

Sturnira bidens. By Jesús Molinari and Pascual J. Soriano

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Sturnira bidens (Thomas, 1915)

Bidentate Andean Fruit-bat

Corvira bidens Thomas, 1915:310. Type locality Baeza, upper Coca River, Napo Province, Ecuador, elevation 6,500 ft (1,981 m).

Sturnira (*Corvira*) *bidens* Gardner and O'Neill, 1969:2. First use of name combination.

CONTEXT AND CONTENT. Order Chiroptera, Suborder Microchiroptera, Family Phyllostomidae, Subfamily Stenoderminae, Genus *Sturnira*, Subgenus *Corvira*, to which both *S. bidens* and *S. nana* are assigned (Davis, 1980; Jones and Carter, 1976; Nowak and Paradiso, 1983). The genus has about 12 recognized living species confined to the tropics and subtropics of the New World (Honacki et al., 1982). At present, no subspecies of *S. bidens* have been described.

DIAGNOSIS. The possession of only one lower incisor in each half of the jaw (Fig. 1) distinguishes *S. bidens* (Fig. 2) from all other known species of the genus. Confusion may arise only with *S. nana*, in which the minute external lower incisor may be difficult to discern in the living animal, but the latter species is much smaller than *S. bidens* (Gardner and O'Neill, 1971).

GENERAL CHARACTERS. Size medium for members of the genus. The forearm and cranial measurements (in mm) of the holotype followed by the range and mean of those of 11 Peruvian specimens (Gardner and O'Neill, 1969, 1971; Thomas, 1915) are: length of forearm, 43.0, 39.8 to 43.3 (42.1); greatest length of skull, 22.2, 20.8 to 22.3 (21.5); condyloincisive length, 20.0, 18.7 to 19.7 (19.1); interorbital breadth, 5.5, 5.0 to 5.8 (5.4); zygomatic breadth, 12.5, 11.6 to 12.3 (11.9); mastoid breadth, 11.7, 10.8 to 12.0 (11.4; $n = 7$) breadth of brain case, 10.0, 9.5 to 10.0 (9.8); palatal length, 6.7, 8.5 to 9.9 (9.1); length of maxillary tooththrow, (not given), 5.8 to 6.4 (6.1); breadth across M2-M2, 7.0, 6.7 to 6.9 (6.8); and length of mandibular tooththrow, (not given), 6.6 to 7.0 (6.8).

The range (in mm) of forearm lengths of two males and seven females from southern Colombia are 39.7 to 41.7, and 41.1 to 42.9. Ranges of cranial measurements (in mm) of the same two males and four of the females are: greatest length of skull, 21.4 to 21.8, 20.0 to 22.1; condyloincisive length, 19.7 to 19.7, 19.6 to 20.3; postorbital breadth, 5.3 to 5.4, 5.0 to 5.5; zygomatic breadth, 12.1 to 12.3, 12.0 to 12.3; mastoid breadth, 11.3 to 11.6, 11.1 to 11.2; depth of brain case, 9.2 to 9.9, 8.4 to 9.0; palatal length, 8.1 to 8.2, 7.4 to 8.6; length of maxillary tooththrow, 6.2 to 6.7, 6.1 to 6.9; breadth across canines, 5.0 to 5.1, 4.8 to 5.0; breadth across M2-M2, 6.9 to 7.0, 7.0 to 7.1; length of mandibular tooththrow, 6.8 to 7.0, 6.9 to 7.6; and length of mandible, 13.3 to 13.6, 13.0 to 13.7 (Marinkelle and Cadena, 1972).

Body masses in g (range, and mean \pm SE) of 4 males and 17 females (none with advanced pregnancies) from the Venezuelan Andes at the Colección de Vertebrados de la Universidad de los Andes, Mérida, are: 15 to 19 (17.5 \pm 1.96), 14 to 21 (17.6 \pm 0.98). The previously published measurements of Peruvian specimens (Gardner and O'Neill, 1969, 1971) do not seem to differ appreciably from equivalent measurements of these 21 Venezuelan specimens, whereas those of Colombian specimens (Marinkelle and Cadena, 1972) average slightly larger than those of both the Peruvian and Venezuelan specimens. At present, no conclusions seem warranted regarding geographic trends in morphometric variation in the species.

The pelage coloration of *Sturnira bidens* is wholly pale brown, wholly brown, or dark grayish brown dorsally and dark brown ventrally. Gardner and O'Neill (1969) stated that dorsal hairs of Peruvian specimens have four color bands (a short white basal band, a dark brown epibasal band about one-third the length of hair, a

silvery gray subterminal band a little more than one-third the length of hair, and a blackish brown terminal band about one-fourth the length of hair). The first of the bands is absent in specimens from Mérida. These specimens also differ in having a brown terminal band. Likewise, hairs on the venter of Peruvian specimens were described as dark brown except for a short, poorly defined, pale epibasal band. Hairs of specimens from Mérida differ in being clearly bicolored with a dark brown basal band about two-thirds the length of hair, and a brown terminal band.

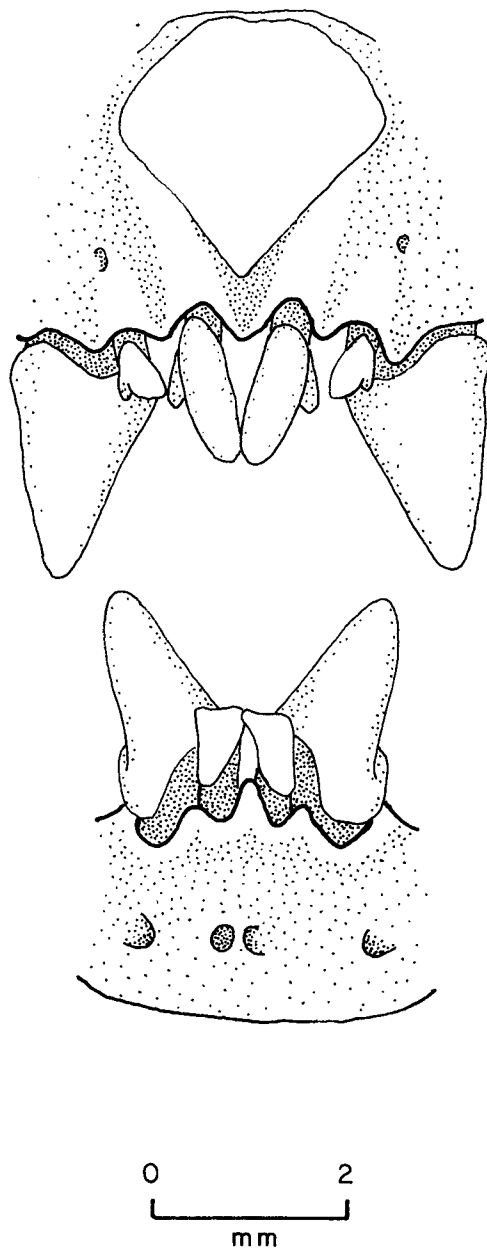


FIG. 1. Frontal view of rostrum and mandibles of *Sturnira bidens*, CVULA I-1459, female from Asentamiento Monterrey, 8 km NNE Mérida, Mérida state, Venezuela. Note presence of only one lower incisor.



FIG. 2. Photograph of an adult *Sturnira bidens* from Asentamiento Monterrey, 8 km NNE Mérida, Mérida state, Venezuela.

Stained shoulder hairs (epaulettes), conspicuous in some species of *Sturnira*, are not evident. Like its congeners, *S. bidens* lacks a tail. There is no calcar, and the calcaneum is less than 1 mm long. The short interfemoral membrane, feet, head and body are densely furred. The pelage is soft and woolly. Dorsal hair is about 8 mm long, and ventral hair is about 6 mm long. The elbow area and adjacent wing membranes are sparsely covered with short (about 4 mm) hair. The skull (Fig. 3) is relatively long, narrow, and anteriorly sloping, with weak or incomplete zygomatic arches. The upper canines, premolars, and molars are not in contact with each other. The lingual cusps (entoconid and metaconid) of the lower molars are poorly defined. The dental formula is $i\ 2/1, c\ 1/1, p\ 2/2, m\ 3/3$, total 30.

DISTRIBUTION. The species is known to inhabit montane regions in the Andes of Venezuela, Colombia, Ecuador, and Peru (Fig. 4). The northern and easternmost records are from localities ($8^{\circ}36' - 38'N, 71^{\circ}01' - 21'W$) in the Mérida state, Venezuela, the westernmost record is from the type locality of Baeza ($0^{\circ}16'S, 77^{\circ}32'W$) in Ecuador, and the southernmost is from Yuraccyacu ($12^{\circ}45'S, 73^{\circ}48'W$), Department of Ayacucho, Peru (Gardner and O'Neill, 1971; Handley, 1976; Soriano, 1983; Soriano and Molinari, 1984; Thomas, 1915). Records from other localities in central Peru and southern Colombia were listed by Gardner and O'Neill (1969, 1971), Lemke et al. (1982), Marinkelle and Cadena (1972), and Tamsitt et al. (in press). The exact limits of the distribution are unknown because of insufficient geographic coverage of collections. The species has not been recorded in the northern part of the Colombian Cordilleras where it is expected to be present, and seems absent from the Cordillera de la Costa of Venezuela. Further sampling in the Sierra de Perijá, along the Colombian-Venezuelan border, in other mountains in northern Colombia (Sierra de Santa Marta included), and in the Andes of southern Peru and adjacent Bolivia are needed to gain adequate knowledge of the distributional limits of the species.

There is no fossil record for the species.

FORM. *Sturnira bidens* ($n = 6$) has 7 cervical, 13 thoracic, and 4 lumbar vertebrae, the last thoracic vertebrae with two short ribs. Walton and Walton (1970) listed a vertebral formula of C7, T12, and L5 as typical for the genus.

By comparison with other stenodermines (Smith and Starrett, 1979), members of *Sturnira*, including *S. bidens*, rank low in relative lengths of forearm, second phalanx of digit III, and first phalanx of digit V; and rank high in lengths of third phalanx of digit III, and fifth metacarpal. Likewise, members of the genus rank high in wing loading, but rank medium in values of aspect ratio (overall, wing tip, plagiopatagium) and tip index.

There is no information on the physiology of *Sturnira bidens*.

ONTOGENY AND REPRODUCTION. In central Peru, three of four females taken in August 1968 were pregnant with

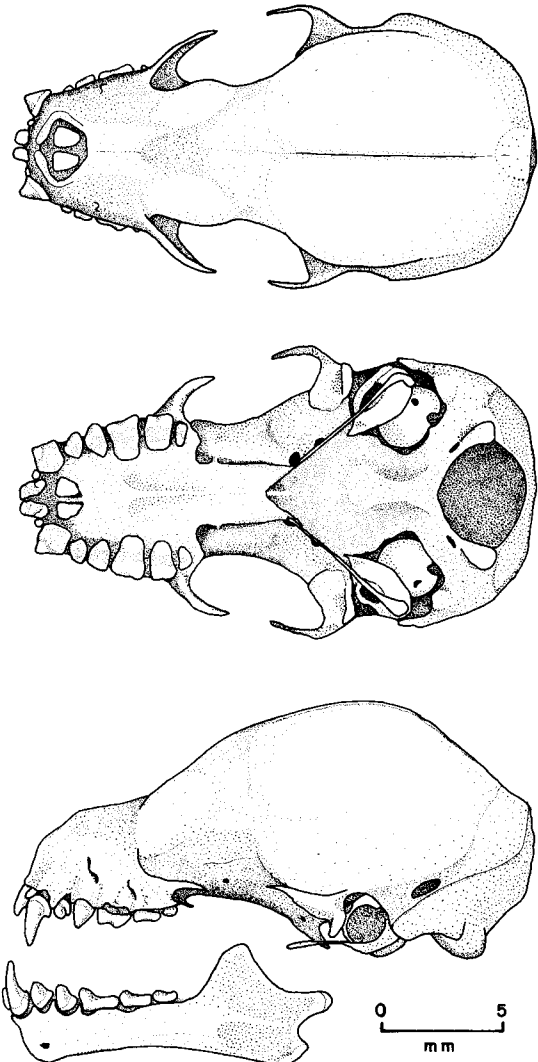


FIG. 3. Dorsal, ventral, and lateral views of cranium, and lateral view of mandible of *Sturnira bidens*. Same specimen as in Fig. 1.

single embryos measuring 15 and 20 mm crown-rump; the testes of a male measured 3.5 by 4.5 mm (Gardner and O'Neill, 1969).

In the Andes of Venezuela, the reproductive pattern of *S. bidens* conforms to bimodal polyestry (Molinari, 1984; Soriano, 1983), a characteristic also prevalent in other frugivorous phyllostomids (Wilson, 1979). The breeding season, the period of the year in which pregnancy and lactation occur, lasts from January to November. During a breeding season most females produce two offspring, each at a different parturition. There are two peaks of pregnancy: the first in February–March at the end of the long dry season that is followed by the first rainy season; and the second in June–July during the short dry season that is followed by the second rainy season. Most juveniles closely approach adult size before the last half (October–November) of the second rainy season.

There are no adequate records on longevity, but we once recaptured an adult female that we marked and released 3 years earlier.

ECOLOGY. Graham (1983) reported the species as occurring at elevations between 1,700 and 2,800 m somewhere in central Peru, and Gardner and O'Neill (1969, 1971) specified localities at 2,000, 2,400 and 2,700 m in the central and southern regions of the same country. Lemke et al. (1982), Marinkelle and Cadena (1972), and Tamsitt et al. (in press) listed localities at 1,800 and 3,000 m in southern Colombia, and Handley (1976), Molinari (1984), Soriano (1983), and Soriano and Molinari (1984) listed seven localities between 2,000 and 2,650 m in the Mérida Andes of Venezuela. Our experience in Venezuela suggests that the species occurs mostly in cloud forest above 2,200 m.

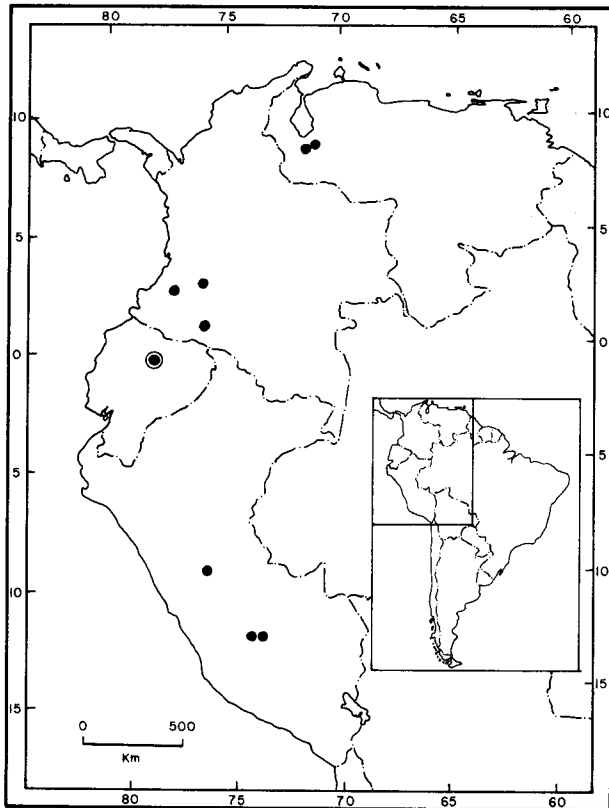


FIG. 4. Map of northwestern South America showing records of occurrence of *Sturnira bidens*; the type locality is encircled.

Other bat species found at the same localities as *S. bidens* are: *Miconycteris megalotis*, *Anoura caudifer*, *A. cultrata*, *A. geoffroyi*, *Carollia brevicauda*, *Sturnira arathomasi*, *S. bogotensis*, *S. erythromus*, *S. ludovici*, *Vampyrops aurarius*, *V. umbratus*, *Artibeus cinereus*, *A. lituratus*, *A. (Enchisthenes) hartii*, *Amerida centurio*, *Sphaeronycteris toxophyllum*, *Myotis oxyotus*, *Eptesicus fuscus*, *E. montosus*, *Histiotus montanus*, *Lasiurus borealis*, *Tadarida brasiliensis* (Gardner and O'Neill, 1969; Handley, 1976; Lemke et al., 1982; Linares, 1973; Molinari, 1984; Soriano, 1983; Soriano and Molinari, 1984; Tamsitt et al., in press).

The only known roosting site is a cave (Tamsitt et al., in press).

Other species of *Sturnira* have been reported to use a tunnel, the underside of highway bridges, houses, hollow trees, and palm trees (Dalquest and Walton, 1970). Because members of the genus rarely have been found in such roosts, the latter authors speculated that small colonies hidden in vegetation and isolated from the roosts of other species may be a prevailing ethological characteristic of the genus.

Molinari (1984) and Soriano (1983) reported the species to have a high recapture rate suggesting that (1) netting sites were close to fixed or habitual roosting sites; (2) "trap-lines," and netting sites were close to habitual "paths" or regularly visited food-plants; or (3) the species has small and rather fixed home ranges. *S. bidens* seems more typical of later seral stages, but may visit secondary forest during the long dry season to take advantage of locally abundant plants of *Anthurium nymphaeifolium* then offering ripe fruits. Fecal samples of 13 specimens contained remains of 14 fruit items distributed by plant species as follows: five *Anthurium nymphaeifolium* (Araceae), one *Vismia baccifera* (Hypericaceae), one *Saurauia excelsa* (Actinidiaceae), one *Psidium caudatum* (Myrtaceae), one *Piper* cf. *diffinatum* (Piperaceae), one *Solanum* sp. (Solanaceae), and four seedless fruit pulps belonging to two unidentified plant species. Dietary overlap with other sympatric frugivorous bats appears minimal. Although sample size is too small to provide a definite conclusion, the absence of insects among food items combined with absence of a tail and presence of a much reduced interfemoral membrane, suggest a highly vegetarian diet. Hence, *S. bidens* may prove to be a strict frugivore sedentary in habit.

Ectoparasites recorded from *S. bidens* (Herrin and Tipton, 1975; Wenzel, 1976) include spinturnicid mites (*Periglischrus*

ojastii, *P. vargasi*), and streblid batflies (*Trichobius hispidus*, *Exastinion deceptium*).

GENETICS. Based on one male and one female from Peru, Gardner and O'Neill (1969) reported that the karyotype of the species has a diploid number (2n) of 30, and a fundamental number (FN) of 56. Autosomes consist of 10 pairs of large to small metacentrics and submetacentrics, and 4 pairs of large to medium subtelocentric chromosomes. The X chromosome is a large subtelocentric, and the Y chromosome is a small acrocentric.

The karyotype closely resembles those of other members of the genus *Sturnira*, and particularly is similar to that of several species (Baker, 1979; Soriano and Molinari, 1984) having an acrocentric Y chromosome.

REMARKS. The generic name *Sturnira* Gray, 1842 was coined to honor the Starling, a small companion vessel to the Sulphur, the leading ship of an expedition to the coasts of Brazil in which the type of the genus was collected (de la Torre, 1961; Jones and Genoways, 1975). The specific name *bidens* refers to the presence of only one lower incisor instead of two in other species of *Sturnira*.

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LITERATURE CITED

- BAKER, R. J. 1979. Karyology. Pp. 107-155, in *Biology of bats of the New World family Phyllostomatidae*. Part III (R. J. Baker, J. K. Jones, Jr., and D. C. Carter, eds.). Spec. Publ. Mus., Texas Tech Univ., 16:1-441.
- DALQUEST, W. W., AND D. W. WALTON. 1970. Diurnal retreats of bats. Pp. 162-187, in *About bats* (B. H. Slaughter and D. W. Walton, eds.). Southern Methodist Univ. Press, Dallas, Texas, 339 pp.
- DAVIS, W. B. 1980. New *Sturnira* (Chiroptera: Phyllostomidae) from Central and South America, with key to currently recognized species. *Occas. Papers Mus., Texas Tech Univ.*, 70: 1-5.
- DE LA TORRE, L. 1961. The evolution, variation, and systematics of the Neotropical bats of the genus *Sturnira*. Unpubl. Ph.D. dissert., Univ. Illinois, Urbana, 146 pp.
- GARDNER, A. L., AND J. P. O'NEILL. 1969. The taxonomic status of *Sturnira bidens* (Chiroptera: Phyllostomidae) with notes on its karyotype and life history. *Occas. Papers Mus. Zool., Louisiana State Univ.*, 38:1-8.
- . 1971. A new species of *Sturnira* (Chiroptera: Phyllostomidae) from Peru. *Occas. Papers Mus. Zool., Louisiana State Univ.*, 42:1-7.
- GRAHAM, G. L. 1983. Changes in bat species diversity along an elevational gradient up the Peruvian Andes. *J. Mamm.*, 64: 559-571.
- HANDLEY, C. O., JR. 1976. Mammals of the Smithsonian Venezuelan project. *Brigham Young Univ. Sci. Bull., Biol. Ser.*, 20(5):1-91.
- HERRIN, S., AND V. TIPTON. 1975. Spinturnicid mites of Venezuela (Acarina: Spinturnicidae). *Brigham Young Univ. Sci. Bull., Biol. Ser.*, 20(2):1-72.
- HONACKI, J. H., K. E. KINMAN, AND J. W. KOEPL. 1982. *Mammal species of the World: a taxonomic and geographic reference*. Allen Press, Inc., and The Assoc. Syst. Coll., Lawrence, Kansas, 694 pp.
- JONES, J. K., JR., AND D. C. CARTER. 1976. Annotated checklist, with keys to subfamilies and genera. Pp. 7-38, in *Biology of bats of the New World family Phyllostomatidae*, Part I (R. J. Baker, J. K. Jones, Jr., and D. C. Carter, eds.). Spec. Publ. Mus., Texas Tech Univ., 10:1-218.
- JONES, J. K., JR., AND H. H. GENOWAYS. 1975. *Sturnira thomasi*. *Mamm. Species*, 68:1-2.
- LEMKE, T. O., A. CADENA, R. H. PINE, AND S. HERNÁNDEZ-CAMACHO. 1982. Notes on opossums, bats, and rodents new to the fauna of Colombia. *Mammalia*, 46:225-234.
- LINARES, O. J. 1973. Présence de l'oreillard d'Amérique du Sud dans les Andes Vénézuéliennes (Chiroptères, Vespertilionidae). *Mammalia*, 37:433-438.

- MARINKELLE, C. J., AND A. CADENA. 1972. Notes on bats new to the fauna of Colombia. *Mammalia*, 36:50-58.
- MOLINARI, J. 1984. Dinámica reproductiva y ecología trófica de *Carollia brevicauda* y otros murciélagos frugívoros. Unpubl. Lic. Biol. thesis, Universidad de los Andes, Mérida (Venezuela), 136 pp.
- NOWAK, R. M., AND J. L. PARADISO. 1983. Walker's mammals of the world. The Johns Hopkins Univ. Press, Baltimore, Maryland, 1:1-568.
- SMITH, J. D., AND A. STARRETT. 1979. Morphometric analysis of chiropteran wings. Pp. 229-316, in *Biology of bats of the New World family Phyllostomatidae. Part III* (R. J. Baker, J. K. Jones, Jr., and D. C. Carter, eds.). Spec. Publ. Mus., Texas Tech Univ., 16:1-441.
- SORIANO, P. J. 1983. La comunidad de quirópteros de las selvas nubladas en los Andes de Mérida. Patrón reproductivo de los frugívoros y estrategias fenológicas de las plantas. Unpubl. M.S. thesis, Universidad de los Andes, Mérida (Venezuela), 113 pp.
- SORIANO, P. J., AND J. MOLINARI. 1984. Hallazgo de *Sturnira aratathomasi* (Mammalia:Chiroptera) en Venezuela y descripción de su cariotipo. *Acta Cient. Venez.*, 35:310-311.
- TAMSITT, J. R., A. CADENA, AND E. VILLARRAGA. In press. Records of bats (*Sturnira magna* and *Sturnira aratathomasi*) from Colombia. *J. Mamm.*
- THOMAS, O. 1915. A new genus of phyllostome bats and a new *Rhipidomys* from Ecuador. *Ann. Mag. Nat. Hist.*, Ser. 8, 16: 310-312.
- WALTON, D. W., AND G. M. WALTON. 1970. Post-cranial osteology of bats. Pp. 93-126, in *About bats* (B. H. Slaughter and D. W. Walton, eds.). Southern Methodist Univ. Press, Dallas, Texas, 339 pp.
- WENZEL, R. 1976. The streblid batflies of Venezuela (Diptera: Streblidae). *Brigham Young Univ. Sci. Bull., Biol. Ser.*, 20(4): 1-177.
- WILSON, D. E. 1979. Reproductive patterns. Pp. 317-378, in *Biology of bats of the New World family Phyllostomatidae. Part III* (R. J. Baker, J. K. Jones, Jr., and D. C. Carter, eds.). Spec. Publ. Mus., Texas Tech Univ., 16:1-441.

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