *loc. cit.*

7. *C. grandidentata* Britton in *Bull. Torr. Bot. Cl. xxxvii.* 346 (1910); glabrous plant; leaves about 8 dm. l.; leaflets in about 14 pairs, upper 7-15 cm. l., margin coarsely and irregularly toothed, apex acute or abruptly acuminate, ending in a long slender acumen.

Hopeton, Westmoreland, 1350 ft., Harris! Fl. Jam. 9944.

Tree to 30 ft. high, slender. *Leaves*: rhachis and petiole striate, intervals between the pairs about 5 cm.; leaflets: lowest about 4 cm. l., ovate, upper 3-4.5 cm. br., opposite leaflets sometimes unequal, oblong, obtuse or subtruncate and more or less oblique at base, petiole 3 mm. l. *Flowers* and *fruit* not known.

8. *C. jamaicensis* Britton in *Bull. Torr. Bot. Cl. xxxvii.* 347 (1910); panicle densely and minutely puberulous; leaves 3-4.5 dm. l., rhachis pilose; leaflets in 10-11-pairs, more or less pubescent on the midrib beneath, and occasionally sparingly pubescent on midrib above and nerves beneath, 7-8 cm. l., margin undulate with shallow teeth, base equal or subequal, rounded to subtruncate.

Dry rocky hill, Green Island, 200 ft., Harris! Fl. Jam. 10,250, also Britton & Hollick, 2132.

Tree 6 ft. high. *Leaves*: pairs not always quite opposite, intervals between the pairs about 3 cm.; leaflets: lowest 2.5-5 cm. l., ovate to ovate-lanceolate, upper about 2 cm. br., oblong or oblong-lanceolate, acute to acuminate; nerves prominent on both sides; petiolules 3-4 mm. l., more or less pubescent. *Panicle* about 3 dm. l., branches short and slender. *Flowers* very young in specimen. *Drupe* not seen.

9. *C. troyensis* Fawc. & Rendle in *Journ. Bot. liz.* 18 (1921); panicle very sparingly puberulous; leaves 2-5 dm. l., leaflets in 6-8-pairs, petiole and rhachis more or less covered with long yellow stiff hairs; leaflets more or less hairy on both sides or

glabrescent, upper 5–10·5 cm. l., margin undulate with small teeth, or almost entire, base unequal-sided, obtuse.

In fl. Feb.; near Troy, 2500 ft., *Harris!* Fl. Jam. 9349. Types in Herb. Mus. Brit. and Herb. Jam.

Tree. *Leaves*: intervals between the pairs, 3–6 cm. l.; leaflets: lowest about 2·5 cm. l., ovate-elliptical, upper 3·4–5 cm. br., ovate-oblong to oblong, apex acute or very shortly acuminate, nerves prominent; petiolule 1–8 mm. l. *Panicle* short, simple. *Pedicels* about 1 mm. l. *Flowers* dark crimson. *Calyx*: segments roundish, about ·6 mm. l., ·6–·7 mm. br. *Petals* broadly ovate, 1–1·1 mm. l. *Drupe* not seen.

5. SPONDIAS L.

Trees. *Leaves* alternate, pinnate with an odd leaflet; leaflets opposite, generally long acuminate. Racemes or panicles terminal or axillary. Flowers small, polygamous. Calyx small, deciduous, 4–5-lobed, lobes slightly imbricate. Petals 4–5, subvalvate. Disk cup-shaped, crenate. Stamens 8–10, inserted under the disk. Ovary 3–5 celled, free; styles 3–5; ovule pendulous. *Drupe* fleshy; putamen bony or woody with openings near the apex, 1–5-celled. Seeds pendulous; embryo straight; cotyledons elongated.

Species 5, natives of the tropics, often cultivated.

Leaflets distinctly unequal-sided at the base.

Leaflets 6–10 cm. l.; panicle usually longer than leaves.

Drupe 3–4 cm. l. 1. *S. Monbin.*

Leaflets 2–4 cm. l.; inflorescence short. Drupe 2·5–3 cm. l. 2. *S. purpurea.*

[Leaflets nearly equal-sided, 6–7 cm. l. Drupe to 10 cm. l. and 5 cm. in diam. *S. cytherea.*]

1. *S. Monbin* *L. Sp. Pl.* 371 (1753) (errore Mombin); common petiole subterete; leaflets 6–10(–13) cm. l., unequal-sided, acuminate, shortly but distinctly petiolulate; panicle usually longer than the leaves.—*L. Amœn. v.* 379; *Jacq. Sel. Stirp. Amer.* 138; *Gaertn. Fruct. ii.* 102; *Hiern Cat. Welw. Afr. Pl. i.* 175; *Urb. Symb. Ant. iv.* 359; *Britton Fl. Berm.* 222. *S. foliis paucioribus* &c. and *S. foliis plurimis* &c. *Browne Hist. Jam.* 229. *S. Myrobalanus* *L. Syst. ed.* 10, 1036 (1759) & *Herb.*; *Willd. Sp. Pl. ii.* 751; *Wright Mem.* 272. *S. lutea* *L. Sp. Pl. ed.* 2, 613 (1762) & *Herb.*; *Griseb. Fl. Br. W. Ind.* 175; *Engl. in Fl. Bras. xii. pt. 2,* 374 & *DC. Monogr. iv.* 244; *Guppy Plants &c. W. Indies,* 111, *S. pseudomirobalanus* *Tussac Fl. Ant. iv.* 97, t. 33 (1827). *S. graveolens* *Macf. Jam. i.* 228 (1837); *Hart in Gard. Chron. u.s. xiii.* 682 (1880). *Prunus americana*, ossiculo &c. *Pluk. Phyt. t.* 218, f. 3. *Myrobalanus folio* &c. *Sloane Cat.* 181 & *Hist. ii.* 125, t. 219, f. 1, 2. *Prunus brasiliensis* &c. *Sloane Cat.* 182 & *Hist. ii.* 127. *Prunus Americana*, *Prunier d'Amerique* *Merian Surin.* 13, t. 13. A specimen from Plukenet in Herb. Sloane xcvi. 128

(figured in *Phyt. Ic.*)!; another specimen in Herb. Sloane lxxxii. 37!

Hog Plum.

In fl. May (Mar.-June); in fr. July; *Sloane* Herb. vii. 65! *Houstoun*! *Wright*! *Shakspear*! *McNab*! *Wilson*! *Worthy Park*, *Moneague*, *Prior*! *March*! *Hitchcock*; *Hope*, 700 ft., *Harris*! *Castleton*, *Thompson*! *Green Valley*, *Cradwick*!—Tropics.

Tree 30-40 ft. high. *Leaves* 2-2.5 dm. l. *Calyx* minute, about .5 mm. l.; segments deltoid. *Petals* yellowish-white, oblong, with the margins folded inwards, about 3 mm. l. *Filaments* very slender, thread-like. *Styles* 4. *Drupe* ovoid, 3-4 cm. l.; endocarp very thick, woody; fleshy exocarp yellow.

The branches grow readily when planted in the ground, and are much used in this way for fence-posts, as well as for shade in pastures. The wood is light, and is used as a substitute for cork. The leaves fall at the end of the year, and the flowers appear about March. The fruit is ripe in August, and is not liable to be attacked by the fruit fly.

2. *S. purpurea* L. *Sp. Pl. ed. 2*, 613 (1762); common petiole angular; leaflets 2-4 cm. l., unequal-sided, obovate to lanceolate, or oblong-elliptical, acute, not acuminate, base obliquely wedge-shaped, more or less obscurely serrulate in the upper part, subsessile; raceme or panicle short, minutely puberulous, branches

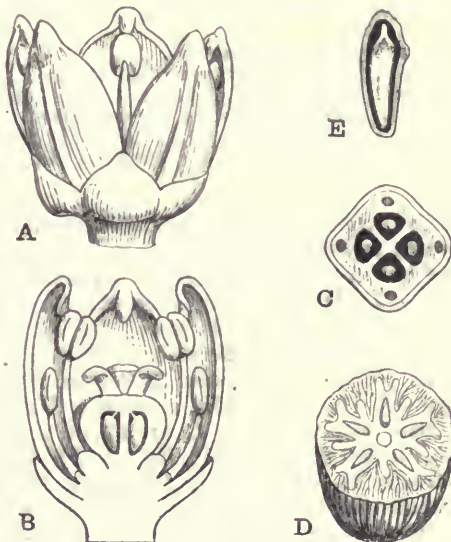


Fig. 7.—*Spondias purpurea* L.

A, Male flower $\times 6$.
B, Female flower $\times 6$.
C, Ovary cut across $\times 9$.

D, Endocarp of *S. mangifera* Willd.,
enlarged.
E, Cell of endocarp of ditto with
embryo, enlarged.

(After Engler.)

with few flowers.—*Descourt. Fl. Ant. v.* 119, *t.* 336; *Macf. Jam. i.* 227; *Griseb. Fl. Br. W. Ind.* 175; *Engl. in Fl. Bras. xii. pt.* 2, 373 (excl. var.) & *DC. Monogr. iv.* 243; *Urb. Symb. Ant. iv.* 359; *Britton in Fl. Berm.* 221. *S. diffusa* &c. *Browne Hist. Jam.* 228. *S. Monbin L. Syst. ed.* 10, 1036 (1759); *Willd. Sp. Pl. ii.* 750 (excl. syn. *Pluk.*); *Wright Mem.* 272. *S. Myrobalanus L. Amœn. v.* 279 (1760); *Jacq. Sel. Stirp. Amer.* 139, *t.* 88; *Gaertn. Fruct. ii.* 102, *t.* 104. *Myrobalanus minor* &c. *Sloane Cat.* 182 & *Hist. ii.* 126, *t.* 219, *f.* 3, 4, 5. *Warmingia pauciflora Engl. in Fl. Bras. xii. pt.* 2, 281, *t.* 57. (Fig. 7.) Owing to the confusion between the two names *S. Monbin* and *S. Myrobalanus* in the *Systema* and the *Amœnitates*, where their meaning is transposed by Linnaeus, we have not thought it wise to restore the strictly earliest name of the species, *S. Myrobalanus*.

Spanish Plum.

In fl. Apr., May (Mar.); in fr. July; *Sloane Herb.* vii. 66! *Wright! Bertero! March! Hitchcock! Harris!*—West Indies, tropical continental America.

Tree 10–20 ft. high. *Leaves* 1·5 dm. l. *Calyx*: segments minute. *Petals* oblong with the point folded inwards, about 3–4 mm. l., bright red or purplish. *Styles* 3, often 4. *Drupe* obovoid, 2·5–3 cm. l.; endocarp fibrous outside, bony inside; fleshy exocarp yellow or purple.

The leaves are shed in January or February. The flowers appear in April or May. As the fruit forms, the young leaves appear. The reddish fruit ripens about July. It has a thick skin and is therefore not liable to the attacks of the fruit fly. The branches are used like the former species as “grow posts.”

Form lutea. Grows at higher altitudes and flowers much later. *Petals* about 6 mm. l., of a rosy tint. *Fruit* yellow, with a thinner skin, very liable to be infested with the maggots of the fruit fly, probably the same species as attacks the mango, *Anastrepa fraterculus* Wied. *S. cirouella Tussac Fl. Ant. iii.* 37, *t.* 8 (1824). *S. lutea Macf. Jam. i.* 226 (1837) (excl. syn.); *Hart in Gard. Chron. n.s. xiii.* 682 (1880).

[*S. cytherea Sonner. Voy. Ind. ii.* 222, *t.* 123 (1782); common petiole compressed above; leaflets 6–7(–9) cm. l., nearly equal-sided, acutely acuminate, shortly but distinctly petiolulate, margin distantly serrate or only indistinctly crenate; panicle as long or longer than the leaf.—*Gaertn. Fruct. ii.* 101, *t.* 103; *Tussac Fl. Ant. iii.* 95, *t.* 28. *S. dulcis Forst. f. Prodr.* 34 (1786), *Pl. Escul.* 33 (1786), & *Ic. ined. Cook's Second Voyage, t.* 144; *Engl. in DC. Monogr. iv.* 246; *Urb. Symb. Ant. iv.* 360; *Hart in Gard. Chron. n.s. xiii.* 682 (1880). *S. macrocarpa Engl. in Fl. Bras. xii. pt.* 2, 375, *t.* 78 (1876).

Otaheite Plum.

Moneague, *Prior!*—Cultivated in the West Indies and tropics generally. Native in Oceania.

Tree 15–20 ft. *Leaves* 2–3 dm. l. *Calyx*: segments ovate. *Petals*
v. c

2·2·5 mm. l. *Drupe* to 10 cm. l., 5 cm. in diam., of a light yellowish-green colour.

The flowers appear just before the young foliage begins to shoot in March or April. The fruit ripens in October and November; it has a subacid flavour and a fine aroma.

FAMILY LIV. CYRILLACEÆ Lindl.

Trees or shrubs. Leaves leathery, entire, persistent, without stipules. Flowers small, in spike-like axillary racemes (in *Cyrilla*), regular, hermaphrodite. Calyx 5-parted (4–8), imbricate, persistent. Petals, the same number as the sepals, free, slightly convolute. Stamens 5 (in *Cyrilla*), hypogynous. Disk saucer-shaped, confluent with the base of the ovary. Ovary 2(–3)-celled (in *Cyrilla*). Ovules solitary in the cells, or (in *Cyrilla*) 3 (2–4) attached to a short placenta hanging from the apex of the cell. Fruit (in *Cyrilla*) small, 2-celled, pericarp spongy, cells 1-seeded. Seed with fleshy endosperm. Embryo central, elongated; radicle superior.

Species 5, natives of the West Indies, subtropical United States, and tropical S. America.

CYRILLA L.

Glabrous plants. Leaves oblanceolate to oval. Racemes clustered at the end of twigs of the preceding season. Petals white. Disk green. Ovary ovoid; style short, thick 2(–3)-lobed.

Species 1, native of West Indies, subtropical United States, and tropical S. America.

C. racemiflora L. *Mant. i.* 50 (1767); *Jacq. Ic. Pl. Rar. t.* 47; *Bot. Mag. t.* 2456; *Surg. Silva ii.* 3, *t.* 51; *Britton Ill. Fl. ii.* 389; *Urb. Symb. Ant. iv.* 361. *C. antillana* Michx. *Fl. Bor.-Amer. i.* 158 (1803); *Griseb. Fl. Br. W. Ind.* 145. *Itea Cyrilla Sw. Prodr.* 50 (1788), *Obs. Bot.* 94, *t.* 4, *f.* 1 & *Fl. Ind. Occ.* 506. (Fig. 8.) Specimens in Herb. Linn. named by Linnæus.

Blood Wood, Beet Wood.

In fl. Mar.–July; in fr. Aug.–Feb.; *Wright!* *Broughton!* *Masson!* *Swartz!* *Bancroft!* *Macfadyen!* Port Royal Mts., *Purdie!* J.P. 890, *Morris!* Prospect Hill, 1500 ft., *Thompson!* St. George, 2200 ft.; near Troy, 2500 ft.; near Cinchona, 4500 ft.; *Harris!* Fl. Jam. 7671, 7947, 8725, 9117.—West Indies, Venezuela, Honduras, Guiana, northern Brazil, southern United States.

Shrub or *tree* to 80 ft. high. *Leaves* 2–12 cm. l., very variable in size and form. *Racemes* longer than the leaves, to 15 cm. l. *Pedicels* 2–3 mm. l. *Calyx* about 1 mm. l. *Petals* about 2·5 mm. l. *Fruit* 2·5–3 mm. l.

The wood is hard, heavy, and close-grained, but it is said to be wanting in strength (Sargent).

Fig. 8.—*Cyrilla racemiflora* L.A, Twig with leaves and flowers $\times 2$.

B, Diagram of flower.

C, Flower with a petal pressed down $\times 5$.D, Apex of ripening ovary $\times 9$.E, Fruit cut lengthwise $\times 9$.

(A, B after Sargent.)

FAMILY LV. AQUIFOLIACEÆ (ILICINEÆ).

Trees or shrubs, glabrous. Leaves alternate, simple, leathery; stipules minute, often deciduous. Inflorescence axillary and terminal, cymose. Flowers small, white, regular, hermaphrodite or polygamo-diœcious. Calyx 3-6-cleft, imbricate, generally persistent. Petals 4-5, free or united at the base, hypogynous, deciduous, imbricate. Stamens hypogynous, as many as the petals, adhering to the base of the short corolla-tube. Ovary free, with 3-5 cells, or more. Style wanting or terminal. Ovules 1, or 2 side by side in the cells, pendulous from the top of the cell. Fruit drupaceous, slightly fleshy, with 3-18 pyrenes; pyrenes 1-seeded. Seed pendulous, with copious fleshy endosperm. Embryo very small, straight, in the apex of the endosperm.

Species about 285, natives mostly of the tropics of America and Asia; several in the temperate regions of the northern hemisphere.

ILEX L.

Leaves generally entire. Flower-parts in fours, fives, or sixes. Corolla rotate. Ovary 4-6(-7)-celled (in Jamaican species); style wanting, or short and thick; stigmas as many as cells of the ovary. Drupe globose, 4-8-pyrened.

Species about 275, mostly natives of warmer regions of S. America and Asia, fewer in the West Indies and in the temperate zone of eastern N. America and eastern Asia, some in Central America, very few in Australia and Oceania, and in Europe, Africa, and California.

Inflorescences solitary.

Leaves more than 3 cm. l.

Leaves with a few small teeth, acute or acuminate... 1. *I. montana*.

Leaves entire, obtuse..... 2. *I. subtriflora*.

Leaves less than 3 cm. l. 3. *I. obcordata*.

Inflorescences clustered.

Leaves more than 3.5 cm. l.

Leaves obovate-elliptical or elliptical.

Apex obtuse to rounded..... 4. *I. occidentalis*.

Apex shortly acuminate or subacute..... 5. *I. Harrisii*.

Leaves elliptical, oblong-elliptical, or ovate.

Leaves membranous.

Female infl. 1-3-flowered (Male infl. not seen) .. 2. *I. subtriflora*.

Leaves papery to leathery.

Male infl. corymbose..... 6. *I. nitida*.

Male infl. 1-flowered..... 7. *I. uniflora*.

Leaves roundish-elliptical, rounded at both ends,

leathery. Female infl. 3-many-flowered..... 8. *I. florifera*.

Leaves less than 3.5 cm. l. 9. *I. vaccinoides*.

1. *I. montana* Griseb. in *Mem. Acad. Amer. Sc. & Art.*, n.s. viii. 171 (1860) (in part), & *Fl. Br. W. Ind.* 147 (excl. syn. *I. cassine*, *I. minutiflora*, *Prinos sideroxyloides*); leaves 3.5-10 cm. l., broadly to narrowly elliptical to lanceolate, more or less acuminate or acute, with a few small teeth towards the apex, rarely subentire, papery to somewhat leathery; inflorescence solitary.—*Locs.* in *Engl. Bot. Jahrb.* xv. 313 & in *Nov. Act. Nat. Cur.* lxxviii. 118. *Prinos montanus* Sw. *Prodr.* 58 (1788) & *Fl. Ind. Occ.* 622; *Macf. Jam.* i. 205. *P. lanceolatus* Macf. *Jam.* i. 206 (1837). *P. Macfadyenii* Walp. *Rep.* i. 541 (1842). Specimen from Swartz in Herb. Mus. Brit.

Winter Berry.

Highest mountains, Swartz! Bancroft! Macfadyen! Portland Gap; Port Royal Mts.; Purdie! hills, St. Andrew, Prior! Jenman! Cinchona, Clute! Cinchona, J.P. 664, Hart! also Fawcett! Blue Mt. Peak, Hitchcock! Blue Mts. (everywhere incl. Port Royal Mts. and Peak) Harris! *Fl. Jam.* 5350, 5428, 5542, 5632, 5641, 5642, 5645, 5669, 5670, 5813, 5872, 5877, 5893, 5968, 8151, 8297, 9115.—Cuba, Hispaniola, lesser Antilles.

Shrub or tree, 10-30 ft. high. Leaves dark green, shining; midrib flat

or slightly prominent or slightly impressed on upper surface, somewhat prominent beneath, nerves and veins more or less evident on both sides; petiole 1-2 cm. l. *Inflorescence*: male once to three or four times forked, divisions 1-3-flowered, female simple, 1-3-flowered; peduncles in male 7-16 mm. l., ultimate pedicels 3-4 mm. l. *Flowers*: parts usually in 6's, sometimes in 5's, rarely in 7's. *Calyx* 1-1.5 mm. l., lobes about equalling the tube, triangular, acute. *Petals* ovate or ovate-elliptical, united to $\frac{1}{2}$ or $\frac{3}{4}$ of their length, about 2 mm. l., 1 mm. br. *Ovary* in female fl. 5-7-celled; stigma disk-like. *Drupe* fleshy, purple, sometimes white, 5-7 mm. in diam.; pyrenes 5-7, smooth, compressed-flattish from the sides, very narrow, semicircular-lunate, 3.5-4 mm. l., about 2 mm. br. on flat side.

2. *I. subtriflora* Griseb. ex Loes. in Engl. Bot. Jahrb. xv. 312 (1892) & in Nov. Act. Nat. Cur. lxxviii. 121; leaves 4-11 cm. l., elliptical (rarely ovate), glabrous, entire, apex obtuse, membranous or papery; inflorescence solitary or clustered.

March; Phoenix Park, Moneague, Prior!

"A pyramidal tree like a cypress in outline" (Prior). *Leaves*: petioles 1-2 cm. l. *Inflorescence* (female) usually solitary and 3-flowered, sometimes clustered and 1-3-flowered, racemose or even paniculate, glabrous, axillary also terminal (in Prior's specimen); peduncle 2-5 mm. l.; pedicels 3-4 mm. l. *Flowers*, parts in 4's or 5's. *Calyx* about 2 mm. in diam., lobes roundish ciliolate, scarcely 1 mm. br. *Corolla* subrotate, about 2 mm. l.; petals ovate, united to $\frac{1}{2}$ of their length. *Fruit* not seen.

3. *I. obcordata* Sw. Fl. Ind. Occ. 338 (1797); leaves 7-1.3 cm. l., roundish obcordate to 1-2 cm. l., oblanceolate, apex rounded, often emarginate, mucronulate, base acute to wedge-shaped, entire, leathery; inflorescence solitary.—Griseb. Fl. Br. W. Ind. 147; Loes. in Engl. Bot. Jahrb. xv. 323 & in Nov. Act. Nat. Cur. lxxviii. 208. *Ilex cuneifolia* Hook. Ic. Pl. t. 294 (1840).

In fl. Dec.-Feb.; in fr. Nov.-Apr.; highest ridge of Blue Mts., Swartz; Macfadyen; Blue Mt. Peak, Purdie! Monkey Hill, Cinchona, J.P., 985, Hart! Morris! Morse's Gap, 5000 ft.; John Crow Peak, 5300 ft.; Harris! G. E. Nichols! Fl. Jam. 5944, 9119, 9139, 9379.—Hispaniola.

Shrub or tree, 6-30 ft. high, glabrous. *Petioles* 1-3 mm. l.; stipules about 1 mm. l., spine-like. *Inflorescence*: male 2-3-flowered, pedicels umbellate (1-2 mm. l.) on a peduncle (to 4 or 5 mm. l.); female 1-flowered, pedicels 3-10 mm. l. *Flowers*, parts in 4's (rarely 5's or 6's). *Calyx* about 1 mm. l., margin of lobes more or less cut. *Corolla* 3 mm. l.; petals elliptical, crenulate. *Ovary* 4-celled. *Drupe* globular, without furrows or lines, 5-6 mm. l. (incl. stigma); stigma capitate, 1 mm. l. and br.; pyrenes 4-6, 3-4 mm. l., more or less 3-cornered.

4. *I. occidentalis* Macf. Jam. i. 204 (1837) (excl. syn. *I. obcordata* Sw.); leaves 3.5-9 cm. l., obovate-elliptical or elliptical, apex obtuse to rounded, base wedge-shaped, papery to leathery; inflorescences clustered.—Griseb. Fl. Br. W. Ind. 147 (in part, excl. hab. Dominica). *I. sideroxyloides* forma jamaicensis Loes. in Urb. Symb. Ant. i. 346 (1899). *I. sideroxyloides* var. *occidentalis* forma jamaicensis Loes. in Nov. Act. Nat. Cur. lxxviii. 354 (1901).

In fl. Sept.-Apr.: in fr. Nov.; Blue Mt. ridge; Orchard; Port Royal Mts.; *Macfadyen*! Manchester, *Purdie*! near Cinchona, J.P. 1205, 1143, *Hart*! J.P. 1400, 2116, *Morris*! Portland Gap, 5500 ft.; Tweedside, north St. Andrew, 2500 ft.; St. George; near Cinchona, 4500 ft.; *Harris*! Fl. Jam. 5643, 6088, 7400, 9110, 9118.

Shrub or tree, 15-40 ft. high. *Leaves*: midrib impressed on upper surface, prominent beneath, nerves and veins not always distinct; petioles .5-1 cm. l. *Inflorescence*: male 3-(6)-flowered, peduncle to 4 mm. l., pedicels 2 mm. l.; female 1-flowered, pedicel 4-8 mm. l. *Flowers*: parts in 4's. *Calyx* about 1 mm. l., lobes broadly triangular. *Corolla* about 2 mm. l., petals of male elliptical, of female ovate- or oblong-elliptical. *Ovary* 4-celled. *Drupe* 3.5-4 mm. l., ovoid; stigma conical; pyrenes 4-1, irregularly furrowed on back, otherwise smooth, obtusely 3-cornered.

Distinguished from *I. sideroxyloides* Griseb. by the leaves more or less obovate, the parts of the flowers in 4's not 6's, and the smaller flowers and fruit.

5. *I. Harrisii* *Loes. in Urb. Symb. Ant. i.* 346 (1899) & in *Nov. Act. Nat. Cur. lxxviii.* 411; leaves 5-8(-10) cm. l., elliptical or obovate-elliptical, apex shortly acuminate or subacute, base wedge-shaped, entire, thinly leathery; inflorescences clustered.

In fl. Feb., Mar.; Green Hill Wood, 3500 ft.; Newhaven Gap, Cinchona, 5600 ft.; Hardware Gap, 4000 ft.; *Harris*! Fl. Jam. 5679, 9200, 10,137.

Shrub or tree, 15 ft. high, glabrous. *Leaves*: midrib impressed on upper surface, prominent beneath, nerves slightly prominent on both sides, network of nerves and veins distinct beneath; petioles 1-1.5 cm. l. *Inflorescences*: male 4-8, usually 3-flowered, peduncles 4-9 mm. l., pedicels umbellate, 1.5-2.5 mm. l.; female 1-5, usually 1-flowered (rarely 2), pedicels 3-5 mm. l. *Flowers*: parts in 4's or 5's. *Calyx*: lobes triangular, a little longer than tube, .7-.8 mm. l. *Corolla*: petals, male elliptical, about 2 mm. l., female ovate to oblong, about 2 mm. l., tube about .6 mm. l. *Ovary* usually 4-celled; stigma capitate, 4-5-lobed. *Drupe* not seen.

6. *I. nitida* *Maxim. in Mém. Acad. Pétersb. sér. 7, xxix. no. 3,* 27 (1881); leaves 7-12 (5.5-14) cm. l., elliptical, or oblong-elliptical (more or less obovate in other countries), apex obtuse, sometimes very shortly and abruptly acuminate; margin entire, or indistinctly more or less crenate-toothed, leathery to papery; inflorescences clustered.—*Loes. in Engl. Bot. Jahrb. xv.* 319 & in *Nov. Act. Nat. Cur. lxxviii.* 313; *Urb. Symb. Ant. iv.* 362. *I. dioica* *Griseb. Fl. Br. W. Ind.* 147. *Prinos nitidus* *Vahl Eclog. ii.* 26 (1798). (Fig. 9.)

In fl. and fr. all the year round; *Wilson*! *Prior*! near Bardowie, 2000 ft.; Ginger Piece bridge, 2800 ft.; near Morse's Gap, 5000 ft.: Mt. Hybla, 4500 ft.; Peckham, 2300 ft.; *Harris*! Cedar Hurst to Silver Hill Gap, *Harris & Britton*! Fl. Jam. 5822, 6237, 7559, 9122, 10,545, 11,073.—Mexico, Porto Rico, Montserrat, Guadeloupe, Martinique.

Shrub or tree 15-20(-60) ft. high, glabrous. *Leaves* shining, olive-green or brownish, midrib flattish on upper surface, somewhat prominent beneath, veins slightly prominent on both sides; petioles .5-1.5 cm. l. *Inflorescences* 3-10: male corymbose, peduncle .5-1(-1.5) cm. l., pedicels 2-4 mm. l.; female 1-flowered, pedicels 4-7 mm. l. *Flowers*: parts in 4's (sometimes 5's). *Calyx* 1-1.5 mm. l.; lobes broadly triangular to rounded,

about as long as tube. *Corolla* 3-4 mm. l., petals elliptical to ovate. *Stamens* a little shorter than the petals. *Ovary* 4-celled. *Drupe* 7-8 mm. l.,

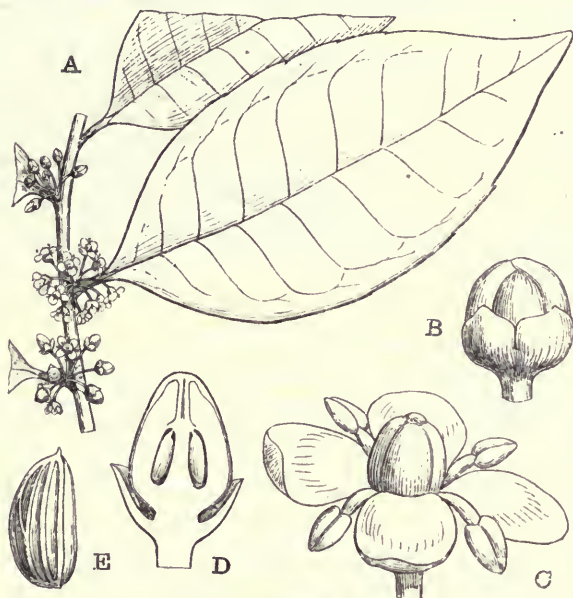


Fig. 9.—*Ilex nitida* Maxim.

A, Flowering twig $\times 3$.

B, Bud $\times 5$.

C, Flower $\times 5$.

D, Ovary cut lengthwise $\times 7$.

E, Pyrene $\times 4$.

orange-scarlet; stigma flat; pyrenes 4-5.5 mm. l., 3-cornered, with 3-5 narrow keels on back. This species has larger flowers and fruit than the other Jamaican species.

I. nitida forma *ovatifolia* Loes. (op. cit. lxxxix. 285, 1903) is a species of *Xylosma* (Flacourtiaceæ).

7. *I. uniflora* Fawc. & Rendle in Journ. Bot. liz. 19 (1921); leaves 9-12 cm. l., 4-7 cm. br., elliptical, sometimes ovate-elliptical, somewhat unequal-sided, apex obtuse, base rounded to obtuse, margin entire, slightly revolute, leathery; inflorescences clustered.

In fl. Nov.; Holly Mount, 3000 ft.; Harris! Fl. Jam. 12,201.

Shrub 12 ft. high, twigs somewhat thick, warm-grey. *Leaves*: midrib and nerves slightly prominent on both sides, veins indistinct; petioles about 1 cm. l. *Inflorescences* (male flowers only known) numerous in axils, 1-flowered; pedicels 5-7 mm. l., glabrous. *Flowers*: parts in 5's. *Calyx* 1.2-1.5 mm. l., lobes much longer than the tube, ovate-triangular, apex obtuse. *Corolla*: petals elliptical, almost free, about 2.5 mm. l., nearly 2 mm. br. *Stamens* 5, only about half as long as the petals. *Pistillode* flattened, with a style-like projection in the centre.

8. *I. florifera* Fawc. & Rendle in *Journ. Bot. lix.* 18 (1921); leaves 6–10 cm. l., 4·5–8 cm. br., roundish-elliptical, apex and base rounded, margin entire, slightly revolute, leathery; inflorescences clustered.

In fl. and fr. Apr., May; Union Hill, near Moneague, Britton & Hollick, 2803! Albion Pen, St. Ann, 2000 ft., Harris! Fl. Jam. 12,012.

Tree to 40 ft. high, glabrous, twigs ash-coloured. *Leaves*: midrib flat or slightly channelled on upper surface, prominent beneath, nerves distinct on both sides, veins indistinct; petioles 7–1 cm. l. *Inflorescences* (female only known) several in each axil, 3- to many-flowered, corymbose; peduncles about 5 cm. in fl. to 1 cm. in fr. *Flowers*: parts in 4's. *Calyx* 1·2–1·5 mm. l.; lobes longer than the tube, transversely subelliptical. *Corolla*: petals oblong-elliptical to roundish-elliptical, subfree, 2·3–2·5 mm. l., 1·5–1·9 mm. br. *Ovary* 4-celled, subovoid; stigma capitate. *Drupe* about 3 mm. l. (incl. stigma), subglobular to pear-shaped; pyrenes 4, 3-cornered, smooth, with a line along the centre of the back, about 2·5 mm. l.

9. *I. vaccinoides* Loes. in *Urb. Symb. Ant. vii.* 270 (1912); leaves 1·5–3 (1–3·5) cm. l., obovate to narrowly elliptical, apex rounded, generally shortly apiculate, base acute to wedge-shaped, leathery, entire or sparingly and minutely serrate near apex; inflorescences clustered.

In fl. April, also Aug.; Monkey Hill, Cinchona, 5800 ft.; Harris! Fl. Jam. 9217, 9379.

Shrub 6 ft. high, or tree 30–40 ft. high, glabrous. *Leaves*: midrib impressed on upper surface, prominent beneath, nerves and veins generally slightly prominent on upper surface, indistinct beneath; petioles 2–3(–6) mm. l.; stipules awl-shaped, 5–1 mm. l. *Inflorescences*: male 1-flowered, or once forked and 2–3-flowered; peduncle 4–7 mm. l., pedicels 1–2 mm. l.; female 1-flowered, 2 or 3 in a cluster, or reduced to 1. *Flowers*: parts in 4's. *Calyx*: lobes unequal, triangular, somewhat longer than the tube, to 1·5 mm. l. *Corolla*: petals 2–2·5 mm. l. *Ovary* 4-celled; stigma disk-like. *Drupe* ellipsoidal, 4 mm. l.; pyrenes 4, one sometimes undeveloped, smooth, 3-cornered, flattish on the sides, with a slight furrow along the back, about 3 mm. l.

FAMILY LVI. CELASTRACEÆ.

Trees or shrubs, erect in Jamaican genera. Leaves opposite and alternate, leathery, simple, never lobed; stipules when present, minute and soon dropping off. Inflorescence mostly cymose. Flowers small, greenish or white, hermaphrodite, by reduction often unisexual, monœcious or dicecious. Calyx small, with 4 or 5 lobes or segments, imbricate, persistent. Petals 4–5, short, spreading, sessile below the margin of the disk, imbricate. Stamens 4–5, inserted on or near the margin of the disk; filaments awl-shaped. Ovary 3–5-celled, with a short thick style, entire or sometimes 3–5-lobed; stigma simple or lobed. Ovules 2 or 1 in the cells, anatropous, erect, rarely pendulous. Fruit a capsule or drupe. Seeds usually erect, with or without an

aril; endosperm fleshy, sometimes wanting. Embryo usually rather large; cotyledons flat, foliaceous.

Species about 450, dispersed over the whole world in tropical and more rarely in temperate regions.

Fruit a capsule. Seed with an aril. Flower-parts in fives 1. *Maytenus*.

Fruit a drupe. Seed without an aril.

Flower-parts in fours.

Flowers hermaphrodite 2. *Rhacoma*.

Flowers 1-sexual, usually dioecious.

Leaves opposite. Cymes pedunculate.

Ovary 2-celled. Seeds generally solitary 3. *Gyminda*.

Ovary 4-celled. Seeds generally more than one 4. *Tetrasiphon*.

Leaves alternate or clustered. Flowers clustered. 5. *Schæfferia*.

Flower-parts in fives 6. *Elæodendron*.

1. MAYTENUS Molina.

Small erect shrubs or trees. Leaves alternate, in 2 rows, entire or serrate. Flowers polygamous, axillary, solitary or clustered (in Jamaican species), parts in fives; pedicels jointed at the base. Anthers ovate-cordate. Disk round with wavy margin. Ovary immersed in the disk and confluent with it, 2-(3)-celled; style wanting or very short; stigma 2-(3)-lobed; ovules 2 (or 1) in the cells, erect. Fruit a capsule, leathery, 1-3-celled, at length loculicidally 2-valved (in Jamaican species); valves keeled and brown or purplish inside. Seeds enclosed altogether or partially by a thin aril, erect; endosperm sometimes wanting.

Species 125, natives of the West Indies, of tropical and subtropical America, and of temperate S. America.

Leaves with apex rounded, obtuse, or shortly acuminate.

Petals longer than 1.5 mm.

Capsule smooth on outside; pedicel thin.

Capsule 12-15 mm. 1. 1. *M. jamaicensis*.

Capsule 7-9 mm. 1. 2. *M. microcarpa*.

Capsule rough outside; pedicel thick.

Leaf-margin revolute..... 3. *M. clarendonensis*.

Leaf-margin flat 4. *M. crassipes*.

Petals about 1 mm. 1. Capsule 13-20 mm. 1., slightly rough; pedicel slender 5. *M. virens*.

Leaves with apex long and narrowly acuminate..... 6. *M. Harrisii*.

1. *M. jamaicensis* Kr. & Urb. in *Notizbl. Berl. Bot. Gard. i. nr. 2, 78* (1895) & in *Urb. Symb. Ant. v. 57* (1904). *M. brachycarpa* Kr. & Urb. in *Urb. Symb. Ant. v. 38* (1904). (Fig. 10, A-D.)

In fl. Nov.-Mar.; in fr. May-Nov.; Chester Vale; Woodcutter's Gap, 4200 ft.; Green River; Whitfield Hall, 3000 ft.; Vinegar Hill, 3500 ft.; Cedar Hurst; Silver Hill Gap, 3600-3800 ft.; between Hardware Gap and

Rose Hill, 3700 ft.; St. George; Peckham, Clarendon, 2500 ft.; *Harris!* John Crow (Blake) Mts., *Harris & Britton!* Fl. Jam. 5331, 5416, 5429, 5430, 5460, 5470, 5505, 5570, 6105, 6438, 6588, 7609, 10,031, 10,135, 10,751.

Shrub or tree, 9-25 ft. high. *Leaves* 5-12(-17) cm. l., roundish, ovate- or oblong-elliptical, ovate, or elliptical; papery or leathery, often thick and stiff, margin entire, or subundulate above, flat, or recurved, or revolute. *Flowers* clustered, yellowish and green, very fragrant; pedicels 4-8 mm. l.,

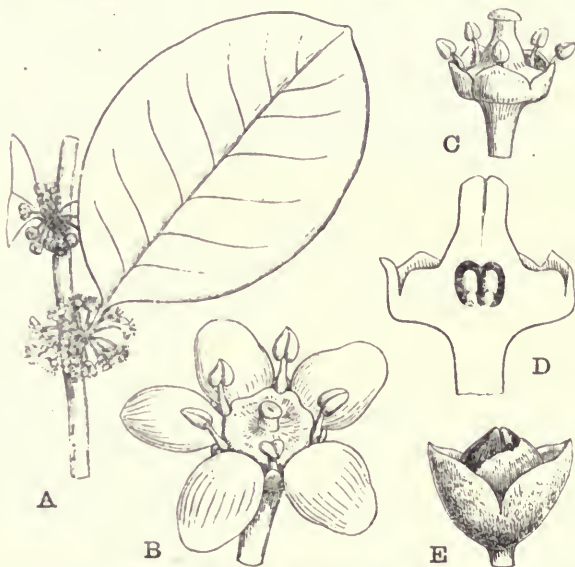


Fig. 10.—*Maytenus jamaicensis* Kr. & Urb.

A, Branch with leaf and flowers $\times 2$.

B, Male flower $\times 5$.

C, Female flower with petals removed $\times 5$.

D, Pistil cut lengthwise $\times 10$.

E, Fruit of *M. crassipes* Urb., showing two seeds with aril, nat. size.

slender. *Calyx* 1.2-1.5 mm. l., lobes usually semilunar. *Petals* 1.8-2.5 mm. l., elliptical-ovate or roundish-elliptical. *Ovary* 2-celled. *Capsule* roundish-ellipsoidal, ovoid or obovoid, apiculate, 12-15 mm. l.; long stipitate (1.5-2 mm. l.), valves 8-10 mm. l., 7-9 mm. br., reddish-brown or purplish on the inside. *Seeds* 4-3 (2-1) ovoid or flatly ellipsoidal, 7-12 mm. l., 3.5-5 mm. br.

The leaves vary considerably in form and size; Urban recognises three varieties, *orbicularis*, *longifolia*, and *minor*.

2. *M. microcarpa* Fawc. & Rendle in Journ. Bot. lix. 19 (1921).

In fl. Dec., Jan.; in fr. May; limestone rocks in woods, Peckham, Clarendon, 2500 ft.; *Harris!* Fl. Jam. 11,054, 12,800. Types in Herb. Mus. Brit. and in Herb. Jam.

Shrub 9-10 ft. high; branchlets with numerous lenticels and bark silvery-grey, splitting. *Leaves* 5-10 cm. l., ovate-elliptical, very shortly and bluntly subacuminate, leathery, margin entire, slightly revolute. *Flowers* 7 or 8, clustered in axils; pedicels slender, 2.5 mm. l. in bud,

5 mm. l. in fr. *Calyx*: lobes transversely elliptical, about 1 mm. l. *Petals* about 1.5 mm. l., roundish. *Capsule* ellipsoidal, slightly apiculate, very shortly stipitate, 7-9 mm. l.; valves 4-5 mm. br., reddish-purple on the inside. *Seeds* flattened-ellipsoidal, about 5.5 mm. l., about 3.5 mm. br., black.

This species is near *M. jamaicensis* Kr. & Urb., but differs in the smaller fruit.

3. *M. clarendonensis* Britton in *Bull. Torr. Bot. Cl. xxxix*. 8 (1912).

In fl. Sept.; in fr. July; Peckham, Clarendon, 2500 ft.; Croft's Mt., Clarendon, 2500 ft.; *Harris!* Fl. Jam. 10,947, 11,222.

Tree, 40-50 ft. high. *Leaves* 6-13 cm. l., 4.5-8.5 cm. br., broadly elliptical, obtuse or rounded at both ends, leathery, margin entire, revolute. *Flowers* solitary or 2 together, greenish-yellow; pedicels thick, 5-6 mm. l. *Calyx* about 1.6 mm. l., lobes roundish or somewhat deltoid. *Petals* roundish or ovate-roundish, 2 mm. l. in young flower. *Capsule* ellipsoidal, apex apiculate, 1.5-1.9 cm. l.; valves 1.1-1.5 cm. l., rough with flat tubercles, reddish-brown inside. *Seeds* 2 or 3, completely covered with the aril, about 1 cm. l.

4. *M. crassipes* Urb. *Symb. Ant. v.* 404 (1908). (Fig. 10, E.)

In fl. Aug.; in fr. Aug., Dec., May; Holly Mount, Mt. Diablo, 2600 ft.; Dolphin Head; Albion Pen, St. Ann, 2000 ft.; Peckham, Clarendon, 2000 ft.; *Harris!* Fl. Jam. 8966, 10,303, 12,014, 12,816; Union Hill, near Moneague, Britton & Hollick, 2737, 2746!

Shrub or tree, 10-25 ft. high. *Leaves* 5-15 cm. l., elliptical, ovate-elliptical or oblong-lanceolate, apex obtuse or obtusely subacuminate, base obtuse to rounded, thinly leathery, margin entire, flat, or sometimes slightly recurved. *Flowers* solitary or clustered, greenish; pedicels in fl. 1-2.5 mm. l., in fr. 1-9 mm. l., 1-2 mm. thick. *Calyx*: lobes roundish to 1 mm. l. *Petals* 1.5-1.8 mm. l. *Capsule* obovoid-globular, or ellipsoidal, not stipitate, 1-1.7 cm. l.; valves 6-1 cm. l., rough outside, woody. *Seeds* 2 or 1, 8-10 mm. l., 6-7 mm. br., flat-ellipsoidal, covered by the aril, black.

5. *M. virens* Urb. *Symb. Ant. v.* 60 (1904).

Rock Wood.

In fl. Sept.-Dec.; in fr. all the year round; Schwallenburg, 2200 ft.; near Troy, 2000-2500 ft.; Fraywoods, 1650-1800 ft.; Peckham, Clarendon, 2500 ft.; *Harris!* Fl. Jam. 7049, 8764, 8797, 8802, 9080, 10,344, 10,346, 11,001, 11,015, 11,050, 11,191, 12,784, 12,796.

Shrub or tree, 9-20 ft. high. *Leaves* 3-10 cm. l., 2-4 (1.5-5) cm. br., ovate to roundish-ovate or oblong, shortly acuminate, papery to leathery, margin entire, narrowly recurved. *Flowers* solitary or clustered, greenish-yellow; pedicels slender, 4-5 mm. l. *Calyx*: lobes semilunar, 7-8 mm. l. *Petals* about 1 mm. l., elliptical. *Capsule* 13-20 mm. l., obovoid-ellipsoidal; valves to 1.1 cm. l., about 8 mm. br.; yellowish-brown on the inside, keel prominent. *Seeds* 2, flatly ellipsoidal.

6. *M. Harrisii* Kr. & Urb. in *Notizbl. Berl. Bot. Gart. i.* 78 (1895) & in *Urb. Symb. Ant. v.* 59.

In fr. July; near Woodcutters' Gap, *Harris!* Fl. Jam. 5266.

Leaves 6-9 cm. l., 3-5 cm. br., ovate or broadly elliptical, apex long and narrowly acuminate, base acute, papery, margin entire or subundulate

above, flat or narrowly subrecurved. *Flowers* clustered; pedicels of fruit 6–10 mm. l. *Capsule* obovate or narrowly obovate, 15–17 mm. l.; valves 8–10 mm. br., reddish-brown on the inside. *Seeds* generally 3, sometimes 4, 2, or 1, flatly ellipsoidal, 10–11 mm. l., 4·5–5 mm. br.

2. RHACOMA L.

Shrubs or small trees. Leaves opposite, alternate, or 3 together, entire, crenate, or spiny. Inflorescence axillary, cymose on long or very short peduncles, or clustered. Flowers hermaphrodite, parts in fours, minute. Calyx lobed. Petals recurved in flower. Ovary 4-celled; ovule solitary in each cell, erect. Fruit a drupe. Seed without an aril; endosperm present.

Species 14, natives of the West Indies (incl. Bahamas), Florida, and northern South America.

R. Crossopetalum L. *Syst. ed.* 10, 896 (1759) & *Amœn. v.* 393, 376; *Trel. in A. Gr. Syn. Fl. N. Am. i. pl.* 1, 399; *Urb. Symb. Ant. iv.* 364, v. 71; *Britton Fl. Berm.* 224; *Britt. & Millsp. Bah.*

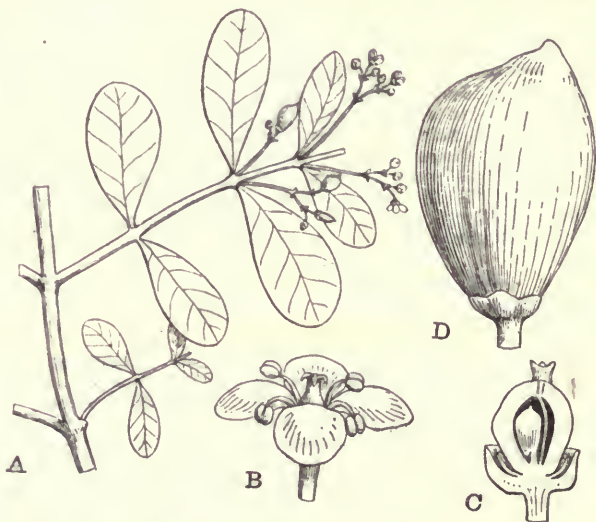


Fig. 11.—*Rhacoma Crossopetalum* L.

A, Twig with leaves and flowers, nat. size.
B, Flower $\times 10$.

C, Ripening ovary cut lengthwise $\times 10$.
D, Fruit $\times 5$.

Fl. 248. *Crossopetalum fruticosum tenue* &c. *Browne Hist. Jam.* 145, t. 17, f. 1. *C. Rhacoma* *Crantz Inst. ii.* 321 (1766). *C. pallens* *Kuntze Rev. i.* 116 (1891). *Myginda Rhacoma* *Sv. Prodr.* 39 (1788) & *Fl. Ind. Occ.* 340; *Jacq. Ic. Pl. Rar. ii.* 9,

t. 311; *Macf. Jam. i.* 204; *Griseb. Fl. Br. W. Ind.* 146. *M. pallens Banks ex Smith in Rees Cycl. xxiv.* (1813); *Griseb. loc. cit.* *M. uragoga Rich. in Sagra Cub. x.* 141 (1845) (non Jacq.). (Fig. 11.) Type specimen from Browne in Herb. Linn.

• **Poison Cherry.**

In fl. and fr. throughout the year; woods, Martha Brae river, *Browne!* *Wright!* hill above Rock Fort, *Broughton!* sandy shore in west, *Swartz!* sea-shore, Old Harbour, *Macfadyen!* *Purdie!* *March!* Lucea, *Hitchcock!* Long Mt., 350 ft., *Campbell!* Healthshire hills, 50 ft., sea-coast near Bull Bay; Long Mt., south side, 250-800 ft.; Albion Mt., St. Thomas, 200 ft.; *Harris!* Fl. Jam. 6148, 9532, 9572, 9582, 9584, 9609, 11,685.—Bermuda, Florida (incl. Keys), Bahamas, West Indies as far south as St. Lucia, Colombia.

Shrub or tree, 2 to 15 ft. high; branches more or less diverging and drooping; young twigs with 4 raised longitudinal lines. *Leaves* opposite, 1-4 (5) cm. l., shape very variable, obovate, elliptical to roundish, or narrowly lanceolate, apex obtuse or rounded, often emarginate, margin usually crenulate, sometimes minutely toothed, or subentire, papery or leathery. *Inflorescence* with minute white hairs, with peduncle (·5-2 cm. l.), divided cymosely once to four times; pedicels 1-2·5 mm. l. *Calyx* ·7 mm. l.; segments imbricate in bud. *Petals* obovate-elliptical, 1-1·2 mm. l., green tinged with red. *Style* with 4 recurved stigmas at apex. *Drupe* to 7 mm. l., scarlet, obliquely obovoid or obliquely globular, style persistent, more or less one-sided, 1(2)-seeded.

3. GYMINDA Sarg.

Shrub or tree. Leaves opposite, entire or crenulate-serrate above the middle. Inflorescence axillary, in pedunculate few-flowered cymes forking once to four times. Flowers minute, unisexual, dioecious, parts in fours. Sepals free or subfree. Petals white, recurved in flower. Stamens (in the male flower only) inserted in the lobes of the disk. Ovary (in male fl. rudimentary) in female fl. 2-celled, combined with the disk, with a 2-lobed stigma; ovule solitary, pendulous in each cell. *Drupe* black or dark blue, often 1-celled. Seed solitary (rarely 2), pendulous; endosperm thin, fleshy.

Species 1, native of the Florida Keys, West Indies, Mexico.

G. latifolia Urb. Symb. Ant. v. 80 (1904) & *iv.* 365. *G. Grisebachii Sarg. in Gard. & For. iv.* 4 (1891) & *Silv. ii.* 14, t. 54; *Trel. in A. Gr. Syn. Fl. N. Am. i. pt. 1,* 399; *Small Fl. S. E. U. St.* 736. *Myginda latifolia Sw. Prodr.* 39 (1788) & *Fl. Ind. Occ.* 342 (excl. syn. *Vahl!*); *Grisebach Fl. Br. W. Ind.* 146. (Fig. 12.)

In fl. and fr. during the first half of the year; St. Ann, *McNab!* *Wullschlaegel!* Great Goat Is.; *Harris!* Fl. Jam. 10,160, 10,174.—Distribution as under genus.

Shrub or tree, 15 to 20 ft. high, glabrous; twigs of one season's growth marked with four raised lines. *Leaves* 1·5-5 cm. l., variable, generally obovate-wedge-shaped with rounded apex, sometimes obovate-oblong or oblong, sometimes rhomboid or rhomboid-elliptical with apex narrowed or obtusely acuminate, apex often emarginate, on the upper surface more

Fig. 12.—*Gyminda latifolia* Urb.A, Flowering twig $\times 5$.B, Male flower cut lengthwise $\times 8$.C, Female flower cut lengthwise $\times 8$.D, Drupe cut lengthwise $\times 6$.

(After Sargent.)

or less glaucescent, beneath brownish (when dry); petioles 1-5 mm. l. *Sepals* 6-8 mm. l., roundish or semicircular. *Petals* 1.6-2.2 mm. l., elliptical. *Drupe* narrowly- to roundish-ellipsoidal, 4-8 mm. l.

4. TETRASIPHON Urb.

A small tree, bushy or slender, glabrous. Leaves opposite, decussate, stalked, entire, penniveined. Stipules small, within the petiole, but not united, persistent. Inflorescences terminal and axillary, cymose; pedicels wanting or very short. Flowers small, diœcious, parts in fours. Petals spreading or recurved in flower. Stamens inserted between the lobes of the disk; anthers cordate, attached at the base. Staminodes none in the female flower. Disk in male flower lobed, in female flower adnate to the base of the ovary. Ovary in male flower rudimentary; in female flower 4-celled; style none; stigmas 4. Ovule solitary in each cell, pendulous from the apex of the ovary. Drupe purplish-black, smooth, exocarp thinly fleshy, mesocarp fibrous, ample, endocarp bony, 2-4-celled. Seeds solitary in a cell, pendulous from the apex of the cell, without an aril, somewhat flattened, oblong-ellipsoidal; endosperm present. Embryo as long as the seed; cotyledons flat, narrowly lanceolate; radicle superior.

Species 1, native of Jamaica.

T. jamaicensis Urb. *Symb. Ant. v. 84* (1904). (Fig. 13.)

In fl. and fr. Jan., Feb., June; in fr. Jan., Feb., June, July; Militia Target Range, *Campbell!* road to Wareka, 200 ft.; Albion Mt., St. Thomas, 150-200 ft.; *Harris!* Fl. Jam. 6501, 8604, 11,865, 11,866, 12,076, 12,077.

Tree 15-30 ft. high. *Leaves* 3-5 (2.5-5.5) cm. l., obovate-elliptical, elliptical to broadly elliptical, apex rounded, below gradually narrowing

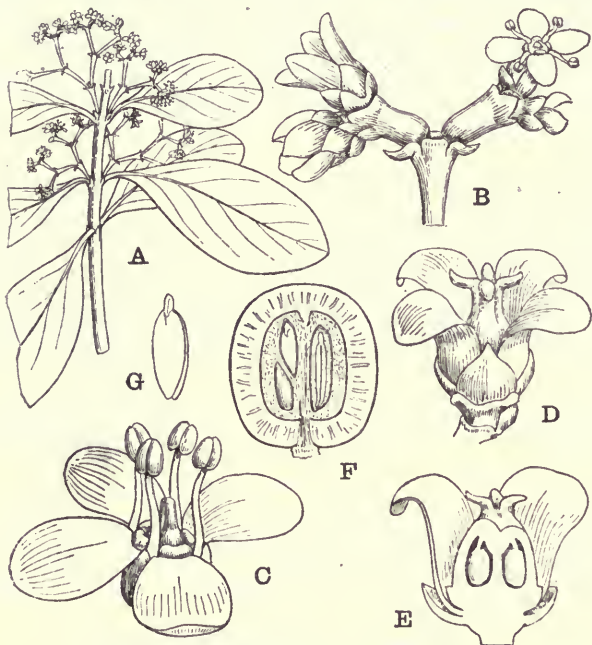


Fig. 13.--*Tetrasiphon jamaicensis* Urb.

A, End of branch with leaves and flowers $\times \frac{1}{2}$.

B, Portion of inflorescence $\times 5$.

C, Male flower $\times 10$.

D, Female flower $\times 10$.

E, Ditto cut lengthwise $\times 10$.

F, Drupe cut lengthwise $\times 2$.

G, Embryo $\times 3$.

into the petiole, margin flat, entire or subentire, brownish on the upper surface when dry, pale beneath. *Inflorescences* .5-1.5 cm. l., peduncle 2-7 mm l., forking cymosely once to four times. *Calyx* about 1 mm. l. *Petals* greenish-yellow: male obovate-oblong or oblong, 1.8-2 mm. l., female ovate-oblong, 2.2-2.5 mm. l. *Drupe* about 1 cm. l., roundish ellipsoidal.

5. SCHÆFFERIA Jacq.

Rigid, glabrous shrubs or small trees. Leaves alternate or clustered on short spur-like branches, small, entire, obovate or spatulate, without stipules. Flowers dioecious or sometimes monœcious, axillary, sessile or shortly stalked, small, green or white; parts in fours. Calyx 4-parted, persistent, segments

roundish. Petals hypogynous, oblong, obtuse. Stamens hypogynous or inserted below the margin of a small inconspicuous disk. Ovary 2-celled; style very short with rather large 2-parted stigma; ovules solitary in the cells, erect. Fruit a small dry drupe, 2-pyrened; pyrenes with a thin roughish shell. Seed without aril, smooth; endosperm fleshy.

Species 8, natives of the West Indies and tropical and subtropical America.

Leaves elliptical to lanceolate, acute, 2.5-6 cm. l. 1. *S. frutescens*.
Leaves obovate, apex rounded, sometimes emarginate.

Leaves 1.5-2.5 cm. l. 2. *S. obovata*.

Leaves .5-1.5 cm. l. 3. *S. Marchii*.

1. *S. frutescens* Jacq. *Enum. Pl. Carib.* 33 (1760) & *Sel. Stirp. Amer.* 259 (1763); *Lam. Illustr. t.* 809; *Karst. Fl. Columb. i.* 183, *t.* 91; *Griseb. Fl. Br. W. Ind.* 146; *Sarg. Silv. ii.* 17, *t.* 55; *Trel. in A. Gr. Syn. Fl. N. Am. i. pt. 1*, 399; *Small Fl. S. E. U. St.* 736; *Umb. Symb. Ant. iv.* 365, *v.* 84; *Britt. & Millsp. Bah. Fl.* 249. *S. completa* Sw. *Prodr.* 38 (1788) & *Fl. Ind. Occ.* 327, *t.* 7; *Macf. Jam. i.* 207. *Buxi folio majore* &c. *Sloane Cat.* 171 & *Hist. ii.* 102, *t.* 209, *f.* 1. (Fig. 14.)



Fig. 14.—*Schaefferia frutescens* Jacq

A, Fruiting branch $\times \frac{3}{8}$.

B, Male flower cut lengthwise $\times 7$.

C, Female flower cut lengthwise $\times 7$.

D, Drupe cut lengthwise $\times 4$.

(After Sargent.)

In fl. Sept., Oct.; in fr. May-Dec.; *Sloane* Herb. vii. 23 & 23*! *Swartz*; hills north of Luidas Vale, *Prior*! *March*! Port Henderson, *Campbell*! base of Long Mt., 100-250 ft.; Great Goat Is.; Corby, Chelsea Hill and Potsdam Hill, St. Cruz Mts., 1500-2200 ft.; near Ferry river; Grant's Pen near Yallahs Bay; Lititz savanna; *Harris*! Fl. Jam. 6050, 8925, 9014, 9321, 9583, 9685, 9694, 9801, 10,041, 10,642, 11,767.—Florida (incl. Keys), Bahamas, West Indies as far south as Grenada, Mexico, Ecuador.

Shrub 6-10 ft. high, or *tree* to 20 ft. high; branches striate with raised lines. *Leaves* 2.5-6 cm. l., broadly elliptical to lanceolate, acute or subacuminate, thinly leathery. *Flowers* solitary or a few in a cluster, greenish or yellow. *Pedicels* 1-3 mm. l. in fl., 1-6 mm. l. in fr. *Calyx* 7-1 mm. l., segments roundish. *Petals* elliptical or oblong, 3-4 mm. l. *Drupe* 4-6 mm. l., spherical to ovoid, bright scarlet to orange-scarlet.

2. *S. obovata* Urb. *Symb. Ant.* v. 405 (1908).

In fr. July-Sept.; between Rock Fort and mouth of Hope river; *Harris*! Fl. Jam. 9384, 10,820.

Shrub 5-6 ft. high. *Leaves* 1.5-2.5 cm. l., broadly to narrowly obovate, apex rounded, papery. *Flowers* greenish-yellow (only female fls. from which the petals had dropped, seen by us). *Pedicels* 2-3(4.5) mm. l. *Calyx* 6-7 mm. l., segments oblong or roundish-triangular. *Drupe* 3.5 mm. l., ovoid or ellipsoidal, green and orange, shortly beaked with the persistent style.

3. *S. Marchii* Griseb. *Fl. Br. W. Ind.* 710 (1864) (name only); *Urb. Symb. Ant.* v. 86. A specimen from March in Herb. Kew., named by Grisebach.

In fr. Sept.; *March*! Windward road, east of Rock Fort, *Harris*! Fl. Jam. 9383.

Shrub 8 ft. high. *Leaves* 5-1.5 cm. l., broadly to narrowly obovate, apex rounded, generally emarginate, papery-leathery. *Flowers* not seen. *Pedicels* in fruit 0-1 mm. l. *Drupe* with 4 persistent roundish sepals, roundish-ellipsoidal, 3.5-4 mm. l.

6. ELÆODENDRON Jacq. f.

Glabrous shrubs or small trees. Leaves opposite and alternate, entire or crenate. Stipules minute. Flowers hermaphrodite or more or less unisexual, dioecious in *E. diœcum*, in cymes on axillary peduncles, parts in fours or fives. Stamens in the female flowers petal-like in West Indian species. Disk thick, with 4 or 5 lobes. Ovary pyramidal, confluent with the disk, generally 3-cornered, 3-(2-5)-celled; style very short; stigma with 2-5 lobes. Ovules 2 in each cell, erect from the base. Drupe dry or pulpy; stone 1-3-celled; cells with one seed, sometimes two. Seeds erect, without an aril.

Species about 60, dispersed throughout the tropics.

E. diœcum Griseb. *Fl. Br. W. Ind.* 709 (1864). *E. attenuatum* Griseb. *op. cit.* 145 (1859) (in part, as regards the Jamaican specimen only) (non *A. Rich.*). *E. xylocarpum* DC. var. *diœcum*

Urb. Symb. Ant. v. 89 (1904). Freziera(?) dioica Macf. Jam. i. 115 (1837). (Fig. 15.)

In fl. May; Tweedside road, opposite Sheldon Works, Port Royal-Mts., Macfadyen!

Tree about 20 ft. high. Leaves crowded at the ends of the branches, elliptical or oblong-elliptical, apex rounded, or very shortly acuminate, base wedge-shaped to very obtuse, distantly serrate-crenate, 7-10 cm. l., 3.5-6 cm. br.; petiole 7-12 mm. l. Peduncles: male about as long as the petiole, forking 2-4 times, with numerous flowers. Male flower: Sepals, petals, stamens 5. Ovary sterile. Female shorter than the petiole,

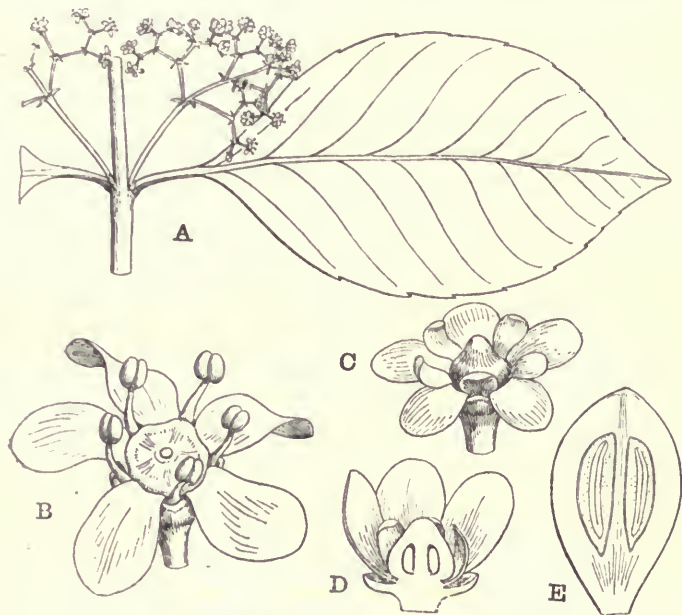


Fig. 15.—*Elæodendron diacum* Griseb. v. *dolichocarpum*.

A, Portion of twig with leaf and inflorescence $\times \frac{1}{2}$.
B, Male flower $\times 5$.

C, Female flower $\times 5$.
D, Ditto cut lengthwise $\times 5$.
E, Drupe cut lengthwise $\times 1\frac{1}{2}$.

bearing about eight small greenish shortly pedicelled flowers in a head. Female flower: Sepals 4-5, rounded. Petals 4-5, elliptical, obtuse. Staminodes petaloid, alternating with petals, oblong, obtuse, spreading, inserted on a hypogynous disk. Ovary conical; stigma obtuse, subentire. Drupe (fide Macfadyen), size of a gooseberry, globose; stone 2-celled, with one cell undeveloped. Seeds solitary, globose, compressed.

Var. *obovatum* (*Urb. loc. cit.* under *E. xylocarpum*); leaves elliptical, sometimes more or less obovate, apex shortly and subabruptly acuminate, base obtuse to acute, 8-10 cm. l.,

4·5–6·5 cm. br.; drupe obovoid or obovoid-globular, apex rounded, 1·7–2 cm. l., 1·2–1·8 cm. br., pale yellow.

In fr. Feb.–July; above Gordon Town; Content road, 1200 ft.; Hall's Delight, St. Andrew, 1200 ft.; Maryland road to Newcastle, 1200 ft. Walderston, 2600 ft.; *Harris!* Fl. Jam. 5578, 5881, 10,108, 10,143, 12,756.

Var. acuminatum (*Urb. loc. cit.* under *E. xylocarpum*); leaves elliptical or elliptical-oblong, apex acuminate or rounded apiculate, base somewhat acute, 10–15 cm. l., 3·5–6 cm. br.; drupe ovoid, apex obtuse, 2·2–2·5 cm. l., 1·5–1·8 cm. thick; bushy tree, 20 ft. high.

In fl. June; Clydesdale, Blue Mts., 3500 ft.; *Harris!* Fl. Jam. 5755.

Var. doliehocarpum (*Urb. tom. cit.* 90 under *E. xylocarpum*); leaves ovate or elliptical, apex shortly and obtusely acuminate, base acute or narrowed into the stalk, 8–12 cm. l., 4–6·5 cm. br.; drupe ellipsoidal or oblong-ellipsoidal, apex obtuse, 2–3 cm. l., 1–1·5 cm. thick.

In fl. April; in fr. Aug.–Nov.; Chester Vale and neighbourhood, Blue Mts., *Harris!* Fl. Jam. 5125, 5325, 5437.

The East Indian species *E. glaucum* Pers. has been introduced into Jamaica, but is readily distinguished from West Indian species by the lax inflorescence as long as the leaves, by the hermaphrodite flowers, and the 2-celled ovary.

FAMILY LVII. HIPPOCRATEACEÆ.

Small trees or climbing shrubs. Leaves opposite; stipules small, deciduous or wanting. Flowers small, in axillary panicles or cymes, greenish or white. Calyx small, with 5 segments, imbricate. Petals 5, spreading, imbricate, sometimes valvate. Stamens generally 3; filaments flattened, inserted within the disk, free or sometimes attached to the base of the ovary, recurved or reflexed at the apex; anthers 2–4-celled, cells at length confluent, opening on the outside. Disk conspicuous. Ovary 3-celled; style short, with a 3-lobed stigma; ovules 2–10 in each cell generally attached axially at the base. In *Hippocratea* the ovary has 3 protuberances from its angles, which continue to grow, so that the 3 ripe carpels are united at the base, compressed, leathery, 2-valved or indehiscent, with few seeds in the cells. In *Hippocratea*, seeds compressed, usually winged below; endosperm wanting; embryo in the upper part of the seed; cotyledons large, flat.

Species, about 200, dispersed through the tropical and sub-tropical regions of the world, except in the islands of the Pacific.

HIPPOCRATEA L.

Description the same as of the family.

Species, about 100, with distribution of the family.

H. oblongata Solander (ms. *descript.* in *Herb. Mus. Brit.*)
ex *Miers in Trans. Linn. Soc.* xxviii. 362 (1872). *Hippocratea*



Fig. 16.—*Hippocratea oblongata* Solander.

- A, Twig with leaves and inflorescence $\times \frac{1}{2}$.
 B, Flower-bud $\times 4$.
 C, Flower $\times 3$.
 D, Flower cut lengthwise with petals cut off $\times 10$.
 E, Ovary of *H. volubilis* L., cut lengthwise through two of the cells as the fruit has begun to form, enlarged.
 F, Ripe fruit of ditto $\times \frac{1}{2}$.
 G, A single valve of one of the capsules $\times \frac{1}{2}$.
 H, Pedicel, receptacle and four seeds from which the two valves have fallen off $\times \frac{1}{2}$.
 I, Embryo, nat. size.
 (E-I after Miers.)

A. Robinson ms. & quoted in *Lun. Hort. Jam.* i. 373. *H. ovata*?
Macf. Jam. i. 142 (1837) (non Lam.); *Griseb. Fl. Br. W. Ind.* 148

(in part). *H. malpighiæfolia* Griseb. loc. cit. (1859) (in part) (non *Rudge*). *H. lancifolia* Wilson ex Tr. & Planch. in Ann. Sc. Nat. sér. 5, xvi. 372 (1872). *Pristimera oblongata* Miers loc. cit. *P. granulosa* Miers tom. cit. 363 (1873). *Hylenæa jamaicensis* Miers tom. cit. 369. *Romualdea lancifolia* Tr. & Planch. loc. cit.; Urb. Symb. Ant. vi. 98.

In fl. and fr. spring; Jamaica, without locality, *Shakspear!* banks of Cabaritta river, *Robinson*; near Ginger Hall Works, St. Thomas in the East, *Macfadyen! Wilson!* (Fig. 16.) Type in Herb. Mus. Brit.

Shrub, climbing. *Stem* jointed. *Leaves* 6–15 cm. l., 2–5.2 cm. br., oblong- or ovate-elliptical, apex acute, base obtuse, entire, network of nerves and veins slightly prominent on both sides; petiole 5–10 mm. l. *Inflorescence* 2.5–3 cm. l., with 8 or 9 flowers; peduncle slender, 1–1.5 cm. l. *Flowers* pale yellow, very fragrant. *Calyx*: larger segments semicircular, about 1.5 mm. l., outer smaller. *Petals* obovate, 4–5 mm. l., 3 mm. br., margin undulate-denticulate. *Disk* somewhat cup-shaped, 5-lobed, half as long as calyx. *Stamens* twice as long as the disk. *Ovary* roundish; style cylindrical, short. *Capsules* (fide *Robinson*); largest 4 cm. l., 3 cm. br., ovate, compressed with many branched veins running from the base to the margins and apex, splitting lengthwise into 2 valves, generally with 2 seeds. *Seeds* (fide *Robinson*), excessively bitter, as are the leaves, ovate, "each adhering to the base of the valve to a small receptacle, with a margin running down their interior parts, ending in a narrow tail or appendicle at the base."

The granulose character of the leaf surface in *Macfadyen's* and *Wilson's* specimens on which *Miers* based his *P. granulosa*, is shown by examination to be pathological.

FAMILY LVIII. STAPHYLEACEÆ.

Glabrous trees or shrubs. Leaves generally opposite, pinnate with an odd leaflet, generally with stipules and stipellæ. Panicles spreading, terminal or axillary. Flowers small, regular, hermaphrodite. Calyx 5-lobed, imbricate. Petals 5, imbricate. Stamens 5, inserted outside the disk. Disk crenate or lobed. Ovary generally 3-lobed, 3-celled; styles 3, free or united; ovules few or many in each cell on a central axis. Fruit sometimes capsular, in *Turpinia* indehiscent, somewhat globular, crowned by the remains of the styles, fleshy or leathery, 3-celled; cells with few or many seeds. Seeds with hard coat, fleshy endosperm, and plano-convex cotyledons.

Species about 25, natives of the north temperate zone, spreading southwards to the tropics.

TURPINIA Vent.

Calyx persistent. Petals broadly spatulate to roundish. Filaments flattened. Disk large. Seed with polished coat.

Species 13, natives of the West Indies, Central America,

mountains of India to southern China, and the Malayan Archipelago.

T. occidentalis G. Don *Gen. Syst.* ii. 3 (1832); *Griseb. Fl. Br. W. Ind.* 128 (excl. syn. *Sloane & Vent.*); *Urb. Symb. Ant.* iv. 368. *Staphylea occidentalis* Sw. *Prodr.* 55 (1788) & *Fl. Ind. Occ.* 566 (excl. syn. *Sloane & Pluk.*); *A. Robinson ms. & ic. ined.*;



Fig. 17.—*Turpinia occidentalis* G. Don.

- A, End of twig with flowers and leaves $\times \frac{1}{2}$.
 B, Flower $\times 5$.
 C, Ditto cut lengthwise $\times 5$.
 D, Fruit cut across $\times 1\frac{1}{2}$.
 E, Seed cut lengthwise, enlarged.
 (E after Engler.)

DC. Prodr. ii. 3; *Macf. Jam.* i. 203 (excl. syn. *Sloane*). S? corymbosa *DC. loc. cit.* (1825). (Fig. 17.) Specimen from Swartz in Herb. Mus. Brit.

Iron Wood, Cassada Wood, Wild Cassada, Mutton Wood.
 In fl. April–June and autumn; *Wright!* *Swartz!* *Macfadyen!* Pedro woods, St. Ann, *Purdie!* *Wilson!* Moneague, *Prior!* *March!* Cinchona,

J.P. 600; Claverty Cottage, J.P. 2019; *Hart!* Cinchona; Vinegar Hill; *Fawcett!* Bryans Hill; near Troy, 2000 ft.; *Harris!* Fl. Jam. 5392, 8150, 9354.—Porto Rico (?), Guadeloupe, Dominica, Martinique, St. Vincent, Grenada, Guatemala.

Tree 20-30 ft. high. *Leaves* with 1-3 pairs of leaflets; stipules inconspicuous; leaflets ovate or elliptical, acuminate, crenate-serrate, stipellate, 4-8 cm. l. *Panicles* as long as, or longer than, the leaf. *Flowers* white, fragrant. *Sepals* varying in size and form, three outer 3, 3.5, and 4 mm. l., elliptical, two inner 4 mm. l., petal-like, somewhat spatulate-roundish. *Petals* varying in size and form, 4-5 mm. l., spatulate to roundish-elliptical. *Filaments* varying in length and breadth, 4.5-3.5 mm. l.; anthers 1.3 mm. l. *Disk* lobed. *Drupe* to 1.5 cm. in diam., 3-mucronate; points (remains of styles) distant. *Seed*: coat thick, woody.

Swartz's specimen shows that he was in error in describing the leaves as alternate, and duplicate-pinnate.

FAMILY LIX. ICACINACEÆ.

Trees or shrubs. Leaves mostly alternate, entire or with wavy margin, without stipules. Inflorescence (in New World species of *Mappia*) lax axillary paniculate cymes. Flowers minute, polygamous (in *Mappia*); parts in fives, rarely fours. Calyx small, not enlarged in fruit. Petals generally free, hypogynous, valvate. Stamens alternate with the petals, and inserted with them. Disk cup-shaped or 5-lobed. Carpels usually 3, united; ovary usually 1-celled by non-development; ovules 2, pendulous; styles undeveloped or united. Fruit a drupe, 1-celled, 1-seeded. Seed pendulous; endosperm fleshy.

Species over 100, natives of the tropics.

MAPPIA Jacq.

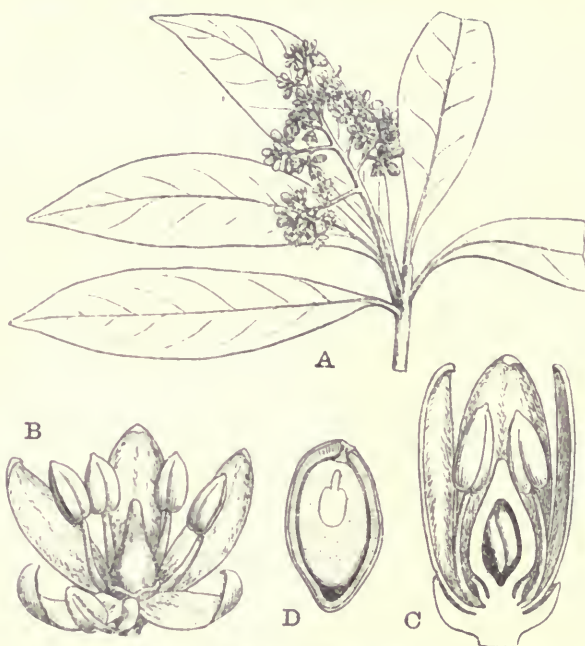
Calyx toothed. Petals hairy inside. Filaments glabrous. Ovary 1-celled. Embryo rather large; cotyledons foliaceous.

Species about 12, natives of tropical S. America, West Indies, India, and Ceylon.

M. racemosa Jacq. *Hort. Schoenbr. i.* 22, t. 47 (1797); *Miers in Ann. & Mag. Nat. Hist. ser. 2, ix.* 394 & *Contr. i.* 64; *Griseb. Fl. Br. W. Ind.* 310; *Urb. Symb. Ant. iv.* 367. *M. affinis* *Miers loc. cit.* (1852). *Iceacina dubia* *Macf. Jam. i.* 122 (1837). (Fig. 18.)

In fl. May, June, Sept., Oct.; Port Royal Mts.; St. David, mts.; *Macfadyen!* Manchester, *Purdie!* Grier Park, St. Ann, *Prior!* Green Valley, 2000 ft., J.P. 1342, *Morris!* also *Harris!* Bryans Hill, 3000 ft.; Westphalia road, 3500 ft.; Mansfield, Bath; Schwallenberg, St. Ann; Peckham, Clarendon, 2500 ft.; *Harris!* Fl. Jam. 5387, 5506, 5761, 5876, 6008, 6511, 7043, 11,193.—Cuba, Porto Rico.

Shrub or *tree* 6-30 ft. high. *Leaves* 8-15 cm. l., lanceolate-oblong, often with a gland in the nerve axils beneath. *Panicles* somewhat shorter than the leaves. *Petals* oblong, thickened at apex, 4 mm. l., yellowish. *Disk* obtusely 5-lobed, glabrous. *Drupe* 1.6-1.8 cm. l.

Fig. 18.—*Mappia racemosa* Jacq.A, Flowering twig $\times \frac{3}{4}$.B, Male flower $\times 5$.C, Hermaphrodite flower cut lengthwise $\times 10$.

D, Drupe cut lengthwise, slightly enlarged.

FAMILY LX. SAPINDACEÆ.

Trees or shrubs, rarely shrubby herbs, sometimes climbing by tendrils. Leaves alternate, without stipules (stipules present in *Paullinia* and sometimes in *Serjania*), abruptly pinnate or with an odd leaflet, sometimes biternate, 3- or 1-foliate. Racemes, or panicles, sometimes corymbose, generally axillary, sometimes terminal. Flowers generally small and polygamo-dioecious, regular or irregular. Sepals 4 or 5, generally imbricate. Petals 4 or 5, sometimes wanting, imbricate, sometimes with scales on the inside. Disk complete in the regular flowers (wanting or small in *Dodonæa*), represented by 2 or 4 glands in the irregular flowers. Stamens generally 8, usually hypogynous and inserted within the disk, sometimes placed on one side. Ovary 3-celled (2-celled in *Allophylus* and 2-3-celled in *Melicocca*). Ovules 1 (or 2) in each cell, attached to the axis. Fruit capsular or indehiscent, drupaceous, baccate, or leathery, or composed in

Serjania of 3 samaras. Seeds without endosperm, generally with an aril.

Species about 1,050, mostly natives of warmer regions of the world.

Plants climbing by tendrils.

Leaves twice 3-foliolate.

- | | |
|--|---------------------------|
| Fruit composed of 3 samaras united in the axis | 1. <i>Serjania</i> . |
| Capsule 3-valved, leathery | 2. <i>Paullinia</i> . |
| Capsule of 3 inflated membranous lobes | 3. <i>Cardiospermum</i> . |

Plants not climbing.

Leaves 3-foliolate.

Petioles not margined.

- | | |
|------------------------------------|------------------------|
| Flowers irregular | 4. <i>Allophylus</i> . |
| Flowers regular | 10. <i>Exothea</i> . |
| Petioles margined. Flowers regular | 9. <i>Hypelate</i> . |

Leaves abruptly pinnate.

Sepals and petals 5.

Fruit not splitting open.

- | | |
|---|----------------------|
| Fruit a 1-seeded berry-like drupe, with the second cell undeveloped | 10. <i>Exothea</i> . |
|---|----------------------|

- | | |
|--|----------------------|
| Fruit fleshy, usually of 1 coccus, the other two undeveloped | 5. <i>Sapindus</i> . |
|--|----------------------|

Fruit splitting open.

- | | |
|------------------|---------------------|
| Capsule dry | 6. <i>Cupania</i> . |
| [Capsule fleshy] | <i>Blighia</i> .] |

- | | |
|---|---------------------|
| Sepals 5, petals rudimentary. Capsule with 1-3 compressed, 2-valved lobes | 7. <i>Matayba</i> . |
|---|---------------------|

- | | |
|---|---------------------|
| [Sepals and petals 4. Drupe 1-celled, 1-seeded] | <i>Melicocca</i> .] |
|---|---------------------|

- | | |
|---|---------------------|
| Leaves simple (1 foliolate). Capsule 3-winged | 8. <i>Dodonæa</i> . |
|---|---------------------|

§ A. Flowers irregular. Petals 4, the place of the fifth vacant. Disk represented by 2 or 4 glands. Stamens unilateral.

1. SERJANIA Plum. ex Schum.

Shrubs climbing by peduncular or axillary tendrils; epidermis with mucous in Jamaican species. Leaves biternate and with pellucid dots in Jamaican species, without stipules or with minute stipules. Racemes or panicles axillary. Flowers polygamous, rather small and white in Jamaican species. Sepals 5 (or sometimes 4), 2 more or less united, tomentose, imbricate, the outer smaller. Petals bearing a scale, the scales of the two inferior petals appendaged at the apex. Disk glands: 2 larger and 2 smaller, the latter sometimes not developed. Stamens 8. Style 3-lobed. Fruit of 3 samaras, broadly winged below, united in the axis, with indehiscent cells at the apex. Seed with a very small aril; embryo incurved; cotyledons incumbent, the inner transversely folded.

Species nearly 200, natives of the West Indies, tropical America, and subtropical S. America

Branches 5-angled, generally thorny. Common petioles naked or lined by a narrow margin, partial petioles with a broader margin

1. *S. mexicana*.

Branches 3-cornered or nearly terete. Petioles not margined.

Fruit about 1.3 cm. l.

2. *S. levigata*.

Fruit about 2.5 cm. l.

3. *S. equestris*.

1. *S. mexicana* Willd. *Sp. Pl. ii.* 465 (1799); branches 5-angled, generally thorny; common petiole of leaves naked or lined by a very narrow margin, partial petioles with a broader

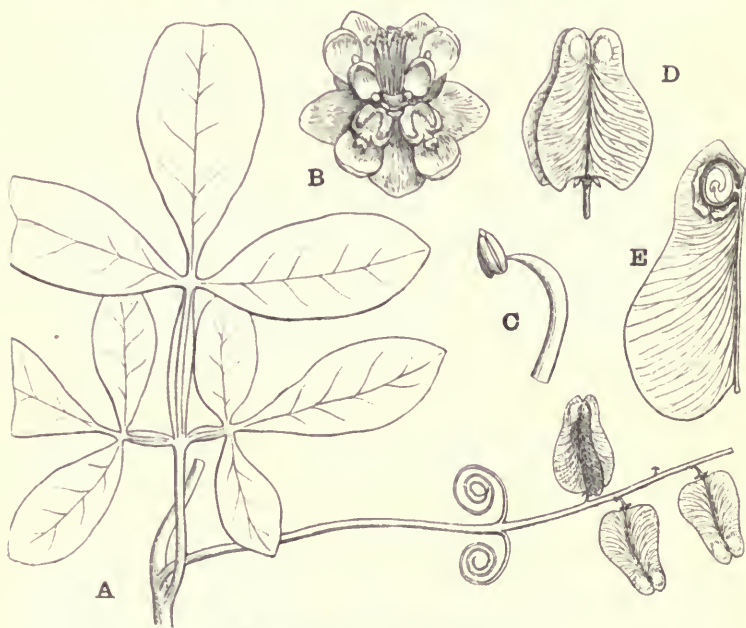


Fig. 19.—*Serjania mexicana* Willd.

A, Leaf and portion of raceme in fruit

D, Fruit, nat. size.

× 3.

E, Samara with seed cut lengthwise

B, Male flower × 4.

× 1½.

C, Stamen × 11.

(A after Schumacher.)

margin; fruit in section 2–2.7 cm. l., 1.4–1.8 cm. br. near base, oblong or ovate, base cordate, scarcely or not at all constricted below the cells, generally glabrous; cells 5–6 mm. l., glabrous within.—*Radlk. Monogr. Serj.* 235 & *Suppl.* 124. *S. divaricata* Schum. in *Skrivt. Naturh. Selsk. Kjoeb. iii.* p. 2, 126, t. 12, f. 2 (1794); *Willd. tom. cit.* 464; *Macf. Jam. i.* 157; *Griseb. Fl. Br. W. Ind.* 123 (excl. specimen from March). *S. spectabilis* Schum. *tom. cit.* 127, t. 12, f. 4; *Willd. tom. cit.* 465. *Paullinia mexicana*

L. Sp. Pl. 366 (1753) (excl. syn. *Plum.*); *Lun. Hort. Jam. ii.* 216. *P. caribæa* Jacq. *Obs. Bot. pt.* 3, 11, t. 62, f. 7 (1768). *P. divaricata* Sw. *Prodr.* 64 (1788) & *Fl. Ind. Occ.* 696. (Fig. 19.) Specimens from Hort. Cliff. in Herb. Mus. Brit. and one in Herb. Linn.

Wright! Broughton! Clarendon, Robinson; Swartz; Port Royal Mts., Macfadyen! Distin! Fairfield, Wulfschlaegel (under *S. lucida* Schum. in Griseb. loc. cit.), Wilson! Prior! Hope Mines, 750 ft.; Potsdam, 2600 ft.; Hope estate, 650 ft.; Harris! *Fl. Jam.* 8364, 9818, 10,804.—Central America, Colombia, Venezuela.

Stem and branches glabrous or pubescent. *Leaves*: lower about 3 dm. l., becoming gradually smaller upwards and sometimes not fully developed; leaflets 6–13 cm. l., elliptical, ovate, obovate, or oblong, terminal narrowed at the base, apex obtuse or retuse, acute, or acuminate, subentire or with 2–4 blunt teeth on each side, glabrous or pubescent beneath, sessile; petioles sometimes thorny beneath. *Racemes* solitary (*S. spectabilis*) or paniculate with divaricate branches (*S. divaricata*). *Sepals* covered with white tomentum, the inner 3 mm. l. with two (third and fifth) united at the base, the outer shorter. *Petals* a little shorter than the sepals; scales (excl. the crest) about half as long as the petals, margin hairy, two (the upper) with a broad emarginate crest, and an appendage turned down, more than half as long as the scale, hairy. *Seed* inserted below the middle of the cell, lens-shaped.

2. *S. lævigata* Radlk. in *Urb. Symb. Ant. i.* 347 (1899); branches 3-angled or nearly terete; leaflets broadly ovate to narrowly elliptical, obtuse or emarginate, base narrowed into the short petiolule, subentire, occasionally with a very short tooth or shallow notch, leathery; petioles not margined; fruit about 1·3 cm. l., cordate-ovate, apex retuse, somewhat constricted below the cells; cells 5 m. l., 3-cornered, with broad partition wall, keeled on the back, slightly crested, puberulous, hairy on internal walls.

In fl. Oct., in fr. Jan.; near Wareka, 400–800 ft.; Spur Tree Hill, 2000 ft.; Harris! *Fl. Jam.* 6679, 9024, 9860.

Stem and branches, very young parts and the inflorescence puberulous. *Leaves*, upper 12–14 cm. l.; leaflets, terminal 6·5–8 cm. l., glabrous on upper surface and also beneath except for a minute hairy tuft in the axils of the nerves. *Panicle* 10–15 cm. l. *Sepals* with white tomentum: two outer 3·5–4 mm. l., roundish to roundish-elliptical, inner 4–4·5 mm. l., broadly elliptical, concave, two slightly connected at base. *Petals* about 5 mm. l., obovate with a small claw; scales (excluding the crest) about half as long as the petals, margin hairy, two (the upper) with a broad semicircular crest, and an appendage turned down, more than half as long as the scale, hairy, the lower scales with crest only. *Fruit* at base 10–14 mm. br., at the cells 7–8 mm. br. *Seed* inserted at the base of the cell, obovoid, 5 mm. l.

3. *S. equestris* Macf. *Jam. i.* 156 (1837); branches 3-angled; leaflets ovate, apex subacuminate, acumen somewhat blunt, sometimes retuse, apiculate, base narrowed, distantly and bluntly toothed above the middle, sessile, sometimes shortly stalked, papery; petioles not margined; fruit about 2·5 cm. l.

cordate, ovate; cells about 1 cm. l., densely and shortly pubescent, with reddish hairs on internal walls.—*Radlk. Monogr. Serj.* 216. *S. paniculata* Griseb. *Fl. Br. W. Ind.* 123 (1859) (in part, as regards the Jamaican specimen) (non Kunth). *S. divaricata* Griseb. *loc. cit.* (in part, as regards specimens from March (non Schum.). Specimen from Macfadyen in Herb. Kew.

Mountain Supple Jack.

Macfadyen! March! Wilson! David's Hill, St. Andrew; near Mahogany Vale Bridge, 1500 ft.; Robertsfield; Bryan's Hill; Harris! 5519, 5742, 6039, 6079, 6548.

Stem and branches, young puberulous, adult glabrate. *Leaflets* about 5 cm. l., terminal larger, subrhomboid, glabrous on upper surface and also beneath except for a minute hairy tuft in the axils of the nerves. *Sepals* covered with white tomentum, the outer two small, roundish, the three inner three times longer than the outer, obovate-roundish, with 2 cohering. *Petals* nearly the same size as the larger sepals. *Seed* obovoid, inserted near the base of the cell.

S. angustifolia Willd. *Sp. Pl.* ii. 466 (1799), *Radlk. tom. cit.* 348, remarkable for its linear-lanceolate leaflets and foliaceous petioles, is said by Descourtilz (*Fl. Ant. iv.* 17, t. 237) to occur in Jamaica, but is unknown except by the descriptions and drawings of Plumier (*Pl. Amer. Burm.* 103, t. 113, f. 1) and Descourtilz.

2. PAULLINIA L.

Shrubs climbing by peduncular or axillary tendrils. Leaves biternate and with partial petioles winged in Jamaican species; stipules deciduous. Inflorescence a thyrse, axillary. Flowers small polygamo-diceious. Sepals minutely puberulous, 5, two outer smaller, two of the inner sepals (third and fifth) more or less united, imbricate. Petals 4, the place of the fifth vacant, each with a crested hooded scale on the inside, the scales of the upper petals with a tongue-like appendage below the apex, pointing downwards, bearded below. Disk with 4 glands, the two larger opposite the smaller petals. Stamens 8, inserted at the anterior side of the flower. Style with 3 stigmas. Fruit capsular, septifragally 3-valved, valves 3-winged or 3-6-ribbed, reddish or yellow, 3- or 2-1-seeded, leathery. Seed arillate; embryo curved. Supple Jack.

Species about 150, natives of tropical America, a few of the West Indies, one wide-spread species extends to tropical Africa, including Madagascar.

Leaflets entire or crenulate. Capsule 3-winged..... 1. *P. barbadiensis*.
Leaflets serrate. Capsule 3-6-ribbed 2. *P. jamaicensis*.

1. *P. barbadiensis* Jacq. *Enum. Pl. Carib.* 36 (1760) & *Obs. Bot.* iii. 12, t. 62, f. 9. Schum. in *Skrivt. Naturh. Selsk. Kjoeb.* iii. pt. 2. 123, t. 9, f. 3, t. 10, f. 6. Griseb. *Fl. Br. W. Ind.* 124; *Radlk. Monogr. Paul. in Abh. K. Bayer. Akad. Wiss.* xix. 293

(1896). *P. pinnata* L. *Sp. Pl.* 366 (1753) (only as regards syn. *Sloane*, and hab. Jamaica); *Wright Mem.* 267. *P. seriana* Gaertn. *Fruct.* 381, t. 79, a-h (1788) (excl. syn.) (non. L.). *P. foliis bitermatis* &c. A. *Robinson ms. & Ic. ined.* *Pisum cordatum* non *vesicarium* *Sloane Cat.* 111 & *Hist. t.* 239 (in part, as regards description of leaves and fruit, excluding

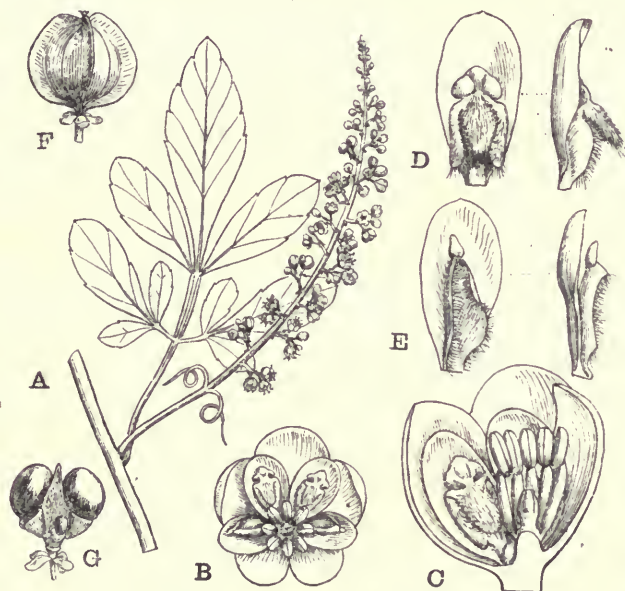


Fig. 20.—*Paullinia barbadensis* Jacq.

- A, Leaf and inflorescence $\times 2$.
 B, Male flower in bud opened out $\times 4$.
 C, Ditto cut lengthwise $\times 7$.
 D, Petal (upper) and scale from front and side $\times 6$.
 E, Petal (lower) and scale from front and side $\times 6$.
 F, Capsule $\times 1\frac{1}{2}$.
 G, Ditto with valves fallen, showing two seeds and one undeveloped $\times 1\frac{1}{2}$.

description of seeds). (Fig. 20.) Specimen from Jacquin in Herb. Mus. Brit. Specimen from Browne in Herb. Linn. named in Solander's hand *P. mexicana*.

Sloane Herb. iv. 103! *Houstoun*! *Browne*! *Wright*! *Broughton*! *Shakspear*! *Bertero*; *Macfadyen*! *March*! *Wilson*; J. P. 1008, *Hart*! near Wareka, 400 ft.; *Harris*! Windward Road, near Hope River; *Harris & Britton*! Fl. Jam. 6583, 10,795.—Barbados (fide *Jacquin*, at present known only as a garden plant).

Shrub glabrous. *Leaves* 6-8 cm. l.; leaflets upper 3-5 cm. l., lower scarcely 1 cm. l., elliptical, obtuse, narrowed to the base, terminal generally obovate, all sessile, entire or crenulate, thinly leathery, common petiole 1-2 cm. l., not margined, partial petioles margined or narrowly winged, a little longer or shorter than the common petiole. *Inflorescence* solitary, 3-15 cm. l., pedunculate or sessile. *Sepals* outer 2 mm. l., inner

3 mm. l. *Petals* elliptical, 3.5-4 mm. l. *Filaments* hairy. *Capsule* 3-winged, 1.4-1.7 cm. l., 1.2-1.5 cm. br.; valves semi-elliptical to semicircular. *Seed* 6-7 mm. l.

The branches of species of *Paullinia*, called "Supple Jacks," are flexible and tough; they are used as riding switches and walking sticks. The seeds are said to possess the property of intoxicating fish.

2. *P. jamaicensis* Macf. *Jam. i.* 158 (1837); *Radlk. Monogr. Paul. in Abh. K. Bayer. Akad. Wiss. xix.* 198 (1896). *P. sarmentosa* &c. *Browne Hist. Jam.* 212. *P. mexicana* L. *Herb. (in Solander's hand)* (non *Sp. Pl.*) no. 4, specimen affixed on left, probably collected by Browne, named "curassavica" by J. E. Smith. *Griseb. loc. cit.* (sub *P. curassavica Jacq. excl. hab. N. Grenada*); *Pisum decimum* &c. *Sloane Cat.* 110 & *Hist. i.* 238 (in part, as regards description of leaves, excluding description of fruit and seeds). *Planta fruticosa scandens ex cujus caule scipiones* &c. *Sloane Cat.* 214 & *Hist. ii.* 185, t. 231, f. 6.

Sloane Herb. iv. 102! *Wright! Robins! Shakspear! Macfadyen! Port Royal Mts., Purdie! March! Moneague, Prior! Walderston, 2000 ft.; near Troy, 1500 ft.; near Content Gap, 2800 ft.; Chester Vale, 3000 ft.; near Grove, Gordon Town; Harris! Fl. Jam.* 7016, 8416, 8563, 9149, 10,019; *Port Morant, Hitchcock.—Cuba.*

Shrub, branches bearing inflorescences, puberulous at length glabrate, with shallow furrows spotted with numerous brown lenticels. *Leaves* 10-20 cm. l.; leaflets terminal 4-8 cm. l., lateral smaller, upper elliptical-lanceolate or terminal subrhomboid, apex acuminate, acute, base narrowly wedge-shaped, lateral lower elliptical, obtuse, all sessile, distantly serrate-dentate, teeth sometimes rather large, membranous-papery; common petiole 2-6 cm. l., rhachis (intermediate partial petiole) with margin or wing (5-1.5 mm. br.). *Inflorescences* solitary or paniculate, puberulous, 4-8 cm. l., pedunculate or sessile. *Sepals*, inner 2 mm. l., subpetaloid, two united to one-third of their length, outer about 1 mm. l. *Petals* obovate, white. *Filaments* glabrous. *Capsule* 3-6-ribbed, ellipsoid-globular, contracted into a stalk-like base, pulverulent-puberulous outside, with short tomentum inside, about 15 cm. l., including the base (4-5 mm. l.); valves obovate subacute.

3. CARDIOSPERMUM L.

Shrubby or annual herbs, much branched, branches ribbed, climbing by 2 tendrils on the peduncle. Leaves biternate; leaflets crenate or serrate, often with pellucid dots or lines. Corymbs axillary. Flowers white, with jointed pedicels, polygamo-diœcious. Sepals 4, in Jamaican species, broadly imbricate, the 2 outer much smaller. Petals in pairs, two with a crested scale which has a bearded appendage pointing downwards, the other two with a scale which has a wing-like crest on the back. Glands 2, opposite the petals with the appendage. Stamens 8. Style 3-lobed. Capsule of 3 inflated membranous lobes, opening loculicidally. Seeds subglobular, black, often arillate at the base; cotyledons large, transversely folded on themselves.

Heart-pea.

Species 10, natives of tropical America, three of these are found in the West Indies, one of which occurs also in tropical Africa, and two are found throughout the tropics.

Flowers 8-10 mm. l. 1. *C. grandiflorum*.

Flowers 4-6 mm. l.

Seed with a heart-shaped bilobed hilum.

Capsule subglobular, 3-4 cm. in diam. 2. *C. halicacabum*.

Capsule 3-angled, apex truncate or depressed,
about 1 cm. high 3. *C. microcarpum*.

Seed with a semicircular hilum scarcely emarginate 4. *C. corindum*.

1. *C. grandiflorum* Sw. *Prodr.* 64 (1788) & *Fl. Ind. Occ.* 698 (1800); leaves, lower (incl. petiole 4-5 cm. l.) 15-20 cm. l.;

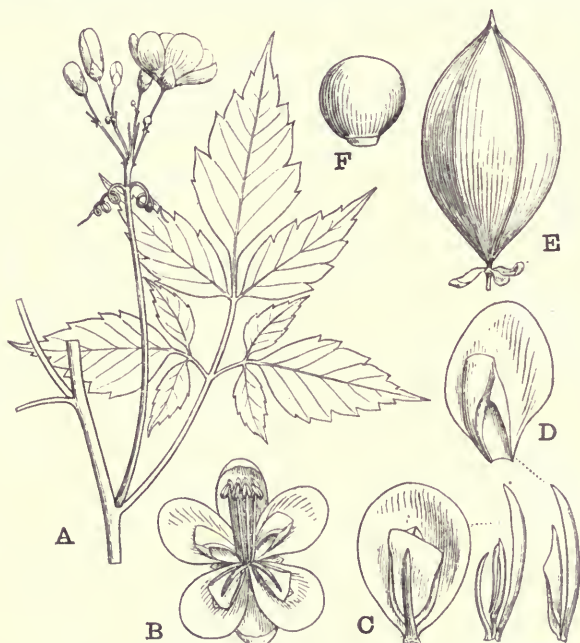


Fig. 21.—*Cardiospermum grandiflorum* Sw.

A, Leaf and inflorescence $\times \frac{3}{4}$.

B, Bud of male flower opened
 $\times 1\frac{1}{2}$.

C, D, Petals of ditto seen from
front and side $\times 2$.

E, Fruit $\times \frac{3}{4}$.

F, Seed $\times 2$.

leaflets deeply serrate, serratures acute; inflorescence as long as the leaves, sometimes longer; petals about 10 mm. l.; disk-glands horn-like; capsule to 6.5 cm. l., to 3.5 cm. br., obovate or ellipsoidal, 3-angled, acute at both ends. *Macf. Jam. i.* 155

Griseb. Fl. Br. W. Ind. 122; *Radlk. in Fl. Bras. xiii. pt. 3*, 433. *C. villosum* &c. *Browne Hist. Jam.* 213. *Pisum cordatum* non *vesicarium Sloane Cat.* 111 & *Hist. i.* 239 (only with reference to the description of the seed). *Pisum decimum* &c. *Sloane Cat.* 110 & *Hist. i.* 238 (only with reference to the description of the fruit and seed). (Fig. 21.)

Wild Supple Jack.

In fl. June-Oct.; *Sloane Herb.* iv. 102! *Wright! Shakspear! Macfadyen! St. Mary; St. Thomas in the Vale; McNab! Distin! Wilson; Prior; March! Blue Mts., Hitchcock; J.P.* 1211, *Hart! Chestor Vale, Cradwick! Round Hill, 1850 ft., Harris! Fl. Jam.* 9969. *Hardware Gap, G. E. Nichols!*—*St. Thomas, Martinique, warmer continental America, tropical Africa.*

Stem to 25 ft. long, woody, pubescent. *Sepals* 2 outer about 3 mm. l., roundish-ovate, inner about 7 mm. l. oblong. *Capsule* greenish-yellow. *Seed* 7 mm. in diam. with a white, roundish aril, about 1.5 mm. in diam.; coat very thick, fleshy.

2. *C. halicacabum L. Sp. Pl.* 366 (1753); leaves, larger (incl. petiole 3–4 cm. l.) 8–12 cm. l.; leaflets incised and obtusely serrate; inflorescence about as long as the leaves; flowers 4 mm. l.; disk glands spheroidal; capsule 3–4 cm. l. subglobular; seed, hilum white, heart-shaped or kidney-shaped.—*L. Amœn. v.* 378; *Gaertn. Fruct. i.* 381, t. 79; *Descourt. Fl. Ant. iv.* 37, t. 241; *Griseb. Fl. Br. W. Ind.* 122 (excl. syn. cf. *C. corindum*); *Radlk. in Fl. Bras. xiii. pt. 3*, 438; *Urb. Symb. Ant. iv.* 369; *Britt. & Millsp. Bah. Fl.* 252. *C. scandens* &c. *Browne Hist. Jam.* 213.

Hartweg! St. Mary, McNab! Lucea, Hitchcock; near Spanish Town, Harris! Fl. Jam. 12,060.—Tropics.

An annual or biennial herb, stem to 6 ft. long, and more, simple or branched. *Sepals* 2 outer roundish-ovate, inner oblong, twice as long as the outer. *Seed* about 5 mm. in diam.

3. *C. microcarpum H. B. & K. Nov. Gen. & Sp. v.* 104 (1821); plant sometimes only a span high, sometimes climbing to a length of 3–10 ft.; terminal leaflet generally lengthened into an acumen; flowers very small; capsule small, about 1 cm. high, 3-angled top-shaped, with a truncate or depressed apex, broader than high.—*Griseb. loc. cit.; Britton Fl. Berm.* 226; *Britt. & Millsp. Bah. Fl.* 252. *C. halicacabum* var. γ *L. Sp. Pl.* 367 (1753); *Bot. Mag. t.* 1049. *C. halicacabum L. var. microcarpum Bl. Rumphia iii.* 185 (1847); *Radlk. in Fl. Bras. xiii. pt. 3*, 442; *Urb. Symb. Ant. iv.* 370. Specimen from Browne in Herb. Linn. named *C. halicacabum* by Linnæus.

Browne! Shakspear! Arnott! Inverness, Clarendon, 300 ft., Harris! Fl. Jam. 12,754.—Tropics.

4. *C. corindum L. Sp. Pl. ed. 2*, 526 (1762); leaves biternate or subbipinnate or subtrternate, larger (incl. petiole) 8–10(–15) cm. l.; leaflets incised and toothed, or only crenate and sub-

entire; inflorescence longer than the leaves; flowers 4–6 mm. l.; disk glands spheroidal; capsule 2.5–3(–4), cm. in diam. if globular, in length if top-shaped; hilum white, semicircular, scarcely emarginate.—*Miller Dict. ed. 8*; *Radlk. in Fl. Bras. xiii. pt. 3, 443. Urb. Symb. Ant. iv. 370. C. villosum &c. Browne Hist. Jam. 213. C. halicacabum L. Amæn. v. 378 (1760); Griseb. Fl. Br. W. Ind. 122 (as regards syn. Mus. Banks, C. molle Kunth, C. loxense Kunth, C. villosum Macf. Coll. Purdie). C. villosum Macf. Jam. i. 154 (1837) (excl. syn. Sloane).*

Houstoun! Browne! Liguanea, Broughton! Swartz! St. Mary, Purdie! Windward Road, Fawcett! August Town, Campbell! road to Hagley Gap, 1000 ft.; Grove, near Gordon Town, 800 ft.; Mona, 700 ft.; Harris! Fl. Jam. 5786, 6589, 6831, 8837.—Tropics.

Stem to 6 ft. long and more, woody, hairy or glabrate. *Sepals*, inner about twice as long as the outer. *Petals* more or less persistent. *Seed* 2.5–4 mm. in diam.

4. ALLOPHYLUS L.

Erect shrubs or small trees, without tendrils. Leaves with 3 leaflets in W. Indian species; leaflets generally large, entire

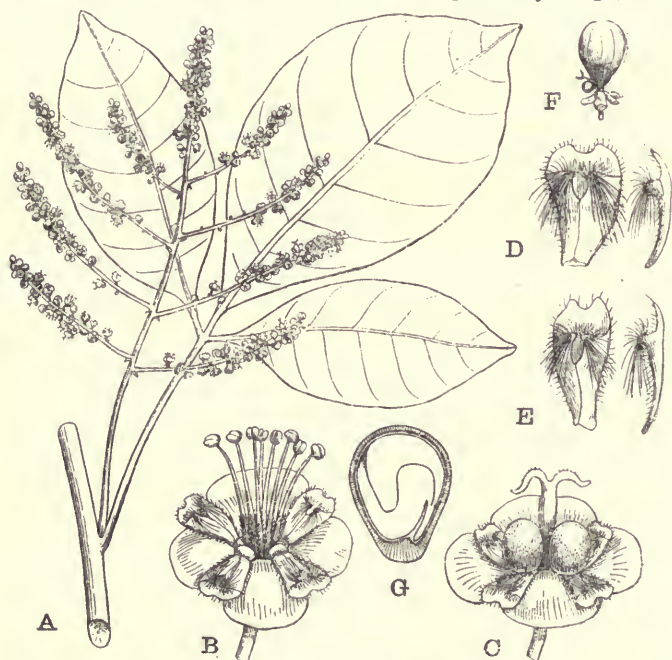


Fig. 22.—*Allophylus jamaicensis* Radlk.

A, Leaf and inflorescence $\times \frac{1}{2}$.

B, Male flower $\times 7$.

C, Female flower $\times 7$.

V.

D, E, Petals seen from front and side $\times 11$.

F, Fruit, nat. size.

G, Seed cut lengthwise $\times 2$.

12

or serrate, often pellucid-dotted or -lined, lateral more or less unequal-sided. Inflorescence raceme-like or laxly paniculate, axillary. Flowers small or minute, globose, often closed, polygamo-dioecious. Sepals 4, opposite in pairs, concave, broadly imbricate, the two outer smaller, elliptical, the inner roundish. Petals, each with a small 2-lobed scale. Disk glands opposite the petals, 4 (in W. Indian species). Stamens 8. Ovary deeply 2-lobed, lobes somewhat globular or obovoid, united by the style: style 2-lobed. Fruit composed of one indehiscent coccus (the other usually undeveloped), obovoid or somewhat globular. Seed erect, with a very short fleshy aril; embryo curved; cotyledons doubled on each other.

Species 156, about equally divided between the three great divisions: tropical America, tropical and south Africa, Asia and the islands of the Pacific.

Leaflets serrate, puberulous..... 1. *A. Cominia*.

Leaflets entire, glabrous.

Leaves 17-30 cm. l. 2. *A. jamaicensis*.

Leaves 7-13 cm. l. 3. *A. pachyphyllus*.

1. *A. Cominia* Sw. *Prodr.* 62 (1788); *Radlk. in Sitzungsber. K. Bayer. Akad. Math. Phys. Kl.* xxxviii. 215; *Britt. & Millsp. Bah. Fl.* 253. *Baccifera indica* &c. *Sloane Cat.* 170 & *Hist.* ii. 100, t. 208, f. 1. *Cominia arborea* &c. *Browne Hist. Jam.* 205. *Rhus Cominia* L. *Amoen. v.* 395 & 377 (1760). *Toxicodendron arboreum* Mill. *Dict. ed.* 8 (1768). *Schmidehnia Cominia* Sw. *Fl. Ind. Occ.* 667 (1798); *Macf. Jam. i.* 161; *Griseb. Fl. Br. W. Ind.* 126. Miller's type, Houstoun's specimen from Campeachy, is in Herb. Mus. Brit. Type from Browne in Herb. Linn.

In fl. Aug., Sept.; in fr. Dec.; Red Hills, *Sloane* Herb. vii. 19*, 20! *Wright*! *Browne*! *Broughton*! *Distin*! St. Mary, *McNab*! Great Valley, Manchester, *Purdie*! *Wilson*! *Ewarton*, *Prior*! *March*! Mavis Bank, J.P. 1131, *Hart*! Robertsfeld, J.P. 1447, *Morris*! Stony Hill, *York Moore*! Belvidere, near Montpelier; near Bito; *Fawcett*! near Christiana, 3000 ft.; near Mona, 800 ft.; Long Mt. 900 ft.; Malvern, 2200 ft.; New Market, 1100 ft.; Troy, 1600-2000 ft.; Font Hill, St. Elizabeth; *Harris*! Providence, *Thompson*! *Fl. Jam.* 8621, 9458, 9928.—Bahamas, Cuba, Is. of Pines, Hispaniola, Martinique.

Tree 20-40 ft. Leaves 15-20 cm. l. (incl. petiole 4-7.5 cm. l.); leaflets 8-15 cm. l., obovate-elliptical to obovate-lanceolate, lateral usually somewhat unequal-sided especially at the base, apex abruptly and shortly acuminate, more or less serrate especially in the upper half, sometimes subentire, puberulous on both surfaces, densely so on midrib and nerves, with small axillary tufts beneath and often tomentose; petiolules, terminal 5-8(-2) mm. l., lateral 0-5 mm. l. Inflorescence usually shorter than the leaves. Flowers pale yellow. Sepals, two outer oblong-elliptical, 8-1 mm. l., two inner petaloid, obovate, 1.2-1.4 mm. l. Petals oblong, about 1 mm. l. Coccus subglobular-ellipsoidal, 5 mm. l. Seed 4 mm. l.

2. *A. jamaleensis* Radlk. in *Urb. Symb. Ant. v.* 407 (1908).
Schmidelia glabrata Griseb. *Fl. Br. W. Ind.* 126 (1859) (non Kunth). (Fig. 22.)

In fl. Sept.; in fr. Nov.-Jan.; Wilson! Mt. Diablo, Prior! near Troy, 1000 ft.-2000 ft.; Peckham, Clarendon, 2000 ft.; Harris! near Mandeville, Harris & Britton! also Britton, 1048! Fl. Jam. 9068, 9440, 10,596, 12,818.

Tree 20-30 ft. high. Leaves 17-30 cm. l. (incl. petiole 4-10 cm. l.); leaflets 11-19 cm. l., elliptical or elliptical-lanceolate, lateral a little smaller, slightly unequal-sided, all shortly and obtusely acuminate, sometimes retuse, entire, glabrous on both sides except for a triangular patch of woolly hair in the axils of nerves beneath; petiolule 5-1.5 cm. l. Inflorescence about as long as the petiole or somewhat longer. Flowers yellowish-green or whitish. Sepals 1.5-1.8 mm. l. Petals 1.3-1.4 mm. l. Coccus somewhat obovoid, 7-8 mm. l., glabrous, ribbed. Seed 5-6 mm. l.

3. *A. pachyphyllus* Radlk. in *Urb. Symb. Ant. v.* 406 (1908).

In fr. Jan.; Bethabara, Wulfschlaegel; near Mandeville, Britton, 1009! near Moneague, Britton & Hollick, 2734! Walderston, Manchester, 2600 ft.; Harris! Fl. Jam. 12,857.

Bushy tree to 20 ft. high. Leaves 6.5-13 cm. l. (incl. petiole 1.5-4 cm. l.); leaflets 5-9 cm. l., elliptical, shortly acuminate, base narrowed into a short petiolule, entire, glabrous on both sides except for woolly hair in the axils of the nerves beneath; petiolule 3-7 mm. l. Inflorescence as long as, or longer than, the petiole. Coccus somewhat obovoid-globular, 7-10 mm. l., glabrous, ribbed.

§ B. Flowers regular. Disk complete (wanting in *Dodonæa*).
 Stamens central.

5. SAPINDUS L.

Trees. Leaves abruptly pinnate, leaflets entire. Racemes paniculate, terminal or axillary. Flowers polygamous. Sepals 5, outer smaller, broadly imbricate. Petals 5. Stamens 8. Filaments hairy, anthers versatile. Ovary 3-celled. Style terminal, stigma 2-4-lobed. Fruit fleshy, rarely of 3 cocci, usually 2 or 1 undeveloped; cocci globose, indehiscent. Seeds globose, not arillate; embryo curved; cotyledons thick.

Species about 10 (fide Radlkofer), natives of tropics and subtropics.

S. *Saponaria* L. *Sp. Pl.* 367 (1753) & *Amœn. v.* 378; *Descourt. Fl. Ant. iv.* 121, t. 261; *Wright Mem.* 267; *Macf. Jam. i.* 159; *Griseb. Fl. Br. W. Ind.* 126; *Radlk. in Sitzungsber. K. Bayer. Akad. Math. Phys. Kl. viii.* 319 & in *Fl. Bras. xiii. pt. 3*, 512, t. 109; *Sarg. Silv. ii.* 69, tt. 74, 75; *Duss. in Ann. Inst. Colon. iii.* 121; *Urb. Symb. Ant. iv.* 371. S. *foliis &c. Browne Hist. Jam.* 206; A. Robinson ms. & ic. ined. S. *rigidus* Mill. *Dict. ed. 8*; *Gaertn. Fruct. i.* 341, t. 70, fig. a-f; *Ait. Hort. Kew ii.* 36; *DC. Prodr. i.* 608. S. *inaequalis* DC. *loc. cit.* (1824);

Griseb. loc. cit. Prunifera seu Nuciprunifera &c. *Pluk. Phyt. t.* 217, *f.* 7. Prunifera racemosa &c. *Sloane Cat.* 184 & *Hist. ii.* 131. Cupania saponarioides *Sw. Prodr.* 62 (1788) & *Fl. Ind. Occ.* 661 (as regards leaves only, the inflorescence and young fruit refer to *Cupania americana*). (Fig. 23.)

Soap Berry Tree.

In fl. Sept.-Oct.; in fr. Mar.; *Houstoun!* *Sloane* Herb. vii. 75! *Wright!* *Broughton!* *Shakspeare!* *Distin!* *Priestmans River, Deans!* *Constant Spring, 600 ft.; Halberstadt, 2900 ft.; Harris!* *Fl. Jam.* 5315, 6666.—

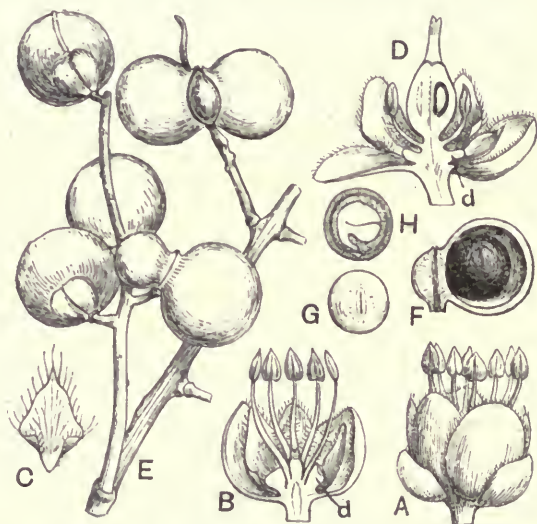


Fig. 23.—*Sapindus Saponaria* L.

A, Male flower $\times 7$.

B, Ditto cut lengthwise $\times 7$.

C, Petal $\times 7$.

D, Female flower $\times 7$.

E, Fruiting branch $\times \frac{3}{4}$.

d, disk.

F, Coccus cut lengthwise, showing the seed $\times \frac{3}{4}$.

G, Seed showing the hilum $\times \frac{3}{4}$.

H, Seed cut lengthwise $\times \frac{3}{4}$.

(After Fl. Bras.)

Native in tropical and subtropical America, including West Indies, from Florida to Argentine; introduced in West Africa, Mascarene Is., Polynesia and Philippines.

Tree 12-30(-50) ft. high. Leaves with 4-5 (3-6) pairs of leaflets; rhachis and petiole sometimes with wing or margin, sometimes without (form *inequalis*); leaflets 7-13 cm. l. (or more), elliptical, oblong, or lanceolate, more or less equal-sided, sometimes (f. *inequalis*) unequal-sided. Panicles terminal, to 3 dm. l. Flowers white, small. Sepals roundish, petaloid, ranging in size from 1 mm. l. to 2 mm. l. Petals shorter than the sepals, hairy. Coccus 1.5-2 cm. in diam., yellow. Seed 1.2 cm. in diam., globular, black.

The wood is heavy, rather hard, close-grained: a cubic foot weighs 52 lb. (Sargent); it is however not durable, except for inside use. The fleshy exterior of the fruit can be used as soap, though it has a bad effect on cloth. The seeds pounded and thrown into a stream intoxicate and

kill fish. Given to fowls, they are said to be a preventive against the disease called fowl-yaws (Macfadyen); they were formerly imported into England for waistcoat buttons.

[MELICOCCA L.

Glabrous trees. Leaves abruptly pinnate; leaflets in 2 or 3 pairs subopposite, subsessile, entire, membranous. Racemes long, terminal on lateral branchlets, simple or paniculate, with numerous flowers. Flowers polygamo-dicæious. Calyx deeply 4-lobed, imbricate. Petals 4, roundish or obovate. Disk 4-5-lobed. Ovary 2-3-celled; stigma peltate, 2-(3)-lobed. Drupe 1-celled with one seed. Seed erect, enclosed in a pulpy aril; embryo straight; cotyledons thick, united.

Species 2, one a native of Nicaragua and northern S. America, cultivated in the West Indies and Brazil; the other of Bolivia and Paraguay.

M. bijuga L. *Sp. Pl. ed. 2*, 495 (1762); *Sw. Obs. Bot.* 146; *Macf. Jam. i.* 164; *Griseb. Fl. Br. W. Ind.* 127; *Radlk. in Fl. Bras. xiii. pt. 3*, 523; *Cook & Coll. in Contr. U.S. Nat. Herb. viii.* 190; *Urb. Symb. Ant. iv.* 372; *Britt. & Millsp. Bah. Fl.* 253. *Melicoccus foliis* &c. *Browne Hist. Jam.* 210. *Sapindus Melicoccus* L. *Amœn. v.* 378 (1760). *Schinus?* *Melicoccus* L. *Amœn. v.* 379 (1760). *Melicoccus bijugatus* *Jacq. Enum. Pl. Carib.* 19 (1760), *Sel. Stirp. Amer.* 108, *t. 72 & Ed. pict. t.* 109. Specimen named by Linnaeus in *Herb. Linn.*

Genip Tree.

In fl. Apr.-June; *Wright!* *Browne!* *Shakspeare!* *Swartz!* *Lindsay!* *Distin!* *Wilson!* *Prior!* King's House grounds, *Briscoe!* Hope grounds, *Harris!* *Fl. Jam.* 7930, 7931, 9228; Port Antonio, *Lucea,* *Hitchcock.*—Cultivated, and, as it were, spontaneous in Bahamas, West Indies, Margarita, Bonaire, Curaçao. Native in tropical America from Nicaragua to Surinam.

Tree 30-40(-70) ft. high. *Leaves* shed annually, young leaves appearing with the flowers in spring, usually 2-paired; petiole and rhachis flat, sometimes winged; leaflets 7-11 cm. l., elliptical or ovate-elliptical, apex acute, subacuminate, or obtuse, base somewhat unequal-sided, entire, usually undulate; petiolules short. *Inflorescence*: male much branched, female less branched. *Flowers* open 6-8 mm. in diam., sweet-smelling. *Fruit* about 3 cm. in diam., green; pulp fibrous, gelatinous, of a sweet subacid slightly astringent taste. *Seeds* usually only one.

The tree is a handsome shade tree, and the flowers are very attractive to bees and humming birds. The fruit is sold in the markets; it is said that the fine fibres of the pulp have caused the death of children, when swallowed, by forming a coating over the lining of the stomach. The timber is hard and heavy, suitable for most purposes in protected situations. *Browne* states that the tree was introduced from Surinam.]

6. CUPANIA L.

Small trees. Leaves with on odd leaflet or abruptly pinnate; leaflets alternate and opposite, entire. Flowers paniculate or

racemose, polygamo-dioecious. Sepals 5, broadly imbricate in 2 series. Petals 5, with 1 or 2 scales more or less united with the petals on the outer margin. Stamens 8, inserted within the disk, central. Ovary 3-angled-subglobular or obovoid; ovules attached to the axis near the base. Capsule obovate-subglobose, 3-cornered, 3-celled, loculicidally 3-valved, with a long or short carpophore. Seeds subglobular, with a cup-shaped aril; embryo thick, curved; cotyledons plano-convex.

Species 38, natives of the warmer regions of America (incl. the West Indies) from Mexico to Argentina.

Capsule glabrous, top-shaped-triangular..... 1. *C. glabra*.

Capsule tomentose, globose, 3-cornered 2. *C. americana*.

1. *C. glabra* Sw. *Prodr.* 61 (1788); leaflets glabrous on both sides or sometimes more or less pubescent beneath, entire, crenate-undulate, or more or less serrate; capsule glabrous, top-shaped-triangular.—Sw. *Fl. Ind. Occ.* 659 (excl. syn. *L.* & *Plum.*



Fig. 24.—*Cupania glabra* Sw.

A, Leaf and inflorescence $\times \frac{1}{2}$.

B, Flower $\times 7$.

C, Ditto cut lengthwise $\times 7$.

D, Petal with two scales $\times 11$.

E, Ditto seen from the side $\times 11$.

F, Fruit splitting open, nat. size.

G, Ditto cut across, nat. size.

& hab. Hispaniola); *Macf. Jam. i.* 162; *Rich. in Sagra Cub. x.* 117 (1845); *Griseb. Fl. Br. W. Ind.* 125; *Radlk. in Sitzungsber. K. Bayer. Akad. Math. Phys. Kl. ix.* 559 (1879); *Urb. Symb. Ant. iv.* 373. *C. arborea* & *c. Browne Hist. Jam.* 178. *C. americana Gaertn. Fruct. ii.* 469, *t.* 177 (1791) (non *L.*). *C. multijuga Rich. tom. cit.* 118, *t.* 31 (1845). *Moschoxylon*, Red Musk Wood, *Robinson ic. ined.* (Fig. 24.)

Loblolly Tree.

In fl. Sept.; in fr. Jan.-Feb.; *Wright! Macfadÿen! Distin! Wulfschlaegel! Prior! March!* Belvedere, near Montpelier, *Fawcett!* Hall's Delight; Green Valley; Yallahs Valley, 1700 ft.; Hopeton, Westmoreland, 1000 ft.; Grandvale, Westmoreland, 500 ft.; Troy, 1600 ft.; Stanmore Hill, 2200 ft.; *Harris!* *Fl. Jam.* 5548, 5607, 6342, 7048, 7059, 9451, 9772.—Key Is., Cuba, Porto Rico, Mexico, Costa Rica.

Shrub or tree, 25-40 ft. high (or more). *Leaflets* 5-1 dm. l., oblong, oblong-elliptical, or obovate-oblong, apex rounded, base wedge-shaped sometimes oblique; petiole 3-5 mm. l. *Panicle* as long as, or longer than the leaves. *Flowers* numerous, crowded, white. *Sepals* 2 mm. l. or shorter, roundish to elliptical, puberulous inside. *Petals* long-clawed, about 2 mm. l. *Style* as long as ovary, 3-lobed. *Capsule* 10-13 mm. l. and br., apiculate with the remains of the style, generally 3-celled, sometimes 2- or 4-celled. *Seed* about 7 mm. l., roundish-ellipsoidal; aril about one-third as long.

2. *C. americana L. Sp. Pl.* 200 (1753); leaflets pubescent on nerves on upper surface, densely pubescent beneath, serrate; capsule tomentose, depressed-globose, 3-cornered.—*Griseb. loc. cit.*; *Radlk. tom. cit.* 557; *Urb. Symb. Ant. iv.* 372. *C. tomentosa, Sw. Prodr.* 61 (1788) & *Fl. Ind. Occ.* 657. *C. saponarioides Sw. Prodr.* 62 (1788) & *Fl. Ind. Occ.* 661 (as regards inflorescence and fruit). *Cupania Plum. Pl. Amer. (Burm.) t.* 110.

Castleton district, 500 ft., *Harris!* *Fl. Jam.* 11,920.—Cuba, Is. of Pines, Hispaniola, Porto Rico, Martinique, Trinidad, Venezuela.

Tree 30-40 ft. high. *Leaflets* 5-2 dm. l., obovate-oblong, obovate-elliptical, or elliptical. *Capsule* about 1.5 cm. l., 2 cm. br., with a very short carpophore.

This species seems to be very rare in Jamaica.

7. MATAYBA Aubl.

Trees. Leaves subopposite (in Jamaican species) or alternate. Panicles axillary, many-flowered. Flowers small, polygamodioecious. Calyx of 5 sepals. Petals 5, rudimentary in Jamaican species. Style terminal, stigma 2-3 lobed. Capsule with thick carpophore, leathery, 1-3-lobed; lobes globose, compressed, 2-valved, opening along the back. Seeds arillate; cotyledons thick.

Species 42, natives of warmer regions in America (incl. West Indies), from Mexico to Argentina.

M. apetala Radlk. in Sitzungsber. K. Bayer. Akad. Math. Phys. Kl. ix. 535 & 624 (1879) & in *Urb. Symb. Ant. i.* 352 & *iv.* 373.

Cupania apetala Macf. *Jam. i.* 162 (1837). *C. oppositifolia* Rich. in *Sagra Cub. x.* 121, *t.* 32 (1845). *Ratonia apetala* Griseb. *Fl. Br. W. Ind.* 126 (1859) (excl. syn. *C. juglandifolia*). (Fig. 25.) Type in Herb. Kew.

Wanika, Cromanty, Bastard Mahogany, Coby, Red Wood.

"Road from Halberstadt to Galloway Lodge; road from Mt. Henry to Ross Valley; Scott's Pass, Hopewell"; Macfadyen! Distin! March!

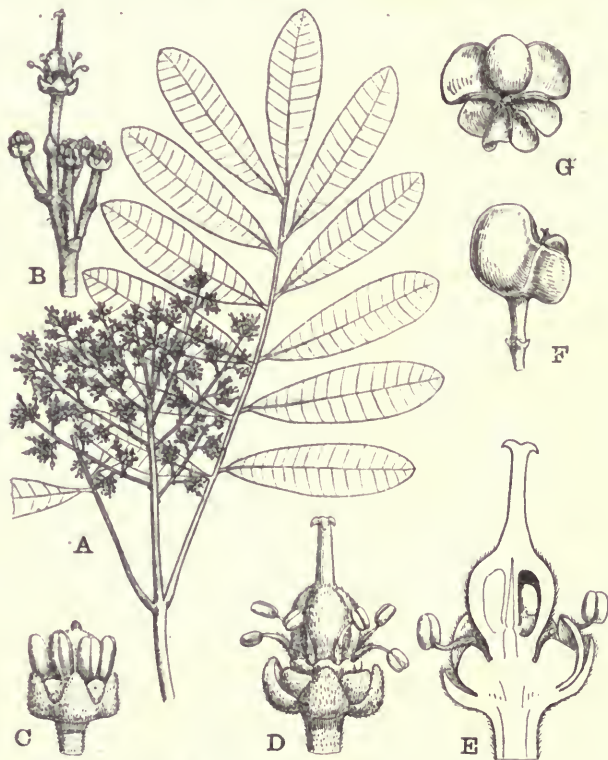


Fig. 25.—*Matayba apetala* Radlk.

- A, Leaf and inflorescence $\times \frac{1}{2}$.
 B, Portion of inflorescence $\times 4$.
 C, Male flower $\times 7$.
 D, Fertile flower $\times 7$.

- E, Ditto cut lengthwise $\times 11$.
 F, Capsule, nat. size.
 G, Ditto ripe and split open, showing one developed seed, nat. size.

Wilson! Jenman! Castleton Hill, 1000 ft., Thompson! Vinegar Hill, 4300 ft.; Troy, 1500 ft.; Lapland, near Catadupa, 1500 ft.; road from Askenish to Dolphin Head, 1000 ft.; Harris! Fl. Jam. 6404, 6404b, 8018, 8676, 9166, 9243.—Cuba, Is. of Pines, Porto Rico, Ruatan Is. (Honduras).

Tree, 15-60 ft. high. Leaves about 2 dm. l.; common petiole somewhat 3-angled; leaflets 10-17 (in Jamaican form) or 4-10, alternate or sub-

opposite, 6-12 cm. l., oblong-elliptical, apex rounded, sometimes obtusely subacuminate, base wedge-shaped and sometimes oblique; petiolule very short and thickened at the base. *Panicle* as long as the leaves or longer or shorter. *Flowers* yellow. *Calyx* deeply 5-lobed, puberulous outside, about 1 mm. l. *Stamens* of hermaphrodite flower 1.5 mm. l., filaments puberulous; of male flower slightly longer than the calyx. *Ovary* hairy, shortly stalked; style long; stigmas 3. *Capsule* usually 2-lobed (one lobe often imperfectly developed) 10-12(-16) mm. l., stalked (stalk thick, 4-6 mm. l.), red. *Seed* 6-8 mm. l., ellipsoidal, black, surrounded at the base by a cup-shaped, light orange-coloured aril.

Timber hard, durable when exposed to weather.

[BLIGHIA Koenig

Tree. Leaves alternate, crowded at the ends of the branches, abruptly pinnate; leaflets in 3-5-pairs, opposite or subopposite, entire, glabrous. Inflorescence an axillary panicle, usually as long as the leaves, many-flowered. Flowers polygamous, white. Calyx 5-parted. Petals 5, with a scale at the base about half as long as the petal. Disk ring-like. Stamens 8, longer than the petals. Ovary 3-celled; ovules one in each cell. Fruit a red-coloured fleshy capsule, 3-celled; valves 3, with the septa in the middle. Seeds black, one in each cell, with a large white fleshy aril, called "akee," round its base, the aril attached to the placenta by a red membrane.

Species 2, natives of West Africa, one naturalized in the West Indies.

B. sapida Koen. in *Ann. Bot.* ii. 571, tt. 16, 17 (1806); *Macf. Jam.* i. 160; *Griseb. Fl. Br. W. Ind.* 125. The Akee, *Broughton Hortus Eastensis* 11 (1794). *Akeesia africana* *Tussac Fl. Ant.* i. 66, t. 3 (1808). *Akea solitaria* *Stokes Bot. Mat. Med.* ii. 353 (1812).

Naturalized; in fl. after the rains in May; in fr. Dec., Jan.—Native in western tropical Africa.

Akee tree.

Tree 30 ft. high. *Leaves* large, common petiole and rhachis about 17 cm. l.; leaflets 10-18 cm. l., lowest pair of the same shape, about half as long; midrib, nerves and venation prominent beneath. *Sepals* about 3 mm. l. *Petals* about 4.5 mm. l. *Fruit* about 7 or 8 cm. l., pendulous.

The timber is durable in protected situations. The white fleshy substance, the "akee," at the base of the seed is the part which is eaten. It is prepared by parboiling in water with salt, and afterwards stewing or frying with butter, or by simply boiling in soups. It is very wholesome (Macfadyen). If not used fresh, or if plucked from a broken branch, the akee is poisonous. It is recognised as fresh when pulled from the capsule by not bringing away with it the red membrane.]

8. DODONÆA L.

Erect shrubs, usually viscous, leaves simple. (1-foliolate), rarely pinnate. Flowers inconspicuous, unisexual or polygamo-

dioecious. Inflorescence axillary or terminal, racemose, corymbose, or paniculate. Sepals 4 (5-3), valvate or narrowly imbricate. Petals wanting. Disk wanting in the male flower, short and stalk-like in the female flower. Anthers linear-oblong, obtusely 4-cornered. Ovary 3-cornered; style lobed at apex; ovules 2 in each cell. Capsule 3-(2-6)-celled, septifragal, 3-valved; valves winged on the back, separating from the persistent column, to the middle of which the seeds are attached. Seeds 2 or 1 in each cell, without an aril; embryo rolled on itself spirally.

Species 43, of which 39 are Australian, the rest dispersed through the tropics and sub-tropics.

D. viscosa Jacq. *Enum. Pl. Carib.* 19 (1760) & *Sel. Stirp. Amer.* 109; *L. Mant.* 228; *Gacrtn. Fruct.* ii. 134, t. 111; *Sw. Obs. Bot.* 151; *Gray Gen.* 218, t. 182; *Griseb. Fl. Br. W. Ind.* 127; *Radlk. in Fl. Bras.* xiii. pt. 3, 639; *Urb. Symb. Ant.* iv. 373.

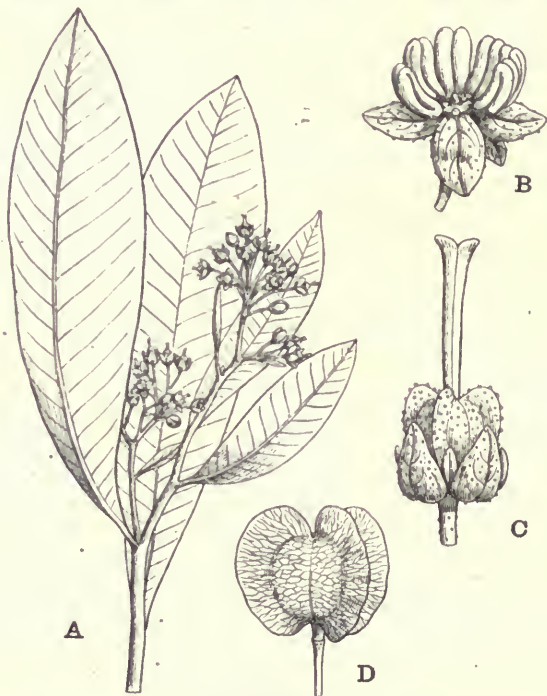


Fig. 26.—*Dodonaea viscosa* Jacq.

A, Portion of branch with flowers and leaves $\times 3$.
 B, Male flower with a sepal pressed down and a stamen removed $\times 4$.
 C, Female flower $\times 4$.
 D, Fruit, nat. size.

D. Burmanniana DC. in *Mém. Soc. Genèv. i. pt. 2*, 447 (1822) & *Prodr. i.* 616; *Griseb. loc. cit.* *Aceri* vel *Paliuro* affinis angusto &c. *Sloane Cat.* 138 & *Hist. ii.* 27, t. 162; f. 3. *Staphylodendron* &c. *Plum. Ic. ined. v. t.* 263 & *Pl. Amer. (Burm.)* 246, t. 247, f. 2. *Ptelea viscosa* L. *Sp. Pl.* 118. (1753). (Fig. 26.)

Switch Sorrel.

Old Harbour; Red Hills; *Sloane* Herb. v. 97! sea-coast, Black River, *Purdie*! Port Royal Mts. *Prior*! *March*! Hope, J.P. 998, *Morris*! Port Henderson, *Campbell*! *Fl. Jam.* 6652.—All warm countries.

Shrub 3–15 ft. high. *Leaves* 3–12 cm. l., 1.5–3.5 cm. br., subobovate-wedge-shaped to oblong-obovate. *Inflorescence* about half as long as the leaves; longer in fruit. *Flowers* greenish-yellow, often hermaphrodite. *Sepals* 2–3 mm. l., oblong. *Stamens* rather shorter than the sepals; filaments scarcely 1 mm. l. *Ovary* 2 mm. l.; style 3.5–4(–6) mm. l. *Capsule* variable in size, 1.2 in diam. to 2.2 cm. l. and 2.5 cm. br., round, notched at apex and base, or apex subobcordate and base subentire. *Seeds* 2.5–3 mm. in diam., black, lens-shaped.

Var. *angustifolia* Benth. *Fl. Austral. i.* 476 (1863); leaves 4–12 mm. br., linear-oblong to narrowly oblanceolate; capsule 12–16 mm. br.—*Hemsl. in Bot. Chall. Exp. Bermuda.* 27. *D. angustifolia* Linn. f. *Suppl.* 218 (1781); *Sw. Obs. Bot.* 150; *Griseb. op. cit.* 128. *D. jamaicensis* DC. in *Mém. Soc. Genèv. i. pt. 2*, 447 (1822) & *Prodr. i.* 616; *Macf. Fl. Jam. i.* 165; *Britt. Fl. Berm.* 225. *Triopteris erecta* &c. *Browne Hist. Jam.* 191, t. 18, f. 1.

Sloane Herb. v. 99! *Houstoun*! *Broughton*! *Shakspear*! *Macfadyen*! Port Royal Mts., *McNab*! *Purdie*! Blue Mts.; *Liguanæa* hills; *Prior*! *March*! *Morris*! Kings House, *Campbell*! *Cinchona*, 5000 ft.; *Malvern*, 2200 ft.; *Lititz savanna*, 300–900 ft.; *Harris*! *Fl. Jam.* 5887, 8578, 9658, 11,753; Blue Mt. Peak, *Hitchcock*; *Cinchona*, *G. E. Nichols*!—All warm countries.

9. HYPELATE Sw.

Tree or shrub. Leaves 3-foliolate; petioles narrowly margined. Flowers small, white, polygamo-monœcious, in axillary panicles. Sepals 5, imbricate, soon falling. Petals 5. Stamens 8, inserted on the disk, shorter in the female flower, and more or less imperfect. Ovary 3-celled, rudimentary in the male flower; ovules 2 in each cell. Fruit a drupe, flesh thin, 1-celled, 1-seeded. Seed without endosperm; cotyledons thin, folded on themselves irregularly.

Species 1, native of Florida Keys, Bahamas, Cuba, Cayman, Jamaica, Hispaniola, Mona, Porto Rico, Anguilla, St. Martin.

H. trifoliata Sw. *Prodr.* 61 (1788) & *Fl. Ind. Occ.* 655, t. 14; *Lun. Hort. Jam. i.* 387; *Macf. Jam. i.* 163; *Deless. Icon. iii.* 23, t. 39; *Griseb. Fl. Br. W. Ind.* 127; *Sarg. Sil. ii.* 78, tt. 80, 81; *Urb. Symb. Ant. iv.* 374; *Britt. & Millsp. Bah. Fl.* 254. *H. fruticosa* &c. *Browne Hist. Jam.* 208. *Cytisus arboreus foliis* &c. *Sloane Cat.* 141 & *Hist. ii.* 33 (excl. t. 176, f. 1).

Amyris Hypelate L. *Amœn.* v. 378 (1760). *A. hypelate* & *A. Philippea* A. Robinson ms. & ex Lun. *Hort. Jam.* i. 149, 150 (1814). *A. ? Robinsonii* DC. *Prodr.* ii. 82 (1825). (Fig. 27.) Swartz's type in Herb. Mus. Brit.

Rio Cobre; Red Hills; Sloane Herb. vi. 3! Wright! Long Mt.; Salt Pond hill; Broughton! Shakspear! Swartz! Wilson! March! Long Mt., 350 ft.; Port Henderson, 50 ft.; Ferry Pen, 150 ft.; Rock Fort; Campbell! Watson's Hill, 600 ft.; near Alligator Pond; near Bull Bay;



Fig. 27.—*Hypelate trifoliata* Sw.

- | | |
|---|---------------------------------------|
| A, Portion of branch with leaves and flowers $\times 3$. | D, Ovary cut across $\times 6$. |
| B, Male flower $\times 3$. | E, Ovary cut lengthwise $\times 12$. |
| C, Female flower $\times 3$. | F, Fruit cut lengthwise $\times 6$. |
| | (After Sargent.) |

Long Mt., 200 ft.; Lititz savanna, 900-900 ft.; Harris! near Salt Ponds, Harris & Britton! Fl. Jam. 5672, 5882, 6261, 6285, 6527, 7229, 9570, 9588, 10,514, 11,754.—Distribution of genus.

Tree or shrub 15-40 ft. high; bark with many shallow depressions. Leaves: petioles 1.5-3.5 cm. l.; leaflets sessile, 2.5-5.5 cm. l., obovate to oblanceolate, lined with close parallel nerves. Panicles 4-9 cm. l., somewhat longer than the leaves, glabrous. Sepals 2.5-3 mm. l., elliptical, concave, coloured. Petals about 2 mm. l., roundish-elliptical. Stamens in male flowers 3 mm. l., exserted. Drupe 6-8 mm. l., ellipsoidal, black.

The wood is very heavy, hard, close-grained, and rich dark brown in colour. It is durable in contact with the soil, and is used for posts, also in shipbuilding and for the handles of tools. (Sargent.)

10. EXOTHEA Macf.

Tree with thin scaly bark. Leaves abruptly pinnate or 3-(1)-foliolate. Flowers small in terminal or axillary panicles, polygamo-dioecious. Sepals 5, imbricate, persistent. Petals 5. Stamens 7 or 8, inserted on the disk, as long as the petals in the male flower, short and imperfect in the female flower. Ovary 2-celled, rudimentary in the male flower; stigma globose; ovules 2 in each cell, hanging, collateral. Fruit a globular 1-seeded berry-like drupe, with the rudiment of the second cell; endocarp parchment-like. Seed without an aril, without endosperm; cotyledons fleshy; radicle very short, enclosed in a cavity of the seed-coat.

Species 2, one a native of Florida, West Indies, and Guatemala, the other a native of Mexico.

E. paniculata Radlk. in *Durand Ind.* 81 (1888) (nomen), & *Sitzungsab. K. Bayer. Akad.* xx. 276 (1891); *Sarg. Silva.* ii. 75, tt. 78, 79; *Small Fl. S.E.U.S.* 746; *Urb. Symb. Ant.* iv. 374; *Britt.*

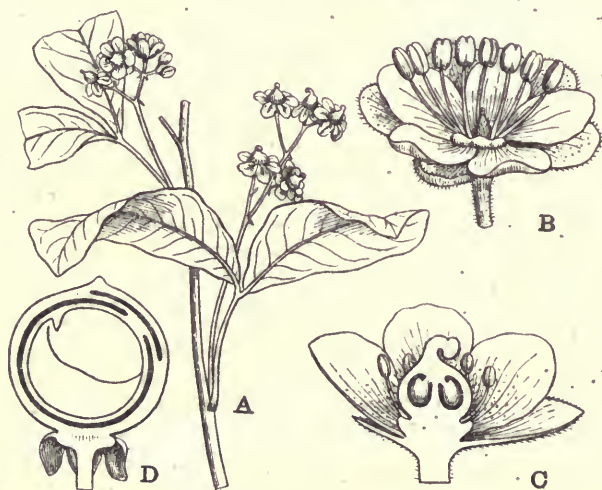


Fig. 28.—*Exothea paniculata* Radlk.

A, Portion of branch with leaves and flowers $\times \frac{1}{2}$.

B, Male flower $\times 5$.

C, Female flower cut lengthwise $\times 5$

D, Fruit cut lengthwise $\times 2$.
(After Sargent.)

& Millsp. *Bah. Fl.* 254. *E. oblongifolia* Macf. *Jam.* i. 232. *Melicocca paniculata* Juss. in *Mém. Mus. Paris*, iii. 187, t. 5 (1817). *Hypelata paniculata* Camb. in *Mém. Mus. Paris*, xviii. 32 (1829); *Hook. Lond. Journ. Bot.* iii. 227, t. 7; *Griseb. Fl. Br. W. Ind.* 127. (Fig. 28.)

Wild Ginep.

Port Royal Mts.; road to Friendship, St. David; *Macfadyen*! Annotto Bay, *Lane*! Prior! Norbrook, 600 ft., *Campbell*! Port Royal Mts.; near Troy, 1500 ft.; road, Askenish to Dolphin Head, 900 ft.; Peckham, Clarendon, 2300 ft.; *Harris*! Fl. Jam. 5121, 5829, 6186, 6532, 6658; 8683, 10,277, 11,077.—Florida and Keys, Bahamas, Cuba, Hispaniola, Mona, Porto Rico, Vieques, St. Eustatius, Désirade, St. Vincent, Guatemala.

Tree 15-50 ft. high; bark red to brown. *Leaves*: petioles 5-2.5 cm. l. on flowering branches; leaflets 6-11 cm. l., oblong-elliptical to elliptical, sessile or subsessile. *Panicles* as long as, or longer than the leaves, the younger branches as well as the sepals covered with yellowish or orange tomentum. *Flowers* white, fragrant. *Sepals* of female flowers 3.5 mm. l., elliptical, reflexed after flowering, of male flowers shorter. *Petals* about as long as the sepals, elliptical. *Fruit* about 1 cm. in diam.; pericarp dark purple, juicy, when ripe. *Seed* about 8 mm. in diam.

The wood is very hard and close-grained, capable of receiving a beautiful polish. Its colour is bright red-brown. It is heavy; a cubic foot of dry wood weighs 60 lbs. It is used for piles, as it resists the attacks of the Terebo; also for boat-building, etc. (Sargent.)

FAMILY LXI. RHAMNACEÆ.

Trees or shrubs. Leaves simple, alternate or (in *Rhamnidium*) opposite, penninerved or (in *Zizyphus*) 3-nerved; stipules small, sometimes changed into spines. Flowers small, hermaphrodite, generally in axillary cymes and of a greenish colour. Calyx: tube obconical or top-shaped, persistent; lobes 4-5, valvate, falling off. Petals 4, 5, or none (in *Zizyphus Chloroxylon* and *Krugiodendron*), inserted at the throat of the calyx, generally smaller than the calyx-lobes, hooded or infolded, sessile or clawed. Stamens 4-5, inserted with the petals, opposite to them and generally enclosed by them. Anthers versatile. Disk perigynous. Ovary free or immersed in the disk, free from or adherent to the calyx-tube, 3-(2-4)-celled. Ovules in each cell 1 (very rarely 2), erect from the base. Fruit free or adherent at lower third or half with the persistent calyx-tube in *Colubrina*, completely in *Gouania*, capsular or drupaceous, 3-coccos or putamen 1-3-celled. Seeds solitary in the cells, erect; endosperm fleshy, often scanty, rarely none. Embryo large, orthotropous; cotyledons flat or plano-convex.

Species about 500, natives of warm and tropical regions of the world.

Leaves 3-nerved. Petals wanting 1. *Zizyphus*.

Leaves penninerved (3-nerved at base in *Colubrina asiatica*).

Trees or shrubs, not climbing. Fruit superior or half-inferior in *Colubrina*.

Leaves alternate.

Petals wanting 2. *Krugiodendron*.

Petals present.

Panicles with alternate branches, terminal and axillary. Calyx-tube beneath fruit... 3. *Sarcocaulis*.

- Panicles with umbelliform cymes.
 Calyx-tube forming an adherent cupule
 round base of fruit. Leaves entire
 (serrate in *C. asiatica*)..... 4. *Colubrina*,
 Calyx-tube free beneath fruit. Leaves
 serrate..... 5. *Rhamnus*.
 Leaves opposite or subopposite..... 6. *Rhamnidium*.
 Shrubs climbing by tendrils. Fruit inferior, crowned
 by calyx 7. *Gouania*.

1. ZIZYPHUS Juss.

Trees (or shrubs). Leaves 3(-5)-nerved; stipulate. Cymes short, axillary, few-flowered. Flowers small, greenish. Calyx 5-lobed; tube broadly obconical, persistent beneath the fruit;

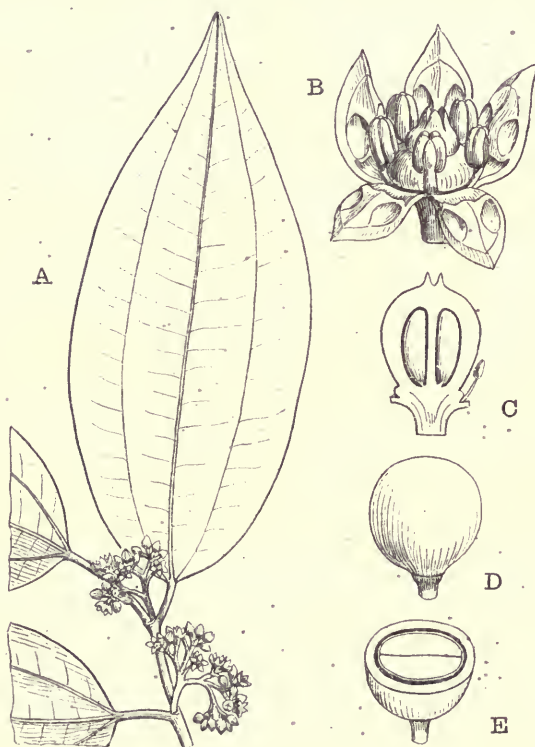


Fig. 29.—*Zizyphus Chloroxyton* Oliv.

A, Portion of branch with leaf and flowers $\times \frac{5}{8}$.
 B, Flower with two calyx-lobes bent down $\times 6$.

C, Unripe fruit cut lengthwise $\times 3$.
 D, Ripe fruit, nat. size.
 E, Ditto cut across, nat. size.

lobes triangular-ovate, acute, spreading, keeled on the inside. Petals 5, or wanting in *Z. Chloroxylon*. Disk 5-cornered, with a free margin. Stamens 5. Ovary immersed in the disk, superior, 2-(3-4)-celled; styles 2-3, or, in *Z. Chloroxylon*, represented by 3 lobes at top of ovary. Fruit a drupe, putamen 1-(3)-celled. Seeds plano-convex; endosperm scanty or none.

Species about 80, natives of tropical regions in Asia and America, fewer in Africa, very few in Australia; some species also occur here and there in subtropical regions.

Z. Chloroxylon Oliv. in *Kew Bull.* (1889) 127, t. & in *Hook. Ic. Pl.* t. 1862 (1889). *Grossularia fructu arbor non spinosa* &c. *Sloane Hist.* ii. 85. *Chloroxylum foliis* &c. *Browne Hist. Jam.* 187, t. 7, f. 1. *Laurus Chloroxylon* L. *Syst. ed.* 10, 1010 (1759) & *Amœn. v.* 378; *Griseb. Fl. Br. W. Ind.* 285. *Ceanothus Chloroxylon* Nees *Syst. Laurin.* 660 (1836). (Fig. 29.) Specimen from Browne in Herb. Linn. named by Linnæus.

Cogwood, Greenheart.

Red Hills, *Sloane* vi. 94! *Browne*! *Prior*! *March*! *T. Harrison*! Mocho, Four Paths, Whitney, *G. Douet*! Stewart Castle, Duncans, *Dewar*! Berwick, Port Royal Mts., 2500 ft.; Peckham, Clarendon, 2500 ft.; *Harris*! Somerset Woods near Mandeville, *Harris & Britton*! *Fl. Jam.* 5652, 10,605, 11,200.

A high timber tree with wide-spreading branches, without spines. Leaves 6-18 cm. l., 4.5-10 cm. br., ovate-elliptical or oblong-elliptical, glabrous, entire; nerves 3; reaching to the apex, somewhat prominent beneath; petioles 5-12 mm. l. Inflorescence corymbose, 2 cm. or less, young parts and buds densely yellow-puberulous. Calyx-segments fleshy, two-pitted inside. Fruit subglobular, 16-20 mm. in diam.; pericarp hard and brittle. Seed of the same shape, solitary.

Z. Jujuba Lam. introduced from the tropics of the Old World, has become naturalized in the Liguanea Plain. It is a small spiny tree; leaves 2.5-6.5 cm. l., roundish to ovate, covered beneath with a dense woolly pale-coloured tomentum; fruit fleshy and mealy.

2. KRUGIODENDRON Urb.

Shrub or tree, without spines. Leaves: lower on the branches generally alternate the upper generally opposite or subopposite, pinninerved, subleathery, entire, persistent. Inflorescence cymose, umbel-like, few-flowered, glabrous. Flowers hermaphrodite. Calyx 5-(4-6)-parted below the middle; tube very short, flattish, persistent beneath the fruit; lobes keeled inside, narrowly triangular, acute. Petals wanting. Stamens equal in number to the sepals, anthers opening laterally inwards. Disk a fleshy ring surrounding the base of the ovary. Ovary free, 2-celled in appearance only, the two partitions free from each other and not quite reaching the opposite walls. Ovules 1 in each compartment. Styles 2, more or less united. Drupe with scanty flesh;

putamen thin, bony, almost always 1-celled. Seed with coat adherent to the endocarp; endosperm none. Cotyledons almost semiglobular.

Species 1, native of Florida and Keys, Bahamas, West Indies as far south as St. Vincent.

K. ferreum Urb. *Symb. Ant.* iii. 314 (1902) & *in.* 375; *Britt. & Millsp. Bah. Fl.* 256. *Rhamnus ferreus* Vahl *in West St. Croix* 276 (1793) (name only) & *Symb.* iii. 41, t. 58 (1794). *Zizyphus emarginatus* Sw. *Fl. Ind. Occ.* 1954 (1806). *Ceanothus ferreus* DC. *Prodr.* ii. 30 (1825). *Scutia ferrea* Brongn. *in Ann. Sc. Nat.*

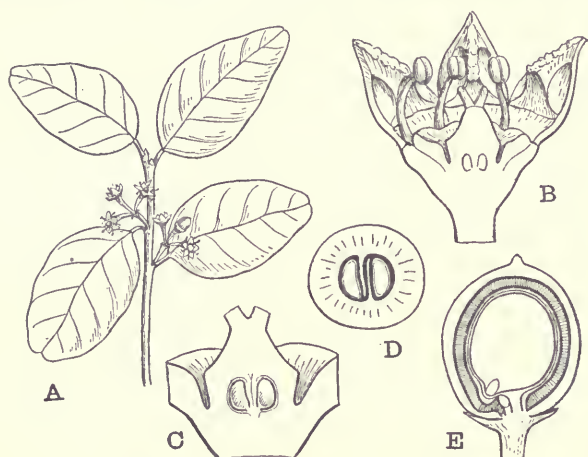


Fig. 30.—*Krugiodendron ferreum* Urb.

- A, Portion of branch with leaves and flowers $\times \frac{1}{2}$.
 B, Flower cut lengthwise $\times 4$.
 C, Ovary cut lengthwise $\times 10$.
 D, Ditto cut across $\times 20$.
 E, Fruit cut lengthwise $\times 3$.
 (E after Sargent.)

sér. 1, *x.* 363 (1827). *Condalia ferrea* Griseb. *Fl. Br. W. Ind.* 100 (1859). *Rhamnidium ferreum* Sarg. *Gard. & For.* iv. 16 (1891) & *Silv.* ii. 29, t. 58. (Fig. 30.)

Black Iron Wood.

Wright! *March!* Blue Mts. (Tweedside; Westphalia road, 3500 ft.; Content road, 1000 ft.; near Cinchona); Grandvale, Westmoreland, 500 ft.; Long Mt., 800 ft.; Great Goat Is.; Peckham, Clarendon, 2500 ft.; *Harris!* Health-bire Hills; *Harris & Britton!* Fl. Jam. 5030, 5723, 5797, 7090, 8593, 8935, 9306, 9316, 10,521, 10,944, 10,982, 10,993, 11,186.—Distribution of genus.

Tree 15-50 ft. high. *Leaves* 3-6 cm. l., ovate to roundish-elliptical, apex obtuse, usually emarginate. *Inflorescence* 7-14 mm. l. *Flowers* greenish-yellow, with a strong almond-like odor. *Calyx* 2.5-3 mm. l. *Stamens* shorter than the calyx. *Drupe* 7-9 mm. l., black.

3. SARCOMPHALUS Griseb.

Trees. Leaves glabrous, entire. Panicles axillary and terminal, branches alternate, few-flowered, corymbose. Flowers small. Calyx 5-lobed, top-shaped; tube persistent beneath the fruit; lobes spreading, keeled on the inside. Petals 5, hooded, long-clawed. Disk covering the base of the calyx. Stamens 5, free, as long as the petals; anthers opening laterally inwards in bud; filaments recurving later. Ovary surrounded by the disk, free; style simple, shortly 2-lobed. Drupe dry, superior; putamen 2-celled, thick, bony; cells 1-seeded.

Species 5, natives of the West Indies.

S. laurinus Griseb. *Fl. Br. W. Ind.* 100 (1859). *S. foliis* &c. *Browne Hist. Jam.* 179; *A. Robinson Ic. ined. & Ms.* *Rhamnus*

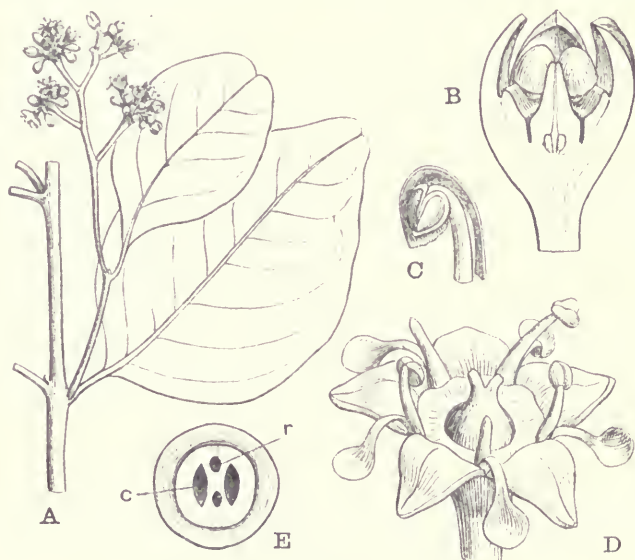


Fig. 31.—*Sarcomphalus laurinus* Griseb.

A, Portion of branch with leaves and flowers $\times \frac{1}{2}$.
 B, Flower-bud cut lengthwise, the petals enclosing the stamens $\times 7$.

C, Petal and stamen from the bud $\times 11$.
 D, Flower $\times 7$.
 E, Fruit cut across; c, cell; r, resin-cell $\times 2$.

Sarcomphalus L. *Syst. ed.* 10, 937 (1759) & *Amœn. v.* 395, 377. *Ceanothus?* *Sarcomphalus* DC. *Prodr. ii.* 30 (1825); *Macf. Jam. i.* 210. (Fig. 31.) A specimen from Browne in Herb. Linn. named by Jännæus.

Bastard Lignum Vitæ.

In fl. Apr.-Aug.; in fr. July, Aug.; *Wright!* Broughton! between Kingston and Albion on Windward road, *Macfadyen!* March! Fort Henderson; Liguanea plain; Long Mt.; *Campbell!* Great Goat Is., 150 ft.; sea-coast near Bull Bay; Long Mt., 500 ft.; hill near Ferry, Liguanea plain, 200 ft.; *Harris!* Fl. Jam. 5883, 6410, 6499, 6558, 9207, 9305, 9571, 9574, 9613, 10,035, 10,384.

Tree 12-45 ft. high, to 2½ ft. thick; bark thick, scaly, branchlets sometimes sparingly armed with pungent axillary spines, glabrous but inflorescence more or less puberulous. *Leaves* 3-9 cm. l., ovate to broadly ovate or even roundish or elliptical, apex obtuse, emarginate, leathery, penninerved; petioles .5-1 cm. l. *Inflorescence* and young buds more or less covered with ferruginous tomentum. *Panicles* shorter than the leaves, puberulous or glabrous; pedicels 2.5-5 mm. l. *Flowers* greenish-yellow or tawny-yellow. *Calyx* about 3.5 mm. l.; lobes slightly thickened at apex. *Petals* 5, about as long as the calyx, acuminate-linear. *Stamens* recurved in the open flower. *Disk* white, waxy. *Drupe* 2-celled, ellipsoidal-globular, about 9 mm. l., 8 mm. br. *Seeds* hemispherical.

The wood is hard, of a dark colour and close grain; it is looked upon as one of the best timber woods in the island. (Browne.)

Var. *Fawcettii* Kr. & Urb. in *Notizbl. Bot. Gart. Berl.* i. 319 (1897) & *Symb. Ant.* i. 357; leaves with apex obtuse or generally obtusely acuminate, membranous; inflorescence and calyx densely ferruginous-tomentose; pedicels 1.5-2 mm. l.—*Rhamnus foliis* &c. *Browne Hist. Jam.* 172, t. 12, f. 1.

In fl. Dec.; near Bull Bay, 200 ft., *Harris!* Fl. Jam. 6677.

Rhamnus Sarcomphalus L. was referred by Rafinesque to his *Sarcomphalus retusus* (Sylva Telluriana, no. 124, 1838); if correct, this would be the earliest tenable name, but Rafinesque's description of the genus as having a tetramerous apetalous flower suggests *Rhamnus* rather than *Sarcomphalus*.

4. COLUBRINA L. C. Rich.

Trees or shrubs. Leaves penninerved or 3-nerved at base; stipules small, soon falling. Inflorescence axillary, paniculate with umbelliform cymules. Calyx 5-lobed, lobes keeled on the inside, spreading, triangular-ovate, tube persistent confluent with the fruit (a cupule). Petals 5, inserted below the disk, clawed, hooded. Stamens 5, enclosed by the petals. Disk 5-cornered or 5-10-lobed, thick, covering the tube of the calyx. Ovary immersed in the disk and confluent with it, 3-celled; style 3-lobed or 3-branched. Fruit subglobose, capsular, 3-coccous, cocci splitting open on the inner side. Seeds flattish-ellipsoidal, with scanty endosperm; cotyledons round, flat or incurved.

Species about 26, chiefly natives of tropical America and subtropical N. America, one widely dispersed through tropical regions of the Old World.

Leaves entire, penninerved.

Leaves rusty-tomentose beneath (rarely glabrate).

Capsule with cupule reaching half-way from base

1. *C. ferruginosa*.

Leaves minutely puberulous beneath or glabrate.

Capsule with cupule reaching one-third from base

2. *C. reclinata*.

[Leaves serrate, 3-nerved at base, glabrous..... *C. asiatica*.]

1. *C. ferruginosa* Brongn. in *Ann. Sc. Nat. sér. 1, x.* 369 (1827); Griseb. *Fl. Br. W. Ind.* 100; *Urb. Symb. Ant. iv.* 377. *C. Colubrina* Millsp. in *Field Col. Mus. Bot. ii.* 69 (1900); Britt. & Millsp. *Bah. Fl.* 258. *Rhamnus arboreus* &c. Broune *Hist. Jam.* 172. *R. colubrina* Jacq. *Enum.* 16 (1760), *Sel. Stirp. Amer.* 74, & *Ed. pict. t.* 74. *R. obscurus* Schrank in *Syll. Pl. Nov. Ratisbon.* 202 (1824). *Ceanothus colubrinus* Macf. *Jam. i.* 212 (1837).

Greenheart, Snake Wood, Black Velvet, Wild or Mountain Ebony.

In fl. Sept.-May, in fr. Oct.-July; Wright! Swartz! Moneague, Prior! March! J.P. 2023, Morris! Corby, St. Cruz Mts., 1500 ft.; Soho, St. Ann, 1400 ft.; Harris! *Fl. Jam.* 9686, 12,026.—Florida and Keys, Bahamas, West Indies as far south as Antigua and Barbados.

A specimen from Swartz in Herb. Mus. Brit. named in Dryander's hand "Rhamnus obscurus Swartz." The specimen mentioned by Schrank is probably of the same collecting.

Tree 20-40 ft. high; branchlets rusty-tomentose. *Leaves* 4-13 cm. l., ovate-elliptical, elliptical, or oblong-elliptical, apex obtuse, or shortly and bluntly acuminate, usually dark brown and glabrous above, paler and more or less covered with rusty tomentum beneath, or glabrate except the nerves, entire, penninerved, often with a few dark roundish glands beneath. *Inflorescence*: peduncle 5-10 mm. l., pedicels shorter than the peduncle. *Flowers* greenish. *Calyx* rusty-tomentose on the outside; lobes 2 mm. l. *Petals* about 2 mm. l., very shortly clawed. *Stamens* about 3 mm. l. *Style* 3-lobed at apex. *Capsule* globular-top-shaped, 6-7 mm. in diam., 7-8 mm. l., twice as long as the cupule, black. *Seeds* about 4 mm. l., flattened-ellipsoidal or roundish, black, shining.

The seeds are shot out by the elastic dehiscence of the cocci, which separate when ripe. The lower halves of the side walls of the cocci are thinly membranous and separate somewhat in the form of a valve, bending outwards, thus separating the cocci. Suddenly the splitting along the inner angle of the coccus extends upwards to the apex and about halfway down the back of the endocarp with a noise like the cracking of glass, and the seed is shot several feet away. In some cases the dehiscence of the cocci is not simultaneous, and the seeds from the one which opens first, the middle coccus, is unable to escape suddenly and merely drops out later (see fig. 32).

The seeds of this and other species are used for making necklaces and other ornaments.

2. *C. reclinata* Brongn. in *Ann. Sc. Nat. sér. 1, x.* 369 (1827); Griseb. *op. cit.* 101; Sarg. *Silva ii.* 49, t. 66; *Urb. tom. cit.* 378; Britt. & Millsp. *Bah. Fl.* 257. *Ceanothus reclinatus* L'Hérit. *Sert. Angl.* 6 (1788); Macf. *Jam. i.* 211. *Rhamnus arborescens* &c. Broune *Hist. Jam.* 172, t. 29, f. 2. *R. ellipticus* Sw. *Prodr.* 50

(1788) & *Fl. Ind. Occ.* 497; *Ait. Hort. Kew* i. 265; *A. Robinson Ic. ined & Ms.* (Fig. 32.)

In fl. July-Feb.; in fr. Dec.-Mar.; *Wright!* Port Royal Mts.; near Halfway Tree; *Macfadyen!* *March!* Fort Clarence Hill, 50 ft.; Round Hill, St. Cruz Mts., 2000 ft.; dry rocky hills, Fort Henderson; *Harris!* Fl. Jam. 9540, 9701, 10,152.—Florida and Keys, Bahamas, West Indies as far south as St. Vincent, Venezuela.

Tree 12-15 ft. high and more; branchlets glabrescent. *Leaves* 2.5-7.5 cm. l., elliptical, acuminate, glabrous on upper surface, minutely

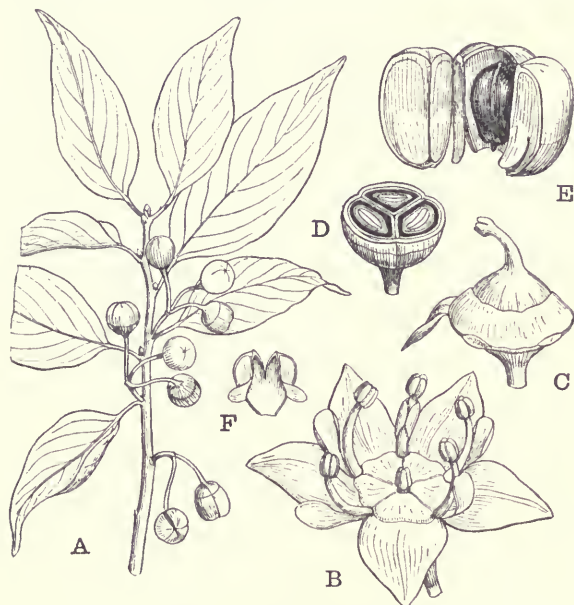


Fig. 32.—*Colubrina reclinata* Brongn.

A, Portion of branch with leaves and fruits $\times \frac{3}{4}$.

B, Flower $\times 7$.

C, Unripe fruit with one lobe of calyx still attached $\times 4$.

D, Ripe fruit before splitting, cut across $\times 2$.

E, Ripe fruit beginning to split $\times 2$.

F, Endocarp of one coccus after splitting $\times 1\frac{1}{2}$.

puberulous beneath, entire, penninerved, often with a gland on the margin on each side near the base and an occasional one higher up. *Inflorescence*: peduncle 3-8 mm. l., pedicels longer than the peduncle. *Flowers* greenish. *Calyx* puberulous on the outside; lobes 1.3 mm. l. *Petals* about 1.2 mm. l., sessile. *Stamens* about 1.5 mm. l. *Style* deeply divided into three. *Capsule* globular, about 7.5 mm. in diam., three times as long as the cupule, purplish-brown or orange-red. *Seeds* about 5 mm. l., flattened-ellipsoidal somewhat obovate, blackish, shining.

[*C. asiatica* Brongn. in *Ann. Sc. Nat. sér. 1*, x. 369 (1827); *Griseb. loc. cit.*; *Laws. in Hook. f. Fl. Brit. Ind.* i. 642; *Guppy*,

Plants, &c. W. Indies, 200. *Ceanothus asiaticus* L. *Sp. Pl.* 196 (1753); *Car. Icon. t.* 440, *fig.* 1. Type in Herb. Hermann in Herb. Mus. Brit.

Hoop Withe.

In fl. Apr.; naturalized; *March*! near Holland Bay on banks of Plantain Garden river, *Harris*! Fl. Jam. 11,952.—Old World tropics.

Bushy *shrub*, 12 ft. high, glabrous, with long trailing branches. *Leaves* 4–7 cm. l., ovate, acuminate, serrate, 3-nerved at base, pinnate above.]

5. RHAMNUS L.

Shrubs or trees. Leaves penninerved. Flowers in axillary clustered pedunculate cymes, hermaphrodite (in *R. sphærosperma*) or polygamo-dioecious. Calyx 5-(4)-lobed; tube free below the

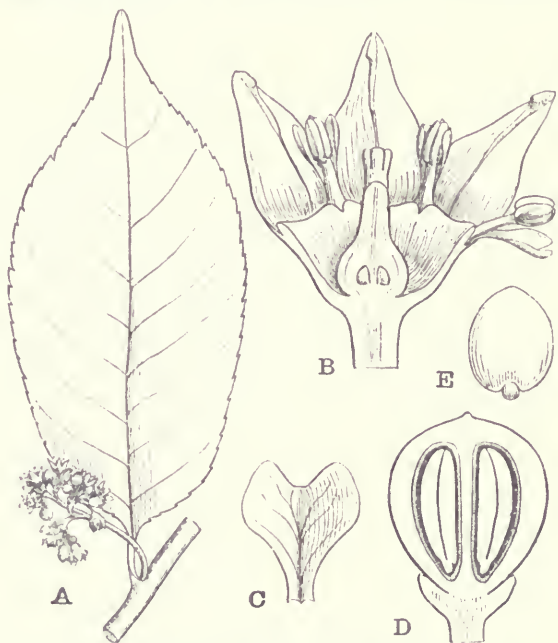


Fig. 33.—*Rhamnus sphærosperma* Sw.

A, Leaf and inflorescence $\times \frac{2}{3}$.
B, Flower cut lengthwise $\times 7$.
C, Petal $\times 11$.

D, Fruit cut lengthwise $\times 4$.
E, Embryo $\times 3$.

fruit; lobes triangular, keeled inside. Petals 5 (4, or wanting), hooded, inserted on the margin of the disk above the ovary. Stamens 5 (4) with very short filaments. Disk covering the tube of the calyx. Ovary free, 2–4-celled, style 2–4-branched

or lobed. Drupe berry-like with 3 (2-4) pyrenes; pyrenes not splitting open or only slightly. Seeds smooth.

Species about 170, natives chiefly of temperate and subtropical regions of America, Asia and Europe, few in the tropics, but not occurring in tropical Africa, Australia or Polynesia.

R. sphærosperma Sw. *Prodr.* 50 (1788) & *Fl. Ind. Occ.* 499; *Urb. Symb. Ant. iv.* 377. *Ceanothus?* *sphærocarpus* DC. *Prodr. ii.* 30 (1825); *Macf. Jam. i.* 210. *Frangula sphærocarpa* Griseb. *Fl. Br. W. Ind.* 99 (1859). (Fig. 33.)

In fl. and fr. Jan.-July; Port Royal Mts., *Macfadyen!* Mount Teviot, St. Andrew, *Purdie!* *Prior!* J.P. 1200, *Hart!* near Blue Mt. Peak; Raymond Hall, 3500 ft.; Peckham, Clarendon, 2800 ft.; *Harris!* *Fl. Jam.* 5219, 5681, 11,089; near Moneague, *Britton* 2663, 2713!—Hispaniola, Porto Rico.

Tree 15-25 ft. high. *Leaves* 7-17 cm. l., elliptical, ovate-elliptical, or oblong-elliptical, shortly acuminate, serrate, glabrous on upper surface, puberulous or glabrous beneath; petiole 1-2 cm. l. *Flowers* greenish. *Calyx* 5-lobed, minutely puberulous outside; lobes 1.6-3 mm. l. *Petals* yellowish-white, 1.3-1.8 mm. l.; clawed, with an emarginate blade. *Style* 3-lobed. *Fruit* globular, about 7 mm. l.; pyrenes about 4 mm. l., flattened-ellipsoidal, somewhat 3-cornered.

6. RHAMNIDIUM Reissek.

Small trees or shrubs. Leaves opposite or subopposite, penninerved; stipules united together in the axil of the petiole. Flowers white. Calyx 5-lobed, lobes triangular, keeled inside, tube persistent in the fruit, not adherent. Petals 5, hooded, clawed. Disk covering the tube of the calyx with free margin. Stamens 5, enclosed by the petals. Ovary surrounded by the disk, free, 2-celled; style short, stigma 2-lobed. Fruit drupaceous, superior, apiculate with the base of the style; endocarp membranous, 1-2-celled. Seed without endosperm; cotyledons obovate or elliptical.

Species 12, natives of Brazil, Cuba, two of Jamaica.

We have followed Urban in assigning the two following species to the genus *Rhamnidium*. In each case only fruiting specimens are known, and the character of the endocarp is tough and leathery—certainly not to be described as membranous.

- | | |
|---|------------------------------|
| Apex of leaves obtuse or acute. Inflorescence | |
| paniculate..... | 1. <i>R. jamaicense</i> . |
| Apex of leaves shortly and bluntly acuminate. | |
| Pedicels in clusters..... | 2. <i>R. dictyophyllum</i> . |

1. *R. jamaicense* Urb. *Symb. Ant. v.* 409 (1908).

On sand dune, Great Pedro Bay, *Harris!* *Fl. Jam.* 9768.

Tree 30 ft. high. *Leaves* 4-6.5 cm. l., opposite or subopposite, ovate to elliptical, apex obtuse or acute, base retuse or subcordate, papery; petiole 1-2 cm. l. *Inflorescence* (in fruit) few-flowered, paniculate, 2-3.5 cm. l.;

peduncle 6-12 mm. l.; pedicels 6-9 mm. l. *Fruit* ellipsoidal-globose, 1.5 cm. l., 2-celled.

2. *R. dictyophyllum* Urb. in *Fedde's Repertorium*, xiii. 459 (1914).

Somerset woods, near Mandeville, *Harris & Britton*! Fl. Jam. 10,606.

Tree 35 ft. high. *Leaves* 6-10(-12.5) cm. l., opposite or subopposite, elliptical or ovate-elliptical, apex shortly and bluntly acuminate, base rounded, sometimes completely cordate, papery-leathery; petiole 6-10 mm. l. *Inflorescence* (in fruit) sessile, few-flowered, clustered; pedicels 4-7 mm. l. *Fruit* ellipsoidal-globose, about 1.5 cm. l.

7. GOUANIA Jacq.

Shrubs climbing high by means of tendrils, formed by the modification of the ends of branchlets. Leaves penninerved, large; stipules soon falling. Flowers small, polygamous. Inflorescence racemose or spicate, axillary and terminal; in *G. lupuloides* the flowers are in clusters on a peduncle. Calyx, tube adherent to the ovary, lobes 5. Petals 5, inserted below the margin of the disk, hooded. Stamens 5, enclosed at first by the petals, inserted on the margin of the disk. Disk 5-lobed; lobes alternate with the stamens. Ovary immersed in the disk, 3-celled; style 3-branched. Fruit inferior, crowned by the persistent calyx; 3-winged, 3-coccos; cocci not splitting open, separating from the axis. Seeds convex, with scanty endosperm; cotyledons roundish.

Species about 50, chiefly natives of S. America, also of tropical Africa and Asia, one of Polynesia, none of Australia.

G. lupuloides Urb. *Symb. Ant.* iv. 378 (1910). *G. domingensis* L. *Sp. Pl. ed.* 2, 1663 (1763); *Wright Mem.* 214; *Sw. Obs. Bot.* 387; *Macf. Jam.* i. 209; *Griseb. Fl. Br. W. Ind.* 101. *G. glabra* Jacq. *Sel. Stirp. Amer.* 264, t. 179, f. 40 & *Ed. pict.* t. 264, f. 96. *Lupulus sylvestris* &c. *Pluk. Phyt.* t. 201, f. 4. *Radix fruticosa* &c. *Sloane Cat.* 214 & *Hist.* ii. 185, t. 232, f. 2, 3. *Banisteria lupuloides* L. *Sp. Pl.* 427 (1753). *Rhamnus sarmentosus* &c. *Browne Hist. Jam.* 172. *R. domingensis* Jacq. *Enum.* 17 (1760). (fig. 34.) Specimen from Plukenet in Herb. Sloane xcvi. 158.

Chaw-stick, Chew-stick.

In fl. Aug.-Nov.; in fr. Nov., Dec.; *Wright*! *Macfadyen*! *Wilson*! Yallahs valley, 1700 ft.; Gordon Town road, 750 ft.; Iron Face, Chester Vale 3000 ft.; Hope Gardens; *Harris*! *Robertsfield*, *Fawcett*! Fl. Jam. 6841, 8424, 10,024.—Florida, Bahamas, West Indies as far south as Grenada, Central America.

Shrub trailing over shrubs and trees to 20 ft. long, supported by the tendrils. *Leaves* 5-9 cm. l., ovate to elliptical, usually shortly and bluntly acuminate, base rounded or subcordate, crenate-serrate, serratures distant, often little developed, with or without minute glands, glabrous, glabrescent, or glabrate, nerves tapering towards the margin. *Inflorescence* pubescent,

not tomentose. *Flowers* yellowish-green. *Calyx* pubescent outside, 1·5–2 mm. l., lobes about 1 m. l. *Petals* as long as the calyx-lobes. *Capsule*: wings 8–9 mm. l. *Seeds* 2·5–3 mm. l.

This species is an agreeable bitter, used as a substitute for hops in ginger-beer and cool drinks. The infusion has been used in cases of

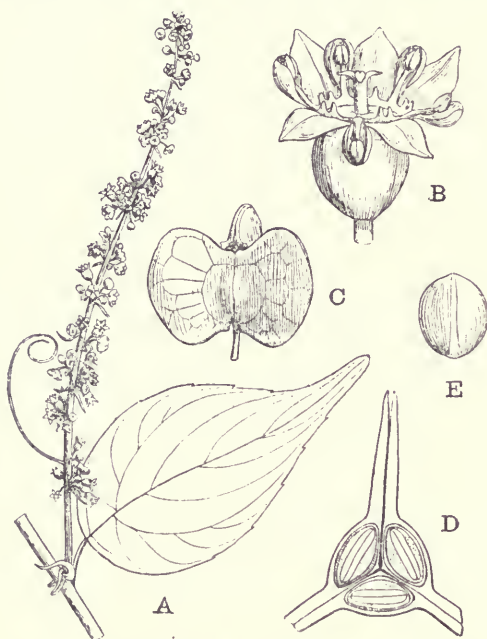


Fig. 34.—*Gouania lupuloides* Urb.

A, Leaf and inflorescence $\times \frac{1}{3}$.
B, Flower $\times 7$.
C, Fruit $\times 2$.

D, Fruit cut across $\times 4$.
E, Seed $\times 4$.

debility to restore the tone of the stomach. It has been recommended for dropsy. In powder it forms an excellent dentifrice. A tincture also is used as a wash in disease of the gums. Chew-stick is also a substitute for the tooth-brush itself. (Macfadyen.)

FAMILY LXII. VITACEÆ (AMPELIDACEÆ).

Woody vines, with a copious watery sap and with swollen jointed nodes, climbing by means of tendrils which are sterile peduncles or sometimes simple branches of the flowering peduncles. Leaves alternate, simple or digitately 3-foliate, stipulate. Inflorescence paniculate, opposite the leaves. Flowers greenish-yellow (red in *Cissus microcarpa*), regular, hermaphrodite or unisexual.

Calyx small, with 4 or 5 teeth or lobes. Petals 4 or 5, soon falling, valvate. Stamens as many as the petals and opposite to them, inserted at the base of the disk or between its lobes. Disk between the stamens and ovary. Ovary generally surrounded by the disk, usually 2-celled; cells with 2 ascending anatropous ovules. Fruit a berry, usually 1-2-celled; cells 1-2-seeded. Seeds with cartilaginous endosperm, at the base of which is the short embryo.

Species, 400 to 450, natives of tropical and subtropical regions.

Inflorescence paniculate with main axis indeterminate,

but branches cymose 1. *Vitis*.

Inflorescence spike-like 2. *Ampelocissus*.

Inflorescence corymbosous 3. *Cissus*.

1. VITIS L.

Shrubby climbing plants with tendrils opposite the leaves or produced from the ends of the peduncles. Leaves simple, variously lobed. Inflorescence with main axis indeterminate, but branches cymose, with or without a tendril. Flowers polygamo-dicæious, the male flower like the hermaphrodite, but with longer stamens and an undeveloped pistil. Calyx cup-shaped with 5 teeth, more or less indistinct. Petals 5, cohering at the tips, the whole corolla usually separating from the base before expansion and soon falling away. Disk of 5 hypogynous glands adhering more or less between themselves and to the base of the ovary. Berry 2-celled. Seeds 1 or 2 in each cell, pear-shaped.

Species about 80, natives of the northern hemisphere, especially of the temperate regions.

V. tillæfolia Humb. & Bonpl. ex Roem. & Schult. Syst. v. 320 (1819); Urb. Symb. Ant. iv. 379. *V. fructu minore* &c. Sloane Cat. 171 & Hist. Jam. ii. 104, t. 210, f. 4. *V. vinifera sylvestris* &c. Pluk. Phyt. t. 249, f. 1. *V. sylvestris* &c. Browne Hist. Jam. 178. *V. Abutili folio* &c. Plum. Pl. Amer. (Burm.) 257, t. 259, f. 1. *V. labrusca* L. Sp. Pl. 203 (1753) (in part, as regards syn. Pluk. & Sloan.). *V. indica* Sw. Obs. Bot. 95 (1791). *V. caribæa* DC. Prodr. i. 634 (1824); Wright Mem. 256; Macf. Jam. i. 181; Griseb. Fl. Br. W. Ind. 102; Planch. in DC. Monogr. v. 330; Small Fl. S.E. U.S. 756. (Fig. 35.)

Water Withe, Wild Grape.

In fr. Sept.; Sloane Herb. vii. 311 and Petiver's coll. clxii. 229! Wright! Broughton! Masson! Macfadyen! McNab! Prior; March! Blue Mts., Hitchcock; J.P. 887, 1016, Morris! near Brown's Town, 1000 ft.; near Troy, 2000 ft.; Harris! Fl. Jam. 7086, 9367.—U.S.A. (Florida to Louisiana and Texas), Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Bartholomew, Guadeloupe, S. America to Ecuador.

Stem sometimes as thick as 2 dm. in diam., running up to the top of high trees, giving off few branches. Branches, young leaves and inflo-

escence covered with reddish or whitish tomentum, persistent on under surface of older leaves. *Leaves* 5-2 dm. l., cordate-roundish, mucronate-toothed, undivided or obscurely angulate-3-lobed, rarely divided into 3 to 5 cuspidate lobes. *Berries* globular, 6-7 mm. in diam. *Seeds* 2 or 3.

"The fruit, though somewhat austere, with its sweetish piquancy is not unpleasant, and is very much eaten as well by way of desert as made into tarts. The vine growing on dry hills in the woods where no water is

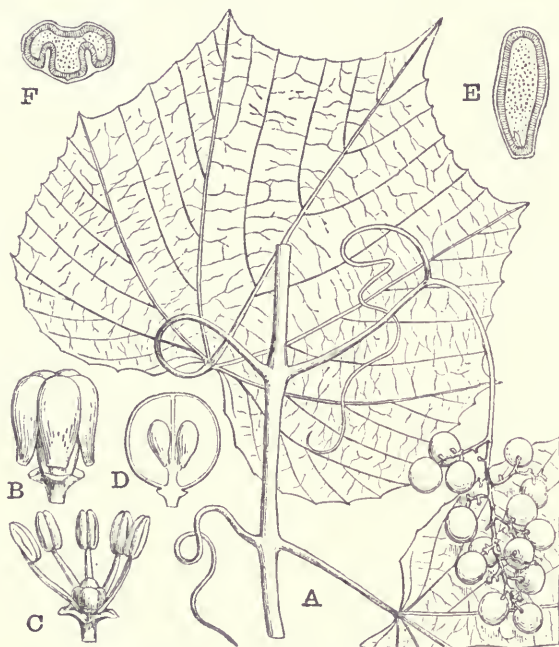


Fig. 35.—*Vitis titicefolia* Humb. & Bonpl.

- A, Portion of stem with leaf, fruit, and tendrils $\times \frac{1}{2}$.
 B, Bud throwing off the united petals $\times 7$.
 C, Ditto, petals having fallen $\times 7$.
 D, Fruit of *V. labrusca* cut lengthwise, enlarged.
 E, Seed of ditto cut lengthwise, enlarged.
 F, Ditto cut across, enlarged.
 (D, E, F after A. Gray.)

to be met with, its trunk, if cut into two- or three-yards-long pieces, and held by either end to the mouth, there issues out of it so plentifully [about a pint] a limpid, innocent and refreshing water or sap as gives new life to the drouthy traveller." (Sloane.) "By proper management and with little expense, a generous rough wine might be made from the fruit." (Wright.) "The berries make first-class jelly." (C. F. Baker on ticket of specimen.)

2. AMPELOCISSUS Planch.

Shrubby climbers; tendrils branches of the flowering peduncles. Leaves simple, entire or lobed. Flowers polygamo-monœcious or

hermaphrodite, in a spike-like inflorescence. Calyx cup-shaped, with 5(-4) lobes or subentire. Petals (in Jamaican species) 5, touching valvately with the margins infolded, apex of each free from the rest, spreading during flowering. Disk hypogynous, forming a ring adherent to the base of the ovary. Berry subglobose, 2-4-seeded. Seeds boat-shaped or 3-cornered, or (in Jamaican species) triangular-ovoid.

Species 65, natives of the tropics, chiefly in Africa and Asia, but also in America and Australia.

Young branches and underside of leaves with reddish woolly cobwebby hairs. Leaves 3(-5)-lobed..... 1. *A. Robinsonii*.

Young branches and underside of leaves with whitish hairs. Leaves not lobed, or sometimes with a small lobe on each side above the middle..... 2. *A. Alexandri*.

1. *A. Robinsonii* Planch. in DC. Monogr. v. pt. 2, 415 (1887); Urb. Symb. Ant. vi. 16. *Irsiola scandens foliis cordatis trifidis v. pentafidis rugosis, baccis nigris majoribus racemosis A. Robinson ex Lun. Hort. Jam. ii. 316. Cissus rugosa DC. Prodr. i. 629 (1824); Macf. Jam. i. 179 (1837).*

Longville, Clarendon Mts. *A. Robinson*.—Hispaniola.

Branches slender, younger covered with reddish woolly cobwebby hairs. Leaves 4-10 cm. in diam., alternate, cordate-ovate, 3-lobed, sometimes with 2 other lobes at base, 5-nerved, toothed, puberulous on the upper surface, with reddish woolly cobwebby hairs beneath. Calyx subentire. Petals oblong. Stamens 5. Ovary surrounded by the disk. Berries as large as the common grape (fide Robinson). Seeds triangular-ovate.

"The general aspect of this plant is exactly that of a true vine." (Planchon.)

2. *A. Alexandri* Urb. Symb. Ant. vi. 15 (1909); Britton in Bull. Torr. Bot. Cl. xxxix. 12 (1912).

In fl. and fr. Dec.; Mt. Diablo, Prior; Union Hill, near Moneague, 1500 ft.; Britton & Hollick 2767.

Branches (flowering) to 3.5 mm. thick, with whitish hairs. Leaves 14-20 cm. l., 11-14 cm. br., cordiform, deeply and broadly cordate at the base, apex long and narrowly acuminate, not lobed, or with a small triangular lobe on each side above the middle, margin irregularly crenate, with very short and sparse hairs on upper surface, with short hairs beneath, especially on the nerves, membranous, 5-nerved. Calyx 5-lobed, 5 mm. l., lobes about as long as the tube. Petals 1.5 mm. l. Berry depressed globose, black, shining, 1.5 cm. in diam. Seeds 2 or 3, depressed-obovoid, slightly rugose, rather deeply and broadly grooved, 5 mm. l., 4 mm. br. The description of the berry is from Britton *loc. cit.*

3. CISSUS L.

Shrubby plants, generally climbing by means of tendrils. Leaves simple or 3-foliate. Inflorescence a corymbose cyme, divided more or less umbellately, generally opposite a leaf.

Flowers hermaphrodite or polygamo-monœcious. Calyx short, subentire. Petals 4, ovate-oblong, spreading during flowering, distinct or sometimes more or less cohering before flowering. Disk 4-lobed. Ovary 2-celled; cells 2-ovuled. Berry 1-(4)-seeded. Seeds ovoid or obtusely 3-cornered.

Species about 300, mostly natives of the tropics.

Leaves simple 1. *C. sicyoides*.

Leaves with 3 leaflets.

Flowers greenish-yellow. Leaflets 1·5-5 cm. l.,
deeply toothed above the middle 2. *C. trifoliata*.

Flowers red. Leaflets 6-10 cm. l., setaceous-serrate 3. *C. microcarpa*.

1. *C. sicyoides* L. *Syst. ed.* 10, 897 (1759) & *Amœn. v.* 376; *Jacq. Sel. Stirp. Amer.* 22, t. 15 & *El. pict. t.* 20; *Wright Mem.* 250, 412; *Sw. Obs. Bot.* 48; *Descourt. Fl. Ant. v.* 29, t. 311. *Macf. Jam. i.* 178; *Griseb. Fl. Br. W. Ind.* 102; *Planch. in DC. Monogr. v.* 521; *Small Fl. S.E. U.S.* 757; *Urb. Symb. Ant. iv.* 379; *Britton Fl. Berm.* 229; *Britt. & Mill'sp. Bah. Fl.* 260. *Bryonia alba geniculata* &c. *Sloane Cat.* 106 & *Hist. i.* 233, t. 144, f. 1. *Irsiola scandens* &c. *Browne Hist. Jam.* 147, t. 4, f. 1, 2. *Spondylantha aphylla Presl Rel. Haenk. ii.* 35, t. 53 (1836) (a monstrous form of the inflorescence with branches and flowers in whorls). *Vitis sicyoides Morales in Pory Repert. i.* 206 (1866); *Bak. in Fl. Bras. xiv. pt.* 2, 202; *Urb. in Engl. Jahrb. xv.* 324. Type in Herb. Linn.

Snake Withe, Wild Yam, Yaws Bush, Bastard Bryony.

In fl. after rains throughout the year; St. Jago de la Vega; Rio Cobre! Black River; *Sloane* Herb. iv. 89, 90! *Browne*; *Broughton! Destin! McNab! Wilson! Prior; March! Charlemont*, near Ewarton, 1000 ft.; Green Valley, Blue Mts., 1800 ft.; *Harris! Providence road*, near Castleton, *Thompson! Port Antonio, Lucea, Hitchcock. Fl. Jam.* 6672, 6767, 7664.—Bermuda, Florida, Bahamas, West Indies, Margarita, Curaçao, Aruba, Tres Marias Is., tropical continental America.

Glabrous. Stem with tendrils, climbing or creeping; branches jointed, rounded. Leaves simple, variable, oblong to cordate-ovate, or ovate, base generally subtruncate or wedge-shaped, minutely toothed, teeth bristle-like, far apart, 5-15 cm. l. Cymes usually shorter than the opposite leaf, forking 2 or 3 times. Flowers small, greenish-yellow or white or purplish. Berry obovoid-globose, black, 8-10 mm. l.

This species climbs to a great height on trees and rocks, sending down bundles of long cord-like fibres, which take root when they reach the ground. Even when the stem is cut across the upper part still survives and roots again by the descending fibres. It is trained to cover arbours, affording a close shade, remaining green in the driest seasons. It is used as an application to sores (e.g. yaws), and as a substitute for adhesive plaster. The leaves bruised in water make a lather like soap. (*Macfadyen*.)

2. *C. trifoliata* L. *Syst. ed.* 10, 897 (1759) (non *Sp. Pl. ed.* 2, 170 (1762) which is *C. microcarpa* Vahl); *Jacq. Sel. Stirp. Amer.* 23; *Urb. Symb. Ant. iv.* 380; *Britt. & Mill'sp. loc. cit.*

Sicyos trifoliata L. *Sp. Pl.* 1013 (1753). *Cissus acida* L. *Sp. Pl. ed.* 2, 170 (1762); *Sw. Obs. Bot.* 49; *Jacq. Hort. Schoenbr.* i. 14, t. 33 (excl. syn. *Rumph.*); *Macf. Jam.* i. 179; *Griseb. loc. cit.*; *Planch. tom. cit.* 534 (excl. var.); *Small Fl. S.E. U.S.* 757. *Bryonoides trifoliatum indicum* &c. *Pluk. Phyt.* t. 152, f. 2. *Bryonia alba triphylla geniculata*, foliis crassis acidis *Sloane Cat.* 106 & *Hist.* i. 233, t. 142, f. 5, 6. *Irsiola triphylla scandens* et *claviculata* &c. *Browne Hist. Jam.* 147. *Vitis trifolia minor* &c. *Plum. Pl. Amer. (Burm.)* 259, t. 259, f. 5. A specimen in Herb. Linn. named *C. acida* by Linnæus with a specimen of another species on the same sheet.

Sorrel Vine.

In fl. May-Sept.; near St. Jago de la Vega; Rio Cobre; *Sloane, Herb.* iv. 87, 88! *Broughton!* *Distin!* *March!* Great Goat Is.; Cane River valley, 300 ft.; Great Pedro Bay; *Harris!* Fl. Jam. 9300, 9634, 9939.—Florida and Keys, Cuba, Hispaniola, Mona, Porto Rico, Vieques, St. Thomas, St. Cruz, St. Jan, Guadeloupe, Martinique, Colombia, Guiana.

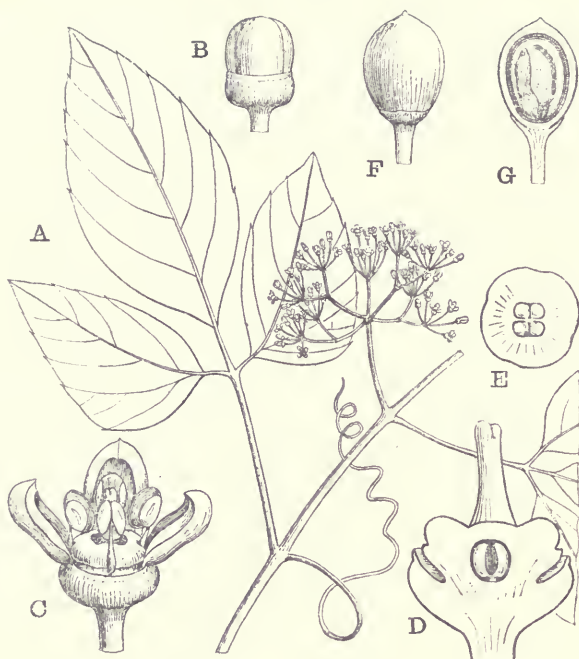
Glabrous. Stem climbing with tendrils over shrubs and low trees; branches somewhat succulent, more or less jointed and flexuose. Leaves with 3 leaflets; leaflets fleshy, obovate-wedge-shaped, deeply toothed above the middle, 1.5-5 cm. l.; teeth close together, spreading. Cymes long-stalked, longer than the opposite leaf. Flowers long-stalked, greenish-yellow or creamy-yellow. Petals slightly hooded at apex. Berry ovoid-globose, mucronate, black, 1-(2)-seeded, 6-7 mm. l.

All parts of the plant have an acid taste. This species can be used like the preceding to cover arbours. The monstrous form (*Spondylantha*) occurs also in this species.

3. *C. microcarpa* Vahl *Eclog.* i. 16 (1796); *C. trifoliata* L. *Sp. Pl. ed.* 2, 170 (1762) (non ed. 1); *Sw. Obs. Bot.* 50; *Macf. Jam.* i. 180; *Griseb. loc. cit.* (omitting syn. *C. obovata*, *C. caustica*, *C. intermedia*); *Planch. tom. cit.* 546. *C. alatus* *Jacq. Sel. Stirp. Amer.* 23 (1763) (as regards syn. and hab. Jamaica). *Bryonia alba triphylla maxima* *Sloane Cat.* 106 & *Hist.* i. 233, t. 144, f. 2. *Irsiola triphylla scandens*, foliis &c. *Browne Hist. Jam.* 147. *Vitis foliis ternatis* &c. *Plum. Ic. ined.* iii. t. 167 & *Pl. Amer. (Burm.)* 258, t. 259, f. 4. *V. trifoliata* *Bak. Fl. Bras. xiv. pt.* 2, 212, t. 50, f. 2. (Fig. 36.) A specimen in Herb. Linn. named *C. trifoliata* by Linnæus. Specimen from Dr. W. Wright, Jamaica, in Herb. Mus. Brit. named *C. trifoliata* by Swartz.

In fl. July-Sept.; near St. Jago de la Vega, *Sloane, Herb.* iv. 91! *Broughton!* *Bertero!* *Distin!* *Prior!* *March!* J.P. 1044, 1198, *Morris!* Annotta Bay, *Thompson!* St. George, 2200 ft.; near Troy, 2000 ft.; Green Valley, St. Andrew, 2000 ft.; *Harris!* Fl. Jam. 6472, 7662, 8759, 12,392.—Cuba, Mexico, Nicaragua, Surinam, Ecuador, Brazil.

Glabrous. Stem with few tendrils; climbing over trees, &c., to a length of 90 ft.; branches below 4-winged, above angled. Leaves with 3 leaflets; terminal leaflets subrhomboid-elliptical, lateral obliquely ovate, unequal-sided, all mucronate-serrate, 6-10 cm. l. Cymes many-flowered, shorter than the opposite leaf. Flowers small, red. Petals ovate-oblong,

Fig. 36.—*Cissus microcarpa* Vahl.A, Leaf and inflorescence $\times \frac{3}{4}$.B, Flower bud $\times 4$.C, Flower $\times 5$.D, Flower with petals removed,
cut lengthwise $\times 11$.E, Ovary cut across $\times 11$.F, Fruit $\times 2$.G, Ditto cut lengthwise $\times 2$.

usually free, sometimes cohering to form a lid. Berry ovoid-globose; about 8 mm. l., purple.

C. quadrangularis L. Mant. 39 (1767) has 4 wings on the thick fleshy stems, and simple leaves. It was introduced from the East Indies by Mr. Hinton East.

C. (?) cucurbitacea Britton in Bull. Torr. Bot. Cl. xxvii. 353 (1910).

Dry rocky hillside, Fort Henderson, Britton & Hollick, 1912; base of Healthshire Hills, climbing to a height of 20 ft. on mangrove, &c., Harris & Britton! Fl. Jam. 10,512.

Woody, high-climbing vine. Stem to 7.5 cm. thick at base; twigs and leaves fleshy. Leaves 6–10 cm. l., triangular-ovate, cordate, sinus wide open, 5-nerved, pinnately veined, remotely dentate with apiculate teeth, rough on both sides with short stiff hairs, or when old papillose; petioles 2–3 cm. l. Tendrils slender, 1–2 dm. l. Flowers and fruit not known.

The position of the tendrils at the side of the leaf-base and the bicollateral vascular bundles suggest that these specimens belong to the *Cucurbitaceæ*.

Leea sambucina Willd. *Sp. i.* 1177 (1797) is naturalized in woodland in the neighbourhood of Castleton Gardens. The flowers are small, white, in corymbose cymes opposite the terminal leaf. The 5 stamens are united below into a wide tube, deeply 5-lobed at mouth, adhering below to the tube of the petals; anthers on inside of tube, alternate with the lobes, united by their edges. The ovary is 6-celled, and berry subglobose flattened at top, purple-black, with 6 seeds. The leaves are bi-ternate, 5-9 dm. l.

FAMILY LXIII. TILIACEÆ.

Trees, shrubs, or herbs. Leaves alternate, rarely opposite or subopposite, simple, entire, toothed or lobed. Stipules usually present. Inflorescence axillary or terminal, generally cymulose, cymules sometimes solitary, few-flowered, sometimes in corymbs or panicles. Flowers regular, hermaphrodite or sometimes polygamous (*Elæocarpus*). Sepals 5 (4-7), free, or cohering, or united into a bell-shaped calyx, generally valvate. Petals usually as many as sepals, sepaloid (in *Sloanea*), or wanting, inserted round the base of the receptacle. Stamens indefinite, usually borne on a development of the receptacle and free. Anthers 2-celled, opening usually longitudinally or sometimes by a chink at the apex (*Sloanea* and *Elæocarpus*). Ovary free, sessile on the receptacle or gonophore, 2-10-celled. Style usually simple, awl-shaped, with as many lobes at apex as ovary-cells. Ovules attached to the interior angle of the cells, anatropous or subanatropous. Fruit 2-10-celled, or with only 1 cell developed, or the cells divided longitudinally or transversely by partitions of later growth between the seeds into many cells; dry, drupe-like or berry-like and not opening, or separating into cocci, or opening by as many valves as true cells. Seeds solitary or indefinite; endosperm fleshy, plentiful or scanty, very rarely wanting. Embryo straight, rarely incurved; cotyledons ovate or roundish-cordate; radicle next the hilum.

Species 380, dispersed through the world, numerous in the tropics, fewer in temperate regions, wanting in alpine districts and in the arctic and antarctic circles.

Herbs or shrubs.

- | | |
|--|------------------------|
| Fruit covered with hooked prickles | 1. <i>Triumfetta</i> . |
| Fruit a herbaceous capsule | 2. <i>Corchorus</i> . |

Trees.

- | | |
|-----------------------------|-----------------------|
| Fruit berry-like | 3. <i>Muntingia</i> . |
| Fruit a woody capsule | 4. <i>Sloanea</i> . |

1. TRIUMFETTA L.

Herbs, undershrubs, or shrubs, usually with star-shaped hairs. Leaves variable in size and shape, often with 3-5 angles

or lobes, generally irregularly toothed-serrate, teeth sometimes glandular. Flowers yellow, axillary or opposite the leaf, few or densely clustered, sometimes a terminal raceme or panicle with the leaves becoming small, bract-like, or wanting. Sepals 5, often coloured yellow, the apex more or less concave or hooded (in *T. Bartramia* shaped like a minute helmet), usually apiculate. Petals 5, sometimes wanting, the base thickened or pitted forming a gland, inserted round the base of the receptacle which is more or less raised and bears the stamens and pistil (gonophore). Stamens indefinite, inserted on the gonophore which is generally 5-glandular and with a saucer-shaped expansion above (disk). Ovary of 2-5 cells; ovules 2 in each cell; stigma 2-5-toothed. Fruit subglobose, dry, glabrous, puberulous, or more or less tomentose, covered with prickles, 2-5-celled, often splitting as the pericarp and partition walls decay; prickles hooked at apex and hispid with minute hairs pointing backwards or glabrous, or pilose. Roadside weeds.

Bur-weed, Bur-bush.

Species about 150, natives of tropical and subtropical regions.

- Prickles of fruit glabrous..... 1. *T. Bartramia*.
 Prickles of fruit hispid.
 Body of fruit glabrous 2. *T. semitriloba*.
 Body of fruit tomentose or puberulous with stellate hairs.
 Petals present.
 Fruit 3-celled 3. *T. hispida*.
 Fruit 2-celled 4. *T. Sloanei*.
 Petals wanting.
 Fruit 4-5 mm. in diam. Stipules 5-6 mm. l.... 5. *T. Lappula*.
 Fruit 2-2.5 mm. in diam. Stipules 2-5 mm. l. 6. *T. heterophylla*.

1. *T. Bartramia* *L. Syst. ed. 10, 1044 (1759)*; leaves with minute stellate hairs on upper surface, stellate-tomentose beneath, usually soft to the touch; stipules 3-5 mm. l., linear-awl-shaped, glabrate on both sides with ciliate margins; flower-bud broader near the apex than below and 5-lobed; sepals hairy outside, apex helmet-like, long apiculate; fruit 3 mm. in diam., tomentose, prickles glabrous, half as long as diam. of fruit, or less.—*Fawc. & Rendle in Journ. Bot. lix. 224*. *T. villosa* &c. *Browne Hist. Jam. 233*. *T. rhomboidea* *Jacq. Enum. Pl. Carib. 22 (1760)*; *Sel. Stirp. Amer. 147, t. 90, & Ed. pict. t. 134*; *Lindl. Coll. Bot. t. 29*; *Macf. Jam. i. 111*; *Griseb. Fl. Br. W. Ind. 96*; *Harv. & Sond. Fl. Cap. i. 227*; *Masters in Fl. Trop. Afr. i. 257* (in part) & in *Hook. f. Fl. Br. Ind. i. 395*; *K. Schum. in Fl. Bras. xii. pt. 3, 132, t. 27, f. 1*; *Trim. Fl. Ceyl. i. 179*; *Sprague & Hutch. in Journ. Linn. Soc. xxxix. 266*; *Small Fl. S.E. U.S. ed. 2, 1351*. *T. rhombæfolia* *Sw. Prodr. 76 (1788)*; *Wright Mem. 274*. *T. indica* *Lam. Encyc. iii. 420 (1789)?* *T. rhombifolia* *Sw. Fl.*

Ind. Occ. 863 (1798). *Lappula Bengalensis* &c. *Pluk. Phyt.* t. 41, f. 5. *Bartramia indica* L. *Sp. Pl.* 389 (1753). B. Lappago *Gaertn. Fruct.* ii. 137, t. 111 (1791). (Fig. 37) Type in Herb. Hermann in Herb. Mus. Brit. Two specimens in Herb. Linn. Linn. in Herb. Mus. Brit. Specimen from Jacquin in Herb. Mus. Brit.

Paroquet Bur.

Wright! Macfadyen! Wilson! Mt. Diablo; Hopo estate; Prior!—Found throughout the tropics, naturalized in Florida.

Undershrub or *perennial herb*, to 3 ft. and more high. *Leaves* 4-8 (2.5-9) cm. l., broadly ovate or rhomboid, 3-5(-7)-nerved, often some-

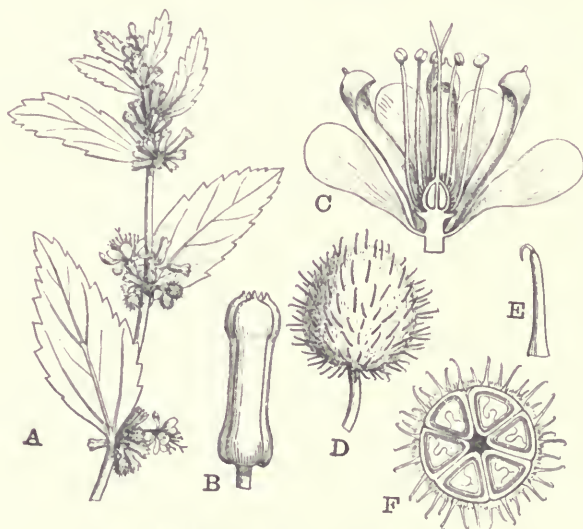


Fig. 37.—*Triumfetta Bartramia* L.

A, Portion of flowering branch $\times 3$.

B, Flower-bud $\times 4$.

C, Flower cut lengthwise $\times 4$.

D, Fruit $\times 4$.

E, Prickle from fruit $\times 11$.

F, Fruit cut across $\times 4$.

(A after K. Schumann.)

what 3-lobed, irregularly toothed, teeth sometimes glandular. *Sepals* 6-8 mm. l., narrowly oblong. *Petals* two-thirds as long as sepals, obovate-oblongate. *Stamens* about 15. *Ovary* of 2 or 3 cells, with 1 or 2 ovules in each cell, secondary walls arise between the ovules if two develop in a cell, so that an ovary may become 4- or 6-celled. *Gonophore* and ring present. *Fruit* 2-6-celled; partition walls not easily recognised, as they are soft and soon decay, liberating the seeds; seed-coats hard.

The bark soaked for 8 or 10 days in water, then washed and dried, makes a white strong hemp. (Wright.)

2. *T. semitriloba* Jacq. *Enum.* 22 (1760) (excl. syn.), *Sel. Stirp. Amer.* 147 & *Hort. Vindob.* iii. t. 76 (omitting the fruit);

leaves generally stellate-tomentose and soft to the touch on both sides; stipules 5–8 mm. l., base deltoid to lanceolate, awl-shaped above, glabrous on upper surface, hirsute beneath; sepals scarcely hooded, shortly apiculate, with minute stellate hairs outside or glabrescent; pistil: parts in threes; fruit 4–5 mm. in diam., glabrous, 3-celled, partition walls bony, thick; prickles hispid.—*L. Mant.* 73; *Macf. Jam.* i. 110; *Masters in Hook. f. Fl. Brit. Ind.* i. 396; *K. Schum. tom. cit.* 134; *Small Fl. S.E. U.S.* 760; *Sprague & Hutch. tom. cit.* 262; *Britton Fl. Berm.* 231; *Britton & Millsp. Bah. Fl.* 263; *Fawc. & Rendle tom. cit.* 225. *T. Lappula Hemsl. Bot. Chall. Exp. Bermuda* 23 (non *L.*). *Lappula Bermudensis* &c. *Pluk. Phyt. t.* 245, *f.* 7. Specimen from Plukenet in Herb. Sloane xevi. 128, and specimens from Hort. Vindob. without fruit in Herb. Mus. Brit.

Houstoun! *Wright!* *Distin!* St. Mary, *McNab!* *Wilson!* *Moneague,* *Prior!* near Cinchona, J.P. 939, 1144, *Morris!* near Ewarton, 950 ft., *Harris!* Fl. Jam. 6617; Port Morant; Port Antonio; Porus; Lucea; *Hitchcock!* Newcastle and road thither; Mt. Diablo; *Ridley!*—Florida, Bermuda, Bahamas, West Indies, tropical continental America, Mauritius, Tenasserim.

Undershrub or *herb* woody below, 2–7 ft. high, and more; stems above tomentellous or more or less with silky hairs. *Leaves* 4–10 (2·5–20) cm. l., broadly ovate, subcordate, 3-lobed or 3-angled, the middle lobe larger 3–5(7)-nerved, upper leaves ovate to oblong and lanceolate or linear-oblong, apex generally acuminate, irregularly toothed, teeth sometimes subglandular. *Sepals* 5–8 mm. l., narrowly oblong. *Petals* somewhat shorter than the sepals, oblong-ob lanceolate. *Stamens* 15–25, filaments generally hairy at base. *Carpels* 3, gonophore and disk present. *Seeds* 1 or 2 in each cell.

3. *T. hispida* *A. Rich. in Sagra Cub. x.* 81 (1845); leaves pubescent—mostly with long simple hairs and sometimes minute stellate hairs, on upper surface, stellate-tomentose beneath; stipules 6–7 mm. l., lanceolate, acuminate, glabrous on upper surface, hairy beneath; sepals long apiculate, with whitish villose down outside; carpels 3; fruit 3–4 mm. in diam., tomentose, 3–6-celled, prickles hispid.—*Griseb. in Bonplandia* (1858) 3 & *Fl. Br. W. Ind.* 96.

Wright! *Broughton!* *Bancroft!* Spanish Town road, *McNab!* *March!* Hope estate, *Prior!* Norbrook, Liguanea plain, 600 ft., *Campbell!* Fl. Jam. 6123; Constant Spring, *Ridley!*—Cuba, Isle of Pines, Hispaniola, Yucatan, Panama, Colombia, Ecuador.

Undershrub. *Leaves* 2·5–7 cm. l., ovate, with or without 3 angles or lobes, acute or acuminate, irregularly toothed, teeth sometimes glandular. *Sepals* 5–8 mm. l. (and more), linear-oblong. *Petals* somewhat shorter than the sepals, narrowly elliptical narrowing towards the base. *Stamens* about 20. *Gonophore* and disk present.

4. *T. Sloanei* *Fawc. & Rendle in Journ. Bot. lix.* 225 (1921); leaves with minute stellate hairs on the upper surface, stellate-tomentose beneath, usually soft to the touch; stipules thread-

like with a short lanceolate base, hispid; sepals linear, apex incurved slightly but not hooded, shortly apiculate, puberulous outside; carpels 2; fruit 3-3.5 mm. in diam., tomentose, 2-celled; prickles hispid, two-thirds as long as diam.—*Agrimonia lappacea* &c. *Sloane Cat.* 92 & *Hist.* i. 211. Types in Herb. Mus. Brit.

St. Jago de la Vega, *Sloane* Herb. iv. 31! Constant Spring, *Ridley*!

Undershrub. Leaves 3-7 cm. l., ovate or rhomboid to lanceolate, 3-5-nerved, often somewhat 3-lobed, base obtuse to acute, somewhat regularly toothed. *Sepals* 5-7.5 mm. l., .8-1.2 mm. br. *Petals* 4.5-6 mm. l., 1.3 mm. br. near apex, oblanceolate. *Stamens* about 15. *Gonophore* and disk present.

5. *T. Lappula* L. *Sp. Pl.* 444 (1753); (excl. syn. *Pluk.* & *Sloane*) base of leaves often subcordate; stipules 5-6 mm. l., ovate-triangular, long acuminate, glabrous on upper surface, hairy beneath; sepals 3-4 mm. l.; petals wanting; carpels 2; fruit 4-5 mm. in diam., puberulous with stellate hairs, prickles hispid.—*Jacq. Enum. Pl. Carib.* 22 & *Sel. Stirp. Amer.* 146; *Lam. Encyc.* iii. 419 & *Illustr. t.* 400; *Desc. Pl. Ant.* ii. 133, t. 101; *Macf. Jam.* i. 109; *Griseb. Fl. Br. W. Ind.* 95; *Hemsl. in Biol. Cent. Am. Bot.* i. 138; *Urb. Symb. Ant.* iv. 384; *Sprague & Hutch. tom. cit.* 262, t. 17, f. 11. *T. fructu* &c. *Plum. Pl. Amer. (Burm.)* 253, t. 255. *T. Plumieri Gaertn. Fruct.* ii. 137, t. 111 (1791). Specimen in Herb. Linn. with leaves only, named by Linnæus. A similar specimen in Hort. Cliff. in Herb. Mus. Brit.

Wright! *Macfadyen!* Kingston, *Prior!* near Gordon Town, *Ball!* Constant Spring; Port Morant; *Hitchcock!* Charlemont, near Ewarton, 1000 ft.; Hope road, 700 ft.; *Harris!* Fl. Jam. 6614, 8217.—West Indies, tropical continental America, Cape Verde Is. and Mauritius.

Herb woody below, or *undershrub*, 2-5 ft. high, velvety with stellate down. *Leaves* 4-12 cm. l., roundish or ovate, with or without 3-5 angles or lobes, upper gradually getting smaller, and sometimes oblong, very irregularly toothed, stellate-tomentose on both sides, or only beneath with scattered stellate hairs on the upper surface, soft to the touch. *Inflorescence* panicleate, leafy at the base; peduncles and pedicels 2-3 mm. l. *Sepals* linear-oblong, hooded, shortly apiculate, hairy outside. *Gonophore* minutely tuberculate, hairy; glands and disk wanting. *Stamens* 10 (6-15). *Fruit* normally 2-celled, but with the development of both ovules in one cell or in both cells sometimes apparently 3-4-celled.

6. *T. heterophylla* Lam. *Encyc.* iii. 420 (1789) (excl. syn.); base of leaves usually wedge-shaped; stipules 2-3.5(-5) mm. l., lanceolate, acuminate, apex hairy, base glabrous on both sides; sepals 4.5-6 mm. l.; petals wanting; carpels 2; fruit 1.5 mm. in diam., tomentose, prickles hispid.—*Hemsl. tom. cit.* 137; *K. Schum. in Fl. Bras. xii. pt.* 3, 139, t. 27, f. 2.

Hanover, *Purdie!*—Central America and tropical South America.

Herb woody at the base, or *undershrub*, 2-5 ft. high. *Leaves* 4-11 cm. l., ovate, acuminate, with or without 3-5 angles or lobes, upper subrhomboid

to oblong-lanceolate, usually irregularly toothed, more or less tomentose. *Peduncles* and *pedicels* 1·5-2·5 mm. l. *Sepals* linear, very shortly apiculate, hairy outside. *Stamens* about 10. *Gonophore* very short, without glands, disk indistinct.

2. CORCHORUS L.

Herbs, undershrubs, or small shrubs, with simple or sometimes stellate hairs. Leaves serrate, usually with stipules soon falling. Peduncles 1-few-flowered, very short, axillary or opposite a leaf. Flowers small, yellow. Sepals and petals 5 (4). Stamens indefinite or sometimes twice as many as the sepals, free, inserted on the receptacle. Ovary 2-5-celled; ovules numerous in each cell. Capsule sometimes pod-like, sometimes short or subglobose and covered with hairs, loculicidally 2-5-valved, with many seeds, sometimes with transverse partitions between the seeds. Seeds hanging or horizontal, with endosperm; embryo generally curved, with leafy cotyledons.

Species about 55, natives of the tropics.

Calyx more than 4 mm. l.

Leaves with teeth equal.

Capsule 2-celled, with 4 short erect points at apex... 1. *C. siliquosus*.

Capsule 3-celled; beak erect 2. *C. orinocensis*.

Capsule 4-celled, woolly 3. *C. hirsutus*.

[Leaves with 2 lowest teeth ending in a long bristle.

Capsule 5-celled *C. olitorius*.]

Calyx not more than 4 mm. l. Capsule 3-celled, horns

horizontal, when ripe 4. *C. æstuanus*.

1. *C. siliquosus* L. *Sp. Pl.* 529 (1753) & *ed.* 2, 746; leaves with teeth equal; calyx 6-7 mm. l.; capsule 2-celled, not beaked but with 4 short erect points at apex, transverse partitions wanting.—*Wright Mem.* 281; *Sw. Obs. Bot.* 219; *Macf. Jam. i.* 106; *Griseb. Fl. Br. W. Ind.* 97; *Urb. Symb. Ant. iv.* 382; *Small Fl. S.E. U.S.* 760; *Britt. & Millsp. Bah. Fl.* 262. *C. linearis* Mill. *Dict. ed.* 8 (1768). *Corchoro affinis chamædryos* &c. *Sloane Cat.* 50 & *Hist. i.* 145, *t.* 94, *f.* 1. *Coreta foliis minoribus* &c. *Browne Hist. Jam.* 147? Specimen from Browne in Herb. Linn. named in Solander's hand.

Broom Weed.

In fl. after rains, *Sloane* Herb. ii. 122! *Browne*! *Broughton*! *Macfadyen*! *Purdie*! *Wilson*! *March*! *Moneague*, *Prior*! *Blue Mts., Rothrock*; *Kingston*; *Bog Walk*; *Porus*; *Port Morant*; *Port Antonio*; *Hitchcock*; *sea-coast*, *Priestman's river district*; *Whitehall*, *St. Thomas*; *Harris*! *Liguanea plain, Campbell*! *Golden Spring, Thompson*! *Fl. Jam.* 5955, 6156, 6178, 8037.—*Florida and Keys, Bahamas, West Indies, continental America* from *Texas* to *Guiana* and *Colombia*.

A somewhat shrubby herb, 1 to 3(-6) ft. high; stem and branches usually with a line of short hairs. Leaves small, variable in size, 2-4 cm. l. (4 mm.-7 cm. l.), ovate, acute or acuminate, or oblong-lanceolate, glabrous or with a few hairs on nerves beneath; petioles hairy on upper surface.

Flowers 2 together or solitary. Petals 5-6 mm. l. Capsule 3.5-5(-8) cm. l., linear, glabrous but minutely puberulous along the line of separation between the valves; transverse divisions wanting, but sometimes indicated by lines. Seeds 3-angular with truncate ends, blue-black, about 1 mm. l.

Browne's description does not agree with the usual flowering specimens, Linnaeus (*Sp. Pl. ed. 2, 746*) appears to think that his description refers to flowers in the spring.

2. *C. orinocensis* H. B. & K. *Nor. Gen. & Sp. v. 337* (1823): leaves with teeth equal; calyx 7-8 mm. l.; capsule 3-valved, glabrous, with erect beak and transverse partitions.—*Urb. Symb. Ant. iv. 382*. *C. pilobolus auct. mult.* (non Link, fide Urban). *C. hirtus* var. *orinocensis* K. Schum. in *Fl. Bras. xii. pt. 3, 127* (1886). (Fig. 38.)

Valley of Rio Cobre, Prior! Kingston, Grabham! Hope Grounds, 700 ft., Harris! Fl. Jam. 6856.—Cuba, Porto Rico, Guadeloupe, Dominica, St. Vincent, Curaçao, Arizona, Mexico, Colombia, Venezuela, Peru, Bolivia.



Fig. 38.—*Corchorus orinocensis* H. B. & K.

A, Portion of stem in flower $\times \frac{1}{2}$.

B, Flower $\times 3$.

C, Capsule cut across before splitting $\times 5$.

D, Capsule opened and most of the seeds fallen out, nat. size.

E, Seed cut lengthwise $\times 11$.

F, Ditto cut across $\times 11$.

Herb, woody below, with 1 or 2 branches, to 3 ft. high, densely puberulous on one side, at length glabrate. *Leaves* 3–10 cm. l., ovate to lanceolate, acuminate, on branches often narrowly elliptical, glabrous, but middle nerve generally with a few hairs; petioles 9–13 mm. l., densely puberulous on the upper surface; stipules 3–4 mm. l., thread-like, puberulous. *Peduncles* 1-flowered, 3–4 mm. l. in flower, 5–6 mm. l. in fruit, puberulous, at length glabrate, generally 2 together. *Petals* 4–5 mm. l. *Ovary* 3-celled. *Capsule* 4–6 cm. l., linear-cylindrical; beak 4–5 mm. l. *Seeds* about 1·2 mm. l., of irregular-cubical shape, somewhat angular, black.

Kunth described the capsule as 2-celled without mention of transverse partitions, but in all the specimens that we have seen, it is as described above. Urban, who has seen the type specimen, has determined the specimens from *Prior* and *Harris* as *C. orinocensis*. The species is closely allied to the widely distributed Old World *C. trilocularis* L.

3. *C. hirsutus* L. *Sp. Pl.* 530 (1753); leaves with teeth equal; sepals 6 mm. l.; capsule 4-celled, woolly with a short erect beak. *Plum. Pl. Amer. (Burm.) t.* 104; *Jacq. Sel. Stirp. Amer.* 165 & *Ed. pict. t.* 157; *Griseb. loc. cit.*; *Urb. loc. cit.*; *Britt. & Millsp. Bah. Fl.* 262. *C. lanuginosus* Macf. *Jam. i.* 108 (1837).

Liguanea, Broughton! on Windward road between Albion and the eleventh milestone; near Mocha House, St. David's; Macfadyen! McNab! Wilson! gravel of Falls river, *Prior! March! Kings House, J. P.* 1351, *Morris! Liguanea plain; Rock Fort; Campbell! Mona woodland, Harris! Fl. Jam.* 5780, 5888, 6253, 6543.—Bahamas, West Indies, tropical Africa. There is an interpolated specimen in Sloane's Jamaican Herbarium vol. iv. before fol. 58, but there is no evidence that it came from Jamaica.

Undershrub 2–5 ft. high, covered with soft star-shaped pubescence. *Leaves* 2–4·5 (6) cm. l., oblong-ovate, lanceolate, or elliptical. *Peduncle* bearing a cluster of 2–6(–8) pedicels. *Sepals* oblong-lanceolate. *Petals* obovate, about as long as the sepals. *Stamens* indefinite, shorter than the petals, with the ovary on a slightly raised receptacle, which is saucer-shaped; anthers versatile. *Ovary* 4-celled. *Capsule* 12 mm. l., oblong-ellipsoidal, "oblong-conical, curved so as to resemble the form of the cornucopia." (Macfadyen.) *Seeds* irregularly ellipsoidal, smooth, 1·5–2 mm. l., black.

[*C. olitorius* L. *Sp. Pl.* 529 (1753); leaves with the two lowest teeth pointing backward, and ending in a long bristle; calyx 7–8 mm. l.; capsule 5-celled, beak long, erect, valves with transverse partitions between the seeds.—*Lam. Encyc. ii.* 103 & *Illustr. t.* 478; *Gaertn. Fruct.* 308, *t.* 64; *Bot. Mag. t.* 2810; *Macf. Jam. i.* 108; *Masters in Oliv. Fl. Trop. Afr. i.* 262 & in *Hook. f. Fl. Br. Ind. i.* 397; *Griseb. Fl. Br. W. Ind.* 97; *K. Schum. in Fl. Bras. vii. pt.* 3, 126; *Watt Dict. Econ. Prod. Ind. & Comm. Prod. Ind.*; *Britt. & Millsp. Bah. Fl.* 262. *Alcea cibaria* &c. *Pluk. Phyt. t.* 127, *f.* 3. Specimen in Herb. Linn. named by Linnaeus.

Jews Mallow.

Naturalized, Black River, *Harris! Fl. Jam.* 9961, 12,499.—Wild and cultivated in India and tropical Africa, naturalized or cultivated in most tropical countries. Specimens in Plukenet's Herbarium in Herb. Sloane xcv. 28; xcix. 37!

Annual herb, 1-9 ft. high; stems woody at the base, usually glabrous. *Leaves* 7-10 (2-12) cm. l., oblong-ovate, apex acute, base usually truncate, glabrous. *Flowers* solitary or 2 together. *Petals* as long as, or longer than, the sepals. *Capsule* 5-7 cm. l., with the projections made by the seeds distinct, prominent. *Seeds* 1.5-2 mm. l., brownish, triangular-rhomboidal, roughish with raised lines.

This species is used as a pot-herb; the leaves afford a substitute for spinach. In India the emollient leaves are used in infusion as a refrigerant in fevers and also in dysentery; the dried plant toasted and powdered is used in visceral obstructions. The commercial fibre, jute, is obtained from this species and from *C. capsularis* L.]

4. *C. æstuans* L. *Syst. ed.* 10, 1079 (1759) & *Amœn. v.* 379; leaves with the two lowest teeth equal to the rest or one or both ending in a bristle; calyx 3-4 mm. l.; capsule 3-celled, 6-angled with 2 or 3 of the angles winged, beak with 3 entire or 2-fid horns, horns becoming horizontal, transverse partitions indicated by raised lines.—*Jacq. Hort. Vindob. t.* 85; *Lam. Encyc. ii.* 104 & *Illustr. t.* 478; *Gaertn. Fruct.* 308, *t.* 64; *DC. Prodr. i.* 504; *Macf. Jam. i.* 107; *Griseb. Fl. Br. W. Ind.* 97; *Fawc. & Rendle in Journ. Bot. lix.* 225. *C. coreta* Elmgren, *Amœn. v.* 398. *C. acutangulus* Lam. *loc. cit.*; *DC. Prodr. i.* 505; *Wight Icon. t.* 739; *Mast. in Oliv. Fl. Trop. Afr. & in Hook. f. Fl. Br. Ind. i.* 398; *Griseb. loc. cit.*; *K. Schum. in Fl. Bras. xii. pt.* 3, 125, *t.* 26, *f.* 2; *Urb. Symb. Ant. iv.* 381; *Small Fl. S.E. U.S.* 1351. *C. campestris* Macf. *Jam. i.* 107. *Lysimachia non papposa* &c. *Pluk. Phyt. t.* 44, *f.* 1. *C. olitorius* L. (*Fl. Zeyl.* 213, specimens in Herb. Hermann). *Triumfetta subvillosa* &c. *Browne Hist. Jam.* 232, *t.* 25, *f.* 1. Type, Browne's specimen, in Herb. Linn.

Browne! Rock Fort, Broughton! *Macfadyen.* Plukenet's specimens in Herb. Sloane xciii. 11; xvi. 168! Tropics of both worlds.

Annual or perennial herb; stem woody at the base, hairy all over or along one line. *Leaves* 3-7 (2-8) cm. l., ovate, sometimes roundish, rarely oblong-lanceolate, acute, base rounded, petioles hairy. *Flowers* 2-3-clustered. *Sepals* broader above. *Petals* 3-4 mm. l., obovate-elliptical, shortly clawed. *Capsule* 1.5-2.5(-3) cm. l., glabrous. *Seeds* disk-like, thick, scarcely angular, dark brown, usually less than 1 mm. l.

3. MUNTINGIA L.

Small tree, with stellate hairs. Leaves alternate, simple, toothed, stipulate. Peduncles 1-flowered, 2 or 3 together, axillary or supra-axillary. Sepals and petals 5 (6, 7). Stamens indefinite, free, inserted round the outside of the cup-like disk. Ovary surrounded by hairs. Cells of the ovary and berry 5 (6, 7); placenta in each cell hanging from the apex, 2-cleft, densely covered with numerous ovules; stigma sessile, sublobed. Fruit a berry. Seeds very small, enclosed in pulp; embryo in the

middle of endosperm, straight; cotyledons small, continuous with the thick radicle.

Species 1, native of Jamaica, Cuba, Is. of Pines, Hispaniola, Trinidad, and tropical continental America.

M. Calabura L. *Sp. Pl.* 509 (1753) & *Amœn.* v. 379; *Jacq. Sel. Stirp. Amer.* 166, t. 107 & *Ed. pict.* t. 158; *Gaertn. Fruct. i.*

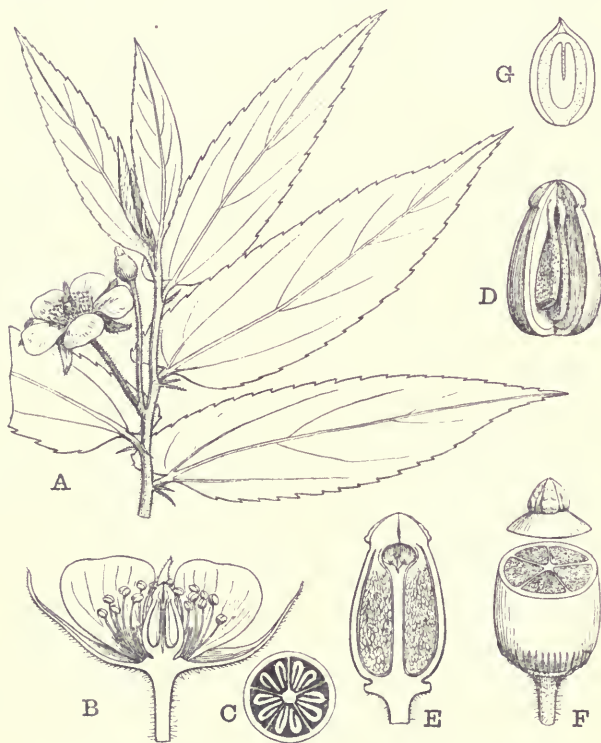


Fig. 39.—*Muntingia Calabura* L.

A, Portion of flowering branch $\times 2$.

B, Flower cut lengthwise $\times 2$.

C, Ovary maturing, cut across, showing the 2-cleft placenta, $\times 4$.

D, Ditto cut lengthwise to expose the placenta, one branch of which is cut

across below to show how it is folded $\times 4$.

E, Fruit cut lengthwise $\times 3$.

F, Fruit cut across $\times 3$.

G, Seed cut lengthwise, enlarged.

(F, G after Karsten.)

285, t. 59; *Swartz Obs. Bot.* 211; *Tussac Fl. Ant.* iv. 59, t. 21; *Descourt. Fl. Ant.* v. 243, t. 308; *Macf. Jam.* i. 111; *Griseb. Fl. Br. W. Ind.* 98; *Karst. Fl. Col.* ii. 55, t. 128; *K. Schum. in Fl.*

Bras. xii. pt. 3, 166, t. 34, f. 1. *M. pedunculis unifloris* L. *Hort. Cliff.* 202 (1737). *M. fruticosa* &c. *Browne Hist. Jam.* 245. *M. rosea* Karst. *loc. cit.* (1862). *Loti arboris folio angustiore* &c. *Sloane Cat.* 162 & *Hist. ii. 80, t. 194, f. 1.* (Fig. 39.) Specimens in *Hort. Cliff.* in *Herb. Mus. Brit.* and in *Herb. Linn.*

In fl. and fr. throughout the year; near Ferry and Guanaboa, *Sloane* *Herb. vi. 80!* *Houston!* *Broughton!* *Shakspear!* *Macfadyen!* *McNab!* *Wilson!* dry bed, Falls river, *Prior!* *March!* J.P. 684, *Jenman!* Green Valley, *Morris!* also *Cradwick!* Liguanea plain, 600 ft., *Campbell!* also 700 ft., *Harris!* Fl. *Jam.* 5717, 6555.—Cuba, Is. of Pines, Hispaniola, St. Vincent, Trinidad, tropical continental America.

Trec 10–40 ft. high, or *shrub*; branchlets densely covered with villose hairs, generally mixed with glandular hairs. *Leaves* 4–11 cm. l., oblong or oblong-lanceolate, acuminate, base oblique, semicordate, puberulous or glabrate on upper surface, tomentose beneath with stellate hairs; petiole 2–6 mm. l.; stipules linear, longer than the petiole. *Pedicels* 1–2.5 cm. l. *Sepals* 8–12 mm. l., lanceolate, with thread-like acumen. *Petals* white, sometimes rosy, about as long as, or slightly longer than, the sepals, obovate. *Stamens* half as long as the petals. *Berry* red, globose, crowned by the prominent stigmas, about 12 mm. in diam.

4. SLOANEA L.

Trees. Leaves alternate or subopposite, entire or toothed, penninerved; petiole swollen just below blade; stipules soon falling. Flowers solitary or in racemes, panicles or clusters axillary or terminal. Calyx-segments 4–5, valvate (or imbricate). Petals none or 1–4, imbricate. Stamens indefinite, covering the broad disk between the petals and the ovary; anthers linear, opening by a chink. Ovary 3–5-celled; ovules several in each cell. Style simple (or divided into 5 branches). Capsule woody, or leathery, densely covered with bristles, or velvety, 5–3(1)-celled, loculicidal. Seeds 1–8 or indefinite, pendulous, with an aril; endosperm present; cotyledons broad, somewhat fleshy.

Species over 60, natives of tropics.

S. jamaicensis Hook. *Ic. Pl. tt.* 693–696 (1844); *Griseb. Fl. Br. W. Ind.* 98; *Benth. in Journ. Linn. Soc. v. Suppl.* 2, 71 (1861). *S. foliis* &c. *Browne Hist. Jam.* 250. *S. emarginata* L. *Amœn. v.* 379 (1760) (non *Sp. Pl.*). *Sloana Plum. Nov. Pl. Amer. Gen.* 48, t. 15. (Fig. 40.)

Break-axe tree, Iron Wood, Lignum durum.

In fl. March, Sept.; young fr. in Feb.; St. Ann; Manchester; Hanover; *Purdie!* Albion Pen, St. Ann, *Prior!* Ramble, Clarendon, *Fawcett & Harris!* Marshall's Pen, Mandeville, 2200 ft.; near Troy, 2200 ft.; Holly Mount, Mt. Diablo, 2500 ft.; Croft's Mountain, Clarendon, 2500 ft.; *Harris!* John Crow (Blake) Mts. 1700 ft. *Harris & Britton!* Fl. *Jam.* 6375, 7028, 8694, 8877, 10,760, 11,211. Type in *Herb. Kew.*

Tree to 100 ft. high and more, often 4 ft. in diam. *Leaves* elliptical, sometimes obovate, apex shortly acuminate, sometimes obtuse, glabrous, entire, or near apex wavy-toothed, 1–2 dm. l.; petiole 1.5–3.5 cm. l.

Flowers yellowish-brown, solitary in axils of leaves near the ends of branches. Peduncle 1.5-3 cm. l., much increased in thickness in fruit. Calyx 4-parted nearly, or quite, to the base; segments broadly ovate, shortly acuminate, somewhat leathery, velvety-puberulous on both sides, 12-17 mm. l. Petals oblong, or oblong-ovate, subacuminate, sometimes toothed, inserted under the hypogynous disk, with texture and hairiness of the calyx. Disk fleshy. Stamens shorter than the petals; filaments



Fig. 40.—*Sloanea jamaicensis* Hook.

- | | |
|---|-----------------------------------|
| A, Apex of twig with leaves and
flowers $\times \frac{1}{2}$. | C, Ovary cut across $\times 4$. |
| B, Flower cut lengthwise $\times 2$. | D, Capsule $\times \frac{1}{2}$. |
| | E, Seed cut lengthwise. |
- (D, E after Hooker.)

very short, silky; anthers linear, terminal, apiculate, 2-celled, cells opening near the apex. Style awl-shaped, overtopping the stamens; stigma acute. Capsule 10-11 cm. l., 8-10 cm. in diam., somewhat spherical with indications of 4 or 5 angles, woody, very hard and thick, 4-5-valved, 4-5-celled, the outside covered with straight bristles. Seeds 2 or more in each cell, covered with a yellowish fleshy aril.

FAMILY LXIV. MALVACEÆ.

Herbs, shrubs, or trees. Leaves alternate, generally palmatinerved; stipules free. Peduncles axillary and 1-flowered, or in racemes, clusters, or panicles, sometimes very short or the flowers sessile. Bracteoles sometimes none or minute at the joint of the peduncle, sometimes 3 or more, close to, or adherent to the calyx, in a whorl or united cup-like, forming the "involucel," like an outer calyx. Flowers regular, hermaphrodite or very rarely dioecious or polygamous. Sepals 5 (3-4), more or less united into a cup; lobes usually valvate. Petals 5, hypogynous, usually adnate to the base of the staminal column, the basal margins often with hairs filling up the spaces between the claws, twisted and overlapping in bud. Stamens indefinite or 5 or 10, hypogynous, more or less united; the column sometimes divided above into 5 bundles ending in stamens, or more or less covered with stamens, the bundles epipetalous. Anthers 1-celled. Ovary with 2 or more cells; carpels in a whorl. Style simple at the base, with as many branches above as ovary-cells. Ovules 1 or more in the cells, attached to the inner angle, anatropous. Fruit dry (in *Malvaviscus* berry-like), the ripe carpels sometimes separating as cocci, not opening or 2-valved, sometimes united into a capsule with an indefinite number of cells opening loculicidally. Seeds with little endosperm. Embryo curved; cotyledons foliaceous folded or twisted and folded.

Species about 700, dispersed over the whole world, arctic regions excepted.

§ 1. Staminal column bearing anthers at the apex. 'Carpels whorled, separating when ripe, but in *Bastardia* forming a capsule.

Ovules 2 or more in each carpel.

Involucel wanting.

Carpels with a transverse ring inside, dividing each more or less into 2 cells

1. *Wissadula*.

Carpels without a ring

2. *Abutilon*.

Involucel of 3 bracteoles. Carpels with a transverse partition.....

3. *Modiola*.

Ovules solitary in each carpel.

Involucel of 3 bracteoles.....

4. *Malvastrum*.

Involucel wanting.

Carpels with a transverse ring inside, beaks pointing upwards

1. *Wissadula*.

Carpels in a star-like whorl, the inner walls of which have more or less disappeared ...

5. *Anoda*.

Carpels with beaks curved towards the centre, or without beaks

6. *Sida*.

Carpels united into a capsule loculicidally 5-valved, valves with the partition in the middle

7. *Bastardia*.

§ 2. Staminal column bearing anthers on the outside, the apex truncate or 5-toothed. Carpels separating when ripe.

Flowers in dense heads with an involucre of leafy bracts, but without involucl, except in *M. radiata* in which the involucl is present..... 8. *Malachra*.

Flowers without an involucre, but with involucl.

Leaves with 1-3 glands beneath.

Involucl of 5 united bracteoles. Ripe carpels covered with numerous barbed spines 9. *Urena*.

Leaves without glands.

Involucl of 5-8 herbaceous bracteoles, distinct or united at base. Carpels without spines or with 1-3 barbed spines at apex 10. *Pavonia*.

Involucl of indefinite bracteoles, herbaceous or bristle-like. Carpels fleshy on the outside, united into a berry, separating after a time 11. *Malva viscus*.

§ 3. Staminal column bearing anthers on the outside, the apex truncate or 5-toothed. Capsule splitting open loculicidally, the carpels not separating.

Style-branches at length spreading or the stigmas spreading. Seeds kidney-shaped.

Ovules 2 or more in each cell of the ovary. Bracteoles indefinite 12. *Hibiscus*.

Ovules solitary in each cell of the ovary. Bracteoles 5-10 13. *Kosteletzkya*.

Style thicker at the apex, undivided, or divided into 5 short erect branches. Seeds obovoid or angled.

Bracteoles 3-8, small..... 14. *Thespesia*.

Bracteoles 3, large, cordate 15. *Gossypium*.

§ 1. Staminal column divided at the apex into an indefinite number of filaments bearing anthers at their apex. Style-branches as many as the cells of the ovary or the carpels. Carpels whorled in a simple series, separating when ripe from the axis, but in *Bastardia* forming a 5-valved capsule. Cotyledons foliaceous, folded in two, or variously contorted in the folding.

1. WISSADULA Medic.

Shrubs, generally covered with white tomentum. Leaves cordate. Peduncles axillary, with one or more flowers, the upper flowers in a terminal panicle or interrupted spike. Flowers yellow, small. Involucl wanting. Calyx 5-lobed. Ovary with 5 cells; ovules in each cell, one pendulous in the lower portion, and two in the upper part ascending, or wanting in the upper part in *W. Fadyenii*; style-branches with capitate stigmas. Fruit more or less top-shaped in form; carpels beaked, with the beaks pointing outwards, partially divided in the inside by an incomplete transverse partition, except in *W. contracta*, sometimes represented by a ring, opening by two valves.

Species 37, natives of tropical America, one ranging also through Africa and tropical Asia.

Ovary-cells with 3 ovules. Ripe carpels usually with 3 seeds.

Carpels constricted and divided into 2 cells.

Leaves ovate-triangular, base with bay open and shallow 1. *W. periplocifolia*.

Leaves ovate-elliptical, base with bay narrow and deep..... 2. *W. hernandioides*.

Carpels scarcely constricted, not divided into 2 cells.

Leaves roundish-ovate, base with bay open and acute 3. *W. contracta*.

Ovary-cells with 1 ovule. Ripe carpels with 1 seed... 4. *W. Fadyenii*.

A. Cells of the ovary with 3 ovules. Carpels with 3 seeds.

1. *W. periplocifolia* Presl Rel. Haenk. ii. 117 (1836); *K. Schum. in Fl. Bras. xii. pt. 3, 441, t. 77*; *R. E. Fries in Svensk. Vet. Akad. Handl. xliii. no. 4, 32* (var. *antillarum*); *Urb.*

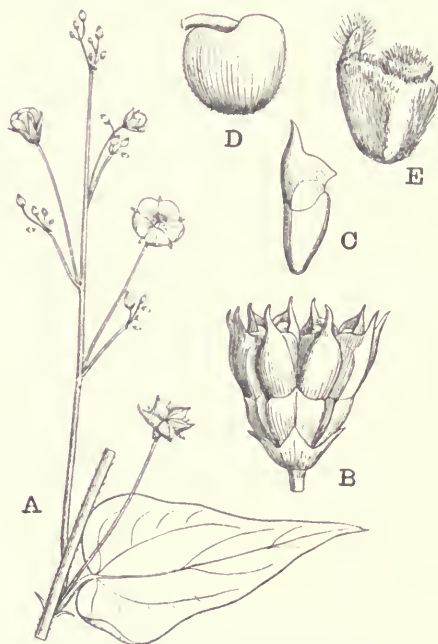


Fig. 41.—*Wissadula periplocifolia* Presl.

- A, Portion of flowering branch with leaf $\times \frac{1}{2}$. C, A single ripe carpel seen from the side $\times 3$.
 B, Fruit separating into its component carpels $\times 3$. D, Seed from upper part of ripe carpel $\times 7$.
 E, Seed from lower part $\times 7$.
 (A after K. Schumann.)

Symb. Ant. iv. 386. *W. zeylanica* Medic. *Malv.* 25 (1787); *E. G. Bak. in Journ. Bot.* xxxi. 70. *Althæa Scammonii* &c. *Pluk. Phyt. t.* 74, *f.* 7. *Sida periplocifolia* L. *Sp. Pl.* 684 (1753) (non *Herb.*). *S. erecta glabra* &c. *Browne Hist. Jam.* 280. (Fig. 41.) Type in *Herb. Hermann* in *Herb. Mus. Brit.* Specimen from Plukenet in *Herb. Sloane* xcv. 39.

Houstoun! *Masson!* *Swartz!* near Halfway Tree, *McNab!*—Cuba, Porto Rico, St. Cruz, Cannouan, Trinidad, tropical S. America, south-east Asia.

Undershrub 3–5 ft. high; younger parts of branches, and inflorescence with brownish-grey tomentum and stellate hairs. *Leaves* 3–6(–14) cm. l., ovate-triangular to lanceolate-triangular, narrowing gradually towards the apex, the tip in Old World plants very long, tail-like, base more or less cordate to truncate, bay very open and shallow,—not deeper than .5 cm., margin entire, 5(7)-nerved, upper surface darker than beneath, covered with minute stellate hairs or subglabrous, beneath white or grey, more or less densely and shortly tomentose, often mixed with brown hairs; petioles 1–3 cm. l.; stipules linear, acuminate, about 3 mm. l., soon falling. *Flowers* axillary, solitary or forming a terminal panicle, long-peduncled, lower peduncles to 10 cm. l. *Calyx* 2–3 mm. l., cut about half-way into triangular lobes. *Petals* about 5 mm. l., white. *Capsule* 8–10 mm. in diam.; carpels 5, very shortly puberulous, beak with a short point about 1 mm. l. *Seeds* 3, 1.5–2 mm. in diam., upper triangular-globose, subglabrous or minutely puberulous, lower obconical-globose, truncate above, hirsute.

2. *W. hernandioides* Garcke in *Zeitschr. f. Naturw. Halle* lxiii. 122 (1890) (in part); *K. Schum. tom. cit.* 439; *Urb. Symb. Ant.* iv. 387 & viii. 411. *W. periplocifolia* var. *hernandioides* Griseb. *Cat. Cub.* 25 (1866). *W. amplissima* R. E. Fries *tom. cit.* 48, *tt.* 4, *f.* 1, 2; 6, *f.* 12–14 (1908) (excl. syn. *L. & Plum.*). *Alcea populi folio incano* &c. *Sloane Cat.* 98 & *Hist. i.* 222 (in part). *Sida hernandioides* L'Hér. *Stirp. ii.* 121, *t.* 58 (1789). *S. periplocifolia* L. *Herb.* (in part); *Sw. Obs. Bot.* 260 (1791). *Abutilon periplocifolium* Sweet *Hort. Brit.* 53 (in part); *Griseb. Fl. Br. W. Ind.* 77 (excl. var. β). The Linnean Herbarium has a sheet with two specimens from Browne labelled by Linnæus *Sida periplocifolia*, the one on the left is *W. hernandioides* Garcke, the other on the right is *W. Fadynii* Planch.

Sloane *Herb.* iv. 64, no. 1! *Browne!* *Broughton!* *Swartz!* *Macfadyen!* *McNab!* *Parnell!* *Linstead,* *Prior!* *March!* near Gordon Town, *Ball!* Green Valley, 1800 ft.; Longville Park to Old Harbour; *Harris!* *Fl. Jam.* 5452, 11,949.—Cuba, Hispaniola, Porto Rico, Vieques, St. Cruz, St. John, Guadeloupe, trop. cont. America, trop. Africa.

Undershrub or *shrub* 1–10 ft. high, branches above minutely stellate-tomentose, at length glabrate. *Leaves* variable in size, 4–15 cm. l., ovate (to roundish-ovate), abruptly- or long-acuminate, base cordate, bay deep (to 1.5 cm.) and usually narrow, margin entire, sometimes obscurely toothed, 7(9)-nerved, nerves and veins beneath prominent, on the upper surface glabrous or more or less densely tomentose, beneath lighter in colour, tomentose with larger stellate hairs; petioles 1–6(–10) cm. l.; stipules linear-acuminate, 5–10 mm. l.; for some time persistent. *Flowers* axillary or in a terminal panicle; flowering peduncles 1(2) cm. l., in

fruit 2-3.5 cm. l. *Calyx* 3-4 mm. l., divided about halfway into ovate-triangular lobes. *Petals* 4(-6) mm. l., yellow. *Capsule* 8-10 mm. in diam., subglobose, puberulous; carpels 4 or 5, 7-8 mm. l., beak acuminate, point .5-1.5 mm. l. *Seeds* about 2 mm. in diam., upper globose-heart-shaped, dotted and with minute white hairs, lower subovoid, truncate above, with longer white hairs.

3. *W. contracta* R. E. Fries in *Svensk. Vet. Akad. Handl. xliii. no. 4, 60, t. 3, f. 1, t. 6, f. 24* (1908); *Urb. Symb. Ant. viii. 412*. *W. hernandioides et rostrata auct.* (in part). *Sida contracta* Link *Enum. Hort. Berol. ii. 204* (1822). *S. Luciana* DC. *Prodr. i. 468* (1824). *Abutilon lucianum* Sweet *Hort. Brit. i. 53* (1826); *Urb. Symb. Ant. v. 415*. *A. periplocifolium* Don *β albicans* Griseb. *Fl. Br. W. Ind. 77* (1859).

St. Andrew's Mts., Purdie!—St. Lucia, Grenada, Tobago, Trinidad, Guatemala, Venezuela, Guiana, Brazil.

Shrub, younger parts tomentellous. *Leaves* 7 (2-12) cm. l.; roundish or ovate, acuminate, base cordate, bay open and acute, to 1 cm. deep, margin entire, on both sides with very minute stellate hairs, on upper surface at length glabrescent, beneath white-tomentellous and soft to the touch, 7(9)-nerved, nerves and veins prominent beneath; petiole 5 (1-9) cm. l.; stipules linear-lanceolate or linear, 3-7 mm. l. *Flowers* in a cylindrical contracted panicle; peduncles flowering .5 cm. l. or less, fruiting 1-1.5 cm. l. *Calyx* 3-3.5 mm. l., divided about halfway into ovate-triangular lobes. *Petals* 3.5-4 mm. l., (when dry) pale yellow or white. *Capsule* 6-9 mm. in diam., subglobose or above more or less truncate, minutely puberulous, not obviously constricted; cells not divided; carpels 3-6, 6-7 mm. l., point .5-1 mm. l. *Seeds* 2-2.5 mm. l., 2 mm. br., all similar, globose-pear-shaped, glabrous or more or less covered with stellate hairs, hairy at the hilum.

B. Cells of the ovary with 1 ovule. Carpels with 1 seed.

4. *W. Fadyenii* Planch. ex R. E. Fries in *Svensk. Vet. Akad. Handl. xliii. no. 4, 30, t. 1, f. 1-2, t. 6, f. 2-4* (1908); *W. divergens* E. G. Bak. *tom. cit. 69* (1893) (in part). *Alcea populifolia*, incano &c. *Sloane Cat. 98 & Hist. i. 222* (in part). *Sida periplocifolia* Macf. *Jam. i. 85* (1837) (non L.) (excl. syn. *Browne, Sw., Rich.*). *S. divergens* Griseb. *Fl. Br. W. Ind. 77* (1859) (non Benth.). Specimen from Browne in *Herb. Linn.* on sheet (right hand) named by Linnaeus *Sida periplocifolia*. Type specimen from Macfadyen in *Herb. Kew* named by Planchon

Sloane *Herb. iv. 64, no. 2 and lxxxii. 39!* *Browne!* *Macfadyen!* *Distin!* *McNab!* *Kingston, Prior!* *Kingston, Hitchcock!* *Hope* grounds, 700 ft.; near *Grove*, 800 ft.; *Pedro Bluff!* *Harris!* *Fl. Jam. 6651, 6830, 9722.*—Trinidad, Colombia.

Undershrub 1 to 4 ft. high, younger parts with yellow-brownish stellate hairs. *Leaves* 5-8 (10) cm. l., ovate-triangular, narrowing gradually into a long tip, base truncate or cordate, margin entire, upper surface covered with very minute white stellate hairs, sometimes subglabrous, beneath densely tomentose and soft to the touch, with larger stellate hairs interspersed, 5-7-nerved, nerves and veins prominent beneath; petioles from very short to 4 cm. l.; stipules 4-5 mm. l., thread-like. *Flowers* in

the axils of the upper leaves and on a large terminal panicle; peduncles 1·5–3 cm. l., in axillary flowers to 5 cm. l. *Calyx* 3–3·5 mm. l., divided about halfway into triangular lobes, purplish. *Petals* tawny-yellow or orange, 4–5 mm. l. *Capsule* about 6 mm. in diam.; carpels minutely puberulous, 4 mm. l., point about ·5 mm. l. *Seed* one only, about 2 mm. l., hirtellous, densely so towards the hilum.

2. ABUTILON Gaertn.

Herbs or shrubs, some few trees, usually with tomentum soft to the touch. Leaves generally cordate. Flowers mostly axillary. Bracteoles of involucrel none. *Calyx* 5-lobed. Ovary with 5 or more cells; style-branches with stigmas at the apex; ovules 3–9 in each cell. The ripe carpels united at the base or completely separating, 2-valved. Seeds, upper usually ascending, the lower pendulous or horizontal, somewhat kidney-shaped.

Species about 150, natives of tropical and subtropical regions, some being widely dispersed.

Carpels with 3 ovules or seeds in each.

Petals erect or spreading, not reflexed.

Flowers corymbose or subumbellate at ends of branches. Petals 8 mm. l. 1. *A. umbellatum*.

Flowers solitary, sometimes also corymbose or racemose at ends of branches.

Plant viscous-glandular. Petals nearly 2 cm. l. 2. *A. hirtum*.

Plant not glandular.

Fruit light yellow, with long white simple hairs, globose-inflated 3. *A. crispum*.

Fruit not as in *A. crispum*.

Leaves beneath tomentose with very minute stellate hairs.

Fruit tomentose with large stellate hairs, 12 mm. l. 4. *A. indicum*.

Fruit villose, 14–15 mm. l. 5. *A. leiostpermum*.

Leaves beneath tomentose with somewhat long stellate hairs. Fruit villose, 9 mm. l. 6. *A. permolle*.

Leaves beneath tomentose with large and small stellate hairs. Fruit tomentose with minute hairs, 15 mm. l. 7. *A. americanum*.

Petals reflexed. Flowers in a panicle 8. *A. giganteum*.

Carpels with 6–8 ovules or seeds in each 9. *A. pauciflorum*.

1. *A. umbellatum* Sweet Hort. Brit. i. 53 (1826); leaves on both sides with minute stellate hairs, denser beneath; flowers corymbose or subumbellate, corymbs becoming crowded at the ends of stem and branches; calyx 5–6 mm. l.; carpels 5–7, each with 3 ovules or seeds, ripe 6–7 mm. l., hirsute-tomentose, awned conspicuously, awns about 2 mm. l.; seeds* brown, with very minute tessellate markings and scattered yellow tubercles.—Griseb. Fl. Br. W. Ind. 78; K. Schum. in Fl. Bras. xii. pt. 3, 373;

* The seeds of species of *Abutilon* are described as seen under a compound microscope with a two-third in. objective.

Urb. Symb. Ant. iv. 384 & *viii.* 409. *Sida umbellata* L. *Syst. ed.* 10, 1145 (1759) & *Amæn. v.* 401, 380; *Jacq. Hort. Vindob. t.* 56: *Car. Diss. i.* 28, t. 6, f. 3 & *v.* 275, t. 129, f. 2. Specimen from Browne in Herb. Linn. named in Solander's hand.

Browne! Broughton! St. George, McNab! Kingston, Prior! Windward Road; Campbell! Fl. Jam. 5976.—West Indies, Mexico, Colombia, Venezuela, Peru.

Herb, annual or perennial, $1\frac{1}{2}$ – $2\frac{1}{2}$ ft. high, woody at the base, young branches, also petioles, villose-tomentose. *Leaves* 3–7 (2–11) cm. l., roundish to ovate, occasionally somewhat 3-lobed, more or less shortly and abruptly acuminate, base cordate or subtruncate, 7(9)-nerved, crenate-serrate; petioles nearly as long as blade below, less than half above; stipules 5–7(–10) mm. l., linear, acute. *Bracts* 2–3 mm. l. *Calyx* tomentose, divided halfway or more into ovate-triangular lobes, acute or very shortly acuminate. *Petals* 8 mm. l., yellow, white-hairy at base. *Seeds* about 2 mm. l.

2. *A. hirtum* *Sweet Hort. Brit. i.* 53 (1826); plant glutinous-hairy; leaves on both sides soft to the touch, stellate-tomentose with some long simple hairs besides, on upper surface glabrescent; flowers solitary, axillary, more or less corymbose at ends of branches; calyx 1.3–1.6 cm. l.; carpels about 20, each with 3 ovules or seeds, ripe 1–1.2 cm. l., blunt or very shortly apiculate, tomentose with moderately long stellate hairs or glabrescent; seeds dark brown, covered with minute pit-markings, with numerous minute stellate hairs, densely covered near hilum with larger stellate hairs.—*Mast. in Oliv. Fl. Trop. Afr. i.* 187; *K. Schum. tom. cit.* 384; *Urb. Symb. Ant. iv.* 385 & *viii.* 409; *Small Fl. S.E. U.S.* 763; *Britt. & Millsp. Bah. Fl.* 265. *A. indicum* v. *hirtum* *Griseb. Fl. Br. W. Ind.* 78 (1859). *A. graveolens* v. *hirtum* *Mast. in Hook. f. Fl. Brit. Ind. i.* 327 (1874); *E. G. Bak. tom. cit.* 213. *Sida hirta* *Lam. Encyc. i.* 7 (1783).

Distin! McNab! Morant Bay, Wilson! Moneague, Prior! Liguanea plain, 100 ft., Campbell! near Mico College, Kingston, Harris! Fl. Jam. 6099, 8869.—Florida and Keys, Bahamas, West Indies, trop. Africa, south-eastern Asia.

Shrub or perennial *herb*, 3–10 ft. high, flowering in its first year, flowering branches with three kinds of hairs—very short stellate, glutinose, and long white hairs. *Leaves* 3–10 cm. l., roundish to roundish-ovate, sometimes indistinctly 3-lobed, apex mucronulate, obtuse, acute, or shortly acuminate, base cordate, 7–9-nerved, irregularly serrate or crenate; petioles 3–10 cm. l.; stipules 7–9 mm. l., linear-lanceolate, for some time persistent. *Peduncles* 2–5 cm. l., glutinous-hairy like the branches, jointed above the middle. *Calyx* divided about halfway into triangular apiculate lobes. *Petals* to nearly 2 cm. l., very broadly subrhomboid-obovate, very oblique, apex subretuse, the basal margin hairy, tawny-yellow or orange with a reddish spot at the base. *Staminal tube* stellate-hairy. *Seeds* 2.5–3 mm. in diam., dark brown.

3. *A. crispum* *Medic. Malv.* 29 (1787); leaves on both sides soft to the touch, more or less tomentose with very minute stellate hairs, denser beneath; flowers axillary, solitary, rarely

with an additional peduncle from the same axil; calyx 4–8 mm. l.; fruit yellowish, inflated, globose, of about 12 carpels, each with 3(–1) seeds, ripe 10–15 mm. l., with minute scattered down and usually long, subspiny hairs; seeds brown-black, with shallow pit markings, and a few minute hairs adpressed.—*Sweet Hort. Brit. i.* 53; *Wight Icon. t.* 68; *Griseb. Fl. Br. W. Ind.* 79; *Mast. in Hook. f. Fl. Brit. Ind. i.* 327; *A. Gr. Gen. Fl. Amer. t.* 126; *K. Schum. tom. cit.* 382, *t.* 70; *E. G. Bak. tom. cit.* 213; *Urb. Symb. Ant. iv.* 385. *A. vesicarium crispum* &c. *Dill. Hort. Elth.* 6, *t.* 5. *A. aliud vesicarium* &c. *Plum. Pl. Amer. (Burn.) 15, t.* 25*. *Sida crispa* *L. Sp. Pl.* 685 (1753) & *Amæn. v.* 380.

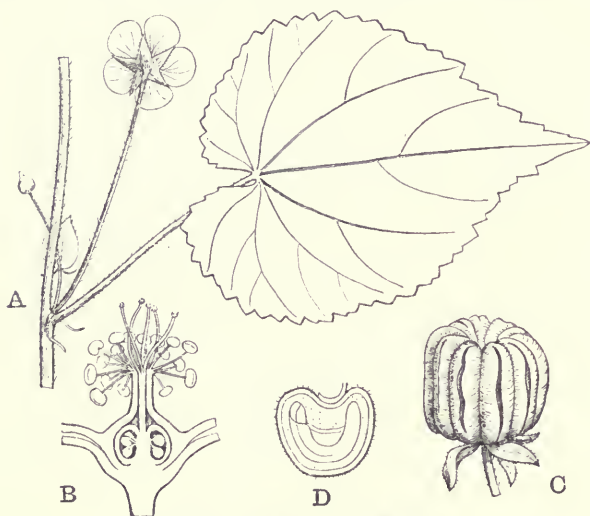


Fig. 42.—*Abutilon crispum* Medic.

A, Leaf and flower $\times \frac{1}{2}$.

B, Flower cut lengthwise, calyx and petals removed, enlarged.

C, Capsule, nat. size.

D, Seed cut through $\times 6$.
(After A. Gray.)

S. erecta subvillosa &c. *Browne Hist. Jam.* 281; *Car. Diss. i.* 30, *t.* 7, *f.* 1 & *v.* 275, *t.* 135, *f.* 2. *Gayoides crispum* *Small Fl. S.E. U.S.* 764 (1903); *Britt. & Millsp. Bah. Fl.* 266; *Urb. Symb. Ant. viii.* 409. (Fig. 42.) Specimen from Browne in *Herb. Linn.* named by Linnæus.

Browne! Kingston, *Prior!* Windward road; May Pen Cemetery; *Campbell!* near Lititz, 500 ft.; Healthshire Hills, 50 ft.; *Harris!* *Fl. Jam.* 5991, 6365, 7312, 9529.—West Indies, Florida, Bahamas, trop. and subtrop. cont. America, south-east Asia, Bourbon.

Herb., trailing along the ground for 3 or 4 ft., or erect, woody at the base, more or less stellate-tomentose and soft to the touch or pubescent. *Leaves* 2–8 cm. l., ovate, acute to shortly acuminate, base cordate, crenate

or serrato, 7-9-nerved, petioles of lower leaves 4-5 cm. l., usually decreasing upwards and sometimes wanting; stipules 3-7 mm. l., awl-shaped, somewhat persistent. *Peduncles* slender, jointed, 1.5-5 cm. l. *Calyx* divided below the middle into lanceolate-triangular acuminate lobes. *Petals* yellow, sometimes a little longer than, sometimes twice as long as, the calyx, apex obtuse, somewhat oblique. *Seeds* about 2 mm. l.

4. *A. indicum* Sweet *Hort. Brit. i.* 54 (1826); leaves on the upper surface with very minute stellate hairs, at first soft to the touch, at length glabrescent, beneath tomentose-white and soft to the touch with very minute stellate hairs; flowers axillary, solitary, often corymbose at ends of branches; calyx about 1 cm. l.; carpels 12-30, each with 3 ovules or seeds, ripe about 1.2 cm. l., tomentose with large stellate hairs, shortly apiculate; seeds, surface marked with minute pits, glabrous but more or less hairy at the hilum.—*Wight Icon. t.* 12; *Griseb. Fl. Br. W. Ind.* 78 (excl. vars. β & γ); *Mast. in Oliv. Fl. Trop. Afr. i.* 186 & *Hook. f. Fl. Brit. Ind. i.* 326; *K. Schum. tom. cit.* 385; *E. G. Bak. tom. cit.* 213; *Urb. Symb. Ant. iv.* 385 & *viii.* 410. *Sida indica* L. *Cent. Pl. ii.* 26 (1756); *Cav. Diss. i.* 33, *t.* 7, *f.* 10. Specimen in Herb. Linn. named by Linnaeus.

Ferry, 100 ft., *Campbell!* *Fl. Jam.* 6160.—West Indies, trop. cont. America, trop. Africa and Asia. The single specimen cited from Jamaica is doubtful. It has glabrous seeds of *A. indicum*, but approaches *A. hirtum* in indumentum of stems and leaves and in staminal tube covered with small stellate hairs.

Herb or undershrub 3-5 ft. high, *shrub* to 10 ft. high, flowering in its first year, young parts covered with white-grey tomentum, usually with long hairs as well. *Leaves* 3.5-9 (2-13) cm. l., roundish-ovate to ovate, apex obtuse, acute, or acuminate, more or less obviously 3-lobed, base cordate, irregularly crenate or serrate, 5-7-nerved; petioles long, as long as, or longer than, the blade, or shorter to one-half; stipules 3-5 mm. l., linear to linear-lanceolate, persisting for some time. *Peduncle* longer than the petiole, jointed near the flower, 3.5(-7) cm. l. *Calyx* divided somewhat more than halfway into 5 ovate-triangular apiculate lobes. *Petals* to nearly 1.5 cm. l., longer than the calyx, yellow, oblique, roundish-triangular, basal margin hairy. *Staminal tube* glabrous. *Ovary* subglobose, depressed above, tomentose. *Seeds* 2-2.5 mm. in diam.

5. *A. leiospermum* Griseb. *Fl. Br. W. Ind.* 79 (1859); leaves on both sides soft to the touch and very minutely tomentose; flowers axillary, solitary; calyx 8-10 cm. l. in fl., to 12 cm. in fr.; carpels 12-20, each with 3 ovules or seeds, ripe 1.4-1.5 cm. l., villous, cuspidate; seeds, surface covered with yellowish tubercles, glabrous.—*Sida vesicaria* Cav. *Diss. ii.* 55, *t.* 14, *f.* 3 (1786)? The type from March named by Grisebach in Herb. Kew.

Distin! March!—Cuba, St. Vincent.

Undershrub, young parts very minutely tomentose, and also with long hairs. *Leaves* 4-10 cm. l., roundish ovate, apex acuminate, base cordate with a broad bay, 7-nerved, unequally broadly toothed, subtrilobed, pale green on upper surface, glaucous-white beneath; petioles 4-7 cm. l., even

to 14 cm. *Peduncles* 4–7 cm. l. *Calyx* deeply divided into ovate apiculate lobes. *Petals* 1·3–1·5 cm. l., varying much in width, yellow, obovate. *Seeds* about 3 mm. l., dark brown.

6. *A. permolle* *Sweet Hort. Brit. i.* 53 (1826); leaves on both sides soft to the touch, on the upper surface with short stellate hairs, beneath tomentose with longer hairs, and of a lighter colour; flowers axillary, solitary, becoming racemose or corymbose at ends of branches; calyx 8–10 mm. l., slightly longer in fruit; carpels 7–10, each with 3 ovules or seeds, ripe 9–10 mm. l., villose, with acuminate beaks; seeds usually with minute tubercles.—*Griseb. Fl. Br. W. Ind.* 78; *Small Fl. S.E. U.S.* 763; *Britt. & Millsp. Bah. Fl.* 265. *Sida permollis* Willd. *Enum. Hort. Berol.* 723 (1809).

Quarry, Spanish Town, *Harris!* *Fl. Jam.* 6757.—Florida, Bahamas, Cuba, Cayman Is.

Undershrub 2–5 ft. high, pubescent on young parts. *Leaves* 2–9 cm. l. or more, ovate to roundish, apex acuminate to obtuse, base cordate, 7-nerved, crenulate; petioles usually half as long as the blades or somewhat longer. *Peduncles* jointed near the flower, somewhat shorter than the petiole below, longer above. *Calyx* divided nearly to the base into ovate-lanceolate segments, tube not angled. *Petals* 1·2–1·7 cm. l., yellow, obovate. *Seeds* 2 mm. in diam.

7. *A. americanum* *Sweet Hort. Brit. i.* 53 (1826); leaves on upper surface more or less densely covered with stellate hairs, beneath tomentose with large and small stellate hairs, on both sides soft to the touch; flowers solitary, axillary, becoming crowded and corymbose at ends of branches; calyx 12–14 mm. l., to 15 mm. l. in fruit; carpels 7–12, each with 3 ovules or seeds, ripe about 1·5 cm. l., tomentose, with a long acuminate beak; seeds more or less covered with a network of minute whitish hairs.—*A. abutiloides* *K. Schum. in Fl. Bras. xii. pt. 3,* 397 (*in obs.*) (1891); *Britt. & Millsp. Bah. Fl.* 265. *A. lignosum* *G. Don Gen. Syst. i.* 501 (1831); *A. Rich. in Sagra Cub. x.* 57 (1845); *Griseb. Fl. Br. W. Ind.* 79; *Urb. Symb. Ant. vi.* 92. *A. Jacquinii* *G. Don tom. cit.* 503 (1831). *Lavatera americana* *L. Syst. ed.* 10, 1148 (1759) & *Amæn. v.* 400, 380. *Sida americana* *L. Sp. Pl. ed.* 2, 963 (1763); *DC. Prodr. i.* 470; *Macf. Jam. i.* 86. *S. abutiloides* *Jacq. Obs. i.* 17, t. 7 (1764); *Macf. Jam. i.* 86; *Urb. Symb. Ant. viii.* 410. *S. lignosa* *Cav. Diss. i.* 28, t. 6, f. 2 (1785). *S. crassifolia* *L'Hérit. Stirp.* 125, t. 60 (1788). Specimen from Browne in *Herb. Linn.* named by Linnæus *Lavatera americana*, another specimen from Browne named by Linnæus *Sida americana*. Specimen from Jacquin in *Herb. Mus. Brit.*

Browne! Broughton! near Kingston, *Prior!* Rockfort, near Kingston, *Graham!* also *Harris & Britton!* *Fl. Jam.* 10,793.—Bahamas, Cuba, Hispaniola, Mexico.

Shrub to 5 ft. high, young parts, petioles, under side of leaves, and pedicels tomentose with stellate hairs mostly minute but mixed with

fewer long stellate hairs. *Leaves* 2-13 cm. l., broadly ovate, usually acuminate, in small leaves (2 cm. l.) very shortly acuminate, base cordate, rarely sub-3-lobed, 7-9-nerved, nerves and veins prominent beneath, crenate or irregularly toothed; petioles one-third to two-thirds as long as the blade; stipules to 1 cm. l., awl-shaped, falling after some time. *Peduncles* generally longer than the petioles. *Calyx* cut nearly to the base into broadly ovate, subcordate, acuminate, sharply pointed lobes. *Petals* 10-12 mm. l., yellow, obovate. *Seeds* 2-2.5 mm. in diam.

A decoction of the leaves is used in cases of diarrhœa.

8. *A. giganteum* *Sweet Hort. Brit. i.* 53 (1826); leaves on both sides soft to the touch, upper surface with stellate hairs intermixed with simple, beneath tomentose, with simple hairs on nerves and veins; flowers solitary, axillary, each with a flowering shoot arising during flowering, forming axillary and terminal panicles, sometimes the solitary flowers are wanting; calyx about 1 cm. l.; petals at length reflexed; carpels 8-14, each with 3 ovules or seeds, ripe 1 cm. l., tomentose, shortly beaked; seeds black or brown, with pit markings and short white hairs tuberculate at base.—*K. Schum. tom. cit.* 394. *A. elatum* *Grisch. Fl. Br. W. Ind.* 79 (1859). *Sida gigantea* *Jacq. Hort. Schœnbr. ii.* 8, t. 141. *S. elata* *Macf. Jam. i.* 87. Jacquin's specimen figured in *Hort. Schœnbr. t.* 141 is in *Herb. Mus. Brit.*

Below Pimento Grove, St. David, *Macfadyen*; sea-coast, Westmoreland, *Purdie*! *Wilson*! J.P. 1054, *Morris*!—Cuba, Trinidad, Central America, Colombia, Peru.

Herb or *shrub* 6 to 15 ft., above (and petioles) tomentose, often also with long hairs, soft to the touch. *Leaves* 6-11 (2-20) cm. l., roundish-ovate, occasionally sub-3-lobed, acuminate, base cordate, 9-nerved, nerves and veins prominent and produced into teeth; petioles often longer than the blade; stipules 3-4 mm. l. *Calyx* divided below the middle into lanceolate-triangular lobes, 1-nerved within. *Petals* orange-yellow, somewhat longer than the calyx, obovate-oblong, obtuse, villose at the insertion of the tube, forming a circle of hair round the staminal tube. *Seeds* about 2 mm. in diam.

9. *A. pauciflorum* *St. Hil. Fl. Bras. Mer. i.* 206 (1825); leaves on both sides soft to the touch, upper surface more or less covered with stellate hairs, beneath woolly-tomentose and of a lighter colour; flowers solitary, axillary; calyx 1.2-1.5 cm. l. or longer in fruit; carpels 10-12, each with 6-8 ovules or seeds, ripe 1.3-1.6 cm. l., villose; seeds with minute pit markings, hispid with hairs springing from tubercled base.—*K. Schum. tom. cit.* 404; *Britt. & Millsp. Bah. Fl.* 266. *A. pedunculare* *Grisch. Fl. Br. W. Ind.* 78 (non *H.B.K.*); *Small Fl. S.E. U.S.* 763. *Sida peduncularis* *Macf. Jam. i.* 85 (non *DC.*).

Baneroft! *Macfadyen*! Kingston; Halfway Tree; *McNab*! Hope estate. *Prior*! *March*! Bath, *Wilson*! J.P. 1340, *Morris*! *Fawcett*! Long Mt. road, 250 ft., *Campbell*! Hope grounds, 600-700 ft.; Santa Cruz, 450 ft.; *Harris*!—Florida, Bahamas, Cuba, Mexico to Paraguay.

Undershrub 3-5 ft. high, younger parts with long spreading white hairs 2-3 mm. l. and tomentose with stellate hairs. *Leaves* 5-15 cm. l., ovate,

acuminate, base cordate, unequally toothed or crenate, 9-nerved; petioles long, 3-12 cm. l.; stipules 5-10 mm. l., thread-like or narrowly awl-shaped. *Peduncles* long, stout. *Calyx* cup-shaped, angular, divided more than halfway into triangular acuminate lobes. *Petals* rose-coloured, longer than the calyx, obovate, apex emarginate, basal margin densely hairy. *Ovary* 10-12-celled, each with 6-8 ovules. Ripe *carpels* 1.3-1.6 cm. l., shortly beaked, villous outside, glabrous on the inside, 6-8 seeded. *Seeds* about 2 mm. in diam.

A. striatum Dicks. ex Lindl. *Bot. Reg. xxv. Misc. Not.* 39, a native of Uruguay, is an escape from gardens in Jamaica. *Shrub* to 10 ft. high. *Leaves* 5-12 cm. l., with 3-5 acuminate lobes. *Flowers* bell-shaped, orange strongly veined with crimson, on long slender stalks. *Ovary* 11-celled, with 7-9 ovules in each. *Griseb. Fl. Br. W. Ind.* 79; *K. Schum. tom. cit.* 426; *Bot. Mag. t.* 3840 (*Sida picta*); *Britton Fl. Berm.* 233.

3. MODIOLA Moench.

Prostrate rooting herbs. Leaves palmately lobed, and lobes again cut; stipules ovate to awl-shaped, soon falling. Flowers small, axillary, pedunculate. Bracteoles 3, free, forming an involucre below the calyx. Calyx 5-lobed. Ovary with an indefinite number (20-14) of cells; ovules 2 (or 3) in each cell; style-branches as many in number, with capitate stigmas. Carpels 2-valved, valves cuspidate on back, transversely partitioned inside between the seeds. Seeds kidney-shaped, 2 in each carpel.

Species 2 or 3, natives of America and South Africa.

M. caroliniana G. Don *Gen. Syst. i.* 466 (1831); *A. Gr. Gen. ii.* 72, *t.* 128; *Griseb. Fl. Br. W. Ind.* 72; *K. Schum. in Fl. Bras. xii. pt.* 3, 453; *Small Fl. S.E. U.S.* 765; *Britt. Fl. Berm.* 234; *Urb. Symb. Ant. viii.* 412. *M. multifida* Moench. *Meth.* 620 (1794); *E. G. Bak. in Journ. Bot. xxvi.* 368. *Malva caroliniana* L. *Sp. Pl.* 688 (1753); *Cav. Diss. ii.* 58, *t.* 15, *f.* 1. *M. prostrata* Cav. *tom. cit.* 59, *t.* 16, *f.* 3 (1786); *Macf.*

Jam. i. 58. *Abutilon repens* &c. *Dill. Elth.* 5, *t.* 4. (Fig. 43.) Specimen in Herb. Linn. named by himself, and one also in Hort. Cliff. in Herb. Mus. Brit.

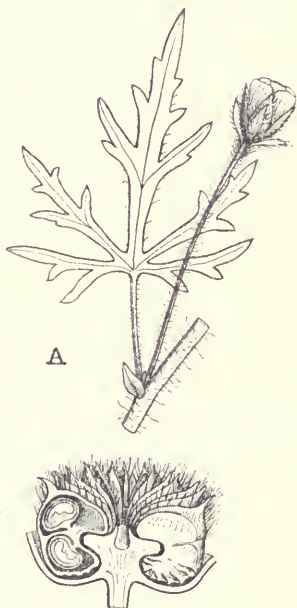


Fig. 43.—*Modiola caroliniana* G. Don.
A, Leaf and flower, nat. size.
B, Fruit cut through to show seeds $\times 3$.
(B after A. Gray.)

Clifton Mount, *Macfadyen!* Abbey Green, Blue Mts., *Prior!* Cinchona, 5000 ft., *Harris!* Fl. Jam. 8576, 11,954.—Bermuda (introd.), Hispaniola, trop. and subtrop. America, S. Africa.

Herb, with prostrate stems, rooting at the nodes, hairy with stellate and simple hairs. *Leaves* 2-4 (1-5) cm. in diam., 7-nerved, with hairs—stellate and simple with bulbous base, or glabrate; petioles 2-5 (1-6) cm. l.; stipules 4-5 mm. l. *Peduncles* 1 or 2 in axils, 2-4 cm. l. *Bracteoles* about 1 mm. below the calyx, about 5 mm. l., persistent. *Calyx* 6-7 mm. l. *Petals* 7-8 mm. l., red (purple when dried). *Ripe carpels* 4 mm. l., cusp 1 mm., hirsute above on the back, glabrous below and tuberculate-ridged. *Seeds* about 1.2 mm. l., brown becoming black near hilum, glabrous.

4. MALVASTRUM A. Gr.

Herbs, sometimes tall, sometimes low growing in clumps, or woody. Leaves serrate (in Jamaican species) or entire, or lobed, or cleft. Flowers shortly pedunculate or subsessile, axillary or in terminal spikes. Bracteoles of involucre 3 in Jamaican species, about as long as the calyx, more or less linear-lanceolate, and sometimes adherent at the base to the calyx, occasionally wanting. Calyx 5-lobed. Ovary with 5 or more cells; ovules one in each cell, attached at the middle of the cell; style-branches as many as the cells, with capitate stigmas. Carpels splitting open on the back down to the middle; back sometimes apiculate. Seeds kidney-shaped, attached at the middle of the cell. Embryo curved; endosperm scanty. Mallow.

Species 85, mostly natives of America, two of these widely dispersed now through the tropics, the rest natives of South Africa.

Branches, &c., strigose.

Carpel with 3 spines on back 1. *M. coromandelianum*.

Carpel without spines 2. *M. corchorifolium*.

Branches, &c., minutely tomentose 3. *M. spicatum*.

1. *M. coromandelianum* Garcke in *Bonplandia* v. 295 (1857); young stems and branches, the leaves on both sides, petioles, peduncles, and calyx with stiff white adpressed hairs, simple or 2-4-armed; flowers at first solitary in the axils, a subsidiary flowering branch appearing later; ripe carpels with a long spine near the apex, and 2 short spines near the middle of the back.—*K. Schum. in Fl. Bras. xii. pt. 3, 268, t. 53; Urb. Symb. Ant. iv. 387 & viii. 412; Britt. Fl. Berm. 235; Britt. & Millsp. Bah. Fl. 267. M. tricuspidatum A. Gr. Pl. Wright. i. 16 (1852); Griseb. Fl. Br. W. Ind. 72. M. americanum Torr. Bot. Mex. Bound. Surv. 38 (1859); Small Fl. S.E. U.S. 768. Malva coromandelianum L. Sp. Pl. 687 (1753) & Amoen. v. 380. M. humilior subvillosa &c. & M. humilior foliis &c. Browne Hist. Jam. 282; Sw. Obs. Bot. 262. M. tricuspidata Ait. Hort. Kew. ed. 2, iv. 210 (1812); Macf. Jam. i. 57; A. Rich. in Sagra Cub. x. 41. Sida jamaicensis Mill. Dict. ed. 8 (non L.). (Fig. 44.)*

Specimen in Herb. Linn. named by Linnæus. Miller's type in Herb. Mus. Brit.

Sloane Herb. iv. 52 (in part)! *Wright*! *Bancroft*! *Macfadyen*; *Distin*! *Wilson*; near Gordon Town, *Ball*! Pen Hill, 2500 ft.; Hope grounds; *Harris*! *Liguanea* plain, *Campbell*! Devon Pen, *Thompson*! Kingston; *Porus*; *Hitchcock*.—Texas, Florida, Bermuda (naturalized), Bahamas, W. Indies, Tropics.

Perennial herb, 1-4 ft. high. Leaves 3-5 (2-8) cm. l., ovate, ovate-oblong or oblong; petioles 1-2 cm. l.; stipules 7-9 mm. l., lanceolate,

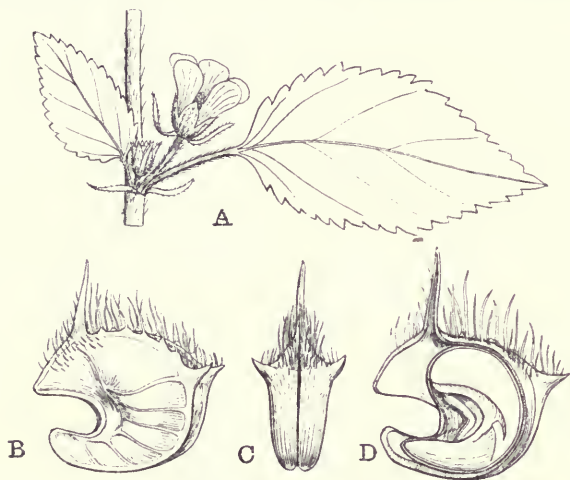


Fig. 44.—*Malvastrum coromandelianum* Garcke.

- A, Portion of flowering branch, nat. size. C, Back of ditto beginning to split open $\times 7$.
B, Ripe carpel $\times 7$. D, Ripe carpel with seed, cut through $\times 7$.

acuminate. Flowers yellow, on short (1-3 mm. l.) peduncles. Bracteoles about as long as the calyx, adherent at the base to the calyx. Calyx about 5 mm. l. in fl. to 7 mm. l. in fr., with many longitudinal hairy angles. Petals 8-9 mm. l.

This species abounds in a mucilaginous sap, and is employed by the natives as a substitute for soap in washing coarse clothes (*Macfadyen*).

2. *M. corchorifolium* Britton in *Small Fl. Miami* 119 (1913); young stems and branches, the leaves on both sides, petioles, peduncles, and calyx with stiff white adpressed hairs, simple or 2-4-armed; flowers solitary in the axils and crowded into a terminal head; ripe carpels 8-15, back hispid on upper half, without spines.—*P. Wils.* in (*Veg. Vieques*) *Bull. N. York Bot. Gard.* viii. 397; *Urb.* in *Fedde Rep.* xvi. 33 & *Symb. Ant.* viii. 413; *Britt. & Millsp. Bah. Fl.* 267. *M. Rugelii* *S. Wats.* in *Proc. Am. Acad.* xvii. 367 (1882); *Small Fl. S.E. U.S.* 768. *Malva corchorifolia* *Desr.* in *Lam. Encyc.* iii. 755 (743 errore)

(1789). *M. scoparia* Jacq. *Coll. i.* 59 (1786) & *Ic. Pl. Rar.* 14, t. 139 (non *L'Hérit.*).

Distin! *Prior!* Near Mandeville, Britton, 1022!—Florida, Bahamas, Cuba, Grand Cayman, Virgin Gorda.

Perennial herb, 2-6 ft. high. *Leaves* 1-5 cm. l., broadly ovate to oblong-ovate; petioles shorter than limb; stipules linear-awl-shaped, shorter than the petiole. *Flowers* subsessile. *Bracteoles* about as long as the calyx. *Calyx* about 4 mm. l. in fl., about 5 mm. l. in fr., hairy. *Petals* about 1 mm. longer than calyx.

3. *M. spicatum* A. Gr. (*Pl. Fendl.*) in *Mem. Am. Acad. n.s. iv.* 22 (1849): young stems and branches, the leaves beneath, and petioles stellate-tomentose: flowers crowded into a spike terminal on stem and branches, sometimes shortened into a head on the branches: ripe carpels: apex at inner angle prolonged, beak-like, hispid on the back, without spines.—*Griseb. loc. cit.*; *Small Fl. S.E. U.S.* 768; *K. Schum. tom. cit.* 271, t. 52, f. 2; *Urb. Symb. Ant. iv.* 388 & *riii.* 413. *Althæa spicata*... flore luteo &c. *Sloane Cat.* 97 & *Hist. i.* 219. *Malva americana* L. *Sp. Pl.* 687 (1753); *A. Rich. in Sagra Cub. x.* 40. *M. spicata* L. *Syst. ed.* 10, 1146 (1759) (excl. reference to *Sloane*) & *Amœn. v.* 401 & 380; *Sw. Obs. Bot.* 262; *Wright Mem.* 291; *Macf. Jam. i.* 58. *M. assurgens* subvillosa &c. *Browne Hist. Jam.* 282. Specimen in Herb. Linn. named by Linnaeus *Malva spicata*.

In fl. Sept.-March; *Sloane* Herb. iv. 56! *Wright!* Kingston, *Broughton!* *Macfadyen!* *Distin!* *Wilson!* *March!* Kingston, *Prior!* Liguanea plain, *Campbell!* Kingston; Constant Spring; Blue Mts.; Lucea; *Hitchcock!* Charlemont, near Ewarton, 1000 ft.; Liguanea plain; Plowden Hill, 1000 ft.; *Harris!* Fl. Jam. 6269 (in part), 6325, 6698, 6908, 8168; Bluefields, Britton, 1605!—Florida, West Indies, tropical and subtropical regions of the whole world.

Perennial herb 2 to 6 ft. high. *Leaves* 2-8 cm. l., usually triangular-ovate, on upper surface rough with stellate hairs, sometimes tomentose; petioles 1-6 cm. l.; stipules thread-like with a lanceolate base, 4-6 mm. l. *Flowers* sessile, the lowest flowers with small leafy bracts with 2 stipules, most of the bracts 2-cleft at the apex. *Bracteoles* 5-7 cm. l. *Calyx* about 5 mm. l., hispid with white hairs from a brown tubercular base. *Petals* 6-8 mm. l.

The bark makes strong white hemp (Wright).

Malva rotundifolia L. according to Browne Hist. Jam. 282 was introduced, but apparently it has died out. It differs from *Malvastrum* in that the thread-like style-branches are stigmatose longitudinally on the inside.

5. ANODA Cav.

Herbs, hispid or glabrescent. Leaves hastate or lobed at the base. Flowers axillary. Bracteoles of involucre wanting. Calyx 5-cleft. Cells of the ovary indefinite, each cell with one ovule. Ripe carpels in a star-like whorl, convex below, flat on top; the internal walls of the cells of the ovary usually become more or less absorbed, so that the ripe carpels open into one another, then the outer portion of each becomes detached and

falls out, generally carrying the seed with it. Seed hanging or attached horizontally.

Species 10, natives of West Indies and trop. cont. America, especially of Mexico.

A. acerifolia DC. *Prodr. i.* 459 (1824); *E. G. Bak. in Journ. Bot. xxx.* 73; *Hochr. in Ann. Cons. et Jard. Bot. Genève xx.* 50. *A. hastata* Schlecht. in *Linnæa xi.* 214 (1837); *Macf. Jam. i.* 77; *Griseb. Fl. Br. W. Ind.* 73 (in part) (non *L.*); *Urb. Symb. Ant. iv.* 394 & *viii.* 419. *Sida acerifolia* Zucc. in *Roemer Collect.* 148 (1809). *S. hastata* Sims *Bot. Mag. t.* 1541 (1813) (non *Willd.*). (Fig. 45.)

Bancroft! Bath; near Gordon Town; *Macfadyen*; *St. Ann, McCatty!* *Morris!* near Gordon Town; *Fawcett!* Walderston, 2000 ft., *Harris!* *Fl. Jam.* 8414.—Cuba, Hispaniola, Porto Rico, Tobago, Mexico to Peru.

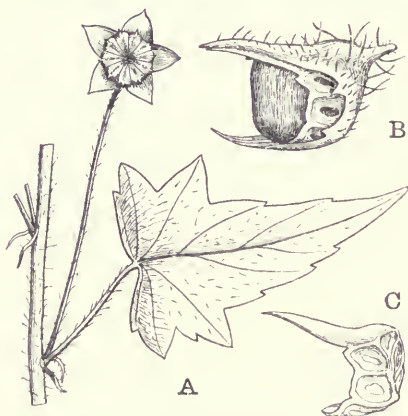


Fig. 45.—*Anoda acerifolia* DC.

A, Leaf and fruit $\times \frac{2}{3}$.

B, Ripe carpel, showing exocarp, endocarp, and seed $\times 5$.

C, Endocarp of ditto $\times 5$.

Plant covered with bristly hairs. *Leaves* 2-7 cm. l., variable in form, lower more or less pentagonal or 5-lobed with large teeth, uppermost hastate, base truncate or slightly cordate. *Flowers* solitary; peduncles sparingly hairy, of fl. 2-8 cm. l., of fr. 7-15 cm. l. *Calyx* in fl. 7-9 mm. l., in fr. to 13 mm. l., lobes ovate, somewhat obtuse, mucronate. *Petals* usually blue, approaching to purple, rarely white (*Macf.*), 8-15 mm. l. *Fruit* of 9-16 carpels, outer angle of back with a very short mucro or simply a boss; endocarp separating from the exocarp, net-veined, not adhering to the seed.

6. SIDA L.

Herbs or shrubs, with stellate or simple hairs, often velvety or tomentose. In Jamaican species leaves serrate, except in

S. linifolia; stipules usually somewhat linear, but more or less lanceolate in *S. glomerata*, *S. jamaicensis*, and *S. acuta*. Flowers axillary, or in terminal racemes, spikes, heads, or rarely panicles. Bracteoles beneath the calyx usually wanting. Calyx with 5 teeth or lobes. Petals usually somewhat longer than the calyx. Carpels 5 or more, the number indicated in the flower by the lobes and the cells of the ovary, and by the number of the style-branches; one pendulous ovule in each cell. Ripe carpels opening usually by 2 valves at the apex, occasionally by irregular splitting below. Seed hanging from apex or attached horizontally. Broom Weed.

Species about 70, mostly American.

Carpels 5 (in *S. pyramidata* 5 or 6).

- Inflorescences terminal and axillary: sessile globose heads intermixed with stipules and stipule-like bracts. Petals yellow. Leaves lanceolate or subrhomboid-lanceolate 1. *S. glomerata*.
- Inflorescences: terminal heads or spikes with 1 or 2 leaf-like bracts; in axils 1 flower or a few clustered. Petals yellow.
- Plants tomentose and soft to touch. Leaves ovate, cordate. Calyx hirsute 2. *S. aggregata*.
- Plants more or less hirsute. Leaves ovate, long acuminate 3. *S. urens*.
- Inflorescences: flowers solitary in axils, with sometimes a flowering branch developing later.
- Ripe carpels opening at apex.
- Plants more or less tomentose with stellate hairs.
- Inflorescences stalked. Petals yellow..... 4. *S. spinosa*.
- Inflorescences subsessile. Petals white or pale buff 5. *S. jamaicensis*.
- Plants procumbent, with minute stellate hairs and also long simple hairs. Petals pale yellow or nearly white..... 6. *S. procumbens*.
- Plants puberulous with simple hairs. Petals orange-yellow..... 7. *S. glabra*.
- Plants with stem and branches with short glandular hairs and longer simple hairs. Petals yellow..... 8. *S. glutinosa*.
- Ripe carpels opening irregularly below. Plants prostrate, rooting. Petals yellow..... 9. *S. hederæfolia*.
- Ripe carpels opening below by the white membrane bursting irregularly. Petals white ... 10. *S. alba*.
- Inflorescence ample, diffuse, panicle-like.
- Calyx 2·5-3 mm. l. Petals purple or crimson ... 11. *S. paniculata*.
- Inflorescence a terminal panicle.
- Calyx 4-5 mm. l. Petals yellow.
- Stem with minute stellate hairs 12. *S. pyramidata*.
- Stem with glandular pubescence 8. *S. glutinosa*.

Carpels more than 5 (in *S. pyramidata* 5 or 6).

Calyx 5-8 mm. l.

Leaves with serrate margin.

Inflorescence a terminal panicle. Petals yellow 12. *S. pyramidata*.

Inflorescence terminal, flowers solitary or usually in leafy heads of 3-8, peduncle adherent to petiole of leafy bract. Petals purplish-red 13. *S. ciliaris*.

Inflorescence: flowers solitary in the axils with a flowering branch also sometimes developing later, the flowers usually becoming crowded at apex of stem and branches.

Leaves tomentose and soft to the touch on both sides.

Carpel: beaks with hairs pointing backwards.

Leaves ovate. Petals yellow-buff..... 14. *S. cordifolia*.

Leaves oblong to linear. Petals pale buff or yellowish-white veined with pale pink..... 15. *S. salviaefolia*.

Carpel: apical corners acute or mucronate.

Petals yellow 14. var. *althææfolia*.

Leaves tomentose and soft to the touch beneath. Petals yellow. Awns long, glabrous or with very minute hairs..... 16. *S. rhombifolia*.

Leaves usually glabrate; stipules sub-lanceolate. Petals yellow or white..... 17. *S. acuta*.

Leaves entire. Petals white with purplish base 18. *S. linifolia*.

Calyx 3-3.5 mm. l. 19. *S. troyana*.

1. *S. glomerata* Cav. *Diss. i.* 18, *t.* 2, *f.* 6 (1785); young branches, petioles, and peduncles tomentose; leaves lanceolate or subrhomboid-lanceolate, narrowed to the apex, base wedge-shaped, or narrowly truncate, or very narrowly cordate, usually 3-nerved, on both sides with long simple hairs, beneath with stellate hairs also, especially on nerves; stipules broadly lanceolate, acuminate; inflorescence sessile or subsessile, axillary and terminal, a many-flowered raceme shortened into a globose head intermixed with stipules and stipule-like bracts; carpels 5, in fruit 2 mm. l., glabrous, net-veined, valves usually ending at apex in a sharp point.—*Griseb. Fl. Br. W. Ind.* 73; *K. Schum. in Fl. Bras. xii.* pt. 3, 323; *E. G. Bak. in Journ. Bot. xxx.* 237; *Urb. Symb. Ant. iv.* 389 & *viii.* 415.

Moneague, Prior!—West Indies, Central and tropical S. America.

Herb with woody base, erect, branching. Leaves 2.5-6 (7) cm. l., unequally serrate; petioles 5-7 mm. l.; stipules 8-10 mm. l., 5-1-nerved, margin ciliate otherwise glabrous, persisting. Peduncles short or very short, jointed at middle. Calyx 5-7 mm. l., 5-angled, 10-nerved, lobes acuminate, margins and angles hispid with long hairs. Petals yellow. Seeds glabrous but puberulous near hilum.

Broom-weeds are so called from being cut and used as brooms.

Pounded and squeezed they yield a mucilaginous juice, which, on mixing with any greasy substance in clothes, &c., answers all the purposes of soap. (Wright.)

2. *S. aggregata* Presl *Reliq. Haenk.* ii. 106 (1836); young branches, petioles, and peduncles soft to the touch, minutely tomentose, sometimes also with long spreading hairs; leaves ovate, cordate, apex acute, obtuse or subacuminate, 7-nerved, on both sides soft to the touch, minutely tomentose; inflorescence terminal and axillary, terminal a dense interrupted spike, axillary a globose cluster with sometimes also a flowering branch; carpels 5, in fruit 2 mm. l., valves blunt at apex, covered with minute stellate hairs, sides glabrous.—*Hemsl. in Biol. Cent. Am. Bot.* i. 102; *E. G. Bak. tom. cit.* 292; *Urb. Symb. Ant.* vi. 92. *S. savannarum* K. Schum. *tom. cit.* 308 (1891); *E. G. Bak. loc. cit.* *Malva assurgens villosa* &c. *Browne Hist. Jam.* 282?

Bancroft! *Macfadyen!* near Gordon Town, *Ball!* *Liguauea* plain, *Campbell!* also *Clute!* *Fawcett!* *Harris!* Fl. Jam. 6084, 6116, 6269 (in part), 6988.—Mexico to Colombia and Guiana.

Perennial shrubby herb. Leaves 2-7 cm. l., unequally serrate; petioles as long as, or shorter than, the blade; stipules 5-7 mm. l., thread-like. Calyx 7-8 mm. l., 10-angled, minutely tomentose, long hirsute midway at the angles; lobes triangular, acute. Petals 11-12 mm. l., buff-yellow. Seed scarcely 2 mm. l., dark brown, glabrous but with a few short hairs near hilum.

3. *S. urens* L. *Syst. ed.* 10, 1145 (1759) & *Amæn.* v. 402, 380; stem and branches, with petioles, peduncles, and angles of calyx, hirsute with long simple hairs, sometimes 2-3-4-armed and often shorter stellate hairs; leaves ovate to oblong-ovate, long acuminate, base cordate, unequally serrate, 5(7)-nerved, covered on both sides, especially on nerves beneath, with short hairs, 3-4-armed or sometimes stellate; flowers sessile or shortly stalked, axillary, one or a few in a subglobose cluster, with a flowering branch developing later into a terminal head or spike with 1 or 2 small leaves or bracts; carpels 5, in fruit somewhat more than 2 mm. l., apex usually with 2 short teeth, glabrous.—*Sic. Obs. Bot.* 261; *Macf. Jam.* i. 82; *Griseb. op. cit.* 75; *Mast. in Fl. Trop. Afr.* i. 179; *K. Schum. tom. cit.* 306, t. 60; *E. G. Bak. tom. cit.* 294; *Urb. Symb. Ant.* iv. 392 & viii. 418; *Britt. & Millsp. Bah. Fl.* 268. *S. hirta urticata* &c. *Browne Hist. Jam.* 280. *Althæa spicata betonicae folio villosa spica breviori & laxiori Sloane Cat.* 97 & *Hist.* i. 44, t. 14, f. 3. (Specimen in Herb. Sloane iv. 57 from "one of the Caribe islands.") Specimen from Browne in Herb. Linn. named by Linnaeus.

Browne! *Wright!* *Macfadyen!* *Wilson!* *Moneague, Prior!* near Gordon Town, *Ball!* Bog Walk; Blue Mts.; Port Antonio; Lucea; Porus; *Hitchcock.*—Bahamas, West Indies, trop. cont. America, trop. Africa, Java.

Perennial herb, 1-2 ft. high. Leaves 2-6(1-9) cm. l.; petioles 1-2.5 cm. l.;

stipules 3-6 mm. l., linear. *Calyx* 6-8 mm. l., 5-angular; lobes long acuminate. *Petals* yellow blotched with red at base. *Seeds* somewhat more than 1.5 mm. l., 3-sided, emarginate at hilum, brown.

4. *S. spinosa* L. *Sp. Pl.* 683 (1753); young branches, petioles, and peduncles more or less covered with very minute stellate hairs, sometimes glabrate; leaves ovate-elliptical, oblong-lanceolate, linear-lanceolate, or lanceolate, base truncate or rounded, crenate-serrate, 5(3-7)-nerved, upper surface more or less covered with very minute stellate hairs, beneath soft to the touch, tomentose with very minute stellate hairs; flowers solitary in axils, sometimes accompanied by a very short flowering branch, at apex sometimes corymbose; carpels 5, ripe about 2.5 mm. l.; valves at apex with 2 short spines, upper part and spines puberulous, back glabrous, hard, margined, brown, opening above.—*Burm. Fl. Ind.* 145; *Aubl. Pl. Guian. ii.* 703; *Lam. Encyc. i.* 4; *DC. Prodr. i.* 460; *Presl Reliq. Haenk. ii.* 109; *Griseb. op. cit.* 74 (in part); *E. G. Bak. tom. cit.* 237 (in part); *Urb. Symb. Ant. iv.* 389 (in part) & *viii.* 414; *Britton Ill. Fl. ii.* 421; *Small Fl. S.E. U.S.* 771; *Britt. & Millsp. Bah. Fl.* 268. *S. foliis cordato-ovatis* &c. *L. Hort. Cliff.* 346. *S. pimpinellifolia* *Mill. Dict. ed.* 8 (1768). *S. angustifolia* *Lam. Encyc. i.* 4 (1783); *L'Hérit. Stirp.* 109, t. 52. *S. minor* *Macf. Jam. i.* 79 (1837). *S. spinosa* var. *angustifolia* *K. Schum. tom. cit.* 298 (1891). *Althæa virginiana* &c. *Pluk. t.* 9, f. 6 (specimens in Herb. Sloane xcii. 10 & xcix. 53). *Malva minor erecta betonicæ folio* &c. *Sloane Cat.* 96 & *Hist. i.* 217. Type in Herb. Linn. Miller's type in Herb. Mus. Brit.

Sloane Herb. iv. 50! *Bancroft!* *Wilson!* *Kingston, Prior!* near Spanish Town, *Harris!* *Fl. Jam.* 11,910.—U.S.A. (New York to Kansas, Florida, and Texas), tropical America (incl. Bahamas and West Indies), infrequent and probably introduced in the Old World and Polynesia.

Perennial herb, 1-3 ft. high. *Leaves* 1-4 cm. l.; petioles .5-2 cm. l., sometimes with 1 or 2 minute tubercles or spines just below the insertion; stipules 5-9 mm. l., linear, awl-shaped. *Calyx* 5-7 mm. l., tomentose with minute stellate hairs, 10-nerved, 5-angled; lobes deltoid, acute. *Petals* yellow. *Seeds* about 2 mm. l., 3-sided, dark brown.

5. *S. jamaicensis* L. *Syst. ed.* 10, 1145 (1759) & *Amœn. v.* 401, 380; young branches tomentose with stellate hairs; leaves oblique and variable in shape, roundish-ovate, ovate, oblong, or sub-rhomboid, apex obtuse, 5-nerved, serrate-crenate above the base, on upper surface with minute stellate hairs, beneath densely tomentose with stellate hairs; flowers solitary in axils with very short peduncles, sometimes with another flower and a short flowering branch appearing later, forming a subsessile cluster, peduncles 2-3 mm. l., not jointed; carpels 5, in fruit 2-3 mm. l., with 2 short beaks, upper part tomentose, back and sides net-veined, glabrous.—*Cav. Diss. i.* 17, t. 2, f. 5; *Sw. Obs. Bot.* 258; *Macf. Jam. i.* 77; *Griseb. op. cit.* 74; *K. Schum. tom. cit.* 304;

E. G. Bak. tom. cit. 237; *Urb. Symb. viii.* 414. *S. alnifolia Presl Reliq. Haenk. ii.* 108 (1836) (non *L.*). *S. humilior foliis &c. Browne Hist. Jam.* 280. *S. sericea Mill. Dict. ed.* 8 (1768). Specimen from Browne in Herb. Linn. named by Linnæus. Miller's type from Houstoun in Herb. Mus. Brit. Specimen from Presl (Reliq. Haenk.) in Herb. Mus. Brit.

Broad-leaved Broom Weed.

Savannas round St. Jago de la Vega, *Sloane Herb. iv.* 52! *Houstoun Hb. Sloane iv.* 52*! *Browne! Bancroft! Moneague, Prior! March!*—Cuba, Hispaniola, St. Thomas, St. John, Santa Cruz, St. Bartholomew, Guadeloupe, Désirade, trop. cont. America.

Perennial decumbent herb or undershrub, 1-2 ft. high. *Leaves* 1 5-4 cm. l.; petioles 4-7 mm. l., villose; stipules equalling the petiole, lanceolate or lanceolate-linear, or linear, hairy. *Calyx* about 6 mm. l., 5-angled, densely tomentose; lobes acuminate. *Petals* as long as the calyx, white or pale buff. *Seeds* 1.5 mm. l., brown, 3-sided, emarginate at apex, sometimes with a few minute hairs on surface, usually some near hilum.

The leaves and buds contain a great quantity of mucilage, and they lather like soap, with water; they are used in shaving washes, &c. The leaves are purgative. (Browne.)

6. *S. procumbens Sw. Prodr.* 101 (1788) & *Fl. Ind. Occ.* 1211; young branches, petioles, peduncles, and calyx more or less covered with minute stellate hairs and also with long simple hairs; leaves ovate to ovate-roundish, cordate, apex obtuse to rounded, crenate-serrate, 7-nerved, minutely tomentose on both sides, often with long hairs on nerves beneath; flowers axillary, usually solitary; peduncles slender, usually longer than the petiole, sometimes longer than the whole leaf, jointed near apex; carpels 5, ripe, 3.3-4 mm. l. (incl. beaks), back glabrous, wrinkled, margined; valves 2-beaked; beaks scarcely 1 mm. l.—*Urb. Symb. Ant. iv.* 390 & *viii.* 416; *Britt. & Millsp. Bah. Fl.* 269. *S. pilosa Cav. Diss. i.* 9, t. 1, f. 8 (non *Retz.*) (1785). *C. ovata Cav. Diss. vi.* 350, t. 196, f. 2 (1788) (non *Forsk.*). *S. supina L'Hér. Stirp. r.* 109 bis, t. 52 bis (1788); *Griseb. op. cit.* 75; *E. G. Bak. tom. cit.* 291; *Small Fl. S.E. U.S.* 770. *S. abutilifolia* (abutilifolia in ms.) *Mill. Dict. ed.* 8 (1768) is perhaps a synonym. Specimen collected in Hispaniola from Swartz in Herb. Mus. Brit. named by him.

Salt ponds, *Broughton! Swartz! Long Mt.,* 1200 ft.; Healthshire Hills, 50 ft.; Luana Point; *Harris! Fl. Jam.* 9388, 9531, 9904.—Florida Keys, Bahamas, Cuba, Hispaniola, Mona, Porto Rico, St. Thomas, St. Cruz, St. Martin, Saba, St. Eustatius, Curaçao, Mexico to Venezuela.

Annual or perennial herb, branched from the base; branches procumbent or spreading, 1-6 dm. l. *Leaves* .6-1.5 cm. l.; petioles nearly equalling the limb; stipules small, thread-like. *Calyx* 5-6 mm. l., lobes ovate, acuminate, somewhat shorter than the 5-angled tube. *Petals* half as long again as the calyx, pale yellow or nearly white. *Seeds* slightly longer than 2 mm., dark brown, with minute hairs or glabrate.

7. *S. glabra* Mill. *Dict. ed.* 8 (1768); young branches, petioles, peduncles, and calyx puberulous with simple hairs; leaves ovate to lanceolate, acuminate, cordate, serrate-crenate, more or less puberulous on the nerves; flowers at first solitary in the axils, a flowering branch with small leaves usually developing later in each axil; peduncles 1-4 cm. l., slender; carpels 5; ripe glabrous, about 2.5 mm. l.; beaks 2, minutely puberulous, 2 mm. l.—*Britton in Brookl. Bot. Gard. Mem.* i. 68. *S. ulmifolia* Cav. *Diss.* i. 15, t. 2, f. 4 (1785); *Griseb. op. cit.* 75; *Urb. Symb. Ant.* iv. 392 & viii. 417. *S. arguta* Sw. *Prodr.* 101 (1788) & *Fl. Ind. Occ.* 1205; *Macf. Jam.* i. 81; *E. G. Bak. tom. cit.* 293. Type specimen from Miller, renamed *S. arguta* by Swartz, in Herb. Mus. Brit.

Macfadyen; Kingston, *Prior! March!* Constant Spring; Bog Walk; Lucea; *Hitchcock*; Lititz, *Harris!* Fl. Jam. 12,687.—West Indies as far south as Martinique, Central America, Colombia, Ecuador.

Shrubby herb, 2-3 ft. high. Leaves 2-7 cm. l.; petioles 1-2.5 (.5-3.5) cm. l.; stipules linear, 2.5-5 mm. l. Calyx 5-6 mm. l.; lobes acuminate. Petals yellow or orange-yellow.

8. *S. glutinosa* Commers. ex Cav. *Diss.* i. 16, t. 2, f. 8 (1785); young stem and branches with short glandular hairs and longer simple hairs; leaves ovate, usually acuminate, base cordate, 7(9)-nerved, irregularly serrate, stellate-puberulous on both sides but denser beneath, velvety in young leaves; flowers with long peduncles, at first solitary in the axils, sometimes with another flower or a flowering branch developing later, ultimately forming a leafy panicle; carpels 5, when ripe 2 mm. l. (excl. beaks), puberulous on upper part; beaks 2, puberulous with simple hairs, spreading or ascending, 1 mm. l.—*K. Schum. tom. cit.* 310; *E. G. Bak. tom. cit.* 293 (incl. var. *cinerea*); *Urb. Symb. Ant.* iv. 394 & viii. 417; *Britt. & Millsp. Bah. Fl.* 269. *S. nervosa* DC. *Prodr.* i. 465 (1824); *Macf. Jam.* i. 83; *Griseb. op. cit.* 75.

Wright! Broughton! Swartz! *Macfadyen!* *Distin!* Mt. Diablo, *Prior!* *March!* Kingston, *Hitchcock*; near Ewarton, 1000 ft., *Harris!* Fl. Jam. 6619.—Bahamas, West Indies, Central America, northern South America.

Shrubby herb, 2-4 ft. high. Leaves 2-6 (1.5-7.5) cm. l.; petioles 2-3.5 cm. l., puberulous, sometimes glandular; stipules 1.5-2 mm. l., thread-like. Peduncles 1-2.5 cm. l., puberulous, often glandular. Calyx 4.5-5 mm. l., puberulous, lobes triangular, subacuminate. Petals yellow. Seeds 1.6 mm. l., glabrous, dark brown.

9. *S. hederæfolia* Cav. *Diss.* i. 8, t. 9, f. 3 (1785); stem simple or with few branches; young branches hispid with stellate hairs or glabrate; leaves roundish or ovate-roundish, cordate, crenate-toothed, more or less hirsute on both sides with stellate hairs (sometimes simple), or glabrate; flowers axillary, solitary; peduncles very slender, about as long as the petioles, glabrate or densely puberulous; carpels 5, when ripe covered all over with

network of slightly prominent lines, about 4 mm. l. (incl. beaks), apex and beaks minutely hirtellous.—*DC. Prodr. i.* 463; *Griseb. Pl. Wright. in Mem. Acad. Amer. n. ser. viii.* 163; *Urb. Symb. Ant. iv.* 391 & *viii.* 417; *Britt. & Millsp. Bah. Fl.* 268. *S. foliis cordatis* &c. *Plum. Pl. Amer. (Burm.) t.* 169, *f.* 3.

Wright!—Bahamas, Cuba, Is. of Pines, Hispaniola, Porto Rico.

Herb. prostrate, rooting at the nodes. *Leaves* 6–2·5 cm. br.; petioles equal to or longer than the limb, 1–3 cm. l., densely hirtellous with stellate hairs or glabrate, or with a line of simple hairs on upper face; stipules about 3 mm. l., linear. *Calyx* 3–3·5 mm. l. *Petals* yellow.

The beaks are described by Cavanilles as “hamatis,” and his figure and that of Plumier agree with the description in representing the beaks as with hairs pointing backwards—otherwise his description agrees with our specimens.

10. *S. alba* *L. Sp. Pl. ed.* 2, 960 (1763) & (name only) *Amœn. v.* 380 (1760); young branches, petioles, and peduncles covered with minute stellate hairs; leaves roundish-ovate to lanceolate, subcordate to rounded at base, serrate, 5-nerved, with very minute stellate hairs on both sides, sparse on upper surface, denser beneath and sometimes tomentose; flowers at first solitary, then a shortened raceme of a few crowded flowers developing, often succeeded by a flowering branch; carpels 5, when ripe about 2 mm. l., opening below by the white thin membrane bursting irregularly, apex with 2 short beaks, puberulous at apex and on beaks.—*Burm. Fl. Ind.* 146; *Lam. Encyc. i.* 4; *DC. Prodr. i.* 460; *Roxb. Fl. Ind. iii.* 174. *S. angustifolia* *Mill. Dict. ed.* 8 (1768). *S. spinosa* var. β *L. Sp. Pl.* 684 (1753). *S. spinosa* *L.* (as regards var. β) *Griseb. op. cit.* 74; *Mast. in Fl. Trop. Afr. i.* 180 & in *Hook. f. Fl. Br. Ind. i.* 323; *K. Schum. tom. cit.* 297; *E. G. Bak. tom. cit.* 237; *Trimen Fl. Ceyl. i.* 142. *Malvinda bicornis* &c. *Dill. Elth.* 214, *t.* 171, *f.* 210. Specimen in *Herb. Linn.* named by Linnaeus, cultivated in *Hort. Upsal.* Miller's type in *Herb. Mus. Brit.*

Distin! Macfadyen! Bethlehem, St. Elizabeth, T. J. Harris! Fl. Jam. 8288.—Bahamas, Cuba, Montserrat, tropical cont. America, Africa, India.

Leaves 1·5–4·5 cm. l.; petioles 2·5–1 cm. l. (–4 mm. l.); stipules linear-awl-shaped, 3–7 mm. l. *Peduncle* 8–13 mm. l. *Calyx* 5–6 mm. l., tomentose with minute stellate hairs, 10-nerved, 5-angled; lobes deltoid, acute. *Petals* white. *Seeds* about 2 mm. l. 3-sided, dark brown.

11. *S. paniculata* *L. Syst. ed.* 10, 1145 (1759) & *Amœn. v.* 401, 380; stem and branches covered with yellow stellate hairs, youngest parts tomentose, at length glabrate; leaves ovate, more or less acuminate, cordate at base, unequally serrate, 7(5)-nerved, upper surface more or less covered with small stellate hairs, beneath tomentose; flowers at first solitary with long slender peduncles in the axils of the upper leaves, followed generally by a flowering branch in each axil, forming ultimately altogether a

large terminal leafy paniculate inflorescence; carpels 5, when ripe 2·5–3·5 mm. l., valves acute at apex or with 1 or 2 very short beaks, back with minute stellate hairs.—*Cav. Diss. i. 16, t. 12, f. 5*; *Sw. Obs. Bot. 259*; *Griseb. Fl. Br. W. Ind. 76*; *K. Schum. tom. cit. 293, t. 58*; *E. G. Bak. tom. cit. 294*. *S. humilior ramosa* &c., *S. foliis cordato-acuminatis serratis* &c. *Browne Hist. Jam. 280*. *S. atrosanguinea Jacq. Ic. Pl. Rar. t. 136*; *Sw. Obs. Bot. 260*; *S. capillaris Cav. Diss. i. 10, t. 1, f. 7*; *Macf. Jam. i. 83*. *S. floribunda H. B. & K. Nov. Gen. & Sp. v. 258, t. 473*. Specimen from Browne in Herb. Linn. named in Solander's hand.

Browne! Wright! Masson! Westmoreland, Purdie! Pedro Bluff; Belle Vue, near Spanish Town; between Old Harbour bay and Longville Park; Two Mile Wood Pen, St. Catherine; Harris! Fl. Jam. 9723, 11,912, 11,948, 12,049, 12,068.—Cuba, Mexico to Paraguay, Galapagos Is., trop. Africa.

Perennial herb, woody at the base, to 3 ft., and more, high. *Leaves* varying much in size, about 5 cm. l. where the flowers begin to show, larger below, and smaller above with inflorescences in their axils; petioles very short in upper leaves, long in lowest leaves; stipules thread-like, 5–8 mm. l. *Calyx* 2·5–3 mm. l., tomentose with stellate hairs, lobes triangular, somewhat acute. *Petals* crimson or purple. *Seeds* 1·5 mm. l., purplish-brown, with very minute adpressed hairs scattered over surface.

12. *S. pyramidata Desportes ex Cav. Diss. i. 11, t. 1, f. 10 (1785) & t. 194, f. 1*; young branches, petioles, and peduncles more or less covered with very minute stellate hairs; leaves roundish ovate, acuminate, cordate, crenate-serrate, 7-nerved, more or less covered with very minute stellate hairs sparsely on upper surface densely beneath; flowers in a terminal panicle; carpels 5 or 6, when ripe about 2·5 mm. l., with 2 very short beaks (·5 mm. l.), back and beaks covered with minute stellate hairs.—*Griseb. tom. cit. 75*; *Urb. Symb. Ant. iv. 393 & viii. 418*. *S. dumosa Sw. Prodr. 101 (1788) & Fl. Ind. Occ. 1209*; *Macf. Jam. i. 82*; *E. G. Bak. tom. cit. 296*. Specimen from Wright in Herb. Mus. Brit. named by Swartz.

Wright! Macfadyen! McNab; Wilson! Prior! March! Porus, Hitchcock; Stony Hill, J.P. 683, Jenman! Grandvale, Westmoreland, 500 ft.; Negril sea-coast, Harris! Fl. Jam. 7071, 10,216.—Cuba, Hispaniola, Porto Rico, Martinique, Mexico to Colombia.

Undershrub, 3–8 ft. high. Leaves 4–11 cm. l.; petioles 1·5–7 cm. l.; stipules 7–10 mm. l., linear-awl-shaped or thread-like. Calyx 4·5–5 mm. l. with minute stellate hairs, 5-cornered in bud; lobes triangular, shortly acuminate with a long narrow tip. Petals 6–7 mm. l. and more, tawny yellow. Seeds about 1·3 mm. l., dark brown, glabrous but with very minute hairs near hilum.

13. *S. ciliaris L. Syst. ed. 10, 1145 (1759) & Amœn. v. 401, 380*; young branches covered with stellate or 2–4-armed adpressed hairs; leaves oblong, oblong-elliptical, or obovate, serrate above the middle, upper surface glabrous, but with simple hairs

in S. American specimens, covered beneath with stellate hairs; inflorescence terminal, flowers solitary or usually in umbelliform heads of 3-8, peduncle adherent to the petiole of the leafy bract; carpels 7-8 (5-6 in S. America), when ripe about 2 mm. l., tuberculate-spiny.—*Cav. Diss. i. 21, t. 3, f. 9*; *Sw. Obs. Bot. 257*; *Macf. Jam. i. 79*; *Griseb. op. cit. 73*; *K. Schum. tom. cit. 283*; *E. G. Bak. tom. cit. 141*; *Urb. Symb. Ant. iv. 388*; *Britt. & Millsp. Bah. Fl. 267*. *Malva minor supina betonicæ folio, flore coccineo &c. Sloane Cat. 96 & Hist. i. 217, t. 137, f. 2*. *Malva minima supina &c. Browne Hist. Jam. 282*.

Savannas, *Sloane Herb. iv. 49*! *Browne*! *Broughton*! *Swartz*! *Bancroft*! near Kingston, *McNab*! *Prior*! Liguanea plain, *Campbell*! Hope grounds, *Fawcett*! near Black River; near Spanish Town; *Harris*! *Fl. Jam. 6023, 8303, 9768, 12,044*.—Florida Keys, Bahamas, West Indies, Texas, Central and South America.

Perennial herb, woody at base. *Stems* several, 1-3 dm. l., prostrate or spreading. *Leaves* 6-13(-25) mm. l.; petiole as long as, or shorter than, the limb; stipules linear or linear-spathulate, ciliate, about as long as the petiole. *Calyx* 4-5 mm. l., lobes rather longer than the tube, triangular, hirsute. *Petals* usually purplish-red, sometimes yellow at tips. *Seeds* about 1.5 mm. in diam., dark brown, covered with minute adpressed hairs.

14. *S. cordifolia* *L. Sp. Pl. 684 (1753)*: stem and branches in upper parts, petioles, and peduncles minutely tomentose, sometimes also with long hairs, at length glabrate; leaves ovate, obtuse or acute, cordate, on both sides soft to the touch, minutely tomentose; inflorescence terminal and axillary, a crowded raceme or corymb or cluster, flowers sometimes solitary in the axils; carpels 7-12; ovary hairy on backs of lobes with minute converging spinules at apex with hairs pointing backwards, ripe carpels 3-4 mm. l., opening at apex, valves, back and sides net-veined, with 2 stiff bristles at apex about as long as the carpel, prolonged beyond the calyx, covered with short hairs pointing backwards.—*Griseb. op. cit. 76*; *Mast. in Fl. Trop. Afr. i. 181 & in Hook. f. Fl. Br. Ind. i. 324*; *K. Schum. tom. cit. 329, t. 62*; *E. G. Bak. tom. cit. 291*; *Small Fl. S.E. U.S. 770*; *Urb. Symb. Ant. iv. 391 & viii. 416*. *S. foliis cordato-ovatis &c. L. Fl. Zeyl. n. 254, 116*. *S. conferta Link Enum. Hort. Berol. ii. 207 (1822)*. *Althæa maderaspatana &c. Pluk. Phyt. t. 131, f. 2* (specimens in Herb. Sloane xcv. 2). *A. orientalis bidens &c. Pluk. Phyt. t. 356, f. 1* (specimens in Herb. Sloane xciii. 21 & xciv. 143). *Malva bicornis &c. Dill. Elth. 211, t. 171, f. 209*. Specimen in Herb. Linn. named by Linnæus. Specimen in Herb. Hermann in Herb. Mus. Brit.

Liguanea plain, *McNab*! Great Valley, Manchester, *Purdie*! Windward road, *Campbell*! *Fl. Jam. 5972*.—Florida and Keys, West Indies, tropical cont. America, trop. and subtrop. Africa and Asia.

Perennial herb or undershrub, erect, 1-5 ft. high. *Leaves* 3-5 (2-8)

cm. 1., serrate; petiole generally about half as long as the blade; stipules 5-7 mm. 1., thread-like, tomentose. *Peduncle* jointed, shorter or longer than the petiole. *Calyx* 6-7 mm. 1. in fl., 8 mm. 1. in fr., tomentose, tube 10-angled. *Petals* about 1 cm. 1., yellow-buff. *Seeds* about 2 mm. 1., somewhat cordate, dark brown, glabrous, but with very minute hairs near hilum.

Var. *althæifolia* Griseb. *loc. cit.* (1859); distinguished by absence of terminal spinules or bristles on ovary and fruit.—*S. althæifolia* Sw. *Prodr.* 101 (1788) & *Fl. Ind. Occ.* 1207; *L'Hér. Stirp.* v. 112 bis; *DC. Prodr.* i. 464; *Macf. Jam.* i. 81. *Althæa* flore luteo Sloane *Cat.* 96 & *Hist.* i. 218, t. 136, f. 2.

Old Harbour, Sloane Herb. iv. 53! Wright! Houstoun! common on dry plains and hills, Macfadyen! Lane! March! Prior! near Gordon Town, Ball! Liguanea plain, Clute!—Cuba, Hispaniola, Isle of Pines, Porto Rico, Yucatan, Cape Verde Is.

15. *S. salviaefolia* Presl *Rel. Haenk.* ii. 110 (1836); stem soft to the touch, tomentose with minute stellate hairs; leaves oblong, oblong-lanceolate to linear, usually obtuse, base rounded, soft to the touch and tomentose with very minute stellate hairs on both sides, 1-3-nerved; flowers solitary in the axils, becoming corymbose at apex; carpels 7-10, when ripe 3 mm. 1. (excl. bristles), hirtellous on upper part of back, broader below, with 2 long bristles at apex, bristles 2-2.3 mm. 1., covered with short hairs pointing backwards.—*K. Schum. tom. cit.* 338 (under *S. rhombifolia* L.) (1891). *S. erecta* Macf. *Jam.* i. 80 (1837); *Urb. Symb. Ant.* vi. 92. *S. spinosa* var. *angustifolia*, form Griseb. *op. cit.* 74 (1859). *S. angustissima* St. Hil. var. *Moritziana* K. Schum. *tom. cit.* 336 (1891). *S. spinosa* var. *salviaefolia* E. G. Bak. in *Journ. Bot.* xxx. 237 (1892). *S. angustissima* R. E. Fries in *Svenska Vetensk. Akad. Handl.* xlii. n. 12, 34 (1908) (with regard to specimens from Porto Rico to Colombia) (non St. Hil.). Specimen from Presl in Herb. Mus. Brit. Specimens from Macfadyen in Herb. Kew.

Liguanea plain, near Halfway Tree, Macfadyen! also McNab! also Campbell! Kingston, Prior! Long Mt. road, Harris! Fl. Jam. 6097, 10,000.—Porto Rico, St. Cruz, Margarita, Mexico, Colombia.

Perennial herb, 1-2 ft. high, erect, branches few. *Leaves* 1-5 cm. 1., serrulate; petioles rather short; stipules thread-like, soon falling. *Peduncle* short, usually longer than the petiole, jointed. *Calyx* 5-6 mm. 1., minutely tomentose, 10-ribbed, 5-angled; lobes acuminate or acute. *Petals* pale buff colour or yellowish-white veined with pale pink.

16. *S. rhombifolia* L. *Sp. Pl.* 684 (1753); young parts of branches, also peduncles, with very minute stellate hairs; leaves lanceolate, oblong, or rhomboid-oblong, wedge-shaped at base, 3-nerved, upper surface with minute stellate hairs or glabrate, minutely tomentose beneath; flowers solitary in the axils, rarely a flowering branch appearing much later than the original flower,

sometimes the terminal flowers become corymbose; carpels 10-14, when ripe 3-4 mm. l., with 1 or 2 beaks at apex, beaks glabrous or with very minute hairs.—*Wright Mem.* 291; *Griseb. op. cit.* 74; *Mast. in Fl. Trop. Afr.* i. 181 & in *Hook f. Fl. Brit. Ind.* i. 323; *K. Schum. tom. cit.* 337, t. 63; *E. G. Bak. tom. cit.* 239; *Small Fl. S.E. U.S.* 771; *Urb. Symb. Ant.* iv. 390 & viii. 415; *Britton Fl. Berm.* 236. *S. rudrata Macf. Jam.* i. 80 (1837). *Malvinda*



Fig. 46.—*Sida rhombifolia* L.

- A, Portion of branch with leaves and flowers $\times \frac{3}{4}$. C, Ditto seen from the back $\times 7$.
B, Ripe carpel seen from the side $\times 7$. D, Seed $\times 7$.

unicornis &c. *Dill. Elth.* 216, t. 172, f. 212. (Fig. 46.) Specimen in Herb. Linn. named by Linnæus. Specimen from Hort. Cliff. in Herb. Mus. Brit.

Wright! St. Mary, *McNab!* St. Ann, *Purdie!* Moncague, *Prior!* Port Morant; *Porus;* *Hitchcock;* J.P. 940, *Morris!* near Castleton, *Thompson!* Pen Hill, Port Royal Mts., 2500 ft.; *Troy,* 2000 ft.; *Harris!* Fl. Jam. 5802, 6742, 12,604.—Bermuda, N. Carolina to Texas and Florida, West Indies, warmer regions of the whole world.

Perennial herb, 1-3 ft. high, usually much branched. *Leaves* 2-8 cm. l. and more, serrate or crenulate above the base; *petioles* 3-5 mm. l.; *stipules* 4-5(-10) mm. l., narrowly linear; tubercles below the petioles occasionally occurring. *Peduncles* often nearly equalling the leaf, 2-3.5 cm. l., jointed above the middle. *Calyx* 6-7 mm. l., 10-angled, with very minute hairs, angles thickened at base. *Petals* yellow, sometimes with a purplish blotch at base. *Seeds* about 2 mm. l., brown, glabrous but with very short hairs near the hilum, somewhat cordate.

17. *S. acuta* *Burm. Fl. Ind.* 147 (1768); young parts of stem and branches together with petioles and peduncles usually with stellate and simple hairs; larger leaves unequal-sided, oblong-lanceolate to ovate or narrowly lanceolate, sometimes sub-acuminate, base rounded or wedge-shaped, 3(1)-nerved, at first with stellate and simple hairs, the stellate very minute on upper surface, mature leaves usually glabrate; flowers at first solitary, later accompanied by a flowering branch often more or less subsessile, with several flowers simulating a globose or umbellate inflorescence; carpels 7–12, when ripe 3–4 mm. l., with margins of back subcrested, sides net-veined, apex with 2 very short beaks, apex and beaks puberulous with very minute stellate hairs.—*Wight Ic. t.* 95; *Small Fl. S.E. U.S.* 771; *Urb. Synb. Ant. iv.* 389 & *viii.* 415. *S. acuta* *Burm. var. carpinifolia* *K. Schum. tom. cit.* 326 (1891); *E. G. Bak. tom. cit.* 238; *Robinson in A. Gr. Fl. N. Amer. i.* 324. *S. ulmifolia* *Mill. Dict. ed.* 8 (1768). *S. carpinifolia* *Linn. f. Suppl.* 307 (1781); *Griseb. op. cit.* 73; *Mast. in Fl. Trop. Afr. i.* 180 & *in Hook f. Fl. Brit. Ind. i.* 323; *Britt. Fl. Berm.* 236; *Britt. & Millsp. Bah. Fl.* 268. *S. stipulata* *Cav. Diss. i.* 22, *t.* 3, *f.* 10 (1785). *S. Balbisiana* *DC. Prodr. i.* 460 (1824). *S. trivialis* *Macf. Jam. i.* 78 (1837). *Althæa coromandeliana angustis* &c. *Pluk. Alm. Mant. fol.* 10, *pl.* 2 & *Phyt. t.* 334 (specimens in *Herb. Sloane xcii.* 10 & *xcix.* 53). *Malva erecta minor carpinifolia* &c. *Sloane Cat.* 96 & *Hist. i.* 218. Specimen from Madeira in *Herb. Mus. Brit.*, also Miller's type. The type of Miller's *S. hirsutissima* (*Dict. ed.* 8) in *Herb. Mus. Brit.* appears to be merely a hirsute form.

St. Jago de la Vega, *Sloane Herb. iv.* 51! *Wright! Swartz!* St. John, *Purdie!* Kingston; Moneague; Mt. Diablo; *Prior! March!* Kingston, *Clute!* Constant Spring; Bog Walk; Porus; Port Morant; *Hitchcock!* near Castleton, *Thompson!* Ton Bridge Pen, 400 ft. *Campbell!* Quarry, Spanish Town, *Harris!* *Fl. Jam.* 6238, 6422, 6759, 8088.—*S.* United States, Bermuda, Bahamas, West Indies, subtropical and tropical regions.

Perennial or annual herb or undershrub, 1–3 ft. high, erect or more or less prostrate, branching. *Leaves* 1·5–7 (9) cm. l., irregularly serrate; petioles 4–5 mm. l.; stipules 1–1·5 cm. l., sublanceolate to linear. *Calyx* 6–8 mm. l., often with minute stellate hairs and long simple hairs on margins and nerves, 10-nerved; lobes acuminate. *Petals* orange-yellow or white. *Seeds* glabrous but puberulous near hilum.

18. *S. linifolia* *Juss. ex Cav. Diss. i.* 14, *t.* 2, *f.* 1 (1785); young parts with simple, forked, or stellate hairs; leaves linear to lanceolate, long attenuate-acuminate, entire, 3-nerved, with simple or forked adpressed hairs on both sides; inflorescence a terminal corymb with sometimes 1 or 2 flowers together in the upper axils; carpels 7–9, when ripe about 2·5 mm. l., glabrous; apex, in still unripe state, hollowed so as to appear as if there were 2 small horns, but these are indistinct when ripe.—*Griseb. op. cit.* 76; *Mast. in Fl. Trop. Afr. i.* 179; *K. Schum.*

tom. cit. 292, *t.* 57; *E. G. Bak. tom. cit.* 140; *Urb. Symb. Ant. viii.* 413.

Hollis's savanna, Upper Clarendon, 2400 ft., *Harris!* Fl. Jam. 12,250.—Cuba, Is. of Pines, Hispaniola, Tobago, Trinidad, Central America, trop. S. America, trop. Africa.

Annual or biennial herb, 1-3 ft. high, becoming woody below. *Leaves* 2-6(-14) cm. l.; petioles 2-6 mm. l.; stipules 4-7 mm. l., linear or narrowly lanceolate. *Calyx* about 5 mm. l., pubescent. *Petals* nearly twice as long as calyx, white with dark purple base. *Seeds* scarcely 2 mm. l., brown, glabrous.

19. *S. troyana* *Urb. Symb. Ant. v.* 419 (1908); young parts of branches, also petioles and peduncles, with minute stellate hairs; leaves oblong-ob lanceolate, base blunt, serrulate but entire near base, upper surface glabrous, beneath minutely stellate-tomentose; flowers solitary in the axils, terminal often corymbose; carpels about 10, when ripe about 3 mm. l., with short beaks about .5 mm. l., glabrous.

Weed in pastures, near Troy, 2200 ft., *Harris!* Fl. Jam. 8805.

Undershrub, 3 ft. high, much branched. *Leaves* .5-2.2 cm. l.; petioles 2-3 mm. l.; stipules 3-4 mm. l., linear-awl-shaped. *Peduncles* 1-2 cm. l. *Calyx* united below the middle; lobes elliptical, prolonged into an awl-shaped tip, 3-3.5 (incl. tip) mm. l. *Petals* none. *Seeds* scarcely 1.5 mm. in diam.; minutely hairy near hilum.

The appearance of this specimen suggests that it may be perhaps a depauperate form of *S. rhombifolia* L. The only flowers present are small, apetalous, at the ends of the shoots.

7. BASTARDIA H. B. & K.

Herbs or undershrubs, with the habit of *Sida*, tomentose, viscous-glandular, foetid. Leaves cordate, entire or crenate-toothed; stipules thread-like, soon falling. Flowers axillary, yellow, solitary or 2 or 3 together, with a flowering branch developing later. Involucre wanting. Calyx 5-cleft. Ovary 5(8)-celled; ovules one in each cell, hanging, attached at the inner angle above; styles as many as the carpels. Capsule loculicidally 5(8)-valved; valves bearing the partition in the middle. Seeds hanging.

Species 6, natives of West Indies and trop. cont. America.

Capsule without beaks 1. *B. viscosa*.
Capsule-valves 2-beaked 2. *B. bivalvis*.

1. *B. viscosa* H. B. & K. *Nov. Gen. & Sp. v.* 256 (199) (1822).—*Griseb. Fl. Br. W. Ind.* 80; *Hemsl. Biol. Cent. Am. Bot. i.* 107; *K. Schum. in Fl. Bras. xii. pt.* 3, 360; *E. G. Bak. in Journ. Bot. xxxi.* 68; *Urb. Symb. Ant. iv.* 393 & *viii.* 419; *Britt. & Millsp. Bah. Fl.* 270. *B. parvifolia* H. B. & K. *tom. cit.* 255, *t.* 472 (1822). *Alcea populi folio villosa* &c. *Sloane Cat.* 98 & *Hist. i.* 222, *t.* 139, *f.* 4. *Sida fruticulosa* &c. *Browne Hist. Jam.* 280.

Sida viscosa L. *Syst.* *æ.* 1145 (1759) & *Amœn.* v. 402, 380; *L'Hér. Stirp.* 111 bis, t. 53 bis. Specimen from Browne in Herb. Linn. named by Linnæus. (Fig. 47, A.)

Sloane Herb. iv. 65 (in part)! *Houstoun!* *Browne!* *Wright!* *Masson!* *Rock Fort, McNab!* *Kingston, Prior!* Windward road, near Kingston; sea-coast, Liguanea plain; *Campbell!* Pedro Bluff, *Harris!* Fl. Jam. 5977, 6326, 9721.—Bahamas, West Indies, trop. cont. America.

Undershrub, 2-3 ft. high, much branched, young stems and branches and petioles soft to the touch, glandular-tomentose with scattered long simple hairs. *Leaves* 1-11 cm. l., ovate, usually acuminate, cordate, 5-7(9)-nerved, with minute teeth, on both sides soft to the touch and minutely tomentose or glabrescent; petioles about as long as the leaves

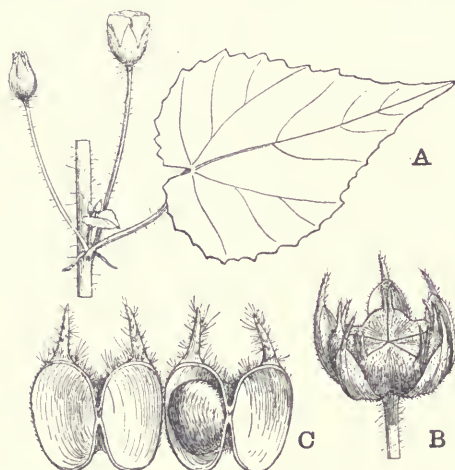


Fig. 47.—*Bastardia*.

A, Portion of flowering branch of *B. viscosa* H. B. & K., nat. size.

B, Capsule of *B. bivalvis* H. B. & K., $\times 2$.
C, Two valves of ditto $\times 4$.

or longer; stipules 2-3 mm. l. *Peduncle* long, 1-3 (.5-3.5) cm. l., puberulous. *Calyx* 3.5-4 mm. l., tomentose; lobes acuminate. *Petals* about 5 mm. l., tawny-yellow. *Capsule* 5-8-celled, very minutely tomentose; valves 3 mm. l., not beaked. *Seeds* 1.7 mm. l., somewhat heart-shaped, black, puberulous with white hairs.

B. bivalvis H. B. & K. *Nov. Gen. & Sp.* v. 255 (198) (*in Obs.*) (1822).—*Griseb. loc. cit.*; *K. Schum. tom. cit.* 363; *E. G. Bak. loc. cit.*; *Urb. Symb. Ant.* iv. 393 & viii. 419. *B. spinifex* Tr. & *Planch. in Ann. Sc. Nat. sér. 4, xvii.* 186 (1862). *Alcea populi folio incano* &c. *Sloane Cat.* 98 & *Hist. i.* 222, t. 139, f. 3. *Sida bivalvis* *Cav. Diss. i.* 13, t. 11, f. 3. *S. viscosa* *Macf. Jam. i.* 84 (excl. syn.) (non L.). *S. fragrans* *L'Hér. Stirp.* 111, t. 53 (1789). (Fig. 47, B, C.)

Sloane Herb. iv. 57 (in part), 64 (in part)! *Salt Ponds, Macfadyen!* *Four Mile Wood, St. David, Wilson!* *March!* *Kingston, Prior!* near Up

Park Camp, *Campbell!* Hope grounds, *Harris!* Fl. Jam. 6098, 6362, 8914.—Cuba, Hispaniola, Porto Rico, trop. S. America.

Herb or shrub to 3-4 ft. high; young stems and branches, petioles, and peduncles glandular-viscous with small stellate hairs and long simple hairs. *Leaves* 2-6 (1-13) cm. l., ovate, acuminate, cordate, 7-nerved, crenate, soft to the touch on both sides, puberulous with minute simple and stellate hairs on upper surface, thickly covered with short stellate hairs beneath; petioles half as long as blade or shorter; stipules 3-4 mm. l. *Peduncles* very short, 1-5 mm. l. *Calyx* 7-8 mm. l., tomentose; lobes acuminate with a thread-like acumen. *Petals* nearly 1 cm. l., pale yellow. *Capsule* 5-celled, puberulous; valves 3.5-4 mm. l., 2-beaked; beaks 1.5-2 mm. l. *Seeds* about 2 mm. l., ellipsoidal-globose, black, puberulous with scattered light-coloured hairs.

- § 2. Staminal column bearing anthers on the outside, the apex truncate or 5-toothed or -crenate. Style-branches 10. Carpels 5, separating when ripe from the axis or receptacle. Cotyledons as in § 1.

8. MALACHRA L.

Hispid herbs or shrubs; stems usually marked with a tomentose-pubescent line. Leaves palmately angled or lobed, with long petiole; stipules thread-like. Flowers yellow, white, or red, in dense axillary or terminal heads, with an involucre of leafy bracts. Bracts usually 3, but 5 or 6 in *M. radiata*, generally doubled down the middle, but flat in *M. radiata*, shortly stalked or sessile, 3-9-nerved, nerves and veins prominent beneath, but veins in *M. radiata* indistinct, each bract with 2 or 4 stipules; bracts wanting for the inner flowers, but stipules present, irregularly mixed with the flowers or wanting. Involucel of 9-12 bracteoles round single flowers in *M. radiata*, wanting in other species. Calyx usually increasing after flowering, 5-cleft or 5-parted; lobes 3-nerved. Ovary 5-celled, each with 1 ovule. Pericarp of ripe carpels membranous, with network of veins slightly prominent, splitting open below at the inner angle, 3-sided-obovate. Seeds of somewhat similar form to the carpel, but slightly smaller. Wild Ochra.

Species 9, natives of tropical and subtropical America, of which 1 or 2 are also widely dispersed in Asia and Africa.

Heads axillary.

Calyx 6-8 mm. l.

Outer bracts roundish. Calyx-lobes ovate-lanceolate. Petals 10 mm. l. 1. *M. capitata*.

Outer bracts broadly triangular. Calyx-lobes lanceolate, long-tipped. Petals 15 mm. l. 2. *M. alceaefolia*.

Calyx 4-5 mm. l.

Leaves undivided 3. *M. urens*.

Leaves 3-5-lobed 4. *M. fasciata*.

Heads terminal 5. *M. radiata*.

1. *M. capitata* L. *Syst. ed.* 12, 458 (1767); whole plant covered with very minute dense stellate hairs, usually forming tomentum on young branches and on under surface of leaves; stem with long white simple and stellate hairs; leaves: lower roundish, palmately sinuate or 5-lobed, upper 3-lobed or undivided, all at base obtuse, rarely subcordate; stipules

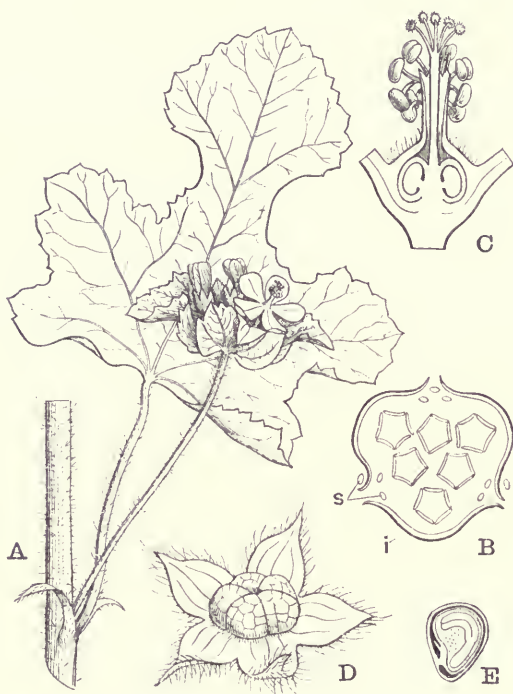


Fig. 48.—*Malachra capitata* L.

A, Leaf and head of flowers $\times 3$.

B, Plan of head of flowers: *i*, bracts of involucre enclosing 6 flowers; *s*, stipules of bracts.

C, Flower with perianth removed cut lengthwise, enlarged.

D, Fruit with the persistent calyx, enlarged.

E, Seed cut lengthwise $\times 3$.

(After A. Gray.)

5–15 mm. l.; heads 1–3 in upper axils; peduncle 1–7 cm. l.; bracts roundish to broadly ovate, apex acute, base cordate, entire or 1–2 teeth, to 2 cm. l., 2–5 cm. br.; calyx 6–8 mm. l., lobes ovate-lanceolate; petals yellow, 9–10 mm. l.—*Gürke in Engl. Bot. Jahrb.* xvi. 348 & in *Urb. Symb. Ant.* iv. 394 & viii. 420; *Small. Fl. S.E. U.S.* 772. *M. palmata* Moench. *Meth.* 615 (1794); *Griseb. Fl. Br. W. Ind.* 81. *M. mexicana* Schrad. in

Ind. Sem. Hort. Goett. (1830); *A. Gr. Gen.* ii. 74, t. 129. *Sida florum capitulis* &c. *L. in Act. Ups.* 1743, 137, t. 2 (1749); *Plum. Pl. Amer.* (Burm.) 162, t. 169, f. 1. *S. capitata L. Sp. Pl.* 685 (1753) & *Amœn. v.* 380. *S. hirta assurgens* &c. *Browne Hist. Jam.* 281. (Fig. 48.) Linnaeus's type in Herb. Linn.

In fl. and fr. Oct. to March; *Wright! Masson! Lucea, Hitchcock;* Green Island, roadside and along edges of pond, dry rocky hill, 200 ft., *Harris!* Fl. Jam. 10,252.—West Indies, as far south as Martinique, Texas to Panama.

Perennial herb, 2-6 ft. high. *Leaves*, lower 6-10 cm. l., shorter above; stipules two, rarely four. *Heads* with 3-6 flowers. *Bracts* somewhat hispid with hairs on upper surface and on nerves beneath, on both sides with very minute hairs, 7-9-nerved. *Carpels* 3-3.5 mm. l., blackish-brown, glabrous. *Seeds* slightly shorter.

2. *M. alceaefolia Jacq. Collect.* ii. 350 (1788) & *Ic. Rar.* iii. t. 549: stem, branches, petioles, and leaves usually with long rigid yellowish bulbous hairs, simple or stellate, besides with sparse very short stellate hairs; leaves: lower cordate at base, upper subcordate or rounded, all roundish or ovate, 3-5-angled or -lobed; stipules 10-15 (20) mm. l.; heads 3-7 in upper axils; peduncle 1-10 cm. l.; bracts broadly triangular, often somewhat 3-lobed, apex acute, base deeply cordate, margin sometimes toothed above, sinuate below, to 25 mm. l. and br.; calyx 6-7 (8) mm. l., membranous, whitish; lobes lanceolate, long tipped; tips and nerves reddish-brown; petals yellow, 15 mm. l.—*Gürke in Fl. Bras. xii. pt.* 3, 461, in *Engl. Bot. Jahrb.* xvi. 350, & in *Urb. Symb. Ant.* iv. 394 & viii. 420. *M. capitata Car. Diss.* ii. 97, t. 33, f. 1 (1786) (excl. vars.); *Macf. Jam.* i. 59; *Griseb. tom. cit.* 80 (non *L.*). *M. rotundifolia Schrank Pl. Rar. Hort. Mon.* t. 56 (1819). *Malva aspera major* &c. *Sloane Cat.* 96 & *Hist. i.* 217, t. 137, f. 1.

In fl. and fr. Aug.-March; in watery places of savannas and by riversides, *Sloane* Herb. iv. 48! *Macfadyen!* Guys Hill, St. Mary, *Purdie!* Mt. Diablo, *Prior!* Ferry, Liguanea plain, *Campbell!* also *Harris!* Lucea, *Hitchcock;* Negril, *Harris!* Fl. Jam. 6159, 6176, 8277, 9050, 10,215.—West Indies, Panama to Guiana.

Perennial, 1½-6 ft. high. *Leaves* 12-3 cm. l. and br., margin irregularly crenate-toothed with large teeth, on both sides rough, 5(3)-nerved. *Bracts* on upper surface and on nerves beneath with scattered long rigid hairs, besides at the base and along the nerves with very minute stellate hairs, 7-nerved. *Calyx*, tip and nerves on both sides hispid with long rigid hairs. Ripe *carpels* 3-3.5 mm. l., puberulous, rarely glabrous.

3. *M. urens Poit. in Ledeb. & Adlerstam Diss.* 22 (1805) & *Schrad. Neu. Journ. Bot.* ii. 293 (1807); stem, leaves, and petioles with rather few rigid yellowish bulbous hairs, simple or sometimes stellate, below glabrescent; leaves ovate to lanceolate, undivided, occasionally angled near base; stipules 5-10 mm. l.; heads solitary (-2) in the upper axils, subsessile or short stalked;

bracts triangular, long acuminate, base deeply cordate, margin bristly-toothed, to 15 mm. l., 7-8 mm. br.; calyx 4-5 mm. l., longer after flowering, membranous, whitish; lobes lanceolate, long tipped; tips and nerves reddish-brown; petals orange-coloured or red, 12 mm. l.—*Griseb. op. cit.* 81; *Gürke in Engl. Bot. Jahrb. xvi.* 352 & in *Urb. Symb. Ant. iv.* 395 & *viii.* 420; *Small loc. cit.* *M. ciliata* Poir. in *Lam. Encyc. Suppl. iii.* 578 (1813).

Masson! Swartz! Distin! Port Morant, Hitchcock.—Florida Keys, Cuba to Porto Rico, Central America.

Perennial herb, about 1½ ft. high. *Leaves* 3-6 (2-9) cm. l., obtuse or somewhat acute at apex, obtuse rarely subcordate at base, with teeth large ending in a bristle, on both sides generally rough. *Bracts* 3-5(7)-nerved. *Ripe carpels* about 3 mm. l., puberulous. *Seeds* about 2.5 mm. l., black.

4. *M. fasciata* Jacq. *Coll. ii.* 352 (1788) & *Ic. Rar. iii. t.* 548; the whole plant, and especially the inflorescences, hispid with long very rigid yellowish bulbous hairs, simple or stellate; leaves: lower 5-lobed (or -parted), upper 3-lobed or undivided and lanceolate, all obtuse at base; stipules to 20-30 mm. l.; inflorescence very hispid with rigid yellow hairs; heads axillary, peduncle 5-15 mm. l.; bracts ovate or broadly triangular, apex long acuminate, base subcordate, sometimes toothed, often ciliate, or above entire, below with 1 or 2 very large teeth on each side, to 25 mm. l., 20 mm. br.; calyx 4-5 mm. l., lobes lanceolate, long tipped, whitish with nerves and tip brown; petals white, reddish outside before flowering, 10 mm. l.—*Gürke in Fl. Bras. xii. pt.* 3, 463, *t.* 81, in *Engl. Bot. Jahrb. xvi.* 353 & in *Urb. Symb. Ant. iv.* 395. *M. humilis* Benth. *Pl. Hartw.* 113 (1843) & *Bot. of Sulph.* 70. *M. radiata* Griseb. *loc. cit.* (non L.).

In fl. and fr. Nov.-Jan.; *Wright! Masson! Distin! Orange Bay morass, Hanover; cane-fields, Vere Common; Purdie! Wilson! Prior! March!*—West Indies (but not reported from Hispaniola), trop. cont. America.

Shrubby perennial herb, 2-9 ft. high. *Leaves:* lower 10-15 cm. l., upper gradually smaller, margin serrate irregularly with large teeth, on both sides hispid with simple rigid adpressed bulbous hairs, 5-3-nerved. *Bracts* 3-5-nerved. *Ripe carpels* 3-3.5 mm. l., reticulate. *Seeds* brown, 2.5 mm. l.

"Admirably adapted for use as a fibre plant" (Wilson ex Griseb. *loc. cit.*). Host-plant for "cotton-stainer" (*Dysdercus saturellus*) in Montserrat.

5. *M. radiata* L. *Syst. ed.* 12, 459 (1767); the whole plant hispid with very rigid long yellowish bulbous stellate hairs; leaves palmately 5-3-parted, base cordate, segments narrowed at the base, oblong, often 3-lobed or cut into strips; stipules 10 mm. l.; heads terminal; bracts roundish-ovate obtuse or acuminate, tip sometimes oblong, base obtuse, serrate-toothed, not folded together; involucre of 9-12 thread-like segments; calyx herbaceous, 8-10 mm. l., longer after flowering; lanceolate-ovate, acute; petals pink, 11-13 mm. l.—*Cav. Diss. ii.* 98, *t.* 33, *f.* 3; *Mast. in Fl. Trop. Afr. i.* 188; *Gürke in Fl. Bras. xii. pt.* 3.

467, t. 83, f. 1, in *Engl. Bot. Jahrb. xvi.* 358 & in *Urb. Symb. Ant. viii.* 421. *M. capitata* Wright *Mem.* 288 (non L.). *Sida radiata* L. *Sp. Pl. ed.* 2, 965 (1763). *S. foliis palmatis* &c. *Plum. Pl. Amer. (Burm.) t.* 19.

Wright!—Cuba, Hispaniola, Central and trop. S. America, trop. Africa.

Perennial shrubby herb, 3-8 ft. high. *Leaves*: lower 12 cm. l., upper gradually smaller, margin serrate with large teeth, on both sides with rigid stellate adpressed hairs or on upper surface glabrescent, 5-3-nerved. *Bracts* on both sides with rigid adpressed hairs, stellate beneath but usually simple on upper surface, 5-7-nerved. Ripe *carpels* 4 mm. l., reticulate, glabrous, minutely warted. *Seeds* 3 mm. l., brown.

A kind of flax is obtained from the bark. (Wright.)

9. URENA L.

Herbs or undershrubs. Leaves usually angled or lobed, with 1-3 long narrow split glands at base of median nerves beneath; stipules awl-shaped. Flowers solitary or in small clusters, axillary. Bracteoles united into a 5-cleft involucre, adhering to the calyx-tube. Calyx 5-cleft. Petals obliquely obovate or obovate, usually pink. Staminal tube about as long as the petals, wider at the base, columnar, bearing anthers below the truncate apex. Each cell of the ovary with one ascending ovule. Ripe carpels 5, not splitting open, armed with barbed spines in New World species. Seeds ascending. Bur Mallow, Indian Mallow.

Species 6, of which 2 are natives of the tropics generally, the rest natives of tropical Asia and Australia.

Leaves more or less angled, or often lobed with narrow bays, rarely cleft as far as middle..... 1. *U. lobata*.

Leaves lobed with roundish bays, cleft to and beyond the middle..... 2. *U. sinuata*.

1. *U. lobata* L. *Sp. Pl.* 692 (1753); *Cav. Diss. vi.* 336, t. 185, f. 1; *Descourt. Fl. Ant. iv.* 176, t. 271; *Bot. Mag. t.* 3043; *St. Hil. Pl. Us. t.* 56; *Griseb. Fl. Br. W. Ind.* 81 (with vars.); *Gürke in Fl. Bras. xii. pt.* 3, 469, in *Engl. Bot. Jahrb. xvi.* 370 (with vars. *Sicartzii*, *americana*, and *viminea*) & in *Urb. Symb. Ant. iv.* 395 & *viii.* 421; *Watt Dict. Econ. Pr. Ind.*; *Small Fl. S.E. U.S.* 773. *U. foliis* &c. *Browne Hist. Jam.* 281. *U. americana* Linn. *f. Suppl.* 308 (1781). *U. viminea* *Cav. Diss. vi.* 335, t. 184, f. 1 (1788). *U. sinuata* *Sic. Obs. Bot.* 263 (1791) (non L.). *U. reticulata* *Macf. Jam. i.* 59 (1837) (non *Cav.*). *Malva vel alcea fruticosa ribesii* &c. *Sloane Cat.* 96 & *Hist. i.* 37, t. 11, f. 2 (specimen from Barbados). (Fig. 49.) Specimen in Herb. Linn. named by Linnaeus.

Broughton! *Distin*! McNab! hills near Kingston; Moneague; *Prior*! *March*! Blue Mt. Peak; Lucea; Porus; *Hitchcock*; J.P. 1060 *Morris*!

near Castleton, 700 ft.; Prospect Hill, 2000 ft.; Brandon Hill, 1200 ft.; *Thompson!* near Ewarton, 950 ft.; near Troy, 2200 ft.; *Harris!* Knowley Park, Devon, 2550 ft.; *Miss H. A. Wood!* Fl. Jam. 6618, 6756, 8034, 8077, 8798.—Florida, West Indies, warmer regions of the world.

Stem 1-4 (6) ft. high, somewhat shrubby, usually tomentose with stellate hairs. *Leaves* 3-8 (-12) cm. l., varying much in form—roundish or ovate to lanceolate, more or less angled, sinuate, or often lobed (with narrow bays, rarely cleft as far as the middle), margin unequally serrate, 3-9-nerved, on both sides hairy or more or less tomentose, with 1 or 3

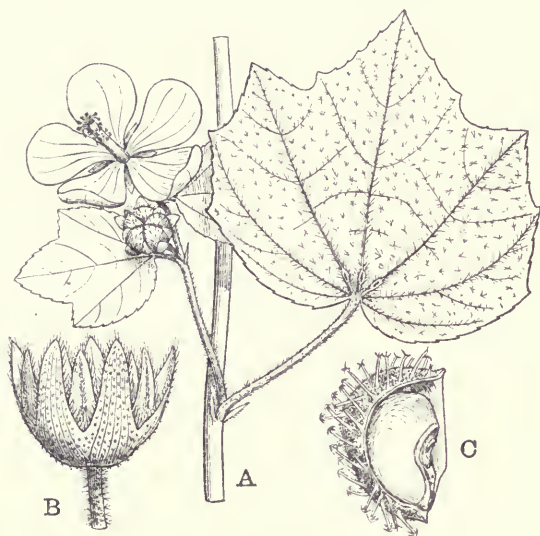


Fig. 49.—*Urena lobata* L.

A, Portion of flowering branch, showing under side of leaf, flower, and young fruit $\times \frac{2}{3}$.

B, Involucre and calyx $\times 2\frac{1}{2}$.

C, A single ripe carpel cut open, showing the seed $\times 3\frac{1}{2}$.

glands beneath. *Involucre* 5-7 mm. l. in fl. *Calyx* 5-7 mm. l., usually shorter than the involucre. *Petals* 2 or 3 times as long as the calyx. *Staminal tube* 15-18 mm. l. *Ripe carpels* about 6 mm. l. *Seeds* about 3.5 mm. l.

The bark of this and the following species yields a good, easily extractable fibre, which is considered suitable for the manufacture of sacking and twine, and a fair substitute for flax. (Watt.)

2. *U. sinuata* L. *Sp. Pl.* 692 (1753) & *Amoen. v.* 380; *Cav. Diss. vi.* 336, t. 185, f. 2; *Griseb. loc. cit.*; *Gürke in Fl. Bras. xii. pt. 3*, 472, in *Engl. Bot. Jahrb. xvi.* 377 & in *Urb. Symb. Ant. iv.* 396. *U. americana* var. *Wright Mem.* 287 (1787) (non *Linn. f.*). *U. aculeata* Mill. *Dict. ed. 8.* *U. Swartzii* Macf. *Jam. i.* 60 (1837) (excl. syn.) (non *DC.*). *Alcea indica* &c. *Pluk. Phyt. t. 5, f. 3* (specimen in Herb. Sloane xcv. 22). Type specimen in Herb. Hermann in Herb. Mus. Brit. Specimen

in Herb. Linn. named by Linnæus. Miller's type in Herb. Mus. Brit.

Wright! Distin! Moneague, Prior! March; Bog Walk, Hitchcock; Trinityville, 2000 ft.; Ewarton, 950 ft.; Harris! Fl. Jam. 6034, 6616.—West Indies, Panama, Colombia, Venezuela, Is. of east Africa, south and east Asia.

Plant much like *U. lobata* but smaller in all parts, and leaves all deeply lobed. *Stem* 1–3 ft. high, rather pubescent than tomentose above. *Leaves* 2–6 cm. l., all 3–5-parted to or beyond the middle, lobes narrowed at the base, bays roundish, 1–5-nerved, usually with 3 split glands beneath. *Involucel* 4–6 mm. l., in fl. *Calyx* 4–5 mm. l. *Petals* 3 or 4 times as long as calyx. *Staminal column* 12–17 mm. l.

10. PAVONIA Cav.

Undershrubs or shrubs (rarely herbs), glabrous or variously hairy, sometimes with a line of dense minute hairs from node to node. Leaves usually with pellucid dots, entire, serrate, angled, or lobed. Stipules usually linear-awl-shaped. Flowers solitary in upper axils, or forming, with non-development of leaves, racemes, corymbs, or panicles at the ends of branches. Bracteoles of involucel 4 to many, usually herbaceous, free or more or less united with each other and with the base of the calyx. Calyx 5-cleft or 5-parted. Petals yellow, white, or rose. Staminal tube with filaments springing in the upper two-thirds or half. Ovary-cells with 1 ovule. Style with 8–10 short branches at apex; stigmas thick. Ripe carpels with, or without, 3–1 spines at apex, more or less 2-valved, occasionally not opening.

Species about 100, most natives of South America, the West Indies, Central America, and the warmer regions of North America, a few in Africa, tropical Asia, and the Polynesian Is., one also of the S. American species occurring in Australia.

Carpels armed with 3 spines.

Flowers solitary in axils. Petals 2–3 cm. l. ... 1. *P. spinifex*.

Flowers in terminal dense heads. Bracts ovate-lanceolate 2. *P. fruticosa*.

Flowers in terminal lax heads or corymbs (5–20 flowers). Bracts linear-lanceolate . 3. *P. rosea*.

Flowers solitary in axils and in few (3–4)-flowered corymbs. Petals 1–1.5 cm. l. ... 4. *P. pseudo-typhalea*.

Carpels without spines.

Branchlets with glandular hairs 5. *P. paniculata*.

Glandular hairs absent 6. *P. spicata*.

1. *P. spinifex* Cav. *Diss. iii.* 133, *t.* 45, *f.* 2 (1787); leaves ovate or oblong-ovate, more or less acuminate, base rounded to cordate; flowers solitary in the axils of the leaves, sometimes 2 or 3 close together at the apex; petals 2–3 (4) cm. l.; carpels with 3 spines at apex, diverging and bearing stiff hairs pointing backwards; 3 ribs running from the spines to the base, back transversely wrinkled.—*Wright Mem.* 287; *Bot. Reg. t.* 339;

Macf. Jam. i. 61; *Griseb. Fl. Br. W. Ind.* 82; *Gürke in Fl. Bras. xii. pt.* 3, 480, *t.* 85; *Small Fl. S.E. U.S.* 773; *Urb. Symb. Ant. iv.* 396; *Britt. Fl. Berm.* 237; *Britt. & Millsp. Bah. Fl.* 270. *P. aristata Cav. loc. cit. t.* 45, *f.* 3 (1787). *P. communis St. Hil. Fl. Bras. Merid. i.* 224 (1825). *Hibiscus foliis cordatis &c. Plum. Pl. Amer. (Burm.) t.* 1 & *Ic. ined. iii.* 174. *H. spinifex L. Syst. ed.* 10, 1149 (1759); *Jacq. Sel. Stirp. Amer.* 196 & *Hort. Vindob. t.* 103. (Fig. 50.) Specimen without flowers and fruit in Herb. Linn. named by Linnæus.

Spur Bur.

Wright! sparingly in limestone districts; Halberstadt; road from Springvale to St. Johns; *Macfadyen! Distin*; Great Valley, Manchester,

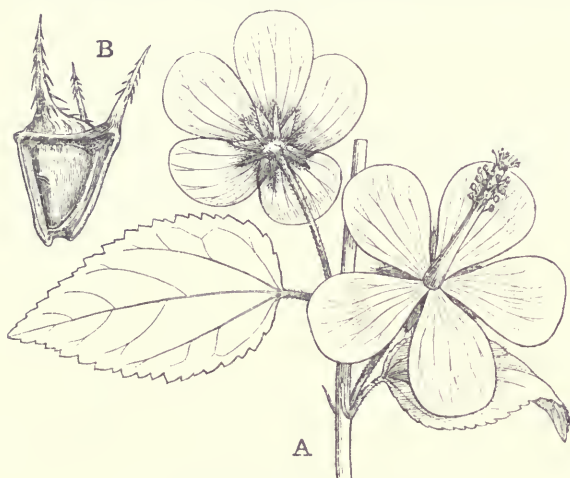


Fig. 50.—*Pavonia spinifex* Cav.

A, Portion of flowering branch $\times \frac{2}{3}$.

B, Fruit with one side cut away to show the seed $\times 2\frac{1}{2}$.

Purdie! Moneague, Prior! March! Porus, Hitchcock; near Alligator Pond, 50 ft.; Spring, Trelawney, 500 ft.; near Balaclava; Lititz, Manchester, 800 ft.; *Harris! Fl. Jam.* 7270, 8170, 12,445.—Bermuda (introduced), Southern U. States, Bahamas, W. Indies, tropical continental America.

Undershrub, 2-15 ft. high, simple or with a few trailing branches (2-3 ft. l.), glabrous or with small stellate hairs. *Leaves* 12-4 (or less) cm. l., serrate or crenate with large irregular teeth, both sides with a few stellate hairs or glabrous, 3-5-nerved; petioles 1-3 cm. l. above, longer (to 6 cm.) below; stipules 7-10 mm. l. *Peduncles* 1-5 (7) cm. l. *Involucel* with 5-8 oblong-linear bracteoles about as long as the calyx. *Calyx* 5-parted to two-thirds down, cup-shaped at base, 9-12 mm. l. *Petals* yellow. *Staminal tube* usually longer than the petals. *Ripe carpels* 4-5 (6) mm. l., not opening; spines 5-10 mm. l.

The species of this genus are fibre plants, yielding a fairly strong flax or hemp; they are also emollient. (Wright.)

2. *P. fruticosa* *comb. nov.*; leaves oblong-elliptical to lanceolate or elliptical, rarely obovate- or oblanceolate-elliptical, apex somewhat acuminate, base wedge-shaped or obtuse to rounded; flowers crowded into a head at apex of stem and floral branches, rarely solitary; bracts at base of heads mostly ovate-lanceolate, 6–8 mm. l., 2–2.5 mm. br.; bracteoles of involucre ovate; carpels with 3 spines close together at apex, with stiff hairs pointing backwards, back smooth, with a very slender median rib.—*P. typhalea* *Car. Diss. iii.* 134 (1787) & *vi.* 350, *t.* 197; *Gürke tom. cit.* 483, *t.* 87, *f.* 1; *Urb. Symb. Ant. iv.* 397 & *viii.* 422. *P. typhaleoides* *H. B. & K. Nov. Gen. & Sp. v.* 279 (1822); *Griseb. op. cit.* 82. *Urena fruticulosa* & *Broene Hist. Jam.* 281. *U. Typhalea* *L. Mant.* 258 (1771); *Sw. Obs.* 264. *Sida fruticosa* *Mill. Dict. ed.* 8 (1768). Miller's type in Herb. Mus. Brit.

Broughton! Shakspear! St. Mary, McNab! Moneague, Prior!—Cuba, Hispaniola, Porto Rico, St. Vincent, Tobago, Trinidad, Central and S. America.

Undershrub, 3–6 ft. high, simple or occasionally with a few branches; stem and branches with stellate hairs above. *Leaves* 20–5 cm. l., serrate or crenate with large irregular teeth, 1–3-nerved, on both sides with minute stellate hairs; petioles 5–1 cm. l.; stipules 5–10 mm. l. *Flowers*, heads 5–15(20)-flowered. *Involucre* with 5(–8) bracteoles united for one-fourth of their length, 8–10 mm. l., 2–4 mm. br. *Calyx* 5-cleft to halfway down, cup-shaped at base, 5–7 mm. l. *Petals* 12–13 mm. l., white. *Staminal tube* shorter than the petals. *Carpels* 5–6 mm. l., 3-sided, opening from base; the median spine 5–7 mm. l., lateral 3–4 mm. l. *Seed* brown, about 4.5 mm. l.

3. *P. rosea* *Schlecht. in Linnæa xi.* 355 (1837); leaves oblanceolate to obovate- or oblong-elliptical or elliptical, apex usually acute or somewhat acuminate, base wedge-shaped or obtuse; peduncles 3–10 cm. l.; pedicels 5–10 mm. l.; flowers crowded into a corymb or loose head at apex of stem and floral branches, rarely solitary—corymbs or heads with 5–20 flowers; bracts 1–3, at base of pedicels linear-lanceolate or linear, 5–7 mm. l., .5–1 mm. br.; bracteoles of involucre linear or linear-lanceolate; carpels with 3 spines, one at apex, one at each side springing from the margin distant from the median spine 1 mm. below, hairs on spines pointing downwards, back smooth with a very slender median rib.—*Gürke tom. cit.* 484, *t.* 87, *f.* 2. *P. typhalea* *Macf. Jam. i.* 61 (1837); *Griseb. loc. cit.* (non *Cav.*).

Wright! Bancroft! common, Macfadyen; moist woods St. Thomas in the Vale, and everywhere, Purdie! Wilson! Rio Cobre, Prior! March! Content road, Campbell! Lennox hill, 300 ft.; Pittsfield; Keith Hall, 2400 ft.; Thompson! Bethlehem, St. Elizabeth, T. J. Harris! Castleton, 490 ft., Harris! Fl. Jam. 6471, 6740, 7977, 8286, 11,875.—Tropical continental America.

Undershrub, 2–6 ft. high, simple or scarcely branching except in the inflorescence; young stem and petioles covered with stellate hairs. *Leaves*

20-4 cm. l., serrate or crenate with large irregular teeth, 1-3-nerved, on both sides rough with minute stellate hairs or glabrescent; floral leaves much smaller, linear-oblong; petioles 4-1 cm. l.; stipules 7-10 mm. l. *Involucel* of 6-8(-10) bracteoles, united for about one-fourth of their length and with the calyx, 5-10 mm. l., 5-1.5 (2) mm. br. *Calyx* 4-5 mm. l., 5-cleft halfway down, cup-shaped at base. *Petals* 10-13 mm. l., of a pale rose colour or white. *Staminal tube* shorter than the petals. *Carpels* about 6 mm. l.; median spine to 9 mm. l., the others shorter.

4. *P. pseudo-typhalæa* Planch. & Lind. ex Tr. & Planch. in *Ann. Sc. Nat. sér. 4, xvii.* 160 (1862); leaves oblong-elliptical or lanceolate, apex acute or slightly acuminate, narrowed to the base or rounded; pedicels 1-3 cm. l.; bracts awl-shaped 6-8 mm. l.; flowers solitary, axillary or crowded into a corymb—corymbs with 3-4 flowers; bracteoles of involucel linear; carpels not seen.—*Gürke tom. cit.* 486; *R. E. Fries in Svensk. Vetensk. Handl. xlii.* 42.

Swartz (fide R. E. Fries).—Colombia.

Undershrub; young stem and petioles covered with stellate hairs. *Leaves* 6-16 cm. l., serrate with large teeth, 1-3-nerved, on upper surface more or less glabrate, beneath rough with stellate hairs; petioles 5-3 cm. l.; stipules awl-shaped, linear, 8-10 mm. l. *Involucel* of 10 bracteoles, 7-9 mm. l., united for about one-third of their length. *Calyx* 5-6 mm. l. *Petals* 12-15 mm. l. *Staminal tube* shorter than petals.

5. *P. paniculata* Cav. *Diss. iii.* 135, *t.* 46, *f.* 2 (1787); leaves ovate, angled or subtrilobed, apex and lobes acute or long acuminate, base cordate; flowers solitary in the axils of the upper leaves, or usually the uppermost leaves not developed and the flowers crowded into a compound corymb or a panicle; carpels without spines or with one very short weak spine at apex, back with a few transverse markings, edges sharp and rough.—*Gürke tom. cit.* 504, *t.* 96, *f.* 1; *Urb. Symb. Ant. iv.* 398 & *viii.* 423. *P. corymbosa* Willd. *loc. cit.* (1801); *Macf. Jam. i.* 62; *Griseb. Fl. Br. W. Ind.* 83. *P. scabra* Presl *Reliq. Hænk. ii.* 129 (1836). *Althæa corymbosa* Sw. *Prodr.* 101 (1788) & *Fl. Ind. Occ.* 1213. Specimen from Peru from Cavanilles in Herb. Mus. Brit.; also a specimen from St. Vincent named by Swartz.

Recorded for Jamaica by Swartz (*Fl. Ind. Occ.* 1213), but no specimen seen by us from that island.—Hispaniola, Porto Rico, Guadeloupe, tropical continental America.

Undershrub, 1-4 ft. high; stem and branches with glandular and stellate hairs, sometimes also with long simple spreading hairs. *Leaves* 12-3 cm. l., crenate or serrate, 7-(9)-nerved, on upper surface pubescent with stellate hairs on nerves and veins or glabrescent, beneath pubescent; petioles 5-2(-10) cm. l.; stipules lanceolate, 10-5 mm. l. or less. *Involucel* with 7-12 linear free bracteoles, twice as long as calyx, 9-13 mm. l., hispid with long simple hairs. *Calyx* 5-cleft to halfway, cup-shaped at base, 5-8 mm. l., hispid with long simple hairs. *Petals* twice as long as the calyx, yellow. *Staminal tube* 5-6 mm. l., bearing long filaments from base to apex. Ripe *carpels* 3-4 mm. l., blackish-brown, 3-cornered. *Seeds* about 2.5 mm. l., kidney-shaped, striate on the back.

6. *P. spicata* Cav. *Diss. iii.* 136, *t.* 46, *f.* 1 (1787); leaves broadly ovate or sometimes roundish, acuminate with a narrow tip, base cordate; flowers in a terminal raceme, sometimes somewhat crowded and subcorymbose at apex; carpels with edges of back sharp, with 3 projections at apex, back sometimes crested in middle at apex, the median projection forming part of the crest.—*Urb. Symb. Ant. iv.* 397 & *viii.* 423. *P. racemosa* Sw. *Fl. Ind. Occ.* 1215 (1800); *Macf. Jam. i.* 62; *Griseb. Fl. Br. W. Ind.* 83; *Small Fl. S.E. U.S.* 773. *Alcea fruticosa aquatica* &c. *Sloane Cat.* 97 & *Hist. i.* 221, *t.* 139, *f.* 2. *Althaea uliginosa frutescens* &c. *Browne Hist. Jam.* 284. *Althaea racemosa* Sw. *Prodr.* 102 (1788). *Malache scabra* B. Ch. *Vogel in Trev Pl. Sel.* 50, *t.* 90 (1772); *Britt. in Bull. Torr. Bot. Cl. xxx.* 344; *Britt. & Millsp. Bah. Fl.* 271.

Smaller Mahoe.

Houstoun! Banks of Salt River and Fresh River, *Sloane Herb.* iv. 63! *Wright!* Rock Fort, *Broughton!* *Shakspear!* *Bancroft!* salt marshes; Rock Fort near Kingston; *Macfadyen!* also *McNab!* St. Mary; between Buff Bay and Annotto Bay; St. Catherine; *McNab!* *Distin!* sea-coast, Westmoreland; interior of St. Ann; *Purdie!* sea-side, St. Thomas in the East and Portland, *Wilson!* Ocho Rios, *Prior!* *March!* sea-side near Jackson Town, *Miss A. Moulton Barrett!* Port Antonio, *Hitchcock!* sea-coast near Falmouth; Ferry River, Liguanea plain; *Harris!* *Fl. Jam.* 7225, 8629.—Florida, Bahamas, West Indies, tropical continental America.

Shrub, 3-16 ft. high; young branches, petioles, peduncles, and pedicels tomentose with small stellate hairs, older parts glabrescent. *Leaves* 6-13(-18) cm. l., entire or sinuate, often with a few minute teeth, 5-7-nerved, on both sides especially near the base with small stellate hairs or glabrate; petioles 2-9 cm. l.; stipules linear-lanceolate, 6-13 mm. l. *Bracts* similar to stipules, to 16 mm. l. *Involucel* with small stellate hairs, dense at base, with 8 (6-10) lanceolate or oblong-lanceolate bracteoles, 9-11 mm. l., 2-3.5 mm. br. at base. *Calyx* covered with small stellate hairs, 5-cleft to halfway, cup-shaped at base, 12-13 mm. l. *Petals* 16-22 mm. l., greenish-yellow. *Staminal tube* 15 mm. l., with filaments on the upper half or uppermost quarter; filaments about 4 mm. l. *Ripe carpels* 9-11 mm. l., light brown, 3-cornered, opening along the inner median line, back with one rib and a very few transverse and longitudinal raised lines. *Seeds* about 5 mm. l., kidney-shaped, striate on the back.

Var. troyana *Urb. Symb. Ant. v.* 530 (1908) & *vi.* 92 (as var. of *P. racemosa* Sw.); involucel-leaves to 5 mm. br. at base; edges of the carpels more or less expanded into wings; shrub 10-15 ft. high, or tree 20 ft. *Pavonia troyana* *Urb. in Fedde Rep. Sp. Nov. xiii.* 459 (1914). *Malache troyana* *Britt. tom. cit.* 345 (1908).

Near Troy, 1400 ft.; Peckham woods, Upper Clarendon, 2500-2800 ft.; Ipswich, St. Elizabeth, 900 ft.; *Harris!* *Fl. Jam.* 9457, 10,868, 10,964, 12,364, 12,775. The specimens from Peckham have carpels not winged.

11. MALVAVISCUS Dill. ex Adans.

Shrubs or undershrubs; twigs variously hairy or glabrous, but with 1 or 2 dense lines of hairs from one node to another.

Leaves entire or toothed, sometimes angular-lobed, variously hairy or glabrous, usually with pellucid dots; stipules linear or awl-shaped. Flowers in axils of upper leaves, solitary or, if uppermost leaves undeveloped, becoming corymbose or racemose. Bracteoles of involucre 5 or more, generally linear. Calyx somewhat campanulate, 5-cleft with sometimes 2 or 3 lobes united. Petals 5, somewhat obovate, unequal-sided, red, convolute into a tube. Staminal tube longer than the petals, spirally 10-striate. Ovary 5-celled, cells with one ovule; style 10-cleft, stigmas capitate. Fruit fleshy outside, berry-like; carpels separating later, not opening. Seeds ascending.

Species 12 or more, natives of tropical and subtropical America, including the West Indies.

M. Sagræanus Rich. in *Sagra Cub.* x. 46, t. 14 (1845); *Britt. & Millsp. Bah. Fl.* 271. *M. arboreus* Desc. *Fl. Ant.* vi. 11, t. 383 (1828); *Macf. Jam.* i. 63; *Griseb. Fl. Br. W. Ind.* 83 (incl. vars.) (non Cav.). *M. arboreus* var. *Sloanei* E. G. *Bak. in Journ. Bot.* xxxvii. 345 (1899). *M. pilosus* *Macf. Jam.* i. 64 (excl. syn. *Sw.*). *Althæa jamaicensis* *arborea* &c. *Pluk. Alm.* 24, *Phyt.* t. 259, f. 3. *Malva arborea* *folio* &c. *Sloane Cat.* 96 & *Hist.* i. 216, t. 136, f. 1. *Hibiscus frutescens* &c. *Browne Hist. Jam.* 284. *H. malvaviscus* *L. Amæn.* v. 380 (1760) & *Herb.* (as regards specimen from Browne) (non *Sp. Pl.*). *Achania Malvaviscus* *Sw. Prodr.* 102 (1788) & *Fl. Ind. Occ.* 1222 (excl. syn. *Linn. & Cav.*); *Wright Mem.* 289. (Fig. 51.) Specimen from Browne named *H. Malvaviscus* in Solander's hand. Plukenet's specimen in *Herb. Mus. Brit.*

Sugar Bark, Morass Bark, Mahoe Rose.

Houstoun! Browne! Wright! Broughton! Bancroft! Macfadyen! banks of Wag Water, *McNab! Distin! Great Valley, Manchester, Purdie! Lane! Wilson!* hills, St. Andrew; Mt. Diablo; *Prior! March!* Catherine's Peak, 3500 ft., *Eggers!* thickets, Blue Mts., J.P. 1032, *Morris! Hart!* Ward's Rock, 700 ft., *Thompson!* Stony Hill, 1100 ft.; Red Hills, 1000 ft.; Walderston, 2600 ft.; *Harris!* Port Antonio; Blue Mt. Peak; *Hitchcock,* Fl. Jam. 8022, 11,143, 11,835, 12,863. —Cuba, Bahamas.

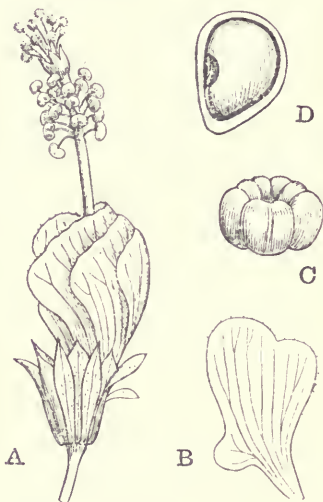


Fig. 51.—*Malvaviscus Sagræanus* Rich.

A, Flower slightly enlarged.

B, Petal slightly enlarged.

C, Fruit about nat. size.

D, Seed in ripe carpel $\times 2\frac{1}{2}$.

(A, B, C after Richard.)

Shrub, 6-15 ft. high, very variable in indumentum, in form of leaves, and in size of the parts of the flower. *Leaves* 3-13 cm. l., roundish- or elliptical-ovate, ovate to lanceolate-ovate, base cordate, emarginate, or rounded, more or less acuminate, unequally crenate or serrate, on both sides tomentose or with minute scattered stellate hairs, or glabrate, on upper surface sometimes slightly rough, beneath sometimes bearded in nerve-axils, and usually indumentum denser; petioles tomentose or villose. *Peduncles* usually villose. *Bracteoles* of involucrel 7-12, erect or somewhat spreading, a little longer or shorter or of the same length as the calyx, villose, ciliate, or tomentose. *Calyx* 9-13 mm. l. *Corolla* crimson, 2-3 cm. l. *Staminal tube* protruding half to the whole length of corolla. *Fruit* 8 mm. l. or more in diam. *Seed* about 5 mm. l., puberulous.

The bark of the young shrubs makes a fine, white, and very strong hemp. (Wright.)

- § 3. Staminal column bearing anthers on the outside, the apex truncate or 5-toothed or very rarely bearing anthers. Style-branches 5. Capsule splitting open loculicidally, the carpels not separating. Cotyledons foliaceous, folded in two, or variously contorted in the folding, sometimes rather thick and very much contorted.

12. HIBISCUS L.

Herbs, shrubs, or trees. Leaves various, often deeply lobed. Flowers of various colours, generally handsome. Bracteoles of involucrel indefinite in number, rarely 3-5, usually narrow, free or united, sometimes more or less attached to calyx. Calyx 5-cleft or 5-toothed, in some species splitting during flowering, spathe-like. Ovary 5-celled, each cell with 2 or more ovules. Style-branches spreading, enlarged at the apex into capitate or spathulate stigmas. Capsule loculicidally 5-valved. Seeds 2 or more, kidney-shaped.

Species about 200, mostly tropical, a few outside the tropics.

Calyx 5-cleft or -toothed.

Bracteoles free or only slightly united at base.

Calyx with thickened margins (10-nerved, nerves to sinus forming margin to the two neighbouring lobes).

Calyx dry.

Leaves 3-lobed. Calyx in fruit leathery, acute 1. *H. bifurcatus*.

[Leaves 3-5-parted. Calyx in fruit membranous, long acuminate..... *H. cannabinus*.]

[Calyx fleshy *H. Sabdariffa*.]

Calyx without thickened margins.

Capsule not winged.

Petals not changing colour.

Seeds with long white cottony hairs.

Bracteoles much shorter than calyx, oblanceolate, more or less tomentose 2. *H. lavateroides*.

Bracteoles longer than calyx, linear, glabrous or with few hairs 3. *H. brasiliensis*.

Bracteoles usually shorter than calyx, linear-spathulate, hispid..... 4. *H. pilosus*.

- Seeds glabrous or pubescent (not cottony).
 [Leaves ovate, acuminate, with large teeth *H. Rosa-sinensis.*]
 Leaves 3-5-angled or -lobed.
 [Bracteoles longer than calyx. Calyx-lobes lanceolate-linear..... *H. lunarifolius.*]
 Bracteoles shorter than the bell-shaped calyx.
 Calyx-lobes triangular-pentagonal, hirsute..... 5. *H. trilobus.*
 Calyx-lobes large, foliaceous, ovate 6. *H. clypeatus.*
 [Leaves 3-5-parted. Calyx enlarging and swelling in fruit *H. Trionum.*]
 [Petals changing colour *H. mutabilis.*]
 [Capsule 5-winged *H. vitifolius.*]
 Bracteoles united into a cup, but free from calyx.
 Calyx and bracteoles persistent in fruit. Petals usually less than 8 cm. l. 7. *H. tiliaceus.*
 Calyx, and usually bracteoles also, falling off in fruit. Petals generally more than 9 cm. l. 8. *H. elatus.*
 [Calyx splitting down along one side as the flower opens, spathe-like.
 [Stem and leaves hirsute *H. Abelmoschus.*]
 [Stem and leaves glabrous or with few hairs only... *H. esculentus.*]

1. *H. bifurcatus* Cav. *Diss. iii.* 146, *t.* 51, *f.* 1 (1787); prickles usually towards apex of stem and branches and on petioles and nerves of leaves; leaves 3-lobed to about halfway, lobes deltoid-ovate or ovate-lanceolate, upper sub-3-lobed or simple; bracteoles 9-13, linear, unequally forked at apex, usually longer than calyx in flower, subequal in fruit, covered with white tuberculate hairs or prickles; calyx with similar hairs, enlarged in fruit, lobes with thickened margins and a gland on median nerve; seeds with minute tubercles, glabrous.—*Macf. Jam. i.* 66; *Griseb. Fl. Br. W. Ind.* 84; *Gürke in Fl. Bras. xii. pt. 3*, 560; *Hochreut. in Ann. Conserv. & Jard. Genève, iv.* 108 (1900); *Urb. Symb. Ant. iv.* 399.

In fl. Oct.—March; sea-shore near Spring Garden estate, St. George, *Macfadyen*.—West Indies, tropical continental America.

Undershrub, 3-6 ft. high. *Leaves*, lower 8-12 cm. l., cordate; petioles shorter than the blade; stipules linear-awl-shaped 6-8 mm. l. *Peduncles* solitary in axils of upper leaves, 1-3 cm. l. *Bracteoles* 12-20 mm. l. *Calyx* 13-15 mm. l. in fl., to 2 cm. l. in fruit. *Petals* 7-9 cm. l., purple. *Staminal tube* about half as long as the corolla. *Capsule* about as long as the calyx, with long white silky hairs; cells 4-5-seeded. *Seeds* of irregular form, 3-4 mm. l.

H. cannabinus L. *Syst. ed.* 10, 1149 (1759), Deccan or Ambari Hemp of India, widely cultivated in tropics; annual or perennial; stem prickly; upper leaves 3-5-parted nearly to base, lobes narrow, serrate; petiole generally prickly, usually longer than the blade; flowers axillary, subsessile; bracteoles 7-10, linear, without or sometimes with an appendage at apex, shorter than the calyx and attached to it at the base; calyx-lobes long acuminate; corolla large, spreading, yellow or deep red with a crimson centre; capsule bristly, shorter than the calyx.

Our specimens from Hope Gardens, *Harris!* (Fl. Jam. 12,326) and from Stewart Town, *Jeffrey-Smith!* (Fl. Jam. 10,925) are without glands on calyx, and usually have an appendage at apex of the bracteoles, agreeing in these respects with specimens from Cuba; thus they belong to the form *radiatus*, which is considered by some botanists as a distinct species, *H. radiatus* Cav.

The hemp is said to be similar to jute, but much superior.

H. Sabdariffa *L. Sp. Pl.* 695 (1753), French, or Indian, or Red Sorrel, or Rozelle; bracteoles and calyx grow together below the middle, increasing in fruit into a purplish fleshy cup; stem commonly purplish; leaves entire or lobed, with a gland at base of midrib beneath; peduncles very short, thickened at apex; corolla yellow; capsule villous, shorter than the calyx; seeds puberulous.—*Wright Mem.* 290; *Sic. Obs. Bot.* 269; *Desc. Fl. Ant. i.* 148, *t.* 31; *Macf. Jam. i.* 67. *Hibiscus rufescens* &c. *Browne Hist. Jam.* 285; *A. Robinson Ic. ined.* *Alcea acetosa* &c. *Sloane Cat.* 99 & *Hist. i.* 224, *Herb. iv.* 681 (in part).—Cultivated in the tropics.

The calyx is antiscorbutic; its acidity neutralizes the bilious secretion; it is made into preserves, and a decoction sweetened and fermented is the refreshing "sorrel drink." The fibre is strong and silky. Specimens from *Distin!* and *Prior!* from Jamaica in Herb. Kew.

2. **H. lavateroides** *Moric. in Mém. Soc. Phys. Gen. vii.* 263, *t.* 16 (1836) & *Pl. Nouv. d'Amér.* 23, *t.* 16; young stem and branches, petioles, and peduncles tomentose with large stellate hairs; leaves deltoid-ovate, apex acute, subacuminate, or obtuse, base cordate to truncate; bracteoles about 10, spathulate or oblanceolate, much shorter than the calyx, more or less tomentose; calyx densely tomentose, lobes united to nearly halfway up; seeds dark brown, with long white cottony hairs.—*Hemsl. Biol. Cent. Am. Bot. i.* 121; *Hochreut. tom. cit.* 77. Original specimen from Moricand in Herb. Mus. Brit.

Greenland, *E. G. Britton*, 2898!—Mexico, Honduras.

Shrubby herb, 2-3 ft. high, or more. Leaves 3-9 cm. l., irregularly serrate, sometimes slightly lobed on each side, with stellate hairs on both sides, denser beneath; petioles shorter than the blade; stipules linear-awl-shaped, 3-6 mm. l. Flowers solitary in the upper axils with peduncle about twice or thrice as long as petiole. Calyx about 17 (15-22) mm. l.; lobes triangular, subacuminate. Petals 3-4 cm. l., with large stellate hairs on the outside, rosy pink or madder lake colour. Staminal tube usually shorter than the corolla. Capsule shorter than the calyx, covered with minute stellate hairs or glabrate.

3. **H. brasiliensis** *L. Sp. Pl. ed. 2*, 977 (1763); young stem and branches glabrous or with very few hairs, often with a tomentose line; leaves deltoid-ovate more or less subacuminate, base truncate to obtuse; bracteoles 9-10, linear, acuminate, longer than calyx or about as long, glabrous or with a few stellate hairs; calyx somewhat hispid, lobes united usually to about 4 mm. from base; seeds black, with long white cottony hairs.—*Hochreut. tom. cit.* 87; *Urb. Symb. Ant. iv.* 398 & *viii.* 424. *H. phæniceus* *Jacq. Hort. Vindob. iii.* 11, *t.* 14 (1776); *Griseb. Fl. Br. W. Ind.* 85; *Gürke tom. cit.* 566. *H. unilateralis* *Cav.*

Diss. iii. 158, *t.* 67, *f.* F, e, f.; *Macf. Jam. i.* 71. *H. foliis cordato-ovatis* &c. *Plum. Pl. Amer. (Burm.)* 153, *t.* 160, *f.* 1.

Probably native, also cultivated; *Macfadyen*; *Lane*! hills, Moneague, *Prior*! *March*! Kingston (cult.), *Harris*! Fl. Jam. 11, 873.—Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Bartholomew, St. Christopher, Antigua, Guadeloupe, Martinique (cult.), St. Vincent, Curaçao, Central America, Colombia, Venezuela, Guiana.

Shrubby herb, 2–5 ft. high. *Leaves* 3–5 (–9) cm. l., crenate-serrate with large teeth, occasionally with an indication of a lobe at each side, on both sides with a few stellate hairs; petioles 1–2 cm. l.; stipules thread-like, 5–6 mm. l. *Flowers* solitary in axils; peduncle 3–5 cm. l. *Calyx* 10–12 mm. l., lobes ovate to lanceolate, acuminate. *Petals* 1.7 (–2) cm. l., spreading, with large stellate hairs on outside, dark crimson or white. *Staminal tube* shorter than or about equalling the corolla. *Capsule* shorter than the calyx, covered with small stellate hairs.

4. *H. pilosus* *comb. nov.*; young stem and branches with adpressed stellate hairs, often with tomentose lines; leaves deltoid-ovate, apex obtuse, base cordate to truncate; bracteoles

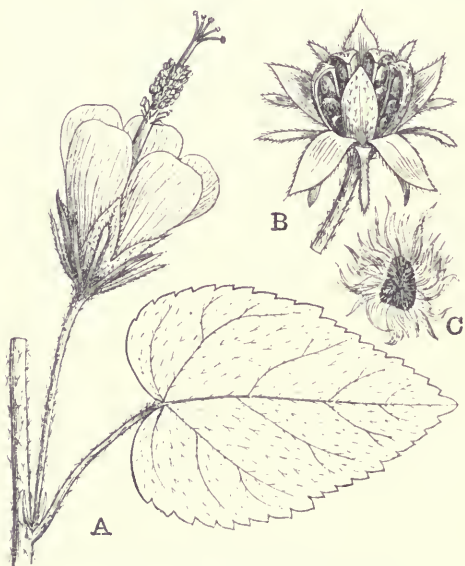


Fig. 52.—*Hibiscus pilosus* Fawc. & Rendle.

A, Flower and leaf, nat. size.

B, Capsule, nat. size.

C, Seed $\times 2$.

9–10, linear-spathulate, usually shorter than the calyx, hispid; calyx hispid, lobes united usually nearly halfway; seeds black, with long white cottony hairs.—*H. spiralis* *Cav. Icon. ii.* 47, *t.* 162 (1793); *Hemsl. Biol. Cent. Am. Bot. i.* 122; *Hochreut.*

tom. cit. 90. *H. Bancroftianus* Macf. *Jam. i.* 70 (1837); *Griseb. loc. cit.* *H. truncatus* Rich. *Sagra Cub. x.* 53, *t.* 16 (1845). *Achania pilosa* Sic. *Prodr.* 102 (1788) & *Fl. Ind. Occ.* 1224; *Ait. Hort. Kew. ii.* 459. *Malvaviscus pilosus* DC. *Prodr. i.* 445 (1824). (Fig. 52.) Specimen of *Achania pilosa* of Ait. Hort. Kew. in Herb. Mus. Brit.

Wright! *Bancroft!* common in the higher mountains, *Macfadyen!* *March!* near Falmouth; Plowden Hill, 800 ft.; Salem, Llandoverly, St. Ann; southern Manchester; *Harris!* *Fl. Jam.* 7224, 8167, 10,379, 12,693. —Cuba, Mexico.

Shrubby herb, 2-5 ft. high. *Leaves* 2-5(-8) cm. l., irregularly crenate-serrate, occasionally with an indication of a lobe at each side, on both sides with stellate and simple hairs; petioles shorter than the blade, 1-3(-5) cm. l., hispid; stipules awl-shaped, sometimes from a broad base, 4-6 mm. l. *Flowers* solitary in the upper axils, with peduncle about twice or thrice as long as the petiole. *Calyx* about 12 (9-15) mm. l.; lobes lanceolate, subacuminate. *Petals* rolled spirally below into a tube, 2·2-2·6 cm. l., glabrous outside, crimson. *Staminal tube* longer than the corolla. *Capsule* longer than the calyx, covered with long stellate hairs.

H. Rosa-sinensis L. *Sp. Pl.* 694 (1753); leaves ovate, acuminate; peduncles as long as or longer than the adjoining leaf; bracteoles linear-tapering, 6 or 7, half the length of the bell-shaped calyx; corolla red; staminal tube longer than corolla; fruit not formed in Jamaica.—*Macf. Jam. i.* 65.—Cultivated in tropics. Type in Herb. Linn.

Cultivated in gardens, and often grown as a hedge. Native of tropical Asia. The common name "Shoe-black" is due to the use made of the flower. Specimens from *Macfadyen!* and *Prior!* from Jamaica in Herb. Kew.

[*H. lunarifolius* Willd. *Sp. Pl. iii.* 811 (1800); young stem and branches hispid with adpressed hairs; leaves on flowering branches roundish-cordate with 3-5 acuminate angles; bracteoles about 10, lanceolate-linear, united at the base, longer by 2-5 mm. than the calyx; lower third of calyx cup-like, lobes lanceolate-linear; seeds black, with very minute stellate hairs arranged irregularly.—*Mast. in Fl. Trop. Afr. i.* 202 & *in Hook. f. Fl. Br. Ind. i.* 338; *Hochreut. tom. cit.* 160.

Naturalized, an escape from Hinton East's botanic garden whence *Prior!* got a specimen; Gordon Town, *Ball!* near Gordon Town; Hope River course, 600 ft.; *Harris!* *Fl. Jam.* 8260.—Native of tropical Africa, India, Ceylon.

Undershrub, 3-6 ft. high. *Leaves* 4-9(-14) cm. l., serrate or crenate, on both sides with simple and stellate hairs, denser beneath; petioles usually longer than the blades, more or less tomentose. *Peduncles* very short, thickened above, tomentose, 1-flowered, in axils of upper leaves, and forming a terminal, more or less leafless, raceme. *Bracteoles* 13-18 mm. l. *Petals* pale yellow with a dark purple centre, 5-6 cm. l. *Staminal tube* half as long as petals, bearing anthers to the base. *Capsule* 15-18 mm. l., ovoid-ellipsoidal, hispid; valves with a long beak at apex 5-7 mm. l. *Seeds* about 3 mm. l.]

5. *H. trilobus* Aubl. *Pl. Guian. ii.* 708 (1775); young stem and branches armed with prickles; leaves on flowering branches 3-lobed or sub-5-lobed, subacuminate, strongly serrate, base

truncate or subcordate; bracteoles 12-14, linear-acuminate, about half as long as the calyx, hirsute; calyx hirsute, 5-cleft about one-fourth of its length, lobes triangular-pentagonal; seeds puberulous-velvety with reddish hairs.—*Cav. Diss. iii.* 147, t. 53, f. 2; *Descourt. Fl. Ant. vi.* 4, t. 381; *Griseb. Fl. Br. W. Ind.* 85 (in part); *Hochreut. tom. cit.* 142; *Urb. Symb. Ant. iv.* 399 & viii. 425, & in *Fedde Rep. xvi.* 34. *H. domingensis* Jacq. *Col. iii.* 213 (1789) & *Ic. Pl. Rar. iii.* t. 550. *H. aquaticus* Tussac *Fl. Ant. iii.* 102, t. 31 (1824) (non DC.). *H. foliis trilobis* &c. *Plum. Pl. Amer. (Burm.)* 152, t. 159, f. 1 & *Ic. ined. v.* 279.

Wright! Distin.—Hispaniola, Porto Rico.

Tree, 10 ft. high. *Leaves* (on flowering branches) 7-11 cm. l., on both sides hispid, especially on the nerves; petioles a little shorter than the leaves, with or without prickles, sparingly puberulous, tomentose in furrow above, the line of tomentum more or less decurrent. *Peduncles* axillary, solitary, longer or shorter than the petiole, 1-flowered. *Calyx* 3-3.5 cm. l., bell-shaped; lobes 5-nerved. *Petals* 7-8 cm. l., scarlet or light purple and very dark purple at base. *Staminal tube* about half as long as the corolla. *Capsule* about as long as the calyx, hispid with light yellow hairs; cells with numerous seeds. *Seeds* about 3.5 mm. l.

6. *H. elypeatus* *L. Syst. ed.* 10, 1149 (1759); more or less velvety all over; leaves sub-3-lobed-angular, cordate, sub-acuminate; bracteoles 9-11, linear-lanceolate, unequal in length, much shorter than the calyx; calyx 5-cleft, lobes long, foliaceous, ovate, acute; seeds roundish-ellipsoidal, very dark brown, glabrous.—*Sw. Obs.* 270; *West, St. Croix*, 298; *Desc. Fl. Ant. vii.* 278, t. 517; *Macf. Jam. i.* 69; *Griseb. Fl. Br. W. Ind.* 85; *Hochreut. tom. cit.* 144; *Urb. Symb. Ant. iv.* 400. *H. foliis cordato-angulatis* &c. *Plum. Pl. Amer. (Burm.)* 153, t. 160, f. 2. *H. fruticosus diffusus* &c. *Browne Hist. Jam.* 286. *H. tomentosus* *Mill. Dict. ed.* 8 (1768). *Malva arborea*... *veluto* &c. *Sloane Cat.* 95 & *Hist. i.* 216, t. 135, f. 1. Miller's type in Herb. Mus. Brit.

Congo Mahoe.

In fl. and fr. Dec.-Feb.; Red Hills, *Sloane Herb.* iv. 44! *Houstoun! Wright!* Sheldon Works and Five Mile Wood, St. David; Salt River, St. Dorothy; *Macfadyen!* St. Andrew, *McNab! March*; New Forest, 500 ft.; Mona, 1000 ft.; Hall's Delight, Port Royal Mts.; Long Mt., 800-900 ft.; *Harris!* Fl. Jam. 7240, 7893, 8254, 8868, 9060.—Cayman, Hispaniola, Porto Rico, St. Cruz (West).

Trailing shrub or small tree, 6-15 ft. high. *Leaves* 1-2 dm. l., smaller at apex, with small teeth; petioles varying in length, often about half as long as the leaves. *Peduncles* axillary, solitary, about twice as long as the petiole, 1-flowered. *Calyx* 3.5-4 cm. l., longer in fruit, lobes 5-nerved. *Petals* 4.5-6 cm. l., reddish-yellow, velvety on backs. *Staminal tube* nearly as long as the corolla. *Capsule* shorter than the calyx, hirsute-tomentose, with bright yellow hairs on the outside and on the margins of the valves inside; cells with numerous seeds. *Seeds* about 4 mm. l.

The bark makes a very fine strong cord, and is employed to make the lashes of whips. (*Macfadyen.*)

H. mutabilis *L. Sp. Pl.* 694 (1753) & *Amœn. v.* 380, Changeable Rose or Hibiscus; small tree or shrub; leaves 5-angled; peduncles axillary, nearly

as long as the leaf; bracteoles 10, nearly free; corolla white or pink on first opening in the morning and deep red by night.—*Wright Mem.* 289; *Desc. Fl. Ant. iv.* 171, *t.* 270. *H. fruticosus brachiatus* &c. *Browne Hist. Jam.* 286. Type in Herb. Linn.—Native of China and Japan. Cult. in tropics.

H. Trionum L. Sp. Pl. 697 (1753); annual, 1–2 ft. high; leaves, upper 3–5-parted, lower roundish, undivided; bracteoles 7–12, linear-tapering; calyx 5-cleft, increasing in size and becoming inflated in fruit; corolla yellow with a purple centre, twice as large as calyx or more; capsule as long as calyx, bristly; seeds minutely warted.—Naturalized; in waste places, Cinchona, 5000 ft., *Harris!* *Fl. Jam.* 12, 338. Type in Herb. Linn.—South Europe and hotter parts of the Old World.

[*H. vitifolius L. Sp. Pl.* 696 (1753); young stem and branches velvety; leaves 3-angular or -lobed or sub-5-lobed, cordate; bracteoles 10–12, thread-like, shorter than the calyx; calyx hirsute, 5-cleft to about the middle, lobes ovate, 5-nerved; capsule-valves winged; seeds minutely warted.—*Cav. Diss. iii.* 145, *t.* 58, *f.* 2; *Mast. in Fl. Trop. Afr. i.* 197 & in *Hook. f. Fl. Br. Ind. i.* 338; *Grisebach Fl. Br. W. Ind.* 85. Type in Herb. Hermann in Herb. Mus. Brit.

Wilson! March! Kingston, Hitchcock; Windward Road, Campbell! marsh near Rock Fort, *Harris & Britton!* *Fl. Jam.* 5975, 10,794.—Naturalized in the West Indies. Native in the tropics of Africa, India, and Australia.

Tall, branched herb. Leaves 2–10 cm. l., toothed, velvety and soft to the touch on both sides; petioles about as long as the blades; stipules thread-like, 3–4 mm. l. Peduncles axillary, 1 (or 2), about as long as the petioles, 1-flowered, often crowded at ends of branches. Calyx 15–20 mm. l., 5-cleft to about the middle, hirsute. Petals yellow with a large purple spot at the base, 4–6 cm. l. Staminal tube about half as long as the corolla. Capsule globose, hirsute, beaked, shorter than the enlarged calyx. Seeds about 3 mm. l.]

7. *H. tillaceus L. Sp. Pl.* 694 (1753); tree or shrub 10–15 (6–35) ft. high; leaves roundish or roundish-ovate, usually shortly and abruptly acuminate, cordate; bracteoles below united into a cup but free from calyx, 6–17 mm. l., 8–11-toothed, or -lobed, persistent; calyx 16–32 mm. l., 5-cleft to about the middle, 3-nerved, middle nerve sometimes with a split gland, persistent; seeds covered with minute warts.—*Cav. Diss. iii.* 151, *t.* 55, *f.* 1; *Bot. Reg.* 232; *Tussac Fl. Ant. ii.* 18, *t.* 5; *Descourt. Fl. Ant. ii.* 327, *t.* 148; *Macf. Jam. i.* 69; *Mast. in Fl. Trop. Afr. i.* 207 & in *Hook. f. Fl. Br. Ind. i.* 343; *Watt Dict. Econ. Pr. Ind.*; *Gürke tom. cit.* 567 (in part); *Hochreut. tom. cit.* 62 (in part); *Small Fl. S.E. U.S.* 776; *Urb. Symb. Ant. iv.* 398 (in part); *Guppy Plants... W. Ind.* 214. *H. arboreus Desv. ex Hamilton Prodr.* 49 (1825). *Malva arborea maritima* &c. *Sloane Cat.* 95 & *Hist. i.* 215, *t.* 134, *f.* 4; *Catesby Nat. Hist. ii.* 90, *t.* 90. *Althæa maritima* &c. *Browne Hist. Jam.* 284. *Paritium tiliaceum A. Juss. in St. Hil. Fl. Bras. Mer. i.* 256 (1825); *Griseb. Fl. Br. W. Ind.* 86; *Britt. Fl. Berm.* 239 (under *Pariti*); *Britt. & Millsp.*

Bah. Fl. 273 (under *Pariti*). Types in Herb. Hermann (with icon.) in Herb. Mus. Brit., and in Herb. Linn.

Sea-side Mahoe.

Sea-side, St. Ann, *Sloane* Herb. iv. 43! common by sea-shore, *Macfadyen*! *McNab*! Holland Bay, *Purdie*! Port Antonio, *Hitchcock*.—Bermuda (naturalized), Florida, sea-shore in all tropical lands.

Leaves 8-20 cm. l., entire or minutely crenate, on upper surface glabrous, beneath hoary-tomentose, venation prominent beneath, usually with a split gland at the base of the median nerve or of the three median nerves; petioles long; stipules 2-4 cm. l., oblong, soon falling. *Flowers* solitary in axils of uppermost leaves, sometimes 2 or 3 close together. *Petals* 40-70(-90) mm. l., obovate, yellow. *Staminal tube* nearly as long as the petals, bearing stamens in its whole length. *Capsule* 15-20(-30) mm. l., ovoid, loculicidally 5-valved, many-sided, tomentose. *Seeds* 4 mm. l.

Dampier wrote of this tree:—"The Musketo Indians make their lines both for fishing and striking with the bark which is made up of strings or threads, very strong; you may draw it off either in flakes or small threads. 'Tis fit for any manner of cordage, and Privateers often make their rigging of it."

For the Pacific islander it supplies the materials for cordage, nets, native cloth, &c.; and it is also used for planking and building light boats. Watt states that the fibre seems highly suitable for the paper trade. From Roxburgh's experiments it seems that the fibre gains in strength when tarred.

8. *H. elatus* Sw. *Prodr.* 102 (1788) & *Fl. Ind. Occ.* 1218; tree 50 to 80 ft. high, diameter to 3 ft.; involucre usually falling off; calyx 34-50 mm. l., falling off in fruit; petals 95-110 mm. l., more or less oblong, changing colour—pale primrose in morning, becoming orange and deep red as the day advances, dark red at base; capsule 30-33 mm. l., globose, hirsute with adpressed hairs; seeds villous.—*Wright Mem.* 288; *Macf. Jam.* i. 68. *Paritium elatum* G. Don. *Gen. Hist.* i. 485 (1831); *Rich. in Sagra Cub. v.* 54; *Griseb. loc. cit.*; *Guppy loc. cit.* *H. arboreus* &c. *Browne Hist. Jam.* 284. *Malva arborea* &c. *Sloane Cat.* 95 & *Hist.* i. 215, t. 134, f. 2, 3. Description like that of *H. tiliaceus* except in the foregoing details.

Blue or Mountain Mahoe, Cuba Bark.

Moist inland parts, *Sloane* Hb. iv. 42! *Wright*! *Macfadyen*! interior of Westmoreland, *Purdie*! *Wilson*! Dove Hall, Moneague, *Prior*! *March*! St. George, *Watt*! *Robertsfield*, 2000 ft.; *Harris*! Phoenix Park, Moneague, *Fawcett & Harris*! *Fl. Jam.* 6179, 7046.—Cuba.

The wood is of a brownish colour with darker or lighter bands, the best variety, when fully ripe, being dark mottled green, having the appearance when polished of dark-green variegated marble. The grain is somewhat coarse, surface lustrous. The wood is very hard, but not so hard as rosewood (*Amyris balsamifera*). Wood of good colour is used in cabinet work, for furniture, &c.; it is much used locally for building purposes, for carriage and cart work and for railway sleepers, it also yields good shingles. It is very flexible, and is said to have "all the characters of the best European ash, but is more durable and longer in the fibre." Use is made of it for gun-stocks, carriage poles, ships' knees, and fishing rods. Weight 44 to 49 lbs. per cubic foot. The fibres of the bark of

young trees make good ropes. The lace-like inner bark was at one time known as Cuba bark from its being used as the material for tying round bundles of Havana cigars. The use of the bark of young trees for making ropes should be sternly suppressed, as it entails the destruction of valuable timber trees. An infusion of the mucilaginous leaves and young shoots is used in dysentery.

[*H. Abelmosehus* *L. Sp. Pl.* 696 (1753) & *Amœn. v.* 380; stem and leaves hispid or hirsute; leaves 3–5-lobed or -angled, more or less hastate or cordate; bracteoles 10–12 mm. l., 8–10, hirsute; calyx 2·5–3·5 cm. l., 5-toothed, cleft during flowering on one side and at length dropping off from a persistent base, pubescent; petals 4–8 cm. l.; seeds glabrous, striate, of a musky smell.—*Car. Diss.* iii. 167, t. 62, f. 2; *Macf. Jam.* i. 67; *Mast. in Fl. Trop. Afr.* i. 207 & in *Hook. f. Fl. Br. Ind.* i. 342; *Watt Dict. Econ. Pr. Ind.*; *Gürke in Fl. Bras.* xii. pt. 3, 570; *Hochreut. tom. cit.* 150; *Urb. Symb. Ant.* iv. 401 & viii. 426. *H. hispidus* &c. *Brown Hist. Jam.* 285; *A. Robinson Ic. ined.* *H. moscheutos* *Wright Mem.* 289 (non *L.*). *Alcea hirsuta* &c. *Sloane Cat.* 98 & *Hist.* i. 223. *Abelmosehus moschatus* *Medic. Malv.* 46 (1787); *Griseb. Fl. Br. W. Ind.* 84. *Alcea moschata* &c. *Pluk. Phyt.* t. 127, f. 1. Specimen in Hort. Cliff. in Herb. Mus. Brit.

Musk Ochra, Musk Seed, Wild Ochra.

Naturalized and cultivated; *Sloane* Herb. iv. 69! *Wright!* *Liguanæa* plain, *Bancroft!* *Shakspear!* *St. Mary, McNab!* *Lacovia, Tomlinson.*—Apparently native in India, and now naturalized and cultivated throughout the tropics.

Undershrub, seldom lasting more than a year, about 4 ft. high. *Leaves*, lower 10–15 cm. l., upper smaller, on both sides hirsute or pubescent; petioles long; stipules awl-shaped, 5–6 mm. l. *Petals* sulphur-yellow, with crimson or purplish claws. *Staminal tube* 3 or 4 times shorter than the petals. *Capsule* 4–7 cm. l., lanceolate-ovoid, hirsute, 5-celled; cells many-seeded. *Seeds* 4–5 mm. l.

Yields a strong fibre and a larger crop per acre than most fibre plants. Seeds used in perfumery as a cheap substitute for musk; also used medicinally in tincture as a stimulant, stomachic, and antispasmodic; also strung as beads.]

[*H. esculentus* *L. Sp. Pl.* 696 (1753) & *Amœn. v.* 380; stem and leaves glabrous or with a few simple hairs; usually 5-lobed to the middle; bracteoles 10–13 mm. l., 8–12, hirsute; calyx 1·5–2·5 cm. l., 5-toothed, cleft during flowering on one side and at length dropping off from a persistent base, pubescent; petals 3–6 cm. l.; seeds globose-kidney-shaped, striate, somewhat hairy, 5 mm. in diam.—*Wright Mem.* 217; *Car. Diss.* iii. 168, t. 61, f. 2; *Tussac Fl. Ant.* i. 91, t. 10; *Stokes Mat. Med.* iii. 546; *Desc. Fl. Ant.* iv. 165, t. 269; *Macf. Jam.* i. 66; *Mast. in Fl. Trop. Afr.* i. 207 & in *Hook. f. Fl. Br. Ind.* i. 343; *Watt Dict. Econ. Pr. Ind.*; *Gürke in Fl. Bras.* xii. pt. 3, 569; *Hochreut. tom. cit.* 150; *Urb. Symb. Ant.* iv. 401 & viii. 426. *H. ramosus* &c.

Browne Hist. Jam. 285; *A. Robinson Ic. ined.* *Alcea maxima*... fructu pentagono &c., Do. . . . decagono &c. *Sloane Cat.* 98 & *Hist. i.* 222, 223. *Abelmoschus esculentus Moench. Meth.* 617 (1794); *Griseb. Fl. Br. W. Ind.* 84; *Britt. & Millsp. Bah. Fl.* 272. Type in Herb. Linn.

Ochra.

Naturalized and cultivated; *Sloane Herb.* iv. 66, 67! *Wright!* Lucea, *Hitchcock*.—Tropics of Old World, and now cultivated in all tropical and subtropical regions.

Herbaceous undershrub, 3-6(-12) ft. high. *Leaves*, on both sides with a few simple hairs; petioles long; stipules thread-like, 8-11 mm. l. *Petals* yellow, with reddish claws. *Staminal tube* about half as long as the corolla. *Capsule* 8-12 cm. l., 1.5-2 cm. br., lanceolate-ovoid, hirsute, 5-celled; cells many-seeded.

Yields a good fibre, but not so strong as that from *H. Abelmoschus*, and only a small crop per acre; a patent was taken out in France for making paper from it. The full but unripe fruit is an excellent vegetable. It abounds in mucilage, and is either dressed plain or employed in soups. Inhalation of the vapour of the decoction is serviceable in allaying cough, hoarseness, and affections generally of the throat. Seeds yield an oil similar to olive oil.]

13. KOSTELETZKYA Presl

Herbs or shrubs, generally hispid or rough. *Leaves* sometimes with angular lobes. *Peduncles* with 1 or more flowers, axillary or in terminal racemes or panicles. *Bracteoles* 5-10, sometimes minute or almost wanting. *Calyx* 5-parted to 5-toothed. *Ovary* 5-celled, each cell with 1 ovule. *Style-branches* with capitate or dilated stigmas. *Capsule* somewhat flattened down, with 5 prominent angles, splitting open loculicidally. *Seeds* kidney-shaped, ascending.

Species 8, natives of subtropical and tropical America (incl. Jamaica).

K. pentasperma Griseb. Fl. Br. W. Ind. 83 (1859); *Hemsl. Bot. Biol. Cent. Am. i.* 120. *K. sagittata Presl Rel. Haenk. ii.* 131, t. 70 (1836); *Gürke in Fl. Bras. xii. pt.* 3, 572, t. 111. *K. hispida Presl tom. cit.* 132. *Hibiscus pentaspermus Bertero ex DC. Prodr. i.* 447 (1824); *Macf. Jam. i.* 65. *H. tampicensis Moric. Pl. Nouv. Amer.* 20, t. 14 (1836). *Melochia depressa Mill. Dict. ed.* 8 & *Fig. Pl. t.* 3, f. B (1768) (non *L.*). (*Fig.* 53.) Specimens from Presl and Miller in Herb. Mus. Brit.

Houstoun! Masson! *Distin!* Morass, Savanna la Mar, *Purdie!* March! Banks of Ferry River, Liguanea; road to Spanish Town; Meylersfield, Westmoreland; *Harris!* *Fl. Jam.* 8189, 9054, 11,790, 11,829.—Cuba, Mexico, Guatemala, Ecuador, Venezuela.

Shrubby herb, 3-6 ft. high; stem, branches, stipules, petioles, leaves, peduncles sparsely or densely covered with spreading white tuberculate hairs, also with one or two longitudinal tomentose lines with minute stellate hairs on branches. *Leaves* 3-8 cm. l., lanceolate to ovate, acuminate to acute, base rounded, truncate to cordate, sometimes sub-

lobed and base sagittate or hastate, irregularly toothed; petioles one-third as long as blades below, gradually getting shorter upwards; stipules thread-like, 3-9 mm. l. Peduncles solitary, one-flowered, axillary, 5 cm. l. below, gradually decreasing upwards to 1 cm. Bracteoles linear, shorter than calyx. Calyx about 4 mm. l., 5-parted; lobes triangular. Corolla white (drying yellow), three times as long as calyx. Staminal tube half as long as corolla. Capsule 8-10 mm. in diam., keels hispid with curved hairs,

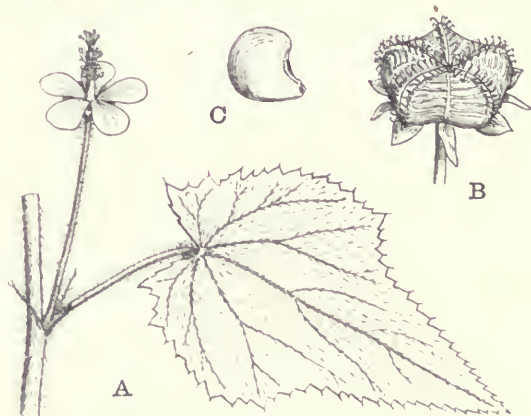


Fig. 53.—*Kosteletzkya pentasperma* Griseb.

A, Leaf and flower $\times \frac{3}{4}$.

B, Fruit $\times 2$.

C, Seed $\times 4$.

valves marked with one median rib and several transverse. Seeds about 2.5 mm. l., blackish-brown, with minute 2-3-branched hooked hairs, and with very minute pits, or glabrous.

We are inclined to agree with Bentham (Pl. Hartweg, 114) that the species referred to in his note on *K. sagittata* are conspecific with above species. Specimens (Pl. Haenk.) of *K. hispida* and *K. sagittata* from Presl are in Herb. Mus. Brit.

14. THESPESIA Solander ex Correa

Trees or tall herbs. Leaves entire, sometimes with angular lobes. Flowers axillary, generally yellow, handsome. Bracteoles 3-8, small or soon falling. Calyx truncate, with 5 minute or bristle-like teeth, rarely 5-cleft. Ovary 5-celled, cells with a few ovules; style thickened, and with 5 furrows and distinct stigmas at the apex, or divided into 5 erect short branches which bear stigmas. Capsule somewhat leathery or woody, releasing the seeds by its decay, or sometimes loculicidally 5-valved. Seeds obovoid, 2-3 in each cell; cotyledons black-dotted, folded together.

Species 7, natives of tropics.

T. populnea Solander (ms. & tab. pict. by S. Parkinson ined. in Herb. Mus. Brit.) ex Correa in Ann. Mus. Par. ix. 290, t. 25,

f. 1 (1807); *Wight Ic.* t. 8; *Griseb. Fl. Br. W. Ind.* 87; *Mast. in Hook. f. Fl. Br. Ind.* i. 345; *Watt Diet. Econ. Pr. Ind.*; *E. G. Bak. in Journ. Bot.* xxxv. 51; *Cook & Coll. in Contr. U.S. Nat. Herb.* viii. 253, tt. 58, 59; *Small Fl. S.E. U.S.* 777; *Urb. Symb. Ant.* iv. 401; *Guppy Plants, Seeds &c. in W. Indies &c.* 244, &c.; *Britt. Fl. Berm.* 240; *Britt. & Millsp. Bah. Fl.* 273. *Hibiscus populneus* *L. Sp. Pl.* 694 (1753); *Cav. Diss.* iii. 152, t. 56, f. 1.

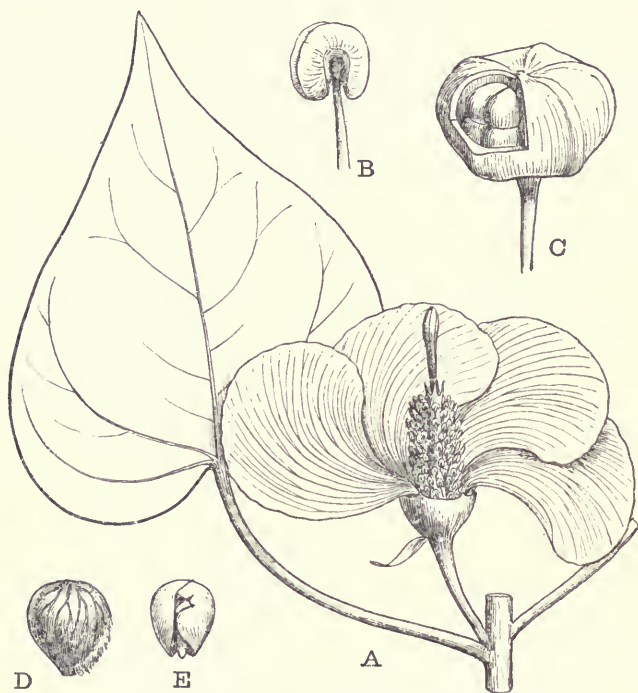


Fig. 54.—*Thespesia populnea* Solander.

A, Leaf and flower with a petal removed $\times \frac{1}{2}$.
B, Stamen $\times 7$.

C, Fruit partly cut open $\times \frac{1}{2}$.
D, Seed, nat. size.
E, Embryo, nat. size.

Malvaviscus populneus *Gaertn. Fruct.* ii. 253, t. 135 (1791). (Fig. 54.) Type in Herb. Hermann in Herb. Mus. Brit.

Sea-side Mahoe, John Bull Tree.

Sea-shore; *Distin*; *Wilson*! Morant Bay, *Prior*! *March*; J.P. 619, *Morris*! Kingston, *Hitchcock*; *Harris*!—Tropics.

A small tree usually; herbaceous parts covered with peltate scales. *Leaves* 5–20 cm. l., entire, ovate, acute or acuminate, cordate, 5–7-nerved, with a glandular pore between the bases of nerves beneath; petiole two-thirds as long as the blade. *Peduncles* as long as or shorter than the petiole. *Bracteoles* 3–5, as long as calyx, oblong-lanceolate. *Calyx*

7-9 mm. l., cup-shaped, sometimes with 5 minute teeth. *Petals* 5-6 cm. l., changing colour from yellow to purple as the day advances. *Fruit* 3 cm. in diam., globose. *Seeds* 8-10 mm. l., with 1 or 2 flat inner faces and rounded back, more or less tomentose, often becoming villose at angles, apex, and base.

This tree, as well as the Silk-cotton tree, harbours the Cotton Stainer, and is therefore destroyed in those West Indian islands where the cotton crop is an important staple.

15. GOSSYPIUM L.

Herbs, or shrubs, sometimes arborescent, generally marked all over with black dots, often with simple or stellate hairs. Leaves 3-5(7)-lobed or occasionally entire. Flowers pedunculate,



Fig. 55.—*Gossypium barbadense* L.

- A, Flower about to open $\times \frac{2}{3}$.
 B, Flower with calyx and corolla cut away, showing staminal tube enclosing pistil, $\times \frac{2}{3}$.
 C, Pistil with ovary cut lengthwise, nat. size.
 D, Capsule open, showing mass of cotton, $\times \frac{2}{3}$.
 E, Seed with cotton attached $\times \frac{2}{3}$.
 F, Seed cut lengthwise, showing twisted embryo, $\times 1\frac{1}{2}$.

solitary, in the axils of the upper leaves, large, yellow to purple. Bracteoles of involucre 3, large, cordate, usually cut above into narrowly lanceolate acuminate segments. Calyx truncate or 3-5-toothed or -crenate. Ovary 3-5-celled; each cell with an indefinite number of ovules attached at the central angle; style with thickened apex with 3-5 furrows and 3-5 stigmas. Capsule splitting loculicidally. Seeds sometimes adhering together in a kidney-shaped mass, more often free, covered with long hairs (lint, cotton) or with very short hairs (fuzz), or more or less with both, fuzz and lint of a rusty colour or white, and fuzz sometimes greenish; cotyledons with many folds, usually black-spotted, with auricles at the base rolled round the straight radicle. Cotton of commerce.

Species, according to Todaro, 54, which probably should be reduced to about 10, natives of tropics and subtropics.

Seeds in each cell of the capsule united into a kidney-shaped mass..... 1. *G. lapideum*.

Seeds free.

Bracteoles dentate, united at base. Leaves with lobes narrow, oblong-lanceolate. Seeds covered with fuzz 2. *G. arboreum*.

Bracteoles deeply cut into lanceolate acuminate segments, free or almost free at base. Leaves with lobes deltoid to ovate or oblong.

Seeds covered with fuzz; lint firmly adherent.

Leaves villose or hirsute beneath or glabrous 3. *G. hirsutum*.

Seeds covered, or only partially covered, with fuzz; lint firmly adherent. Leaves usually tomentose beneath..... 4. *G. peruvianum*.

Seeds with only a small portion of the surface covered with fuzz; lint easily separable.

Leaves more or less glabrous.

Lateral lobes of leaf longer than body of leaf ... 5. *G. barbadense*.

Lateral lobes shorter than body 6. *G. purpurascens*.

1. *G. lapideum* Tussac *Fl. Ant. ii.* 67 (1818). *G. brasiliense* Macf. *Jam. i.* 72 (1837); *Tod. Relaz. Monogr. Goss.* 265, *tt.* 9, 12, *f.* 34; *Watt Wild & Cult. Cott.* 295, *t.* 50. *G. acuminatum* Roxb. *Fl. Ind.* 186 (1832); *Wight Ill. Ind. Bot. i.* 57, *t.* 27. *G. barbadense* var. *a* Griseb. *Fl. Br. W. Ind.* 86 (1859). *G. religiosum* Parl. *Sp. Cot.* 54, *t.* 4 (1866) (in part, excl. many syn.); Gürke in *Fl. Bras. xii. pt.* 3, 583 (in part, excl. many syn.) (non *L.*). Specimen in Herb. Linn. without name.

Chain Cotton, Kidney Cotton.

Houstoun! St. Mary, McNab! Hall's Delight; Mavis Bank; Harris! *Fl. Jam.* 5255.—S. America, cult. throughout tropics.

Shrub, 4-5 ft. high, or small tree, pubescent, hirsute, or glabrate. *Leaves* 10-17 cm. l., with 4 or 5 (3) lobes; lobes ovate or ovate-oblong, acuminate. *Peduncles* with a gland at apex below each bracteole. *Bracteoles* nearly as long as or longer than petals, broadly cordate, cut into 9-13 segments, often with long hair-like points. *Capsule*: valves 3(-5),

ovate-oblong, acuminate, pit-marked. *Seeds* united together into one mass, naked, with white lint.

2. *G. arboreum* *L. Sp. Pl.* 693 (1753); *Mast. in Fl. Trop. Afr. i.* 211 & in *Hook. f. Fl. Br. Ind. i.* 347; *Watt tom. cit.* (incl. vars.) 81. *G. herbaceum* &c. *Pluk. Phyt.* 188, f. 3. *G. oligospermum Macf. Jam. i.* 74 (1837). *G. neglectum Tod. Oss. Sp. Cot.* 35 (1863) & *Relaz. Monogr. Goss.* 169. Type in Herb. Linn. Plukenet's specimens in Herb. Sloane (xcvi. 59, c. 107).

Tree Cotton.

Liguanea plain, *Macfadyen*; near Rock Fort, *Thompson*!—In gardens in most tropical countries.

Shrub or tree, 6-15 ft. high; young portions pubescent. *Leaves* 5-8 cm. l., deeply 3-5(7)-lobed or entire; lobes oblong-lanceolate, mucronate. *Peduncles* without glands at apex. *Bracteoles* with 3-5 (7) lanceolate teeth at apex or nearly entire, obviously united at base. *Capsule* 3-4-celled, 2-3 cm. l., rough. *Seeds* covered with fuzz, lint firmly attached.

3. *G. hirsutum* *L. Sp. Pl. ed. 2*, 975 (1763) & *Mant.* 436; *Mill. Dict. ed. 8*; *Sw. Obs. Bot.* 265 (we take "semina adhaerentia" to mean adhering to the lint in contrast to "facile separanda" of *G. barbadense*); *Macf. Jam. i.* 74; *Griseb. Fl. Br. W. Ind.* 86; *Parl. Sp. Cot.* 41, t. 5; *Tod. Relaz. Monogr. Cot.* 210; *Gürke in Fl. Bras. xii. pt. 3*, 581 & in *Urb. Symb. Ant. iv.* 402; *Watt Wild & Cult. Cott.* 183. *G. procerius* &c. *Browne Hist. Jam.* 282; *A. Robinson Ic. ined.* *G. tricuspidatum Lam. Encyc. ii.* 135 (1786); *Tussac Fl. Ant. ii.* 65, t. 17. *G. religiosum L. Syst. ed.* 12, 462 (1767) & *Herb.* *G. punctatum Schum. & Thonn. Beskr. Guin. Pl. in Vid. Sel. Skr. Copenh. iv.* 83 (1829); *Britt. & Millsp. Bah. Fl.* 274; *Watt op. cit.* 168 (1907) (incl. vars.). *G. jamaicense Macf. Jam. i.* 73 (1837). Miller's specimen in Herb. Mus. Brit.

Short Staple Cottons.

McNab! Montego Bay, *Parnell*! Bull Bay road, *Thompson*! Sea-coast between Portland Point and Rocky Point, *Harris*! *Fl. Jam.* 10, 179.—Tropical America and Africa.

Shrub, 4-15 ft. high, usually villose or hirsute with long spreading simple and stellate hairs. *Leaves* 4-12(-15) cm. l., broadly and somewhat shallowly cordate, with 3(-5) lobes, or sometimes entire, glabrous on upper surface or with a few simple hairs near base, hirsute or villose beneath, especially at base on the nerves, with one gland beneath; lobes short, deltoid to ovate and usually shortly acuminate, more or less ascending; petioles nearly as long as the blade, villose; stipules lanceolate, acuminate, 1 cm. l. or more. *Peduncles* shorter than the petiole. *Bracteoles* 3-5 (6) cm. l., shorter than the petals and capsule, more or less hairy outside, broadly cordate ovate, cut into 9-13 segments. *Petals* pale lemon-yellow or yellow, changing to pink, rarely with a purple spot at base. *Capsule*: valves 3 or 4, ovate-elliptical, acuminate, rough. *Seeds* covered with fuzz, greenish or rusty, and white silky lint, firmly adherent.

4. *G. peruvianum* *Cav. Diss.* 313, t. 168 (1788); *Parl. Sp. Cot.* 54 (under *G. religiosum*); *Tod. Relaz. Monogr. Goss.* 240; *Watt Wild & Cult. Cott.* 213.

South American Cottons.

Sloane vi. 65, 66! *Wright*!—Tropical America and Africa.

Leaves 7–9 cm. l., cordate, 3–5-lobed or entire, usually tomentose and with 1 or 3 glands beneath; lobes ovate to ovate-oblong, usually acute, mucronate. *Peduncles* with a gland at apex below each bracteole. *Bracteoles* much shorter than petals, about as long as capsule, cut into about 9–11 segments. *Capsule*: valves 3, abruptly acuminate, pit-marked. *Seeds* free, covered or only partially covered with fuzz, lint firmly adherent.

5. *G. barbadense* *L. Sp. Pl.* 693 (1753); *Sw. Obs. Bot.* 266; *Bot. Reg. t.* 84; *Macf. Jam. i.* 73; *Griseb. Fl. Br. W. Ind.* 86; *Parl. Sp. Cot.* 48, t. 3 (excl. most syn.); *Tod. op. cit.* 234; *Bentl. & Trim. Med. Pl. i. t.* 37; *Gürke in Fl. Bras. xii. pt.* 3, 582, t. 114; *Watt op. cit.* 265 & var. *maritimum*, 275; *Britt. & Millsp. Bah. Fl.* 274. *G. maritimum* *Tod. Oss. Cot.* 83 (1862) & *Relaz. Monogr. Goss.* 225, tt. 7, 8, 11, ff. 27–30, 12, f. 31. *G. frutescens* ... *barbadense* *Pluk. Phyt. t.* 188, f. 1. *G. frutescens* ... *Providentiæ* *Pluk. Phyt. t.* 188, f. 2. (Fig. 55.) Plukenet's specimens in *Herb. Sloane* (c. 105, xcvi. 60).

Sea Island and Long Staple Cottons.

David's Hill, *Fawcett*!—West Indies and tropical continental America.

Shrub, 3–8 (–15) ft. high. *Leaves* 5–14 (–16) cm. l., cordate, 3–5-lobed or entire, lobes ovate to ovate-lanceolate, somewhat ascending. *Bracteoles* shorter than petals, broadly cordate, usually with few (3–7) segments. *Capsule*: valves 3 (rarely 4), ovate, acuminate, pit-marked. *Seeds* free, naked; lint long, white, easily separable.

6. *G. purpurascens* *Poir. Encyc. Suppl. ii.* 369 (1811); *Macf. Jam. i.* 73; *Tod. Relaz. Monogr. Goss.* 244; *Watt op. cit.* 250.

Bourbon Cotton.

Liguanea, *Macfadyen*; between Portland Point and Rocky Point, *Britton*, 1896!—Tropics.

Shrub or tree, 15 to 20 ft., branches purpurascens. *Leaves* 3-lobed, 1-glandular; lobes shortly ovate, with apex spreading outwards. *Peduncle* with 3 large glands at apex. *Bracteoles* nearly as long as petals and somewhat longer than capsule, cut into 5–7 segments at apex. *Seeds* naked, with lint easily separable.

FAMILY LXV. BOMBACACEÆ.

Trees. *Leaves* alternate, digitate, or simple; stipules free, very soon falling. *Peduncles* 1-flowered, axillary or subterminal, solitary or in clusters. *Involucel* of 3 bracteoles present in *Ochroma*. *Calyx* generally closed in bud, bursting at apex in flowering and then cup-shaped, truncate or sinuate with irregular lobes, sometimes 5-cleft, persistent. *Petals* 5, often adherent at base to the staminal column. *Stamens* generally indefinite, united into one or several bundles; staminal column divided somewhat high up or close to the base into 5 branches, each bearing 1, 2, or more anthers, or subentire with anthers covering the column. *Anthers* with 1, 2, or more cells, globose, linear, or

in horseshoe-shaped curves; pollen not spiny. Pistil in 5 (2-3) parts. Ovary 5(1)-celled, each cell with an indefinite number of ovules, attached at the inner angle; style entire or divided into as many very short branches as ovary-cells. Capsule usually splitting loculicidally by 5 valves, the carpels not separating, often packed with wool, a development of the endocarp. Endosperm scanty, wanting, or fleshy. Cotyledons twisted, folded, or flat.

Species more than 100, natives of the tropics.

Leaves compound, digitate..... 1. *Ceiba*.

Leaves simple 2. *Ochroma*.

1. CEIBA Gaertn.

Trees with or without prickles. Leaves digitate, leaflets generally 3-7, entire. Staminal column divided into 5 branches, each bearing 2 or 3 anthers, simulating a single anther. Style thickened at the apex, 5-cornered. Capsule woody or leathery, the cells inside very densely woolly. Seeds obovoid or globular, wrapped in the wool of the endocarp; endosperm very little or none; cotyledons very much twisted in the folds, enclosing the incurved radicle.

Species 9 or 10, all natives of tropical America except one which is Asiatic and African.

C. pentandra Gaertn. *Fruet.* ii. 244, t. 133 (1791); *K. Schum.* in *Fl. Bras. xii.* pt. 3, 209; *Cook & Coll.* in *Contr. U.S. Nat. Herb.* viii. 111, t. 24; *Howe* in *Torreya* vi. 217, with illustrations; *Urb. Symb. Ant.* iv. 403 & viii. 428; *Britt. Fl. Berm.* 241; *Britt. & Millsp. Bah. Fl.* 274. *C. Casearia* Medic. *Malv. Fam.* 16 (1787); *Britt. & E. G. Bak.* in *Journ. Bot.* xxxiv. 173. *Gossipium arboreum* &c. *Sloane Cat.* 159 & *Hist.* ii. 72. *Bombax foliis digitatis, brachiis erecto-patentibus*, & *B. . . porrectis* Browne *Hist. Jam.* 277. *B. pentandrum* L. *Sp. Pl.* 511 (1753); *Jacq. Sel. Stirp. Amer.* 191, t. 176, f. 70 & *Ed. pict.* 93, t. 182; *Cav. in Lam. Encycl.* ii. 551 & *Diss.* v. 293, t. 151; *Wright Mem.* 284; *Descourt. Fl. Ant.* iv. 64, t. 247; *Prain in Journ. As. Soc. Beng.* lxii. pt. 2, 66. *B. aculeatum* L. *Syst. ed.* 10, 1141 & *Amen.* v. 380 (in part). *B. inerme* L. *loc. cit.* (in part). *B. ceiba* Lun. *Hort. Jam.* i. 243 (1814) (non L.). *B. orientale* Spreng. *Syst.* iii. 124 (1826). *B. occidentale* Spreng. *loc. cit.* *Eriodendron anfractuosum* DC. *Prodr.* i. 479 (1824); *Macf. Jam.* i. 92; *Gosse, Naturalist's Sojourn in Jamaica* 271, 499; *Griseb. Fl. Br. W. Ind.* 88; *Watt Dict. Econ. Prod. Ind.* (Fig. 56.)

Silk-cotton Tree, Ceiba.

Sloane Herb. vi. 67! *Wright!* *Distin!* *Moneague, Prior!* between Hope and Gordon Town, *Fawcett!* Hope grounds, *Harris!* *Fl. Jam.* 8448, 12,333; *Bag Walk, Hitchcock;* *Montego Bay;* *Spanish Town;* *Ridley!*—Introduced

in Bermuda and Bahamas, native in West Indies, Central America, northern S. America, trop. Africa and Asia.

Tree to 150 ft. high and 40 ft. and more in circumference; trunk while young commonly swollen above the base, covered with green bark and armed with strong spines, young branches also spiny, branching sometimes

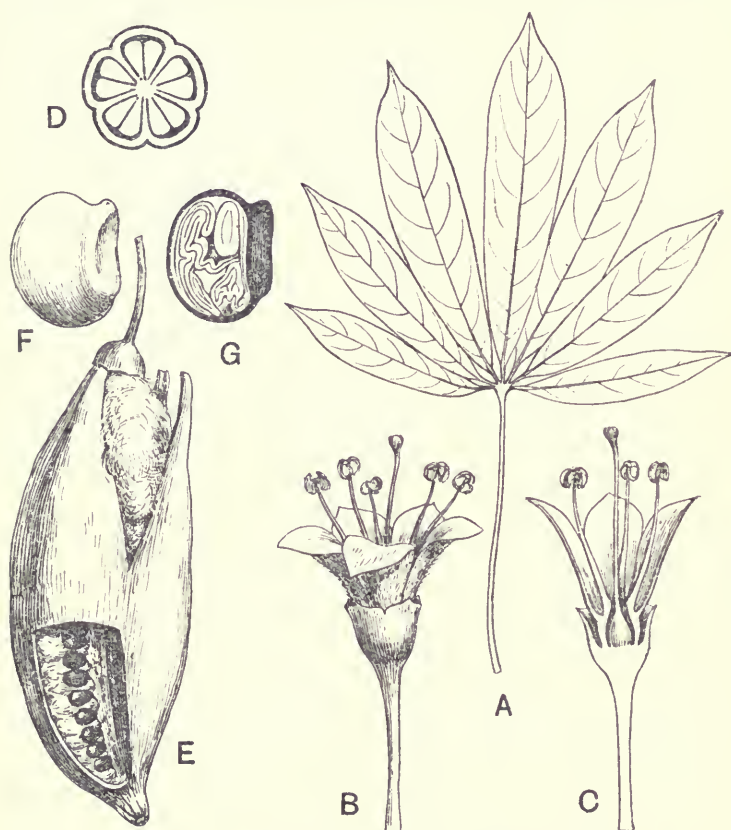


Fig. 56.—*Ceiba pentandra* Gaertn.

A, Leaf $\times \frac{1}{2}$.
B, Flower $\times \frac{2}{3}$.
C, Ditto cut lengthwise.
D, Section of ovary $\times 4$.

E, Ripe capsule with part cut away to show seeds $\times \frac{1}{2}$.
F, Seed $\times 4$.
G, Ditto cut lengthwise showing crumpled embryo.

low down, sometimes at a great height (50-80 ft.); branches horizontal, generally 3 or 4 on the same plane, wide spreading to a great length and often contorted, bearing an immense quantity of epiphytes; buttresses developed at the base of the trunk to the large roots, often stretching out even to 12 or 15 ft., and extending upwards even to 12 ft., but with a uniform thickness of a few (6-12) inches. *Leaflets* 5-7 (8), lanceolate or

oblong. *Calyx* 1-1.5 cm. l. *Petals* 2.5-4 cm l., pale rose-colour tinged with purple, covered outside with white tomentum. *Capsule* 11-16(-30) cm. l., 4-5 cm. in diam., oblong-ellipsoidal or obovoid. *Seeds* 4-6 mm. in diam.

We are unable to separate specifically the New and Old World specimens, which apparently include a number of geographical forms.

The Silk-cotton Tree drops its leaves in the late autumn or winter months, but flowers only in alternate years. In a flowering season the leaves drop off usually in November or December, and immense quantities of blossoms appear in January or February at the ends of the branches. The seed-pods are well developed, sometimes even ripe, before the young leaves appear again in April or May. In the following season, when flowers are not produced, the young leaves appear as early as the end of January, so that in this case the tree is not without leaves very long. This alternation usually affects the whole tree, but sometimes one side of the tree flowers, while the other is full of leaf without flowers, and *vice versa* the following season. The leaves occasionally fall as early as the end of July. (Gosse.)

The wood is soft and subject to the attacks of insects, but Macfadyen states that if it is steeped in strong lime water it will last for several years even when made into boards or shingles, and in situations exposed to the influence of the weather. Young branches grow when planted in the ground. The trunk is sometimes hollowed out to make canoes. The silky wool from the pods is exported as "Kapok" from the Malay Archipelago, where the trees are abundant.

The Silk-cotton Tree, and also the Sea-side Mahoe or John Bull Trees (*Thespesia populnea*), are accused of harbouring the Cotton Stainer (*Dysdercus delauneyi*), and have been destroyed in the West Indies where cotton is cultivated.

2. OCHROMA Sw.

Trees. Leaves simple, cordate, subentire, or toothed, or angular, or lobed. Involucel of 3 bracteoles, very soon falling. Flowers large, stalked, at ends of branches. *Calyx* 5-lobed; lobes unequal, 2 with pointed apex, 3 rounded at apex. *Petals* 5. Staminal tube shortly 5-lobed at apex, covered from the middle to the apex with adnate anthers; anthers 1-celled, cohering, more or less spirally twisted. Ovary conical, 5-sided; style cylindrical, 5-sided, enclosed in the tube of the filaments; stigmas 5, protruding beyond the anthers, spirally twisted and furrowed. Capsule elongate, 5-valved, inside covered very densely with cottony hairs. Seeds many, enclosed by the cotton of the endocarp, obovoid; endosperm fleshy; cotyledons broad, with infolded margins; radicle short.

Species 1, native of West Indies, Central America, Colombia to Bolivia, Venezuela, Para.

O. pyramidale Urb. in *Fedde Rep. Beihefte* v. 123 (1920) & *Symb. Ant.* viii. 759. *O. Lagopus* Sw. *Prodr.* 98 (1788), *K. Vet. Acad. Handl.* xiii. 150, t. 6, & *Fl. Ind. Occ.* 1144, t. 23; *Wright Mem.* 285; *Macf. Jam.* i. 94; *Griseb. Fl. Br. W. Ind.* 88; *Tr. & Planch. in Ann. Sc. Nat. sér. 4, xvii.* 323; *Cook & Coll. in Contr. U.S. Nat. Herb.* viii. 205, t. 47; *Urb. Symb. Ant.* iv. 403 &

viii. 429; *Britt. Fl. Berm.* 241. *O. tomentosa* Willd. *Enum.* 695 (1809); *Tr. & Planch. loc. cit.* *Gossypium* &c. *Pluk. Phyt. t.* 189, f. 2. *Hibiscus arborescens* &c. *Browne Hist. Jam.* 286. *Bombax*

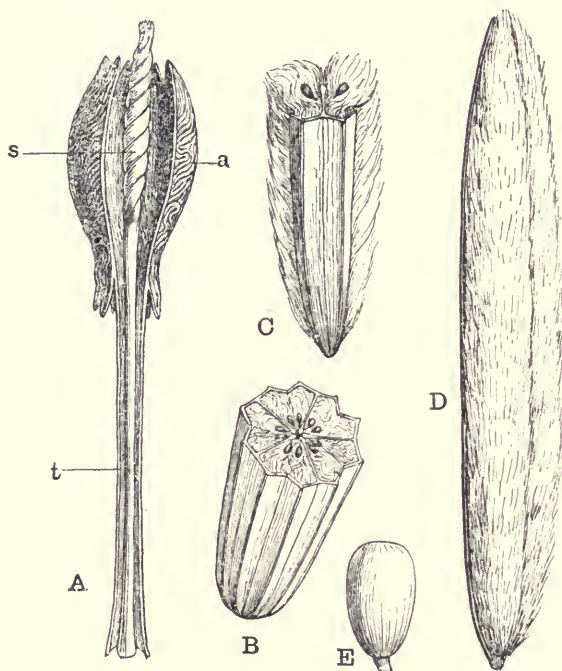


Fig. 57.—*Ochroma pyramidale* Urb.

A, Stamens and style. The staminal tube, *t*, is cut open to show the style and stigmas, *s*. On the outside of the upper half of the tube are the twisted adnate anthers, *a* $\times \frac{1}{2}$.

B, Portion of unopened capsule cut across, reduced.

C, Portion of a valve of the capsule, somewhat reduced.

D, Endocarp of a valve with attached cottony hairs $\times \frac{1}{2}$.

E, Seed $\times 6$.

pyramidale Cav. in *Lam. Encycl.* ii. 552 (1786) & *Diss.* v. 294, t. 153. (Fig. 57.)

Cork-wood, Down Tree, Bombast Mahoe, Balsa-wood (of continental America).

Common in the lower mountains and in damp situations; *Wright!* *Macfadyen!* *Manchester,* *Purdie!* *Wilson!* Port Morant, *Hitchcock!* *Schwallenburgh,* St. Ann, 1800 ft.; Castleton district, 500 ft.; *Harris!* *Fl. Jam.* 11,962.—Distribution of genus.

Tree, 20-60 ft. high; growth very rapid, attaining its full height in 12 to 14 years, and even in half that time under favourable conditions. *Leaves* 1-3.5 dm. l. *Involucel* 1.5-2 cm. l. *Calyx* 7-9 cm. l. *Petals* 12-14 cm. l., pale reddish or yellowish colour. *Stigmas* about 2.5 cm. l.,

protruding beyond the anthers. *Capsule* 3 dm. l. and more; when mature, the outer husk falls off, and the down expands, and looks somewhat like a hare's foot, whence Swartz's specific name. It contains a large quantity of silky cotton-like fibres of a pale reddish colour. *Wood* white stained with red, luminous, sometimes silky. It is very porous and absorbent of water, the lightest of all woods, lighter even than true cork; when dry, this wood has a weight of only 7·3 lb. per cub. ft., while cork weighs 13·7 lb. per cub. ft.

Although the wood is used as floats for nets and to make rafts (balsa is Spanish for raft), it absorbs water rapidly and soon becomes water-logged; but a water-proofing process has been invented which makes the wood non-absorbent, so that it retains its buoyancy longer than cork. It is particularly well adapted for insulating purposes. During the war attention was first directed to its use in aeroplanes, and for lifeboats, and life-rafts used in men-of-war, as well as transports; while special refrigerating trucks, with balsa as the insulating material, were used in France. In constructing the submarine mine barrage in the North Sea, 250 miles long, 80,000 floats made of balsa wood were used. The cotton-like fibres are used for stuffing pillows and mattresses. There is a specimen of the plant collected by Dr. Wm. Wright in Herb. Mus. Brit., to which is attached a piece of cloth "made of 3 parts of Spanish wool and 1 part of the down of *Ochroma*." See Agric. News vi. 253 (1907); xvii. 206, 357 (1918); xx. 147 (1921).

FAMILY LXVI. STERCULIACEÆ.

Herbs, shrubs, or trees, commonly with stellate hairs, sometimes mixed with simple hairs. Leaves alternate or very rarely subopposite, sometimes simple, entire, toothed, or lobed, sometimes digitately 3–9-foliate. Stipules usually present and soon falling. Inflorescence axillary or more rarely terminal, racemose, or cymose-paniculate, or reduced to solitary flowers. Flowers usually hermaphrodite, rarely unisexual. Calyx generally persistent, with 5 (4–3) valvate lobes. Petals 5, hypogynous, twisted-overlapping in bud, often marcescent-persistent, or wanting. Stamens generally more or less united into a tubular column; the column generally divided at the apex into 5 teeth or lobes (staminodes) which alternate with the petals, and bearing in the bays between the teeth or lobes solitary anthers or 2–5 (or more) together; sometimes the apex of the tube entire and bearing anthers, either 15 (10) crowded without order (*Sterculia*) or 10–12 in a simple series in a ring (*Cola*); sometimes stamens 5, opposite the petals, united at the base or beyond the middle (*Melochia*, *Waltheria*). Ovary free, carpels more or less united, 2–5-celled, or reduced to a single carpel (*Waltheria*). Ovules 2 to many (1) in each cell, attached to the interior angle, anatropous. Styles as many as the carpels, or more or less united, or combined into one style. Fruit dry or somewhat rarely fleshy outside, the carpels sometimes united into a capsule either opening loculicidally or woody and not opening, sometimes separating into cocci either not opening or

opening by two valves or along the ventral line. Seeds not woolly, testa various.

Species more than 1000, most of them found in the tropics or in S. Africa and extra-tropical Australia, and extending into the southern United States.

Flowers hermaphrodite. Petals present.

Petals soon falling.

Petals flat. Gonophore very long 1. *Helicteres*.

Petals hooded.

Petals with a linear 2-cleft appendage 2. *Guazuma*.⁷

Petals with a spatulate appendage 3. *Theobroma*.

Petals without appendage or with a stalked gland ... 4. *Ayenia*.

Petals withering without falling off, flat.

Ovary 5-celled 5. *Melochia*.

Ovary 1-celled 6. *Waltheria*.

Flowers unisexual or polygamous. Petals wanting.

Seeds with endosperm..... 7. *Stereulia*.

[Seeds without endosperm..... *Cola*.]

1. HELICTERES L.

Small trees, shrubs, or undershrubs, with stellate hairs or tomentum. Leaves serrate, crenate, somewhat lobed, or entire. Flowers axillary, solitary or in clusters. Calyx 2-lipped or tubulose with 5-cleft apex. Petals 5, flat, unequal or equal, clawed, auriculate on the claws. Gonophore longer than the calyx, curved, forming a sort of noose above the calyx before the flower is fully expanded. Staminal tube rarely and then only slightly developed. Stamens 6, 8, 10, or indefinite; filaments slightly united in pairs at base; anther-cells 2, diverging, sometimes confluent into one. Staminodes between the pairs of stamens nearer the centre. Ovary with 5 styles cohering or free, 5-celled, with many ovules near the inner angle. Fruit spiral or sometimes straight, composed of 5 follicular carpels, splitting open along the inner seam. Seeds small, ovoid, flattened above and below by mutual pressure; endosperm scanty; embryo straight; cotyledons foliaceous, folded round the inferior radicle.

Species 45, natives of the tropics (excl. Africa), chiefly American.

H. jamaicensis Jacq. *Enum.* 30 (1760), *Sel. Stirp. Amer.* 235, t. 179, f. 99, *Ed. pict.* t. 226, & *Hort. Vindob.* ii. 67, t. 143; *Sw. Prodr.* 98. & *Fl. Ind. Occ.* 1156; *Reichb. Ic. & Descr. Pl.* i. t. 48, f. 1; *Descourt. Fl. Ant.* vi. 102, t. 407; *Macf. Jam.* i. 89; *Griseb. Fl. Br. W. Ind.* 89; *Urb. Symb. Ant.* iv. 407 & viii. 433; *Britt. & Millsp. Bah. Fl.* 276. *H. arbor ind. occident. &c. Pluk. Phyt.* t. 245, f. 3. *H. Isora* var. β *L. Sp. Pl.* 963 (1753); *H. villosa* &c. *Browne Hist. Jam.* 330, *Ehret. Icon. ined.* 85. *H. barbadensis*

Jacq. Enum. 38 (1766). *H.* brevior *Mill. Dict. ed.* 8, 1768. *H. spiralis* *Northrop Mem. Torr. Club xii.* 50, t. 11 (1902). *Abutilo* affinis &c. *Sloane Cat.* 97 & *Hist.* i. 220. *Isora*... *crassiori Plum. Gen.* 24, t. 37. (Fig. 58.) Specimen from Browne in *Herb. Linn.* named by *Linnaeus H. Isora*.

Screw Tree.

In fl. May to Dec.; Red Hills, *Sloane* iv. 61! near Kingston (seeds) *Jacquin*; *Browne*! *Wright*! *Broughton*! *Masson*! *Macfadyen*! banks of *Yallahs R.*, *Purdie*! *March*! base of Long Mt., 350 ft., *Campbell*! *Windward Road*, *Fawcett*! *Hall's Delight*; *Watson's Hill*, 1000 ft.; near

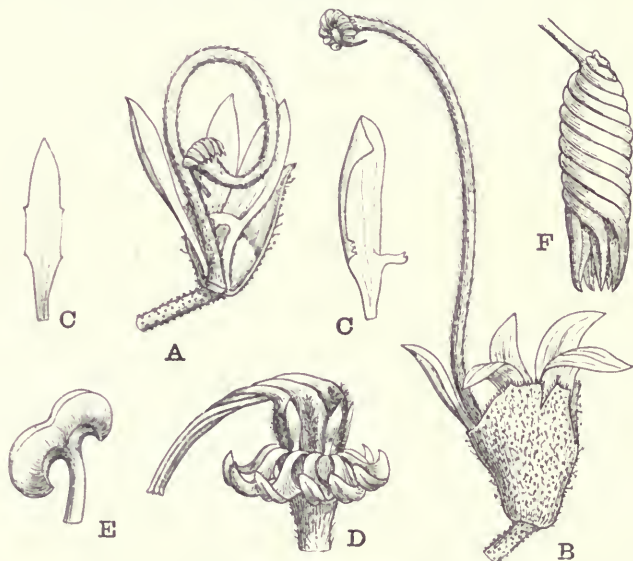


Fig. 58.—*Helicteres jamaicensis* Jacq.

A, Bud of flower just opening cut lengthwise, nat. size.

B, Flower, nat. size.

C, Petals, nat. size.

D, Apex of gonophore with stamens and pistil $\times 4$.

E, Stamen $\times 8$.

F, Fruit $\times 3$.

Wareka; near Letitz, 500 ft.; Long Mt., 800 ft.; Great Goat Is.; Cane R. valley, 300 ft.; Grove; *Harris*! Fl. Jam. 6155, 6314, 6582, 7262, 8865, 9342, 9632.—Bahamas, West Indies as far south as St. Martin, Central America.

Shrub or *tree*, 4 to 15 ft. high; twigs densely tomentose. *Leaves* 4–20 cm. l., ovate-elliptical to ovate-lanceolate, usually acute or acuminate and rather deeply cordate, often unequal at base, unequally crenate-toothed, pubescent or tomentose on upper surface, tomentose beneath; petioles short, tomentose; stipules tomentose, awl-shaped. *Peduncles* terminal or axillary, tomentose, few-flowered, 1.5–3 cm. l.; pedicels .5–1.5 cm. l., glandular at junction with peduncle. *Calyx* 1.5–2 cm. l., densely tomentose, bell-shaped, 2-lipped, unequally 5-toothed; base inside thickened. *Petals* longer than the calyx, white, differing in form, unequal-sided, oblong, more or less auricled at base. *Gonophore* about 7–8 cm. l.,

curved, villose. *Stamens* 10, with short filaments; staminodes 5. *Ovary* tomentose-villose on surface not covered by staminodes. *Style* 5-furrowed, with 5-cleft stigma. *Carpels* 5, twisted nearly round twice so as to show 8-10 threads, becoming, when quite ripe, more or less free at apex for about 1 cm. *Seeds* numerous.

Jacquin described this species from 3 small trees grown in the Vienna botanic garden from seeds which he collected near Kingston, Jamaica, in 1757, and sowed in a hothouse in 1770.

2. GUAZUMA Adans.

Trees, with tomentum of stellate hairs or glabrescent. Leaves unequally toothed, often oblique, stipulate. Cymes axillary. Flowers small. Calyx 2-3-parted. Petals 5, hooded-concave, apex 2-cleft, bearing a terminal linear 2-cleft appendage. Staminal column with 5 staminodes alternate with the petals, acuminate; anthers with 2 diverging cells, 2 or 3 together between the staminodes. Ovary 5-lobed, 5-celled, with numerous ovules in each cell; styles more or less united. Fruit subglobose, woody, tuberculose-spiny or with very long soft plumose bristles, not opening or with apex imperfectly loculicidally 5-valved. Seeds with endosperm; embryo slightly curved; cotyledons leaf-like, inflexed-folded; radicle very near the hilum. Bastard Cedar.

Species 5, natives of West Indies and tropical continental America.

G. ulmifolia Lam. *Encycl.* iii. 52 (1789); *St. Hil. Pl. Usuelles* tt. 47, 48; *St. Hil. et Naud. in Ann. Sc. Nat. sér. 2, xviii.* 31; *Descourt. Fl. Ant.* ii. 73, t. 85; *Macf. Jam.* i. 99; *Griseb. Fl. Br. W. Ind.* 91; *K. Schum. in Fl. Bras.* xii. pt. 3, 80; *Urb. Symb. Ant. in.* 407 & viii. 432. *G. tomentosa* H. B. & K. *Nov. Gen. & Sp.* v. 320 (1823); *Rich. in Sagra Cub.* x. 74; *Griseb. Fl. Br. W. Ind.* 90; *Mast. in Hook. f. Fl. Brit. Ind.* i. 375; *Urb. loc. cit.* *G. hibernica* Tuss. *Fl. Ant.* iv. 69, t. 24 (1827). *G. Guazuma* Cockerell in *Bull. Torr. Bot. Cl.* xix. 95 (1892); *Cook & Coll. in Contr. U.S. Nat. Herb.* viii. 155, t. 36; *Britt. Fl. Berm.* 242. *Cenchræmidea jamaicensis morifolia* &c. *Pluk. Phyt.* t. 77, f. 2 & *Alm.* 92. *Alni fructu, morifolia* &c. *Sloane Cat.* 135 & *Hist.* ii. 18. *Theobroma Guazuma* L. *Sp. Pl.* 782 (1753); *Sw. Obs. Bot.* 291; *Reliq. Houst.* t. 14; *Wright Mem.* 286. *T. foliis* &c. *Browne Hist. Jam.* 306. *T. foliis serratis* *Plum. Pl. Amer. (Burm.)* 135, t. 144, f. 1 & *Id. ined.* t. 300; *A. Robinson Ic. ined.* (Fig. 59.) Specimen from Browne in *Herb. Linn.* named in Solander's hand, with drawings noted by J. E. Smith as "ex D. Allemand."

Bastard Cedar.

Sloane Herb. v. 64, 65! *Houstoun!* *Browne!* *Wright!* *Broughton!* *Dancer!* *Shakspear!* *Distin!* *McNab!* *Montego Bay,* *Parnell!* *Moncague;* *Kingston;* *Prior!* *March!* *Liguanea plain,* J.P. 1394, *Morris!* also

Campbell! Constant Spring; Porus; Lucea; Port Antonio; Port Morant; *Hitchcock!* Hope, 700 ft.; near Hope, 800 ft.; Great Goat Is.; *Harris!* Fl. Jam. 5705, 6829, 6994, 9320, 11,008.—West Indies, tropical continental America.

Tree, 10–50 ft. high. *Leaves* 3–13(–21) cm. l., very variable in form, ovate to oblong or lanceolate, base unequal, glabrous, or more or less covered with minute hairs on upper surface, and more or less tomentose beneath. *Inflorescence* paniculate. *Calyx* 3-lobed, tomentose outside, 2.5–3 mm. l. *Petals* yellow, narrowed gradually to the base, puberulous, 3.5–4 mm. l.; appendage 4–4.5 mm. l., cleft more than halfway down. *Staminal column* bell-shaped, divided about one-third; staminodes lanceolate; stamens 2 or 3 together; filaments short. *Styles* united. *Fruit*

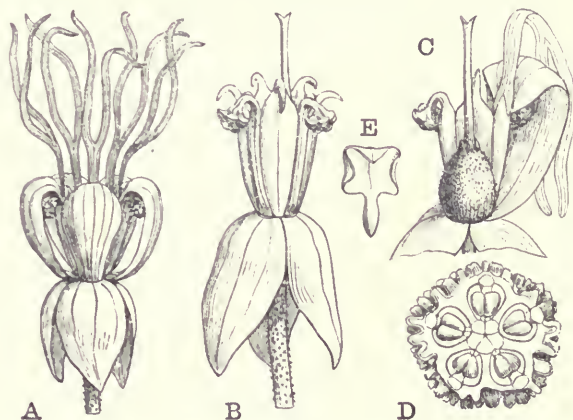


Fig. 59.—*Guazuma ulmifolia* Lam.

- A, Flower $\times 4$.
B, Ditto with petals removed, showing staminal tube with stamens and staminodes, $\times 7$.
C, Portion of flower showing the apex

- of a petal with appendage lying on a stamen, also ovary and style, $\times 7$.
D, Fruit cut across, nat. size.
E, Embryo $\times 11$.

purplish-black, globose or ellipsoidal, rounded at apex and base, pericarp tuberculose, perforated with numerous holes between the tubercles, 2–2.5 cm. l. *Seeds* indefinite in each cell, in 2 or 3 series, 3.5–4 mm. l.

The Bastard Cedar grows in both wet and dry districts in Jamaica. It is encouraged in pastures, as besides being a shade tree, the foliage and capsules are readily eaten by cattle and horses, and are of some importance where the grass is apt to be burnt up in times of drought. In this respect it is as useful as the Bread Nut (*Brosimum Alicastrum* Sw.). The capsules, coarsely bruised, are often given to horses as a substitute for corn. The timber is light, splits readily, and is easily worked; it has been used for the staves of sugar hogsheads, and by carriage-builders for side pieces.

3. THEOBROMA L.

Trees. *Leaves* large, undivided. *Peduncles* axillary or lateral, one-flowered and clustered, or branching with numerous flowers. *Flowers* small. *Calyx* 5-parted. *Petals* 5, hooded-concave,

clawed, with a terminal spatulate appendage. Staminodes 5, opposite the sepals, linear or lanceolate; anthers 2 or 3 together between the staminodes, with 2 diverging cells. Ovary 5-celled,

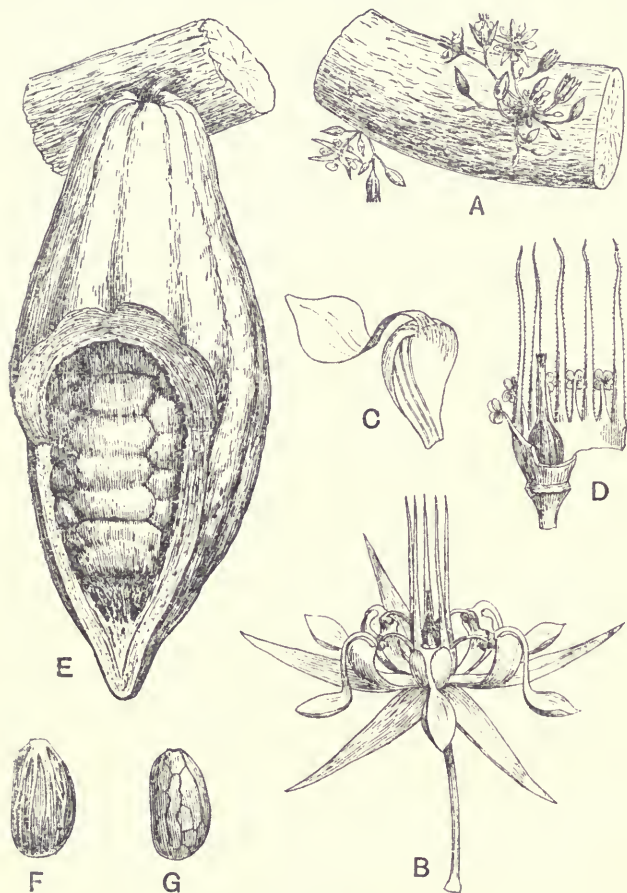


Fig. 60.—*Theobroma Cacao* L.

- A, Portion of a branch with flowers $\times \frac{2}{3}$. E, Pod cut away below to show seeds
 B, Flower $\times 4$. surrounded by pulp $\times \frac{1}{2}$.
 C, Petal $\times 8$. F, Seed $\times \frac{2}{3}$.
 D, Staminal column partly cut to show G, Embryo $\times \frac{2}{3}$.
 pistil $\times 5$.

with numerous ovules in each cell. Fruit fleshy outside. Seeds covered with pulp, without endosperm; cotyledons thick, corrugate; radicle very short.

Species 12, natives of tropical America.

T. Cacao *L. Sp. Pl.* 782 (1753); *Wright Mem.* 239, 276; *A. Robinson Ic. ined.*; *Descourt. Fl. Ant. iv.* 147, t. 266; *Macf. Jam. i.* 96; *Griseb. Fl. Br. W. Ind.* 91; *Bentl. & Trim. Med. Pl. t.* 38; *K. Schum. in Fl. Bras. xii. pt.* 3, 72, t. 16. *Theobroma* 2 & 3 *Browne Hist. Jam.* 306. *Cacao Sloane Cat.* 134 & *Hist. ii.* 15, tt. v. f. 2, 160. *C. guianensis Aubl. Pl. Guian. ii.* 682, t. 275 (1775). *C. minus Gaertn. Fruct. ii.* 190, t. 122 (1791). *C. Theobroma Tussac Fl. Ant. i.* 101, t. 13 (1808). (Fig. 60.) Specimens of leaves in Herb. Linn. named by Linnæus.

Cacao, Cocoa, Chocolate Tree.

Sloane Herb. v. 59!—Cultivated and spontaneous in West Indies and tropical continental America, introduced into the tropical regions of the Old World.

Tree, 10–25 ft. high. *Leaves* 2–3·5 dm. l., ovate or obovate-oblong, acuminate, somewhat unequal at the obtuse or rounded base, entire, glabrous; petiole 2–3 cm. l. *Inflorescence*: many-flowered clusters on the trunk. *Calyx* divided almost to the base, 5–6 mm. l. *Petals*: hood 2·5 mm. l.; appendage 5 mm. l., rhomboid-spathulate with a long claw with a knee-like bend. *Staminodes* awl-shaped; stamens bearing 2 anthers.

4. AYENIA L.

Herbs or undershrubs, with stellate tomentum, or hirsute, or glabrescent. Leaves serrate. Flowers small, solitary or in clusters or cymes, in the axils. Calyx 5-parted. Petals 5, limb hooded-concave, apex inflexed and affixed to the staminal tube, with a very long thread-like claw. Staminal tube with lobes (staminodes) without anthers, alternate with the petals; anthers solitary, between the staminodes, 3-celled. Ovary stalked, 5-celled, with 2 ovules in each cell; style simple, with stigma of globose lobes. Capsule spiny, 5-coccous; cocci 1-seeded, opening along the inner angle. Seeds oblong, narrowing to one end, without endosperm; cotyledons spirally rolled round the radicle.

Species about 40, natives of tropical America, including the West Indies.

Leaves serrate.

Leaves ovate-cordate, acuminate, 5–9 cm. l.... 1. *A. magna*.

Leaves oblong to roundish, 1–3 cm. l. 2. *A. pusilla*.

Leaves entire 3. *A. levigata*.

1. **A. magna** *L. Syst. ed.* 10, 1247 (1759); *Griseb. Fl. Br. W. Ind.* 91; *Hemsl. Biol. Cent. Am. Bot. i.* 134; *Urb. Synb. Ant. v.* 423, f. K–N. (Fig. 61, D, E.) Specimen from Browne in Herb. Linn. named by Linnæus.

In fl. & fr. Nov.–March; *Browne!* Liguanea plain; *Macfadyen!* St. Andrews, *McNab!* *March!* *Campbell!* *Harris!* Plowden Hill, 800 ft.; Fort Clarence Hill, 50 ft.; dry rocky hills, Fort Henderson; *Harris!* Fl. Jam. 6085, 6950, 8172, 9539, 10,147.—Mexico, Colombia, Venezuela, Bonaire Is.

Shrub, 2-6 ft. high. *Leaves* 5-9 cm. l., ovate-cordate, acuminate, serrate, pubescent, soft to touch beneath; petiole nearly half as long as the limb. *Flowers* white or greenish, in stalked umbellate 2-3-flowered cymes. *Calyx* 2.5-3 mm. l., divided to three-fourths of length, segments ovate-lanceolate, acuminate, puberulous on outside. *Petals*: limb without a gland, kidney-shaped, hastate; claw much longer than limb. *Staminal tube* cup-shaped, free from ovary; lobes erect, entire. *Ovary* sessile. *Capsule* 5-6 mm. l., about 8 mm. in diam., depressed globose, more or less covered with soft spines, 1-1.5 mm. l. *Seeds* 3.5-4 mm. l., transversely wrinkled, with minute tubercles, black.

2. *A. pusilla* L. *Syst. ed.* 10, 1247 (1759); *Cav. Diss.* v. 289, t. 147; *Gaertn. Fruct. i.* 383, t. 79; *Macf. Jam. i.* 101; *Griseb. Fl. Br. W. Ind.* 92; *K. Schum. in Fl. Bras. xii.* pt. 3, 105, t. 24; *Small Fl. S.E. U.S.* 781; *Britt. & Millsp. Bah. Fl.* 278; *Urb. Symb. Ant. iv.* 406, v. 423, f. A-D, & viii. 432. *Urticæ folio*

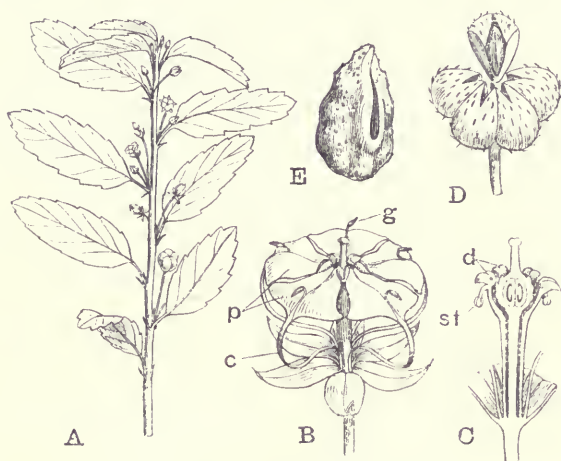


Fig. 61.—*Ayenia pusilla* L.

A, Portion of branch with leaves and flowers $\times \frac{1}{2}$.
B, Flower; p, petals; c, claw of petal; g, gland on petal $\times 6$.

C, Ditto with calyx and petals removed; st, stamens; d, staminodes $\times 8$.
D, Capsule of *A. magna* L. with one carpel detached $\times 2$.
E, Seed of *A. magna* L. $\times 4$.

anomala &c. *Sloane Cat.* 90 & *Hist. i.* 209, t. 132, f. 2. *Ayenia* L. in *K. Vetensk. Acad. Handl. xvii.* 23, t. 2 (1756). *D'Ayenia pusilla* Mill. *l.c.* t. 118 & *Dict. ed.* 8 (1768). (Fig. 61, A-C.) Specimen in Herb. Linn. named by Linnæus.

In fl. and fr. June-Aug.; among low shrubs and grasses in savannas; savanna of St. Jago de la Vega, *Sloane* Herb. iv. 23! *Browne*! between Kingston and Rock Fort, *Broughton*! Two-mile-wood Pen, St. Catherine, *Harris*! Fl. Jam. 12,069, 12,405.—Florida Keys and Texas to California, Bahamas, West Indies to Guadeloupe, tropical continental America.

Plant about 6 in. to 1 ft. high; stems numerous from a perennial root. *Leaves* variable in size and form, .5-3 cm. l., ovate, oblong, elliptical, or roundish, serrate. *Flowers* purple, solitary or 2-3 together. *Calyx* 2-3 mm. l., divided nearly to the base, segments ovate-lanceolate, acute or acuminate. *Petals*: claw a little longer than the calyx; limb roundish-rhomboid, 2-cleft, with a stalked oblong gland on back, much shorter than the limb. *Staminal tube* funnel-shaped above, tubular below, more or less united to the stalk of the ovary; lobes erect, subemarginate. *Ovary* long-stalked. *Capsule* 3 mm. l., 4 mm. in diam., globose slightly flattened above, muricate. *Seeds* slightly longer than 2 mm., tuberculate, transversely rough.

3. *A. lævigata* Sw. *Prodr.* 97 & *Fl. Ind. Occ.* 1131; *Macf. Jam. i.* 101; *Griseb. Fl. Br. W. Ind.* 91; *Urb. Symb. Ant. v.* 423, f. E-II.

In fl. Feb., May, July; *Swartz*; on Long Mt. above Rock Fort, *Broughton!* near Wareka, Long Mt., 500-600 ft.; Albion Mt., St. Thomas, 150-200 ft.; *Harris!* Fl. Jam. 6692, 8932, 9612, 11,867.—A specimen in Herb. Mus. Brit. labelled "America meridionalis, R. Shakespear."

Shrub or small *tree*, 10 to 18 ft. high, glabrous. *Leaves* 2-6 cm. l., ovate to lanceolate, obtuse or acute, entire; petiole 2-4 mm. l. *Peduncles* solitary or 2 together, very slender, red. *Flowers* dark reddish-brown. *Calyx* 4 mm. l., divided nearly to the base, segments lanceolate, acute. *Petals*: limb with 2 tail-like appendages at base, without a gland; claw about twice as long as limb. *Staminal tube* cup-shaped above, tubular below united with the stalk of the ovary; lobes spreading, 2-cleft. *Capsule* 12-13 mm. l., about 10 mm. in diam., globose-ellipsoidal, more or less covered with soft spines about 2 mm. l. *Seeds* 6-7 mm. l., oblong, narrowing to one end, surface rough, dark brown.

5. MELOCHIA L.

Herbs, shrubs, or trees, stellate hairs not intermixed with simple hairs. Leaves serrate, narrow, ovate, or broadly cordate. Flowers usually small, sometimes clustered in the axils or in a spike-like inflorescence, sometimes more laxly cymose or paniculate, axillary or terminal, hermaphrodite, heterostyled. Calyx 5-lobed or 5-toothed, bell-shaped, enlarged in *M. lupulina*, persistent. Petals 5, spatulate or oblong, with roundish apex, narrowed into a claw, more or less adherent to the stamens below, marcescent. Stamens 5, opposite the petals, united into a tube which is adherent below with the claws of the petals, rarely bearing 5 alternate teeth or lobes (staminodes); anthers with 2 parallel cells. Ovary 5-celled, with 2 ovules in each cell; styles 5, free or more or less united. Capsule septicidal and more or less loculicidally 5-valved, or loculicidal only, 5-10-seeded. Seeds ascending, with more or less endosperm; embryo straight, cotyledons flat, radicle next the hilum.

Species about 90, growing in tropical and subtropical regions.

Capsule 5-lobed-globose, composed of 5 cocci at length separating.

Cocci slightly opening along the inner angle.

Calyx enlarged after flowering. Inflorescence axillary, flowers in clustered pedunculate corymbs 1. *M. lupulina*.

Calyx not enlarged. Inflorescence axillary, flowers subsessile in dense subglobose clusters..... 2. *M. nodiflora*.

Cocci splitting at apex by 2 short valves. Inflorescence a terminal panicle, leafless above, composed of pedunculate corymbs..... 3. *M. venosa*.

Cocci splitting completely into 2 valves. Inflorescence a terminal interrupted or compact leafy spike, composed of dense axillary sessile or subsessile clusters..... 4. *M. hirsuta*.

Capsule pyramidal, 5-angled.

Plant glabrous. Inflorescence opposite the leaves... 5. *M. pyramidata*.

Plant tomentose.

Inflorescence axillary 6. *M. tomentosa*.

Inflorescence opposite the leaves 7. *M. crenata*.

1. *M. lupulina* Sw. *Prodr.* 97 (1788) & *Fl. Ind. Occ.* 1141; inflorescence axillary, flowers in clustered pedunculate corymbs; calyx much enlarged after flowering; capsule 5-lobed-globose,

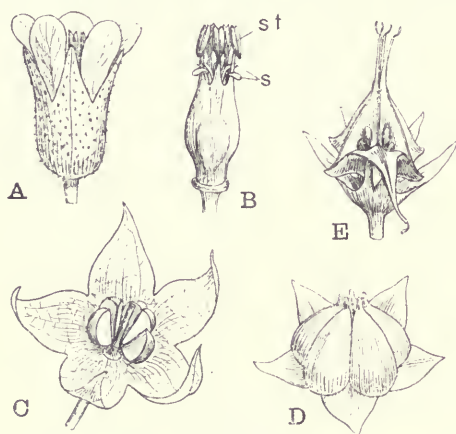


Fig. 62.—*Melochia lupulina* Sw.

A, Flower $\times 2$.

B, Ditto with calyx and petals removed; st, stamens; s, styles $\times 4$.

C, Fruit $\times 6$.

D, Fruit of *M. nodiflora* Sw. $\times 4$.

E, Fruit of *M. tomentosa* L. $\times 2$.

composed of 5 cocci at length separating and slightly opening along the inner angle.—*Griseb. Fl. Br. W. Ind.* 94; *K. Schum. in Fl. Bras. vii. pt. 3*, 35. *Mougeotia inflata* H. B. & K. *Nov. Gen. & Sp. v.* 330, t. 484 (1822). *Riedleia inflata* DC. *Prodr. i.* 491 (1824); *Macf. Jam. i.* 103. (Fig. 62, A–C.)

Macfadyen! *Parnell!* *Purdie!* *Wilson!* near Morant Bay, *Prior!* Port Morant, *Hitchcock!* Woodstock, Westmoreland; *Kempshot*, 1100–1600 ft.;

near Holland Bay; *Harris*! Phillipsfield, near Bowden, *Harris & Britton*! Fl. Jam. 9831, 10,328, 10,783, 11,955.—Panama, Colombia, Ecuador, Peru.

Herb or *undershrub*, 3 ft. high, sometimes with trailing branches supported by other shrubs and growing to a height of 10 ft., puberulous at ends of branches. *Leaves* 2-9 cm. l., ovate, acuminate to acute, subcordate to rounded, serrate, on upper surface pubescent with adpressed hairs, beneath pubescent or subtomentose. *Calyx* 4-4.5 mm. l. in fl. *Petals* slightly longer than sepals, oblong, shortly clawed, white with a yellow spot in centre. *Filaments* united to middle. *Ovary* shortly stalked; styles distinct. *Fruit* puberulous, 3 mm. l. *Seeds* about 1.6 mm. l.

2. *M. nodiflora* Sw. *Prodr.* 97 (1788) & *Fl. Ind. Occ.* 1139; inflorescence axillary, flowers subsessile in dense subglobose clusters; capsule 5-lobed-globose, composed of 5 cocci at length separating and slightly opening along the inner angle.—*Griseb. op. cit.* 94; *Urb. Symb. Ant. iv.* 405 & viii. 430; *Britt. & Millsp. Bah. Fl.* 277. *Mougeotia nodiflora* H. B. & K. *tom. cit.* 330 (1823). *Riedleia nodiflora* DC. *Prodr. i.* 491 (1824); *Macf. Jam. i.* 103. *Abutilon fruticosum foliis &c. Cat.* 97 & *Hist. i.* 219, t. 135, f. 2. (Fig. 62, D.)

St. Jago de la Vega, *Sloane* Herb. iv. 59! *Wright*! *Broughton*! *Shakespear*! *Masson*! *Macfadyen*! *Lanc*! Kingston; Mt. Diablo; *Prior*! *March*! *Jenman*! Liguanea plain, 200 ft., *Campbell*! near Ewarton, 1000 ft.; *Harris*! Fl. Jam. 6090, 6615, 6697; Kingston, *Rothrock*; Constant Spring; Bog Walk; Port Morant; Porus; *Hitchcock*.—Bahamas, West Indies, Central America, Colombia, Bolivia.

Undershrub, 2-6 ft. high; glabrate, but younger parts at first puberulous. *Leaves* 2-12 cm. l., ovate, ovate-elliptical to ovate-lanceolate, apex acuminate to acute, base rounded, truncate, or emarginate, serrate, puberulous on nerves beneath; petioles about one-fourth as long as the blade; stipules 4-5 mm. l., linear-lanceolate. *Calyx* 3.5-4 mm. l.; lobes triangular-lanceolate, shortly acuminate. *Petals* about 4.5 mm. l., white, striped with rose, or reddish-white, obovate-oblong, shortly clawed. *Filaments* united to apex. *Ovary* sessile; styles distinct. *Fruit* puberulous, nearly 3 mm. l. *Seeds* about 2 mm. l., black.

3. *M. pilosa* *comb. nov.*; inflorescence a narrow terminal panicle, leafless above, composed of pedunculate corymbs; capsule 5-lobed-globose, of 5 cocci at length separating and splitting at apex by 2 short valves.—*M. venosa* Sw. *Prodr.* 97 (1788) & *Fl. Ind. Occ.* 1137; *Griseb. op. cit.* 94; *K. Schum. tom. cit.* 37. *Mougeotia polystachya* H. B. & K. *tom. cit.* 328, tt. 483, 483a (1822). *Sida pilosa* Mill. *Dict. ed.* 8 (1768). *Riedleia jamaicensis* DC. *Prodr. i.* 492 (1824). *R. virgultosa* Macf. *Jam. i.* 104 (1837). Miller's type in Herb. Mus. Brit.

Houstan! *Wright*! *March*; road to Constitution Hill, 1000-1500 ft., *Harris*! Fl. Jam. 6815, 9026.—Tropical S. America.

Undershrub to 3 ft. high; younger branches woolly. *Leaves* 2-8 cm. l., ovate to oblong or elliptical or lanceolate, apex acute or obtuse, base rounded; petioles short; stipules 7-8 mm. l., linear-lanceolate. *Calyx* 5-5.5 mm. l., lobes lanceolate, acuminate to a long point. *Petals* 6.5-8 mm. l., obovate, clawed, yellow. *Filaments* united to apex. *Ovary* sessile; styles distinct. *Fruit* villose, 3-4 mm. l. *Seeds* about 2 mm. l., blackish.

4. *M. villosa* *comb. nov.*; inflorescence a terminal interrupted or compact leafy spike, composed of dense axillary sessile or subsessile clusters; capsule 5-lobed-globose, of 5 cocci at length separating and splitting completely into 2 valves.—*M. hirsuta* Cav. *Diss. vi.* 323, *t.* 175, *f.* 1 (1788); *Rich. in Sagra Cub. x.* 77; *Griseb. op. cit.* 94; *K. Schum. tom. cit.* 45; *Urb. Symb. Ant. iv.* 405 & viii. 430. *M. serrata* St. Hil. & Naud. in *Ann. Sc. Nat. sér. 2, xviii.* 36 (1842); *Griseb. op. cit.* 93. *Althæa spicata*...villosissimo *Sloane Cat.* 97 & *Hist. i.* 218, *t.* 138, *f.* 1. *Sida villosa* Mill. *Dict. ed.* 8 (1768). *Riedlea serrata* Vent. *Choix t.* 37 (1803); *Macf. Jam. i.* 104. *Mougeotia hirsuta* H. B. & K. *tom. cit.* 331 (1823). Miller's type in Herb. Mus. Brit.

Mt. Diablo, *Sloane* Herb. iv. 55! *Wright!* St. Thomas in the Vale, *Macfadyen!* *McNab!* *Purdie!* Moneague; Mt. Diablo; *Prior!* *March!* Bull Head, *Fawcett!* Oxford, 1200 ft.; Kellits, Clarendon, 2000 ft.; Hollis's savanna, Clarendon, 2400 ft.; James Hill savanna, 2400 ft.; *Harris!* Fl. Jam. 8468, 9428, 11,151, 12,251, 12,842.—West Indies, tropical continental America.

Undershrub, 3-5 ft. high, young branches densely hairy with long hairs intermixed with short. *Leaves* 2-5 cm. l., ovate-oblong to ovate-elliptical, apex acute to obtuse, base rounded or subcordate, doubly serrate, on both sides with long silky adpressed hairs, upper surface sometimes glabrate; petioles short; stipules 5-6 mm. l., lanceolate. *Bracteoles of involucrel* 3, twice as long as calyx, linear-tapering, hirsute. *Calyx* 4 mm. l., hirsute; lobes ovate, acuminate. *Petals* 6-7 mm. l., obovate, clawed, attached by claws to the staminal tube, pink to rosy-violet. *Staminal tube*, in the long-styled form, 4 mm. l.; in the short-styled form, 7 mm. l., cut below the middle. *Pistil* 7 or 4.5 mm. l.; styles united below. *Fruit* about 3 mm. l. *Seeds* 1.5-2 mm. l., mottled greenish-grey and black.

5. *M. pyramidata* L. *Sp. Pl.* 674 (1753) & *Amœn. v.* 380; inflorescence cymose-umbellate, opposite the leaves, 3-10-flowered; capsule pyramidal, 5-angled, angles cuspidate or acute at base; plant glabrous.—*Jacq. Hort. Vindob.* 11, *t.* 30; *Cav. Diss. vi.* 319, *t.* 172, *f.* 1; *Sw. Obs. Bot.* 255; *Macf. Jam. i.* 102; *A. Gr. Gen. ii.* 86, *t.* 134; *Griseb. op. cit.* 93; *K. Schum. tom. cit.* 34; *Urb. Symb. Ant. iv.* 404 & viii. 429. *M. herbacea* &c. *Browne Hist. Jam.* 276. *M. domingensis* *Jacq. Sel. Stirp. Amer.* 194. *Abutilon herbaceum procumbens* &c. *Sloane Cat.* 97 & *Hist. i.* 220, *t.* 139, *f.* 1. *Moluchia pyramidata* *Britton in Mem. Brookl. Bot. Gard. i.* 69 (1918); *Britt. & Millsp. Bah. Fl.* 277. Specimen in Herb. Linn. named by Linnæus.

Road St. Jago de la Vega to St. John, *Sloane* Herb. iv. 60! *Broughton!* *Macfadyen!* Corby, St. Cruz Mts., 1500 ft.; Pepper, St. Elizabeth, 250 ft.; Inverness, Clarendon, 300 ft.; *Harris!* Fl. Jam. 9744, 9861, 12,751; Lucea, *Hitchcock*.—Bahamas, West Indies south to Grenada, continental tropical America north to Texas, Old World tropics (probably introduced).

Herbs or undershrubs, 1-2 ft. high. *Leaves* 2-7 cm. l., green, the larger ovate, oblong, or lanceolate to smaller, elliptical or roundish, glabrous; petioles 1-4 cm. l.; stipules 2-3 mm. l., awl-shaped. *Calyx* 3.5-4 mm. l., minutely puberulous; lobes lanceolate-awl-shaped, about 2 mm. l. *Petals*

6–8 mm. l., obovate-lanceolate, narrowing into the claw, rosy or light violet-blue with yellow claws. *Flowers* of 2 forms, long-styled and short-styled, with corresponding variation in staminal tube. *Ovary* and styles very minutely puberulous. *Fruit* 6–8 mm. l. *Seeds* about 2 mm. l.

6. *M. tomentosa* L. *Syst. ed.* 10, 1140 (1759) & *Amœn. v.* 400, 380; inflorescence axillary, cymose-umbellate, 7–3(–10)-flowered; capsule pyramidal, 5-angled, angles more or less rounded; plant tomentose.—*Cav. Diss. vi.* 319, *t.* 172, *f.* 2; *Jacq. Sel. Stirp. Amer.* 193; *Sw. Obs. Bot.* 256; *Wright Mem.* 285; *Macf. Jam. i.* 101; *Griseb. loc. cit.* (excl. var.); *K. Schum. tom. cit.* 33; *Urb. Symb. Ant. iv.* 404 & *viii.* 429. *M. frutescens* &c. *Browne loc. cit.* *M. Turpiniana* H. B. & *K. tom. cit.* 323, *t.* 482. *Abutilon arboreum* &c. *Sloane Cat.* 97 & *Hist. i.* 219, *t.* 138, *f.* 2, 3. *Althæa americana incana* &c. *Pluk. Phyt. t.* 131, *f.* 4. *Moluchia tomentosa* Britton *loc. cit.*; *Britt. & Millsp. Bah. Fl.* 276. (Fig. 62, e.) Specimen in Herb. Linn. named by Linnaeus.

Sloane Herb. iv. 58! *Wright!* *Broughton!* *Shakespear!* *McNab!* *Lane!* *Purdie!* *Kingston, Prior!* *March!* near Gordon Town, *Ball!* *Watson's Hill,* Manchester, 800 ft.; sea-coast near Falmouth; near Alligator Pond, 300 ft.; Plowden Hill, 1000 ft.; *Harris!* Long Mt. road, *Fawcett!* Fl. Jam. 6315, 7222, 7230, 7313, 8171.—Bahamas, West Indies, tropical continental America north to Texas and California.

Undershrub or *shrub*, 6–10 ft. high. *Leaves* variable in size and form, 1–7 cm. l., ovate, oblong, or lanceolate, more or less whitish-tomentose; petioles very short or long; stipules 4–7 mm. l., awl-shaped from a lanceolate base, very soon falling. *Calyx* about 6 mm. l.; lobes 4 mm. l., linear-acuminate, stellate-tomentose outside. *Petals* 10–13 mm. l., oblanceolate, with a long claw, rosy or purple. *Stamens* 5·5–6 mm. l., tube 4 mm. l. *Pistil* 10–11 mm. l.; ovary stalked, puberulous; styles united about half the length, puberulous. *Fruit* 9 mm. l. *Seeds* about 2 mm. l., irregularly ovoid, 1 or 2 in each cell.

7. *M. crenata* Vahl *Symb. iii.* 86, *t.* 68 (1794); inflorescence cymose-umbellate, opposite the leaves, 3–1(–5)-flowered; capsule pyramidal, 5-angled, often somewhat oblong in outline, angles rounded; plant tomentose.—*Riedleia crenata* DC. *Prodr. i.* 491 (1824). Specimen collected by von Rohr near S. Martha, Colombia, in Herb. Mus. Brit.

Wright! Palisadoes, J.P. 1002, 1530, *Hart!*—Colombia.

Undershrub, branches and petioles white-woolly-tomentose. *Leaves* 1·5–3 cm. l., elliptical to round, on both sides white-tomentose, soft to the touch, margin crenulate; petioles 8–23 mm. l.; stipules 3 mm. l., ovate or deltoid, more or less persistent, glabrous above, tomentose beneath. *Calyx* 4·5–5·5 mm. l., woolly-tomentose; lobes lanceolate, acuminate, about 2·5–3 mm. l. *Petals* 14 mm. l., obovate, narrowing below into a rather short claw. *Stamens* 7–8 mm. l., tube about 4·5 mm. l. *Pistil* about 11 mm. l.; ovary and styles somewhat hirsute with branched hairs; styles united shortly (1·5–2 mm.) at base. *Capsule* pyramidal, 5-angled, angles rounded, about 1 cm. l., more or less tomentose. *Seeds* 2 in each cell, 2·3 mm. l., semiovoid, somewhat acuminate.

It is stated on von Rohr's specimen that it was “repens in arenosis.” *Hart* collected his specimens on the Palisadoes, which is a sandbank.

6. WALTHERIA L.

Herbs or shrubs, with stellate hair. Leaves serrate or crenulate. Stipules narrow. Flowers usually small, yellow, clustered in the axils or in terminal heads, racemes, or panicles. Bracteoles in Jamaican species linear or linear-lanceolate, free. Calyx 5-lobed. Petals 5, spathulate, marcescent. Stamens 5, united at the base, opposite the petals; staminodes none; anthers with 2 parallel cells. Ovary of one carpel, 1-celled, with 2 ovules; style slightly lateral, club-shaped above or fringed. Capsule 2-valved; seed solitary. Seed ascending; endosperm present; embryo straight, cotyledons flat, radicle next the hilum.

Species about 60, growing in the tropics, mostly in America.

Leaves ovate to lanceolate, 3-9 cm. l. 1. *W. americana*.
Leaves roundish-ovate or -obovate, 1·5-3·5 cm. l. 2. *W. calicicola*.

1. *W. americana* L. *Sp. Pl.* 673 (1753); *Sw. Obs. Bot.* 254; *Macf. Jam. i.* 105; *Griseb. Fl. Br. W. Ind.* 95 (excl. syn. *W. ovata* Cav. & *W. angustifolia* H. B. & K.); *Mast. in Fl. Trop. Afr. i.* 235; *K. Schum. in Fl. Bras. xii. pt. 3,* 63; *Small Fl.*

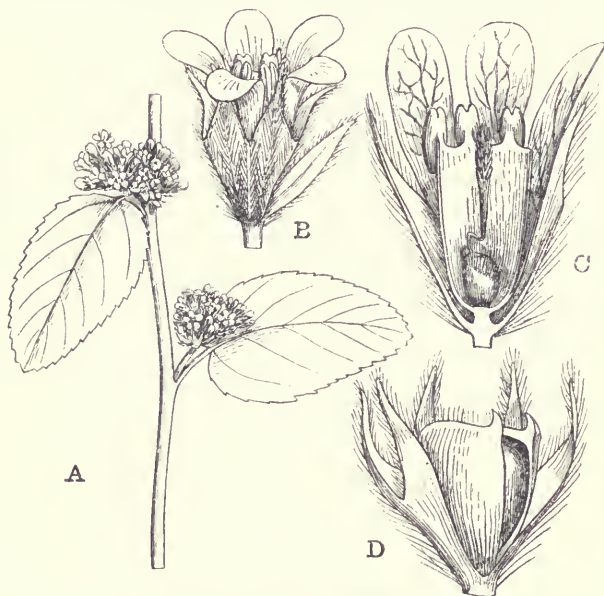


Fig. 63.—*Waltheria americana* L.

A, Portion of branch with leaves and flowers $\times \frac{3}{4}$.

B, Flower with bracteole $\times 4$.

C, Ditto cut lengthwise $\times 7$.

D, Fruit with persistent calyx, showing seed, $\times 7$.

S.E. U.S. 780 ; *Urb. Symb. Ant.* iv. 405 & viii. 431 ; *Britt. Fl. Berm.* 242 ; *Britt. & Millsp. Bah. Fl.* 278. *W. indica* *L. Sp. Pl.* 673 (1753) & *Amœn. v.* 380 ; *Jacq. Ic. Pl. Rar. i.* 13, t. 130 ; *Mast. in Hook. f. Fl. Br. Ind. i.* 374. *W. angustifolia* *L. Syst. ed.* 10, 1140 & *Amœn. v.* 380. *W. foliis angustis* &c. & *W. fruticosa* &c. *Browne Hist. Jam.* 276. *Betonia arborescens Maderaspatana* &c. *Pluk. Phyt. t.* 150, f. 5. *Betonia arborescens foliis* &c. *Pluk. Phyt. t.* 150, f. 6. *Malva americana abutili* &c. *Sloane Cat.* 97 & *Hist. i.* 218. (Fig. 63.) Specimen in *Herb. Linn.* named by Linnæus.

Sloane *Herb.* iv. 54 ! *Houstoun* ! *Wright* ! *Broughton* ! *Shakespear* ! *Distin* ; *McNab* ! *Parnell* ! *Wilson* ; *Liguanea* hills ; *Kingston* ; *Prior* ! *March* ; *Liguanea* plain, J.P. 1947, *Morris* ! also J.P. 1460, *Hart* ! near *Gordon Town*, *Ball* ! *Constant Spring* ; *Lucea* ; *Hitchcock* ; near *Kingston*, *Clute* ! *Hope*, *Harris* ! *Liguanea* plain, *Campbell* ! *Fl. Jam.* 5654, 5865.—*Key Is.* *Florida*, *Bahamas*, *West Indies*, *tropical and subtropical regions*.

Undershrub, 3-6 ft. high, stem and branches more or less tomentose or woolly. *Leaves* 2.5-9 cm. l., ovate, oblong, or lanceolate, apex obtuse or somewhat acute, base obtuse, rounded, or subcordate, on both sides tomentose, usually whitish, serrate ; petioles 4-15(-25) mm. l. ; stipules lanceolate-awl-shaped, 3-6 mm. l. *Inflorescence* axillary, sessile or stalked, flowers crowded into a globose mass. *Calyx* 4-5 mm. l., lobes awl-shaped, with lanceolate base. *Petals* nearly 6 mm. l., oblong, claws slender. *Staminal tube* 2 mm. l., undivided. *Pistil* 2 mm. l., ovary hirsute ; style club-shaped at apex, penicillate. *Capsule* 2 mm. l. *Seeds* 1.5 mm. l.

2. *W. calcicola* *Urb. Symb. Ant. i.* 475 (1900) & iv. 406. *W. foliis subrotundis* &c. *Browne Hist. Jam.* 276.

Dry, rocky hills, *Fort Henderson* ; *Harris* ! *Fl. Jam.* 10,155.—*Porto Rico*.

Low shrubby plants forming thickets (*Harris*), 3-6 ft. high, young stem and branches tomentose with stellate hairs. *Leaves* 3.5-1.5 cm. l., roundish-ovate or -obovate, apex rounded, base rounded or subtruncate, margin crenulate except the base, on both sides tomentose ; petioles 3-6 mm. l. ; stipules thread-like, 3.5-6 mm. l. *Inflorescence* subcapitate at the apex of the branches, usually 2 flowers together in the axils of very small leaves. *Calyx* 6-8 mm. l. ; lobes triangular-lanceolate, about 3 mm. l. *Petals* about as long as the calyx or a little longer, oblanceolate narrowing into a rather broad claw. *Stamens* about 4 mm. l. ; filaments united into a tube 2 mm. l., free above. *Pistil* about as long as the petals ; stigma composed of many rays forming a small head.

7. STERCULIA L.

Trees. Leaves undivided, lobed, or digitate. Inflorescence paniculate or sometimes racemose, generally axillary. Flowers unisexual or polygamous, the terminal flowers usually female. Calyx 5-cleft, usually coloured. Petals wanting. Gonophore somewhat shorter than calyx. Staminal tube with 10-15 anthers crowded at the apex. Carpels of the ovary 5, subdistinct, cohering at apex only by the united styles, with 2 to

many ovules in each, stigmatic apex peltate or lobed. Ripe carpels distinct, generally opening along the ventral line. Seeds 1 or many in each carpel; endosperm fleshy, adhering to the foliaceous cotyledons; embryo straight.

Species about 200, growing in the warmer regions of the world, chiefly in tropical Asia.

[Leaves 5-lobed on flowering branches, tomentose beneath..... *S. apetala*.]

Leaves entire on flowering branches, puberulous or glabrate beneath *S. caribæa*.

[*S. apetala* Karst. *Fl. Columb.* ii. 35, t. 118 (1862-69); *Britt. Fl. Berm.* 242; *Urb. Symb. Ant.* viii. 433. *S. carthaginensis* Cav. *Diss.* vi. 353 (1788); *R. Br. in Benn. Pl. Jav. Rar.* 228; *Griseb.*

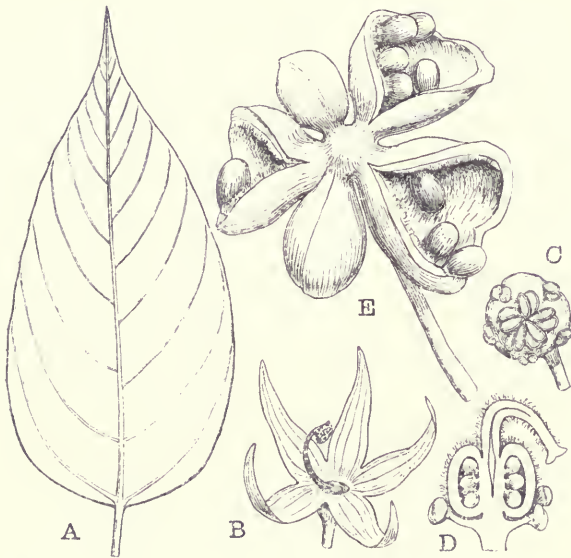


Fig. 64.—*Sterculia caribæa* R. Br.

A, Leaf $\times \frac{1}{2}$.

B, Male flower $\times 2$.

C, Apex of gonophore with anthers $\times 7$.

D, Female flower $\times 8$.

E, Fruit of *S. apetala* Karst. $\times \frac{1}{2}$.
(E after Pittier.)

Fl. Br. W. Ind. 89; *Pittier in Contrib. U.S. Nat. Herb.* xiii. 447, with figs. 70-76 in text, & t. 89. *S. Helicteres* Pers. *Syn. Sp. Pl.* ii. 240 (1806). *Helicteres apetala* Jacq. *Enum.* 30 (1760), *Sel. Stirp. Amer.* 238, t. 181, f. 97 & *Ed. pict.* 115, t. 263, f. 74. (Fig 64, E.) Specimen of flower from Jacquin in Herb. Mus. Brit.

Naturalized; *March!* Liguanea plain, *Harris!* Fl. Jam. 8282, 9215; Kingston, *Donnell Smith.*—Natives of Central America, Colombia, Venezuela, Paraguay.

Tree, 30–50(–100) ft. high. *Leaves* to 30 cm. and more in diam., deeply 3–5-lobed, shining on upper surface, tomentose beneath with penicillate hairs; petioles 10–20 cm. l., more or less tomentose above. *Inflorescence* in terminal panicles 20–25 cm. l., tomentose with penicillate hairs, unisexual or with male and hermaphrodite flowers. *Male flowers*: *Calyx* 15–18 mm. l., bell-shaped, cut halfway, coloured inside dirty yellow with purplish spots and lines. *Gonophore* 10–13 mm. l., curved. *Staminal tube* short. *Anthers* 7–15. *Ovary* rudimentary. *Hermaphrodite flowers*: *Calyx* similar to male. *Gonophore* shorter. *Staminal tube* shallow, cup-like. *Anthers* 12–16. *Ovary* 3 mm. in diam., tomentose; style bent down. *Ripe carpels* spreading, 6–12 cm. l., covered inside with a dense layer of erect stiff yellowish prickly hairs about 2 mm. l., with 2–4 seeds. *Seeds* about 2 cm. l., ellipsoidal, black.]

S. caribæa R. Br. in *Benn. Pl. Jav. Rar.* 228 (1844); *Griseb. Fl. Br. W. Ind.* 90. *S. Ivira* Sw. *Prodr.* 98 (1788) & *Fl. Ind. Occ.* 1160 (in part); *Macf. Jam. i.* 96. (Fig. 64, A–D.) Type in Herb. Mus. Brit.

Bastard Mahoe.

Woods near Roaring River, *Macfadyn;* *Purdie!*—Dominica, Martinique, St. Lucia, St. Vincent, Trinidad.

A high tree. *Leaves* 10–20 cm. l., ovate or ovate-elliptical, entire on flowering branches, sometimes 3-lobed on lower part of tree, glabrous on upper surface, puberulous or glabrate beneath; petioles 2–6 cm. l., glabrous. *Inflorescence* in terminal panicles, 5–15 cm. l., covered with yellow-brownish powdery tomentum. *Flowers* male or hermaphrodite. *Male flowers*: *Calyx* 10–12 mm. l., cut nearly to base, yellowish; lobes oblong-lanceolate, spreading, glandular about the middle. *Gonophore* about 6 mm. l., curved. *Staminal tube* minute. *Anthers* 8–10. *Ovary* rudimentary. *Hermaphrodite flowers*: *Calyx* similar to male. *Gonophore* 5 mm. l. *Staminal tube* minute. *Anthers* about 7. *Ovary* about 2 mm. in diam., tomentose; style bent down. *Ripe carpels* about 4 cm. l., the carpophore nearly of the same length.

[COLA Schott

Trees. Leaves entire or lobed. Flowers unisexual or polygamous, axillary, clustered or shortly cymose or paniculate. Calyx 5-cleft. Petals wanting. Gonophore very short. Staminal column with 10–12 anthers, sessile, in a double ring round the apex. Carpels 3–10, subdistinct, each with several ovules; styles as many as the carpels. Ripe carpels thick, opening along the ventral line. Seeds several in each cell, without endosperm; cotyledons thick; radicle next the hilum.

Species nearly 100, growing in tropical Africa.

C. acuminata Schott & Endl. *Meletem.* 33 (1832); *R. Br. in Benn. Pl. Jav. Rar.* 237 (1844); *Griseb. Fl. Br. W. Ind.* 90; *Bot. Mag. t.* 5699. *Ceratonia affinis siliquosa* &c. *Sloane Cat.* 154 & *Hist. ii.* 60. *Sterculia acuminata* Beauv. *Fl. Owar. i.* 41, *t.* 24 (1805); *Macf. Jam. i.* 95. Bichy Tree Broughton, *Hortus*

Eastensis, 34 (1794), reprinted in *Bryan Edwards Hist. W. Ind.* iii. 407 (1794); *Lunan Hort. Jam.* i. 86.

Cola, Kola, Bichy.

Introduced; *Sloane* Herb. vi. 55! *Macfadyen!* *March!* *Prior!* *Campbell!* *Thompson!* *Harris!*

Tree to 35 ft. high. *Leaves* 8-16 cm. l. (on flowering branches), oblong or subovate-oblong, shortly and obtusely acuminate, wedge-shaped and 3-nerved at base, glabrous, entire. *Inflorescence* a corymbose panicle. *Calyx* cleft beyond the middle, with minute stellate hairs inside and densely hairy outside, of hermaphrodite flower to 16 mm. l.; lobes oblong-triangular pointed. *Ovary* hairy, 5-celled; ovules 10-12 in each cell. *Stigmas* linear-lanceolate, recurved. *Ripe carpels* 8-14 cm. l. *Seeds* 3.5-4.5 cm. l.

The seed is chewed by the African native to promote digestion. It is also used medicinally, and to render putrid water wholesome. The seeds are sometimes ground and made into a drink like cocoa.]

FAMILY LXVII. DILLENIACEÆ.

Trees, shrubs, sometimes climbing, or rarely perennial herbs or undershrubs. Leaves alternate, usually entire or toothed, generally leathery. Stipules either none or wing-like, attached to the petiole, soon falling. Flowers hermaphrodite or polygamous. Sepals 5 (3-6, or indefinite), very much overlapping, persistent. Petals 5 (1-6), very much overlapping, often corrugate, soon falling. Stamens generally indefinite, hypogynous, free or united at the base. Anthers innate, the cells opening laterally or inwards or by an apical pore. Pistil free; carpels one to indefinite, distinct, rarely cohering in the centre of the flower. Ovules one to indefinite, anatropous, erect from the base or attached in 2 series to the inner angle, raphe ventral. Styles separate, terminal or subdorsal, diverging; stigma simple. Ripe carpels opening on the inner side or on the back, sometimes crustaceous or berry-like and indehiscent. Seeds solitary or few, thick, with an aril. Endosperm fleshy. Embryo minute, close to the hilum.

Species 350, mostly in the tropics or in Australia, very few in N. America or in eastern Asia outside the tropics.

Flowers hermaphrodite. Sepals 2 inner, very large, concave, increasing in size and becoming leathery, enclosing the fruit

1. *Davilla*.

Flowers polygamous. Sepals not enclosing the fruit..... 2. *Tetracra*.

1. DAVILLA Vand.

Shrubs generally climbing by twining. Leaves pinnate-nerved, nerves parallel. Panicles terminal or in the upper axils. Flowers hermaphrodite, yellow. Sepals 5, very unequal, two interior very large, concave, increasing in size, at length leathery, enclosing the fruit and looking like a globose capsule. Petals 1-6.

Stamens with filaments thickened at the apex. Anthers short, with diverging cells. Carpels 1-3, with 2 erect ovules, not opening when ripe or bursting irregularly. Seeds enclosed almost completely by an aril.

Species nearly 40, natives of tropical America (including the West Indies).

D. rugosa Poir. *Encycl. Suppl.* ii. 457 (1811); *St. Hil. Pl. Us. t.* 22; *Griseb. Fl. Br. W. Ind.* 2; *Eichl. in Fl. Bras. xiii. pt.* 1, 106. *D. brasiliensis* DC. *Syst.* 405 (1818); *Deless. Ic. Sel.* i. 18,

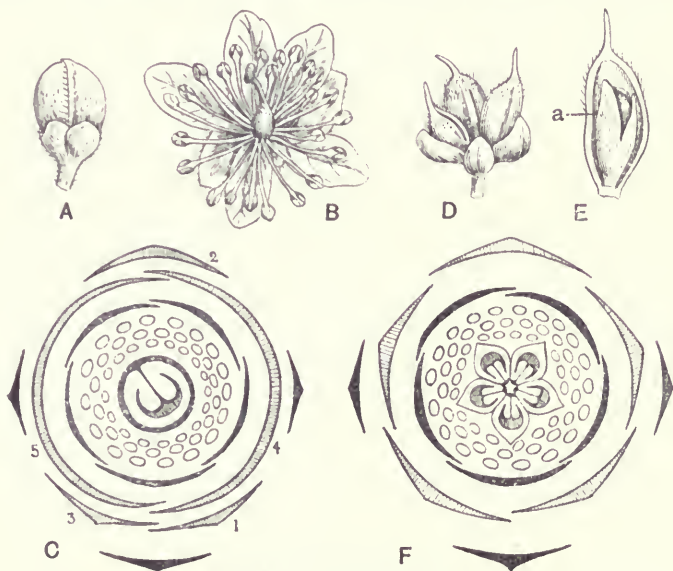


Fig. 65.—*Davilla rugosa* Poir.

A, Flower-bud $\times 2$.

B, Open flower $\times 2$.

C, Diagram of a flower.

Tetracera Poeppigiana Schlecht.

D, Fruit $\times 1\frac{1}{2}$.

E, Ripe carpel cut open showing an arillate seed $\times 2$; a, aril.

F, Diagram of a flower.

(A, B, D, E after A. Richard; C, F after Eichler.)

t. 71. *D. Sagræana* A. Rich. *Sagr. Cub.* x. 8, xii. t. 2 (1845).
D. ciliata A. Rich. *Sagr. Cub.* x. 9, xii. t. 3 (1845). (Fig. 65, A-C.)

Red Withe.

Wright! *Macfadyen*; *Prior*; climbing over bushes, Schwallenburgh, St. Ann; Oxford, near Balaclava; *Harris!* *Fl. Jam.* 7042, 8826; between Fontabelle and Galloway, *Mrs. E. G. Britton* 2870!—Cuba, Is. of Pines, Trinidad, tropical continental America.

Climbing shrub, very variable. *Leaves* 5-13 cm. l., elliptical to oblong-elliptical, apex obtuse to rounded, base decurrent into the short petiole,

nerves impressed above, prominent beneath, margin entire or obscurely toothed. *Calyx* in flower: larger sepals 5–6 mm. l., smaller about 2 mm. l. *Petals* 6–8 mm. l. *Fruit* enclosed by the two larger hardened yellowish sepals about 7 mm. in diam.; the thin reddish-brown pericarp encloses a large seed with a shiny blackish coat, enveloped in a thin whitish aril.

Stems useful for making baskets, &c.

2. TETRACERA L.

Climbing shrubs, rarely trees, glabrous or rough-pubescent. Leaves pinnate-nerved, nerves parallel. Panicles terminal or in the topmost axils. Flowers usually hermaphrodite, sometimes polygamous, rarely dioecious. Sepals 4–6, spreading. Petals as many or fewer. Stamens with filaments widening to apex. Anthers with cells separated. Carpels generally 3–5, acuminate, with ovules indefinite, in two series, leathery when ripe, opening along the inner line or by 2 valves. Seeds 1–5, surrounded by an aril.

Species about 100, dispersed throughout the tropics.

T. jamaicensis DC. *Syst. i.* 399 (1818); *Macf. Jam. i.* 5. *T. volubilis* Griseb. *Fl. Br. W. Ind.* 2 (non L.). (Fig. 65, D–F.)

Wiles; St. Thomas in the Vale; *Macfayden*! also *Prior*! Bachelor Hall, near Bath, *Harris & Britton*! *Fl. Jam.* 10,577.—South America (R. Shakespear in *Herb. Mus. Brit.*).

Shrub climbing over fences and trees; stem and branches rough, with minute stellate hairs. *Leaves* 10–18 cm. l., elliptical, base decurrent into the petiole, wavy-serrate, but entire towards the base, teeth very small at ends of nerves, rough on both sides; nerves impressed above, prominent beneath and hispidulous. *Inflorescence* 7–12 cm. l., somewhat compact in fruit, roughish with minute stellate hairs. *Calyx* outside puberulous, inside silky; sepals 5, unequal, 4.5–5.5 mm. l. *Petals* 5, yellow, ovate-oblong, rounded. Ripe *carpels* usually 4, surrounded by the persistent sepals (outer 5–7 mm. l., inner 9–10 mm. l.), glabrous, shining, 15 mm. l., beaked with persistent style.

Wormia Burbridgei Hook. f. (*Bot. Mag. t.* 6531) is an escape from Castleton Garden, and is well established on the neighbouring hillsides. This handsome shrub is a native of Borneo. The flowers are pale golden yellow, 2½ inches in diam. Anthers opening by apical pores. Carpels 7. Leaves 6 inches to 1 ft. long.

FAMILY LXVIII. OCHNACEÆ.

Herbs, shrubs, or trees. Leaves alternate, simple, stipulate, glabrous, entire or serrulate. Flowers terminal in panicles or racemes, or axillary, sometimes solitary or clustered in the axils, hermaphrodite. Sepals 5 (4–10), free, imbricate. Petals 5 (4–10), free, soon falling, imbricate or convolute. Receptacle enlarged after flowering. Staminodes usually none, but in *Sauvagesia* of one or two forms. Stamens 5 or 10 (4, 8, or indefinite), inserted at the base of the receptacle, or above it. Anthers linear-

elongate, opening longitudinally or by terminal pores. Ovary 2–10-lobed, or entire and 1–10-celled. Style simple, awl-shaped, or, rarely, with apex 2–10-lobed; stigma simple, terminal. Ovules 1, or 2, or indefinite, in each cell, ascending or rarely hanging. Fruit very various. Seeds solitary, few, or numerous; endosperm fleshy or none. Embryo somewhat large, usually straight.

Species 400 or more, natives of the tropics, mostly American.

- Flowers yellow; without staminodes. Fruit—drupes on
a receptacle 1. *Ouratea*.
Flowers white, rose, or violet; with staminodes. Fruit—
a 3-valved capsule 2. *Sauvagesia*.

1. OURATEA Aubl.

Trees or shrubs, glabrous. Leaves persistent, leathery, shining, entire or serrulate with sharp teeth, with very numerous nerves. Stipules in American species free. Panicles or racemes terminal, or terminal and axillary. Flowers yellow. Sepals 5, usually coloured, imbricate, elliptical-oblong. Petals 5, imbricate, obovate, clawed. Receptacle thick, elongated below the pistil. Stamens 10, inserted at the base of the receptacle; filaments very short; anthers long, opening by pores at apex. Ovary 5–6-parted, the lobes inserted obliquely on the receptacle; styles united, stigma simple; ovules solitary in each cell, ascending from the base. Drupes 5 or fewer, on the expanded receptacle. Seed erect; cotyledons fleshy, plano-convex; radicle descending to the hilum.

Species more than 200, natives of tropics, mostly in America.

- Inflorescence dense, dome-shaped; sepals 5 mm. l. 1. *O. laurifolia*.
Inflorescence loosely paniculate; sepals 7 mm. l. or more.
Leaves lanceolate, acuminate. Pedicels 1·5–2 cm. l. 2. *O. elegans*.
Leaves elliptical or oblong-elliptical, cuspidate.
Pedicels less than 1·5 cm. l.
Drupes globose. Sepals 7–8 mm. l. 3. *O. nitida*.
Drupes obovoid. Sepals 8–10 mm. l. 4. *O. jamaicensis*.

1. *O. laurifolia* Engl. in *Fl. Bras. vii. pt. 2*, 350 (1876); leaves elliptical-lanceolate to lanceolate, entire; inflorescence dense, dome-shaped; pedicels 1–2 cm. l.; sepals 5 mm. l.; petals 5–6 mm. l., irregularly obovate, apex slightly emarginate; drupes narrowly ellipsoidal.—*Urb. Symb. Ant. v.* 430. *Gomphia laurifolia* Sw. *Fl. Ind. Occ.* 741 (1798); *Macf. Jam. i.* 200; *Griseb. Fl. Br. W. Ind.* 104. (Fig. 66.)

In fl. Jan.–March; in fr. March, Apr.; *Swartz*; near Bridgehill; near Pleasant Hill, St. Andrew; *Macfadyen*! rocky woods, St. Ann, *Purdie*! Liguanea plain, 600 ft. *Campbell*! Port Royal Mts. (Sheldon; Hall's Delight; Plato; Bridge Hill, 1500 ft.; Iron Face, Chester Vale, 3500 ft.);

Holly Mount, near Ewarton, 2600 ft.; Peckham, Clarendon, 2500 to 2800 ft.; Constant Spring to Bardowie, 750 ft.; *Harris!* Fl. Jam. 5513, 5535, 6250, 6978, 7869, 8898, 10,104, 10,870, 10,875, 11,919.

Shrub or *tree*, 10-20 ft. high. *Leaves* 6-11 cm. l., nerves and veins similar and running in the same direction, curved upwards, slightly prominent on the upper surface; petioles 6-10 mm. l. *Inflorescence* 5-9 cm. l.



Fig. 66.—*Ouratea laurifolia* Engl.

A, Portion of branch with leaves and flowers $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 4$.

C, Fruit, nat. size.

D, Seed cut lengthwise $\times 2$.

Sepals greenish-yellow. *Petals* unequal, claw 1.5-2 mm. l. *Stamens* 3.5-4 mm. l. *Anthers* sessile or with short filaments (.5 mm. l.). *Receptacle* (in fruit) somewhat globose, bearing 4-5 drupes. *Drupes* 9-11 mm. l.

2. *O. elegans* Urb. *Symb. Ant. v.* 428 (1908); leaves lanceolate, acuminate, entire or occasionally slightly crenulate above; inflorescence loosely paniculate; pedicels 1.5-2 cm. l.; sepals 9-11 mm. l.; petals 13-15 mm. l., broadly obovate.

In fl. Sept.; Woodstock, near Beaufort, Westmoreland, 1300 ft., *Harris!* Fl. Jam. 9912.

Tree, 30 ft. high, glabrous. *Leaves* 9-13 cm. l., 2-3.5 cm. br., nerves and transverse veins slightly prominent on both sides; petioles 4-6 mm. l. *Anthers* subsessile, 7 mm. l.

3. *O. nitida* Engl. in *Fl. Bras. xii. pt. 2*, 310 (1876) (only as regards syn. *Sw.* and habitat Jamaica); leaves elliptical, cuspid-

date, acute, serrulate with very small sharp teeth; pedicels 5–7 mm. l.; sepals 7–7.5 mm. l.; petals slightly longer than sepals, somewhat roundish, with a short claw; drupes globose.—*Urb. Symb. Ant. i.* 364, v. 428, 429. *Ochna nitida Sw. Prodr.* 67 (1788). *Gomphia nitida Vahl Symb. ii.* 49 (1791); *Sw. Fl. Ind. Occ.* 739; *Macf. Jam. i.* 201; *Griseb. Fl. Br. W. Ind.* 105 (excl. syn.). Specimen from Shakespear named by Swartz.

Shakespear! Swartz.

Tree of moderate height. *Leaves* 5–12 cm. l., nerves and veins similar, veins running somewhat transversely, only the midrib slightly prominent; petioles 3–5 mm. l. *Pedicels* about 1 cm. l. in fr. *Anthers* subsessile, 7 mm. l., slightly connected at apex in pairs, as long as the calyx; filaments like small roundish glands. *Ovary* globose, 5-furrowed, each carpel on a distinct short stalk; styles combined spirally into one, which extends beyond the anthers. *Receptacle* (in fruit) somewhat ovate-roundish, bearing 1–5 drupes. *Drupe*s 7 mm. l., 6 mm. br. *Seed* large, globose.

4. *O. jamaicensis Urb. Symb. Ant. i.* 362 (1899) & v. 430; leaves elliptical to oblong, acute or cuspidate, entire or occasionally with a few small teeth above; pedicels in fl. 5–12 mm. l.; sepals 8–10 mm. l.; petals 10–11 mm. l., roundish-obovate, with a short claw; drupes obovoid.—*V. Tiegh. in Ann. Sc. Nat. sér. 8, xvi.* 257 (1902). *O. guianensis Engl. in Fl. Bras. xii. pt. 2,* 314 (1876) (in part). *Gomphia guianensis Griseb. Fl. Br. W. Ind.* 105 (1859) (non *Rich.*) (in part). *G. jamaicensis J. E. Planch. in Hook. Lond. Journ. Bot. vi.* 11 (1847).

Cabbage Bark.

In fl. July–Nov.; *Macfadyen! Browns Town, Prior! Holly Mount,* 2500 ft.; near *Troy,* 2500 ft.; *Peckham, Clarendon,* 2500 ft.; *Harris! Pedro,* St. Ann, *E. G. Barrett! Fl. Jam.* 6529, 9071, 10,999.

Tree, 30 ft. high. *Leaves* 8–13 cm. l., nerves and veins (running in same direction) often slightly prominent especially on upper surface; petioles 5–8 mm. l. *Pedicels* 12–17 mm. l. in fr. *Anthers* sessile, 6 mm. l. *Receptacle* (in fruit) ovate if only one drupe, transversely ellipsoidal if two or more drupes. *Drupe*s 10–13 mm. l., 7–8 mm. br.

2. SAUVAGESIA L.

Herbs or undershrubs, glabrous. Leaves rigid, entire or serrulate. Stipules comb-like-ciliate. Flowers axillary or in terminal racemes, white, rose, or violet. Sepals subequal. Petals equal, convolute. Stamines usually of 2 series, outer thread-like, sometimes alternate with the 5 petals, sometimes indefinite, the inner 5 petal-like or scale-like, opposite the petals, enclosing the stamens and ovary. Filaments of the fertile stamens very short, alternating with the inner stamines; anthers linear, cells opening at the sides. Ovary 1-celled; placentas of the ovary 3; style simple with obtuse stigma. Capsule septicidally 3-valved. Seeds indefinite, small; testa thin and brittle; endosperm fleshy; radicle longer than the cotyledons.

Species 18, natives of the West Indies and tropical and sub-tropical America, very few in the tropics of the Old World.

S. Brownei Planch. *MS. ex Trois. Voy. Linden* i. 64 (1863); *Urb. Symb. Ant.* v. 430 & vi. 93. *S. erecta* Macf. *Jam.* i. 45 (excl. syn. *Jacq. & Aubl.*); *Griseb. Fl. Br. W. Ind.* 112 (as regards plants from Jamaica and Cuba) (non *L.*). Iron herbaceous &c. *Browne Hist. Jam.* 179, t. 12, f. 3. (Fig. 67.)

Sloane Herb. iv. 24! Pastures between Mt. Diablo and St. Ann, *Browne*! May Day Hill, *Broughton*! Guys Hill, St. Mary, *McNab*! Cold-spring, St. George, *Purdie*! Meneague, *Prior*! Castleton Garden, 400 ft.;

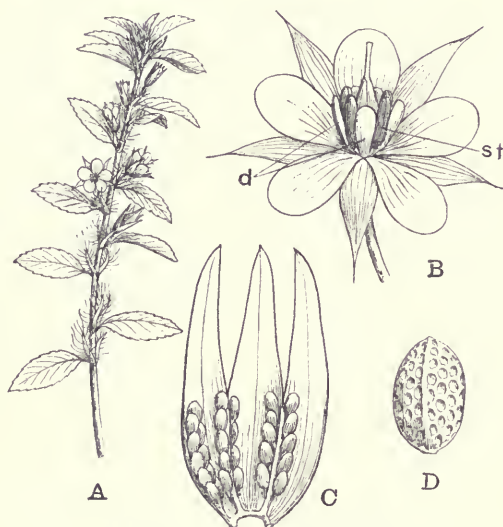


Fig. 67.—*Sauvagesia Brownei* Planch.

- A, Portion of branch with leaves and flowers $\times 2$.
 B, Flower; st, stamens; d, staminodes $\times 4$.
 C, Capsule split open $\times 6$.
 D, Seed $\times 20$.

Brandon Hill road; Prospect Hill, 2000 ft.; *Thompson*! near Bardowie, *Harris*! Bull Head, *Fawcett*! lower mountains near Kingston, *Hansen*; Port Antonio, *Hitchcock*; Richmond Hill, *Millspaugh*; Fl. Jam. 5867, 7940, 8003, 8097, 8470.—Cuba, Is. of Pines.

Stems procumbent or ascending. *Leaves* 7–13 mm. l., lanceolate to elliptical, acute at both ends, serrulate, subsessile; stipules linear-lanceolate. *Flowers* axillary, usually solitary. *Pedicels* erect, about as long as the flower. *Sepals* 4.5–5 mm. l., lanceolate, with a hair-like tip (1–1.5 mm. l.). *Petals* white, shorter, or somewhat longer than the sepals. *Staminodes* (of the inner series only) oblong, about as long as the stamens. *Stamens* 1.5 mm. l. *Capsule* about as long as the sepals. *Seeds* ellipsoidal, about .7 mm. l., surface pitted.

S. erecta L., native of the West Indies from Hispaniola east and south, and of tropical continental America, has larger leaves and flowers, two series of staminodes, the outer of very short, indefinite staminodes, filament-like with kidney-shaped capitate apex, the inner of 5 oblong staminodes about half as long as the sepals.

FAMILY LXIX. MARCGRAVIACEÆ.

Shrubs, epiphytic or climbing, rarely tree-like. Leaves alternate, simple, leathery, entire. Stipules usually wanting. Racemes terminal. Bracts more or less attached to the pedicel, usually transformed into nectariferous, sack-like or hooded organs. Flowers regular, hermaphrodite. Sepals 4-5, strongly overlapping, persistent. Petals 5, hypogynous, free or united at the base, or united to form a lid-like organ breaking away all round at the base and falling off. Stamens indefinite or 5, hypogynous, united slightly at base and free from the corolla, or more or less attached at base to the petals; anthers opening inwards. Ovary: cells indefinite or 3-6; stigma sessile, more or less distinctly radiate. Ovules indefinite, attached to thick placentas projecting from the axis, horizontal or ascending, anatropous. Fruit globose, fleshy or leathery, not opening or opening after some time loculicidally from the base. Seeds numerous, small, oblong; endosperm scanty. Embryo straight or curved; radicle short.

Species between 60 and 70, natives of the West Indies and tropical continental America.

MARCGRAVIA L.*

Shrubs, climbing on the trunks of trees or over rocks by means of rootlets emitted just below the insertion of the leaves. The leaves of the first shoots are 2-ranked, closely adpressed to the tree trunk, and protect the rootlets, which also become covered by a moss (*Pilotrichum mucronatum* Mitten in *M. Brownei*). The rootlets grow into the interstices of the bark, which, with the moss, forms a soil for them, the union being so intimate that the shoot cannot be detached from the trunk without removing some of the bark with it. Shoots are thrown out horizontally, bearing spirally arranged leaves of a different form, and flowers at the apex enclosed at first by the terminal leaf acting like a spathe (in *M. Brownei*). Leaves of the creeping stem small and submembranous, of the flowering branches leathery. Racemes usually contracted, umbel-like, pendulous. The lower outer flowers perfect, without bracts, the upper central abortive and

* Consult I. W. Bailey, Pollination of *Marcgravia*, in American Journal of Botany, ix. 370 (1922).

with large tubular sack-like coloured bracts adherent to the pedicels. Bracts with the opening at the base, and (in Jamaican species) somewhat inflated at the apex. Bracteoles 2, minute, sepal-like, tightly adpressed to the calyx, persistent. Sepals 4, decussate. Corolla a lid-like organ without differentiation into petals, soon falling off. Stamens 12–40, mostly slightly united at the base, free from the corolla; anthers oblong-linear. Ovary incompletely 4–12-celled; style short or none; stigma obscurely radiate. Fruit leathery.

Species more than 40, with distribution of family.

Bracts sessile or subsessile 1. *M. Brownei*.

Bracts on pedicel 2. *M. brachysepala*.

1. *M. Brownei* Kr. & Urb. *Symb. Ant. i.* 367 (1899).
M. rectiflora var. *Brownei* Tr. & Planch. in *Ann. Sc. Nat. sér. 4*,
xvii. 365 (1862); Urb. in *Engl. Jahrb. xxi.* 514. *M. scandens* &c.

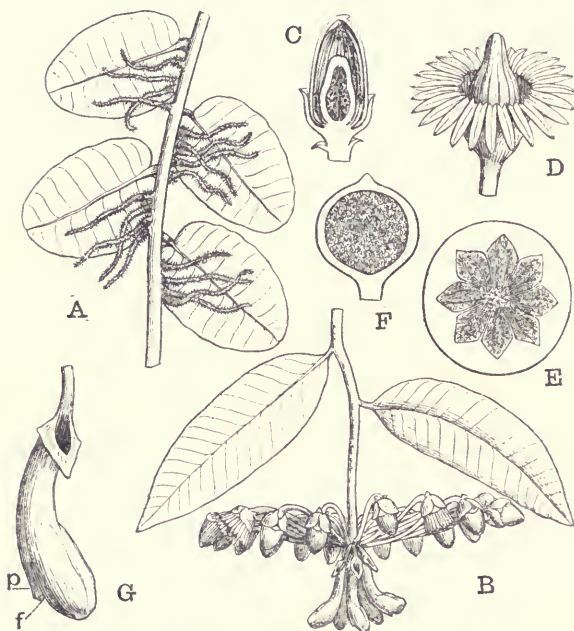


Fig. 68.—*Marcgravia Brownei* Kr. & Urb.

A, Portion of climbing shoot, showing under side of leaves next the trunk with rootlets $\times \frac{2}{3}$.

B, Portion of flowering shoot $\times \frac{1}{2}$.

C, Flower-bud cut lengthwise, nat. size.

D, Flower after the fall of the corolla, nat. size.

E, Ovary cut across $\times 4$.

F, Fruit cut lengthwise, nat. size.

G, Hollow bract containing honey adherent to pedicel, *p*, which bears at its apex abortive flower, *f*, $\times \frac{2}{3}$.

Browne Hist. Jam. 244, t. 26; *Ehret's Original Sketches of Browne's Jamaican Plants*, 30. *M. umbellata* L. *Amoen.* v. 379 (1760) & *Sp. Pl. ed.* 2, 719 (so far as regards reference to Jamaica); *Lunan Hort. Jam.* i. 490; *Descourt. Fl. Ant. iv.* 25, t. 239; *Macf. Jam. i.* 141; *Griseb. Fl. Br. W. Ind.* 110 (in part); (non *L. Sp. Pl. ed.* 1, 503). *Marcgravia Sw. Obs. Bot.* 205. *Phyllitidi scandenti affinis major folio crasso subrotundo Sloane Cat.* 15 & *Hist. i.* 74, t. 28, f. 1. (Fig. 68.)

Sloane Herb. i. 64! *Browne! Shakspear!* "montes frigid. sylvos.," *Swartz!* Port Royal Mts., *Purdie!* Claverty Cottage road, J.P. 602, *Hart!* Morse's Gap, *Watt!* Hardware Gap, 4000 ft., *Harris!* also *G. E. Nicholls!* Tweedside, below Moody's Gap, 3500 ft., *Harris!* Fl. Jam. 6022, 10,121.

Climbing even to a height of 50 ft., glabrous. *Leaves* of the climbing stem 1-5.5 cm. l. to 4 cm. br., roundish-elliptical, subsessile, apex rounded, emarginate, base subcordate; of the flowering branches 7-13 cm. l., 3-5 cm. br., subsessile, oblong, apex abruptly cuspidate-acuminate, base unequal-sided, obtuse to somewhat rounded, midrib prominent beneath, nerves inconspicuous or invisible on both sides, glands somewhat rare on the pellucid margin, beneath with 6-8 rather large glandular pores on each side, starting from the base of the midrib and curving to near the margin, where they are smaller and extend to the apex. *Inflorescence* with 13-19 perfect flowers, set somewhat straight on pedicels; pedicels 4-5 cm. l., 2 mm. thick. *Bracts* usually 2-4, sessile, with pedicel attached, more or less curved inwards, with the outer lip of the opening prolonged and recurved. *Sepals* 5-6 mm. l. *Corolla* ovoid, about 1 cm. l., 7-8 mm. br. *Stamens* numerous. *Ovary* about 9-celled; style about 4 mm. l. *Fruit* about 11 mm. in diam., globose, crowned by the style. *Seeds* about 1 mm. l., 3-sided, back rounded, surface pitted.

2. *M. brachysepala* Urb. *Symb. Ant. vi.* 17 (1909). *M. umbellata* Griseb. *Fl. Br. W. Ind.* 110 (1859) (so far as regards reference to Jamaica, in part); *Urb. in Engl. Jahrb. xxi.* 517 (so far as above) (non *L.*). *Marcgravia* of Westmoreland *A. Robinson descr. & icon. ined.* P. sc. aff. minor folio crasso oblongiori; P. sc. aff. minima folio crasso oblongiori; *Sloane Cat.* 15, *Hist. i.* 74, t. 28, f. 2, 3.

Mt. Diablo, Archer's Ridge, Orange River, *Sloane Herb.* iv. 65-67! *Mrs. Poore* (1779)! *Wullschlaegel!* Phoenix Park, Moneague, *Prior!* Tyre, 1500 ft.; near Troy, 1600-2000 ft.; Toms Cave Wood, Clarendon, 2500 ft.; *Harris!* Cuna Cuna Pass; John Crow (Blake) Mts., 1500 ft.; *Harris & Britton!* Fl. Jam. 8647, 8767, 9444, 10,565, 10,688, 10,771, 10,859.

Climbing to 30 ft., glabrous. *Leaves* of the climbing stem 1-4.5 cm. l., 1.5-2.5 cm. br., subsessile, ovate-oblong to ovate, apex obtuse, base cordate; of the flowering branches 5-10 cm. l., 3-4 cm. br., subsessile, ovate-elliptical or elliptical-oblong, apex acutely acuminate, base rounded or subtruncate, nerves on upper surface scarcely visible or very slightly prominent, beneath more or less slightly prominent with a network of veins, with glands sunk into the margin, beneath with 3-5 rather large pores on each side above the base, and with some very small pores here and there near the margin; petioles 3-5 mm. l. *Inflorescence* with 15 to 35 perfect flowers, set obliquely on pedicels; pedicels 2-3 cm. l., .8 mm. thick; abortive flowers 3-7 at the apex of the rhachis, the pedicels springing at a distance of 2-3 mm. from the pedicels of the perfect flowers.

Bracts 1·2–2 cm. l., with a length of pedicel below them of 1–1·5 cm. *Sepals* about 1 mm. l. *Corolla* ovoid or ovoid-ellipsoidal, 8–9 mm. l., 4–5 mm. thick. *Stamens* 8–14. *Ovary* 5(4)-celled; style 1·5 mm. l. *Fruit* shortly obovate-globulose, barely 1 cm. in diam.

FAMILY LXX. TERNSTRÆMIACEÆ (THEACEÆ).

Trees or shrubs. Leaves alternate, usually simple and leathery, pinnate-nerved. Stipules none. Flowers axillary, one or few, or rarely in terminal or axillary racemes, regular, usually hermaphrodite. Bracteoles often 2 under the calyx, somewhat like the outer sepals. Sepals generally 5, free or shortly united at the base, overlapping. Petals usually 5, hypogynous, free or more often cohering at the base into a ring or short tube, generally widely overlapping. Stamens usually indefinite, hypogynous, generally united at the base and adhering to the corolla and falling off with it. Ovary usually free, with 2–5 or indefinite cells; ovules 2 to indefinite in each cell. Fruit sometimes fleshy, leathery, or somewhat woody, and not splitting open, sometimes capsular, valves opening loculicidally or septicidally, generally leaving a persistent axis. Seeds few or indefinite, attached to the inner angle, placentas often prominent, spongy or fleshy; endosperm scanty or wanting, or abundant and fleshy. Embryo a little shorter than the endosperm when present, straight or curved, horseshoe-shaped or spiral; radicle near the hilum; cotyledons sometimes half-cylindrical, continuous with the radicle, not wider and much shorter than it, sometimes much larger than the radicle.

Species 200, almost all growing in the tropics of America, Asia, and the East Indian Archipelago, few in Africa, some are found in N. America and Eastern Asia beyond the tropics, but the Family is wanting in Australasia.

Ovary 2–5-celled. Petals less than 1·5 cm. l. Fruit not opening. Seeds curved horseshoe-like.

Flowers hermaphrodite.

Style simple, stigma punctiform 1. *Ternstræmia*.

Style with 2–5 short branches at apex, stigmas small 2. *Eroteum*.

Flowers polygamous or diœcious. Style wanting or very short, stigmas 3 oval to oblong 3. *Freziera*.*

Ovary 5–10-celled. Petals 1·5–3 cm. l. Fruit a capsule.

Seeds flattish, winged..... 4. *Laplacea*.

[Ovary 3–5-celled. Fruit a capsule. Seeds not winged... *Camellia*.]

1. TERNSTRÆMIA Linn. f.

Trees or shrubs. Leaves entire (in Jamaican species) or toothed-crenate, nerves and veins inconspicuous. Peduncles 1-flowered, recurved, axillary, solitary or a few clustered, with

2 bracteoles to each flower. Flowers white. Sepals 5, increasing in size in fruit. Petals 5-7, united at base or even to one-half their length, very soon falling. Stamens indefinite, usually in two series, rarely in one or several; outer filaments adhering to the base of the corolla; anthers glabrous, longer than filaments, connective more or less prolonged. Ovary 2 (3, 4)-celled; style simple; stigma or stigmas minute or more or less developed, entire or lobed; ovules several to 2 in each cell (10-16 in Jamaican species), hanging. Fruit crowned by the persistent style, not splitting open. Seeds rather large, curved like a horseshoe, but more compressed; endosperm fleshy, scanty; embryo curved; cotyledons shorter than the radicle, half-cylindrical. Wild Mammee-Sapota, Scarlet Seed.

Species over 70, most natives of the West Indies and tropical continental America, the rest natives of the warmer parts of Asia, especially the East Indian Archipelago.

Sepals in fl., outer roundish, less than 1.5 cm. l.

Petals 11-13 mm. l. Leaves, apex rounded or pointed obtuse, narrowed gradually to base and prolonged into the petiole..... 1. *T. granulata*.

Petals 7-10 mm. l.

Leaves, apex pointed obtuse, base very obtuse or rounded, suddenly narrowed or contracted into the petiole..... 2. *T. Hartii*.

Leaves, apex rounded or very obtuse, narrowed gradually to the base and prolonged into the petiole..... 3. *T. rostrata*.

Sepals in fl., outer ovate-elliptical, 1.5 cm. l. or more.

Leaves, apex rounded, base rounded to wedge-shaped and contracted suddenly into the petiole 4. *T. calycina*.

1. *T. granulata* Kr. & Urb. in Engl. Bot. Jahrb. xxi. 534 (1896). *T. obovalis* Griseb. Fl. Br. W. Ind. 103 (1859) (in part) (non Rich.).

In fl. May-Sept.; Wright! McNab! Purdie! near Browns Town, Prior! Ramble, St. Ann, 1700 ft., Fawcett & Harris! near Troy, 2000 ft.; road to Holly Mount, 2000 ft.; Ipswich, St. Elizabeth, 900 ft.; Harris! near Mile Gully, 1700 ft., Harris & Britton! Fl. Jam. 7026, 8786, 8987, 10,621, 12,369.

*Tree, 20-30 ft. high and more. Leaves 4-9 cm. l., 3-4 cm. br., obovate-elliptical, narrowed gradually to the base and prolonged into the petiole, apex rounded or pointed-obtuse, on both sides densely granulate; margin narrowly revolute; midrib distinctly channelled on upper surface; nerves 7-9, slightly prominent beneath, scarcely or not evident on upper surface; petioles 5-10 mm. l. Peduncles 2-4 cm. l. Bracteoles ovate to ovate-triangular, 4-5 mm. l., 3-4 mm. br., margin often glandulose-denticellate, back more or less keeled. Flowers white, fragrant. Sepals, outer 9-10 mm. l., 10-11 mm. br., inner 9-10 mm. l., 8-9 mm. br., increasing in fr. to 1.5 cm. l., roundish, roundish-elliptical, or triangular-ovate, the outer glandulose-denticulate on the whole margin or on the lower part. Petals 11-13 mm. l., obovate, emarginate at apex, falling as

soon as the fl. expands. *Anthers* oblong or linear; connective prolonged, tongue-like. *Ovary* 2-celled; cells with 10-12 ovules; stigma minute. *Fruit* nearly 3 cm. in diam., spheroidal, apex rounded, granulate. *Seeds* (in fruit not ripe) more than 1 cm. l., covered with scarlet papillæ.

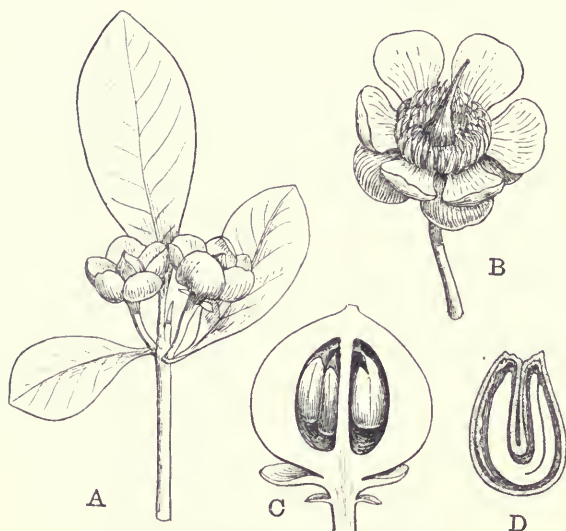


Fig. 69.—*Ternstroemia granulata* Kr. & Urb.

- | | |
|---|-------------------------------------|
| A, Portion of branch with leaves and young flowers $\times \frac{1}{2}$. | C, Fruit cut lengthwise, nat. size. |
| B, Flower, nat. size. | D, Seed cut lengthwise $\times 2$. |

2. *T. Hartii* Kr. & Urb. in *Engl. Bot. Jahrb. xxi.* 532 (1896). Arbor minor diffusa, obscure virens &c. *Browne Hist. Jam.* 368, t. 20, f. 3; *Lunan Hort. Jam. ii.* 149 (fide Urban, but we think that it is more likely to refer to *T. granulata*).

In fl. June, in fr. Sept.; Cleveland, Portland, J.P. 655, *Hart!* St. George, 2200 ft.; Mansfield, Bath, 400 ft.; *Harris!* Fl. Jam. 5767, 6057.

Tree, 25-30 ft. high. *Leaves* 6-11 cm. l., 3-5.5 cm. br., elliptical or obovate-elliptical, very obtuse or rounded at base, suddenly narrowed or contracted into the petiole, apex pointed-obtuse, on both sides granulate; margin flat; midrib slightly impressed; nerves 7-10, scarcely, or not, visible; petioles 6-10 mm. l. *Peduncles* 3-7 cm. l. *Bracteoles* 3-4 (5) mm. l., ovate. *Sepals* roundish, outer 5-6 mm. l., 6.5-8 mm. br., inner 5-8 mm. l., 6-7.5 mm. br., margin usually entire, but the outer sometimes glandulose-denticulate, at any rate at base. *Petals* 8 mm. l., obovate, apex not, or only slightly, emarginate. *Ovary* 2-celled; cells with 13-16 ovules; stigma minute. *Fruit* (from Mansfield) about 2 cm. l., 2.5 cm. br., ovoid-spheroid, apex rounded; pericarp 4-6 mm. thick. *Seeds* narrowly ovoid, 8-9 mm. l. (or more), covered with scarlet papillæ.

We follow Urban in including provisionally here the fruiting specimen no. 6057 from Mansfield.

3. *T. rostrata* Kr. & Urb. in *Engl. Bot. Jahrb.* xxi. 533 (1896). *T. meridionalis*? Sw. *Prodr.* 81 (1788) & *Obs. Bot.* 207 (in part); *Macf. Jam. i.* 113 (non *Mutis*).

In fl. throughout the year; Wright! *Rev. Lindsay*! below Trafalgar House, Port Royal Mts., *Macfadyen*; *McNab*! *March*! above Egner Gap, J.P. 964, *Hart*! St. George, *Gilbert*! summit of John Crow Peak, *Britton*, 266! Fish River Mts., 400 ft.; N.E. of Dolphin Head; *Harris*! Fl. Jam. 10,259, 10,317.

Tree, 30–40 ft. high. *Leaves* 3·5–10 cm. l., 2–5 cm. br., obovate-elliptical or narrowly obovate-elliptical, narrowed gradually to the base and usually prolonged into the petiole, apex rounded or very obtuse, sometimes slightly emarginate, upper surface granulate, margin flat or slightly recurved; nerves 6–8, slightly prominent beneath, not, or scarcely, visible on the upper surface; petioles 5–7 mm. l. *Peduncles* 3–5·5 cm. l. *Bracteoles* roundish to ovate, margin entire, not, or slightly, keeled, 3–5 mm. l., 4–5 mm. br. *Flowers* rather showy, white, fragrant. *Sepals* green, outer roundish, inner elliptical or elliptical-roundish, in fl. 7–12 mm. l., 7–10 mm. br., in fr. outer 8–9 mm. l., inner 11–14 mm. l.; margin entire, rarely denticulate all round. *Petals* oblong, sometimes somewhat broader above, 7–10 mm. l. *Ovary* 2-celled; cells with 11 or 12 ovules; stigma minute. *Fruit* 1·5–2 cm. in diam., spheroidal, or roundish-ovoid, acuminate-beaked, granulate. *Seeds* about 8, ovoid or somewhat narrowly ovoid, more or less compressed, 9–10 mm. l., densely covered with papillæ.

We have followed Urban in recording the above as three species; further investigation may show them to be merely forms of one species. The material and information available is at present too scanty for decision.

4. *T. calycina* Fawc. & Rendle in *Journ. Bot.* lx. 363 (1922).

In fl. May, in young fr. July; Peckham woods, Clarendon, 2500 ft., *Harris*! Fl. Jam. 10,979, 11,035.

Tree, 10–30 ft. high. *Leaves* 5–9 cm. l., obovate-elliptical, apex rounded or very obtuse, base rounded to wedge-shaped and contracted suddenly into the petiole, upper surface wrinkled-granulate; margin slightly recurved, leathery; midrib flat or scarcely impressed on upper surface, somewhat prominent beneath; nerves 6–8, comparatively conspicuous and more or less slightly prominent on both sides; petioles 5–8 mm. l. *Peduncles* 1·5–2 cm. l. *Bracteoles* 7–9 mm. l., ovate. *Sepals* 17–13 mm. l., 11–9 mm. br., ovate-elliptical, crimson; margin glandulose-denticulate or entire. *Petals* not seen. *Ovary* 2-celled; style (from fl. of which petals have fallen) 9–12 mm. l.; stigma 2-punctate.

2. *EROTEUM* Sw. (*Cleyera* Choisy).

Trees or shrubs. Leaves papery or papery-leathery, crenate or crenulate, toothed, or entire. Peduncles short, axillary, solitary or often clustered. Flowers small, one or a few in the axils. Bracteoles minute, soon falling. Sepals 5. Petals 5, alternate with the sepals, united at base or subfree. Stamens 12–30, united at the base to the corolla; anthers usually with bristly hairs, opening near the apex, much shorter than the filaments. Ovary 2–5-celled; style 2–5-cleft at the apex only or sometimes to the base; stigmas small; ovules 10–50, attached to a placenta at the middle of the cell. Fruit berry-like, not splitting

open. Seeds 5-8, horseshoe-shaped, 2-3 mm. in diam., with fleshy endosperm; embryo horseshoe-shaped; cotyledons shorter than the radicle.

Species about 12, natives of the West Indies and tropical continental America from Mexico to Venezuela, a few natives of India or Japan.

E. theæoides Sw. *Prodr.* 85 (1788) & *Ic. ined.* t. 41; *G. Maza* in *Ann. Hist. Nat. Madrid*, xix. 222 (1890). *Fawc. & Rendle* in

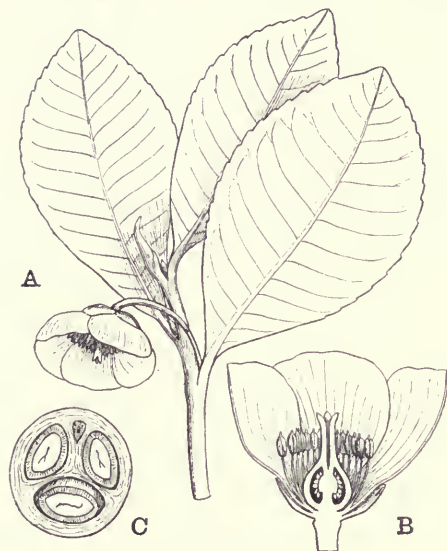


Fig. 70.—*Eroteum theæoides* Sw.

A, Portion of branch with leaves
and flower $\times 2$.

B, Flower cut lengthwise $\times 2$.
C, Fruit cut across $\times 2$.

Journ. Bot. lx. 362. *Freziera theoides* Sw. *Fl. Ind. Occ.* 972, t. 19 (1800); *DC. Prodr.* i. 524; *Macf. Jam.* i. 115; *Bot. Mag.* t. 4546. *Cleyera theoides* Choisy in *Mém. Soc. Phys. Genève*, xiv. 110 (1855) (excl. syn. Tul.); *Griseb. Fl. Br. W. Ind.* 103 (excl. syn. Tul. and Choisy.); *Urb. in Engl. Bot. Jahrb.* xxi. 538 & in *Ber. Deutsch. Bot. Ges.* xiv. 1, 48. (Fig. 70.) Specimen from Swartz in Herb. Mus. Brit.

Wild Damson.

In fl. throughout the year; *Wright*! Catherine Peak, *Swartz*! *Moerter*! *Macfadyen*! Blue Mt. Peak, *McNab*! *Purdie*! *Wilson*! Portland Gap, 5550 ft., J.P. 654, *Morris*! near Cinchona, J.P. 654, *Hart*! Morse's Gap, *Jam. Bot. Dept.*! St. George; Content road, 3500 ft.; John Crow Peak, 5600 ft.; Sir John's Peak, 6000 ft.; *Harris*! *Fl. Jam.* 5536, 6104, 6513, 9514.—Cuba, Central America.

Shrub or tree, 10-30 ft. high. *Leaves* 3-8 cm. l., obovate or elliptical; petioles 3-7 mm. l. *Peduncles* solitary (or 2), 1-2 cm. l. *Sepals* 4-6 mm. l., roundish to elliptical, outer 2-3·5, inner 3·5-5 mm. in diam. *Petals* 8-9 mm. l., white or greenish-yellow. *Filaments* about 30. *Anthers* small, with 1 or a few bristly hairs on the back. *Ovary* 3-celled; ovules 14-18 in each cell. *Fruit* globose, 8-10 mm. in diam., purple, juicy. *Seeds* 6-8, 3 mm. in diam.

The leaves are astringent with taste exactly that of tea. (Swartz and Macfadyen.)

3. FREZIERA (Sw.) Choisy (emend.).

Shrubs or small trees. Leaves usually serrate-crenate and many-nerved. Flowers small, 1 or several clustered in the axil of the leaf, or in 2 ranks on an abbreviated branch, with persistent bracteoles, polygamous or diœcious (rarely hermaphrodite).

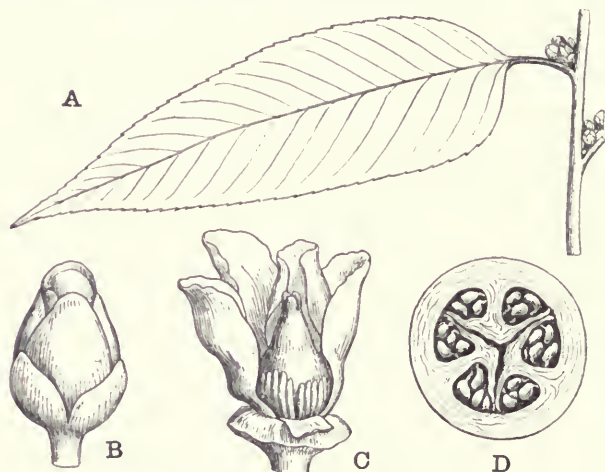


Fig. 71.—*Freziera Grisebachii* Kr. & Urb.

A, Portion of branch with leaf and flowers

× ½.

B, Female flower with bracteoles × 3.

C, Ditto with sepals cut off near base and

turned back, and one petal cut off, showing stamens round the base of the ovary, × 4.

D, Ovary cut across × 10.

Sepals 5. *Petals* 5, alternate with the sepals, scarcely united at the base or free. Male or hermaphrodite fls.: *Stamens* 15-30, united at the base to the corolla; anthers glabrous, opening to the base, much shorter than the filaments, rarely as long as the smaller filaments. *Ovary* 3(2-5)-celled; style entire; stigmas 3(2-5), oval to oblong, short; ovules 15-60, attached to a placenta intruded into the middle of the cell. Female fls.: *Staminodes* generally fewer; anthers minute. *Ovary* and style as in the hermaphrodite fl. *Fruit* not opening, dry. *Seeds* 10-50, kidney-shaped, 5-1 mm. in diam., embryo somewhat

straight or slightly curved; cotyledons about half as short as the radicle.

Species about 20, natives of the West Indies and tropical continental America.

Sepals 4-5 mm. 1. Petals only a little longer 1. *F. Grisebachii*.
 Sepals 1·5-2 mm. 1. Petals about 3 times as long ... 2. *F. undulata*.

1. *F. Grisebachii* Kr. & Urb. in *Engl. Bot. Jahrb.* xxi. 542 (1896); *Griseb. Fl. Br. W. Ind.* 104 (1859) (as regards the reference to Jamaica under *F. hirsuta* Sm.). *Eroteum hirsutum* G. Maza in *Ann. Hist. Nat. Madrid*, xix. 222 (1890).

In fl. Nov.; March; Tweedside, below Moody's Gap, 3150 ft., Harris! Fl. Jam. 5658, 6067.—Cuba.

Tree, 30-40 ft. high; branches above with reddish hairs, below glabrescent. *Leaves* 13-15 (7-17) cm. l., 4-5·5 cm. br., ovate-lanceolate, oblong-lanceolate or elliptical, apex generally tapering to a point, sometimes acuminate; petioles 10-15(-20) mm. l. *Peduncles* 2-3 in the leaf-axils, 2-4 mm. l., with reddish hairs. *Bracteoles* semicircular, 2-3 mm. l. *Sepals* 4-5 mm. l. *Petals* free at base, 5-6 mm. l., white. *Female fl.*: *Staminodes* about 1·6 mm. l., linear, about 25 in one series. *Ovary* ovate-conical; style conical, continuous with ovary; ovary and style 4 mm. l.; stigmas 3, short, ovate, blunt, fleshy, about ·5 mm. l.; ovules about 50 in each cell.

2. *F. undulata* Sw. *Fl. Ind. Occ.* 974 (1800); *Griseb. Fl. Br. W. Ind.* 104; Urb. in *Engl. Jahrb.* xxi. 542 (incl. all vars.); Fawc. & Rendle in *Journ. Bot.* lx. 362. *F. hirsuta* Sm. in *Rees Cycl.* xv. n. 4 (1819); *Griseb. loc. cit.* (in part). *Eroteum undulatum* Sw. *Prodr.* 85 (1788); *Vahl Symb.* ii. 61; *Wikstr. Guad. in Vet. Akad. Handl. Stockholm*, 1827 (1828).

Wright (Hb. *Forsyth*)! *Forsyth* (Forseith) (fide *Vahl*).—St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Trinidad.

Tree to 50 ft. high; young branches, petioles, peduncles, and bracteoles glabrate or densely villose in var. *hirsuta*. *Leaves* 5-15 cm. l., usually lanceolate, acuminate; petioles 5-15 mm. l. *Peduncles* 3-2 (1) in axils, 3-5 (1-10) mm. l. *Sepals* 1·5-2·5 mm. l., roundish. *Petals* 5-6 mm. l., white. *Filaments* generally 20. *Anthers* glabrous, lanceolate, longer than the filaments. *Ovary* 3-celled; ovules 15-20 in each cell. *Fruit* 4-5 mm. l.

4. LAPLACEA H. B. & K.

Trees or shrubs. Leaves toothed or crenate, papery or papery-leathery. Flowers solitary, generally subsessile in the upper axils, hermaphrodite or unisexual. Sepals 5, unequal, varying in size from the bracteoles to the petals. Petals 5-7, cohering slightly at the base. Stamens indefinite, outer or all more or less united or in bundles of 5 together and adhering to the base of the petals; anthers versatile. Ovary 5-10-celled; carpels with short diverging styles at apex, or with sessile and distinct stigmas; ovules 3-8 in each cell, pendulous. Capsule

somewhat woody, sometimes thin, oblong, opening loculicidally, with persistent axis. Seeds somewhat flat, produced at the apex into an oblong wing; endosperm wanting; embryo straight, oblique; cotyledons oblong, flat; radicle short, superior.

Species 28, natives mostly of tropical America, including the West Indies, 3 natives of the East Indian Archipelago.

Leaves obovate, villose beneath 1. *L. villosa*.

Leaves elliptical, with inconspicuous hairs beneath 2. *L. hæmatoxylon*.

1. *L. villosa* Griseb. *Fl. Br. W. Ind.* 104 (1859). *Gordonia villosa* Macf. *Jam. i.* 117 (1837). *Hæmocharis Choisy in Mém. Soc. Phys. Genève, xiv.* 144 (1855); *Urb. in Engl. Bot. Jahrb. xxi.* 547.

In fl. July-Dec.; Morse's Gap, *Macfadyen*! Nowhaven Gap, J.P. 987, *Hart*!

Shrub, 5-8 ft. high; young parts of branches villose. *Leaves* 5-10 cm. l., 3-5.5 cm. br., obovate, apex rounded or obtuse, crenate to sub-entire, papery-leathery, beneath villose; petioles 1-3 mm. l. *Peduncles* 3-6 mm. l., densely villose. *Flowers* white, becoming pinkish, showy. *Sepals* 12-15 mm. l., with silky adpressed hairs. *Petals* 5-7, obovate, with silky hairs outside. *Ovary* 5-celled; cells with 6 or 7 ovules in each; styles 5, about 1 mm. l. *Capsule* 2.5 cm. l. *Seeds* 5 in each cell.

2. *L. hæmatoxylon* G. Don *Gen. Hist. i.* 569 (1831); Griseb. *loc. cit.* *Hæmocharis hæmatoxylon* Choisy in *Mém. Soc. Phys.*

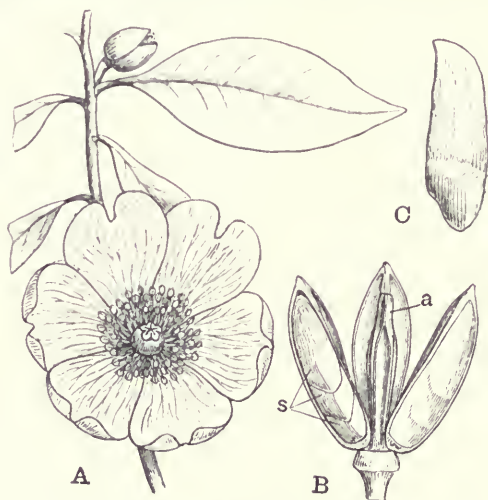


Fig. 72.—*Laplacea hæmatoxylon* G. Don.

A, Portion of branch with leaves, bud, and flower $\times \frac{1}{2}$.

B, Capsule opened with 2 valves removed; a, persistent axis; s, seeds $\times 1\frac{1}{2}$.

C, Seed $\times 2$.

Genève xiv. 144 (1855); *Urb. tom. cit.* 546. *Gordonia hæmatoxylon Sw. Fl. Ind. Occ.* 1199 (1800); *Macf. Jam. i.* 116. (Fig. 72.)

Bloodwood, Ironwood.

Wright! Broughton! *Swartz!* Bertero; *Macfadyen!* Jenman! Latimer, Cinchona plantation, Morris! *Hart!* J.P. 594, 609, 902; Vinegar Hill, 3950 ft.; Clydesdale, 3000 ft.; near Woodcutters' Gap, 4300 ft.; Hardware Gap, 4000 ft.; Toms Cave Wood, Clarendon, 2500 ft.; *Harris!* John Crow (Blake) Mts., 1700 ft., *Harris & Britton!* Fl. Jam. 5493, 5662, 6736, 10,124, 10,763, 10,852.

Tree, 15-40 ft. high. *Leaves* 5-10 cm. l., elliptical, apex obtuse or shortly and obtusely acuminate, base narrowed into the petiole, crenulate or serrate-crenate chiefly above, papery, with inconspicuous hairs at the base and on midrib beneath; petioles 4-8 mm. l. *Flowers* large, showy, white. *Peduncles* 2-5 mm. l. *Sepals*, larger, 9-11 mm. l., puberulous. *Petals* 5 or 6, obovate, emarginate, 1.5-3 cm. l., subglabrous. *Ovary* 5(6)-celled; cells with about 5 ovules in each. *Capsule* 1.5-2 cm. l. *Seeds* 4-6 in each cell; wing and seed 10-14 mm. l.

The wood is of a deep red colour, very hard, heavy, fine-grained, and handsome. It is suitable for building purposes in exposed situations, for mill work and for turnery; it might be used as a substitute for boxwood.

[THEA L.

Trees or shrubs. Leaves leathery or membranous, serrate. Flowers axillary, solitary or somewhat clustered. Sepals 5-6, unequal. Petals shortly cohering at the base, overlapping. Stamens indefinite, the outer in indefinite series united shortly or nearly to the apex, and adhering to the base of the petals, the inner 5-12, free. Ovary 3-5-celled; styles more or less united or free; ovules 4-5 in the cells, pendulous. Capsule woody, opening loculicidally. Seeds usually solitary, somewhat thick, not winged; endosperm none; embryo straight, cotyledons thick, radicle short, superior.

Species 16, growing in tropical or eastern Asia.

T. sinensis L. *Sp. Pl.* 515 (1753); *Urb. in Engl. Bot. Jahrb.* xxi. 549; *Szyszyłowicz in Engl. & Prantl Pflanzenfam.* iii. 6, 182, fig. 92. *T. Bohea* L. *Sp. Pl. ed.* 2, 734 (1762). *T. viridis* L. *tom. cit.* 735; *Bot. Mag. t.* 3148; *Macf. Jam. i.* 118. *Tea Bull. Dept. Agric. Jamaica, i.* 150 & *new ser. i.* 176. *Camellia sinensis* Kuntze in *Acta Hort. Petrop. x.* 195 in obs. (1887). *C. Thea* Link *Enum. ii.* 73 (1822); *Benth. & Trim. Med. Pl. i.* t. 34. *C. viridis* Link *loc. cit.* (Fig. 73.)

Tea.

Naturalized in Blue Mts. Native of Asia.

Shrub, 5-10 ft. high. *Leaves* 6-11 cm. l., elliptical to lanceolate. *Flowers* solitary, drooping, white, slightly fragrant. *Peduncle* 5-10 mm. l. *Petals* 5-9, roundish, slightly clawed. *Stamens* united at the base. *Ovary* 3-celled. *Capsule* 1.5-2 cm. in diam., 3-lobed, 3-celled, 3-valved. *Seeds* 1-1.5 cm. in diam., light-brown, 1 or 2 in each cell.

The tea shrub was first introduced into Jamaica in 1771 (Bull. Dept. Agric. Jamaica, i. 150, 1903), and soon became naturalized in the Blue Mts.]

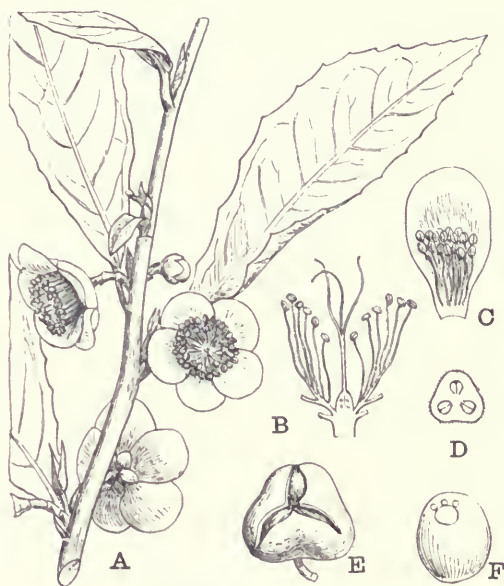


Fig. 73.—*Thea sinensis* L.

- | | |
|--|-------------------------------------|
| A, Portion of branch with leaf and flower $\times \frac{1}{2}$. | C, Petals with stamens $\times 2$. |
| B, Section of flower with sepals and petals cut off $\times 2$. | D, Ovary cut across, nat. size. |
| | E, Capsule $\times \frac{1}{2}$. |
| | F, Seed, nat. size. |

(A, C–E after Bentley & Trimen ; B, F after Szyzylowicz.)

FAMILY LXXI. GUTTIFERÆ.

Trees or shrubs, sometimes epiphytic, with resinous sap, often yellow or greenish. Leaves opposite, generally decussate, rarely whorled, leathery, penninerved, simple, entire, without stipules. Flowers terminal or axillary, sometimes solitary or clustered, sometimes in few-flowered cymes, or in trichotomous panicles, or raceme-like panicles, white, yellow, or pink ; regular, diœcious, polygamous, or hermaphrodite (in *Symphonia*). Sepals 2–6, rarely indefinite, widely overlapping or decussate, persistent. Petals 2–6, rarely indefinite, contorted or sometimes overlapping. Male flowers: Stamens numerous, very rarely definite, hypogynous; filaments free or variously combined, sometimes united without form into a fleshy mass or combined into as many bundles as there are petals and opposite to them, sometimes long

and thread-like. Ovary wanting, or more or less developed. Female or hermaphrodite flower: Staminodes or stamens surrounding the ovary, often definite or fewer in number and not combined to such an extent as the stamens of the male flower. Ovary with 2 or more cells or 1-celled in *Calophyllum*; ovules 1 to indefinite in each cell, attached to the central angle or erect from the base in *Calophyllum*. Stigmas as many as the cells of the ovary, various in form, sessile or at the apex of separate styles. Fruit generally fleshy-leathery, sometimes not opening, berry-like or drupaceous, sometimes opening septicidally into as many valves as cells. Seeds thick, often with an aril or strophiole, without endosperm. Embryo filling the seed, sometimes consisting of a thick radicle with the cotyledons minutely scale-like or on the whole inconspicuous, sometimes divided into 2 cotyledons united without form or scarcely separable, radicle very short, inferior.

Species 830, all natives of the tropics.

- Petioles with a large pit inside at base 2. *Rheedia*.
 Petioles without a pit.
 Stamens forming a tube round pistil 3. *Symphonia*.
 Stamens free or united only at base.
 Style wanting or very short. Ovary 4-10-celled with
 indefinite ovules 1. *Clusia*.
 Style long or not very short.
 Ovary 1-celled with 1 ovule 4. *Calophyllum*.
 Ovary 2-4-celled with 4 ovules..... 5. *Mammea*.

1. CLUSIA L.

Trees or shrubs, often epiphytic,* rarely climbing. A viscid resinous yellow sap flows from every part when cut. Leaves leathery, with a strong midrib, but without nerves or with numerous pinnate nerves. Flowers diœcious, polygamous, or hermaphrodite, at the ends of branches, sometimes rather large and solitary or few, sometimes rather small in paniced cymes. Bracts 2-6. Bracteoles 2-14, decussate in pairs, sepal-like, but smaller. Sepals 4-6, roundish, decussate in pairs or overlapping. Petals 4-10, obovate or oblong, overlapping or decussate. Male flowers: Stamens in male flowers indefinite, usually numerous, free or more or less united at base (in W. Indian species), sometimes all growing together into a sessile globose mass or into an upright column, with the anthers immersed, sometimes the interior or exterior growing together and sterile, while the anthers of the exterior or interior are free; anthers with 2

* The epiphytic habit is due to birds getting rid of the seeds on the branches of trees, which germinate there, and send their roots down the trunk to the ground below, eventually smothering their host.

(rarely indefinite) cells, opening by a longitudinal chink on each side or in various ways. Female flowers: Staminodes 5 to several, free or united, without anthers or anthers more or less without pollen. Ovary 4–10-celled; stigmas radiating, sessile or with short thick styles, distinct or more or less combined; ovules indefinite in the cells, anatropous, attached at or near the inner angle, usually more or less horizontal. Capsule thick, leathery or fleshy, opening at length septicidally, showing the angular-winged axis. Seeds generally indefinite, enclosed in a fleshy aril; embryo thick-fleshy, cotyledons minute and scale-like at the apex. Balsam Tree, Wild Fig.

Species about 100, growing in the West Indies and tropical and subtropical continental America.

Bracteoles 6–4. Fruit 2–2.5 cm. l. Stigmas about 12. 2. *C. flava*.
Bracteoles 2–4.

Fruit 5–8 cm. l. Stigmas 6–9. Sepals to 2 cm. l. 1. *C. rosea*.

Fruit less than 3 cm. l. Stigmas 5 (sometimes 4
in No. 3).

Sepals 4–6 mm. l.

Fruit about 18 mm. l. 3. *C. havetioides*.

Fruit 12–14 mm. l. 4. *C. stenocarpa*.

Sepals 18 mm. l. Fruit 2–2.5 cm. l. 5. *C. clarendonensis*.

1. *C. rosea* Jacq. *Enum.* 34 (1760) & *Sel. Stirp. Amer.* 270; *L. Sp. Pl. ed.* 2, 1495; *Tussac Fl. Ant. iv.* 42, t. 15 (under *C. rosea*); *Griseb. Fl. Br. W. Ind.* 107; *Vesque Guttiferæ in DC. Monogr. Phan.* viii. 108; *Engler Pflanzenfam.* iii. 6, 226; *Cook & Coll. in Contrib. U.S. Herb.* viii. 119, t. 28; *Urb. Symb. Ant. iv.* 414 & viii. 439; *Britt. & Millsp. Bah. Fl.* 281. *C. major* *L. Sp. Pl.* 509 (1753) (in part and var. β). *C. silvicola* *Britton in Torr. Bot. Cl. Bull.* xxxvii. 354 (1910). *C. flore roseo &c. Plum. Ic. ined.* (*Hb. Mus. Brit.*) ii. 103. *Cenchramidia &c. Pluk. Phyt. t.* 157, f. 2; *Catesby Carol. ii. t.* 99. (Fig. 74.) Type from Catesby in *Herb. Mus. Brit.*

March! Grounds of Hope Gardens, *Fawcett!* coastal thickets, Bluefields (25 ft. high, growing on *Dipholis*) *Harris!* *Fl. Jam.* 10, 197; wooded hill near Dolphin Head, 1300 ft., *Britton* 2330!—Bahamas, West Indies, Panama, Venezuela.

Tree, 20–50 ft. high, growing on other trees or rocks. *Leaves* 9–18 cm. l., obovate, apex rounded or rounded-retuse, narrowed towards the base, wedge-shaped or obtuse, margin scarcely recurved, midrib on upper surface slightly prominent below, flat or disappearing above, very prominent beneath but disappearing near apex, nerves numerous, parallel, slightly prominent on both sides; petioles 1–2 cm. l. *Inflorescence* 3–5 cm. l., with 1, 2 or 3 flowers, with the oldest in the centre. *Bracts* ovate, about 6 mm. l. *Bracteoles* 2–4, sepal-like, but smaller. *Flowers* polygamous. *Sepals* 4–6, to 2 cm. l. *Petals* 6–8, 3–4 cm. l., pink and white, obovate or obcordate. *Male flowers: Stamens:* outer fertile in several series, at the base more or less united to form a cup or ring, anthers narrow, cuspidate with the prolonged connective, cells 2, linear, opening by a longitudinal chink; inner sterile, grown together into a solid resinous mass. *Female*

flowers: *Staminodes* grown together to form a cup. *Stigmas* 6-9. *Fruit* globose, greenish or nearly white, 5-8 cm. in diam., 6-8-celled.

"The seeds contain a pitchy resin, which is used [in Virgin Islands] for caulking the seams of boats, for which purpose it is said to be the equal of asphalt. This is recovered in an ingenious manner. The seeds

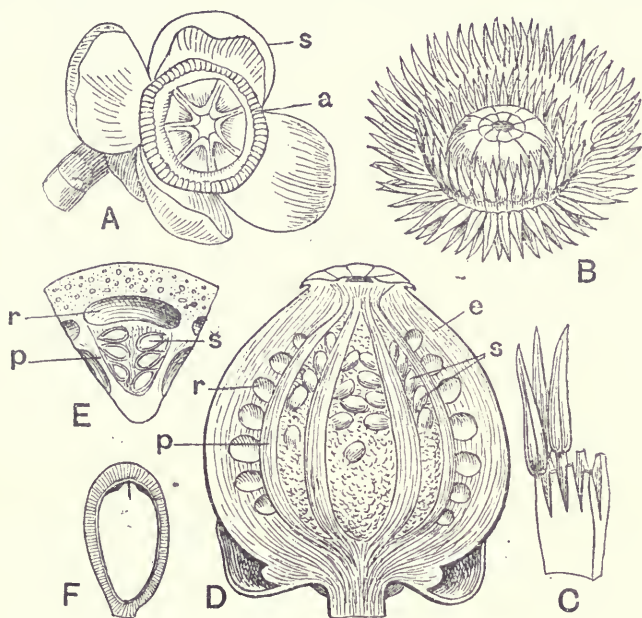


Fig. 74.—*Clusia rosca* L.

A, Female flower with the petals removed, nat. size; *s*, sepals; *a*, staminodes.

B, Double ring of stamens surrounding pistil of hermaphrodite flower, nat. size.

C, Portion of the staminal ring, enlarged.

(A after Schlechtendal; B, C after de Tussac; D, E, F after Engler.)

D, Fruit cut lengthwise $\times \frac{2}{3}$; *e*, exocarp; *r*, resin passage; *p*, placenta; *s*, seeds.

E, Portion of same cut across, showing one cell with the seeds attached to the placentas.

F, Seed cut lengthwise $\times 3$.

are set in an ordinary dutch stove, and set alight, burning readily. The melting resin flows down through the grate, and is collected in the ash chamber below." (Note in Hb. Kew from Comm. of Agric. W.I., 1913.)

2. *C. flava* Jacq. *Enum.* 34 (1760), *Sel. Stirp. Amer.* 272, t. 167, & *Ed. pict.* t. 251; *L. Sp. Pl. cd.* 2, 1495; *Andrews Repos.* t. 223; *Maycock Flora Barbadosensis* 398; *Macf. Jam. i.* 134; *Nutt. N. Amer. Sylva ii.* 111, t. 77 (1852); *Griseb. loc. cit.*; *Vesque Guttiferæ tom. cit.* 81; *Small Fl. S.E. U.S.* 782. *C. major* *L. Sp. Pl.* 509 (1753) (in part) & *Amæn. v.* 383. *C. arborea* & *Browne Hist. Jam.* 236 (excl. syn. *Catesb. & Pluk.*). *Terebinthus*

folio singulari &c. *Sloane Cat.* 167, *Hist.* ii. 91, t. 200, f. 1 (excl. fruit). Specimen from Browne in Herb. Linn.

Sloane Herb. vi. 107 (excl. fruit)! *Browne*! *Wright*! *March*! *Moneague*, *Prior*! *Ferry*, *Grabham*! *Malvern*, *Miss Barrows*! *Bridge Hill*, 1500 ft.; *Great Goat Is.*; *Potsdam*, 2600 ft.; *Kentucky Hill*, *Bluefields Mt.*, 2000-2500 ft.; *sea-coast*, *Negril*; *Harris*! *Fl. Jam.* 7087, 9376, 9976, 10,213, 10,223.—*Barbados* (fide *Maycock*), *Grand Cayman* (*Hitchcock*), *Florida Keys* (fide *Nuttall*).

Tree, 15-30 ft. high, growing on rocks and trees, often killing its tree host and then supported by its own roots. *Leaves* 6-14 cm. l., obovate, apex rounded or rounded-truncate, narrowed towards the base, wedge-shaped or obtuse, margin usually slightly recurved, midrib on upper surface more or less flat, sometimes slightly impressed below, usually disappearing above, prominent beneath but disappearing above, nerves parallel, 11-15, usually conspicuous and prominent beneath, not so much so on upper surface, sometimes inconspicuous or not visible on both sides; petioles 1-2 cm. l. *Inflorescence*: male 3-5 cm. l., with 2-7 flowers; female usually solitary. *Bracts* 4-6, 3 mm. l. *Bracteoles* 6-14, sepal-like but smaller and decreasing in size gradually downwards, sometimes also 6-8 on pedicels still smaller. *Sepals* 4, 9-11 mm. l. *Petals* 4, opposite the sepals, one pair larger than the other, pale yellow, obovate, apex truncate, very thick, 2-2.5 cm. l. *Male flowers*: *Stamens* very many, inserted on a receptacle, crowded, free; filaments very short; anthers opening along the sides, oblong, basifixed, not cuspidate. *Ovary* very small, sterile, with four 3-rayed stigmas. *Female flowers*: *Staminodes* 8-12 in 4 bundles, free, with anthers. *Stigmas* about 12, distinct, persistent. *Fruit* subglobose, 2-2.5 cm. in diam., with about 12 cells and 12 valves. *Seeds* several.

3. *C. havetioides* *Planch. & Tr. in Ann. Sc. Nat. sér. 4, xiii.* 368 (1860); *Vesque Guttif. tom. cit.* 57. *Tovomita havetioides* *Grisch. Fl. Br. W. Ind.* 106 (1859).

Wilson! above *Ferry*, *Purdie*! *Chester Vale*; road to *Whitfield Hall*, 4000 ft.; near *Clydesdale*, 4400 ft.; *Harris*! *Schwallenburg*, *Fawcett & Harris*! *Fl. Jam.* 5356, 6053, 6521, 7013; *Cinchona*, *G. Nichols*! *New Haven Gap*, 5600 ft.; *Vinegar Hill Road*, 4500 ft.; *Pessin*.

Tree, 15-20 ft. high. *Leaves* 4-10 cm. l., obovate-elliptical, obovate to oblanceolate, apex rounded, base wedge-shaped, narrowing into the broad petiole, margin recurved, midrib on upper surface slightly prominent above, canaliculate below, prominent beneath, nerves numerous, parallel, usually slightly prominent on both sides; petioles flat above, slightly margined, 1.5-5 mm. l., or even less. *Inflorescence*: male cymes compound, densely corymbiform, terminal; female with 1 or 3 flowers. *Male flowers*: *Bracts* ovate, 2-5 mm. l. *Bracteoles* 2, ovate-triangular or roundish, 2-2.5 mm. l. *Sepals* 4 (5), irregularly elliptical, about 5 mm. l. *Petals* 5 (6), about 6 mm. l. *Stamens* numerous, free; filaments 2-3 mm. l.; anthers ellipsoidal, opening at the sides. *Female flowers*: somewhat larger than male. *Stigmas* 5 (4). *Fruit* (? ripe) ovoid or ovoid-ellipsoidal, 5(4)-celled, 18 mm. l.

4. *C. stenocarpa* *Urb. Symb. Ant. v.* 433 (1908).

Green Hill, 3000 ft.; between *Hardware Gap* and *Rose Hill*, 3600 ft.; *Harris*! *Fl. Jam.* 5929, 10,134.

Tree, 20-35 ft. high. *Leaves* 7-12 cm. l., 4-8.5 cm. br., broadly obovate, apex rounded, base narrowed more or less abruptly into the short petiole,

margin recurved, midrib on upper surface slightly prominent above, somewhat impressed below, prominent beneath, nerves as in *C. havetioides*; petioles 4-7 mm. l. *Inflorescence* (in fruit) to 5 cm. l., regularly branched, 15-flowered. *Bracts*, primary ovate, acuminate, to 6 mm. l., upper shorter and more triangular. *Bracteoles* 2 or 4, 2-3 mm. l., lower triangular, the upper sepal-like. *Female flowers*: *Sepals* 4, roundish-ovate, 4-5 mm. l. *Petals* (fide Urban) obovate, broadly clawed, 6-8 mm. l., 4 mm. br. above. *Stigmas* 5, sessile. *Fruit* ellipsoidal or ellipsoidal-oblong, 5-celled, slightly fleshy, 12-15 mm. l. *Seeds* 6-9 in each cell, 2.5 mm. l.

5. *C. clarendonensis* Britton in Bull. Torr. Bot. Cl. xxxix. 7 (1912).

In fr. July and Dec.; Peckham woods, Clarendon, 2500 ft., Harris! Fl. Jam. 10,992, 12,793.

Tree, 15 ft. high, low, spreading, growing on limestone rocks. *Leaves* 5-10 cm. l., 4-8 cm. br., broadly obovate, apex rounded-retuse or rounded, base narrowed into the short petiole (4-6 mm. l.) or truncate, sessile, margin flat or slightly recurved, midrib on upper surface slightly prominent above, somewhat impressed below, prominent beneath, nerves as in *C. havetioides*. *Inflorescence* (in fruit) 5-8 cm. l., with a terminal and 2 lateral flowers. *Bracts*, primary and secondary, ovate, triangular, 5-8 mm. l. *Bracteoles* 2, semicircular, 4 mm. l. *Female flowers*: *Sepals* 4, outer roundish, inner elliptical, about 8 mm. l. (in fr.). *Stigmas* 5, sessile. *Fruit* 2-2.5 cm. l., ellipsoidal, 5-celled. *Seeds* about 7 in each cell, 3-4 mm. l.

2. RHEEDIA L.

Trees, with yellow sap. Leaves rigidly leathery, with pinnate nerves; petioles with a margined pit inside at the base. Peduncles axillary or lateral, 1-flowered, in clusters. Flowers polygamodioecious, generally small. Sepals 2, united at the base, overlapping at the apex or on one side valvate. Petals 4, decussately overlapping, the outer alternate with the sepals. Male flowers: Stamens indefinite, free, inserted around the base of a hemispherical thick fleshy disk; anthers small, 2-celled, opening longitudinally. Hermaphrodite flowers: Stamens round the disk in a single series. Ovary situated on the disk, 3-4(5)-celled; stigma peltate-discoid, subsessile or with a short style; ovules solitary in each cell, erect, attached at the inner angle above the base. Fruit a berry, with a leathery wall, 1-celled by the disappearance of the partition walls, with 1-5 seeds, crowned by the persistent stigma. Seeds enclosed in an aril-like pulp, ovoid or oblong, seed-coat thin. Embryo large, fleshy, resinous; cotyledons very small or wanting.

Species 32, of which 13 are found in the West Indies, and the rest in tropical continental America.

Leaves elliptical to broadly ovate, 12-30 cm. l.

Petals 6-7 mm. l. 1. *R. lateriflora*.

Petals about 10 mm. l. 2. *R. sessiliflora*.

Leaves narrowly ovate-oblong, acuminate, 5-12 cm. l.

Petals 3 mm. l. 3. *R. pendula*.

1. *R. lateriflora* L. *Sp. Pl.* 1193 (1753); *Tussac Fl. Ant.* iii. 104, t. 32; *Descourt. Fl. Ant.* v. 149, t. 343; *Planch. & Tr. in Ann. Sc. Nat. sér. 4, xiv.* 307; *Vesque in DC. Monogr. Phanerog.* vii. 497; *Urb. Symb. Ant.* viii. 440. *Vaurheedia Plum. Gen.* 45, t. 18. *Rheedia Plum. Pl. Amer. (Burm.)* 255, t. 257. *Mammea humilis Vahl Eclog.* ii. 40, t. 20 (1798); *Griseb. Fl. Br. W. Ind.* 108 (excl. syn. *Garcinia macrophylla*).

Wild *Mammea*.

Wright! high woods, Pedro, *Purdie! March!*—Hispaniola, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Trinidad.

Tree, medium height. *Leaves* 12–28 cm. l., elliptical, apex acute, base obtuse to very obtuse, or sometimes subcordate, or acute, running down into the petiole, thick, nerves 12–20, with the veins, prominent on both sides; petioles 1–2 cm. l. *Pedicels* several in axils of fallen leaves, 1–2 cm. l., of fruit 1.5–2.5 cm. l. *Sepals* 2 (3, 4), 1.5 mm. l. *Petals* 4 (6), elliptical, 2 broader, white, 6–7 mm. l. *Stamens* 20–12. *Ovary* 3–4-celled; stigmas 3–4. *Fruit* ellipsoidal to subglobose, yellow, acuminate, 3–4 cm. l. *Seeds* 3–1.

2. *R. sessiliflora* *Planch. ex Vesque Epharm.* ii. 23, t. 62 (1889) & *DC. Monogr. Phanerog.* viii. 500. *R. lateriflora* L. forma *Planch. & Tr. loc. cit.* (1860). (Fig. 75.)

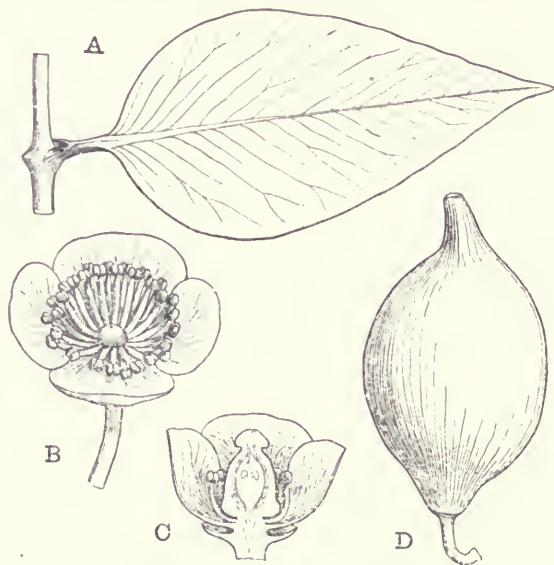


Fig. 75.—*Rheedia sessiliflora* Planch.

A, Leaf showing pit at base of petiole $\times \frac{1}{2}$. C, Hermaphrodite flower cut lengthwise $\times 1\frac{1}{2}$.
B, Male flower $\times 1\frac{1}{2}$. D, Fruit $\times \frac{3}{2}$.
(D after Vesque.)

Wild Lime.

High woods, Manchester, and St. Ann, *Purdie*! near Manchioneal, *Jenoure*! Shooters Hill, *Scharschmidt*! Glasgow, near Troy, 1400 ft.; Tyre, near Troy, 2000 ft.; Peckham, Clarendon, 2500 ft.; *Harris*! Fl. Jam. 8668, 9471, 10,965.

Tree, 12-30 ft. high. *Leaves* 10-17 cm. l., 6-11 cm. br., broadly ovate to oblong-elliptical, apex generally acute, base very obtuse to subcordate, thick, nerves 15-20, with veins, prominent on both sides; petioles 1.5-2 cm. l. *Pedicels* several in axils, 4-15 mm. l. in fl. *Sepals* 4-5 mm. in diam., roundish. *Petals* about 1 cm. l., roundish, greenish-yellow or pale yellow, two outer broader (12-13 mm. br.), two smaller. *Male flowers*: *Stamens* 25-30. *Female flowers*: *Stamens* about 10. *Ovary* 4-celled. *Stigmas* 4, broad, reflexed. *Fruit* (fide Vesque) ellipsoidal, apex gradually and long acuminate, crowned by the persistent stigma, at the base contracted, 6 cm. l., 3.5 cm. br., tip 1 cm. l.

3. *R. pendula* Urb. *Symb. Ant. i.* 368 (1899).

March! below Vinegar Hill, 3500-3900 ft.; near Mabess River, 4000 ft.; Battersea wood, near Christiana, 3000 ft.; Peckham, Clarendon, 2500 ft.; *Harris*! Fl. Jam. 7451, 7898, 8278, 10,102, 11,208.

Shrub or tree, 8-30 ft. high, with drooping branches. *Leaves* 5-12(-16) cm. l., narrowly elliptical- or ovate-oblong, apex acuminate and usually folded but not spiny, base obtuse or acute, nerves 15-25, with the veins, prominent on both sides; petioles 8-15 mm. l., margined. *Male flowers*: *Pedicels* 5-8 in axils, 3-8 mm. l. *Sepals* about 1 mm. l. *Petals* about 3 mm. l., roundish-elliptical or semicircular. *Stamens* 8-9, unequal, half as long to as long as the petals. *Disk* fleshy with an umbo at apex. *Hermaphrodite flowers*: *Pedicels* lengthening in fruit to 3.5 cm. l. *Sepals* as in male fl. *Petals* not seen. *Stamens*, some persisting in the young fruit, apparently as in male. *Stigmas* broad, spreading, persisting in the fruit. *Ovary* 3-4-celled. *Fruit* ellipsoidal, acuminate, 5-8 cm. l., fleshy on outside, 1-celled with 2 or 3 cells undeveloped. *Seed* one.

3. SYMPHONIA Linn. f.

Trees or shrubs, with yellowish sap. Leaves thin-leathery, pinnate-nerved with the nerves parallel and close together. Flowers hermaphrodite, terminal, generally scarlet, rather large, subumbellately paniculate or rarely solitary. Sepals 5, overlapping. Petals 5, larger than the calyx, forming a globular corolla before spreading. Disk below the stamens, cup-like. Stamens united into a tube with 5 narrow lobes above opposite the petals, the lobes bearing 3 or 4 anthers outside below the apex; anthers linear, adhering, parallel. Ovary enclosed in the staminal column, 5-celled; style long, radiately 5-lobed at the apex, lobes minutely stigmatic at the apex; ovules 6-8 in each cell. Fruit a globose or ovoid berry. Seeds few, sometimes solitary, coat thin, veiny. Embryo of the same form as the seed, undivided, cotyledons wanting, radicle very large.

Species 15, one (*S. globulifera* Linn. f.) widely dispersed in the tropics of America and Africa, another native of tropical Africa, the rest natives of Madagascar.

S. globulifera Linn. *f. Suppl.* 302 (1781); *Planch. & Tr. in Ann. Sc. Nat. sér. 4, xiv.* 287; *Engl. in Fl. Bras. xii. pt. 1,* 469, *t.* 108; *Vesque in DC. Monogr. viii.* 227; *Pittier in Contrib. U.S. Nat. Herb. xiii.* 456. *Moronobea coccinea* Aubl. (in part) *t.* 313, *f.* a-j (1775); *Mart. Nov. Gen. & Sp. iii.* 163, *t.* 287; *Macf. Jam. i.* 139; *Griseb. Fl. Br. W. Ind.* 107, 708; *Urb. Symb. Ant. viii.* 440. Hog Gum Tree *A. Robinson ms. & icon. ined.*;

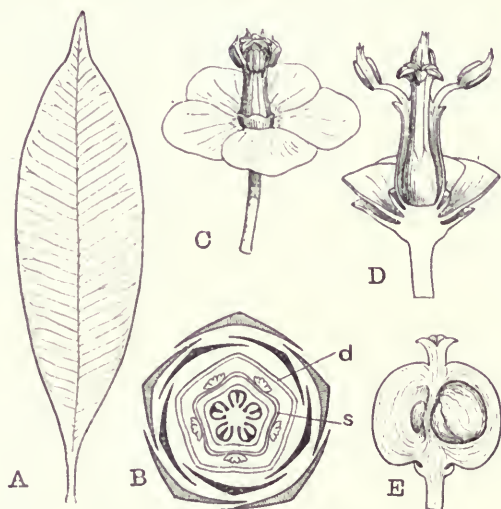


Fig. 76.—*Symphonia globulifera* Linn. f.

A, Leaf, nat. size.

B, Diagram of flower; d, disk; s, staminal tube.

C, Flower, nat. size.

D, Ditto with sepals, petals, and part of staminal tube cut off, increased by one-third.

E, Fruit cut lengthwise showing a ripe seed and one partially developed $\times \frac{3}{4}$.

Bancroft in Hook. Journ. Bot. iv. 136; *Fawcett in Journ. Bot. ix.* 52 (1922). (Fig. 76.) A specimen in Herb. Linn. in a cover named *Symphonia*, but without specific name.

Hog Gum Tree.

Bancroft! *Bertero!* *Bertero!* damp mountain forests St. George and Portland, *Macfadyen!* *Distin!* *Purdie!* below Vinegar Hill; Middle Quarters Morass, *Harris!*—Hispaniola, Guadeloupe, Dominica, St. Lucia, Trinidad, tropical continental America, tropical Africa, and Madagascar.

Tree, 50–100 ft. high. Aerial roots are emitted from the trunk for 3 or 4 ft. from the ground. *Leaves* 5–12 cm. l., lanceolate, oblanceolate, or oblong-elliptical, acuminate, base wedge-shaped, light green; petioles 3–8 mm. l. *Flowers* scarlet, several in umbel-like cymes terminal at the ends of short lateral branches, hermaphrodite; buds globose, about 1 cm. in diam. *Sepals* 4–4.5 mm. l. *Petals* about 12 mm. l. *Fruit* ovoid or globose, 1.5–2 cm. l. *Seeds* solitary, 12–15 mm. l., glabrous.

The gum which exudes, on cutting into the bark, is at first fluid and pellucid, but afterwards changes to a yellow colour, and becomes hard and

friable, resembling Burgundy pitch in appearance for which it is used as a substitute in plasters. Mixed with lard, wax, and rosin, it forms an ointment, well adapted as a dressing for indolent sores. The Indians of the Continent make torches with it, which give a good light without much smoke or smell; and employ it to pitch the outside of their beats, and to fix on a head of fish-bone to their arrows. (Macfadyen.)

4. CALOPHYLLUM L.

Trees. Leaves leathery, shining, striate with very numerous pinnate nerves close together, without veins. Panicles axillary or terminal, cymose-trichotomous, or raceme-like. Flowers polygamous. Sepals 4, decussate, the 2 inner often more or less

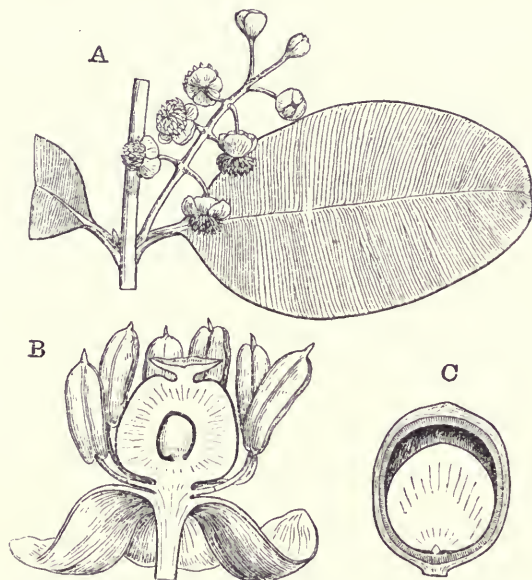


Fig. 77.—*Calophyllum Jacquinii* Fawc. & Rendle.

A, Portion of branch with leaf and inflorescence $\times \frac{1}{2}$.

B, Hermaphrodite flower cut lengthwise $\times 8$.

C, Fruit with seed, cut lengthwise, nat. size.

petaloid. Petals none or one or more. Stamens indefinite, free or scarcely united at the base; filaments short, thread-like; anthers ovate or oblong, 2-celled, opening longitudinally. Ovary 1-celled; style usually long, with shield-like stigma; ovule 1, erect, anatropous. Fruit a drupe, shell hard and brittle. Seed erect, ovoid or globose, seed-coat sometimes thin, sometimes thick and spongy. Cotyledons thick and fleshy, radicle very short.

Species about 100; 3 or 4 are tropical American, including

one or two also found in the West Indies, the rest growing in the tropics of the Old World and Oceania.

Leaves elliptical, 7-14 cm. l. 1. *C. Jacquinii*.
 Leaves narrowly oblong, 15-30 cm. l. 2. *C. longifolium*.

1. *C. Jacquinii* *nom. nov.*; *C. Calaba* *Jacq. Sel. Stirp. Amer.* 269, t. 165 (1763) & *Ed. pict. t.* 249 (non *L. Sp. Pl.* 514 (1753)); *L. Sp. Pl. ed.* 2, 732 (1762) (only as regards reference to *Jacq. Stirp.*); *Sw. Obs.* 216; *Descourt. Fl. Ant. ii.* 30, t. 74; *Macf. Jam. i.* 136; *Griseb. Fl. Br. W. Ind.* 108 (excl. reference to Brazil); *Planch. & Tr. in Ann. Sc. Nat. sér.* 4, xv. 249; *Urb. Symb. Ant. in.* 412 & vii. 438; *Vesque in DC. Monogr. Phan. viii.* 588; *Britton Fl. Berm.* 246. *Mali persicæ Mameyæ &c. Sloane Cat.* 180 & *Hist. ii.* 124. *Arbor altissima &c. Browne Hist. Jam.* 372. *Calaba &c. Plum. Gen.* 39, t. 18. (Fig. 77.)

Santa Maria, Wild Mamee.

Sloane Herb. vii. 58! *Wright! March*; *Prior*; *Castleton, Fawcett! Langley, Harris! Fl. Jam.* 5514, 6329.—West Indies (naturalized in Bermuda).

A lofty tree. Leaves 7-14 cm. l., elliptical, apex rounded or rounded-emarginate, base obtuse or wedge-shaped, thinly leathery. Racemes axillary, 3 cm. l. Sepals 5-8 mm. l. Petals none or 1-2, shorter than the inner sepals. Male flowers: Stamens 40-50. Pistil very small. Female flowers: Stamens few, in one series. Ovary globose; style short; stigma shield-shaped. Drupe globose, 2-2.5 cm. in diam. Seed globose, about 1.3 cm. in diam.

C. Calaba *L. Sp. Pl.* 514 (1753) is founded on a Ceylon plant (*Fl. Zeyl.* no. 202) (named later *C. Burmanni* *Wight Ill. i.* 129, 1838), a different species from the West Indian plant described by *Jacquin* under the same name. In *Sp. Pl. ed.* 2, 732, *Linnæus* added the reference to *Jacquin*.

2. *C. longifolium* *Willd. in Mag. der Gesellsch. Naturforsch. Freunde* 80 (1811); *Planch. & Tr. in Ann. Sc. Nat. sér.* 4, xv. 255. *C. brasiliense* *Camb. var. longifolium* *Vesque in DC. Monogr. viii.* 592 (1893); *Sloane Hist. ii. t.* 217, f. 4.

White Santa Maria.

Sloane Herb. vii. 58! *Union Hill, Moneague, Prior! March! Murray* (225, 228 in *Herb. DC.*) *sic Planch. & Tr. loc. cit.*

Leaves 15-30 cm. l., 4-7 cm. br., oblong, apex-rounded or obtusely acuminate, base obtuse or rounded or somewhat acute, margin thickened, very narrowly repand; petiole 10-18 mm. l. Flowers and fruit not known.

5. MAMMEA L.

Trees. Leaves hard and leathery, generally with pellucid dots, nerves pinnate, slender and close together, connected by a network of veins. Peduncles axillary, 1-flowered, solitary or clustered. Flowers polygamous. Calyx splitting valvately into 2 sepals on flowering. Petals 4-6. Stamens numerous, free or united at the base; filaments thread-like; anthers erect, oblong, 2-celled, opening longitudinally. Disk wanting. Ovary 2-celled,

each cell with 2 ovules, or 4-celled, each cell with 1 ovule; style short, with shield-like stigma broadly 2-lobed. Drupe edible, with 1 to 4 seeds. Seeds large. Embryo: cotyledons very large, thick and fleshy, united or separable; radicle very short.

Species one, indigenous in the West Indies and tropical America, cultivated in the tropics of the Old World.

M. americana L. *Sp. Pl.* 512 (1753); *Jacq. Sel. Stirp. Amer.* 268, t. 181, f. 82 & *Ed. pict. t.* 248; *Sw. Obs.* 214; *Lunan Hort. Jam.* i. 481; *Tussac Fl. Ant.* iii. 32, t. 7; *Wright Mem.*

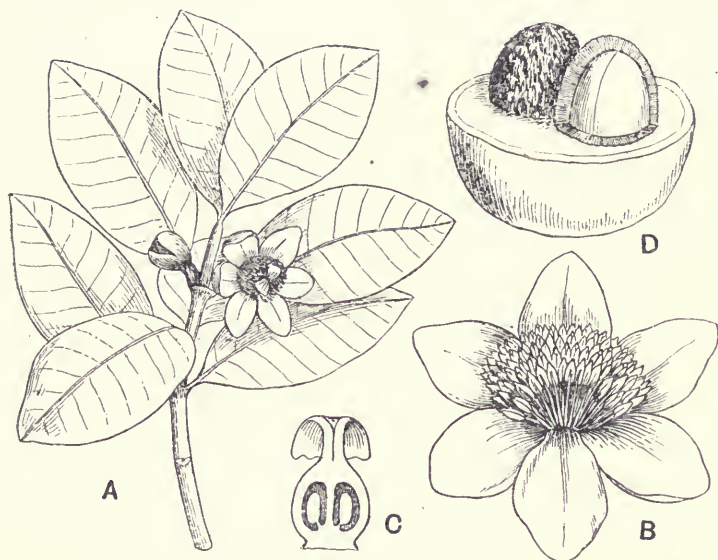


Fig. 78.—*Mammea americana* L.

A, Tip of branch, showing leaves, a bud, and hermaphrodite flower, $\times \frac{1}{4}$.

B, Male flower, nat. size.

C, Pistil cut lengthwise, enlarged.

D, Fruit cut across, showing 2 stones, one of which is opened to show the seed, $\times \frac{1}{5}$.

(After Engler.)

280; *Macf. Jam.* i. 135; *Griseb. Fl. Br. W. Ind.* 108; *Planch. & Tr. in Ann. Sc. Nat. sér. 4, xv.* 242; *Engl. in Fl. Bras. vii. pt. 1,* 395, t. 79; *Vesque in DC. Monogr. viii.* 636; *Urb. Symb. Ant. iv.* 412 & viii. 438; *Pittier in Contrib. U.S. Nat. Herb. xiii.* 451, tt. 90; 91. *M. maxima* &c. and *M. foliis* &c. *Browne Hist. Jam.* 249. *Malus Persica maxima* &c. *Sloane Cat.* 179 & *Hist. ii.* 123, t. 217, f. 3. (Fig. 78.) A specimen from Jacquin in Herb. Mus. Brit. A specimen in Herb. Linn. in cover *Mammea*, the specific name added by J. E. Smith. (Fig. 78.)

Mammee.

In fl. June, July; wild and cultivated; *Sloane Herb.* vii. 58! *Macfadyen!* near Browns Town, *Prior!* J.P. 1383, *Morris!* Holly Mount, 2500 ft., *Harris!*—West Indies, Colombia, Guiana. Cultivated in tropical regions.

Tree, 25–60 ft. high. *Leaves* 1–2.5 dm. l., elliptical, sometimes obovate, apex rounded, base wedge-shaped, obtuse, or rounded, with pellucid glands prominent beneath amongst the veins. *Flowers* white, fragrant. *Sepals* 1.3–1.7 cm. l. *Petals* 1.7–2 cm. l. *Fruit* 10–15 cm. in diam., globose, apiculate, with thick russet-brown skin and fibrous-pulpy yellow mesocarp. *Seeds* 2–4, about two-thirds as long as the fruit, with a reddish rough fibrous coat.

The fruit, when quite ripe, is agreeable, suggesting the apricot, but the thick skin is bitter and must be carefully removed, and the inner flesh next the stones is also bitter. It is often sliced and soaked in wine with sugar before eating. A marmalade is also made with sugar and spice. In the French Islands the flowers are distilled with spirit to make a liqueur known as *eau créole*. The gum, melted with fat, is applied to the sores made by chigoes.

FAMILY LXXII. HYPERICACEÆ.

Herbs, shrubs, or rarely trees. Leaves usually opposite and herbaceous, simple, entire or glandular-dentate; stipules wanting. Flowers regular, hermaphrodite, usually terminal, yellow or white. Foliaceous parts often dotted with pellucid glands, petals and stamens also dotted but not conspicuously. Flowers regular, hermaphrodite. Sepals 5, but in *Ascyrum* 4, overlapping. Petals the same number as the sepals, hypogynous, overlapping. Stamens indefinite, hypogynous, variously united except in *Ascyrum*. Ovary usually of 3–5 carpels, more or less perfectly 3–5-celled, in *Ascyrum* 1-celled. Styles thread-like, usually free. Ovules indefinite, anatropous. Fruit various. Seeds without an aril; endosperm wanting.

Species about 290, dispersed through the temperate and warmer regions of the whole world.

ASCYRUM L.

Leafy undershrubs. Leaves small, entire. Flowers yellow, about 3 together at the ends of twigs. Sepals 4, 2 outer very large or all subequal. Petals 4. Stamens slightly united at the base or free. Ovary 1-celled, with 2 or 3 (4) placentas on the walls; styles as many as the placentas, free or cohering at the base. Fruit a capsule, opening at the placentas. Seeds not winged. Embryo straight, cylindrical, with cotyledons generally shorter than the radicle.

Species 6 or 7, growing in the West Indies and North America, one in Bermuda, and one in the Himalayas.

A. hypericoides L. *Sp. Pl.* 788 (1753) (excl. syn. *Pluk.*); *Sw. Obs.* 294; *Macf. Jam.* i. 132; *Griseb. Fl. Br. W. Ind.* 112;

Small Fl. S.E. U.S. 785; *Britt. & Brown Ill. Fl. ii.* 428; *Urb. Symb. Ant. iv.* 411 & *viii.* 437. *A. crux-Andree* *L. Sp. Pl. ed. 2,* 1107 (1763) (excl. syn. *Pluk.*) (non *ed. 1*). *A. fruticosum* &c. *Browne Hist. Jam.* 309. *A. foliis oblongis* &c. *Plum. Pl. Amer. (Burm.)* 146, *t.* 152, *f.* 1. (Fig. 79.) Specimen from Browne in *Herb. Linn.* named *Hypericum angustifolium* in Solander's hand with correction to *Ascyrum*, the correct specific name added by J. E. Smith.

In fl. all the year; highest mts., *Broughton!* cooler mts. of New Liguanea, *Browne!* *Swartz!* *Hartweg!* *Purdie!* coffee plantations, *St. Andrew, Bromfield!* *Wilson!* *Prior!* *March!* Blue Mts., *Morris!* Prospect Hill, near Castleton, 2000 ft., *Thompson!* Cinchona, 5000 ft., *Harris!* also *Clute!* *Fl. Jam.* 7936, 8534! Blue Mt. Peak, *Hitchcock.*—Cuba, Hispaniola, Porto Rico, continental America from Massachusetts to Colombia.

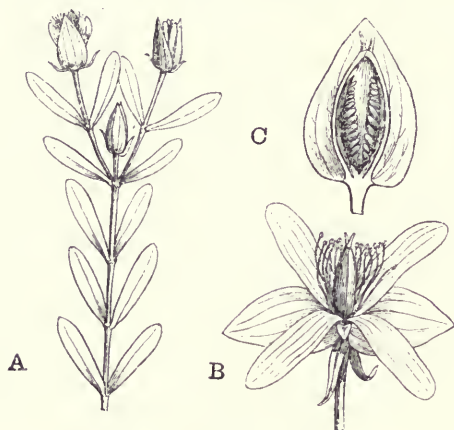


Fig. 79.—*Ascyrum hypericoides* L.

A, Portion of stem with leaves and flowers, nat. size.
B, Flower $\times 2$.

C, Fruit cut lengthwise with one sepal behind $\times 2$.

Shrub, 1-2 ft. high, with compressed 2-edged branches. *Leaves* 7-18 mm. l., oblong-oblancoelate, narrowed to the base, 2-glandular at base, with pellucid dots. *Bracteoles* 2, linear, about 4 mm. l. *Sepals*: 2 outer ovate-elliptical or oblong-ovate, base subcordate, about 1 cm. l., inner about 3 mm. l., lanceolate. *Petals* shorter or somewhat longer than the large sepals. *Styles* short, 2. *Capsule* usually shorter than the large persistent sepals. *Seeds* about 1 mm. l., black, oblong, minutely pitted.

FAMILY LXXIII. QUINACEÆ.

Trees or shrubs, sometimes climbing. Leaves opposite or whorled, entire or pinnately cleft. Stipules generally 2, narrow. Flowers small, regular, usually polygamous, in short

axillary or terminal panicles, raceme-like or clustered. Sepals 4-5, overlapping. Petals 4-5 (6-8), hypogynous, overlapping or twisted. Stamens 15-30, or numerous, free or united at base and with the petals, hypogynous or perigynous; anthers small, globose. Ovary 2-3- or 7-14-celled, free or attached to calyx; styles 2-3, distinct, linear, or wanting; stigmas peltate; ovules 2 (or more) in each cell, anatropous, ascending. Fruit berry-like, with fibrous endocarp, at length opening irregularly by valves, usually 1-celled with 1-4 seeds, or 11-14-celled with 1-4 seeds in each cell. Seeds ovoid or globose, tomentose. Embryo straight; endosperm wanting or present; cotyledons thick, distinct; radicle very short.

Species about 30, natives of West Indies and tropical continental America.

QUIINA Aubl.

Stamens 15-30, hypogynous. Ovary 2-3-celled, free; styles 2-3, stigmas obliquely peltate; ovules 2 in each cell. Fruit usually 1-celled, with 1-4 seeds. Endosperm wanting.

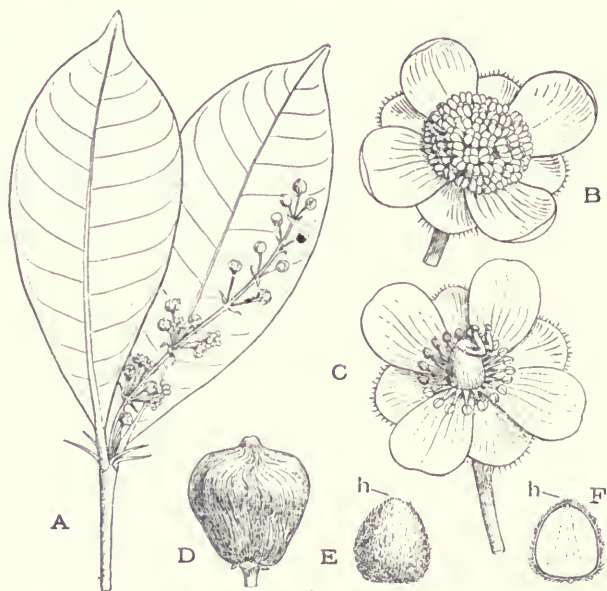


Fig. 89.—*Quiina jamaicensis* Griseb.

A, Portion of flowering shoot with leaves and flowers $\times \frac{1}{3}$.

B, Male flower $\times 8$.

C, Hermaphrodite flower $\times 8$.

D, Fruit, nat. size.

E, Seed, nat. size; h, point of attachment.

F, Ditto cut lengthwise, nat. size.

Species 27, natives of West Indies and tropical continental America.

Q. jamaicensis Griseb. *Fl. Br. W. Ind.* 105 (1859); *Planch. & Tr. in Ann. Sc. Nat. sér. 4, xv.* 310; *Oliv. in Hook. Ic. Pl. under Pl.* 1998. (Fig. 80.)

Velvet Seeds, Mountain Bay.

Wright! Moneague, *Prior!* March! Liberty Hall, St. Ann, *Miss Stennett!* near Troy, 2000-2500 ft.; *Soho*, St. Ann, 1400 ft.; *Harris!* *Fl. Jam.* 8721.

Shrub 6 ft. high, or *tree* 15-25(-40) ft. high. *Leaves* 6-15 cm. l., oblong-elliptical to elliptical, shortly acuminate, base narrowing gradually and running down into the petiole; nerves curving strongly upward near the margin; veins very slender, sometimes scarcely evident; young foliage often rosy-coloured; petioles thick, about 5 mm. l. *Sepals* 1.5-2 mm. l., ciliate. *Petals* obcordate, 2.5-3 mm. l. *Fruit* 1.5-1.7 cm. l., obovoid, apex apiculate. *Seeds* 1 or 2, about 1 cm. l., covered with reddish-brown velvety hairs.

FAMILY LXXIV. BIXACEÆ.

Shrub or small tree, abounding in a yellow or red sap. Leaves alternate, simple, ample, entire; palmately nerved. Stipules 2, falling very soon. Flowers hermaphrodite, large, in a terminal panicle. Pedicels with 5 glands below the calyx. Sepals 5, overlapping, very soon falling. Petals 5, overlapping, soon falling. Stamens indefinite, inserted on a thick receptacle; anthers oblong, horseshoe-shaped with the arms united at the back, opening at the apex by 2 short chinks which at length become a single pore. Ovary free, 1-celled, with 2 placentas on the cell-walls; ovules indefinite; style simple, long, terminal; stigma very shortly 2-lobed. Capsule densely covered with spines, 2-valved; valves thick, with the placentas in the middle line. Seeds numerous, obovoid; coat somewhat fleshy, with red or yellow sap used as a dye. Embryo in the axis, straight; cotyledons broad; radicle conical-cylindrical.

Genus one (*Bixa*), species one, native of the West Indies and tropical and subtropical America, introduced into tropics of Old World.

BIXA L.

B. Orellana L. *Sp. Pl.* 512 (1753); *A. Robinson Ic. ined.*; *Wright Mem.* 192; *Gaertn. Fruct. i.* 292, t. 61; *Jacq. Hort. Schoenbr. iv.* t. 483; *Tussac Fl. Ant. ii.* 85, t. 20; *Macf. Jam. i.* 41; *Griseb. Fl. Br. W. Ind.* 20; *Eichl. in Fl. Bras. xiii. pt. 1,* 433, t. 87; *Warb. in Pflanzenfam. iii.* 6, 310, fig. 142; *Urb. Symb. Ant. iv.* 415 & *viii.* 441; *Britt. Fl. Berm.* 248. *Bixa foliis* &c. *Browne Hist. Jam.* 254. *Orleana*, *Orellana*, s. *Urucu*

&c. *Pluk. Phyt. t.* 209, *f.* 4. *Urucu Sloane Cat.* 150 & *Hist. ii.* 52, *t.* 181, *f.* 1. (Fig. 81.) Specimen in Herb. Plukenet in Herb. Sloane xcvii. 41.

Annatto.

Sloane Herb. vi. 38, 39! *Houstoun!* *Broughton!* *Macfadyen!* St. Mary, *McNab!* *Moneague, Prior!* Hope Gardens, *Harris!* W. Indies, trop. cont. America, introduced in tropics of Africa and Asia.

Shrub or small *tree*, 10-20 ft. high. *Leaves* 1-2 dm. l., ovate, base subcordate, apex acuminate. *Flowers*, when open, 3-4 (5) cm. in diam. *Sepals* 1.2-1.4 cm. l., covered with reddish-brown scaly hairs. *Petals* about 2.5 cm. l., rose-coloured, rarely white. *Stamens* somewhat shorter

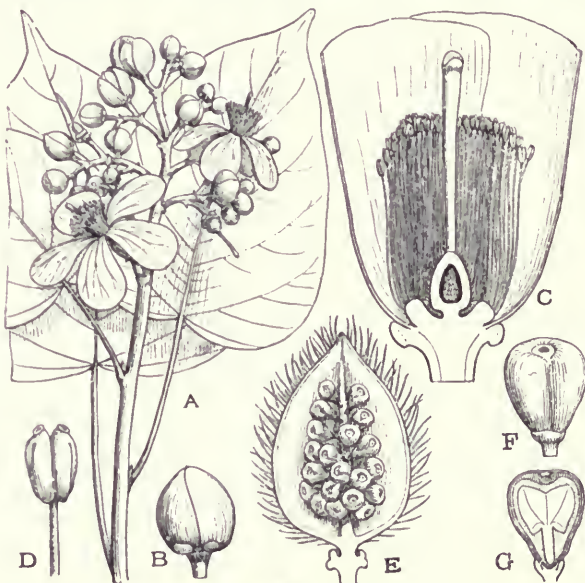


Fig. 81.—*Bixa Orellana* L.

A, Portion of branch with flowers and leaves $\times 1$.
B, Flower bud, nat. size.
C, Flower cut lengthwise $\times 2$.

D, Anther $\times 8$.
E, A valve of the capsule with seeds $\times 5$.
F, Seed $\times 2$.
G, Ditto cut lengthwise $\times 2$.

than the petals; filaments yellow at the base, purplish upwards. *Ovary* spiny; style as long as or longer than the stamens. *Capsule* 3-4 (5.5) cm. l., ovoid, dark red. *Seeds* about .5 cm. l., angular, covered with a reddish-orange waxy pulp.

The dye, annatto, prepared from the seed-coats is used for colouring butter, cheese, soups, chocolate, &c. The seeds are exported from Jamaica, and the colouring matter removed in England. In Cayenne and Guadeloupe the annatto is made up into cakes for export. Mr. J. J. Bowrey, Island Chemist in Jamaica, invented a method of obtaining a superior kind of annatto (*Bull. of Bot. Dept. Jam.* no. 7, 1888). The bark yields a fibre. The friction of two pieces of the soft wood is said to produce fire readily.

FAMILY LXXV. CANELLACEÆ.

Trees, glabrous, with aromatic bark. Leaves alternate, entire, pinnate-nerved, with pellucid dots, without stipules. Flowers regular, hermaphrodite, in cymes, axillary or terminal. Sepals 3, roundish, widely overlapping, persistent. Petals 4 or 5, usually free, thick, soon falling, overlapping, inner narrower. Petaloid scales as many and nearly as long as the petals and alternating with them, thin, sometimes wanting. Stamens hypogynous; filaments united into a tube. Anthers of numerous linear cells attached outside the tube close together in a ring, opening longitudinally. Ovary free, 1-celled, with 2-6 placentas on the ovary-walls, with 2 or more ovules. Style short, thick, with 2-6 stigmas. Ovules ascending or horizontal. Fruit a berry. Seeds 2 or more; coat shining, hard and brittle. Embryo short within oily and fleshy endosperm; radicle short, near the hilum; cotyledons oblong.

Species 6, 4 growing in the West Indies and tropical continental America, 1 in East Africa, 1 in Madagascar.

Inflorescence terminal	1. <i>Canella</i> .
Inflorescence lateral	2. <i>Cinnamodendron</i> .

1. CANELLA Sw.

Cymes disposed in a terminal subcorymbose panicle shorter than the leaves. Sepals 3. Petals 5. Placentas of the ovary 2; ovules on each placenta 2 or 3, kidney-shaped, ascending; style with stigma faintly 2-lobed. Berry subglobose. Seeds 3 or 4, filling the cavity of the fruit.

Species 2, one occurring in West Indies as far south as Barbados, and Florida, the other in Colombia.

C. Winterana Gaertn. *Fruct. i.* 373, *t.* 77 (1788); *Small Fl. S.E. U.S.* 782; *Britt. & Millsp. Bah. Fl.* 282. *C. alba* Murr. *Syst. Veg. ed.* 14, 443 (1784); *Wright Mem.* 194; *Sw. Trans. Linn. Soc. i.* 96, *t.* 8 & *Obs. Bot.* 190; *Descourt. Fl. Ant. viii.* 229, *t.* 568; *Macf. Jam. i.* 137; *Miers in Ann. & Mag. N. Hist. ser. 3, i.* 347 & *Contrib. i.* 116, *t.* 23, A; *Griseb. Fl. Br. W. Ind.* 109; *Baill. Hist. Pl. i.* 165, *f.* 211-215; *Benth. & Trim. Med. Pl. i.* *t.* 26; *Sarg. Silva i.* 37, *t.* 20; *Urb. Symb. Ant. viii.* 441. *C. foliis &c.* *Browne Hist. Jam.* 275, *t.* 27, *f.* 2, 3; *A. Robinson Ic. ined.* *Laurus Winterana* L. *Sp. Pl.* 371 (1753). *Winterana Canella* L. *Syst. ed.* 10, 1045 (1759); *Urb. Symb. Ant. iv.* 415. *Cassia Cinamomea* s. *Cinamomum sylvestre* *Barbadensium &c.* *Pluk. Phyt. t.* 160, *f.* 7. *Arbor baccifera, laurifolia, aromatica &c.* *Sloane Cat.* 165 & *Hist. ii.* 87, *t.* 191, *f.* 2; *Catesby Carol. ii. t.* 50. (Fig. 82.) Specimen in Herb. Linn. named by Linnæus.

Wild Cinnamon, Whitewood Bark, White Cinnamon.

In fl. April-July, in fr. Aug.-Feb.; *Sloane* Herb. vi. 100! *Wright*! Long Mt.; Salt Pond Hill; *Broughton*! Port Royal Mts., *Macfadyen*! *Distin*! *Wilson*! *March*! Rock Fort, *Grabham*! near Alligator Pond, 300 ft.; New Forest, 50 ft.; road to Wareka, Long Mt., 800 ft.; Great Goat Is., 150 ft.; sea-coast, Bull Bay; Lititz savanna, 300-900 ft.; *Harris*! Fl. Jam. 7176, 8011, 8176, 8937, 9021, 9223, 9324, 9593, 11,757.—Florida Keys, Bahamas, Cuba, Cayman, Porto Rico, St. Thomas, S. Cruz, St. Jan, St. Martin, Guadeloupe, Désirade, Martinique, Barbados.

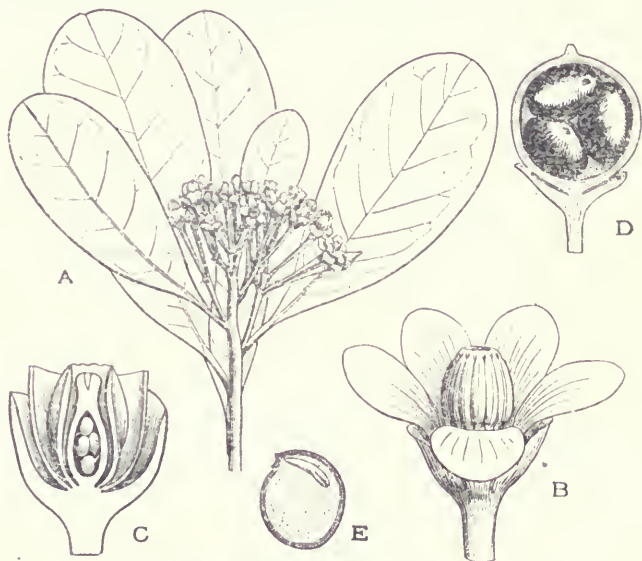


Fig. 82.—*Canella Winterana* Gaertn.

A, Portion of branch with leaves
and flowers $\times \frac{1}{2}$.
B, Flower $\times 4$.

C, Ditto cut lengthwise $\times 4$.
D, Fruit cut vertically $\times 2$.
E, Seed cut lengthwise $\times 2$.

Tree, 10-50 ft. high; bark white, aromatic. Leaves 5-7 cm. l., obovate-elliptical, with rounded apex, narrowing gradually to the base and running down into the short petiole, nerves and veins prominulous on both sides. Sepals 2-3 mm. l. Petals 4-5 mm. l., fragrant, red. Petaloid scales wanting. Berry 9-12 mm. l., purplish-black; when ripe, sweet and aromatic, when gathered green and dried, hot like black pepper. Seeds 5-6 mm. l., black.

Canella Bark is an aromatic stimulant and slight tonic, rarely used now in medicine. The berries are eaten by pigeons, and impart to the flesh a peculiar and pleasing flavour.

2. CINNAMODENDRON Endl.

Cymes few-flowered, axillary. Sepals 3. Petals 5. Petaloid scales 5, thin, subequal. Placentas of the ovary 4-5, with

indefinite ovules; stigmas 4-5, discoid, sessile round the apex. Seeds enclosed by the enlarged pulpy placentas.

Species 2, one Jamaican, the other Brazilian.

C. corticosum Miers in *Ann. & Mag. Nat. Hist. ser. 3, i. 351* (1858) & *Contrib. i. 121, t. 24, B*; *Griseb. Fl. Br. W. Ind. 109*;

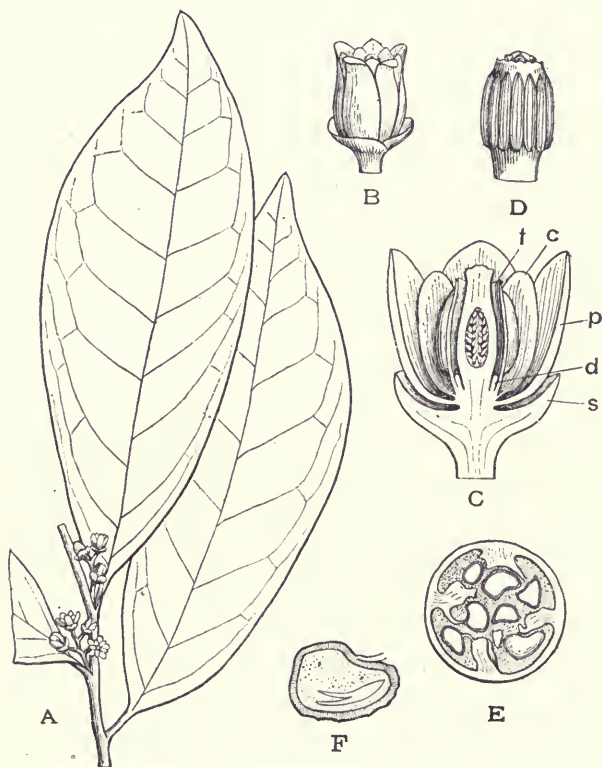


Fig. 83.—*Cinnamodendron corticosum* Miers.

- A, Portion of branch with leaves and flowers $\times \frac{3}{4}$.
 B, Flower $\times 4$.
 C, Flower cut lengthwise; s, sepal; p, petal; c, scale; t, staminal tube; d, disk; $\times 6$.
 D, Staminal tube surrounding the pistil $\times 8$.
 E, Fruit cut across $\times 2$.
 F, Seed cut lengthwise, enlarged.

Eichl. in Fl. Bras. xiii. pt. 1, 524, t. 105, f. 2; *Benth. & Trim. Med. Pl. t. 27.* (Fig. 83.)

Mountain Cinnamon, Red Canella.

Sloane Herb. vi. 102! *Wilson! March!* Whitfield Hall, Blue Mts., 3000 ft.; *Harris! Fl. Jam. 5552, 5963, 6458, 7691*; *Priestmans River, Deans!*

Tree, 10–30 ft. high; bark brownish-grey. *Leaves* 5–12 cm. l., somewhat obovate-elliptical, sides unequal, apex shortly acuminate, blunt at the base often unequal; nerves and veins prominulous on both sides. *Sepals* scarcely 2 mm. l. *Petals* about 5 mm. l., scarlet. *Scales* shorter than the petals. *Stamens* about as long as scales. *Fruit* about 1 cm. in diam.

Cinnamodendron bark, like *Canella* bark, is stimulant, tonic, and aromatic. Both barks have been used in dyspepsia and chronic forms of gout and rheumatism, and also in the West Indies as a condiment.

[FAMILY VIOLACEÆ.

Herbs or shrubs, sometimes trees. Leaves usually alternate, simple, entire (or sometimes cut). Stipules leafy or small. Flowers usually hermaphrodite, irregular or regular. Inflorescence in *Viola* 1–2 axillary flowers. Sepals 5, generally persistent, overlapping. Petals 5, hypogynous or slightly perigynous, in *Viola* unequal, the lower petal larger or unlike and often spurred, twisted or overlapping. Stamens 5, hypogynous or slightly perigynous. Anthers erect, in a ring round the ovary sometimes united, sessile or subsessile, connective often flattened or produced beyond the cells into a membranous appendage, cells opening usually by a longitudinal chink. Ovary free, sessile, 1-celled, placentas 3 (4–5) on ovary-walls. Style simple. Ovules indefinite (1, 2) on each placenta, anatropous. Fruit capsular, opening with as many valves as placentas (or berry-like, not opening). Seeds attached by very short stalks; seed-coat hard and brittle (leathery or membranous); endosperm fleshy, generally copious. Embryo in the axis, generally straight; cotyledons flat; radicle next the hilum.

Species over 300, found all over the world.

VIOLA L.

Herbs, rarely somewhat woody. Leaves alternate. Stipules persistent, often leafy. Sepals subequal, produced at the base beyond the insertion. Petals spreading. Anthers subsessile; connective flattened, produced at the apex into a membrane, two of the lower stamens generally spurred at the back. Style capitate, club-shaped or variously dilated above, almost straight with terminal stigma, or more or less recurved with anterior stigma. Capsule elastically 3-valved. Seeds ovoid-globose, usually with a swelling at the hilum; coat hard and brittle.

Species over 200, of which nearly two-thirds are in the temperate regions of the northern hemisphere, nearly one-third in S. America, chiefly in the mountainous regions, a few in Australia and New Zealand, and very few in tropical and S. Africa.

Stemless. Stipules entire 1. *V. Patrinii*.
Stem erect or ascending. Stipules pinnately lobed 2. *V. tricolor*.

1. *V. Patrinii* DC. *Prodr. i.* 293 (1824); *Hook. f. Fl. Br. Ind. i.* 183 (excl. some syn.). *V. primulifolia* L. *Sp. Pl.* 934 (in part, with reference to Siberia).

A weed in open places in the cinchona plantations, 4900-5600 ft., J.P. 1051, *Morris!* *Harris!* *Fl. Jam.* 9202, 10,928.—Native of Asia and mid-Russia.

Herb, stemless, without stolons; rootstock short, woody. *Leaves* 4-8 cm. l., very variable, ovate, triangular or oblong, crenate or serrate, base hastate, cordate, or wedge-shaped, running down into the petiole making it margined; petiole 5-13 cm. l.; stipules entire, linear or linear-lanceolate, adhering below. *Sepals* lanceolate. *Petals* violet or violet-blue (in Jamaican specimens), white in the typical form; spur usually short and broad. *Stigma* terminal, truncate, depressed, 3-lobed, margined. *Capsule* straight, 6-12 mm. l.; valves narrow.

2. *V. tricolor* L. *Sp. Pl.* 935 (1753); *Griseb. Fl. Br. W. Ind.* 26; *Eichl. in Fl. Bras. xiii. pt. 1*, 361 in obs.; *Robinson in A. Gr. Syn. Fl. N. Amer. i. pt. 1*, 204; *Britton Ill. Fl. ii.* 455.

Heartsease, Pansy.

Cinchona fields, J.P. 1178, *Morris!* above St. Helens Gap, Cinchona, 5300 ft., *Harris!* *Fl. Jam.* 11,976.—Native of Europe, N. Africa, N. and W. Asia.

Herb, 4-18 in. high, variable, branching from the root; stem erect or ascending, angular. *Leaves* 1.5-4 cm. l., long-stalked, ovate-oblong or lanceolate, lowest roundish or cordate, coarsely and remotely crenate-serrate; stipules very large, leafy, pinnately divided, with upper lobe larger. *Sepals* with large auricles. *Petals* shortly clawed, with a thick blunt spur, upper erect. *Stigma* capitate, hollow, with a pencil of hairs on each side.]

FAMILY LXXVI. FLACOURTIACEÆ.

Trees or shrubs. Leaves alternate, simple, toothed or entire. Stipules small, soon falling, or wanting. Flowers often small, regular, hermaphrodite or unisexual. Sepals distinct or united below, free from the ovary or sometimes united to it below, overlapping or valvate. Petals wanting in Jamaican genera, except in *Hemalium*. Stamens definite or indefinite. Ovary free or more or less half-inferior, 1-celled, placentas on the ovary-walls 2-6, ovules indefinite; style simple or more or less divided. Fruit, a berry, or berry-like, ultimately opening by 2-5 valves, or a capsule. Seeds usually few, sometimes with aril, or the exterior pulpy; endosperm fleshy; embryo axile; cotyledons broad, often cordate.

Species over 500, natives of the tropics.

Flowers hermaphrodite.

Petals wanting (calyx often petal-like).

Sepals overlapping.

Calyx 4-6-lobed or divided nearly to base.

Stamens alternating with staminodes.

Style present. Stamens 6-15 1. *Casearia*.

Style wanting. Stamens 20-40 2. *Zuelania*.

- Staminodes wanting. Stamens on calyx-throat... 3. *Samyda*.
 Sepals distinct, reflexed. Staminodes wanting.
 Stamens hypogynous 4. *Lactia*.
 Calyx-lobes valvate..... 5. *Lunaria*.
 Petals linear-oblong, persistent. Calyx united with
 base of ovary 6. *Homalium*.
 Flowers diœcious (or polygamous). Petals wanting..... 7. *Xylosma*.

1. CASEARIA Jacq.

Trees or shrubs. Leaves often with pellucid dots or lines; stipules soon falling. Flowers hermaphrodite, clustered or umbellate, less often solitary, inconspicuous, greenish or yellow, occasionally rosy; pedicels jointed, bracts at the base. Calyx-lobes 4–6, overlapping. Petals wanting. Stamens 6–15, inserted in a simple series on the tube or at the base of the calyx, alternating with as many staminodes; filaments free or united amongst themselves and with the staminodes in a ring. Ovary free, ovoid or oblong, narrowed into a short style; stigma capitate or with 3 stigmas; ovules indefinite, growing on 3 placentas on the ovary-walls. Capsule fleshy or dry, with 3 or 4 valves bearing indefinite seeds along the middle line. Seeds oblong or angled, with a fleshy aril; endosperm fleshy; embryo straight; cotyledons oblong or roundish, flat; radicle cylindrical.

Species about 200, growing in the tropics.

- Flowers in stalked corymbose cymes. Stamens 8 1. *C. nitida*.
 Flowers in stalked clusters. Stamens 10 2. *C. arborea*.
 Flowers in sessile clusters.
 Stigma 3-cleft. Calyx 2–2.5 mm. l. Stamens 10..... 3. *C. sylvestris*.
 Stigma capitate, undivided. Calyx 4–5 mm. l.
 Leaves glabrous or sometimes slightly pubescent,
 especially on the nerves.
 Sepals united to $\frac{1}{4}$ or $\frac{1}{3}$ of length.
 Leaves generally 9–18 cm. l. Pedicels jointed
 close to base 4. *C. guianensis*.
 Leaves generally 4–7 cm. l. Branches often
 spinescent. Pedicels jointed about middle
 or between middle and base..... 5. *C. aculeata*.
 Sepals united near base. Leaves generally 3–7
 cm. l., apex shortly and abruptly acuminate.
 Pedicels jointed between middle and base 6. *C. odorata*.
 Leaves pubescent on both sides with brownish hairs,
 beneath densely so and soft to touch..... 7. *C. hirsuta*.

1. *C. nitida* Jacq. *Enum.* 21 (1760), *Sel. Stirp. Amer.* 132, & *Ed. pict. t.* 126; leaves 3–10 cm. l., ovate or ovate-elliptical, usually shortly acuminate, base rounded to subcordate, minutely dentate or serrulate or subentire, glabrous; flowers in axillary corymb-like stalked cymes (1–2 cm. l.); stamens 8; stigma capitate.—*Macf. Jam. i.* 214; *Griseb. Fl. Br. W. Ind.* 24; *Eichl.*

in *Fl. Bras. xiii. pt. 1*, 463. *Samyda nitida* L. *Syst. ed.* 10, 1025 (1759) & *Amœn. v.* 378. *S. fruticosa* &c. *Browne Hist. Jam.* 217, t. 23, f. 3. (Fig. 84.) The original specimen from which t. 126 of Jacq. *Sel. Stirp. Amer. ed. pict.* was drawn is in *Herb. Mus. Brit.*

Wright! *Shakespeare!* Liguanea plain, *Macfadyen!* McNab! *March!* Kingston, *Prior!* Liguanea plain, J.P. 1302, *Morris!* also J.P. 1080, *Hart!* *Campbell!* *Harris!* Long Mt., south side, *Harris!* *Fl. Jam.* 6423, 6937, 9617, 12,140.—Tropical continental America.

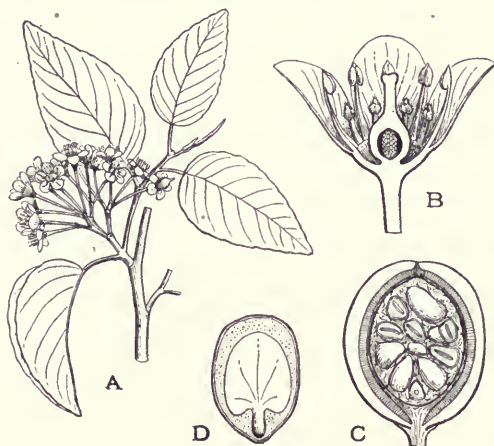


Fig. 84.—*Casearia nitida* Jacq.

A, Portion of branch with leaves and flowers $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 4$.

C, Fruit cut lengthwise $\times 1\frac{1}{2}$.

D, Seed cut lengthwise $\times 4$.

Shrub or *tree*, 6–20 ft. high, without spines, glabrous. *Leaves* when young of a reddish colour; petioles 1 cm. (8–13 mm.) l. *Flowers* yellowish-white or whitish, fragrant. *Calyx* about 4 mm. l.; tube somewhat more than 1 mm. l.; lobes elliptical or oblong. *Staminodes* spatulate, red, hairy. *Fruit* 11–14 mm. l., fleshy, ellipsoidal to spherical, 3–4-cornered, pale yellow or purple, at length 3–4-valved. *Seeds* several, angled-ovoid, almost enclosed by an orange-coloured aril; coat glabrous, with resinous glands.

2. *C. arborea* Urb. *Symb. Ant. iv.* 421 (1910) & *viii.* 447; leaves 3–10 cm. l., oblong or oblong-lanceolate, acuminate with long and narrow tip, densely serrulate-dentate, on upper surface glabrous and shining, beneath of a lighter colour, sometimes tomentose with greyish or brownish hairs, sometimes glabrate; flowers in stalked clusters; stamens 10; stigma capitate.—*C. stipularis* Vent. *Choix. t.* 46 (1803); *Griseb. Fl. Br. W. Ind.* 23; *Eichl. in Fl. Bras. xiii. pt. 1*, 478. *C. serrulata* Griseb. *loc. cit.* (as regards the Jamaican specimens, non Sw.). *C. serrata* Macf.

Jam. i. 216 (1837); *Urb. Symb. Ant. vi.* 88 in *Obs.* *Samyda arborea* *L. Rich. in Act. Soc. Hist. Nat. Par. i.* 109 (1792).

In fl. Nov.-March; *Wright!* near Rose Hill, St. Andrew, *Macfadyen!* Moneague, *Prior!* Claverty Cottage, Blue Mts., J.P. 1465, *Morris!* Bull Head, *Fawcett!* Vinegar Hill, *Harris!* Port Antonio, *Hitchcock;* S.E. slopes, John Crow (Blake) Mts., *Harris & Britton!* Fl. Jam. 5475, 10,691, 10,734.—Cuba, Hispaniola, Porto Rico, Guiana, Brazil.

Shrub or tree, 8-20 ft. high; young branches densely puberulous or glabrate. *Leaves:* pellucid dots and lines sometimes numerous, but few or not conspicuous in leaves tomentose beneath; petioles 2-4 mm. l.; stipules about 1 cm. l. (or less), lanceolate-linear, densely puberulous, falling very soon. *Peduncles* 1-2 mm. l.; *pedicels* about as long as the calyx. *Calyx* 3.5-4.5 mm. l.; tube scarcely half as long. *Anthers* twin-subglobose, with a minute hairy gland on the back at apex. *Staminodes* oblong-lanceolate-spathulate, hairy, about half as long as the stamens. *Ovary* glabrous but hairy at apex; style hairy near base. *Fruit* about 4 mm. l., ellipsoidal. *Seeds* about 2 mm. l., ellipsoidal, minutely reticulately pitted.

3. *C. sylvestris* *Sw. Fl. Ind. Occ.* 752 (1798); leaves 6-9 (3-14) cm. l., oblong, elliptical, or ovate, acuminate with a long narrow tip, base usually somewhat unequal, subentire, glabrous; flowers in axillary sessile clusters; calyx 2-2.5 mm. l.; stamens 10; stigma 3-cleft.—*Griseb. Fl. Br. W. Ind.* 23; *Eichl. in Fl. Bras. xiii. pt.* 1, 481; *Urb. Symb. Ant. iv.* 422 & *viii.* 448. *C. parviflora* *Macf. Jam. i.* 216 (non *Willd.*). *Arbor baccifera foliis &c.* *Sloane Cat.* 173 & *Hist. ii.* 108, t. 211, f. 2. *Samyda foliis ovatis cum acumine &c.* *Browne Hist. Jam.* 217. *S. parviflora* *L. Syst. ed.* 10, 1025 (1759) & *Amæn. v.* 378 (non *Loefl.*). Specimens from Swartz in Herb. Mus. Brit. and in Mus. Botan. Stockholm.

Banks of Rio Cobre, *Sloane Herb. vii.* 99! *Wright!* *Dancer!* *Swartz!* *Distin!* *Wilson!* Moneague, *Prior!* *March!* J.P. 711, *Jenman!* Kings House, J.P. 907, *Hart!* Claverty Cottage, Blue Mts., J.P. 1464, 1466, *Morris!* Port Morant, *Hitchcock;* Cascade; Whitfield Hall; Troy, 2000 ft.; *Harris!* Liguanea plain, 600 ft., *Campbell!* between Bath and Cuna Cuna Pass, *Harris & Britton!* Ythanside, Portland, *Moore!* Robertsfield, Blue Mts., *Perkins!* Fl. Jam. 5236, 5390, 6239, 9408, 10,555, 10,646.—West Indies, tropical continental America.

Shrub or tree, 12-30 ft. high. *Leaves* with numerous pellucid dots and lines; petioles 4-5 mm. l.; stipules cordate-ovate or roundish, 1-1.5 mm. l. *Flowers* white. *Pedicels* 3-5 mm. l. *Calyx* sparingly puberulous; tube about one-fourth of length. *Stamens* free; anthers subglobose with a glabrous gland at apex. *Staminodes* spatulate-oblong, hairy, about half as long as stamens. *Pistil* glabrous; style short. *Fruit* subglobose, red or orange, 4.5-5 mm. l., 3-cornered, 3-valved; valves at length spreading, united at base. *Seeds* 2 mm. l., flattened-ellipsoidal, swollen at hilum.

4. *C. guianensis* *Urb. Symb. Ant. iii.* 322 (1902); leaves 6-18 cm. l., oblong-elliptical, obovate-elliptical, or elliptical, obtuse and shortly acuminate, more or less serrulate-dentate, nerves 5-6, pubescent in young leaves on both sides; stipules 2-5 mm. l., linear-awl-shaped, soon falling; pedicels jointed close

to base; flowers in axillary sessile clusters, usually at nodes which have dropped their leaves below the leafy apex of the twigs; stamens 8; stigma capitate.—*Urb. Symb. Ant. iv.* 420 & *viii.* 447. *C. ramiflora* Vahl *Symb. ii.* 50 (1791); *Griseb. Fl. Br. W. Ind.* 24 (excl. var. β); *Eichl. in Fl. Bras. xiii. pt. 1,* 464. *Troucana guianensis* Aubl. *Guian. i.* 329, *t.* 127 (1775). A specimen from Aublet in Herb. Mus. Brit.

Macfadyen! St. Mary, *McNab!* March! Friendship, St. Ann, *Britton* 2559! *Lucea, Hitchcock!* Mocha road, Catadupa, 2000 ft.; Gully road, St. Ann's Bay; Peckham, Clarendon, 2000 ft.; near Bath; *Harris!* Fl. Jam. 9179, 10,367, 10,369, 11,039, 11,956.—West Indies, Central and S. America.

Shrub 10–12 ft. high, or shrubby tree 20–30 ft. high, without spines; young twigs with brown hairs. *Leaves* with numerous pellucid dots and lines; petioles 3–6 mm. l. *Flowers* white, greenish-white, or greenish-yellow, very fragrant; pedicels 5–7 mm. l., usually, together with the calyx, with brown hairs. *Calyx* 4 to nearly 5 mm. l.; tube less than or about 1 mm. l. *Stamens* glabrous. *Staminodes* villose, oblong, broader near apex. *Ovary* villose. *Fruit* white, often with one side brownish-violet or reddish-brown, 6–12 mm. l., ellipsoidal or subglobose, obtusely 6-cornered. *Seeds* 3–10, subovoid, 3–3.5 mm. l., buff-coloured, minutely pitted, swollen at hilum, with orange-coloured aril.

5. *C. aculeata* Jacq. *Enum.* 21 (1760) & *Scl. Stirp. Amer.* 133; leaves 4–7 (3–12) cm. l., elliptical, ovate-elliptical, obovate-elliptical, or lanceolate-ovate, acute, obtuse, obtusely acuminate, remotely serrate-dentate or subentire, nerves 4–5, more or less with brown hairs on nerves of younger leaves; stipules 1 mm. l., lanceolate, very soon falling; pedicels jointed about the middle or between middle and base; flowers in axillary sessile clusters at the nodes (leafy or leafless) of younger branches, in other respects as in *C. guianensis*.—*Urb. Symb. Ant. iv.* 419 & *viii.* 446. *C. spinosa* Willd. *Sp. Pl. ii.* 626 (1799); *Eichl. in Fl. Bras. xiii. pt. 1,* 463. *C. hirta* Sw. *Fl. Ind. Occ.* 756 (1798); *Griseb. Fl. Br. W. Ind.* 23; *Macf. Jam. i.* 215. *Samyda spinosa foliis* &c. *Plum. Pl. Amer. (Burm.)* 138, *t.* 147, *f.* 1. *S. spinosa* L. *Sp. Pl. ed. 2,* 557 (1762). *S. tomentosa* Sw. *Prodr.* 68 (1788). *S. multiflora* Cav. *Icon. i.* 48, *t.* 67 (1791). *C. ramiflora* Vahl var. *spinosa* *Griseb. Fl. Br. W. Ind.* 24 (1859). Type from Jamaica of *C. hirta* Sw. in Mus. Botan. Stockholm, and specimens from Swartz from Hispaniola in Herb. Mus. Brit.

Woody pastures, *Swartz!* *Macfadyen!*—Cuba, Isle of Pines, Hispaniola, Porto Rico, tropical continental America.

Shrub, 6–8 ft. high; branches frequently spiny; young twigs glabrous or more or less with brown hairs, at length glabrate. *Leaves* with numerous pellucid dots and lines. *Fruit* ovoid-subglobose, obtusely 3-cornered. *Seeds* as in *C. guianensis*.

6. *C. odorata* Macf. *Jam. i.* 215 (1837); leaves 2.5–9 cm. l., elliptical, obovate, or subrhomboidal, apex scarcely or abruptly and shortly acuminate, tip obtuse or subemarginate, base acute,

running into the petiole, margin more or less evidently crenulate-serrulate, on upper surface shining, beneath on nerves puberulous or glabrescent; stipules 1-2 mm. l., lanceolate or linear-lanceolate, acute or shortly awl-shaped; flowers in axillary sessile clusters; stamens 8; stigma capitate.—*Urb. Symb. Ant. iii.* 321. *C. ramiflora* v. *spinosa* Griseb. *Fl. Br. W. Ind.* 24 (as regards the specimen from Jamaica).

Cockspur.

In fl. June-Oct.; Wright! Swartz! savannas, St. Thomas in the Vale; Port Royal Mts.; Macfadyen! Distin! Pedro district, Purdie! Moneague, Prior! Claverty Cottage, Blue Mts., J.P. 1463, Hart! Yallahs valley, 1500 ft.; Mavis Bank; Cascade Rock; Troy, 1600 ft.; Stanmore Hill, 2200 ft.; Malvern, 2200 ft.; New Market, 1150 ft.; Harris! Fl. Jam. 5744, 6595, 8155, 9467, 9773, 9808, 9868, 9878.

Shrub, without spines, 6-12 ft. high, sometimes straggling vine-like, growing to a length of 30 ft., occasionally a tree 15-20 ft. high. *Leaves* with numerous pellucid dots but few lines; petioles 4-6 mm. l. *Flowers* greenish-white, very fragrant, 4-10(-15) in a cluster. *Pedicels* 4-5 mm. l. *Sepals* 4-5 mm. l., elliptical-oblong, united at base. *Fruit* globose, nearly 1 cm. l., angled, 3-valved.

7. *C. hirsuta* Sw. *Fl. Ind. Occ.* 755 (1798); leaves 6-12 cm. l.; elliptical, apex rounded or acute or with a short pointed tip, base sometimes unequal, pubescent on both sides with brownish hairs, beneath soft to the touch, obscurely crenate- or dentate-serrate; pedicels jointed between middle and base; flowers in sessile clusters; stamens 8 or 10; stigma capitate.—*Macf. Jam. i.* 217; *Griseb. op. cit.* 23; *Eichl. tom. cit.* 470 (*in Obs.*); *Urb. Symb. Ant. viii.* 447. *C. mollis* H. B. & K. *Nov. Gen. & Sp. v.* 365, t. 480 (1823) (*Lindleya mollis in tab.*). *C. hirta* Griseb. *loc. cit.* (non Sw.). *Frutex* baccifer folio &c. *Sloane Cat.* 173 & *Hist. ii.* 109. *Samyda foliis ovatis villosis* &c. *Browne Hist. Jam.* 218? *S. Guindonia* L. *Amœn. v.* 379? (1760). Type in Mus. Botan. Stockholm. Specimen from Browne in Herb. Linn., named "*Samyda? nitida* or *lateriflora*" with a reference to page 218 of Browne's *Hist. Jam.*

Cloven Berries.

Browne! Broughton! Shakespear! Masson! Swartz! Baneroft! Macfadyen! St. Elizabeth, Purdie! Moneague, Prior! March! Liguanea plain, J.P. 625, 1292, Morris! Berwick Hill; Hope Mines, 750 ft.; Round Hill, Santa Cruz Mts., 1850 ft.; Harris! Fl. Jam. 8365, 9698.—Cuba, ls. of Pines, Hispaniola, Panama, Venezuela, Guiana.

Shrub, 8-25 ft. high, without spines. *Leaves*: nerves and veins slightly prominent on both sides, with numerous pellucid dots but very few lines; petioles 4-5 mm. l.; stipules 3 mm. l., linear-lanceolate. *Flowers* white or greenish-white, fragrant. *Calyx* 4-5 mm. l., minutely tomentose; tube less than half as long. *Fruit* ovoid, 3-cornered, 3-valved, 1-1.5 cm. l.

2. ZUELANIA A. Rich.

Trees or shrubs. Leaves with pellucid dots, stipulate. Flowers hermaphrodite, in dense clusters; pedicels jointed, with

bracts at the base. Calyx-lobes 4-5, overlapping. Petals wanting. Stamens 20-40, alternating with as many staminodes. Ovary free; stigma sessile or subsessile, peltate; ovules numerous on 3 placentas on the ovary-walls. Capsule large, fleshy, globose, berry-like, at length opening by valves. Seeds numerous, with an aril; endosperm fleshy.

Species 1 or 2, natives of Cuba, Jamaica, and the Bahamas.

Z. Guidonia Britt. & Millsp. *Bah. Fl.* 285 (1920). *Z. laetioides* A. Rich. in *Sagra Cub. x.* 33, *xii. t.* 12 (1845). *Laetia Guidonia*



Fig. 85.—*Zuelania Guidonia* Britt. & Millsp.

A, Portion of branch with flowers and young leaves $\times \frac{1}{3}$.

B, Flower $\times 3$.

C, Flower just opening $\times 3$.

D, Fruit $\times \frac{1}{2}$.

Sw. Prodr. 83 (1788); *Macf. Jam. i.* 43. *L. longifolia* A. Rich. *tom. cit.* 31, *t.* 10 (1845). *Samyda icosandra* *Sw. Fl. Ind. Occ.* 1962 (1806). *S. major* &c. A. Robinson *l.c. ined.* *Thiodia laetioides* Griseb. *Fl. Br. W. Ind.* 22 (1859). (Fig. 85.)

Cuffey Wood, Silver Wood, Glass Wood.

Wright! *Swartz!* Moneague, *Prior!* *March!* Greenvale, Westmoreland, 500 ft.; Potsdam, 2600 ft.; Peckham, Clarendon, 2500 ft.; *Harris!* *Fl. Jam.* 7088, 9819, 11,020.—Cuba, Bahamas.

Tree, 20-60 ft. high. *Leaves* 6-11 (5-20) cm. l., elliptical, oblong, or oblong-lanceolate, apiculate, base more or less unequal, obtuse, rounded, or rarely subcordate, serrulate or subentire, puberulous on both sides, glabrescent above; petioles 1 cm. l. or less. *Flowers* terminal on twigs before the leaves appear, after which the shoot is prolonged, so that the fruit becomes lateral; pedicels puberulous, 6-10 mm. l. *Calyx* 6-7 mm. l., white. *Staminodes* about half as long as stamens. *Ovary* tomentose. *Fruit* subglobose, 3-5 cm. in diam., many-seeded.

The timber is used for building.

3. SAMYDA L.

Shrubs. *Leaves* distichous, oblong, with pellucid lines and dots. *Flowers* hermaphrodite, solitary or clustered, axillary. *Calyx-tube* bell-shaped, coloured. *Sepals* 4-6, overlapping, unequal. *Petals* wanting. *Stamens* 8-13, growing from the throat of the calyx; filaments more or less completely united into a tube. *Ovary* free, ovoid, narrowing into the style; stigma capitate; ovules very many, on 3-5 placentas on the ovary-walls. *Fruit* subglobose, leathery-fleshy, with 3-5 valves at apex, and indefinite seeds. *Seeds* angular, with a ventral hilum, fleshy aril, coat hard and brittle, endosperm fleshy; embryo small, with leafy cotyledons.

Species 4 or 5, natives of the West Indies and Mexico.

Leaves obovate-oblong, or obovate-elliptical, or elliptical, densely puberulous beneath 2. *S. pubescens*.
Leaves oblong-elliptical to ovate-lanceolate.

Leaves: apex blunt, base generally acute and shortly prolonged into the petiole, more or less glabrous beneath 1. *S. glabrata*.

Leaves: apex acuminate, base rounded unequal, villosa on nerves beneath 3. *S. villosa*.

1. *S. glabrata* Sw. *Prodr.* 68 (1788) & *Fl. Ind. Occ.* 760; leaves 2-8(-18) cm. l., oblong, oblong-elliptical, or ovate-lanceolate, apex blunt or broadly acuminate, base generally acute and shortly prolonged into the petiole, glabrous or beneath sparingly and minutely hairy on the nerves, margin entire; flowers solitary (rarely 2); calyx not keeled.—*Macf. Jam. i.* 213; *Griseb. Fl. Br. W. Ind.* 24 (measurement of flower incorrect) (in part, excl. syn. *Vent.* and hab. Porto Rico and St. Thomas); *Warb. in Engl. & Prantl Pflanzenfam.* iii. 6, a. 47, f. 18, D-F. *S. acuminata* Urb. *Symb. Ant. v.* 441 (1908). Specimen in Herb. Stockholm collected by Swartz in Jamaica and named in his own hand; a specimen apparently collected from the same shrub by Swartz in Herb. Mus. Brit.

In fl. (fide Sw.) Oct., Nov.; high mountains, Swartz! *Distin!* Dunrobin Castle, *Purdie!* Wilson! Moncague, *Prior!* in fl. June, near Old England, Blue Mts., *Harris!* *Fl. Jam.* 5176.

Shrub or small *tree*, branchlets glabrous. *Petioles* 3-6 mm. l. *Stipules*

linear-awl-shaped or awl-shaped from a broad base, about 1 mm. l. *Flowers* greenish outside, white inside. *Pedicels* 1-3 mm. l. *Calyx* 9-10 mm. l.; tube about 5 mm. l. *Stamens* 10; tube white. *Ovary* oblong-ovate, pubescent. *Style* as long as or longer than the stamens. *Fruit* 3-cornered, 3-valved, 3-4 cm. l.; valves thick, leathery. *Seeds* numerous; aril orange-coloured.

2. *S. pubescens* L. *Sp. Pl. ed. 2*, 557 (1762) (excl. syn.); leaves 3-7 cm. l., usually obovate-oblong or obovate-elliptical, apex usually rounded, sometimes obtuse or acute, base obtuse to rounded, sometimes unequal, on both sides soft to the touch, on upper surface puberulous and densely so beneath, margin minutely toothed; flowers 2-4; calyx 5-keeled, lobes 3-keeled.—*Sw. Obs.*

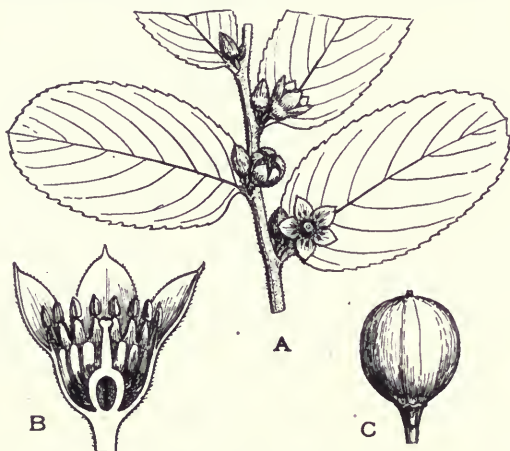


Fig. 86.—*Samyda pubescens* L.

A, Portion of branch with leaves and flowers $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 2$.
C, Fruit, nat. size.

179; *Spreng. Syst. ii.* 354. *S. serrulata* Andr. *Bot. Rep. iii. t.* 202 (1802); *Griseb. Fl. Br. W. Ind.* (in part) (non L.). *S. rosea* Sims *Bot. Mag. t.* 550 (1802); *Urb. Symb. Ant. viii.* 445. (Fig. 86.)

St. Mary, McNab! March! near Gordon Town, Rev. J. Roberts! Miss Long! Bermuda Mount, 950 ft., Harris! *Fl. Jam.* 5726.—Hispaniola.

Shrub, 5 ft. high, branchlets villose. *Leaves*: petioles 2-3 mm. l.; stipules awl-shaped, 1-2 mm. l. *Flowers* red or white. *Pedicels* about 4 mm. l. *Calyx* 9-16 mm. l.; tube less than half its length; lobes unequal, semi-elliptical. *Stamens* 10-12; tube 2 mm. l. *Fruit* ellipsoidal, 12-15 mm. l.

3. *S. villosa* Sw. *Prodr.* 68 (1788) & *Fl. Ind. Occ.* 758; leaves 4-11 cm. l., oblong-elliptical or elliptical, acuminate, base rounded, unequal, puberulous and soft to the touch on both sides, villose with brown hairs on nerves especially beneath, margin obscurely

and obtusely serrate or subentire; flowers solitary; calyx not keeled.—*Macf. Jam. i.* 214. *Sadymia villosa Griseb. Fl. Br. W. Ind.* 25 (1859).

In fl. in spring; *Wright!* mountains, *Swartz!*

Shrub, about 6 ft. high, young branchlets villose. *Petioles* 3–4 mm. l., villose; stipules thread-like, villose, 1 mm. l. *Flowers* in axils of leaves, subsessile. *Calyx* 8 mm. l.; tube about half its length, puberulous; lobes oblong, "white, becoming green below" (Sw.). *Stamens* 10; tube, 10-striate, white. "*Fruit* ovate, shortly acuminate, fleshy, obtusely 3–4-cornered, 3–4-valved. *Seeds* several, ovate, shining; aril scarlet or pale red" (Sw.).

Grisebach separates this species as belonging to a distinct genus on the ground that the stamens are distinct, and the very short filaments inserted on the throat of the calyx-tube, but this is contrary to Swartz's description.

4. LAETIA Loebl.

Small trees. Leaves usually crenate or serrate, with pellucid dots and lines. Flowers hermaphrodite, axillary or terminal, clustered or corymbose. Sepals 4 or 5, broad, subpetaloid, widely overlapping, at length reflexed and then soon falling. Petals wanting. Stamens indefinite, rarely 15 to 10, hypogynous, sometimes slightly united at base, staminodes wanting; anthers ovoid. Ovary with 3 (4 or 6) placentas; ovules indefinite; style simple;

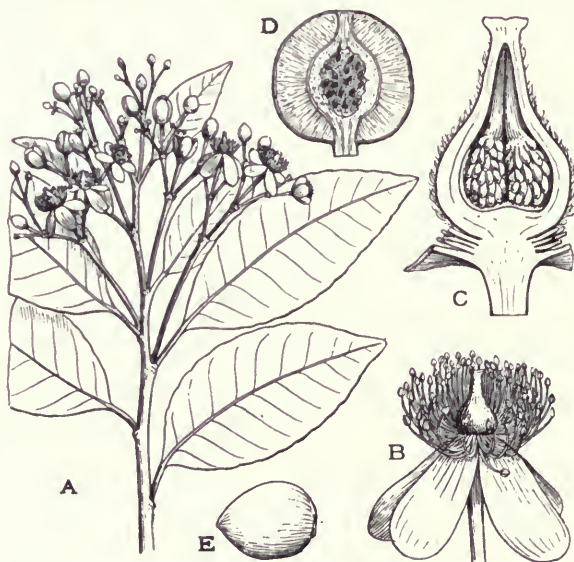


Fig. 87.—*Laetia Thamnia* L.

A, Portion of branch with inflorescence $\times 3$.

B, Flower $\times 2$.

C, Ovary cut lengthwise $\times 6$.

D, Fruit cut lengthwise, nat. size.

E, Seed $\times 6$.

stigma capitate or 3-lobed. Fruit: berry, often resinous inside, opening after a time by valves. Seeds with an aril; coat leathery; embryo straight; cotyledons broad.

Species about 20, growing in tropical America, including the West Indies.

L. Thamnia *L. Amœn. v.* 413, 379 (1760); *Sw. Prodr.* 83 & *Fl. Ind. Occ.* 950; *Macf. Jam. i.* 44; *Griseb. Fl. Br. W. Ind.* 20; *Urb. Symb. Ant. viii.* 445. *L. americana* *L.* (in part) *Syst. ed.* 10, 1074 (1759) & *Amœn. v.* 379. *Thamnia foliis* &c. *Browne Hist. Jam.* 245, t. 45, f. 2. T. Swartzii *Hitchc. in Fourth Ann. Rep. Miss. Bot. Gard.* 59 (1893). *Guidonia* &c. *Browne Hist. Jam.* 249. *Casearia contracta* *Urb. Symb. Ant. vi.* 19 (1909). (Fig. 87.)

Wattle Wood.

In fl. March-July; in fr. Aug.; *Wright! Shakespear! Macfadyen! Manchester, Purdie! Manchioneal; Mansfield, near Bath, 1200 ft.; Wilson! Moneague, Prior! J.P. 717, Jenman! Kings House, J.P. 1278, Hart! Green Valley, Blue Mts., J.P. 1278, Campbell! Lucea, Hitchcock; near Cinchona; Mona Mt.; Fawcett! Blue Mts. (below Berwick Hill; Sheldon; Green Valley); near Troy, 2000 ft.; Long Mt., road to Wareka; Harris! Fl. Jam.* 5105, 5128, 5214, 8756, 9619, 10,013; *Robertsfield, Blue Mts., Perkins!—Cuba, Hispaniola.*

Tree, 8-18 ft. high, very fragrant. *Leaves* 5-10 cm. l., elliptical or elliptical-lanceolate, entire or indistinctly crenulate, with pellucid dots, especially in the young thin leaves; petiole .5-1 cm. l.; stipules triangular, .7-1 mm. l. *Flowers* white with a tinge of rose colour or light yellow, in stalked corymbs. *Sepals* 4, petaloid, about 4 mm. l. *Fruit* globose, fleshy, 2-4 cm. in diam., 1-celled, 4-5-valved, many-seeded.

The common name is due to the use of the long branches in the construction of huts.

5. LUNANIA Hook.

Trees with slender zigzag branches. Leaves stalked, entire, 3-5-nerved, nerves connected by transverse veins, with minute pellucid dots; stipules wanting. Flowers hermaphrodite, small, in slender racemes or panicles, axillary or terminal, simple or branching; pedicels jointed at the base. Calyx subglobose, at length split valvately into 2 or 3 spreading membranous lobes. Petals wanting. Stamens 6-10, inserted round and attached to a hypogynous cup-shaped disk, alternating with its teeth or lobes (staminodes); anthers ovoid or oblong, opening on the outside. Ovary ovoid, narrowing into a 3-lobed style with truncate stigmas; ovules very many, growing on 3 broad placentas. Capsule leathery, globose, 3-valved, with few or many seeds. Seeds with a fleshy aril.

Species 8, 2 natives of Jamaica, 4 of Cuba, 1 of Bolivia and Peru, and 1 of Mexico.

Racemes solitary, long, pendulous..... 1. *L. racemosa*.

Panicles with erect branches, umbel-like at apex... 2. *L. polydactyla*.

1. *L. racemosa* Hook. *Lond. Journ. Bot.* iii. 317, *tt.* 11, 12 (1844); *Griseb. Fl. Br. W. Ind.* 20; *Urb. Symb. Ant.* vi. 19 in *Obs.* 1. (Fig. 88.)

Woods above Rio Manna, St. Mary, *Purdie!* *Wilson!* near Browns Town, St. Ann, *Prior!* eastern slopes of south end of John Crow (Blake) Mts., *Harris & Britton!* *Fl. Jam.* 10,738.

Tree, 25 ft. high. Leaves 6-12 cm. l., ovate, base often oblique, above gradually acuminate, tip acute, subleathery-membranous, the 3 strong

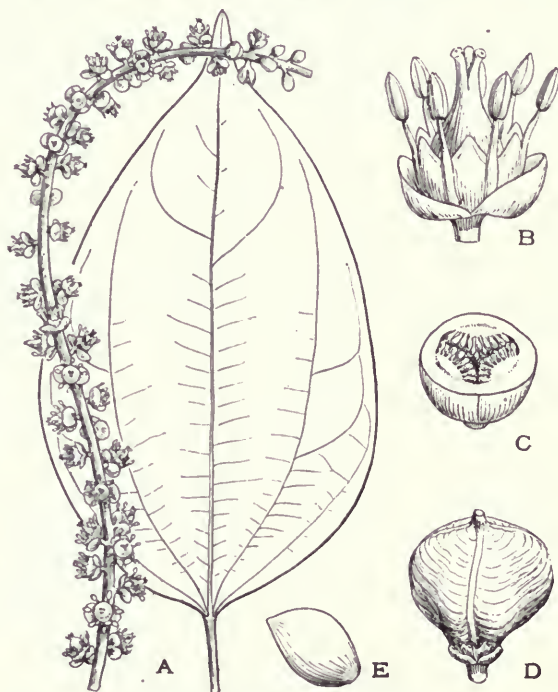


Fig. 88.—*Lunania racemosa* Hook.

A, Leaf and portion of inflorescence

$\times \frac{1}{2}$.

B, Flower $\times 4$.

C, Ovary $\times 7$.

D, Fruit $\times 2$.

E, Seed $\times 6$.

nerves separating a little above the base; petioles 1-1.5 cm. l. *Racemes* solitary at the apex of branches, above usually forked, 3 dm. l. and more, pendulous. *Pedicels* 2-1.5 mm. l. *Sepals* 2, about 3 mm. l., chestnut-brown colour. *Stamens* 6-9. *Disk* about as long as the calyx. *Fruit* depressed-obovoid, brown, crowned by the style, splitting into 3 valves. *Seeds* many, ellipsoidal.

2. *L. polydactyla* Urb. *Symb. Ant.* vi. 18 (1909); *Griseb. loc. cit.* under *L. racemosa* Hook. (so far as regards *Wilson's* specimen).

Swartz! Mansfield, Bath, 1000 ft., *Wilson!* Hibernia, Blue Mts., 3000 ft.; St. George, 2400 ft.; south-eastern foot-hills of John Crow (Blake) Mts.; Toms Cave wood, Clarendon, 2500 ft.; *Harris!* Fl. Jam. 5298, 5747, 5801, 10,686, 10,851; between Vinegar Hill and Thomson's Gap, *J. R. Perkins!*

Tree, 20-30 ft. high. *Leaves* 4-7(-10) cm. l., ovate or ovate-elliptical, base rounded, sometimes slightly cordate and suboblique, somewhat abruptly acuminate, tip obtuse, sometimes with unequal sides, papery, the 3 strong nerves springing from the insertion of the petiole; petioles about 1 cm. l. *Inflorescence* terminal and lateral; branches racemose-spike-like, erect or spreading, slender, the terminal 4-5 branches clustered umbel-like. *Pedicels* .5-1 mm. l. *Sepals* 2 or 3, about 1.5 mm. l., 2 mm. br. *Stamens* 5-7; filaments 1 mm. l. *Disk* about 1 mm. l. *Style* almost none, undivided; stigmas 3, sessile. *Fruit* spheroid-3-cornered, to 5 mm. in diam. *Seeds* many, ellipsoidal or globose-ellipsoidal.

6. HOMALIUM Jacq.

Shrubs or trees. Leaves ovate or lanceolate, glandular-crenate or serrate, less often entire. Flowers hermaphrodite, small, in axillary racemes (in Jamaican species). Calyx-tube united with the base of the ovary; lobes 6-7, persistent. Petals 6-7, inserted at the throat of the calyx, alternate with calyx-segments, persistent. Disk present in the form of glands opposite the calyx-segments. Stamens as many as the petals and opposite them, or more numerous in clusters opposite the petals, alternate with the glands; anthers small. Ovary half-superior, 1-celled; styles 2-6, thread-like; ovules many or few, attached to 2-6 placentas on the ovary-walls. Capsule half-superior, leathery, 2-6 valves at the apex, with few seeds. Seeds angular or oblong, coat hard and brittle, endosperm fleshy; cotyledons leafy.

Species about 80, natives of tropical America (incl. W. Indies), Africa, Asia, north Australia, Fiji islands.

Leaves crenate or crenate-serrate. Petals 3.5-5 mm. l. 1. *H. racemosum*.

Leaves subentire or obscurely crenate or crenate-serrate. Petals 2.5-3.8 mm. l. 2. *H. integrifolium*.

1. *H. racemosum* Jacq. *Sel. Stirp. Amer.* 170, t. 183, f. 72 (1763); *Sw. Prodr.* 86 & *Fl. Ind. Occ.* 989, t. 17; *Bot. Mag.* t. 519; *Macf. Jam.* i. 218; *Griseb. Fl. Br. W. Ind.* 298; *Benth. Journ. Linn. Soc.* iv. 36. *H. racemosum* Jacq. subsp. *barbellatum* Blake in *Contr. U.S. Nat. Herb.* xx. 229 (1919). *Bradleya*, *A. Robinson Ic. ined.* (Fig. 89.)

In fl. July, Aug.; in fr. Sept.; Port Royal Mts., *Macfadyen*; Great Valley, Manchester, *Purdie! March!* J.P. 697, *Jenman!* Mavis Bank, *Fawcett!* Sheldon road; Content road, 3000 ft.; Old England, Blue Mts., 3500 ft.; Hope River valley; *Harris!* Fl. Jam. 5563, 6108, 6465, 8156, 9981.—Cuba, Hispaniola, Porto Rico, Antigua, Guadeloupe, Martinique.

Shrub 9 ft., or *tree* 15-40 ft. high; younger branches with whitish lenticels. *Leaves* 5-13 cm. l., broadly to narrowly elliptical, apex pointed

to very shortly acuminate, crenate or crenate-serrate, glabrous but often bearded in axils of nerves beneath. *Racemes* simple or paniculate; peduncles 2-4 cm. l., glabrous; rhachis 2-8 cm. l. *Calyx*: segments



Fig. 89.—*Homalium racemosum* Jacq.

A, Twig with leaves and flowers $\times \frac{1}{2}$.

B, Flower with sepals, petals, and stamens pressed down in front $\times 3$.

C, Ovary cut across $\times 6$.

D, Fruit cut down, showing seed, which has filled the cavity, $\times 2$.

usually lanceolate, 2.8-3.5 mm. l. *Petals* 3.5-5 mm. l. *Stamens* in clusters of 3 or 4. *Styles* 3, distinct. *Ovary* conical, densely villous; placentas 3; ovules 3 on each placenta. *Capsule* with 1 or 2 seeds.

2. *H. integrifolium* Britton, *Bull. Torr. Bot. Cl. xxxvii*. 354 (1910); *Blake loc. cit.*

White Logwood.

In fl. in March; S.E. end of John Crow (Blake) Mts., *Harris & Britton!*

Tree, 50 ft. high; younger branches with whitish lenticels. *Leaves* 7-14.5 cm. l., elliptical, oblong-elliptical, or ovate-elliptical, apex acuminate or acute, obscurely crenate or crenate-serrate or subentire, glabrous on

both sides but sometimes bearded in the axils of nerves beneath. *Racemes* simple, puberulous; peduncles 1.3-2.5 cm. l.; rhachis 3-7 cm. l. *Calyx*: segments usually lanceolate, 1.5-3 mm. l. *Petals* 2.5-3.8 mm. l., ovate or oval-ovate. *Stamens* in clusters of 3, shorter than the petals. *Styles* 3, distinct. *Ovary* depressed-conical, villose.

Should perhaps be included under *H. racemosum*.

7. XYLOSMA Forst.

Shrubs or trees, often with axillary spines. Leaves toothed or less often entire, shortly stalked; stipules wanting. Flowers clustered in the axils or sometimes shortly racemose, diœcious,

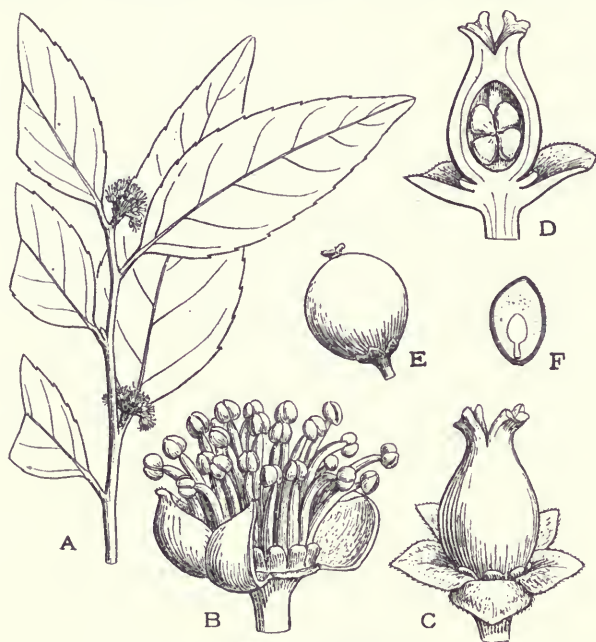


Fig. 90.—*Xylosma nitidum* A. Gr.

A, Portion of branch with leaves and flowers $\times 3$.

B, Male flower with part of the calyx cut off to show the disk $\times 7$.

C, Female flower with sepals turned down to show the disk $\times 7$.

D, Ditto cut lengthwise $\times 7$.

E, Fruit $\times 2$.

F, Seed $\times 2$.

rarely polygamous. Sepals 4-5, scale-like, generally ciliate, overlapping. Petals wanting. Stamens indefinite, free, often surrounded by a glandular disk; anthers versatile, short. Ovary surrounded by a disk; placentas 2, sometimes 3-6, with 2 or few ovules on each; style entire or more or less divided, with dilated stigmas, or, occasionally the stigma sessile, flattened

and lobed. Berry 1-celled, small, with 2-8 seeds. Seeds obovoid; coat smooth, hard and brittle; cotyledons broad.

Species, about 65, most in tropical and subtropical regions of the whole world.

Leaves 5-11 cm. l., ovate to elliptical, acuminate 1. *X. nitidum*.

Leaves 3-6 cm. l., elliptical, apex obtuse or acute..... 2. *X. Fawcettii*.

Leaves 2-3.5 cm. l., obovate, apex rounded..... 3. *X. schæfferioides*.

1. *X. nitidum* A. Gr. ex Griseb. *Fl. Br. W. Ind.* 21 (1859) (excl. several syn.); leaves 5-11 cm. l., ovate to elliptical or ovate-lanceolate, shortly and obtusely acuminate; petioles 5-6 mm. l.; pedicels 2-4 mm. l.; sepals of male fls. nearly 3 mm. l., erect.—*Hisingera nitida* Hellenius in *K. Vetensk. Acad. Nya Handl.* xiii. 35, t. 2 (1792). *Myroxylon nitidum* Kuntze *Rev. i.* 44 (1891); *Urb. in Engl. Bot. Jahrb.* xv. 299. (Fig. 90.)

Manchester, *Purdie*! Kings House, J.P. 1078; Cinchona, 5000 ft., J.P. 1128, 1182; John Crow Peak, Blue Mts., J.P. 1479; *Hart*! Green Valley, Blue Mts., J.P. 2086, *Morris*! St. George; near Portland Gap, 5400-5550 ft.; between Clydesdale and Cinchona, 4500 ft.; below Greenwich Hill, 3500 ft.; *Harris*! *Fl. Jam.* 5412, 5543, 5568, 5668, 6143, 10,034, 10,138.

Shrub or tree to 20 ft. high; lower part of trunk often spiny. *Leaves*: base rounded, obtuse, or acute, serrate-crenate to the base, nerves on both sides prominent. *Flowers* fragrant, dioecious, in 1 or 2 umbel-like clusters in axils. *Sepals* light green or greenish-yellow, with hairs on inside, margin more or less ciliate. *Disk* consisting of 6, 8, or 12 scales, free or more or less united. *Male flowers*: *Sepals* roundish. *Stamens* 15-25, yellowish-green; filaments 3-4 mm. l. *Female flowers*: *Sepals* ovate, about 2 mm. l., persistent. *Stamens* sometimes 1-4, with anthers sterile. *Styles* 2, continuous with ovary, united on inner face, each with 2 roundish hollow stigmas. *Ovary* with 2 placentas; ovules 4-8. *Berry* globose, 5-6 mm. in diam.

2. *X. Fawcettii* Urb. *Symb. Ant. v.* 440 (1908); leaves 3-6 cm. l., elliptical to ovate or obovate, apex obtuse or acute, sometimes rounded; petioles 3-4 mm. l.; pedicels of male fls. 5-8 mm. l.; sepals of male fls. 1.5-2 mm. l., spreading horizontally or recurved.

Moneague, *Prior*! Stanmore Hill, 2200 ft.; Glasgow, near Troy, 2000 ft.; Soho, St. Ann, 1400 ft.; Peckham, Clarendon, 2500 ft.; *Harris*! *Fl. Jam.* 9776, 10,672, 11,987, 12,792.

Shrub 9 ft. or *tree* 15-40 ft. high. *Leaves*: base wedge-shaped, crenate-toothed from above the base, nerves and veins on both sides slightly prominent. *Flowers* dioecious (male only seen), in clusters of 3-9. *Sepals* 5 or, by union of two, 4, roundish-ovate, shortly acuminate, greenish-yellow, fragrant. Glands of *disk* usually united into a crenate ring, 5 mm. l. *Stamens* 10-17; filaments 3-4 mm. l.

3. *X. schæfferioides* A. Gr. in Griseb. *Pl. Wright. in Mem. Acad. Amer. n. ser. viii.* 155 (1860); leaves 2-3.5 cm. l., obovate or oblanceolate, apex rounded or very obtuse; petioles 2-3 mm. l.

—*Urb. Symb. Ant. viii.* 444. *Myroxylon schæfferioides* Kr. & *Urb. in Engl. Bot. Jahrb. xv.* 300 (1892).

White Logwood.

March! Corby, Santa Cruz Mts., 1500 ft.; *Harris!* Fl. Jam. 9746.—Cuba, Hispaniola,

Tree to 20 ft. high. *Leaves* wedge-shaped at base, entire or sparingly crenulate above, nerves ascending, on both sides prominulous or sometimes only beneath. *Flowers* dicæious, in umbel-like clusters in axils. *Pedicels* 4-7 mm. l. *Sepals* yellow, erect or spreading, about 1 mm. l., roundish or ovate. *Disk* fleshy, ring-like, margin wavy. *Male flowers*: *Stamens* 2-2.5 mm. l., 10-16. *Female flowers*: *Style* one, very short, stigma broad with crenulate margin. *Fruit* globose, 5 mm. l., scarlet.

FAMILY LXXVII. TURNERACEÆ.

Herbs or shrubs, rarely trees, glabrous or pubescent, hairs usually simple, not stinging. Leaves alternate, simple or pinnately divided, usually acutely serrate, often 2-glandular at the base. Stipules small or wanting. Flowers regular, hermaphrodite, axillary, solitary or few, sessile or stalked, sometimes racemose; peduncles free or united with the petiole, often jointed and 2-bracteolate. Sepals 5, united below into a tube (receptacle), soon dropping off, imbricate. Petals 5, perigynous, clawed, membranous, twisted in bud, soon dropping off. Stamens 5, inserted at the base or middle or throat of the calyx-tube (receptacle), very rarely hypogynous; filaments free. Anthers oblong, opening inwards. Ovary free, ovoid or elongated, 1-celled. Styles 3, terminal, thread-like, simple (*Turnera*) or more or less divided (*Piriqueta*); stigmas brush-like, with an indefinite number of branches, or rarely simply fan-like. Ovules indefinite, attached to 3 placentas on the ovary-walls in 2 series opposite the styles, ascending, anatropous. Capsule 1-celled, 3-valved at the apex or through the whole length, valves with the placentas in the middle, with indefinite seeds. Seeds oblong-cylindrical, slightly curved; aril membranous; coat somewhat hard and brittle, pitted; endosperm copious. Embryo large, axile, straight or bent; cotyledons plano-convex.

Species about 150, mostly American, a few African, one widely dispersed throughout Asia but certainly not indigenous.

Styles simple 1. *Turnera*.
 Styles divided 2. *Piriqueta*.

1. TURNERA L.

Herbs, shrubs, or undershrubs, glabrous, pubescent, or tomentose. Leaves serrate, or somewhat pinnately divided, or entire, often 2-glandular at the base. Stipules small or wanting. Flowers solitary, perigynous, yellow; peduncle usually united to

the petiole, with 2 bracteoles. Receptacle-tube short. Sepals oblong, linear, or lanceolate. Petals obovate-roundish or spatulate. Stamens inserted below the petals, sometimes hypogynous. Ovary sessile. Styles simple, with stigma brush-like or fan-like. Capsule in Jamaican species ovoid-ellipsoidal and minutely tuberculate. Seeds in Jamaican species obovoid-oblong; aril unilateral.

Species about 100, natives chiefly of tropical S. America, but extending to Mexico and the West Indies, and even to Madagascar; one species has been introduced into the E. Indies.

Leaves large, 4-15 cm. l., with 2 glands at base. Shrub... 1. *T. ulmifolia*.
Leaves small, .5-4 cm. l., usually without glands.

Annual. Flowers in a terminal leafy head. Leaves

1-4 cm. l. 2. *T. Pumilca*.

Shrub. Flowers more or less solitary. Leaves .5-1.5

cm. l. 3. *T. diffusa*.

1. *T. ulmifolia* L. *Sp. Pl.* 271 (1753), *Hort. Cliff.* t. 10, & *Amæn.* v. 377; shrubby herb or shrub, 1-4 ft. high; leaves large,

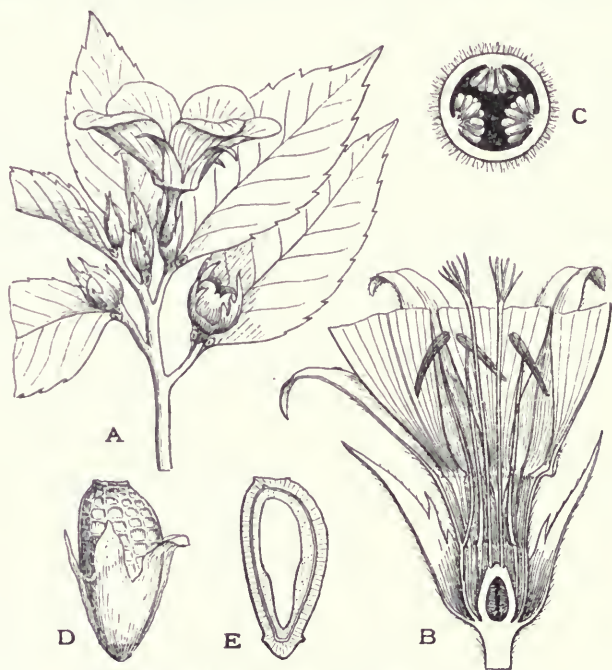


Fig. 91.—*Turnera ulmifolia* L.

A, Portion of branch with flower and fruit $\times \frac{3}{4}$.

B, Flower cut lengthwise, petals cut, $\times 2$.

C, Ovary cut across $\times 6$.

D, Seed with aril $\times 10$.

E, Seed cut lengthwise $\times 10$.

7-15 cm. l., with 2 glands at base; calyx 2-2.5 cm. l.—*Mill. Dict. ed. 8 & Ic.* 179, t. 268; *Wright Mem.* 261; *Descourt. Fl. Ant. iv.* 322, t. 302; *Macf. Jam. ii.* 163; *Bot. Mag. t.* 4137; *Griseb. Fl. Br. W. Ind.* 296; *Urb. in Jahrb. Bot. Gart. Berl. ii.* 138 & in *Fl. Bras. xiii. pt. 3*, 158, t. 48; *Small Fl. S.E. U.S.* 1352; *Britt. Fl. Berm.* 247; *Britt. & Millsp. Bah. Fl.* 282. *T. frutescens ulmifolia Plum. Gen.* 15, t. 12; *Mart. Cent. t.* 49. *T. e petiolo florens &c. Browne Hist. Jam.* 189. *T. angustifolia Mill. op. cit.* (1768); *Bot. Mag. t.* 281. *T. ulmifolia L. var. angustifolia Willd. Sp. Pl. i.* 1503 (1797); *Urb. Symb. Ant. iv.* 424, viii. 450 & in *Fl. Bras. tom. cit.* 161. *T. acuta Spreng. Syst. i.* 940 (1825); *Macf. Jam. ii.* 164 (1850). *T. triglandulosa Millsp. in Field Columb. Mus. Bot. ii.* 77 (1900). *Cistus urticæ folio &c. Sloane Cat.* 86 & *Hist. i.* 202, t. 127, f. 45. (Fig. 91.) Specimen in Herb. Linn. named by Linnaeus.

Sloane Herb. iv. 4! *Wright! Shakespear! Masson! Bertero!* St. Andrew, *McNab! Lane! Distin! Prior!* Liguanea plain, J.P. 961, 1831, *Morris!* Constant Spring; Port Morant; *Hitchcock!* Lucea, *Rothrock!* Bog Walk, *Fawcett!* Annotto Bay; Prospect Hill, 2000 ft.; *Thompson!* Southfield, 1500 ft.; road between Montego Bay and Lucea; Peckham, Clarendon, *Harris!* Fl. Jam. 6485, 7073, 7923, 7950, 9236, 11,029.—Bermuda, Bahamas, West Indies as far east and south as St. Eustatius, Central America south to Guiana, Margarita, Curaçao, introduced in tropics of Old World.

Younger stem and branches usually with adpressed hairs. Leaves 2-5 cm. br. (sometimes barely exceeding 1 cm.), sometimes ovate or ovate-lanceolate, usually (in Jamaica) lanceolate or oblong-lanceolate, coarsely and often irregularly serrate, usually soft to the touch on both sides with adpressed hairs, dense beneath, but in the broad-leaved form glabrate; petiole 1-2 cm. l. Flowers not forming a head; peduncle united to the petiole. Bracteoles generally leaf-like, ovate-lanceolate to lanceolate-linear, 1-3 cm. l. Calyx-tube about 1 cm. l. Petals (in Jamaican forms) bright yellow, overtopping the calyx by one-half its length. Filaments united by their margins to the base of the calyx-tube. Capsule 3-valved above, 7-9 mm. in diam. Seeds obovoid-oblong, slightly curved, surface reticulate-striate, about 2.5 mm. l., about 1 mm. br. at broader end.

2. *T. Pumilea L. Amæn. v.* 395, 377 (1760); herb, annual, not more than 6 inches high; leaves 1-4 cm. l., generally without glands; flowers sessile in a terminal leafy head; calyx 6-7 mm. l.—*Sw. Obs.* 116; *Macf. Jam. ii.* 164; *Griseb. Fl. Br. W. Ind.* 297; *Urb. in Jahrb. Bot. Gart. Berl. ii.* 114 & in *Fl. Bras. xiii. pt. 3*, 135. *Chamæcistus urticæ folio &c. Sloane Cat.* 87 & *Hist. i.* 202, t. 127, f. 6. *Pumilea minima &c. Browne Hist. Jam.* 188. Specimen in Herb. Linn. named in Solander's hand. Specimen from Swartz in Herb. Mus. Brit.

Amongst grass in savannas; *Sloane Herb. iv.* 5! *Swartz!* Two Mile Wood, St. Catherine, *Harris!* Fl. Jam. 12,066.—Cuba, Isle of Pines, tropical continental America.

Villose with white woolly hairs. Leaves lanceolate or oblong-lanceolate, coarsely serrate; petioles short or very short; stipules wanting. Bracteoles linear-awl-shaped, entire, 4-8 mm. l. Calyx: tube half its length. Petals

4-4.5 mm. l., slightly overtopping the calyx, yellow. *Capsule* 3-valved, 3-6 mm. l. *Seeds* about 2 mm. l., obovoid-oblong, curved, reticulate-pitted.

3. *T. diffusa* Willd. ex Schult. *Syst. vi.* 679 (1820); shrubby, to 3 ft. high, much branched; leaves 6-15 mm. l., without glands; flowers more or less solitary, towards the ends of branches, peduncle very short, free, or wanting; calyx 5-7 mm. l.—*Urb. in Jahrb. Bot. Gart. Berl. ii.* 125, in *Fl. Bras. xiii. pt. 3*, 146, t. 44, & *Symb. Ant. iv.* 423 & viii. 449. *T. microphylla* Desv. in *Hamilt. Prodr.* 33 (1825). *Bohadsehia humifusa* Presl *Reliq. Haenk. ii.* 98, t. 68 (1836). *Triacis microphylla* Griseb. *Fl. Br. W. Ind.* 297 (1860).

Long Mt., south side, 500 ft.; Yardley Chase, 1600 ft.; *Harris!* *Fl. Jam.* 9606, 9608, 9679.—Bahamas, Cuba, Hispaniola, Mona, Porto Rico, Vieques, St. Thomas, St. Cruz, St. Jan, peninsula of California, Mexico, Brazil.

Young shoots densely puberulous. *Leaves* obovate to oblanceolate, coarsely toothed or crenate, usually densely puberulous on both sides, especially beneath; petioles very short; stipules minute. *Bracteoles* oblong-linear to linear-awl-shaped, 2-4 mm. l. *Calyx*: tube half its length. *Petals* overtopping the calyx by one-third its length or less, bright orange-yellow. *Capsule* 3-4 mm. l., 3-valved. *Seeds* curved, 1.5-2.3 mm. l., reticulate-striate.

2. PIRIQUETA Aubl.

Herbs (in the Jamaican species), shrubs or trees, much like *Turnera*, but usually with stellate hairs and bristly hairs. Leaves of various form, in Jamaica oblong to linear-lanceolate, remotely serrate or serrate-repand, and without stipules. Flowers axillary, usually solitary; peduncles free, without bracteoles in Jamaican species. Calyx with a narrow membranous fringed corona continuous round the tube at the base of the petals. Styles more or less divided at the apex, in *P. cistoides* divided to about the middle. Capsule in the Jamaican species opening from the apex nearly to the base, smooth.

Species about 30, mostly natives of Brazil, but also occurring in West Indies, tropical continental America extending to the southern United States, South Africa, and Madagascar.

P. cistoides Griseb. *Fl. Br. W. Ind.* 298; *Urb. in Jahrb. Bot. Gart. Berl. ii.* 73, in *Fl. Bras. xiii. pt. 3*, 104, t. 35, f. 1, & *Symb. Ant. iv.* 422 & viii. 449. *T. cistoides* L. *Sp. Pl. ed. 2*, 387 (1762); *Sw. Obs.* 117. *Chamæcistus caule hirsuto* &c. *Sloane Cat.* 87 & *Hist. i.* 202, t. 127, f. 7. *Turnera hispida* &c. *Plum. Pl. Amer. (Burm.)* 141, t. 150. *Pumilea?* subhirsuta &c. *Browne Hist. Jam.* 189. (Fig. 92.) Specimen in Herb. Linn. named by Linnæus.

Sloane Herb. iv. 61 cane fields, St. Thomas in East, *Broughton!* *Shake-spear!* *Masson!* St. Andrew; St. Mary; *McNab!* Liguanea plain, 600 ft., *Campbell!* Moneague, *Lady Blake!* Prospect Hill, 2000 ft., *Thompson!*

Liguanea plain, 800–1000 ft., *Harris!* Fl. Jam. 6230, 7961, 8273, 8940, 10,831.—West Indies, tropical continental America.

Annual, 1–2 ft. high, variable, usually with reddish stellate and simple hairs. *Leaves* 3–8 cm. l., oblong to linear-lanceolate, without glands,

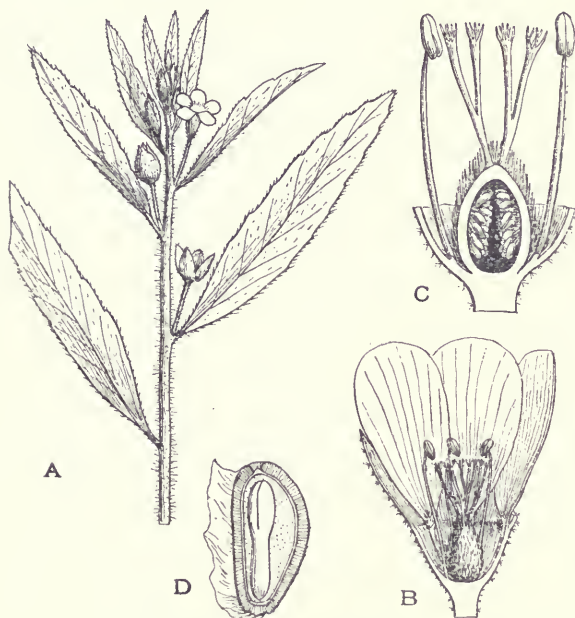


Fig. 92.—*Piriqueta cistoides* Meyer.

A, Portion of branch with flowers and fruit $\times \frac{3}{4}$.

B, Flower cut lengthwise $\times 4$.

C, Ditto showing ovary cut lengthwise $\times 8$.

D, Seed cut lengthwise, with aril, $\times 10$.

remotely serrate or serrate-repand. *Calyx* 4–9 mm. l.; tube half or nearly half as long. *Petals* 6–9 mm. l., usually more or less overtopping the calyx, yellow. *Styles* divided to about the middle. *Capsule* smooth, 4–7 mm. l. *Seeds* 1.4–1.8 mm. l., obovoid, reticulate-striate.

FAMILY LXXVIII. PASSIFLORACEÆ.

Herbs, shrubs, erect or climbing by tendrils, or rarely trees. Leaves alternate, simple, entire, or lobed, very rarely compound; petiole usually glandular. Stipules 2, thread-like, or large, ovate. Peduncles usually jointed. Bract and bracteoles 3, small, distant from flower, or large, foliaceous, close to the flower, forming an "involucre." Tendrils axillary, unbranched. Flowers axillary, hermaphrodite or rarely unisexual, regular, solitary, cymose-racemose or -paniculate. Calyx-tube (receptacle) somewhat flat,

saucer-like, or bell-shaped, giving rise in the centre to a gonophore.* Sepals 5, rising from the throat of the receptacle, overlapping, with often a small "horn" on the back near the apex, usually coloured on the inside. Petals either wanting or as many as the sepals and alternate with them, rising from the throat of the receptacle, free, overlapping, withering while still attached. Corona rising from the throat or walls of the receptacle, of one or several series, cut into radiating or erect filaments or membranous, rarely wanting. Stamens in West Indian species 5 (8). Ovary superior, free, stalked, 1-celled. Style simple with 3 or 4 branches or usually 3 (5) styles. Ovules pendulous, usually indefinite, attached to 3 or 5 placentas on the ovary-walls. Fruit more or less berry-like, or sometimes capsular opening by 3 valves at apex. Seeds numerous, usually ovoid, compressed, covered with a fleshy aril or pulp; endosperm fleshy. Embryo rather large; cotyledons often foliaceous; radicle straight.

Species about 340, all tropical or subtropical, the greatest number in S. America.

PASSIFLORA L.

Flowers bell-shaped, funnel-shaped, or saucer-like. Calyx-tube (receptacle) generally shorter than the rest of the flower. Corona of one or usually of several series, the highest of one or more series at the throat of the receptacle of coloured filaments or membranous; the median usually of one series, protecting the nectary at the base of the gonophore, generally membranous, bent inwards or more or less erect; the basilar of 1 or 2 series, usually ring-like; (see Fig. 93, B). Style one, very short, or, more often, styles 3, distinct from the base. Fruit a berry, ellipsoidal or globose, dry or pulpy, sometimes opening by valves at apex. Seeds with hard pitted coat.

Species over 300, most of them American, a few Asiatic and Australian.

Involucre of 3 large segments (bract and bracteoles)
below the flower.

Segments leafy. Petioles glandular.

Segments not united.

Leaves deeply 3-lobed, serrate *P. edulis.*

Leaves entire.

Petioles with 2 or 3 pairs of glands *P. quadrangularis.*

Petioles with 1 pair of glands *P. laurifolia.*

Segments united above the base, and longer
than flower. Leaves entire. 1. *P. maliformis.*

* An elongation of the axis above the petals from which spring both stamens and pistil.

Segments pinnately cut into glandular filaments.

Leaves 3-lobed, minutely toothed, often entire; petioles without glands.

Plant villose or velvety 2. *P. fœtida*.

Plant glabrous 3. *P. ciliata*.

Involucre wanting. Bract and bracteoles small or wanting, usually at the joint of the peduncle.

Petioles with 2 glands. Petals wanting. Leaves without glands.

Calyx yellowish-green. Leaves entire or more or less 3-lobed, median lobe longest; petiolar glands sessile 4. *P. suberosa*.

Calyx scarlet. Petiolar glands stalked.

Leaves entire or with indistinct basal lobes 5. *P. lancifolia*.

Leaves 3-lobed with basal lobes half as long as median lobe 6. *P. regalis*.

Petioles without glands. Petals present.

Receptacle (calyx-tube) somewhat flat. Flowers greenish-white.

Peduncles, each with one flower.

Leaves without glands beneath, cordate, with 2 triangular lobes 7. *P. rubra*.

Leaves with glands beneath, with 3 small erect lobes, or apex subtruncate 8. *P. penduliflora*.

Peduncles, each with 3, or more, smaller flowers. Leaves 3-lobed.

Leaves without glands beneath 9. *P. sexflora*.

Leaves with glands beneath 10. *P. triflora*.

Receptacle cup-shaped. Flowers reddish. Leaves with glands.

Corona at the throat filamentose.

Leaves broader than long.

Leaves: base cordate, lateral lobes spreading horizontally, usually clasping the stem with their rounded auricles 11. *P. perfoliata*.

Leaves: base broadly rounded or cordate, slightly 3-lobed or subtruncate 12. *P. tacsonioides*.

Leaves longer than broad, base obtuse or rounded, with 2 or 3 short erect lobes, sometimes 2-lobed, with the lobes long, lanceolate 13. *P. oblongata*.

Corona at the throat tubular 14. *P. Murucuja*.

* *P. edulis* Sims *Bot. Mag. t.* 1789 (1818); shrubby; leaves deeply 3-lobed, lobes oblong to elliptical, acuminate, serrate, upper surface glabrous, shining; petioles with 2 sessile glands below the apex; stipules linear-awl-shaped; peduncles longer than the petioles; segments of involucre leafy, not united, ovate, serrate, usually glandular; receptacle (calyx-tube) bell-shaped, slightly

* This and the following two species are probably not truly native.

fleshy; berry edible, ellipsoidal, purplish.—*Sabine Trans. Hort. Soc. Lond. iii. 99, t. 3*; *Jacq. Eclog. ii. 5, t. 124* (*P. rigidula*); *Mast. in Fl. Bras. xiii. pt. 1, 609*; *Britt. Fl. Berm. 253*. *P. incarnata* β *Bot. Reg. t. 152*.



Fig. 93.—*Passiflora edulis* Sims.

A, Portion of branch with leaves and flowers $\times 3$.

C, Seed $\times 3$.

B, Flower cut lengthwise, nat. size.

D, Ditto cut lengthwise $\times 3$.

Mountain Sweet Cup.

J.P. 1031, *Hart*! Newhaven Gap, 5600 ft., *Fawcett*! also *Harris*! *Fl. Jam.* 11,953; Blue Mt. Peak, *Hitchcock*; Morse's Gap, *G. E. Nichols*!—Cultivated or spontaneous in many warm parts of the world, supposed to be a native of Brazil.

A high climber. *Leaves* 6–16 cm. l. *Flowers* 4–6 cm. or more in diam. *Sepals* green outside, white inside, with a “horn” near the apex. *Petals* white, smaller than the sepals. *Corona*: at the throat of the receptacle, of several series, thread-like, the outermost threads flattened, spreading, shorter than or as long as the petals, whitish, purple at base,—inside these threads there are very short threads; the median corona rising from the middle of the receptacle is membranous, divided above into short threads; basilar corona membranous. *Fruit* about the size of a hen's egg; the pulp is scanty.

P. quadrangularis *L. Syst. ed.* 10, 1248 (1759) & *Amœn.* v. 382; branches 4-angled, the angles more or less winged; leaves entire, 1-nerved from base, ovate to suborbicular, apex abruptly acuminate, base cordate, subcordate or sometimes rounded; petioles with 6 glands; stipules ovate to ovate-lanceolate; segments of involucre leafy, not united, much shorter than the calyx, each broadly ovate, entire or serrulate; fruit edible, ellipsoidal, yellowish-green, pericarp fleshy, thick.—*Jacq. Sel. Stirp. Amer.* 231, t. 143 & *ed. pict.* t. 218; *Cav. Diss.* x. 453, t. 283; *Sw. Obs.* 332; *Sowerby Trans. Linn. Soc.* ii. 21, t. 3 f. a.; *Tussac Fl. Ant.* iv. 29, tt. 10, 11; *Wright Mem.* 283; *Macf. Jam.* ii. 158; *Griseb. op. cit.* 293; *Mast. tom. cit.* 595; *Urb. Symb. Ant.* iv. 428 & viii. 455; *Britt. Fl. Berm.* 253. *P. foliis amplioribus* &c. *Browne Hist. Jam.* 327. *P. hexangularis* *Wright in Lond. Med. Journ.* viii. pt. 3 (1787) & *Mem.* 228. *P. macrocarpa* *Mast. tom. cit.* 597. *Granadilla* *Rev. J. Lindsay Ic. & Ms. ined.* Specimen in Herb. Linn. named by Linnaeus. Specimen from Jacquin in Herb. Mus. Brit.

Granadilla.

Cultivated in Jamaica and in all tropical regions, said to be indigenous in Nicaragua.

Leaves 1–2 dm. l., 7–16 cm. br.; stipules 2–4 cm. l. *Peduncles* 3-angled, shorter than the petiole. *Flowers* 8–10 cm. in diam. *Sepals* usually with the "horn" at the apex not or only slightly developed. *Corona*: at the throat, of several series, the outer two thread-like, about as long as the petals, the inner of 3–4 series of short tubercules; above the middle, of 1 or 2 series rising from the receptacle below the throat, membranous at the base, divided at the apex into short horizontal threads; median, growing horizontally from the receptacle, denticulate along the margin; the basilar near the bottom of the receptacle, ring-like. *Fruit* varying in size up to 2 dm. l., 1.5 dm. br.

This species is a vigorous climber, and is best grown on an arbour; the foliage is dense and the flowers large and ornamental; it is easily propagated by slips. It forms a tuber of large size which can be eaten like a yam. The taste of the fruit of this and other edible species is sweet and subacid, relished particularly by the sick in fevers. The thick rind of unripe granadilla is often made into pickles or preserved with sugar as sweetmeats.

P. laurifolia *L. Sp. Pl.* 956 (1753) & *Amœn.* v. 382; branches grooved-striate; leaves entire, glabrous, 1-nerved, elliptical, apex with a short acute point, base rounded; petioles with 2 glands near the apex; stipules linear; peduncles solitary, longer than the petiole; segments of involucre leafy, not united, each elliptical to roundish, margin usually glandular-toothed; fruit narrowly ellipsoidal, with a soft shell of an orange-yellow colour.—*Jacq. Sel. Stirp. Amer. ed. pict.* 112, t. 219, the same drawing also in *Hort. Vindob.* ii. t. 162; *Wright Mem.* 228; *Cav. Diss.* x. 454, t. 284; *Sm. Obs.* 333; *Bot. Reg.* t. 13; *Macf. Jam.* ii. 157; *Griseb. op. cit.* 293; *Mast. tom. cit.* 603; *Urb. Symb. Ant.* iv. 428 & viii. 456; *Britt. Fl. Berm.* 252. *P. foliis ovatis* &c. *Browne*

Hist. Jam. 327. *P. arborea* &c. *Pluk. t.* 211, *f.* 3. *Clematitis indica fructu citriformi* &c. *Plum. Descr.* 64, *t.* 80 & *Ic. orig. ined. iv.* 229. Specimens from Jacquin and Plukenet in *Herb. Mus. Brit.*

Pomme d'Or, Golden Apple, Water Lemon.

Indigenous and cultivated in West Indies, Guiana, Brazil.

Leaves 6-14 cm. l.; stipules 6-9 mm. l. *Flowers* 6-10 cm. in diam., pink or white, with red blotches and crown violet with white streaks. *Sepals* horned below the apex. *Petals* shorter and narrower than the sepals. *Corona*: at the throat, of thread-like divisions in many series, the outer shorter than the petals, strap-shaped, serrulate at apex; the filaments that come next are as long as the petals, like the outer but entire at the apex; then follow very numerous short tooth-like filaments; the median membranous, turned inwards. *Fruit* to 7 or 8 cm. l., the size of a large hen's egg.

1. *P. maliformis* *L. Sp. Pl.* 956 (1753) & *Amcn. v.* 382; branches terete; leaves entire, 3-nerved from base or from just above base, sometimes 3-lobed, glabrous, ovate- or oblong-elliptical, apex acute, sometimes shortly awned, base rounded to subcordate; petioles with 2 (4 or 6) glands; stipules narrowly lanceolate; segments of involucre entire, united above the base, ovate, half as long again or twice as long as the flower; receptacle short, bell-shaped; fruit globose, yellowish-green, with a hard shell.—*Wright Mem.* 228; *Bot. Reg. t.* 94; *Macf. Jam. ii.* 156; *Griseb. op. cit.* 293; *Mast. tom. cit.* 594; *Urb. Symb. Ant. iv.* 427 & *viii.* 455; *Britt. Fl. Berm.* 253. *P. foliis cordatis* &c. *Browne Hist. Jam.* 328. *Clematitis indica latifolia* &c. *Plum. Descr.* 67, *t.* 82.

Sweet Cup, Water Lemon.

Wright! Broughton! Waters! Moneague, Prior! Hope Gardens; near Balaclava, 1200 ft.; *Harris! Fl. Jam.* 9430.—Indigenous or cultivated in West Indies, Colombia, Venezuela, Brazil.

Leaves 10-16 cm. l., 5-8 cm. br.; stipules shorter than the petiole. *Peduncles* longer than the petioles. *Flowers* 5-6 cm. in diam. *Sepals* subkeeled on back, with a bristle-like "horn" near apex, greenish with red spots. *Petals* shorter and narrower than sepals, greenish-white with red spots. *Corona*: at the throat, of two series, filamentose, the threads thick, fleshy, reddish-violet ribbed with white, the outer threads shorter and reflexed, the inner about as long as the sepals, erect; then come very numerous and very short tubercle-like threads in the tube. *Fruit* size of a small apple.

P. ligularis *Juss. in Ann. Mus. Par. vi.* 113, *t.* 40 (1805) is a native of tropical America and is cultivated in Jamaica under the name "Granaditta." It differs from *P. maliformis* *L.* in the stalks of the leaves having six long strap-shaped glands, the leaves being broader and deeply cordate, and the stipules broad and large (2.5-3 cm. l.); the fruit is about the size of an orange and contains an agreeable pulp. (*Bot. Mag. t.* 2967; *Harris in Bull. Dept. Agric. Jam. n.s. ii.* 166.)

2. *P. fœtida* *L. Sp. Pl.* 959 (1753); villose; leaves generally more or less 3-lobed and cordate, rarely lanceolate with very

small lateral lobes near base, lobes minutely toothed or more or less entire, ciliate with hairs and glands; petioles without glands; stipules deeply cut, divisions thread-like with gland at apex; segments of involucre 3-pinnatisect, divisions long thread-like, ultimate ending in a gland; receptacle flattish; berry yellow.—*Cav. Diss. x.* 458, t. 289; *Descourt. Fl. Ant. v.* 269, t. 375; *Macf. Jam. ii.* 159; *Griseb. op. cit.* 294; *Mast. tom. cit.* 582; *Small Fl. S.E. U.S.* 809; *Urb. Symb. Ant. iv.* 425 & viii. 452; *Britt. & Millsp. Bah. Fl.* 287. *P. vesicaria* &c. *Pluk. Phyt. t.* 104, f. 1; *Broune Hist. Jam.* 327. *P. vesicaria* *L. Amœn. v.* 382 (1760). *P. ciliata* *Jacq. Eclog. t.* 122 (1844) (non *Ait.*)? *Flos passionis folio...fœtido* *Sloane Cat.* 104 & *Hist. i.* 229. Specimen in Herb. Linn. named by Linnæus.

Love in a mist.

Houstoun! Broughton! Macfadyen! Kingston, Purdie! Lane! Prior! March! near Annotto Bay, 100 ft., *Thompson! Bethlehem, St. Elizabeth, T. J. Harris! Mt. Diablo; Savoy, Clarendon; Harris! Green Valley, Blue Mts., Bot. Dept.!* *Fl. Jam.* 7924, 8283, 8520, 12,324; *Bog Walk; Porus; Hitchcock;* near Bulstrode, *Mrs. E. G. Britton, 2879!*—Bahamas, West Indies, tropics and subtropics of continental America, tropical Africa, S.E. Asia.

Annual or rarely *perennial*. *Leaves* 3-12 cm. l. Segments of *involucre* a little longer than the sepals. *Flowers* white with the corona rosy. *Sepals* 2.5 cm. l., or shorter, greenish outside, oblong. *Petals* of the same form and size as the sepals. *Corona*: at the throat, filamentose in several series, the outer threads slender, white, a little shorter than the petals, the inner much shorter, curved; the median ring-like. *Fruit* the size of a walnut.

This species has been used in agriculture as a cover crop (*Agric. News xvii.* 92, 1918). The plant has a disagreeable smell, but the ripe fruit has a pleasant smell and an agreeable sweet-acid pulp.

Var. *gossypifolia*; stem, petioles and leaves velvety and soft to the touch; involucre generally shorter than the flowers.—*P. gossypifolia* *Desv. in Ham. Prodr. Fl. Ind. Occ.* 48 (1825); *Bot. Reg. t.* 1634; *Bot. Mag. t.* 2619 (*P. fœtida* L.). *Clematitis indica hirsuta fœtida* *Plum. Descr.* 71, t. 86 & *Ic. orig. ined. iv. t.* 232.

Sloane *Herb. iv.* 79! *Waters! Kings House Grounds, J.P.* 1290, *Hart!*—Cuba, tropical and subtropical continental America.

3. *P. ciliata* *Ait. Hort. Kew. iii.* 310 (1789); like *P. fœtida* but differing in the following characters: glabrous; leaves, middle lobe long and narrow, margin more or less denticulate and glandular-ciliate; segments of involucre 2-pinnatisect; flowers light purplish; fruit bright red.—*Bot. Mag. t.* 288; *Griseb. loc. cit.* (excl. hab. Bahamas); *Britt. in Torr. Bot. Cl. Bull. xxxv.* 343. *P. fœtida* var. *ciliata* *Mast. tom. cit.* 583. Type from *Hort. Kew.* in *Herb. Mus. Brit.*

Wright! Black River savanna, Purdie! Meylersfield, Harris! Fl. Jam. 11,816; *Bulstrode, Westmoreland, Mrs. E. G. Britton.*

4. *P. suberosa* L. *Sp. Pl.* 958 (1753) & *Amæn. v.* 382; annual or perennial; older cortex usually corky, whitish; leaves varying very much in form and size even on the same plant, usually more or less 3-lobed with the median lobe the longest, sometimes entire, glabrous to hirsute, without glands beneath, sometimes subpeltate; petiole with 2 glands; peduncles solitary or twin, equalling the petioles; receptacle saucer-shaped; calyx greenish-yellow; petals wanting; fruit ovoid or subglobose, blue or purple.—*Jacq. Hort. Vindob.* 77, t. 163; *Cav. Diss. x.* 442, t. 265; *Macf. Jam. ii.* 152; *Griseb. op. cit.* 290; *Mast. tom. cit.* 578; *Urb. Symb. Ant. iv.* 424 & *viii.* 451; *Small Fl. S.E. U.S.* 809; *Britt. Fl. Berm.* 251. *P. lutea* L. *Sp. Pl.* 958 (1753) (only as regards syn. Sloan. & hab. Jamaica). *P. pallida* L. *Sp. Pl.* 955 (1753); *Descourt. Fl. Ant. vii.* 33, t. 460; *Bot. Reg. t.* 660; *Griseb. op. cit.* 291; *Britt. & Millsp. Bah. Fl.* 288. *P. suberosa* v. *pallida* *Mast. tom. cit.* 579. *P. hirsuta* L. *Sp. Pl.* 958 (1753); *Griseb. loc. cit.* *P. suberosa* v. *hirsuta* *Mast. loc. cit.* *P. villosa* *Macf. Jam. ii.* 150 (1850); *Griseb. loc. cit.* *P. parviflora* *Sw. Prodr.* 97 (1788). *P. minima* L. *Sp. Pl.* 959 (1753); *Jacq. op. cit. t.* 20; *Sw. Obs.* 338; *Griseb. op. cit.* 290. *P. suberosa* v. *minima* *Mast. loc. cit.* *P. angustifolia* *Sw. Prodr.* 97 (1788) & *Fl. Ind. Occ.* 1133; *Bot. Reg. t.* 188; *Bot. Mag. t.* 1983; *Griseb. op. cit.* 291. *P. suberosa* v. *angustifolia* *Mast. loc. cit.* *P. foliis nitidis* &c. *Browne Hist. Jam.* 328. *P. longifolia* *Lam. Encyc. iii.* 40 (1789); *Cav. Diss. x.* 446, t. 270. *P. heterophylla* *Jacq. Hort. Schoenbr.* 28, t. 181 (1797) (non *Lam.*). *P. hederacea* *Cav. Diss. x.* 448 (1790); *Griseb. loc. cit.* *P. suberosa* v. *hederacea* *Mast. loc. cit.* *P. lineariloba* *Hook. f. in Trans. Linn. Soc. xx.* 222 (1847); *Griseb. loc. cit.* *P. peltata* *Cav. Diss. x.* 447, t. 274 (1790); *Macf. Jam. ii.* 152. *Clematitis*... *hederaceo* &c. *Plum. Descr.* 70, t. 84 & *Ic. orig. ined. iv.* 231 (in *Herb. Mus. Brit.*). *C...* *angusto* &c. *Plum. Descr.* 70, t. 85. *C... minimo* &c. *Plum. Descr.* 73, t. 88. *C... pallido* &c. *Plum. Descr.* 74, t. 89. *Flos passionis minor folio... profundius* &c. *Sloane Cat.* 104 & *Hist. i.* 230. *Flos passionis minor folio... minus* &c. *Sloane Cat.* 104 & *Hist. i.* 231. Specimens in *Herb. Linn.* named respectively *P. suberosa* & *P. minima* by Linnæus, also one from Browne named *P. polymorpha* in hand of an amanuensis.

Sloane *Herb.* iv. 83, 84! *Wright! Swartz; Bancroft; Macfadyen! Distin! McNab! Yallahs valley; Brockenhurst; Purdie! Lane; Wullschlaegel; Ocho Rios; Moneague; Prior! March; Liguanea plain, Campbell! Lime Cay, Fawcett! Port Antonio; Porus; Lucea; Hitchcock; Bethlehem, St. Elizabeth, T. J. Harris! Port Royal Mts. and Blue Mts. 2000-3800 ft.; Inverness, Clarendon, 300 ft.; Hope Gardens; Harris! Fl. Jam.* 5920, 6232, 6649, 6377, 12,747.—*Bermuda, Florida and Keys, Bahamas, West Indies, tropical continental America.*

Flowers 1.5-3 cm. in diam. *Corona* at throat, of several filamentose series, the outermost threads spreading, half as long as the sepals, then

shorter threads, the innermost being hair-like; the median membranous, plicate, fringed at apex. *Berry* .6-2 cm. l.

P. coriacea Juss. has been reported both by Grisebach and Masters as collected in Jamaica by Purdie. His ticket states that he found it in "woods above Maencha, May, 1844." But Purdie left Jamaica in April, 1844, and arrived in Santa Marta on 4th May, so that the habitat is in Colombia. Masters made the same mistake with reference to a specimen of *P. biflora* Lam. (*P. lunata* Sm.) collected by Purdie in the same place. Neither of these species has been found in Jamaica.

Macfadyen (ii. 152) cites *P. lutea* as a doubtful native of Jamaica; it is a N. American species, not known in Jamaica.

5. *P. lancifolia* Desv. in *Ham. Prodr. Fl. Ind. Occ.* 48 (1825); pubescent; stem angled; leaves ovate-lanceolate, entire or with basal lobes short or just indicated, apex acute, mucronulate, pubescent beneath or glabrescent, papery or somewhat leathery; petioles pubescent, with 2 stalked glands about 1 mm. from leaf; stipules linear-awl-shaped, 7-10 mm. l.; peduncles generally twin, slender, much longer than the petiole; flowers scarlet; sepals lanceolate-linear; petals wanting; filaments long, flattened-linear; berry globose, black.—*Mast. tom. cit.* 558.

Liguanea plain, Broughton! Macfadyen! Purdie! St. David, Wilson! between Newcastle and Greenwich, J.P. 1440, Hart! Silver Hill, 350J ft., Harris! Fl. Jam. 6536.

Leaves 5-7.5 cm. l., 2-5 cm. br. at base; petiole 1-2 cm. l. *Peduncles* 2-5 cm. l. *Corona*: below the throat, in thread-like divisions much shorter than the sepals, decurrent; median membranous, fringed above, bent inwards, decurrent in whitish raised lines to near the base of the receptacle. *Berry* about 1 cm. in diam.

6. *P. regalis* Macf. *Jam. ii.* 151 (1850); pubescent; stem angled; leaves 3-lobed, median lobe elliptical-oblong, lateral lobes elliptical, half as long as median, apex rounded or retuse, very shortly mucronulate, pubescent beneath, glabrescent on upper surface, papery; petioles more or less pubescent, with 2 shortly stalked glands at a distance of 2-3.5 mm. from leaf; stipules linear-awl-shaped, about 5 mm. l.; peduncles generally twin, slender, much longer than the petiole; flowers scarlet; calyx-tube (receptacle) wider at base; sepals linear; petals wanting; filaments long, flattened-linear; berry not known.—*Griseb. op. cit.* 292.

Between Lucky Valley and Drummond Castle, Port Royal Mts., Macfadyen!

Leaves 3-3.5 cm. l.; petiole 5-12 mm. l. *Peduncles* to 2 cm. l. *Corona*: at the throat, of thread-like divisions very much shorter than calyx; median very short, near the base of the tube, membranous, fringed; basal a narrow ridge.

7. *P. rubra* L. *Sp. Pl.* 956 (1753); pubescent; leaves cordate or subcordate, 2-lobed, sometimes with a third small lobe at apex, lobes triangular, spreading upwards with a broad bay between,

without glands, membranous; petioles without glands; stipules bristle-like, minute; peduncles solitary or twin, each with one greenish-white flower; receptacle saucer-shaped; petals about half as long as sepals; fruit ellipsoidal, reddish, hispid.—*Jacq. Ic. Rar. i. t.* 186; *Cav. Diss. x.* 445, *t.* 268; *Sw. Obs.* 336; *Bot. Reg. t.* 95; *Griseb. op. cit.* 292; *Mast. tom. cit.* 589; *Urb. Symb. Ant. iv.* 426 & *viii.* 453; *Britt. & Millsp. Bah. Fl.* 288. *P. foliis tenuioribus* &c. *Browne Hist. Jam.* 328. *P. erubescens Macf. Jam. ii.* 154 (1850). *Clematitis indica flore clavato* &c. *Plum. Descr.* 68, *t.* 83 & *Ic. orig. ined. t.* 230. *Flos passionis folii media* &c. *Sloane Cat.* 104 & *Hist. i.* 229. Specimen from Browne in Herb. Linn. named by Linnæus and identified with Br. *Hist.* 328, no. 12. Specimen from Jacquin in Herb. Mus. Brit.

Bull Hoof, Dutchman's Laudanum.

Rio Cobre; St. Jago de la Vega; Sloane Herb. iv. 80, 81! *Browne*! *Broughton*! *Bancroft*! *Distin*! St. Mary, *Purdie*! Moneague, *Prior*! *March*! near Gordon Town, *Ball*! Liguanea plain, J.P. 1072, *Hart*! near Castleton, 400 ft., *Thompson*! Bog Walk; Blue Mts.; Port Antonio; Lucea; Porus; *Hitchcock*; Mount Diablo, *Harris*! Fl. Jam. 7981.—Bahamas, West Indies, tropical continental America.

Leaves 2–10 cm. l. along the midrib, 4–10 cm. br. between the apex of the lobes, 3-nerved. *Flowers* 3–4 cm. in diam. *Calyx* about 2 cm. l. *Corona*: at the throat, cut nearly to the base into reddish strap-like divisions, as long as the petals; within this is a very short series, membranous at the base, more or less filamentose above. *Berry* about 2.5 cm. l., marked with 6 longitudinal lines, resembling in size and appearance the common red English gooseberry (*Macfadyen*).

P. capsularis L. appears to be similar, but the fruit has an acuminate apex as figured in *Plum. Amer. (Burm.) t.* 138, f. 2.

8. *P. penduliflora Bertero ex DC. Prodr. iii.* 326 (1828); glabrous; stem angled; leaves somewhat leathery; irregularly semi-elliptical, broader at the apex; shallowly 3-lobed at apex only, glands in two rows beneath, two large ones at base, base obtuse or rounded; petioles without glands, 1.5–2 cm. l.; peduncles longer than the leaf, pendulous, solitary or twin, each with one greenish-yellow bell-shaped flower; calyx-tube longitudinally lobed; gonophore longer than petals; fruit purple, globular-ellipsoidal.—*Macf. Jam. ii.* 155; *Bot. Mag. t.* 4565; *Griseb. op. cit.* 294; *Mast. tom. cit.* 554. *P. lutea* L. *Amœn. v.* 382 (non *Sp. Pl.* 958). *P. rotundifolia* L. *Herb.*; *Sw. Obs.* 337 (non *L. Sp. Pl.* 957). *P. foliis trinerviis* &c. *Browne Hist. Jam.* 328. Specimen in Herb. Linn. from Browne named in Solander's hand *P. rotundifolia*.

Browne! *Wright*! *Macfadyen*! *Distin*! St. Mary, *McNab*! also *Purdie*! *Wilson*! Phoenix Park, Moneague, *Prior*! J.P. 956, 1262, *Morris*! near Troy, 2000 ft.; *Peters Vale*, Westmoreland, 700 ft.; *Harris*! Fl. Jam. 9414, 9941.

Leaves 2.5–6.5 cm. l. along midrib, 2–7 cm. br. at the apex of the lobes. *Peduncles* 7–14 cm. l. *Flowers* 2–3.5 cm. l. *Corona*: at the throat, of one

series filamentose, the threads broader at apex, half as long as the petals, of a deep orange colour, median wanting. *Berry* 2·5 cm. l.

A favourite withe for tying fences.

P. rotundifolia *L. Sp. Pl.* 957 and *P. Swartzii* *Mast. tom. cit.* 556 are allied species. *P. rotundifolia* has leaves pubescent beneath, and peduncles short and not pendulous. It is a native of Guadeloupe and islands further south and of northern S. America. *P. Swartzii* differs in the leaves being broader than long, glabrous, mostly 2-lobed, the peduncles much shorter and not pendulous, the calyx-tube subglobose, sepals and petals white, narrower. It is a native of Dominica.

9. *P. sexflora* *Juss. in Ann. Mus. Par. vi.* 110, *t.* 37, *f.* 1 (1805); puberulous and soft to the touch; leaves subcordate, 3-nerved, 3-2-lobed, lateral lobes triangular, spreading, the middle smaller or very much reduced, without glands; petiole without glands; peduncles twin, each with 3 or more flowers; receptacle saucer-shaped; berry globose, densely puberulous, purple.—*Macf. Jam. ii.* 148; *Griseb. op. cit.* 292; *Mast. tom. cit.* 548. *P. triflora* *Macf. Jam. ii.* 149 (1850). *P. foliis trilobis medio &c.* *Browne Hist. Jam.* 328?

Macfadyen! St. Mary, *Purdie!* *Wulfschlaegel!* Moneague, *Prior!* Cinchona, 5000 ft., *J.P.* 669, 1171; Claverty Cottage, Blue Mts., *J.P.* 969; *Hart!* Cinchona, *Fawcett!* Blue Mts., *Hitchcock!* Moneague, *Lady Blake!* Whitfield Hall, 3000 ft., *Harris!* *Fl. Jam.* 7707.

Leaves variable in size and form, measuring 2-8 cm. along the midrib, and 5-14 cm. from tip to tip of lateral lobes. *Flowers* 1·5-2 cm. in diam. *Corona*: at the throat, outer filaments variegated-purple, as long as the petals, the inner much shorter, erect, the median cup-shaped, with the margin bent inwards. *Berry* 6-8 mm. in diam.

10. *P. triflora* *Macf. Jam. ii.* 149 (1850); stem pubescent, compressed; leaves glabrescent, 3-lobed, lateral lobes acute, diverging, median lobe indistinct, base subcordate, with glands beneath; petioles without glands; peduncles twin, each with 3 flowers; sepals longer than the white petals; corona in 3 series; outer threads purple tipped with white.—*Griseb. op. cit.* 293.

"Between Bath and Maroon Town, Portland," *Macfadyen.*

Leaves 7-8 cm. l. along the midrib, about 14 cm. br. *Bracteoles* small, awl-shaped, sometimes 3-cleft. *Sepals* greenish. *Petals* like the sepals, but shorter and narrower.

We have not seen any specimen of this species.

11. *P. perfoliata* *L. Sp. Pl.* 956 (1753); leaves somewhat leathery, 2-lobed with a much reduced lobe at apex (sometimes wanting), cordate at base with the rounded auricles clasping the stem, lateral lobes diverging, oblong, glabrous, glandular beneath; petiole very short without glands; peduncle solitary, shorter than transverse diameter of leaf; bracteoles thread-like; flowers tubular-campanulate, crimson to reddish-purple; sepals linear, acuminate; petals longer and broader than sepals, oblong-lanceolate; berry globose, fleshy, bluish.—*Sw. Obs.* 334; *Bot. Reg. t.*

78; *Macf. Jam. ii.* 153; *Griseb. op. cit.* 295; *Mast. tom. cit.* 557. *P. foliis trilobis*, cruribus oblongis obtusis intermedio fere obsoleto et setula terminato *Browne Hist. Jam.* 328. *P. divaricata* *L. Mant.* 491 (1771). Flos passionis perfoliatus &c. *Sloane Cat.* 104 & *Hist. i.* 230, *t.* 142, *f.* 3, 4. Specimen from Browne in *Herb. Linn.* named by Linnæus, and identified with Br. *Hist.* 328, no. 10.

Sloane Herb. iv. 82! *Houstoun!* *Browne!* *Wright!* *Broughton!* *Masson!* *Waters!* *Macfadyen!* near Cocoa Walk, St. David; near Carlton, St. Mary; *McNab!* Port Royal Mts., *Purdie!* Blue Mts.; Liguanea hills; Hope Estate; *Prior!* near Gordon Town, *Ball!* Liguanea plain, J.P. 1311; *Mavis Bank*, J.P. 2128; *Hart!* *Mavis Bank*, *Fawcett!* Rock Fort, *Campbell!* Windward road, near Kingston; between Malvern and Mountain Side, 1200 ft.; *Harris!* Fl. *Jam.* 6291, 9516, 9918; Halberstadt, *Norman!*

Leaves: lobes to 6 cm. l., to 3.5 cm. br., 3-nerved. *Flowers* 3-4 cm. l. *Corona*: at the throat, of strap-shaped fleshy threads bending inwards, the inner membranous, divided at apex. *Berry* 1.5-2 cm. in diam.

Var. *normalis* var. *nov.*; leaves with oblong to linear-oblong lobes, to 8.5 cm. l., 1 cm. br., base cordate to retuse or rounded, auricles not overlapping each other.—*P. foliis trilobis cruribus angustis* &c. *Browne Hist. Jam.* 328. *P. normalis* *L. Syst. ed.* 10, 1248 (1759); *Macf. Jam. ii.* 149; *Urb. Symb. Ant. vi.* 109. *P. perfoliata* *Jacq. Hort. Schoenbr. ii.* 28, *t.* 182 (non *L.*). Specimen (type) from Browne named by Linnæus, and identified with Br. *Hist.* 328, no. 11.

Houstoun (Herb. *Sloane* iv. 84*)! *Browne!* *Wright!*

12. *P. taesonoides* *Griseb. Fl. Br. W. Ind.* 295 (1860); glabrous; stem, bark, and flower-structure of *P. oblongata*; leaves broader than long, subtruncate or slightly 3-lobed, 3-mucronulate, base broadly rounded or truncate, with glands beneath; petioles 1.6-1.2 cm. l., without glands; peduncles jointed about the middle, twin or solitary, twice as long as the petiole.

Huntley, Manchester, *Wulfschlaegel.*

Leaves 4-2.5 cm. l. along the midrib, 5-7.5 cm. br. *Peduncles* 2.5-3 cm. l. *Sepals* 2.5-3 cm. l. *Petals* 1.6 cm. l.

We have seen no specimens.

13. *P. oblongata* *Sw. Prodr.* 97 (1788) & *Fl. Ind. Occ.* 1135; glabrous; stem shrubby, cortex of older stems corky with longitudinal furrows; leaves 3-nerved, longer than broad, oblong to elliptical, with 2 or 3 short erect lobes at apex, lobes acute, mucronulate, base rounded or obtuse, with glands beneath, leathery, lateral lobes sometimes long and acuminate (*P. lyræfolia* Tussac), the leaves on the flowering branches much reduced in size; petioles 2 cm. l. and more, without glands; stipules rigid, linear-awl-shaped; flowering branch axillary, sometimes growing from old wood, like a leafy raceme, with numerous flowers, some-

times crowded; peduncles 2 in each axil, 1·7–2·1 cm. l., jointed below the middle; flowers long, bell-shaped, crimson; sepals linear-oblong; petals linear, smaller than the sepals; fruit globose-ellipsoidal.—*Griseb. op. cit.* 295 (incl. var.); *Mast. tom. cit.* 557. *P. oblonga* DC. *Prodr.* iii. 326; *Macf. Jam.* ii. 156. *P. lyræfolia* Tussac *Fl. Ant. i.* 70, t. 4 (1808).

Wright! Broughton! *Dancer!* mts. St. George, Tussac; *Bancroft!* McNab; woods near Mandeville; St. Ann; *Purdiel!* Moneague, *Prior!* March; *Jennan!* Cedar Valley, J.P. 1239, *Morris!* Portland, *Fawcett!* Lacovia, *Tomlinson!* St. George, 2400 ft., *Harris!* Fl. Jam. 5758; Bath, *Norman!*

Leaves on stems 6–18 cm. l., those on flowering branches 1·2–5 cm. l. *Calyx-tube* about 1 cm. l. *Sepals* 2·3–2·4 cm. l. *Petals* 1·7–2 cm. l. *Corona*: at the throat filamentose, threads 2·5 mm. l.; median membranous, bent downwards, 5–6 mm. l. reaching to base of gonophore. *Gonophore* about 2 cm. l. in fl., about 3 cm. in fruit. *Berry* 1·8–3 cm. l.

14. *P. Murucuja* L. *Sp. Pl.* 957 (1753); leaves membranous, 3(5)-nerved, 2-lobed, base obtuse or truncate, lobes oblong, diverging, glabrous, glandular beneath; petiole short, without glands; peduncles twin or solitary, 2 or 3 times as long as the petiole; bracteoles thread-like; flowers crimson; petals shorter and narrower than the sepals; receptacle divided at the base by 10 parallel partitions into as many cells; fruit ellipsoidal.—*Cav. Diss. x.* 456, t. 287; *Sw. Obs.* 336; *Bot. Reg. t.* 574; *Descourt. Fl. Ant. i.* 265, t. 62; *Griseb. op. cit.* 295; *Mast. tom. cit.* 557; *Urb. Symb. Ant. viii.* 454. *Murucuia ocellata* Pers. *Syn. ii.* 222 (1806); *Tussac Fl. Ant. ii.* 24, t. 7; *Macf. Jam. ii.* 160 (excl. syn. *Browne*). *Clematitis Indica* flore puniceo &c. *Plum. Descr.* 72, t. 87. Specimen in Herb. Linn. named by Linnæus. Specimens from Swartz collected in Hispaniola in Herb. Mus. Brit.

Tussac; Bancroft (fide *Grisebach*); rare, east end, *Macfadyen*.—Cuba (fide *Grisebach*), Hispaniola.

Leaves variable in size, length of midrib 8–16 mm. l., breadth between apex of lobes 3–5 cm. *Calyx-tube* 4–6 mm. l., lobes 2·5–3 cm. l. *Corona*: tubular, entire, nearly half as long as calyx. *Gonophore* exserted. *Berry* 1·5–2·5 cm. l.

Flos passionis major pentaphyllus *Sloane Cat.* 104 & *Hist. i.* 229 with the specimen in Herb. Sl. iv. 78, is not a species of *Passiflora*, but is *Cionosicya pomiformis* *Griseb.* (*Cucurbitaceæ*).

Passiflora foliis quinquelobis profunde divis, lobis oblongis *Browne Hist. Jam.* 323 is identified by Browne with *P. cærulea* L., and he speaks of it as a “native of the cooler woods.” *P. cærulea* is not a native and is not cultivated, so far as we know, in Jamaica. Browne’s plant is probably also *Cionosicya pomiformis*.

FAMILY LXXIX. CARICACEÆ (PAPAYACEÆ).

Trees or shrubs, erect, trunk usually unbranched, thick, spongy, with a terminal crown of leaves, with milky juice. Leaves alternate, petiolate, subpeltately palmate or digitately

5-12-foliolate. Stipules wanting. Inflorescence axillary. Flowers white, yellow, or greenish, unisexual, or a few in the inflorescence hermaphrodite. Perianth of male and female unlike. Male flowers in a cymose-racemose panicle: calyx very small, 5-lobed. Corolla with a long slender tube and a flat limb; lobes valvate or twisted in bud. Stamens 10, inserted in the corolla-tube; anther-cells opening inwards, with the connective often produced beyond the cells. Female flowers solitary, or crowded in a few-flowered cymose panicle: calyx as in the male flower. Petals 5, soon falling. Staminodes wanting. Ovary free, sessile, 1-celled, or with false divisions 5-celled; style wanting or short, with 3-5 stigmas, dilated or linear, simple or lobed; ovules indefinite, rarely few, attached to 5 placentas. Berry fleshy, furrowed or angular, with indefinite seeds.

Species 40, native of tropical America.

CARICA L.

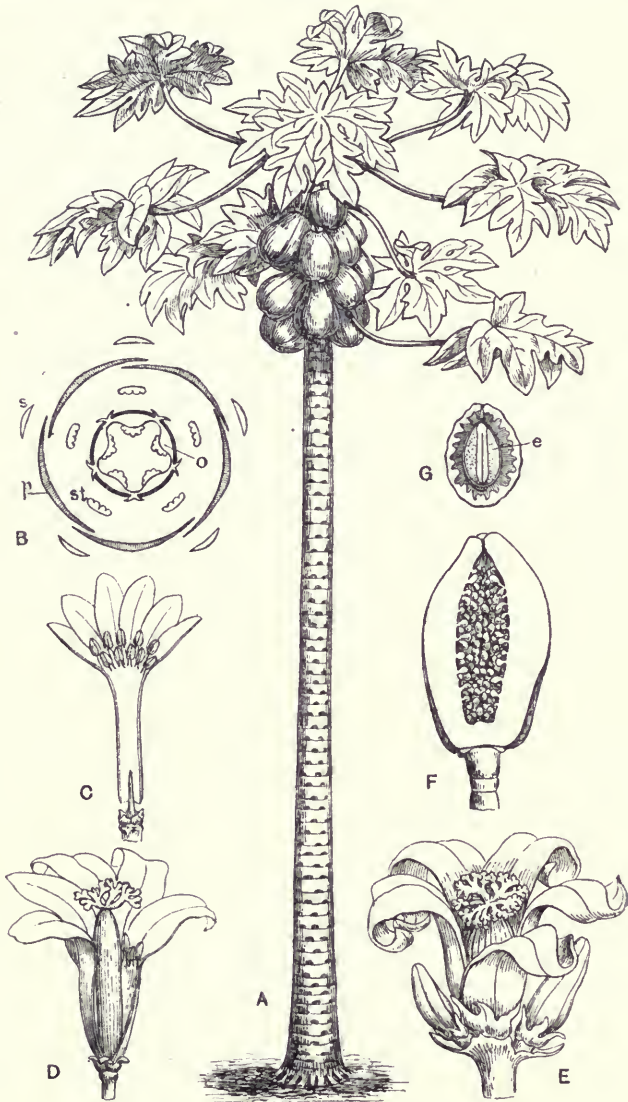
Leaves spreading, subpeltately palmate, sometimes digitately 7-9-foliolate, rarely oblong. Racemes often with long peduncles. Corolla-lobes of male flower oblong or linear. Stamens 10, inserted in the throat of the corolla, 5 alternating with the lobes of the corolla with short filaments, 5 opposite the lobes, sessile; anthers adnate to the filament. Rudiment of the ovary awl-shaped. Petals of the female flower linear-oblong. Style wanting or very short; stigmas 5, dilated or linear, simple or lobed. Berry pulpy within, not opening.

Species 35, natives of tropical America.

1. *C. Papaya* L. *Sp. Pl.* 1036 (1753) & *Amœn. v.* 383; *Sw. Obs.* 378; *Wright Mem.* 305; *Bot. Reg. t.* 459; *Bot. Mag. tt.* 2898, 2899; *Lunan Hort. Jam.* ii. 36; *Griseb. Fl. Br. W. Ind.* 290; *Solms-Laubach in Fl. Bras. xiii. pt.* 3, 188, t. 49; *Koehler Med. Pflanz.* 33, 34, tt. 1, 2; *Watt Dict. Econ. Pr. Ind.; Engl. & Prantl Pflanzenfam.* iii. 6 a, 95-98, fig. 33-36; *Urb. Symb. Ant.* iv. 428 & viii. 456; *Agric. News xix.* 246; *Britt. Fl. Berm.* 250; *Britt. & Millsp. Bah. Fl.* 289. *C. fronde &c. Browne Hist. Jam.* 360. *Papaya major flore et fructu minoribus &c. Sloane Cat.* 203 & *Hist. ii.* 166. *P. major flore et fructu majoribus &c. Sloane Cat.* 202 & *Hist. ii.* 164. *Papaya Hughes, Barbados,* 181, tt. 14, 15; *Trew Pl. Select. t.* 7. *P. sativa Tussac Fl. Ant.* iii. 45, tt. 10, 11 (1824); *Descourt. Fl. Ant. i.* 215, tt. 47, 48. *Papaw Rev. J. Lindsay Ic. & Ms. ined.; A. Robinson Ic. & Ms. ined.* Specimen in Herb. Linn. named by Linnæus. (Fig. 94.)

Papaw Tree.

Sloane Herb. vii. back of 88! *Houstoun! Distin! Moneague, Prior!—*

Fig. 94.—*Carica Papaya* L.

A, Female tree, much reduced.

B, Diagram of hermaphrodite flower; s, sepal; p, petal; st, stamen; o, ovary.

C, Male flower cut open, enlarged.

D, Hermaphrodite flower cut open, enlarged.

E, Female flower, somewhat enlarged.

F, Young fruit cut open, showing seeds.

G, Seed cut lengthwise; e, endosperm; enlarged.

(A, B, F after Fl. Bras.; C, D, E after Koehler Med. Pflanz.; G after Engler & Prantl Pflanzenfamilien.)

Cultivated and subspontaneous in S. Florida, Bahamas, and West Indies. Native country unknown, cultivated throughout the tropics.

Tree, 6-20 ft. high; trunk hollow, soft, 4-24 inches in diam., marked with the scars of the fallen leaves; dioecious or polygamous. *Leaves* 1.5-3.5 dm. l., deeply cut into 5-7 segments; segments usually more or less lobed; petiole very long. *Inflorescence*: male and polygamous pendulous, with long peduncle, cymose-paniculate, panicle more or less ample; female very short, generally cymose-3-flowered. *Flowers*: corolla twisted in bud; male 2-3.5 cm. l., elongate-tubulose, yellowish, odorous; female 4-5 cm. l., with corolla cut almost to base. *Ovary* 1-celled; stigma 5-rayed, each ray with several flattened lobes. *Fruit* shortly stalked, pendulous, varying in colour when ripe, from green or yellow with or without red markings, to purple; form ovoid, roundish, pear-shaped, or ellipsoidal; varying in size from a few ounces to 25 pounds weight; flesh a shade of yellow, sometimes reddish; cavity ample or small, with many seeds, or few, or none. *Seeds* ellipsoidal, rough, angular, 6-7 mm. l., enclosed in a membranous aril and in pulp.

The juice of the papaw fruit and leaves contains an enzyme (papain) which has an energetic digestive action on proteins, and like pepsin curdles milk. Papain is a commercial product and is used medicinally. In the tropics, in order to make meat tender, it is washed in water containing some of the papaw juice, or it is wrapped in the leaves of the papaw for a few hours. The fruit varies very greatly in size and quality, sometimes it is large and sweet, sometimes coarse and hardly edible. The better qualities are wholesome and are eaten with sugar and lime juice, or with pepper and salt. (See G. Watt's Commercial Products of India, 269, 270.)

2. *C. jamaicensis* Urb. *Symb. Ant. vi.* 20. *C. sylvestris* minor, lobis minus divisis, caule spinis inermibus opposito *Browne Hist. Jam.* 360. *C. posoposa* L. *Amœn. v.* 383 & *Sp. Pl. ed. 2*, 1466 (1763) (only with reference to syn. *Browne*) (non L. *Sp. Pl.* 1036). *C. prosoposa* (sic) *Lun. Hort. Jam. ii.* 38 (1814)? *Griseb. Fl. Br. W. Ind.* 290? *Papaya* minor, flore et fructu minoribus, pediculis curtis (fem.) et longis (masc.) insidentibus *Sloane Cat.* 203 & *Hist. ii.* 166. *Wild Papaw* A. *Robinson Ic.*

Wild Papaw.

Sloane Herb. vii. 89! Schwallenburg, St. Ann; Glasgow, near Troy, 2000 ft.; *Harris* Fl. Jam. 7020, 10,673.

Tree to 15 ft. high, but also said to flower and fruit when 4 or 5 ft. high. *Leaves* of female plant to 6 dm. l., with a deep bay at base, with 7 lobes palmately cut to two-thirds or more of their length, lobes shortly acuminate, the lower 2 entire, the rest with 5-7 lobes pinnately cut to three-fourths of their length; of male plant the leaves 1-2.5 dm. l., the terminal lobe with 5 lobules not deeply cut, the rest entire, or with only one or two short lobules. *Male inflorescence* like that of *C. Papaya*, also the flowers though somewhat smaller. *Female fruiting inflorescence*: peduncle to 5 mm. l., bearing 1 to 6 fruits closely crowded; pedicels almost none or to 5 mm. l. *Fruit* globose or ovate-globose, apiculate or shortly acuminate, on specimen 2.3 cm. l., 2 cm. thick, 1-celled, filled with the seeds; placentas (as in *C. Papaya*).

A. Robinson in *Ic. ined.* figures the female flower of "Wild Papaw" about 4 cm. l., the pistil about 3 cm. l., stigmas with 3-5 small lobes; fruit 5-7 cm. l.

FAMILY LXXX. LOASACEÆ.

Herbs, rarely shrubs or trees, erect or twining, branching in a forked manner, generally with barbed hairs, barbs in whorls, sometimes stinging. Leaves opposite or alternate, entire, lobed, pinnately cut, or 2-3-pinnatifid. Stipules wanting. Flowers regular, hermaphrodite, solitary, or generally cymose; peduncles often opposite the leaves. Calyx: lobes 5 (4-7), slightly overlapping or generally open, persistent. Petals equal in number to sepals. Staminodes none or present, alternating with the petals. Stamens generally indefinite, inserted with the petals; filaments free or often in clusters opposite the petals. Anthers opening laterally or inwards. Ovary usually inferior, 1-celled. Style entire or 2-3-cleft; stigma a point, or capitate, or marked with 3-5 striæ. Ovules one or more, attached at the apex of the ovary or to placentas on the walls of the ovary, pendulous, anatropous. Fruit usually a capsule, 1(2, 3)-celled, 3-7-valved at the apex or longitudinally, valves alternating with the placentas. Seeds 1 or more, varied in form and size; endosperm wanting or generally present, fleshy. Embryo straight or curved, linear, oblong, or cylindrical; cotyledons plano-convex, leafy or hemispherical.

Species over 220, almost all natives of America, three in the West Indies, one in south and east Africa and Arabia.

MENTZELIA L.

Herbs, shrubs or trees, rough with hairs (not stinging). Leaves alternate or rarely opposite. Inflorescence terminal, cymose. Flowers often large, golden-yellow or white. Calyx-lobes 5, persistent. Petals 5, overlapping in bud. Stamens indefinite, equal or the exterior petaloid-dilated. Ovary 1-celled; style thread-like, long, with more or less indistinct longitudinal stigmatic striæ; ovules indefinite, inserted on 3-5 placentas on the ovary-walls. Capsule top-shaped, club-shaped, or cylindrical, with few or many seeds; apex 3-7-valved. Seeds angular, flattened, or winged, smooth or roughish; endosperm not large, or scanty, or wanting. Embryo straight; cotyledons flat, oblong; radicle cylindrical.

Species about 60, natives of America, mainly tropical and subtropical, especially in the west.

M. aspera L. *Sp. Pl.* 516 (1753) & *Amœn.* v. 379; *Macf. Jam.* ii. 162; *Griseb. Fl. Br. W. Ind.* 298; *Urb. in Nov. Act. Leop.-Carol. Akad. Naturf.* lxxvi. 43, t. 2, f. 17-19, *Symb. Ant.* iv. 428

& viii. 457. *M. setis* &c. *Browne Hist. Jam.* 249. *M. foliis* &c. *Plum. Gen.* 41, t. 6. Specimen from Browne in Herb. Linn. named in Solander's hand.

Among bushes in savannas about Kingston, *Browne!* *Wright!* hedges round Kingston, *Broughton!* dry thickets on southside, *Macfadyen!* Liguanea plain, *McNab!* Kingston, *Prior!* also *Hitchcock!*—Cuba, Hispaniola, Porto Rico, St. Lucia, Bonaire, Curaçao, Aruba, warmer regions of continental America.

An annual herb, 1-4 ft. high. Stem erect, usually densely covered with barbed hairs, barbs in whorls (Fig. 95, c) and with spine-like hairs (Fig. 95, h).

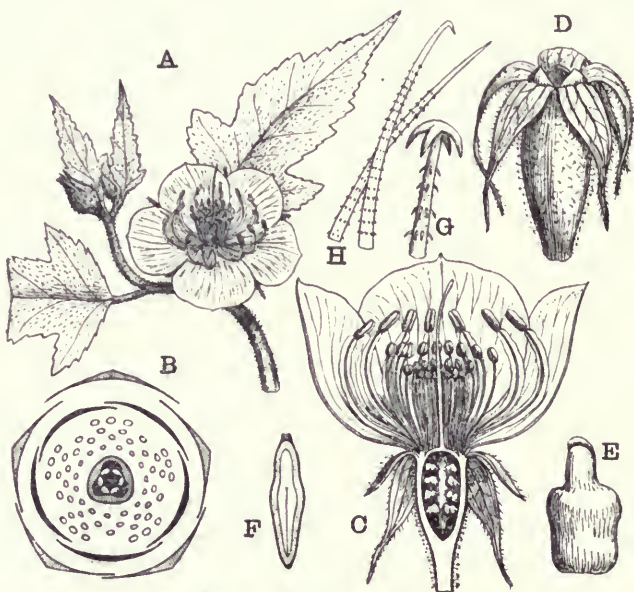


Fig. 95.—*Mentzelia aspera* L.

- | | |
|--|--|
| A, Portion of flowering branch, nat. size. | E, Seed seen from the flat side $\times 6$. |
| B, Diagram of flower of <i>M. aurea</i> Baill. | F, Ditto seen from the narrow side, cut |
| C, Flower cut lengthwise of <i>M. hispida</i> | lengthwise, $\times 6$. |
| Willd., nat. size. | G, Hair from stem and fruit, highly |
| D, Fruit opening at apex of <i>M. hispida</i> | magnified. |
| $\times \frac{1}{2}$. | H, Hairs from stem, highly magnified. |

(B after Eichler.)

Leaves, the lowest to 15 cm. l., becoming gradually smaller upwards, alternate, triangular-ovate, or ovate to lanceolate, acute or shortly acuminate, serrate or deeply cut to semi-3-lobed, rough with hairs on both sides, hairs spine-like and sometimes with whorls of barbs; petiole 2-5 cm. l. *Calyx-lobes* 5-9 mm. l., erect and persistent in fruit. *Petals* united at the base with the stamens into a ring, longer than the calyx-lobes, yellow. *Stamens* 20-30, the outer filaments flattened, all fertile. *Capsule* cylindrical narrowing slightly downwards, sessile, about 2 cm. l., very rough with barbed hairs (Fig. 95, g), erect, somewhat papery in texture. *Seeds* 6-9, not winged.

FAMILY LXXXI. BEGONIACEÆ.

Herbs or shrubs, usually perennial in W. Indian species, with woody stem or sometimes succulent; stem erect, simple or branching, sometimes tall or reduced to a tuberous rhizome, rarely climbing. Leaves alternate, very rarely somewhat whorled, entire, lobed, or digitately parted, with **unequal** sides, toothed, sometimes peltate. Stipules 2, free, **often** persistent. Peduncles axillary, divided into unisexual or bisexual cymes; bracts and bracteoles generally opposite. Flowers monœcious, usually not symmetrical. Male flowers: Perianth-segments (in *Begonia*) free, 2 or 4; outer generally 2, opposite, valvate; inner usually 2 or wanting. Stamens (in *Begonia*) indefinite, inserted on the receptacle; filaments free or united. Female flowers: Perianth segments (in *Begonia*) 2-5, rarely more, free, overlapping. Ovary inferior (in *Begonia*), usually 3-celled, and 3-winged or 3-cornered, more rarely 2-celled, exceptionally more; placentas usually on the axis of the ovary, projecting into the cell, rarely on the walls, simple or divided, rarely branching. Styles usually as many as cells of ovary, free or united at base, usually 2-cleft. Ovules very numerous, anatropous. Fruit a capsule usually 3-cornered or unequally 3-winged, opening loculicidally below the perianth-limb (in *Begonia*), rarely fleshy and berry-like, bursting irregularly. Seeds very numerous, minute; coat net-veined; endosperm thin or wanting. Cotyledons very short; radicle cylindrical.

Species about 600, natives of tropical America, Asia, and Africa, also of subtropical S. Africa, rare in the islands of the Pacific Ocean; with the exception of a few, all included in the genus *Begonia*.

BEGONIA L.

Wood Sorrel.

Plants climbing. Stigmas papillose on all sides.

Placenta entire 1. *B. glabra*.

Plants not climbing. Stigmas papillose on a spiral band.

Leaves fleshy. Placenta divided. Perennials.

Stamens 30-50 2. *B. minor*.

Stamens 8-22.

Bracteoles of female fl. dentate-serrate, ciliate.

Capsule with the smaller wings broadest above, their upper margin straight, level with that of larger wing 3. *B. acutifolia*.

Bracteoles of female fl. entire. Capsule with

the smaller wings much narrower, rounded, **generally crescentic** 4. *B. purpurea*.

Leaves membranous. Placentas divided or entire.

Plants without a distinct stem. Perennial 5. *B. Purdieana*.

Plants with stem. Annual 6. *B. humilis*.

1. *B. glabra* Aubl. *Pl. Guian.* ii. 916, t. 349 (1775); stem climbing; leaves broadly ovate to roundish, shortly acuminate, base rounded or obtuse, irregularly toothed or crenate; stamens

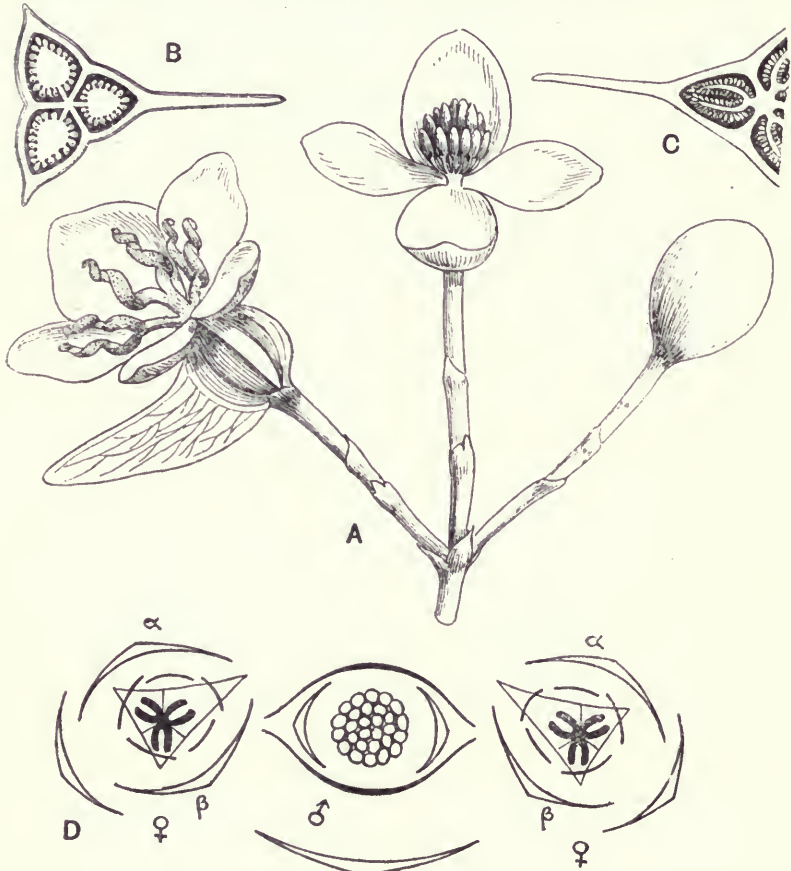


Fig. 96.—*Begonia*.

A, Portion of inflorescence of *B. glabra* Aubl., showing a central male flower, a female flower, and a male flower-bud, $\times 6$.
B, Ovary cut across, enlarged.

C, Ovary of *B. acutifolia* Jacq., enlarged.
D, Plan of an ultimate branch of the inflorescence of *B. acutifolia* Jacq. (stamens too many).
(D after Eichler.)

10–17; capsule: largest wing broader above, obtuse or acute or broader in middle, the other wings very narrow.—*O. E. Schulz in Symb. Ant. vii. 4.* *B. obliqua* L. *Amæn. v. 383* (with reference to *Browne Hist. 203*). *B. scandens* Sw. *Prodr. 86* (1788), *Fl. Ind.*

Occ. 992, & *Ic. ined. t.* 14; *Dryander in Trans. Linn. Soc. i.* 168; *Griseb. Fl. Br. W. Ind.* 305; *A. DC. Prodr. xv. pt.* 1, 362. *Rumex sylvestris scandens* &c. *Browne Hist. Jam.* 203 (excl. syn.). Specimen from Aublet in Herb. Mus. Brit. (Fig. 96, A, B.)

Sloane Herb. iii. 121 (in part)! *Wright!* *Broughton!* *Shakespear!* *Swartz;* *Wiles!* Hopewell, St. Ann, *McNab!* *Distin!* *Purdie!* Ocho Rios ravine, *Prior!* Blue Mts., J.P. 971, *Hart!* Ramble, Claremont, 1700 ft., *Fawcett & Harris!* Holly Mount, 2600 ft.; *Lapland, Catadupa,* 1400 ft.; *Walderston, Manchester,* 2600 ft.; *Harris!* above Gordon Town, *Miss R. Capper!* Cockpit Country, *Norman!* Fl. Jam. 7011, 8880, 9171, 12,860.—Cuba, Dominica, Trinidad, Central America, tropical S. America (except Brazil).

Stem climbing on mossy trees and rocks, rooting at the nodes. *Leaves* 5-14 cm. l.; *petioles* 3·5-1 cm. l.; *stipules* oblong-ovate, 2-1 cm. l., persistent. *Bracteoles* under the female flower lanceolate, 1·5-2 mm. l. *Flowers* white. *Male flowers:* *Perianth-segments:* outer 2, 3·5-4 mm. l., inner 2, 3·3-5 mm. l. *Female flowers:* *Perianth-segments* 5, 3-5 mm. l. *Capsule* 7-11 mm. l., 4-6 mm. br., the largest wing 8-14 mm. br.

2. *B. minor* *Jacq. Collect. i.* 126 (1786) (excl. syn. *Plum.*) & *Ic. Pl. Rar. iii.* 18, *t.* 618; leaves obliquely ovate, cordate, or kidney-shaped, apex acute or shortly acuminate, subentire-wavy, glabrous; *stamens* 30-50; *capsule*, the largest wing broader above, obtuse, the other wings much narrower, broader towards the middle.—*O. E. Schulz tom. cit.* 9. *B. obliqua* *L'Hérit. Stirp. Nov. 95, t.* 46 (1788) (excl. syn.). *B. nitida* *Ait. Hort. Kew. iii.* 352 (1789) (excl. syn. *Sw.*); *Dryander tom. cit.* 159 (excl. syn. *Sw.*); *Sw. Fl. Ind. Occ.* 996; *Descourt. Fl. Ant. v.* 153, *t.* 344; *Bot. Mag. t.* 4046; *Griseb. op. cit.* 304.

Wright! *Broughton!* *McNab!* in mts., *March;* *Metcalfe!* *Morris* J.P. 896! *Blue Mt. Peak, Hitchcock;* *Cinchona, G. E. Nichols!*

Stems woody, to 3 or 4 ft. high, spreading from the base, glabrous, reddish-brown. *Leaves* 15-8(-20) cm. l., glossy, nerves about 8; *petioles* 4-1·5(-7) cm. l.; *stipules* 2·5-1·5 cm. l.; *ovate-lanceolate*, mucronate, very soon falling. *Bracteoles* under the female flower broadly elliptical, 5 mm. l. *Male flowers:* *Perianth-segments:* outer 2, suborbicular, base cordate, 15-13 mm. l., pink; inner 2, oblong, obovate, white or pink. *Female flowers:* *Perianth-segments* 5, obovate, 7·5-13 mm. l., white. *Capsule* 15-18 mm. l., 9 mm. br., the largest wing 17-20 mm. br.

3. *B. acutifolia* *Jacq. Collect. i.* 128 (1786) (excl. syn. *Plum.*); leaves oblong-lanceolate to oblong-elliptical, acuminate, base half-cordate, margin ciliate, unequally toothed, teeth at end of nerves much larger and mostly pointing upwards, hairy on nerves beneath; *stamens* 12-17; *capsule*, largest wing broadest above, obtuse, the others narrower, broader above, the upper margins of all on the same level.—*Dryander tom. cit.* 165; *O. E. Schulz tom. cit.* 13. *B. obliqua* *L. Sp. Pl.* 1056 (1753) (so far as it refers to syn. *Sloan.*); *B. acuminata* *Dryander tom. cit.* 166, *t.* 14, *f.* 5, 6 (1791); *Bot. Reg. t.* 364; *Bot. Mag. t.* 4025; *Griseb. op. cit.* 304. *Aceris fructu herba anomala flore tetrapelalo*

albo *Sloane Cat.* 83 & *Hist. i.* 199 (in part) *t.* 127, *f.* 1, 2. (Fig. 96, c, d.) Dryander's type of *B. acuminata* in Herb. Mus. Brit.

Woods by Hope R., and Rio Cobre, *Sloane Herb.* iii. 121 (in part)! *Wright!* *Masson!* *Swartz;* *von Rohr!* *Bancroft!* *McNab!* *March!* Mt. Diablo, *Prior!* Cinchona, 5000 ft., J.P. 1353, *Morris!* also *Harris!* also *Clute!* Brandon Hill road, near Castleton, *Thompson!* Fl. Jam. 8095, 9148; Blue Mt. Peak; Bog Walk; *Hitchcock;* Clyde River, below Cinchona, 4000 ft., *G. Nichols!*

Stems woody, to 2 ft. high, glabrous, purplish-brown. *Leaves* 10–5 cm. l.; petioles 2.5–1 cm. l., hairy or glabrescent; stipules ovate-lanceolate, mucronate, 8–10 mm. l., persistent. *Bracteo*le under the female flower elliptical, serrate, ciliate, 5 mm. l. *Male flowers:* *Perianth-segments:* outer 2, roundish-ovate, 12–17 mm. l., pink; inner 2, much narrower, oblong-obovate, 10–14 mm. l., white. *Female flowers:* *Perianth-segments* 5, narrowly elliptical, unequal, 8–15 mm. l., white or pink. *Capsule* 8–14 mm. l., 1–2 cm. br.

4. *B. purpurea* Sw. *Prodr.* 86 (1788) (excl. syn.); leaves oblong-elliptical to oblong-lanceolate, usually acuminate, base half-cordate or irregularly cordate, irregularly serrulate, sometimes subentire, usually glabrous; stamens 8–10; capsule, largest wing broadest above, obtuse-angled, the other wings much narrower, rounded, generally crescentic.—*O. E. Schulz tom. cit.* 16. *B. acutifolia* Sw. *Fl. Ind. Occ.* 994 (1800) (excl. all syn. except *B. purpurea*); *Griseb. loc. cit.* (excl. hab. Porto Rico) (non *Jacq.*). *B. jamaicensis* A. DC. in *Ann. Sc. Nat. sér.* 4, xi. 124 (1859) & *Prodr. xv. pt.* 1, 297.

Wood-sorrel.

On limestone rocks; *Swartz;* *Bancroft;* Fairfield, *Wulfschlaegel;* Mt. Diablo, *Prior!* Holly Mount, 2600 ft.; Walderston, 2000 ft.; Tyre, near Troy, 2200 ft.; Lapland, near Catadupa, 1900 ft.; Peckham, Clarendon, 2000 ft.; *Harris!* Fl. Jam. 6690, 8308, 9033, 9157, 12,813.

Stems woody, 2–4 ft. high, glabrous. *Leaves* 5–11 cm. l.; petioles 1–2 cm. l.; stipules oblong, mucronate, 9–8 mm. l., soon falling. *Bracteo*les under the female flower oblong-elliptical, 9 mm. l., red. *Male flowers:* *Perianth-segments:* outer 2, ovate, pink or purple, 7–11 mm. l.; inner elliptical, white, narrower. *Female flowers:* *Perianth-segments* 5, 6–9 mm. l., outer red, inner white or pink. *Capsule* 8–12 mm. l.; largest wing 13–25 mm. br.

5. *B. Purdieana* A. DC. in *Ann. Sc. Nat. sér.* 4, xi. 124 (1859) & *Prodr. xv. pt.* 1, 297; stemless; leaves membranous, obliquely ovate, acute or shortly acuminate, cordate, irregularly crenate, with scattered hairs on both sides; petioles sparsely hairy; stamens 8 or more; capsule, largest wing broader above, sub-acute-angled, the other wings narrower, broadest above.—*Griseb. op. cit.* 305; *O. E. Schulz tom. cit.* 24. Type (unique specimen) in Herb. Kew.

In fl. and fr. Jan.; Hanover, *Purdie!*

Stemless herb. *Stock* about $\frac{1}{2}$ inch long, covered with roots and stipules. *Leaves* 8.5–9.5 cm. l., $\frac{1}{2}$ cm. br.; petioles 2–6 cm. l.; stipules

oblong-lanceolate, about 1 cm. l. *Scapes* 11-18 cm. l., with 5-7 flowers at apex. *Flowers* white. *Male flowers*: *Perianth-segments*: outer 2, elliptical, 6 mm. l.; inner 2, obovate, scarcely shorter. *Female flowers*: *Perianth-segments* 5, obovate, 3-5 mm. l. *Capsule* 8 mm. l.; largest wing 12-15 mm. br., other wings about 4 mm. br.

6. *B. humilis* Dryander in Ait. Hort. Kew. iii. 353 (1789); annual? herbaceous; stem and branches glabrous; leaves obliquely ovate to oblong-ovate, acute, base slightly cordate, margin ciliate, unequally crenate-serrulate; stamens 8-15(-20); capsule, the largest wing rounded, broadest above, the others rounded, only half as broad, broadest above or towards the middle.—*Dryander tom. cit.* 166, t. 15; *Hook. Exot. Fl. i. t.* 17; *Griseb. op. cit.* 304; *O. E. Schulz tom. cit.* 26.

Jamaica (without locality) McNab! in Herb. R. Bot. Gard. Edinburgh.—Tobago, Trinidad.

Herb, possibly an annual, 1-2 ft. high. *Leaves* 11-3 cm. l., hairy on upper surface with flattish hairs, 1 mm. l.; petioles 4-1 cm. l., hairy only at apex; stipules oblong-ovate, more or less serrulate and ciliate, with a long hair-like tip, 7-5 mm. l. *Bracteoles* under the female flower 1-1.5 mm. l., often remote from the ovary. *Flowers* white. *Male flowers*: *Perianth-segments*: outer 2, roundish or transversely oval, 4 mm. l.; inner 2, very narrow, sublinear, 3 mm. l., sometimes wanting. *Female flowers*: *Perianth-segments* 5, oblong-obovate, 2-4 mm. l. *Capsule* 6-10 mm. l.

We consider that its occurrence in Jamaica requires confirmation.

B. hirtella Link, a native of tropical S. America, Guadeloupe, and Martinique, is quoted doubtfully from Jamaica on a garden specimen from Hort. Soc. Lond. in Lindley's Herbarium, but there is no direct evidence of its occurrence in Jamaica.

B. peponifolia Visiani, a plant cultivated in various botanic gardens, has been ascribed to Jamaica, but we have no evidence of its occurrence.

FAMILY LXXXII. CUCURBITACEÆ.

Herbs or undershrubs, annual or with a perennial root, rarely shrubs; stems climbing or prostrate. Leaves alternate, simple, palmately-lobed or -partite, or pedate, usually cordate and membranous. Tendrils, when present, lateral, next the flower-stalks. Flowers monœcious, or rarely diœcious, usually regular, racemose, paniculate, or solitary. Calyx-tube (receptacle) bell-shaped or tubular; limb with 5 (3 or 6) overlapping lobes. Petals 5 (3 or 6), free or united. Stamens free or variously united, usually 3, of which one has a 1-celled anther, the others 2-celled anthers. Anthers free, cohering, or confluent into a head; cells flexuose (bent upwards and downwards), or (in *Melothria*) straight or curved, or (in *Fevillea*) oblong. Ovary inferior, or with the apex free (in *Sechium*), usually of 3 carpels, 3-celled, rarely 1-2 or apparently 4-6-celled; placentas usually meeting in the axis of the ovary. Ovules generally horizontal in West Indian species, but erect in *Cayaponia*, pendulous in *Sechium* and

Fevillea, usually on the sides of the placentas next to the wall of the ovary and immersed in pulp. Fruit usually berry-like, fleshy or corky, not opening, but in *Momordica* opening by valves, in *Luffa* by a lid; 1-celled through the partitions or placentas dissolving into pulp, but *Luffa* 3-celled and fibrous inside. Seeds indefinite in number or few or only one (in *Serchium*), without endosperm. Cotyledons foliaceous. Germination takes place on the surface of the ground.

Species 800, natives of the warmer regions, especially of the tropics.

Petiole 2-glandular where it joins leaf-blade. Fruit woody outside, with spongy flesh..... [*Lagenaria*.]
Petiole not glandular.

Flowers: male racemose, female solitary.

Leaves entire, angled, or shortly 3-5-lobed.

Tendrils simple. Fruit small, berry-like..... 1. *Melothria*.

Tendrils branched. Fruit large, fleshy, not opening, seed protruding..... 2. *Serchium*.

Leaves 5-7-lobed.

Tendrils simple. Fruit fleshy, orange-coloured ... [*Momordica*.]

Tendrils 3-branched. Fruit dry, cylindrical, fibrous inside, opening by a lid [*Luffa*.]

Flowers: male clustered, rarely solitary, female solitary; leaves deeply 5-lobed, lobes obovate; tendrils simple. Fruit fleshy, not opening, prickly 3. *Cucumis*.

Flowers all solitary (rarely clustered).

Leaves deeply 3-lobed, lobes lobulate; tendrils 2-branched. Fruit oblong or globose, fleshy, not opening [*Citrullus*.]

Leaves entire or 3-lobed; tendrils simple, tips dilated. Fruit globose, not opening, size of an orange, perianth thin..... 4. *Cionosicya*.

Leaves deeply 3-5-lobed, lobes acuminate; tendrils 3-branched, tips dilated. Fruit as in No. 4 5. *Sicana*.

Flowers in panicles. Leaves entire or more or less 3-5-angled or -lobed.

Male and female flowers on same panicle. Tendrils 2-3-branched. Fruit small, berry-like..... 6. *Cayaponia*.

Male and female flowers in panicles on separate plants. Tendrils 2-branched at apex. Fruit large, woody outside, marked with the scar of the fallen calyx..... 7. *Fevillea*.

This key applies only to species found in Jamaica.

1. MELOTHRIA L.

Herbs climbing or prostrate, slender, annual or with a perennial rootstock. Leaves entire or more or less lobed. Tendrils slender, usually simple. Flowers small, yellow or white, monœcious (in Jamaican species) or diœcious. Male fls. racemose, very rarely solitary. Calyx-tube bell-shaped. Sepals 5, tooth-like. Corolla deeply 5-parted. Stamens 3 (5), inserted on the calyx-tube; anthers, one 1-celled, the rest 2-celled, sometimes

all 2-celled ; cells usually straight. Rudiment of ovary globose or ring-like. Female fls. solitary or clustered (in W. Indian species), usually with a long slender stalk. Calyx and corolla as in male. Stamynodes 3 or wanting. Ovary constricted below the flower, with 3 placentas ; style surrounded at base by a ring-like disk, with 3 stigmas ; ovules numerous, horizontal. Fruit small, berry-like. Seeds ovoid or oblong, usually compressed.

Species 85, natives of tropical and subtropical regions.

Leaves 5-10 cm. l., base with a roundish bay 1. *M. guadalupensis*.
Leaves 4-5 cm. l., base with a narrow bay 2. *M. fluminensis*.

1. *M. guadalupensis* Cogn. in *DC. Monogr. iii.* 580 (1881) & in *Engl. Pflanzenr. Cucurb.-Fevill.* 83 ; *Urb. Symb. Ant. iv.* 610 &

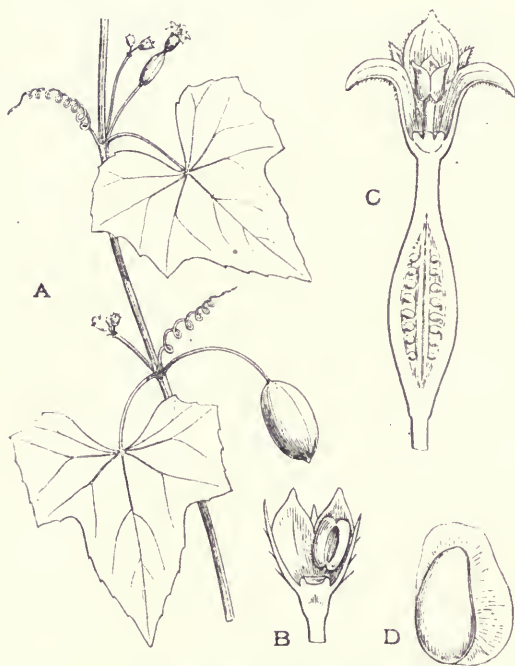


Fig. 97.—*Melothria guadalupensis* Cogn.

A, Portion of branch with leaves, flowers, and fruit, $\times \frac{1}{2}$. C, Female flower of ditto cut lengthwise $\times 3$.
B, Male flower of *M. cucumis* Vell., cut lengthwise, one stamen removed, $\times 5$. D, Seed of *M. guadalupensis* Cogn. $\times 4$.

viii. 694 ; *Britt. & Millsp. Bah. Fl.* 426. *M. scandens* &c. *Browne Hist. Jam.* 124. *M. foliis cordatis* &c. *Plum. Pl. Amer. (Burm.)* 55, t. 66, f. 2. (excl. syn.) & *Ic. Original ined. iv.* 205. *M. pendula*

L. Sp. Pl. 35 (1753) (with regard to syn. *Sloane*. & hab. Jamaica), *Syst. ed.* 10, 861 & *Amœn. v.* 375; *Sw. Obs.* 27. *M. pervaga* Griseb. *Fl. Br. W. Ind.* 289 (1860). *Bryonia guadalupensis* Spreng. *Syst. iii.* 15 (1826). *Landersia pervaga* Macf. *Jam. ii.* 142 (1850). *Cucumis minima* &c. *Sloane Cat.* 103 & *Hist. i.* 227, *t.* 142, *f.* 1. Specimen in Herb. Linn. named by Linnæus. (Fig. 97.)

Sloane Herb. iv. 76! *Macfadyen*; *Distin*! *Waters*! *Parnell*! Brokenhurst, Manchester, *Purdie*! *Wilson*; *Wulfschlaegel*; *Moneague*, *Prior*! also *Lady Blake*! *Liguanea* plain, J.P. 1047, *Hart*! *Cinchona*, *Fawcett*! Port Royal Mts. (Green Valley and Robertsfield, 2000 ft.) *Harris*! *Fl. Jam.* 5912, 7796; Port Morant; *Lucea*; *Hitchcock*; Bog Walk, *Ridley*!—Bahamas, W. Indies, Central America, northern S. America.

Stem climbing or creeping, much branched, sometimes 6 ft. l. *Leaves* 5–10 cm. l., ovate-cordate or triangular-subagittate, entire or 3–5-lobed, apex acute or shortly acuminate, base cordate with a somewhat roundish bay, margin wavy or with a few small teeth, on upper surface very rough, beneath somewhat rough; petiole 2–4 cm. l. *Flowers* minute. *Male racemes* about as long as the petiole. *Calyx* 2·5 mm. l. *Female peduncles* longer than the petiole, 3–6 cm. l. *Fruit* 1·5 cm. l., 1 cm. thick, ellipsoidal or subglobose, rounded at both ends, at first green, marked with 6 pale lines, at length red, finally purple-black. *Seed* winged, 4 mm. l.

2. *M. fluminensis* *Gardn. in Hook. Lond. Journ. Bot. i.* 173 (1842); *Cogn. in DC. Monogr. iii.* 583 & in *Engl. Pflanzenr. iv.* 275, i. 85; *Urb. Symb. Ant. iv.* 611. Specimens from Gardner in Herb. Mus. Brit. and Kew.

Oersted; Bog Walk, *Hitchcock*.—West Indies, tropical continental America.

Stem climbing, branched. *Leaves* 4–5 cm. l., broadly ovate-cordate, entire, 5-angled, or slightly 3–5-lobed, apex usually acute or shortly acuminate, base with a narrow bay, on upper surface rough, beneath more or less pubescent-roughish; petiole 2–4 cm. l. *Flowers* minute. *Male racemes* shorter than the leaf. *Calyx* 1·5–2 mm. l., narrowly bell-shaped. *Female peduncles* a little shorter than the leaf, 3–4 cm. l. *Fruit* 9–13 mm. l., 6–9 mm. thick, subglobose, colour the same all over.

2. SECHIU M Juss.

Annual herb, hairy, high climbing. Leaves membranous, angled or lobed, base deeply cordate. Tendrils with 3 (2–5) branches. Flowers greenish, or cream-coloured, or white, monœcious. Male fls. racemose, sometimes in clusters on a long peduncle. Calyx-tube hemispherical. Sepals 5. Corolla rotate, deeply 5-parted. Stamens 3, inserted at the bottom of the receptacle, the short filaments united into a column; anthers free, flexuose, one 1-celled, the rest 2-celled. Female fls. solitary or twin in the same axil as the male fls. Calyx and corolla as in the male fls. Style rising from a spreading toothed disk. Ovary 1-celled; stigma with 5 or 6 recurved lobes; ovule one, hanging from apex of cell. Fruit

fleshy, furrowed. Seed one, with very large fleshy cotyledons, often germinating in the fruit.

Species 1, spontaneous and cultivated in the Bahamas, West Indies, tropical continental America, introduced into tropics of Old World:

S. edule Sw. *Fl. Ind. Occ.* 1150 (1800); *Macf. Jam.* ii. 141; *Griseb. Fl. Br. W. Ind.* 286; *Cogn. in Fl. Bras.* vi. pt. 4, 111,



Fig. 93.—*Sechium edule* Sw.

- A, Leaf, tendril, and inflorescence with female flower and buds of male flowers, $\times \frac{3}{4}$.
 B, Male flower-bud $\times 15$.
 C, Ditto opened out.
 D, Female flower cut lengthwise $\times 4$; s, disk.
 E, Fruit cut lengthwise $\times \frac{1}{2}$.
 (A after Fl. Bras.; B, C, E after Baillon.)

t. 35 & in *DC. Monogr.* iii. 901; *Baill. Hist. Pl.* viii. 383–385, figs. 228–233; *Urb. Symb. Ant.* iv. 616 & viii. 698; *Bot. Mag. t.* 8738; *Britt. Fl. Berm.* 376 (cult.). *S. foliis cordato-angulatis* &c. *Browne Hist. Jam.* 355. *Sicyos edules* *Jacq. Enum.* 32 (1760), &

Sel. Stirp. Amer. 258, t. 163; *Sw. Prodr.* 116. Chayota edulis Jacq. *Sel. Stirp. Amer. ed. pict.* t. 245. Concombre cristophine Descourt. *Fl. Ant.* v. 94, t. 328. (Fig. 98.)

Cho-cho.

Distin! Moneague, Prior!—Spontaneous and cultivated in West Indies and tropical continental America. Introduced into tropics and subtropics of Old World.

Stem climbing to a height of several feet; the root of the mature plant large and fleshy, resembling the yam in appearance, and weighing from 10 to 20 pounds. *Leaves* 1-2.5 dm. l., cordate at base, 3-5-angled or -lobed. *Tendrils* 5-6 cm. l., usually 3-branched. *Peduncle* 1-3 dm. l. *Fruit* generally about 10 cm. l., light green or white, usually with small herbaceous prickles. *Seed* ovate, compressed, protruding from the cleft apex of the ripe fruit, and emitting several rootlets.

Fruit very wholesome, usually used as a vegetable like the vegetable-marrows; sometimes with the addition of lime-juice and sugar it supplies an ingredient for tarts. The root when cooked is wholesome and palatable, much like a yam. (Macfadyen.)

[MOMORDICA L.

Herbs climbing or prostrate, annual or with perennial rhizome. Leaves lobed (in Jamaican species) or entire, or with 3 to 7 leaflets. Tendrils simple (in Jamaican species) or 2-branched. Flower-stalk sometimes with a large bract. Flowers mostly yellow, monœcious (in Jamaican species) or dicecious. Male fl. solitary, racemose, or corymbose. Calyx tube very short, closed by 2 or 3 oblong incurved scales. Sepals 5. Corolla rotate or bell-shaped, usually 5-cleft to base; segments obovate, ribbed. Stamens generally 3, attached at the mouth of the tube; anthers at first cohering, at length free, one 1-celled, the rest 2-celled, usually flexuose, protruding beyond receptacle. Female fl. solitary. Calyx and corolla as in male. Staminodes wanting or 3 glands surrounding base of style. Ovary with 3 placentas; stigmas 3; ovules numerous, horizontal. Fruit oblong, spindle-shaped, or cylindrical, berry-like, not opening or with 3 valves.

Species nearly 50, most of them African, a few dispersed through all tropical regions.

Bract of male flower entire, above the base or about the middle of peduncle. Apex of leaf-lobules blunt, mucronate 1. *M. Charantia*.
 Bract of male flower toothed, near apex of peduncle.
 Leaf-lobules deeply cut, acute 2. *M. Balsamina*.

1. *M. Charantia* L. *Sp. Pl.* 1009 (1753), *Amœn.* v. 383 & *Hort. Cliff.* 451; *Bot. Mag.* t. 2455. *Wright Mem.* 301; *Macf. Jam.* ii. 140; *Wight Ic.* t. 504; *Griseb. Fl. Br. W. Ind.* 287; *Cogn. in DC. Monogr.* iii. 436; *Watt Econ. Prod. Ind.*; *Gard. Chron. ser. 3*, lii. 473 with col. plate; *Small Fl. S.E. U.S.* 1136; *Urb. Symb. Ant.* iv. 612 & viii. 696; *Britt. & Millsp. Bah. Fl.* 425.

M. subhirsuta &c. *Browne Hist. Jam.* 353. *Cucumis africanus* *Bot. Reg. t.* 980. *Momordique Descourt. Fl. Ant. iii.* 62, *t.* 164.

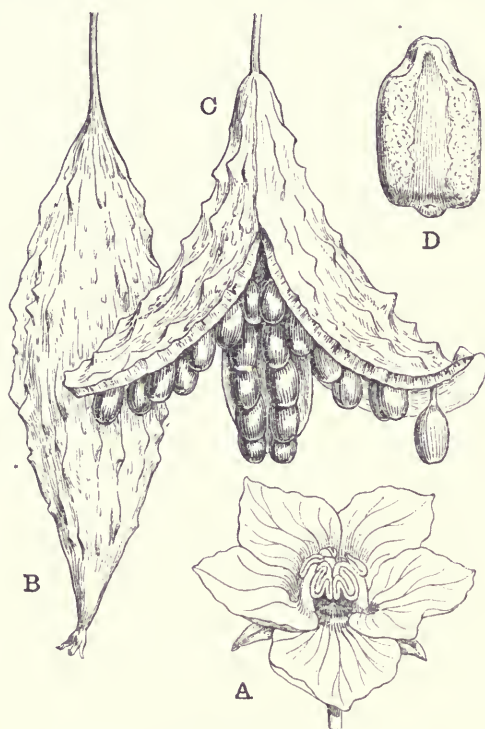


Fig. 99.—*Momordica*.

- A, Male flower of *M. Balsamina* L., nat. size. C, Ditto fully ripe, open, showing the seeds, $\times \frac{3}{4}$.
 B, Fruit of *M. Charantia* L. $\times \frac{3}{4}$. D, Seed $\times 2$.
 (A after Baillon ; B, C after Gard. Chron.)

Cerasee *Rev. J. Lindsay Ic. & Ms. ined.* Specimen in Herb. Linn. named by Linnaeus. Specimen in Hort. Cliff. in Herb. Mus. Brit. (Fig. 99, B-D.)

Cerasee.

Distin! *Wulfschlaegel*; *Moneague, Prior!* J.P. 2103, *Hart!* Hope grounds, 700 ft., *Harris!* Annotto Bay, *Thompson!* Windward road, *Fawcett!* Fl. Jam. 6779, 6934, 7922, 8246, 8460. *Lücca*; *Porus*; *Hitchcock*.—Tropics and subtropics of Old World, introduced into America and West Indies.

Stem climbing, puberulous or tomentose especially at apex, 3-6 ft. l. *Leaves* 4-12 cm. in diam., cut to the middle or almost to the base into 5-7 lobes, much narrower at the base, toothed or lobulate, apex of each usually blunt, mucronate, pubescent on both sides, especially on nerves beneath, or glabrescent. *Peduncle* of male fl. 5-15 cm. l., with a kidney

shaped or roundish-cordate entire bract at or below the middle, 5-15 mm. br.; of female fl. 5-10 cm. l., with bract generally near base. *Corolla* yellow, segments 1.5-2 cm. l. *Fruit* 8-15 cm. l. and more, orange-yellow, oblong-ellipsoidal, narrowed to both ends; tuberculate, when ripe 3-valved from apex. *Seeds* 10-16 mm. l., slightly 3-lobed at each end, corrugate on margin, covered with pulp of a rich crimson colour.

Var. *abbreviata* Ser. ex DC. *Prodr.* iii. 311; plant much smaller, lobes of leaves usually narrower; fruit shorter, ovate-mucronate; seeds smaller, generally smooth.—*Cogn. tom. cit.* 437; *Urb. loc. cit.* *M. zeylanica* Mill. *Dict. ed.* 8 (1768). Smaller *Ceracee* Rev. J. Lindsay *Is. & Ms. ined.*

Kingston; Constant Spring; Port Morant; *Hitchcock.*

The fruits of species and variety are eaten cooked in curries, or sliced and fried. It is necessary to soak them in hot water or salt and water before cooking to remove some of the bitterness. Sliced and dried, they will keep for months, if kept in an airy place.

2. *M. Balsamina* L. *Sp. Pl.* 1009 (1753), *Amœn. v.* 383 & *Hort. Cliff.* 450; *Macf. Jam. ii.* 138; *Griseb. loc. cit.*; *Cogn. tom. cit.* 439; *Watt Econ. Prod. Ind.*; *Small loc. cit.*; *Urb. Symb. Ant. iv.* 612. *M. glabra* &c. *Browne loc. cit.* *Cucumis puniceus* *Sloane Hist. i.* 228. *Momordique* *Descourt. Fl. Ant. viii.* 355, t. 594. Specimen in Herb. Linn. named by Linnæus. Specimens in *Hort. Cliff.* in Herb. Mus. Brit. (Fig. 99, A.)

Ceracee.

Houston in *Sloane Herb. iv.* 76*! *Macfadyen*; *Wilson*! trailing along the sand on sea-beach, Alligator Pond, *Harris*! *Fl. Jam.* 6415.—Distribution of preceding species.

Stem low-growing, subglabrous, 2-4 ft. l. *Leaves* 4-7 cm. in diam., cut to the middle in 3-5 rhomboid lobes, which are deeply and acutely lobulate. *Peduncle* of male fl. 3-7 cm. l., with a roundish-cordate toothed bract at the apex; of female fl. 5-1.5 cm. l., without a bract or with one at base. *Corolla* orange-yellow, about 1.5 cm. l. *Fruit* 3-6 cm. l., orange-red, broadly ovoid, crested-tuberculate, "bursting irregularly and laterally from the base" (*Macfadyen*). *Seeds* 10-11 mm. l., margin subentire.

The young green fruit is used as a pickle; when ripe it is eaten as a vegetable in stews, &c.]

[LUFFA Cav.

Annual herbs, glabrous, rough, or pubescent. Leaves usually 5-7-lobed. Tendrils with 2 or more branches (3 in Jamaican species). Flowers monœcious, large, usually yellow, sometimes white. Male flowers racemose. Calyx-tube bell- or top-shaped; lobes 5, triangular or lanceolate. Petals free, spreading, obovate or obcordate. Stamens 3 (4 or 5); filaments free or 2 united; anthers, when 3, 1-celled, the rest 2-celled, cells linear, flexuose. Female flowers solitary. Calyx-tube (receptacle) prolonged above the ovary; lobes and corolla as in the male fls. Ovary long, with 3 placentas; stigma 3-lobed; ovules indefinite, horizontal. Fruit dry, oblong or cylindrical, fibrose inside, 3-celled, with style persistent, opening by the

dropping off of the lid-like apex. Seeds indefinite, oblong, compressed.

Species 7 or 8, of which one is tropical American, the rest natives of tropics of Old World, but cultivated or subsponaneous in tropics of New World.

Fruit not ribbed. Seeds smooth, winged. Leaves

5-lobed 1. *L. cylindrica*.

Fruit 10-ribbed. Seeds rough, not winged. Leaves

5-angled or sublobed 2. *L. acutangula*.

1. *L. cylindrica* M. Roem. Syn. Pepon. ii. 63 (1846); Cogn. in DC. Monogr. iii. 456; Urb. Symb. Ant. iv. 613 & viii. 697. *L. ægyptiaca* Mill. Dict. ed. 8 (1768); Macf. Jam. ii. 136. *Momordica cylindrica* L. Sp. Pl. 1009 (1753). Strainer Rev. J. Lindsay Ic. & Ms. ined. Specimen in Herb. Linn. named by Linnæus.

Strainer Vine.

Distin! Guava Ridge, Harris!—Native of tropics of Old World. Cultivated and subsponaneous in tropics and subtropics of New World.

Stem climbing, 10–20 ft. l. and more, 5-angled, glabrous, rough at angles. *Leaves* 15–20 cm. in diam., cordate at base, palmately 5-lobed, lobes acute or acuminate, rough on both sides. Tendrils usually with 3 branches. Male and female flowers in same axil. *Calyx*-tube not angled, segments not keeled. *Petals* oblong-wedge-shaped, rounded at apex or scarcely emarginate, 3–5-nerved, 2–3 cm. l., 1–1.5 cm. br. *Stamens* 3, one 1-celled, two 2-celled, or 5 1-celled; filaments 6–8 mm. l. *Fruit* 15–30 cm. l., 6–10 cm. br., cylindrical or obscurely 3-cornered, not ribbed but with 10 dark longitudinal lines. *Seeds* smooth, surrounded by a short wing, 12 mm. l., 8–9 mm. br., 2–2.5 mm. thick.

2. *L. acutangula* Roxb. Hort. Beng. 70 (1814) & Fl. Ind. iii. 713; Macf. Jam. ii. 136; Griseb. Fl. Br. W. Ind. 288; Cogn. in DC. Monogr. iii. 459; Watt Econ. Prod. Ind.; Urb. Symb. Ant. iv. 613; Guppy Plants... W. Indies &c. 223. *L. fetida* Cav. Ic. i. 7, tt. 9, 10 (1791); Bot. Mag. t. 1638. *Cucumis acutangulus* L. Sp. Pl. 1011 (1753); Jacq. Hort. Vindob. iii. 40, tt. 73, 74. Specimen from Jacquin in Herb. Mus. Brit.

East Indian Ochra.

March.—Native of tropical Asia and tropical Africa. Cultivated and subsponaneous in all tropical countries.

Description as in *L. cylindrica*, except in the following points:—*Leaves* cordate-roundish, palmately 5–7-angled or sub-lobed. *Calyx*-tube 5-angled, segments keeled. *Petals* obcordiform, emarginate at apex, mucronulate, slightly veined, 2 cm. l., 2–2.5 cm. br. *Stamens* 3; filaments 3–4 mm. l. *Fruit* club-shaped, apex obtuse or shortly acute, acutely 10-ribbed. *Seeds* rough, not winged, slightly 2-lobed at base.

The fruit of both species while still young, and not more than 4 inches long, is an excellent vegetable. It is peeled, boiled, and served dressed with butter, pepper, and salt, or is used as an ingredient in curries. The fibrous coat is used in baths as a flesh-brush.]

3. CUCUMIS L.

Annual herbs, or with perennial rootstock; stem trailing along the ground or climbing over shrubs; hispid or roughish.

Leaves deeply cut or angular, toothed or palmately 3-7-lobed. Tendrils simple. Flowers yellow, monœcious or rarely diœcious. Male flowers clustered or rarely solitary. Calyx-tube bell-shaped or top-shaped; limb 5-lobed. Corolla somewhat bell-shaped, 5-parted. Stamens 3, free, inserted on the calyx-tube; anthers, one 1-celled, rest 2-celled, cells linear, flexuose or curved, rarely straight, the connection prolonged above into a papillose appendage. Ovary represented by a gland. Female flowers solitary. Calyx and corolla as in male fls. Staminodes 3. Ovary with 3-5 placentas; stigmas 3-5; ovules numerous, horizontal. Fruit of various shapes, usually not opening, with many seeds.

Species about 40, mostly natives of tropical Asia and Africa, very few of America and Australia.

C. Anguria L. *Sp. Pl.* 1011 (1753) & *Anœn.* v. 383; *Macf. Jam.* ii. 133; *Griseb. Fl. Br. W. Ind.* 288; *Bot. Mag.* t. 5817; *Cogn. in Fl. Bras. vi. pt. 4, 16, t. 2* & in *DC. Monogr. iii.* 501; *Small Fl. S.E. U.S.* 1137. *C. sylvestris* &c. *Pluk. Phyt.* t. 170, f. 3.

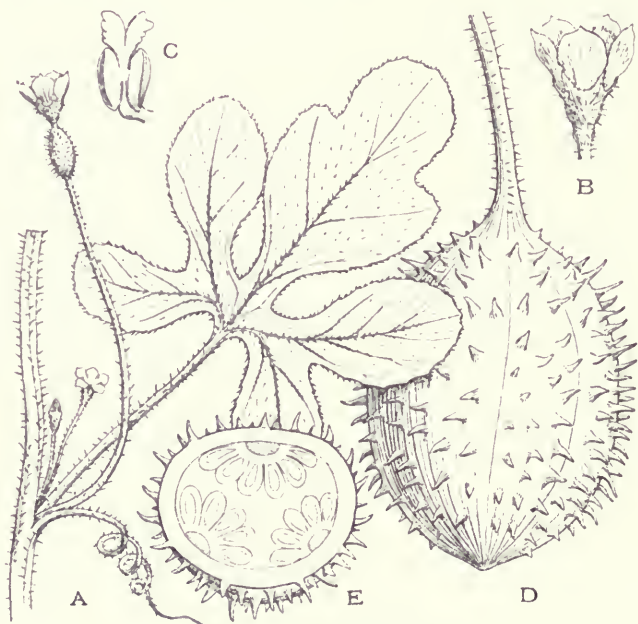


Fig. 100.—*Cucumis Anguria* L.

- A, Portion of branch with leaf, tendril, and male and female flowers, $\times \frac{1}{2}$.
 B, Male flower $\times 3$.
 C, Stamen much enlarged.
 D, Fruit $\times \frac{3}{4}$.
 E, Ditto cut across $\times \frac{2}{3}$.
 (B-E after Bot. Mag.)

C. anguriæ &c. *Sloane Cat.* 103 & *Hist. i.* 227. *C. subhirsutus* &c. *Browne Hist. Jam.* 353. *C. jamaicensis* *Gandoger in Bull. Soc. Bot. Fr. lxx.* 28 (1918). Specimen in Herb. Linn. named by Linnæus. Specimen from Plukenet in Herb. Mus. Brit. (Hb. *Sloane* xcv. 200). (Fig. 100.)

Wild Cucumber, West Indian Gherkin.

Sloane Herb. iv. 74, 75! *Broughton! Macfadyen*; Kingston, Prior! Hope grounds, 700 ft.; *Harris!* Fl. Jam. 6650, 6820, 6967, 9043.—West Indies, tropical and subtropical continental America from Texas and Florida.

Annual herb. Stem 3-6 ft. l., angled, rough, hispid, with long white hairs. Leaves 5-10 cm. l., 3-lobed with the side lobes divided again, margin wavy, with small teeth, base cordate, lobes obtuse, somewhat obovate, sometimes lobulate. Flowers small, yellow. Male flowers: Peduncle 1-2 cm. l. Calyx 5-7-mm. l. Anthers: appendage deeply 2-lobed, lobes lobulate. Female flowers: Peduncle 5-10 cm. l. Fruit the size and shape of a hen's egg, pale yellow, more or less covered with prickles, not opening.

"This fruit is eaten very greedily by sheep and all manner of cattle, and they are thought to thrive extremely by feeding on them. The fruit is likewise eat in lieu of our European cucumbers, are very cooling, and equal, if not exceed, them in everything." (*Sloane*.) This is a very wholesome vegetable, dressed plain, or in stews or soups. It is also esteemed as a pickle. (*Macfadyen*.)

C. Melo *L. Sp. Pl.* 1011 (1753) & *Amæn. v.* 383, the Melon, is cultivated. Annual; leaves 8-15 cm. l., 5-angled or 3-7-lobed, base cordate, hairy on both sides; ovary densely and smoothly villose; fruit of many forms, smooth, pubescent or glabrate.—*Macf. Jam. ii.* 132; *Cogn. tom. cit.* 482. Melo fructu &c. *Browne Hist. Jam.* 353. *C. jamaicensis* *Bert. ex Spreng. Syst. iii.* 46 (1826).

C. sativus *L. Sp. Pl.* 1012 (1753) & *Amæn. v.* 383, the Cucumber, is cultivated. Annual; leaves 12-18 cm. l., palmately 3-5-lobed, lobes triangular, toothed, acute and acuminate, hairy on both sides; fruit mostly oblong, 3-cornered or cylindrical, sparsely tuberculate, when ripe sometimes almost or quite smooth.—*Macf. Jam. ii.* 133; *Cogn. tom. cit.* 498. *C. sativus* &c. *Browne Hist. Jam.* 353.

[CITRULLUS Schrad.]

Annual or perennial herbs, musky or fetid, trailing along the ground. Leaves deeply 3-5-lobed, lobes lobulate. Tendrils 2-branched. Flowers rather large, yellow, monœcious, all generally solitary. Male fl.: Calyx-tube broadly bell-shaped, limb 5-lobed. Corolla somewhat bell-shaped, deeply 5-parted. Stamens 3; anthers, one 1-celled, rest 2-celled, cells linear, flexuose, connective not prolonged. Ovary represented by a gland. Female fl.: Calyx and corolla as in male fl. Staminodes 3. Ovary with 3 placentas; stigmas 3; ovules numerous, horizontal. Fruit globose or oblong, not opening.

Species 2, natives of the eastern Mediterranean region, tropical Africa, and West Asia; cultivated in all tropical and subtropical regions.

C. vulgaris Schrad. in *Linnæa* xii. 412 (1838); *Cogn. in DC. Monogr. iii.* 508. *Anguria prima* Citrullus dicta *Sloane Cat.* 101 & *Hist. i.* 226. *Cucurbita*, Citrullus *L. Sp. Pl.* 1010 (1753); *Descourt. Fl. Ant. v.* 4, t. 305. *Cucumis trilobus* *L. Amæn. v.* 383. *C. Citrullus* *Ser. ex DC. Prodr. iii.* 301; *Macf. Jam. ii.* 134. *C. foliis multipartitis* *Browne Hist. Jam.* 353. Specimen in Herb. Linn. named by Linnæus.

Water Melon.

Sloane Herb. iv. 73!—Native of tropical and south Africa; cultivated and spontaneous in all tropical and subtropical regions.

Annual. *Stem* hairy. *Leaves* 8–20 cm. l., deeply cut into 3 segments, segments pinnately or bipinnately cut, lobes with wavy margin or more or less lobulate, on both sides somewhat rough. *Ovary* woolly. *Fruit* subglobose or ellipsoidal, flesh sweet and edible, sometimes bitter at the bottom. *Seeds* generally marginate.

The pulp is of a red colour with the cells filled with watery fluid, so that it dissolves nearly entirely in the mouth, whence the name Water Melon. It is given with advantage in fever. It is slightly laxative. (Macfadyen.)

This species is nearly allied to *C. Colocynthis* Schrad., the Colocynth plant.]

4. CIONOSICYS Griseb.

Glabrous herbs, high climbing. Leaves membranous, cordate or subcordate at base, broadly ovate, acuminate, entire or 3-lobed. Tendrils simple, dilated towards apex. Flowers large, long-stalked with a joint below the flower, all solitary, monœcious. Male fl.: Calyx-tube top-shaped or funnel-shaped. Sepals 5, rather large, leathery, ovate- or oblong-lanceolate. Corolla funnel-shaped-rotate, 5-parted, segments ample, obovate, ribbed. Stamens 3–5; filaments free, hirsute, inserted into the base of the corolla; anthers all united in a cylindrical column, which is shortly exceeded by 5 connectival lobes, cells conduplicate. Female fl.: Calyx-tube cup-shaped. Corolla as in the male. Ovary with 3 placentas; stigmas 3, bent back, leafy; ovules numerous, horizontal. Fruit roundish-ovoid, fleshy, yellowish, glabrous. Seeds numerous.

Species 1, native of Jamaica.

C. pomiformis Griseb. *Fl. Br. W. Ind.* 288 (1860); *Cogn. in DC. Monogr. iii.* 516. *Trichosanthes foliis denticulatis* &c. *Browne Hist. Jam.* 354; *A. Robinson Ic. & Ms. ined.* *T. pomiformis* *Macf. Jam. ii.* 144 (1850). Climbing Melon *Rev. J. Lindsay Ic. & Ms. ined.* (Fig. 101.)

Wild Melon.

In fl. Oct.–May; *Browne*; *Wright*! *Broughton*! *Shakespear*! *Macfadyen*; *Distin*! *St. Mary*, *McNab*! *Wilson*! *Wulfschlaegel*; *Moneague*, *Prior*! *Cinchona*, J.P. 638, *Morris*! also *Fawcett*! road from Orchard to Mocha, Port Royal Mts., 2500 ft.; near Troy, 2000 ft.; Hardware Gap,

4000 ft.; Harris! Fl. Jam. 5862, 8534, 10,130; foot of John Crow (Blake) Mts., Norman!—Isle of Pines.

Stem slender, angular, glabrous. *Leaves* 5–10 cm. l., 3-nerved with lateral nerves 2-branched, remotely and minutely toothed. *Peduncles* of male fl. 4–5 cm. l., of female fl. about 1.5 cm. l. *Flowers* greenish-white.

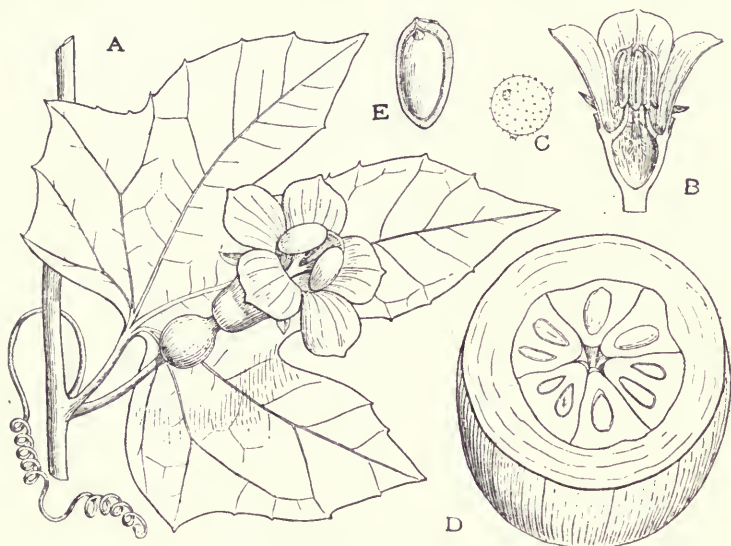


Fig. 101.—*Cionosicya pomiformis* Griseb.

A, Portion of branch, with leaf, tendril, and female flower, $\times \frac{2}{3}$.

B, Male flower cut lengthwise $\times \frac{2}{3}$.

C, Pollen grain $\times 75$.

D, Fruit cut across $\times \frac{2}{3}$.

E, Seed with part of the coat removed, nat. size.

(D after A. Robiuson.)

Male flowers: Calyx-tube narrowed to base, 10–12 mm. l.; sepals 12 mm. l., acute. *Corolla* about 4 cm. l., tomentose. *Female flowers*: *Peduncle* shorter than male. *Calyx-tube* 1 cm. l.; sepals 5 mm. l., lanceolate. *Corolla* 3.5–4 cm. l., outside papillose, inside hairy. *Fruit* the size of an orange, "yellow (when ripe), 3-celled; cells 9-seeded. *Seeds* imbedded in pulp" (Macfadyen), about 12 mm. l.

[LAGENARIA Ser.

Annual herbs, high climbing, softly pubescent, smelling of musk. *Leaves* roundish-cordate, toothed; petiole with 2 glands next the leaf. *Tendrils* 2-branched. *Flowers* large, white, monœcious, all solitary, long-stalked. *Fruit* not opening, of various shapes and sizes, woody, with a spongy flesh. *Seeds* numerous, compressed, margined.

Species 1, native of tropical Asia and Africa, cultivated everywhere in warm climates.

L. vulgaris Ser. in *Mém. Soc. Genève*, iii. pt. 1, 29, t. 2 (1825); *Macf. Jam.* ii. 131; *Griseb. Fl. Br. W. Ind.* 288; *Cogn. in DC. Monogr. Phan.* iii. 417; *Urb. Symb. Ant.* iv. 614. *Lagenaria lagenaria* Cocker. in *Bull. Torr. Club* xix. 95 (1892); *Small Fl. S.E. U.S.* 1137. *Cucurbita lagenaria* L. *Sp. Pl.* 1010 (1753) & *Amæn. v.* 383; *Wright Mem.* 300; *Britt. Fl. Berm.* 376. *Cucurbita* &c. *Sloane Cat.* 100, 101 & *Hist. i.* 225, 226. *C. villosa* &c. & *C. fructu maximo* &c. *Browne Hist. Jam.* 354; *Descourt. Fl. Ant. v.* 85, t. 325.

Specimen in Herb. Linn. named by Linnaeus.

Bottle Gourd.

Sloane Herb. iv. 70 (seeds only)! *Ramble*, *Claremont*, *Fawcett & Harris!* *Fl. Jam.* 7034.—Tropical Africa and Asia. Cultivated and spontaneous throughout the tropics.

Leaves 1-4 dm. br.; petiole shorter than the limb. *Peduncle* of male fls. longer than the petiole, of the female fls. as long or shorter. *Male fls.*: *Calyx* 1.5-2.5 cm. l. *Petals* 3-4 cm. l.]

5. SICANA Naud.

Annual climbing herbs. Leaves palmately deeply 3-5-lobed. Tendrils with 3-5 branches. Flowers large, yellow, monœcious, all solitary. Calyx-tube bell-shaped; lobes 5. Corolla broadly bell-shaped, 5-lobed. Male fl.: Stamens 3; anthers united in Jamaican species, cells twisted forming a head. Female fl.: Staminodes reduced to bristles or wanting. Ovary with 3 placentas; stigmas 3; ovules numerous, horizontal. Fruit large, fleshy, not opening. Seeds flattened, narrowly winged or inconspicuously margined.

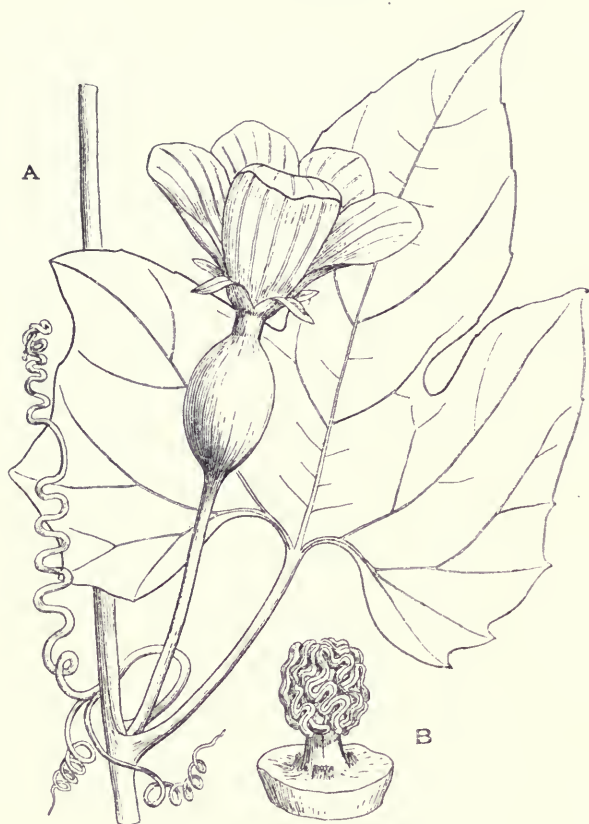
Species 2, one a native of Jamaica, the other of tropical S. America.

S. spherica Hook. f. in *Bot. Mag.* t. 7109 (1890); drawings by J. H. Hart incd. in *Herb. Kew.* Type in *Herb. Kew.* (Fig. 102.)

Latimer Cinchona plantations, Blue Mts., 5000 ft., *Morris!* also *Fawcett!*

Branchlets puberulous. *Leaves* 8-12 cm. in diam., glabrous or dotted, base cordate with a deep rounded bay, deeply 3-5-lobed, lobes ovate, long acuminate, entire or with small teeth. *Tendrils* 3-branched, tips dilated. *Peduncles* solitary. *Calyx* pubescent or tomentose; lobes ovate, spreading. *Corolla* 7-8 cm. l., pubescent outside, tomentose inside. *Male flowers*: *Filaments* free, very short, glabrous; anthers in a subglobose head. *Female flowers*: *Ovary* cylindrical. *Fruit* globose, about the size of a small orange, glabrous. *Seeds* narrowly winged.

Coccinia grandis Roem. *Syn. Monogr. fasc.* 2, 93 (1846). *C. cordifolia* *Cogn. in DC. Monogr.* iii. 529 (1881), a native of the East Indies, has been found naturalized near Kingston, *Harris!* *Fl. Jam.* 12,533. Leaves ovate-cordate, 5-angled or -lobed. Flowers all solitary, large, bell-shaped, white. Fruit 5 cm. l., rounded-ellipsoidal, red with reddish pulp.

Fig. 102.—*Sicana spherica* Hook. f.

A, Leaf with tendril and female flower $\times \frac{3}{4}$. B, Stamens of male flower, enlarged.
(B after Hooker fl.)

6. CAYAPONIA Manso.

Herbs climbing or very rarely prostrate, with a perennial root-stock. Leaves palmately 3-7-lobed (upper entire in *C. racemosa*), occasionally with 3-5 leaflets, very rarely all entire. Tendrils generally with 2-5 branches. Flowers usually small, monœcious or very rarely diœcious, usually in panicles or racemes. Male fls.: Calyx-tube bell-shaped; limb 5-toothed or deeply 5-cleft. Corolla bell-shaped or rotate, 5-parted, segments ovate or oblong. Stamens 3, inserted on the receptacle; anthers usually cohering in a cylindrical column, one 1-celled, the rest 2-celled, cells flexuose. Female fls.: Calyx and corolla as in

male fls. Staminodes 3, minute. Ovary usually 3-celled; style inserted in a basilar disk; stigmas 3, dilated; ovules 1-4 in the cells, ascending from the base. Fruit ellipsoidal or globose, not opening, with 3 (1-12) seeds. Seeds erect, with a hard coat.

Species 70, natives chiefly of tropical S. America, also of West Indies, Central America, subtropical N. America and W. Africa.

C. racemosa Cogn. in *DC. Monogr. iii.* 768 (1881); *Urb. Synb. Ant. iv.* 614 & *viii.* 697; *Britt. & Millsp. Bah. Fl.* 427. *Bryonia*

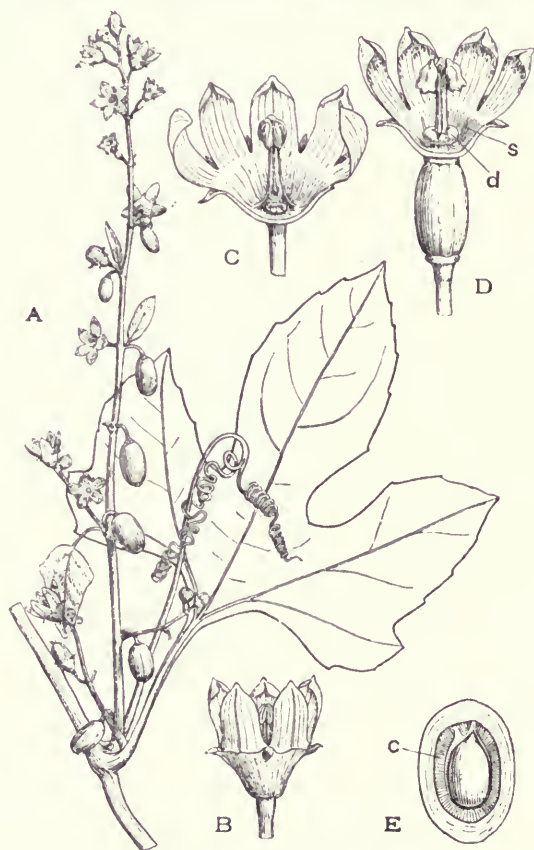


Fig. 103.—*Cayaponia racemosa* Cogn.

A, Leaf with inflorescence and tendril $\times \frac{3}{4}$.

B, Male flower $\times 2$.

C, Male flower cut open.

D, Female flower; s, staminodes; d, disk; $\times 4$.

E, Fruit cut lengthwise $\times 2$; c, hard coat of seed.

racemosa foliis ficulneis *Plum. Descr.* 83, *t.* 97. B: *racemosa* *Mill. Dict. ed.* 8; *Sw. Prodr.* 116 & *Fl. Ind. Occ.* 1148; *Macf. Jam. ii.* 137. B. foliis hirtis &c. *Browne Hist. Jam.* 355. Bryone d'Amerique *Descourt. Fl. Ant. ii.* 281, *t.* 136. *Cionandra racemosa* *Griseb. Fl. Br. W. Ind.* 286 (1860).

Wild Cerasee, Mountain Bryony.

Wright! Macfadyen! Distin! Purdie! March! Prior! Montego Bay, *McCatty!* Liguanea plain, *Campbell!* Ramble, Claremont, *Fawcett & Harris!* Giddy Hall, *Fawcett!* Halls Delight, St. Andrew, 1200 ft., *Harris!* *Fl. Jam.* 10,076, 10,107. (Fig. 103.)—Cuba to Tortola, Tobago, Trinidad, Central America, Guiana, Venezuela.

Stem somewhat woody, often high-climbing, to 20 ft. l. *Leaves* very variable, 6–13 cm. l., upper entire or nearly so, lower more or less 3–5-lobed, rough on upper surface, puberulous or glabrescent beneath, running into the petiole and more or less glandular beneath at base; petioles 2–7 cm. l. *Tendrils* with 2 or 3 branches. *Flowers* yellowish-green, male and female on the same panicle (often leafy). *Male flowers:* *Calyx*-tube 3 mm. l., teeth about 1 mm. l. *Corolla* about .5 cm. l. *Female flowers:* *Calyx:* tube 1.5 mm. l., teeth .5 mm. l. *Corolla* 3 mm. l. *Fruit* 1–1.5 cm. l., ellipsoidal, reddish-orange when ripe.

All parts of the plant are intensely bitter.

7. FEVILLEA L.

Climbing shrubs. Leaves cordate, palmately lobed or angled, membranous. Tendrils lateral, 2-branched at apex. Peduncles collateral with tendrils and leaves. Flowers small, in hanging panicles, yellow or greenish, diœcious. Male fls.: *Calyx*-tube short, bell-shaped or cup-like; sepals 5. Petals 5, clawed, spreading, with an erect longitudinal tongue along the midrib. *Staminodes* 5, minute, between the petals, united to the sepals. *Stamens* 5, in the centre of the receptacle; anthers 1-celled opening by a longitudinal slit, connective broad. Female fls.: *Calyx* as in male fls. Petals 5, clawed, spreading. *Staminodes* 5 or more; 20 very small glands at base of petals. *Ovary* 3-celled, sometimes free at apex; styles 3; stigmas 2-lobed; ovules 6 or fewer in each cell, hanging from the margins of the carpels. *Fruit* large, ringed above the middle with the scar of the fallen calyx-limb, 3-celled below, marked with 3 radiating lines at the apex. Seeds indefinite, large, hanging from the margins of the placentas in the upper part of the cell, overlapping, compressed, roundish in outline; cotyledons large, round in outline.

Species 7, natives of West Indies and tropical continental America.

F. cordifolia L. *Sp. Pl.* 1013 (1753) & *Amœn. v.* 383; *Sw. Obs.* 377; *Macf. Jam. ii.* 129; *Griseb. Fl. Br. W. Ind.* 289; *Cogn. in DC. Monogr. iii.* 941 & in *Engler's Pflzr. Cucurbitaceæ—Fevilleæ* 7; *Baill. Hist. Pl. viii.* 378, 379, *figs.* 212–217; *Urb. Symb. Ant. iv.* 610 & *viii.* 693; *Guppy Plants . . . W. Indies &c.*

124. *F. trilobata* L. *Sp. Pl.* 1014 (1753) (so far as regards syn. Sloan. & hab. Jamaica). *F. scandens* L. *Sp. Pl. ed. 2*, 1457 (1763) & var. β (so far as regards syn. Sloan.); *Wright Mem.* 211.



Fig. 104.—*Fevillea cordifolia* L.

A, Portion of branch with leaf and flowers $\times \frac{1}{2}$.

B, Leaf from another part of branch $\times \frac{1}{2}$.

C, Male flower $\times 2$.

D, Stamen from back showing connective and one of the walls of the ripe anther-cell bent back, enlarged.

E, Stamen: anther-cell about to open along median line, enlarged.

F, Female flower of *F. trilobata* cut lengthwise; s, staminode; $\times 2$.

G, Fruit cut open along the sear of fallen calyx, showing seeds inside, $\times \frac{1}{2}$.

H, Seed $\times \frac{1}{2}$.

I, Ditto cut lengthwise $\times \frac{1}{2}$.

(F, I after Baillon.)

F. foliis &c. *Browne Hist. Jam.* 374; *Plum. Pl. Amer. (Burm.)* 203, t. 209 & *Ic. orig. ined. in Herb. Mus. Brit. iii. tt. 155, 156.*
Ghandiroba vel *Nhandiroba* *Sloane Cat.* 85 & *Hist. i.* 200.

Nhandiroba scandens &c. *Plum. Nov. Gen.* 20, t. 27. *Nandhiroba* &c. *Descourt. Fl. Ant.* iii. 216, t. 198. Antidote cocoon *Rev. J. Lindsay, Ic. & Ms. ined.* (Fig. 104.)

Antidote Cocoon.

Wiles! Macfadyen! Cave R., St. Ann, Purdie! St. Thomas in Vale, Prior! Lancaster; Hope Gardens; Harris! Fl. Jam. 5600, 8381, 8382.—West Indies, tropical continental America.

Stem perennial, climbing over tops of trees. *Leaves* cordate at base, early leaves undivided, ovate, those towards the ends of branches 5-angled or more or less lobed, glabrous, 7-17 cm. l.; petioles 3-7 cm. l. *Tendrils* very long. Male common *peduncle* puberulous, many-flowered, 20-60 cm. l. *Sepals* 2 mm. l. *Petals* dusky orange, ovate-roundish, 4 mm. l. *Fruit* globose, russet, hard, 10-12 cm. in diam. *Seeds* 10-12, yellowish-grey, smooth, margin acute or shortly winged, 5.5-6 cm. br., 2 cm. thick.

The seeds abound in oil, burn freely when ignited, and put on skewers have been used instead of candles; the expressed oil gives a clear light when burnt in lamps. (Macfadyen.)

FAMILY LXXXIII. CACTACEÆ.

Herbs, shrubs, or trees, usually succulent, with distinct spine-bearing areas ("areoles"). Stem elongate, branching, or reduced to a cone, globe, or column, rounded, angular, ribbed, or bearing tubercles (shortened branches), fleshy inside, with a cylinder composed of a network of woody fibres running through, and with a very wide pith; the ribs and tubercles dotted with small woolly cushions (areoles) scattered or in a series and bearing sharp points or spines. Spines of many forms, smooth or transversely ribbed, straight or hooked, sometimes covered with a loose epidermis, some barbed at the apex in *Opuntia* and *Nopalea*. Leaves usually minute, scale-like, soon falling, arising in the small cushions, large only in *Pereskia*. Stipules wanting. Flowers hermaphrodite, usually regular, solitary (except in *Pereskia*), sessile, axillary, terminal, or inserted on the ribs or in the notches of a crenate stem, usually showy. Calyx-tube short or prolonged beyond the ovary; lobes indefinite, often numerous and in many series, scale-like, leafy or petaloid, overlapping. Petals indefinite in number, generally numerous and in many series, the outer not distinct from the calyx-lobes, free or united into a short tube, erect or spreading, overlapping. Stamens very numerous and in many series, inserted at the throat of the calyx, free or adherent to the base of the petals; filaments thread-like, free or the outer adherent to the calyx-tube on one side or all round, of equal length or the outer longer. Ovary sunk in the stem or free, smooth or with scale-like bracts on the outside, or areolate, 1-celled. Style elongate, terminal, simple; stigma with 2 or more rays, rays usually spreading, linear, tuberculate on the surface. Ovules very many, on indefinite placentas on the ovary-walls, horizontal, anatropous.

Berry pulpy, smooth, scaly, with or without areoles, apex depressed or crowned with the withered perianth, 1-celled, placentas pulpy, with indefinite seeds. Seeds hard and brittle or bony; endosperm present or wanting. Embryo bent or straight. Cotyledons leaf-like or scarcely differentiated.

Species about 1500, growing in great plenty in tropical and subtropical America, a few also in Chile; one or more species of *Rhipsalis* native in tropical Africa, Mauritius, and Ceylon; a few species of *Opuntia* and *Nopalea* introduced into the Old World, and now widely spread.

- Leaves broad, flat. Flowers stalked. Plants woody 1. *Pereskia*.
 Leaves not broad, usually small and soon dropping off, or wanting. Flowers without stalks. Plants fleshy.
 With many branches and joints, without ribs; joints flattened; areoles spine-bearing. Flowers without a tube.
 Sepals and petals erect. Stamens much longer than the petals 2. *Nopalea*.
 Sepals and petals rotate. Stamens shorter than the petals 3. *Opuntia*.
 With few branches and joints, ribbed or angled; areoles spine-bearing. Flowers funnel- or salver-shaped, tubular, or bell-shaped; segments several or many.
 Erect, with several long joints. Flowers and spines borne at the same areoles 4. *Cereus*.
 Short, without joints. Flowers and spines borne at different areoles; flowering areoles forming a central terminal head 5. *Melocactus*.
 With many branches and joints, hanging from trees or rocks; spineless. Flowers with few perianth-segments 6. *Rhipsalis*.

1. PERESKIA Miller.

Woody shrubs, or clambering vines, or trees, with rounded leafy branches. Leaves alternate, broad, flat, somewhat fleshy. Areoles in the axils, bearing spines in pairs or in clusters, neither sheathed nor barbed. Flowers stalked, solitary, corymbose, or paniculate, terminal or lateral, rotate. Calyx: tube not prolonged beyond the ovary; lobes numerous, leafy, often persistent. Petals numerous, in indefinite series, spreading. Stamens numerous. Style slender. Berry pear-shaped or ovoid, depressed at the apex, scaly or bearing little cushions. Cotyledons large, leafy. Seedlings without spines.

Species 19, natives of West Indies and tropical America.

P. aculeata Miller *Gard. Dict. ed. 8* (1768); *Descourt. Fl. Ant. iv.* 289, *t.* 294; *Bot. Reg. t.* 1928; *Maef. Jam. ii.* 181; *Griseb. Fl. Br. W. Ind.* 303; *Bot. Mag. t.* 7147; *Urb. Symb. Ant. viii.* 468. *P. Pereskia* Karsten *Deutsch. Fl.* 888 (1882); *Britt. & Rose Cact. i.* 10, *t.* 2. *P. aculeata* flore &c. *Plum. Gen.* 35, *t.* 26; *Cactus Pereskia L. Sp. Pl.* 469 (1753) & *Amœn. v.* 379.

C. sarmentosus &c. *Browne Hist. Jam.* 237. *Grossulariæ fructu majore* &c. *Sloane Cat.* 165 & *Hist.* ii. 86. Specimen in Herb. Linn. named by Linnæus. (Fig. 105.)

West Indian Gooseberry.

Sloane Herb. vi. 98*1! *Oracabessa, A. Bancroft!* Hope Gardens, *Harris!*—West Indies, tropical continental America.

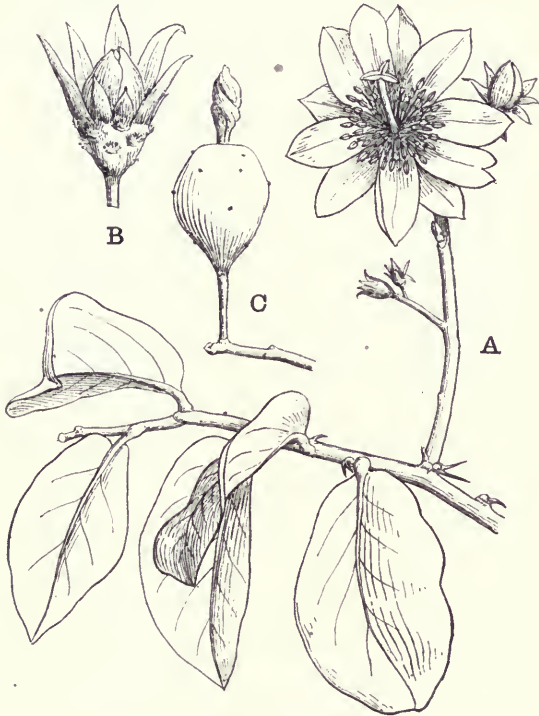


Fig. 105.—*Pereskia aculeata* Miller.

A, Portion of branch with leaves and flowering shoot $\times \frac{1}{2}$. B, Flower about to open $\times 2$.
C, Fruit, nat. size.
(A, C after Britton & Rose.)

Shrub: branches trailing and climbing over bushes, &c., often 10 to 30 ft. l. *Spines*: long, slender, and straight, in clusters on the stem, but solitary or only 2 or 3 together on the lower part; in pairs (or 3) recurved, short, in the axils of leaves. *Leaves* 3-7(-10) cm. l.; elliptical or ovate; petioles very short. *Cymes* paniculate, many-flowered. *Calyx*-tube spiny. *Petals* about 2 cm. l., oblong-elliptical, white, pale yellow, or pinkish. *Berry* 1-1.5 cm. in diam., globose, bearing the leafy sepals at apex. *Seeds* few, black, 4 or 5 mm. in diam.

Often cultivated for its fruit.

Lunan (*Hort. Jam.* ii. 236) and Macfadyen (*loc. cit.*) state that *P. portu-lacifolia* was cultivated in Jamaica. Macfadyen describes it as a tree with

the trunk armed with clusters of long spines; flowers solitary; fruit without remnants of sepals. Sloane describes the specimen seen by him as a tree with "the face of a *Rhamnus*" about 15 ft. high and well spread. It grew near the old monastery ruins by the town of St. Jago de la Vega. It is possible that this is the same species as the *P. portulacifolia* quoted by Lunan and Macfadyen. The specimen in Herb. Sloane appears to be *P. aculeata*.

2. NOPALEA Salm-Dyck.

Fleshy shrubs with cylindrical trunks; branches jointed, joints very much flattened, obovate or oblong, with scattered areoles bearing white wool, with small barbed spines, and often long spines. Leaves small, scale-like, soon falling. Flowers solitary from the areole, at or near the edges of the joints. Calyx-tube inserted in the depression at top of ovary; lobes 6-8, erect. Petals red or pinkish, 12-18, erect, closely adpressed against the numerous protruding stamens. Ovary with a deep depression at apex, not sunk in joint; surface tuberculate, each tuberculate portion slightly swollen, with an areole near its apex; style as long as or longer than the stamens; stigmas with 5-7 erect rays. Berry red, juicy, pear-shaped, edible, usually spineless. Seeds numerous, flat, with a thick bony raphe.

Species 7, natives of West Indies, Mexico, and tropical S. America; one widely cultivated in subtropical regions of the Old World.

N. cochenillifer Salm-Dyck *Cact. Hort. Dyck*, 1849, 64 (1850) (as *coccinellifera*); *K. Schum in Fl. Bras. iv. pt. 2*, 301, t. 60 & *Monogr.* 750; *Urb. Symb. Ant. iv.* 433 & *viii.* 467. *Britt. & Rose Cact. i.* 34, t. 4, f. 1. *Cactus cochenillifer L. Sp. Pl.* 468 (1753); *Descourt. Fl. Ant. vii.* 273, t. 516; *Bot. Mag. tt.* 2741, 2742. *C. brachiatus et articulatus subinermis &c. Browne Hist. Jam.* 237. *Opuntia maxima folio oblongo &c. Sloane Cat.* 194 & *Hist. ii.* 152, t. 8, f. 1, 2, t. 9. *O. cochinellifera Mill. Gard. Dict. ed. 8* (1768); *Macf. Jam. ii.* 179; *Griseb. op. cit.* 302. *Tuna mitior &c. Dill. Elth.* 399, t. 297. Upright Prickly Pear *Rev. J. Lindsay Ic. & Ms.* (Fig. 106.)

Wulfschlaegel; Harris! Bog Walk; Lucea; Hitchcock! Fl. Jam. 5614.—Cultivated and spontaneous in West Indies and tropical continental America; introduced into many parts of the Old World; original habitat unknown.

Tall plants, often 9 to 12 ft. high, trunks to 8 in. thick; branches of ascending or spreading obovate-oblong joints, sometimes $1\frac{1}{2}$ ft. l. *Areoles* very distant, small, roundish. *Spines* wanting, or a few small ones at first on the older joints; small barbed spines numerous, soon falling. *Flowers* crimson, several appearing usually near the top of the joint especially at the edges, from base of ovary to tip of style 5.5-7 cm. l. *Ovary* semi-ellipsoidal, about 3 cm. l. *Fruit* red, about 5 cm. l.

The specific name was given because it is the chief species of cactus on which the cochineal insect was grown. The Spaniards found the cochineal industry established when they conquered Mexico in 1518. The plantations

of the cactus plants were called nopalries, after the Mexican name for the plant, Nopal; one is figured in Sloane Hist. ii. t. 9. Browne states that this cactus plant is "more rare than any of the rest."

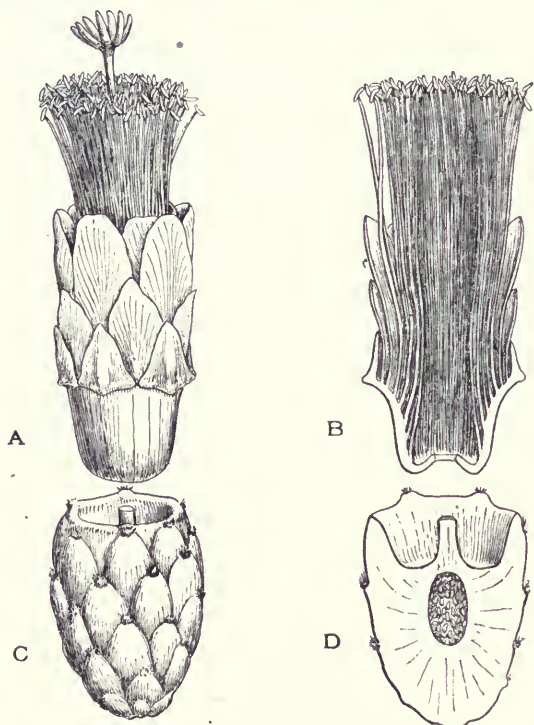


Fig. 106.—*Nopalea cochenillifer* Salm-Dyck.

- A, Flower removed from ovary, nat. size. C, Ovary with base of style, nat. size.
 B, Ditto cut lengthwise and style removed, nat. size. D, Ditto cut lengthwise, nat. size.

3. OPUNTIA Miller.

Sometimes tree-like, the stem branching in older plants from a cylindrical base, more often much branched from the ground, branches jointed, flat, globose to subcylindrical; areoles bearing leaves, spines, very short barbed bristles, hairs, and flowers. Leaves scale-like, soon falling. Flowers usually one at an areole, yellow, red, or purple. Calyx: lobes numerous, outer scale-like or leaf-like, adherent to the ovary, inner short, flat. Petals united at the base, spreading. Stamens: filaments shorter than the petals, free or combined. Ovary not sunk in tissue of joint, glabrous, with areoles; style cylindrical, scarcely overtopping the

stamens, thicker below, hollow above, with 2-7 thick erect stigmatic rays. Berry pear-shaped, depressed at apex, with areoles, with or without spines. Seeds compressed; coat bony; endosperm little or much; cotyledons leafy.

Species about 250, natives of the West Indies and tropical and subtropical America, one or two very widely spread through the Old World.

Areoles with long spines.

Joints obovate to elliptical. Plants 2-5 ft. high.

Joints obovate-elliptical. Spines yellow, to 3.5 cm. 1. *O. Tuna*.

Joints obovate with long tapering base. Spines white, to 2.5 cm. 1. 2. *O. jamaicensis*.

Joints narrowly oblong. Plant to 16 ft. high, with spiny trunk 3. *O. spinosissima*.

Areoles without long spines (rarely with small solitary spines)..... 4. *O. Ficus-indica*.

1. *O. Tuna* Miller Gard. Dict. ed. 8 (1768); bushy, much branched, erect; joints obovate or elliptical; areoles with 3-5 (2-6)

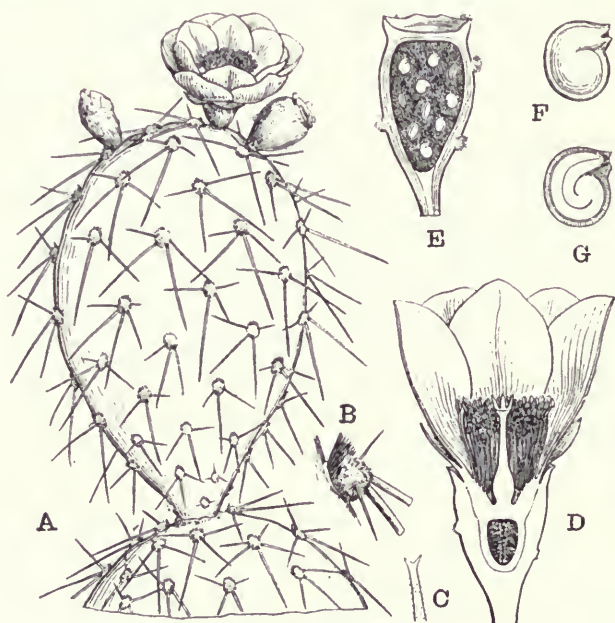


Fig. 107.—*Opuntia Tuna* Miller.

A, Shoot with flower-bud, flower, and fruit, $\times \frac{1}{2}$.

B, Areole with long spines cut, nat. size.

C, A small spine from B, much enlarged.

D, Flower cut lengthwise, nat. size.

E, Fruit cut lengthwise $\times \frac{3}{4}$.

F, Seed $\times 3$.

G, Ditto cut lengthwise.

slender needle-shaped spines, yellow (at least when young); flowers yellow; ovary 1.5–2 cm. l.; fruit red.—*Macf. Jam. ii.* 178; *Griseb. Fl. Br. W. Ind.* 302 (excl. hab. Antigua); *Britt. & Rose Cact. i.* 113, *figs.* 141, 142. *Cactus Tuna L. Sp. Pl.* 468 (1753). *C. brachiatus et articulatus articululis ovatis &c. Browne Hist. Jam.* 237. *C. polyanthos Bot. Mag. t.* 2691. Prickly Pear *Rev. J. Lindsay Ic. & Ms.* (Fig. 107.)

Prickly Pear (a name applied to this and allied species).

"Confined to Jamaica lowlands on southern side" (Britton & Rose *l.c.*); near Kingston; Old Hope road, 400 ft; *Harris!* *Fl. Jam.* 6347, 11,632.

Plants 2–3 ft. high. *Joints* 10–20 cm. l. *Areoles* large. *Spines*: longest 2.5–3.5 cm. l. *Flowers* about 5 cm. br. *Sepals* roundish, yellowish with a purple stripe along the centre. *Petals* light yellow slightly tinged with red, 2–2.5 cm. l. *Fruit* red, obovoid, about 3 cm. l.

This species, in the early part of the nineteenth century, was renamed *O. humilis* and also *O. polyantha*. The name *O. Tuna* was transferred to *O. Dillenii*, one of the most common species, both wild and cultivated (Britton & Rose *l.c.*). In *O. Dillenii* the spines are 1–4 (to 10 on areoles of first year's joints) to 7 cm. l. *Petals* 4–5 cm. l. *Fruit* 5–7 cm. l.

A whitewash is prepared by slicing the joints of a Prickly Pear, macerating them in water for 24 hours, and to this solution of creamy consistence lime is added and well mixed in. When the mixture is applied to any surface, be it wood, iron, or other material, a beautiful pearly white appearance is produced which endures through rain for many years. (*Agricultural News* xvi. 204.) For a study of Prickly Pears as a pest in Agriculture see J. H. Maiden in *Agric. Gaz. of N.S. Wales* ix. 979 (1899).

2. *O. jamaicensis Britt. & Harr. Torreyia xi.* 130 (1911); shrubby, erect; branches several, ascending; joints obovate with a long tapering base; spines 2–3 (1–5), slender, needle-shaped, white with yellowish-green tips; flowers yellow; ovary 2 cm. l.; fruit red.—*Britt. & Rose Cact. i.* 113, *t.* 18, *f.* 4, 5, *t.* 19.

Roadside plains near Salt Ponds, St. Catherine, *Harris & Britton!* *Fl. Jam.* 10,887.

Plant 3 ft. high. *Joints* 7–13 cm. l. *Areoles* about 2.5 cm. apart. *Spines* 2.5 cm. l. or less; short spines barbed. *Flowers* 4 cm. br. *Petals* light lemon-yellow with a reddish-brown streak at the middle, 2.5 cm. l. *Fruit* pear-shaped, 3.5–4 cm. l.

3. *O. spinosissima Miller Gard. Dict. ed.* 8 (1768); erect, trunk cylindrical, not jointed, densely spiny, giving off pendulous branches 4–5 ft. from the ground; joints narrowly oblong; spines in areoles of joints 3 or 4 (1–4), needle-shaped, straw-coloured or whitish, minute barbed spines brown, densely covering the areoles; flowers at first yellow, then turning reddish-orange; fruit red.—*Macf. Jam. ii.* 177; *Griseb. loc. cit.*; *Britt. & Rose Cact. i.* 204, *fig.* 258, *t.* 36. *O. major spinosa caulescens foliis atrovirentibus longis et angustis pendulis flore rubro Sloane Cat.* 195 & *Hist. ii.* 154, *t.* 224, *f.* 2. *Cactus brachiatus et articulatus articululis oblongo-ovatis &c. Browne Hist. Jam.* 237. Prickly Pear Tree *Rev. J. Lindsay Ic. & Ms.*

Southern coast; *Sloane* Herb. vii. 83! *Macfadyen*.

Plants to 16 ft. high, trunk often as thick as a man's thigh with spines 5 cm. l. and more. *Joints* 1·5–3 dm. l., 5–7 cm. br., their *areoles* 1 to 2 cm. apart. *Flowers* 2·5–3 cm. br. *Petals* about 1 cm. l. *Ovary* 5–6 (3–8) cm. l., narrowing to a stalk-like base.

O. Dillenii *Haworth Suppl. Pl. Succ.* 79 (1819); joints obovate, 13–20 (7–40); areoles with 1–4 (–10) stout spines yellow and somewhat mottled with brown, commonly flattened, longest usually 3 cm. l., sometimes to 7 cm. l.; petals yellow tinged with red, 4–5 cm. l.; fruit red-purplish, 5–7·5 cm. l.—*Britt. Fl. Berm.* 255; *Britt. & Millsp. Bah. Fl.* 296; *Britt. & Rose Cact. i.* 162, f. 201, t. 28, f. 2, t. 29, f. 2. *Tuna major* &c. *Dill. Elth. ii.* 398, t. 296. *Cactus Dillenii Ker-Gawl Bot. Reg. t.* 255 (1818). *Cactien en Raquette Descourt. Fl. Ant. vii.* 262, t. 513 (1829).

Prickly Pear.

Possibly occurring in Jamaica.—Coasts of S. Carolina, Florida, Bermuda, West Indies, east coast of Mexico, northern S. America.

Bushy-branched, 1½–5 ft. high. *Areoles* somewhat elevated. *Fruit* pear-shaped, edible.

4. **O. Ficus-indica** *Miller Gard. Dict. ed.* 8 (1768); large plants, bushy or tree-like; stems hard and woody with age; joints elliptical, oblong, or obovate, thick; spineless, or areoles rarely with one spine; flowers yellow; ovary 4–5 cm. l.; fruit red, sometimes white or yellow, edible.—*Griseb. Fl. Br. W. Ind.* 302; *Britt. & Rose Cact. i.* 177, ff. 217, 218. *O. pseudo-tuna Salm-Dyck ex Macf. Jam. ii.* 180 (1850). *Cactus Ficus-indica L. Sp. Pl.* 468 (1753).

Indian Fig.

Macfadyen; King's House grounds, J.P. 1308, *Hart! Hitchcock*.—Native country not known, but now found cultivated or as an escape throughout the tropics and subtropics.

Plants 5 to 15 ft. high. *Joints* usually 3–5 dm. l. *Leaves* awl-shaped, green, 3 mm. l. *Areoles* small. *Flowers* 7–10 cm. br. *Fruit* obovoid, with reddish pulp, 5–9 cm. l., with a shallow depression at the apex.

4. CEREUS Miller.

Stem short or elongate, erect or climbing or creeping, ribbed or angular, continuous or jointed, simple or branched, bearing areoles. Flowers lateral, usually opening at night. Calyx-tube bearing tomentose cushions; lobes numerous, in indefinite series, the outer scale-like, inner elongate, overlapping spirally. Petals indefinite, in indefinite series, recurved-spreading. Stamens: filaments attached to the calyx-tube, included or protruding. Ovary not sunk in the stem, more or less scaly; style thread-like. Berry scaly or tuberculate, bearing areoles. Seeds generally without endosperm; cotyledons parallel to the sides of the seed, generally hooked, short or leafy.

Species about 230, natives of the West Indies, tropical and subtropical America.

Erect columnar plants.

Stem and branches stout. Flowers short-funnel-shaped 1. *C. peruvianus*.

Stem and branches slender. Flowers long-tubular-funnel-shaped 2. *C. gracilis*.

Climbing plants with aerial roots.

Stem 3-angled. Flowers white 3. *C. triangularis*.

Stem 7-angled. Flowers white 4. *C. grandiflorus*.

Stem cylindrical, slightly 10-ribbed. Flowers crimson 5. *C. flagelliformis*.

1. *C. peruvianus* Miller *Gard. Dict. ed. 8* (1768); *Macf. Jam. ii.* 174. *C. crassissimus fructu intus et extus rubro* Sloane *Cat.* 196 & *Hist. ii.* 157. *C. Swartzii* Griseb. *Fl. Br. W. Ind.* 301 (1860); *Gard. Chron. n.s., x.* 185, fig. 37. *Cactus peruvianus L. Sp. Pl.* 467 (1753); *Sw. Obs.* 199. *C. cylindraceus erectus sulcatus major summitate obtusus &c.* Browne *Hist. Jam.* 238. *Cephalocereus Swartzii* Britt. & Rose *Contr. U.S. Nat. Herb. xii.* 420 (1909) & *Cact. ii.* 46. *Lemaireocereus bystris* Britt. & Rose *Contr. U.S. Nat. Herb. xii.* 425 (1909) & *Cact. ii.* 86, figs. 126-128. Large erect Indian Fig or Dildo *Rev. J. Lindsay Ic. & Ms. ined.*

Dildo.

Dry parts of Jamaica on southern side.—Cuba, Hispaniola, and small islands near Porto Rico.

Plant tall, erect, stout, simple or with erect branches, 16-20(-40) ft. high; trunk short, 2 ft. or more l., 5 inches to 1 ft. in diam., smooth, brownish-yellow; branches 7-10 cm. in diam., ribbed, spiny. *Ribs* 10 (8-12). *Areoles* rather large, felted. *Spines* gray with brown tips, stout needle-shaped, radials about 10, central spines usually 3, one often longer than the others 2.5(4) cm. l. *Flowers* short-funnel-shaped, 8-9 cm. l. (incl. ovary); tube 5 cm. l., dark green to purplish above, bearing few short broad scales; inner perianth-segments pinkish or white, spreading or recurved; the perianth withering and at length falling away from the ripening fruit. *Ovary* tuberculate, bearing usually small ovate scales. *Fruit* 5-6 cm. l., globose, red, covered with clusters of spines which soon fall, bursting when quite ripe, showing the dark red edible pulp and the numerous black seeds.

Cereus peruvianus of Britton & Rose (*Cact. ii.* 11) is quite a different plant, a native of the south-eastern coast of S. America. We keep the specific name for the Jamaican species, as we believe it to be the one named by Linnaeus. The plant referred to in *Hortus Upsaliensis*, 120, is said to be a native of Jamaica. Linnaeus gives as a synonym *Cereus peruanus* &c. *Bauh. pin.* 458, and apparently concludes that the species is a native of both Jamaica and Peru. In *Amcen. v.* 379, he identifies *Cactus peruvianus* with Browne's *Cactus* No. 8 (*Hist. Jam.* 238).

We are unable to follow Britton & Rose (*Cact. ii.* 46) in regard to *C. Swartzii* Griseb. as a distinct species characterized by the want of scales on the ovary. Sloane, Swartz, and Macfadyen (also Grisebach) distinguished only the one species. The presence of scales and spines on the ovary and fruit would seem from the description to be a variable character.

2. *C. gracilis* Miller *Gard. Dict. ed. 8* (1768). *C. altissimus gracilior fructu extus luteo intus niveo &c.* Sloane *Cat.* 197 & *Hist. ii.* 158. *C. altissimus* &c. *Trew Pl. Select. t.* 14. *C. repandus*

Haworth Syn. Pl. Succ. 183 (1812); *Bot. Reg. t.* 336 (under *Cactus*); *Macf. Jam. ii.* 174; *Griseb. loc. cit.* (non *L.*). *Cactus erectus*... *tenuior* &c. *Browne Hist. Jam.* 238. *Harrisia gracilis Britt. Bull. Torr. Club xxxv.* 563 (1908); *Britt. & Rose Cact. ii.* 151, fig. 221, 222, *t.* 20, *f.* 1. *H. undata Britt. tom. cit.* 564 (1908). Dildo Pear Tree or Small erect Indian Fig *Rev. J. Lindsay Ic. & Ms. ined.*

Torch-wood.

Plant much branched, to 20 ft. high, dark green. *Ribs* 9-11, rounded; depressions shallow. *Areoles* 1.5-2 cm. apart, with 9-16 needle-like spines (sometimes fewer), the longer 2-2.5 cm. l. *Corolla* 20 cm. l.; scales of tube greenish brown, narrowly lanceolate, acuminate, about 2 cm. l.; subtending a few hairs. *Perianth-segments*: outer pale brown, inner white, denticulate. *Fruit* depressed-globose, yellow, about 5 cm. l., with flattened tubercles, each of which has a green scale in the middle with or without wool in the axis.

The woody centre of the stems after the decay of all the soft parts "is used for a torch by the Indians to catch fish in the night time; they hold it out of the ends of their canoes lighted, and, the fish leaping at it, strike them with their instruments, and great plenty of them are caught so." (*Sloane*.) The fruit is sometimes served up at table with other fruit. (*Browne*.)

C. eriophorus Herb. Berol. ex Pfeiffer Enum. 94 (1837); *Pfeiffer & Otto Cact. t.* 22, according to *Grisebach*, occurs in Jamaica. It is very similar to the previous species, but the flowers are rather smaller, and the inner perianth-segments are entire. *Griseb. loc. cit.*; *Harrisia eriophora Britton Bull. Torr. Club xxxv.* 562 (1908); *Britt. & Rose Cact. ii.* 149, fig. 215, *t.* 18.

3. *C. triangularis Haw. Syn. Pl. Succ.* 180 (1812); *Macf. Jam. ii.* 175; *Griseb. loc. cit.* *Ficus indica folio triangulari* &c. *Sloane Cat.* 196 & *Hist. ii.* 155. *Cactus triangularis L. Sp. Pl.* 468 (1753). *C. debilis* &c. *Browne Hist. Jam.* 238. *Hylocereus triangularis Britt. & Rose Contrib. U.S. Nat. Herb. xii.* 429 (1909) & *Cact. ii.* 192, *f.* 269. Strawberry Pear *Rev. J. Lindsay Ic. & Ms. ined.* (Fig. 108, c.)

Prickly Withe, God Óchra.

On trees in Savanna woods near St. Jago de la Vega *Sloane* (specimen in *Herb. vii.* 83* from Philip Miller, Chelsea Garden)! *Wright!* On rocks, stone-walls, &c. *Macfadyen*; Westphalia road, near Cinchona, J.P. 1380, *Morris!*

High-climbing or creeping plants, sharply 3-angled, 3-4 cm. br.; giving off numerous long aerial roots. *Areoles* about 2 cm. apart, with a few short spines, 6-8 together. *Flowers* 20 cm. l. or more, opening at night, white. *Perianth-segments*: outer to 10 cm. l., linear; inner shorter and broader. *Scales* on the ovary and tube linear from a broad base, green, 2-5 cm. l. *Fruit* crimson, with large persistent scales, edible, 10 cm. l.

Withea are made from the stems. *Fruit* used as a substitute for ochras, and even served up at table with other fruit. (*Browne*.)

4. *C. grandiflorus Miller Gard. Dict. ed.* 8 (1768) & *Ic. t.* 90, *Bot. Mag. t.* 3381; *Macf. Jam. ii.* 175; *Griseb. loc. cit.* *C. gracilis*

scandens &c. *Trew Pl. Ehret. tt.* 31, 32. *Cactus grandiflorus L. Sp. Pl.* 467 (1753); *Desc. Fl. Ant. i.* 277, *t.* 65. *Selenicereus grandiflorus Britt. & Rose Contrib. U.S. Nat. Herb. xii.* 430 (1909) & *Cact. ii.* 197, *t.* 32, *f.* 3, *t.* 33. Climbing Indian Fig *Rev.*



Fig. 108.—*Cereus flageliformis* Miller.

A, Portion of stem with flower $\times \frac{3}{4}$. C, Fruit of *C. triangularis* Haw.
 B, Flower cut lengthwise $\times \frac{3}{4}$. D, Seed of *C. grandiflorus* Haw.
 (A, B after Trew; C after Schumann; D after Schleiden.)

J. Lindsay Ic. & Ms. ined. Specimen in Herb. Linn. grown in Hort. Upsal. and named by Linnæus. Specimen in Hort. Cliff. in Herb. Mus. Brit. (Fig. 108, D.)

Night-blooming *Cereus*.

Walls, rocks, and tree-trunks; *Wright! Macfadyen*; Port Royal Mts., *Johnson! Arcadia, Trelawny, Fawcett! Port Antonio*; Lucea: *Hitchcock.*—Cuba.

Stems climbing up trunks of trees, then branching freely, with pendulous bunches of branches 1.5-2.5 cm. in diam., ribbed, giving off long aerial

roots. *Ribs* 7 (5-8), with rounded furrows between. *Areoles* small, bearing 5-12 spines, 5-7(-10) mm. l., intermixed with longer hairs. *Flowers* 18-21 cm. l., opening at night, fragrant; tube 12-13 cm. l.; scales of tube and ovary strap-shaped, light yellow, 5-14 mm. l., with long brownish hairs in axils. *Perianth-segments*: outer narrow, salmon-coloured, inner much broader and shorter, white. *Fruit* roundish-ovoid, 5(-8) cm. l., orange-coloured or yellow, covered with scales and clusters of spines and hairs which soon drop off.

This plant, and especially the flowers, is said to be a remedy in functional heart disease; see *Pharm. Journ.* lix. (4th ser., v.) 165 (1897).

5. *C. flagelliformis* Miller *Gard. Dict.* ed. 8 (1768); *Griseb. loc. cit.* *C. minima* serpens &c. *Sloane Cat.* 197 & *Hist.* ii. 158. *C. minimus* scandens &c. *Ehret Plantæ*, t. 2, f. 3 & *Trew Pl. Select.* t. 30. *Cactus flagelliformis* L. *Sp. Pl.* 467 (1753); *Sw. Obs. Bot.* 200; *Tussac Fl. Ant.* ii. 106, t. 28. *C. cylindraceus*, *sulcatus*, *pusillus* &c. *Browne Hist. Jam.* 238. *Aporocactus flagelliformis* Lemaire *Illustr. Hort.* vii., *Misc.* 68 (1860); *Britt. & Rose Cact.* ii. 218, t. 11, f. 2. Specimen in *Herb. Linn.* grown in *Hort. Upsal.* and named by *Linnaeus*. (Fig. 108, A, B.)

Stem 6-10 mm. in diam., whitish or glaucous green, climbing up the trunks of trees and over rocks and walls; ribs 10-12, not prominent nor acute in living specimens, but often acute in shrunken herbarium specimens. *Areoles* 4-6(-8) mm. apart on the ribs; spines 10-16, bristly rather than spiny, 2 or 3 in the centre stouter, often longer than the rest. *Flowers* 7-8 cm. l., crimson; outer perianth-segments narrow, more or less reflexed; inner perianth-segments broad, only slightly spreading. *Fruit* globose, 10-12 mm. in diam., red, bristly.

Red Hills on road to Guanaboa, *Sloane Herb.* vii. 83*, 85 (from P. Miller, Chelsea)! On trees near the sea, *Swartz*.—Tropical continental America (cultivated).

5. MELOCACTUS Link & Otto.

Stem cone-like or subglobose, fleshy, flat at the base, ribbed, when mature crowned by a narrower head densely woolly, bearing the flowers, ribs vertical, 9-20, bearing clusters of spines. Head a compact mass of slender stiff adpressed bristles or spines, dark reddish-orange (in *M. communis*), embedded in white wool. Flowers arising out of the top of the head, small, rose-coloured. Calyx-tube cylindrical, wider at the base, prolonged beyond the ovary; lobes to 24, small, attached to the tube in a series or subspirally, overlapping. Petals in 2 or 3 series, combined at the base into a tube, outer narrower. Stamens inserted on the calyx-tube, enclosed. Ovary enclosed, smooth, ovoid, flat at the apex; style thread-like, with 5 or more stigmatic rays. Berry at length protruding, smooth, crowned with the withered corolla. Seeds black, without endosperm; embryo subglobose, on germination 2-cleft at the apex.

Species 18, natives of West Indies, Central America, Brazil, Colombia, Peru.

M. communis Link & Otto Verh. Beförd. Gartenb. iii. 417, t. 11 (1827); Macf. Jam. ii. 172; Griseb. Fl. Br. W. Ind. 300 (so far as the Jamaica habitat is concerned). Cactus Melocactus

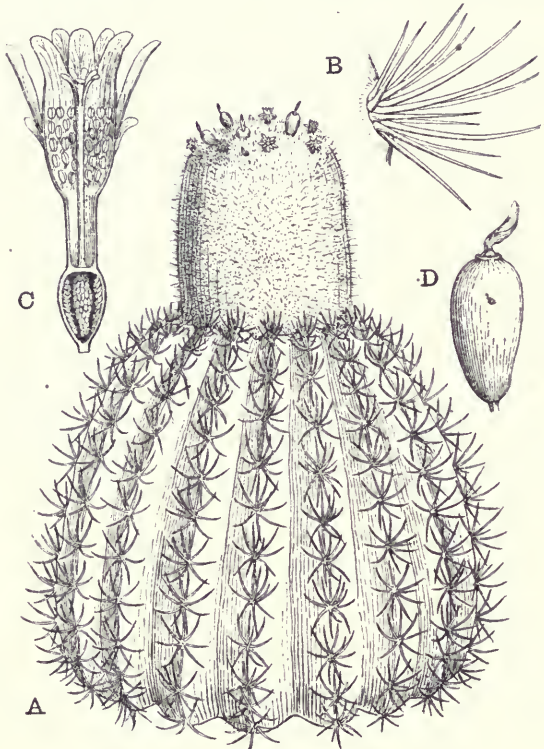


Fig. 109.—*Melocactus communis* Link & Otto.

A, Plant, reduced.

B, Cushion of spines, $\frac{1}{2}$ nat. size.

C, Flower cut lengthwise, nat. size.

D, Fruit, $\frac{1}{3}$ nat. size.

L. Sp. Pl. 466 (1753); *Lunan Hort. Jam.* i. 503; *Tussac Fl. Ant.* ii. 104, t. 27; *Britt. & Rose Cact.* iii. 224. *C. humilis* &c. *Browne Hist. Jam.* 238. *Echinomelocactus Sloane Cat.* 198 & *Hist.* ii. 159. (Fig. 109.)

Turk's Head, Turk's Cap, Pope's Head, Melon Thistle.

Savanna near Port Henderson; near Rock Fort; *Macfadyen*; Port Royal, *Hitchcock*; Healthshire Hills, south of Spanish Town, *Britton & Harris*.

Stem, a succulent mass, at first roundish, at length becoming elongated, 1-3 ft. high, 10-12 ins. in diam.; ribs 10-14, 2-3 cm. deep. *Spines* 10-12, 2-5 cm. l. *Head* 2-6 ins. high or more, 3-4½ ins. in diam., at first flat,

then elongating to become cylindrical. *Flowers* imbedded in the head, of a rich crimson colour, 3-4 cm. l. *Fruit* club-shaped, 5-6 cm. l., 12 mm. br. above, rose-pink.

Fruit of an agreeable acid taste. "In times of drought cattle have been observed to rip open these plants with their horns, and devour the fleshy moist part." (Lunan.)

Mammillaria simplex Haw. Grisebach *Fl. Br. W. Ind.* 300, cites this from Jamaica on the authority of Patrick Browne, who, however, has no reference to this plant. There is no evidence that it occurs in Jamaica.

6. RHIPSALIS Gaertn.

Shrubs growing on trees or rocks, fleshy, with a woody axis; branches alternate or in whorls, jointed, subrooting, elongate, cylindrical or flattened, leaf-like and crenate, spineless. Areoles minute, above scales (modified leaves), with short hairs and sometimes with bristles. Flowers usually solitary or twin, arising from the areoles of the upper joints, rather small. Sepals 2, 3, or more, very short, scale-like. Petals 6-10, unequal, free or united at the base into a short tube. Stamens indefinite, usually few, inserted near the base of the petals. Ovary exserted or not, usually glabrous, sometimes bearing several scales; style with 2-5 stigmatic rays. Berry crowned sometimes with the withered sepals or petals. Seeds usually without endosperm; cotyledons thick; radicle conical.

Species 69, natives of West Indies and tropical continental America, one or more in tropical Africa, Mauritius, and Ceylon.

Branches cylindrical, slender 1. *R. Cassutha*.

Branches flat, foliaceous.

Branches 1-2.5 cm. br. Flowers 6-8 mm. l. Berry

subglobose 2. *R. jamaicensis*.

Branches 4-6 cm. br. Flowers 15 mm. l. Berry

oblong..... 3. *R. alata*.

1. *R. Cassutha* Gaertn. *Fruct. i.* 137, t. 28 (1788); *Hook. Exot. Fl. i. t. 2*; *Bot. Mag. t.* 3080; *Macf. Jam. ii.* 182; *Griseb. Fl. Br. W. Ind.* 302; *Britt. in Torreya ix.* 155; *Urb. Symb. Ant. viii.* 465; *Britt. & Rose Cact. iv.* 225. *R. parasiticus* Haw. *Syn. Pl. Succ.* 187 (1812). *Cactus parasiticus inermis* &c. *Browne Hist. Jam.* 238. *C. parasiticus* L. *Syst. ed.* 10, 1054 (1759) (excl. syn. *Sloan.*), *Amœn. v.* 379 & *Sp. Pl. ed.* 2, 668. *C. inermis* &c. *Plum. Pl. Amer. (Burm.)* 190, t. 197, f. 2. *C. pendulus* Sw. *Prod.* 77 (1788) & *Fl. Ind. Occ.* 876; *Tussac Fl. Ant. iii.* 81, t. 22. *Cassutha filiformis* Mill. *Dict. ed.* 8 (1768) (non L.). *Rev. J. Lindsay Ic. ined.* Specimen from Browne in Herb. Linn. named by Linnæus *Cactus parasiticus*, with the letter A underneath, which is a reference to the name in the *Systema*. In *Sp. Plant. ed.* 2, 668, Linnæus substitutes the reference to

Browne (*Hist. Jam.* 238) for the reference to Sloane. Specimen in Herb. Mus. Brit. from Swartz.

Mistletoe, Currant Cactus.

Sloane Herb. vi. 110 (in part)! *Houstoun*! *Browne*! *Wright*! *Broughton*! *Swartz*! near *Cinchona*; Belvedere, Hanover; *Harris*! *Fl. Jam.*

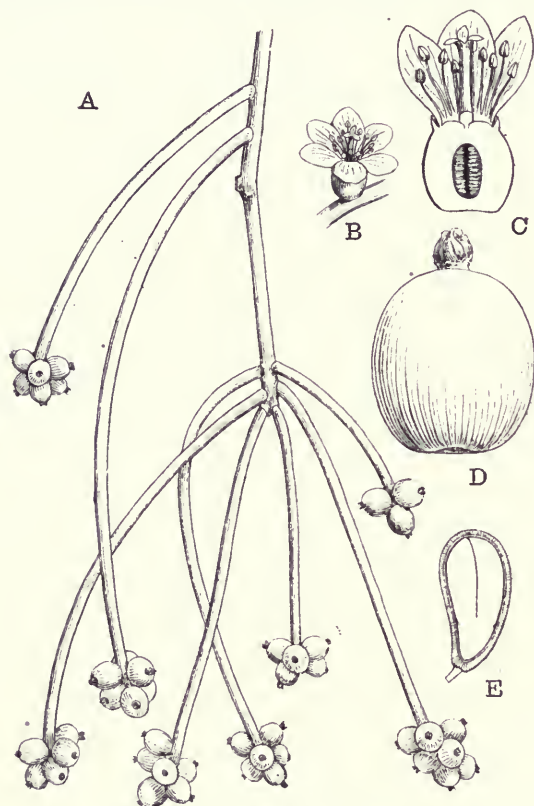


Fig. 110.—*Rhipsalis Cassutha* Gaertn.

A, Portion of branching stem with
fruits $\times \frac{3}{4}$.
B, Flower $\times 2$.

C, Flower cut lengthwise $\times 4$.
D, Fruit $\times 4$.
E, Seed cut lengthwise $\times 16$.

7408, 7646; Blue Mts.; Port Antonio; *Hitchcock*.—West Indies, tropical continental America, tropical Africa, Ceylon.

Stem cylindrical, jointed, pendulous, epiphytic on trunks of trees and on rocks, 2-forked or branches whorled, 4-8 cm. l. or more, 2-3 mm. in diam. *Areoles* .5 mm. in diam. with very minute hairs, and a small deciduous bristle longer than the triangular scale, those on the younger joints with several hair-like bristles. *Flowers* solitary. *Sepals* 2-4. *Petals* 4-6, longest 2-4 mm. l. *Stamens* 9-12. *Berry* 4-6 mm. l., ovoid-

globose, crowned with the remains of sepals and petals, fleshy with viscous juice, white (sometimes tinged with red), transparent. *Seeds* several, black, about 1 mm. l.

2. *R. jamaicensis* Britt. & Harris in *Torreya* ix. 159, fig. 3 (1909); Britt. & Rose *Cact. iv.* 242, t. 22, f. 4. *R. Swartziana* Griseb. *loc. cit.* (non Pfeiff.) (in part, so far as regards Wullschlaegel's specimen, *fide* Urban). *R. sp. Urb. Symb. Ant. vi.* 109. *Opuntia non spinosa* &c. *Sloane Cat.* 216 & *Hist. ii.* 159. *Cactus mitis* &c. *Browne Hist. Jam.* 237. *C. Phyllanthus* L. *Amœn. v.* 379 (1760) (only as regards Browne's plant).

Sloane Herb. vii. 84! *Wright!* *Wullschlaegel* (*fide* Urban); *Claverty Cottage*, northern slope of Blue Mts., J.P. 1352, *Hart!* *Ramble*, Claremont, *Fawcett & Harris!* *Lancaster*, 3300 ft.; *Troy*, 2200 ft.; *Harris!* near *Troy*, 1000 ft., *Harris & Britton!* *Fl. Jam.* 6516, 7354, 8562; *Troy*; *Bath* to *Cuna-Cuna Gap*; *Britton*; near *Troy*, *Maxon*; near *Montpelier*, *Mrs. Britton*.

Plant hanging from rocks and branches of large trees, 1-4 ft. l. *Stem* cylindrical, sometimes angular, branching; branches flattened, foliaceous, narrowly elongate-lanceolate or linear-lanceolate, below decurrent into a stalk-like base, dull green, indistinctly notched or slightly crenate, 1-3 (4) dm. l., 1-2.5 cm. br. *Flowers* solitary, yellowish-green, about 6 mm. l. *Petals* about 7, oblong to oblanceolate, apex blunt. *Stamens* 20-30, varying in length from $\frac{1}{2}$ to $\frac{3}{4}$ as long as the petals. *Ovary* oblong, bearing a few scales. *Style* much longer than the 3 oblong stigmas. *Berry* globose, white, 6-8 mm. in diam.; scales 3 mm. br.

3. *R. alata* K. Schum. in *Fl. Bras. iv. pt. 2*, 288 (1890) (in part, so far as regards the Jamaican plant); Britt. in *Torreya* ix. 156, fig. 2. *R. Swartziana* Pfeiff. *Enum.* 131 (1837); Griseb. *loc. cit.* (in part). *R. Harrisii* Gürke *Monats. Kakt. xviii.* 180 (1908). *Cactus alatus* Sw. *Prodr.* 77 (1788) & *Fl. Ind. Occ.* 878 (excl. syn.). *Cereus alatus* DC. *Prodr. iii.* 470 (1828); Macf. *Jam. ii.* 176. *Pseudorhipsalis alata* Britt. & Rose *Cact. iv.* 213, ff. 217, 218, t. 22, f. 5 (1923). Specimen from Swartz in Herb. Mus. Brit.

Swartz! *Belvedere*, Hanover, 500 ft.; *Woodstock*, 1400 ft.; *Harris!* *Fl. Jam.* 7619, 9995.

Plant hanging from rocks and branches of large trees, 6-16 ft. l. *Stem* below cylindrical, woody, branching; branches elongate-lanceolate, below decurrent into a stalk-like base, bright green, indistinctly notched or broadly crenate, 2-4 dm. l., 3-6 cm. br. *Flowers* yellowish-white, 15 mm. l. *Tube* 4 mm. l. *Perianth-segments* 8-10 mm. l., lanceolate, 10 in 2 series. *Stamens* numerous, about half as long as the perianth. *Style* about 3 times as long as the 5 linear stigmas or longer. *Berry* ovoid, yellowish-green ("black," Macf.), 1 cm. l.

FAMILY LXXXIV. THYMELÆACEÆ.

Trees or shrubs with a strong inner bark (bast) which is filamentous or net-like. Leaves usually alternate, entire; stipules wanting. Flowers usually in heads, racemes, or spikes, herm-

aphrodite or unisexual, regular. Perianth inferior, tubular, sometimes constricted below the throat (receptacle); perianth-lobes 4 or 5, overlapping in bud. Stamens as many or twice as many as the lobes, attached above the middle of the tube or at the throat, those opposite the lobes usually higher. Disk under the ovary, ring-like or cup-like, or represented by 4 or 5 scales usually higher up, or wanting. Ovary 1(2)-celled; ovule solitary in ovary (or in each cell), attached near the apex on one side, anatropous. Fruit not opening. Seed with endosperm wanting, sparse, or rarely copious. Embryo straight; cotyledons fleshy; radicle short, superior.

Species nearly 500, numerous in temperate regions of Old World, especially S. Africa and Australia, fewer in the tropics; many in the New World.

Flowers in a spike 1. *Lagetta*.

Flowers in umbels or heads..... 2. *Daphnopsis*.

1. LAGETTA Juss.

Trees with a network of inner bark (bast fibres). Leaves alternate. Flowers in loose terminal spikes or racemes, sessile or shortly stalked, hermaphrodite or unisexual. Perianth-tube (receptacle), slightly constricted at the throat. Perianth-lobes 4, short. Stamens 8, 4 at the base of the lobes, 4 lower down near the throat. Scales 4, short, at the constriction of the tube below the stamens, bending over the stigma, nearly closing the tube. Ovary 1-celled; stigma large, capitate, prominent above the throat. Fruit dry, enclosed by the persistent perianth. Endosperm sparse; cotyledons thick, fleshy.

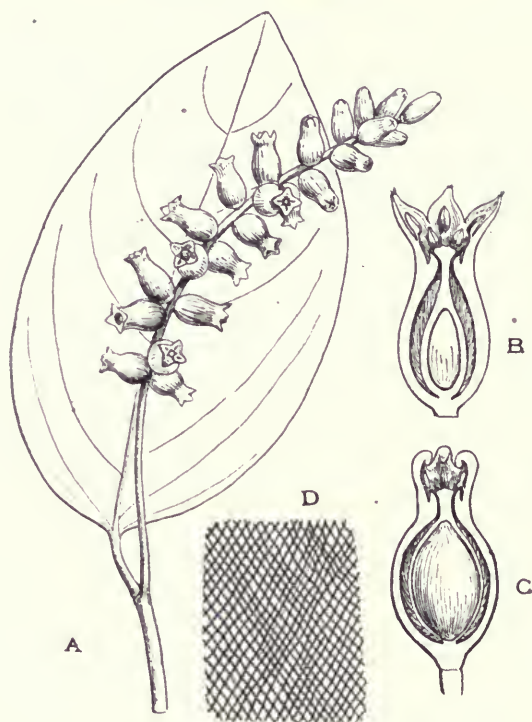
Species 3, natives of Jamaica, Cuba, and Hispaniola.

L. lagetto Nash in Journ. N. York Bot. Gard. ix. 117, figs. 14-16 (1908). *L. lintearia* Lam. Encyc. iii. 376 & 440 (1789) & Ill. t. 289; Hook. Journ. Bot. ii. t. 4 (1850); Bot. Mag. t. 4502; Meisn. in DC. Prodr. xiv. 526; Griseb. Fl. Br. W. Ind. 279; Urb. Symb. Ant. viii. 469. Daphne Lagetto Wright Med. Pl. Jam. in Lond. Med. Journ. viii. 250 (1787) & Mem. 207, 266; Sw. Prodr. 63 & Fl. Ind. Occ. 680. Laurifolia arbor &c. Sloane Cat. 137 & Hist. ii. 22, t. 168, f. 1, 2, 3; t. 169, f. 1. Frutex foliis majoribus &c. Browne Hist. Jam. 371, t. 31, f. 5. (Fig. 111.)

Lace-bark, Lagetto.

Luidas, Sloane, Herb. v. 82! Wright! above Christiania, Purdie! Wilson! Holly Mount, Mt. Diablo, 2600 ft.; near Troy, 2200 ft.; Peckham woods, Upper Clarendon, 2500 ft.; Harris! Fl. Jam. 6611, 8692, 8762, 10,972, 11,027, 11,179.—Cuba, Hispaniola.

Tree 15-30(-40) ft. high. Leaves 4-15 cm. l., elliptical to roundish-elliptical or ovate, shortly and abruptly acuminate. Spikes 4-10 cm. l., erect, with 10-23 hermaphrodite flowers. Fruit 5 mm. l.

Fig. 111.—*Lagetta lagetta* Nash.

A, Apex of branch with leaf and flower-spike $\times \frac{5}{8}$.
 B, Flower cut lengthwise $\times 3\frac{1}{2}$.

C, Fruit enclosed in persistent receptacle $\times 3\frac{1}{2}$.
 D, Fibres from inner bark.

2. DAPHNOPSIS Mart. & Zucc.

Trees or shrubs. Leaves alternate. Flowers diœcious, sometimes apparently monœcious, in umbels, heads or subracemose, peduncles sometimes branched at the ends of branches, sometimes simple axillary. Male flower: Perianth-tube (receptacle) slender. Perianth-lobes 4, spreading. Stamens 8, the 4 upper on or opposite the lobes, the 4 lower alternate; anthers sessile. Scales under the ovary 2 or 4, small. Ovary undeveloped. Female flowers: Perianth-tube (receptacle) smaller than in the male. Staminodes minute or wanting. Ovary oblong, sessile, 1-celled; style short, thick; stigma capitate. Fruit ovoid or subglobose. Seeds without endosperm; cotyledons thick, fleshy; radicle very short. Burn-nose Bark.

Species 33, natives of the West Indies and tropical America, from Mexico to Peru and Brazil.

Peduncles simple. Perianth-lobes acute..... 1. *D. occidentalis*.

Peduncles branched dichotomously. Perianth-lobes obtuse 2. *D. tinifolia*.

1. *D. occidentalis* Kr. & Urb. in *Engl. Bot. Jahrb.* xv. 349 (1892). *D. Swartzii* Meisn. in *DC. Prodr.* xiv. 522 (1857); Griseb. *Fl. Br. W. Ind.* 278. *Daphne occidentalis* Sw. *Prodr.* 63



Fig. 112.—*Daphnopsis occidentalis* Kr. & Urb.

A, Portion of branch with leaves and inflorescence $\times \frac{1}{2}$.

B, Male flower cut lengthwise $\times 4$.

C, Female flower cut lengthwise $\times 4$.

D, Fruit cut lengthwise $\times 3$.

& *Fl. Ind. Occ.* 685. *Arbor cortice* &c. *Browne Hist. Jam.* 372 (in part). Specimen from Swartz in Herb. Mus. Brit. (Fig. 112.)

In fl. July-Dec.; in fr. Aug.-Dec.; *Swartz!* Moneague, *Prior!* Liguanea hills, 1800 ft.; near Christiana, 3000 ft.; near Troy, 2500 ft.; Holly Mount, Mt. Diablo, 2500-2700 ft.; Hopeton, Westmoreland, 1300 ft.; Iron Face, Chester Vale, 3000 ft.; Peckham, Clarendon, 2500 ft.; Crofts

Mt., Clarendon, 2500 ft.; *Harris!* Fl. Jam. 5821, 8269, 8793, 8965, 8967, 9002, 9394, 9764, 10,023, 11,185, 11,218.

Shrub 3-4 ft., or *tree* 15-30 ft. *Leaves* 5-14 cm. l., lanceolate, apex acuminate to rounded, of a lighter colour beneath, papery, puberulous beneath especially on midrib. *Peduncle* 1-5 cm. l., not branched. *Flowers* sometimes apparently monocious, white, greenish-white or yellowish-white, shortly stalked or sessile, in a head. *Perianth-tube*: male narrowly funnel-shaped, about 8 mm. l.; female stalk-like below, bell-shaped above, 4 mm. l. *Perianth-lobes*: male 4 mm. l., female 2-2.5 mm. l., acute. *Fruit* ellipsoidal, 1.4-1.8 cm. l., yellowish-white or milky white.

Browne probably includes both species under "*Arbor cortice &c.*" He says the bark makes very good ropes; it is fine, and spreads something like lace-bark; the seeds have a sharp biting taste.

2. *D. tinifolia* Griseb. *Fl. Br. W. Ind.* 278 (1860). *D. tinifolia* v. *Cumingii* Meisn. in *DC. Prodr.* xiv. 523 (1856). *D. americana* Urb. in *Arkiv för Botan.* xvii. no. 7, 44 (1921); *Fauv. & Rendle in Journ. Bot.* lxxiii. 51 (1925). *Daphne tinifolia* Sw. *Prodr.* 63 (1788) & *Fl. Ind. Occ.* 683. *Arbor cortice &c.* *Browne Hist. Jam.* 372 (in part). Specimen from Swartz in Herb. Mus. Brit. Specimen in Herb. Kew. named by Grisebach.

In fl. May-Nov.; in fr. Sept.-Oct.; *Wright!* highest mountains, *Swartz!* *Macfadyen!* *Cuming!* Great Valley, Manchester, *Purdie!* *Moneague, Prior!* *March!* *Jenman!* *Cinchona*, J.P. 1281, *Morris!* *Whitfield Hall*, Blue Mts., 2500 ft.; *Round Hill*, S. Cruz Mts., 2000 ft.; *Peckham*, Clarendon, 2300 ft.; *Worthy Park*, St. Catherine, 1200 ft.; *Harris!* Fl. Jam. 6478, 9700, 11,084, 11,231.—Hispaniola.

Tree, 15-30 ft. high. *Leaves* 6-12 cm. l., oblong-lanceolate, elliptical, or roundish-elliptical, glabrous: petioles 5-10 mm. l. *Peduncles* 1-3-times forked, silky-puberulous or glabrescent. *Flowers* greenish-yellow or yellowish-white. *Male flowers*: sessile. *Perianth-tube* to 9 mm. l., stalk-like below, becoming wider above, perianth-lobes to 2.5 mm. l., recurved. *Female flowers*: *Perianth-tube* 4-5 mm. l., stalk-like below, bell-shaped above; lobes 1 mm. l., spreading. *Fruit* 11-13 mm. l., ovoid, apex pointed, crowned with the persistent style and stigma, shortly stalked.

D. caribæa Griseb. (loc. cit.) differs in the flowers being smaller: male perianth-tube 7 mm. l., lobes 2 mm. l.; female perianth-tube 2 mm. l. (stalk-like part very short or wanting), lobes 1 mm. l.; fruit about half as large. It is a native of the Lesser Antilles, and Margarita.

FAMILY LXXXV. LYTHRACEÆ.

Herbs, shrubs, or trees, with twigs often 4-angled. Leaves generally decussate, sometimes whorled or alternate, entire. Stipules minute or wanting. Flowers usually hermaphrodite and regular (irregular in *Cuphea*), usually solitary or cymose, rarely paniculate. Calyx usually free, persistent, generally tubular or bell-shaped, with 3-12 valvate, primary teeth or lobes, sometimes with as many accessory teeth or lobes. Petals as many as the primary teeth or lobes of the calyx, rarely fewer or none, clawed, membranous and wavy, equal or in a few very unequal, overlapping. Disk wanting or ring-like, situated at

the base or throat of the calyx-tube. Stamens very variable in number, inserted at various heights in the calyx-tube, in one or more series, equal or some smaller or imperfect, of 2 forms in some genera. Ovary free, 2-6-celled, sometimes becoming 1-celled through the disappearance of the partitions or the non-development of the other cell. Style simple or none. Ovules indefinite, usually on the axis or the base of the cells, anatropous. Capsule more or less enclosed by the calyx, with 2 or more cells or 1-celled, as in ovary, opening in various ways or not opening; with many seeds. Seeds usually ascending; endosperm wanting. Embryo straight; cotyledons usually flat.

Species 450, mostly natives of the tropics, chiefly of America, a few widely dispersed through the temperate regions.

Flowers irregular 1. *Cuphea*.

Flowers regular.

Flowers in clusters. Capsule bursting irregularly 2. *Ammannia*.

Flowers solitary. Capsule loculicidally 3-6-valved..... 3. *Heimia*.

1. CUPHEA Adans.

Herbs or shrubs. Leaves usually decussate, occasionally whorled, entire. Flowers solitary or in racemes simple or compound with alternate branches, often leafy. Bracteoles 2, wanting in *C. ciliata*. Flowers irregular, parts in sixes. Calyx: tube long, ribbed, base gibbous or spurred, with oblique mouth, usually coloured. Petals usually 6 (2), wanting in *C. platycentra*. Stamens unequal, usually 11, ventral 9, dorsal 2 shorter. Ovary usually sessile, with a dorsal disk (rarely cup-like) at the base, unequally 2-celled, one cell smaller and often empty, the partition gradually disappearing; style with a 2-lobed capitate stigma; ovules 2 or more inserted on a thread-like placenta adherent to the middle of the partition. Capsule enclosed by the persistent calyx, very thinly membranous, 1-celled, opening on the side and sometimes protruding through the split side of the calyx; the columnar placenta free, with few or many seeds. Seeds somewhat flattened-lens-shaped; coat smooth, leathery; cotyledons roundish, radicle short.

Species about 230, natives of West Indies and tropical and subtropical continental America.

Calyx 2-2.5 cm. l., with subglobose spur. Petals wanting.....

Calyx usually less than 1 cm. l., gibbous at base or with short spur. Petals present. 1. *C. platycentra*.

Calyx not exceeding 6 mm. Annual herbs..... 2. *C. Parsonsia*.

Calyx exceeding 6 mm.

Flowers solitary, alternate. Herbs.

Perennial, smelling of onions 3. *C. Melanimum*.

Annual, viscous 4. *C. petiolata*.

Flowers opposite in a terminal raceme. Small shrub 5. *C. ciliata*.

1. *C. platycentra* Lemaire *Fl. des Serres* ii. t. 180 (1846) (non Benth.); shrub; pedicels 5–12(–23) mm. l.; flowers solitary, axillary; calyx 2–2.5 cm. l., spur subglobose, contracted at base.—*Paxton Mag.* xiii. 267 (1847); *Koehne in Engl. Pflanzenreich* iv. 216, 167. *C. ignea* A. DC. in *Fl. des Serres* v. *miscell.* n. 248 (1849). *Parsonsia micropetala* Hitchc. in *Rep. Miss. Bot. Gard.* iv. 87 (1893)?

Newcastle, 4000 ft., and higher, *Lehmann!* also *Eggers!* *Clute!* and *Harris!* *Cinchona*, J.P. 1373, *Hart!* and *Morris!* also *G. E. Nichols!* Blue Mt. Peak, *Hitchcock.* *Fl. Jam.* 9143, 11,935.—Mexico.

Shrub, 1–3 ft. high when growing in open, but amongst shrubs reaching a height of 6 ft. *Leaves* 2–4(–8) cm. l., lanceolate to oblong, stalked or sessile. *Calyx* bright carmine red, dark violet at apex, mouth and marginal cilia white. *Petals* wanting. *Disk* dorsal, deflexed. *Stamens* 11, 5 protruding from calyx. *Style* also protruding. *Ovules* 14–20. *Capsule* 8–9 mm. l. *Seeds* not winged.

2. *C. Parsonsia* R. Br. ex Steud. *Nom.* 245 (1821)*; annual herbs generally prostrate; flowers when solitary alternate, 2 or 3 together on lateral shoots; calyx 4–6 mm. l., in fruit bladder-

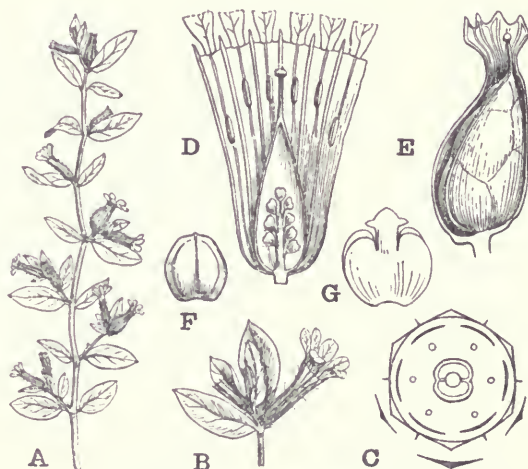


Fig. 113.—*Cuphea Parsonsia* R. Br.

A, Portion of branch in flower $\times \frac{1}{2}$.

B, Short flowering branch $\times 2$.

C, Diagram of flower.

D, Calyx split open, ovary cut lengthwise, and petals cut across, $\times 5$.

E, Fruit with part of the calyx cut away $\times 5$.

F, Seed $\times 5$.

G, Embryo $\times 10$.

(C after Eichler.)

like, base gibbous.—*Macf. Jam.* ii. 36; *Griseb. Fl. Br. W. Ind.* 269; *Koehne in Engl. Pflanzenreich* iv. 216, 122, fig. 16A, p. 119. *Urb. Symb. Ant.* iv. 436 & viii. 472. *C. radicans* Macf. *Jam.* ii. 37.

* See R. Br. in *Mem. Soc. Wern.* i. 65 (1811).

Parsonsia herbacea &c. *Browne Hist. Jam.* 199, t. 21, f. 2. *P. Parsonsia Britt. & Millsp. Bah. Fl.* 300. *P. radicans Hitchc. in Rep. Miss. Bot. Gard. iv.* 87 (1893). *Lythrum Parsonsia L. Syst. ed.* 10, 1045 (1759) and *Amœn. v.* 379; *Sw. Obs.* 193. Specimen (type) from Browne in Herb. Linn. named by Linnæus. (Fig. 113.)

Browne! Wright! Shakespear! Masson! Bancroft! Macfadyen! Distin! Pedro district, St. Ann, *Purdie! March!* Moneague, *Prior!* Ramble, Claremont, 1700 ft., *Fawcett & Harris!* Port Morant, *Hitchcock!* Port Antonio; Mandeville, 2200 ft.; Tyre, near Troy, 2000 ft.; near Spanish Town; *Harris!* Knowsley Park, Devon, *Miss H. A. Wood!* Fl. Jam. 5980, 6223, 7019, 9085, 12,054.—Bahamas, Cuba, Hispaniola, Porto Rico, Mexico.

Stems 1-3·5 dm. l., branching. *Leaves* 5-2·5 cm. l., ovate to oblong. *Petals* equal, pale purple. *Stamens* 6 (4-9). *Ovules* 4-5(-11). *Style* less than half as long as ovary, enclosed. *Capsule* 3-4 mm. l. *Seeds* narrowly winged.

3. *C. Melanium R. Br. ex Steud. Nom.* 245 (1821); perennial herb smelling of onions; flowers near the ends of the branches, subsolitary, alternate; calyx 8-9 mm. l., gibbous at base, with 12 (or fewer) conspicuous striæ and teeth.—*Macf. Jam. ii.* 36; *Koehne tom. cit.* 117; *Urb. Symb. Ant. viii.* 471. *Melanium herbaceum* &c. *Browne Hist. Jam.* 215. *M. alliaceum Spreng. Syst. ii.* 454 (1825). *Lythrum Melanium L. Syst. ed.* 10, 1045 (1859) & *Amœn. v.* 379; *Sw. Obs.* 193.

Wright! Browne; Swartz; Macfadyen.—Lesser Antilles.

Stems 1 ft. or more long, prostrate and ascending, branching, puberulous on young stems. *Leaves* 1·5-3·5 cm. l., ovate to ovate-lanceolate, acute, base acute, scabrous. *Petals* 4-5 mm. l., purple, subequal. *Stamens* 8-10. *Seeds* 8-4.

4. *C. petiolata Koehne in Engl. Bot. Jahrb. ii.* 173 (1881) & in *Engl. Pflanzenreich iv.* 216, 152; annual herb; flowers solitary; calyx about 1 cm. l., spur very short, blunt.—*C. viscosissima Jacq. Hort. Vindob. ii.* 83, t. 177 (1772); *Macf. Jam. ii.* 36; *Griseb. loc. cit.* (excl. syn. *L. Melanium L.*). *Lythrum petiolatum L. Sp. Pl.* 446 (1753). *Parsonsia petiolata Rusby Mem. Torr. Club v.* 231 (1894); *Britt. & Br. Ill. Fl. ii.* 473.

"This is not uncommon in the neighbourhood of the Bath Garden, as well as of that in St. Andrew" [East's Garden, Gordon Town], *Macfadyen.*—Eastern United States.

Herb, very viscous and densely pubescent. *Leaves* 2-5 cm. l., ovate-lanceolate to lanceolate. *Calyx* viscous-hispid, purplish or violet, often with purple hairs. *Petals* rose or purple, 2 dorsal obovate, larger than the ventral. *Stamens* 11, alternately unequal. *Style* enclosed.

5. *C. ciliata Koehne in Engl. Bot. Jahrb. i.* 454 (1881) & in *Engl. Pflanzenreich iv.* 216, 109, fig. 14, f on p. 103 (non *Ruiz & Pavon*); small shrub; flowers opposite in terminal racemes, pedicels 2-5 mm. l.; calyx about 8 mm. l., base gibbous.—

C. decandra R. Br. in *Ait. Hort. Kew. ed. 2, iii.* 151 (1811); *Spreng. Syst. ii.* 455 (1825); *Macf. Jam. ii.* 38; *Griseb. op. cit.* 270; *Urb. Symb. Ant. viii.* 471. *C. racemosa* *Spreng. loc. cit.* (as regards hab. Jamaica). *Lythrum ciliatum* *Sw. Prodr.* 76 (1788) & *Fl. Ind. Occ.* 868. Specimen from Swartz from Jamaica in Herb. Mus. Brit.

In fl. during year; mountains, *Swartz!* *Macfadyen*; St. George, *McNab!* *Purdie!* *Hartweg!* *Prior!* *March*; Castleton, J.P. 721, *Jenman!* Grove and Gordon Town; Falls river, 2500 ft.; Cane river valley, 400 ft.; coastal thickets between Portland Point and Rocky Point; *Harris!* *Fl. Jam.* 6594, 6833, 9640, 10,192.—Cuba (ex *Koehne*), Hispaniola, Mexico, Colombia.

Shrub, 1-2 ft. high, much branched; branches hirtellous and occasionally somewhat glandular. *Leaves* 1-4 cm. l., obovate or obovate-elliptical, base wedge-shaped or gradually narrowing, margin and nerves beneath more or less ciliate. *Calyx* strongly ribbed, glandulose-hirtellous, teeth subequal. *Petals* purple, obovate-roundish, ventral about 4 mm. l., the two dorsal smaller than the rest. *Stamens* 10-11, the nine ventral alternately unequal. *Style* at length protruding from calyx by 1.5-2 mm. *Capsule* about 5 mm. l.

2. AMMANNIA L.

Annual herbs, found in swampy places, glabrous (calyx sometimes hirtellous); stem and branches more or less 4-angled. Leaves decussate, rarely subalternate, sessile, entire. Flowers small, axillary, in 2-forked cymes or reduced to clusters; flower-parts in fours in Jamaican species. Calyx 8-nerved, after flowering subglobose; primary teeth or lobes usually 4, accessory as many or wanting. Petals none or 4, inserted in the throat of the calyx, generally dropping off very soon. Stamens 4-8 (2), inserted about the middle of the tube of the calyx. Ovary sessile, incompletely 1-5 celled; style wanting or exserted; stigma capitate; ovules numerous on placentas projecting from the axis or attached to the partitions. Capsule very thinly membranous, bursting irregularly, enclosed by the calyx or protruding from it, 1-5-celled. Seeds numerous, very small, with leathery coat.

Species 20, growing in marshes and wet places in tropical and subtropical regions of the whole world, mostly in Africa.

Petals wanting. Style not exserted 1. *A. latifolia*.

Petals pink. Style long exserted 2. *A. coccinea*.

1. *A. latifolia* L. *Sp. Pl.* 119 (1753), *Amæn. v.* 376 & *Hort. Cliff.* 35; *Reliq. Houst.* 4, t. 5 & *Ic. orig. ined. in Herb. Mus. Brit.*; *Macf. Jam. ii.* 34; *Griseb. Fl. Br. W. Ind.* 270 (in part); *Koehne in Fl. Bras. xiii. pt. 2*, 206, t. 40, f. 2 & in *Engl. Pflanzenreich iv.* 216, 50, fig. 5, E; *Urb. Symb. Ant. iv.* 435 & viii. 470; *Small Fl. S.E. U.S. ed. 2*, 827; *Britt. & Millsp. Bah. Fl.* 299. *Aparines folio &c. Sloane Hist. i.* 44, t. 7, f. 4. *Isnardia? folio &c. Browne*

Hist. Jam. 148. Specimen in Herb. Linn. named by Linnaeus. Specimen in Hort. Cliff. in Herb. Mus. Brit. Specimen from Sloane in Herb. ii. 125 from "Barbadoes or one of the Caribes." (Fig. 114.)

Houstoun! Ferry, *Browne*; *Shakespeare!* *McNab!* sea-coast, St. James, *Purdie!* Castleton, *Morris!* Ferry, *Campbell!* sea-coast, Green Island; *Harris!* *Fl. Jam.* 6170, 10,337; Port Antonio; Lucea; *Hitchcock.*—Florida and Keys, Bahamas, West Indies, tropical continental America.

Plant glabrous. Stem simple in its first year, branched in second year. Leaves 2-8 cm. l., decussate, lanceolate-linear or linear, auriculate-cordate

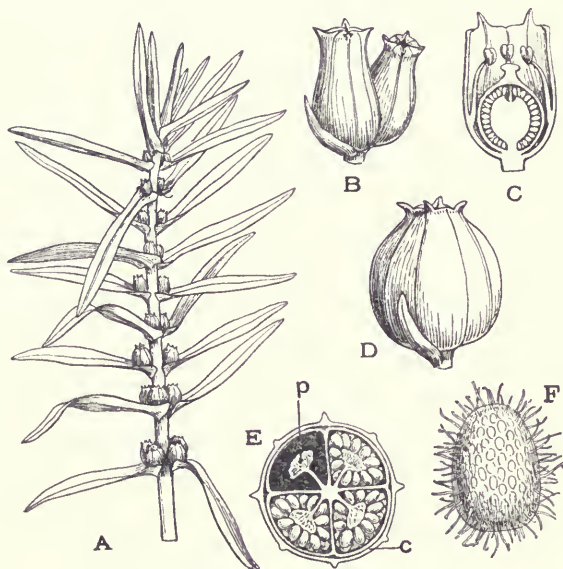


Fig. 114.—*Ammannia latifolia* L.

- | | |
|---|--|
| A, Portion of branch in flower and fruit
× $\frac{1}{2}$. | D, Fruit enclosed in the globose calyx
× 4. |
| B, Two flowers from axil of leaf × 4. | E, Ditto cut across; c, calyx; p, placenta,
the seeds removed; × 4. |
| C, Flower cut lengthwise and spread out
× 4. | F, Seed × 30. |

at base. Flowers clustered, 5-1, sessile. Calyx 4 mm. l., bell-shaped narrowing at mouth, globose in fruit; lobes indistinct, accessory lobes 4, spreading. Petals wanting. Stamens 4(-8), enclosed within the calyx. Style very short. Capsule completely enclosed by calyx.

2. *A. coccinea* Rottb. *Pl. Hort. Univ. (Havn.) Programm. Descr.* 7 (1773) (non Pers.); Koehne in *Engl. Pflanzenreich* tom. cit. 49; Urb. *Symb. Ant.* iv. 435 & viii. 470; *Small loc. cit.* *A. sanguinolenta* Sw. *Prodr.* 33 (1788) & *Fl. Ind. Occ.* 272; *Macf. Jam.* ii. 35. *A. latifolia* Griseb. *loc. cit.* (in part).

Specimens from Swartz collected in Jamaica and Hispaniola in Herb. Mus. Brit.

Swartz! cane-fields, St. Thomas in Vale; Yallahs River; *Prior!* Salem, Llandover, St. Ann, *Harris!* Fl. Jam. 10,377.—Cuba, Hispaniola, Porto Rico, St. Thomas, St. Croix, Antigua, Martinique, Curaçao, subtropical and tropical continental America, Sandwich, Marianne and Philippine Is.

Stem simple or branched. *Leaves* 2–10 cm. l., decussate, lanceolate or linear, auriculate-cordate at base. *Flowers* clustered, 1–3(–5), sessile or subsessile. *Calyx* 3–5 mm. l., bell-shaped narrowing at mouth, subglobose in fruit; lobes distinct but short, accessory lobes 4, often subequalling the lobes. *Petals* 4, pink. *Stamens* 4–8(–11), very shortly exserted. *Style* nearly as long as the ovary. *Capsule* completely enclosed by calyx.

3. HEIMIA Link.

Shrubs, sometimes arborescent, branches stiff and upright. Leaves decussate or 3 in a whorl, rarely alternate, mostly sessile, entire. Flowers solitary, axillary; parts of flowers in fives, sixes,

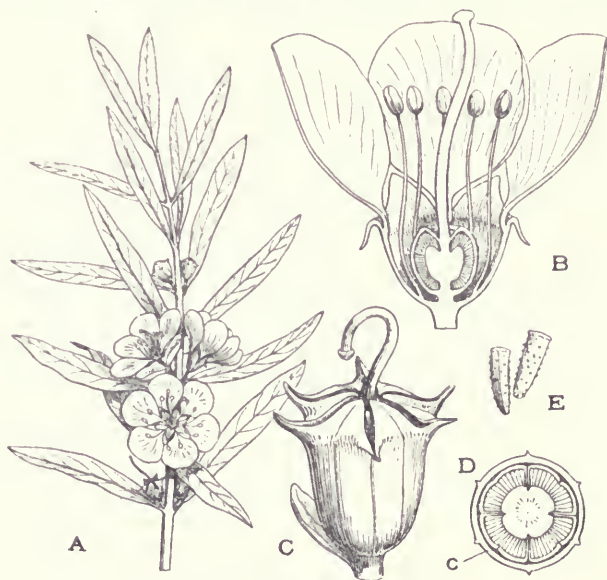


Fig. 115.—*Heimia salicifolia* Link.

A, Portion of branch with buds, flowers,

and fruits, $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 2\frac{1}{2}$.

C, Fruit enclosed in the persistent calyx $\times 4$.

D, Section through C; c, calyx; $\times 4$.

E, Seeds $\times 10$.

or sevens; pedicels very short or none. Calyx bell-shaped or semiglobose; primary teeth 6 (5–7), accessory as many, narrower. Petals 6 (5–7), inserted in the calyx-throat, yellow. Stamens

12 (10-18), inserted below the middle of the tube. Ovary 3-6-celled; style overtopping the stamens; stigma capitate; ovules indefinite on placentas projecting from the central angle of the cells. Capsule enclosed by the calyx, subglobose, 3-6-celled, loculicidally 3-6-valved; valves bearing the partitions. Seeds obconical.

Species 2 or possibly only 1, natives of tropical continental America, one in Jamaica.

H. salicifolia Link *Enum. Hort. Berol.* ii. 3 (1822); Link & Otto *Pl. Select. Hort. Berol.* 63, t. 28 (1820-8); Sweet *Brit. Flow. Gard.* iii. t. 281; Koehne in *Fl. Bras. xiii.* pt. 2, 202, t. 39, f. 5 & in *Engl. Pflanzenreich* iv. 216, 241; Griseb. *Fl. Br. W. Ind.* 271; Hook. *Ic. Pl.* vi. t. 554 (1843), with *H. grandiflora*. *H. salicifolia* v. *grandiflora* Lindl. in *Bot. Reg. xxvii.* t. 60 (1841). Nesaea *salicifolia* H. B. & K. *Nov. Gen. & Sp.* vi. 192 (1823). (Fig. 115.)

March! Castleton district; Mavis Bank, Blue Mts., 3500 ft.; Harris! Fl. Jam. 11,882, 11,972.—Central America and warmer parts of S. America.

Low shrub; branches 4-angled. Leaves 1.5-7 cm. l., linear or sub-lanceolate, usually opposite. Calyx 5-7 mm. l., lobes bending in over the ripe capsule. Petals 12-17 mm. l., yellow.

Lawsonia inermis L. (in an enlarged sense) (*L. alba* Lam.) is an introduced shrub, now naturalized, 6-20 ft. high; flowers smelling like mignonette, parts in fours, well known under its common name Henna. It is indigenous probably in north and east Africa, and west and south Asia, now cultivated or naturalized throughout the tropics.

Lagerstrœmia speciosa Pers. (*L. Flos-Reginæ* Retz.), the Queen's Flower Tree, is a native of east Asia, Philippines, Moluccas, north-east Australia. It is a tree 20-60 ft. high with showy flowers, cultivated in many tropical countries; parts of flowers in sixes, petals purple-lilac, sometimes white. It is found naturalized in pastures, an escape from gardens.

FAMILY LXXXVI. LECYTHIDACEÆ.

Trees usually of large size. Leaves alternate, generally in bunches at ends of twigs; without stipules. Flowers generally in axillary or terminal racemes or panicles, sometimes solitary or in clusters on the trunks. Sepals 4-6 (2), generally free, overlapping in bud. Petals 4-6, overlapping, springing from a ring-like disk round the top of the ovary. Stamens more or less united at the base borne on the disk above the petals, numerous, in several whorls, often partly sterile, bent inwards in the bud; anthers generally basifixed, usually short, and opening at the sides. Ovary generally inferior, occasionally semisuperior, 2-6-celled; ovules ascending, hanging, or horizontal; style generally simple. Fruit fleshy or capsular. Seeds generally large, one to indefinite. Endosperm wanting. Embryo often undifferentiated.

Species 140, natives of the tropics.

GRIAS L.

High trees, growing in streams or moist places; branches falling off below, leaving the trunk bare, with only the apex bearing branches. Leaves alternate, crowded at the ends of branches, often very long, pinnate-veined, entire or obscurely sinuate-toothed. Flowers in clusters on the trunk and branches, with very short stalks. Calyx: tube top-shaped; limb cup-shaped, at first subentire, at length bursting irregularly into 2-4 persistent lobes. Petals 4, rarely 5, spreading. Stamens indefinite, inserted in indefinite series on a thick cup-like disk; filaments thick angular, bending towards the centre and forming a globular mass; anthers small, cells distinct, opening longitudinally. Ovary inferior, 4-celled; style wanting or shortly conical, stigmas 4, cruciform; ovules 2-4 in each cell, hanging. Fruit at first fleshy, becoming woody-fibrous, ovoid, crowned by the calyx-limb. Seed generally one, hanging, coat thick.

Species 4, one a native of Jamaica, the rest natives of tropical S. America.

G. cauliflora L. *Syst. ed.* 10, 1075 (1759) & *Sp. Pl. ed.* 2, 732; *Sw. Obs.* 215; *Macf. Jam.* ii. 127; *Griseb. Fl. Br. W. Ind.* 243; *Miers in Trans. Linn. Soc.* xxx. 299; *Guppy Plants &c. in*

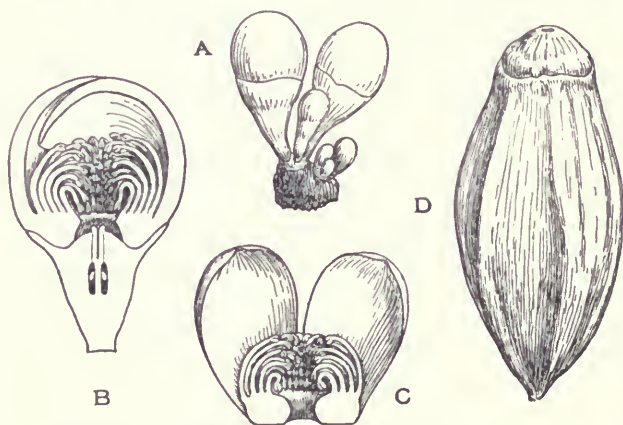


Fig. 116.—*Grias cauliflora* L.

- A, Buds on a piece of bark $\times 1\frac{1}{2}$. C, Flower, upper part, cut in two, $\times 1\frac{1}{2}$.
B, Bud cut lengthwise $\times 2$. D, Fruit $\times \frac{1}{2}$.

W. Indies 211. *Palmis affinis* &c. *Sloane Cat.* 179 & *Hist.* ii. 122, *tt.* 216, 217. *Calophyllum?* *foliis* &c. *Browne Hist. Jam.* 245; *A. Robinson Ic. & Ms. ined.* The genus and species are founded

on Sloane's plates and description. Specimen from Swartz in Herb. Mus. Brit. (Fig. 116.)

Anchovy Pear.

Sloane Herb. vii. 56, 57! *Swartz*! White R., *Prior*! Cult. Hope Gardens, *Harris*!—Ecuador? (Guppy tom. cit. 212).

Tree, 20–50 ft. high, tapering upwards. *Leaves* 2 dm. to 1 m. l. and more, 5–23 cm. br., hanging, oblong-oblancheolate to oblong-elliptical. *Flowers* fragrant, springing from the trunk or branches below the leaves. *Calyx* about 3 mm. l. *Petals* oblong-elliptical, 1·5–2 cm. l. *Fruit* 7–9 cm. l., elliptical, 8-ribbed. *Seed* 3·5–5 cm. l., fleshy, tough.

FAMILY LXXXVII. RHIZOPHORACEÆ.

Trees and shrubs, usually glabrous. Leaves opposite and stipulate, rarely alternate and without stipules, stalked, thick-leathery, mostly entire. Stipules between the petioles united in pairs, falling very soon. Flowers usually hermaphrodite, axillary; inflorescences of various forms, generally cymose, rarely solitary. Calyx hypogynous to epigynous. Sepals 3–14, valvate, persistent. Petals as many as the sepals, generally concave or involute, embracing the stamens, often clawed, limb usually lobed or fringed, folded inwards in the bud. Stamens generally numerous, often opposite to the petals in pairs, inserted on a lobed perigynous or epigynous disk, sometimes sterile. Ovary inferior in *Rhizophora*, free in *Cassipourea*, 2–5(6)-celled, or the partitions disappearing and 1-celled. Style simple. Ovules usually 2 in each cell, hanging side by side from the axis above the middle. Fruit leathery or somewhat fleshy, crowned by the calyx, not opening or opening at length septicidally by valves, 1-celled, with 1 seed, or 2–5-celled, with 1 seed in each cell. Seeds hanging; endosperm fleshy or wanting; aril sometimes present.

Species 60, natives of tropics.

Flowers on forked peduncles. Bracteoles united in form of a cup. Ovary inferior. Embryo without endosperm, radicle perforating apex of fruit persisting on tree..... 1. *Rhizophora*.

Flowers solitary or clustered. Bracteoles absent. Embryo immersed in fleshy endosperm 2. *Cassipourea*.

1. RHIZOPHORA L.

Trees; branches thick, with short stem supported by prop-roots and aerial-roots growing down from the upper branches, marked with the scars of fallen leaves. Leaves elliptical, entire, glabrous. Peduncles 2- or 3-forked, few-flowered. Flowers rather large, leathery. Calyx surrounded by 2 bracteoles united at the base into a cup; sepals 4, lanceolate, thick and leathery.

Petals 4, inserted at the base of a fleshy disk, entire. Stamens 8-12, inserted with the petals, filaments very short; anthers with numerous round pollen-sacs, at length 2-valved, long, acuminate. Ovary half-inferior, 2-celled, prolonged above the calyx into a fleshy cone; style awl-shaped, with a 2-toothed

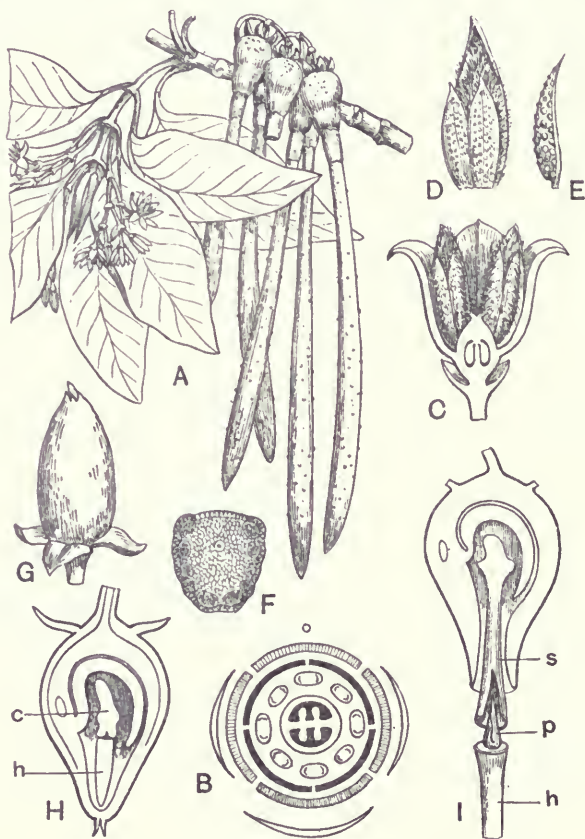


Fig. 117.—*Rhizophora mangle* L.

A, Portion of branch with leaves, flowers, and germinating fruits, reduced.

B, Diagram of flower.

C, Flower cut lengthwise $\times 2$.

D, Petal with two stamens $\times 3$.

E, Stamen $\times 4$.

F, Stamen cut across, enlarged.

G, Fruit beginning to germinate, somewhat reduced.

H, Fruit cut lengthwise of *R. conjugata* L., showing the abortive cell on left; c, cotyledon surrounded by endosperm; h, hypocotyl which has grown out into the cavity of the fruit; nat. size.

I, Later stage of ditto in germination; s, sheath of cotyledon from which the hypocotyl, h, bearing the plumule, p, has separated.

(A, B, C, G after Baillon; F after Fl. Bras.; H, I after Kerner.)

stigma. Fruit leathery, surrounded above the base by the reflexed sepals, 1-celled, 1-seeded. Embryo without endosperm; cotyledons doubled up together; radicle long and club-shaped, perforating the apex of the fruit while still on the tree, descending towards the mud. **M a n g r o v e.**

Species 3-5. Common on muddy tropical sea-shores.

R. Mangle *L. Sp. Pl.* 443 (1753) & *Amœn. v.* 379; *Jacq. Sel. Stirp. Amer.* 141, *t.* 89 & *Ed. pict. t.* 132; *Wright Mem.* 273; *Macf. Jam. ii.* 22; *Griseb. Fl. Br. W. Ind.* 274; *Engl. in Fl. Bras. xii. pt.* 2, 426, *t.* 90; *Small Fl. S.E. U.S.* 834; *Urb. Symb. Ant. iv.* 437 & *viii.* 474; *Guppy Plants. . . W. Indies &c.* 96; *Britt. Fl. Berm.* 265; *Britt. & Millsp. Bah. Fl.* 308. *R. utrinque &c. Browne Hist. Jam.* 211; *A. Robinson Ic. ined.* *Mangle pyri &c. Sloane Cat.* 155 & *Hist. ii.* 63. *Candela americana &c. Catesby Car. ii. t.* 63. *Mangrove Gosse Nat. Sojourn Jam.* 245.

Specimen in *Herb. Linn.* named by Linnæus. (Fig. 117.)

Sloane Herb. vi. 62! *Houstoun! Shakespear! Ferry River, Liguanea plain, Campbell! also Harris! Falmouth, Miss A. Moulton-Barrett! Port Morant, Hitchcock.*—Muddy sea-shores and estuaries in West Indies, tropical continental America, West Africa, and islands in Pacific.

Tree, 10-50 ft. high; roots shooting out above the base, curving outwards and downwards into the mud in the form more or less of the quadrant of a circle. *Leaves* 7-15 cm. l. and more, shining green; stipules 2.5-4 cm. l. *Calyx* about 1 cm. l. *Petals* yellow, 7-8 mm. l., villose on inside chiefly below apex. *Stamens* 8, about 5 mm. l. *Fruit* 2.5-3.5 cm. l. *Seeds* usually one, occasionally 2 or 3 seeds are developed.

The wood is hard and makes good posts, lasting for many years sunk into the earth; it has also been used for piles. The bark is used for tanning leather, especially sole-leather.

2. CASSIPOUREA Aubl.

Trees or shrubs, glabrous. Leaves entire or sinuate-crenate, pinnate-nerved, stipulate. Flowers solitary or clustered, white, shortly stalked; pedicels with very small ovate densely pilose bracteoles at the base. Calyx perigynous, free, bell-shaped, 4-5-lobed, in Jamaican species outside glabrous, inside densely covered with silky adpressed hairs. Petals 4-5, inserted at the bottom of the calyx at the base of a cup-shaped crenulate disk, clawed, spatulate, fringed above. Stamens 10-40, inserted on the margin of the disk. Ovary densely silky-pilose, 3-4-celled, sometimes 1-celled. Style simple, with stigma 3-4-lobed. Fruit ovoid, somewhat fleshy, 3-4-celled, at length opening septically. Seeds with an aril, angled, coat leathery; endosperm fleshy; embryo straight with flat cotyledons.

Species 63, natives of the West Indies and tropical S. America from Panama to northern Brazil.

Flowers distinctly stalked.

Pedicels about 5 mm. l. Leaves brightly shining,
base wedge-shaped..... 1. *C. elliptica*.

Pedicels about 3 mm. l. Leaves, base obtuse 2. *C. Brittoniana*.
Flowers sessile or subsessile.

Leaves elliptical, base obtuse..... 3. *C. subsessilis*.

Leaves ovate, base subcordate or emarginate..... 4. *C. subcordata*.

1. *C. elliptica* Poir. *Encyc. Suppl.* ii. 131 (1811); *Macf. Jam.* ii. 24; *Griseb. Fl. Br. W. Ind.* 274 (excl. vars. β , γ); *Engl. in Fl. Bras.* xii. pt. 2, 430 (in part, with reference to the

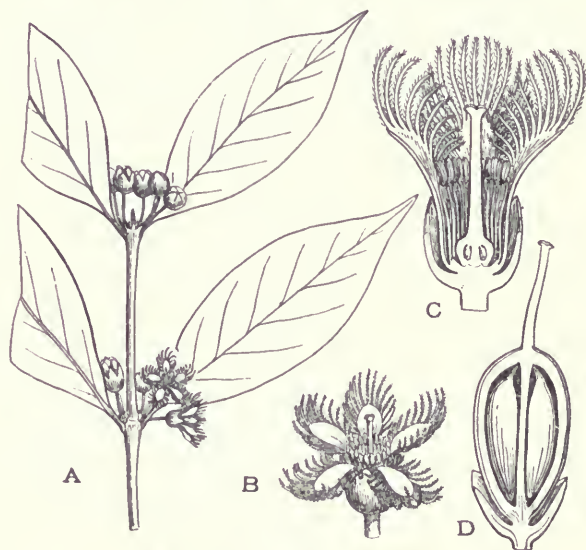


Fig. 118.—*Cassipourea elliptica* Poir.

A, Portion of branch with leaves and
flowers $\times \frac{1}{2}$.

B, Flower, somewhat enlarged.

C, Flower cut lengthwise $\times 2$.

D, Fruit cut lengthwise \times about 3.

Jamaican plant); *Britt. in Bull. Torr. Bot. Club xxxv.* 339, 340. *Legnotis elliptica* Sw. *Prodr.* 84 (1788) & *Fl. Ind. Occ.* 969, t. 17. Specimen from Swartz in Herb. Mus. Brit. (Fig. 118.)

In fl. March–Sept.; *Wright! Swartz!* rocky woods, St. Ann, *Purdie!* Kempshot, 1100–1600 ft.; Fraywoods, St. James, 1650–1800 ft.; Kellits, Clarendon, 2000 ft.; *Harris!* Fl. Jam. 10,330, 10,340, 11,158; Kempshot, *Britton*, 2397, 2423.

Tree, 10–30 ft. high. *Leaves* 5.5–8 cm. l., elliptical, acuminate, sometimes shortly and abruptly, sometimes with long narrow tip, base wedge-shaped, brilliantly shining; petioles 4–5 mm. l.; stipules 5–6 mm. l., oblong-linear, glabrous. *Flowers* in threes (to fives); pedicels about 5 mm. l., as long as or longer than the globose buds. *Calyx*: tube 3–3.5 mm. l.; lobes 2–2.5 mm. l. *Petals* white, half as long again

as the calyx, fringe flesh-coloured (Swartz), villose with white hairs. *Stamens* slightly longer than the calyx. *Style* lengthening sometimes in fruit to twice as long as calyx. *Capsule* ovoid, 3-cornered, 3-valved.

2. *C. Brittoniana* Fawc. & Rendle in *Journ. Bot.* lxiv. 14 (1926).

Coco-plum of Troy.

Woods, Tyre, near Troy, 2000 ft., *Harris!* Fl. Jam. 10,670.

Tree to 30 ft. high. *Leaves* 4-6 cm. l., elliptical, shortly acuminate, base obtuse; petioles 3-4 mm. l.; stipules 4 mm. l., lanceolate-oblong, glabrous. *Flowers* 1-3 together, greenish; pedicels 3 mm. l. *Calyx*: tube 2.5 mm. l.; lobes 3.5 mm. l. *Petals*: fringe villose with white hairs. *Stamens* longer than the calyx.

3. *C. subsessilis* Britt. in *Bull. Torr. Bot. Club* xxxv. 340 (1908).

Near Dolphin Head, 1300 ft.; *Britton* 2316; also *Harris!* Fl. Jam. 10,307.

Tree, about 25 ft. high. *Leaves* 6-9 cm. l., elliptical or elliptical-lanceolate, acuminate, base obtuse; petioles 4-7 mm. l.; stipules 5 mm. l., lanceolate-oblong, puberulous with adpressed hairs. *Flowers* 1 or 2 together, nearly or quite sessile. *Calyx*: tube about 3 mm. l., lobes 3-3.5 mm. l. *Stamens* about as long as calyx. *Capsule* 1.3 cm. l., oblong-conical, glabrescent (apparently ripe).

4. *C. subcordata* Britt. in *Bull. Torr. Bot. Club* xxxv. 340 (1908).

Marshy ground, Troy, 1600 ft.; *Britton*, 488; also *Harris!* Fl. Jam. 9466.

Shrub or *tree*, 12 ft. high. *Leaves* 3.5-7 cm. l., ovate, shortly acuminate, base rounded, subcordate or emarginate; petioles 2-3 mm. l.; stipules 8-9 mm. l., ovate-lanceolate or lanceolate, glabrous above. *Flowers* white, 1-3 together, subsessile. *Calyx*: tube 2-2.5 mm. l., lobes 2.5-3 mm. l. *Stamens* about as long as calyx. *Capsule* as in *C. subsessilis*.

FAMILY LXXXVIII. COMBRETACEÆ.

Trees or shrubs, often climbing. Leaves opposite, alternate, or rarely whorled, usually simple, stalked, entire, without stipules. Flowers hermaphrodite, sometimes polygamo-diœcious or unisexual, usually in spikes, racemes or heads, rarely panicleate. Calyx more or less deeply divided into 5 or 4 (6-8) lobes; lobes usually valvate. Petals wanting, or 4-5, small. Stamens 4-5, or 8, or 10, inserted usually on the calyx, inflexed in bud; anthers attached at the middle. Ovary inferior, 1-celled; style and stigma simple, but stigma 4-lobed in *Laguncularia*. Ovules usually 2-6, hanging from the apex of the cell by slender stalks (stalk wanting in *Laguncularia*). Fruit leathery or drupe-like, angled or winged, 1-celled, 1-seeded, usually not opening, endosperm wanting. Cotyledons often fleshy and oily; radicle small, superior.

Species, more than 500, natives of the tropics of the whole

world, less frequent in the warmer temperate parts of India and South Africa.

Petals wanting. Leaves alternate.

Flowers in spikes.

Calyx cut to middle with 5 or 4 lobes, soon falling... 1. *Terminalia*.

Calyx toothed, persisting. Anthers versatile..... 2. *Bucida*.

Calyx toothed, soon falling. Anthers not versatile.

Ovary narrowed into a long neck 3. *Buchenavia*.

Flowers in dense heads..... 4. *Conocarpus*.

Petals present. Leaves opposite.

Calyx persistent. Fruit angled 5. *Laguncularia*.

Calyx soon falling. Fruit winged..... 6. *Combretum*.

1. TERMINALIA L.

Erect shrubs or trees, without spines. Leaves alternate, often crowded at the ends of the branches, often with glands at base beneath. Flowers hermaphrodite or male, small, usually green or white, in spikes or subcapitate. Calyx bell-shaped, usually cut to the middle with 4 or 5 lobes, soon falling. Petals wanting. Stamens 10 or 8 in 2 series, the 5 lower opposite the lobes of the calyx, the 5 upper alternating; anthers versatile. Disk epigynous, hairy. Ovary lanceolate-cylindrical or sub-ovoid, somewhat constricted under the calyx. Ovules 2 (3). Fruit flattened-ellipsoidal, margins acute or 2-5-winged, sometimes samara-like, 1-seeded, with thin flesh or none outside; stone leathery or bony. Cotyledons convolute.

Species about 120, natives of the tropics.

Large trees. Leaves usually more than 14 cm. l.

Leaves tapering into petioles. Fruit with acute margins 1. *T. latifolia*.

Leaves auriculate at base, not or rarely tapering into

petioles. Fruit distinctly but very narrowly

winged [*T. Catappa*.]

Shrub. Leaves not more than 8 cm. l. 2. *T. arbuscula*.

1. *T. latifolia* Sw. *Prodr.* 68 (1788) & *Fl. Ind. Occ.* 747; trees; leaves 14-24 cm. l., tapering into the petiole, often with glands or hair-tufts in the nerve-axils beneath; fruit with margins more or less acute.—*Macf. Jam. ii.* 17; *Griseb. Fl. Br. W. Ind.* 276. *Arbor maxima forte* &c. *Sloane Cat.* 184 & *Hist. ii.* 130. *Tetracera? foliis* &c. *Browne Hist. Jam.* 255; *A. Robinson Ic. ined.* Specimen from Swartz in Herb. Mus. Brit. (Fig. 119.)

Broad Leaf Tree.

In fl. Feb.-May; common in woods; *Wright!* *Swartz!* *Distin!* *St. Mary, McNab!* *Purdie!* *Prior!* *Shafston*, 500 ft., *Harris!* Cockpit country, N. of Appleton, in wet forest, *Norman!*

Tree of 100 ft. or more; branches spreading horizontally, whorled. Leaves becoming glabrous on both sides, obovate or oblanceolate, apex rounded or sometimes broadly and shortly acuminate; petioles 2-3 cm. l.

Spikes axillary, closely rusty-tomentose when young, male flowers above, hermaphrodite below. Drupe ovoid-ellipsoidal with one side flattened,



Fig. 119.—*Terminalia latifolia* Sw.

A, End of branch with leaves and inflorescence $\times \frac{1}{2}$.

B, Flower, much enlarged.

C, Portion of calyx with anthers and disk of *T. Catappa*, much enlarged.

D, Fruit $\times \frac{1}{2}$.

3–5 cm. l., 2 cm. br.; pericarp pulpy or fleshy, greenish-red. Seed, kernel white, with taste of sweet almond.

Affords a valuable timber, and splits readily into shingles. Kernel of seed edible.

[*T. Catappa* L. *Mant.* 519 (1771); trees; 2–3 dm. l., auriculate at base, rarely tapering into petiole, usually with a gland on each side of the midrib at the base; fruit rounded at apex or acuminate, with the margins more or less distinctly winged.—*Wight Ic. t.* 172; *Bot. Mag. t.* 3004; *Macf. Jam. ii.* 16; *Griseb. Fl. Br. W. Ind.* 276; *Eichl. in Fl. Bras. xiv. pt.* 2, 83, *t.* 33, *f.* 1; *Urb. Symb. Ant. iv.* 438; & *viii.* 475; *Guppy Plants &c. in the West Indies* 116; *Britt. Fl. Berm.* 260; *Britt. & Millsp. Bah. Fl.* 302. Specimen in Herb. Linn. named by Linnæus.

Indian Almond.

Introduced and naturalized in the West Indies and tropical continental America; a native of the tropics of the Old World.

Tree to 80 ft., with whorled horizontal branches. *Leaves* shortly stalked, obovate or obovate-oblong, apex rounded, sometimes apicular, glabrous above, pubescent with brown hairs or glabrescent beneath; petioles 1 cm. l. *Spikes* axillary; male flowers crowded at apex, hermaphrodite few, subdistant at base. *Calyx* tomentose without, densely hairy within; lobes triangular, 2 mm. l. *Ovary* tomentose, becoming glabrous. *Drupe* compressed-ellipsoidal, 4-6 cm. l., about 3 cm. br.; pericarp with a thick layer of cork-like buoyant tissue.

Bark and leaves are astringent and contain tannin. The natives of India make Indian ink by mixing them with iron salts. The kernels are eaten like almonds; they yield by pressure a valuable oil like almond oil; and the residual cake is a good food for pigs.]

2. *T. arbuscula* Sw. *Prodr.* 68 (1788) & *Fl. Ind. Occ.* 750; shrub; leaves small, acute at the base, petiolate, without glands; *Macf. Jam. ii.* 16. *Chuncoa arbuscula* Griseb. *Fl. Br. W. Ind.* 275 (1860) (in part).

On the hills in the north: Swartz!

Shrub, 6 ft. high; stem much branched, erect, smooth. *Leaves* 4.5-7 cm. l., at the ends of the branches and in the forks, oblong or lanceolate-oblong, acute at base, puberulous when young, becoming glabrous; petiole about 1 cm. l. *Spikes* terminal, many-flowered, equalling the length of the leaves. *Calyx* 5-lobed, glabrous without, densely hairy within. *Ovary* puberulous.

Fruit and male flowers unknown. (Swartz.)

This plant is only known from Swartz's specimens; one in Stockholm and one in Herb. Mus. Brit., the latter without flowers. Although the flowers are very young, and no fruit has been seen, there seems no doubt that the plant is a *Terminalia*.

2. BUCIDA L.

Tree; branchlets often with 2 or 3 spines at the apex. *Leaves* alternate, crowded at the end of branches, without glands. *Flowers* hermaphrodite or male irregularly mixed on the same rhachis, in axillary spikes. *Calyx* bowl-shaped, shallowly 5-toothed, persisting. *Petals* wanting. *Stamens* 10 in two series, the 5 lower opposite the calyx-teeth; anthers versatile. *Ovary* subovoid, constricted under the calyx. *Ovules* 2 or 3. *Disk* epigynous, of 5 fleshy glands round the base of the style, shortly hispidulous. *Fruit* fleshy-leathery, obtusely 5-angled, drawn up into a neck crowned by the persistent calyx. *Cotyledons* convolute.

Species 1 or 2, natives of West Indies, Florida Keys, Bahamas, less frequent in tropical continental America.

B. buceras L. *Syst. ed.* 10, 1025 (1759); Sw. *Obs.* 180; *Macf. Jam. ii.* 13; Griseb. *Fl. Br. W. Ind.* 276; Eichl. in *Fl. Bras. xiv. pt. 2*, 94, t. 35, f. 1; *Small Fl. S.E. U.S.* 830; Cook & Coll. in *Contrib. U.S. Nat. Hb. viii.* 96, t. 20; Urb. *Symb. Ant. iv.* 439 & viii. 476; M. T. Cook in *Bull. Torr. Bot. Club xxxv.* 305; Britt. & Millsp. *Bah. Fl.* 300. *Cucurbita arbor forte foliis sub-*

rotundis &c. *Sloane Cat.* 208 & *Hist.* ii. 176, t. 228, f. 3. C... oblongis... nascentibus *Sloane Cat.* 208 & *Hist.* ii. 176, t. 169, f. 3. Mangle julifera foliis subrotundis &c. *Sloane Cat.* 156 & *Hist.* ii. 67, t. 189, f. 3. Bucas ramulis &c. *Browne Hist. Jam.* 221,

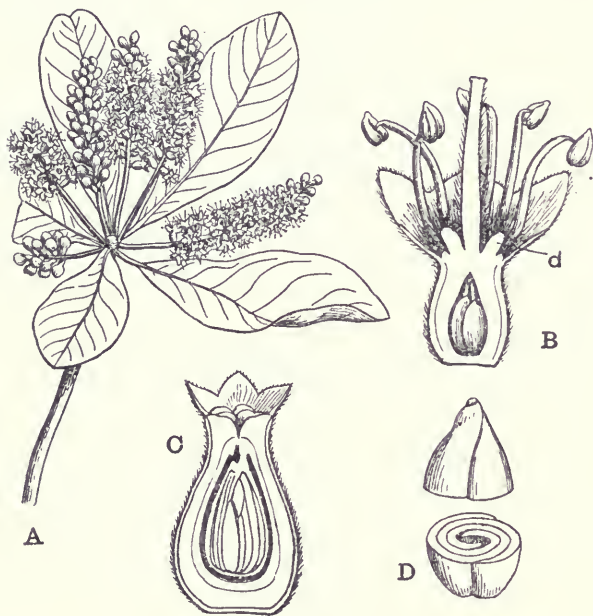


Fig. 120.—*Bucida buceras* L.

A, Portion of branch with leaves and inflorescences $\times \frac{1}{2}$.

B, Flower cut lengthwise; d, disk; $\times 8$.

C, Fruit cut lengthwise, enlarged.

D, Embryo cut across to show the convolute cotyledons, enlarged.

(A, C, D after Sargent.)

t. 23, f. 1. *Terminalia Bucas* Wright in *Sauvaille Fl. Cub.* 38 (1868); *Sarg. Silva* viii. 21, t. 201. Specimen (type) from Browne in Herb. Linn. named by Linnæus. (Fig. 120.)

Olive Bark Tree, Black Olive.

In salt marshes on the sea-coast; *Barham* Herb. *Sloane* clxii. 257! *Sloane* Herb. vii. 4, 110! *Houstoun*! *Browne*! *Wright*! Ferry river, *Broughton*! *Shakespear*! *Cuming*! *McNab*! *Purdie*! *Prior*! Ferry, Spanish Town road, 100 ft., *Campbell*! near Falmouth; Great Morass, Negril; Grant's Pen near Albion Estate; *Harris*! *Fl. Jam.* 5847, 7170, 10,244, 10,816.—Distribution of genus.

Tree, 30–60 ft. high, much branched, the leaf-bearing portions of the branches thickened and showing leaf-scars. *Leaves* to 9 cm. l., obovate or oblanceolate, tapering to the base, apex rounded or broadly pointed, sometimes emarginate, when young finely silky hairy on both sides, or glabrescent; petioles to 2 cm. l. *Inflorescence* tawny-tomentose. *Calyx*

x 2

glabrous within. *Style* with tuft of hairs at base. *Drupe* about 6 mm. l., ovate-conical, oblique.

Owing to a mite, *Eriophyes* sp., the ovary sometimes develops into a long linear gall, often 16 cm. l.; hence the name buceras—bull's horn.

An excellent timber tree, though with narrow trunk; wood, used by cabinet-makers, is grained, light yellow-brown, sometimes slightly streaked with orange, the thick sapwood being clear pale yellow. Bark was formerly used to tan leather.

3. BUCHENAVIA Eichl.

Trees or erect shrubs. Leaves alternate or crowded at the end of branches, often 2-glandular at base. Flowers hermaphrodite or male, irregularly mixed on the same rhachis in spikes or heads, axillary or arising out of scales covering buds, shooting at the same time as the leaves. Ovary lanceolate-cylindrical, narrowed into a long neck. Calyx broadly cup-shaped, subentire or very slightly 5-toothed, soon falling. Petals wanting. Stamens 10, in 2 series, the five lower opposite the calyx-teeth; anthers fixed at the enlarged apex of the filaments. Disk epigynous, 5-lobed, villose. Ovules 2 or 3. Fruit a drupe, acute or acuminate; stone bony. Cotyledons convolute.

Species about 8, natives of the West Indies and tropical S. America.

B. capitata Eichl. in *Flora xlix.* 165 (1866) & in *Fl. Bras. xiv. pt. 2*, 96; *Urb. Symb. Aut. iv.* 439 & *viii.* 475. *Bucida capitata* Vahl *Eclog. Amer. i.* 50, *t. 8* (1796); *Gaertn. Fruct. iii.* 208, *t. 217*; *Macf. Jam. ii.* 14; *Griseb. Fl. Br. W. Ind.* 277. *Hudsonia arborea* A. Robinson ex Lun. *Hort. Jam. ii.* 310 (1814). *Cucurbita arbor forte...lanugine ferruginea* &c. *Sloane Cat.* 208 & *Hist. ii.* 176, *t. 228, f. 4*. Specimen from Ryan, Montserrat, in Herb. Mus. Brit.

Yellow Sanders, Mountain Wild Olive.

On limestone hills; *Sloane* Herb. vii. iii! *Purdie!* *Prior!* J.P. 2100, *Morris!* Ayton, 3000 ft., *Harris!* *Fl. Jam.* 6464; steep bank of Shooting river, Port Royal Mts., *Norman*, 197!—Distribution of genus.

Tree, 20-60 ft. high; young branches and leaves rusty, silky-tomentose, the leaf-margins ciliate with silky hairs, becoming more or less glabrous; leaf-bearing portions of the branches thickened and bearing leaf-scars. *Leaves* 4-6.5(-8) cm. l., obovate, tapering into the petiole, at length leathery, more or less shining; apex rounded, sometimes emarginate; *petiole* to 1.5 cm. l. *Inflorescence*: rhachis and ovary rusty-tomentose; flowers in somewhat oblong or globose heads. *Calyx* glabrous without, *style-base* with a tuft of hairs. *Drupe* glabrous, pointed, 2 cm. l.

Wood of light yellow colour, takes a good polish, with satiny grain, durable, used to make bedsteads and other furniture, and in cabinet work.

4. CONOCARPUS L.

Small trees or shrubs, erect or procumbent. Leaves alternate, entire, with two glands on the margins at the base of the leaves,

sometimes with glands in the axils of the nerves beneath. Flowers hermaphrodite and male, minute, densely crowded in heads paniculate at the ends of the branches. Calyx cup-like, 5-cleft to the middle, falling after a time. Petals wanting. Stamens 10-5. Disk epigynous, formed of 5 fleshy villose glands surrounding base of style. Ovary compressed, constricted under the calyx, villose. Ovules 2 (3). Fruits scale-like, winged, curved outwards and downwards, overlapping, not opening, 1-seeded, the flower-head* becoming a cone-like fruiting head. Cotyledons convolute.

Species 1 or 2 in West Indies, Florida and Keys, Bahamas, tropical continental-America, and west tropical Africa.

C. erecta L. *Sp. Pl.* 176 (1753) & *Amæn. v.* 377; *Jacq. Sel. Stirp. Amer.* 78, t. 52, f. 1 & *Ed. pict.* t. 78; *Gaertn. Fruct. ii.* 470, t. 177; *Sw. Obs.* 79; *Descourt. Fl. Ant. vi.* 68, t. 399;



Fig. 121.—*Conocarpus erecta* L.

A, Portion of branch with leaf and flower-heads $\times \frac{1}{2}$.
C, Head of fruits $\times 1\frac{1}{2}$.

B, Flower cut above the calyx-tube; *d*, the lobed disk; $\times 8$.
D, Single fruit $\times 2$.

Wright Mem. 255; *Macf. Jam.* ii. 18; *Griseb. Fl. Br. W. Ind.* 277; *Eichl. in Fl. Bras. xiv. pt. 2*, 101, t. 35, f. 2; *Sarg. Silva v.* 24, t. 202; *Cook & Coll. in Contrib. U.S. N. Hb. viii.* 124; *Guppy Plants... W. Indies &c.* 201; *Britt. Fl. Berm.* 260; *Britt. & Millsp. Bah. Fl.* 302. *C. foliis oblongis &c. Browne Hist. Jam.* 159; *Plum. Pl. Amer. (Burm.)* 135, t. 144, f. 2 & *lc. ined.* t. 36. *Alni fructu laurifolia &c. Sloane Cat.* 135 & *Hist. ii.* 18, t. 161, f. 2. Specimen from Browne in Herb. Linn. named in Solander's hand. (Fig. 121.)

Button Tree, Button Mangrove, Button Wood.

Mangrove swamps, also sandy and rocky shores; *Sloane* Herb. v. 63! *Houstoun!* *Brown!* *Wright!* *Broughton!* *Shakespear!* *Masson!* near Kingston, *McNab!* *Prior!* Ferry; Lime Key; Drunken Man Key; *Campbell!* Port Antonio, *Harris!* Fl. Jam. 6049, 6177; Kingston; Lucea; *Hitchcock.*—Distribution of genus.

Tree or shrub, 10-20 ft. high, erect or prostrate and trailing over rocks; very variable. Leaves 4-7(-9) cm. l., lanceolate to elliptical, acute, narrowed into petiole, often decurrent, glabrescent or glabrous. Calyx 5-cleft to one-third, about 1 mm. l. Fruit 7 mm. across the wings; exocarp thin, impervious; endocarp of spongy air-bearing tissue outside with a hard layer inside.

Wood very hard, heavy, strong and close-grained, dark, yellow-brown, with thin lighter coloured sapwood; a cubic foot of dry wood weighs nearly 62 lbs.; it burns slowly like charcoal, and is highly valued for fuel. Bark bitter and astringent, used for tanning, and in medicine as an astringent and tonic (Sargent). Used in building boats and barges, also for shelving, being very durable when grown on dry ground; it is also used to make charcoal for forges (Cook and Collins).

Var. *sericea* Griseb. loc. cit. leaves larger (to 10 cm. l.), lanceolate, covered with silky tomentum.—Mangle foliis . . . holosericea &c. *Sloane Hist. ii.* 67, t. 187, f. 2.

Old Harbour *Sloane* Herb. vi. 64! Pedro Bluff; coast between Portland Point and Rocky Point; *Harris!* Fl. Jam. 9814.

5. LAGUNCULARIA Gaertn. f.

Shrub or tree. Leaves opposite, thick and leathery, oblong, ovate-oblong, or elliptical, obtuse, faintly veined, with minute glands on both sides near the margin and 2 glands at apex of petiole. Flowers mostly hermaphrodite, a few male intermixed sometimes, small, distant from one another on axillary spikes and on a terminal panicle usually of 3 spikes, the central one sometimes 3-branched; inflorescence tomentose. Bracteoles 2, scale-like, below the calyx. Calyx cup-like, 5-cleft to the middle, persistent. Petals 5, roundish, soon falling. Stamens 10 in 2 series; anthers cordate, versatile. Ovary crowned by the disk; stigma obscurely 2-lobed. Ovules 2. Fruit crowned by the calyx, elongate-obovoid, unequally ribbed, the 2 lateral ribs produced into narrow wings, 1-seeded; exocarp leathery outside, corky inwards; endocarp thin and brittle. Seed oblong; cotyledons green, convolute.

Species 1, native of the shores of the West Indies, eastern tropical America, and tropical W. Africa.

L. racemosa Gaertn. f. *Fruct. iii.* 209, t. 217 (1805); *Macf. Jam. ii.* 19; *Griseb. Fl. Br. W. Ind.* 276; *Eichl. in Fl. Bras. xiv.* pt. 2, 102, t. 35, f. 3; *Sarg. Silva v.* 29, t. 203; *Small Fl. S.E. U.S. ed.* 2, 831; *Cook & Coll. Contrib. U.S. Nat. Hb. viii.* 173, t. 43; *Urb. Symb. Ant. iv.* 440 & *viii.* 477; *Guppy Plants...*

W. Indies &c. 221; *Britt. & Millsp. Bah. Fl.* 301. Mangle
julifera foliis ellipticis &c. *Sloane Hist.* ii. 66. *Conocarpus foliis*
elliptico-ovatis &c. *Browne Hist. Jam.* 159. *C. racemosa L. Syst.*

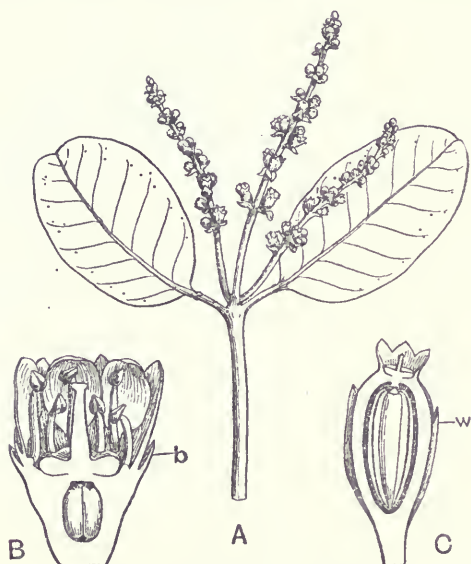


Fig. 122.—*Laguncularia racemosa* Gaertn. f.

A, Portion of branch with leaves and flowers $\times \frac{2}{3}$. B, Flower cut lengthwise; *b*, bracteole; $\times 6$. C, Fruit cut lengthwise; *w*, wing; $\times 1\frac{1}{2}$.

ed. 10, 930 (1759); *Jacq. Sel. Stirp. Amer.* 80, t. 53 & *Ed. pict.* t. 79; *Sw. Obs.* 79. *C. procumbens L. Amæn. v.* 377 (non *Syst.*). Specimen in Herb. Linn. named by Linnæus. (Fig. 122.)

White Mangrove.

In marshy places on the sea-coast; *Sloane Herb.* vii. 3! *Wright! Broughton! Lane! Ferry, Campbell! Port Morant; Port Antonio; Hitchcock; Lime Key; Ferry; Harris! Fl. Jam.* 5852, 8275, 8276.—Distribution of genus.

Shrubby small tree, but sometimes reaching 60 ft. in height. *Leaves* 5-11 cm. l., glabrous; *petioles* .5-2 cm. l. *Calyx* 2 mm. l. *Petals* not longer than the calyx, roundish, scarcely clawed. *Fruit* 1.5-2 cm. l.

"This plant is as a rule merely semi-viviparous; only in rare instances does one find the radicle protruding from the fruit on the tree. Generally the dark-green embryo does not effect more on the plant than the rupture of the thin seed-coats, the protrusion of the hypocotyl taking place shortly after the fruit has dropped on the mud or into the water." (Guppy.)

Wood heavy, hard, strong, close-grained, dark yellow-brown with lighter coloured sapwood; a cubic foot of dry wood weighs 45 lbs. Bark contains a large amount of tannic acid, and is sometimes used in tanning leather, and as an astringent and tonic. (Sargent.)

6. COMBRETUM L.

Trees or shrubs, usually climbing. Leaves usually opposite, rarely 3 or 4 in a whorl, stalked, usually membranous, entire. Flowers hermaphrodite or male irregularly mixed, in spikes or racemes, sometimes on one side only of the rhachis, the spikes or racemes often paniculate. Calyx bell-shaped, 4(-5)-cleft or toothed, soon falling. Petals 4 (5), small, inserted between the lobes of the calyx, and falling away with it. Stamens 8 or 10, in 2 series. Ovary ovoid or oblong, 4-5-angled, constricted under the calyx. Ovules 2-6. Fruit leathery or somewhat spongy, not opening, 4-6-angled or 4-6-winged, wings usually membranous, 1-seeded. Cotyledons angled, folded, twisted and folded, or deeply furrowed.

Species about 350, from tropical and subtropical regions, excluding Australia and Polynesia.

Leaves 12-25 cm. l., 9-11 cm. br., elliptical, shortly and abruptly acuminate, base auriculate, auricles overlapping petiole 1. *C. Robinsonii*.
 Leaves 8-12 cm. l., 2.2-3.8 cm. br., oblong or lanceolate, apex obtuse, mucronate, narrowed to the obtuse base 2. *C. Marchii*.

1. *C. Robinsonii* Fawc. & Rendle in Journ. Bot. lxi. 115 (1925). Combretum A. Robinson Mss. & Ic. ined. *C. laxum* Sw. Obs. 143 (1791) (non Jacq.)?; Macf. Jam. ii. 20. *C. Jacquini* Griseb. Fl. Br. W. Ind. 275 (1860) (only with reference to Macf. Jamaica). (Fig. 123, D.)

Red Withe.

Banks of river to windward of Lucca and in morass near Pauls Island, Westmoreland, *Robinson*; thickets at west end of island, *Macfadyen*; banks of Black river, near Lacovia (leaves and fruit only) *Harris*!

Shrub, stem climbing to a height of 30-50 ft. over trees, 2 inches in diam., bark reddish-brown. *Leaves* 12-25 cm. l., 9-11 cm. br., elliptical, shortly and abruptly acuminate, base auriculate, auricles overlapping the short (.5 cm.) tomentose petiole. *Calyx* cup-shaped, 4-toothed, villose within. *Petals* 4, transversely elliptical, clawed, whitish-yellow, nearly as long as the calyx-tube. *Stamens* 8, of varying lengths, as long as, or slightly exceeding, the petals. *Style* as long as the stamens, with acute apex. *Fruit* 4-winged, 3-4 cm. l., shortly pedicellate. *Seed* 4-furrowed, surface rough.

Flowers not seen; the description is taken partly from that of Robinson and Macfadyen, and partly from Robinson's drawing.

2. *C. Marchii* Fawc. & Rendle in Journ. Bot. lxi. 115 (1925). Type in Herb. Kew. (Fig. 123, A-C.)

Locality in Jamaica not stated, March 1863!

Shrub; branchlets, when young, rhachis and branches of inflorescence, and petioles, pubescent-tomentose with brownish hairs. *Leaves* 8-12 cm. l., 2.2-3.8 cm. br., oblong-lanceolate, apex obtuse, mucronate, narrowed to the obtuse base; petioles 4-6 mm. l. *Flowers* densely spicate on the spreading branches of a terminal panicle, 8-15 cm. l.; spikes cylindrical,

2-3 cm. l. *Calyx* bowl-shaped, with 4 shallow lobes, villose within, sparsely puberulous outside, about 1 mm. l. *Petals* transversely elliptical; limbs .5-.6 mm. l., .7-1.2 mm. br.; claws .2-.3 mm. l. *Stamens* about

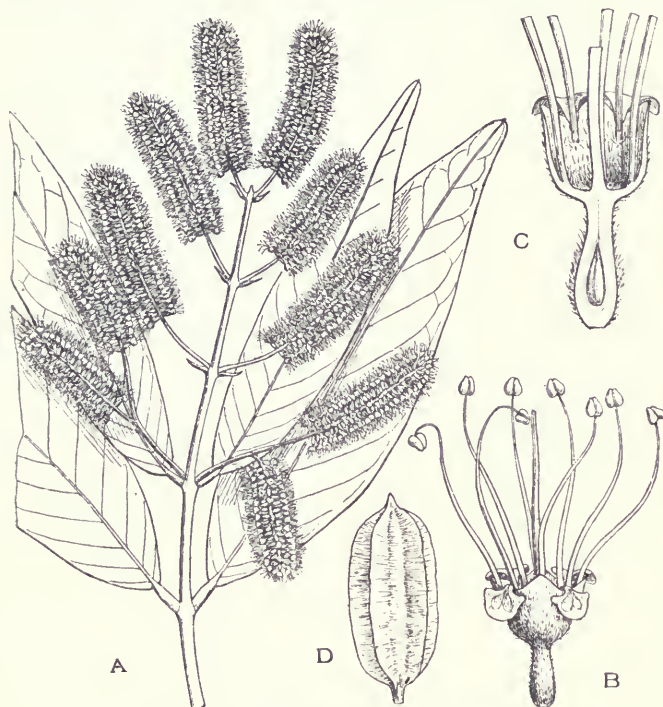


Fig. 123.—*Combretum Marchii* Fawc. & Rendle.

A, Portion of flowering branch with leaves and inflorescence $\times \frac{2}{3}$.
B, Flower $\times 5\frac{1}{2}$.

C, Ditto cut lengthwise $\times 11$.
D, Fruit of *C. Robinsonii* $\times \frac{2}{3}$.

3 mm. l. *Style* as long as the stamens. *Ovary* 1.7 mm. l., densely ferrugineo-tomentose. *Fruit* not known.

Quisqualis indica L., a native of Malaya and northern India, is common in gardens and on adjoining fences. It is remarkable for the very long calyx-tube ($1\frac{1}{2}$ -2 $\frac{1}{2}$ inches long). The 5 petals are rose or scarlet; seed-vessel about 1 inch with very sharp angles, scarcely winged.

FAMILY LXXXIX. MYRTACEÆ.

Trees or shrubs. Leaves simple, usually entire, opposite (in W. Indian species), rarely alternate, with resinous or pellucid glandular dots, sometimes small with one or more nerves, sometimes larger, pinnate-nerved. Stipules usually wanting.

Inflorescence simple, racemose, or racemose-paniculate, rarely cymose, axillary or subterminal when the terminal bud is not developed. Bracts solitary at the base of the peduncles, or overlapping when the lower flowers are not developed. Bracteoles 2 opposite, often quickly dropping, rarely wanting. Flowers generally regular or subregular, hermaphrodite or polygamous. Calyx: tube (receptacle) adherent to the ovary at the base or even to the insertion of the stamens; limb generally equally divided into 4-5 lobes or segments, overlapping in bud, sometimes subentire and truncate, or undivided in bud and splitting valvately in the flower. Petals 4-5 (6), or fewer, or wanting, inserted at the margin of a disk, in the bud generally broadly overlapping, and forming a globe, the outer often wholly enclosing the inner, sometimes more or less united, or doubled together like a cap, which drops off during flowering. Disk clothing the calyx-tube, the margin bearing the stamens forming a thin ring or broad and thick almost closing the mouth of the calyx. Stamens generally indefinite, inflexed or involute in bud, variously inserted in one or more series on the disk. Anther: connective with a small globular gland, or sometimes prolonged. Ovary inferior, or sometimes half-inferior, sometimes 1-celled, more often with 2 or more cells, with the placentas attached to the axis. Style simple with small terminal capitate stigma. Ovules 2 or more on each placenta. Fruit sometimes inferior or more or less superior, sometimes a loculicidal capsule, (in W. Indian species) a berry or drupe. Seeds one or more; endosperm usually none.

Species about 2750, mostly in the tropics and Australia, a few in the temperate regions of the northern hemisphere and in extra-tropical Africa.

- Calyx-limb in bud undivided, during flowering splitting irregularly or down to the disk..... 1. *Psidium*.
 Calyx-limb in bud undivided, during flowering falling off like a lid 2. *Calypttranthes*.
 Calyx-limb in bud with 4 or 5 lobes, during flowering not splitting deeper.
 Calyx-lobes 4. Petals 4.
 Stigma peltate, thicker than style. Ovule 1 in each cell, hanging from apex..... 3. *Pimenta*.
 Stigma small. Ovules few to numerous in each cell, attached to the partition-wall 6. *Eugenia*.
 Calyx-lobes 5. Petals 5. Stigma small.
 Ovules 6-7 in each cell, attached to margin of placenta at top of partition-wall 4. *Amomis*.
 Ovules 2 in each cell, side by side. 5. *Myrcia*.

1. PSIDIUM L.

Trees, shrubs, or rarely undershrubs. Flowers generally somewhat large, usually 1-3, cymose, on axillary peduncles.

Calyx-lobes wanting or 4 or 5; undivided in bud in Jamaican species; during flowering usually splitting valvately to the disk. Petals 4 or 5, spreading. Stamens numerous, usually in indefinite series on a broad disk, free. Ovary 4-5(2-7)-celled; stigma peltate or capitate; ovules indefinite in each cell, attached to a central placenta, often 2-cleft. Berry crowned, or not, by the calyx. Seeds somewhat kidney-shaped, with a hard coat; embryo curved, horseshoe-shaped, or almost a ring, with a very long radicle and small cotyledons.

Species about 120, natives of the West Indies and sub-tropical and tropical America, one cultivated in the tropics of the whole world.

Leaves elliptical, elliptical-oblong, or elliptical-lanceolate.

Leaves (beneath), inflorescence and young branches pubescent or velvety. Buds constricted under calyx.

Lateral leaf-nerves many (more than 10); midrib and veins impressed on upper surface 1. *P. Guajava*.

Lateral nerves usually less than 10; midrib and veins scarcely impressed on upper surface [*P. guineense*.]

Leaves and inflorescence glabrous. Buds not constricted under calyx 2. *P. montanum*.

Leaves roundish.

Leaves petiolate. Ovary 4-5-celled 3. *P. albescens*.

Leaves sessile. Ovary 2-celled 4. *P. Harrisianum*.

1. *P. Guajava* *L. Sp. Pl.* 470 (1753) & *Amœn. v.* 379; *Urb. in Engl. Jahrb.* xix. 565, *Symb. Ant.* iv. 441 & viii. 478; *Cook & Coll. in Contrib. U.S. Nat. Hb.* viii. 224; *Britt. Fl. Berm.* 262; *Britt. & Millsp. Bah. Fl.* 307. *P. pyriferum* *L. Sp. Pl. ed.* 2, 672 (1762); *Lun. Hort. Jam.* i. 350; *Wright Mem.* 278; *Descourt. Fl. Ant.* ii. 20, t. 72; *Bot. Reg. t.* 1079; *Macf. Jam.* ii. 106. *P. pomiferum* *L. Sp. Pl. ed.* 2, 672 (1762); *Tussac Fl. Ant.* ii. 92, t. 22. *P. Guava* *Griseb. Fl. Br. W. Ind.* 241 (1860). *P. fruticosum* &c. *Browne Hist. Jam.* 238. *P. fragrans* *Macf. Jam.* ii. 108 (1850). *Malo punicæ* &c. *Sloane Cat.* 198, 199, 200, & *Hist.* ii. 161, 163. (Fig. 124.)

Sloane *Herb.* vii. 87! *Wright!* *Cuming!* *McNab!* *Parnell!* *Prior!* Constant Spring; Bog Walk; Port Morant; *Hitchcock*; Green Valley; Hope; *Harris!* *Fl. Jam.* 5117.—West Indies, tropical continental America; cultivated in Bermuda, Florida, and Old World.

Shrub or *tree*, 15(-20) ft. high; young branches 4-cornered, these and under side of leaves, peduncles and buds, more or less silky with adpressed hairs or velvety. *Leaves* 5-12 cm. l., elliptical to oblong, apex acute or obtuse, generally apiculate, base rounded or obtuse, papery, with numerous minute glandular dots, pellucid in very young leaves, on upper surface glabrous or minutely puberulous; midrib and nerves impressed on upper surface, very prominent beneath, nerves numerous; petiole 3-5 mm. l. *Flowers* solitary or 3 together; pedicels 1-2.5 cm. l. *Buds* constricted under the calyx. *Calyx* at length cleft irregularly; lobes 1-1.5 cm. l.

Petals 1.5-2 cm. l., white, with little smell. *Fruit* pear-shaped or globose, 3-6 cm. in diam., yellow, with red or yellow pulp.

A form with narrow oblong leaves is *P. Guajava* v. *Cujavillum* Kr. & Urb. in *Engl. Jahrb.* xix. 566 (*P. pumilum* Vahl, *P. fragrans* Macf.).

Fruit usually stewed with sugar and served with milk, or used to make the famous jelly. Bark useful for tanning leather. A decoction of the

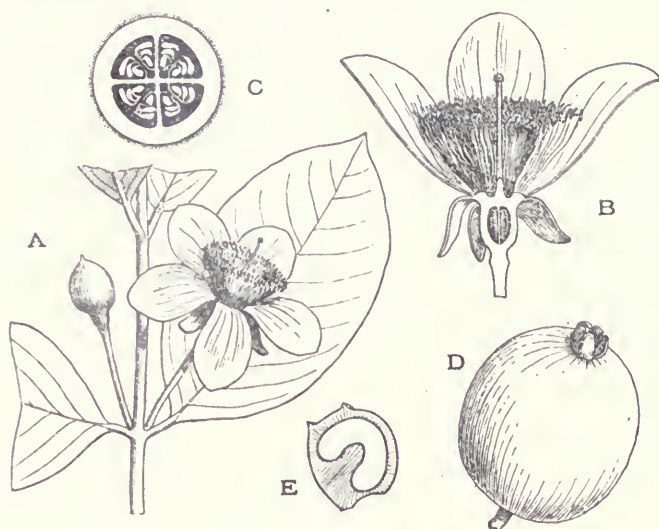


Fig. 124.—*Psidium Guajava* L.

A, Portion of branch with leaf, bud, and flower, $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 1\frac{1}{2}$.

C, Ovary cut across $\times 6$.

D, Fruit $\times \frac{1}{2}$.

E, Seed cut to show the embryo $\times 7$.

bark, young leaves and unripe fruit, being astringent, has been given as a remedy in diarrhoea and dysentery. Wood small, but of a compact texture, very hard and tough, used for cattle yokes and agricultural implements where strength and elasticity are needed.

[*P. guineense* Sw. *Prodr.* 77 (1788) & *Fl. Ind. Occ.* 881; Urb. in *Engl. Jahrb.* xix. 567, *Symb. Ant.* viii. 478, & ix. 82. *P. polycarpum* A. Anders. ex Lamb. in *Trans. Linn. Soc.* xi. 231, t. 17 (1815); Berg in *Fl. Bras.* xiv. pt. 1, 398; Griseb. *Fl. Br. W. Ind.* 241. Specimen from Swartz (cultivated in Hispaniola) in Herb. Mus. Brit.

Cultivated or subsontaneous; J.P. 898 Hart! Davids Hill, *Campbell!* Resource; Hope grounds, *Harris!* Fl. Jam. 6871, 6919;—also in W. Indies, considered indigenous in Cuba, Trinidad, and tropical continental America.

Shrub, 4 ft. high; branches straggling horizontally, young cylindrical or compressed, these, and leaves, especially on the under side, petioles, peduncles and buds, densely pubescent or velvety. *Leaves* 6-13 cm. l., elliptical to oblong-elliptical, apex obtuse, or rounded, often apiculate, base wedge-shaped to rounded, leathery to papery, with numerous minute

glandular dots more or less pellucid, on upper surface puberulous; midrib impressed on upper surface, very prominent beneath; nerves fewer than in *P. Guajava*, flat or slightly prominent on upper surface, very prominent beneath; veins forming a flexuose line midway between the nerves; petioles 5-13 mm. l. *Peduncles* solitary or twin, 1-3- or more-flowered. *Buds* constricted under the calyx, not divided. *Calyx* at length cleft irregularly. *Fruit* obovoid-globose, ovoid, or subglobose, about 2 cm. in diam., yellow.

Fruit edible, tastes much like a strawberry.]

2. *P. montanum* Sw. *Prodr.* 77 (1788) & *Fl. Ind. Occ.* 879; *Lun. Hort. Jam.* i. 351; *Macf. Jam.* ii. 108; *Griseb. Fl. Br. W. Ind.* 242; *Urb. in Engl. Jahrb.* xix. 567. *P. arboreum* &c. *Browne Hist. Jam.* 239. *P. Wrightii* *Herb. Lambert ex Wright Mem.* 278 (1828).

Wright! Macfadyen! St. Mary, McNab! Wilson! Moneague, Prior! Liganea plain, J.P. 1278, *Morris! Chester Vale, Watt! Tweedside, Green river; near Cinchona; Chester Vale; Whitfield Hall (about 4000 ft.); near Troy, 2000 ft.; Cato, Chester Vale, 3000 ft.; near Guy's Hill, St. Ann, 1800 ft.; Harris! Fl. Jam.* 5026, 5122, 5156, 5201, 5333, 5408, 8769, 9406, 10,016, 12,036.

Tree, 30-50(-100) ft. high; young branchlets 4-cornered, glabrous or sometimes glabrescent. *Leaves* 3-9 cm. l., elliptical, oblong-elliptical, or elliptical-lanceolate, apex acuminate, sometimes obtuse, base obtuse, or wedge-shaped, sometimes rounded, upper surface shining, papery or somewhat leathery, with numerous minute glandular dots more or less pellucid, glabrous, on upper surface, midrib impressed, nerves flat or impressed, veins indistinct, beneath midrib very prominent, nerves slightly prominent, veins few, somewhat indistinct; petiole 3-6 mm. l. *Flowers* with fragrance of bitter almonds, solitary, sometimes forming a false raceme, the leaves having dropped, or remaining small; pedicels 1-3 cm. l. *Buds* glabrous, not constricted under the calyx, not divided. *Calyx* at length cleft irregularly into 2 or 3 lobes; lobes 4-5 mm. l., white-villose within. *Petals* white, about 1 cm. l. *Fruit* subglobose, green, about 2 cm. in diam. Wood hard, tough, variegated, useful for gun-stocks, &c., not durable in earth. Fruit edible, very fragrant, and is considered by some to have a more delicate flavour than the common Guava. "When ripe, it perfumes the air for a considerable distance" (Harris).

P. cordatum *Griseb. Fl. Br. W. Ind.* 242 (non Sims) (so far as regards the Jamaican specimen), *P. ? pulverulentum* *Kr. & Urb. in Engl. Jahrb.* xix. 567, is *Pisonia obtusata* *Jacq. fide Urban in Symb. Ant. v.* 442, *Obs.* 2.

3. *P. albescens* *Urb. Symb. Ant. v.* 441 (1908).

In fl. June, July; in fr. Nov.; Long Mt., south side, road to Wareka, 600 ft.; *Harris! Fl. Jam.* 9583, 9998.

Bushy tree, 15-20 ft. high; young branchlets glabrous, whitish, with small brownish glands. *Leaves* 3-5 cm. l., roundish, obovate-roundish to obovate, leathery, margin slightly recurved, midrib broadly prominulous below, narrowly upwards, lateral nerves proceeding from the midrib at a very acute angle, on both sides prominulous, marked on both sides with numerous minute glandular dots more or less pellucid, upper surface shining, lower opaque and somewhat paler; petiole 3-8 mm. l. *Inflorescences* axillary and apparently terminal; peduncle 1-5 mm. l., 1-6-flowered; pedicels 10-4 mm. l. *Buds* globulose, not divided, apex rounded. *Calyx* glandular-granulate; limb 6 mm. l., bursting irregularly into 2 or 3 lobes down to the disk. *Petals* 5, white, soon falling. *Ovary* 4-5-celled.

4. *P. Harrisianum* Urb. *Symb. Ant. vii.* 294 (1912).

In fl. July; Peckham woods, Clarendon, 2500 ft., *Harris!* Fl. Jam. 11,000.

Shrub, 9 ft. high; branches glabrous, grey, with longitudinal chinks. *Leaves* 3.5–8 cm. l., sessile, roundish, ovate, or obovate, apex rounded or subtruncate, base rounded, subtruncate, or subcordate, midrib on upper surface slightly impressed near base, becoming prominent above, lateral nerves spreading, leathery, margin recurved, covered densely on both sides with dots more or less pellucid, glabrous, shining. *Inflorescence* terminal, racemose, 4–6 flowers in decussating pairs (in the single specimen seen); pedicels about 3 mm. l. *Buds* globose, not divided, with rounded apex. *Calyx* outside densely glandulose-granulate; limb bursting irregularly to the disk in 2 or 3 irregular lobes, 2.5–3 mm. l. *Petals* 4, leathery, glandular-dotted, soon falling. *Ovary* 2-celled.

P. Cattleianum Sabine, *Purple Guava*, a native of Brazil, a small tree with obovate-elliptical leaves, is planted for its fruit.

2. CALYPTRANTHES Sw.

Trees or shrubs. Flowers small; peduncles axillary and subterminal, cymose or paniculate, primary and secondary branches of the panicles usually racemose, the ultimate cymose. Calyx-tube (receptacle) prolonged above the ovary. Calyx-limb undivided in bud, during flowering separating like a lid, but remaining attached at one point. Petals 2–5, very small, or wanting. Stamens indefinite, free. Ovary inferior, 2–3-celled; ovules 2, side by side, attached to the inner angle of each cell. Berry crowned by the receptacle. Seeds generally 1 or 2, subglobose; radicle somewhat long, incurved; cotyledons somewhat large, twisted and folded.

Species about 70, natives of West Indies and tropical America.

Leaves small, 1.8–5 cm. l. Twigs of first year 2-keeled or 2-winged. Inflorescence glabrous (but peduncles of *C. Mazonii* tomentose).

Leaves more or less acuminate. Petioles 2–5 mm. l.

Twigs 2-keeled.

Peduncles solitary, with 3–1 flowers 1. *C. rigida*.

Peduncles about 4 together, with 15–30 flowers... 2. *C. Fawcettii*.

Leaf-apex obtuse or roundish. Petioles very short or none. Twigs 2-winged

Leaves elliptical, base acute 3. *C. Wilsonii*.

Leaves ovate-roundish, base subcordate 4. *C. Mazonii*.

Leaves of moderate size, 2.5–7 cm l. Twigs of first year compressed (2-edged, sometimes slightly tomentose in *C. pallens*).

Apex of leaves obtuse, sometimes shortly acuminate. Inflorescence not tomentose nor velvety.

Midrib prominent on upper surface..... 5. *C. Zuzygium*.

Midrib impressed in lower half of upper surface; peduncles keeled 6. *C. umbelliformis*.

- Midrib impressed on upper surface; peduncles compressed..... 7. *C. impressa*.
 Apex long acuminate.
 Inflorescence glabrous..... 8. *C. acutissima*.
 Inflorescence with reddish velvety indumentum 9. *C. pallens*.
 Leaves somewhat large, 5-15 cm. l., apex usually long acuminate. Twigs of first year compressed or subcylindrical. Inflorescence usually reddish velvety.
 Inflorescence usually longer than leaf. Leaves 4-9 cm. l. 10. *C. chytraculia*.
 Inflorescence shorter than leaf.
 Leaves beneath at base and on midrib, also petioles, tomentose, to 10 cm. l. 11. *C. Urbanii*.
 Leaves and petioles glabrous.
 Petioles 5-7 mm. l. Leaves to 15 cm. l., long acuminate 12. *C. nodosa*.
 Petioles 15-20 mm. l. Leaves to 10 cm. l., shortly acuminate 13. *C. Tussaceana*.
 Leaves very large, 26-37 cm. l., apex long acuminate, base cordate 14. *C. discolor*.

1. *C. rigida* Sw. *Prodr.* 80 (1788) & *Fl. Ind. Occ.* 923; *Griseb. Fl. Br. W. Ind.* 233, & *Cat. Cub.* 86; *Urb. in Engl. Jahrb.* xix. 603. Specimen from Swartz in Herb. Mus. Brit.

Catherine Peak, St. Andrew, Swartz!—Cuba.

Tree, 12-15 ft. high, glabrous; youngest branchlets 2-keeled. *Leaves* 2-2.5 cm. l., ovate, ovate-lanceolate, or elliptical, apex acutely or obtusely acuminate, base obtuse to wedge-shaped; midrib on upper surface slightly impressed, prominent beneath, nerves on upper surface not evident or slightly impressed, beneath not evident or slightly prominent, veins not evident; with minute dots on both sides but scarcely evident, not pellucid, leathery, margin slightly recurved; petiole 2-5 mm. l. *Peduncles* solitary, axillary, usually about as long as the leaves or somewhat shorter, erect, 3(1)-flowered; pedicels as long as the flower. *Buds* globose, subglabrous. *Flowers* white, small. *Calyx* subglobose, minutely mucronate, 2 mm. in diam. *Petals* wanting. *Berry* subglobose, minute, 1-seeded.

2. *C. Fawcettii* Kr. & Urb. in *Engl. Jahrb.* xix. 600 (1895).

In fl. Sept., in fr. Feb., March; near Newhaven Gap, Blue Mts., Sullivan! also Harris! John Crow (Blake) Mts., 1500 ft. Harris & Britton! Crofts Mt., Clarendon, 2500 ft.; John Crow Peak, Blue Mts., 6000 ft., Harris! Fl. Jam. 5036, 5213, 5358, 10,775, 12,901.

Shrub or *tree*, 7-30 ft. high, glabrous; branchlets of last and this year 2-keeled. *Leaves* 3-5 cm. l., ovate or ovate-lanceolate, apex more or less acuminate with blunt tip, base acute or somewhat wedge-shaped; midrib on upper surface impressed, prominent beneath, nerves on upper surface slightly impressed or not evident, beneath slightly prominent, veins not evident, with numerous minute dots on upper surface, not pellucid, leathery, margin recurved; petiole 3-5 mm. l. *Inflorescences* paniculate, with 15-30 flowers, as long as the leaves or slightly overtopping them, peduncles about 4 together, often with two vegetative branchlets, umbel-like, at the ends of branches. *Flowers* at the apex of the branchlets, in threes, sessile, the lateral flowers rarely shortly stalked. *Buds* obovoid, 3 mm. l. *Berry* globose, 5-6 mm. in diam., dark red.

3. *C. Wilsonii* Griseb. *Fl. Br. W. Ind.* 233 (1860). *Urb. tom. cit.* 603. Specimen named by Grisebach in Herb. Kew.

"Eastern peak of John Crow Hill, near Bath, 3000 ft." *Wilson!* eastern slope of south end of John Crow (Blake) Mts., *Harris & Britton!* *Fl. Jam.* 10,747.

Small tree or shrub, 10 ft. high, glabrous; youngest branchlets flat, 2-edged, with longitudinal wings, with a gland at base between the petioles. *Leaves* 2-3 cm. l., 1.5-1 cm. br., elliptical, apex obtuse, base acute, veins not evident, papery, pellucid-dotted; petioles very short. *Pedicels* 16-8 mm. l., much longer than the flower, very slender, 2 together or solitary in the axils. *Calyx* 3 mm. l., scarcely 1 mm. in diam., ellipsoidal-linear, acuminate. *Petals* wanting.

4. *C. Maxonii* Britton & Urb. *Symb. Ant. vii.* 296 (1912).

In fl. June; near Troy, *Maxon* 2896.

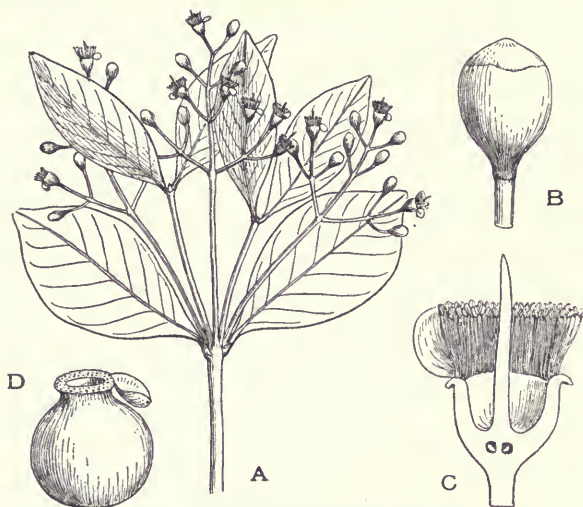
Branches of last year glabrous, 2-winged, 2-forked. *Leaves* 1.8-2.3 cm. l. & br., sessile, ovate-roundish, apex roundish, base subcordate; midrib on upper surface impressed, nerves (and veins) on upper surface slightly prominent or scarcely evident, beneath prominent, not pellucid-dotted, leathery, margin more or less recurved. *Inflorescences* 2-3, terminal; peduncles about 2 cm. l., brownish-tomentose, bearing 3 heads of (to 12) sessile flowers, the 2 lateral heads more or less stalked. *Buds* narrowly obovate, with brownish hairs, scarcely 2.5 mm. l.

We have not seen Maxon's specimen.

5. *C. Zuzygium* Sw. *Prodr.* 79 (1788) & *Fl. Ind. Occ.* 919, t. 5, fig. a-f, l. (sub *C. Syzygio*); *Macf. Jam. ii.* 111; *Griseb. Fl. Br. W. Ind.* 232 (sub *C. Syzygio*); *Urb. in Engl. Jahrb. xix.* 595, & *Symb. Ant. viii.* 480 (sub *C. syzygio*); *Britt. & Millsp. Bah. Fl.* 307. *C. rigida* *Macf. Jam. ii.* 110 (1850) (non Sw.). *Myrtus Zuzygium* L. *Syst. ed.* 10, 1056 (1759) & *Amœn. v.* 398, 379. *Suzygium fruticosum* &c. *Browne Hist. Jam.* 240, t. 7, f. 2. Specimen in Herb. Linn. named by Linnaeus *Myrtus Syzygium*. (Fig. 125.)

In fl. June-Aug.; *Wright!* *Macfadyen!* Moneague, *Prior!* Port Royal Mts. (Silver Hill, near Guava Ridge, Tweedside, Chester Vale, near Bryans Hill, road to Sheldon); *Harris!* Upper Liguanea plain (Norwood, 600 ft.; Cherry Garden, 600 ft.; Mona woodland, 1000 ft.); *Campbell!* also *Harris!* Hope Mines, 750 ft.; near Troy, 2000 ft. and 2500 ft.; Potsdam, Santa Cruz Mts., 2600 ft.; Potsdam Hill, 2200 ft.; Chester Vale, Port Royal Mts., 3000 ft.; Peckham, Clarendon, 2500 ft.; between Constant Spring and Bardowie, 800 ft.; *Harris!* *Fl. Jam.* 5027-5029, 5040, 5073-5075, 5178, 5324, 5338, 5549, 5735, 5766, 6541, 8366, 8550, 8718, 9752, 9804, 10,022, 11,056, 12,103.—Florida (fide Britton), Bahamas, Cuba, Hispaniola.

Shrub 8-10 ft. or *tree* 15-25 ft. high, glabrous; twigs of first year 2-edged, of previous year usually cylindrical. *Leaves* 2.5-5 cm. l., elliptical, sometimes somewhat obovate or ovate, usually shortly and abruptly acuminate, with blunt tip, base running down into the very short petiole; midrib and nerves flat or slightly prominent on both sides, veins scarcely evident, with numerous minute dots on both sides, not pellucid, leathery, margin more or less recurved; petioles 2-4 mm. l. *Inflorescences* longer (sometimes shorter) than the leaf, with numerous white flowers; peduncles 1.5-4.5 cm. l., rising 3-4 together umbel-like from a terminal node with two vegetative branches, forming a raceme or panicle, with stalked flowers

Fig. 125.—*Calyptranthes Zuzygium* Sw.

A, Portion of branch with leaves, flower-buds, and flowers, $\times \frac{3}{4}$.
B, Flower-bud $\times 4$.

C, Flower cut lengthwise $\times 4$.
D, Fruit with the persistent calyx-limb $\times 2$.

at ends of branches; pedicels 4-8 mm. l. *Buds* obovoid-globose, with rounded apex or very shortly mucronate. *Calyx-tube* 2-2.5 mm. l. *Petals* wanting. *Berry* globose, 7-9 mm. in diam., with 3 or 4 seeds, but only one becoming mature.

6. *C. umbelliformis* Kr. & Urb. in *Engl. Jahrb.* xix. 596 (1895).

Vinegar Hill, Blue Mts.; *Harris*! Fl. Jam. 5300, 5998.

Shrub or *tree*, 10-20 ft. high, glabrous; branchlets of first year compressed, not keeled. *Leaves* 4-5 cm. l., broadly rhombic-oval, oval, or the highest oval-oblong, apex very shortly and obtusely acuminate, base wedge-shaped and prolonged into the petiole; midrib on the upper surface flat or slightly impressed towards the base, nerves on both sides flat or slightly prominent, veins on the upper surface only evident, reticulate; with numerous minute dots on both sides, not pellucid, somewhat leathery, margin recurved; petiole 4-6 mm. l. *Inflorescences* many-flowered (15-27), overtopping the leaf; peduncles 3-5 cm. l., keeled on edges, crowded several together (4-15), umbel-like at the ends of branches, once or twice 3-forked with 3 sessile flowers at apex. *Calyx-tube* top-shaped, 2.5-3 mm. l. *Buds* narrowly obovate, apiculate, 3.5-4 mm. l. *Berry* depressed-globose, 5-6 mm. in diam.

7. *C. impressa* Urb. *Symb. Ant.* v. 442 (1908).

In fl. Aug.; Mabess river, *Harris*! Fl. Jam. 7701.

Tree, 26 ft. high, glabrous; branchlets of this year somewhat compressed, not keeled. *Leaves* 4-5.5 cm. l., variable on the same branch, shortly obovate, subrhomboid to ovate-elliptical, apex rounded or obtusely

acuminate, running down as a margin to the petiole; midrib on upper surface impressed, prominent beneath, nerves on both sides slightly prominent, veins on upper surface very slightly prominent, not evident beneath; with numerous minute dots, not pellucid, leathery, margin recurved; petiole 8-5 mm. l. *Inflorescences* few-flowered, overtopping the leaf; peduncles 1 or 2, 4-7 cm. l., with 1 or 2 vegetative branches whorled at end of branches, twice 3-forked, the extreme branchlets bearing 3-flowered cymules. *Flowers* sessile or very shortly stalked (1.5 mm. l.). *Calyx*-tube top-shaped, 3 mm. l.

8. *C. acutissima* Urb. *Symb. Ant.* vi. 22 (1909).

In fr. March; Dolphin Head, 1800 ft., Harris Fl. Jam. 10,270.

Tree, 20 ft., glabrous; branchlets of this year slightly compressed, not keeled. *Leaves* 5-6.5 cm. l., oblong-lanceolate to elliptical-oblong, acuminate with long and narrow tip, base obtuse or rounded contracted into the petiole and forming a margin to it above; midrib on upper surface slightly impressed, nerves on upper surface not evident, scarcely so beneath, not pellucid-dotted, leathery; petioles 5-6 mm. l. *Inflorescence* (in fruit) equalling the leaf, apparently few-flowered; peduncle 2.5-5 cm. l. *Berry* globose, dotted, 7-9 mm. l., 8-10 mm. br., apparently sessile or with very short pedicel, the branchlet simulating a pedicel 7 mm. l.

9. *C. pallens* Griseb. (*Veg. Kar.*) in *Goett. Abh.* vii. 67 (1857) & *Fl. Br. W. Ind.* 233; Urb. *tom. cit.* 598 & *Symb. Ant.* viii. 480; Britt. & Millsp. *Bah. Fl.* 307. *C. chytraculia* Nutt. *Sylv.* i. 117, t. 26; Sarg. *Silv.* v. 36, t. 205 (non Sw.). *Eugenia pallens* Poir. in *Lam. Encyc. Suppl.* iii. 122 (1813). Nuttall's specimen in Herb. Mus. Brit.

In fl. April-July; Wright! Masson! St. Mary, McNab! near mouth of Yallahs R., Prior! March! road to Wareka, Long Mt., Campbell! north side of Long Mt.; N.E. of Dolphin Head; Harris! Fl. Jam. 5693, 8943, 10,313, 11,216.—Florida and Keys, Cuba, Cayman Is., St. Thomas, St. Croix, Guadeloupe.

Shrub 12 ft. or *tree* 25 ft. high; branches slightly 2-edged, when young usually more or less slightly reddish-tomentose. *Leaves* 3-7.5 cm. l., lanceolate to elliptical, acuminate, base wedge-shaped, with very short tomentum on young leaves especially beneath and petioles, later glabrate, ashy-grey colour beneath; midrib on upper surface impressed, nerves and veins flat or scarcely prominent on upper surface, slightly prominent beneath, with dots scarcely any pellucid, thick papery, margin slightly recurved; petioles 4-8 mm. l. *Inflorescences* with reddish velvety tomentum, much longer than the leaf, with numerous flowers; peduncles 2.5-4 cm. l., rising 2-5 together umbel-like from a terminal node or from axils, occasionally accompanied by a vegetative branch, forming a panicle with clusters at ends of branchlets of sessile or shortly stalked flowers; branches of panicle erect-diverging. *Buds* obovoid with rounded apex, velvety-tomentose. *Calyx*-tube 2 mm. l. *Petals* wanting. *Berry* globose-depressed, 4 (or more) mm. in diam., dark red.

10. *C. chytraculia* Sw. *Prodr.* 79 (1788) & *Fl. Ind. Occ.* 921; Macf. *Jam.* ii. 111; Griseb. *tom. cit.* 232; Urb. *tom. cit.* 597. *Myrtus Chytraculia* L. *Syst. ed.* 10, 1056 (excl. syn. *Pluk.*) & *Amen.* v. 398, 379. *Chytraculia arborea* &c. Browne *Hist. Jam.* 239, t. 37, f. 2. *Chytraculia Chytraculia* Millsp. *Field Mus.*

Publ. Bot. ser. ii. 80 (1900); *Small Fl. S.E. U.S.* 833. Specimen in Herb. Linn. named by Linnæus.

Bastard Green Heart.

Wright! *Macfadyen!* *March!* *Prior!* Silver Hill; Stoneleigh; *Harris!* Cokely, Junction Road, *Campbell!* Farm Hill, Blue Mts., 3500 ft., *Cradwick!* Whitfield Hall; Chester Vale; Tyre near Troy, 1500 ft.; Peckham, Clarendon, 2300 ft.; near Guys Hill, St. Ann, 1800 ft., *Harris!* between Bath and Cuna-Cuna Pass, *Harris & Britton!* Fl. Jam. 5031-5035, 5037, 5082, 5085, 5100, 6276, 8654, 8678, 10,557, 11,069, 12,042.—Florida and Keys, Cozumel, Cuba.

Tree or *shrub*, 10-20 ft. high; branchlets of this year compressed, tomentose with long reddish-brown hairs, later cylindrical, glabrous. *Leaves* 4.5-9 cm. l., ovate to elliptical, apex acuminate with a rather long and narrow tip, base obtuse, base of this year's leaf usually puberulous beneath at base and midrib, later glabrous on both sides, light green beneath; midrib on upper surface impressed, nerves and veins scarcely prominent on upper surface, slightly prominent beneath, with numerous minute dots seldom evident on either surface, pellucid or not, thick papery, margin flat or slightly recurved; petioles 4-7 mm. l., of this year's leaves tomentose, later glabrescent or glabrate. *Inflorescences* with reddish velvety tomentum, about as long as or shorter than the leaf and broader than long, with numerous white flowers; peduncles 2-4(-6) cm. l., rising 2-5 together umbel-like from a terminal node or from axils, occasionally accompanied by a vegetative branch, forming a panicle with clusters at ends of branchlets of flowers, sessile or very shortly stalked; branches of panicle diverging more or less horizontally. *Buds* obovoid, mucronate, tomentose-villose, becoming glabrescent above. *Calyx*-tube 2 mm. l. *Petals* wanting. *Berry* globose, 5 mm. in diam.

Wood hard and heavy.

11. *C. Urbanii* Fawc. & Rendle in Journ. Bot. lxx. 14 (1926).

In fr. Sept.; on banks of Black river between Lacovia and Elam, *Harris!* Fl. Jam. 9846 (in fruit only).

Tree, 30 ft. high; branches of last year glabrous, of this year tomentose, of both years cylindrical or somewhat compressed. *Leaves* 9-10 cm. l., oval-elliptical, acuminate, base obtuse, tomentose beneath near base and along the midrib; midrib impressed on upper surface, prominent beneath, nerves and veins on upper surface flat or scarcely prominent, slightly prominent beneath, with numerous minute dots scarcely evident, not pellucid except in young leaves; papery or subleathery, margin flat; petioles 6-7 mm. l., tomentose. *Inflorescence* reddish-tomentose, shorter than the leaf, with few flowers; peduncles 3.5-5 cm. l., rising 3 together (vegetative branches wanting) from a terminal node, apparently with trichotomous branching, sometimes thrice repeated, with 3 pedicellate flowers at apex; pedicels 5-12 mm. l., tomentose. *Berry* 8 mm. in diam., black.

12. *C. nodosa* Urb. Symb. Ant. v. 444 (1908).

Red wood.

In fl. June, in fr. July, Aug.; Crown lands near Troy; *Harris!* Fl. Jam. 8711, also berries collected from same tree in July of same year.

Tree, 30 ft. high, branches of last year glabrous, subcylindrical, of this year not developed at time of flowering; nodes near apex swollen, 2-5-forked. *Leaves* 7-15 cm. l., oval-elliptical to elliptical-oblong, apex acuminate, often with the tip long and narrow, generally narrowed at base and running down into the petiole; midrib on upper surface, chiefly

near the base, impressed, nerves and veins slightly prominent on both sides, midrib prominent beneath, nerves forming a continuous marginal nerve, with very numerous minute dots, not pellucid, leathery, margin slightly recurved or flat; petioles 7-5 mm. l., glabrous. *Inflorescences* reddish-tomentose, much shorter than the leaf, with several flowers; peduncles 2.5-3.5 cm. l., rising 3-7 together umbel-like from the terminal nodes without accompanying vegetative branches, 2-3-forked, each branch bearing at apex a cluster of sessile flowers. *Buds* obovate, reddish-tomentose below, glabrescent above. *Calyx*-tube 3 mm. l. *Berry* depressed-globose, deformed by insect attack.

13. *C. Tussaceana* Berg in *Linnaea* xxvii. 25 (1854); Griseb. *tom. cit.* 233; *Urb. tom. cit.* 597, & *Symb. Ant.* v. 444 in obs. *C. rigida* Tuss. *Fl. Ant.* iii. 91, t. 26 (1824) (non Sw.).

In fl. Aug.; mountains, St. Ann, *Tussac*.

Tree, 15 ft. high. *Leaves* 5-10 cm. l., ovate or ovate-oblong, narrowed to both ends, glabrous, veins not evident, rigid; petioles 2-1 cm. l. *Inflorescences* shorter than the leaves; peduncles 1 or 2 in axils of leaves, branching trichotomously or racemously, with 3-6 sessile flowers at apex of branchlets. *Buds* top-shaped, 6 mm. l. *Petals* wanting. *Fruit* globose.

We have not seen any specimen to correspond with Tussac's description and figure.

14. *C. discolor* Urb. *Symb. Ant.* v. 443 (1908).

Mountain Bay.

In fl. Mar.-May; slopes of Dolphin Head Mt., Harris! 9264, 10,279.

Shrub, 12-20 ft. high; branchlets of this year glabrous, 2-furrowed in the upper part of the internode. *Leaves* (about 1 ft. l.) 26-37 cm. l., 7-10 cm. br., elliptical-oblong, narrowing upwards and long acuminate, apex obtuse, base cordate; midrib on upper surface flat or subimpressed below, slightly prominent upwards, nerves and veins prominent on both sides, nerves forming a prominent marginal nerve; with minute pellucid dots, glabrous on upper surface, with very minute reddish or brownish hairs beneath esp. on midrib, papery, margin flat; petiole 6-10 mm. l. *Inflorescences* 9-10 cm. l. (No. 10,279) to 3 cm. l. (No. 9264), paniculate, puberulous with reddish hairs; peduncles 2 opposite, each 1-1.5 cm. above the leaf-axil and subtended by oblong-lanceolate bracts about 1.5 cm. l., 20 cm. l. (No. 10,279), or solitary and apparently terminal, 13 cm. l. (No. 9264). *Flowers* white, numerous, sessile, in clusters at apex of branchlets and below. *Calyx*-tube bell-shaped, 1.5 mm. l.

3. PIMENTA Lindley.

Tree, very fragrant. *Leaves* papery, glandular dots on both sides. *Flowers* in many-flowered cymes, branching in threes, in the upper axils. *Calyx*-tube (receptacle) shortly prolonged above the ovary; limb with 4 spreading, persistent lobes. *Petals* 4, spreading. *Stamens* indefinite, free. *Stigma* peltate-convex, much thicker than the style. *Ovary* 2-celled; ovules 1 in each cell (very rarely 2), hanging from the apex of the inner angle. *Berry* crowned by the calyx, shortly globose to globose-pear-shaped, with 2 (rarely 1) seeds. *Embryo* involuto-spiral in two

coils or two and a half; cotyledons very short, radicle thick, very long.

Species one, native of Jamaica, Cuba, and Central America, cultivated in the East Indies.

P. officinalis Lindl. *Coll. in text* to t. 19 (1821); *Berg Handb. Pharm. Bot.* iii. 339 (excl. var. *cumanensis*) (1855) & in *Linnæa* xxvii. 422; *Benth. & Trim. Med. Pl.* t. 111; *Niedenzu in Engl. &*



Fig. 126.—*Pimenta officinalis* Lindl.

A, Portion of branch with leaves and fruit $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 7$.

B', Ovary cut at right angles to B $\times 7$.

C & C', Similar figures of *Amomis caryophyllata* Kr. & Urb. $\times 7$.

D, Berry of *Pimenta* cut lengthwise, showing section of embryo and an undeveloped cell, enlarged.

(D after Engler.)

Prantl Pflfam. iii. pt. 7, 71, fig. F-H; *Urb. in Engl. Jahrb.* xix. 571. *P. vulgaris* Lindl. in *Lond. Encycl. Pl.* 418 (1829); *Griseb. Fl. Br. W. Ind.* 240. *P. Pimenta* Cockerell in *Bull. Torr. Bot. Club* xix. 95 (1892); *Britt. Fl. Berm.* 263; *Britt. & Millsp. Bah.*

Fl. 305. *Myrtus arborea* &c. *Sloane Cat.* 161 & *Hist.* ii. 76, t. 191, f. 1; *Hugh. Barb.* 145, t. 10*. *M. Pimenta L. Sp. Pl.* 472 (1753) & *Amæn. v.* 379; *Wright Mem.* 227; *Sw. Obs.* 202; *Lun. Hort. Jam.* ii. 66; *Tussac Fl. Ant.* iv. 32, t. 12. *Caryophyllus aromaticus*, *Americanus folio* &c. & *Caryophyllus aromaticus*, *Americanus Lauri* &c. *Pluk. Phyt.* t. 155, ff. 2, 4. *C. foliis . . . alternis* &c. *Browne Hist. Jam.* 247. *C. Pimento Mill. Dict. ed.* 8 (1768). *Eugenia Pimenta DC. Prodr.* iii. 285 (1828); *Mayc. Barb.* 212; *Macf. Jam.* ii. 125. *Pimento Gosse Nat. Sojourn* 64. (Fig. 126.)

Pimento, All-spice tree.

Sloane Herb. vi. 77* & 78! *Wright! Shakespear! Bancroft! Distin!* *St. Mary, McNab! Parnell! Portland, Purdie! Wilson! Prior!* (also a form with small flowers near Moneague); *Bellevue*, 4500 ft., *Eggers*, 3771! *Port Royal Mts., Cradwick!* also *Harris!* also *Miss J. R. Perkins!* near Falmouth, *Ewen!* *Holly Mount, Mt. Diablo, Harris! Lucea, Hitchcock.* *Fl. Jam.* 5041, 5042, 5934, 5937, 7254, 7929, 8502, 10,507. Form with small leaf (4-5.5 cm. l.), *Hagley Gap, Fawcett!*—Distribution of genus.

Tree, 30-40 ft. high. *Leaves* 6-14 cm. l., elliptical, elliptical-oblong, apex blunt, usually subemarginate; midrib impressed on upper surface, prominent beneath, nerves and veins only slightly prominent with dots on both sides. *Calyx*-lobes rounded at apex. *Petals* white. *Ovary* outside powdery-white or shortly silky. *Berry* 4-6 mm. l., 4-6.5 mm. in diam., black, pulpy, sweet, almost tasteless. *Seeds* 2 (1), hot to taste.

Wood, flowers, fruit, leaves are aromatic. Berries while still green and unripe are gathered and dried for export, chiefly used as a condiment in cookery; they have a warm spicy taste like cloves, and an aromatic odour resembling a mixture of cinnamon, cloves, and nutmegs, hence called allspice; they are used medicinally for their aromatic, carminative, and stimulant properties. Wood is tough and close-grained, used for cart shafts; saplings are made into walking-sticks. For insect pests and injury by picking, see Annual Report on Dept. Agric. 30 (1917).

4. AMOMIS Berg.

Shrub or tree, very fragrant. Leaves leathery, glandular dots beneath. Flowers in many-flowered cymes, branching in threes, in the upper axils or terminal. Calyx-tube (receptacle) prolonged above the ovary; limb 5-toothed, persistent. Petals 5, roundish, soon falling. Stamens numerous. Stigma minute, not thicker than the upper part of style. Ovary 2-celled. Ovules 6-7 in each cell, attached at the margin to the peltate placenta projecting from the upper part of the partition. Berry ovoid or obovoid-globose, crowned by the calyx, 1-2-celled, with 2-8 seeds. Embryo involuto-spiral, the spire scarcely more than one coil; cotyledons very short, radicle very long.

Species 1, native of the West Indies, Venezuela, Guiana, cultivated in Bahamas, Bermuda, and the East Indies.

A. caryophyllata Kr. & Urb. in Engl. Jahrb. xix. 573 (1895); *Cook & Coll. in Contr. U.S. Nat. Herb.* viii. 74; *Britt. Fl. Berm.*

263. *A. acris*, *A. Pimento* (incl. var. *jamaicensis*), *A. pimentoides*, *A. oblongata* *Berg Handb. Pharm. Bot.* iii. 339, 340 (1855) & in *Linnaea* xxvii. 417-421. *A. jamaicensis* *Britt. & Harris in Journ. N. York Bot. Gard.* xxi. 38 (1920); *Annual Report for 1918-19, Dept. of Agric. Jamaica*. *Myrtus caryophyllata* *Jacq. Obs.* ii. 1 (1767) (non *L.*). *M. acris* *Sw. Prodr.* 79 (1788) (excl. var. *b.*) & *Fl. Ind. Occ.* 909; *Lun. Hort. Jam.* i. 75. *Caryophyllus aromaticus* *Ind. Occident. foliis &c. Pluk. Phyt. t.* 155, f. 3. *C. foliis* . . . oppositis &c. *Browne Hist. Jam.* 247. *C. racemosus* *Mill. Dict. ed.* 8 (1768). *Myrcia acris* *DC. Prodr.* iii. 243 (1828); *Mayc. Barb.* 209; *Macf. Jam.* ii. 109 (cells wrongly described as 1-ovuled); *Bot. Mag. t.* 3153. *Pimenta acris* *Kostel. Allg. Med. Pharm. Fl.* iv. 1526 (1835); *Griseb. Fl. Br. W. Ind.* 241; *Benth. & Trim. Med. Pl. t.* 110; *Bull. Bot. Dept. Jamaica, No.* 26, 8 (1891); *W. Ind. Bull.* iv. 126-128, 189-194 (1904); *Kew Bull.* (1918) 158; *Agric. News* xx. 340, 356, 372 (1921); *Journ. Soc. Chem. Ind.* xl. 9, 491 (1921). *P. Pimento* *Griseb. loc. cit.* (1860). (Fig. 126, c, c').

Wild Cinnamon, Wild Clove, Bay Rum Tree, Bay Berry Tree.

Sloane *Herb.* vi. 79! *Browne*; *Swartz*; *Macfadyen*; *Peckham*, *Clarendon*, 2500 ft., *Harris*! *Fl. Jam.* 12,788, 12,876.—Distribution of genus.

Shrub or tree, 30-50 ft. *Leaves* 4-12 cm. l., variable in form and size, obovate-oval, elliptical, or elliptical-oblong, apex obtuse or emarginate, sometimes shortly acuminate, midrib impressed on upper surface, prominent beneath, nerves and network of veins equally prominent on both sides; petioles 4-12 mm. l. *Calyx*-lobes very broadly triangular. *Petals* white, tinged pink. *Ovary* glabrous outside (but densely white-tomentose in var. *grisea*). *Berry* 8-10 mm. l., 5-7 in diam., blackish when ripe.

Wood somewhat hard and heavy, strong and durable, fine and compact in texture, taking a high polish; heart-wood brownish-red or almost black, sap-wood very light with darker lines; suitable for carpenters and cabinet-work. The leaves distilled yield an essential oil, "oil of bay," the most important ingredient of bay-rum; information on economics will be found in literature quoted above.

5. MYRCIA DC.

Trees or shrubs. Flowers generally small; peduncles axillary and subterminal, primary or secondary branches of the panicles generally racemose, ultimate branches cymose. *Calyx*: tube not, or more or less, prolonged above the ovary, segments or lobes of the limb usually 5. *Petals* usually 5, spreading. *Stamens* indefinite, free. *Ovary* 2(3-4)-celled; ovules 2, side by side, in each cell. *Berry* crowned by the remains of the calyx-limb. *Seeds* generally 1 or 2, subglobose; radicle rather long, incurved; cotyledons large, twisted and folded.

Species about 500, natives of subtropical and tropical America (incl. W. Indies).

Anthers 2-celled. Leaves not tomentose.

Inflorescence, calyx-tube, and young branchlets silky-puberulous or pubescent..... 1. *M. splendens*.

Plant glabrous 2. *M. leptoclada*.

Anthers 4-celled. Under surface of leaves brown-tomentose 3. *M. Fenzliana*.

1. *M. splendens* DC. *Prodr.* iii. 244 (1828) (excl. var.); *Griseb. Fl. Br. W. Ind.* 234 (in part); *Urb. in Engl. Jahrb.* xix. 583; *Symb. Ant.* iv. 443 & viii. 479. *Myrtus splendens* Sw. *Prodr.* 79

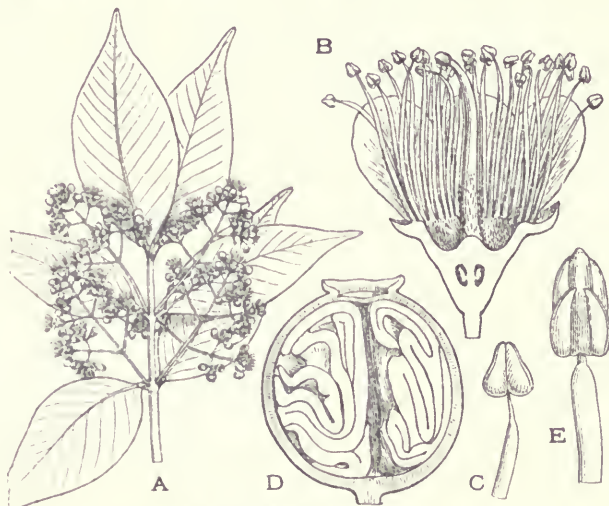


Fig. 127.—*Myrcia splendens* DC.

A, Portion of branch with leaves and inflorescences $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 7$.

C, Stamen $\times 20$.

D, Fruit cut lengthwise $\times 4$.

E, Stamen of *M. Fenzliana* $\times 20$.

(1788) & *Fl. Ind. Occ.* 907. *M. foliis ovato-lanceolatis* Plum. *Pl. Amer. (Burm.)* 202, t. 208, f. 1. *Eugenia periplocifolia* Jacq. *Coll.* 108, t. 4 (1788). (Fig. 127, A-D.)

Wright!—Cuba, Hispaniola, Porto Rico, Guadeloupe, Martinique, St. Lucia, St. Vincent, Tobago, Trinidad.

Shrub 10–20 ft. high or *tree* 30 ft. high; youngest branchlets pubescent. *Leaves* 3–8 cm. l., ovate to narrowly lanceolate, more or less long acuminate, base rounded or obtuse, occasionally acute, network of nerves and veins slightly prominent on both sides, papery, with pellucid dots; petioles 2–4 mm. l. *Inflorescence* and calyx-tube silky-puberulous. *Flowers* white (or pink). *Calyx* not prolonged cup-like above the ovary.

2. *M. leptoclada* DC. *Prodr.* iii. 244 (1828); *Griseb. Fl. Br. W. Ind.* 711; *Urb. in Engl. Jahrb.* xix. 582, *Symb. Ant.* iv. 443

& viii. 479. *Aulomyrcia leptoclada* Berg in *Linnæa* xxvii. 40 (1854) (excl. syn. *Poir.*).

Wright (Hb. Kew.)!—Hispaniola, Porto Rico, Guadeloupe, Dominica, Martinique, St. Vincent, Tobago, Trinidad.

Shrub 6–12 ft. high, or *tree* 15–30 ft. high, glabrous. *Leaves* 5–9 cm. l., elliptical-oblong to lanceolate, acuminate, network of nerves and veins prominent beneath, not so evident on upper surface, papery-leathery, not or obscurely pellucid-dotted; petioles 2–4 mm. l. *Flowers* white, fragrant. *Calyx* prolonged cup-like above the ovary.

The occurrence of the preceding two species in Jamaica rests only on specimens collected by Dr. Wm. Wright and labelled as from Jamaica. The geographical distribution in the West Indies is not opposed to this, and Wright collected several species in Jamaica, not found, or rarely, by other botanists.

3. *M. Fenzliana* Berg in *Linnæa* xxvii. 121 (1855) (*nomen*) & in *Fl. Bras.* xiv. pt. 1, 196 (1857). *Gomidesia Lindeniana* Berg in *Linnæa* xix. 208 (1857); *Griseb. in Mem. Amer. Acad. N.S.* viii. 180 (1861) & *Cat. Cub.* 85; *Urb. in Engl. Jahrb.* xix. 605, *Symb. Ant.* iv. 445 & viii. 481. (Fig. 127, E.)

In fl. May, in fr. Sept.; below Vinegar Hill, St. George, Blue Mts., 3000 ft., *Harris*! Fl. Jam. 6282, 6348, 6589, 7348.—Cuba, Hispaniola, Porto Rico, St. Kitts, Montserrat, tropical South America.

Shrub or small *tree*, 10–15 ft.; young branchlets, inflorescence, nerves and veins of under surface of leaves covered with yellowish-brown tomentum. *Leaves* 8–16 cm. l., 4–8 cm. br., elliptical, narrowed to both ends, acuminate with long narrow tip; upper surface somewhat pubescent, with midrib and nerves slightly impressed and veins not evident, beneath midrib, nerves and veins prominent and tomentose with rather long hairs, leathery, not pellucid-dotted at any rate in the older leaves; petioles 6–8 mm. l. *Panicles* one or two in axils and subterminal, many-flowered. *Buds* 4 mm. l. *Flowers* fragrant. *Sepals* broadly deltoid, acute, 1.5 mm. l. *Petals* roundish, tomentose on back, otherwise glabrous, white, margin membranous. *Berry* globose, puberulous, with 2–4 seeds.

6. EUGENIA L.

Trees or shrubs. Inflorescence sometimes centripetal, the 1-flowered pedicels opposite, axillary, solitary, clustered, or in a short raceme (a leafless branch), rarely centrifugal, with the cymes terminal, dense, or in terminal or lateral panicles branching by threes. *Calyx*: tube more or less prolonged beyond the ovary or not prolonged; segments of limb 4 (5), distinct, sometimes ample, overlapping, sometimes short or scarcely prominent on a truncate margin. *Petals* 4 (5 or more, or none), spreading and distinct, or converging and more or less united to form a lid. *Stamens* indefinite. *Ovary* 2(3)-celled; ovules indefinite in each cell, attached to a placenta not or slightly prominent on the partition. *Berry* generally sub-drupaceous or pulpy. *Seeds* generally 1–4; embryo thick and fleshy, radicle short, cotyledons thick, generally more or less indistinguishable from one another.

Species more than 600, growing in great abundance in the West Indies and subtropical and tropical America, and in tropical Asia, fewer in Australia and Africa.

A. Inflorescences centripetal.

a. Sepals 4-5 mm. l.

Flowers solitary in axils of leaves. Leaves

1.5-3 cm. l. 1. *E. heterochroa*.

Flowers solitary in axils of narrow bracts, usually several close together. Leaves 2.5-5 cm. l.

Leaves lanceolate-oblong to oval-elliptical, apex obtuse.....

2. *E. ligustrina*.

Leaves ovate to ovate-lanceolate

3. *E. uniflora*.

Flowers shortly racemose; fruiting pedicels

3-3.5 cm. l.; rhachis 5-8 mm. l. Leaves

5-7 cm. l., ovate or shortly ovate.....

4. *E. mandevillensis*.

Flowers in clusters at nodes (usually leafless) or on trunks, pedicels 5-13 mm. l. Leaves

4-80 cm. l.; petioles long.

Leaves ovate to ovate-oblong or oval, apex obtuse, base rounded to acute. Sepals

ovate

5. *E. Marchiana*.

Leaves elliptical or oval-elliptical, apex shortly or obtusely acuminate, base obtuse or roundish. Sepals roundish

6. *E. amplifolia*.

Leaves elliptical or ovate-elliptical, narrowed to obtuse apex, base cordate or subcordate. Sepals roundish

7. *E. lamprophylla*.

b. Sepals less than 4 mm. l.

a. Inflorescence: flowers solitary in axils.

Leaves .5-1.5 cm. l., ovate, leathery

8. *E. alpina*.

Leaves 1-1.5 cm. l., linear, membranous*...

9. *E. Macnabiana*.

β. Inflorescences racemose, rhachis more than 1 cm. l. (sometimes less).

α'. Inflorescences puberulous or tomentose.

† Infl. 2-5(-7) cm. l. Pedicels 3-12(-15) mm. l.

Petioles 9-14 mm. l.

Leaves elliptical to oblong-elliptical, scarcely or shortly and obtusely

acuminate, nerves slightly prominent above, more so beneath.

Sepals 3 mm. l.

10. *E. Fadyenii*.

Leaves ovate or ovate-elliptical, broadly acuminate, nerves impressed

above. Sepals 1.5 mm. l.

11. *E. sulcivenia*.

Petioles 3-8 mm. l.

Leaves ovate or ovate-elliptical to lanceolate, long and narrowly acuminate, 3.5-8 cm. l., 1.5-3 cm. br.,

nerves usually impressed above. Sepals 1.5-2 mm. l.

12. *E. biflora*.

var. *virgultosa*.

* The position of *E. Macnabiana* is uncertain, as the flowers are unknown.

- Leaves lanceolate to ovate-elliptical or elliptical, more or less obtusely acuminate, 3-7 cm. l., 1.5-3 cm. br., nerves scarcely evident or slightly prominent on both sides. Sepals 1.8-2.5 mm. l., to 3 mm. l. in fruit 12. *E. biflora*.
- Leaves elliptical or roundish-elliptical, generally moderately acuminate, 4-6.5 cm. l., 2-3.5 cm. br., nerves slightly prominent or flat, rarely slightly impressed above. Sepals 1.5-2 mm. l. 12. *E. biflora*.
var. *ludibunda*.
- Petioles 2-4 mm. l.
- Leaves oblong-lanceolate, acuminate with a long tip, 3-6 cm. l., .7-1.5 cm. br., nerves not evident nor impressed above. Sepals 1-1.2 mm. l. 12. *E. biflora*.
var. *Wallenii*.
- †† Infl. 1-2 cm. l. Pedicels 3-7 mm. l.
- Leaves elliptical to ovate-lanceolate, acuminate with acute tip, 5-7 cm. l., midrib furrowed-impressed, nerves scarcely or not evident, dots not evident on surface but subpellucid. 13. *E. brachythrix*.
- Leaves ovate or ovate-oblong, acuminate with obtuse tip, 6-9 cm. l., midrib slightly impressed, nerves slightly prominent, dots dense, not evident on upper surface, slightly prominent beneath, pellucid 14. *E. jamaicensis*.
- Leaves oval-oblong or oblong, acuminate with tip acute or sometimes apiculate and obtuse, 8-5(-11) cm. l., midrib canaliculate-impressed, nerves very slightly prominent or subimpressed, densely tuberculate-dotted 15. *E. Alexandri*.
- Leaves ovate- or oblong-elliptical, more or less acuminate, tip acute or mucronate, 6-9 cm. l., midrib impressed, nerves and veins slightly prominent or impressed, dots pellucid, not numerous, not conspicuous on upper surface except in young leaves, very few evident beneath 16. *E. disticha*.
- b'. Inflorescences glabrous. Rhachis 3.5-1 cm. l. Leaves acuminate.
- Leaves ovate or ovate-oblong, tip obtuse. Inflorescence conspicuously glandular 17. *E. Harrisii*.
- Leaves narrowly ovate or ovate-oblong, tip rounded, pedicel 12-6 mm. l. ... 18. *E. crenata*.
- Leaves lanceolate to narrowly elliptical, tip obtuse, pedicels 4-6 mm. l. 19. *E. Nicholsii*.
- Leaves ovate, tip acute or mucronate. 20. *E. Rendlei*.

- γ. Inflorescences shortened racemose, rachis less than 1 cm. l.
- Leaves obovate or oblanceolate. Pedicels 0-5 mm. l. Sepals .5-1 mm. l. 21. *E. burifolia*.
- Leaves more or less ovate to lanceolate or elliptical.
- Leaves moderately acuminate.
- Sepals 1.5 mm. l.
- Pedicels 1-3 mm. l.
- Leaves 5-7.5 cm. l., ovate to oblong-lanceolate, glabrous, midrib furrowed-impressed. Bracteoles triangular 22. *E. abbreviata*.
- Leaves 3.5-7 cm. l., ovate-elliptical to elliptical, with obtuse tip, glabrous but puberulous on midrib, midrib broad, flat, very slightly impressed near base, slightly prominent near apex. Bracteoles triangular-roundish. 23. *E. Schulziana*.
- Leaves 6-9 cm. l., ovate- or oblong-elliptical, puberulous or glabrescent, midrib impressed. Bracteoles ovate, acute 16. *E. disticha*.
- Pedicels 4-8 mm. l. Leaves 3-5 cm. l., lanceolate or elliptical-lanceolate, tip acute, mucronate. 24. *E. Wilsonella*.
- Sepals 1-1.2 mm. l. Leaves 3.5-8 cm. l., elliptical, elliptical-oblong, or ovate, glabrous, midrib deeply impressed. Bracteoles semicircular. Berry oblong 25. *E. glabrata*.
- Sepals .8 mm. l. Leaves 4-8(-11) cm. l., elliptical or broadly ovate to oblong, glabrous, midrib impressed. Bracteoles rounded. Rachis rarely 11 mm. l. Berry roundish..... 26. *E. axillaris*.
- Leaves shortly or scarcely acuminate.
- Pedicels 1-7 mm. l. Sepals 1-2 mm. l.
- Leaves with obtuse tip.
- Midrib deeply impressed. Pedicels 4-7 mm. l. Leaves 6-9 cm. l., elliptical to ovate-elliptical, dots dense, prominent 27. *E. isosticta*.
- Midrib impressed in lower half. Pedicels 5-7 mm. l. Leaves 3-4.5 cm. l., elliptical, narrowed to both ends, dots numerous, prominent esp. in first year ... 28. *E. Sloanei*.
- Midrib not impressed (or rarely impressed). Pedicels 1-5 mm. l. Leaves 1.5-8 cm. l., ovate to narrowly lanceolate 29. *E. monticola*.
- Pedicels 10-15 mm. l. Sepals 3.5-2.3 mm. l. 30. *E. polypora*.
- Leaves acuminate with long linear-lanceolate tip. Pedicels 8-16 mm. l. Sepals 1.5-2 mm. l. 31. *E. confusa*.

- δ. Inflorescences umbelliform, rhachis wanting.
 Midrib of leaf not, or only slightly, impressed towards base.
 Leaves 2·5–6 cm. l. Pedicels 5–17 mm. l.
 Petioles 3–6 mm. l. Sepals 2·8–1·5 mm. l.
 Leaves 2·5–6 cm. l., ovate to lanceolate, ovate-elliptical, or rhomboid.
 Pedicels 5–15 mm. l. 32. *E. rhombea*.
 Leaves 2·5–4 cm. l., elliptical-lanceolate to lanceolate. Pedicels 10–17 mm. l. 33. *E. clarendonensis*.
 Petioles 2–3 mm. l. Sepals 1 mm. l.
 Leaves 2·5–4 cm. l., ovate, elliptical, or subrhomboid, rarely roundish.
 Pedicels 12–16 mm. l. 34. *E. Brownei*.
 Leaves 5–10 cm. l. Pedicels 0–2·5 mm. l.
 Leaves 5–7 cm. l., ovate-elliptical to elliptical-lanceolate. Pedicels 0–1 mm. l. Calyx-tube prolonged beyond ovary. Sepals 1 mm. l. 35. *E. pycnoneura*.
 Leaves 7–10 cm. l., elliptical or elliptical-oblong. Pedicel 1·5–2·5 mm. l.
 Sepals 2–1 mm. l. 36. *E. eperforata*.
- B. Inflorescences centrifugal.
 Calyx-tube subglobose, not prolonged beyond ovary. Flowers small 37. *E. fragrans*.
 Calyx-tube top-shaped, produced beyond ovary. Flowers large.
 Flowers crimson. Leaves elliptical or elliptical-oblong [*E. malaccensis*.]
 Flowers white. Leaves lanceolate [*E. Jambos*.]

1. *E. heterochroa* Urb. *Symb. Ant. vii*. 299 (1912); glabrous; leaves 1·5–3 cm. l., elliptical or elliptical-oblong, occasionally obovate, apex rounded or subtruncate, sometimes slightly emarginate, base obtuse, midrib* deeply impressed, nerves on upper surface more or less slightly prominent, not evident beneath, veins not evident, with dots pellucid in leaves of the first year, thick and leathery; petioles 2–3 mm. l.; flowers solitary, axillary, occurring 1–4 together, umbel-like at the apex or just below the apex of the branches; pedicels 7–10 mm. l.; sepals 4, very unequal, the larger semi-oval, 5 mm. l., the smaller half-roundish, 3 mm. l.; ovules several in each cell; berries globose, 10–12 mm. in diam.

In fl. July; Peckham, Clarendon, 2500 ft., Harris! Fl. Jam. 10,989, 11,017, 12,807.

Shrub, 10 ft. high; branchlets of the first year glandular-granulate, when older densely tuberculate-granulate. *Pedicels* glandular-granulate.

* The description of the midrib here and later refers to the upper surface.

Bracteoles ovate, somewhat obtuse, 1-1.5 mm. l. *Petals* white. *Ovary* glabrous.

2. *E. ligustrina* Willd. *Sp. Pl.* ii. 962 (1800); branchlets puberulous, glabrescent; leaves 2.5-5 cm. l., 1-2 cm. br., lanceolate-oblong or oval-elliptical to oblanceolate or obovate, apex obtuse, base acute, midrib usually impressed, nerves and veins slightly evident, leathery; petioles 1-5 mm. l.; pedicels 1-4 cm. l., solitary on the lower part of branchlets of the first year from the axils of the upper lanceolate-linear or narrowly spatulate scales 5-10 mm. l. (the lowest scales are shorter and more crowded); sepals 4-5 mm. l., recurved, oblong-lanceolate; ovules in each cell 10-14; berry 6-8 mm. in diam., globose, glandular-dotted, otherwise smooth.—*Maye. Barb.* 210; *Macf. Jam.* ii. 112; *Griseb. Fl. Br. W. Ind.* 239; *Urb. in Engl. Jahrb.* xix. 618, *Symb. Ant.* iv. 446 & viii. 484. *Myrtus ligustrina* Sw. *Prodr.* 78 (1788) & *Fl. Ind. Occ.* 885. *Stenocalyx ligustrinus* Berg in *Fl. Bras. xiv. pt. 1*, 343 (1857).

In fr. June-Aug.; Wright! Falls river, Port Royal Mts., 2000 ft., Harris! Fl. Jam. 5231, 5768, 12,562.—West Indies, Brazil.

Shrub 6-10 ft. high, or *tree* 20 ft. *Petals* white, 8-12 mm. l. *Berry* sweet, scarlet. *Seeds* roundish, 1-3.

Urban identifies with this "Arbor baccifera, myrti folio latiore &c." of *Sloane Cat.* 172 & *Hist.* ii. 107. Sloane, however, says "the fruit stands on a small, eighth of an inch long foot-stalk, is like black cherries," which is inconsistent with *E. ligustrina*. It grew in woods on the Red Hills. Sloane has no drawing of it, and there is no specimen in his Herbarium. It seems to us more probable that it should be placed under *E. disticha* DC., judging from the length of the pedicel and the description of the fruit.

3. *E. uniflora* L. *Sp. Pl.* 470 (1753) (in part); glabrous; leaves 3.5-6 cm. l., ovate to ovate-lanceolate, apex usually shortly acuminate, base obtuse to rounded, sometimes subcordate; midrib flat or slightly impressed, nerves and veins evident on both sides, with numerous pellucid dots, papery, glabrous; petioles 1-2 mm. l.; pedicels 1.5-3.5 cm. l., solitary or several, approximate on branchlets of first year from the axils of scales; sepals recurved, linear-oblong; ovules in each cell 8-14; berry depressed-globose, 8-furrowed or 8-ribbed, up to 2.5 or 3 cm. in diam.—*Griseb. Fl. Br. W. Ind.* 239; *Urb. in Engl. Jahrb.* xix. 620 & *Symb. Ant.* viii. 484; *Britt. Fl. Berm.* 262; *Britt. & Millsp. Bah. Fl.* 304; *Bot. Mag. t.* 8599. *Myrtus brasiliانا* L. *Sp. Pl.* 471 (1753). *Philadelphus arborescens* foliis myrtineis &c. and *P. arb. foliis ovato-acuminatis* &c. *Browne Hist. Jam.* 240, 241. *Plinia pedunculata* Linn. f. *Suppl.* 253 (1781); *Bot. Mag.* 473. *Stenocalyx Michelii* Berg in *Linnæa* xxvii. 310 (1856) & in *Fl. Bras. xiv. pt. 1*, 337. There is a specimen of this species in Herb. Linn. named by Linnæus *Myrtus brasiliانا*.

Surinam Cherry.

In fl. Jan., in fr. March; Port Royal Mts. *March!* Pleasant Hill, Port Royal Mts.; cult. Hope Gardens; *Harris!* Fl. Jam. 5080, 10,811.—Guiana, Brazil, Argentina; perhaps only naturalized in West Indies, Bermuda, and Bahamas; cultivated in tropics of Old World.

Shrub to 13 ft. or *tree* 15–30 ft. high. *Petals* white, 8–12 mm. l. *Berry* edible.

Berries used in making preserves and jellies.

4. *E. mandevillensis* Urb. *Symb. Ant. vii.* 306 (1912); glabrous; leaves 5–7 cm. l., 3·5–4·5 cm. br., ovate or shortly ovate, shortly acuminate with an obtuse tip, base rounded or truncate, midrib slightly or scarcely impressed, nerves on upper surface scarcely prominent, beneath with the veins a little more evident, with dots not pellucid, leathery; petioles 6–8 mm. l.; inflorescences shortly racemose with 3–6 flowers, rhachis 5–8 mm. l., sometimes growing on into a leafy twig with flowers below and leaves above; pedicels in fruit 3–3·5 cm. l.; sepals 4, very unequal, the larger roundish or ovate-roundish, 5 mm. l., the smaller 2 mm. l.; berries (unripe) globose, 1 cm. in diam.

With unripe fr. in Sept.; Marshall's Pen, near Mandeville, *Harris & Britton!* Fl. Jam. 10,600.

Shrub or *tree* to 15 ft. high. *Berries* densely granular-dotted, not ribbed, glabrous.

5. *E. Marchiana* Griseb. *Fl. Br. W. Ind.* 238 (1860); glabrous; leaves 9–20 cm. l., 3·5–10 cm. br., ovate, ovate-oblong, or oval, apex obtuse, rarely emarginate, base rounded, truncate, or acute and prolonged a little into the petiole, midrib impressed or towards the apex a little prominent, nerves and veins on both sides more or less prominent, with dots not pellucid, in older leaves slightly prominent, leathery or papery-leathery; petioles 10–20 mm. l.; flowers 4–20 in a cluster at nodes from which the leaves have usually dropped; pedicels 5–12 mm. l.; sepals 4, the longer ovate, 4–5 mm. l., the shorter crescent-shaped or semicircular-triangular 1·5–3·5 mm. l.; ovary 2(3)-celled; ovules numerous in each cell.—Urb. in *Engl. Jahrb. vix.* 652.

Manchester, *Purdie!* *March!* above Cinchona, J.P. 1091, *Hart!* also *C. Nicholls!* Vinegar Hill, Blue Mts., *Cradwick!* between Morse's Gap and Claverty Cottage, Blue Mts., *C. Nicholls & Harris!* Whitfield Hall fields; Portland Gap, 5550 ft.; Mabess river, Blue Mts.; near Troy; *Harris!* wooded slope on S.E. of John Crow (Blake) Mts., *Harris & Britton!* Fl. Jam. 5001, 5002, 5007, 5071, 5072, 5258, 7698, 8551, 10,693.

Shrub 10 ft. or *tree* 20 ft. high; branches sometimes fistulose. *Bractcoles* roundish or broadly triangular, apex rounded or obtuse, united at the base, 1·5–3 mm. l. *Petals* 7 mm. l., about 5 mm. br. *Berries* ellipsoidal or globose, 17 mm. l., 9 mm. thick.

It is possible that more than one species is included here, but, as Urban indicates, study of a series of specimens in the field is necessary.

6. *E. amplifolia* Urb. *Symb. Ant. v.* 445 (1908); glabrous; branchlets fistulose; leaves 13–30 cm. l., 9–12 cm. br., elliptical or oval-elliptical, apex obtuse or shortly and very obtusely acuminate, base obtuse or roundish, midrib impressed towards the base, less so or not at all towards the apex, nerves and veins on both sides prominent, with dots not pellucid in older leaves, papery-leathery; petioles 15–20 mm. l.; flowers in clusters on trunk and at nodes of old branches; pedicels 7–10 mm. l.; sepals 4, the larger roundish, 5 mm. l., the smaller semicircular, 3 mm. l.; ovules several in each cell; berries ellipsoidal, 12–15 mm. l., 7–9 mm. thick.

In fl. Sept., in fr. Feb.–March; Hopeton, Westmoreland, 1000 ft.; near Troy, 1400 ft.; *Harris!* eastern slopes of south end of John Crow (Blake) Mts., *Harris & Britton!* Fl. Jam. 7050, 9476, 10,750.

Tree, 15–20 ft. high. Dots of leaves prominent beneath. *Bracteoles* shortly ovate-cordate, united at base, 1.5 mm. l. *Berries* densely granular-dotted, not ribbed, red, glabrous, 1-seeded.

7. *E. lamprophylla* Urb. *Symb. Ant. vii.* 308 (1912); glabrous; leaves 9–18 cm. l., 3.5–9.5 cm. br., elliptical or ovate-elliptical, usually narrowed towards the obtuse apex, base rounded emarginate in young leaves, cordate in old leaves, midrib impressed from base to apex, nerves in young leaves on upper surface a little impressed or scarcely prominent, beneath with the veins slightly prominent, in old leaves nerves and veins prominent on both sides, with more or less pellucid dots, on both sides slightly prominent, leathery, shining; petioles 10–15 mm. l.; flowers several at the nodes of the old wood, umbel-like; pedicels 7–13 mm. l.; sepals 4, very unequal, the larger roundish, 5 mm. l., the smaller semilunate, 3 mm. l.; ovules many in each cell.

In fl. July–Sept.; Peckham, Clarendon, *Harris!* Fl. Jam. 10,955, 11,175.

Tree, 25 to 40 ft. high. Young leaves bronze on upper surface, rose-coloured beneath. *Bracteoles* united at base, shortly ovate, obtuse, 2 mm. l. *Petals* pale rose colour, 7–8 mm. l., 5 mm. br., roundish-elliptical, ciliate. *Stamens* pale rose colour.

8. *E. alpina* Willd. *Sp. Pl. ii.* 961 (1800); young branchlets more or less pubescent or puberulous with brownish hairs; leaves 5–1.5 cm. l., 3–4(–2) in a whorl, elliptical to lanceolate, midrib impressed, nerves and veins not evident, dots on upper surface impressed, opaque, leathery, rigid, glabrous; petioles 1–2.5 mm. l.; peduncles pseudo-terminal and axillary, solitary, 1.5–3 mm. l., tomentose; sepals 4, 3 mm. l., broadly ovate, somewhat acuminate; ovules several in each cell; berry 6–8 mm. l.—*Macf. Jam. ii.* 113; *Griseb. Fl. Br. W. Ind.* 236; *Urban in Engl. Jahrb. xix.* 608. *Myrtus alpina* Sw. *Prodr.* 77 (1788) & *Fl. Ind. Occ.* 883. Specimen from Swartz in Herb. Mus. Brit.

In fl. May–Sept.; Blue Mt. Peak, *Swartz!* *McNab!* Blue Mt. Peak, *Purdie!* also *Prior!* J.P. 877, Monkey Hill, Blue Mts., *Morris!* and John

Crow Peak, *Hart*! Blue Mt. Peak; Monkey Hill; *Harris*! Fl. Jam. 5004-5006, 5648; Sir John Peak, *Mrs. E. G. Britton*, 3862!

Shrub or tree, 6-20 ft. *Bracteoles* ovate, acuminate, tomentose, 3 mm. l. *Petals* 4, white, longer than sepals.

9. *E. Macnabiana* Urb. *Symb. Ant. vi.* 104 (1909); branchlets with minute straight hairs; leaves 1-1.5 cm. l., 2.5-3 mm. br., linear, apex rounded, not apiculate, narrowed to the base, midrib on upper surface not evident or slightly prominent, nerves beneath slender, evident, joined together along the margin, with pellucid dots, membranous.—*E. oligandra* var. *Macnabiana* Kr. & Urb. in *Engl. Jahrb. xix.* 613 (1895). *E. rigidifolia* Griseb. *Fl. Br. W. Ind.* 711 (1864) (non *Rich.*).

McNab (specimen not seen).

10. *E. Fadyenii* Kr. & Urb. in *Engl. Jahrb. xix.* 622 (1895); branchlets of the first year more or less brownish-tomentose or glabrescent; leaves 6-13 cm. l., elliptical or oblong-elliptical, apex scarcely or shortly and obtusely acuminate, base wedge-shaped or acute and slightly prolonged into the petiole, midrib impressed, nerves and veins on upper surface slightly prominent, beneath more so, with densely crowded pellucid dots, papery, glabrous; petioles 6-14 mm. l.; inflorescence racemose, brown-tomentose, or glabrate, 7-11-flowered, 2-5 cm. l., rarely paniculate; pedicels 3-12 mm. l.; sepals 4, somewhat roundish, larger 3 mm. l.; ovules 10-14 in each cell.—*E. chrysophylloides* Macf. *Jam. ii.* 124 (1850) (non *DC.*); *Griseb. Fl. Br. W. Ind.* 238 (1860) (under *E. Gregii* DC.). *Myrto affinis* arbor &c. *Sloane Cat.* 162 & *Hist. ii.* 80, t. 193, f. 2.

In fl. July-Sept., in fr. Sept.-Dec.; near Spanish Town, *Sloane* Herb. vi. 77! Salt Hill, Port Royal Mts., *Macfadyen*; Hopewell, St. Mary, *McNab*! *Prior*! Mavis Bank, *C. Nicholls*! Port Royal Mts. (Ginger Piece, Falls river); Four Paths; Cornwall, St. Elizabeth; *Harris*! Fl. Jam. 5008, 5009, 5039, 5251, 5453, 10,630, 10,638, 12,097.—Cuba.

Shrub or tree, 10-25 ft. *Bracteoles* lanceolate, not united at base. *Petals* white.

E. aeruginea DC. has been cited by Grisebach as occurring in Jamaica, but we have not seen a specimen. It is a native of the W. Indian Islands from Cuba to Trinidad. It differs from *E. Fadyenii* especially in the roundish bracteoles united at base.

11. *E. sulcivenia* Kr. & Urb. in *Engl. Jahrb. xix.* 632 (1895); branchlets of the first year at the apex puberulous with very short spreading hairs, later glabrescent; leaves 7-10 cm. l., 3-5 cm. br., ovate or ovate-elliptical, apex long but somewhat broadly acuminate with rounded or obtuse tip, base rounded or rather narrow, subacute, midrib strongly impressed, nerves on upper surface impressed, beneath slightly prominent, veins scarcely or not evident, with frequent pellucid dots, on the upper

surface subimpressed, leathery, glabrous; petioles 10–12 mm. l.; inflorescences 2–5 cm. l., with 10–16 flowers, puberulous; bracts broadly triangular or ovate-triangular, obtuse or acute, .8–1.5 mm. l.; pedicels 3–6 mm. l.; sepals: the longer 1.5 mm. l., apex subtruncate, the shorter slightly apiculate; ovary semiglobose or semiovoid; ovules 17–22 in each cell; berry obliquely globose, 5 mm. in diam.

In fl. and fr. Aug.; near Newcastle, 5049, *Hart*!

Bractcoles triangular, somewhat obtuse, about .8 mm. l., scarcely united at base. *Berries* glandular-granulate.

12. *E. biflora* *DC. Prodr. iii.* 276 (1828); young branchlets puberulous with very short spreading hairs or somewhat silky; leaves 3–7 cm. l., 1.2–3 cm. br., lanceolate to ovate-elliptical or elliptical, more or less acuminate with tip generally rounded or obtuse (rarely, 5057, acute), base wedge-shaped, midrib impressed, nerves and veins very slightly prominent or scarcely evident on both sides, with few dots more or less pellucid, on upper surface impressed or not evident or slightly prominent, beneath generally slightly prominent often brownish, glabrous on both sides or hairy on the midrib; petioles 3–8 mm. l.; inflorescences racemose, axillary or pseudo-terminal, 2–4- even to 10-flowered, shortly pubescent or tomentose, 1–7 cm. l.; pedicels 5–15 mm. l.; sepals 1.8–2.5 mm. l., in fr. 3 mm. l.; berries 6–10 mm. in diam.—*E. biflora* v. *pallens* *Kr. & Urb. in Engl. Jahrb. xix.* 629 (1895). *E. pallens* *DC. Prodr. iii.* 284 (1828); *Griseb. Fl. Br. W. Ind.* 237 (in part). *E. dumosa* *Macf. Jam. ii.* 123 (1850) (non *DC.*). *Myrtus biflora* *L. Syst. ed.* 10, 1056 (1759) & *Amœn. v.* 398, 379; *Lun. Hort. Jam. i.* 537. *Caryophyllus fruticosus* &c. *Browne Hist. Jam.* 248, t. 25, f. 3. *C. fruticosus* *Mill. Gard. Dict. ed.* 8 (1768). Type from Browne in Herb. Linn.; specimen from Swartz in Herb. Mus. Brit.

Rodwood.

Browne! *Swartz!* *Macfadyen!* *Purdie!* *March!* J.P. 904, Kings House grounds; J.P. 1419 (in part) near Cinchona, *Hart!* Blue Mts.; Port Royal Mts.; near Hope, 750–1000 ft.; Great Goat Is.; *Harris!* between Four Paths and Clarendon Park, *Harris & Britton!* Fl. Jam. 5012, 5018, 5019, 5057, 5232, 5270, 5741, 5746, 5771, 5793, 5863, 5953, 8369, 8951, 9322, 10,631, 10,632.

Shrub 8–10 ft. high, or *tree* 15 ft. high. *Leaves* papery-leathery. *Petals* 4–5 mm. l. *Ovary* on outside white-silky. *Berries* obliquely obovate-globose, with 1 or 2 seeds.

The specimen from McNab (in Herb. Hort. Reg. Bot. Edin.) cited by Grisebach (*op. cit.* 239) as *E. floribunda* West, is probably to be referred to *E. biflora*; it consists only of leafy shoots.

Var. *virgultosa* *Kr. & Urb. tom. cit.* 628; leaves 3.5–8 cm. l., 1.5–3 cm. br., ovate, ovate-elliptical, to lanceolate, acuminate, with long or very long and narrow tip, acute or somewhat obtuse, on both sides somewhat pubescent with adpressed hairs, at

length especially on upper surface glabrescent, on upper surface impressed distinctly or slightly, beneath prominent, with pellucid dots impressed on upper surface, usually not evident beneath, papery-leathery; petioles 3–7 mm. l.; inflorescences with 8–10 flowers, puberulous or more or less pubescent with adpressed hairs; pedicels 3–10 mm. l.; sepals: the longer 1·5–2 mm. l.; ovules 9–13 in each cell.—*E. virgultosa* DC. *Prodr.* iii. 280 (1828) (in part); *Macf. Jam.* ii. 122; *Griseb. Fl. Br. W. Ind.* 237 (in part). *E. acutiloba* DC. *Prodr.* iii. 281 (1828); *Macf. Jam.* ii. 123. *E. virgata* *Macf. Jam.* ii. 121 (1850)? *Myrtus virgultosa* Sw. *Prodr.* 79 (1788) & *Fl. Ind. Occ.* 905 (excl. syn. *Plum.*).

Rodwood.

Wright! *Swartz*; Blue Mts., *Tussac* (in Hb. DC.); Port Royal Mts.; Rock Fort; Portland Gap; *Purdie!* Blue Mts. and Port Royal Mts. *Harris!* Fl. Jam. 5014, 5015, 5022, 5044, 5079, 5084, 5185, 5200, 5240–5242 (approaching var. *ludibunda*), 5243, 5248, 5268, 5289, 5291, 5301, 5336, 5349, 5365, 5368, 5418, 5469; Morses Gap, *G. E. Nichols!*—Northern Brazil.

Var. *ludibunda* Kr. & Urb. in *Engl. Jahrb.* xix. 630 (1895); leaves 4–6·5 cm. l., 2–3·5 cm. br., elliptical, roundish-oval, or obovate, generally moderately acuminate with obtuse tip, nerves 6–10, on the upper surface slightly prominent or flat, rarely slightly impressed, beneath with the veins more or less prominent, with dots pellucid, on upper surface slightly prominent or not evident, beneath prominent or scarcely evident; petioles 3–7 (–12) mm. l.; inflorescences with 6–12 flowers; pedicels 3–12 mm. l.; bracteoles roundish-ovate, 1–1·2 mm. l.; sepals: the longer 1·5–2 mm. l., roundish or semi-oval.—*E. ludibunda* *Bertero ms. ex DC. Prodr.* iii. 280 (1828). *Myrtus arborea* inodora, foliis latis subrotundis, flore albo fructu monopyreno *Sloane Cat.* 162 & *Hist.* ii. 78.

Near Spanish Town, *Sloane* Herb. vi. 73! *Wright!* *Shakespear!* *Macfadyen!* Corby, Santa Cruz Mts., *Fawcett!* Gordon Town road, 800 ft.; coastal thickets, Bluefields; *Harris!* Fl. Jam. 8591, 9687, 10,196. The specimen from Corby, Fl. Jam. 9687 (with narrower leaves), and that from Bluefields, Fl. Jam. 10,196 (with larger leaves up to 10 cm. l. and 3·5 cm. br.), are regarded by Urban as forms of this variety.—Hispaniola, Porto Rico, St. Cruz, Antigua.

Var. *Wallenii* Kr. & Urb. *tom. cit.* 629; leaves 3–6 cm. l., 1·7–1·5 cm. br., narrowly oblong to oblong-lanceolate, acuminate with a very long drawn out tip somewhat obtuse or acute, nerves on the upper surface not evident nor impressed, beneath a little prominent or slightly evident, on both sides sparingly hairy or glabrescent, with pellucid dots, on upper surface impressed, beneath not evident; petioles 2–4 mm. l.; inflorescences with 7 (5–11) flowers, often with a terminal flower; pedicels 3–7 mm. l.; sepals: the longer 1–1·2 mm. l., roundish.—*E. Wallenii* *Macf. Jam.* ii. 118 (1850). *E. modesta* v. *jamaicensis* *Berg in Fl.*

Bras. xiv. pt. 1, 314 (1857). E. *Hartii* Kiaersk. in *Bot. Tidsskr. xvii. 271, f. 6, t. 9B (1888).*

In fl. June-Dec.; Cold Spring; Wallenford; *Macfadyen!* *Purdie!* J.P. 1048, high mountain thickets, *Hart!* Blue Mts. and Port Royal Mts.; *Harris!* Fl. Jam. 5043, 5045-5047, 5077, 5078, 5081, 5083, 5129, 5222, 5269, 5287, 5288, 5290, 5299, 5357, 5364, 5368, 5483, 5485, 5524, 5608, 5651, 5719.

13. *E. brachythrix* Urb. *Symb. Ant. vi. 23 (1909)*; branchlets of first year densely covered with very short, spreading, simple hairs; leaves 5-7 cm. l., elliptical to ovate-lanceolate, acuminate with tip long and rather narrow, more or less narrowed at base into the petiole, midrib on upper surface narrowly furrowed-impressed, nerves on upper surface scarcely or not evident, beneath nerves and veins slightly prominent, marginal vein 1 or 2 mm. from margin, dots few, not evident on surface but pellucid, glabrescent or glabrate, papery or somewhat leathery; petioles 2.5-4 mm. l.; inflorescences axillary and terminal, racemose, with 4-10 flowers, 1.5-2 cm. l., with very short, adpressed hairs; bracts acute; pedicels 4-7 mm. l.; calyx with short and adpressed white hairs; larger lobes 2 mm. l., 1.5 mm. br., roundish, apex rounded, smaller half-roundish; ovules in each cell few; berries unripe, obovoid, densely glandular-granulate.

In fl. and fr. Aug., in fr. to Dec.; Spanish River, Blue Mts., *Harris!* Fl. Jam. 5306, 5307, 5440.

Inflorescences generally solitary from the axils, at the apex of the branches several, shortly or very shortly pedunculate; bracts persistent, ovate or triangular, .7-1.4 mm. l. *Bracteoles* ovate-triangular, acute, slightly united at base. *Calyx*-lobes glandular-granulate with short white hairs.

14. *E. jamaicensis* Berg in *Linnaea xxvii. 237 (1856)*; young branchlets puberulous with adpressed white hairs; leaves 6-9 cm. l., ovate or ovate-oblong, acuminate with obtuse tip, often apiculate, base acute, midrib slightly impressed, nerves on upper surface slightly prominent, nerves and veins beneath prominent, with very dense pellucid dots not conspicuous on upper surface, very slightly prominent beneath, submembranous, glabrous; petioles 5-7 mm. l.; inflorescences with 6-10 flowers, 1-1.5 cm. l.; puberulous with very short adpressed hairs; pedicels 4-7 mm. l.; sepals subequal, ovate; ovules in each cell few.—*Urb. in Engl. Jahrb. xix. 625.*

Wright!? *Scot!* *Cuming!* hill north of Montego Bay, *Harris!* Fl. Jam. 10,320.

15. *E. Alexandri* Kr. & Urb. in *Engl. Jahrb. xix. 626 (1895)*; young branchlets puberulous at apex with very short adpressed hairs; leaves 8-5(-11) cm. l., oval-oblong or oblong, acuminate with tip acute or sometimes obtuse and apiculate, base subacute,

obtuse, or rounded, midrib canaliculate-impressed, nerves on upper surface scarcely prominent or subimpressed, beneath prominent, veins beneath slightly or scarcely evident, with very dense tuberculate dots on both sides especially beneath, pellucid, unequal, puberulous with very short hairs on upper surface, subglabrous beneath, submembranous or papery, margin minutely crenate; inflorescences axillary, subsessile, with 6-8 flowers, 1-2 cm. l., puberulous with very short and adpressed hairs; pedicels 3-7 mm. l.; sepals: the larger 2-2.3 mm. l., roundish or semioval, apex rounded or subtruncate; ovules in each cell numerous; berry globose, 12-13 mm. in diam.—*E. disticha* Griseb. *Fl. Br. W. Ind.* 237 (1860) (in part) (non DC.). *Myrtus disticha* Bot. Mag. t. 867 (non Sw.). Type in Herb. Kew.

In fl. Jan.-July; Moneague, Prior!

Shrub. Bracteoles shortly triangular-half-roundish, slightly united. Petals 5-6 mm. l. Berry 3-seeded.

16. *E. disticha* DC. *Prodr.* iii. 274 (1828); branchlets of first year puberulous above with very short hairs or silky; leaves 6-9 cm. l., ovate-elliptical or oblong-elliptical, more or less acuminate, with tip acute or mucronate, base rounded, midrib impressed, nerves on upper surface very slightly prominent or impressed, beneath with veins slightly prominent, with pellucid dots not numerous, not conspicuous on upper surface except in young leaves, very few evident beneath, puberulous on both sides at first, glabrescent later, papery; petioles 2-4 mm. l.; inflorescences axillary, 1-2 cm. l., or shorter, with 4-9 flowers, puberulous with very short adpressed hairs; bracteoles ovate, acuminate; pedicels generally 1.5-3 mm. l.; sepals: the larger 1.5 mm. l., roundish with rounded apex; ovules about 15 in each cell; berry ovate or obovate.—Griseb. *Fl. Br. W. Ind.* 237 (excl. reference to Jacq.); Urb. in *Engl. Jahrb.* xix. 627. *Myrtus disticha* Sw. *Prodr.* 78 (1788) & *Fl. Ind. Occ.* 894; Lindl. *Coll.* t. 19. *M. horizontalis* Vent. *Malm.* t. 60 (1803).

Rod wood.

In fl. and fr. Feb.-May; Wright! Shakespear! Moneague, Prior! March! Ugly river, Jenman! Kentucky Hill, Bluefields Mt., 2000-2500 ft.; Harris! Fl. Jam. 10,206; near Moneague, Britton 2675!

Specimens from Dolphin Head, Fl. Jam. 9256 and 9259, are distinguished by stouter and slightly longer petioles; the young foliage is described as "brilliant crimson."

Shrub, 4-8 ft. high. Berry red to purplish-brown, with 2-4(-8) seeds.

17. *E. Harrisii* Kr. & Urb. in *Engl. Jahrb.* xix. 632 (1895); branchlets of the first year glabrous; leaves 5-8.5 cm. l. (3.5), 1.5-4 cm. br., ovate or ovate-oblong or oblong-lanceolate, apex obtusely acuminate, base obtuse or rounded, sometimes acute, midrib impressed, nerves on the upper surface slightly impressed,

beneath slightly or scarcely prominent, veins not or scarcely evident, with usually numerous impressed dots on upper surface, pellucid dots few, leathery, glabrous; petioles 6–12 mm. l.; inflorescences 1–3·5 cm. l., with 7–11 flowers, glabrous, axillary, solitary, racemose, sometimes branched from the base and subpaniculate, somewhat rarely two, one above the other, generally with a subsessile terminal flower, conspicuously glandular; peduncle 0–15 mm. l.; bracts triangular, obtuse, ·5–1 mm. l.; pedicels 5–12 mm. l.; sepals: the longer roundish, rounded at the apex, 1·5–1·8 mm. l.; the shorter sometimes somewhat pointed; ovary glabrous on outside, shortly obovoid; ovules in each cell 9–14 (fide Urban); berry ovoid or obovoid, 2–7-seeded.—*E. disticha* Macf. *Jam. ii.* 114 (1850) (non DC.) may be conspecific, but we have not seen a specimen.

In fl. throughout year, chiefly June–Sept.; *Purdie*; J.P. 1150, *Morris*! J.P. 1419, *Hart*! Latimer road, near Cinchona, *Fawcett*! Blue Mts.; Port Royal Mts.; *Harris*! Fl. Jam. 5010, 5017, 5020, 5021, 5056, 5058, 5182, 5211, 5239, 5256, 5282, 5283, 5297, 5305, 5311, 5353, 5366, 5367, 5634, 5732, 5739, 7258.

Shrub, 5–16 ft. high. *Bracteoles* triangular, acute or shortly acuminate, ·5–1 mm. l. *Petals* rose or sometimes white, 2·5–3 mm. l. *Berries* 8–10 mm. l.

Var. *grandifolia* Kr. & Urb. l.c.; leaves 10–12 cm. l.; petiole 12–16 mm. l.; bracts triangular, acute to ovate-lanceolate, acuminate, 1–2 mm. l.; pedicels ·5 mm. thick; flowers larger; sepals 2·5–3 mm. l.

In fl. and fr. Sept.; Egnor Gap, *Harris*! Fl. Jam. 5048.

18. *E. crenata* Berg in *Linnæa* xxvii. 226 (1856); glabrous; branchlets of the first year glabrous except the young tips puberulous; leaves 4–6 cm. l., narrowly ovate or ovate-oblong, narrowly acuminate with a rounded tip, base acute (or obtuse), midrib usually impressed, nerves on the upper surface scarcely evident, beneath slightly prominent, dots very frequent, pellucid, on both sides prominent, blackish (in old leaves becoming impressed above), papery becoming leathery, margin crenate; petiole 4–5(–13) mm. l.; inflorescences 1–2(–4) cm. l., racemose, with 5–20 flowers, glandular, glabrous or with a few hairs; bracts triangular, obtuse, ·5–·8 mm. l.; pedicels 12–6 mm. l.; sepals: the longer 1·5–1·8 mm. l.; petals about 3 mm. l.; ovules few in each cell.—*Urb.* in *Engl. Jahrb.* xix. 633. *E. pallens* Griseb. *Fl. Br. W. Ind.* 237 (1860) (in part) (non DC.).

Near Portland Gap, Blue Mts., *Purdie*! near Fairfield, *Wulfschlaegel*, 836.

Type specimen from Wulfschlaegel not seen.

19. *E. Nicholsii* Fawc. & Rendle in *Journ. Bot.* lxiv. 14 (1926); young branchlets puberulous; leaves 5·5–3 cm. l., 1·5–2 cm. br., lanceolate to narrowly elliptical, acuminate, tip long, obtuse, base

rounded or blunt, midrib impressed, nerves and veins scarcely evident on upper surface, slightly prominent beneath, with dots scarcely pellucid, impressed on upper surface, conspicuous beneath in younger leaves, glabrous, leathery; petioles 5–6 mm. l.; inflorescences terminal and axillary, 3–10-flowered, racemulose, rhachis of terminal 1–3·5 cm. l., of axillary 4–10 mm. l., glabrous, glandular; pedicels 4–6 mm. l.; sepals 2–1·5 mm. l., semicircular to roundish, ciliate; ovary 2-celled, ovules several (about 12) in each cell; berry 6 mm. l., ellipsoidal, 4-seeded. Type in Herb. Kew.

Morses Gap, 5000 ft., Blue Mts., *G. E. Nichols*, 23!

Bracteoles 1·2 mm. l., ovate, ciliate. *Petals* 3·5–4 mm. l., elliptical.

20. *E. Rendlei* *Urb. Symb. Ant. vii.* 302 (1912); branchlets of the first year glabrous; leaves 7–11 cm. l., ovate, acuminate with an acute or mucronate tip, base rounded, midrib on upper surface deeply impressed, nerves on both sides not or scarcely evident, with numerous pellucid dots, leathery, glabrous, margin entire; petioles 5–10 mm. l.; inflorescences axillary, sessile or shortly stalked, racemose with 4 flowers, 1–2·5 cm. l.; pedicels 5–9 mm. l.; sepals: the longer narrowly ovate, 2 mm. l., the shorter half-roundish, 1 mm. l.; petals 4 mm. l.; ovules few in each cell.

In fl. Mar.; John Crow (Blake) Mts., 1700 ft., *Harris & Britton!* *Fl. Jam.* 10,768.

Tree, 20 ft. high. *Peduncle* almost none to 6 mm. l., glandular-granulate, as also the pedicels. *Sepals*, apex rounded. *Petals* white. *Stamens* white. *Ovary* glabrous.

21. *E. buxifolia* *Willd. Sp. Pl. ii.* 960 (1800); branchlets of the first year with short or very minute spreading hairs, sometimes subglabrous or glabrous; leaves 2·5–4·5 cm. l. (rarely more), obovate to oblanceolate, apex rounded or at least less narrowed than at the base, base more or less wedge-shaped, rarely oval with obtuse base, midrib not impressed, but sometimes from about the middle narrowly furrowed, nerves and veins slightly prominent above, more so beneath, the lowest subparallel to margin, with dots not pellucid, glabrous, leathery; petioles 1–4 mm. l.; inflorescences 1–4 in the leaf axils, or at nodes where leaves have fallen, very short racemes, 2 mm. l., or flowers in clusters, rarely loosely-flowered; pedicels 0–·5 mm. l.; sepals: the longer ·6–1 mm. l., semicircular to shortly ovate; ovules in each cell generally few; berries globose, 4–6 mm. in diam.—*Macf. Jam. ii.* 116; *Nutt. Sylva i.* 108, t. 29; *Sarg. Silva v.* 43, t. 206; *Urb. in Engl. Jahrb. xix.* 637; *Symb. Ant. iv.* 448 & viii. 486; *Small Fl. S.E. U.S. ed.* 2, 832; *Britt. & Millsp. Bah. Fl.* 303. *E. lateriflora* *Griseb. Fl. Br. W. Ind.* 236 (1860) (excl. hab. *S. Croix*) (non *Willd.*). *Myrto affinis buxi foliis* &c. *Sloane Cat.* 162 & *Hist. ii.* 79, t. 192, f. 6. *Myrtus buxifolia* *Sw. Prodr.*

78 (1788) & *Fl. Ind. Occ.* 899. Specimens from Swartz from Hispaniola and Jamaica in Herb. Mus. Brit. (Fig. 128.)

Rodwood.

In fl. June-Aug.; *Sloane* Herb. vi. 76! *Wright*! *Masson*! *Swartz*! *Macfadyen*! Green Valley, Port Royal Mts., J.P. 903, *Morris*! Liguanea plain, J.P. 903, *Hart*! Port Royal Mts.; Grove, above Hope, 800 ft.;

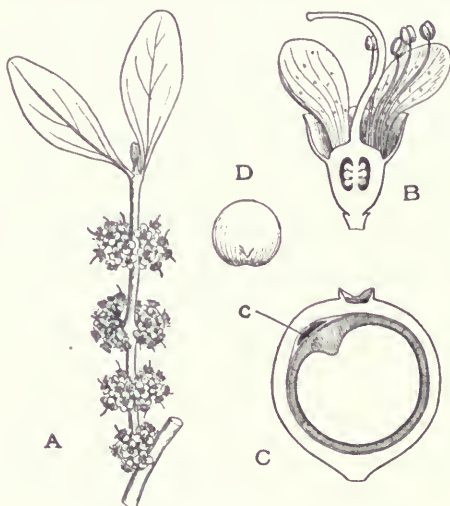


Fig. 128.—*Eugenia buxifolia* Willd.

- A, Portion of branch with leaves and flowers $\times \frac{3}{4}$.
 B, Flower cut lengthwise with most of the stamens removed $\times 7$.
 C, Berry cut lengthwise, showing the undeveloped cell, c, and the seed, $\times 4$.
 D, Embryo $\times 2$.

Long Mt., 700–800 ft.; between Portland Point and Rocky Point; *Harris*! base of Long Mt., *Campbell*! Fl. Jam. 5025, 5063–5065, 5770, 6526, 8859, 8641, 9018, 10,017, 10,181.—Florida, Bahamas, Cuba, Hispaniola, Porto Rico, St. Thomas, St. Cruz.

Shrub 4–16 ft. or *tree* 15–25 ft. high. *Petals* 1.5–2.5 mm. l., white or pink. *Berries* when ripe red, afterwards black. *Seed* 1 (2).

Wood very heavy, hard, strong, close-grained, but of small size.

22. *E. abbreviata* Urb. *Symb. Ant.* vi. 24 (1909); branchlets of first year glabrous; leaves 5–7.5 cm. l., ovate or elliptical to oblong-lanceolate, acuminate with obtuse tip, base rounded or gradually narrowing, midrib furrowed-impressed, nerves on upper surface scarcely prominent, more so beneath, veins beneath slightly prominent, with numerous dots somewhat pellucid, above slightly impressed, beneath not or scarcely prominent, stiffly papery or leathery, glabrous; petioles 3–4 mm. l.; inflorescences axillary, with 2–4 flowers, much shortened, 3–7 mm. l., sparingly

puberulous, with peduncle 2 mm. l. or none; pedicels 1–2 mm. l., in fruit 4 mm. l.; sepals: the larger 1.5 mm. l., roundish, truncate at apex; ovules few in each cell; berry globose, to 8 mm. in diam.

In fl. and fr. Feb., March; *Distin!* Manchester, *Purdie!* near Grand-vale, 480 ft., *Harris!* Fl. Jam. 7101.

Bracteoles triangular, slightly united at base. *Calyx*-tube puberulous with minute adpressed white hairs. *Petals* 3 mm. l. *Berry* glabrate, densely granulate.

23. *E. Schulziana* Urb. *Symb. Ant. vii.* 304 (1912); branchlets of first year with very minute spreading hairs (seen under a strong lens); leaves 3.5–7 cm. l., oval-elliptical or elliptical, acuminate with obtuse tip, narrowed to the base, midrib broad, flat, very slightly impressed towards the base, slightly prominent towards the apex, nerves on upper surface slightly prominent, beneath nerves and veins more prominent, joined together 2–3 mm. from margin, with dots not or scarcely pellucid, a little prominent or on upper surface not evident, glabrous except on the midrib which is very minutely puberulous, papery; petioles 2 mm. l.; inflorescences racemosely 4–6-flowered, much shortened, rhachis 3–5 mm. l., densely puberulous with very minute hairs; pedicels 3–1.5 mm. l.; sepals: the larger roundish, 1.5 mm. l., 2 mm. br.; ovules few in each cell.

In fl. Sept.; near Hopeton, Westmoreland, 1350 ft., *Harris!* Fl. Jam. 9765.

Tree, 30 ft. high. *Inflorescences*, axillary 1 or 2, with one above the other, the lower less developed, pseudoterminal, peduncle 1–2 mm. l. *Bracteoles* triangular-roundish, close together at base, but not united. *Calyx*-tube very minutely puberulous.

24. *E. Wilsonella* Fawc. & Rendle in *Journ. Bot.* lxiv. 15 (1926); glabrate, but very young branchlets puberulous; leaves 3–5 cm. l., 10–17 mm. br., lanceolate or elliptical-lanceolate, acuminate, tip acute, base acute to obtuse, midrib impressed, nerves and veins scarcely evident on upper surface, slightly prominent beneath, with dots pellucid, slightly prominent (when young) or impressed or not evident on upper surface, slightly prominent or not evident beneath, puberulous on upper surface especially on midrib, at length glabrate, papery; petioles 3 mm. l.; inflorescences axillary, with 4–6 flowers, racemulose or sub-clustered, much shortened, rhachis 2–0 mm. l., minutely puberulous or glabrate; pedicels 4–8 mm. l.; sepals 1.5–1.1 mm. l., roundish, ciliate, apex mucronate; ovules few (2–7) in each cell. Type in Herb. Kew.

Wilson!

Inflorescence sometimes grows on into a leafy shoot. *Bracteoles* 1.5 mm. l., triangular, acute, united below. *Calyx*-tube minutely warty. *Petals* 3–3.5 mm. l., glandular.

25. *E. glabrata* DC. *Prodr.* iii. 274 (1828); young branchlets with very minute hairs (glabrous in Jamaican specimens); leaves 3.5–8 cm. l., elliptical, elliptical-oblong, or ovate, acuminate with obtuse tip, base rounded or acute, midrib deeply impressed, nerves on upper surface slightly or scarcely prominent, beneath more so, veins scarcely evident on both sides, with dots not pellucid, glabrous, papery; petioles 5–7 mm. l.; inflorescences short racemes, 1–4, clustered, 4–11 mm. l., with minute hairs; pedicels 1–1.5 mm. l.; bracteoles minute, semicircular; sepals: the longer semioval, 1–1.2 mm. l., obtuse or rounded; ovary minutely puberulous; ovules in each cell few; berries oblong, 10–13 mm. l.—*Urb. in Engl. Jahrb.* xix. 642 & *Symb. Ant.* vii. 487. *Myrtus glabrata* Sw. *Prodr.* 78 (1788) & *Fl. Ind. Occ.* 903. Specimen from Swartz from Hispaniola in Herb. Mus. Brit.

In fr. Jan.–July; *Morris*, J.P. 1017! Port Royal Mts. (near Chester Vale; near Woodcutters' Gap; Silver Hill Gap, 3600 ft.); Peckham Woods, Clarendon, 2500–2800 ft.; *Harris*! *Fl. Jam.* 5069, 5557, 5609, 5725, 5784, 10,867.—Cuba, Hispaniola.

The Jamaican specimens are in fruit only. Urban places them under *E. glabrata* provisionally, and thinks that possibly they may be only a variety of *E. axillaris* Willd.

Shrub 4–5 ft. or tree (in Jamaica) 15–30 ft. high. *Petals* 3 mm. l. *Berries* black.

26. *E. axillaris* Willd. *Sp. Pl.* ii. 960 (1800); young branchlets glabrous; leaves 4–8 cm. l., 1.5–5.5 cm. br., elliptical or broadly ovate to oblong, apex obtuse or generally obtusely acuminate, base acute, prolonged into the petiole, rarely rounded, midrib deeply impressed, nerves and veins scarcely prominent on upper surface, beneath slightly prominent, with dots not pellucid, glabrous, papery-leathery; petioles 5–8 mm. l.; inflorescences 1–3, clustered in axils, very short racemes, 2–4 mm. l., rarely longer (–11 mm. l.), glabrous; pedicels 1–1.5 mm. l.; bracteoles minute, rounded, united below or nearly to apex; sepals: the longer .6–.8 mm. l., semicircular or semioval; ovules few in each cell; berries globose, 7–10 mm. in diam.—*Macf. Jam.* ii. 115; *Griseb. Fl. Br. W. Ind.* 236; *Urb. in Engl. Jahrb.* xix. 639, *Symb. Ant.* iv. 448 & viii. 486; *Small Fl. S.E. U.S. ed.* 2, 832; *Britt. Fl. Berm.* 261; *Britt. & Millsp. Bah. Fl.* 303. *E. baruensis* Jacq. *Coll.* iii. 183 (1789) & *Ic. Rar.* iii. 6, t. 486. *E. monticola* Griseb. *loc. cit.* (excl. syn. *E. fetida*); *Sarg. Silva v.* 45, t. 207 (non DC.). *Myrtus axillaris* Sw. *Prodr.* 78 (1788) & *Fl. Ind. Occ.* 901.

Rodwood, Brown Leaf Rodwood.

In fl. June–Nov.; *Sloane* Herb. vi. 75 (in part)! *Wright*! Port Royal Mts., *Macfadyen*! *March*! *Ewarton*, *Prior*! Liguanea plain, J.P. 1083, *Hart*! near Cinchona, J.P. 1451, *Hart*! Port Royal Mts., Blue Mts., Peckham woods, Clarendon, 2500 ft.; Middlesex, St. Ann, 1600 ft.; Dolphin Head, 1800 ft.; *Harris*! *Fl. Jam.* 5013, 5052, 5054, 5060, 5066, 5070, 5076,

5086, 5087, 5118, 5284, 5285, 5303, 5322, 5323, 5403, 5405, 5896, 10,268, 11,172, 12,081; near Moneague, *Britton*, 2674, 2766!—Bermuda, Keys Is., Florida, Bahamas, Cuba, Cayman, Hispaniola, Mona, Porto Rico, St. Cruz, St. Martin, Saba, St. Eustache, Antigua, Guadeloupe, Marie-Galante Is., Baru near Carthagena.

Shrub 8–15 ft. or *tree* 15–40 ft. high. *Petals* white, strongly scented, 1·8–2(–3) mm. l. *Ovary* glabrous. *Berries* black, 1-seeded.

Wood is heavy, hard, strong, and very close-grained, brown often tinged with red; a cubic foot weighs about 57 lbs. (Sargent.)

27. *E. isosticta* Urb. *Symb. Ant. vii.* 305 (1912); young branchlets glabrous; leaves 6–9 cm. l., 2·5–3·5 cm. br., ovate-elliptical or elliptical, more or less acuminate with a broad and very obtuse tip, base gradually narrowed into the stalk, midrib on the upper surface deeply impressed, nerves on the upper surface slightly prominent, beneath together with the veins prominent, dots very dense on both sides, pellucid, glabrous, papery-leathery or leathery; petioles 7–10 mm. l.; inflorescences axillary, very abbreviated, shortly racemose, with few flowers; peduncle scarcely any, rhachis 1–7 mm. l., glabrous; pedicels 4–7 mm. l.; sepals ovate, apex obtuse, the larger 2 mm. l., the smaller 1·5 mm. l.; berries (unripe) globose, glabrous, 6 mm. in diam., one-seeded.

In fr. (unripe), Sept.; hills between Browns Town and Porus, Manchester, *Britton*, 3280.

No specimen seen by us.

28. *E. Sloanei* Urb. in *Fedde's Repertorium xiv.* 338 (1916); shrub 8–10 ft. high; branchlets verruculose, young branchlets brown, with minute spreading hairs, older ash-coloured; leaves 3–5 (6) cm. l., broadest about the middle or a little below the middle, 1–2·8 cm. br., elliptical or elliptical-oblong, apex very obtusely acuminate, gradually narrowing into the petiole, midrib impressed in lower half, nerves and veins slightly prominent on both sides, leathery, with densely crowded dots evident on both sides, more or less pellucid, glabrous; petioles 2–3 mm. l.; inflorescences axillary, sessile, very shortly racemose, rhachis 2–5 mm. l., apparently with 6–12 flowers; pedicels of fruit 5–8 mm. l., glabrous; sepals (in fruit): the longer semioval, 1·2 mm. l., the shorter broadly triangular; berries spheroidal (when 1-seeded), 4·5–5 mm. in diam., sometimes 2-seeded and then transversely shortly oval, 5·5–6 mm. in diam., very densely glandular-dotted.

Rod wood.

In fr. July–Sept.; *March!* Falls river, Port Royal Mts., 2500 ft.; below Flamstead, St. Andrew, 3000 ft.; near Lacovia; Peckham, Clarendon, 2500 ft., *Harris!* Fl. Jam. 5244, 12,561, 12,779, 12,896.

29. *E. monticola* DC. *Prodr. iii.* 275 (1828); branchlets of first year puberulous; leaves variable in size and form, 1·5–4 cm. l., ·5–2 cm. br., ovate to narrowly lanceolate, or elliptical, apex scarcely acuminate, obtuse, rarely with long and narrow

tip, base wedge-shaped, midrib on upper surface not or rarely impressed, nerves and veins on upper surface slightly prominent or scarcely evident, beneath slightly prominent, papery-leathery, dots not or somewhat pellucid, glabrous; petioles 3 mm. l.; inflorescences shortly racemose to somewhat clustered, glabrous, 3–15 mm. l.; pedicels 1–5 mm. l.; bracteoles minute, rounded or generally triangular, obtuse, generally free; sepals: the longer 1–1.3 mm. l., semicircular; ovules few in each cell; berries globose, 4–6 mm. in diam.—*Macf. Jam. ii.* 117; *Urb. in Engl. Jahrb. xix.* 635, *Symb. Ant. iv.* 448 & *viii.* 485. *E. buxifolia* Griseb. *Fl. Br. W. Ind.* 236 (1860) (excl. *syn.*) (non Willd.). *Myrtus monticola* Sw. *Prodr.* 78 (1788) & *Fl. Ind. Occ. ii.* 898.

Specimen from Swartz from Jamaica in Herb. Mus. Brit.

In fl. July–Dec.; high mts., Swartz! Port Royal Mts., Macfadyen! Waters! Hagley Gap, Blue Mts., Purdie! Yallahs Valley, Prior! March! J.P. 1194, 1203, Morris! Port Royal Mts.; Blue Mts.; Red Hills; Stony Hill; Potsdam; Harris! *Fl. Jam.* 5053, 5055, 5059, 5061, 5062, 5250, 5260, 5302, 5304, 5309, 5313, 5329, 5380, 5397, 5462, 5531, 6128, 6882, 9751, 9802, 11,138; near Cinchona, Miss J. R. Perkins!—West Indies.

Shrub 6–15 ft. or *tree* 15–35 ft. high. *Bracteoles* minute, generally free. *Petals* white, 2 mm. l. *Berries* at length black.

Var. *latifolia* Kr. & Urb. *tom. cit.* 636 (1895); leaves 4–8 cm. l., 1.5–4.5 cm. br. *E. glabrata* Macf. *Jam. ii.* 118 (1850) (non DC.).

Masson! Swartz! St. Mary, McNab! Moneague, Prior! Port Royal Mts.; Blue Mts.; Crofts Mt., Clarendon; Peckham woods, Clarendon; Harris! neighbourhood of Castleton, Thompson! *Fl. Jam.* 5051, 5103, 6747, 8014, 9108, 11,226, 12,767.—W. Indies, Mexico.

30. *E. polypora* Urb. *Symb. Ant. vi.* 24 (1909); glabrous; leaves 6–8 cm. l., 3–5 cm. br., ovate or narrowly ovate, apex very shortly acuminate with obtuse tip, base rounded or subtruncate, prolonged a little into the petiole, midrib prominent, nerves and veins on both sides slightly prominent, with dots very dense, pellucid, papery-leathery; petioles 7–10 mm. l.; flowers several, axillary in an umbel-like raceme, rhachis 4 mm. l.; fruiting pedicels 10–15 mm. l.; sepals 4, the larger roundish, 3.5 mm. l. in fr., the smaller 2.3 mm. l.; berries globose, 12–15 mm. in diam.

In fr. March; Dolphin Head, 1800 ft.; Harris! *Fl. Jam.* 10,271.

Tree to 60 ft. high, with a trunk to 1 ft. in diam. *Bracteoles* not united, .5 mm. l. *Berries* densely and minutely granulate-dotted, not ribbed, glabrous, 1-seeded.

31. *E. confusa* DC. *Prodr. iii.* 279 (1828); young branchlets glabrous; leaves 4–6.5 cm. l., very variable in form, elliptical, ovate, but lanceolate to linear-lanceolate in the Port Royal Mts. form (*E. filiformis*), long and narrowly acuminate with acute or

obtuse tip, base obtuse to wedge-shaped, midrib impressed, nerves and veins distinct and prominent on upper surface, less so beneath, with numerous dots, a few pellucid, shining on upper surface, leathery, glabrous; petioles 4–8 mm. l.; inflorescences axillary, racemose-umbelliform, rhachis 7–0 mm. l.; pedicels slender, 8–16 mm. l.; sepals 1·5–2 mm. l., broadly ovate; berries subglobose, 5–6 mm. in diam.—*Urb. in Engl. Jahrb. xix.* 643 & *Symb. Ant. iv.* 449; *Small Fl. S.E. U.S. ed. 2*, 832; *Britt. & Millsp. Bah. Fl.* 304. *E. filiformis Macf. Jam. ii.* 116 (1850). *E. Garberi Sarg. in Gard. & For. ii.* 28, f. 87 (1889) and *Silva v.* 49, t. 209.

In fl. Apr. to Sept.; below Trafalgar, Port Royal Mts., *Macfadyen*! *Prior*! Silver Hill, Port Royal Mts.; near Troy, 1500 ft.; *Harris*! Fl. Jam. 5525, 5675, 8684, 8740.—Florida, Bahamas, Porto Rico to Dominica.

Shrub 8–10 ft. or *tree* to 20 ft. high. *Bracteoles* nearly 1 mm. l., narrowly lanceolate. *Petals* about twice as long as sepals, white. *Berries* scarlet, 1-seeded.

32. *E. rhombea* Kr. & *Urb. in Engl. Jahrb. xix.* 644 (1895); young branchlets glabrous; leaves 2·5–6 cm. l., 1·2–3 cm. br., ovate to lanceolate, ovate-elliptical, ovate-oblong or rhomboid, more or less acuminate, with a very obtuse, broad, and rounded tip, base rounded to acute, midrib slightly or scarcely prominent in upper half, slightly furrowed towards the base, nerves on upper surface scarcely prominent, beneath with a few veins slightly prominent, with more or less pellucid dots, papery-leathery; petioles 3–6 mm. l.; inflorescences axillary, umbelliform, 1–3, with 2–8 flowers; pedicels 2–15 mm. l., glabrous; the longer sepals roundish, about 2·5 mm. l.; ovary glabrous; ovules many in each cell; berries globose or obliquely globose, 6–7 mm. l., 8–9 mm. thick, or even larger, orange, scarlet, or black.—*Small Fl. S.E. U.S. ed. 2*, 832; *Britt. & Millsp. Bah. Fl.* 304; *Urb. Symb. Ant. ix.* 106. *E. procera* *Nutt. Sylva i.* 106, t. 28 (1842); *Sarg. Silva v.* 47, t. 208 (non *Poir.*).

In fl. July, in fr. Nov.; Long Mt., behind Mona, 800 ft.; Long Mt., south side, 300 ft., *Harris*! Fl. Jam. 8849, 9618.—Florida, Bahamas, Cuba to Guadeloupe.

Shrub 10 to 12 ft. or *tree* 15 to 25 ft. high.

Wood heavy, hard, close-grained, light brown. (Sargent.)

33. *E. clarendonensis* *Urb. Symb. Ant. vii.* 305 (1912); glabrous; leaves 2·5–4 cm. l., 1·1–5 cm. br., elliptical-lanceolate to lanceolate, gradually narrowed towards the obtuse apex, base obtuse or rounded, midrib impressed towards the base, nerves on both sides little prominent or scarcely evident, veins not evident, with numerous dots but not pellucid in older leaves, leathery, shining on upper surface; petioles 3–6 mm. l.; flowers in the axils of leaves, 1–4 or as many as 8, umbelliform at the end of branches; pedicels 10–17 mm. l.; sepals 4, very unequal, the

larger ovate-roundish, 2·5–2·8 mm. l., the smaller 1·5–2 mm. l.; ovules many in each cell.

In fl. July; Peckham woods, Clarendon, 2500 ft., *Harris!* Fl. Jam. 10,967, 10,974 (type).

Shrub, 10 ft. high. *Petals* 4 mm. l. *Anthers* rose-coloured.

34. *E. Brownei* Urb. in *Fedde's Repertorium* xviii. 368 (1922); young branchlets with very minute hairs; leaves 2·5–4 cm. l., 1·2–2·5 cm. br., ovate, elliptical, or subrhomboid, rarely roundish or round, apex narrowed or acuminate with very obtuse tip, base acute, narrowed into the petiole, midrib impressed to beyond the middle, slightly prominent towards the apex, nerves and veins somewhat prominent on both sides, a continuous arch 1–1·5 mm. from the margin, with very numerous pellucid dots, glabrous, papery; petioles 2–3 mm. l.; inflorescences axillary, with 2–4 flowers umbelliform; pedicels 12–16 mm. l.; sepals: the larger 1 mm. l., 1·8 mm. br.; ovules very few in each cell.

In fl. Sept.; banks of Black river between Lacovia and Elam Wharf, *Harris!* Fl. Jam. 9848.

High *shrub*. *Petals* white, 3·5 mm. in diam. *Ovary* glabrous.

35. *E. pycnoneura* Urb. *Symb. Ant.* vi. 25 (1909); branchlets glabrous; leaves 5–7 cm. l., 1·8–2·5 cm. br., ovate-elliptical to elliptical-lanceolate, apex generally long and very narrowly acuminate, tip obtuse or acute, midrib flattish and a little prominent, nerves 15–20 on each side, slightly prominent on both sides, veins scarcely evident, with dots few, pellucid, papery or papery-leathery; petioles 6–7 mm. l.; flowers 1–3, axillary, subsessile or with pedicels to 1 mm. l.; tube of calyx glabrous, bell-shaped, long-prolonged above the ovary, 1·5 mm. l.; ovules few in each cell.—*E. polyneura* Urb. *Symb. Ant.* v. 446 (1908) (non *Koord. & Val.*).

In fl. Oct.; Vinegar Hill, Blue Mts., 3500 ft.; *Harris!* Fl. Jam. 7448.

Tree, 25 ft. high. *Leaves* glabrous; petioles puberulous or glabrate. *Bracteoles* united into a short cup, glabrous. *Calyx*: tube persistent after flowering, overtopping the ovary by many times; lobes roundish, a little shorter than the tube, 1 mm. l., falling away after flowering with the petals and stamens. *Petals* roundish, 1·3 mm. l., densely ciliate on the margin.

Wood very hard. (*Harris.*)

36. *E. eperforata* Urb. *Symb. Ant.* vi. 25 (1909); glabrous; leaves 7–11 cm. l., 2·5–5 cm. br., elliptical or elliptical-oblong, apex shortly acuminate with obtuse tip, base acute or obtuse, a little prolonged into the petiole, midrib flat or scarcely impressed, nerves on upper surface scarcely prominent, beneath slightly prominent and veins scarcely evident, with dots not pellucid, papery; petioles 5–7 mm. l.; flowers at nodes with and without leaves, and also near the apex of abortive branches, umbelliform

or on a very short rhachis (3–5 mm. l.), with 1–6 flowers; pedicels 1.5–2.5 mm. l.; calyx glabrous, the larger sepals roundish-semicircular, 2 mm. l., apex rounded, the smaller scarcely more than 1 mm. l.; ovules numerous in each cell. Type in Herb. Kew.

In fl. July; Green Park, St. Ann, *Prior*!

Bracts round the base of the pedicels several, minute, .5 mm. l. *Peduncle* wanting. *Bracteoles* roundish, very shortly apiculate, not united, 1.2–1.4 mm. l. *Petals* 4 mm. l.

37. *E. fragrans* Willd. *Sp. Pl.* ii. 964 (1800) (excl. syn. *Jacq. & Aubl.*); young branchlets of first year puberulous; leaves 1.5–7 cm. l., variable in form and size, roundish, elliptical, obovate to obovate-roundish, apex rounded or obtuse, base wedge-shaped or obtuse, often prolonged into the petiole, midrib impressed from base to apex, nerves and veins on upper surface more or less slightly prominent, beneath more prominent, sometimes not evident on both sides, with dots pellucid but opaque in thick leathery leaves, papery to leathery, puberulous on younger leaves especially on upper surface along the midrib, afterwards glabrate; petioles puberulous or glabrate, 3–5(–8) mm. l.; inflorescences cymose, cymes usually of 3 flowers on a long peduncle which sometimes branches, forming a panicle; peduncle 2–7 cm. l.; pedicels 2–10 mm. l., the central flower sessile; ovules many in each cell.—*Bot. Mag.* t. 1242; *Macf. Jam.* ii. 121; *Urb. in Engl. Jahrb.* xix. 663, *Symb. Ant.* iv. 451 & viii. 489. *E. balsamica* *Jacq. Fragm.* 40, t. 45, f. 2 (about 1805); *Macf. Jam.* ii. 113 (inflorescences 1-flowered). *E. ?dichotoma* *DC. Prodr.* iii. 278 (1828); *Macf. Jam.* ii. 119; *Nutt. Sylva* i. 103, t. 27. *E. emarginata* *Macf. Jam.* ii. 113 (1850) (non *DC.*) (inflorescence scarcely an inch long, 1-flowered). *E. rotundifolia* *Macf. Jam.* ii. 114 (1850) (form with subsessile roundish leaves, base sometimes subcordate, obscurely crenulate, inflorescence 1–2-flowered). *E. bracteata* *Macf. Jam.* ii. 120 (1850). *Myrtus fragrans* *Sw. Prodr.* 79 (1788) (excl. syn. *Aubl.*) & *Fl. Ind. Occ.* 914. *Ananomis fragrans* *Griseb. Fl. Br. W. Ind.* 240 (1860); *Britt. Fl. Berm.* 263. *A. punctata* *Griseb. loc. cit.* *A. dichotoma* *Sarg. Silva* v. 32, t. 204; *Small Fl. S.E. U.S. ed.* 2, 833. *A. grandis* *Britt. in Bull. Torr. Bot. Cl.* xxxvii. 355 (1910) (form with obovate leaves and divergent pedicels).

In fl. nearly all the year; *Swartz*; Port Royal Mts., *Macfadyen*; St. Ann, *Purdie*; Moneague and near Mt. Diablo, *Prior*! Greenwich, Port Royal Mts., J.P. 1450, *Hart*! Port Royal Mts.; Blue Mts.; Great Goat Is.; Peckham woods, Clarendon; Albion Pen, St. Ann; *Harris*! *Fl. Jam.* 5023, 5101, 5111, 5197, 5220, 5337, 5395, 5411, 5484, 9307, 11,086, 12,008.—Florida, Cuba, Mona, Hispaniola, St. Cruz, St. Jan, Tortola, St. Martin, Saba, St. Bartholomew, St. Kitts, Antigua, Guadeloupe.

Shrub 10 ft. or *tree* 15–50 ft.; bark reddish-yellow, aromatic. *Flowers* white, very fragrant.

[*E. malaccensis* L. *Sp. Pl.* 470 (1753); leaves 1·5–3 dm. l., elliptical or elliptical-oblong, acuminate or obtuse, papery-leathery; petioles about 1 cm. l.; inflorescences in short clusters at nodes which have dropped their leaves, flowers jointed to very short pedicels; calyx: tube obconical, produced beyond the ovary; petals and stamens crimson; fruit somewhat pear-shaped, about 7 cm. l., 2·5–5 cm. thick, pink or white.—*Lunan Hort. Jam.* ii. 127; *Tussac Fl. Ant.* iii. 89, t. 25; *Urb. in Engl. Jahrb.* xix. 666. *Jambosa malaccensis* DC. *Prodr.* iii. 286 (1828); *Bot. Mag.* t. 4408; *Griseb. Fl. Br. W. Ind.* 235. *J. purpurascens* DC. *loc. cit.*; *Macf. Jam.* ii. 105.

Otaheite Apple.

Prior! Harris! Fl. Jam. 11,900. Naturalized, introduced from Otaheite by His Majesty's ship "Providence" in 1793. Said to be a native of Malaya, but apparently only found now cultivated; cult. throughout tropics.

Tree, 25–60 ft. high. Wood soft, a cubic ft. weighs 38 lbs. Fruit eaten raw, cooked, or preserved in syrup.]

[*E. Jambos* L. *Sp. Pl.* 470 (1753); leaves 1–2·5 dm. l., lanceolate-acuminate, papery-leathery; petioles 5–8 mm. l.; inflorescence a terminal corymb of 4 or 5 flowers, rhachis 2·5–0 cm. l., flowers large, jointed to pedicels (5–15 mm. l.); calyx: tube obconical; petals white; stamens yellowish-white; fruit subglobose, about 3 cm. in diam.—*Bot. Mag.* t. 1696; *Descourt. Fl. Ant.* v. 49, t. 315; *Urb. in Engl. Jahrb.* xix. 666. *Jambosa vulgaris* DC. *Prodr.* iii. 286; *Bot. Mag.* t. 3356; *Macf. Jam.* ii. 105; *Griseb. Fl. Br. W. Ind.* 235. Type in Herb. Hermann ii. 20 in Herb. Mus. Brit.

Rose Apple.

Naturalized; *Wright! March! Prior!* and others; native and cultivated in S.E. Asia to Australia; cult. throughout tropics.

Shrub to 12 or 14 ft. or small *tree*. Fruit with flavour of rose-water, sometimes made into a preserve.]

Syzygium Jambolanum DC. *Prodr.* iii. 259 (1828); *Macf. Jam.* ii. 105; *Griseb. Fl. Br. W. Ind.* 235; *Urb. in Engl. Jahrb.* xix. 669. *Eugenia Jambolana* Lam. *Encycl.* iii. 198 (1789); *Duthie in Hook. f. Fl. Brit. Ind.* ii. 499 & in *Watt Dict. Econ. Prod. Ind.* The Jambolan or Damson tree, has elliptical, leathery leaves, 7–10 cm. l.; the flowers clustered on lateral 3-forked cymes; calyx prolonged above the ovary, entire or with only a slight indication of lobes; petals cohering and falling away like a lid; berry in cultivated plants often as large as a pigeon's egg, purple-black, edible, somewhat astringent.

In fl. Jan.–April, in fr. May; *Lane! Westmoreland, Purdie! Distin!* between Kingston and Salt Ponds, *Fawcett! Mona*, 700 ft., *Harris! Fl. Jam.* 8146, 8931. Native of East Indies and Australia. Naturalized in West Indies, usually cultivated.

Wood is reddish-grey, close-grained, and durable. Bark affords brown dyes, and a kind of gum kino; it is astringent, used in dysentery, and also in tanning. Fruit is said to be improved in taste by being pricked, rubbed with salt, and allowed to stand an hour.

FAMILY XC. MELASTOMACEÆ.

Herbs, shrubs, or trees, erect, a few (e.g. *Adelobotrys*) climbing, branches opposite. Leaves opposite, very rarely whorled, with 3-9 nerves, the lateral curving from base to apex, or 3-plinerved, &c., when springing from above the base (one-nerved in *Mouriria*), with parallel transverse nerves or veins more or less at right angles to them (very numerous and close together in *Blakea*), entire, serrulate, or crenulate, sometimes unequal-sided, the pairs often unequal; stipules wanting. Inflorescences spicate, paniculate, or corymbose; in a few the flowers are solitary or clustered. Flowers regular, hermaphrodite. Calyx-tube (receptacle) free or adherent to the ovary by longitudinal partitions, or partly or wholly adherent; limb truncate, lobed, or lid-like, lobes usually overlapping. Petals as many as the calyx-lobes, inserted in the mouth of the tube, overlapping. Stamens usually twice as many as the petals and inserted with them, sometimes as many, alternate stamens are occasionally smaller or rudimentary, inflexed in the bud. Anthers 2-celled, usually with a pore (rarely 2 or 4) at the apex; connective often with appendages of various shapes. Ovary with 2 or more cells. Ovules usually indefinite, anatropous, attached at the inner angle of the cell. Fruit enclosed by the calyx-tube, capsular or berry-like, bursting irregularly or opening loculicidally by valves. Seeds without endosperm, minute, but large in *Mouriria*. Embryo very small, rounded, but large in *Mouriria*.

Species nearly 3000, natives of the tropics, very many in S. America, many in the West Indies, fewer in Asia, rare in Africa and Polynesia.

Leaves with 3 or more nerves.

Ovary usually free from calyx. Fruit a capsule.

Seeds several to many, minute.

Flowers small, usually solitary, terminal and axillary. Herbs, sometimes shrubby. Leaves small

1. *Acisanthera*.

Flowers small, numerous in a terminal panicle.

Herbs, sometimes shrubby. Leaves small.....

2. *Nepsera*.

Flowers large, terminal, few. Herbs straggling to 12 ft.

3. *Arthrostema*.

Flowers small, numerous in a terminal panicle.

Climbing shrubs. Leaves large

4. *Adelobotrys*.

Flowers large, terminal and axillary. Trees or large shrubs. Leaves large

5. *Meriania*.

Ovary adherent more or less to the calyx. Fruit berry-like, soft, or somewhat hard and breaking up irregularly. Seeds several to many, minute.

Inflorescences terminal.

Calyx-limb falling off like a lid when bud opens

6. *Conostegia*.

- Calyx-limb not lid-like.
 Calyx-limb without long thread-like processes.
 Calyx-limb not spreading.
 Petals forming a bell-shaped corolla 7. *Charianthus*.
 Petals spreading or reflexed 8. *Miconia*.
 Calyx-limb spreading in fruit 9. *Tetrazygia*.
 Calyx-limb with long thread-like processes.
 Calyx with scarcely any hairs 10. *Calycogonium*.
 Calyx hairy 11. *Heterotrichum*.
 Inflorescences axillary or lateral (rarely terminal in *Ossæa*).
 Bracteoles below flowers small or none.
 Petals obtuse or notched.
 Connective not prolonged below anther-cells, or rarely shortly.
 Anthers long, with 1 minute pore at apex... 12. *Clidemia*.
 Anthers somewhat thick, apex with long curved beak and 1 small pore 13. *Henriettea*.
 Connective prolonged below cells, and jointed with filament. Anther-cells short, with 1 or 2 gaping pores 14. *Mecranium*.
 Petals with acute or tapering tip.
 Flowers solitary or in clusters 15. *Henriettella*.
 Flowers in cymes or panicles 16. *Ossæa*.
 Bracteoles 4-6, large, opposite in pairs 17. *Blakea*.
 Leaves with one nerve. Ovary adherent more or less to calyx. Fruit a berry. Seeds 1-4, large 18. *Mouriria*.

1. ACISANTHERA P. Browne.

Herbs or small shrubs. Leaves generally small, shortly stalked or sessile, entire or serrulate. Flowers terminal and axillary, solitary or in short panicles. Calyx: tube bell-shaped; lobes 4-5, acute, nearly as long as the tube. Petals 4-5, obovate or roundish. Stamens 8-10, unequal, the larger alternating with the petals, the smaller often imperfect; anthers with 1 pore at apex, connective prolonged below the cells and forming at the insertion of the filament a 2-lobed appendage. Ovary free, 3(2-4)-celled. Capsule 2-4-valved. Seeds somewhat ellipsoidal or shell-shaped, covered with minute pits. The Jamaican species are annual herbs, growing in damp situations.

Species about 35, natives of tropical S. America and the West Indies.

A. quadrata Juss. ex Poir. *Encyc. Suppl. i.* 111 (1810); Macf. *Jam. ii.* 38; Griseb. *Fl. Br. W. Ind.* 269; Cogn. in DC. *Monogr. vii.* 130; Urb. *Symb. Ant. iv.* 453 & viii. 490. *A. erecta* &c. Browne *Hist. Jam.* 217, t. 22, f. 1. *A. recurva* Griseb. *loc. cit.* (so far as the Jamaican specimens are concerned). *Rhexia*

Acisanthera L. *Amœn. v.* 396, 378. Specimen in Herb. Linn. with name in Solander's hand. (Fig. 129.) Specimens from Swartz in Herb. Mus. Brit. & Herb. Stockholm.

In fl. June-Sept.; in fr. July-Dec.; *Browne!* *Wright!* *Masson!* *Swartz!* *Macfadyen*; Guys Hill; St. Thomas in Vale; St. Ann; *McNab!* Guys Hill; St. Mary, *Purdie!* *Wulfschlaegel*; Moneague and James Hill Savanna, *Prior!* Troy, 1600-2200 ft.; Cornwall, Lacovia, 300 ft.;

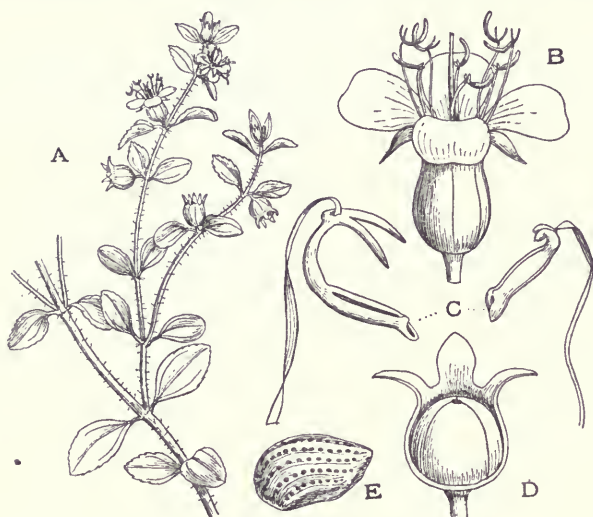


Fig. 129.—*Acisanthera quadrata* Juss.

A, Portion of branch with leaves, flowers, and fruits, $\times \frac{2}{3}$.

B, Flower $\times 4$.

C, Stamens of two kinds $\times 7$.

D, Fruit with part of calyx removed $\times 2\frac{2}{3}$.

E, Seed $\times 30$.

Hollis Savanna, Clarendon, 2400 ft.; *Harris!* Fl. Jam. 8825, 9460, 9758, 12,094, 12,233, 12,840.—Cuba, Is. of Pines, Hispaniola, Porto Rico, Central America, Peru.

A much-branched annual herb, 9-16 in. high; stem and branches acutely 4-angled, glabrous or hairy especially at nodes, sometimes glandular. Leaves 1.5-1 cm. l., ovate-elliptical to lanceolate, membranous, serrulate, 3-nerved, glabrous; petiole 2-5 mm. l. Pedicels solitary, 1-2 mm. l. Calyx: tube bell-shaped, narrower at mouth, 2.5-3 mm. l.; lobes 2-3 mm. l. Petals 6 mm. l., apex subretuse, rosy- or purplish-mauve, soon falling. Larger anthers oblong-truncate. Spur-like lobes of the connective acute, nearly as long as the anthers. The smaller stamens with connective below very shortly 2-lobed. Ovary 3-celled. Capsule 3-valved. Seeds somewhat kidney-shaped.

2. NEPSERA Naud.

Herb or small slender shrub, erect, branching. Leaves ovate, minutely serrulate. Panicles forking with branches in

threes. Flowers small. Calyx-lobes 4, as long as the tube, persistent. Petals 4, oblong-lanceolate, acute. Stamens 8, unequal; anthers unlike, connective prolonged below the cells, and produced inwards at the insertion of the filament into a 2-lobed appendage. Ovary free, 3-celled. Capsule 3-valved. Seeds short, shell-like, covered with large shallow pits.

Species 1, native of the West Indies, Colombia, Guiana, Brazil, in wet places.

N. aquatica Naud. in *Ann. Sc. Nat. ser. 3, xiii.* 28 (1849) & *xii. t. 14, f. 1*; Griseb. *Fl. Br. W. Ind.* 268; Cogn. in *Fl. Bras. xiv. pt. 3, 231, t. 53* & in *DC. Monogr. vii.* 146; Urb. *Symb. Ant. iv.*

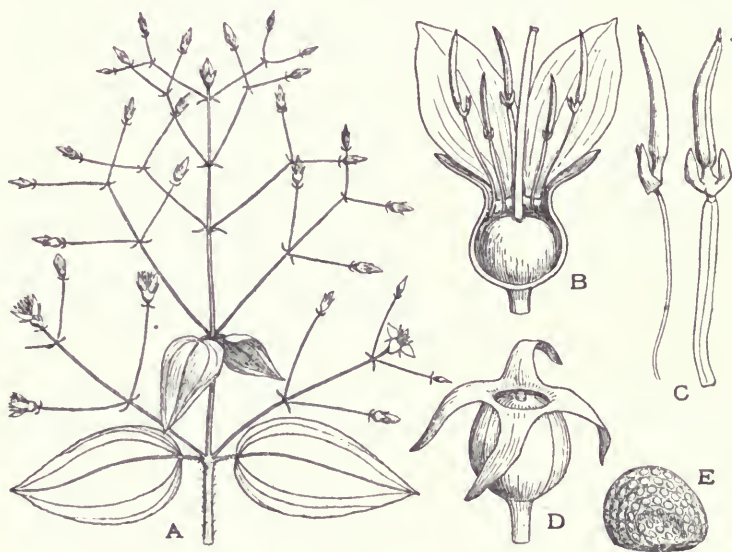


Fig. 130.—*Nepsera aquatica* Naud.

A, End of floral branch with leaves, buds, and flowers, $\times \frac{1}{2}$.

B, Flower with part of perianth and stamens removed $\times 4$.

C, A longer stamen seen front and side ways $\times 7$.

D, Fruit enclosed by calyx $\times 4$.

E, Seed $\times 24$.

453 & *viii.* 490. *Melastoma aquatica* Aubl. *Guian. i.* 430, *t.* 169. (1775); Sw. *Prodr.* 73. *Rhexia aquatica* Sw. *Fl. Ind. Occ.* 650 (1798). *Spennera aquatica* Mart. ex *DC. Prodr. iii.* 116 (1828); Macf. *Jam. ii.* 43. Specimen from Aublet in Herb. Mus. Brit. (Fig. 130.)

In fl. all the year; Wright! hedges in Clarendon Mts., Broughton! Swartz! Purdie! Portland, March! Moneague, Prior! Claverty Cottage,

Blue Mts., J.P. 978, *Hart!* Port Antonio, *Hitchcock*; Hollis Savanna, Clarendon, 2400 ft., *Harris!* Fl. Jam. 12,248; banks on roadside between Port Antonio and Moore Town, *Norman!*—West Indies, trop. S. America.

Plant, 1-4 ft. high; young stem more or less glandular-hairy. *Leaves* 2.5-5 (6) cm. l., membranous; 3-nerved with a marginal and an outer obscure nerve, neither reaching apex. *Panicle* pyramidal, 1-3 dm. l. *Calyx*: tube 2-3 mm. l., lobes as long. *Petals* white, 6-8 mm. l. *Pistil* and *stamens* rosy-violet. *Capsule* globose, 3 mm. in diam.

3. ARTHROSTEMA Ruiz & Pav.

Herbs, sometimes shrubby at base. Leaves stalked, membranous, serrulate, 5-7-nerved. Flowers cymose at the ends of branches or scorpioid, rose or purple, parts of the flower in fours. Calyx glabrous; tube oblong or narrowly bell-shaped; lobes

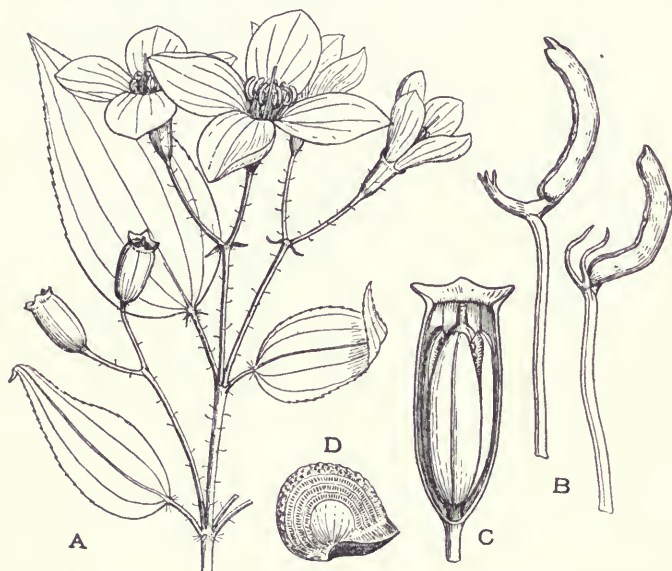


Fig. 131.—*Arthrosteina fragile* Lindl.

- A, Portion of branch with leaves, flowers, and fruit, $\times \frac{1}{2}$. C, Fruit opening with calyx partly removed $\times 2$.
B, Stamens of two kinds $\times 4$. D, Seed $\times 16$.

triangular, much shorter than the tube, persistent. Petals obovate, very soon falling. Stamens 8, more or less unequal; filaments glabrous; anthers wavy, curved, of 2 kinds, the connective of the larger produced below the cells, and at the insertion on the filament prolonged inwards into a slender appendage thicker at apex with 3 small teeth; the appendage of the smaller anthers forming 2 spur-like lobes. Ovary free or

more or less adherent, 4-celled, glabrous. Capsule covered with the calyx-tube, 4-valved. Seeds shell-like, deeply striate.

Species 10, natives of Jamaica, Cuba, Mexico, Venezuela Colombia, Peru.

A. fragile Lindl. in *Journ. Hort. Soc.* iii. 74 & fig. p. 75 (1848); Triana in *Trans. Linn. Soc.* xviii. 35, t. 2, f. 21, b; Cogn. in *DC. Monogr.* vii. 140. *Heteronoma diversifolium* Link & Otto, *Ic. Pl. Rar.* t. 37 (non *DC. nec Benth.*). (Fig. 131.)

In fl. and fr. during the year; Lapland near Catadupa, 1200 ft.; between New Market and Darliston; Masons River, 2500 ft.; near Guys Hill, St. Ann, 1800 ft.; Hollis Savanna, Clarendon, 2400 ft.; Peckham, Clarendon, 2000 ft.; Fl. Jam. 9193, 9930, 11,232, 12,037, 12,271, 12,827; Bower Hill, near Lucea, Norman!—Cuba, Central America.

Stem weak, with long straggling branches trailing over bushes or along the ground, sometimes to a length of 12 ft.; branches 4-keeled, sparsely covered with long hairs thicker at glandular apex, and occasionally with short prickles. *Leaves* 4–8 cm. l., ovate-oblong, acuminate, base rounded or subtruncate, occasionally subcordate, 5-nerved with a marginal pair not reaching apex and an outer obscure nerve at base, margin ciliate-serrulate. *Flowers* few, long-stalked. *Calyx* 7–9 mm. l., glabrous. *Petals* 2–2.5 cm. l., rosy-pink. *Stamens* slightly unequal. *Capsule* 1–1.5 cm. l.

4. ADELOBOTRYS DC.

Climbing shrubs. Leaves ovate-oblong, large, 3–5-nerved, entire or serrulate. Flowers in many-flowered terminal panicles. Calyx: tube bell-shaped, narrower at mouth, limb spreading, with uneven margin below which are 5 minute teeth. Petals 5, obovate, cohering between themselves and with the stamens at their base. Stamens 10, equal; anthers beaked, with 1 pore, connective not prolonged below the cells, produced outwards at the insertion of the filament into an erect appendage. Ovary free, 5-celled. Capsule as long as the calyx, oblong, 5-valved. Seed-coat prolonged at both ends.

Species 12, natives of tropical continental America, and one of Jamaica.

A. adscendens Triana in *Trans. Linn. Soc.* xviii. 67, t. 5, f. 56 (1871); Cogn. in *DC. Monogr.* vii. 419. *A. scandens* Macf. *Jam.* ii. 99 (1850) (non *DC.*). *Melastoma scandens* Sw. *Prodr.* 69 (non *Aubl.*). *M. adscendens* Sm. *Fl. Ind. Occ.* 772 (1798). *Miconia scandens* Ruiz & Pav. *Fl. Peruv.* iv. t. 395 (ined.). *Davya guyanensis* DC. *Mém. Mélast.* 18, t. 3 (1828). *D. adscendens* Griseb. *Fl. Br. W. Ind.* 265 (1860). Specimens from Swartz in *Herb. Mus. Brit.* & *Herb. Stockholm.* (Fig. 132.)

In fl. Feb.–April, in fr. March, April; Swartz! Wullschlaegel; mountain woods on north side, Macfadyen! Wilson! Unity Vale, near Moneague, Prior! John Crow (Blake) Mts., Harris & Britton! *Fl. Jam.* 10,729.—Central America, Guiana, Bolivia, Peru.

Stem emitting roots, so attaching itself to trunks of trees and climbing to 20 or 30 ft., sparingly branched. *Leaves* 10-15 cm. l. (-30 cm. l. in lower leaves), elliptical or ovate-elliptical, shortly acuminate, base rounded to obtuse, 5-nerved with a marginal pair, often hidden by the margin

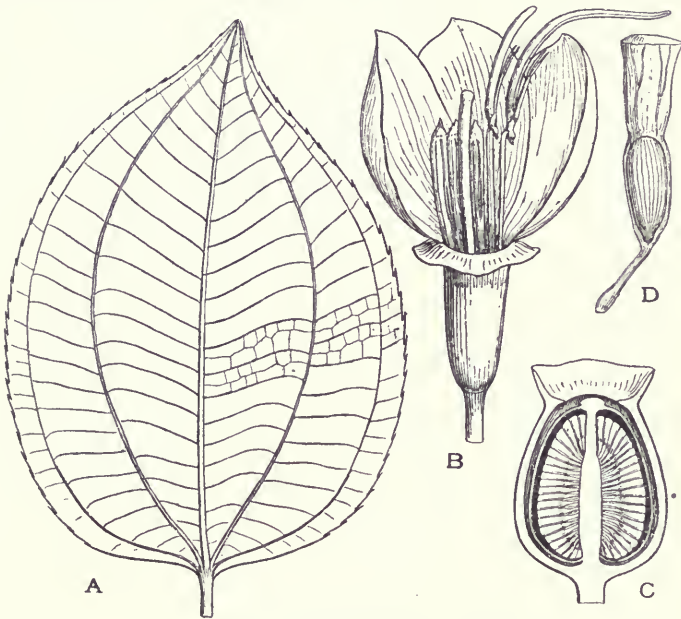


Fig. 132.—*Adelobotrys adscendens* Triana.

A, Leaf $\times \frac{3}{4}$.

B, Flower with two petals removed
 $\times 4$.

C, Fruit enclosed in calyx cut length-
wise $\times 4$.

D, Seed $\times 24$.

recurved, ciliate with reddish hairs, and with minute teeth; petioles 1.5-3 cm. l., reddish-pubescent. *Panicles* 2-3 dm. l.; pedicels 4-7 mm. l. *Calyx* 5 mm. l., increasing to 6 or 7 mm. in fruit, at first hairy, later glabrate, at length 10-keeled. *Petals* 6-7 mm. l., white tinged with pink.

5. MERIANIA Sw.

Trees and erect shrubs. Leaves usually long-stalked, 3-5-nerved. Flowers rather large, in short panicles or cymes, or solitary, terminal and lateral; parts in fives. Bracts 2 at apex of peduncle. Bracteoles 2, sometimes wanting. Calyx persistent; limb double, outer lobes long and narrow (in Jamaican species). Stamens 10; anthers beaked, opening by one pore, connective not elongated below the cells, produced outwards at the insertion of the filament into a minute or long appendage. Ovary free,

3-5-celled. Capsule subglobose, as long as the leathery bell-shaped tube of the calyx, 3-5-valved. Seeds narrowly oblong-pyramidal.

Species 41, natives of the West Indies and tropical America.

Leaves 8-16 cm. l. *Bracteoles* wanting or very soon falling 1. *M. leucantha*.

Leaves 3-6 cm. l., with 2 swellings at base between the nerves on upper surface.

Bracteoles persistent 2. *M. purpurea*.

1. *M. leucantha* Sw. *Fl. Ind. Occ.* 826, t. 15, f. a. (1798); *Macf. Jam.* ii. 40; *Triana in Trans. Linn. Soc.* xxviii. 65, t. 5, f. 55b; *Cogn. in DC. Monogr.* vii. 423. *M. rosea* Tussac *Fl. Ant.*

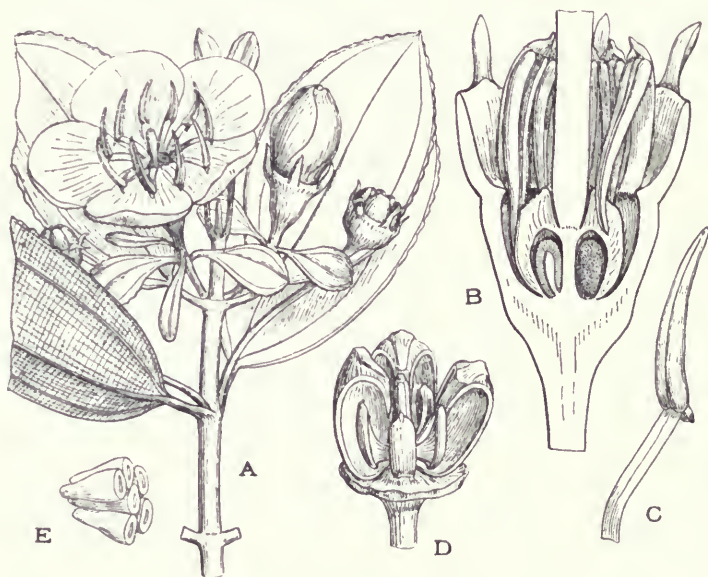


Fig. 133.—*Meriania leucantha* Sw.

A, Part of branch with leaves, buds, flowers, and fruit, $\times \frac{1}{2}$.

B, Flower-bud cut lengthwise, petals removed, with anthers still bent down, one cell of ovary showing surface

view of ovules, the other with placenta cut lengthwise, $\times 2\frac{1}{2}$.

C, Stamen after opening of flower $\times 2\frac{1}{2}$.

D, Fruit with two valves removed, and persistent placentas, $\times 2\frac{1}{2}$.

E, Ovules $\times 30$.

i. 78, t. 6 (1808); *Descourt. Fl. Ant.* iv. 326, t. 303; *Griseb. Fl. Br. W. Ind.* 264 (so far as description refers to *M. leucantha*). *M. purpurea* Macf. *Jam.* ii. 42 (1850) (non Sw.). *Rhexia leucantha* Sw. *Prodr.* 61 (1788). Specimen from Swartz named

by him in Herb. Mus. Brit. and one in Herb. Stockholm. (Fig. 133.)

In fl. throughout the year; *Wright!* *Swartz!* *Wiles!* St. Ann, *McNab!* Portland, *Purdie!* *Wilson!* *March!* *Prior!* J.P. 1088, *Morris!* Morse's Gap, *C. Nicholls!* Clydesdale, 3500-4000 ft., *Harris!* near Cinchona, *Fawcett!* The small form (var. *nana* Naud.) occurs on Bull Head, *Fawcett!* Fl. Jam. 3500, 6350, 7002, 8472.—Cuba (the small form).

Shrub, 10-12 ft. high; young branches obtuse-angled or more or less 4-sided. *Leaves* 8-16 cm. l., oblong-elliptical or elliptical, apex obtuse or rarely acute, somewhat rigid, 3-nerved with a marginal pair on lower surface, minutely serrulate or entire, veins beneath very numerous, transverse, more or less parallel; petioles 1-3 cm. l. *Peduncles* solitary in the upper axils. *Bracts* 2 at the apex of the peduncle, oblong or broadly spatulate, usually 3-nerved, toothed or subentire, 1.5-3 cm. l. *Bracteoles* wanting or occasionally present, falling very soon, 12 mm. l., narrowly spatulate, 1-nerved. *Calyx*: tube 7-10 mm. l.; lobes shallowly rounded, the dorsal processes awl-shaped, 5-8 mm. l. *Petals* 2.5-3 cm. l., white tinged with red at base, or rosy.

2. *M. purpurea* Sw. *Fl. Ind. Occ.* 829, t. 15, f. b-i. (1798); *Tussac Fl. Ant. i.* 82, t. 7; *Triana loc. cit. t.* 5, f. 55a; *Cogn. loc. cit.* *M. rosea* Macf. *Jam. ii.* 41 (1850) (non *Tussac*). *M. bullifera* Griseb. *Fl. Br. W. Ind.* 265 (1860). *Rhexia purpurea* Sw. *Prodr.* 61 (1788). Specimen from Swartz in Herb. Stockholm.

In fl. throughout the year; *Wright!* Catherine Peak, *Broughton!* *Shakespear!* *Masson!* *Swartz!* *Bancroft!* *Macfadyen!* *McNab!* Portland Gap, *Purdie!* Port Royal Mts., *March!* Maroon wood, St. George, *Moore!* near Woodcutters' Gap, *Harris!* Fl. Jam. 6287.—Colombia.

Shrub or *tree* to 20 ft. high; young branches terete. *Leaves* 2.5-5.5(-8) cm. l., narrowly elliptical to ovate-lanceolate, 3-nerved, with an outer obscure nerve, and with 2 swellings on the upper surface between the nerves at the base, minutely serrulate or entire, veins beneath very numerous, transverse, more or less parallel; petioles .5-1.5 cm. l. *Peduncles* 2 or 3, solitary in the upper axils. *Bracts* 2, at the apex of the peduncle, oblong or spatulate, 1-3-nerved, 1.5-2 cm. l. *Bracteoles* 2, more or less persistent, linear-spatulate, 1-nerved. *Calyx*: tube 4-6 mm. l.; lobes broadly triangular, the dorsal processes slender, 6-7 mm. l. *Petals* 2-3 cm. l., crimson-purple.

6. CONOSTEGIA Don.

Shrubs or small trees. Leaves large, stalked, 3-5-nerved. Flowers in terminal panicles, branches opposite, cymose. Calyx glabrous, tube bell-shaped or hemispherical, limb closed, dropping off from its base like a lid when the flower opens. Petals 5-10, obovate, obcordate, or oblong-obovate. Stamens 10-25, equal; anthers with one pore, connective not elongated, without appendage. Ovary adherent or the apex free, 5-15-celled. Berry with numerous seeds. Seeds obovoid, smooth.

Species 44, natives of the West Indies, Central and tropical S. America.

Panicles simply branched.

Flower-buds large, 12–17 mm. l.

Buds 12–15 mm. l., spindle-shaped, usually with acute base. Leaves ovate-lanceolate..... 1. *C. procera*.

Buds 14–17 mm. l., somewhat ovoid with obtuse or rounded base. Leaves elliptical..... 2. *C. Balbisiana*.

Flower-buds medium, 8–10 mm. l.

Buds 10 mm. l., lid convex, rounded. Plant glabrous..... 3. *C. Grisebachii*.

Buds 8–9 mm. l., lid convex, rounded, often with mucro. Plant hirsute..... 4. *C. subhirsuta*.

Buds 8–10 mm. l., lid conical, obtuse. Plant with bran-like hairs..... 5. *C. rufescens*.

Panicles much branched.

Flower-buds small, 5–8 mm. l.

Leaves oblong or oblong-lanceolate, base acute.

Plant with minute stellate hairs..... 6. *C. montana*.

Leaves ovate, base rounded. Plant subglabrous..... 7. *C. superba*.

1. *C. procera* D. Don in *Mem. Wern. Soc. iv.* 317 (1823); *DC. Prodr. iii.* 174 (1828); glabrous, but young branchlets sometimes brown-tomentose; leaves 3-nerved or sometimes 3-plinerved, usually with an outer obscure nerve, entire or obscurely and minutely toothed; inflorescences: branches slender, ascending; buds 12–15 mm. l., spindle-shaped, lid conical, acuminate; petals 6(–5), rosy or white tinged with crimson, 10–12 mm. l. and br.—*Macf. Jam. ii.* 69; *Griseb. Fl. Br. W. Ind.* 253; *Cogn. in DC. Monogr. vii.* 699, excl. syn. *C. Balbisiana* Ser. *C. gloriosa* *Macf. Jam. ii.* 68? *Melastoma procera* Sw. *Prodr.* 68 (1788) & *Fl. Ind. Occ.* 764; *Bonpland Mélast.* 118, t. 51. Specimens from Swartz in Herb. Mus. Brit., and also in Herb. Stockholm.

In fl. June–Aug.; high mountains, *Swartz! Dancer, Cuning*; between Farm Hill and Radnor, *Macfadyen! Cuna-Cuna Pass, Purdie! St. Thomas* in East, 1000 ft., *Wilson! March! Claverty Cottage, Blue Mts., J.P.* 1402, *Hart!*

Shrub 8 ft. or *tree* 20–50 ft. high. *Leaves* 6–12 cm. l., 4–5·5(–6) cm. br., narrowly elliptical to ovate-lanceolate, obtusely acuminate, base subacute, papery, entire or sparingly wavy-toothed, often bearded between the axils of nerves at base, the larger cross-veins sloping slightly upwards, small veins numerous, forming a network; petioles 1·5–3 cm. l. *Panicles* about 1 dm. l., with several flowers; lateral pedicels jointed at the middle. *Calyx*-tube 5 mm. br. at truncate apex. *Petals* broadly obovate-cordate. *Anthers* about 18 (10–20), 3 mm. l. *Style* about 6 mm. l. *Ovary* usually 6–5-celled.

2. *C. Balbisiana* Ser. ex *DC. Prodr. iii.* 174 (1828); glabrous; young branchlets usually with enlarged nodes; leaves 3-plinerved or 3-nerved with a marginal pair; inflorescences: branches stout, spreading; buds 14–17 mm. l., ovoid, lid broadly conical, acute or apiculate but not acuminate; petals of a rose or rosy-lilac colour, 17–22 mm. l. and br. *C. procera* var. *Balbisiana* *Griseb. loc. cit.*

In fl. during the year; *Bertero* (fide *DC.*); St. Ann, *McNab*! Guys Hill and Union Hill, near Moneague, *Prior*! between Claremont and Moneague, *Fawcett*! Holly Mount, near Ewarton, 2500-3000 ft.; Soho, St. Ann, 1400 ft.; *Harris*! eastern slopes of south end of John Crow (Blake) Mts., *Harris & Britton*! Fl. Jam. 6452, 8403, 8984, 8993, 10,730, 12,024.

Tree, 12-35 ft. high. *Leaves* 8-16 cm. l., 6-8.5 cm. br., generally-broadly elliptical, very shortly and abruptly acuminate, base rounded, parchment-

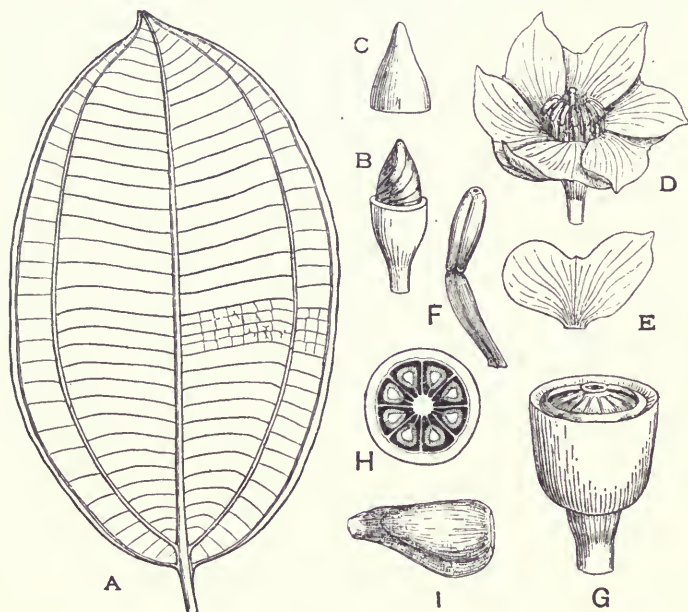


Fig. 134.—*Conostegia Balbisiana* Ser.

- A, Leaf $\times \frac{3}{4}$.
 B, Flower-bud with the calyx-limb removed, nat. size.
 C, Calyx limb removed from B, nat. size.
 D, Flower, nat. size.
 E, Petal, nat. size.
 F, Stamen $\times 3\frac{1}{4}$.
 G, Berry enclosed in the persistent calyx $\times 2$.
 H, Cross-section of ditto $\times 2$.
 I, Seed $\times 30$.

like, entire or sparingly wavy-toothed, often bearded between the axils of nerves at base, larger cross-veins almost horizontal, small veins not numerous, forming a network of somewhat large square spaces; petioles 1.5-3.5 cm. l. *Panicles* 1-1.5 dm. l., with several flowers; lateral pedicels jointed at the middle. *Calyx*-tube 6 mm. br. at truncate apex.

3. *C. Grisebachii* Cogn. in *DC. Monogr. vii.* 700 (1891); glabrous; leaves 3-nerved with an outer obscure nerve; buds 10 mm. l., 6 mm. br., ellipsoidal, lid convex, apex obtuse, subrounded; petals 5, 10-12 mm. l.

March 598! (in Herb. Griseb. & in Herb. Kew.).

Branchlets 4-cornered. *Leaves* 7-11 cm. l., 4-6.5 cm. br., elliptical,

apex abruptly, very shortly, and obtusely acuminate, base rounded, rigid, nerves beneath prominent. *Panicles* subcorymbiform, few-flowered, about 1 dm. l.; pedicels 5-10 mm. l., lateral jointed at the middle. *Anthers* oblong, 3 mm. l. *Style* stout, 6-7 mm. l., narrowing to apex.

4. *C. subhirsuta* DC. *Prodr.* iii. 174 (1828); young branchlets, petioles, nerves on under surface of leaves, and panicle-branches hirsute; leaves 3-plinerved besides a marginal pair and an outer obscure nerve; buds 8-9 mm. l., lid convex, rounded, usually with a short blunt mucro; petals 8-10, white, 7-8 mm. l.—*Macf. Jam.* ii. 67; *Naud. in Ann. Sci. Nat. sér. 3, xvi.* 106 & xviii. t. 3, f. 5; *Griseb. tom. cit.* 253; *Cogn. in Fl. Bras. xiv. pt. 4,* 211, t. 46 & in *DC. Monogr.* vii. 706; *Urb. Symb. Ant.* viii. 760.

In fl. March-Oct.; *Wiles*; *Portland, Macfadyen*; *Waters*! *Guys Hill*, *St. Thomas in Vale, McNab*! *March*! eastern slope of south end *John Crow (Blake) Mts., Harris & Britton*! *Fl. Jam.* 10,721.—*Cuba, Hispaniola, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Trinidad, Mexico, Guatemala, Colombia, Brazil, Paraguay.*

Shrub or tree, 10-18 ft. high; young branchlets somewhat stout, 4-cornered. *Leaves* 12-20 cm. l., 5-9 cm. br., elliptical or oblong-elliptical, apex narrowly acuminate, base narrowed or somewhat rounded, entire or with small wavy teeth, glabrous except nerves beneath, nerves beneath prominent; leaves of a pair sometimes unequal; petioles 2-4 cm. l. *Panicles* 5-1 dm. l., branches corymbiform, 3-10-flowered. *Buds* 6-7 mm. br., obovoid or subglobose, at length glabrous. *Petals* obcordiform. *Anthers* 16-25, oblong, 2 mm. l. *Ovary* 12-15(-20)-celled. *Style* thick, 3-4 mm. l.; stigma peltate.

5. *C. rufescens* *Naud. in Ann. Sc. Nat. sér. 3, xvi.* 108 (1851); young branchlets, petioles, under surface of leaves, and inflorescences with buds with rusty mealy hairs; leaves 3-nerved or 3-plinerved with a marginal pair and occasionally an obscure outer nerve; buds 8-10 mm. l., 5 mm. br., lid conical, somewhat obtuse; petals 6, about 10 mm. l., white.—*Griseb. tom. cit.* 253; *Cogn. tom. cit.* 704. *C. formosa* *Macf. Jam.* ii. 70 (1850).

In fl. March-Sept.; *Wright*! mts., *Swartz*! woods, *St Mary, Macfadyen*! *Guys Hill, St. Thomas in Vale, McNab*! *Cuming*! *Portland, Purdie*! *March*!—*Colombia.*

Shrub, 10-12 ft. high; younger branchlets 4-cornered. *Leaves* 8-12 cm. l., 4-6 cm. br., ovate-elliptical, oblong-elliptical, or somewhat obovate-elliptical, shortly acuminate, base subacute or obtuse, entire or with wavy small teeth, nerves beneath prominent, leaves of a pair unequal; petioles 1-4 cm. l. *Panicle*: branches with 3-7 flowers; pedicels shorter than the flowers, not jointed. *Petals* obliquely obovate, truncate above. *Anthers* 15-18, narrow, 3 mm. l. *Ovary* 6-8-celled. *Style* somewhat thick, 6 mm. l.; stigma subpeltate.

6. *C. montana* *D. Don in Mem. Wern. Soc.* 317 (1823); *DC. Prodr.* iii. 175 (1828); young branchlets, petioles, nerves of leaves beneath, and panicle-branches with minute stellate hairs, later glabrate; leaves 3-plinerved besides a marginal pair and an outer obscure nerve; buds 6-8 mm. l., 3-4 mm. br., lid conical,

bluntly acute; petals 5-6, white, 5-6 mm. l.—*Macf. Jam. ii.* 70; *Naud. tom. cit.* 109; *Griseb. tom. cit.* 254; *Cogn. tom. cit.* 701. *C. alpina* *Macf. Jam. ii.* 72 (1850). *Melastoma montana* *Sw. Prodr.* 69 (1788) & *Fl. Ind. Occ.* 766. Specimen from Swartz in Herb. Mus. Brit. and one in Herb. Stockholm.

In fl. June-Sept.; *Wright! Swartz! Wiles! Catherine's Peak*; woods, St. George; *Macfadyen! March! Blue Mts., J.P.* 1488, *Morris!* also Newcastle, *Hart!* J.P. 2110, *Hart!* below Vinegar Hill, St. George, 3500 ft., *Harris!* below Morse's Gap, Portland, *Miss J. R. Perkins!*

Shrub, 6-16 ft. high; young branchlets bluntly 4-cornered. *Leaves* 7-10 cm. l., oblong-elliptical to oblong-lanceolate, shortly abruptly and obtusely acuminate, base subacute to rounded, subentire, leaves of one pair often unequal, nerves prominent beneath; petioles 1.5-3 cm. l. *Panicles* 4-8 cm. l., secondary branches somewhat corymbiform with 3-5 pedicels, much shorter than the flowers. *Buds:* lid somewhat swelling over the semiglobose calyx-tube. *Petals* obovate, retuse. *Anthers* 14-15 (10-16), 2 mm. l. *Ovary* 5-6-celled. *Style* 3 mm. l., slender; stigma capitate.

7. *C. superba* *Naud. in Ann. Sc. Nat. sér.* 3, xvi. 108 (1851) (Bonpland's specimen seen by Naudin); subglabrous; leaves large, 3-plinerved with a marginal nerve and an obscure outer nerve; buds 6-7 mm. l., 4.5-5 mm. br., lid conical, acute to subacute; petals 5-6, white, 5-6 mm. l.—*Griseb. Fl. Br. W. Ind.* 253; *Cogn. tom. cit.* 701. *C. glabra?* & *C. alternifolia?* *Macf. Jam. ii.* 71 (1850). *C. macrophylla* *Naud. tom. cit.* 112 (fide *Cogn.*). *Melastoma superba* *Bonpl. ined. ex Don in Mem. Wern. Soc.* 317 (1823).

Cuna-Cuna road, near Cornwall Barracks; St. George; woods on road from Morse's Gap; *Macfadyen!* near Petersfield, St. Mary, *McNab! Wilson! March!* north side of Cuna-Cuna Pass, Portland, *Harris & Britton!* Fl. Jam. 10,562.—Central America.

Shrub, 12-16 ft. high; younger branchlets 4-cornered. *Leaves* 1.5-3 dm. l., 1-1.5 dm. br., elliptical to ovate-elliptical, shortly and abruptly acuminate, base obtuse or rounded, subentire or with a few blunt, wavy teeth, parchment-like, nerves and transverse veins very prominent beneath, leaves of a pair usually unequal; petioles 3-5 cm. l. *Panicles* 1-1.5 dm. l., many-flowered; ultimate branches with several flowers umbelliform; pedicels 3-4 mm. l. *Petals* triangular-obovate, retuse. *Anthers* 15-16(-10), 3 mm. l. *Ovary* 5-celled. *Style* slender, 4 mm. l. *Stigma* subcapitellate.

7. CHARIANTHUS Don.

Shrubs, generally glabrous. Leaves leathery, entire, 3-5-nerved. Flowers in terminal paniculate or corymbose cymes; parts in fours. Calyx-limb persistent, obscurely lobed. Petals free but forming a bell-shaped corolla, broadening upwards. Stamens 8, equal, much longer than the petals; anthers opening by a longitudinal chink or by a pore, connective not elongated and without any appendage. Ovary not free, 2-4-celled, with glabrous apex; style very long with blunt stigma. Berry crowned by the limb of the calyx. Seeds pyramidal.

Species 8, natives of the mountains in the West Indies and also found in British Guiana.

Leaves elliptical to ovate, apex blunt. Anthers with one pore at apex. Ovary 2-celled 1. *C. Fadyenii*.
 Leaves narrowly ovate, shortly and obtusely acuminate.
 Anthers with longitudinal chinks. Ovary 4-celled... 2. *C. tinifolius*.

1. *C. Fadyenii* Griseb. *Fl. Br. W. Ind.* 264 (1860); *Cogn. in DC. Monogr. vii.* 717. *Tetrazygia Fadyeni* Hook. *Journ. Bot. i.* 379, t. 12 (1849); *Macf. Jam. ii.* 57. (Fig. 135.)

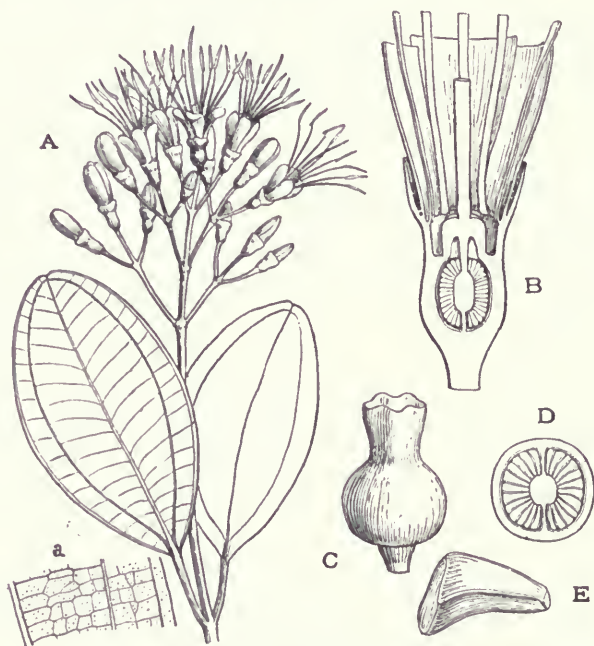


Fig. 135.—*Charianthus Fadyenii* Griseb.

A, Portion of branch with leaves and inflorescence $\times \frac{1}{2}$; a, small portion of lower surface of leaf, enlarged.
 E, Seed $\times 11$.

B, Flower cut lengthwise with petals, stamens, and style cut off, $\times 7$.
 C, Berry $\times 2$.
 D, Ditto cut across $\times 2$.

In fl. Feb.—Sept.; road from Lluidas to St. Thomas in the Vale, *Macfadyen!* Mount Diablo, *McNab!* Pedro district, St. Ann, *Purdie!* *March!* Albion Pen and Friendship, St. Ann, *Prior!* Holly Mount near Ewarton, 2600 ft.; Dolphin Head, 1500 ft.; Peckham, Clarendon, 2500 ft.; rocky woodland, Mulgrave, St. Elizabeth, 1300 ft.; *Harris!* *Fl. Jam.* 6512, 6513, 8883, 8994, 9254, 10,997, 11,181, 11,190, 12,373.

Shrub or tree, 6-30 ft. high, glabrous. *Leaves* 3-8 cm. l., elliptical to ovate, apex blunt, base rounded to acute, 3-plinerved besides an outer obscure nerve, with very minute black dots beneath; petioles 8-12 mm. l.

Panicles 5–10 cm. l.; *pedicels* 8–12 mm. l., jointed below the apex. *Calyx* 5 mm. l., obscurely lobed. *Petals* 4, crimson or purple, narrowly oblong, broadening upwards, with rounded apex, 8–10 mm. l., 2·5–3 mm. br. *Stamens* 8, 11–12 mm. l.; *anthers* 4·5–5 mm. l., with one pore at apex. *Ovary* 2-celled. *Style* 2 cm. l. *Berry* subglobose, 5 mm. thick, 2-celled.

"This is the most beautiful plant I have seen in Jamaica." (Purdie in note on sheet in Hb. Kew.)

"One of the most beautiful flowering shrubs that I have ever met with in my travels, but very difficult to cultivate." (Prior in note on sheet in Hb. Kew.)

2. *C. tinifolius* D. Don in *Mem. Wern. Soc. iv.* 329 (1823); *Cogn. tom. cit.* 715.

McNab.—St. Vincent (?) (Anderson in Herb. Deless.).

Leaves 5–7 cm. l., 2·5–3·5 cm. br., narrowly ovate, shortly and obtusely acuminate, base subacute, 3–5-nerved. *Cymes* 3–4 cm. l., few-flowered; *pedicels* 4–6 mm. l., purple. *Calyx* 5 mm. l., lobes broadly rounded, apex minutely apiculate. *Petals* crimson-purple, 12 mm. l. *Anther-cells* opening by longitudinal chinks. *Ovary* 4-celled. *Style* 16–18 mm. l.

We have not seen a specimen.

8. MICONIA Ruiz & Pav.

Shrubs or trees. Leaves usually opposite. Flowers generally in terminal panicles or corymbs; hermaphrodite (diœcious in *M. rubens*); flower-parts usually in fives (sixes in *M. macrophylla* and *M. dodecandra*, fours in *M. tetrandra*). Calyx-limb truncate or lobed, sometimes bursting irregularly, usually persistent, lobes short. Petals obovate or oblong with obtuse or notched tip (ovate in *M. racemosa*), spreading or reflexed. Stamens twice as many as the petals, but only 4 in *M. tetrandra*; anthers usually with one minute pore at apex, but with a chink in *M. chrysophylla*, broadly 2–4-pored in §5, or with one very large pore in §6; connective not or scarcely prolonged at base, 2-auriculate or 2-tuberculate. Ovary generally adherent, 2–5 celled; ovules numerous. Berry 1–5-celled, with one or more seeds in each cell. Seeds not curved.

Species about 600, natives of the West Indies and tropical America.

Leaves 5–7-nerved, sometimes with 3 or 5 nerves united above the base (3-plinerved or 5-plinerved) with the addition of one or two pairs of nerves from the base.*

Leaves with hairy or powdery covering beneath.

Calyx 5–7 mm. l. Petals 6–8 mm. l.

Leaf-base emarginate or subcordate 1. *M. macrophylla*.

Leaf-base rounded to acute 2. *M. dodecandra*.

* The *marginal* pair of nerves is evenly curved, sometimes indistinct, and occasionally does not reach the apex. The *outer* nerve or vein bounding the network of veins, usually a succession of arches, is *obscure* and sometimes coincides with the margin.

The *marginal* pair which does not reach more than half-way towards the leaf-apex, and the *outer obscure* nerve or vein are not counted in the Key.

- Calyx 1·5-3 mm. l. Petals 1-3 mm. l.
 Leaves sessile or subsessile. Leaf-base subauriculate. Panicle-branches simple, spike-like 6. *M. impetiolaris*.
 Leaves stalked.
 Leaf-base emarginate-cordate. Panicle with flowers on one side only of branches 7. *M. albicans*.
 Leaf-base narrowed. Panicle with flowers crowded on branches 14. *M. elata*.
 Leaves hairy or powdery only on nerves and veins beneath, or glabrous.
 Inflorescence hairy or powdery.
 Calyx 6-7 mm. l. Petals 5 mm. l. 3. *M. furfuracea*.
 Calyx 1·5-3 mm. l. Petals 1-4 mm. l.
 Flowers sessile or subsessile.
 Stem-branchlets powdery or stellate-hairy.
 Leaves 5-nerved Style 6-7 mm. l., apex thicker, truncate 9. *M. laevigata*.
 Leaves 3-plinerved with a marginal pair. Style 4 mm. l.; stigma peltate 10. *M. splendens*.
 Stem-branchlets slightly puberulous or glabrate. Leaves 3-plinerved with a marginal pair. Style 5-6 mm. l.; stigma subpeltate 11. *M. prasina*.
 Inflorescence glabrous or glabrate.
 Flowers sessile or subsessile.
 Flowers more or less on one side or clustered on reduced branches.
 Calyx 2 mm. l. Petals 2-2·5 mm. l. 13. *M. ciliata*.
 Flowers on all sides of spreading branches. Calyx 2·5-3·5 mm. l. Petals 2-3 mm. l. 11. *M. prasina*.
 Flowers shortly stalked. (Marginal pair of nerves rather indistinct.) Calyx 1·5 mm. l. Petals 1-1·5 mm. l. 17. *M. theaezans*.
 Leaves 3-nerved or 3-plinerved.
 Flowers sessile or subsessile.
 Flower-clusters on main axis of inflorescence 4. *M. triplinervis*.
 Flower-clusters on short reduced branches of inflorescence 5. *M. multispicata*.
 Panicle-branches once 2-forked 8. *M. trinervia*.
 Panicle-branches not 2-forked.
 Leaves coppery-coloured, scaly-pitted beneath 12. *M. chrysophylla*.
 Leaves not scaly-pitted beneath.
 Calyx 1·5-2 mm. l.
 Flower-parts in 4's or 5's. Style 1·5-2 mm. l.; stigma peltate, wider than style. Berry 2 mm. br. 15. *M. rubens*.

- Flower-parts in 4's. Style 4 mm. l.;
stigma acute. Berry 4 mm. br. ... 16. *M. tetrandra*.
Flower-parts in 5's. Style 5-6 mm. l.
Berry 4 mm. br. 11. *M. prasina*
Calyx 2-3 mm. l. Flower-parts in 5's. var. *attenuata*.
Style 4 mm. l.; apex truncate. Berry
4-5 mm. br. 18. *M. quadrangularis*.
Flowers with pedicels 8-12 mm. l. Calyx 5 mm. l. 19. *M. rigida*.

§ 1. Flower-parts usually in sixes. Calyx 5-7 mm. l., at length narrower below the shortly lobed limb. Petals obovate-oblong, 6-8 mm. l. Stamens about double the number of petals; anthers long, awl-shaped, curved, with one minute pore at apex; connective not or scarcely prolonged below the cells, at base without appendage or in front sometimes 2-auriculate, at back usually gibbous. (Species 1-3.)

1. *M. macrophylla* Triana in *Trans. Linn. Soc.* xxviii. 103 (1871); *Cogn. in Fl. Bras. xiv. pt. 4*, 239, t. 49 & in *DC. Monogr. vii.* 734; *Urb. Symb. Ant. iv.* 455 & viii. 493. *Chitonia macrophylla* D. Don in *Mem. Wern. Soc. iv.* 319 (1823) (*Melastoma macrophylla* Pavon ms.). *Diplochita serrulata* DC. *Prodr. iii.* 177 (1828); *Griseb. Fl. Br. W. Ind.* 252 (in part).

Masson! Wiles! Moneague, Prior! March! Claverty Cottage, Blue Mts., J.P. 982, Hart! Brandon Hill road, 800 ft., Thompson! near Castleton, 600 ft.; Darliston, 1400 ft.; Hollis' savanna, Clarendon, 2400 ft.; Harris! Fl. Jam. 7639, 8043, 9827, 12,276.—Cuba, Hispaniola, Porto Rico, St. Thomas, S. Cruz, Trinidad, Mexico, tropical S. America.

Shrub or tree, 8-40 ft. high; young branchlets, petioles and panicle-branches densely tomentose. Leaves 1.5-3 dm. l., base emarginate or subcordate, sub-7-plinerved with an outer obscure nerve, puberulous on upper surface at length glabrate, beneath densely and very shortly stellate-velvety, margin distinctly crenulate-serrate; petioles 3-7 cm. l. Bracteoles 6-7 mm. l., very soon falling, white tomentose. Flowers sessile. Calyx stellate-tomentose. Petals whitish, pale yellow, or pink. Filaments hirtellous. Style hairy below, 11-13 mm. l. Berry subglobose, 6 mm. in diam.

2. *M. dodecandra* Cogn. in *Fl. Bras. xiv. pt. 4*, 243 (1887) & in *DC. Monogr. vii.* 740; *Urb. Symb. Ant. viii.* 493. *Melastoma dodecandra* Desr. in *Lam. Encyc. iv.* 46 (1797-98). *M. Tamonea* Sw. *Prodr.* 70 (1788) & *Fl. Ind. Occ.* 783 (excl. syn.). *M. Swartziana* Rich. in *Bonpl. Mélast.* 74, t. 33 (1811). *Diplochita Swartziana* DC. *Prodr. iii.* 177 (1828); *Macf. Jam. ii.* 73. *D. Fothergilla* Macf. *Jam. ii.* 74; *Griseb. Fl. Br. W. Ind.* 251 (as regards specimen from Prior) (non DC.). *D. rosea* Macf. loc. cit. Specimen from Swartz in Herb. Stockholm named by him.

Wright! Liguanea, Broughton! Swartz! Port Royal and St. Andrew Mts.; banks of Rio Grande; Macfadyen! Morse's Gap, Blue Mts., Purdie!

Clifton Mount, St. Andrew, 4000 ft., *Wilson!* Mt. Diablo; Moneague; *Prior!* near Cinchona, J.P. 1075, *Morris!* Shingle Heap, St. George, 2400 ft.; near Vinegar Hill, St. George, 4200 ft.; near Woodcutters' Gap, 4000 ft.; Olive river, Christiana district, 2500 ft.; Peckham, Clarendon; *Harris!* below Hardware Gap, north side, *Harris & Britton!* Fl. Jam. 6358, 6360, 6442, 8241, 10,533, 11,095; below Vinegar Hill, Blue Mts., *Miss J. R. Perkins!*—Cuba, Hispaniola, Martinique, trop. cont. America.

Shrub or tree, 10–50 ft. high; young branchlets, petioles, and panicle-branches densely tomentose. *Leaves* 1–2 dm. l., base subrounded, 5-nerved with an indistinct marginal pair, upper surface glabrous, beneath densely and very shortly stellate-velvety, margin entire or sometimes slightly crenulate; petioles 2–6 cm. l. *Pedicels* 4–10 mm. l. *Bracteoles* 6–7 mm. l., white tomentose, soon falling. *Calyx* white tomentose. *Petals* white veined with crimson, yellowish-white, orange, or scarlet. *Filaments* glabrous. *Style* 10–12 mm. l.; stigma peltate. *Berry* subglobose, 5 mm. in diam.

3. *M. furfuracea* Griseb. *Fl. Br. W. Ind.* 257 (1860); *Triana in Trans. Linn. Soc.* xxviii. 104; *Cogn. in DC. Monogr.* vii. 736. *Mcclastoma furfuraceum* Vahl *Elog. Am.* iii. 13 & *Ic. t.* 22 (1807).

Masson! *Wiles!*—Guadeloupe, Dominica, Martinique, St. Lucia, Venezuela.

Shrub or tree?; young branchlets, petioles, and panicle-branches covered with rusty bran-like hairs. *Leaves* 1–3 dm. l., elliptical, very shortly acuminate, base obtuse to rounded, margin entire, wavy, or with small teeth, glabrous but nerves beneath with brown bran-like hairs, 3-plinerved with a marginal pair, two of a pair unequal; petioles 2–4 cm. l. *Panicle* with short branches; flowers lateral with short (3 mm. l.) pedicels, terminal sessile. *Calyx*: tube slightly furrowed, glabrescent with minute stellate hairs. *Petals* oblong, obliquely retuse, 5 mm. l.

§ 2. Flower-parts usually in fives, small or minute. *Calyx* shortly bell-shaped or sometimes hemispherical. *Petals* obovate, usually obliquely retuse at apex, at length spreading or reflexed. *Anthers* somewhat short, linear, slightly curved, usually slightly narrowed upwards, at apex minutely 1(2)-pored, connective not or scarcely prolonged below the cells, at the base 2-auriculate or 2-appendaged. (Spp. 4–11.)

A. Panicles contracted; flowers sessile, in clusters, either on the main axis or on the much contracted primary branches. (Spp. 4, 5.)

4. *M. triplinervis* Ruiz & Pav. *Syst. i.* 105 (1798); *Cogn. in DC. Monogr.* vii. 767. *M. trinervis* Griseb. *Fl. Br. W. Ind.* 257 (1860) (excl. syn. *Sw.*). *Cremanium trinerve* Macf. *Jam. ii.* 94 (1850).

St. Mary, McNab! Mt. Stewart, Westmoreland; Woodside, St. Mary; *Purdie!* *Wilson!* *Prior!* Toms Cave Wood, Clarendon, 2500 ft.; Mabess valley, Portland, 4000 ft.; *Harris!* Fl. Jam. 10,850, 12,877.—Mexico, Peru.

Shrub, 3-5 ft. high; glabrous; young branchlets 4-cornered and narrowly 2-6-winged, these with nerves of leaves beneath and inflorescence covered more or less with minute stellate hairs. *Leaves* 1·5-2·5 dm. l., elliptical-lanceolate, tapering at both ends, base running into petiole, 3-nerved with an outer obscure nerve; petiole ·5-1 cm. l. *Panicle* 1-1·5 dm. l.; clusters on main axis. *Calyx* 2·5-3 mm. l. *Petals* 2 mm. l., white. *Berry* globose, 3-4 mm. in diam.

5. *M. multispicata* Naud. in *Ann. Sc. Nat.* xvi. 131 (1851); Griseb. *Fl. Br. W. Ind.* 257; Cogn. in *DC. Monogr.* vii. 770. *Cremanium integrifolium* Macf. *Jam.* ii. 93 (1850).

Lapland, St. James, Purdie! Pleasant Valley, Moneague, Prior! Claverty Cottage, Blue Mts., Harris! Tweedside, below Moody's Gap, Blue Mts.; south-eastern slopes of John Crow (Blake) Mts.; Harris & Britton! Fl. Jam. 6333, 10,540, 10,722; St. George, Blue Mts., Miss J. R. Perkins!—Trinidad.

Bushy tree, 18-25 ft. high; young branchlets, petioles, panicle-branches, and calyx densely stellate-tomentose. *Leaves* 1-1·5 dm. l., elliptical to oblanceolate, shortly acuminate, base rounded or obtuse, subtriplinerved with an outer obscure nerve, stellate-tomentose on nerves beneath, otherwise glabrous; petiole 1-2 cm. l. *Panicle* ·5-1 dm. l.; clusters on very short, reduced branches. *Calyx* 3-3·5 mm. l. *Petals* broadly obovate, 2-3 mm. l. *Berry* black, broadly subglobose, 5-7 mm. in diam.

B. Panicles with long spreading branches; branches interruptedly spike-like with clusters of sessile flowers. Leaves sessile or subsessile, subamplexicaul, auriculate.

6. *M. impetiolaris* D. Don in *Mem. Wern. Soc.* iv. 316 (1823); Macf. *Jam.* ii. 83; Griseb. *Fl. Br. W. Ind.* 256; Cogn. in *DC. Monogr.* vii. 775; Urb. *Symb. Ant.* iv. 457 & viii. 493. *M. macrophylla* Macf. *Jam.* ii. 84 (1850) (non Triana). *Melastoma impetiolaris* Sw. *Prodr.* 70 (1788) & *Fl. Ind. Occ.* 788; Vahl *Eclog.* iii. 22, *Ic. t.* 25; Rich. in *Bonpl. Mélast.* 64, *t.* 29. Specimen from Swartz in Herb. Mus. Brit. and in Herb. Stockholm.

Browne! (specimen from Linnæus in Herb. Stockholm), Wright! Broughton! Swartz! Bath; Port Royal Mts.; Macfadyen! St. Mary; Moneague; McNab! Distin! Seaford Town, Westmoreland, Purdie! St. Thomas in Vale, Prior! March! Claverty Cottage, Blue Mts., J.P. 2020, Hart! near Troy, 1500 ft.; Peckham, Clarendon, 2500 ft.; Harris! Fl. Jam. 8558, 11,096.—Cuba, Is. of Pines, Hispaniola, Porto Rico, St. Thomas, St. Cruz, St. Eustache, Montserrat, Guadeloupe, Dominica, trop. cont. America.

Shrub or tree, 8-25 ft. high; young branchlets, panicle-branches, under surface of leaves, and calyx densely stellate-tomentose. *Leaves* 1·5-3(-5) dm. l., long and narrowly elliptical, shortly and acutely acuminate, margin entire or wavy with minute teeth, 3-plinerved with union of nerves close to base, and with 1 or 2 marginal pairs, on upper surface glabrous or occasionally with a few hairs at base of midrib. *Panicles* pyramidal, 1·5-2·5 dm. l. *Calyx* shortly lobed, 2·5-3 mm. l. *Petals* white, 2-3 mm. l. *Style* 5-6 mm. l. *Berry* globose, 4-5 mm. in diam., at first scarlet, at length blue.

- C. Panicles pyramidal, primary branches twice or thrice forked, branchlets with the flowers on one side. (Spp. 7, 8.)

7. *M. albicans* Triana in *Trans. Linn. Soc.* xxviii. 116 (1871); *Cogn. in DC. Monogr.* vii. 785. *M. holosericea* DC. *Prodr.* iii. 181 (1828); *Macf. Jam.* ii. 79; *Griseb. Fl. Br. W. Ind.* 256. *M. rufescens* Macf. *Jam.* ii. 80 (1850) (non DC.). *Melastoma albicans* Sw. *Prodr.* 70 (1788) & *Fl. Ind. Occ.* 786. *M. holosericea* Vahl *Eclog.* i. 42 (1796); *Bonpl. Mélast.* 52, 53, tt. 23, 24 (non L. nec Sw.). Specimens named by Swartz in Herb. Mus. Brit. and Herb. Stockholm.

Masson! Swartz! St. Thomas in Vale, Macfadyen! St. Elizabeth, McNab! Purdie! Wulfschlaegel; Moneague; Linstead; Prior! Marsh! Bull Head, J.P. 1515, Hart! also Fawcett! also Harris! Prospect Hill, near Castleton, 2000 ft., Thompson! Cinchona, Watt! Peckham, Clarendon, 2500 ft., Harris! Fl. Jam. 7952, 8464, 10,073, 11,205, 12,269.—West Indies, trop. cont. America.

Shrub, 6–15 ft.; young branchlets, petioles, under surface of leaves, panicle-branches, and calyx densely covered with a white tomentum of minute stellate hairs and long white adpressed hairs. *Leaves* 6–14 cm. l., ovate-elliptical or oblong-elliptical, apex a short pointed tip, base emarginate-cordate, upper surface of young leaves covered with stellate hairs, at length glabrate and dark-coloured, beneath white or grey, tomentose, 3-plinerved with a marginal pair, parchmenty; petioles 5–1.5 cm. l. *Panicles* about 1 dm. l., terminal and also sometimes axillary. *Flowers* sessile. *Calyx* 2.5–3 mm. l., 5-toothed. *Petals* 2.5 mm. l., white or yellowish. *Style* 4–5 mm. l.; stigma funnel-shaped. *Berry* 4–5 mm. in diam., blue.

M. eriodonta DC. *Prodr.* iii. 185 (1828) is cited by Cogniaux in *Fl. Bras.* xiv. pt. 4, 300 and in *DC. Monogr.* vii. 793 as occurring in Jamaica collected by de Tussac.

We have not seen any specimen from Jamaica, nor does the species occur in any of the West Indian Islands, being known only from Guiana, New Grenada, and Bolivia.

The leaves are 3-nerved, 1–3 dm. l., at length glabrous on both sides. The flowers are crowded on one side of the panicle-branches. The branchlets are terete, stellate-tomentose.

8. *M. trinervia* D. Don ex Loud. *Hort. Brit.* 174 (1830); Triana in *Trans. Linn. Soc.* xxviii. 106 (1871) (non Griseb. nec Cogn.); Fawc. & Rendle in *Journ. Bot.* lxiv. 104. *M. scorpioides* Naud. in *Ann. Sc. Nat. sér.* 3, xvi. 243 (1851); *Cogn. in Fl. Bras.* xiv. pt. 4, 283 & *DC. Monogr.* vii. 782. *M. anceps* Naud. *tom. cit.* 150 (1851). *Melastoma trinervia* Sw. *Prodr.* 69 (1788) & *Fl. Ind. Occ.* 774. *M.?* scorpioides Schlecht. & Cham. in *Linnaea* v. 564 (1830). Specimen from Swartz in Herb. Stockholm.

Mountains, Swartz! Troy, 2000 ft., Harris!—Trop. cont. America.

Shrub or *tree*, about 15 ft. high; youngest branchlets alternately very compressed and 2-edged, densely covered together with petioles and inflorescence with stellate or scaly hairs. *Leaves* 1.5–2.5 dm. l., oblong-elliptical or obovate-elliptical, shortly and acutely acuminate, base decurrent,

3-plinerved, lateral nerves near margin, without an outer obscure nerve, on upper surface glabrous, beneath with minute stellate or scaly hairs, membranous; petioles laterally compressed, 1-2 cm. l. Panicles 1.5-2.5 dm. l., branches short, once 2-forked, flowers in 2 series on one side of the branch, sessile. Calyx covered with stellate hairs, 2 mm. l., limb 5-toothed. Petals 2.5 mm. l. Style 6 mm. l., slightly thickened at apex. Berry subglobose, 5 mm. in diam.

D. Panicles pyramidal, occasionally subcorymbiform. Flowers not wholly on one side of panicle-branchlets. (Spp. 9-11.)

9. *M. lævigata* DC. *Prodr.* iii. 188 (1828); *Griseb. Fl. Br. W. Ind.* 257 (in part); *Cogn. in DC. Monogr.* vii. 798; *Urb. Symb.*



Fig. 136.—*Miconia lævigata* DC.

A, Portion of branch with leaf and inflorescence $\times \frac{1}{3}$.
B, Flower $\times 4$.

C, Stamens $\times 8$.
D, Calyx and ovary cut lengthwise $\times 6$.
E, Fruit cut across $\times 6$.

Ant. iv. 457 & *viii.* 494. *Melastoma laevigata* Linn. *Syst.* 1022 (1759) * & *Sp. Pl. ed.* 2, 559. *M. foliis...ramulis purpurascens* Browne *Hist. Jam.* 219; *Sw. Obs.* 176; *Bot. Reg. t.* 363. *M. grossularioides* Mill. *Dict. ed.* 8 (1768). *M. pendulifolia* Bonpl. *Mélast.* 79, *t.* 35 (1811). *M. pyramidalis* Desr. in *Lam. Encyc. iv.* 53 (1797-8); *Bonpl. Mélast.* 48, *t.* 21. *Grossularia fructu non spinosa, malabathri foliis oblongis, floribus herbaceis racemosis, fructu nigro* Sloane *Cat.* 165 & *Hist. i.* 39. Type from Browne in Herb. Linn. named *M. laevigata* by Linnaeus, another specimen of the same species from Browne named *M. discolor* by Linnaeus. (Fig. 136.)

Sloane Herb. *vi.* 97! *Houstoun!* *Wright!* *Broughton!* *Shakespear!* *Browne!* *Swartz!* *Distin!* St. Thomas in Vale; St. Mary; *McNab!* *Macfadyen!* *Waters!* *Purdie!* *Gosse!* *Wilson!* *Moneague, Prior!* *March!* J.P. 959, 1389, *Morris!* near Gordon Town, *Ball!* Newcastle, J.P. 1435, *Hart!* Prospect Hill, near Castleton, 2000 ft., *Thompson!* Farm Hill, Blue Mts., 3500 ft.; near Troy, 2000 ft.; Holly Mount, Mt. Diablo, 2600 ft.; Peckham, Clarendon, 2300 ft.; *Harris!* Fl. Jam. 6275, 7949, 8781, 8902, 9364, 11,078; Morse's Gap; Content road, Blue Mts., 1026; *Miss J. R. Perkins!*

Shrub, 6-10 ft. high; young branchlets, petioles, panicle-branches, and calyx with minute stellate hairs or powdery scales. *Leaves* 1-2 dm. l., ovate, oblong-ovate, or lanceolate, long acuminate, base rounded to subacute, glabrous except nerves and veins beneath powdery, 5-nerved often with an obscure nerve, margin entire or sometimes with minute teeth, membranous; petioles 1-3 cm. l. *Panicle* .5-1.5 dm l. *Flowers* usually sessile, somewhat crowded. *Calyx* 3-2 mm. l. *Petals* 4-3 mm. l., white or pale pink. *Style* 6-7 mm. l., thickened and truncate at apex. *Berry* globose, blue or black, slightly 10-ribbed, 3 mm. in diam. *Seed* obovoid, light brown, .7 mm. l.

10. *M. splendens* Griseb. *Fl. Br. W. Ind.* 256 (1860); *Triana in Trans. Linn. Soc. xxviii.* 107; *Cogn. in DC. Monogr. vii.* 800. *M. elliptica* Macf. *Jam. ii.* 88 (1850). *M. obovalis* Naud. in *Ann. Sc. Nat. xvi.* 183 (1851); *Cogn. tom. cit.* 803. *Melastoma foliis ovato-acuminatis &c.* Plum. *Pl. Amer. (Burm.)* 130, *t.* 140. *M. splendens* Sw. *Prodr.* 70 (1788) & *Fl. Ind. Occ.* 789. Specimen from Swartz in Herb. Stockholm named by him.

Masson! *Swartz!* *Macfadyen!* Ginger Hill, *Purdie!* *Moneague, Prior!* *March!* Hopeton, Westmoreland, 1000 ft., *Harris!* Castleton, *Thompson!* Fl. Jam. 7267.—Hispaniola, Porto Rico.

Shrub, 6-10 ft. high; young branchlets, petioles, panicle-branches and calyx powdery or with minute stellate hairs. *Leaves* 2-3 dm. l., 9-12(-16) cm. br., elongate-elliptical tapering to both ends, apiculate, base acute running down into the petiole, generally 3-nerved or 3-plinerved with a marginal pair evident or obscure which scarcely reaches the apex, glabrous except that the nerves beneath are more or less powdery; margin entire or wavy with minute teeth, papery; petioles 1.5-5 cm. l. *Panicles* pyramidal, 1-2 dm. l. *Flowers* sessile or subsessile, clustered, parts in

* Sloane's fig. cited as a synonym refers to a specimen of *Zizyphus Chloroxyton* Oliv. (see p. 64).

fives. *Calyx* 2-3 mm. l., shortly lobed, limb not persistent. *Petals* 2-3 mm. l. *Style* 4 mm. l.; stigma peltate. *Berry* subglobose, 3 mm. in diam.

Swartz describes the leaf as being "5-nerved, not counting the marginal pair"; the leaves of his specimen are of the usual type near the inflorescence, 3-nerved or 3-plinerved with 1 marginal pair.

11. *M. prasina* DC. *Prodr.* iii. 188 (1828); *Macf. Jam.* ii. 86; *Griseb. Fl. Br. W. Ind.* 257; *Triana in Trans. Linn. Soc.* xxviii. 109; *Cogn. in DC. Monogr.* vii. 805; *Urb. Symb. Ant.* iv. 458 & viii. 495. *Melastoma prasina* Sw. *Prodr.* 69 & *Fl. Ind. Occ.* 777. *M. lævigata* Aubl. *Pl. Guian.* i. 412, t. 159 (1775) (non Linn.). Specimens from Swartz from Hispaniola in Herb. Mus. Brit. and from Jamaica in Herb. Stockholm.

Swartz! *Wiles!* Marsh near Grosmond, St. Elizabeth, *McNab!* Potosi, near Bath; *Moortown!* *Macfadyen!* *Wilson!* near Moneague, *Prior!* *March!* Spring Hill, Portland, 2200 ft.; Olive river, Christiana district, 2600 ft.; near Troy, 2000 ft.; *Harris!* Prospect Hill, near Castleton, 2000 ft.; Golden Spring, 800 ft.; *Thompson!* *Fl. Jam.* 6653, 7953, 7955, 8036, 8243, 9363.—Cuba, Is. of Pines, Hispaniola, Porto Rico, Tortola, Grenada, Trinidad, Margarita, trop. cont. America.

Shrub or *tree*, 8-20 ft. high; young branchlets slightly puberulous or glabrate. *Leaves* 1-2 dm. l., 4-7 cm. br., narrowly elliptical to lanceolate, acute or somewhat acuminate, narrowed to an acute base, subentire, glabrous, 3-plinerved with a marginal pair, transverse veins prominent; petiole usually somewhat 2-winged, .5-1.5 cm. l. *Panicle* more or less powdery, pyramidal, .5-1.5 dm. l., many-flowered. *Calyx*: limb-margin wavy or shallowly toothed, 3-3.5 mm. l. *Petals* obovate, white or yellowish-white, or pinkish, rarely pale pink, 2-3 mm. l. *Style* 5-6 mm. l.; stigma subpeltate. *Berry* black-purple, 10-ribbed, to 4 mm. thick.

Var. *attenuata* Cogn. *tom. cit.* 806; leaves 8-15 cm. l., 3-5 cm. br., somewhat rigid, scarcely acuminate, entire, 3-plinerved occasionally with an outer obscure nerve, petiole .5-1 cm. l.; calyx densely powdery.—*M. attenuata* DC. *Prodr.* iii. 186 (1828). *M. palustris* Macf. *Jam.* ii. 89.

Manchester, *Purdie!* St. Elizabeth, *McNab!* Moneague, *Prior!* near Troy, 2000 ft.; Savannah, Upper Clarendon, 2500 ft.; Kellits, Clarendon, 2000 ft.; *Harris!* *Fl. Jam.* 8703, 9405, 11,107, 11,155; between Grange Hill and Glasgow, *Mrs. E. G. Britton*, 2884! near Troy, 2000 ft., *Miss J. R. Perkins*, 1412!

- § 3. Flower-parts in fives; flowers minute, sessile. *Calyx* bell-shaped; limb truncate or obscurely 5-toothed. *Petals* obovate, rounded at apex. *Anthers* rather short, linear, straightish, with 1 clink, connective shortly prolonged below the cells, without an appendage at base.

12. *M. chrysophylla* Urb. *Symb. Ant.* iv. 459 (1910) (only as regards the synonyms, not the Porto Rico plant) viii. 760 & in *Fedde Rep.* xvii. 406 (1921). *Miconia fulva* DC. *Prodr.* iii. 180 (1828); *Cogn. in DC. Monogr.* vii. 857 (for the most part).

M. discolor Macf. *Jam. ii.* 85 (1850). *Melastoma chrysophylla* L. C. Rich. in *Act. Soc. Hist. Nat. Paris i.* 109 (1792). *M. fulva* L. C. Rich. in *Bonpl. Mélast.* 23, t. 11 (1807). *Eurychaenia punctata* Griseb. *Fl. Br. W. Ind.* 259 (1860).

Near Moneague, Prior!—Trinidad, Guiana, Bolivia, Brazil.

Shrub, 6–16 ft. high; young branchlets acutely 3–4-cornered or sometimes somewhat 2-edged, not winged. *Leaves* 1–2.5 dm. l., 2–5 cm. br., the upper usually 3 or 4 together in a whorl, elsewhere opposite, narrowly elliptical to oblanceolate or lanceolate, narrowly acuminate, narrowing to base, usually coppery-coloured, beneath covered with minute glassy stellate scales attached at the depressed centre giving the appearance of a pitted surface, 3-plinerved or 9-nerved with an outer obscure nerve, midrib on upper surface narrowly impressed, transverse nerves beneath flat, margin wavy-crenate; petioles .5–1 cm. l. *Panicles* 10–13 cm. l., branches opposite or whorled. *Calyx* 2 mm. l. *Petals* 1.8–2 mm. l., yellowish. *Ovary* 3-celled. *Style* 4 mm. l. *Berry* 2.5–3 mm. in diam.

M. punctata D. Don is reported from Jamaica on the authority of the specimen of *M. chrysophylla* Urb. from Prior cited above and named on the sheet in Herb. Kew. by Grisebach *Eurychaenia punctata* Griseb., and the identification by Grisebach of *M. discolor* Macf. as a synonym. However, *M. punctata* is easily distinguished from *M. chrysophylla* Urb. by the anthers opening by pores, leaves entire, the midrib on upper surface somewhat prominent in a shallow furrow, the transverse nerves beneath usually prominent, and petals larger, 2.5–3 mm. l. It is known from Cuba, Hispaniola, Porto Rico, Guatemala, Bolivia.

§ 4. Flower-parts in fives; flowers small, sessile. *Calyx* bell-shaped, limb truncate or obscurely lobed. *Petals* obovate, apex obliquely retuse. *Anthers* short, thickish, oblong, straight or slightly curved, apex obtuse and with one minute pore, connective not produced below the cells, without appendage.

13. *M. ciliata* DC. *Prodr. iii.* 179 (1828); *Cogn. in DC. Monogr. vii.* 867. *M. racemosa* Naud. in *Ann. Sc. Nat. xvi.* 153 (1851) (in part). *M. racemosa* var. *ciliata* Griseb. *Fl. Br. W. Ind.* 258. *M. racemosa* var. *Urbaniana* Cogn. in *Urb. Symb. Ant.* v. 448 (1908). *Melastoma octandria* Mill. *Dict.* (1768) (non *M. octandra* L.). *M. ciliata* L. C. Rich. in *Act. Soc. Hist. Nat. Paris* 1792, 109 & in *Bonpl. Mélast.* 62, t. 28 (excl. syn.).

Purdie! Guys Hill, Moneague, Prior! *March*! J.P. 2102, *Morris*! Prospect Hill, near Castleton, 2000 ft., *Thompson*! near Cinchona, *Watt*! Kellits, Clarendon, 2000 ft., *Harris*! *Fl. Jam.* 7954, 10,074, 11,154.

Shrub, 9–16 ft. high; young branches more or less 4-furrowed, glabrous. *Leaves* 1–2.5 dm. l., narrowly elliptical, oblong-elliptical, or ovate to lanceolate, narrowed to apex or acuminate, base blunt to rounded, 5-nerved with an obscure marginal pair, glabrous on both sides, margin with minute teeth and ciliate, papery; petioles 1–4 cm. l. *Panicles* 5–12 cm. l.; branches opposite, 2- or 3-forked; flowers more or less on one side, or clustered on reduced branches; bracteoles minute, persistent. *Calyx* 2 mm. l. *Petals* pink, 2–2.5 mm. l. *Style* 2 mm. l. *Berry* 3–4 mm. in diam.

§ 5. Flower-parts in fives, in *M. tetrandra* in fours; flowers small or minute. Calyx 1-2 mm. l., bell-shaped, truncate or very shortly lobed, lobes outside very often minutely toothed or tuberculate. Petals obovate or oblong, apex rounded or slightly notched. Anthers short, usually somewhat wedge-shaped, straight, apex truncate, with 2 pores (4 in *M. theæzans*), connective more or less prolonged below the cells, base without appendage or with 2 tubercles. (Spp. 14-17.)

14. *M. elata* DC. *Prodr.* iii. 182 (1828); *Macf. Jam.* ii. 81; *Cogn. in DC. Monogr.* vii. 903. *M. eurychænioides* Griseb. in *Mem. Am. Acad. N.S.* viii. 185 & *Cat. Cub.* 99 (in part). *Grossulariæ* . . . folio maximo &c. *Sloane Cat.* 164 & *Hist.* ii. 84, t. 196, f. 1. *Melastoma elata* Sw. *Prodr.* 70 (1788) & *Fl. Ind. Occ.* 781.

Sloane Herb. vi. 90! *Wright!*—Cuba.

Tree, 30-40 ft. high; young branchlets 4-cornered and 4-furrowed, together with petioles, panicles, and calyx densely covered with minute rusty scales or stellate hairs. *Leaves* 1-3 dm. l., elliptical to oblong-elliptical, abruptly and shortly acuminate, narrowed to base, margin wavy with small teeth, beneath stellate-tomentose, 5-nerved with an obscure marginal pair, nerves and veins very prominent beneath; petioles 2-4 cm. l. *Panicles* 1-1.5 dm. l., pyramidal; flowers sessile crowded; parts in fives. *Calyx* 2 mm. l., obscurely toothed. *Petals* about 1.5 mm. l. *Style* 2, at length 4 mm. l. *Berry* 10-ribbed, globose, 4-5 mm. in diam.

15. *M. rubens* Naud. in *Ann. Sc. Nat.* xvi. 169 (1851); *Cogn. in DC. Monogr.* vii. 921. *M. microbotrya* Naud. *tom. cit.* 195 (1851). *Melastoma rubens* Sw. *Prodr.* 71 (1788) & *Fl. Ind. Occ.* 797. *Cremanium rubens* DC. *Prodr.* iii. 191 (1828); *Macf. Jam.* ii. 91; *Griseb. tom. cit.* 261 (in part). Types in Herb. Mus. Brit. and Herb. Stockholm.

Wright! *Swartz!* *Wiles!* *Bancroft!* *Macfadyen!* *McNab!* near Radnor, *Purdie!* 4000 ft., *Wilson,* 841! *March,* 594! *Albion,* St. Ann, *Prior!* *Catherine Peak,* 4500 ft., *Eggers,* 3622 (in part)! above Portland Gap, 5800 ft., *Harris!* *Fl. Jam.* 6340; *Blue Mt. Peak,* *G. E. Nichols,* 108!—Venezuela.

Shrub, 5-10 ft., glabrous; branchlets 4-cornered, furrowed, reddish. *Leaves* 6-9 cm. l., elliptical, apex acuminate with a short narrow tip, base acute, 3-nerved or 3-plinerved with an outer obscure nerve, veins pellucid, submembranous, network of veins with comparatively few meshes, margin minutely toothed; petioles 1-1.5 cm. l. *Panicle* pyramidal, 4-7 cm. l. *Flowers* dioecious, subsessile; parts in fours or fives. *Calyx* 1.5-2 mm. l., drying black in herbarium specimens. *Petals* white, .7 mm. l., obovate-roundish. *Style* 1.5-2 mm. l.; stigma peltate, much wider than style. *Berry* globose, 2 mm. in diam.

16. *M. tetrandra* D. Don in *Loud. Hort. Brit.* 174 (1830); *Cogn. in DC. Monogr.* vii. 922; *Urb. Symb. Ant.* iv. 460. *Melastoma tetrandra* Sw. *Prodr.* 72 (1788); *Fl. Ind. Occ.* 795 & *Ice.* t. 13. *Tetrazygia tetrandra* DC. *Prodr.* iii. 172 (1828); *Macf.*

Jam. ii. 56. *Cremanium tetrandrum Griseb. Fl. Br. W. Ind.* 262 (1860). Specimens from Swartz in Herb. Mus. Brit. and in Herb. Stockholm.

Peaks of Blue Mts., Swartz! Vinegar Hill, on main ridge of Blue Mts., 4300 ft., also below on north side, 3500 ft., Harris! Fl. Jam. 6408; Trafalgar, Blue Mts., Miss J. R. Perkins!—Cuba, Porto Rico, Guadeloupe, Dominica, Grenada, Trinidad.

Tree 20–50 ft., or sometimes a *shrub* 4–13 ft. high; panicle-branches and calyx with rusty-brown powdery covering. *Leaves* 1–2 dm. l., elliptical or ovate or narrowly ovate-elliptical, shortly acuminate, base usually rounded, often emarginate, 3-plinerved with an obscure nerve hidden by the revolute entire margin, nerves beneath with minute scaly hairs with stellate margin, glabrate on the upper surface, somewhat leathery; petioles 2–3 cm. l. *Panicle* pyramidal, 1–1.5 dm. l. *Flowers* sessile or subsessile; parts in fours. *Calyx* 1.5–2 mm. l., slightly constricted below the toothed or subtruncate limb. *Petals* white, 1.8 mm. l. *Stamens* 4(–5). *Style* 4 mm. l.; stigma acute. *Berry* black, globose, 4 mm. in diam.

17. *M. theezans Cogn. in Fl. Bras. xiv. pt. 4*, 419 (1888), and in *DC. Monogr. vii.* 923 (and p. 914 under *M. vulcanica Naud.* so far as the Jamaican specimen is concerned); *Urb. Symb. Ant. vi.* 106. *M. milleflora Naud. in Ann. Sc. Nat. xvi.* 237 (1851); *Triana in Trans. Linn. Soc. xxviii.* 130. *Melastoma theezans Bonpl. Mélast. 17, t. 9* (1807). *Cremanium theezans DC. Prodr. iii.* 194 (1828). *C. rubens Griseb. Fl. Br. W. Ind.* 261 (1860) (in part, non *DC.*).

Macfadyen! Purdie! Cinchona, 5000 ft., J.P. 650, Morris! also Hart! also Harris! Fl. Jam. 9187; *Cinchona*, 5000 ft., G. E. Nichols, 134! Clyde road, near Cinchona, Miss J. R. Perkins, 1217!—Tropical S. America.

Shrub, 4–16 ft. high, glabrous. *Leaves* 6–12 cm. l., narrowly elliptical, acuminate, base acute, 3-nerved or sub-3-plinerved with a marginal pair rather indistinct and an outer obscure nerve sometimes coinciding with the margin, veins usually pellucid but the transverse parallel veins usually not pellucid, papery, network of veins with comparatively numerous meshes, margin sometimes minutely toothed; petioles 1–2 cm. l. *Panicle* pyramidal, 5–6 cm. l.; pedicels short or almost wanting. *Flower-parts* in fives. *Calyx* 5-lobed, 1.2–1.5 mm. l., usually drying yellow in herbarium specimens. *Petals* yellowish-white, obovate-roundish, 1–1.5 mm. l. *Anthers* with 4 pores. *Style* 2.5–3 mm. l., apex thick. *Berry* globose, blue, 2–2.5 mm. in diam.

This species is the food-plant, in the Blue Mts., of the very beautiful moth *Urania sloanei*, at any rate near Cinchona, where it was formerly very abundant. Gosso mentions the Avocado Pear as the food-plant in the neighbourhood of Bluefields.

§ 6. Flower-parts in fives. Calyx 2–5 mm. l. Petals obovate, 2–5 mm. l. Stamens twice as many as petals. Anthers short, obovoid or wedge-shaped, with one very large pore prolonged downwards as a chink. Berry subglobose, 4–5 mm. in diam. (Spp. 18, 19.)

18. *M. quadrangularis Naud. in Ann. Sc. Nat. xvi.* 197 (1851); *Cogn. in DC. Prodr. vii.* 933. *Melastoma quadrangulare*

Sw. Prod. 69 (1788) & *Fl. Ind. Occ.* 770. *Chænopleura quadrangularis*. *Macf. Jam. ii.* 96 (1850). *Pleurochænia quadrangularis* *Griseb. Fl. Br. W. Ind.* 260 (1860). Specimen from Swartz in Herb. Mus. Brit. & in Herb. Stockholm.

In fl. Feb.-May; Blue Mts.; *Swartz!* *Wiles!* Blue Mts. range, *Macfadyen!* *McNab!* Portland Gap, *Purdie!* *Wilson!* *March!* Blue Mt. Peak, *Prior!* Cinchona, 5000 ft., J.P. 651, *Morris!* also *Hart!* near Vinegar Hill, 4000 ft.; near Woodcutters' Gap, 4000 ft.; *Harris!* *Fl. Jam.* 6357, 6434; Catherine Peak, 4000 ft., *Eggers,* 3600! Clyde stream, *Miss J. R. Perkins!*

Shrub or *tree*, 12-20 ft. high; branchlets acutely 4-cornered, glabrous. *Leaves* 6-15 cm. l., oblong-lanceolate or lanceolate, acuminate, base sub-acute, 3-nerved with an outer obscure nerve, somewhat rigid; petioles 1-2 cm. l. *Panicles* glabrous, pyramidal, 5-8 cm. l.; branches close-together, ascending; pedicels wanting. *Flower-parts* in fives. *Calyx* 2-3 mm. l. *Petals* white with a yellowish tinge, 2-3 mm. l. *Style* 4 mm. l.; stigma thick, truncate. *Berry* glabrous, 4-5 mm. in diam., purple.

19. *M. rigida* *Triana in Trans. Linn. Soc. xxviii.* 130 (1871); *Cogn. in DC. Monogr. vii.* 929; *Urb. Symb. Ant. viii.* 497. *Melastoma rigida* *Sw. Prodr.* 69 (1788); *Fl. Ind. Occ.* 768 & *Ic. ined. t.* 67. *Cremanium rigidum* *Macf. Jam. ii.* 93 (1850). *Pleurochænia rigida* *Griseb. Fl. Br. W. Ind.* 260 (1860). Specimens named by Swartz in Herb. Mus. Brit. and Herb. Stockholm.

Blue Mts.; *Wright!* *Masson!* *Swartz!* *Macfadyen!* *McNab!* John Grant Peak, Blue Mts., J.P. 1035, *Hart!* Blue Mt. Peak, *Morris!* also at 7000 ft., *Harris!* *Fl. Jam.* 6337.—Hispaniola.

Shrub, 6-12 ft. high; young branchlets, petioles, panicle-branches, and calyx covered with powdery scales or hairs, associated on inflorescence and calyx with glandular hairs. *Leaves* 8-12 cm. l., elliptical to ovate-elliptical, base rounded or emarginate, 3-nerved with an outer obscure nerve, powdery-sealy on the nerves and veins, otherwise glabrous, margin with very minute teeth, rigid; petioles 1.5-3 cm. l. *Panicle* pyramidal, 1-2 dm. l.; pedicels 8-12 mm. l. *Calyx* at length constricted below limb, about 5 mm. l. *Petals* white, 4-5 mm. l. *Style* 4 mm. l. *Berry* brown, sealy, hairy, 5 mm. in diam.

9. TETRAZYGIA L. C. Rich.

Shrubs or small trees, usually scurfy with soft scales. Leaves stalked, 3-5-nerved. Flowers small, many, in terminal panicles or corymbs, white or tinged with purple. Calyx: tube constricted above the ovary, limb spreading, 4-5-lobed. Petals 4-5, obovate, obtuse. Stamens twice as many as the petals, equal; anthers with one pore, connective not prolonged below the cells. Ovary half-adherent, 3-6-celled; style narrowing to a stigmatic point. Berry crowned by the limb of the calyx. Seeds numerous, minute.

Species 18, natives of the West Indies, one also occurring in British Guiana.

Parts of flowers in fives.

Leaves elliptical to elliptical-lanceolate, 3-plinerved... 1. *T. pallens*.

Leaves ovate, 3-nerved 2. *T. ovata*.

Parts of flowers in fours.

Plant hirsute..... 3. *T. hispida*.

Plant not hirsute.

Leaves ovate..... 4. *T. albicans*.

Leaves narrowly lanceolate 5. *T. angustifolia*.

1. *T. pallens* Cogn. in *DC. Monogr. vii.* 724 (1891). *T. elæagnoides* Hook. in *Bot. Mag. t.* 4383 (1848) (non *DC.*). *T. angustiflora* Griseb. *tom. cit.* 254 (1860) (in part). *Melastoma pallens*

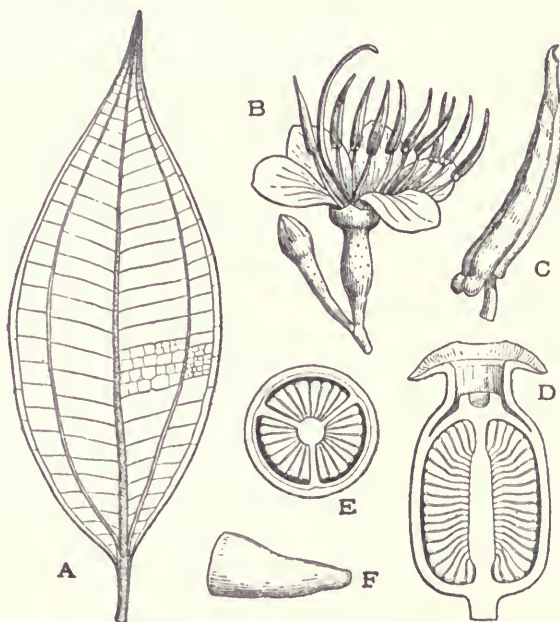


Fig. 137.—*Tetrazygia pallens* Cogn.

A, Leaf $\times \frac{1}{2}$.

B, Flower and bud $\times 1\frac{1}{2}$.

C, Anther $\times 4$.

D, Fruit cut lengthwise $\times 2\frac{1}{2}$.

E, Fruit cut across $\times 2\frac{1}{2}$.

F, Seed $\times 10$.

Spreng. Syst. ii. 296 (1822). *Diplochita?* *angustiflora* Benth. *Pl. Hartw.* 263 (1846). *Harrera gerascanthoides* Macf. *Jam. ii.* 61 (1850). *H. trinervis* Macf. *Jam. ii.* 63 (1850). (Fig. 137.)

In fl. May–Nov.; Masson! Port Royal Mts. (Salt Hill; Green Valley) Macfadyen! Waters! McNab; St. Thomas in Vale; Golden Valley, St. Andrew; Purdie! near Stony Hill, Hartweg, 1539! Wilson; Wullschlaegel; March! near Moneague, Prior! Cherry Garden, Liguanea,

E. Campbell! Stony Hill, *Jenman!* also *Fawcett & Harris!* Halls Delight, Port Royal Mts.; near Troy, 2000 ft.; N.E. of Dolphin Head; Peckham, Clarendon, 2500 ft.; between Constant Spring and Bardowie, 800 ft.; *Harris!* Montego Bay, *McCatty!* Fl. Jam. 5512, 7462, 8744, 10,316, 10,961, 11,176, 12,039.—Cuba, Dominica.

Tree, 20–60 ft. high; younger branchlets, under surface of leaves, petioles, inflorescence with calyx grey tomentose with minute stellate or scaly hairs. *Leaves* 6–15 cm. l., 3–6.5 cm. br., elliptical to elliptical-lanceolate, shortly or long acuminate, base acute to subrounded, 3-plinerved with an outer obscure nerve, papery, petioles 1–3 cm. l. *Panicles* many-flowered, 10–15 cm. l.; pedicels 3–6 mm. l., lateral jointed. *Calyx* 6–7 mm. l., limb spreading, with 5 very short obtuse lobes. *Petals* 5, white or pink, narrowly obovate, apex obliquely subtruncate, 6–8 mm. l. *Anthers* 5–6 mm. l. *Style* 12–15 mm. l. *Berry* subglobose, 6–7 mm. thick.

2. *T. ovata* Cogn. in Urb. Symb. Ant. v. 447 (1908).

In fl. Aug.; Holly Mount, near Ewarton, 2600 ft., *Harris!* Fl. Jam. 6450.

Tree, 25 ft. high; younger branchlets, under surface of leaves, petioles, inflorescence with calyx tomentose with minute stellate hairs. *Leaves* 9–13 cm. l., ovate, shortly acuminate, base rounded, 3-nerved with an outer obscure nerve; petioles 2.5–4 cm. l. *Panicle* pyramidal, 15–17 cm. l.; pedicels very short. *Calyx* 6–7 mm. l., limb spreading, truncate or obscurely 5-lobed. *Petals* 5, white, obliquely obovate, 7–8 mm. l. *Anthers* 5–6 mm. l. *Style* 14–15 mm. l.

3. *T. hispida* Macf. Jam. ii. 58 (1850); Cogn. tom. cit. 723. *Melastoma hispida* Sw. Prodr. 72 (1788) & Fl. Ind. Occ. 821. *M. glandulosa* Sw. Fl. Ind. Occ. 799 (1798). *Heterotrichum hispidum* Griseb. tom. cit. 251 (1860). *H. octandrum* Macf. Jam. ii. 66 (1850) (fide Grisebach). Specimen from Swartz in Herb. Stockholm, with name *Melastoma glandulosa* Sw. There is also a leaf and a portion of inflorescence with name *M. hispida* written by Swartz, but it is evidently *Clidemia strigillosa* DC.

In fl. May, June; *Masson!* *Swartz!* *Waters!* *McNab!* *Wilson!* *Wulfschlaegel!* *March!* Goshen, Moneague, *Prior!* Blue Mt. Peak, *Hitchcock!* near Troy, 2000 ft.; Albion Pen, St. Ann, 2000 ft.; *Harris!* Fl. Jam. 8735, 12,010.

Shrub or tree, 12–25 ft. high; younger branchlets, under surface of leaves, petioles, inflorescence with calyx densely hispid with short hairs. *Leaves* 6–12 cm. l., ovate-elliptical, shortly acuminate, base rounded or subcordate, entire, 3-nerved with a marginal pair of nerves, upper surface with short bristly hairs, beneath bearded in axils of transverse nerves; petioles 1.5–4 cm. l. *Panicle* 6–12 cm. l., loosely pyramidal, many-flowered; pedicels 2–4 mm. l. *Calyx*: tube 4 mm. l., lobes 4, 2 mm. l. *Petals* 4, obovate, apex obliquely subtruncate, rosy or white, 6 mm. l. *Anthers* oblong, 2.5 mm. l. *Style* 1 cm. l.

Wulfschlaegel's specimen, less hairy, is Grisebach's var. *lævis*.

4. *T. albicans* Triana in Trans. Linn. Soc. xxviii. 100 (1871); Cogn. in DC. Monogr. vii. 718. *Chitonina albicans* Don ex Naud. in Ann. Sc. Nat. sér. 3, xv. 339 (1851) & xvi. t. 25, f. 2.

Wiles (in Herb. Deless.).

Small tree; younger branchlets densely covered with bran-like hairs.

Leaves 6-8 cm. l., 3-5.5 cm. br., ovate, apex somewhat acute, base rounded, 5-plinerved, beneath nerves prominent and surface hoary-tomentose. *Panicles*: branchlets thick, compressed, diverging, at apex 3-flowered. *Flowers* sessile, spreading. *Calyx* tomentose with bran-like hairs; tube 7-8 mm. l.; lobes 4, 3-4 mm. l., triangular, acuminate. *Petals* 4. *Ovary* 6-celled. *Style* 1 cm. l.

We have not seen a specimen.

5. *T. angustifolia* DC. *Prodr.* iii. 172 (1828); *Cogn. in DC. Monogr.* vii. 720; *Urb. Symb. Ant.* iv. 454. *Melastoma angustifolia* Sw. *Prodr.* 71 (1788) & *Fl. Ind. Occ.* 796; *Vahl Eclog.* iii. 25 & *Ic. Amer.* t. 26; *Rich. in Bonpl. Mélast.* 20, t. 10. *Miconia angustifolia* Griseb. *Fl. Br. W. Ind.* 258 (1860). Specimen from Swartz from Jamaica in Herb. Stockholm. Specimens from de Ponthieu and Ryan, cited by Swartz, in Herb. Mus. Brit.

Swartz!—Porto Rico, St. Thomas, St. Cruz, St. John, Tortola, Montserrat, Guadeloupe, Dominica, Martinique, Trinidad. Swartz gives habitat in Prodomus as West Indies, in *Flora Ind. Occ.* as "in Jamaica, in Insulis Caribaeis (de Ponthieu) Ins. St. Johannis (Ryan)."

Shrub or small *tree*. *Leaves* 4-6 cm. l., 4-8 mm. br., narrowly lanceolate, acuminate, 3-nerved, veins transverse, ladder-like, nerves and veins beneath prominent, grey-tomentose beneath with minute stellate hairs; petioles .5-1 cm. l. *Panicles* 2-6 cm. l., branches corymbiform, covered together with calyx with minute bran-like hairs. *Flowers* many, small, crowded, stalked. *Calyx*: tube 1.5 mm. l., lobes 4, .8-1 mm. l. *Petals* 4, yellowish or rosy, 2 mm. l. *Anthers* 2 mm. l. *Style* 4 mm. l.

10. CALYCOGONIUM DC.

Shrubs, generally velvety-tomentose, sometimes glabrous. Leaves somewhat small, oblong or lanceolate, leathery, entire, obscurely 3-5-nerved, nerves evident beneath (3-plinerved in Jamaican species). Flowers small, solitary or a few clustered, axillary or terminal. Calyx: limb truncate, processes 4 (5, 6), thread-like, inserted below the margin of the limb. Petals 4 (5, 6), obovate. Stamens equal, twice as many as petals; anthers with 1 pore, connective not elongated and without any appendage. Ovary adherent, 3-4-celled. Berry globose. Seeds pyramidal.

Species 22, natives of the West Indies.

Leaves 4-8 cm. l., bearded at base of nerves beneath.

Pedicels 1-2 cm. l. 1. *C. glabratum*.

Leaves 2-4 cm. l., usually glandular at base of nerves beneath. Pedicels very short or wanting 2. *C. rhamnoidium*.

1. *C. glabratum* DC. *Prodr.* iii. 168 (1828); *Naud. in Ann. Sc. Nat. sér.* 3, xvi. 84; *Griseb. Fl. Br. W. Ind.* 245; *Cogn. in DC. Monogr.* vii. 940. *Melastoma glabrata* Sw. *Prodr.* 71 (1788), *Fl. Ind. Occ.* 806, & *Ic. med.* t. 39. Specimens from Swartz in Herb. Mus. Brit. and in Herb. Stockholm.

In fl. during the year; *Swartz!* Port Royal Mts., *Purdie!* Wilson! Chesterfield, 3200 ft.; Silver Hill, 3500 ft.; *Harris!* Fl. Jam. 5791, 6208, 6289.—Cuba:

Shrub, 4–10 ft. high. *Leaves* 4–8 cm. l., 2–3 cm. br., elliptical to lanceolate, obscurely 3-plinerved beneath with an outer nerve, usually bearded at base of nerves beneath, otherwise glabrous; petioles 5–10 mm. l. *Pedicels* 1–2 cm. l.; solitary. *Calyx*: tube 5 mm. l., processes 4, 6–8 mm. l. *Petals* 4, obovate, minutely apiculate, 5 mm. l. *Ovary* 4-celled.

2. *C. rhamnoideum* Naud. in *Ann. Sc. Nat. sér. 3, xvi.* 85 (1851); *Griseb. loc. cit.*; *Cogn. tom. cit.* 941. *C. glabratum* Macf. *Jam. ii.* 46 (1850) (non DC.). (Fig. 138.)

Rodwood.

In fl. during the year; Port Royal Mts.; Halberstadt; near Dunrobin Castle, *Macfadyen!* *Purdie!* *March!* Clifton Mount, Port Royal Mts., *Harris!* Fl. Jam. 6207; Halberstadt, *Norman!*—Cuba.

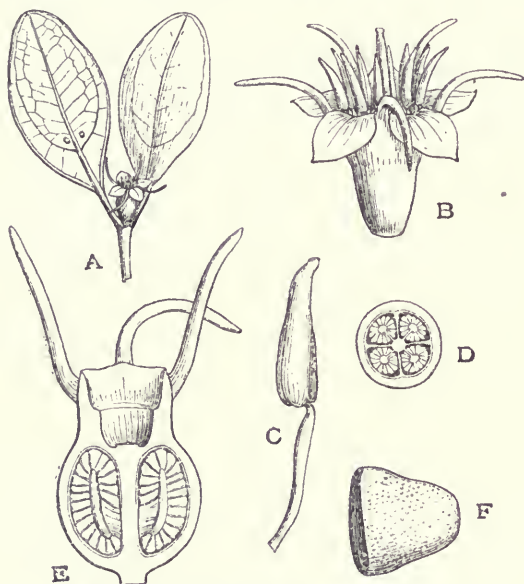


Fig. 133.—*Calycogonium rhamnoideum* Naud.

A, End of branch with leaves and flower $\times 3$.
 B, Flower $\times 2\frac{1}{2}$.
 C, Stamen $\times 6$.

D, Fruit cut across below $\times 3$.
 E, Fruit cut lengthwise $\times 6$.
 F, Seed $\times 20$.

Shrub, 2–6 ft. high. *Leaves* 2–4 cm. l., 1–2.5 cm. br., elliptical-oblong narrowed to base, obscurely 3-plinerved beneath, usually glandular at base of nerves beneath, glabrous; petioles 2–6 mm. l. *Flowers* sessile or subsessile, solitary. *Calyx*: tube 4–5 mm. l., processes 4 or 5, 4–5 mm. l. *Petals* 4 or 5, obovate, acute, 3–4 mm. l., white. *Ovary* 4-celled.

11. **HETEROTRICHUM** DC.

Shrubs, usually hispid or glandular. Leaves large, stalked, 3-5-nerved. Flowers usually in terminal panicles. Calyx: tube usually constricted at mouth, lobes 5-9, very short, processes thread-like, usually long. Petals 5-9, obovate, obtuse, large, spreading. Stamens twice as many as petals, equal; anthers with one pore, connective not elongated and without appendages. Ovary 6-12-celled, more or less adhering to the calyx-tube, or nearly free. Berry leathery or fleshy, crowned by the calyx-limb. Seeds minute, ovoid.

Species 12, natives of the West Indies, Colombia, and Guiana.

Hairs glandular. Flower-parts in sixes. Calyx processes 5 mm. l. 1. *H. umbellatum*.
Hairs longer, seldom glandular. Flower-parts in eights.
Calyx processes 2-3 mm. l. 2. *H. octonum*.

1. *H. umbellatum* Urb. in *Fedde Rep.* xv. 14 (1917). *H. patens* DC. *Prodr.* iii. 173 (1828); *Macf. Jam.* ii. 64; *Cogn. in DC. Monogr.* vii. 956. *H. niveum* DC. *loc. cit.*; *Griseb. Fl. Br. W. Ind.*

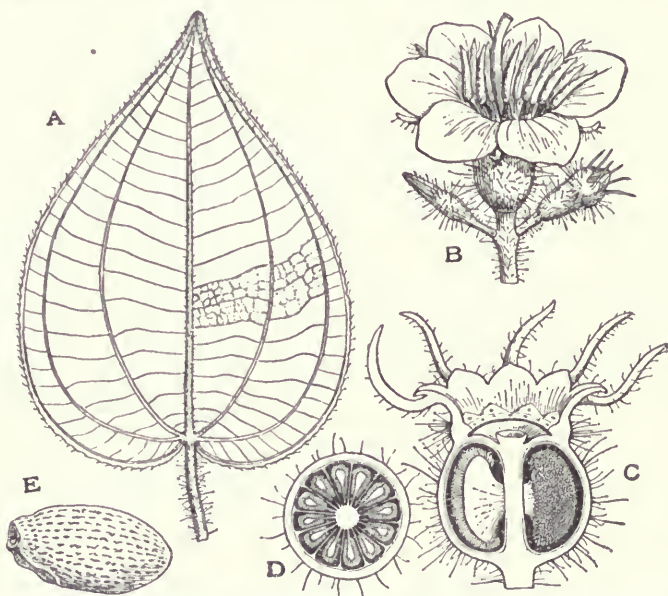


Fig. 139.—*Heterotrichum umbellatum* Urb.

A, Leaf $\times 3$.

B, Terminal branchlet of inflorescence, showing flower and buds, $\times 2$.

C, Flower cut lengthwise $\times 2\frac{1}{2}$.

D, Ovary cut across $\times 4$.

E, Seed $\times 50$.

251. *Melastoma umbellata* Mill. Dict. ed. 8 (1768). *M. patens* Sw. Prodr. 68 (1788) & Fl. Ind. Occ. 791. *M. nivea* Desr. in Lam. Encyc. iv. 42 (1797); Bonpl. Mélast. 102, t. 44. Miller's type from Houstoun in Herb. Mus. Brit. Specimen from Browne from Jamaica "ex herbario Linnæi" in Herb. Stockholm. Specimens from Swartz from Jamaica and Hispaniola in Herb. Stockholm. (Fig. 139.)

American Gooseberry.

In fl. during the year; *Houstoun!* *Broughton!* *Dancer!* Blue Mts., *Masson!* higher mts., *Swartz!* *Wiles!* common in mts., *Macfadyen!* *McNab!* *St. Thomas!* in Vale; near Port Antonio; *Purdie!* *A. W. Lane!* *Wilson!* *Abbey Green!* Blue Mts.; *Bath!* *Worthy Park!* *Prior!* *March!* J.P. 945, 1390, *Morris!* Port Antonio, *Hitchcock!* above Abbey Green, 4500 ft.; *Silver Hill Gap!* 8500 ft.; above Gordon Town; *Tyre!* near Troy, 1500 ft.; *Harris!* near Castleton (Providence, 700 ft.; Prospect Hill, 2000 ft.; Brandon Hill road, 800 ft.) *Thompson!* Fl. Jam. 6371, 6437, 7912, 7951, 8056, 8092, 8377, 8652; near Troy, *Miss J. R. Perkins!* Cockpit country, north of Appleton, *Norman!*—Cuba, Hispaniola.

Shrub, 6-12 ft. high; young branchlets, petioles, and inflorescence incl. calyx tomentose with minute stellate hairs and densely covered with glandular long coarse hairs. *Leaves* 6-16 cm. l., 4-11(-13) cm. br., ovate to ovate-elliptical, acuminate, cordate or subcordate, 5-nerved with a marginal nerve and sometimes an extra incomplete one, beneath densely tomentose with minute white stellate hairs and a few long simple hairs on upper surface with a few long simple hairs, two of a pair subequal; petioles 2-5 cm. l. *Cymes* paniculate, terminal, 5-11 cm. l., with several flowers; pedicels usually long. *Flowers*: parts in fives or sixes. *Calyx*: tube 6-8 mm. l.; lobes scarcely distinct, processes flexuose, 5-6 mm. l. *Petals* white or rosy white, 10-15 mm. l. *Anthers* about 4 mm. l. *Berry* globose, black, edible, 1 cm. (or more) in diam.

2. *H. octonum* DC. Prodr. iii. 173 (1828); Cogn. tom. cit. 954. *Melastoma octona* Bonpl. Mélast. 7, t. 4 (1806). *Staphidium octonum* Naud. in Ann. Sc. Nat. sér. 3, xvii. 306 (1852) & op. cit. xviii. t. 4, f. 2. The specimen from Swartz in Herb. Stockholm is named *Melastoma strigillosa* by him.

In fl. May; *Swartz!* near Troy, 2000 ft., *Harris!* Fl. Jam. 8566.—Cuba, trop. cont. America.

Shrub, 6-10 ft. high; young branchlets, petioles, inflorescence with calyx with stellate tomentum and long red spreading hairs (about 8 mm. l.) rarely glandular. *Leaves* 6-15(-20) cm. l., 4-9(-15) cm. br., broadly ovate, cordate, 5-nerved with a marginal pair in the lower part, on upper surface with long red adpressed simple hairs with minute stellate-tomentose hairs more or less on midrib and lateral nerves, beneath densely covered with white stellate hairs, leaves of a pair often unequal; petioles 2-4(-10) cm. l. *Panicle* with several flowers. *Flowers*: parts in eights. *Calyx*: tube bell-shaped, 4-5 mm. l.; lobes, inner very short, obtuse, processes 2-3 mm. l. *Petals* white, 8-9 mm. l. *Anthers* about 4 mm. l. *Berry* ovoid, 7-8 mm. l.

12. CLIDEMIA D. Don.

Shrubs hairy or tomentose, occasionally glabrous. Leaves rather large, stalked, occasionally sessile, usually ovate or oblong, 3-7-nerved, entire, crenulate, or small toothed. Flowers small

or minute, in panicles, racemes, or clusters, or solitary, axillary, very rarely subterminal, sometimes crowded into a head, white, pink, or purple; parts in fours or fives, rarely sixes. Calyx: tube more or less bell-shaped, limb usually prolonged beyond the ovary, shortly lobed or sometimes truncate, processes often long. Petals usually obovate or oblong. Stamens usually equal, twice as many as petals; anthers linear or awl-shaped, with one minute pore at apex; connective usually not prolonged below the cells and without appendages, or with 2 small tubercles at base. Ovary more or less adherent to calyx-tube, usually with 3, 4, or 5 cells; style slender; stigma a point or truncate or sometimes somewhat capitate. Berry often hairy, crowned with calyx-limb. Seeds usually small, not curved.

Species 105, natives of West Indies and tropical continental America.

Flower-parts in 5's or 6's. Leaves with more than 3 nerves.

- | | |
|---|----------------------------|
| Leaves with hairs not swollen at base | 1. <i>C. hirta</i> . |
| Leaves with hairs on upper surface swollen at base. | |
| Inflorescence paniculate | 2. <i>C. strigillosa</i> . |
| Inflorescence spicate | 3. <i>C. spicata</i> . |

Flower-parts in 4's.

Leaves with more than 3 nerves.

Leaves 3-plinerved with another pair scarcely reaching apex.

- | | |
|---|-------------------------------|
| Leaves ovate. Calyx-tube 3-4 mm. l. | 4. <i>C. plumosa</i> . |
| Leaves elliptical. Calyx-tube 1.5 mm. l. | 5. <i>C. pilosa</i> . |
| Leaves 5-plinerved with 1 or 2 pairs of marginal nerves in lower part | 6. <i>C. septuplinervis</i> . |
| Leaves 3-plinerved, narrowly elliptical | 7. <i>C. Grisebachii</i> . |
| Leaves 3-nerved. | |
| Leaves narrowly elliptical | 8. <i>C. crossosepala</i> . |
| Leaves lanceolate, long acuminate..... | 9. <i>C. capillaris</i> . |

(The outer obscure nerve is not counted above.)

1. *C. hirta* *D. Dou* in *Mem. Wern. Soc. iv.* 309 (1823); *Macf. Jam. ii.* 44; *Griseb. Fl. Br. W. Ind.* 246; *Cogn. in DC. Monogr. vii.* 986; *Millsp. in Field Col. Mus. Bot. ii.* 80; *Urb. Symb. Ant. iv.* 463 & *viii.* 501. *C. erythropogon* *DC. Prodr. iii.* 157 (1828); *Cogn. tom. cit.* 989. *Arbuscula jamaicensis* *quinquenervis* & c. *Pluk. Phyt. t.* 264, *f.* 1, *Alm.* 40. *Melastoma hirta* *L. Sp. Pl.* 390 (1753) (excl. syn. *Plum.*); *Sw. Obs.* 175; *Bot. Mag. t.* 1971. *M. crenata* *Vahl Eclog. i.* 41, (1796) *iii.* 21, *Ic. iii. t.* 24. *M. sessiliflorum* *Spreng. Syst. ii.* 304 (1825) (non *Vahl*). *Staphidium Wilsonii* *Naud. in Ann. Sc. Nat. sér. 3, xvii.* 311 (1852). Specimen from Browne in *Herb. Linn.* named by *Linnaeus*. Specimens from *Swartz* in *Herb. Stockholm*. Specimen in *Herb. Pluk. in Herb. Sloane xcix.* 115. (Fig. 140.)

Browne! Wright! Masson! Swartz! Cuming, 27! St. Mary, McNab! Port Royal Mts., Purdie! Wilson! near Moneague, Prior! March! near

Castleton, Morris! Claverty Cottage, Blue Mts., J.P. 1067, Hart! Port Antonio, Hitchcock; also Millspaugh; Brandon Hill, near Castleton, 1000 ft., Thompson! near Spring Hill, Portland, 2000 ft.; Tyre, near Troy, 1500 ft.; between New Market and Darliston, 1100 ft.; Stony Hill, 1100 ft.; Harris! Fl. Jam. 6654, 8053, 8096, 8653, 9887, 11,128; Thomson Gap, Blue Mts., Miss J. R. Perkins!—West Indies, trop. cont. America.

Shrub, 4–12 ft. high; younger branchlets, petioles, peduncles, and calyx hirsute with long reddish hairs and often also minute stellate hairs. *Leaves* 4–16 cm. l., 2–7 cm. br., ovate-elliptical, ovate, or lanceolate, acuminate, base obtuse or rounded, often emarginate, often oblique,

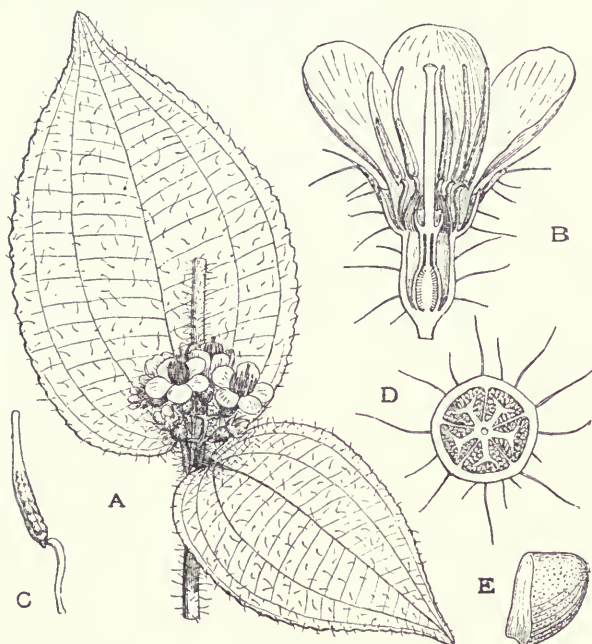


Fig. 140.—*Clidemia hirta* D. Don.

A, Portion of branch with leaves

and flowers $\times \frac{1}{2}$.

B, Flower cut lengthwise $\times 3$.

C, Stamens $\times 4$.

D, Fruit cut across $\times 2$.

E, Seed $\times 20$.

subentire or minutely crenulate, 5-nerved with a marginal pair in the lower part, or 3-plinerved with an additional pair of nerves below and an obscure marginal pair, hirsute on both sides (hairs not swollen at base), more sparsely on mature leaves, two leaves of a pair more or less unequal; petioles 5–2 cm. l. *Cymes* few-flowered, 1–3 cm. l., or almost reduced to a cluster, axillary and terminal. *Flowers* subsessile, or pedicels 3–6 mm. l.; parts in fives (or sixes). *Calyx*: tube to 5 mm. l.; lobes about 1.5 mm. l.; processes to 5 mm. l. *Petals* white, often with a tinge of pink, 7–10 mm. l. *Anthers* to 5 mm. l., lanceolate; connective very shortly prolonged below the cells, with 2 small tubercles at base. *Ovary* 5-celled. *Berry* hirsute, blue, 6–7 mm. l., ovoid, 5-celled.

Var. elegans Griseb. *loc. cit.*; large ovate or broadly ovate cordate leaves with very evident crenatures. *Melastoma elegans* Aubl. *Pl. Guian.* i. 427, t. 167 (1775). *Clidemia elegans* D. Don *loc. cit.*

Broughton! Prior; near Guys Hill, St. Ann, 1800 ft.; Peckham, Clarendon, 2000 ft.; Harris! Fl. Jam. 12,038, 12,824.—Distribution of species.

2. *C. strigillosa* DC. *Prodr.* iii. 159 (1828); Macf. *Jam.* ii. 44; Cogn. in *Fl. Bras.* xiv. pt. 4, 484 & in DC. *Monogr.* vii. 995; Urb. *Symb. Ant.* iv. 464 & viii. 501; Fawc. & Rendle in *Journ. Bot.* lxiv. 104. *C. agrestis* Macf. *Jam.* ii. 99 (1850). *Arbuscula jamaicensis* pentaneuros &c. Pluk. *Phyt.* t. 264, f. 3. *Melastoma strigillosa* Sw. *Prodr.* 71 (1788), *Fl. Ind. Occ.* 793 & *l.c. ined.* 68. *Heterotrichum viscosum* & *H. dubium* Macf. *Jam.* ii. 65 (1850). *C. spicata* var. *strigillosa* Griseb. *Fl. Br. W. Ind.* 247 (1860). Specimens from Wright and Masson in Herb. Banks in Herb. Mus. Brit. named by Swartz. Specimen in Plukenet's Herb. in Herb. Sloane xcix. 118!

In fl. throughout year; Wright! Masson! Swartz! Wiles! Wulfschlaegel; A. W. Lane! St. Thomas in Vale; Moneague, St. Ann; Prior! March! Mt. Airy, 3000-3500 ft., Harris! Bull Head, Fawcett! Fl. Jam. 7458, 7564, 8477.—Cuba, Hispaniola, Porto Rico, Guiana, Peru.

Shrub, 3 ft. high, younger branchlets, petioles, and peduncles thickly covered with stellate-tomentose hairs, and with hairs more or less glandular. *Leaves* 6-10 cm. l., ovate, acuminate, base rounded and slightly emarginate-subcordate, margin with unequal small teeth, ciliate, 5-nerved with a marginal pair in the lower part, two leaves of a pair subequal, hispid on upper surface with long hairs swollen at base, densely tomentose with short stellate hairs beneath; petioles 7-14 mm. l. *Panicles* crowded with many flowers, 3-5 cm. l., axillary or subterminal. *Flower-parts* in fives (or sixes). *Calyx* minutely stellate-tomentose with short hairs sometimes glandular, tube 3.5-5 mm. l., lobes narrowly ovate with rounded apex, 2-3 mm. l., processes a little longer than tube. *Petals* 5-4 mm. l., greenish or white, purplish when dry. *Anthers* 2.5 mm. l., oblong, connective scarcely produced, without appendages; filaments 3-5 mm. l. *Berry* black, 5-6-celled.

3. *C. spicata* DC. *Prodr.* iii. 159 (1828) (non Don); Griseb. *Fl. Br. W. Ind.* 247 (in part); Cogn. in *Fl. Bras.* xiv. pt. 4, 485 & in DC. *Monogr.* vii. 996. *Melastoma spicata* Aubl. *Pl. Guian.* i. 423, t. 165 (1775). Specimen from Aublet in Herb. Mus. Brit.

Wulfschlaegel (fide Cogniaux).—Cuba, St. Thomas, Trinidad, trop. cont. America.

Shrub, 1-3 ft. high; younger branchlets, petioles, peduncles, and calyx shortly and densely tomentose with stellate hairs and hirsute with long stiff hairs usually not glandular. *Leaves* 6-10 cm. l., 4-5 cm. br., ovate or ovate-elliptical, shortly and acutely acuminate, base rounded, margin minutely toothed, 5-nerved with an obscure marginal pair in lower part, two leaves of a pair more or less unequal, hispid on upper surface with long hairs swollen at base, densely tomentose with short stellate hairs beneath; petioles 2-10 mm. l. *Panicles* axillary, usually contracted into a spike, 4-7 cm. l. *Flowers* sessile or subsessile; parts in fives or sixes. *Calyx*:

tube 3 mm. l.; lobes obovate-roundish, 1·5-2 mm. l.; processes 3-4 mm. l. *Petals* white, rose, or sometimes purplish, 4 mm. l. *Berry* blue-black, subglobose, 5 mm. thick.

We have not seen a specimen from Jamaica.

4. *C. plumosa* DC. *Prodr.* iii. 159 (1828); *Cogn. in DC. Monogr.* vii. 1019. *C. Berterii* Griseb. *Fl. Br. W. Ind.* 247 (1860). *Melastoma plumosa* Desr. in *Lam. Encyc. iv.* 31 (1797-98). *Sagraea Berterii* DC. *Prodr.* iii. 171 (1828); *Macf. Jam.* ii. 53.

In fl. during the year; *Wiles!* *Bertero*; Cuna-Cuna pass, 3000 ft., *Wilson!* *Petersfield*, St. Mary, *McNab!* *Purdie!* *Mansfield*, 800 ft.; near Mabess river, 3000 ft.; *Harris!* between Mansfield and Devil's river; *John Crow* (Blake) Mts., 1700 ft.; *Harris & Britton!* *Fl. Jam.* 5965, 7470, 9127, 10,572, 10,762; *Miss J. R. Perkins!*—Venezuela.

Shrub, 5-9 ft. high; younger branchlets, petioles, peduncles, and calyx densely villose-hirsute. *Leaves* 1-2·5 dm. l., 7-14 cm. br., ovate, acuminate with a long slender tip, base rounded to truncate, margin with small teeth, 3-plinerved with a pair scarcely reaching the apex, and an obscure marginal pair, two leaves of a pair somewhat unequal, hirsute on both sides with adpressed hairs; petioles 3-8 cm. l. *Panicles* 1 or 2 together, with several flowers, usually about as long as the petiole. *Flower-parts* in fours. *Calyx*: tube 3-4 mm. l.; lobes very short, about ·5 mm. l.; processes scarcely 3 mm. l. *Petals* 2·5-4 mm. l., greenish-yellow. *Berry* edible.

C. umbrosa Cogn. is reported by Cogniaux to have been collected in Jamaica by Ryan, but the locality on Ryan's specimen in Herb. Mus. Brit. is "insulæ caribææ," i.e. one of the smaller W. Indian Islands—Montserrat in Vahl *Eclog.* iii. 27. It is found in the islands from Guadeloupe to Trinidad. It is at once distinguished from *C. plumosa* (which it resembles) in the processes of calyx being only ·5 mm. l.

5. *C. pilosa* Cogn. in *DC. Monogr.* vii. 1023 (1891). *C. Swartzii* Griseb. *Fl. Br. W. Ind.* 248 (in part). *Melastoma pilosa* Sw. *Prodr.* 72 (1788) & *Fl. Ind. Occ.* 819. *Sagraea pilosa* DC. *Prodr.* iii. 171 (1828); *Macf. Jam.* ii. 54. Specimens from Swartz in Herb. Mus. Brit. and Herb. Stockholm.

Mountain woods, *Swartz!* *Guys Hill*, St. Thomas in Vale, *McNab* also *Purdie!*

Shrub or small tree; young branchlets, petioles, peduncles, and calyx hirsute. *Leaves* 10-17 cm. l., 4·5-7·5 cm. br., elliptical, acuminate, base rounded, entire, 3-plinerved with marginal pair scarcely reaching the apex, and an obscure marginal pair, two leaves of a pair unequal, on upper surface sparsely hirsute or glabrate, hirsute beneath especially on the nerves; petioles 1-2·5 cm. l. *Panicles* 2-3 cm. l. *Flower-parts* in fours. *Calyx*: tube 1·5 mm. l., shallowly lobed. *Petals* small, somewhat roundish, white with a red spot at base. Filaments red; anthers white. *Berry* subglobose, hairy, 4-celled, 4 mm. in diam.

6. *C. septuplinervia* Cogn. in *Fl. Bras. xiv. pt. 4*, 506 (1888) & in *DC. Monogr.* vii. 1008. *C. crossosepala* Griseb. *Fl. Br. W. Ind.* 248 (1860) (in part). Specimen from Wilson named by Grisebach in Herb. Kew.

In fr. Dec.; locality not stated, *Wilson!*—Colombia, Peru.

Younger branchlets, petioles, under side of leaves, and calyx rusty-

powdery. *Leaves* 1-2 dm. l., elliptical to ovate-lanceolate, acuminate, narrowed to base and somewhat decurrent on the petiole, entire, 5(3)-plinerved with 1 or 2 pairs of marginal nerves in lower part, glabrous on upper surface, two of a pair unequal; petiole .5-2 cm. l. *Flowers* closely clustered on a much shortened axillary raceme or panicle; parts in fours; pedicels .5-1(-4) mm. l. *Calyx*: tube about 3 mm. l.; lobes triangular, scarcely 1 mm. l.; processes from below the apex of lobes 1.5-2 mm. l., with long glandular-capitate hairs. *Petals* white. *Berry* subglobose, 4-5 mm. l., indigo-blue.

7. *C. Grisebachii* Cogn. in *DC. Monogr. vii.* 1009 (1891). *C. crossosepala* Griseb. *Fl. Br. W. Ind.* 248 (1860) (in part). *Sagraea Grisebachii Triana* in *Trans. Linn. Soc. xxviii.* 139 (1871). Specimen from Wilson in Herb. Kew.

In fl. March; Manchioneal, Wilson, 476!

Shrub, 8-10 ft. high; branchlets acutely 4-cornered, young branchlets and petioles hairy. *Leaves* 4-11 cm. l., narrowly elliptical, acuminate at both ends, 3-plinerved with an obscure marginal pair, usually puberulous on midrib on upper surface, sometimes pubescent on nerves beneath, two of a pair unequal; petioles 6-9 mm. l. *Flowers* minute, solitary or in clusters; flower-parts in fours; pedicels very short or to 3 mm. l. *Calyx* 1.5-2 mm. l. *Berry* subglobose. (The single specimen now bears flowers in bud only.)

8. *C. crossosepala* Griseb. *Fl. Br. W. Ind.* 248 (1860) (in part); Cogn. in *DC. Monogr. vii.* 1010 (1891) (under *C. crosso-petala*). *Sagraea crossopetala Triana* loc. cit. (1871). Specimen from Wilson in Herb. Kew.

Mansfield, near Bath, Wilson, 472!

Shrub; young branchlets with a few scattered hairs, petioles, peduncles, and calyx with minute bran-like scales. *Leaves* 7-12 cm. l., narrowly elliptical, acuminate, base wedge-shaped, entire, 3-nerved with an obscure marginal pair, glabrous or sometimes very sparsely pubescent beneath, two of a pair generally very unequal; petioles .5-1.5 cm. l., slightly furrowed and hirsute on upper side. *Flowers* in inconspicuous clusters; flower-parts in fours; pedicels 1-2 mm. l. *Calyx*: tube cylindrical, 1.5 mm. l.; lobes wanting; processes about .5 mm. l. *Petals* with a short bristle at apex.

9. *C. capillaris* Griseb. *Fl. Br. W. Ind.* 249 (1860) (non *Don*); Cogn. in *DC. Monogr. vii.* 1024. *C. capillaris* v. *leiocalyx* Cogn. in *Urb. Symb. Ant. v.* 451 (1908). *Melastoma capillaris Sw. Prodr.* 71 (1788), *Fl. Ind. Occ.* 808 & *Ic. ined. t.* 38. *Sagraea capillaris DC. Prodr. iii.* 170; *Macf. Jam. ii.* 51. Specimens from Swartz in Herb. Mus. Brit. and Herb. Stockholm.

Hills above hot springs, Bath, Swartz! Bertero; road to Raymond Hall, Port Royal Mts., St. Andrew, Macfadyen! Mansfield, 1200 ft., Wilson! March! St. Thomas in Vale; near Moneague; Prior! near Troy, 1500 ft.; Resource, near Holly Mount, 2000 ft.; Albion Pen, St. Ann, 2000 ft.; Harris! valley of Sulphur river, Bath, Harris & Britton! *Fl. Jam.* 8543, 8995, 10,587, 12,007.—Cuba.

Shrub, 3 to 10 ft. high, without hairs except on calyx and fruit; branchlets slender, with somewhat enlarged nodes. *Leaves* 5-10 cm. l.,

1-2 cm. br., lanceolate, long acuminate, entire, 3-nerved, two of a pair often unequal; petioles 8-10 mm. l. *Racemes* usually clustered, 2-4 cm. l., 1-5-flowered. *Peduncles* and *pedicels* capillary, sometimes with a few scattered glandular hairs. *Flower-parts* in fours. *Calyx*: tube oblong, with a few glandular-capitate hairs 3-3.5 mm. l.; processes .5 mm. l. *Petals* scarcely 1 mm. l., white. *Berry* 7-8 mm. l., deep violet-blue, sometimes with a few glandular-capitate hairs.

13. HENRIETTEA DC.

Trees or shrubs. Leaves stalked, large, oblong or lanceolate, entire, 3-5-nerved. Flowers in clusters at leafless nodes in Jamaican species, or solitary or in panicles; parts in fives (or

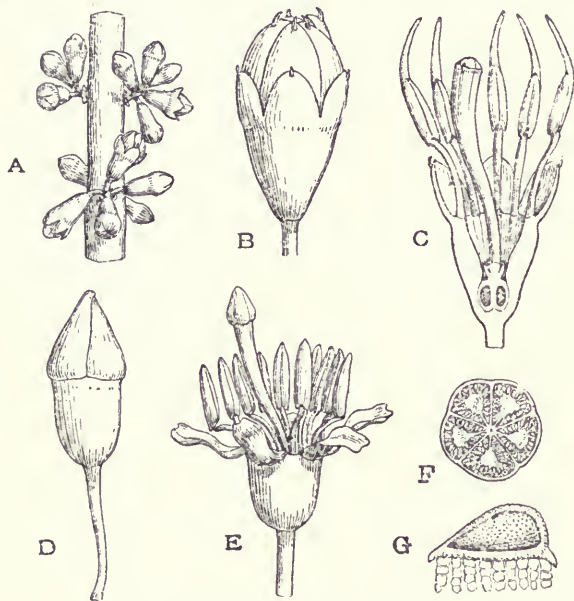


Fig. 141.—*Henriettea ramiflora* DC. and *Henriettella sessilifolia* Triana.

A, Portion of branch with flowers of *Henriettea ramiflora* $\times \frac{3}{4}$.

B, Bud of ditto $\times 2$.

C, Flower cut lengthwise of ditto, petals having fallen, $\times 2$.

D, Bud of *Henriettella sessilifolia* $\times 2$.

E, Flower of ditto $\times 2$.

F, Fruit of ditto cut across $\times 2$.

G, Seed of ditto with epidermal outgrowths protruded after moistening $\times 20$.

sixes). *Calyx*: tube thick, leathery; limb spreading, lobed, with a minute sharp tooth outside beneath apex of each lobe. *Petals* oblong or obovate, clawed, apex usually obtuse or rounded. *Stamens* twice as many as petals; anthers (in *H. ramiflora*) somewhat thick, apex with curved beak, with one pore; connective

not prolonged below the cells, not appendaged at the base, or occasionally spurred on the back. Ovary 5(6)-celled, altogether adherent to the calyx-tube. Style thicker towards apex; stigma truncate. Berry leathery-fleshy. Seeds oblong-pyramidal.

Species 14, natives of Jamaica, Colombia, Guiana, Brazil.

H. ramiflora DC. *Prodr.* iii. 178 (1828); *Griseb. Fl. Br. W. Ind.* 246 (excl. syn. *H. grandifolia*); *Cogn. in Fl. Bras. xiv. pt. 4*, 531 & in *DC. Monogr. vii.* 1036 (excl. *H. grandifolia*). *Melastoma ramiflora* Sw. *Prodr.* 69 (1788) & *Fl. Ind. Occ.* 775. Type in Herb. Mus. Brit. (Fig. 141, A-C.)

Swampy places in St. Thomas in the Vale, Masson! also Prior; March! —Trinidad, Surinam.

A tree-like shrub or tree, 20-30 ft. high, trunk 5-6 inches in diam.; young branchlets, petioles, and calyx with adpressed bristle-like hairs. Leaves 10-15(-20) cm. l., elliptical or narrowly-elliptical, apex shortly and acutely acuminate, narrowing to an acuminate or obtuse base, 3-plinerved with an obscure marginal pair, on upper surface at first with a few adpressed bristle-like hairs at length glabrescent, beneath covered with brownish-yellow tomentum of stellate hairs and bristle-like hairs; petioles about 1 cm. l. Peduncles 2-3 mm. l., 1-flowered 10-15 in a cluster at leafless nodes. Flower-parts in fives. Calyx: tube 7 mm. l., becoming constricted above in fruit; lobes roundish-ovate, about 2 mm. l. Petals pink, unequal-sided, one side with a minute appendage, 8-10 mm. l. Anthers 7-8 mm. l. Style 10-12 mm. l.

14. MECRANIUM Hook. f.

Glabrous shrubs or small trees. Leaves stalked, 3-plinerved, network of veins fine-meshed. Flowers small or minute, in short branching panicles, axillary or at leafless nodes; pedicels minutely bracteolate; parts in fours or fives. Calyx: tube bell-shaped or hemispherical; limb short, obtusely lobed. Petals obovate. Stamens twice as many as petals; anther-cells short, gaping with 1 or 2 large pores, connective prolonged below the cells, jointed with the filament, without appendage. Ovary adherent, 3-5-celled. Berry small, globose. Seeds minute, ovoid, somewhat shell-shaped, minutely granulate.

Species 9, natives of the West Indies.

- Calyx-tube, base obtuse, 1.5-2 mm. l. Leaves ovate, ovate-oblong, oblong-lanceolate, elliptical-lanceolate, or oblong-elliptical... 1. *M. amygdalinum*.
 Calyx-tube, base acute, 3 mm. l. Leaves lanceolate to ovate-lanceolate, or narrowly elliptical..... 2. *M. virgatum*.
 Calyx-tube, base obtuse, 2.5 mm. l. Leaves obovate-elliptical to elliptical..... 3. *M. purpurascens*.

1. *M. amygdalinum* Triana in *Trans. Linn. Soc. xxviii.* 139 (1871); *Cogn. in DC. Monogr. vii.* 981 (incl. vars.), & in *Urb. Symb.*

Ant. iv. 463 & *viii.* 500. *M. amygdalinum* v. *Urbanianum* Cogn. in *Urb. Symb. Ant. vi.* 27 (1909). *M. integrifolium* Triana loc. cit. *Melastoma amygdalinum* Desr. in *Lam. Encyc. iv.* 35 (1795-6); Rich. in *Bonpl. Mélast.* 82, t. 36. *Cremanium axillare* Macf. *Jam. ii.* 92 (1850). *C. amygdalinum* Griseb. *Fl. Br. W. Ind.* 261 (1860). *Ossæa brachystachya* Naud. in *Ann. Sc. Nat. xvii.* 337 (1852). *O. integrifolia* Naud. loc. cit. (Fig. 142.)

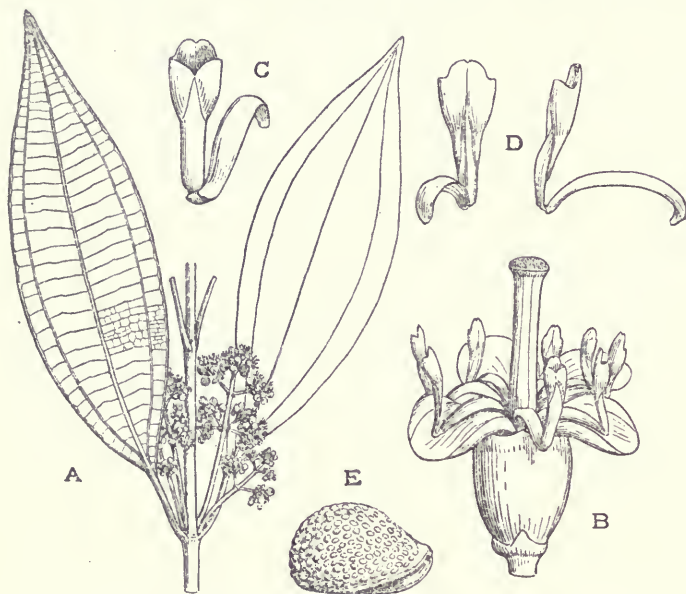


Fig. 142.—*Mecranium amygdalinum* Triana.

A, Portion of branch with leaves and inflorescence $\times \frac{3}{8}$.
B, Flower $\times 11$.

C, D, Stamens, different views, $\times 21$.
E, Seed $\times 30$.

Masson! Swartz! Moneague, St. Ann, Macfadyen! Hanover, Purdie! Betty's Hope, 2500 ft. above Manchioneal, Wilson! March! Prior! Silver Hill Gap, Port Royal Mts., 3500 ft.; wooded hill N.E. of Dolphin Head; Peckham, Clarendon, 2500 ft.; Harris! south end of John Crow (Blake) Mts., Harris & Britton! *Fl. Jam.* 6436, 10,315, 10,735, 11,041.—Cuba, Hispaniola, Porto Rico.

Shrub or bushy tree, 5-18 ft. high; branches often enlarged at nodes. *Leaves* 5-10 cm. l., 1.5-4 cm. br., ovate, ovate-oblong, oblong-lanceolate, elliptical-lanceolate, or oblong-elliptical, acuminate, base obtuse to acute, sometimes decurrent into the petiole, 3-plinerved with an obscure marginal nerve, the lateral nerves prominent beneath, base blunt or acute, decurrent sometimes on the midrib, axils of nerves sometimes bearded, transverse veins at right angles, fine-meshed, margin usually entire or sometimes obscurely crenulate, membranous; petioles .5-2 cm. l. *Panicles* 1-3 cm. l. *Calyx* 1.5-2 mm. l., bell-shaped, ovoid, or subhemispherical, base obtuse,

minutely 4-lobed. *Petals* 4, 1-1.5 mm. l., apex obtuse or notched, white or yellowish-green. *Stamens* 8; filaments about 1 mm. l.; anther with connective about 1 mm. l. *Style* 2 mm. l., stigma capitate. *Fruit* about 3.5 mm. in diam., black, globose, skin thin with seeds showing through. *Seeds* .6 mm. l.

The Jamaican specimens recede somewhat from Desrousseaux's original description of the specimen from Hispaniola, but the species appears to be very variable, Cogniaux having noted several varieties.

2. *M. virgatum* Triana in *Trans. Linn. Soc.* xxviii. 140 (1871); *Cogn. tom. cit.* 983. *Melastoma virgata* Sw. *Prodr.* 72 (1788) & *Fl. Ind. Occ.* 816. *Cremanium virgatum* Griseb. *op. cit.* 261. *Ossæa purpurascens* Macf. *Jam. ii.* 49 (1850) (non DC.). *Sagraea virgata* Macf. *Jam. ii.* 52 (1850)? *Henriettea racemosa* Macf. *Jam. ii.* 76 (1850). Specimen from Swartz in Herb. Stockholm.

In mountain woods, Swartz; Catherine Peak, Macfadyen! Purdie! Wilson! March! Castleton, Morris! Bellevue, 4500 ft., Eggers, 3776! Abbey Green, Blue Mts., 4000 ft., Harris! Brandon Hill, 1000 ft., near Castleton, Thompson! south-eastern foothills of John Crow (Blake) Mts., Harris & Britton! *Fl. Jam.* 6274, 8061, 10,684; Water Works glen, Port Antonio, Norman!—Specimen from Shakespear labelled from South America, possibly a mistake for Jamaica.

Shrub or *tree*, 12-20 ft. high; branchlets enlarged at nodes. *Leaves* 7-17 cm. l., 2.5-5 cm. br., lanceolate to ovate-lanceolate, or narrowly elliptical, acuminate, base acute, margin entire or slightly wavy, 3-plinerved with an obscure marginal pair, nerves beneath prominent, transverse veins somewhat close together, inclined very slightly upwards, network fine-meshed, papery; petioles 1-2 cm. l. *Panicles* numerous, 2-4 cm. l., usually at leafless nodes, longer than the petiole. *Calyx*-tube narrowly bell-shaped, base acute, very minutely 4-toothed or irregularly truncate, 3 mm. l., 2 mm. br. *Petals* white, apex obtuse, 2 mm. l. *Stamens* 8. *Style* 5-7 mm. l. *Berry* ovoid with truncate apex, 4.5 mm. l. *Seed* .6 mm. l., ovoid, shell-like, coat rough.

3. *M. purpurascens* Triana in *Trans. Linn. Soc.* xxviii. 139 (1871); *Cogn. tom. cit.* 982. *Melastoma purpurascens* Sw. *Prodr.* 71 (1788) & *Fl. Ind. Occ.* 804 (non Aubl.); *Griseb. op. cit.* 261. Specimen from Swartz in Herb. Stockholm.

Masson! Swartz! Wiles; near Cinchona, Blue Mts., J.P. 1255, Morris

Shrub or small *tree*; branchlets enlarged at nodes. *Leaves* 4-3 cm. l., 2.5-3 cm. br., obovate elliptical to elliptical, apex mostly apiculate on flowering branches to shortly acuminate on branches without flowers, base subacute, entire, 3-plinerved with an obscure marginal nerve, transverse veins somewhat close together, tending slightly upwards, intermediate network of veins with very fine mesh, usually coloured, papery; petioles 5-8(-12) mm. l. *Panicles* much longer than the petioles, 3-4 cm. l. *Calyx*-tube bell-shaped, base obtuse, minutely 4-lobed, about 2.5 mm. l., 2 mm. br. *Petals* minute, roundish, white. *Style* 5 mm. l.

15. HENRIETTELLA Naud.

Trees or shrubs. Leaves somewhat leathery, elliptical, oblong, or lanceolate, 3-5-nerved. Flowers in clusters at leafless

nodes of one-year-old branches, stalked or subsessile. Flower-parts in fives. Calyx: tube bell-shaped; limb truncate or shortly lobed. Petals ovate, oblong, or lanceolate, usually acute or acuminate. Stamens 10; anthers, apex obtuse, with 1 pore, not beaked, connective not prolonged and without appendage at base. Ovary adhering by almost its whole surface, 4-5-celled. Berry 4-5-celled. Seeds in pulp, irregularly obovate-angled.

Species 22, natives of tropical America, including the West Indies.

Base of leaves sessile or subsessile, auriculate..... 1. *H. sessilifolia*.

Base acute or acuminate.

Leaves glabrous 2. *H. Macfadyenii*.

Leaves hispid 3. *H. fascicularis*.

1. *H. sessilifolia* Triana in *Trans. Linn. Soc. xxviii.* 143 (1871); *Cogn. in DC. Monogr. vii.* 1039. *Melastoma foliis amplioribus* &c. Browne *Hist. Jam.* 219, t. 24, f. 1, 2 (excl. syn.). *M. sessilifolia* L. *Syst. ed.* 10, 1022 & *Amœn. r.* 378. *Loreya trinitensis* Crueg. in *Linnæa* xx. 108 (1847); Griseb. *Fl. Br. W. Ind.* 245. *L. fasciculiflora* Naud. in *Ann. Sc. Nat. sér. 3, xviii.* 110 (1852). *Henriettea grandifolia* Macf. *Jam. ii.* 76 (1850). Type from Browne in *Herb. Linn.* (Fig. 141, D-G.)

Browne! Jobs Hill, St. Mary, *McNab!* above Fort Stewart, *Purdie!* Wilson! south-eastern foothills of John Crow (Blake) Mts., *Harris & Britton!* *Fl. Jam.* 10, 678.—Trinidad, Venezuela.

Shrub, 10-20 ft. high. *Leaves* 2-3.5 dm. l., elliptical, subsessile, apex obtuse, mucronate, base long, narrow, usually ending in auricles, 3-plinerved with union of nerves 3-4.5 cm. above base, with a marginal pair and an obscure nerve, usually entire, glabrous, but at base of leaves beneath and along midrib and nerves with short adpressed hairs swollen below. *Pedicels* usually 3-7, .5-1.5 cm. l. *Flower-parts* in fives. *Calyx* 4 mm. l., truncate. *Petals* 8-10 mm. l., white, roundish or irregularly oblong, apiculate or somewhat obtuse. *Anthers* 4 mm. l. *Stigma* conical, 5-ridged. *Berry* pulpy, subglobose, 5-6 mm. in diam. *Seed* .8 mm. l., somewhat helmet-shaped, the base like an inverted dish bearing numerous short flat epidermal outgrowths which protrude when wetted.

2. *H. Macfadyenii* Triana in *Trans. Linn. Soc. xxviii.* 143 (1871); *Cogn. in DC. Monogr. vii.* 1040; *Urb. Symb. Ant. iv.* 465.

Locality in Jamaica not given, *Macfadyen!*—Porto Rico.

Tree, 25-60 ft. high; branchlets acutely 4-cornered. *Leaves* 8-14 cm. l., narrowly elliptical, apex shortly acuminate, base acute, 3-plinerved with an obscure marginal pair, glabrous, papery; petioles 1-2 cm. l. *Pedicels* 5-8 mm. l. *Flower-parts* in fours or fives. *Calyx* subhemispherical, 2 mm. l.; the narrow limb spreading.

3. *H. fascicularis* Triana in *Trans. Linn. Soc. xxviii.* 143 (1871); *Cogn. in DC. Monogr. vii.* 1042. *Melastoma fascicularis* Sw. *Prodr.* 71 (1788) & *Fl. Ind. Occ.* 801. *Henriettea ramiflora* Macf. *Jam. ii.* 75 (non DC.). *Ossæa fascicularis* Griseb. *Fl. Br. W. Ind.* 246 (1860). Specimen from Swartz in *Herb. Stockholm.*

Wright! Masson! Swartz! Guys hill, St. Thomas in Vale, *McNab!* Kew Park, *Purdie!* Moneague, *Prior!* Hopeton, Westmoreland; Troy, 1500 ft.; Crofts Mt., Clarendon, 2500 ft.; *Harris!* Fl. Jam. 7091, 8679, 11,290.—Cuba, Hispaniola, Porto Rico.

Tree, 15-45 ft. high; young branchlets and petioles densely covered with bristle-like hairs. *Leaves* 8-16 cm. l., elliptical, shortly acuminate at both ends, 3-plinerved with a marginal pair, entire, hispid on both sides especially on the midrib and nerves, papery; petioles 7-1.5 cm. l. *Pedicels* 3-6 mm. l. *Flower-parts* in fours. *Calyx* 2.5-3 mm. l., bell-shaped, obscurely 4-toothed. *Petals* white, 4 mm. l., triangular-lanceolate, long acuminate. *Anthers* 2.5 mm. l. *Style* 5-6 mm. l.; stigma scarcely thicker than style. *Berry* subglobose, black, 6-7 mm. l. *Seeds* 1.5 mm. l., ovoid, granulate.

16. OSSÆA DC.

Shrubs or undershrubs. Leaves stalked or rarely 3 in a whorl, 3-plinerved in Jamaican species, but 3-nerved in *O. hirtella*. Flowers usually small, in cymes or panicles which are often clustered, axillary or rarely terminal, few-flowered. Flower-parts in fours in Jamaican species, except *O. asperifolia*—in fives. Calyx-limb usually prolonged, with mouth truncate or lobed. Petals ovate-acuminate, lanceolate, or awl-shaped, generally cohering in bud into a cone. Stamens twice as many as petals; anthers usually linear, sometimes oblong, with one pore; connective not or very shortly prolonged below the cells, without appendage or obscurely spurred or tuberculate. Ovary adhering almost altogether, 4(3-5)-celled. Berry globose, 4(3-5)-celled, usually fleshy. Seeds angular, pyramidal, or obovoid.

Species 50, natives of the West Indies and tropical continental America.

Flowers not in clusters.

Leaves 3 cm. l. or less..... 1. *O. microphylla*.
Leaves more than 3 cm. l.

Leaves 3-nerved with an obscure marginal pair.

Pedicels very short 2. *O. hirtella*.

Leaves 3-plinerved with a marginal pair.

Leaves membranous to papery.

Leaves on both sides and young branchlets
with long slender hairs. Lateral pedicels
2 cm. l. 3. *O. hirsuta*.

Leaves beneath and young branches minutely
scurfy. Fruit 8-ribbed 4. *O. micrantha*.

Leaves leathery, with pyramidal tubercles on
upper surface, minute globose tubercles
beneath 5. *O. asperifolia*.

Flowers sessile or subsessile, in clusters.

Leaves 3-plinerved, usually with one marginal pair.

Calyx shaggy with long bristle-like hairs 6. *O. glomerata*.

Leaves 3-plinerved, usually with two marginal pairs.

Calyx with short hairs, themselves covered with
very minute hairs..... 7. *O. scabrosa*.

1. *O. microphylla* Triana in Trans. Linn. Soc. xxviii. 146 (1871); *Cogn. tom. cit.* 1059. *O. pratensis* Macf. Jam. ii. 48 (1850). *Melastoma microphylla* Sw. Prodr. 72 (1788) & Fl. Ind. Occ. 813. *Sagraea microphylla* DC. Prodr. iii. 171 (1828); Naud. in Ann. Sc. Nat. sér. 3, xviii. 95; Macf. Jam. ii. 54. *Clidemia microphylla* Griseb. Fl. Br. W. Ind. 248. Type (from Masson) in Herb. Mus. Brit.

In fl. May and Nov.; Masson! Bertero; St. Thomas in Vale, Macfadyen; Purdie! March! Dove Hall, St. Thomas in Vale, Prior! near Troy, 2000 ft.; road to Dolphin Head, 1200 ft.; near Guys Hill, St. Ann, 1800 ft.; Harris! Fl. Jam. 9090, 9247, 12,039.—Cuba.

Shrub, 2-5 ft. high, with trailing branches, young branchlets and petioles densely hirtellous with short brown hairs. Leaves 1-3 cm. l., elliptical or ovate, 3-plinerved with an obscure marginal pair, on upper surface with short adpressed bristle-like hairs, beneath tomentose, nerves and cross-veins hirtellous; petioles 2-3 mm. l. Flowers solitary, or 2 or 3 together, or forming a cyme 1-2 cm. l., usually with 3 flowers, terminal one sessile, lateral pedicelled, pedicels hirtellous, about 1 cm. l., thread-like. Calyx hirtellous; tube 2 mm. l., lobes linear-awl-shaped, from a broad base, bent outwards, scarcely 1 mm. l. Petals oblong, acutely acuminate, 4 mm. l. Style oblong, apex awl-shaped, 2.5 mm. l. Berry about 5 mm. l., blue-black, hirtellous. Seeds smooth, shining, yellow, pyramidal, about 1 mm. l.

2. *O. hirtella* Triana in Trans. Linn. Soc. xxviii. 146 (1871); Cogn. in DC. Monogr. vii. 1057. *Melastoma hirtella* Sw. Prodr. 72 (1788) & Fl. Ind. Occ. 810. *Sagraea hirtella* DC. Prodr. iii. 171 (1828); Macf. Jam. ii. 51. *Clidemia hirtella* Griseb. Fl. Br. W. Ind. 249 (1860) (non Griseb. Cat. Cub. 97). Specimens from Swartz in Herb. Mus. Brit. and Herb. Stockholm.

In fl. May-Oct.; higher mts., Wiles! Swartz! near Bath; Cuna-Cuna Pass, 3000 ft.; Wilson!

Shrub, 3-6 ft. high, "with wand-like branches" (Wiles); young branchlets and petioles hirsute. Leaves 4-8 cm. l., lanceolate, acuminate, sparsely ciliate with bristle-like hairs, on upper surface glabrous, beneath sparsely hirsute, 3-nerved with an obscure marginal pair, under side much lighter than upper; petioles .5-1 cm. l. Inflorescence .5-1 cm. l., flowers solitary, or 2-3, cymose; pedicels about 1 mm. l. Calyx 1.5 mm. l., shortly toothed. Petals ovate to lanceolate, acuminate, 1 mm. l. Berry 2.5 mm. l., globose, hairy, deep purple, 4-celled.

3. *O. hirsuta* Triana in Trans. Linn. Soc. xxviii. 146 (1871); Cogn. tom. cit. 1058. *Melastoma hirsuta* Sw. Prodr. 72 (1788), Fl. Ind. Occ. 811 & Ic. ined. t. 40. *Sagraea hirsuta* DC. Prodr. iii. 171 (1828); Macf. Jam. ii. 55. *Clidemia hirsuta* Griseb. Fl. Br. W. Ind. 248. Specimens from Swartz in Herb. Mus. Brit. and Herb. Stockholm.

In fl. Nov.-Jan.; hills above hot springs, Bath, Swartz! near Bath, Macfadyen! Port Royal Mts., Purdie! Wilson! between Bath and Cuna-Cuna Pass, Harris & Britton! Fl. Jam. 10,548.

Shrub, 2-4 ft. high, with straggling branches; young branchlets, petioles, and peduncles hirsute with long slender purplish hairs. Leaves

5-9 cm. l., lanceolate, acuminate, base rounded, often oblique, 3-plinerved with a marginal pair which does not reach the apex, on both sides with long slender hairs (not tuberculate), beneath especially on nerves and veins, subentire; petioles .5-1.5 cm. l. *Cymes* 1-3 cm. l., few-flowered, terminal flower subsessile, with 2 long-pedicelled lateral flowers or with 2 branches springing from just below it, each with 1 or 3 flowers. *Calyx* very hirsute; tube ovoid, about 3 mm. l.; lobes linear-awl-shaped, about 5 mm. l. *Petals* white. *Berry* hairy, black-purple.

4. *O. micrantha* Macf. *Jam. ii.* 49 (1850); *Cogn. tom. cit.* 1066. *Melastoma micrantha* Sw. *Prodr.* 71 (1788) & *Fl. Ind. Occ.* 803. *Ocopleura micrantha* Griseb. *Fl. Br. W. Ind.* 260 (1860); *Triana tom. cit.* 146. Specimens from Swartz in Herb. Mus. Brit. and Herb. Stockholm

Swartz! Wiles; Ginger Hill, St. Elizabeth; St. George; Purdie! Manchioneal, 2000 ft., Wilson! Prior; between Bath and Cuna-Cuna Pass; John Crow (Blake) Mts., slope below big level; Harris & Britton! *Fl. Jam.* 10,556, 10,695.—Central America, Venezuela, Ecuador, Peru.

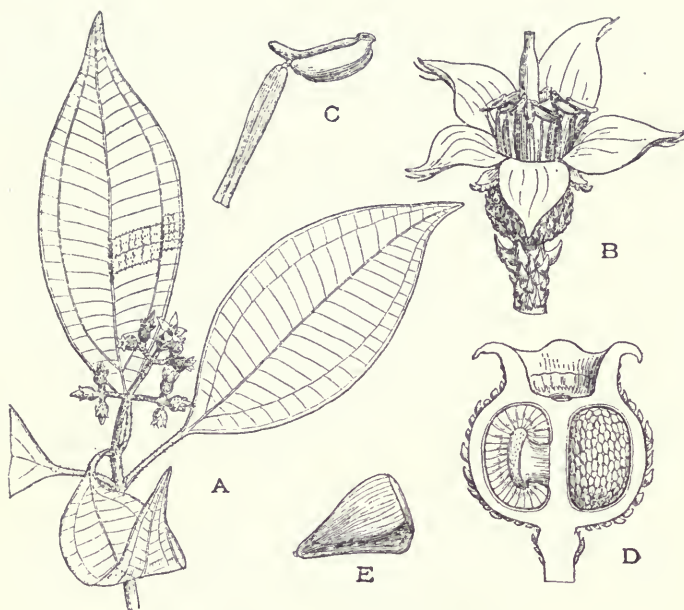
Shrub 6-10 ft. high, or *tree* 15 ft.; young branchlets, petioles, peduncles, and calyx slightly scurfy. *Leaves* .5-1.5(-2) dm. l., elliptical or narrowly elliptical, shortly and obtusely acuminate, base usually acute, membranous, margin wavy or subentire, sometimes with minute teeth, 3-plinerved with a marginal pair, glabrous above, slightly scurfy on nerves and veins beneath; petioles .5-3.5 cm. l. *Panicles* 3-5 cm. l., branches spreading; pedicels 3-4 mm. l. *Calyx* bell-shaped, 2 mm. l., 4-toothed. *Petals* white with a crimson spot at base, lanceolate, 3-4.5 mm. l. *Berry* flattened-subglobose, 4 mm. thick, 8-ribbed, "when ripe snow-white, pellucid" (Macfadyen).

5. *O. asperifolia* Triana in *Trans. Linn. Soc. xxviii.* 147 (1871) (excl. syn. Griseb. & hab. Cuba). *O. Eggersiana* Urb. in *Fedde Rep. xvii.* 406 (1921). *Clidemia asperifolia* Naud. *op. cit.* xvii. 342 (1852). *C. hirsuta* Macf. *Jam. ii.* 45 (1850). *C. lima* Griseb. *Fl. Br. W. Ind.* 249 (1860) (non DC.). *Leandra Eggersiana* Cogn. in *DC. Monogr. vii.* 641 (1891). (Fig. 143.)

High mountains, Wiles! Macfadyen! Purdie! Quashi Hill, about 5000 ft., Eggers; Silver Hill Gap, 3500 ft., Harris! south-eastern foothills of John Crow (Blake) Mts., Harris & Britton! *Fl. Jam.* 6292, 10,682, 10,773; Trafalgar, Portland, Miss J. R. Perkins!—Cuba.

Shrub 4-8 ft. or *tree* 15-25 ft. high; young branchlets, nerves of leaves beneath, petioles, and peduncles densely covered with adpressed brown bristle-like hairs, thickened below, usually not tuberculate. *Leaves* 4-8 cm. l., elliptical, shortly acuminate, base subacute, with minute teeth, 3-plinerved with a marginal pair, on upper surface with pyramidal tubercles, sometimes sharp-pointed, beneath with minute globose tubercles, sometimes pointed, network of veins very prominent; petioles .5-1.5(-2) cm. l. *Cymes* paniculate, terminal, and axillary to the uppermost pair of leaves, 3-4 cm. l., with clusters of 3 or more subsessile flowers at end of branches of inflorescence. *Flower*-parts in fives. *Calyx*: tube 3-3.5 mm. l., covered with sharp-pointed tubercles; lobes 5, blunt, about 1 mm. l. *Petals* ovate, acuminate, 3-4 mm. l. *Anthers*: connective at base shortly spurred. *Ovary* 5-celled.

O. lima Triana has been reported from Jamaica; it was first described from a specimen from Hispaniola. It also occurs in Cuba, but we have

Fig. 143.—*Ossaea asperifolia* Triana.

A, Portion of flowering branch with
leaves and inflorescence $\times \frac{3}{4}$.
B, Flower $\times 4$.

C, Stamen $\times 11$.
D, Fruit cut lengthwise $\times 11$.
E, Seed $\times 24$.

not seen any specimen from Jamaica. The under side of the leaves differs from *O. asperifolia* Tr. in not having the minute globose tubercles, but is grey-scaly with a very prominent network of veins.

6. *O. glomerata* Triana in *Trans. Linn. Soc.* xviii. 146 (1871); *Cogn. in DC. Monogr.* vii. 1059. *Sagræa glomerata* Naud. in *Ann. Sc. Nat. sér. 3*, xviii. 96 (1852). *S. scabrosa* Naud. *tom. cit.* 97 (excl. *syn.*). *Clidemia scabrosa* Griseb. *Fl. Br. W. Ind.* 248 (1860) (in part).

In fl. Sept.–Dec.; Wiles! Port Royal and St. David, mts., *Macfadyen*! near Dove Hall, St. Thomas in Vale, *Prior*! Old England, Blue Mts., 3500 ft.; Iron Face, Chester Vale, 3000 ft.; *Harris*! Fl. Jam. 6470, 10,028.

Slender shrub, 4–10 ft. high; young branchlets and petioles with long, purplish, thickish hairs. *Leaves* 4–10 cm. l., ovate or ovate-oblong, apex acute or blunt, base blunt or subrounded, 3-plinerved with 1 or 2 marginal pairs, obscurely crenulate, on upper surface with short tuberculate bristle-like hairs, beneath more or less densely hirtellous, tomentose, two of a pair sometimes somewhat unequal; petioles .5–1.5 cm. l. *Flowers* sessile or subsessile, several forming a globose cluster. *Calyx* shaggy with long bristle-like hairs minutely tuberculate at base; tube 2–2.5 mm. l.; lobes linear-awl-shaped, 2–2.5 mm. l. *Petals* white, ovate or lanceolate, acuminate, 2–3 mm. l. *Style* 3 mm. l.

7. *O. scabrosa* DC. *Prodr.* iii. 169 (1828); *Macf. Jam.* ii. 47; *Cogn. tom. cit.* 1060. *Melastoma subhirsuta* &c. *Browne Hist. Jam.* 219, t. 24, f. 3. *M. scabrosa* L. *Syst.* 1022 (1759) & *Amæn. v.* 378; *Sw. Obs.* 174. *Sagra Lindeniana Naud. tom. cit.* 96 (1852). *Clidemia scabrosa* Griseb. *Fl. Br. W. Ind.* 248 (1860) (in part). Type from Browne in Herb. Linn.

In fl. Nov., Dec.; *Browne!* *Swartz!* Sulphur river, Bath, *Macfadyen!* *Wilson!* between Bath and the hot springs, *Harris & Britton!* *Fl. Jam.* 10,570.—Cuba.

Shrub, 3–12 ft. high; young branchlets and petioles densely covered with long thickish hairs, themselves bearing very minute hairs. *Leaves* 4–13 cm. l., ovate, somewhat acuminate with blunt apex, base rounded or emarginate, 3-plinerved with 2 pairs of nerves below, not reaching apex, crenulate, on upper surface with short tuberculate bristle-like hairs, beneath pitted, hirtellous on nerves and veins, two of a pair often very unequal; petioles 2–6 cm. l. *Flowers* sessile, 6–10, closely clustered in axils, sometimes at nodes that have dropped their leaves. *Calyx* with similar hairs to stem, purplish; tube 2 mm. l.; lobes triangular at base, 1–1.5 mm. l. *Petals* lanceolate, acuminate, 2 mm. l., white tinged with purple. *Style* crimson, 3 mm. l. *Berry* globose, hirsute, 4-celled.

17. BLAKEA L.

Shrubs erect or climbing. Leaves subsessile or stalked, large, somewhat leathery, elliptical or oblong, acuminate, subentire, 3–7-nerved, the transverse veins very numerous and close together. Flowers rather large, axillary, solitary or clustered; bracteoles 4–6, opposite in pairs, forming an involucre. Calyx, limb 6-lobed. Petals 6. Stamens 12; anthers with 2 pores, connective very thick, prolonged into a spur. Ovary adhering to the base of the calyx, 4–6-celled. Ovules numerous in the cells, on thick placentas fixed at the interior angle of the cell. Berry fleshy. Seeds ovoid-pyramidal.

Species 38, natives of the West Indies, Venezuela, Colombia, and Peru.

Leaves 5–14 cm. l., elliptical to roundish-elliptical.

Flowers rosy, crimson, or purple; 4–8 cm. across... 1. *B. trinervia*.

Leaves 10–19 cm. l., ovate to broadly elliptical. Flowers

white, 6–8 cm. across 2. *B. Urbaniana*.

1. *B. trinervia* L. *Syst. ed.* 10, 1044 (1759), *Amæn. v.* 379 & *Sp. Pl. ed.* 2, 635 (1762); *Sw. Obs.* 188; *A. Robinson Ic. ined.*; *Bot. Mag. t.* 451; *Tussac Fl. Ant.* iii. 86, t. 24 (t. 24 is a copy of Browne's drawing, badly coloured); *Macf. Jam.* ii. 95; *Griseb. Fl. Br. W. Ind.* 263 (as *B. trinervis*); *Cogn. in DC. Monogr.* vii. 1071. *B. fruticosa* &c. *Browne Hist. Jam.* 323, t. 35. Specimen in Herb. Linn., name in Solander's hand.

Jamaica Rose.

In fl. throughout the year; *Wright!* *Masson!* *Bertero!* St. Mary; St. Georges Gap, Blue Mts.; *McNab!* *Moneague,* *Prior!* J.P. 656, *Morris*

between Claremount and Moneague, *Fawcett*! near Woodcutters' Gap, 4000 ft.; near Troy, 1500-2000 ft.; Amity Hall, St. Ann, 1400 ft.; *Harris*! Fl. Jam. 6435, 8535, 8648, 12,029; Hardware Gap, 4000 ft., *G. E. Nichols*! near Troy, *Miss J. R. Perkins*!

Shrub climbing on trees; young branchlets, petioles, nerves of leaves beneath, and peduncles with thick brown hairs or minute scales. *Leaves*

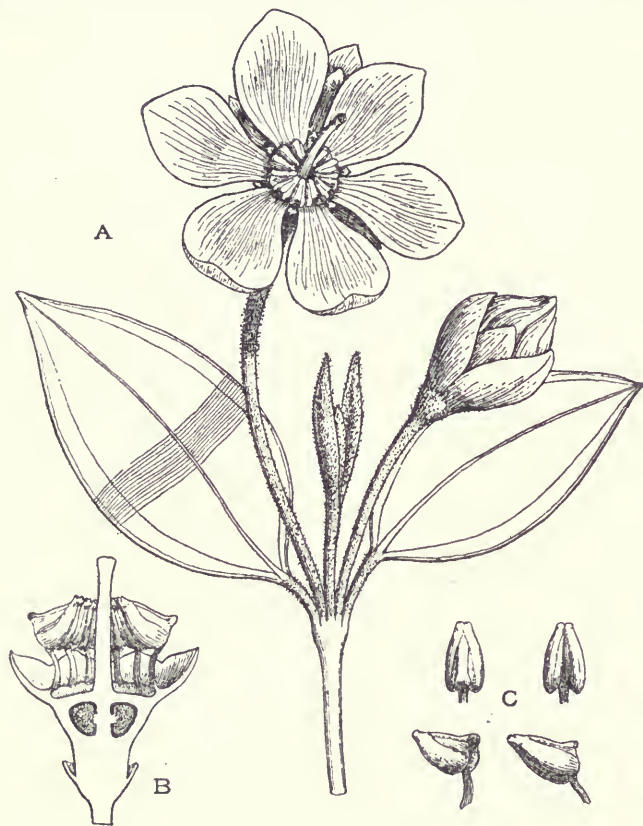


Fig. 144.—*Blakea trinervia* L.

A, Portion of branch with leaves and flowers $\times \frac{3}{4}$.

B, Flower cut lengthwise with petals and bracteoles removed $\times 1\frac{1}{2}$.

C, Stamens, various views, $\times 1\frac{1}{2}$.

5-10 cm. l., 3-5 cm. br., narrowly elliptical or elliptical, shortly and abruptly acuminate, base rounded or obtuse, 3-plinerved or 3-nerved with a marginal pair, glabrous on both sides except nerves beneath; petioles 1-3 cm. l. *Flowers* solitary; peduncles 3-6 cm. l. *Bracteoles* roundish, with powdery-stellate scales, puberulous, or glabrate, margin above the middle tomentose, with many longitudinal nerves, rigid, 1.5-2 cm. l.

v.

2 D

Calyx crimson, lobes tomentose near apex, 2-4 mm. l., obtuse. *Petals* 2·5-3·5 cm. l., of a bright crimson. *Filaments* crimson; anthers yellow. *Style* 1·5 cm. l., crimson.

Var. *Normanii* Fawc. & Rendle in *Journ. Bot.* lxiv. 105 (1926); leaves 10-14 cm. l., 5·5-8·5 cm. br., elliptical to roundish-elliptical; petals smaller, about 2 cm. l., purple. *Rev. J. Waters!* Mandeville, *Norman!*

2. *B. Urbaniana* Cogn. in *Urb. Symb. Ant.* vi. 27 (1909).

Between Askenish and Dolphin Head, 900-2000 ft., *Harris!* *Fl. Jam.* 9244, 10, 274.

Shrub climbing on trees; young branches, petioles, and peduncles with brown powdery scales or short slender hairs. *Leaves* 10-19 cm. l., 5-9 cm. br., ovate to ovate-elliptical, somewhat abruptly and shortly acuminate, base rounded, 3-plinerved or 3-nerved with a marginal pair, on both sides glabrous or beneath at base very slightly puberulous; petioles 2-4 cm. l. *Flowers* solitary; peduncles 1-3 cm. l. *Bracts* broadly elliptical-ovate, outside sparsely powdery-stellate-puberulous or glabrate, with many longitudinal nerves, rigid, 1·5-2 cm. l. *Calyx* broadly hemispherical, 1·5 cm. br., limb wavy-lobed, lobes apiculate. *Petals* white, ovate-lanceolate, 3·5 cm. l. *Style* 2 cm. l.

18. MOURIRIA Juss.

Shrubs or small trees, glabrous. Leaves sessile or shortly stalked, entire, one-nerved or somewhat pinnate-nerved, very rarely subtrinnerved. Inflorescence axillary. Flowers small, parts usually in fives. Calyx-limb cup-shaped, lobed or truncate. Petals, apex acute or acuminate. Stamens twice as many as the petals, usually exserted; anther-cells with 2 pores or ehinks, connective more or less prolonged below the cells, thickened and laterally compressed and forming a spur, with a gland at the middle of the back. Ovary inferior, usually 2-5-celled; ovules 2 or more in each cell, inserted side by side at the inner angle. Berry globose, drupe-like, with 1-4 seeds, often crowned by the calyx-limb. Seeds roundish, coat often adhering to the cell; cotyledons thick, plano-convex, radicle small.

Species 51, natives of tropical continental America and of the West Indies, one only in Jamaica.

M. myrtilloides Poir. in *Dict. Sc. Nat.* xxxiii. 163 (1824); *Macf. Jam.* ii. 11; *Griseb. Fl. Br. W. Ind.* 243; *Cogn. in DC. Monogr.* vii. 1125; *Urb. Symb. Ant.* viii. 504. *Myrti folio arbor cortice &c. Sloane Cat.* 162 & *Hist.* ii. 78, t. 187, f. 3. *Arbor foliis cordatis myrtineis &c. Browne Hist. Jam.* 370? *Petaloma myrtilloides Sw. Prodr.* 73 (1788) & *Fl. Ind. Occ.* 833, t. 14. Specimens from Swartz from Hispaniola in *Herb. Mus. Brit.* and *Herb. Stockholm.* (Fig. 145.)

Sloane *Herb.* vi. 69! *Wright!* *Lindsay!* *Wilson!* *March!* *Moneague,* *Prior!* between Four Paths and Clarendon Park, *Harris & Britton!*

Peckham, Clarendon, 2500 ft., Harris! Fl. Jam. 10,629, 11,037.—Cuba, Hispaniola.

Tree or shrub, 12–25 ft. high, with slender branches. *Leaves* 3–5 cm. l., lanceolate, apex acute, base rounded or subcordate, somewhat oblique, one-nerved, subsessile or sessile. *Flowers* usually solitary, about 8 mm. l.;

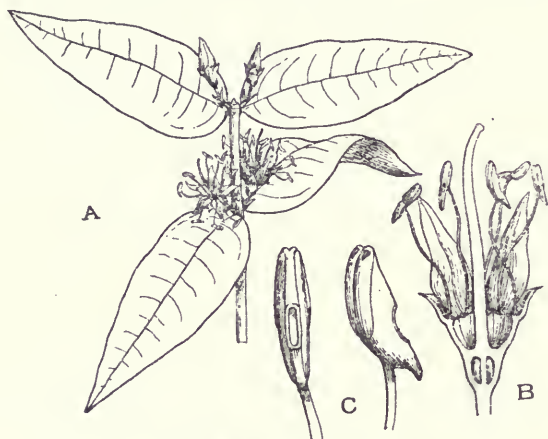


Fig. 145.—*Mouriria myrtilloides* Poir.

A, Portion of branch with leaves and flowers $\times \frac{1}{3}$.

B, Flower cut lengthwise $\times 2\frac{1}{2}$.

C, Stamens, side view and back view, $\times 7$.

pedicels 2–4 mm. l., with 2 bracteoles at the middle. *Calyx* yellow, bell-shaped; lobes ovate, acute, spreading-reflexed, persistent. *Petals* white. *Stamens* yellow; anther-cells as long as the spur. *Style* exserted. *Berry* globose, 1–(2)-seeded.

Melastoma malabathricum L., an escape from Castleton Garden, is a native of India. It is a spreading shrub, 6 ft. high; the 5-nerved leaves 5–12 cm. l., with hairs on both sides, the flower-buds enclosed by large elliptical bracts, and the large flowers with mauve-purple petals 2–3.5 cm. l., sufficiently distinguish it from native plants belonging to this family.

FAMILY XCI. ONAGRACEÆ.

Herbs, rarely shrubs or trees. Leaves opposite or alternate; stipules very small or wanting. Flowers usually hermaphrodite and regular, axillary and solitary or spicate or racemose towards the ends of the flowering branches, paniculate in a few. Calyx-tube prolonged beyond the ovary and deeply cleft above into 2–4 (5–6) valvate lobes. Petals generally 2–4 (sometimes wanting in *Ludwigia*), inserted at the base of the disk (when present), twisted in bud, soon falling. Stamens usually 1–8, inserted with the petals, in 1 or 2 series, the second series sometimes without anthers. Anthers opening towards the centre. Disk epigynous.

Ovary inferior, usually 4-celled (3-6-celled in *Ludwigia*). Ovules numerous in the cells, sometimes solitary. Fruit a capsule, a berry in *Fuchsia*, or nut-like, septicidally or loculicidally 4-valved, valves separating from the axis to which the seeds are attached. Seeds numerous (few or solitary), usually small; endosperm wanting or a very thin layer. Embryo usually obovoid, cotyledons compressed, plano-convex, radicle small, short, straight.

Species about 470, dispersed everywhere through the temperate regions of the whole world, rarer in the tropics.

Calyx-tube not or scarcely prolonged beyond the ovary.

Capsule septicidal.

Stamens twice the number of petals 1. *Jussieua*.

Stamens the same number as petals 2. *Ludwigia*.

Calyx-tube prolonged beyond the ovary. Stamens twice the number of petals.

Capsule loculicidal 3. *Cenothera*.

Berry pulpy 4. *Fuchsia*.

1. JUSSIEUA L.

Herbs, rarely shrubs, very rarely small trees; usually growing in wet places, sometimes floating. Leaves alternate, membranous, entire (serrate in *J. sedoides*); stipules 2, very small. Flowers yellow or white, axillary, solitary; peduncle with 2 bracteoles at the apex, which are usually small or represented by glands, conspicuous or somewhat leafy in *J. peruviana*. Calyx-tube not prolonged beyond the ovary; lobes 4-6, acute, persistent. Petals 4-6, inserted under the margin of an epigynous disk, spreading. Disk 4-5-lobed, lobes hairy. Stamens twice as many as the petals, inserted with them. Ovary 4-5(6)-celled; style simple; stigma 4-6-lobed; ovules indefinite, inserted at the interior angle of the cells, placentas often prominent. Capsule terete or with 4-12 angles or ribs, 4-6-celled, crowned by the calyx-lobes and disk, loculicidally and septicidally 4-5-valved, valves decaying and leaving 8-10 persistent ribs. Seeds usually numerous, affixed to the margins of the valves or to placentas separating from the valves; cotyledons obtuse; radicle short.

Species 40, natives of the tropics, especially in America.

§ 1. Capsule obconical. Seeds very numerous, in several series, horizontal, narrowly ellipsoidal, with a slightly or scarcely prominent raphe.

Plant shrubby, erect 1. *J. peruviana*.

Plant floating 2. *J. sedoides*.

§ 2. Capsule prismatic, 4-cornered. Seeds as above 3. *J. erecta*.

§ 3. Capsule subcylindrical or obscurely 5-cornered. Seeds in one series in the cells, narrowly ellipsoidal, surrounded by thick corky endocarp.

Plant herbaceous or somewhat woody, erect 4. *J. leptocarpa*.

Plant creeping or floating 5. *J. repens*.

§ 4. Capsule cylindrical. Seeds in several series, with a very large raphe simulating an empty cell attached to the seed, the whole externally flattened-sub-spherical with a groove 6. *J. suffruticosa*.

(Seeds should be perfectly ripe, especially in No. 6, when used in the Key.)

§ 1. Capsule obconical. Seeds very numerous in the cells, in several series, narrowly ellipsoidal, slightly curved, with a slightly or scarcely prominent raphe.

1. *J. peruviana* L. *Sp. Pl.* 388 (1753); *Mich. in Fl. Bras. xiii. pt. 2*, 151; *Millsp. in Field Columb. Mus. Bot. ii.* 81; *Urb. Symb. Ant. iv.* 466 & *viii.* 505; *Fawc. in Journ. Bot. lxiv.* 13 (1926). *J. hirta* Sw. *Obs.* 143 (1791); *Vahl Eclog. ii.* 31; *Macf. Jam. ii.* 30; *Griseb. Fl. Br. W. Ind.* 273. *J. grandiflora* Ruiz & Pav. *Ic. t.* 382. *J. macrocarpa* HBK. *Nov. Gen. & Sp. vi.* 102, *t.* 533 (1824). *J. speciosa* Ridl. in *Journ. Bot. lix.* 259 (1921) (excl. syn. *Thwaites*). *Lysimachia*...major &c. *Sloane Cat.* 85 & *Hist. i.* 201, *t.* 127, *f.* 3. *Onagra laurifolia* &c. *Feuillée Journ. Obs. ii.* 716, *t.* 9 (1714). *Oenothera assurgens hirsuta* &c. *Browne Hist. Jam.* 208. *Œ. hirsuta* &c. *Plum. Pl. Amer. (Burm.) t.* 174, *f.* 2. *Œ. hirta* L. *Syst. ed.* 10, 998 (1759) & *Amœn. v.* 378. *Jussie herissée* *Descourt. Fl. Ant. vi.* 28, *t.* 388.

Sloane Herb. *iii.* 125! *Wright!* Wag Water, *McNab!* *Hodges*, St. Elizabeth, *Purdie!* Ocho Rios; *Moneague;* *Prior!* Port Antonio, *Hitchcock;* also *Millspaugh;* *Charlton;* *Hollis savanna*, 2400 ft.; *Harris!* *Fl. Jam.* 8514, 12,252; near Falmouth, *Miss Moulton Barrett!* near Troy, 2000 ft., *Miss J. R. Perkins!* Millbank, Portland, *Norman!*—Florida, Cuba, Is. of Pines, *Hispaniola*, Porto Rico, Trinidad, trop. cont. Amer.

Shrub, 5–10 ft. high, erect, hairy. *Leaves* 6–10 cm. l., broadly lanceolate, entire, acute at both ends; *petioles* 1–4 mm. l. *Pedicel* about 1 cm. l. in fl. *Bracteoles* 8–13 mm. l., sometimes somewhat leafy. *Flowers* bright yellow, large; parts in fours, occasionally in fives. *Calyx*-lobes triangular-ovate, acuminate, 9–12 mm. l., later to 16 mm. l. *Petals* about twice longer than the calyx-lobes, roundish, emarginate, with a short claw. *Capsule* 2–2.5 cm. l. *Seeds* .6–.8 mm. l.

2. *J. sedoides* Humb. & Bonpl. *Pl. Équin. i.* 13, *t.* 3, A (1805); *Griseb. Fl. Br. W. Ind.* 272; *Mich. in Fl. Bras. xiii. pt. 2*, 158.

Ponds, St. Elizabeth, *Purdie!* *Lacovia;* between New Market and Darliston, 800 ft.; Shettlewood, 500 ft.; *Harris!* *Fl. Jam.* 7243, 9872, 11,646.—Panama, Ecuador, Brazil, Peru, Paraguay.

Herb growing in ponds, floating, with long slender roots at the nodes. *Leaves* becoming crowded at the top of the stem; limb 7–14 mm. l. & br., rhomboidal, toothed on upper edges, entire below; *petioles* 2–6 cm. l. *Flowers* yellow; parts in fours; *peduncle* 12–25 mm. l.; erect while in flower, afterwards spreading or reflexed. *Calyx*-lobes 6–7 mm. l., ovate. *Petals* about twice as long as calyx-lobes, roundish-obovate. *Capsule* 12–18 mm. l., obconical. *Seeds* .6 mm. l.

§ 2. Capsule prismatic, 4-cornered. Seeds as in § 1.

3. *J. erecta* L. *Sp. Pl.* 388 (1753) & *Amen. v.* 378; *Gaertn. Fruct. i.* 159, t. 31; *Lam. Encyc.* 332, *Ill. t.* 280, f. 2; *Macf. Jam. ii.* 28; *Mich. in Fl. Bras. xiii. pt. 2,* 160; *Small Fl. S.E. U.S. ed. 2,* 839; *Urb. Symb. Ant. iv.* 467 & *viii.* 505; *Fawc. in Journ. Bot. lxiv.* 11 (1926). *J. Onagra Mill. Dict. ed. 8* (1768). *J. acuminata Sw. Fl. Ind. Occ.* 745 (1798)?; *Macf. ii.* 28?; *Griseb. Fl. Br. W. Ind.* 272 (in part); *Mich. tom. cit.* 163 (in note to *J. linifolia*). (Fig. 146, f.)

Wright! St. Mary, *McNab!* St. Thomas in East; Westmoreland; *Purdie!* Wag Water valley, 400-600 ft.; *Thompson!* also *Harris!* Spanish Town; *Johns Hall,* Clarendon, 2200 ft.; *Harris!* *Fl. Jam.* 6193, 7989, 11,874, 12,836.—Florida, West Indies, trop. cont. America and Africa, Madagascar.

Stem up to 4 ft. high, much branched, angled obscurely by the decurrent petioles, erect, glabrous. *Leaves* 5-8 cm. l., 8-12(-24) mm. br., narrowly lanceolate to broadly lanceolate, acuminate at both ends, those on the branches sometimes almost linear, roughish on the margin and sometimes on the nerves above; petiole 2-5 mm. l. *Flowers* small, subsessile or sessile; parts in fours. *Calyx*-lobes lanceolate-ovate, 4-5 mm. l. *Petals* obovate-elliptical, as long as or a little longer than the calyx-lobes. *Capsule* about 1.5 cm. l., about 3 mm. br. *Seeds* 4-5 mm. l.

Micheli (tom. cit. 163) includes *J. acuminata* Sw. as he has seen a specimen from *Swartz* "in herbario Candolleano"; *Urban* does so also, as he has seen a specimen from *Swartz* in *Hb. Holm.* which appears to him to be only a juvenile form. *Swartz* describes the species as with stem 6 inches high, not branched, leaves broadly lanceolate, petals ovate, acuminate, capsule base acuminate, seeds roundish. *Macfadyen* gives a similar description, but we have not seen any specimen to correspond. *J. acuminata* of *Benth.* in *Hook. Jn. Bot. ii.* 316 (1840), of *Oliv. Fl. Tr. Africa ii.* 489, of *C. Wright* in *Journ. Linn. Soc. x.* 478, also of *Griseb.* (l.c. in part) are *J. linifolia* Vahl.

§ 3. Capsule subcylindrical or obscurely 5-cornered. Seeds in one series in the cells, narrowly ellipsoidal, surrounded by thick corky endocarp.

4. *J. leptocarpa* Nutt. *Gen. Amer. i.* 279 (May, 1818); *C. Wright* in *Journ. Linn. Soc. x.* 477; *Small Fl. S.E. U.S. ed. 2,* 838; *Urb. Symb. Ant. iv.* 467 & *viii.* 505. *J. variabilis* Mey. *Prim. Fl. Esseq.* 174 (Sept. 1818); *Griseb. Fl. Br. W. Ind.* 272. *J. pilosa* H. B. & K. *Nov. Gen. & Sp. vi.* 101, t. 532 a & b (1823); *Mich. in Fl. Bras. xiii. pt. 2,* 164. (Fig. 146, n.)

Distin; *Wulfschlaegel;* *March;* *Moncague,* *Prior!* Port Antonio, *Hitchcock.*—Cuba, Hispaniola, Porto Rico, Martinique, Guadeloupe, Grenada, Trinidad, trop. and temp. cont. America, trop. Africa, Madagascar.

Plant somewhat shrubby, pubescent or glabrous, 2-6 ft. high; branches spreading, angled. *Leaves* on stem 6-15 cm. l., on branches often as short as 2-5 cm. l., lanceolate, tapering towards the subsessile base. *Flowers* shortly stalked; parts in fives (4-6). *Calyx*-lobes 4-6 mm. l., ovate-lanceolate or lanceolate, acuminate. *Petals* about as long as calyx-lobes,

obovate. *Stamens* unequal, those opposite the petals shorter. *Capsule* 2.5-4 cm. l., endocarp corky, enclosing the seed, forming a horseshoe-shaped cell round each, but leaving it free and exposed above and below. *Seeds* .7 mm. l.

5. *J. repens* L. *Sp. Pl.* 388 (1753); *Sw. Obs.* 172; *Ruiz & Pav. Ic. ined. iv. t.* 382, *fig. b.*; *Hook. Bot. Misc. iii. Suppl. t.* 40; *Griseb. Fl. Br. W. Ind.* 272; *Mich. in Fl. Bras. xiii. pt. 2,* 166, *t. 34, f. 2*; *Urb. Symb. Ant. iv.* 468 & *viii.* 506; *Fawc. in Journ. Bot. lxiv.* 12 (1926). *J. Swartziana* DC. *Prodr. iii.* 54 (1828); *Macf. Jam. ii.* 27. *Lysimachia minor &c. Sloane Cat.* 85 & *Hist. i.* 201, *t. 128, f. 2, 3.* *Oenothera herbacea repens* Browne *Hist. Jam.* 208? (Fig. 146, G.)

Sloane Herb. iii. 127! *Broughton!* *Swartz!* *McNab!* Orange Bay, Hanover, *Purdie!* *March!* Moneague, *Prior!* Port Morant, *Hitchcock!* Passage Fort, *Campbell!* Castleton, *Thompson!*—Cuba, Hispaniola, Porto Rico, tropics.

Stem creeping in mud, or floating by means of tufts of white spongy bodies at nodes, with ascending branches, rooting at the nodes. *Leaves* 1-4(-5) cm. l., obovate, spatulate or oblanceolate, entire; petiole shorter than limb. *Flowers* yellow, solitary, axillary; parts in fives; pedicels 5-8 mm. l., increasing in fruit. *Calyx*-lobes narrowly lanceolate or sublinear, 4-5(-7) mm. l. *Petals* obovate, about twice as long as calyx-lobes. *Capsule* 1.5-2(-3) cm. l., cylindrical, usually 10-ribbed; endocarp thick, hard, surrounding the seeds and united with them. *Seeds* 2-3 mm. l.

§ 4. *Capsule* cylindrical. *Seeds* in several series, with a very large raphe simulating an empty cell attached to the ripe seed, the whole externally flattened-spherical with a groove.

6. *J. suffruticosa* L. *Sp. Pl.* 388 (1753) (excl. syn.); *Griseb. Fl. Br. W. Ind.* 273; *Mich. in Fl. Bras. xiii. pt. 2,* 169; *Britt. & Millsp. Bah. Fl.* 310; *Fawc. in Journ. Bot. lxiv.* 12 (1926). *J. pubescens* L. *Sp. Pl. ed.* 2, 555 (1762) (excl. syn. *Sloane*); *Mill. Dict. ed.* 8 (1768); *Fawc. tom. cit.* 13. *J. erecta* Mill. *loc. cit.* (non L.). *J. hirsuta* Mill. *loc. cit.* *J. angustifolia* Lam. *Encyc. iii.* 331 & *Ill. t.* 280, *f. 3* (1789); *Griseb. loc. cit.* *J. villosa* Lam. *loc. cit.* *J. octonervia* Lam. *tom. cit.* 332 & *Ill. t.* 280, *f. 1* (1789); *Macf. Jam. ii.* 29; *Mich. tom. cit.* 170, *t. 35.* *J. octovalvis* Sw. *Obs.* 142 (1791); *Millsp. in Field Columb. Mus. Bot. ii.* 81. *J. erecta* Sw. *Obs.* 173 (1791)? (non L.). *J. palustris* Mey. *Prim. Fl. Esseq.* 173 (1818)?; *Griseb. Fl. Br. W. Ind.* 272. *J. octofila* DC. *Prodr. iii.* 57 (1828); *Macf. Jam. ii.* 30. *Lysimachia...foliis glabris &c. Sloane Cat.* 85 & *Hist. i.* 37, *t. 11, f. 1.* *Oenothera assurgens glabra &c. Browne Hist. Jam.* 208? *O. octovalvis* Jacq. *Sel. Stirp. Amer.* 102, *t. 70* (1763). (Fig. 146, A-E.)

Houstoun! *Wright!* *Cuming!* *Distin!* St. Mary, *McNab!* Moneague, *Prior!* *March!* near Gordon Town, *Ball!* Claverty Cottage, Blue Mts.,

J.P. 970, *Hart*! Yallahs valley, 1800 ft.; *Hope*, 600 ft.; *Harris*! Mona, Liguanea plain, 600 ft., *Campbell*! Halfway Tree, *Miss Wood*! Golden Spring, 800 ft.; *Wards Rock*, 700 ft.; *Thompson*! Port Morant; *Port Antonio*; *Hitchcock*; near Port Antonio, *Norman*! Fl. Jam. 5785, 5807, 5869, 7636, 7984, 8021.—Bahamas, West Indies, warmer regions of the whole world.

Plant herbaceous, often woody at base, villous-pubescent, puberulous, or glabrous; stem 3-4 ft., erect, branching; branchlets angled. Leaves

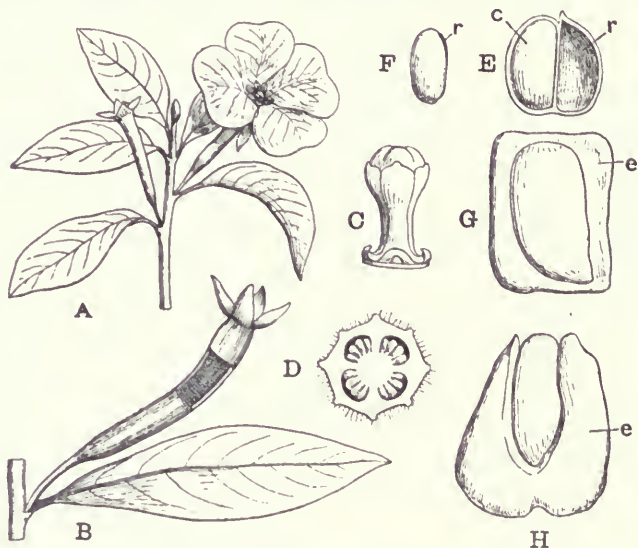


Fig. 146.—*Jussiaea suffruticosa* L.

- A, Portion of branch with leaves, flower, and young capsule, $\times \frac{1}{2}$.
 B, Leaf and ripe capsule with part of pericarp removed $\times \frac{1}{2}$.
 C, Style, enlarged.
 D, Ovary cut across, enlarged.
 E, Seed; c, embryo; r, the hollow enlarged raphe; $\times 20$.

- F, Seed of *J. erecta* L.; r, inconspicuous raphe; $\times 20$.
 G, Seed of *J. repens* L. surrounded by e, endocarp, $\times 20$.
 H, Seed of *J. leptocarpa* Nutt. lying loose in e, endocarp, $\times 20$.

(C, D after Fl. Bras.)

3-10 cm. l., narrowly lanceolate to elliptical-ovate, narrowed at both ends, acute, membranous; petiole short, 3 mm. l. to about 1 cm. l. *Flowers* shortly stalked, parts in fours. *Calyx* hirsute or puberulous with adpressed hairs, or glabrous, or only ciliate at base; lobes ovate or ovate-lanceolate, acute or shortly acuminate, 5-7-nerved, 5-12 mm. l., 3-8 mm. br. *Petals* obovate-wedge-shaped, emarginate, sessile, generally half as long again or twice as long as calyx-lobes. *Capsule* 3-4.5 cm. l., cylindrical, 8-ribbed; pedicels .5-1 cm. l. *Seeds* with raphe attached .7 mm. in diam.

2. LUDWIGIA L.

Annual or perennial herbs, aquatic in Jamaican species. Leaves opposite or alternate, usually lanceolate, entire. Flowers

generally axillary, solitary, and sessile or shortly stalked. Calyx: tube not produced above the ovary; lobes 4 (3-5), acute. Petals 4 (3-5) or wanting, inserted under the margin of a disk. Stamens 4 (3-5), inserted with the petals. Ovary 4 (5)-celled; ovules inserted in indefinite series on placentas prominent from the interior angle of the cells. Capsule crowned by the epigynous disk and the calyx-lobes, rounded or with 4-5 ribs, angles, or wings, opening loculicidally by 4 valves (in Jamaican species). Seeds very numerous, minute.

Species about 30, mostly North American (3 in Jamaica), a few in the Old World.

Leaves alternate..... 1. *L. microcarpa*.

Leaves opposite.

Capsule 5-7 mm. l., tapering at base..... 2. *L. repens*.

Capsule 3-4 mm. l., rounded at base..... 3. *L. palustris*.

1. *L. microcarpa* Mich. Fl. Bor. Am. i. 88 (1803); *Small Fl. S.E. U.S. cd.* 2, 836; *Britt. & Millsp. Bah. Fl.* 310. *Isnardia microcarpa* Poir. in *Lam. Encyc. Suppl.* iii. 188 (1813); *Griseb. Fl. Br. W. Ind.* 271.

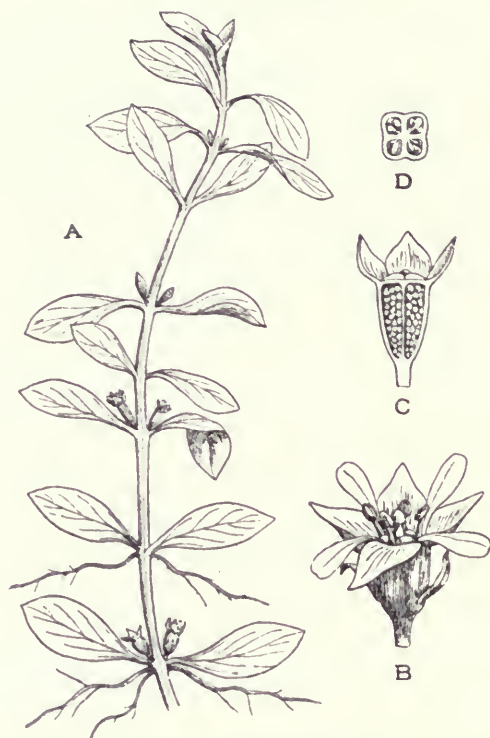
Moneague, Prior; Marsh near Black River, Harris! Fl. Jam. 9935.—S. U. States, Bahamas, Cuba.

Perennial herb, glabrous; stems simple or branched, ascending or trailing, often stoloniferous, becoming woody, young shoots 3-angled. Leaves 8-15 mm. l., alternate, spatulate or obovate-spatulate. Flowers sessile. Sepals triangular, acute, about 1 mm. l. Petals wanting. Capsule obconical, about 2 mm. l.

2. *L. repens* Sw. Prodr. 33 (1788), *Fl. Ind. Occ.* 273, & *Icon. t.* 8; *Urb. Symb. Ant.* viii. 507; *Britt. & Millsp. Bah. Fl.* 309. *Isnardia repens* DC. Prodr. iii. 60 (1828); *Macf. Jam. ii.* 31; *Griseb. Fl. Br. W. Ind.* 271; *Britt. Fl. Berm.* 267. *I. natans* *Small Fl. S.E. U.S.* 835 (1903). *Oldenlandia aquatica* &c. *Browne Hist. Jam.* 146. Specimen from Browne in Herb. Linn., the sheet pinned to the sheet of the European *Isnardia palustris* L. (Fig. 147.)

Browne! Shakespear! Masson! Ferry, Purdie! between Porus and Clarendon Park, Harris & Britton! Fl. Jam. 10,627.—Bahamas, Cuba, Hispaniola, Mexico, Bermuda, southern U.S. (Carolina to Florida and California).

Herb, 1-6 dm. l., creeping or floating, glabrous, rooting at the nodes, simple or sparingly branched. Leaves opposite, elliptical, long-tapering at base to a short petiole, about 3 cm. l. including the petiole, 1-1.5 cm. br. Flowers greenish-yellow. Calyx-lobes 4 or 5, about 2 mm. l. to 3 mm. in fruit, ovate-triangular, acute. Petals shorter than the calyx-lobes, inconspicuous. Capsule oblong, tapering slightly at base, more or less 4-angled, 5-7 mm. l.

Fig. 147.—*Ludwigia repens* Sw.

A, Portion of stem with roots, leaves, flower-buds, and flowers, $\times \frac{1}{2}$. B, Flower (stamens and style drawn from a bud) $\times 4$.
 C, Fruit cut lengthwise $\times 2$. D, Fruit cut across $\times 2$.

3. *L. palustris* Ell. *Sketch i.* 211 (1817); *Urb. Symb. Ant.* viii. 506. *Isnardia palustris* L. *Sp. Pl.* 120 (1753); *Griseb. Fl. Br. W. Ind.* 271; *Reichb. Ic. Germ. xxiii. t.* 22; *Small Fl. S.E. U.S. ed.* 2, 835; *Britt. Fl. Berm.* 266.

Moneague, *Prior.*—Cuba, Hispaniola, N. America, Bermuda, Mexico, Peru, west and south Europe, trop. and south Africa.

Herb. 1–5 dm. l., creeping or floating, glabrous. *Leaves* opposite, elliptical, tapering into a long slender petiole, 1.5–4 cm. l. including the petiole, .4–2 cm. br. *Flowers* axillary, sessile. *Calyx*-lobes triangular, acute. *Petals* small, reddish, or usually wanting. *Capsule* 4-sided, slightly longer than broad, rounded at base, 3–4 mm. l.

3. CENOTHERA L.

Herbs, rarely small shrubs. Leaves alternate. Flowers axillary, solitary, racemose, or crowded into a head. Calyx-tube

long, narrow; sepals 4, reflexed. Petals 4. Stamens 8. Ovary 4-celled; ovules inserted at the interior angle of the cell, horizontal or ascending. Capsule 4-celled, 4-valved; valves with the partition in the middle separating from the axis which carries the seeds. Seeds indefinite, attached to the axis or the partitions.

Species between 70 and 100, natives of North and South America beyond the tropics, rarer within the tropics, one species native of Tasmania; a few aliens from America in warm regions of the Old World.

- § 1. Capsule obovoid-club-shaped with a stalk-like base, angles winged, faces ridged, valves obovate. Petals pink or purplish, 10-13 mm. l. Body of capsule 5-10 mm. l. *O. rosea*.
 Petals white, turning reddish, 2-3 cm. l., obcordate. Body of capsule 15-17 mm. l. [*O. tetraptera*.]
 § 2. Capsule oblong, cylindrical-4-cornered, sessile, valves linear. Petals yellow, turning reddish. Petals roundish-obcordate. Calyx-tube above ovary 6-7 cm. l. [*O. longiflora*.]
 Petals roundish-obovate. Calyx-tube above ovary 3-4 cm. l. [*O. Drummondii*.]

O. rosea is probably native. *O. longiflora* was introduced before Macfadyen's time, and was said by him to be common in mts. of St. Andrew. The others were introduced by Morris in 1884.

O. rosea Soland. in Ait. Hort. Kew. ii. 3 (1789); Bot. Mag. t. 347; Macf. Jam. ii. 26; Griseb. Fl. Br. W. Ind. 273 & Cat.

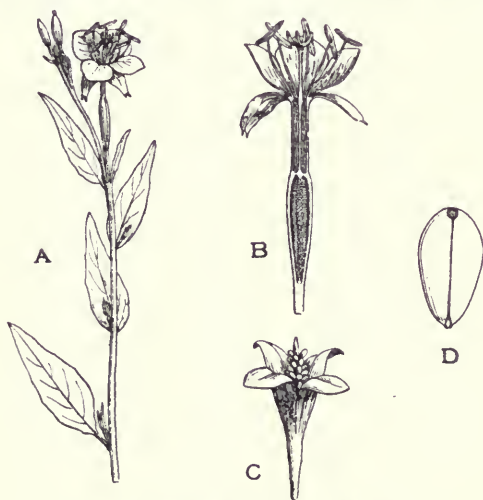


Fig. 148.—*Oenothera rosea* Soland.

- A, Portion of branch with leaves, flower-buds, and flowers, $\times \frac{2}{3}$. C, Fruit $\times 1\frac{1}{2}$.
 B, Flower cut lengthwise $\times 1\frac{1}{2}$. D, Seed $\times 22$.

Cub. 108. *Æ. rubra* Cav. *Icon. iv.* 68, t. 400 (1797). Hartmannia rosea G. Don in *Sweet Hort. Brit. ed.* 3, 236 (1839); *Small Fl. S.E. U.S. ed.* 2, 843; *Britt. Fl. Berm.* 269. Type in Herb. Mus. Brit. (Fig. 148.)

Bancroft; river courses of Yallahs and Hope; mts. of St. Andrew, Port Royal and St. David; *Macfadyen*; *Purdie*; Clydesdale road, J.P. 1026, 1334, *Morris*! *Cinchona*, *Harris*! *Fl. Jam.* 12,340.—Cuba, south central United States, Central America, northern South America and Peru; naturalized in India and other countries.

A branched erect plant, 8 inches to 2 ft. high, woody at the base, young parts puberulous. *Leaves* entire or toothed, upper generally lanceolate, lower lyrate, 3-4 cm. l. *Sepals* 7-9 mm. l., tube above the ovary 5-6 mm. l. *Petals* 8(-13) mm. l., broadly obovate, pink or purple, entire. *Stigma* 4-lobed. *Capsule* 5-10 mm. l., obovoid-club-shaped with a stalk-like base, angles winged, faces ridged, valves obovate.

4. FUCHSIA L.

Shrubs, undershrubs, or small trees. Leaves opposite (or alternate), sometimes whorled; stipules very small. Flowers



Fig. 149.—*Fuchsia boliciana* Carr.

A, Portion of branch with leaves, flower-buds, and flowers, $\times \frac{1}{2}$. B, Flower cut lengthwise, with the ovary removed, slightly less than nat. size. C, Fruit cut lengthwise $\times 1\frac{1}{2}$.

axillary, long-stalked, nodding or pendulous, solitary or clustered, or rarely racemose or paniculate at apex of branches. Calyx-tube prolonged far beyond the ovary into a 4-lobed limb. Petals 4. Stamens 8. Ovary 4-celled; ovules attached to the inner angle. Berry 4-celled. Seeds angular or kidney-shaped. Embryo without endosperm.

Species about 90, natives of Central and S. America, and of Jamaica and Hispaniola.

F. boliviana Carr. in *Rev. Hortic. xlviii.* 150, t. (1876).
F. boliviana var. *luxurians* Johnston in *Contrib. Gray Herb. lxxv.* 38 (1925). *F. cuspidata* Fawc. & Rendle in *Journ. Bot. lxiv.* 105 (1926). (Fig. 149.)

Near Woodcutters' Gap, 4000 ft.; *Harris!* Cinchona Garden (cult.); *Harris!* also *Downes!* Fl. Jam. 5825, 7605; near St. Helens Gap, Cinchona, 4900 ft., *Maxon & Killip*, 571.—Bolivia, Guatemala.

Shrub, 18–20 ft.; stem, branches, petioles, under side of leaves, peduncles and ovary densely covered with short soft hairs. *Leaves* 7–18 cm. l., opposite or 3-whorled, elliptical to oblong-elliptical, tapering to apex, base blunt, often oblique and unequal-sided, entire, with inconspicuous minute blunt teeth, sparsely puberulous on upper surface, nerves 14–24 on each side; petioles 1–4(–6) cm. l. *Flowers* pendulous, solitary in axils of much reduced leaves at ends of branches forming a terminal corymbiform raceme or panicle; peduncles 1–1.5 cm. l. *Buds* mucronate at apex with cusps of calyx-lobes. *Calyx* dark red, outside sparsely puberulous; lobes 1.7–2.1 cm. l., 4 mm. br. at base, lanceolate, apex acuminate, cuspidate; tube 4.5–6.5 cm. l., increasing in diam. evenly to 7 mm. br. at apex, puberulous inside over whole length. *Petals* 1.5 cm. l., oblong, acute, light red. *Stamens*, the longer 1.4 cm. l.; filaments light red; anthers creamy white. *Style* with stigma ultimately as long as the calyx-lobes. *Ovary* 8–13 mm. l. *Berry* linear-oblong, 1.8 cm. l., 4 mm. br.

[*F. coccinea* Ait. *Hort. Kew. ii.* 8 (1789).

Naturalized; road to Greenhill, 4000 ft., Blue Mts.; near Cinchona, 4500 ft.; *Harris!* Fl. Jam. 5824, 9130.—Chili.

Shrub, 1–3(–10) ft. high, glabrous. *Leaves* 3–4 cm. l., opposite or 3-whorled, lanceolate, acute, with a few minute sharp teeth, shortly petioled. *Flowers* solitary, pendulous, on long thread-like peduncles. *Calyx* crimson; lobes oblong, acute, 1.5–2 cm. l.; tube, free part shorter than lobes. *Petals* obovate, convolute, dark purple, about half as long as the calyx-lobes. *Style* usually longer than the long exserted stamens; stigma undivided.]

FAMILY XCII. ARALIACEÆ.

Trees or shrubs, very rarely herbs, sometimes high climbing, generally tomentose with stellate hairs, or sometimes hairy or bristly with simple hairs, sometimes spiny. Leaves usually alternate, simple, entire, toothed, or divided palmately or pinnately, or compound digitately or pinnately (*Sciadophyllum*) or decompound. Stipules adnate to the petiole, sometimes not distinct from the dilated base of the petiole embracing the stem, sometimes united within the petiole and produced into a blade,

sometimes wanting. The heads, umbellules, spikes, or racemes of flowers racemose, paniculate, or umbellate. Flowers hermaphrodite, polygamous or rarely diœcious; in polygamo-diœcious plants the fertile flowers sometimes occur in terminal umbels, the sterile in lateral umbels. Calyx reduced to a ring-like or broadly and shortly cup-like limb. Petals free, 3 to indefinite, generally 5, usually valvate and then with a thickened apex hook-like or bent inwards, and easily cohering especially in the perfect flowers, sometimes slightly imbricate. Stamens usually as many as the petals, and inserted with them within the margin of the calyx around the epigynous disk. Ovary inferior, with 1 or more cells. Styles as many as the cells of the ovary. Ovules solitary in each cell, hanging from the top of the cell, anatropous. Fruit generally drupe-like, sometimes berry-like, endocarp divided into 1 or more distinct pyrenes. Seeds solitary in the pyrenes, hanging; endosperm copious, sometimes ruminant. Embryo next the hilum, very small; cotyledons ovate or oblong.

Species about 700, most of them flourishing within the tropics, a few in temperate regions.

Leaves digitately compound..... 1. *Sciadophyllum*.

Leaves simple.

Flowers in heads..... 2. *Oreopanax*.

Flowers in umbels 3. *Gilibertia*.

1. SCIADOPHYLLUM P. Br. (*Sciadophyllum*).

Trees or shrubs. Leaves digitately compound, leaflets entire; stipules within the petiole, often elongated. Branchlets of inflorescence (in Jamaican species) forming a simple raceme, each branchlet with an umbel or head of flowers at apex. Bracts at base of branchlets and of umbels. Flowers hermaphrodite or polygamous. Calyx-margin truncate or wavy-toothed. Petals 5 (4), valvate, united into a lid which soon falls. Stamens as many as the petals. Disk flattened. Ovary 3-5-celled; styles distinct, at length recurved, or sometimes united beyond the middle into a column. Fruit subglobose, generally angular in drying, at first fleshy outside. Seeds with endosperm not ruminant.

Species 25, natives of tropical America and the West Indies.

Flowers distinctly pedicellate. Inflorescence puberulous or glabrate; umbel bearing branchlets to 12 mm. l. Calyx truncate

..... 1. *S. Brownei*.

Flowers sessile or subsessile.

Inflorescence white powdery tomentose; umbel-bearing branchlets to 3 mm. l. Calyx-teeth minute

..... 2. *S. prætermisum*.

Inflorescence densely white hairy tomentose; umbel-bearing branchlets to 7 mm. l. Calyx-teeth prominent

..... 3. *S. trojanum*.

1. *S. Brownei* Spreng. *Syst. i.* 953 (1825); Macf. *Jam. ii.* 191; Griseb. *Fl. Br. W. Ind.* 306; Seem. in *Journ. Bot. iii.* 263; Urb. *Symb. Ant. i.* 196. *Sciadaphyllum foliis* &c. *Browne Hist. Jam.* 190, t. 19, f. 1, 2. *S. heptaphyllum* Hitchc. in *Miss. Bot. Gard. Rep. iv.* 91 (1893) (excl. syn. *L.*). *Aralia Sciadaphyllum Sw.*

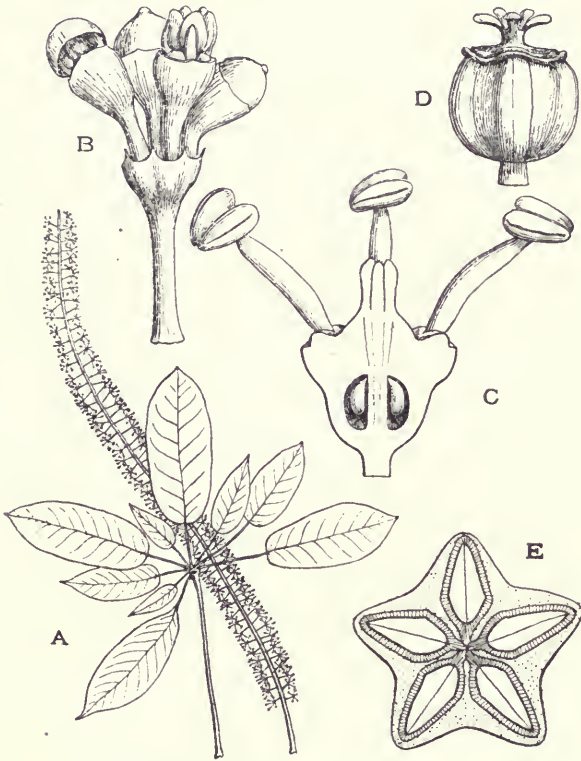


Fig. 150.—*Sciadophyllum Brownei* Spreng.

- A, Compound digitate leaf and inflorescence $\times \frac{1}{2}$.
 B, Umbel-bearing branchlet with two flower-buds, a flower with the corolla dropping off, and another from which the corolla has fallen, $\times 4$.
 C, Open flower cut lengthwise $\times 7$.
 D, Fruit $\times 4$.
 E, Fruit cut across, showing five seeds, $\times 7$.

Prodr. 55 (1788). *Hedera Sciadaphyllum Sw. Fl. Ind. Occ.* 519 (1797). *Schefflera Sciadaphyllum Harms in Engl.-Prantl Pflanzenfam. iii.* 8, 37 (1894). (Fig. 150.)

Masson! mts., St. Andrew, Purdie! Blue Mts., Linden 1686! Union Hill, Moneague, Prior! March! Blue Mt. Peak, Hitchcock; Catherine Peak, 4000 ft., Eggers, 3664! Wallingford, Moore! Morse's Gap, 5000 ft.;

Hollymount, 3000 ft.; *Harris!* Fl. Jam. 7560, 9010; below Thomson Gap, Portland, Blue Mts., *Miss J. R. Perkins*, 1223!

Shrub or *tree* to 20 ft. high; stems several or solitary, 2-4 ins. in diam. *Leaflets* 7-13, 1-3 dm. l., 3-11 cm. br.; very shortly and abruptly acuminate, base rounded to subcordate, glabrous; petiole of leaflets 2-8 cm. l.; petiole of leaf 1.5-3.5 dm. l., clasping the stem at base and united to the stipules. *Inflorescences* 3-6 dm. l., puberulous or glabrate, axillary near summit of stem or terminal; branchlets numerous, 3-12 mm. l., bearing at apex 4-8 pedicellate flowers; pedicels 2-4 mm. l.; buds about 3 mm. l. *Calyx*-limb very short, wavy or with an occasional very short tooth. *Corolla* about 1.4 mm. l. *Styles* 5, free, about 1 mm. l. *Fruit* 5-angled, 5-celled, about 4 mm. l.

2. *S. prætermisum* Norm. in *Journ. Bot.* lxiv. 159 (1926).

J.P. 884, *Morris!* Morse's Gap, 5000 ft., *Harris!* Fl. Jam. 6997.

Tree to 20 ft. high. *Leaves* as in the preceding species, but perhaps not attaining to the largest measurements. *Inflorescences* 3.5-4.5 dm. l.; rhachis and branchlets white-tomentose, powdery or with minute hairs; branchlets numerous, 2-3 mm. l., bearing at apex 9-12 subsessile flowers; buds about 2 mm. l. *Buds*: *Calyx* glabrate or sparsely white-tomentose; teeth about .4 mm. l. *Corolla* 1.3 mm. l., bell-shaped, glabrous. *Ovary* 2.8 mm l. *Styles* 5, .4 mm. l.

3. *S. troyanum* Urb. *Symb. Ant.* v. 451 (1908).

Near Troy, 2000 ft.; Peckham, Clarendon, 2500-2800 ft.; *Harris!* Fl. Jam. 9369, 10,876, 11,052.

Tree, 10-20 ft. high. *Leaflets* 9-12, 1-3 dm. l., 5-9 cm. br., elliptical-oblong, very shortly and abruptly acuminate, base cordate to retuse, upper surface glabrous, with network of veins usually impressed, puberulous with dust-like hairs beneath; petioles of leaflets 1.5-12 cm. l.; petioles of leaf 1.5-4 dm. l. *Inflorescences* 2.5 to 5.5 dm. l.; rhachis and branchlets tomentose with minute white hairs; branchlets numerous, 5-8 mm. l., bearing at apex 5-15 subsessile flowers; buds 5 mm. l., 3 mm. br. *Calyx* densely white-tomentose; tube 4 mm. l.; lobes 1 mm: l., triangular. *Corolla* 2.5-3 mm. l., conical, white-tomentose. *Styles* 5, free, 2 mm. l.

2. OREOPANAX Decne. & Planch.

Trees or shrubs. *Leaves* simple, entire (in *O. capitatum*), or variously divided. *Stipules* united into one small intra-axillary stipule, more or less united to petiole. *Branchlets* of inflorescence paniculate (in *O. capitatum*) or racemose. *Bracts* one under each peduncle; bracteoles scale-like, 3 under each flower. *Flowers* polygamo-dioecious, sessile. *Calyx*-limb truncate, with minute distant teeth. *Petals* 5 (4-7), valvate. *Stamens* as many as the petals. *Disk* evident, not thick. *Ovary* 3-5(6-12)-celled; styles free or more or less united. *Fruit* globose, berry-like. *Seed* compressed, somewhat 3-angled. *Endosperm* ruminant, or sometimes (in *O. capitatum*) not or scarcely ruminant.

Species 80, natives of the West Indies and tropical continental America, chiefly in the Andes.

O. capitatum Decne. & Planch. in *Rev. Hort.* sér. 4, iii. 108 (1854); *Seem.* in *Journ. Bot.* iii. 270 (1865); *March.* in *Fl. Bras.*

xi. pt. 1, 253; *Urb. Symb. Ant. i.* 198 & *viii.* 508. *Aralia capitata* Jacq. *Enum.* 18 (1760), *Sel. Stirp. Amer.* 89, t. 61 & *Ed. pict.* 46, t. 91; *Sw. Prodr.* 55. *Hedera capitata* Smith *Ic. pict. rar.* 4, t. 4



Fig. 151.—*Oreopanax capitatum* Decne. & Planch.

- A, Portion of branch with leaf and lowest branch of inflorescence $\times \frac{3}{4}$. B, Male flower; b, bracteoles; $\times 7$. C, Female flower cut lengthwise; s, rim of calyx; b, bracteoles; $\times 7$. D, Head of very young fruit $\times 4$. E, Fruit cut lengthwise $\times 4$.

(1790); *Sw. Fl. Ind. Occ.* 516; *Macf. Jam. ii.* 193. *Sciadophyllum capitatum* Griseb. *Fl. Br. W. Ind.* 306 (1860). (Fig. 151.)

Woman Wood, Three fingered Jack, Growing Stiek.

Wright! Broughton! Masson! Bromfield! Wilson! March! Moneague; Luidas Vale; Prior! J.P. 878, Hart! Blue Mts., Hitchcock; Plato road, 3000 ft., Harris! Fl. Jam. 7684; Robertsfield, Blue Mts.; near Troy, 2000 ft., Miss J. R. Perkins!—Hispaniola, Antigua, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, trop. cont. America.

Tree to 60 ft. high, or shrub 15 ft., sometimes epiphytic on other trees. Leaves on flowering shoots 1-2 dm. l., simple, entire, glabrous, elliptical or ovate, sharply acuminate, base 5-nerved, rounded or wedge-shaped; petioles 5-12(-15) cm. l. Inflorescences, small heads borne on a terminal panicle, 1-2 dm. l., more or less puberulous in all its parts except the petals. Heads 5-6 mm. in diam., to 12 mm. in fruit. Petals white, about 1.5 mm. l. Styles 2 in male fl., free, 5-12, free and recurved in female and hermaphrodite fls. Berry 3-5 mm. in diam., globose, 5-celled, with 5-12 seeds.

3. GILIBERTIA Ruiz & Pav.

Trees or shrubs, glabrous. Leaves simple and entire (in Jamaican species), rarely 3-5-lobed, usually clustered at end of branches; stipules very small, within the petiole, or wanting. Inflorescences terminal, composed of umbels either solitary or arranged in a short raceme, rarely ending in a compound umbel. Peduncles striate or angled, at apex usually dilated into a receptacle for the insertion of the pedicels. Bracteoles scale-like, crowded in the receptacle and sometimes forming an involucre externally. Flowers hermaphrodite or polygamous. Calyx subentire or minutely toothed. Petals 5-8, valvate, with incurved apex. Stamens as many as the petals. Disk continued in the middle into a styler column. Styles united above the middle or throughout their length, very rarely almost free. Fruit globose or ovoid.

Species about 50, natives of the West Indies, tropical America and Asia, China and Japan.

Inflorescence a raceme of simple umbels with a compound umbel at apex

1. *G. arborea*.

Inflorescence a simple umbel.

Leaves broadest at or below the middle. Umbel with more than 40 fls.

Leaves ovate-oblong or narrowly elliptical, obtuse at both ends, leathery, nerves and veins indistinct.

2. *G. pendula*.

Leaves lanceolate, apex acute or blunt, base running into the petiole, papery

3. *G. Swartzii*.

Leaves lanceolate, apex acute, base obtuse, leathery.

4. *G. elongata*.

Leaves oval-elliptical, breadth a little more than half the length, acute or shortly acuminate, base rounded, emarginate, or subcordate.....

5. *G. ovalifolia*.

Leaves broadly ovate, breadth two-thirds length, apex obtuse or shortly acuminate, base cordate or subcordate.....

6. *G. cordifolia*.

Leaves broadly elliptical, shortly subacuminate at both ends, veins distinct beneath, papery-leathery. Peduncle nodding, 5-7 cm. l.

7. *G. nutans*.

Leaves elliptical, obtuse at both ends, papery, dense network of veins prominent on both sides.

Umbel with 20-50 fls. Peduncle erect, 3-4 cm. l. 8. *G. grandis*.
Leaves broadest above the middle. Umbel with less than 20 fls.

Calyx and ovary 7-8 mm. l. Leaves obovate, leathery 9. *G. grandiflora*.

Calyx and ovary less than 3 mm. l.

Leaves obovate-elliptical to elliptical, leathery.

Calyx with ovary 2.5 mm. l. 10. *G. blakeana*.

Leaves oblong-elliptical to oblong-oblancoleate, papery. Calyx with ovary 1.3-1.5 mm. l.... 11. *G. filipes*.

1. *G. arborea* March. in Bull. Soc. Bot. Belg. xxx. 281 (1891); Urb. Symb. Ant. i. 201, iv. 469 & viii. 508. *Aralia arborea* foliis

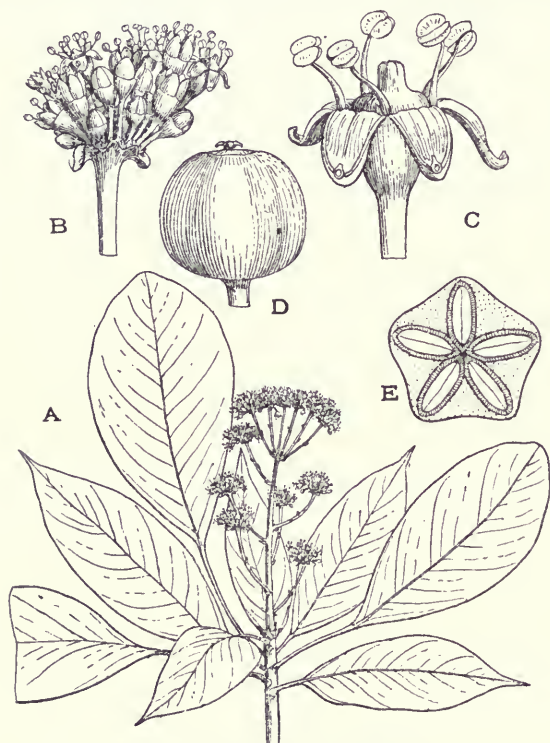


Fig. 152.—*Gilibertia arborea* March.

A, Portion of branch with leaves and inflorescence $\times \frac{1}{2}$.

B, Umbellule $\times 3$.

C, Flower $\times 7$.

D, Fruit $\times 2$.

E, Ditto cut across $\times 2$.

&c. Browne Hist. Jam. 189. *A. arborea* L. Syst. x. 967 (1759) & Amæn. v. 396, 377; Jacq. Sel. Stirp. Amer. 89 & Hort. Schoenbr.

t. 51; *Sw. Obs.* 119. *A. foliis ovatis &c. Plum. Pl. Amer. (Burm.)* 139, *t.* 148. *Hedera arborea Sw. Fl. Ind. Occ.* 518 (1797); *Macf. Jam. ii.* 192. *Sciadophyllum Jacquinii Griseb. Fl. Br. W. Ind.* 306 (1860). *Dendropanax arboreum Decne. & Planch. in Rev. Hortic. sér. 4, iii.* 107 (1854); *Seem. in Journ. Bot. ii.* 301 (excl. *Hedera alaris* & *Dendropanax alare*); *Britt. in Bull. Torr. Bot. Cl. xxxix.* 1. (Fig. 152.)

Galipee, Angelica Tree.

Foot of Red Hills, Browne; Wright! Broughton! Masson! Swartz! Macfadyen! Purdie! Hartweg! Wilson! Moneague, Prior! March! Claverty Cottage, Blue Mts., Morris! King's House; Mavis Bank; J.P. 976, 1079, 1092, Hart! Latimer, near Cinchona; Wallenford, 2500 ft.; near Troy, 2200 ft.; Holly Mount, Mt. Diablo, 2500 ft.; Peckham, Clarendon, 2500 ft.; Stony Hill, 1100 ft.; Harris! Castleton Hill, 1000 ft., Thompson! Fl. Jam. 7610, 8031, 8708, 8976, 10,950, 11,051, 11,055, 11,144; Port Antonio, Hitchcock.—Cuba, Hispaniola, Porto Rico, St. Thomas, St. Vincent, Grenada, Margarita, trop. cont. America.

Tree, 15–40(–60) ft. high, or *shrub*. *Leaves* 1–1.5(–2) dm. l., elliptical to ovate-elliptical, or obovate-elliptical, acuminate, base wedge-shaped to rounded; nerves and network of veins prominent on both sides; petioles 1–8 cm. l. *Inflorescences* a terminal raceme of a few simple umbels on ascending peduncles, ending with a compound umbel of about 4–6 rays; peduncle 1.5–8 cm. l.; pedicels 6–8 mm. l. *Calyx* truncate or with 4 to 6 short sharp teeth. *Petals* 4–6, acute, greenish-white. *Fruit* 5–6-angled, 5–7 mm. l.

2. *G. pendula* March. *ex Urb. Symb. Ant. i.* 200 (1899). *Hedera pendula Sw. Prodr.* 51 (1788), *Icon. t.* 9(?) & *Fl. Ind. Occ. i.* 512; *Macf. Jam. ii.* 192; *Griseb. Fl. Br. W. Ind.* 306 (in part) (excl. reference to Wilson). *Dendropanax pendulum Decne. & Planch. in Rev. Hortic. sér. 4, iii.* 107 (1854); *Seem. tom. cit.* 300. Specimen from Swartz in Herb. Mus. Brit.

Swartz!

Tree or *shrub*, 10–12 ft. high. *Leaves* 10–5.5 cm. l., ovate-lanceolate, apex obtuse, base obtuse, nerves indistinct, scarcely prominent on both sides, veins very few, leathery; petioles to 6 cm. l. *Peduncle* to 3 dm. l. and more, pendulous, jointed; receptacle 7–8 mm. br., cushion-like. *Umbel* with 40–70 fls.; pedicels about 15 mm. l. *Calyx* 2.5 mm. l. (in bud), subentire. *Petals* oblong, acute. *Filaments* shorter than corolla. *Style* simple. *Berry* with 5 seeds.

3. *G. Swartzii Fawc. & Rendle in Journ. Bot. lxiv.* 158 (1896). *Hedera pendula Griseb. Fl. Br. W. Ind.* 306 (1860) (in part).

Swartz (with label attached inscribed *Hedera nutans*)! Wilson (specimen in Herb. Kew. named by Grisebach *Hedera pendula*)! Newhaven Gap, Blue Mts., J.P. 983, Hart! also Harris! Claverty Cottage, Blue Mts., J.P. 983, Hart!

Leaves 7–14 cm. l., lanceolate, ovate-lanceolate or narrowly elliptical, apex acute, sometimes blunt, base acute, running into the petiole, nerves together with network of veins flat or slightly prominent on upper surface, slightly prominent beneath, papery; petioles to 4 cm. l. *Peduncle* 23–10 cm. l., jointed; receptacle somewhat cushion-like, concave below, 5–7 mm. br. *Umbel* simple with 50–70 fls.; pedicels 15–18 mm. l. *Petals*

5 mm. l., ovate-elliptical. *Filaments* 7 mm. l. *Ovary* turbinate, about 3 mm. l. *Style* simple, conical, 2.5 mm. l. *Fruit* about 6 mm. l., ellipsoidal, 5-angled.

4. *G. elongata* *comb. nov.* *Dendropanax elongatum* Britt. in *Bull. Torr. Bot. Cl. xxxix.* 3 (1912).

Peckham, Clarendon, 2500-2800 ft., *Harris!* Fl. Jam. 10,874.

Slender tree, 25 ft. high. *Leaves* 1-2 dm. l., 2.5-6 cm. br. (6-8 cm. l. at base of peduncle), leathery, lanceolate to narrowly elliptical, apex acute, base obtuse; nerves flat or slightly prominent on upper surface, together with veins prominent beneath; petioles .5-8.5 cm. l. *Inflorescence* very young. *Peduncle* 12 cm. l., jointed; receptacle cushion-like, concave beneath. *Umbel* with about 40 fls. (small buds).

5. *G. ovalifolia* *Fawc. & Rendle in Journ. Bot. lxiv.* 158 (1926). *Dendropanax pendulum* Britt. in *Bull. Torr. Bot. Cl. xxxix.* 2 (1912).

Lapland, near Catadupa, 2000 ft.; Mulgrave, St. Elizabeth, 1300 ft.; *Harris!* Fl. Jam. 9188, 12,378.

Shrub 12 ft. high, or *tree* 25 ft. *Leaves* to 13 cm. l., about half as broad as long, or a little more, oval-elliptical, very shortly acuminate, acute or rarely obtuse, base rounded, emarginate, or subcordate, nerves together with veins flat or slightly prominent on the upper surface, more so beneath, papery; petioles to 8 cm. l. *Peduncle* 26-20 cm. l., jointed; receptacle somewhat capitate, less than 1 cm. br. *Umbel* with 55-90 fls.; pedicels 15-18 mm. l. *Calyx* subentire. *Petals* 4 mm. l., greenish, triangular, acute. *Filaments* 6 mm. l. *Style* simple, 2 mm. l.

6. *G. cordifolia* *comb. nov.* *Dendropanax cordifolium* Britt. in *Bull. Torr. Bot. Cl. xxxix.* 4 (1912).

Woodlands, summit of Dolphin Head, about 1800 ft., Britton & Hollick, 2856!

Tree, about 20 ft. high. *Leaves* 20 cm. l. or less, about two-thirds as broad as long, broadly ovate, apex obtuse or shortly acuminate, base cordate or subcordate, nerves prominent, papery; petioles stout, about 1 dm. l. or shorter. *Umbel* many-flowered. *Peduncle* inclined, stout, 12-15 cm. l., not jointed, with bracts at and very near the base. *Pedicels* rather slender, 2.5 cm. l. *Calyx* subentire; tube 4-5 mm. br. *Petals* white, about 5 mm. l. *Filaments* slightly longer than the petals. *Style* of young fruit very broadly conical, 2 mm. l. or less.

We are indebted to Dr. Britton for a specimen.

7. *G. nutans* *March. ex Urb. Symb. Ant. i.* 201 (1899). *Hedera nutans* Sw. *Prodr.* 51 (1788) & *Fl. Ind. Occ.* 514; *Macf. Jam. ii.* 193; *Griseb. Fl. Br. W. Ind.* 306 (excl. syn. *Al.*). *Dendropanax nutans* Decne. & *Planch. loc. cit.*; *Seem. tom. cit.* 300. Specimen from Swartz in Herb. Mus. Brit.

Blue Mt. Peak, 7400 ft., Swartz! *Macfadyen!* *McNab!* J.P. 983 (in part), *Morris!* *Harris!*

Tree, 10-15 ft. high. *Leaves* 5-14 cm. l., broadly elliptical, shortly subacuminate at both ends, nerves slightly prominent on both sides, veins distinct beneath, papery-leathery; petioles to 6 cm. l. *Peduncle* 5-7

cm. l.; receptacle 8-10 mm. br., cushion-like, convex above, concave below. *Umbel* with 40-80 fls.; pedicels 15-20 cm. l. *Petals* 4.5 mm. l., ovate. *Stamens* 4.5 mm. l. *Ovary* turbinate, about 3 mm. l. *Style* conical, 2 mm. l.

8. *G. grandis* *comb. nov.* *Dendropanax grande* Britt. in Bull. Torr. Bot. Cl. xxxix. 4 (1912). Type in Herb. Kew.

In the forest on the road to Grier Park, Moneague, *Prior*!

Tree, 40 to 50 ft. high. *Leaves* to 15 cm. l., elliptical, apex obtuse, base obtuse, nerves about 8 on each side, the two lowest keeping more or less at same distance from margin, together with dense network of veins with small meshes slightly prominent on both sides, papery; petioles stout, to 12 cm. l. *Peduncles* erect, stout, 3-4 cm. l.; receptacle cushion-like, about 10 mm. br. *Umbel* with 20-50 fls.; pedicels rather stout, 2 cm. l. *Petals* 4.5 mm. l., lanceolate-triangular. *Filaments* 5 mm. l. *Ovary* about 3 mm. l., subhemispherical.

Cited by Grisebach op. cit. 306 and Urban op. cit. 201 under the previous species.

9. *G. grandiflora* *comb. nov.* *Dendropanax grandiflorum* Britt. in Bull. Torr. Bot. Cl. xxxix. 3 (1912).

Peckham, Clarendon, 2500 ft., *Harris*! Fl. Jam. 10,994, 11,011, 11,028, 12,791.

Tree, 15-30 ft. high. *Leaves* 6-12 cm. l., 3-7 cm. br., obovate, apex rounded or sometimes bluntly pointed, base wedge-shaped, leathery; petioles 1.3 cm. l. or less. *Peduncle* 2-5 cm. l.; receptacle 5-6 mm. br., flat. *Umbel* solitary, or sometimes another in axil of uppermost reduced leaf, with 5-11 fls.; pedicels 1.5-2 cm. l. *Calyx* with ovary 7-8 mm. l., 10 mm. l. in fr.; calyx truncate. *Petals* 7 mm. l., oblong, greenish-yellow. *Style* 4.5 mm. l., increasing to 5 or 6 mm. in fr. *Fruit* ellipsoidal, 10-12 mm. l.

10. *G. blakeana* *comb. nov.* *Dendropanax blakeanum* Britt. in Bull. Torr. Bot. Cl. xxxix. 4 (1912).

John Crow (Blake) Mts., 1700 ft., *Harris & Britton*! Fl. Jam. 10,761.

Slender *tree*, 25 ft. high. *Leaves* 4-10 cm. l., 2-4.3 cm. br., obovate-elliptical to elliptical, apex acute or very shortly subacuminate, base wedge-shaped, leathery; petioles 3 mm. l.—3 cm. l. *Peduncle* about 11 cm. l.; receptacle about 6 mm. br. *Umbel* with about 18 fls.; pedicels 15-18 mm. l. to 20 mm. in fr. *Flower-buds* just before opening 3 mm. l. *Calyx* with ovary about 2.5 mm. l.; calyx truncate or wavy with rounded lobes. *Fruit* (fide Britton) subglobose, 5 mm. in diam., the persistent style 2.5 mm. l.

11. *G. filipes* *comb. nov.* *Dendropanax filipes* Britt. in Bull. Torr. Bot. Cl. xli. 9 (1914).

Peckham, Clarendon, 2500 ft., *Harris*! Fl. Jam. 11,057.

Slender straggling *shrub* to 10 ft. high. *Leaves* 7-12 cm. l., 2-3.5 cm. br., oblong-elliptical to oblong-oblancoate, apex rounded to acute, base obtuse, upper surface shining, papery; petioles 4.5-5 cm. l. *Peduncle* slender, 7-11 cm. l.; receptacle 3 mm. br. *Umbel* with 10-13 fls.; pedicels slender, 14-19 mm. l. *Calyx* with ovary 1.3-1.5 mm. l.; calyx truncate, wavy or toothed. *Petals* 1.5-2 mm. l., oblong-lanceolate.

FAMILY XCIII. UMBELLIFERÆ.

Herbs often reaching a considerable size; stem hollow. Leaves alternate or occasionally opposite under the forks of the stem, the petiole usually dilated at the base into a sheath, entire, generally very variously palmately or pinnately divided. Flowers small, umbellate or sometimes in heads; umbels simple or more often compound, terminal or lateral, solitary or very many in a panicle. Bracts under the outer rays of the umbel and on the pedicels of the umbellules form an involucre and involucels, or rarely are wanting. Flowers hermaphrodite (in Jamaican species) or polygamo-dicecious, rarely dicecious, regular, or subirregular with the outer petals enlarged forming a ray. Calyx of small teeth round the upper edge of the ovary, or wanting. Petals 5, equal or the outer sometimes larger. Stamens 5. Ovary inferior, 2-celled, crowned by a conspicuous disk. Styles 2, distinct. Ovules solitary in each cell, hanging from the apex, anatropous. Fruit inferior, dry, generally crowned by the disk and the styles, marked by longitudinal ribs, between which are the canals (vittæ) containing essential oil, separating septically into 2 carpels (mericarps), not opening, 1-seeded, the inner face (commissure) flat, usually leaving the persistent carpophore free from the carpels from the base to the apex, the carpels at length hanging from the apex of the branches of the carpophore. Seed adherent to the pericarp; endosperm cartilaginous. Embryo small, near the hilum; radicle superior; cotyledons short.

Species about 2700, numerous in the temperate regions, in the tropics chiefly on the mountains.

Umbels simple. Leaves undivided, peltate or cordate..... 1. *Hydrocotyle*.

Umbels compound. Leaves much divided 3. *Apium*.

Flowers in a dense head. Plant spiny..... 2. *Eryngium*.

1. HYDROCOTYLE L.

Herbs, sometimes perennial, prostrate or rooting at the nodes, sometimes annual and erect, often very small. Leaves entire, palminerved or cut palmately. Stipules small, scarious. Umbels usually simple or the flowers also in distant whorls below the terminal umbel. Bracts of the involucre few or none. Flowers white or rarely purplish, sometimes unisexual. Teeth of the calyx minute or wanting. Petals entire, valvate or imbricate. Disk evident. Fruit compressed from the side, with narrow commissure; mericarps compressed from the side; primary ridges nerve-like; vittæ wanting or very slender. Seed compressed from the side. Penny-wort.

Species about 75, mostly living in moist or swampy ground, very widely dispersed through the warmer and temperate regions of the world.

Leaves peltate.

Inflorescence a simple terminal umbel.

Flowers many, pedicellate 1. *H. umbellata*.

Flowers few, subsessile 2. *H. pusilla*.

Inflorescence in whorls 3. *H. verticillata*.

Leaves not peltate, base cordate 4. *H. asiatica*.

1. *H. umbellata* L. *Sp. Pl.* 234 (1753); leaves peltate, roundish, somewhat kidney-shaped, crenate, to 5 cm. across; flowers many, with long pedicels, usually in a simple terminal umbel; petals valvate.—*Sic. Obs.* 111; *Macf. Jam.* ii. 185; *Griseb. Fl. Br. W. Ind.* 307; *Urb. in Fl. Bras.* xi. pt. 1, 269, t. 72, f. 1; *Symb. Ant.* iv. 471 & viii. 510; *Coul. & Rose in Contrib. U.S. Nat. Herb.* vii. 25; *Small Fl. S.E. U.S.* ed. 2, 858. *H. foliis orbiculatis peltatis* &c. *Browne Hist. Jam.* 185. *Cotyledon aquatica* *Sloane Cat.* 93 & *Hist.* i. 212. Specimen in Herb. Linn. named by Linnaeus.

Caymanas and banks of Rio Cobre, *Sloane* Herb. iv. 35! Broughton! St. Mary, *Purdie! March!* swamp near Unity Vale, Moneague, Prior! Temple Hall, 800 ft., *Harris! Perry, Campbell!* Fl. Jam. 5901, 6163; near Kingston, *Hitchcock*.—West Indies, N. and S. America, Galapagos Is., S. Africa, Madagascar, and Bourbon.

A creeping herb, glabrous. *Petioles* to 25 cm. 1. or more. *Peduncles* equalling the petioles. *Bracts* of the involucre rather numerous, very small, broadly ovate; pedicels 4-12 mm. 1. *Fruit* about 2 mm. 1., about 3 mm. br., notched at base and apex; primary dorsal ridges prominent, obtuse.

2. *H. pusilla* A. Rich in *Ann. génér. Sci. Phys.* iv. 167, t. 52, f. 2 (1820); leaves peltate, roundish, not emarginate, crenate, scarcely reaching 1.5 cm. across; flowers few, sessile or subsessile in a simple terminal umbel.—*Urb. in Fl. Bras.* xi. pt. 1, 272, t. 72, f. 2, *Symb. Ant.* iv. 471 & viii. 510.

Macfadyen! Mt. Moses, J.P. 2092, *Hart!* Tweedside, below Moody's Gap, *Harris & Britton!* Fl. Jam. 10,542.—Hispaniola, Porto Rico, Peru, Brazil, Uruguay, Paraguay.

A small slender creeping herb, glabrous, or with a few hairs on the under side of the leaves. *Petioles* 1-3.5 cm. 1. *Peduncles* hair-like, varying in length like the petioles; pedicels to 1 mm. 1. or almost wanting. *Bracts* of involucre minute, linear. *Petals* valvate, 4-6 mm. 1. *Fruit* .6- .8 mm. 1., 1.2-1.4 mm. thick, often punctate, ridges rather indistinct.

3. *H. verticillata* Thunb. *Diss. Hydroc.* 5, with fig. (1798); leaves peltate, roundish, crenate, 1.5-5 cm. across; inflorescence of several few-flowered whorls. *Urb. in Fl. Bras.* xi. pt. 1, 268, *Symb. Ant.* iv. 471 & viii. 509; *Coulter & Rose, tom. cit.* 27; *Small loc. cit.*; *Britt. Fl. Berm.* 273; *Britt. & Millsp. Bah. Fl.* 312.

In marshy places; *Wright!* *Swartz!* Grandvale, Westmoreland, 500 ft.; between Llandovery and Runaway Bay; *Harris!* Fl. Jam. 7094, 10,373.—Bermuda, Bahamas, Cuba, Hispaniola, Porto Rico, Guadeloupe, cont. America, S. Africa, Sandwich Is.

A creeping glabrous herb. *Petioles* 3 to nearly 20 cm. l. *Peduncles* generally somewhat shorter than the petioles, bearing about 6 (or less) few-flowered distant whorls; pedicels 0-2 mm. l. *Bracts* of the involucre very small, ovate. *Petals* valvate. *Fruit* 1.5-2 mm. l., 3-3.5 mm. br., ridges prominent.

4. *H. asiatica* L. *Sp. Pl.* 234 (1753); leaves not peltate, ovate-roundish, base heart-shaped, more or less deeply cut; *Griseb. Fl. Br. W. Ind.* 307; *C. B. Clarke in Hook. f. Fl. Brit.*

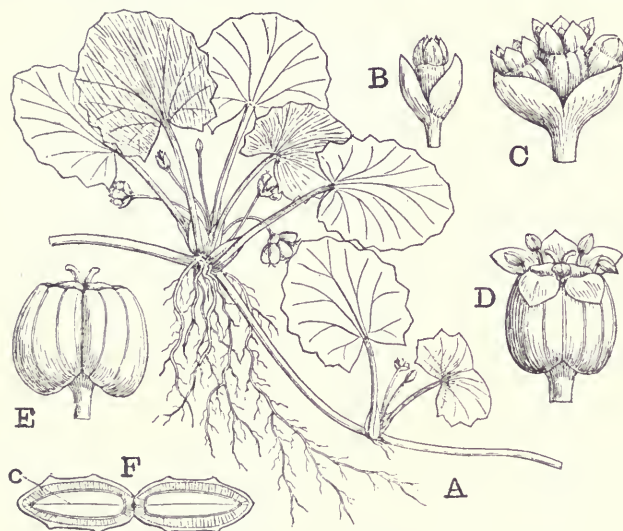


Fig. 153.—*Hydrocotyle asiatica* L.

A, Portion of plant bearing flowers and fruit, nat. size.

B, Young inflorescence, the central flower-bud only is seen emerging from the involucre of two bracts, $\times 2\frac{1}{2}$.

C, Inflorescence in which lateral flowers have also developed $\times 2\frac{1}{2}$.

D, Flower $\times 4$.

E, Fruit $\times 4$.

F, Fruit cut across; c, cotyledons; $\times 7$.

Ind. ii. 669. *H. brevipes* DC. *Prod. iv.* 63; *Macf. Jam. ii.* 186. *H. humilior foliis semi-ellipticis &c. Browne Jam.* 185. *H. repanda Pers. Syn. i.* 302 (1805). *Centella asiatica Urb. in Fl. Bras. xi. pt. 1,* 287, *t. 78, f. 1*; *Britt. Fl. Berm.* 273. *C. repanda Small Fl. S.E. U.S.* 859. Specimen in Herb. Linn. named by Linnæus. (Fig. 153.)

In marshy places; *Masson!* *Broughton!* *Bertero!* St. Mary, *Purdie!* *March!* St. Anns Bay; Tiddenham, St. Ann; *Prior!* Bull Head, J.P. 1522, *Hart!* Prospect Hill, near Castleton, 2000 ft., *Thompson!* near Troy, 1500 ft., *Harris!* Fl. Jam. 7956, 8557.—Warmer regions of the world.

A creeping herb, rooting at nodes. Leaves to 4 cm. l., 4 cm. br. (or more), coarsely toothed, hairy when young, or becoming glabrate; petioles 2-10 cm. l., hairy or glabrous. Inflorescence a simple umbel in the leaf-axils, either subsessile or on peduncles which are usually shorter than the petioles. Bracts of the involucre roundish or ovate, rather large, 2-4 mm. l., embracing the flowers. Petals imbricate. Fruit roundish-kidney-shaped, dark brown; ridges prominent, branching, forming a network, the pericarp much thickened, 2.5-3 mm. l., 4-5 mm. br.

2. ERYNGIUM L.

Herbs mostly perennial. Leaves usually with spiny teeth, undivided or lobed or deeply cut. Flowers sessile in heads or

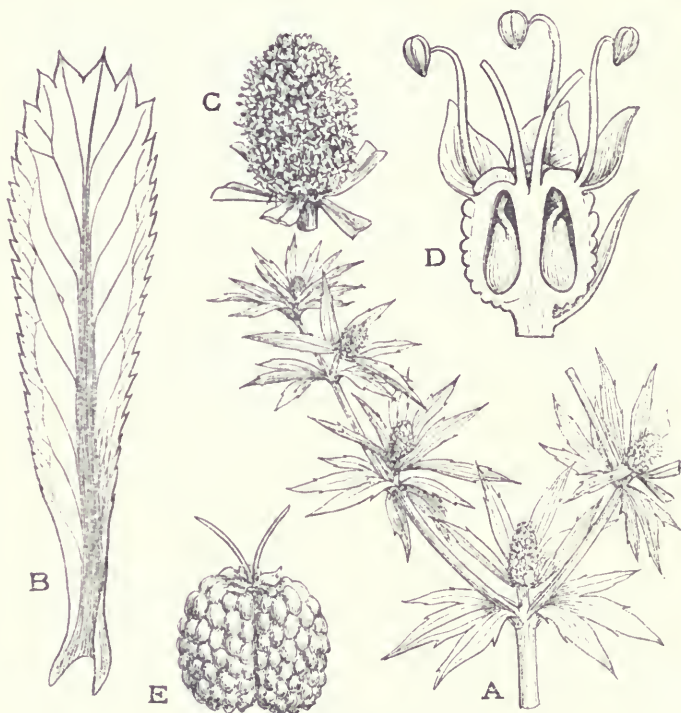


Fig. 154.—*Eryngium foetidum* L.

A, End of flowering shoot, nat. size.
B, Radical leaf, slightly reduced.
C, Head of flowers $\times 2\frac{1}{2}$.

D, Flower cut lengthwise, the petals
having dropped, $\times 16$.
E, Fruit $\times 10$.

dense spikes, each flower with a bract, the exterior bracts forming an involucre, hermaphrodite. Calyx-teeth stiff, sharp. Petals with inflexed point. Disk with a thick margin. Fruit

only slightly compressed, with a broad commissure; primary ribs equal, scarcely or very slightly prominent—neither ribs nor vittæ evident in West Indian species. Carpophore wanting.

Species 220, dispersed throughout temperate and warmer regions, but in Africa only met with in the Mediterranean region.

E. foetidum L. *Sp. Pl.* 232 (1753); *Sw. Obs.* 110; *Macf. Jam. ii.* 187; *Griseb. Fl. Br. W. Ind.* 308; *Oliver Fl. Trop. Afr. iii.* 6; *Urb. in Fl. Bras. xi. pt. 1,* 301, *t.* 79, *f.* 2, *Symb. Ant. iv.* 472 & *viii.* 511; *Wolf in Engl. Pflanzenreich Umbellif.-Saniculoid.* 203; *Rendle Classif. Fl. Pl. ii.* 415, *fig.* 205. *E. foliis angustis serratis* &c. *Sloane Cat.* 127 & *Hist. i.* 264, *t.* 156, *f.* 3 & 4. Specimen in *Herb. Linn.* named by Linnæus. (Fig. 154.)

Spirit Weed, Fit Weed.

Sloane Herb. v. 47, 48! *Houstoun! Broughton! Shakespear! Bancroft! St. Mary, McNab! Phoenix Park, Moneague, Prior! Golden Valley, Thompson! Hope Grounds,* 700 ft., *Harris! Fl. Jam.* 8042, 11,888; *Hardware Gap, G. E. Nichols,* 105!—West Indies, trop. cont. America.

Biennial herb, 1-2 ft. high, with 2-forked branching. *Leaves:* radical to 25 cm. l., 1.5-2.5(-4) cm. br., lanceolate or oblanceolate, apex obtuse, clasping the stem at the base, coarsely toothed, teeth mucronate; lower stem-leaf like the radical leaves but smaller and more deeply toothed, the rest smaller still and with the apex 3-5-cleft. *Flower-heads* cylindrical, to 1.5 cm l. *Bracts* of the involucre 5-6, leaf-like, to 3 cm. l., unequal, lanceolate, acute, the margins entire or with a few spiny teeth. *Sepals* .5-1 mm. l. *Petals* .6-.7 mm. l. *Fruit* covered with scales, to 2 mm. l.

3. APIUM L.

Annual or perennial herbs, glabrous. Leaves thrice-pinnate (or pinnate). Umbels compound, opposite the leaves in Jamaican species. Involucre and involucrel wanting in Jamaican species. Flowers white. Calyx-teeth wanting. Petals ovate. Fruit laterally compressed. Mericarps with 5 ribs, and single vittæ between the ribs.

Species about 30, dispersed throughout almost the whole world.

A. leptophyllum F. v. Muell. ex Benth. *Fl. Austr. iii.* 372 (1866); *Sprague in Journ. Bot. lxi.* 129. *A. ammi* Urb. in *Fl. Bras. xi. pt. 1,* 341, *t.* 91 (1879) (non Crantz) & *Symb. Ant. viii.* 512; *Coult. & Rose in Contrib. U.S. Nat. Herb. vii.* 86; *Small Fl. S.E. U.S. ed. 2,* 866. *Sison ammi* Jacq. *Hort. Vindob. ii.* 95, *t.* 200 (1772) (non L.). *Helosciadium leptophyllum* DC. *Prodr. iv.* 105 (1830); *Macf. Jam. ii.* 188; *Griseb. Fl. Br. W. Ind.* 308. *H. Ammi* Britt. *Fl. Berm.* 279 (1918); *Britt. & Millsp. Bah. Fl.* 314. Specimen from Jacquin in *Herb. Mus. Brit.* (Fig. 155.)

Coffee-pieces, Port Royal Mts., *Macfadyen!* roadsides, *Hope*; Cokely, near Castleton, 600 ft.; Walderston, 2600 ft.; *Harris!* Fl. Jam. 8615, 11,894, 12,759; near Pleasant Hill, 3660 ft., *Miss J. R. Perkins, 1471!*—Bermuda, Bahamas, Cuba, Hispaniola, Guadeloupe, Martinique, Barbados, trop. cont. America, Australia.

An erect or spreading slender glabrous annual. Leaves thrice-ternately divided into numerous linear or thread-like segments, the lower with

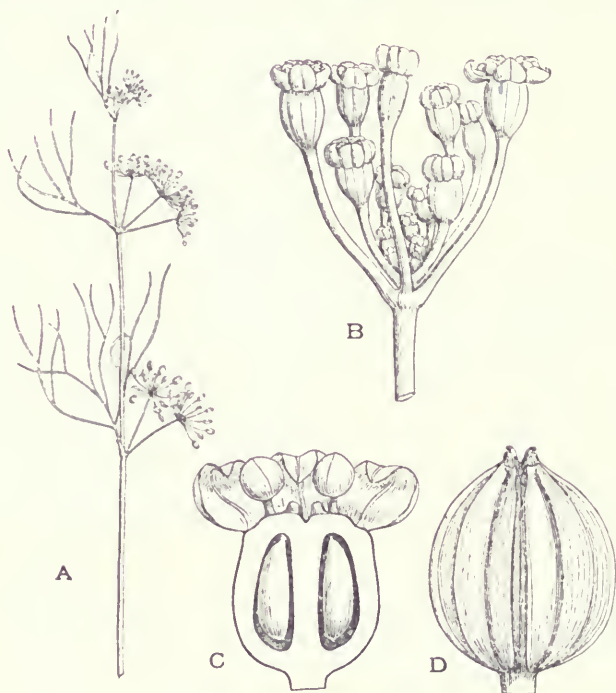


Fig. 155.—*Apium leptophyllum* F. v. Muell.

A, Branch with leaves and flowers $\times \frac{3}{4}$.

B, Umbellule $\times 12$.

C, Flower cut lengthwise $\times 34$.

D, Fruit $\times 17$.

rather long petioles, the upper petioles shorter, a sheath at the base of the petioles. Umbels usually sessile, sometimes with peduncle (1–2 cm. l.), opposite the leaves, of 1–3 rays (8–12 mm. l.); umbellule bearing 8–15 flowers; pedicels 2–7 mm. l., central flower sometimes sessile. Fruit 1.5–2.5 mm. l., ovoid, slightly laterally flattened; mericarps with 5 prominent ribs, one vitta in each narrow furrow; carpophore shortly 2-forked at apex.

The following species are escapes from cultivation :—

Arracacia xanthorrhiza Bancroft in *Jamaic. Journ.* iv. 18 (1826) (ex *Ind. Kew.* i. 193). *A. esculenta* DC. *Prodr.* iv. 244 (1830); *Bot. Mag.* 3092; *Macf. Jam.* ii. 189; *Cook & Collins* in

Contr. U.S. Nat. Herb. viii. 84. *Conium arracacha Hook. Exot. Fl. ii.* 152 (1825). *Arracacha*. Native of northern S. America.

Petroselinum sativum Hoffm. Gen. Umb. 177 (1814); *DC. Prodr. iv.* 102 (1830). *Apium Petroselinum L. Sp. Pl.* 264 (1753). Parsley. Native of S. Europe.

Fœniculum vulgare Mill. Gard. Dict. ed. 8 (1768). Fennel. Native in Europe, N. Africa, W. Asia to India.

Pastinaca sativa L. Sp. Pl. 262 (1753). Parsnip. Native in Europe and Siberia.

Daucus Carota L. Sp. Pl. 242 (1753). Carrot. Native in Europe, N. Africa, N. Asia, W. Asia to India.

FAMILY IIIA. GARRYACEÆ.

(Omitted from Vol. iii.)

Tree or shrubs, with 4-angled twigs. Leaves opposite, entire or with undulate margin, pinnately nerved; petioles united at their base by a ridge. Inflorescences: spikes, sometimes branched, of unisexual flowers, deciduous when function complete, terminal and axillary. Flowers small, without petals, diœcious, solitary or 3 together, within decussate connate bracts. Male inflorescence more or less pendulous, falling when pollen is shed; flowers more or less long-pedicelled; calyx 4-parted, segments valvate, cohering at the top; stamens 4, alternate with the sepals, opening longitudinally. Female inflorescence erect, falling on ripening of fruit; flowers sessile or subsessile; calyx wanting; ovary 1-celled, styles 2, ovules 2, hanging side by side from apex of cell. Berry ovoid, crowned by the persistent styles, with one or two seeds. Seeds with copious fleshy endosperm; embryo cylindrical, minute, in the upper part of the endosperm; cotyledons oblong.

Species 15, natives of south-western United States and Mexico, with one species in Jamaica and Cuba.

GARRYA Dougl.

Characters as in the family.

G. Fadyenii Hook. Ic. Pl. t. 333 (1841); *Benth. Fl. Hartweg.* 266; *DC. Prodr. xvi. pt.* 1, 488; *Wangerin in Engl. Pflanzenreich, Garryaceæ*, 14. *Fadyenia Hookeri Endl. Gen. Suppl. iv.* 38 (1847); *Griseb. Fl. Br. W. Ind.* 286 & *Pl. Wright. in Mem. Am. Acad. U.S. viii.* 189. (Fig. 156.)

Macfadyen; McNab 42! *Purdie*; Flamsted and Trafalgar, Port Royal Mts., *Hartweg*, 1570! *March*; J.P. 1097, 1206, 2117, *Hart*! Flamsted Hill, 3000 ft.; near Bellevue, 4500 ft.; *Eggers*, 3773! near Cinchona, 4800 ft., *Harris*! Fl. Jam. 12,414.—Cuba, Hispaniola.

A shrub or slender tree to 25 ft. high; young twigs pubescent. Leaves leathery, narrowly elliptical, apex more or less obtuse and mucronulate,



Fig. 156.—*Garrya Fadyenii* Hook.

A, Branch of male inflorescence $\times \frac{1}{2}$.

B, Male flower $\times 7$.

C, Ditto with sepals separated to show stamens $\times 7$.

D, Portion of branch with female inflorescence $\times \frac{1}{2}$.

E, Female flower cut lengthwise $\times 7$.

F, Fruit $\times 2$.

G, Seed cut lengthwise, showing embryo. $\times 4$.

3–7 cm. l., to 3 cm. br., glabrous, shining above, thinly covered with curved hairs beneath when young, becoming glabrous; petiole 1–1.5 cm. l. Inflorescences densely tomentose throughout; male 2–3 cm. l., branching; female to 5 cm. l., with lanceolate bracts. Fruit drying black, globose, glabrate, 5–7 mm. in diam.

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(Synonyms in *italics*)

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