

Morphometry of the teeth of western North American tyrannosaurids and its applicability to quantitative classification

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Acta Palaeontologica Polonica 50 (4), 2005: 757-776

Gross tooth morphology and serration morphology were examined to determine a quantifiable method for classifying tyrannosaurid tooth crowns from western North America. From the examination of teeth in jaws, tyrannosaurid teeth could be qualitatively assigned to one of five types based on the cross-sectional shape of the base of the tooth and characteristics of the mesial carina. A principal component analysis (PCA) revealed that much of the variance in tooth shape was a result of isometry, but some gross morphological variables exhibited strong positive allometry. Non-size associated factors were also important in determining tooth shape, particularly when data on denticle dimensions were considered in the analysis. While PCA identified important factors in variation, PCA ordination plots did not cluster the teeth into distinct, separate groupings based on taxon or bone of origin. The group classification functions determined by discriminant analysis, though not universally successful for classifying unidentified isolated teeth of all tyrannosaurids, do identify bone of origin of adult *Albertosaurus*, *Daspletosaurus*, and *Gorgosaurus* teeth at a statistically acceptable level.

Key words: Theropoda, Tyrannosauridae, dentition, classification, quantitative analysis, Cretaceous, North America.

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