ACTA PALAEONTOLOGICA POLONICA

Wear facets and enamel spalling in tyrannosaurid dinosaurs

Blaine W. Schubert and Peter S. Ungar
Acta Palaeontologica Polonica 50 (1), 2005: 93-99

Numerous paleontologists have noted wear facets on tyrannosaurid lateral teeth over the past century. While several workers have proposed explanations for these features, there remains to this day no consensus concerning their etiology. Here we report on an examination of wear surfaces on these teeth from the Upper Cretaceous (mid-Campanian) Judith River Group of southern Alberta, Canada. This study reveals two distinct types of wear features on the labial and lingual sides of tyrannosaurid lateral teeth: irregular 'spalled' surfaces and wear facets. The irregular spalled surfaces typically extend to the apex of the tooth, which evidently reflects flaking of enamel resulting from forces produced during contact between tooth and food. These surfaces are often rounded, presumably from antemortem wear following spalling. Wear striations on these surfaces are oriented heterogeneously. The wear facets, in contrast, occur on only one side of the tooth and are typically elliptical in outline and evince parallel wear striations. Similar patterns of parallel wear striations in extant mammals reflect tooth-tooth contact. We therefore propose that wear facets in tyrannosaurids were formed by repeated tooth-tooth contact between the lingual side of maxillary teeth and labial side of dentary teeth. It remains unclear whether this contact was serendipitous or adaptive, though it appears to be unusual for reptiles, as we have found no evidence for wear facets in extant varanids and crocodilians.

Key words: Daspletosaurus, Gorgosaurus, Tyrannosauridae, enamel spalling, wear facets, lateral teeth, diet.

Blaine W. Schubert [schubert@etsu.edu], Department of Physics, Astronomy, and Geology, P.O. Box 70636, East Tennessee State University, Johnson City, Tennessee 37614, USA; Peter S. Ungar [pungar@uark.edu], Department of Anthropology, Old Main 330, University of Arkansas, Fayetteville, Arkansas 72701, USA (corresponding author).

This is an open-access article distributed under the terms of the Creative Commons Attribution License (for details please see creativecommons.org), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.


Full text (618.5 kB)