THE CORRELATION BETWEEN DIET AND MORPHOLOGY: MULTIVARIATE ANALYSES OF CRANIODENTAL VARIABLES IN GLIRES AND UNGULATES

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Previous studies of morphological correlates of diet in extant mammals have generally focused on artiodactyls and other groups of ungulates. Although these studies are appropriate for inferring diet in some extinct ungulates, they may not be appropriate for reconstructing the paleoecology of extinct South American groups such as notoungulates and litopterns. Because of the ambiguous phylogenetic placement of these orders and their lack of living descendants, additional herbivore taxa should be included in any study aiming to elucidate patterns of correlation between diet and morphology that are broadly applicable across groups of terrestrial mammalian herbivores.

In a first step toward inferring the diets of members of South American paleocommunities, 72 genera of modern herbivores including caviomorphs, lagomorphs, artiodactyls, perissodactyls, and hyracoids were measured for a maximum of 83 craniodental variables. Each taxon was classified as a grazer, browser, intermediate feeder, or omnivore according to available dietary information. Glires were included in addition to a diversity of ungulate taxa since many typothere notoungulates are hypothesized to have been rodent or lagomorph analogs; furthermore, caviomorphs themselves were likely a significant component of South American Neogene communities.

Principal components analysis of the log-transformed data suggest that functional morphological variables do correlate with dietary preference across phylogenetic boundaries. However, the boundaries of these dietary morphofunctional complexes are not discrete; they therefore should be applied with caution when discriminating relative dietary preference in fossil taxa of uncertain phylogenetic affinity.