

## Paleoenvironments: Vertebrates

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### An Insect-eating Bat (Mammalia: Chiroptera) from the Pleistocene of Argentina

Carlos A. Iudica, Joaquín Arroyo-Cabrales, Timothy J. McCarthy, and Ulyses F. J. Pardiñas

Compared with other mammals, the fossil record for bats (Mammalia: Chiroptera) is sparse. Among the reasons proposed for this are lack of fossilization, poor preservation of bat bones, and bias introduced by collecting techniques (Arroyo-Cabrales 1992). However, an enhanced bat record has recently been produced by implementing archaeological excavation methodology in paleontological sites. In fact, the first well-documented Chiropteran occurrence in Argentina (Pardiñas and Tonni 2000) was recently published. Another fossil specimen from the Argentinean Pleistocene is documented here.

The studied specimen comes from the archaeological site Epullán Grande Cave (Neuquén, Argentina), with an associated radiocarbon date of  $7550 \pm 70$  yr B.P. (Beta-47401; stratigraphic provenience level 7, roof). Epullán Grande Cave,  $40^\circ 23' 21''$  S,  $70^\circ 11' 40''$  W, is located ca. 40 km southwest of Piedra del Aguila, Department of Collón Curá, Province of Neuquén, Argentina. It was excavated and studied by Crivelli Montero et al. (1996a). The archaeological sequence covers the early Holocene to the post-Hispanic late Holocene. The remains of small mammals are very abundant, especially toward the middle levels.

Epullán Grande Cave is centered in the western district of the Patagonian steppe, 80 km directly west of the first forests of *Nothofagus* and equidistant from both the Monte and the Central phytogeographical districts (Cabrera 1971). A herbaceous steppe is dominated by *Stipa*, with an important shrubby component of *Mulinum*, *Larrea*, and *Schinus*, and a small "cortaderal" (*Cortaderia*) that flanks both; a cañadón and temporary mallín occur within 5 km of the deposit.

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Carlos A. Iudica, Mammalogy, Florida Museum of Natural History, Gainesville, FL 32611-7800; e-mail: casaiud@flmnh.ufl.edu

Joaquín Arroyo-Cabrales, Laboratorio de Arqueozoología, INAH, Moneda # 16, Col. Centro, 04460 México, D.F. México; e-mail: arromatu@prodigy.net.mx

Timothy J. McCarthy, Section of Mammals, Carnegie Museum of Natural History, 5800 Baum Boulevard, Pittsburgh, PA 15206-3706; e-mail: McCarthyT@CarnegieMuseums.Org

Ulyses F. J. Pardiñas, Centro Nacional Patagónico, 9120 Puerto Madryn, Chubut, Argentina; e-mail: ulyses@cenpat.edu.ar

This cave is a good opportunity to examine the environmental evolution of the last 10 ka in the north of the Patagonian steppe. Stratigraphy is complex. For example, level 7 is a sequence of sands that represents the first 3,000 years of cave fill. Segment 10-7 ka (represented by level 7) possibly indicates a condensation of events. Globally, it reflects severe (although not extreme) environmental conditions, with limited water availability and dominant westerly winds. The low incidence of the sigmodontine rodent *Eligmodontia* sp. at that stage suggests a shrubby steppe less developed than the current one and possibly lower mean temperature (Pardiñas 1999). Additionally, palynological data suggest the development of a herbaceous steppe (Prieto and Stutz 1996).

The specimen MLP 96-V-23-1 is a left mandibular ramus lacking all but the m3. The specimen is almost complete; there is damage to the anterior portion and a pitted coronoid process. Based on the present alveoli, it apparently had the dental formula  $i \text{ ?}, c \text{ /1}, pm \text{ /2}, m \text{ /3}$ . The morphology of the m3 is that of Vespertilioninae m3 type B of Menu (1985). This determination precludes its assignment within the genus *Lasiurus*, which has South American species within the size range of the fossil specimen. *Lasiurus* is considered m3 type C. Furthermore, the fossil mandible is quite gracile, different from the more robust *Lasiurus* mandibles. The tooth is very similar in morphology to that of several species of *Histiotus*. It is provisionally referred to the genus pending a complete review of diagnostic characters of the species within the genus.

This fossil specimen from the Pleistocene of northwestern Patagonia is the first Argentinean fossil record of a bat of the genus *Histiotus* (Vespertilionidae). The presence of such a bat in a lowland locality is surprising. The big-eared brown bat genus *Histiotus* is known from four recent species in Argentina and at least two others within South America (Bárquez et al. 1999; Handley 1996). Among the four species documented for Argentina, the fossil remains suggest an individual whose size and shape fall between the extant species *H. montanus* and *H. macrotus*. Specimens from these two species are rare occurrences in forests, open dry areas, and at high elevations in the mountains. These two species are not known within fossiliferous deposits in Argentina, and the only fossil record for the genus is from Lagoa Santa, Brazil (Paula Couto 1946).

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