MAMMALIAN SPECIES

Otonycteris hemprichii.

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Otonycteris Peters, 1859

Otonycteris Peters, 1859: 223. Type species Otonycteris hemprichii Peters, 1859.

CONTEXT AND CONTENT. Order Chiroptera, Suborder Microchiroptera, Family Vespertilionidae, Subfamily Vespertilioninae. Otonycteris hemprichii is the only currently recognized species in the genus.

Otonycteris hemprichii Peters, 1859

Hemprich’s long-eared bat

Otonycteris hemprichii Peters, 1859: 223. Type locality not given, but because the type was collected by Hemprich and Ehrenberg, Kock (1969) restricted it to the "Nil Valley between Aswan in Egypt and Northern Province in Sudan."


CONTEXT AND CONTENT. Context same as for genus. Five subspecies are currently recognized (Atallah, 1977; Ellerman and Morrison-Scott, 1951; Harrison and Bates, 1991):

O. h. hemprichii Peters, 1859 (see above). See above for type locality. Including saharae (type locality in the Algerian Sahara), ustus (type locality in the Sudan).

O. h. cinereus Satunin, 1909:281, 297. According to Ognev (1928), the type locality is in Zararakh county, near the Bamrud irrigation ditch in Khurassan (N.E. Iran) and not in Persian Bahuchistan as stated in the original description.

O. h. jin Cheesman and Hinton, 1924:454. Type locality Hufuf, Hass, Saudi Arabia. Perhaps a valid subspecies for Arabian and eastern Mediterranean specimens.

O. h. leucophaeus Severtzov, 1873:18. Type locality NW Turkestan (*Turkmenia). Including bresnianus.

O. h. petersi Anderson and de Winton, 1900:120. Type locality Fao, Iraq. Possibly a synonym of O. h. jin (in that case petersi would have priority) based on personal observations.

DIAGNOSIS. Bats of this genus are the largest vespertilionids in their range. They have long prominent ears (up to 42 mm) that are broad with rounded tips and relatively smooth margins. Unlike those of Plecotus (long-eared bats), ears of O. hemprichii are not joined at the forehead. The tragus is long, directed upwards and outwards, simple, and has no nodules at its base as found in Plecotus. The pelage color is white, tinted with yellow to brown. Hairs on the dorsum have whitish-gray bases and pale purple-gray tips. Two pairs of pectoral nipples are found in this species, a condition rare among vespertilionid bats (Madkour, 1976a). The characteristic glass penis is expanded and projects forward between two lateral swellings (Harrison and Bates, 1991).

GENERAL CHARACTERS. Otonycteris hemprichii is a relatively large (total length 118–135 mm; length of forearm 50–70 mm) and heavily-built bat (about 20 g; Fainour, 1980; Gaisler et al., 1972). The tail is shorter than head and body (averaging 58 mm) with the tip projecting 4–5 mm beyond the margin of the uropatagium. Although size variation is apparent in available specimens (DeBlase, 1980; Harrison and Bates, 1991; Kowalski and Rzebi-Kowalski, 1991; Qumsiyeh, 1985), the extent to which this variation is geographic cannot be determined because of small sample sizes.

The forehead of this species is not raised above the level of the face, and the large ears are directed nearly horizontally (Fig. 1). The nostrils are simple, crescent-shaped, and located on the side of the snout. Wings are broad and the fifth digit is longer than the fourth. The shallow antibrachial membrane stretches from the shoulders to the base of the first digit of the manus. Each wing membrane arises from the side of the metatarsal of the first digit as in Plecotus. The interfemoral membrane is supported by a short calcus and the tip of the tail extends a short distance beyond the uropatagium (Roberts, 1977).

The skull is similar to that of a large Eptesicus or Myotis, but more elongated and narrow with the interorbital region deeper and lambdoidal ridge shallower (Fig. 2). The dental formula is I 1/3, c 1/1, pm 1/2, m 3/3, total 30. The teeth are similar to those of Eptesicus, but are generally heavier, and the outer upper incisor is missing in Otonycteris. The remaining single upper incisor is a large unicuspided with a prominent postero-lateral cingulum. M3 is greatly reduced, without a metacone or mesostyle. The lower incisors are bifid and overlap, forming an even U-shaped curve between the canines. The lower canines are robust (Harrison and Bates, 1991).

DISTRIBUTION. Otonycteris hemprichii is rare in collections, but is distributed over a wide range including most desert and desert habitats of the Paleartic region (Fig. 3). It is reported from Morocco, north Niger, Algeria, Tunisia, Libya, Egypt, north Sudan, the Arabian Peninsula, Iraq, Iran, northern Pakistan, northern Afghanistan, Turkmenia, Uzbekistan, and Tadzhikistan (Bogdanov, 1953; DeBlase, 1980; Harrison and Bates, 1991; Horacek, 1991; Roberts, 1977). No fossils are specifically reported for this genus. Solounias (1981) described a Turelian (late Miocene) bat, Samonoterus majori, as similar to Otonycteris, Eptesicus, and Scotophilus.

FORM. The pelage is dense, soft, and long (reaching 11 mm in the mid-dorsal region), but sparser on the ventral than on the dorsal surface. Ears appear to have a yellowish-brown tinge. The pinna of the ear has nine to ten transverse ridges (Fig. 1). The antitragus of each ear is small and defined by a shallow notch at its origin. The tragus is large, lanceolate, broader at its base, and roughly half the length of the ear (about 20 mm). The calcar extends about half the distance between the heel and the tail and has no postcalcareal lobes. Flight membranes are

Fig. 1. Hemprich’s long-eared bat, Otonycteris hemprichii, from Jordan. Photograph by M. B. Qumsiyeh.
thick and leathery, and almost hairless; they appear pallid and semi-translucent with a yellowish-brown color, more so near the body. Overall, the wings are pale grayish-brown distally, with their extreme tips and posterior margins whitish.

The skull of *O. hemprichii* is large and relatively elongated. The rostrum is comparatively long (greatest length of skull 22–27 mm) and narrow. Supraorbital ridges are very well defined, with prominent angular processes projecting posteriorly. Zygomatic arches are moderately flared. The braincase is elongated with the lambdoid crest forming a V-shaped posterior projection. Mastoids also have blunt angular flanges and the sagittal crest is well developed. Shallow basioccipital pits are seen opposite to the hamulars on the ventrum of the skull. The tympanic bullae are very large, forming bulges. The mandible has a strong horizontal ramus, high coronoid process, and laterally-deflected angular process.

The following description of the alimentary canal is based on a female *O. hemprichii* from Egypt (Madkour, 1976b). The esophagus is about 28 mm long and the stomach is wide and simple. The small intestine is about 123 mm in length and the hind-gut only 6 mm in length. The tongue has three types of papillae: circumvallate, filiform and fungiform. In *O. hemprichii*, small rounded accessory rugae are found in the spaces between the third, fourth, and fifth pairs of palatal rugae (Wassil and Madkour, 1972b).

The skeletal system has 11 pairs of ribs and a sternum composed of three segments (Wassil and Madkour, 1970b). As shown by the drawing of Wassil and Madkour (1970b), the vertebral column is made up of 7 C, 11 T, 6 L, 5 S pseudo-sacral, total 29 + an undetermined number of caudal vertebrae. Unlike other microchiropterae, both sexes of *O. hemprichii* lack a pubic symphysis in the pelvic bone (Wassil and Madkour, 1973). The anterior cornu of the hyoid bone is formed by the stylohyoid alone, a condition also seen in *Plecostus* and *Pipistrellus* (Wassil and Madkour, 1970a).

*Ontobatis hemprichii* has the longest os penis of Egyptian vespertilionids. It is pivot-shaped, with a short and cylindrical style, and an expanded base. In lateral view, the baculum appears crescent-shaped (Wassil and Madkour, 1972a).

**ONTogeny and reproduction.** Little reproductive data have been reported for *Ontobatis hemprichii*. DeBlase (1980) bases on four females collected in mid-June from Lebanon, Iran and reported no embryos. Gromov et al. (1928) reported a female with two embryos on 12 June from central Asia. Three pregnant females were obtained on 2 May from Azraq Oasis in northeast Jordan, with early June estimated as the date of birth (Atallah, 1977). Two of three females collected on 24 June 1974 in the Air Mountains (Niger) were lactating (Fairon, 1980). Six females from central Asia (no date given; Horáček, 1991), as well as the three from Jordan (Atallah, 1977) were each carrying two embryos. Two males collected from Saudi Arabia, one in August and one in October, had testes 4.2 and 4.8 mm wide, respectively (Harrison and Bates, 1991).

**Ecology and behavior.** *Ontobatis hemprichii* roosts in the fissures of rocks or in human constructions. It is mostly solitary, but occasional clusters of up to 18 females have been reported (Bogdanov, 1953). Its habitats are xeric, sparsely vegetated, and usually rocky. This bat seems to be well adapted to arid climates. During flight, Hemprich’s long-eared bats appear to hover close to the ground (personal observations by MBK in South Jordan) and have been caught in nets at heights of 10 cm to 3 m (Horáček, 1991). Norberg and Fenton (1988) showed that wing parameters in this species are similar to *Antrozous*, a carnivorous bat. Stomach contents indicate diets consisting of lepidodermis, Blattoidea, and Orthoptera (Horáček, 1991). Captive individuals have also been fed geckos (Corel, 1977).

Hemprich’s long-eared bats start their activity just before dusk, flying low along rocks. Later in the evening, they fly 4–9 m above the ground. Flight patterns include circles 20–60 m in diameter and straight flight without fluttering or quick maneuvers (Gromov et al., 1928; Horáček, 1991). Hemprich’s long-eared bat emits short series of low frequency clicks with regular low repetition rate increasing when approaching a prey and terminating with feeding. Calls range from 18–40 kHz with a maximum intensity at 30–32 kHz. When flying low, this bat seems to stop echolocating suggesting that when feeding on a non-flying prey, *O. hemprichii* is a facultative echolocator. This bat emits a second regular harmonic with half the intensity of the first and a third harmonic with a rather low intensity of about 75 kHz (Horáček, 1991).

The only reported predator of these animals is the barn owl *Tyto alba*. Remains of this bat were found in barn owl pellets in Djebel, Algeria (Hein De Balsac, 1965). A helminth parasite, *Anchrema sauguinum*, was described from several Egyptian bats including *O. hemprichii* (Saoud and Ramadan, 1977).

**Genetics.** In the eastern part of its range, Hemprich’s long-eared bat has a diploid number of 30 with sixteen metacentrics, four submetacentrics, six acrocentrics, two "dot-like chromosomes", a submetacentric X and a small Y (Zima et al., 1991). Zima et al. (1992) also compared chromosomes of *Ontobatis*, *Plecotus*, and *Myotis* and proposed that *Ontobatis* chromosomes are composed of the following primitive (sensu Bickham, 1979) arm
combinations: 1/2, 3/4, 5/6, 19/7, 21/8, 12/9, 15/10, 14/11, 18/13, 16/17, 20, 22, 23, 24 (identity uncertain), X, and Y. Quinney and Bickham (1993) reevaluated these homologies and reported the following arm combinations for one Jordanian specimen based on C-band analysis: 1/2, 3/4, 5/6, 14/11, 16/17, 21/9, 15/20-9, 21/7, 12/10, 22/8, 24/19/13, 23, X, and Y. The difference in diploid numbers between the Jordanian specimens (2n = 28) and the Caucasian material (2n = 30) is interesting and may reflect subspecies differences.

REMARKS. According to Koopman (1993), Otonycteris is a distinct genus that has no obvious relationship to other vespertilionid species. Miller (1907) suggested a relationship to Epilicus, Scotinomys, and Scotomys. Handley (1959) did not address Otonycteris in his revision of the American genera Euderma and Plecotus (which at that time included Corynorhinus and Idionycteris as subgenera), probably based on the view of Miller (1907) that Otonycteris was a distant relative of plecotine bats. Hill and Harrison (1987) included Otonycteris in the Plecotini but also included Rhogeessa, Baedon, and Nycticeius in the group. Both morphological (Bogdanov and Owen, 1994; Hill and Harrison, 1987; Horáček, 1991) and chromosomal (Quinney and Bickham, 1993; Volleth and Heller, 1994; Zima et al., 1992) data suggest that Otonycteris is closely related to Plecotus and Barbastelea, both of which belong to the tribe Plecotini. More studies on the relationship of Rhogeessa and Nycticeius are needed. As discussed earlier, Otonycteris has a striking external resemblance to Antrozous and other carnivorous insectivores, but this is probably the result of parallelism. Otonycteris is derived from the Greek oto meaning ear and nycterido, bat. Another, but uncommon, vernacular name for Otonycteris hemprichii is Hemprich’s arrow-eared bat.

LITERATURE CITED


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