Differentiating Ankylosaur Dinosaur Tooth Shapes with Implications for Paleobiogeography

Fossil teeth provide key information about the biodiversity and palaeoecology of extinct animals. Ankylosaurs, a group of herbivorous armoured dinosaurs, have leaf-shaped teeth that can vary in morphology (size and shape) between the major subgroups and between species. Statistical analyses of tooth morphology have previously been used to understand dinosaur biodiversity but have not been applied to most herbivorous dinosaurs. Ankylosaur skeletal fossils are rare, but their teeth are relatively common throughout the Cretaceous and can potentially provide insight into the diversity of ankylosaurs. Three main questions are investigated: 1) is it possible to distinguish nodosaurids from ankylosaurids using tooth morphology? 2) can ankylosaurid and nodosaurid species be identified from teeth?, and 3) do tooth sizes and proportions change through time and across paleogeographic distributions? Ankylosaur teeth in museum collections from the Cretaceous North America were studied. Understanding ankylosaur diversity is important as it can reveal insight into the ecological niches of these animals. Additionally, the data has the potential to test the hypothesis that ankylosaurids faced extinction in North America in the mid-Cretaceous before migrating back in the Late Cretaceous from Asia.