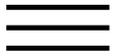


Implications of beak morphology for the evolutionary paleoecology of the megaherbivorous dinosaurs from the Dinosaur Park Formation (upper Campanian) of Alberta.

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Volume 394, 15 January 2014, Pages 29-41

Implications of beak morphology for the evolutionary paleoecology of the megaherbivorous dinosaurs from the Dinosaur Park Formation (upper Campanian) of Alberta, Canada

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Highlights

- â€¢ Megaherbivores from the Dinosaur Park Formation differ broadly in their beak morphologies and inferred feeding styles.
- â€¢ Beak morphology does not differ between confamilial taxa.
- â€¢ Different feeding styles were necessary but insufficient to sustain megaherbivore diversity.

meganerdivore diversity.

â€” The distribution of beak morphologies was maintained for at least 1.5Â Myr.

Abstract

Using the megaherbivorous dinosaur assemblage from the Dinosaur Park Formation as a model, linear and geometric morphometrics are applied to examine the degree to which different feeding stylesâ€”as reflected by beak morphologyâ€”facilitated the coexistence of these animals on the Late Cretaceous island continent of Laramidia. Our findings indicate that megaherbivorous dinosaurs occupied a spectrum of feeding habits. The wide, square beaks of the ankylosaurs suggest that these animals were bulk-feeders that consumed more fibrous herbage than traditionally assumed. Conversely, the narrow, square beaks of the ceratopsids evoke concentrate feeders, although the large body sizes and sophisticated dental batteries of these animals suggest a diet of forbs and low-growing scrub, akin to the feeding strategy of the black rhinoceros (*Diceros bicornis*). Both nodosaurids and hadrosaurids had beaks of intermediate size and shape, suggesting that these were mixed feeders that consumed a diversity of plant types of variable nutritional quality. Contrary to previous suggestions, there is little evidence for different feeding styles within the aforementioned families. Feeding styles were evolutionarily stable, and lend further support to the contention that the fossil assemblage of the Belly River Group constitutes a chronofauna.



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Keywords

Evolutionary paleoecology; Dinosaur Park Formation; Beak morphology; Ankylosauria; Ceratopsidae; Hadrosauridae

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