

LOCOMOTOR STRATEGY AND MASS PREDICTION FOR THE  
NOTOUNGULATE *PROTYPOTHERIUM* (EARLY MIOCENE, SANTA CRUZ,  
ARGENTINA)

ANDERSON, Leah, CROFT, Darin, Case Western Reserve Univ., Cleveland, OH

Mammal fossils are abundant, diverse, and well preserved in the early Miocene Santa Cruz Fauna of southern Argentina. Some of the most common remains are of notoungulates, the most speciose group of endemic South American ungulates. Despite the availability of excellent specimens, few studies have investigated notoungulate paleobiology. This partly stems from the lack of living descendents which presents challenges for reconstructing attributes such as body mass and locomotor strategy. We here present results of a study that uses a variety of extant mammals to infer these attributes for one Santa Cruz notoungulate, *Protypotherium* (Interatheriidae: Interatheriinae).

Postcranial measurements were taken from 45 species of modern rodents, lagomorphs, and ungulates of known body mass (< 10 kg) and locomotor habit (fossorial, occasionally fossorial, generalized, saltatory, cursorial, or arboreal). Some measurements were expressed as ratios to form ten indices related to limb function (e.g. humerus robustness index). Body mass of *Protypotherium* was inferred using 14 postcranial regression equations calculated from these extant taxa: estimates were averaged and results (6.92 kg and 6.55 kg) are similar to previously published values. Principal Components Analyses (PCA) and Discriminant Function Analyses (DFA) of both raw measurements and functional indices were used to assess locomotor habit.

*Protypotherium* plots closest to fossorial taxa in the PCA of raw data but plots closest to a generalized mammal (*Proechimys*) in the PCA of indices. It is classified as arboreal in the DFA of raw data and as fossorial in the DFA of functional indices. These results indicate that the limbs of *Protypotherium* were adapted for force not speed. The relatively large mass of *Protypotherium* and the inferred fossorial habits of closely-related notoungulates suggest a fossorial lifestyle is more likely. The humerus, femur, and manus of *Protypotherium* most closely resemble the arboreal rodent *Erethizon* among extant taxa examined, however. A broader study of modern arboreal and fossorial taxa would likely help discriminate between the two alternatives.