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Cormura brevirostris.

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Cormura Peters, 1867

Emballonura Wagner, 1843:367. Type species *Emballonura brevirostris* Wagner.
Cormura Peters, 1867:475. Based on *Emballonura brevirostris* Wagner.
Myropteryx Miller, 1906:59–60. Type species *Myropteryx pullus* Miller.

CONTEXT AND CONTENT. Order Chiroptera, suborder Microchiroptera, family Emballonuridae, subfamily Emballonurinae. *Cormura* is monotypic.

Cormura brevirostris (Wagner, 1843)

Wagner's Sac-winged Bat

Emballonura brevirostris Wagner, 1843:367. Type locality "Marabitanas," Rio Negro Amazonas, Brazil.
Cormura brevirostris: Peters, 1867:475. Name combination.
Myropteryx pullus Miller, 1906:60. Type locality "Surinam."

CONTEXT AND CONTENT. Context as above. *Cormura brevirostris* is monotypic.

DIAGNOSIS. Among emballonurids, only *Cormura brevirostris* (Fig. 1) has a wing sac in the center of the antebrachial membrane. Wing sacs open outward and extend from anterior border almost to elbow (Husson 1962; Sanborn 1937), whereas in other sympatric emballonurids (*Saccopteryx* and *Peropteryx*), sacs are close to body. *Cormura* can be distinguished from *Peropteryx* by the smaller feet in the first and by attachments of wing membranes to feet and metatarsus in *Cormura* and to femora in *Peropteryx*. Unlike *Saccopteryx*, *Cormura* lacks dorsal stripes.

GENERAL CHARACTERS. *Cormura brevirostris* is a small emballonurid, with length of forearm from 41 to 50 mm and body mass from 7 to 11 g. Upper parts are deep black-brown or red-brown. Underparts slightly paler. Fur is soft, dense, and shiny. Wings are black, and wing membranes attach to distal half of metatarsus near base of outer toe. Fur covers both surfaces of wing membranes, reaching middle of humerus and middle of femur. Wing sacs are developed in males and vestigial in females. Interfemoral membrane is well developed, reaching slightly beyond foot when stretched; its ventral surface is sparsely covered with short, whitish hair, usually on sides of tail. Tail does not reach edge of interfemoral membrane; instead, tail perforates membrane close to middle of the dorsal surface. Free end of tail is 1–3 mm. Calcar is slightly shorter than tibia but distinctly longer than free margin of interfemoral membrane (Husson 1962).

Upper incisors are minute (Fig. 2); P1 is small and rounded, with distinct anterior and posterior cusps, almost or actually touching canine, but separated by a distinct space from large P2. Lower incisors are small, with 3 cusps, and form a continuous row between canines. First lower premolar is triangular with distinct anterior and posterior cusps that touch both canine and p2; p1 is as high as or slightly higher than anterior margin of cingulum of canine but half as high as p2 (Husson 1962).

Mean external measurements (range in parentheses, in mm or g) for 16 males and 16 females, respectively, from Paracou, French Guiana (Simmons and Voss 1998), are: mass, 8.9 (6.8–11.0), 8.1 (7.3–9.0); length of head and body, 69.1 (58.0–72.0), 66.3 (58.0–71.0); length of tail, 14.1 (9.0–17.0); length of hind foot, 7.8 (6.0–9.0), 7.9 (6.0–9.0); length of ear, 14.7 (13.0–16.0), 14.5 (13.0–16.0); length of forearm, 47.2 (45.0–49.0), 46.3 (44.5–48.0). Cranial measurements (in mm) for 6 males and 6 females, respectively, from same locality are: zygomatic breadth, 10.02 (9.64–10.36), 10.03 (9.85–10.16); length of maxillary toothrow, 6.17 (6.01–6.35), 6.18 (5.91–6.50); breadth across molars, 7.27 (6.98–7.55), 7.39 (7.23–7.55); condylocanine length for males and females combined, 14.23 (13.67–14.73). Ranges of external and skull measurements (sample sizes in parentheses) from Suriname of sexes combined (Husson 1962) are: length of forearm, 41.5–47.0 (10); length of 3rd digit, metacarpal, 40.0–42.0 (10); length of 3rd digit, 1st phalanx, 12.0–14.0 (10); length of 3rd digit, 2nd phalanx, 19.0–22.0 (10); length of 4th digit, metacarpal, 33.0–36.0 (10); length of 4th digit, 1st phalanx, 9.0–10.5 (10); length of 4th digit, 2nd phalanx, 6.0–8.0 (9); length of 5th digit, metacarpal, 30.5–34.0 (10); length of 5th digit, 1st phalanx, 11.0–11.5 (10); length of 5th digit, 2nd phalanx, 5.0–7.0 (9); length of tibia, 15.0–16.5 (10); length of hind foot, 6.5–7.0 (9); length of calcar, 13.0–15.5 (9); greatest length of skull, 15.1–15.8 (4); condylobasal length, 14.7 (1); condyle to front of canine, 13.6–14.3 (5); basal length, 11.3–13.0 (4); palatal length, 5.2–7.3 (5); zygomatic breadth, 9.6–10.0 (4); breadth of braincase, 7.5–7.8 (5); height of braincase without crest, 6.0–6.3 (5); mastoid breadth, 8.3–8.8 (5); interorbital constriction, 4.5–5.0 (5); postorbital constriction, 2.7–3.2 (6); width across molars, 6.9–7.4 (5); width across cingula of canines, 3.7–3.8 (5); length of upper toothrow, C–M3, 6.2–6.3 (8); length of lower toothrow, c–m3, 6.3–6.6 (8); length of mandible, 11.0–11.3 (8).

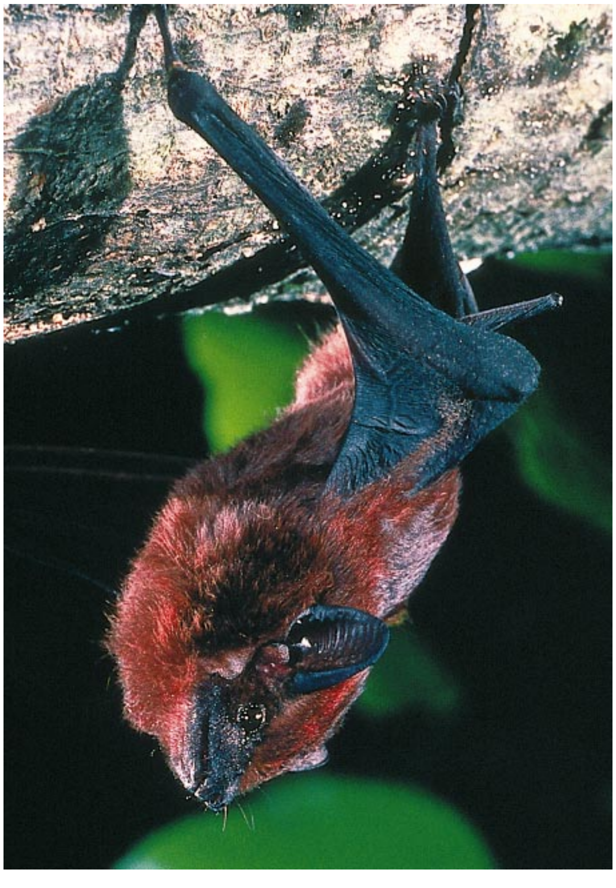

FIG. 1. *Cormura brevirostris* from Panamá. Photograph by M. D. Tuttle, Bat Conservation International.

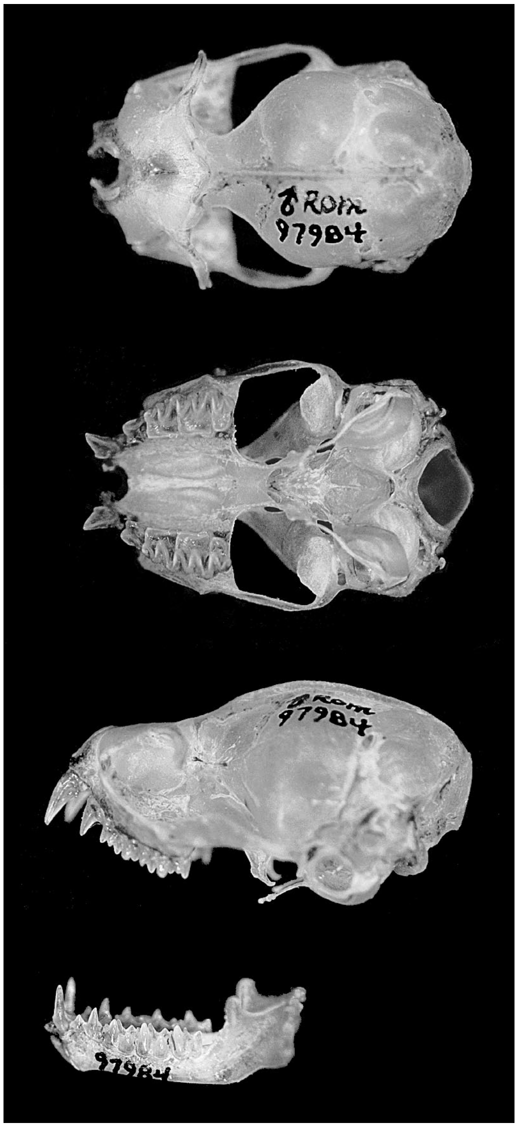

FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of an adult male *Cormura brevirostris* from 30 km NE of Surama (4°20′N, 58°51′W), Guyana (Royal Ontario Museum 97984). Greatest length of skull is 15.2 mm.

DISTRIBUTION. Wagner's sac-winged bat occurs from Nicaragua to Peru, the Guianas, and the Amazon Basin to Mato Grosso State in Brazil (Fig. 3; Cabrera 1957; Eisenberg and Redford 1999; Jones and Hood 1993; Koopman 1982; Reid 1997). No fossils are known.

FORM AND FUNCTION. Dental formula is i 1/3, c 1/1, p 2/2, m 3/3, total 32 (Husson 1962). Sagittal crest, which is well developed and extends from postorbital region to supraoccipital bone in both sexes, is higher in males than in females.

Hairs have a maximum diameter of 30.6–37.4 μm. Scales on hairs are denticulate coronal, bearing a single V-shape incision, with melanin granules generally dispersed and most abundant in distal half of fiber; length of scales is not >17 μm (Benedict 1957).

Hyoid region is markedly modified, with basihyal element diamond-shaped (Griffiths and Smith 1991). In *Cormura brevirostris*, anterior point of diamond is blunted, and posterior point is elongated. The muscle mylohyoideus profundus is absent in *C. brevirostris* (Griffiths and Smith 1991), but a few continuous fibers of the mylohyoid muscle pass dorsally to insertion of sternohyoid and omohyoid to insert on basihyal. Insertion of the muscle ceratohyoideus is on posterior surfaces of entire ceratohyal and on medial one-half of epihyal (Griffiths and Smith 1991).

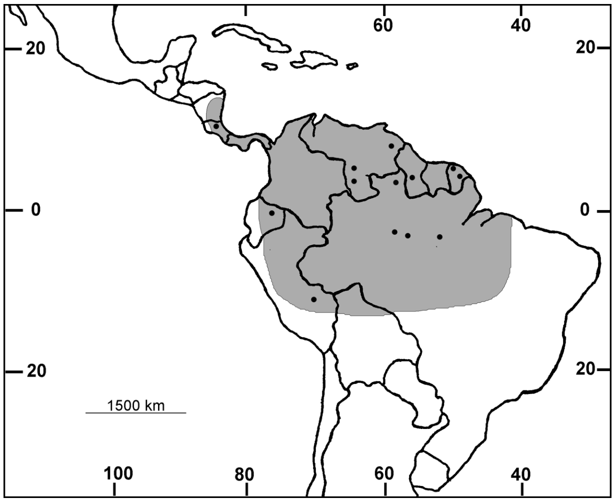

FIG. 3. Distribution of *Cormura brevirostris* in Central and South America (after Eisenberg and Redford 1999; Reid 1997). Solid circles indicate collection sites of specimens.

ONTOGENY AND REPRODUCTION. Pregnant females were found in Panama in April and May but not in June, July, September, and October (Fleming et al. 1972). In French Guiana, pregnant females were observed in August and September (Nowak 1999). Litter size is not known.

ECOLOGY. *Cormura brevirostris* forages inside the forest, usually in openings between canopy and subcanopy, as well as in forest gaps. *C. brevirostris* was captured both in ground-level and elevated mist nets (Bernard 2001; Simmons and Voss 1998). Stomach contents were entirely insects (Fleming et al. 1972). *C. brevirostris* roosts in hollow trees, fallen trees, shallow cavities in base of living trees, and concrete bridges. One roosting group was clinging to an unmodified leaf of *Phenakospermum guyanensis* (Simmons and Voss 1998). *C. brevirostris* has roosted with *Saccopteryx bilineata* (Tuttle 1970) and used roost sites previously occupied by 3 species of *Peropteryx* (*P. kappleri*, *P. leucoptera*, and *P. macrotis*) but never roosted simultaneously with them (Simmons and Voss 1998). *C. brevirostris* hosted a single species of ectoparasite, the streblidae fly *Strebla cormurae*, in Suriname, Peru, and Venezuela (Guerrero 1996; Wenzel 1976).

BEHAVIOR. In French Guiana, roosting groups consisted of 2–5 individuals, with a modal group size of 3 (Simmons and Voss 1998). Roosts contained >1 adult male but never >1 adult female. Individuals usually cluster together in a compact mass, sometimes touching each other back-to-belly. *Cormura brevirostris* starts to forage at dusk in sites also used by *Saccopteryx bilineata* and *S. leptura* (Kalko 1995). Hunting activities of the 3 species were separated by time and foraging strategy. *C. brevirostris* foraged higher (5–10 m aboveground), flew faster, kept a greater distance (5–10 m) from vegetation, and performed much wider circles (20–30 m long) than the *Saccopteryx* species (Kalko 1995). Circular movements were only briefly interrupted during insect pursuit. After a feeding interval of ca. 10–15 min, *C. brevirostris* began foraging above the canopy, disappearing minutes later. Activity during the night was rare, and a 2nd peak in feeding activity happened just before dawn (Kalko 1995).

Cormura brevirostris emits search-phase echolocation calls in triplets, with each subsequent signal 2–3 kHz higher than preceding signal (Barclay 1983; Kalko 1995). The 1st signal has a mean frequency of 25.4 kHz (range: 24.4–26.1 kHz), mean duration of 9.3 ms (range: 7.0–11.3 ms), and mean pulse interval of 84 ms (range: 48.8–105.1 ms). The 2nd signal has a mean frequency of 28.7 kHz (range: 27.3–29.8 kHz), mean duration of 10.1 ms (range: 7.7–11.9 ms), and mean interval pulse of 85.8 ms (range: 62.1–100.5 ms). The 3rd signal has a mean frequency 32.1 kHz (range: 30.6–33.4 kHz), mean duration of 5.2 ms (range: 3.7–6.9 ms), and mean pulse interval of 102.3 ms (range: 79.9–136.0 ms). *C. brevirostris* has search signals with narrowband components that are dominated by a narrowband portion and a small frequency-modulated portion. These characteristics improve detection of flying insects. Lower call frequencies indicate a long-range detection strategy (Kalko 1995).

In Guyana, loud chirps of a captive juvenile attracted a lactating adult female that repeatedly flew into a roofed shelter and eventually landed on the cloth bag containing the young bat (Reid 1997). Echolocation calls and feeding behavior described by Kalko (1995) as belonging to *Peropteryx* are actually from *C. brevirostris*, and those described as *C. brevirostris* are from *Centronycteris maximiliani* (E. K. V. Kalko, pers. comm.).

GENETICS. Diploid number is 22, with a fundamental number of 40 (Baker and Jordan 1970). *Cormura brevirostris* has a uniquely large X chromosome, which comprises >30% of haploid genome (Hood and Baker 1986). Largest pair of autosomes is heteromorphic in length of short arm (Baker et al. 1981). Albumin and transferrin immunological distance values and allozyme data for *C. brevirostris* are provided by Robbins and Sarich (1988).

CONSERVATION STATUS. *Cormura brevirostris* is represented by few specimens in museum collections and consequently is considered rare (Eisenberg and Redford 1999). *C. brevirostris* is identified as a species with low risk of extinction by the International Union for Conservation of Nature/Chiroptera Specialist Group (Hutson et al. 2001). As *C. brevirostris* is associated with forests, main threats are loss of roost and food resources due to habitat destruction and forest fragmentation (Hutson et al. 2001).

REMARKS. Evolutionary relationships between *Cormura brevirostris* and other genera of Neotropical emballonurids are unclear. Data based on morphology of skull and hyoid musculature suggest that *Cormura* is more closely related to *Saccopteryx* (Barghoorn 1977; Griffiths and Smith 1991), whereas immunological and electrophoretic data suggest *Peropteryx* and *Peronymus* are closest (Robbins and Sarich 1988). Based on 141 morphological characters, Dunlop (1998) considered *Cormura* closer to *Peropteryx*, but when 28 behavioral and ecological characters were included, *C. brevirostris* was considered a separate group.

The generic name *Cormura* comes from the Greek *kormos* meaning "stump" and *oura* meaning "tail." The specific name comes from the Latin *brevis* meaning "short" and *rostrum* meaning "face" (Jaeger 1955).

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