SIZE VARIATION IN POPULATIONS OF *TETRACLAENODON* (MAMMALIA, 'CONDYLARTHRA'), FROM THE TORREJONIAN NALMA OF THE SAN JUAN BASIN, NEW MEXICO, REVEALS NEW INSIGHTS INTO THEIR EVOLUTION AND PALEOENVIRONMENT

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After the end-Cretaceous mass extinction, approximately 75% of life on land and in the sea disappeared. The mammals of the early Cenozoic rapidly diversified and dispersed, rising to numerical and ecological dominance beyond their Mesozoic norms. Among those initial groups that ushered in the Age of Mammals, Paleocene and Eocene 'condylarths' are thought to include the ancestors of modern odd-toed ungulates (horses, tapirs, rhinos). *Tetraclaenodon* is the oldest genus of the 'condylarth' group Phenacodontidae and one of the most abundant fossils from the San Juan Basin (SJB) of New Mexico. *Tetraclaenodon* was a medium sized (mean body mass ca. 10kg), terrestrial mammal which was lightly built and had an omnivorous to herbivorous bunodont dentition.

Here we use multivariate and statistical analyses to investigate body mass and dental variation in 110 teeth of *Tetraclaenodon* spanning the Torrejonian (Paleocene) interval of the SJB. The specimens were grouped into six time bins by their biostratigraphical reference, from Tj1 (~63.8 Ma) through Tj6 (~62.7 Ma). Measurements of the length, mesial and distal width of the lower first molars (m1) were subject to principal component analysis (PCA), and m1 area was used to predict body mass using a regression equation. The PCA morphospace ordinates specimens along a PC1 axis that accounts for 90.05% of total variance and is significantly correlated with body size. A PERMANOVA test finds a significant difference in morphospace occupation (non-overlap) between clusters of specimens from Tj1-3 and Tj4-6, but there are no significant differences between the individual time bins within each cluster. This trend is also seen in the body size estimates: Mann-Whitney tests recover significant differences between the two clusters. These results suggest that Torrejonian populations of *Tetraclaenodon* were relatively constant in size throughout Tj1-3, but between Tj3 and Tj4 underwent an increase in body mass and subsequently stabilized (at this resolution) for the remainder of the Torrejonian. A similar trend is seen in contemporary populations of the periptychid 'condylarth' *Periptychus*, suggesting that there were selective environmental pressures acting on these herbivorous species. These body size differences may reflect the emergence of a new, larger *Tetraclaenodon* species in Tj4, or may be associated to an environmental change, perhaps relating to climate or vegetation. In either case, this illustrates dynamic evolution of mammals during the few million years after the extinction.

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