Stenoderma rufum. By Hugh H. Genoways and Robert J. Baker
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Stenoderma É. Geoffroy St.-Hilaire, 1818

Stenoderma É. Geoffroy St.-Hilaire, 1818:122. Type species "Stenoderme roux" (=Stenoderma rufa Desmarest, 1820).

Histioptis Peters, 1869:299. Type species Artilbaeus undatus Gervais (=Stenoderma rufa Desmarest).

CONTEXT AND CONTENT. Order Chiroptera, Family Phyllostomatidae. Subfamily Stenodermatinae. The genus Stenoderma contains a single species, Stenoderma rufum, as treated below.

Stenoderma rufum Desmarest, 1820

Red Fig-eating Bat

Stenoderma rufa Desmarest, 1820:117. Type locality unknown, but specimens from St. John and St. Thomas in the Virgin Islands were considered to be indistinguishable from the holotype by Hall and Tamsitt (1968:3).

Artilbaeus undatus Gervais, 1855:35. Type locality unknown.

CONTEXT AND CONTENT. Context noted in generic summary. Three subspecies are recognized as follows:

S. r. rufum Desmarest, 1820:117, see above.
S. r. darion Hall and Tamsitt, 1968:1, Type locality 1 mi. NW El Yunque Peak, 355 m, Puerto Rico.
S. r. anthonyi Choate and Birney, 1968:407. Type locality Cueva de Clara, approximately ½ mi. N, 3 mi. W Morovis, Barahona District, Puerto Rico (based on material from sub-Recent cave deposit).

DIAGNOSIS. Because the genus is monotypic, the diagnosis given below applies to genus and species. Cranium resembling that of the other Antillean genera Phyllops, Artites, and Arilops (figure 1); skull characterized by nasal region much depressed between high supraorbital ridges; braincase domed, with distinct sagittal crest; incisive foramina separated from roots of incisors by space equal to their greatest diameter; inner upper incisor with high slender crown; first and second upper molars with low but distinct metacone on surface of crown between hypocone and metacone; third molars small. Dental formula i 2/2, c 1/1, p 2/2, m 3/3, total 32. External characters of the red fig-eating bat include: nose-leaf simple, erect, and lanceolate; pinnac of ears naked and pale to dark brown; flight membranes black to dark brown; interfemoral membrane sparsely haired; proximal two-fifths of forearm and associated portion of patagium well-haired; calcare approximately 3.5 mm long; tail absent (figure 2). Pelage varies from 8 mm long dorsally to 6 mm long on the venter. Upper parts vary in coloration from Buckthorn Brown to Dresden Brown (nomenclature from Ridgway, 1912), paler ventrally; a white spot, 4 mm in diameter, is located where the wing joins the side of the body and a crescent of white (18 mm long) is directed anteriorly below each ear. The above comments are modified from Miller (1907:165-166) and Hall and Bee (1960:72-73).

GENERAL CHARACTERS. Means and extremes (in parentheses) for four external measurements (from Jones et al., 1971:245) for adult males (13 individuals for first three and 14 for last) and adult females (five for first three and six for last) from Puerto Rico were in millimeters, respectively, as follows: total length, 65.5 (60.0 to 73.0), 67.8 (66.0 to 70.0); length of hind foot, 13.4 (12.0 to 15.0), 13.8 (13.0 to 15.0); length of ear, 17.4 (16.0 to 19.0), 17.8 (17.0 to 18.0); length of forearm, 47.5 (46.2 to 48.8), 49.7 (48.9 to 51.0). Cranial measurements, in the same order, for specimens (15 males and seven females) from Puerto Rico were: greatest length of skull, 22.3 (21.8 to 22.9), 22.9 (22.6 to 23.4); zygomatic breadth, 14.8 (14.4 to 15.4), 15.4 (15.2 to 15.8); postorbital constriction, 5.5 (5.2 to 5.8), 5.7 (5.5 to 6.0); breadth of braincase, 10.7 (10.3 to 11.0), 10.8 (10.5 to 11.3); mastoid breadth, 12.3 (11.8 to 12.7), 12.7 (12.4 to 13.5); length of maxillary toothrow (C-M3), 6.9 (6.7 to 7.2), 7.2 (6.9 to 7.4); breadth across upper molars (M2), 9.7 (9.5 to 9.8), 10.0 (9.8 to 10.2); depth of braincase, 11.9 (11.4 to 12.3), 12.3 (12.0 to 12.8); length of mandible, 13.2 (12.8 to 13.6), 13.9 (13.6 to 14.1); height of coronoid process, 7.7 (7.4 to 7.8), 7.9 (7.7 to 8.0). Additional discussion of characteristics of Stenoderma can be found in Peters (1876), Anthony (1918, 1925), and Hall and Bee (1960).

Three males examined by Jones et al. (1971) lacked a baculum.

The Recent subspecies, *Stenodermorufum darioi*, of Puerto Rico is distinguished from *S. rufum* of St. John and St. Thomas by darker coloration and more marked secondary sexual dimorphism. Also the female examined from St. John is much smaller than females from Puerto Rico, although males from these places are essentially the same size.

No information is available on the post-cranial skeleton or soft anatomy of this species.

**FUNCTION.** Hematological data for *Stenoderma* were presented by Valdivieso and Tamsitt (1971). They found 20 g of hemoglobin per 100 ml of blood. A white blood cell differential count revealed 57% neutrophils, 29% lymphocytes, 1% eosinophils, 0 basophils, and 5% monocytes. 

**ECOLOGY.** Live specimens of *Stenoderma rufum* have been taken on three islands: Puerto Rico, St. John, and St. Thomas. Ecological data are available for areas of capture on the former two islands but nothing is published about the condition under which the one known specimen from St. Thomas was obtained. The habitat in which this species was taken on St. John was "a dry arboreal vegetation" (Hall and Bee, 1960). More specifically the three specimens obtained there were collected "among larger trees, at the mouths of canyons, on lowland grazed by domestic stock until 1956, one tenth of a mile from the ocean, on the southern side of the island" (Hall and Bee, 1960). Bat species associated with *Stenoderma* at this locality were *Noctilio leporinus*, *Brachyphylla cavernarum*, *Arizabus jamacicensis*, *Tadarida brasiliensis*, and *Molossus molossus*.

The ecology of the collection site in Luquillo National Forest, Puerto Rico (Hall and Tamsitt, 1968; Jones et al., 1971), has been intensively studied (Odum and Pigeon, 1971). However, little is known concerning how *Stenoderma* interacts in this environment. The forest, which was described in great detail, is a tropical rain forest with a higher annual precipitation than the St. John locality. Specimens of *Stenoderma* have been collected from up to 3 m above paths and streams in the forest (Hall and Tamsitt, 1968; Jones et al., 1971) and from above the canopy of the forest (Jones et al., 1971). Eight species of bats have been reported from Luquillo National Forest (Tamsitt and Valdivieso, 1971; Jones et al., 1971).

Three species were frugivorous (*Arizabus jamacicensis*, *Brachyphylla cavernarum*, and *Stenoderma*), two were nectarivorous (*Monophyllus redmani* and *Erophylla bombifrons*), and three were insectivorous (*Eptesicus fuscus*,
Pteronotus cornelli, and Molossus mosoius). Of the frugivorous species found at this locality, Artibeus is the commonest. Mist-netting produced at least two specimens of Artibeus for each specimen of Stenoderm a. Specimens of Bothropus hystrix were seen only above the forest canopy and appeared to be less numerous than the other two species.

No observations on the food habits of Stenoderm a have been published. One of us (RJB) maintained three specimens alive for 3 weeks on a diet of mangoes, various fruits teas and bananas. It was necessary to expose the flesh of the fruit before the animals would attempt to eat. They seemed to prefer the overripe portions of mangoes.

Ectoparasites of Stenodera have been reported. Two species of Stenodera are known to occur on Stenodera are mites (Acarina) of which one is a listrophilid, Paralabidocarpus arcti Florinchonge, and the other a spinturnid, Periglychus inorni Oudemans.

REPRODUCTION AND ONTOGENY. Pregnant females of Stenodera rufum have been collected on 3 July (only adult female collected—Tamsitt and Valdivi o, 1971), from 17 to 20 July (six of 12 adult females collected—Jones et al., 1971) and on 5 August (only adult female obtained—Tamsitt and Valdivi o, 1966). The female obtained on 3 July contained an early implantation (with the greatest diameter of the uterus being 5.1 mm). The seven pregnant females collected from 17 to 20 July and on 5 August all contained embryos that were near full term and two gave birth within 24 hours of capture. Of the six other adult females netted in the period 17 to 29 July, one was lactating and the others showed no apparent signs of reproductive activity. Males obtained in July, August, and February had enlarged scrotal testes with active spermatozoa (Tamsitt and Valdivi o, 1971).

Parturition of one young was described by Tamsitt and Valdivi o (1966). Birth was by head presentation. At birth the body of the young was well furled, with hairs 2 mm long, but the face was pink and mostly devoid of hair. The eyes were open. One day after birth the young weighed 7 g. Measurements in millimeters of the day-old young followed by those of the female parent were head and body 45, 61: hind foot, 12.1, 13.0: forearm, 29.4, 49.6; and wingspan 201, 385. One of us (RJB) observed parturition in another female and these observations agreed closely with those described by Tamsitt and Valdivi o.

GENETICS. The karyotype of Stenodera rufum darioi is known from 12 males (figure 4) and four females (Baker and Lopez, 1970). The diploid number is 50 (females) and 51 (males) with a fundamental number of 56. The sex determining system is XXY/XXY, and is similar to that described for Artibeus jamaicensis (Hsu et al., 1968). Although one of the most anatomically aberrant species within the subfamily Phyllostominae, Stenodera is similar chromosomally to the more typical sternodermine genus Artibeus. It shares with Artibeus (Artibeus phaeotis excepted) a common diploid number, fundamental number, and the same type of sex determining system. It differs from Artibeus by having two less pairs of subtelocentric autosomes (Baker, 1967). From a morphological point of view, two other genera, Amerotri a and Centario, are more closely related to Stenodera than is Artibeus. Amerotria has a karyotype with the autosomes similar to Stenodera and an XX/YY male chromosome system. However, the two Y chromosomes are acrocentric in Stenodera and the Y chromosome is translocated in Amerotria and Hemimeristis. The karyotype of Centario is unlike that of either Artibeus or Stenodera. Centario has a diploid number of 28, fundamental number of 52, and an XX/YY sex chromosome system. In summary, the chromosomes of Stenodera suggest that it has a common origin with Artibeus, Enchstiкус, and Amesiuda (Baker and Lopez, 1970).

The hemoglobin of S. r. darioi has been compared electrophoretically with that of other phyllostomatids as well as with representatives of the families Mormoopidae, Vesper-tiliidae, and Molossidae (Valdivi o et al., 1969; Tamsott and Valdivi o, 1969). Stenodera possessed a hemoglobin electrophoretic pattern that was indistinguishable from that of other phyllostomatids tested. Each of the other three families exhibited a unique electrophoretic pattern.

REMARKS. Although specimens of Stenodera rufum are rare in scientific collections, the species has a long and rather confusing taxonomic history. The first reference to the species in the literature was under the name Stenodera, rufum Oken (1816). However, Oken's names are not available under the current rules of zoological nomenclature because he was not consistently binary nor consistently binomial under the rules in work by Desmarest in 1820. The holotype, which was of unknown geographic origin, was the only modern specimen recorded in the scientific literature until the report of Hall and Bee (1960) from St. John. In the intervening years, however, Anthony (1918, 1925) reported sub-Recent cave material from Puerto Rico, confirming speculations by earlier authors (Allen, 1911:238) that the species inhabited the West Indies.

The species was poorly characterized until Piers visited the Paris Museum in 1869, where he studied the holotype as represented by a damaged skin from which the skull had been removed. Piers was deceived by Geoffroy's faulty figure, and concluded that Stenodera was Pampyrops (Peters, 1869:399). Later, Piers examined the holotype of Artibeus undatus Gervais in the anatomical collection of the Paris Museum and was impressed by the similarity between the skull of undatus (the holotype of undatus was a skull, the skin of which was lost) and the skull figured by Geoffroy. Peters (1876) concluded that the skull of undatus was the long lost skull of Stenodera rufum and defined the characteristics of the species, thus ending speculation as to its validity. The above remarks were taken from Anthony (1918, 1925). It should be noted that the skull of the holotype of Artibeus undatus could not be located in the Paris Museum in 1958 (Hall and Bee, 1960:69).

Stenodera is from the Greek words stenos and derma meaning "narrow skin," which undoubtedly refers to the narrow interfemoral membrane mentioned by Geoffroy in his description of the genus. The specific name, rufum, is from the Latin word meaning red. The names darioi and anthonyi, are commemoratives, proposed, respectively, in honor of Dario Valdivi o, for his contributions to neotropical zoology, and H. E. Anthony, for his classical work on the mammals of Puerto Rico.

LITERATURE CITED


The principal editor of this account was S. Anderson.