

A collection of recent and subfossil mammals from southern Turkey (Asia Minor), including the dormouse *Myomimus personatus*

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Introduction

In the summer of 1965 an expedition from University College, London went to southern Turkey (Anatolia) to make a study of caves in the southern Taurus Mountains of Antalya Province. A number of small caves and rock shelters were mapped, and collections made of the mammals and invertebrates found. This paper is concerned with the mammals obtained by the expedition during its five weeks of field work (August and September 1965), with special emphasis on the discovery of subfossil remains of the little-known dormouse, *Myomimus personatus* (p. 567). All the subfossil and most of the recent specimens have been deposited in the British Museum (Natural History) (subfossil : BM 67.615–629 ; recent : BM 66.166–192).

Location and topography of collecting sites

A base camp was set up inland from Finike, a small town on the south coast of Turkey at 36° 18' N, 30° 08' E, about 80 km S.W. of Antalya. The mountainous terrain is dry and very hot, and vegetation is sparse. Very little previous mammalogical work has been reported from this region. Specimens were collected by the Expedition from the following localities.

TURUNÇOVA. A marshy area about 15 km N.E. of Finike. Trapping for small mammals was attempted, but met with little success.

ÇATALLAR. About 40 km N.W. along the road leading inland from Finike there is a small human settlement, marked on some maps as Çatallar. There are some high cliffs here overlooking a resurgence. The cliffs contain several small rift or fissure caves.

Leopard Cave. This consists of three passages, totalling about 40 metres, mostly low and narrow. A leopard skeleton was found lying on a small ledge, at the end of the southern passage. The bones were associated and, in some cases, articulated. What flesh remained was completely desiccated. The skeleton was not buried and is presumed to have lain there for a relatively short time (no more than 20 years).

ELMALI. Elmali is a town about 70 km inland from Finike. The neighbouring mountains contain a number of caves which were visited, but little of zoological interest was found.

YALNIZ. Base camp was established in an area known as Yalniz. The camp itself was some 25 km from the coast, beside the road and river that reach the coast at Finike. There were no large caves in this region, only a few small

rock shelters. Trapping of small mammals was attempted, but the dry terrain evidently harboured few mammals. *Apodemus mystacinus* was the only species caught. The local people were quite helpful and were induced to collect other species.

FINIKE. About 3 km along the coast road leading west from Finike is a rocky bluff containing several small caves. Three of these proved to be of zoological interest.

1. *The 'Porcupine Den'*. This was a high rift, partially choked with boulders at different levels. From the quantity of quills and dung found, it would appear to have been in use as a porcupine den for a considerable time. Boulders were polished by the passage of the animals. A number of ungulate bones (? donkey) were found, gnawed in a characteristic porcupine manner. (Hyaenas and leopards are also known to carry bones into caves, but they tend to shatter the bones, whereas those found in the porcupine den had clearly been gnawed.)

The skull of a porcupine (*Hystrix indica*) was found in the lowest part of the cave.

2. *The 'Owl Roost'*. Another narrow rift, a few yards from the porcupine den, was used as a roosting place by a medium sized owl of undetermined species. The undigested prey remains found in this cave indicated that the owl had been feeding mainly on beetles and small passerine birds. Owls with different feeding habits probably account for the large quantity of small mammal remains found in the Cliff Cave.

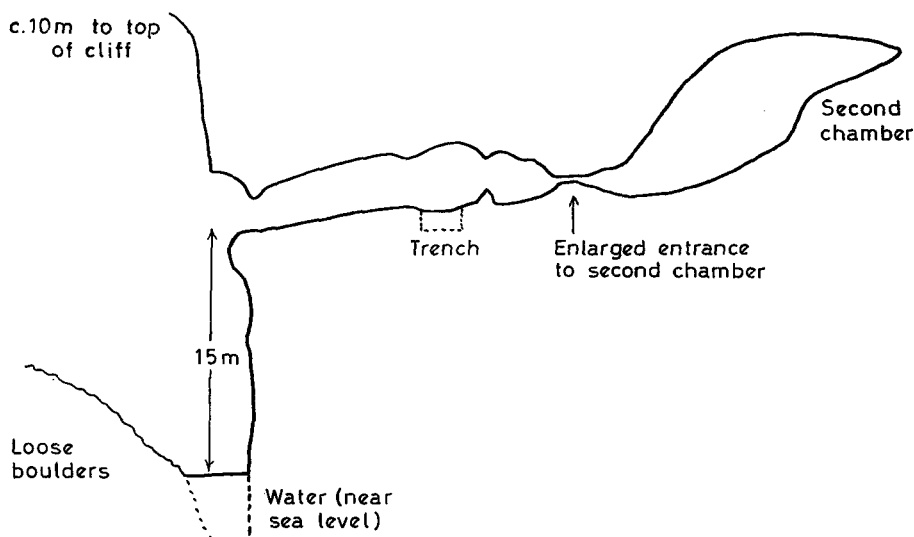


FIG. 1. 'Cliff Cave', Finike : diagrammatic section.

3. *The 'Cliff Cave'*. The entrance to this cave was some 15 metres above the foot of the cliff, and rendered inaccessible to non-flying animals by steep overhangs above and below (fig. 1). No mammal could either climb or fall into the cave. The expedition gained access by using ropes and scaling ladders.

When first seen, the cave floor was covered with a smooth layer of undisturbed dust. A number of bat skeletons (*Rhinolophus euryale*) were found lying on the surface. Near the entrance was a small pile of hedgehog bones (*Erinaceus europaeus*). These represent the remains of two individuals of different ages but the bones are badly broken and do not include hind limbs or pelvic girdles from either animal. It seems most probable that they were carried up to the cave in the stomach of some large predaceous or scavenging bird, regurgitated as a pellet, and later all trace of fur and organic matter was removed by insects, leaving the broken bones closely associated in a small heap.

At the rear of the main chamber of the Cliff Cave, a small horizontal slit, no more than 50 cm × 10 cm opened into another large chamber. The slit was enlarged sufficiently to permit human entry for the first time. The floor of this second chamber was rock, covered in places by a slimy deposit of bat dung. The remains of three bat species were found (*Rhinolophus euryale*, *R. blasii*, *Eptesicus serotinus*) and a single dentary of *Rattus rattus*, apparently recent. A live *Rhinolophus blasii* was caught here using a mist net.

In the main chamber of the Cliff Cave a trench was dug in the fine dusty deposit in search of evidence of previous human occupation. The presence of fish bones, burnt wood and both terrestrial and marine mollusc shells suggested some human activity. A number of artefacts found at different levels (stone beads, worked obsidian flakes, stone and bone tools) have all been tentatively assigned to a period about 5000 B.C. Pieces of crude pottery indicate a very primitive culture; no well-shaped rims or bases were found and none of the pottery was decorated. In the absence of any more advanced artefacts it is suggested that the cave was inhabited about 5000 B.C. but was vacated at the time of a serious rockfall, which left the entrance in its present inaccessible state. The cave therefore has had no human occupants for the last 7000 years.

The deposit on the cave floor proved to be about 1.5 metres deep. A section was prepared but revealed no clear-cut stratification, and apart from odd pockets of ash or gritty material, the whole deposit seemed to be homogeneous. However, the section was divided arbitrarily into numbered layers (1-8) with increasing depth. A sample of each was carefully sieved and a search made for items down to the size of mouse dentaries.

The same type of human artefacts were found both near the surface and at a depth of over 130 cm. The faunal composition does not appear to change with depth either. It is therefore suggested that all the buried mammals and artefacts are roughly contemporaneous (within a few hundred years) and the floor deposit has accumulated only extremely slowly since the end of human habitation. Mammals found on the surface of the deposit (e.g. the hedgehogs) are obviously much more recent and probably represent species that still inhabit the area today.

Notes on the mammals recovered from the floor deposit of the Cliff Cave

All the species recorded, with the exception of *Myomimus personatus*, are known members of the recent fauna of Asia Minor, although some have been

recorded rarely and only marginally, e.g. *Rousettus aegyptiacus* on the southern border and *Tadarida teniotis* in the extreme northeast. No attempt has been made to identify remains of small mammals other than dentaries, cranial fragments that include teeth or alveoli, and two auditory bullae.

Specimens designated as 'unstratified' are from an unrecorded depth and were found during the digging of the first exploratory trench. 'Stratified' specimens are those known to have originated from one of the arbitrarily defined layers numbered 1 (surface) to 8 with increasing depth. The designation '8x' refers to a small section of the deepest layer (8) composed almost entirely of bones, underneath a boulder. A two gallon bucket was filled with this part of the deposit and subsequently sieved in daylight. The small mammal bones are probably the remains of prey animals taken by a cave-roosting owl. Many bones were broken, no complete crania were found and all the species, with the exception of one rat and one marten, are mouse-sized, so the bird was probably only a small one comparable in size to a tawny owl. There is no sign of present occupation by owls, but one does still roost in an adjacent cave as noted above.

Annotated list of species

Species marked * are those of which *living* specimens were obtained. Those not marked thus may now be extinct in the area, especially those represented only by remains in the Cliff Cave deposit.

* *Erinaceus europaeus* L.

Two adults and a juvenile caught alive at Yalniz. All three have pure white fur on the throat and chest. Remains of two individuals found on the floor of the Cliff Cave at Finike.

Crocidura suaveolens (Pallas)

Two broken dentaries from layer 8x of the Cliff Cave.

Rousettus aegyptiacus (E. Geoffroy)

Three pairs and five single dentaries, with wing bones and cranial fragments, in the unstratified collection from the Cliff Cave, and a broken cranium from layer 3. All were buried fairly deeply and are therefore probably of considerable antiquity (as noted above). Consequently these remains cannot be regarded as positive evidence of fruit bats living in the vicinity of Finike at the present time. Four of the dentaries have unerupted teeth, suggesting that the Cliff Cave may once have housed a nursing colony of these bats.

There appears to be only one previous record of this species in Asia Minor, at Hatay on the Syrian frontier (Kahmann & Çağlar, 1960). It is known from Cyprus, Lebanon and Syria.

Tadarida teniotis (Rafinesque)

One mandible from the unstratified collection in the Cliff Cave. The only previous record of this species in Asia Minor appears to be from Erzeroum in the northeast (Osborn, 1963).

* *Rhinolophus ferrumequinum* (Schreber)

Three live specimens obtained from the Çatallar caves, and one shot in a rock shelter at Yalniz. The floor surface of the Cliff Cave yielded one complete, associated skeleton.

Rhinolophus euryale Blasius

Three skulls, with mandibles and some skin, from the surface of the cave floor ; two skulls and four dentaries from the surface of the second chamber of the Cliff Cave. These specimens are distinguishable from *R. mehelyi* by the smaller cheek-teeth.

* *Rhinolophus blasii* Peters

In the second chamber of the Cliff Cave one live specimen was caught and a skull and two maxillae found. One complete skull was also collected from the porcupine den at Finike.

Myotis myotis (Borkhausen)

One intact dentary in the unstratified collection, and some fragments in layer 4 of the Cliff Cave. The molars are equal in size to those of *M. m. macrocephalicus* Harrison & Lewis, from Lebanon.

Eptesicus serotinus (Schreber)

One maxilla from the surface of the second chamber of the Cliff Cave. This species is known from Crete, Israel and central Asia Minor (Osborn, 1963).

* *Pipistrellus pipistrellus* (Schreber)

Two specimens taken from a colony living behind the shutters of a house at Yalniz.

Miniopterus schreibersi (Kuhl)

One skull from the surface of the Cliff Cave floor and another from a depth of 40 cm in the trial trench. No mandibles were found.

* *Vulpes vulpes* (L.)

One shot in the hills near Yalniz. This is a small, very pale animal with thick long fur. Its description exactly fits that of *V. v. flavescens* Gray given by Danford & Alston (1877).

Martes cf. foina (Erxleben)

One fragment in layer 4 of the Cliff Cave : a bulla, with part of the squamosal attached, of a young animal. This could equally well be referred to *M. martes* which is, however, not known to occur in western Asia Minor.

Meles meles (L.)

One skull, lacking mandibles, found outside a den in loose boulders south of Elmali.

Panthera pardus (L.)

One complete skeleton, evidently fairly recent, in the Leopard cave at Çatallar.

* *Sus scrofa* L.

One animal shot in cultivated land near Çatallar. The species was said to be common there. An associated skeleton of a younger animal was found at about 2000 metres on a mountain near Finike.

* *Sciurus anomalus* Schreber

One shot in thick pine wood on a steep hillside above Yalniz.

* *Citellus* sp.

Ground squirrels were seen, but not captured nor positively identified, among the boulders and cliffs at Çatallar. Several of the caves there contained stores of nuts which had been gnawed at one end.

* *Hystrix indica* Kerr

Fresh dung and newly shed quills found in the porcupine den at Finike suggest that this species lives in the hills around Finike. When questioned, local people agreed that porcupines were commonly seen in the area.

One skull was found in the deepest part of the porcupine den, and a single broken dentary was dug out of loose soil in one of the smaller caves at Çatallar.

* *Apodemus mystacinus* (Danford & Alston)

Three males and four females trapped at Yalniz. This was the second most abundant species in the deposit of the Cliff Cave where all layers yielded specimens and a total of 89 dentaries and 13 maxillae were recovered. The great majority of these can be confidently assigned to *A. mystacinus* on the basis of large size and broad teeth with the labial cusps especially well developed. A few of the very smallest (in particular five from layer 8x) come into the upper size range of recent *A. sylvaticus* or *A. flavicollis* and it seems probable that they represent one or other of these species. *A. sylvaticus* has been recorded near Finike by Osborn (1965).

* *Rattus rattus* (L.)

Seven trapped at Yalniz and one at Turunçova. One dentary on the floor of the second chamber of the Cliff Cave.

* *Mus musculus* L.

One trapped in a marsh at Turunçova ; two trapped at Antalya. One from Antalya is dark grey above and pale grey below, one is brown above and very pale buff below. Nine dentaries from layers 4-8 of the Cliff Cave.

Cricetulus migratorius (Pallas)

Two dentaries from layer 8x of the Cliff Cave, one with all three teeth, the other with M_2 only. This species was recorded from Mancarl Dağ, Finike, by Osborn (1965).

Microtus guentheri (Danford & Alston)

The most abundant species in the deposit in the Cliff Cave from which 143 dentaries, 21 pairs of maxillae and 7 single maxillae were recovered, from all layers. Measurement of 62 M_1 did not indicate any strong bimodality suggestive of more than one species, but the possibility that *M. arvalis* may be represented at the lower end of the scale cannot be ruled out.

Myomimus personatus Ognev

Three dentaries from layer 8x in the Cliff Cave and one dentary and an auditory bulla from the unstratified collection. One dentary has all four teeth present (fig. 2 a), one has M_2 and M_3 , whilst the other two lack teeth but have all the alveoli intact.

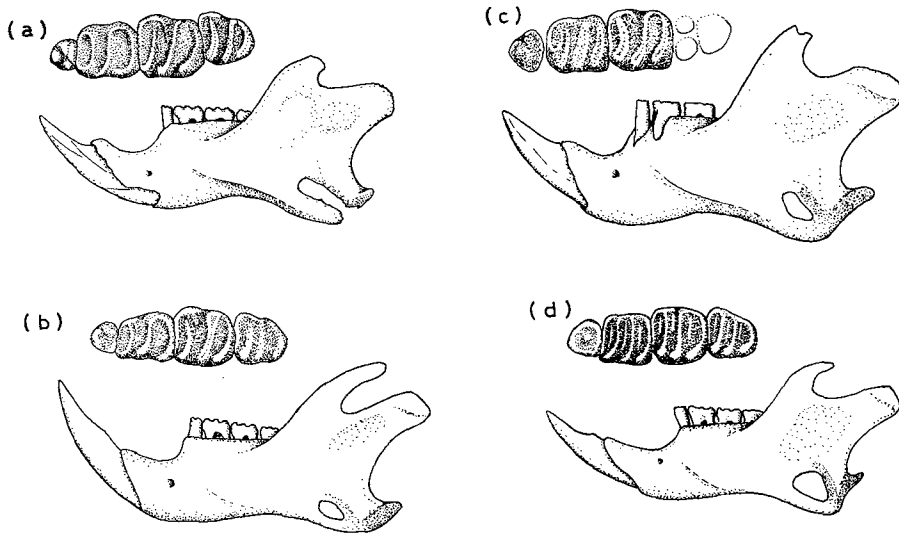


FIG. 2. Left dentary and lower left cheek-teeth of *Myomimus personatus* and *Dryomys nitedula*. (a) *M. personatus*, subfossil, Finike, Asia Minor (B.M. 67. 623); (b) *M. personatus*, recent, Bulgaria (B.M. 66.5992); (c) *M. personatus*, fossil, Israel (paratype of *Philistomys roachi* Bate, B.M. M16271); (d) *D. nitedula*, recent, Israel (B.M. 51.323).

This species of dormouse, the only representative of its genus, is known alive from only two areas, namely the Kopet Dagh, between Turkmenia and Iran (Ognev, 1924; Kamnev *et al.*, 1962) and from south-eastern Bulgaria (Peshev *et al.*, 1960, 1964; Heptner, 1960; Angermann, 1966). However, it is also known fossil from caves in Israel under the name *Philistomys roachi* Bate. This was described in 1937 as a new genus and species on the basis of three fragments of skull and seven dentaries from strata associated with Palaeolithic industries (Acheulean and Levallois-Mousterian) in the Tabun Cave, Mount Carmel, Israel (Bate, 1937 a; amplified and illustrated 1937 b). Subsequently *Philistomys roachi* has been recorded from similar strata at Oumm Qatafa, east of Bethlehem (Haas, 1951), and from late bronze age strata (1600–1300 BC) in a cave at Azor, east of Tel Aviv–Jaffa (Haas, 1960).

The specimens from Finike have been compared with two skulls of recent *Myomimus personatus* from Bulgaria, kindly presented to the British Museum by Professor Peshev (fig. 2 b), and with the type and paratypes of *Philistomys roachi* (fig. 2 c). They show almost perfect agreement with the two recent *Myomimus personatus*. They cannot be compared with the holotype of *P. roachi* since this is part of a rostrum and maxilla, but they agree very closely with five of the six dentaries referred to *P. roachi* by Bate. (The sixth is quite different and is probably a *Dryomys*.) The only detectable difference is the slightly larger size of the premolar in the only ramus of *P. roachi* that has this tooth, but Peshev *et al.* (1964) figure a Bulgarian skull with an equally large premolar. The specimen of *P. roachi* illustrated (fig. 2 c) is older than the others, being more massive, with more heavily worn teeth but it is the only dentary available with more than one tooth.

The holotype of *P. roachi* agrees perfectly with *M. personatus*, not only with respect to the teeth but also in the long incisive foramina whose posterior margins are level with the anterior margins of the first alveoli, a condition unique amongst recent dormice. *Philistomys roachi* Bate, 1937 can therefore be considered a synonym of *Myomimus personatus* Ognev, 1924,

Bate (1937 b) considered *Philistomys* to be rather closely related to *Hypnomys* from the Pleistocene of the Balearic Islands (Bate, 1918). The types of *Hypnomys morpheus* and *H. mahonensis* have been examined. Both are very large species without the highly simplified teeth of *Myomimus* and therefore can be excluded from further consideration here.

Mandibles of *M. personatus* can be recognized by the following combination of characters: length about 14–16 mm (i.e. comparable only with *Dryomys nitedula* amongst western Palaearctic dormice, fig. 2 d); depth in region of diastema (across mental foramen) much greater than in *D. nitedula* (2.5–3.0 mm); mental foramen almost equidistant from upper and lower margins of mandible; M_{1-3} each with three roots, two anterior and one posterior; masticatory surfaces of M_{1-3} with a simple pattern of transverse ridges. This pattern comprises basically three prominent transverse ridges arising from cusps on the labial margin. In *Dryomys* supplementary ridges are present between the first of these and the anterior margin, between ridges 1 and 2, and between ridges 2 and 3 (fig. 2 d). These are absent in *M. personatus* except for a short one between ridges 1 and 2.

In Bulgaria and Turkmenia *M. personatus* has been found in areas of dry wooded steppe and amongst rocks, and it is therefore conceivable that it might still survive in the vicinity of Finike.

Summary

Living representatives of twelve species of mammal are recorded from the vicinity of Finike, south-western Asia Minor. A further six species were found in the form of skulls or skeletons, mainly on the surface of cave floors. Some of these, along with an additional eight species, were also found by excavating the floor of a cave that now opens on the face of a cliff. These were associated with artefacts suggesting that the entire deposit was formed about 5000 B.C. All the mammals from the cave deposit are of species known to be living in Asia Minor, except the dormouse *Myomimus personatus*.

Philistomys roachi Bate, from Pleistocene and post-Pleistocene cave deposits of Israel, is shown to be a synonym of *Myomimus personatus* Ognev.

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