

Alberta Palaeontological Society

Plesiosaur (Reptilia: Sauropterygia) body size comparisons between marine and non-marine depositional environments

Speaker: James Campbell, Ph.D. candidate, University of Calgary

Location: Mount Royal University, Room B108

Time: November 17, 2017, 7:30 pm

Abstract:

Plesiosaurs are a bizarre group of aquatic reptiles that lived from the Late Triassic to the Late Cretaceous, and achieved a global distribution. They were generally large-bodied (up to 15 m), and ecomorphologically unique, with a proportionately short trunk and tail, four flippers for underwater flight, and a neck of variable length, including the longest ever evolved. Plesiosaurs are known predominantly from marine deposits, but are also known sparingly from non-marine units such as the Late Cretaceous (Campanian) Dinosaur Park Formation (DPF) of southern Alberta. The DPF represents a fluvial to estuarine environment, which was situated along the western shore of the expansive Western Interior Seaway (WIS) of North America.

The DPF includes an elasmosaurid (long-necked) plesiosaur assemblage composed of individuals of variable size, and likely growth stage, based on the differing degree to which their external features are developed. This assemblage is unusual, however, as large plesiosaur specimens, such as those found in the more offshore Bearpaw and Pierre formations of the WIS, are conspicuously absent. The relatively small-bodiedness of the DPF assemblage may be attributable to immaturity, or alternatively, to the presence of a small-bodied elasmosaurid taxon in this formation.

A preliminary assessment of some of the largest DPF specimens suggests that they may belong to the subadult to adult range, which would indicate the presence of a small-bodied elasmosaurid taxon inhabiting a non-marine environment. However, this possibility requires further exploring and testing via ongoing histological analysis of plesiosaur specimens from the Dinosaur Park, Bearpaw, and Pierre formations of western Canada. This study represents a rare opportunity to study the palaeoecology of non-marine plesiosaurs, which may have had greater constraints on body size than those inhabiting deeper marine settings.

Biography:

James is originally from Ottawa, where he completed his B.Sc. (2011) and M.Sc. (2014) in the Department of Earth Sciences at Carleton University. For his B.Sc. with Dr. Claudia Schröder-Adams, James examined a fossilized assemblage of foraminifera, which served to better constrain the age of a Cretaceous marine basin (Eagle Plain Basin, Yukon Territory) – part of the northern end of the Western Interior Seaway. During his fieldwork in the Yukon, he also discovered a fossil vertebra of a marine reptile, which turned out to be the first plesiosaur fossil from that territory. For his M.Sc. with Drs. Schröder-Adams and Michael Ryan, he conducted a systematic re-evaluation of the horned dinosaurs *Chasmosaurus* and *Vagaceratops* from the Late Cretaceous of Alberta. For his doctoral work in the Department of Biological Sciences at the University of Calgary, under the supervision of Dr. Jason Anderson, James is re-visiting plesiosaurs and studying body size differences between marine and non-marine forms from the

Late Cretaceous of North America. On the side, James enjoys camping, marathon running, and playing the bagpipes.

Information:

This event is presented jointly by the Alberta Palaeontological Society, the Department of Earth and Environmental Sciences at Mount Royal University, and the Palaeontology Division of the Canadian Society of Petroleum Geologists. For details or to present a talk in the future, please contact CSPG Palaeontology Division Chair Jon Noad at jonnoad@hotmail.com or APS Coordinator Harold Whittaker at 403-286-0349 or contact programs1@albertapaleo.org. Visit the APS website for confirmation of event times and upcoming speakers: <http://www.albertapaleo.org/>.