

Reanalysis of the relationships among perissodactyls and certain South American native ungulates using an expanded matrix

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South American native ungulates (SANUs) are a collection of extinct Cenozoic placental lineages known almost exclusively from South America. Many SANUs superficially resemble hooved placental lineages from other continents, such as perissodactyls and artiodactyls, at least in certain respects. The relationships of SANUs to other placentals are not well understood, despite their extensive fossil record. Molecular data (DNA and collagen) obtained from two Late Pleistocene SANUs, one litoptern and one notoungulate, indicate that the closest living relatives of these lineages are perissodactyls. Subsequent studies have attempted to evaluate support for this claim via parsimony analyses of morphological data by adding representatives of several SANU lineages (specifically litopterns, didolodontids, and kollpaniines) to a published matrix originally created to analyze relationships among cambaytheres (an extinct group from the Eocene of India), perissodactyls, and paenungulates. One major limitation of these analyses is that they have included relatively few other extant and extinct placental lineages. Here, we analyze an expanded version of this “cambaythere matrix” that includes five additional afrotheres, two additional laurasiatheres, and three representatives of Euarchotheres, a

supraordinal group not previously included in these analyses. The matrix includes the same SANUs as the previous studies and expands the number of characters from 214 to 332. An unconstrained parsimony analysis of this matrix recovers a monophyletic grouping of the SANU lineages with artiodactyls as their sister-taxon, and with Perissodactylamorpha as sister to this clade. Constraining the analysis to conform to the results of molecular studies of placental relationships results in a strict consensus that is far less resolved, though the majority rule consensus supports SANU lineages as having closer relationships to Perissodactylamorpha than to Artiodactyla. In future analyses, we will integrate additional SANU lineages, including notoungulates and astrapotheres.

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From tots to titans: Implications of different modes of parental care on community structure in dinosaurs vs. mammals

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Mesozoic dinosaurs and Cenozoic mammals are often regarded as broadly ecologically equivalent, as they included the majority of medium-to-large-bodied terrestrial vertebrates of their respective eras. One of the most significant differences between them is their mode of reproduction: oviparity and large clutch size regardless of adult body size in the former; viviparity and litter size decreasing with adult body size in the latter. Furthermore, the disparity between hatchling and adult body size is much greater in dinosaurs than neonate and adult body size