

*LAKUKULLUS ANATISROSTRATUS*, GEN. ET SP. NOV., A NEW MASSIVE NOTHROTHERIID SLOTH (XENARTHRA, PILOSA) FROM THE MIDDLE MIOCENE OF BOLIVIA

FRANÇOIS PUJOS,<sup>\*1,2</sup> GERARDO DE IULIIS,<sup>3,4</sup> BERNARDINO MAMANI QUISPE,<sup>5</sup> and RUBEN ANDRADE FLORES<sup>5</sup>;  
<sup>1</sup>Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales (IANIGLA), CCT-CONICET-Mendoza, Avda. Ruiz Leal s/n, Parque Gral. San Martín, 5500 Mendoza, Argentina, fpujos@mendoza-conicet.gov.ar; <sup>2</sup>Institut Français d'Études Andines, UMIFRE 17 CNRS MAE USR 3337, Casilla 18-1217, Av. Arequipa 4595, Lima 18, Peru; <sup>3</sup>Department of Zoology, University of Toronto, 25 Harbord Street, Toronto, Ontario, M5S 3G5, Canada; <sup>4</sup>Department of Palaeobiology, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, M5S 2C6, Canada, gerry@zoo.utoronto.ca; <sup>5</sup>Departamento de Paleontología, Museo Nacional de Historia Natural, Calle 26 s/n, Cota Cota, La Paz, Bolivia, bmamani@hotmail.com; randradeflores@gmail.com

Xenarthra constitute one of the most representative groups of South American endemic mammals. The armored Cingulata is recorded beginning in the Itaboraian SALMA (lower Eocene; Pujos et al., 2012). Its sister group is Pilosa, which includes Tardi-grada, the sloths, and Vermilingua, the South American anteaters. Sloths appear during the Eocene–Oligocene transition (Tinguirirican SALMA) in Chile, represented by *Pseudoglyptodon* (McKenna et al., 2006). The late Oligocene Deseadan SALMA saw the emergence of Mylodontidae (e.g., *Octodontotherium* and *Orophodon*) and Megalonychidae (e.g., *Deseadognathus*) in Patagonia and the Bolivian altiplano (Pujos et al., 2007). Megatherioidea appear later during the middle Miocene, Megatheriidae in the Santacrucian SALMA (i.e., *Megathericulus*; Pujos et al., 2013), and Nothrotheriidae in the Huayquerian SALMA (i.e., *Mionthropus*; De Iuliis et al., 2011). According to De Iuliis et al. (2011), Nothrotheriidae is supported by 13 unequivocal synapomorphies and includes at least five genera: *Mionthropus*, *Pronothrotherium*, *Thalassocnus*, *Nothrotherium*, and *Nothrotheriops*. Several possible nothrotheriids, generally represented by poor material, have been described from Colombia (*Huilabradys*), Argentina (e.g., *Nothropus*, *Chasicobradys*, *Amphibradys*, and *Xyophorus*), and Bolivia (*Xyophorus* and *Hiskatherium*). Those from Argentina are poorly diagnosed, cannot certainly be differentiated morphologically from other taxa such as *Hapalops*, and are likely invalid. *Nothropus priscus* is exclusive to the Pleistocene of Argentina and is not present in the Amazon (see De Iuliis et al., 2011, for further details).

By its central geographical position in South America, the present territory of Bolivia (Fig. 1) has played an important role in the evolution and diversity of mammals during the Paleogene and Neogene periods (Croft, 2007), although few nothrotheriids have been recorded from this country. St.-André (1996) assigned a dentary and an astragalus to *Xyophorus villarroeli* from the Huayquerian SALMA of Achiri; previously this genus was known from the Santacrucian (Ameghino, 1887, 1891, 1894) and Chasicuan of Argentina with *X. bondesioi* (Scillato-Yané, 1979). A partial skull and mandible of *X. villarroeli* is also recorded from the Laventan SALMA of Quebrada Honda (= *Hapalops angustipalatus* Frailey, 1988; Fig. 3 A–D; see Scillato-Yané and Carlini, 1999, for further details), which also yielded the dentary of the peculiar Megatherioidea *Hiskatherium saintandrei*, recently described by Pujos et al. (2011). Croft et al. (2009) noted the presence of *Xyophorus* cf. *bondesioi* in the Friasian SALMA of Cerdas.

The Laventan SALMA Quebrada Honda vertebrate locality was identified by Hoffstetter (1977). Croft (2007) presented the

most recent list of the vertebrate fauna, which includes the marsupials Didelphimorphia, Paucituberculata, and Sparassodonta, native ungulates Litopterna, Notoungulata, and Astrapotheria, five rodent clades (Dasyproctidae, Eocardiidae, Octodontidae, Echimyidae, and Chinchillidae), and xenarthrans, represented by dasypodids, glyptodontids, and sloths. Three sloths have previously been reported from Quebrada Honda: the nothrotheriid *Xyophorus villarroeli*, the megatherioid *Hiskatherium saintandrei*, and a mylodontid indet. (Takai et al., 1984). Here we describe the fourth sloth, a massive Nothrotheriidae.

**Institutional Abbreviations**—CONICET, Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires, Argentina; FLMNH, Florida Museum of Natural History, Gainesville, U.S.A.; HMS, Harvard Medical School, Boston, U.S.A.; IFEA, Institut Français d'Études Andines, Lima, Peru; MCL, Museu de Ciências Naturais da Pontifícia Universidade Católica de Minas Gerais, Belo Horizonte, Brazil; MNHN, Muséum national d'Histoire naturelle de Paris, Paris, France; MNHN-Bol-V, Departamento de Paleontología de Vertebrados, Museo Nacional de Historia natural de Bolivia, La Paz, Bolivia; MUSM, Museo de Historia Natural de la Universidad Mayor de San Marcos, Lima, Peru.

**Paleontological Abbreviations**—c., lower caniniform tooth; HI, hypsodonty index; m., lower molariform tooth; SALMA, South American Land Mammal Age.

SYSTEMATIC PALEONTOLOGY

MAMMALIA Linnaeus, 1758  
XENARTHRA Cope, 1889  
TARDIGRADA Forster in Latham and Davies, 1795  
(= PHYLLOPHAGA Owen, 1842)  
MEGATHERIOIDEA Gray, 1821  
NOTHROTHERIIDAE Gaudin, 1994  
NOTHROTHERIINAE Ameghino, 1920  
*LAKUKULLUS ANATISROSTRATUS*, gen. et sp. nov.  
(Fig. 2, Table 1)

**Holotype**—MNHN-Bol-V 006601; nearly complete mandible, right caniniform tooth is broken at the base of the crown and left is missing; condyloid process missing and extremities of angular and coronoid processes incomplete; small parts of ascending ramus and spout have been reconstructed, but the general morphology of the anterior border of the spout is conserved.

**Etymology**—The generic name from 'Laku'kullu,' 'wild animal of heights' in Aimara, a native Bolivian language, in reference to the locality where the specimen was found. The specific epithet is from the Latin 'anatisrostratum,' 'duck bill' in relation

\*Corresponding author.