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A New Species of *Allactaga* (Rodentia: Dipodidae) from Iran

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INTRODUCTION

Among the rodents collected by the W. S. and J. K. Street Expedition to Iran in 1968, co-sponsored by Field Museum of Natural History and the Iran Game and Fish Department, are four jerboas collected near the village of Shah Reza, Isfahan Province, that represent an unrecognized species. The new species is described here and its relationships with other dipodids are considered.

METHODS AND MATERIALS

All skin measurements were taken according to the American system. Skull measurements were taken with dial calipers to the nearest tenth millimeter. The length of the tooth rows was measured at the alveolar level. The premolars were measured at the widest place between the occlusal surface to the teeth and the top of the alveolus.

SYSTEMATICS

Allactaga firouzi, new species

Holotype. — FMNH 112348, adult female, skin and skull from 18 miles S. Shah Reza (32°02'N, 51°50'E), elev. 2,253 m., Isfahan Province, Iran; collected 2 October 1968 by members of the Street Expedition; field number 4706.

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Measurements (in mm.) of the holotype. — Total length, 295; tail length, 189; hind foot length, 62; ear length, 43; mandible length, 17.1; greatest length of skull, 29.2; condylobasal length, 27.6; zygomatic breadth, 20.6; interorbital constriction, 8.4; braincase width, 15.8; nasal length, 10.8; incisive foramina length, 5.9; palatal length, 15.3; length of maxillary tooth row, 5.0; length of maxillary tooth row excluding P4, 4.7; diastema length, 8.6; length of mandibular tooth row, 5.4; upper premolar transverse diameter, 0.3. Selected measurements (in mm.) of the holotype and the paratypes presented in Table I.

TABLE I. Selected measurements in millimeters of *Allactaga firouzi*. The characters chosen are those which best separate the new species from the other species in this genus.

	112348	112349	112350	112351
Total length	295	293	319	295
Tail length	189	174	199	183
Hind foot length	62	58	58	60
Ear length	43	42	44	46
Length of maxillary tooth row	5.0	5.1	5.3	5.2
Length of maxillary tooth without P4	4.7	4.8	4.9	4.6
Length of nasals	10.8	10.5	10.4	10.3

Referred Material. — Three adult specimens in addition to the holotype, two males and one female, FMNH 112349-112351. All from the type locality.

Geographic Range. — Known only from the type locality in Isfahan Province, Iran (fig. 2).

Description. — The jerboa is medium-sized and has long, soft pelage. The dorsal body hair is gray basally, followed by a fawn-colored band, and tipped with black. Pelage grades to a paler shade on the sides and flanks and lacks a distinct rufous band on the sides of the body. Dorsally, the head and ears are covered with short, fawn-colored hair, which is lightest in color at the base of the ears and grades to dark gray at the tips of the ears. Ventrally, the body is white as are the medial sides of the fore and hind limbs. A distinctive band of dark gray hair extends from the base of the tail over the posterior surfaces of the hind limbs to the hocks. A large, white hip stripe is present. The tail is covered with short, fawn and gray



FIG. 1. Occlusal views of the skull and mandible of the holotype of *Allactaga firouzi* n. sp., FMNH 112348.

hair. The ventral side is lighter than the dorsal side. Distally, the tail hairs lengthen to form a tufted, black, subterminal band, varying from 2.5 to 4.8 cm. in length, and finally a white, terminal tuft.

The skull is characterized by a low profile, a narrow rostrum, and tympanic bullae that are inflated ventrally. Maxillary and mandibular tooth rows are short with the fourth upper premolars reduced to minute pegs, showing no wear pattern. The incisive foramina are large, the palatal foramina nearly oval, and the palate broad (fig. 1). Since the small number of specimens of *A. firouzi* is inadequate to determine the presence of sexual variation within the species, the sexes were grouped for this description.

COMPARISONS

Allactaga firouzi most resembles *A. hotsoni*, which is known only from eastern Iran and southeastern Afghanistan. It is intermediate in size between *A. hotsoni* and *A. euphratica caprimulga*, known only from the region of Shibar Pass in eastern Afghanistan (Hassinger, 1973). *Allactaga firouzi* is most distinct from and probably marginally sympatric with *A. euphratica williamsi*, whose range is restricted to northwestern Iran and eastern Turkey. *Allactaga euphratica euphratica* from Iraq is smaller than *A. firouzi* in external measurements.

Allactaga firouzi is readily distinguishable from *A. euphratica williamsi* from Iran by its smaller size (table 2), lighter coloration, and shorter tail and foot. The black, subterminal tail band is smaller and the tail less tufted in *A. firouzi*. Turkish specimens of *A. e. williamsi* are lighter and more rufous in color with fewer grizzled guard hairs and have a smaller white hip stripe than *A. firouzi*. The skull of *A. firouzi* is smaller than that of *A. e. williamsi*, the tooth rows and mandible are shorter, and the upper fourth premolar is reduced to a minute peg showing little or no wear. The premolar in *A. e. williamsi* has a definite wear pattern and a prominent labial reentrant groove, which is absent in *A. firouzi*.

Allactaga e. caprimulga resembles *A. firouzi* in body size, but is more rufous in color, particularly on the cheeks, sides, and flanks, than the new species. Ellerman (1948) distinguishes this race by its long ears (47 to 52 mm.) and relatively short tooth rows and nasals. In a more recent study, Atallah and Harrison (1968) also separate *A. e. caprimulga* from all other races of *A. euphratica* by its longer

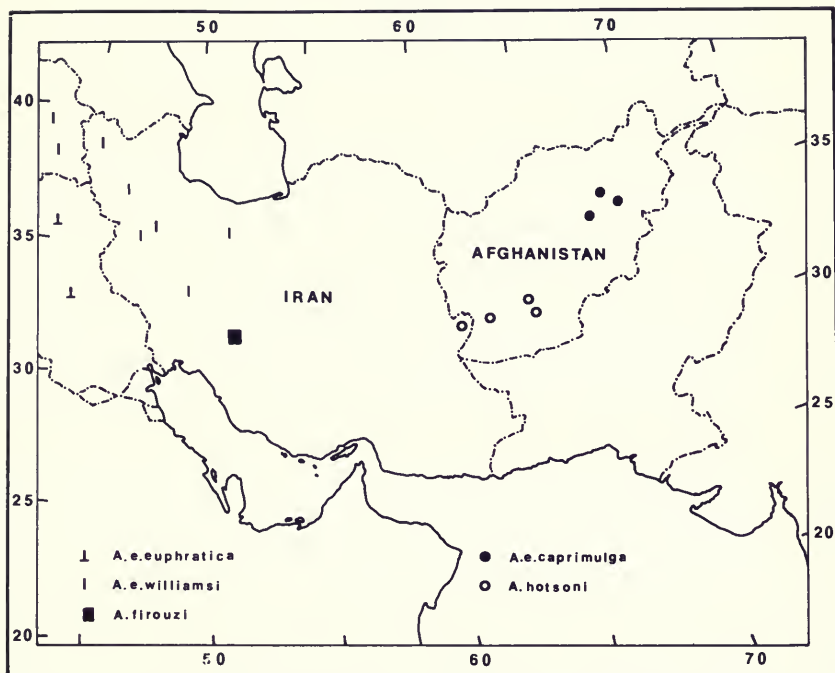


FIG. 2. Distribution and location of major collecting areas of the genus *Allactaga* in Iran and adjacent countries.

ear length. Seven specimens of *A. e. caprimulga* recently collected by Hassinger (1973) have shorter ear lengths than those reported by Ellerman. These measurements overlap or fall within the range of variability of *A. firouzi* and *A. e. williamsi* from Iran and Turkey. Only *A. hotsoni* and *A. e. euphratica* are separable from *A. firouzi* by ear length alone. The tooth rows and nasals in *A. firouzi* are shorter than those in *A. e. caprimulga*. The upper premolar of *A. e. caprimulga* is larger than that of the new species, and either has a deep labial reentrant groove or complete transverse groove behind a small circular area of wear on the anterior part of the tooth. The auditory bullae are less inflated ventrally than in *A. e. williamsi*, *A. hotsoni*, or *A. firouzi*. With the bullae in contact with a plane surface the occipital condyles are in contact or near contact with the surface while those of the other species are raised above it.

Allactaga e. euphratica is the smallest race of this species and is readily separated from *A. firouzi* by its external measurements. Measurements for this race from Atallah and Harrison (1968) are

TABLE 2. External and cranial measurements of *A. firouzi*, *A. hotsoni*, *A. e. caprimulga*, *A. e. williamsi*. Means in millimeters and extremes in parentheses in millimeters are followed by the number of specimens in each group.

	<i>A. euphratica</i>					
	<i>A. firouzi</i>	<i>A. hotsoni</i>	Turkey	Iran	Afghanistan	Iraq*
Total length	300.50 (293-319)4	285.40 (269-304)5	331.05 (253-386)18	324.3 (275-351)18	300.5 (288-310)6	254 (226-271)3
Tail length	186.25 (174-199)4	180.40 (165-194)5	209.5 (164-255)18	200.3 (167-224)18	182.8 (172-195)6	156 (149-176)4
Hind foot	59.50 (58-62)4	54.6 (53-58)5	66.95 (64-71)20	67 (65-72)18	59.4 (54-65)7	52.4 (50-53)6
Ear	43.75 (42-46)4	36.2 (33-38)5	45.95 (40-51)20	45.38 (41-49)18	45.4 (39-49)7	30 (29-32)6
Greatest skull length	29.26 (28.6-30.0)3	27.5 (27.4-27.7)3	32.14 (29.2-34.5)19	32.11 (29.4-33.4)11	30.4 (29.6-31.2)5	30.0 (28.9-30.6)4
Condylbasal length	27.86 (27.6-28.3)3	26.1 (25.9-26.4)3	30.65 (27.6-33.5)18	30.4 (27.7-31.6)11	28.7 (27.8-29.2)5	27.3 (25.4-28.4)4
Zygomatic breadth	20.92 (20.6-21.5)4	19.4 (18.6-20.2)3	22.76 (20.2-24.6)15	22.6 (19.5-25.6)11	21.2 (20.5-21.8)5	20.7 (19.4-22.0)2
Braincase breadth	15.92 (15.8-16.2)4	15.2 (14.7-15.6)3	17.6 (16.6-18.8)19	17.8 (16.4-18.3)11	16.4 (15.8-16.9)5	15.2 (15.2-15.4)4
Interorbital constriction	8.7 (8.4-9.1)4	8.3 (8.2-8.6)3	8.9 (8.5-9.5)19	9.06 (8.1-9.6)11	8.4 (8.0-9.1)5	7.8 (7.6-8.1)7
Maxillary tooth row	5.15 (5.0-5.3)4	5.1 (5.0-5.3)3	6.69 (6.3-7.0)19	6.73 (6.2-7.1)11	5.9 (5.9-6.2)5	6.1 (5.8-6.3)3
Mandibular tooth row	5.42 (5.4-5.5)4	5.2 (5.0-5.5)3	6.66 (6.2-7.0)19	6.66 (6.1-7.2)11	6.2 (6.0-6.3)5	6.0 (5.6-6.2)4
Mandible length	17.37 (17.1-17.8)4	17.5 (17.2-17.7)3	20.7 (18.1-22.5)19	20.31 (17.2-20.4)11	18.1 (17.4-19.1)5	20.7 (19.4-22.4)7
Nasals	10.49 (10.3-10.8)4	9.5 (9.3-10.0)3	12.77 (11.0-14.6)19	13.0 (11.1-13.5)11	11.6 (11.3-12.4)5	
Maxillary tooth row without P4	4.8 (4.6-4.9)4	4.7 (4.5-4.9)3	5.86 (5.5-6.2)19	5.8 (5.5-6.2)11	5.3 (5.3-5.5)5	

*From Atallah and Harrison (1968)

given in Table 2. The maxillary and mandibular tooth rows and the length of the mandible of *A. e. euphratica* are longer than those in *A. firouzi*. The white hip stripe is broader in *A. firouzi* than in *A. e. euphratica*.

Allactaga firouzi is distinguished from *A. hotsoni* by having a longer tail, ears, and feet, as well as darker coloration and a longer, darker and more tufted black tail band. A band of dark hair extends from the base of the tail to the hock in some specimens of *A. hotsoni* as in *A. firouzi*. The skull of *A. hotsoni* is smaller than that of *A. firouzi*; however, the auditory bullae are as large as those of *A. firouzi* and *A. e. williamsi* (Thomas, 1920). The premolars of *A. hotsoni* are larger than those of *A. firouzi*, while the incise and palatal foramina are narrower.

Allactaga elater is the only other species of this genus occurring in Iran. It is easily separated from *A. firouzi* by its external measurements. Extremes and means of 14 skins of *A. elater* in Field Museum of Natural History are total length, 230-283 mm., 262 mm.; tail, 145-180 mm., 161 mm.; hind foot, 48-59 mm., 52 mm.; and ear, 31-39 mm., 35 mm.

REMARKS

The holotype and the paratypes were collected on a flat plain with a gravel substrate and sparse, mountain steppe vegetation consisting entirely of dry *Artemisia herba-alba* and *Astragalus* sp. The hard-packed, gray, sandy soil contained little organic material. Although a spring was located near camp, there was no evidence of water on the plain or near the barren mountains rising abruptly from this plain several miles to the northeast.

Three specimens, including the holotype, were captured at night in a line of museum special traps set at 10-pace intervals. The fourth specimen was spotlighted and dug from a hole. The burrow was 3.2 cm. in diameter, 45.7 cm. long, and sloped down to a depth of 20.3 cm. The single burrow found was not associated with any surface feature or vegetation, nor was any dirt distributed around the entrance. It lacked a chamber and nesting material.

Allactaga e. williamsi is usually encountered on rocky hillsides at elevations ranging from 1,000 to over 2,500 m. in Iran (Lay, 1967) and at similar elevations in eastern Turkey. *Allactaga e. euphratica* is reported from the southwestern deserts of Iraq (Hatt, 1959) at elevations below 1,000 m. *Allactaga hotsoni* is reported at

elevations below 1,000 m. in clay-loess deserts with sparse, clumped vegetation (Hassinger, 1968). Hassinger (1973) also collected *A. e. caprimulga* from dry mountain slopes and plateaus at elevations between 1,800 and 3,200 m.

No molt is visible on the specimens, and all are in winter pelage. The dorsal and lateral body hair is much longer than in specimens of *A. euphratica* collected in August, 1962 in Iran and similar in length to specimens of *A. hotsoni* collected in November, 1965, 10 miles south of Kang, Afghanistan. There was no evidence of reproductive activity.

CONCLUSIONS

The degree of morphological similarity between *A. firouzi*, *A. hotsoni*, and the various races of *A. euphratica* suggests that their isolated distributions are of recent origin and possibly the result of habitat restriction due to increasing aridity since the late Pleistocene (Butzer, 1965). No intermediate populations of *A. euphratica* are known between the isolated ranges of *A. firouzi* and *A. hotsoni* or *A. e. caprimulga* and *A. hotsoni* or *A. e. euphratica* and *A. e. williamsi*.

SPECIMENS EXAMINED

All specimens compared with *A. firouzi* are listed below and are a part of the Field Museum of Natural History collection.

Allactaga e. caprimulga. Afghanistan: 20 miles W. Kabul (1); 7.5 miles S.S.W. Shibar Pass (1); Pagman (1); Old Kabul-Pagman Road (4).

Allactaga e. williamsi. Iran: 5.1 miles S. Bijar, Kurdistan (1); 3 miles S.E. Ali-goodarz, Lurestan (4); 9 miles S.E. Dewan Darreh, Kurdistan (2); 5 miles N. Dewan Darreh, Kurdistan (2); 2 miles N. Dewan Darreh, Kurdistan (1); Maku, Azarbaijan (1); 1.7 miles N. Bijar, Kurdistan (1); 20 miles N. Rezaiyeh, W. Azarbaijan (1); 19 miles N. Rezaiyeh, W. Azarbaijan (1); 10 miles S.W. Rezaiyeh, W. Azarbaijan (2); Kohne Hezar, Kurdistan (1); Rachtagen, Tehran (1). Turkey: Van, Van (13); Van, Edremit (2); Bitlis, near Norsinc (5).

Allactaga hotsoni. Afghanistan: Between Girishk and Musa Qala (3); Qala-i-Kang (3).

Allactaga elater. Iran: Maku, Azarbaijan (1); Pahlavi Dezh, Gorgan (1); 15 miles N. Pahlavi Dezh, Gorgan (8); 13 miles N. Gunar-i-Kawus, Mazanderan (2); Karadj, Tehran (1); Kamalabad, Tehran (1).

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