

Further record of *Golunda ellioti* Gray, 1837 from South East of Iran with notes on its postcranial skeleton

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Genus *Golunda* Gray, 1837 is a monotypic taxon, which is known in family Muridae by its grooved upper incisors and special columnar structure of upper molar high separated cusps. It is believed that this genus is one of the most primitive species in this family. The Indian Bush Rat, *Golunda ellioti* Gray, 1837 is a rat-like rodent and is very similar to *Rattus rattus* but its size is considerably smaller and the tail is slightly shorter than the head and body length. Also, the tail is covered with short hairs. The head of *Golunda* is vole-like in its appearance. Eyes are relatively bigger than *Rattus* species and ears are more flattened, circular and covered with hairs. Bush Rat has stout and well-developed feet with four digits on the forefeet and a very short vestigial thumb, bearing a claw. The soles of the hind feet are always blackish unlike other murids. With their naked soles they are adapted for climbing trees and low bushes. Incisors are reddish and deeply grooved. Cheek teeth are strongly cuspidate with three rows of columnar cusps. Due to their peculiar molars, they are well adapted to feeding on hard seeds (Roberts, 1977). Type locality of this species is India, Dharwar and it is distributed in the SE of Iran (Misonne, 1990), Pakistan (Roberts, 1977), Nepal (Ellerman, 1966), N and NE India south through Indian peninsula to Sri Lanka (Agrawal, 2000). Nazari and Farid (1991) were recorded this species in Iran from 40 Km of southeast of Jiroft in Kerman Province (28° 37'N and 57° 46'E, 1410 m asl).

In this study, we captured two adult as well as one immature specimens from Jiroft (28° 33' 17.33" N and 57° 43' 46.63" E, 615 m asl) in a Palm and Citrus orchards (Fig. 1). Detailed morphometric data and the morphological characteristics of the specimens were presented in table 1 and figure 2, respectively.

The general morphological comparison of postcranial skeleton between *G. ellioti* and *R. norvegicus* showed several differences as follow: resistance to tensile forces in the shoulder region partly based on the development of the infraspinous fossa (Argot, 2003). This pattern is less observed in *G. ellioti* than *R. norvegicus*. On the dorsal margin of the ischium, just posterior to the acetabulum, a rugose tuberosity suggests strong pull exerted by the ischio-caudalis (Argot, 2003). This is the characteristic of *G. ellioti* in comparison to *R. norvegicus*. Fossoriality was strongly expressed by greater robusticity in long limb bones of the fore and hind limb (Weisbecker & Schmid, 2007). Other skeletal differences between *G. ellioti* and *R. norvegicus* are listed in the Appendix.

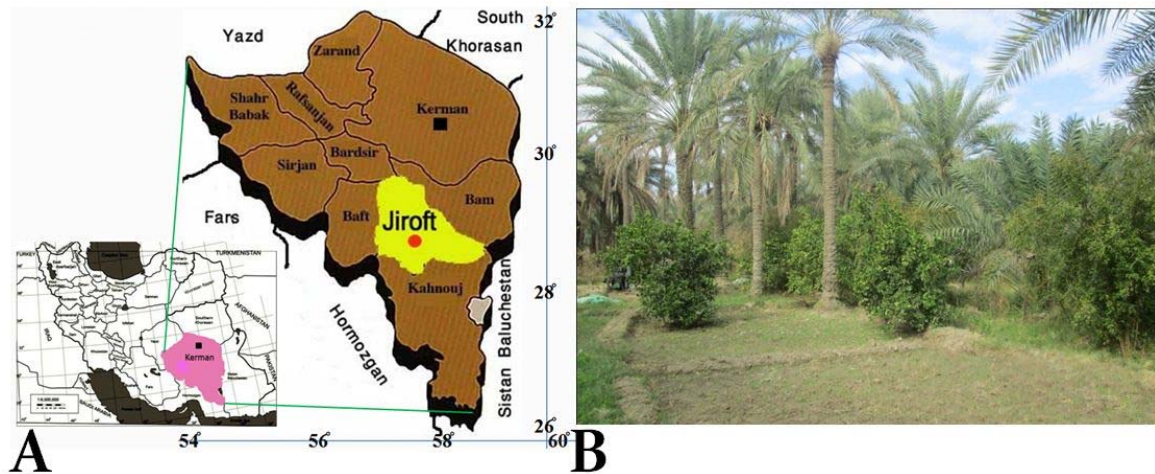


FIGURE 1. A: Sampling locality and B: Habitat of *G. ellioti* in Jiroft, Kerman province, Iran.

TABLE 1. Morphometric characters of *G. ellioti*.

Row	Variable	Mean (mm)
1	Length of upper cheek teeth row from alveole	6.09
2	Length of first upper molar	2.76
3	Width of first upper molar	2.10
4	Length of second upper molar	2.55
5	Width of second upper molar	2.17
6	Length of third upper molar	2.01
7	Width of third upper molar	1.73
8	Length of upper diastema	7.58
9	Length of nasal	8.80
10	Width of Nasal	4.57
11	Length of anterior palatine foramen	4.55
12	Infraorbital thickness	3.44
13	Length of lower cheek teeth row from alveole	6.39
14	Length of first lower molar	2.75
15	Width of first lower molar	1.66
16	Length of second lower molar	1.82
17	Width of second lower molar	1.60
18	Length of third lower molar	1.75
19	Width of third lower molar	1.73
20	Length of lower diastema	4.09
21	Mandibular length	16.77
22	Mandibular height	8.66
23	Head and body length	112.1
24	Tail length	101
25	Hind foot length	23.5

All current information about the evolutionary history of the genus *Golunda* confirms its endemism to the Indian subcontinent (Wilson & Reeder, 2005). This species has survived in the extreme southern coastal region of Sindh as well as in the extreme north-eastern part of the Punjab adjacent to the Himalayan foothills, but is not highly adapted to arid regions (Roberts, 1977). Considering that this species was not found in the west of the Hub River Valley near Karachi until its first record from Jiroft, Kerman in 1991 (Nazari & Farid, 1991), its presence in Iran shows the westernmost distributional range of *G. ellioti* and indicates its westward range expansion (Nazari & Farid, 1991).

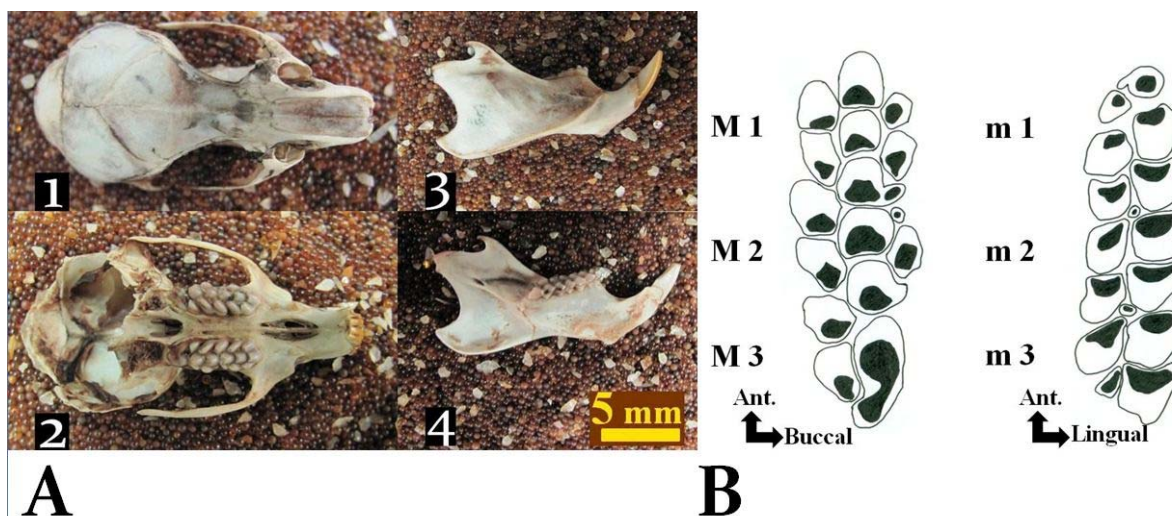


FIGURE 2. A: Skull and mandible of *G. ellioti* from dorsal (1), ventral (2), lateral (3) and medial (4) view and B: Upper and lower cheek teeth row of *G. ellioti*.

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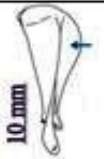










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APPENDIX. Postcranial skeleton of *G. ellioti* and *R. norvegicus*: In a general comparison.

Skeletal component	Character	Character state			
		<i>Golunda ellioti</i>		<i>Rattus norvegicus</i>	
Total number of thoracic and lumbar vertebra (respectively)		12- 7	-	13- 6	-
Scapula	Width of supraspinous fossa	Smaller		Bigger	
Humer	Deltoid tuberosity shape	Hooked		Arced	
Ulna	Semilunar notch shape	Angulate		Semilunar	
	Presence of small pit above semilunar notch	Present		Absent	
Innominate bone	Iliopectinal eminence	Not obvious		Obvious	
	Shape of dorsal margin of ischium body	Triangular		Arced	