

Bats from the Cameroons, with the description of a new species of *Pipistrellus*

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In the course of further studies on Mount Cameroon and other mountains of the Western Cameroons (see map, p. 2), Professor Martin Eisentraut of the Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn has obtained a small collection of bats which he has referred to the British Museum (Natural History) for identification. I am indebted to Professor Eisentraut for the opportunity of examining his collection, which is of considerable interest since not only does it add *Rhinolophus clivus*, *Pipistrellus kuhlii* and *Tadarida ansorgei* to the recorded bat fauna of the Cameroons but also includes examples of a species of *Pipistrellus* hitherto undescribed. The specimens are designated by their collection numbers in this paper and will be retained by the Museum Alexander Koenig, excepting one paratype of the new species which has been presented to the British Museum (Natural History). Notes on some of the localities collected are given by Eisentraut (1957) and this author later (1963) provides a detailed account of the region, with maps.

Nycteris hispida hispida (Schreber, 1775)

♂ No. 88 (in alcohol, skull extracted). Nyasoso, Mount Kupe, 900 metres. 14th. November 1966.

Rhinolophus alcyone (Temminck, 1852)

♂ No. 339 (in alcohol). Nyasoso, Mount Kupe, 850 metres. 7th. January 1967.
♀ No. 644 (in alcohol). Wildi Cave, Buena, Mount Cameroon, c. 1,100 metres. 16th. March 1967.

Rhinolophus alticolus (Sanborn, 1936)

♂♂ Nos. 648, 649 (in alcohol), ♀♀ Nos. 625—627 (skins, skulls), 628, 629 (in alcohol). Wildi Cave, Buea, Mount Cameroon. 15th. March 1967.

Rhinolophus clivus (Cretzschmar, 1826)

♀ No. 308 (in alcohol, skull extracted). Camp III, Lake Manenguba, Manenguba Mts., 1,800 metres. 28th. December 1966.

In this specimen the connecting process is high and rounded, the sella parallel-margined for much of its length and the lancet very narrow terminally, the margins in its upper quarter more or less parallel. The anterior upper premolar (pm^2) and the second lower premolar (pm_3) are lacking. For these reasons, the specimen is referred to *R. clivus*, hitherto unre-

corded from West Africa. It is a rather large example which cannot be assigned immediately to any of the described subspecies of *clivosus* and it is possible that further material may demonstrate the existence of a distinct subspecies in the Cameroons. In size the specimen exceeds *R. silvestris* Aellen, 1959 from Gaboon which has not been examined, but which has a low connecting process.

Measurements (in millimetres): length of forearm 57.4; of tibia 24.7; condylocanine length 20.9; rostral width 6.8; anteorbital width 6.0; zygomatic width 12.9; least interorbital width 2.9; width of braincase 9.9; c^1-c^1 6.7; m^3-m^3 9.0; $c-m^3$ 9.0; $c-m_3$ 9.8.

Hipposideros beatus beatus (Andersen, 1906)

♂ No. 621 (in alcohol), ♀ No. 622 (in alcohol). Isobi, near Bibundi, 30 metres. 12th. March 1967.

Hipposideros caffer guineensis (Andersen, 1906)

♂♂ Nos. 101, 177 (skins, skulls), ♀♀ Nos. 97 (in alcohol), 102, 111, 175, 176 (skins, skulls). Camp I, Mount Kupe, c. 900 metres. 16th.—26th. November 1966.

♂♂ Nos. 645, 647 (in alcohol), ♀ No. 646 (in alcohol). Buea, Mount Cameroon, 16th. March 1967.

♀♀ Nos. 675 (skin, skull), 676 (in alcohol). Musake Hut, above Buea, Mount Cameroon, 1,850 metres. 19th. March 1967.

Hipposideros commersoni gigas (Wagner, 1845)

♀ No. 613 (skin, skull). Camp V, near Dikume-Balue, Rumpi Highlands, 1,100 metres. 6th. March 1967.

Hipposideros cyclops (Temminck, 1853)

♂ No. 213 (skin, skull). Camp II, Mount Kupe, c. 1,100 metres. 2nd. December 1966.

Pipistrellus kuhlii (Natterer, 1817)

♂ No. 458 (in alcohol), ♀ No. 449 (in alcohol, skull extracted) Camp IV, Lake Oku, Bansa Highlands, 2,100 metres. 30th.—31st. January 1967.

There is no previous record of *P. kuhlii* from any part of West Africa. These specimens, clearly referable to this species, have the outer upper incisor (i^3) one half of the height of the unicuspid inner upper incisor (i^2), extruded from the toothrow to lie at the side of the inner tooth, with a large central cusp flanked by small lateral cusps. The anterior upper premolar (pm^2) is small, visible externally, and is intruded from the toothrow to lie in the angle between the canine and the posterior upper premolar (pm^4), which are almost in contact.

The African range of *P. kuhlii* includes Algeria and the Sahara (*P. k. pallidus*); Morocco, Egypt (*P. k. kuhlii*); Eritrea; Ethiopia; Kenya (*P. k. fuscatus*); Tanzania; Natal, Transvaal (*P. k. broomi*) to Cape Province (*P. k.*

subtilis). Specimens available in the collections of the British Museum (Natural History) are insufficient to establish subspecific validities or boundaries. These from the Bansa Highlands have dark brown dorsal pelage, the hairs basally blackish but brown at the tips: the ventral pelage is predominantly buffy brown, the hairs black at the base and for much of their length, tipped with pale buffy brown and with the dark basal colour showing through the paler overlay. They are similar in colour to the darker examples of a series from Dangila, 40 miles south of Lake Tana, Ethiopia, 6,700—7,000 feet, in the collection of the British Museum (Natural History). At one time thought to be representative of *aero* (of which there is a topotype in the collections), these specimens are however rather larger and are referable to *P. kuhlii*. Like the specimens from the Bansa Highlands, they are larger on the whole than *kuhlii* from North Africa and Egypt and are darker both above and below.

Measurements (in millimetres: 458, 449 [skull broken]): length of forearm 33.6, 34.5; greatest length of skull 13.7; condylobasal length 12.9; condylocanine length 12.6; zygomatic width 8.7; least interorbital width 3.8; width of braincase 6.8; mastoid width 7.6; c^1-c^1 4.2; m^3-m^3 6.0; $c-m^3$ 4.9.

Pipistrellus nanus nanus (Peters, 1852)

♀ No. 545 (in alcohol, skull extracted). Camp V, Dikume-Balue, Rumpi Highlands. 23rd. February, 1967.

Pipistrellus eisentrauti sp. nov.

Holotype: M. Eisentraut No. 498 (skin and skull, the right bulla and right first and second lower molars missing). Adult ♂. Camp V, Dikume-Balue, Rumpi Highlands. 18th. February 1967. Collected by Professor Martin Eisentraut and now in the collection of the Museum Alexander Koenig, Bonn, No. 68.5.

Other material: M. Eisentraut No. 198 (skin and skull). Adult ♀. Camp II, Mount Kupe, c. 1,100 metres. 30th. November 1966. B.M. 67.2129 (originally M. Eisentraut 643) (skin and skull). Old ♀. Buea, Mount Cameroon. 15th. March 1967. Both collected by Professor Martin Eisentraut: the first in the collection of the Museum Alexander Koenig, Bonn, the second presented to the British Museum (Natural History).

Diagnosis: A large pipistrelle (forearm length c. 33.5—35 mm.) characterised by high braincase with elevated frontal region which is almost as high as the occiput; expanded supraorbital region with slight but clearly defined supraorbital ridges terminating in an angular junction with the orbital margin, the upper surface of the rostrum thus more or less pentagonal; high, massive rostrum; absence of basioccipital pits and by long, narrow upper incisors which are bicuspid and blade-like.

Description: Dorsal pelage dark brown, the hairs unicolorous: ventral pelage slightly paler, the hairs bicolored, basally blackish brown, tipped with dark brown. The specimen from Buea is slightly paler above and below than the other two and ventrally is a little tinged with buff. Ears of moderate size, rounded at

the tip, margin smoothly convex anteriorly with a small basal lobe, posteriorly nearly straight in distal part, proximal part convex with small antitragal lobe. Tragus a little more than one third the length of the ear, its tip rounded, its greatest width at about one half its height; margin nearly straight anteriorly with slight basal concavity, posteriorly slightly convex for most of its length but nearly straight at the base. Wing inserted at base of first digit: a small post-calcaneal lobe or epiblema.

Braincase broad, inflated, frontal region elevated almost to the occipital height; slight sagittal and lambdoid crests. Interorbital region wide; rostrum short, deep and massive, its upper surface nearly pentagonal in outline; supraorbital region inflated and swollen with a shallow median depression, the supraorbital ridges slight but clearly defined, terminating in an obtusely angular junction with the orbital margin which is nearly vertical anteriorly. Narial emargination short, narrow, rounded posteriorly, extending for approximately one half of the distance from the tip of the rostrum to the anterior orbital margin. Palate short, wide, with a narrow, U-shaped anterior emargination extending posteriorly almost to a line joining the posterior faces of the canines; broad, ligulate post-palatal spicule. Basioccipital pits lacking; width of bullae equal approximately to one and one half times their distance apart.

Inner upper incisor (i^2) long, narrow, blade-like, its longitudinal diameter approximately twice its transverse diameter, so orientated that posteriorly it is directed slightly inwards from the toothrow. It is strongly bicuspid, with a large anterior cusp and an equally massive but slightly lower posterior cusp: there is a low, undeveloped posterior cingulum cusp. Outer upper incisor (i^3) short, wide, its longitudinal diameter little more than one half its transverse diameter, lying laterally and slightly posteriorly to i^2 with its longer axis nearly transverse to the toothrow. Its principal cusp extends almost to the tip of the posterior cusp of i^2 : it is hollowed posteriorly and flanked by low lateral cingulum cusps. Canines slender and delicate but relatively massive at the base, with a low posterior cingulum cusp: the upper canine almost in contact with the posterior upper premolar (pm^4). Anterior upper premolar (pm^2) small, with well-developed cingulum and conical cusp, just visible externally, recessed into the angle between the posterior face of the canine and the anterior face of pm^4 . Lower incisors tricuspid and slightly imbricated: anterior lower premolar (pm_2) reduced, its height and basal area little more than one half that of the posterior lower premolar (pm_4).

Remarks: Apart from any other features, the large size and especially the large skull of *P. eisentrauti* readily distinguish it from many of the African species of *Pipistrellus* with bicuspid i^2 such as *nanus*, *nanulus*, *musculus* and *pipistrellus*. Its narrow tragus, high braincase and inflated supraorbital region disassociate it from *savii*: no specimens of *permixtus* Aellen, 1957 or *inexpectatus* Aellen, 1959 are available, but Dr. H.-J. Kuhn of Frankfurt/M. has kindly loaned photographs of the skulls of the type specimens so that comparison could be made. *Pipistrellus eisentrauti* is larger than either of these and has a higher braincase which is more elevated frontally while neither *permixtus* nor *inexpectatus* has the supra-orbital region so expanded that the upper surface of the rostrum assumes a pentagonal outline. *Pipistrellus crassulus* approaches *eisentrauti* in size and also displays some lateral expansion of the supraorbital region: however, in *crassulus* the braincase is low and the frontal not elevated, the rostrum lower and less massive than in *eisentrauti* and shallow basioccipital pits are present.

Table 1. Measurements (in millimetres) on *Pipistrellus eisentrauti*:

Dimension	M. Eisentraut 498 Type Rumpi Highlands	M. Eisentraut 198 Mount Kupe	B. M. 67.2129 Mount Cameroon
Length of forearm	33.7	35.1	34.2
Greatest length of skull	14.0	14.3	14.0
Condylbasal length	13.2	13.3	13.3
Condyllocanine length	12.8	12.9	12.8
Palatal length	5.1	—	—
Rostral width	4.5	4.5	4.8
Anteorbital width	5.7	5.7	6.1
Width across supraorbital region	5.4	5.4	5.9
Zygomatic width	9.5	—	—
Least interorbital width	4.0	4.0	4.2
Width of braincase	7.2	7.3	7.2
Mastoid width	—	—	7.9
c ¹ —c ¹	4.5	4.4	4.5
m ³ —m ³	6.0	—	6.3
c—m ³	5.0	—	5.0
Length of mandible	10.0	10.1	9.9
c—m ₃	5.5	5.6	5.5

Miniopterus schreibersii villiersi Aellen, 1956

♂♂ Nos. 95, 96 (in alcohol), 119 (skin, skull), ♀♀ Nos. 91 (skin, skull), 100, 129 (in alcohol). Camp I, Mount Kupe, c. 900 metres. 15th.—19th. November, 1966.

♂♂ Nos. 195, 197, 212 (skins, skulls), ♀♀ Nos. 196 (skin, skull), 233 (in alcohol), sex undetermined No. 209 (skin, skull). Camp II, Mount Kupe, c. 1,100 metres. 30th. November — 6th. December 1966.

♂♂ Nos. 387 (in alcohol, skull extracted), 450 (skin, skull), ♀♀ Nos. 448 (skin, skull), 451 (skin only). Camp IV, Lake Oku, Bansa Highlands. 22nd. — 30th. January 1967.

♂ 650 (in alcohol). Wildi Cave, Buea, Mount Cameroon, c. 1,100 metres. 16th. March 1967.

These specimens agree with *villiersi* rather than with the larger *inflatus* and confirm the opinion of Koopman (1965: 19) that *villiersi* represents *M. schreibersii* in the Congo, Cameroons and Guinea rather than *inflatus*, although Aellen (1956: 890) described *villiersi* initially as a subspecies of *inflatus*. There seems little to differentiate specimens from the Cameroons from *M. schreibersii natalensis* from South Africa north to Angola except that these on the whole average a little larger than the long series of *natalensis* measured by Harrison (1953: 72), but nevertheless their measure-

ments fall within the extremes quoted for *natalensis* by this author. However, present representation of the genus is quite inadequate for any proper treatment of the African subspecies of *M. schreibersii*, there being little material in the British Museum (Natural History) from the Congo or from East Africa.

Measurements (in millimetres; number of specimens, minimum, maximum and mean, in that order) of the specimens from the Cameroons: length of forearm (17) 43.3—46.5 (44.7); greatest length of skull (9) 15.1—16.4 (15.7); condylobasal length (9) 14.2—15.4 (15.0); condylocanine length (9) 13.6—14.6 (14.1); basi-sinual length (10) 11.1—12.2 (11.6); zygomatic width (9) 8.3—8.9 (8.6); width of braincase (10) 7.5—7.8 (7.7); mastoid width (8) 8.1—8.6 (8.4); c^1-c^1 (6) 4.2—4.4 (4.3); m^3-m^3 (9) 5.9—6.7 (6.3); i^1-m^3 (9) 6.8—7.3 (7.1); $c-m^3$ (9) 5.7—6.2 (5.9); length of mandible (8) 10.7—11.5 (11.1); i_1-m_3 (10) 7.2—7.6 (7.4); $c-m_3$ (7) 6.1—6.5 (6.3).

Tadarida ansorgei (Thomas, 1913)

♀ 404 (skin, skull). Camp IV, Lake Oku, Banso Highlands, 2,100 metres. 24th. January 1967.

This specimen is the first of *T. ansorgei* to be recorded from the Cameroons and represents a wide extension of range from the eastern Congo and Angola.

Measurements: (in millimetres): length of forearm 45.2; greatest length of skull 18.3; condylobasal length 17.1; condylocanine length 16.5; zygomatic width 11.4; least interorbital width 4.0; width of braincase 9.5; mastoid width 10.5; c^1-c^1 4.8; m^3-m^3 8.1; $c-m^3$ 6.9.

Summary

The small collection of bats from the Western Cameroons reported in this paper is complementary to the earlier detailed studies of the area and its fauna by Professor Martin Eisentraut (1957, 1963), who obtained the present collection. The majority of the species represented have already been recorded from the region but the new material now reported adds *Rhinolophus clivosus*, *Pipistrellus kuhlii* and *Tadarida ansorgei* to the known bat fauna of the Cameroons and additionally includes three specimens of a novel *Pipistrellus*, here described as *Pipistrellus eisentrauti* in honour of its collector.

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Bonn zoological Bulletin - früher Bonner Zoologische Beiträge.](#)

Jahr/Year: 1968

Band/Volume: [19](#)

Autor(en)/Author(s): Hill J. E.

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