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NOTEWORTHY RECORDS OF BATS (CHIROPTERA) FROM PARAGUAY

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ABSTRACT: Two years of extensive sampling in Paraguay, as well as the comparison of the newly collected material with specimens deposited in museums, revealed the presence of three previously unrecorded species of bats in Paraguay: *Tonatia brasiliense*, *Chiroderma doriae*, *Natalus stramineus*, and *Histiotus macrotus*. Additionally, exact localities documenting the presence of *Diaemus youngi* in Paraguay are documented for the first time. The sudden appearance and abundance of this species in Paraguay may be the result of increasing livestock activities in the area.

RESUMEN: Importantes registros de murciélagos (Chiroptera) de Paraguay. Dos años de colecta intensiva de pequeños mamíferos en territorio Paraguayo, así como la comparación del nuevo material con ejemplares de museo, ha permitido reconocer la presencia en Paraguay de tres especies de murciélagos no reportadas previamente: *Tonatia brasiliense*, *Chiroderma doriae*, *Natalus stramineus* e *Histiotus macrotus*. Asimismo, se documenta por primera vez de manera exacta la presencia de *Diaemus youngi* en Paraguay. La aparentemente súbita aparición y abundancia de esta especie en el Chaco paraguayo puede ser resultado del incremento en las actividades pecuarias en el área.

Key words: new records, Paraguay, *Tonatia brasiliense*, *Chiroderma doriae*, *Natalus stramineus*, *Diaemus youngi*, *Histiotus macrotus*

Palabras clave: nuevos registros, Paraguay, *Tonatia brasiliense*, *Chiroderma doriae*, *Natalus stramineus*, *Diaemus youngi*, *Histiotus macrotus*.

Extensive sampling of small mammals in Paraguay by representatives of Texas Tech University, in collaboration with personnel from the Ministry of Agriculture and Livestock of Paraguay, has been conducted as a part of a project entitled "Paraguayan Mammals and their Ectoparasites". Examination of specimens collected by that project, as well as of previously collected material, has revealed the presence of three species of bats not yet recorded for the country, as well as additional specimens of two species previously known in Paraguay from one or two localities. The specimens reported here are deposited at the Museo Nacional de Historia Natural del Paraguay, Asunción, Paraguay (MNHNP); The Museum, Texas Tech University, Lubbock, Texas (TTU); and the Field Museum of Natural History, Chicago, Illinois (FMNH).

Tonatia brasiliense (Peters, 1867). Departamento Presidente Hayes: Estancia La Victoria, 23°29.04'S, 58°34.79'W, 120 m (TTU 75274). One female was collected from this private reserve on July 29, 1995, in a mist net set 4.5 m

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high in palm-savanna habitat, about 50 m from Siete Puntas River. One *Eumops bonariensis* was captured in the same net. Selected measurements (mm) are: greatest length of skull, 20.3; condylobasal length, 18.3; mastoid breadth, 9.7; zygomatic breadth, 9.8; width across third upper molars, 6.9; length of mandibular toothrow, 7.9; length of forearm, 40.2 (taken from specimen preserved in alcohol).

Taxonomic and nomenclatorial status of the small-sized species of *Tonatia* remains unclear. Here, we follow Genoways and Williams (1984), and recognize *T. brasiliense* as the valid name applicable to this specimen. The species has been recorded from Amazonia without specifying the exact locality (Mok et al., 1982), and from Reserva de la Biósfera "Estación Biológica Beni" in Bolivia (Wilson and Salazar, 1990). These are apparently the southernmost records for the species. The known range for *T. brasiliense* is therefore extended at least 1000 km southward based on the Paraguayan specimen.

Chiroderma doriae Thomas, 1891. Departamento Cordillera: Estancia Sombrero, 25° 04.55'S, 56° 36.08'W, 110 m (TTU 75275); private reserve. One female was collected on October 20, 1995, in a mist net set across a creek at its opening into a pond. Vegetation at the point of capture was secondary interior Atlantic forest, surrounded by cultivated grasslands and natural wetlands, all grazed by cattle. A specimen of *Artibeus jamaicensis planirostris* (sensu Handley, 1991) was collected in the same net. Selected measurements (mm) are: greatest length of skull, 28.2; condylobasal length, 26.1; mastoid breadth, 13.8; width across second upper molars, 12.9; length of mandibular toothrow, 10.7; length of forearm, 52.5.

C. doriae currently is known only from southeastern Brazil, in the states of Minas Gerais and São Paulo, the southwesternmost record being Campinas, São Paulo (Taddei, 1979; Baker et al., 1994). The known range for this species, based on the Paraguayan specimen, is extended at least 1000 km west and 200 km south.

Diaemus youngi (Jentink, 1893). Departamento Alto Paraguay: Estancia General Díaz, approx. 100 km W Fuerte Olimpo (2, MNHNP 1951, FMNH 145266), one male, one female, July 14, 1991. Estancia Parra Cue, 2° 05.91'S, 57° 53.52'W, 85 m (1, TTU 75276), male, December 16, 1995. Departamento Boquerón: Parque Nacional Defensores del Chaco, Cruce Cuatro de Mayo, destacamento Patricio Colmán (1, MNHNP 0823), male, August 10, 1988. Departamento Presidente Hayes: Estancia Loma Pora, 23° 29.93'S, 57° 32.89'W, 77 m (6, TTU 75278-75283), 5 males, 1 female, June 21-30, 1996; Estancia La Victoria, 23° 39.03'S, 58° 34.79' W, 120 m (l, TTU 75273), female, July 29, 1995. All specimens were caught in the western region (Chaco) of Paraguay, in mist nets. With the exception of the individual from Estancia La Victoria, all were collected in close association with buildings. The female collected on July 29, 1995, was pregnant. The male collected on July 14 had scrotal testes.

Two of the specimens reported herein (MNHNP 0823 and 1951) were reported by Gamarra de Fox and Martin (1996), but without exact localities or other information. A third locality for *D. youngi* (Fuerte Olimpo) listed in that publication, apparently is an error. No specimen corresponding to this locality was found at the MNHNP.

Although *D. youngi* was known from northeastern and northwestern Argentina (Barquez, 1984, 1988; Barquez and Ojeda, 1992), it has only recently been reported from the Chaco, and then only marginally (Barquez and Ojeda, 1992). The localities reported herein, however, represent several Chaco habitats. The recent documentation of this species in the Chaco, and its evident association with human habitation, probably indicates a relatively recent range expansion which reflects the progressive introduction to this area of domestic animals (mainly livestock), on which these bats may feed.

Natalus stramineus Gray, 1838. Departamento Concepción: Parque Nacional Serranía de San Luis, 22° 40.34'S, 57° 20.96'W, 170 m. One male was collected at this locality on April 11, 1996 (TTU 75277). Measurements (mm) for this specimen are: greatest length of skull, 16.9; condylobasal length, 15.6; mastoid

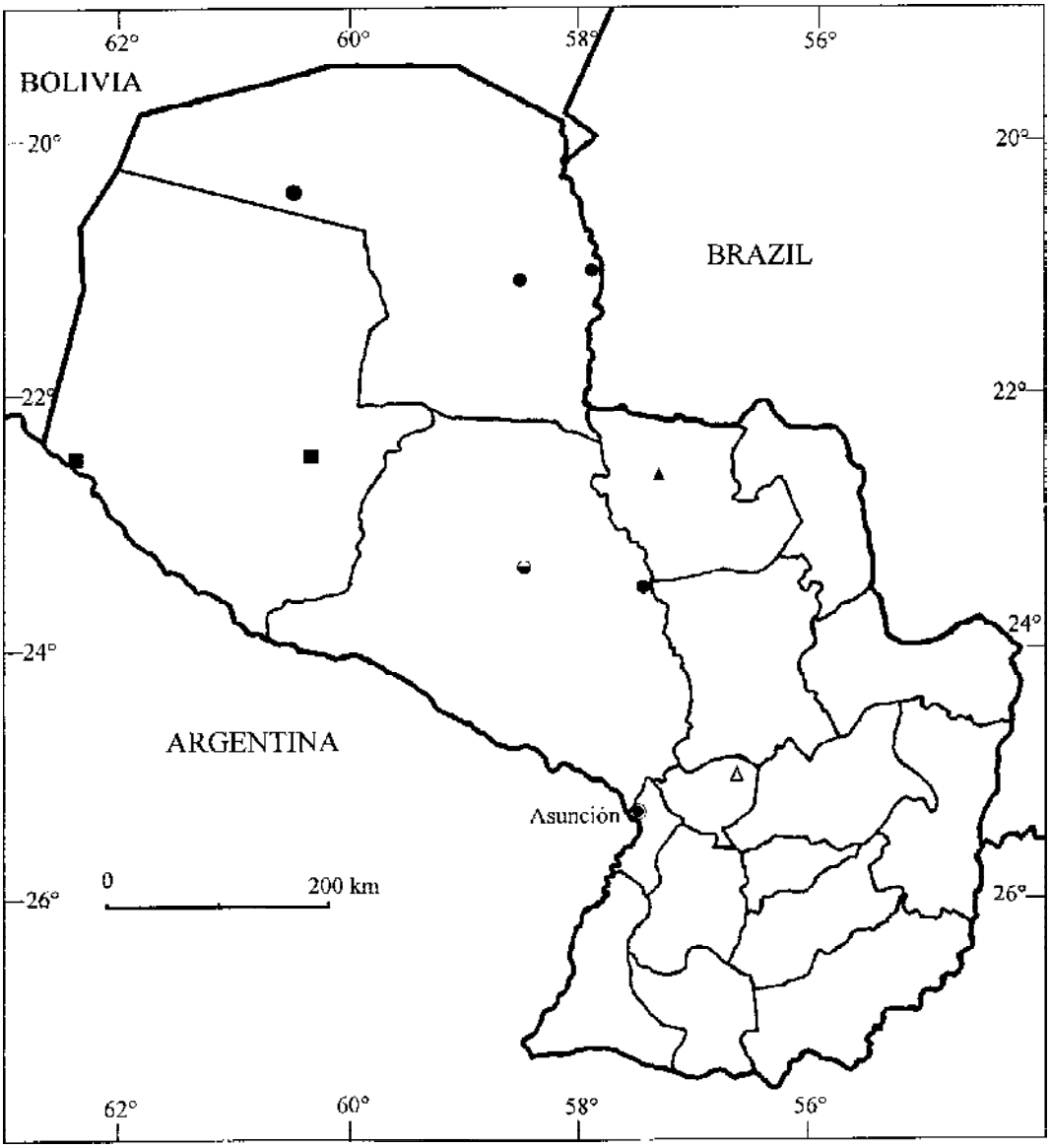

Fig. 1. Collection localities for distributional noteworthy records of four species of bats in Paraguay. (Open semi-circle, *Tonatia brasiliense*; open triangle, *Chiroderma doriae*; closed semi-circles and circles *Diaemus youngi*; closed triangle, *Natalus stramineus*; closed squares, *Histiotus macrotus*). Boundaries of departments are indicated by solid lines. For exact localities see text.

breadth, 7.5; zygomatic breadth, 8.6; width across third upper molars, 5.5; length of mandibular toothrow, 7.3; length of forearm, 38.4. The specimen was collected in a mist net set along the Tagatiya River, at about 50 m from the administration building, at the edge of low, secondary forest. Specimens of *Carollia perspicillata*, *Platyrrhinus lineatus*, *Sturnira lilium*, *Artibeus lituratus*, *A. j. planirostris*, *Eptesicus furinalis*, and *Molossops temminckii* were collected in the same net, during three successive days. An earlier specimen (MNHNP 1897) from the same locality was reported (but without exact locality or other information) in Gamarra de Fox and Martin (1996).

N. stramineus is known to occur in South America as far southwest as SW Amazonia, from Aripuaná, Mato Grosso do Norte, Brazil (Mok et al., 1982). It has been recorded also from Iporanga, São Paulo State, Brazil (24° 34'S, 48° 42'W) (Trajano, 1982). The two Paraguayan specimens extend the known range for this species at least 800 km south and west, from these two Brazilian localities.

Histiotus macrotus (Poeppig, 1835). Departamento Boquerón: Base Naval Pedro P. Peña, 22° 27.16'S, 62° 20.65' W, 240 m (6, TTU 75255-75260), collected between August 17 and 24, 1996; Estancia La Gama, 200 km NW Pozo Colorado (1, MNHNP 0850, skin only), collected on October 22, 1990. The specimen from estancia La Gama was reported in Gamarra de Fox and Martin (1996), but was identified as *Histiotus velatus*.

The specimens from Pedro P. Peña were collected in mist nets set along the Pilcomayo River or across backwaters formed by the river bank sandbars which appear when water levels in the river are low. The vegetation surrounding the area is sparse thorn scrub with cacti, interdigitating with broad areas of sandy, bare soil. Other species collected in the same nets include *Noctilio leporinus*, *Myotis albescens*, *M. nigricans*, *Eptesicus furinalis*, *Lasiurus ega*, *Eumops bonariensis* (sensu Koopman, 1994, although it may be referrable to *E. patagonicus*), *E. glaucinus*, *Molossops temminckii*, *M. planirostris*, *Molossus molossus*, and *Promops nasutus*. Mean, and range of selected measurements (mm) for the six TTU specimens are: greatest length of skull, 17.9, 17.7-18.2; condylobasal length, 16.9, 16.6-17.6; mastoid breadth, 9.05, 9.02- 9.19; zygomatic breadth, 10.3, 10.1-10.7; width across third upper molars, 6.6, 6.5-6.7; length of mandibular toothrow, 6.3, 6.2-6.6; length of forearm (7 specimens, including the skin from estancia La Gama), 45.8, 44.0- 48.7.

This species is known as far north as Jujuy Province in Argentina (8 km SE Tres Cruces, 3600 m; Barquez and Lougheed, 1990). Published records indicate that the species occurs at high elevations on the eastern slope of the Andes (Barquez and Ojeda, 1992; Barquez et al., 1993). Although Paraguayan specimens were collected only about 300 km east of the northernmost known locality, they were taken at an elevation 3350 m lower, in a markedly different habitat. These bats may be using the Pilcomayo River and its tributaries as a corridor, moving along its course from the Andean Cordillera to the Paraguayan lowlands.

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