

Postcranial remains of basal tyotherian notoungulates from the Eocene of northwestern Argentina

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Notoungulates represent the most taxonomically diverse and temporally and geographically widespread group among South American native ungulates. Here, we analyze anatomical and systematic aspects of proximal tarsal bones recovered from the Lower and Upper Luján formations (middle and late middle Eocene) in northwestern Argentina. We provide detailed descriptions, comparisons, and infer foot stances and range of movements for the taxa implicated. Material studied includes astragali belonging to the oldfieldthomasiid *Colbertia lujanensis* (Lower Luján Formation), a set of proximal tarsals referred as *Tyotheria* indet. (Lower Luján Formation), and tarsals (also including navicular and cuboid) of the informal taxon “*Campanorco inauguralis*” (Upper Luján Formation). The comparison of the tarsals of *Colbertia lujanensis* (middle Eocene of Argentina) with *Colbertia magellanica* (early Eocene of Brazil) reveals several differences including variations on the development and arrangement of articular facets, and the size of the dorsal astragalar foramen in the Argentinean species. The specimen of *Tyotheria* indet. shows morphological affinities with basal interatheriid taxa. However, its larger size contrasting with the overall small body sizes of Eocene interatheriids precludes an indisputable taxonomic assignment. Concerning “*Campanorco inauguralis*”, our observations indicate that there is no morphological evidence for a close phylogenetic relationship with Mesotheriidae. It presents a “reversed alternating tarsus” condition, which is also observed in Leontiniidae, “*Notohippidae*”, Toxodontidae, and some tyotherians. However, the spectrum of singularities exhibited by this form precludes the assessment of its relationships in the context of the Paleogene radiation of *Tyotheria* and it is necessary to extend the comparison to Eocene notoungulates. Finally, in a morphofunctional context a plantigrade foot posture is inferred for the specimens here reported. These observations have the potential to provide functional proxies for paleoecological reconstructions to be applied to the study of the early radiation of these notoungulate faunas.

Key words: Mammalia, Notoungulata, calcaneum, astragalus, plantigrade, foot stances, Paleogene, South America.

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