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## THE STATUS OF *VESPERTILIO BORBONICUS* E. GEOFFROY, 1803 (CHIROPTERA: VESPERTILIONIDAE)

by

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### ABSTRACT

The taxonomic history of *Scotophilus borbonicus* (E. Geoffroy, 1803) from Réunion Island is reviewed and summarised, with the designation of a lectotype. The insular form that it represents is considered conspecific with the small *Scotophilus viridis* (Peters, 1852) of southern Africa. As a result, *Scotophilus borbonicus* becomes the valid name for this species, and will also replace *Scotophilus leucogaster* (Cretzschmar, 1830), if the small members of the genus from more northerly localities in Africa are united with their southern congeners.

### INTRODUCTION

*Vespertilio borbonicus* E. Geoffroy, 1803<sup>1)</sup> has for many years been referred to *Scotophilus*, a genus of vespertilionid bats widely distributed in Africa and southeastern Asia. Proposed originally for specimens from the island of Réunion (Bourbon), it was employed by some early authors for African representatives of the genus, but more recently this opinion has been overlooked and through taxonomic change the status and application of the name has become uncertain (Hayman & Hill, 1971: 50). It is one of the earliest names in *Scotophilus* and its possible nomenclatorial significance

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<sup>1)</sup> This nominal taxon is sometimes cited from E. Geoffroy, 1806, Ann. Mus. Hist. Nat. Paris, 8: 201. However, it first appears in E. Geoffroy, 1803, Catalogue des Mammifères du Muséum National d'Histoire Naturelle (Paris): 55, with a description of the same specimens. The proper publication of this now rare work has been considered doubtful: elements of its history can be found in I. Geoffroy, 1839: 5, footnote; 1847: 115; 1851: v, footnote, and in Cahn, 1962: 55. The work is not accepted by Sherborn (1922: lviii) and its use as an original source has been erratic and inconsistent, but Holthuis (1963: 242) has argued convincingly that it fulfils the modern criteria for publication, leading China (1963: 243) to withdraw a proposal (1962: 289) for its rejection. Among early authors, Desmarest (1804: 12) listed *Vespertilio borbonicus* without description and remarked in a footnote that Geoffroy had described it in his Catalogue, but subsequently (1819: 474; 1820: 142) Desmarest cited it from the later work.

suggested an attempt to establish the relationship of the Mascarene form that it represents to those described from Africa.

Geoffroy (1803: 55; 1806: 201, pl. 46) based *Vespertilio borbonicus* on two specimens sent from Réunion to the Muséum National d'Histoire Naturelle, Paris, by Macé. Measurements given by Desmarest (1820: 142) show that he examined one at least of these syntypes, while Temminck (1840: 153, pl. 47 fig. 7) remarked that examples of *Nycticejus borbonicus* were to be seen in Paris and in the Musée du Pays Bas at Leiden, but it is not clear to which of these his measurements refer. The descriptions by one or more of these three authors are the basis of further accounts of *borbonicus* by Gray (1827: 94), Fischer (1829: 108), Wagner (1840: 543; 1855: 768), Giebel (1855: 928) and Fitzinger (1870: 383). Although the collections of the Muséum National d'Histoire Naturelle include specimens of other bats from Réunion that date from the period, no trace can now be found of the two syntypes (A. S. Cheke, pers. comm., 1976) and there is no entry for *Vespertilio borbonicus* in the catalogue by Rode (1941) of type specimens of bats in that institution.

#### THE LEIDEN SPECIMEN

Jentink (1888: 184) records a mounted adult individual (cat. 'c') of *Scotophilus borbonicus* Geoffroy from Bourbon (= Réunion) in the collection of the Muséum d'Histoire Naturelle des Pays Bas (Rijksmuseum van Natuurlijke Historie, Leiden), obtained from the voyage of Macé. Still extant, this specimen is no longer mounted, but is a study skin with outstretched wings, the skull in situ. It is in a generally poor condition, with a modern label repeating the data given by Jentink and referring the specimen to *Scotophilus borbonicus* (E. Geoffr.); it bears the new registration number 28508. However, the original label is preserved in the Rijksmuseum, attached to the pedestal on which the specimen was once mounted, and reads '*Nycticejus borbonicus*, Tem' in handwriting from that earlier period. This specimen was the only example to be labelled in this way and undoubtedly it is the source of the reference by Temminck to *Nycticejus borbonicus* in the Museum at Leiden (C. Smeenk, in litt., 29.i.1980).

Nothing is known of its history beyond these brief details. However, it seems very probable that it is one of the original syntypes, although no certain proof has yet been found. There is no indication that Macé sent the specimen directly to Temminck, who did not begin collecting specimens of natural history (chiefly birds) until about 1810, and there is no record of Macé in his archives (C. Smeenk, in litt., 29.i.1980). Moreover, at the time that Macé evidently sent specimens to Paris there was no important

collection of natural history (at least not of vertebrates) in the Netherlands, a country then under the control of the French who had in fact confiscated the collection of the Prince of Orange in 1795 and removed it to Paris. On becoming independent, the Dutch endeavoured to regain this collection: many of the original specimens were returned in 1815, together with a large series of duplicate specimens from the Muséum National d'Histoire Naturelle at Paris to replace those that remained in France or could not be recovered. At first housed in the University at Leiden, the specimens were subsequently incorporated into 's Rijks Museum van Natuurlijke Historie when it was founded in 1820 (Gijzen, 1938: 22-28). Unfortunately, there is no record of the duplicate specimens received from Paris, but these may well have included one of the two syntypes described by Geoffroy.

The specimen in the Rijksmuseum van Natuurlijke Historie is now light reddish brown dorsally, the hairs over the shoulders and foreback creamy at the base, but elsewhere reddish brown for most or all of their length. The skin of part of the ventral surface is missing, but otherwise the ventral pelage is chiefly dull white with a brownish area beneath the chin. The coloration of the specimen has been affected by light and it is obviously faded, but in colour it agrees in general with the description of *borbonicus* by Geoffroy (1803: 55; 1806: 201), who noted that the soft glossy pelage was red above, white below, the hairs on the ventral surface tipped with a russet tint, and in size (Table 1) the specimen agrees with the dimensions recorded for *borbonicus* by Geoffroy (1803: 55), Desmarest (1820: 142) and Temminck (1840: 153). So far as can be determined, it seems to be the only surviving example of *Scotophilus* collected by Macé on Réunion and since, unless otherwise established, there is every probability that it is one of the two specimens sent originally to Paris, it is here designated as the lecto-

TABLE 1

Measurements of early specimens of *Scotophilus borbonicus*  
(1 pouce = 27.07 mm)

	Geoffroy, 1803: 55	Desmarest, 1820: 142	Temminck, 1840: 153	RMNH 28508
Total length	-----	-----	4 pouces 6 lignes	
	---	---	= 121.3 mm	113.9 mm'
Length of head and body	2 pouces 11 lignes	2 pouces 11 lignes	-----	
	= 78.7 mm	= 78.7 mm	---	76.3 mm
Length of tail	-----	1 pouce 6 lignes	1 pouce 7 lignes	
	---	= 41.5 mm	= 42.7 mm	37.6 mm'
Length of forearm	-----	-----	1 pouce 9 lignes	
	---	---	= 47.4 mm	50.3 mm

mm', tail now distorted and curved at tip

type of *Vespertilio borbonicus* E. Geoffroy, 1803. If indeed it is one of the two syntypes as it appears to be, then it must be No. CXXII of Geoffroy (1803: 55) which he noted had two upper incisors, as does this example: the other specimen, No. CXXIII, apparently had three, suggesting to Geoffroy that one pair was missing from the first of these individuals.

#### TAXONOMIC HISTORY

Current uncertainties in the classification of African *Scotophilus* present immediate difficulties in considering the status of the Mascarene form that this specimen represents. The African distribution of the genus includes most of the continent south of the Sahara from Senegal, Niger and Sudan, excepting only the most arid southwestern areas: to the northeast the genus extends to Ethiopia and Somalia, with an African representative in Aden. The several named forms are generally rather uniform in external, cranial and dental morphology and are usually distinguished chiefly by differences in size. On this basis, the large species known until recently as *S. gigas* is very clearly distinct, with a forearm length of 77-89 mm, but size differences among the smaller named forms with forearms varying in length from 43 mm to as much as 65 mm are open to more than one interpretation, and the classification of this assembly is uncertain and as yet a matter of differing opinion.

Kock (1969: 192) considered this group of African *Scotophilus* to represent but a single species, the wide variation in size sometimes found in one region being a consequence of the presence of younger animals in the population at certain times of the year. A more commonly accepted view is that there are two species, often sympatric, one larger, the other smaller, a division recognised by Peters (1869b: 137), but first explored in detail by Thomas & Wroughton (1907: 287; 1908a: 777; 1908b: 166; 1908c: 538), who recognised two size groups in southern Africa. Subsequently Aellen (1956: 28) extended this concept to the entire range of *Scotophilus* in Africa. Sympatry has been reported from numerous areas, for example from Senegal (Aellen, 1956: 28, 30), Togo (De Vree, De Roo & Verheyen, 1969: 206), Tchad (Viellard, 1974: 986), Ethiopia (Largen, Kock & Yalden, 1974: 249), Mozambique (Thomas & Wroughton, 1907: 287), Rhodesia (Harrison, 1964: 3), Malawi (Kershaw, 1922: 182), Zambia (Ansell, 1960: 23), Angola (Sanborn, 1950: 59) and Namibia (Thomas, 1906: 174, 175).

The two species so recognised can be readily distinguished in southern Africa by size and by the relative dimensions of the palate and teeth, but in northeastern Africa the distinctions tend to become blurred and definition more difficult, and in eastern Africa there is apparently a geographical hiatus

in the distribution of the smaller species. As a result, Koopman (1975: 414), while recognising two sympatric species in southern Africa, referred the more northern forms to a single species since in his opinion specimens from northeastern Africa link the larger examples from Uganda and Kenya to smaller representatives from western Ethiopia and Sudan, but more recently Koopman, Mumford and Heisterberg (1978: 4) have modified this opinion by the recognition of two species in West Africa. Further revision is clearly needed: in the meantime the existence of two sympatric species (excluding the large species until recently called *S. gigas*) in southern Africa is widely accepted.

Thomas & Wroughton (1908c: 538) allocated the larger forms in southern Africa to *Scotophilus nigrata* (Schreber, 1774), but Robbins (1978: 212) has demonstrated that this name properly applies to the very large species hitherto called *Scotophilus gigas* Dobson, 1875. The next available name for the larger of the two species remaining is *Scotophilus dinganii* (A. Smith, 1833). Smaller forms in southern Africa were allocated to *Scotophilus viridis* (Peters, 1852) by Thomas & Wroughton: according to Aellen (1956: 28), if the separation into larger and smaller species is extended to the Sudan and Ethiopia, then *Scotophilus leucogaster* (Cretzschmar, 1830) is the earliest name. However, Peters (1866: 855) had long since indicated that he considered *viridis* to be a synonym of *borbonicus* by publishing the brief statement "*Scotophilus borbonicus* Geoffroy sp. = *Nycticejus viridis* Ptrs." in a list of mammals and amphibians from East Africa and the Malagasy region, obtained through the activities of Baron Carl von der Decken. In amplifying this initial reference, Peters later (1869a: 7) formally synonymised *viridis* with *borbonicus*, remarking that he believed the species to be identical after comparing *viridis* with one of the examples of *borbonicus* in the Leiden Museum that fitted quite well with the description by Geoffroy, subsequently again (1869b: 137) listing *viridis* as a synonym of *borbonicus*. Dobson (1878: 260; 1880: 187) and Jentink (1887: 279; 1888: 184) employed *borbonicus* for specimens from the African mainland, the former suggesting in his Catalogue of the Chiroptera in the British Museum (1878: 260) that *Vespertilio nigrata* Schreber, 1774 might be a prior name by listing it in the synonymy of *borbonicus*, but preceded by a query. Indeed, Thomas has substituted *nigrata* for *borbonicus* in a copy of this work in the library of the British Museum (Natural History), with the annotation "Can be no query here. The number of incisors,  $\frac{2}{6}$ , locality, Senegal, and an excellent figure all agree with this species and no other", thus initiating his subsequent use of *nigrata*.

TABLE 2

Measurements (in millimetres) of *Scotophilus dinganii* from southern Africa, *S. borbonicus* and RMNH 28508

	No. of specimens	Length of Forearm	No. of specimens	c'-c'	No. of specimens	m <sup>3</sup> -m <sup>3</sup>	No. of specimens	c-m <sup>3</sup>	No. of specimens	c-m <sub>3</sub>	No. of specimens	width c'
<i>S. dinganii dinganii</i>	(44)	50.3-60.2 (54.3)	(68)	6.8-7.7 (7.3)	(27)	8.9.-2.9 (9.4)	(30)	6.8-7.5 (7.2)	(29)	7.7-8.6 (8.1)	(34)	1.7-2.1 (1.9)
<i>S. dinganii herero</i>	(25)	50.9-52.9 (54.1)	(12)	6.3-7.2 (6.8)	(12)	8.6-9.4 (9.0)	(12)	6.8-7.4 (7.0)	(12)	7.5-8.3 (7.9)	(12)	1.7-1.9 (1.8)
<i>S. borbonicus viridis</i>	(21)	43.9-50.0 (47.0)	(16)	5.6-6.4 (6.1)	(16)	7.7-8.8 (8.4)	(16)	5.8-6.5 (6.3)	(16)	6.8-7.2 (7.0)	(16)	1.3-1.6 (1.5)
<i>S. borbonicus damarensis</i>	(29)	45.0-52.7 (49.2)	(24)	5.3-6.2 (5.9)	(24)	7.5-8.4 (8.0)	(29)	5.9-6.5 (6.1)	(24)	6.5-7.3 (6.8)	(27)	1.3-1.5 (1.4)
RMNH 28508		50.3		6.1		8.7		6.6		7.5		1.5

#### SUBSPECIFIC IDENTITY OF THE LECTOTYPE

The lectotype of *Scotophilus borbonicus* agrees closely in size (Table 2) with mainland specimens until now allocated to *S. viridis viridis* or to *S. viridis damarensis* Thomas, 1906, the smaller representatives of the genus in southern Africa, and there can be little doubt that all should be referred to the same species. Dorsally, however, it has a definite red tinge in contrast to the dark brown dorsal surface of *viridis* or the brown back of *damarensis*, and its ventral surface is predominantly white rather than yellowish brown as in *viridis* or greyish as in *damarensis*. Although the specimen is old and faded, such colour differences suggest that the Mascarene population that it represents should be regarded as subspecifically distinct, rather than identical with *viridis* as was thought by Peters, perhaps from his examination of this same specimen in Leiden. *Scotophilus borbonicus* (E. Geoffroy, 1803) is by far the earliest name among the smaller members of the genus in Africa and must therefore replace *Scotophilus viridis* (Peters, 1852) and indeed *Scotophilus leucogaster* (Cretzschmar, 1830) if the smaller northern form is united with its southerly congener.

The subspecies *Scotophilus b. borbonicus* is now apparently very rare if not extinct on Réunion (Cheke, 1975: 37), with the last record in the Muséum d'Histoire Naturelle de St. Denis in about 1867 (A. S. Cheke, pers. comm., 1976). No authentic record of *S. borbonicus* from Mauritius has

been found, the suggestion by Hayman & Hill (1971: 50) that it occurs on that island being based on the mistaken assumption by Allen (1939: 99) that "Ile-Bourbon" is Mauritius rather than Réunion. The species was recorded from Madagascar by Dorst (1947a: 311; 1947b: 86), who distinguished it (1947a: 311) from its local congener *S. robustus* Milne-Edwards, 1881 (= *S. dinganii robustus*) by its smaller size, different coloration and less massive skull with less prominent sagittal crest. This author (1947b: 86) gives the length of the forearm of *S. borbonicus* in Madagascar as 42-50 mm and further characterises it by its beige dorsal and whitish ventral surface, features suggesting the possibility that Madagascan specimens should be referred to the nominate subspecies.

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