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Cranial anatomy of tyrannosaurid dinosaurs from the Late Cretaceous of Alberta, Canada

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Beautifully preserved, nearly complete theropod skeletons from Alberta (Canada) allow re-evaluation of the taxonomic status of North American tyrannosaurids. It is concluded that the most parsimonious interpretation of relationships leads to the separation of the two species of *Albertosaurus* (*sensu* Russell 1970) into *Gorgosaurus libratus* from the Campanian Dinosaur Park Formation and *Albertosaurus sarcophagus* from the upper Campanian/lower Maastrichtian Horseshoe Canyon Formation. Albertosaurus and Gorgosaurus are closely related, but can be distinguished from each other by more characters than are known to justify generic distinction within another tyrannosaurid clade that includes *Daspletosaurus*, *Tarbosaurus* and *Tyrannosaurus*. *Daspletosaurus* is known from multiple species that cover extensive geographic, ecological and temporal ranges, and it is sensible to maintain its generic distinction from *Tyrannosaurus*. All tyrannosaurid species have consistent ontogenetic trends. However, one needs to be cautious in assessing ontogenetic stage because many characters are size-dependent rather than age-dependent. There are relatively few osteological differences that can distinguish tyrannosaurid species at any age. For example, *Nanotyrannus lancensis* is probably a distinct species from *Tyrannosaurus rex* because there is no evidence of ontogenetic reduction of tooth counts in any other tyrannosaurid species. Some characters that are good for separating mature tyrannosaurids, such as differences in the sizes and shapes of maxillary fenestrae, are not useful for identifying the species of juveniles.

Key words: Dinosauria, Saurischia, Theropoda, Coelurosauria, Tyrannosauridae, Cretaceous, Alberta, skull anatomy.

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