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**OBSERVATIONS ON THE NORTH AFRICAN SEROTINE
BAT, EPTESICUS SEROTINUS ISABELLINUS
(TEMMINCK, 1840) (MAMMALIA: CHIROPTÈRA)**

by

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Eptesicus isabellinus was originally described as *Vespertilio isabellinus* by Temminck (1840, p. 205, pl. 52 figs. 1, 2) from a series of specimens obtained by J. F. H. Clifford Cocq van Breugel in the vicinity of Tripoli, Libya. Unfortunately Temminck's original description did not include any cranial measurements and as a result the precise affinities of this bat have been uncertain ever since. Lataste (1887, p. 625) described a small serotine bat from the vicinity of Cairo, which he named *Vesperugo (Vesperus) Innesi*. He stated that he had compared this with a specimen of *E. isabellinus* (the essential data of which were not given) and that *E. innesi* was smaller. Lataste evidently regarded *E. isabellinus* as a form of *E. serotinus* (Schreber, 1774). Once again, however, full cranial measurements were not given for the new form *E. innesi*. Harrison (1962) re-examined the lectotype and other specimens of *E. innesi* in the British Museum; extracted the skull of the lectotype and gave full cranial and external measurements. Setzer (1957, p. 40) in his review of Libyan mammals, treated *E. isabellinus* as a distinct species and stated that it had not been taken since Temminck's description. He noted that Zavattari (1934, p. 887) listed it as *Vespertilio serotinus isabellinus*. Allen (1939, p. 87) also listed it as a subspecies of *E. serotinus*. Ellerman & Morrison-Scott (1951, p. 156) treated *E. isabellinus* as a distinct species on the grounds that the measurements given by Tate (1942, p. 275) were too small for *E. serotinus* and they regarded Lataste's small species *E. innesi* as a subspecies of it.

In view of all this uncertainty it seemed essential to re-examine the original type material of *E. isabellinus* and make direct comparisons with *E. innesi* and the European *E. serotinus* in order to finally clarify its status. Three of the original syntypes, collected by Van Breugel, which are now in the collection of the Rijksmuseum van Natuurlijke Historie at Leiden, Holland, have been sent to the author for examination. They include two adult females nos. 17648 (cat. k) and 17650 (cat. n), the former with a nearly perfect skull, the supra-occipital region only missing; the latter with the whole braincase lacking, but the rostrum and mandibles intact. The third syntype seen, no. 17653 (cat. q) is a skin without skull and is clearly an infant, with the epiphyses of the long bones of the wings unfused. They have been compared with the lectotype and all other known specimens of *E. innesi* and also with material of *E. serotinus*.

The two adult female syntypes of *E. isabellinus* are robust serotine bats, their external and cranial dimensions are outstandingly larger than those of *E. innesi*. External measurements were not recorded in the flesh, but those that can be taken from the dried specimens are clearly comparable with those of *E. serotinus* (see table). The cranial dimensions are also outstandingly larger than those of *E. innesi* and clearly also comparable with those of *E. serotinus*. Their external characters agree closely with those of *E. serotinus*, apart from their pallid colour. It is difficult to know to what extent these specimens are now faded, but it is clear from Temminck's original description (1840, p. 205, 206) that their colour was very different to that of *E. s. serotinus*. He stated that the upper surface of the adult was "d'une belle teinte isabelle; la pointe du museau et des lèvres noires; toutes les parties inférieures d'une teinte isabelle très claire". The membranes he described as "d'un brun noirâtre et abondamment veinées de lignes jaunâtres". The following detailed description is given of the most perfect adult ♀ specimen seen, no. 17648, which is here selected as the lectotype of *Vespertilio isabellinus* Temminck, 1840.

The hair on the mid-dorsal region is about 8 mm long, fine, dense and rather silky. On the belly it is a little shorter, about 6 mm long. The distribution of the pelage is similar to that of *E. serotinus*. It extends thinly on to the proximal quarter of the interfemoral membrane above. It ceases at the edge of the wing membranes above and ventrally; part of the membrane behind the humerus is lightly pubescent. The bases of the ears posteriorly are hairy and also their internal margins for about half their height. The ear resembles that of *E. serotinus* in size and form, its internal margin is strongly convex and the ear is tall with its tip broadly rounded off. The conch is crossed by about five transverse ridges. The external margin is

slightly concave below the tip, but with a distinct convexity below, just before the external margin turns inwards at its base. The antitragal lobe is separated from the external margin by a distinct notch; it is rather low and its upper border is gently convex. The tragus has its tip bluntly pointed, its internal border is nearly straight, its external border convex and it is widest opposite the origin of its anterior border. There is a distinct, bluntly rounded basal lobule projecting near the base of its posterior border. The tip of the tail projects from the interfemoral membrane for a distance of 2-3 mm and a robust calcar supports the outer half of the interfemoral membrane. A well developed post-calcareal lobe is present 6 mm long by 2 mm in width. The feet are robust, with strong brownish claws, and the dorsal surfaces of the toes are hairy. The wing membrane is inserted at the base of the outer toe. The wing resembles that of *E. serotinus* in its proportions and the measurements of its distal components are given below: —

Thumb, with claw	7.2 mm
Metacarpal 2	43.8 mm
1st phalanx of digit 2	3.2 mm
Metacarpal 3	46.8 mm
1st phalanx of digit 3	18.2 mm
2nd phalanx of digit 3	15.2 mm
3rd phalanx of digit 3	8.7 mm
Metacarpal 4	46.6 mm
1st phalanx of digit 4	16.2 mm
2nd phalanx of digit 4	10.2 mm
3rd phalanx of digit 4	2.2 mm
Metacarpal 5	42.8 mm
1st phalanx of digit 5	11.1 mm
2nd phalanx of digit 5	6.2 mm
3rd phalanx of digit 5	2 mm

The skull of this specimen is in quite good condition, only part of the supraoccipital lacking. It is that of a sub-adult animal in which the suture between the basioccipital and basisphenoid is still just detectable and the braincase is rather smooth, lacking the prominent lambda of the adult *E. serotinus*. It agrees with that species in its general configuration. The rostrum is broad; the lachrymal ridges are prominent, although not so pronounced as in the imperfect skull of no. 17650, which was evidently fully adult. The zygomatic arches are flared laterally, their widest point situated posteriorly. The braincase has prominent angular projections in the mastoid region and the dorsal profile is nearly flat, the braincase being only very little elevated above the facial skeleton. The premaxillae are not co-ossified; the anterior palate is emarginated almost to the level of the middle of the shaft of the upper canine. The palate has a distinct median ridge anteriorly

behind the emargination, but its central part is distinctly concave. Its posterior margin is a little damaged but there was evidently a median projection, so that the anterior margin of the mesopterygoid space was double emarginate. The mesopterygoid space is a little longer than broad and very slightly widened posteriorly. The tympanic bulla is rather small, similar to that of *E. serotinus* in size and form and as in that species the basiocciput is broad. The temporo-mandibular joint has a well formed but narrow posterior lip lateral to the apex of the bulla. The infraorbital foramen is ovoid, the anterior edge of its lateral plate is situated above the parastyle of m^1 , as in *E. serotinus*. The mandible is similar to that of *E. serotinus* with a tall bluntly triangular coronoid process, the anterior border of which is almost vertical. The angular process is well formed; it is a little outwardly deflected and just projects behind the condyle when viewed from above. The horizontal ramus is deep and the symphysis has a distinct submental projection below (pl. VI).

The upper incisors (fig. 1) are similar to those of *E. serotinus*, i^1 is large, with a distinct cingulum and it is bicuspidate, the secondary cusp situated at about three-quarters of the height of the principal one. i^2 is very small.

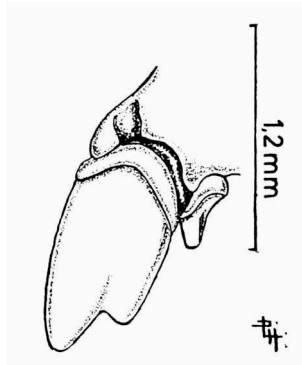


Fig. 1. *Eptesicus serotinus isabellinus* (Temminck), lectotype, Rijksmuseum van Natuurlijke Historie Reg. No. 17648. Left upper incisors.

only just exceeding the cingulum of i^1 in height. The upper canine is powerful and its anterior surface is convex. It has a strong posterior cutting edge, the postero-lateral and postero-medial surfaces are concave and the antero-medial surface bears two distinct ridges converging towards the tip. The principal cusp of the single upper premolar attains three-quarters of the height of the upper canine; its posterior commissure is externally angulated and it has a distinct antero-medial cingular cusp. m^1 and m^2 are subequal; the metacone is predominant in each tooth, the protocones are small and

hypocones absent. In each tooth the parastyle and mesostyle are larger than the metastyle, quite similar to those of *E. serotinus*. m^3 is reduced, consisting of the protocone, paracone and two commissures with only a very small vestige of the third commissure. The parastyle has been eroded by wear in this specimen, but was almost certainly present. The lower incisors were six in number, but the two outer ones on the right had been shed in this specimen. The crowns of the remaining lower incisors are very much worn in this specimen as are those of no. 17650, so that it is impossible to say how many cusps were present. Residual grooves on two of the teeth at least show that the crowns were originally imbricated. (The lower incisors were trifid in the young animal, according to Temminck). The lower canine has an antero-medial cingular cusp. The lower cheekteeth are much worn so that the precise details of form are obscured but they agree in size and proportions with those of *E. serotinus*. The crown area of the anterior lower premolar is about two-thirds of that of the posterior tooth; m_1 and m_2 are subequal; m_3 has its posterior crown reduced, as in *E. serotinus*.

The following measurements (in mm) were taken from the lectotype (no. 17648) and a paralectotype (no. 17650) of *Eptesicus isabellinus*, both of which are adult females:

	no. 17648	no. 17650
Forearm	51.3	51.2
Hind foot	11.6	11.8
Tibia	21.9	20.2
Condylbasal length	18.2	—
Zygomatic breadth	12	—
Interorbital constriction	4.2	—
Breadth of braincase	8.8	—
Maxillary cheekteeth c- m^3	6.7	6.9
Mandibular cheekteeth c- m_3	8.1	8.0
Mandible	15.2	14.6

CONCLUSIONS

1. The original type material of *Eptesicus isabellinus* (Temminck, 1840) agrees with *Eptesicus serotinus* Schreber, 1774, in size and in all essential characters, the specimens differing only in their pallid colour. The form is thus regarded as a pale N. African desert subspecies of *E. serotinus*, which should be known as *Eptesicus serotinus isabellinus* (Temminck).

2. A specimen of the original type series, now No. 17648 in the Rijksmuseum van Natuurlijke Historie, Leiden, is here selected as the lectotype and is described in detail.

3. *Eptesicus innesi* Lataste, 1887, is clearly a distinct species from *E. sero-*

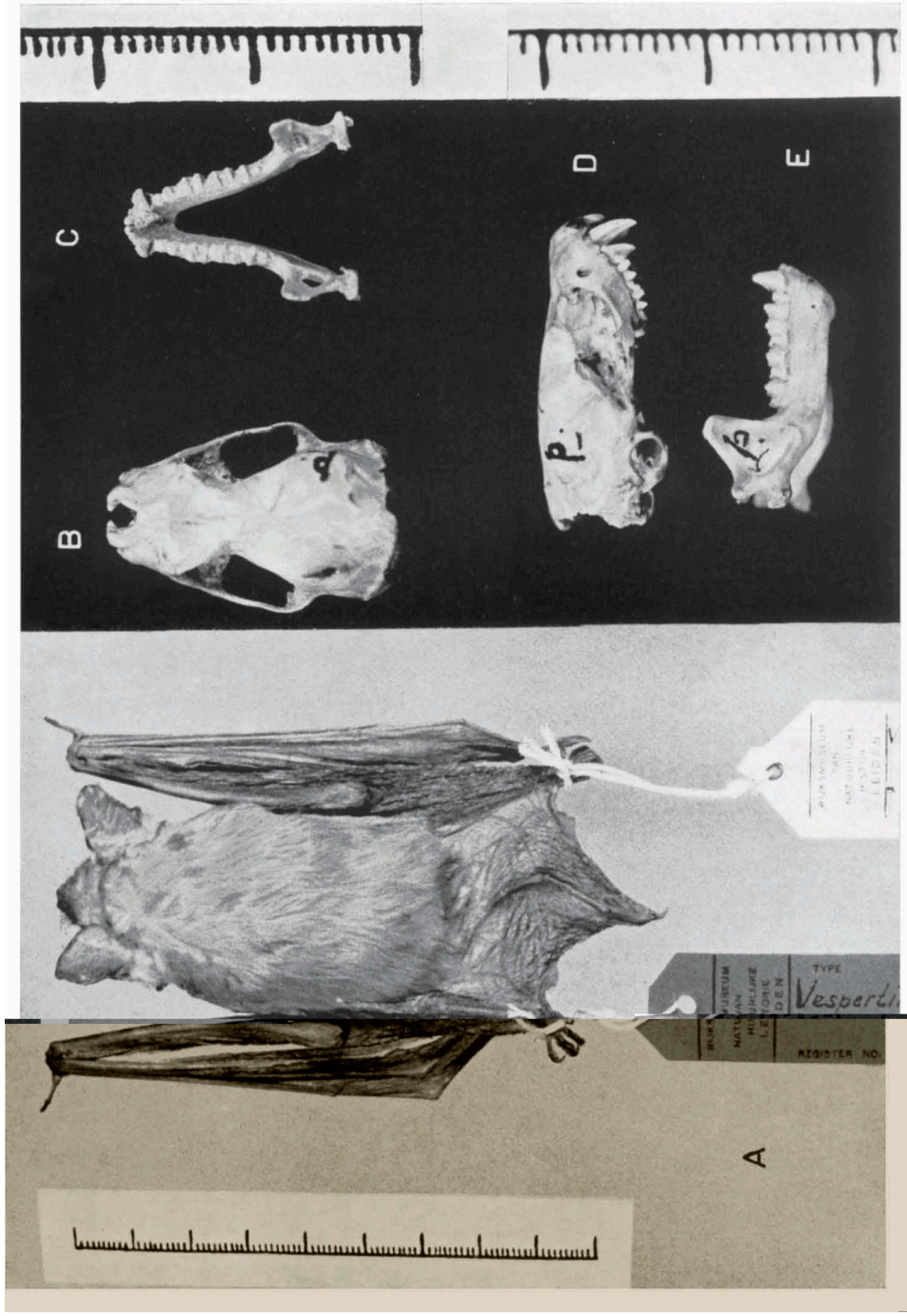
tinus isabellinus, being much smaller (forearm 40.3-42.3 mm, condylobasal length of the skull 15.2-16 mm).

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Eptesicus serotinus isabellinus (Temminck), lectotype, Rijksmuseum van Natuurlijke Historie Reg. No. 17648. A, dorsal view of skin; B, dorsal view of skull; C, dorsal view of mandible; D, lateral view of skull; E, lateral view of mandible.