

Sunday September 15th, 10:25am talk

A Basal Alligatoroid from the Upper Cretaceous (Campanian) Two Medicine Formation of Montana

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Abstract

The Campanian Two Medicine Formation (TMF) is a series of fluviolacustrine deposits formed in seasonal semi-arid uplands between approximately 82 and 75 Ma. Like the correlative Judith River Formation and members of the Belly River Group, the TMF yields an extensive fossil fauna including dinosaurs, pterosaurs, champsosaurs, turtles, lizards, mammals, invertebrates, and insect traces. However, until recently there had been no reports of crocodyliforms from the TMF.

Here we report on a partial crocodyliform skeleton collected from the upper TMF by the Museum of the Rockies (MOR). This specimen (MOR 552) is comprised of partial limbs, a partial ilium, vertebral elements, osteoderms and a partial skull. MOR 552 was previously referred to *Borealosuchus*, but closer examination of the maxilla and quadrates reveals alligatoroid synapomorphies including a dorsally-shifted foramen aëreum and maxillary shelf separating the tooth row from the ectopterygoid. It closely resembles the basal-most known alligatoroid, *Leidyosuchus canadensis*, in several ways, including a rugose ventral maxillary surface between the tooth row and suborbital fenestra and dentary alveolar size distribution in which the 12th and 13th alveoli are enlarged. The surangular appears to extend to the posterior tip of the retroarticular process, a feature shared with *Borealosuchus*, but some specimens of *L. canadensis* approach the condition seen in the TMF form. Maximum parsimony analysis supports a close relationship with *L. canadensis*, but trees supporting a close relationship between the TMF form and *Diplocynodon*, a European basal alligatoroid lineage first appearing in the Paleocene, are not substantially longer.

Based on environmental differences between the TMF and correlative units in western North America, we hypothesize that TMF alligatoroids were better adapted for living in semi-arid conditions than taxa that lived closer to the Western Interior Seaway. This study of MOR 552 along with increased sample sizes from the TMF may help resolve the origin of *Diplocynodon* and document the transition from generalized snout shapes to the specialized short snouts

with crushing dentition found in more derived alligatoroid clades.