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Hadrosaurs as ungulate parallels: Lost lifestyles and deficient data

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Hadrosaur dinosaurs (Ornithischia: Hadrosauridae) were abundant in Late Cretaceous terrestrial environments of North America and Asia. Their derived dental and postcranial specializations for herbivory have led to the suggestion that these dinosaurs were analogous to modern ungulates in lifestyle. Ungulates display a suite of morphological features that are correlated with diet, habitat preference, and sexual dimorphism. In this paper we examine several of these same features in hadrosaurs in order to determine whether they display similar patterns under multivariate analysis. Initial results confirm the resemblances between hadrosaurs and ungulates but suggest that missing data may considerably affect the outcomes of statistical analyses. Using the hadrosaur dataset as a template, we artificially degrade the (previously complete) ungulate datasets and perform the same analyses. Results are consistent with earlier results and provide an opportunity to assess the impact of missing data on the original multivariate structure. Our results support the hypothesis that hadrosaurs were similar to ungulates in patterns of ecomorphology.

Key words: Dinosauria, Ornithischia, Ornithopoda, multivariate statistics, paleoecology, Mammalia, NMDS.

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