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# Noteworthy Mammal records from the Summan Plateau / NE Saudi Arabia

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(With 1 figure)

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Summary

Recent mammal bones collected in caves of the Summan Plateau in Saudi Arabia are put on record. Of particular interest are the second records for Saudi Arabia of the species *Allactaga euphratica* and *Gerbillus henleyi,* extending the known ranges of these two species.

Zusammenfassung

Anläßlich speläologischer Untersuchungen in Saudi-Arabien sammelten die Herren Ralf BENISCHKE, Dr. Gerald FUCHS und Mag. Volker WEISSENSTEINER vom Landesverein für Höhlenkunde in der Steiermark in Graz in Höhlen des Summan-Plateaus rezente Säugetierreste. Diese kleine Ausbeute aus einem säugetierfaunistisch noch weitgehend unerforschten Gebiet erbrachte Nachweise für 11 Arten. Besonders erwähnenswert sind unter diesen die Nagetiere *Allactaga euphratica* und *Gerbillus henleyi,* die damit jeweils zum zweitenmal in Saudi-Arabien gefunden wurden und eine entsprechende Ausweitung der bekannten Areale erfuhren.

## Introduction

Conducting a survey of caves in northeastern Saudi Arabia in February/March 1986, Ralf BENISCHKE, Dr. Gerald FUCHS and Mag. Volker WEISSENSTEINER, all members of the Landesverein für Höhlenkunde in der Steiermark/Graz, found and collected an assortment of mammal remains, that they forewarded to the Vertebrate Zoology Department of the Naturhistorisches Museum in Wien for identification. Continuation of the survey in February 1987 was zoologically less rewarding, but added some material. Since these small collections come from a rather poorly investigated area and provide welcome new locality records, a short report seems in order.

The area surveyed lies at the southwestern border of the Summan, a limestone plateau stretching from the coastal plain of the northern Persian Gulf towards Ad Dahna, the sand belt connecting the Great Nafud in the North with the Rub' Al

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Khali in the south. The caves investigated 1986 have coordinates between 26°14.21 N/47°15.90 E and 26°28.83 N/47°11.26 E, somewhat WSW of Ma'aqla (26°32 N/48°31 E) and about 200 km NNE of Riyad.

The area is a barren plateau of neogene limestone at an altitude of 500–650 m, partly covered by moving sand dunes. The karstic limestone is riddled by caves of rather uniform type: Vertical shafts of about 8 m depth give access to horizontal systems varying in length from 50 to 1000 m. The shafts provide routes of access for bats, owls and carnivores using the more sheltered parts of the caves and act as traps for terrestrial mammals. Zoological finds were made 1986 in the following caves:

B 1 (26°14.22 N/47°15.90 E) inspected February 26th 86, held the scattered but nearly complete skeleton of a jird and the maxillaries and mandibles of another jird, the latter most likely from a disintegrated owl pellet (NMW H 87–24/1–2).

B 3 (26°24.21 N/47°15.62 E), investigated March 2nd 86, contained in an area of complete darkness some 50 m from the entrance shaft the osteous and chitinous remains from a collection of disintegrated owl pellets: 4 large tenebrionid beetles, 7 bird bones representing 2(-5) warbler-sized and one thrush-sized passerine and one more medium-sized bird of uncertain allocation, and a minimum of 84 rodents (NMW H 87-25/1-10). Since no intact pellet and no feathers remained, the species of owl responsible can not be identified with certainty. From the three species possibly present and frequenting cave roosts, *Bubo bubo, Strix butleri* and *Tyto alba,* the last seems the most likely.

B 7 (26°24.36 N/47°15.18 E), studied March 4th 86, held assemblages of camel bones pushed into some lateral niches. One humerus collected shows epiphyseal damage and tooth marks left by a hyena. Among three gazelle horns found with these bones are two complete sheaths and another horn with core and sheath crushed and bitten off some 3–4 cm above the basis (NMW H 87–26/1-2).

B 28 (26°27.50 N/47°16 E), checked March 16th 86, held the skeleton of the only bat recorded 1986 (NMW H 87-27).

In 1987 the group continued the survey in the same general area. Zoological finds were only made in two of the caves investigated:

Eagle Cave (26°31.62 N/47°7.80 E), Some 7 km SE of the village Al-Aytaliah, altitude 430 m, in some terrestrial sediment of (?) miocene age, al Sulb Plateau, visited 13th February 87, held a skeleton and a mummy of *Asellia* (the former's skull kept as NMW H 87-51, The rest returned to the collectors for a dating experiment).

Dahl Al-Hanan (26°31.16 N/47°19 E), a cave some 1,5 km W Ma'aqla, altitude 420 m in paleozoic limestone of the Umm-er-Radhuma formation, explored 23rd February 87, held a cranium of *Vulpes rueppelli* (NMW H 87-52).

## Species represented

The fact, that in spite of the diverse sources of the samples recovered (cave habitat, owl pellets, hyena lair) the total number of wild mammals represented is only 11, certainly reflects the harshness of the environment in this inland part of the

Eastern phytogeographical region (MIGAHID & HAMMOUDA 1974, ABD EL RAHMAN 1986). The three skeletons and the fox skull are clearly fresh (two of the former still with some shed skins of dermestid larvae); the camel bone looks recent, but the gazelle horns show slight weathering. The bones from owl pellets seem quite recent too, but in some cases the teeth of younger individuals are split and crumbling and show faint deposits of gypsum crystals between lamellae. From literary and local sources it appears, that gazelles no longer exist in the area, but the other species recorded might still be living in the vicinity of the caves.

Since D. L. HARRISON's marvellous handbook (1964, 1968, 1972) provides an easy reference and since the material at hand adds nothing substantial to our understanding of the infraspecific variation of the species represented, use of species names seems sufficient. As far as measurements are given, they follow HARRISON's selection and mode of measuring. Measurements of some more or less complete rodent skulls have been arranged in table 1, others are mentioned in the text. Specimens are kept under the biospeleological record numbers mentioned in the Säugetiersammlung of the Naturhistorisches Museum in Wien.

1. *Asellia tridens,* Trident Leaf-nosed-Bat: The partial skeleton of a nearly full-grown juvenile from cave B 28 (NMW H 87-27), a mummy (♂) and a skeleton (♀) from Eagle Cave (NMW H 87-51). *Asellia tridens* is a rather common species of wide saharo-sindian distribution and recorded from most parts of the Arabian peninsula. HARRISON (1964) and NADER (1975) reported it from four localities in Saudi Arabia, one, Hufuf, some 250 km SE from our new station near the southern end of the Summan. The fore-arm measurements (♂ 47,5/48,5, ♀ 50,5/51,6 mm) agree with the small sample from Hufuf recorded by HARRISON (1957, 1964).

2. *Vulpes rueppelli,* Rüppell's Sand Fox: The cranium of an aged individual with well worn teeth from Dahl Al-Hanan (NMW H 87-52). With greatest length of skull 102,0, condylobasal length 97,4, zygomatic breadth 58,4 and interorbital constriction 19,7 mm, it fits into the sample recorded by HARRISON (1968). Death resulted from an obvious bite (a rather superficial and a deeply penetrating wound some 12 mm apart) in the region of contact between the left temporal and frontal bones. Distance and size of the tooth marks fit the two upper canines of *V. rueppelli* perfectly and better than any other carnivore. Therefore, it seems, that this fox died in or after a fight with a conspecific individual.

3. *Hyaena hyaena,* Striped Hyena: Cave B 7 provided proof of hyena activity, but the exploring group found no indication of present occupation of this or another cave inspected. A recent mapping of historic and actual records (GASPERETTI et al. 1985) shows, that this endangered species only rarely has been found as far inland. Nearest localities on record are Safa, 170 km N, and Jabal Qidam, 170 km E, represented by a specimen in the British Museum (N. H.) and a young ♀ captured alive 1947 for the San Diego Zoo (HARRISON 1968, GASPERETTI et al. 1985). The bite marks on the camel bone are unmistakable, but the less distinctly marked horns of the gazelles also seem to be prey remains. The collectors searched in vain for other parts of gazelle skeletons and it seems well to remember,

that in a study in the Namib desert (SKINNER & VAN AARDE 1981) all, that the bigger Spotted Hyena *Crocuta crocuta* left from the very substantial Gemsbok *Oryx gazella* were the sheathed horn cores with small pieces of the frontals.

4. *Gazella subgutturosa,* Goitred Gazelle: Two left male horns and one left female horn from the hyena lair in cave B 7 (NMW H 87-26/1). Horn length of the latter and the complete one of the former is 189 and 275 mm, fitting well into the range of variation of *G. s. marica.* There is also good agreement in the general form of the horns, strongly lyrate in the ♂ and nearly straight in the ♀. HARRISON's (1968) dot map indicates the nearest localities of (historic) occurence about 250 km to the north at the northwestern end of the plateau and in the Kuwait plain, and 330 km E on Bahrain island. From all available information it seems, that this once widely distributed species has been completely extirpated on the Summan plateau (HABIBI 1986).

5. *Allactaga euphratica,* Euphratic Jerboa: More or less complete skulls of 20 individuals could be recovered from the pellet material from cave B 3 (NMW H 87-25/1). This Jerboa with a center of distribution in the Syrian desert and extending from there onto the Anatolian and Iranian plateaus and into Transcaucasia has been recorded only once in Saudi Arabia, a single specimen being collected at Qaisumah near the Iraqi border (LEWIS et al. 1965). Since the nearest locality known is Dibdibba in southern Kuwait, the new find extends the range of the species some 250 km southward (Fig. 1). *A. euphratica,* generally a rather scarce animal, seems to be quite common locally. Contrary to the usual relationship (LEWIS et al. 1965, HARRISON 1981b), it is nearly twice as common as the Lesser Jerboa in this sample and only marginally surpassed in number by the two common gerbillids. For measurements of some of the more complete skulls see table 1.

6. *Jaculus jaculus,* Lesser Jerboa: This saharo-arabian jerboa, well recorded from all desert areas of the peninsula, is represented by remains of 11 individuals in the owl pellet material from cave B 3 (NMW H 87-25/2; some measurements table 1).

7. *Gerbillus henleyi,* Pygmy Gerbil: This rare smallest species of the genus provides the second record of special interest in this small collection. Not too long ago considered truly saharan, it was collected east of Sinai only recently: Israel (HARRISON 1963), Jordan (ATALLAH & HARRISON 1967), North Yemen (BAHMANYAR & LAY 1975), Oman (HARRISON 1981a) and Western Saudi Arabia (BÜTTIKER & HARRISON 1982). Our record, the second for Saudi Arabia, is founded on remains of two individuals (2 left, 1 right maxillaries with moderately worn teeth, 1 right bulla, 1 broken right mandible) from the pellet material in cave B 3 (NMW H 87-25/3). Measurements (upper tooth row length 2,6, 2,7, 2,7 mm, bulla length 8,5 mm, lower tooth row length 2,7 mm) and direct comparison with a specimen of similar age from Hassi-Bahbah/Algeria (NMW 19833) leave no doubt about the identity. 830 km NE from the first Saudi Arabian locality, this find fills the remaining big gap on the map (fig. 1) and indicates, that this tiny species might be expected in all parts of the peninsula. The record further enhances BÜTTIKER &

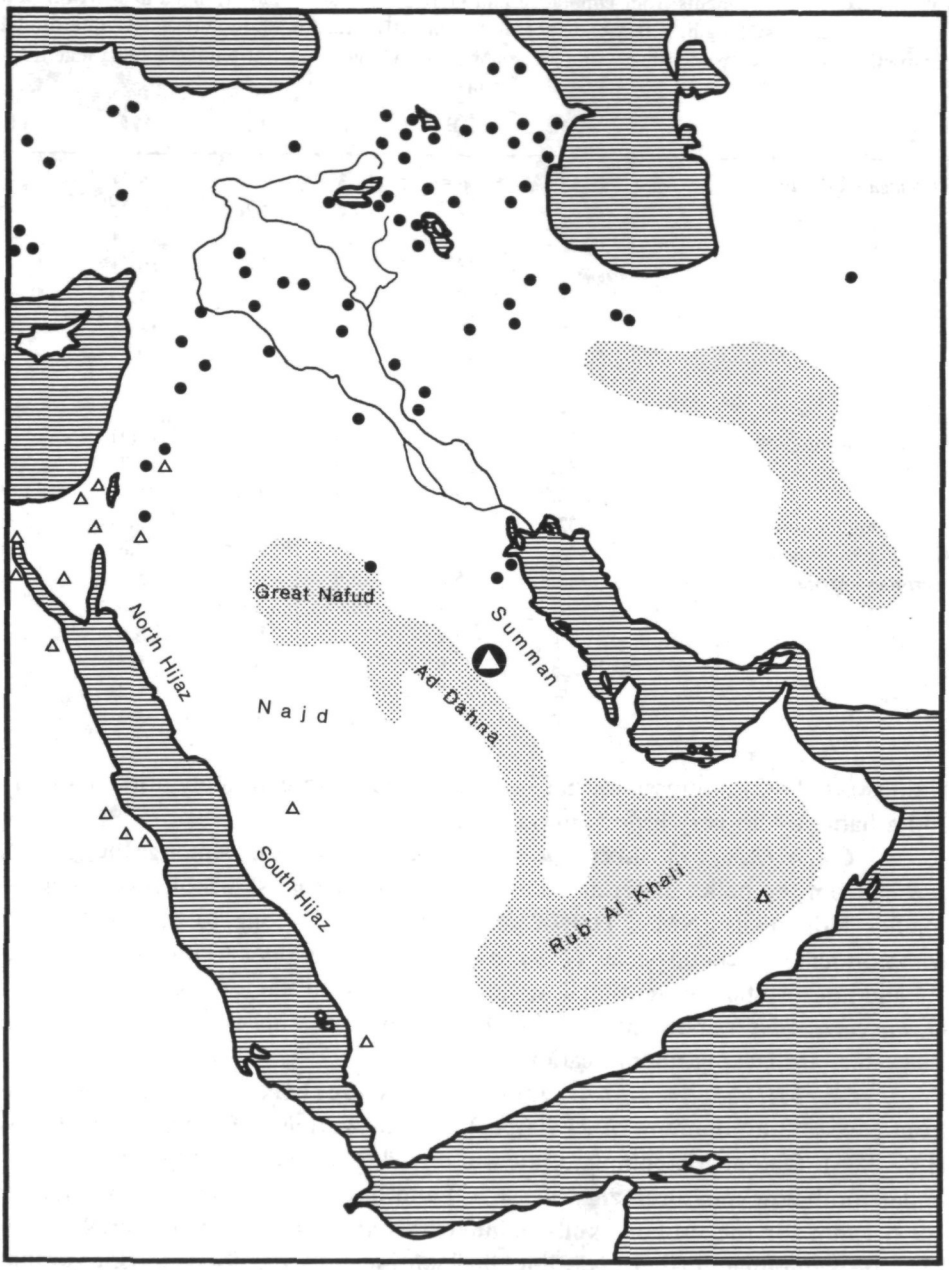


Figure 1. Near Eastern distribution of *Allactaga euphratica* (black dots) and *Gerbillus henleyi* (open triangles) from HARRISON (1972), with additional records for *A. euphratica* from ETEMAD (1976), KOCK & NADER (1983) and the NMW Collection (Lake Khatuniya, El Haseke and Raqqa, all NE Syria), for *G. henleyi* from OSBORN & HELMY (1980) and sources cited under that species. The big symbol represents the collecting locality of the new material and indicates the range extensions for these two species.

Table 1. Skull measurements from Dipodidae and Gerbillinae, taken and arranged as in HARRISON (1972). GL greatest length, CB Condylobasal length, BB breadth of braincase, IC interorbital constriction, MT maxillary toothrow [in () if taken from the alveolae], TB tympanic bulla length (in mm).

| | GL | CB | BB | IC | MT | TB |
|---|---|---|---|---|---|---|
| *Allactaga euphratica* | 30,2 | 28,4 | 14,3 | 8,3 | (6,5) | – |
| | – | 29,3 | 16,2 | 8,0 | (6,5) | – |
| | – | 29,0 | 16,0 | 8,1 | (6,2) | – |
| | – | 28,7 | 15,8 | 7,9 | (6,3) | – |
| | – | 30,1 | – | 8,2 | 6,3 | – |
| | – | 29,1 | – | 8,1 | (6,3) | – |
| | – | 29,0 | – | 7,8 | 6,5 | – |
| | – | 28,9 | – | 7,7 | (6,5) | – |
| | – | 27,9 | – | 7,7 | 6,0 | – |
| *Jaculus jaculus* | 34,6 | 29,7 | 23,6 | 11,9 | (5,3) | 14,9 |
| | 33,8 | 29,7 | 23,6 | 11,8 | (5,2) | 14,5 |
| | 32,9 | 28,6 | 23,5 | 11,8 | (5,0) | 14,0 |
| | 32,5 | 29,3 | – | 11,6 | (5,1) | 13,6 |
| *Gerbillus cheesmani* | – | 26,4 | 13,5 | 5,0 | 3,8 | 11,5 |
| *Meriones crassus* | 40,8 | 35,8 | 16,6 | 6,3 | 5,8 | 17,2 |
| | – | 34,4 | 16,0 | 5,9 | 5,6 | – |
| | – | 34,2 | 15,6 | 6,2 | 5,6 | 16,2 |
| | – | 32,9 | 16,3 | 6,2 | 5,3 | – |
| | – | 32,7 | 16,1 | 5,7 | (5,2) | 15,8 |
| | – | 31,5 | 15,6 | 5,7 | 5,4 | 15,5 |

HARRISONS (1982) impression, that it is well adapted to extremely arid conditions and a habitat with very little plant growth.

8. *Gerbillus* (?) *dasyurus,* Wagner's Gerbil: Among the greater gerbils from the pellet material from cave B 3 are partial skulls of two somewhat smaller individuals (NMW H 87-25/4), that should belong to one of the two common naked-footed species *G. nanus* or *dasyurus*. Upper tooth row length 3,6 3,6 and interorbital constriction 4,4, 4,6 mm seem to fit the regional population of *G. dasyurus* better, but since the bullae, offering the only infallible osteological character, are lacking, identification is tentative.

9. *Gerbillus cheesmani,* Cheesman's Gerbil: In the pellet material from cave B 3 a minimum of 23 (larger) medium gerbils are represented (NMW H 87-25/5). One nearly complete, measurable skull (table 1) is *G. cheesmani* and upper tooth row measurements of 3,7–4,0 and interorbital constriction values of 4,9–6,1 mm for the broken skulls point to this species too. Eight complete and some broken bullae further underline this identification, the characteristic swelling of the anterodorsal rim of the meatus acusticus externus and the equally characteristic partial ossification of the tympanic membrane of *G. nanus* and *dasyurus* lacking in all these. The psammophilous *G. cheesmani* and *G. dasyurus,* who favours rocky escarpments and boulder slopes, fit into the general description of the surrounding habitat, while episodically flooded "playas", preferred by *G. nanus,* seem not to be available in the vicinity.

10. *Meriones libycus,* Libyan Jird: From a total of 26 jirds represented in the pellet material from cave B 3 only one could be identified with the help of a complete pair of bullae as this common and widely distributed species (NMW H 87-25/6). From the postdranial material found with these skulls, it seems, that length and massiveness of the long bones could be further useful characters in the identification of fragmentary pellet material of this species.

11. *Meriones crassus,* Sundevalls Jird: To this species belongs the complete skeleton from cave B 1 (NMW H 87-24) and a series of at least 18 of the total of 26 jirds from the pellet material in cave B 3 (NMW H 87-25/7), as could be ascertained from complete skulls and well preserved loose bullae. BÜTTIKER & HARRISON (1982) mention sabkhas and alluvial wadi beds with relatively rich vegetation as favourite habitats for both species. Contrary to the Libyan Jird however, *M. crassus* is able to earn a living under less luxuriant conditions. HARRISON (1981b) mentions it for sandy desert and VESEY-FITZGERALD (1953) recorded it from limestone overblown with sand, two habitats well represented in the surroundings of our caves.

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