

*Natalus major*. By Reginald A. Hoyt and Robert J. Baker

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*Natalus major* Miller, 1902

Large Funnel-eared Bat

*Natalus major* Miller, 1902:398. Type locality near Savaneta, Dominican Republic.

*Natalus primus* Anthony, 1919:642. Type locality Cueva de los Indios, Daiquiri, Oriente, Cuba.

**CONTEXT AND CONTENT.** Order Chiroptera, Family Natalidae. The genus *Natalus* contains three subgenera, *Natalus*, *Chilonatalus*, and *Nyctiellus*. *Natalus major* is in the subgenus *Natalus*, which contains three species. Three subspecies of *Natalus major* are recognized:

*N. m. major* Miller, 1902:398, see above.

*N. m. jamaicensis* Goodwin, 1959:910. Type locality St. Clair, St. Catherine Parish, Jamaica.

*N. m. primus* Anthony, 1919:612, see above.

**DIAGNOSIS.** The subgenus *Natalus* differs from *Chilonatalus* and *Nyctiellus* in that the natalid organ of *Natalus* is large, bell-shaped, and covers the facial area. In *Chilonatalus* the natalid organ is of medium size, rounded, and located on the base of the muzzle, and in *Nyctiellus* it is small, rounded, and located on the median part of the muzzle. The lower lip of *Natalus* has a shallow invagination, whereas that of *Chilonatalus* is deeply grooved, and that of *Nyctiellus* has no invagination or cleft. The ears of both *Natalus* and *Chilonatalus* are large in size; however, in the former the ears are straight beyond the median lobe (Fig. 1), whereas those of *Chilonatalus* are truncated to a 30° angle beyond the median lobe. The ears of *Nyctiellus* are smaller and are constricted beyond the median lobe. The index of the forearm to the tibia is 59 in *Natalus*, 50 in *Chilonatalus*, and 47 in *Nyctiellus*.

Skeletal features also distinguish these subgenera. The braincase of *Nyctiellus* is flattened, whereas it is rounded in *Natalus* (Fig. 2) and *Chilonatalus*. The rostrum of *Natalus* tips downward, whereas that of *Chilonatalus* tips upward. The first premolars and the canines are reduced in *Nyctiellus*, but not in *Natalus* or *Chilonatalus* (Dalquest, 1950). *Natalus* and *Chilonatalus* differ also in palatal ridges and bacular structure (Harrison

and Pembleton, 1973). The palate of *Natalus* has 10 ridges, the anterior six being undivided and the posterior four divided. *Chilonatalus* has nine ridges, of which the anteriormost and posterior four are divided, and the remaining four are undivided. The basal part of the baculum of *Natalus* is expanded and excavated ventrally and the shaft tapers and angles upward to a blunt point. In contrast, the baculum of *Chilonatalus* is smaller, the basal part is only a little wider than the short, blunt, straight shaft, and the base is not excavated.

*Natalus major* is easily distinguished by its larger size from the other two species (*Natalus stramineus* and *Natalus tumidirostris*) within the subgenus *Natalus*. The length of the forearm of *Natalus major* is greater than 40 mm, and the greatest length of the skull is more than 17 mm. In addition, the three species of the subgenus *Natalus* are easily separated on the basis of their geographic distribution (Fig. 3).



FIGURE 1. Photograph of a living *Natalus major*.

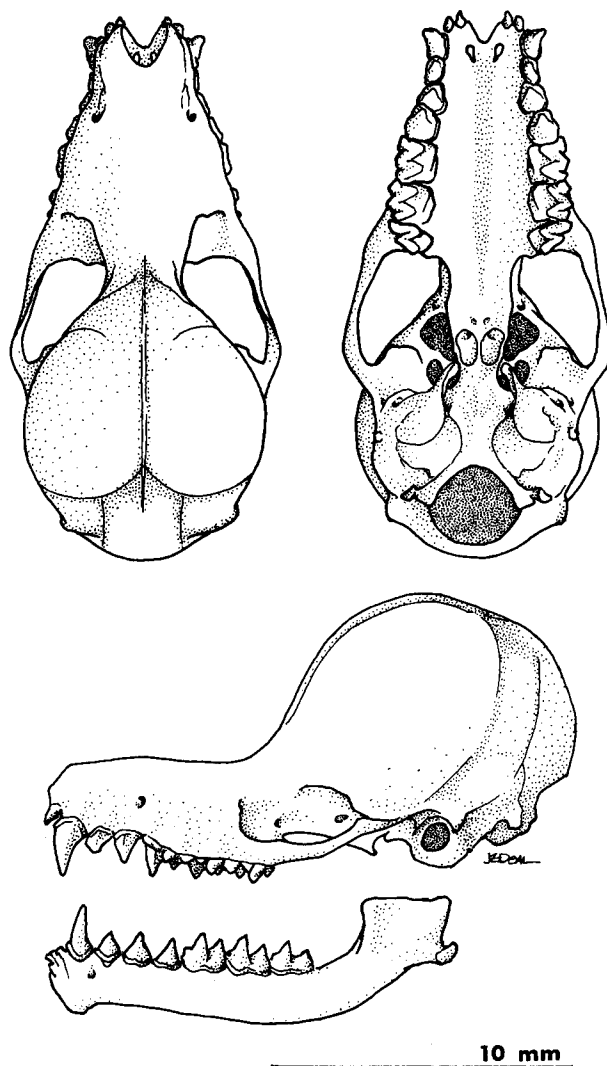


FIGURE 2. Dorsal, ventral and lateral views of cranium and lateral view of lower jaw of *Natalus major jamaicensis* (T.T.U. no. 29111, male) from St. Clair Cave, St. Catherine Parish, Jamaica. Drawn by Julia Z. Deal.

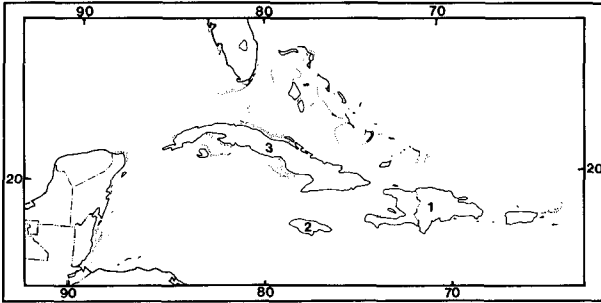


FIGURE 3. Map of Greater Antilles showing the geographic distribution of the three subspecies of *N. major*: 1, *N. m. major*; 2, *N. m. jamaicensis*; 3, *N. m. primus*.

More detailed discussions of the characteristics of the subgenera of *Natalus* and the species of the subgenus *Natalus* may be found in Dalquest (1950) and Goodwin (1959).

**GENERAL CHARACTERISTICS.** For the following measurements (mm), those of males precede those of females. External measurements for four adults, two males and two females, from St. Clair Cave, Jamaica, in the collection at The Museum, Texas Tech University, are as follows: total length, 109, 110, 108, 110; length of tail, 57, 57, 57, 58; length of hind foot, 9, 9, 10, 10; length of ear, 17, 20, 17, 18. Lengths of forearm for 12 adults, the two males and two females measured above, and six males and two females from the Dominican Republic and Jamaica examined by Goodwin (1959) average as follows: 44.3 (42 to 45.2), 43.1 (43 to 43.5).

Cranial measurements from eight adult specimens, consisting of six males and two females (measurements of condylobasal length and width across molars are available for only five males and one female) in the series examined by Goodwin (1959) are as follows: greatest length of skull, 18.0 (17.8 to 18.3), 17.0 (16.9 to 17.0); condylobasal length, 16.6 (16.2 to 16.8), 16.1; zygomatic breadth, 9.3 (9.0 to 9.6), 8.9 (8.8 to 9.0); breadth of braincase, 8.7 (8.5 to 9.0), 8.1 (7.8 to 8.3); interorbital width, 3.2 (3.0 to 3.6), 3.3 (3.2 to 3.3); width across canines, 4.1 (3.9 to 4.4), 3.7 (3.6 to 3.8); width across molars, 6.2 (6.0 to 6.3), 5.9; length of maxillary toothrow, 8.0 (7.8 to 8.1), 7.7 (7.5 to 7.8).

**DISTRIBUTION.** This species is restricted to Cuba, Hispaniola, and Jamaica (Fig. 3). Specific locations include only those listed previously as type localities.

**FOSSIL RECORD.** *Natalus major primus* is known from fossil remains reported by Anthony (1919) and Koopman and Roubal (1955) from Cuba. A subfossil of *N. m. jamaicensis* was reported by Koopman and Williams (1951).

**FORM.** *Natalus major* resembles *N. stramineus*, the type species of the genus, but is larger in size, with a forearm length ranging from 40 to 45 mm. No significant secondary sexual dimorphism is apparent in the available measurements. As in other members of this subgenus, the natalid organ is large and bell-shaped. The fur is moderately long, soft and slightly woolly at the base. The general color of the upper parts is tawny olive; the bases of the hairs are pinkish buff. The under parts are uniformly pinkish buff to the base of the hairs, and the flight membranes are Saccardo's Umber (color descriptions from Goodwin, 1959).

**ONTOGENY AND REPRODUCTION.** Little is known about reproduction of this species. The one adult female taken by Goodwin (1970) from St. Clair Cave on December 29, 1965, was not pregnant. The testicular lengths of two adult males taken on the same date were 2.5 and 3.0 mm.

**ECOLOGY.** The delicate wing membranes are subject to rapid dehydration; thus, these bats probably require caves with high relative humidity for daytime roosts. The largest collections of *N. major* came from St. Clair Cave, Jamaica. This is a deep cave with high humidity. Goodwin (1970) found this species in a large mixed colony with *N. micropus* in a chamber measuring 6 by 6 by 3 m high. They were the only bats in the chamber, but in the passageway that ran adjacent to it he found *Erophylla* and *Phyllonycteris*. The general conditions seemed similar in the two locations; however, the chamber was located behind a ledge 3.7

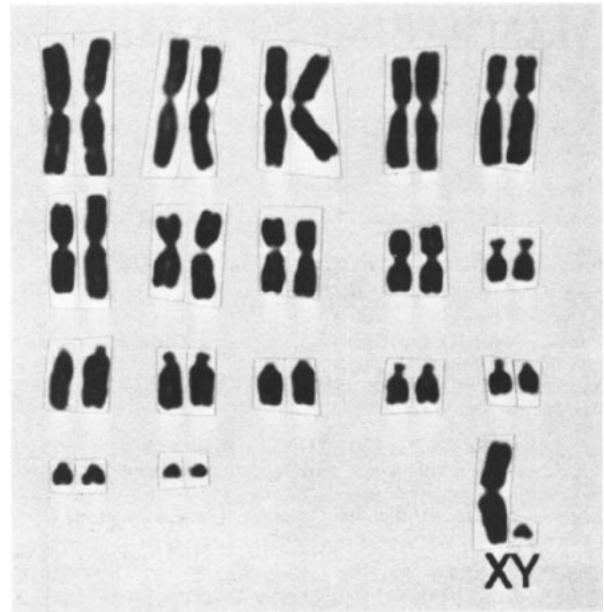


FIGURE 4. A representative karyotype of a male *Natalus major* from St. Clair Cave, St. Catherine Parish, Jamaica.

m above the floor of the passageway. The bats were found in a ratio of one *N. major* to three *N. micropus*. There was a tendency for bats to segregate into species flocks when disturbed, and Goodwin assumed that there was some segregation of species while roosting.

Observation by one of us (RJB) in a larger chamber in St. Clair Cave confirmed Goodwin's experience. *Natalus major* were found at the mouth of the bat chamber and occurred only for the first 50 m or so. *Natalus micropus* occurred in much larger numbers and most individuals were distributed more than 50 m distant from the mouth of the bat chamber. Goodwin (1970) noted that resting bats hung by one foot and did not cluster tightly; instead, they positioned themselves no closer than 75 to 100 mm apart.

Other species of bats recorded from St. Clair Cave are *Pteronotus fuliginosa*, *P. macleayi*, *P. parnellii*, *Mormoops blainvillii*, *Monophyllus redmani*, *Erophylla sezekorni*, *Phyllonycteris aphylla*, and *Natalus micropus* (Goodwin, 1970), and *Artibeus jamaicensis*.

**GENETICS.** The karyotype of a specimen from Jamaica is shown in Fig. 4. *Natalus major* shares a diploid number of 36 chromosomes with *N. micropus*, *N. stramineus* and *N. tumidirostris* (Baker, 1970; Baker and Jordan, 1970; Kerridge and Baker, 1978).

**REMARKS.** Bats of the genus *Natalus* need systematic revision. It has been suggested by several authors, for example Varona (1974) and Koopman (1975), that *N. major* may be conspecific with *N. stramineus*. However, additional research is needed before its status can be determined.

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