

GSA 2014



19-22 October | Vancouver, BC, Canada



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2014 GSA Annual Meeting in Vancouver, British Columbia (19–22 October 2014)

Paper No. 221-17

Authors will be present from: 9:00 to 11:00 AM, and 5:00 to 6:30 PM

LOCOMOTION AND BEHAVIOR OF THE ANCIENT WHALE GEORGIACETUS

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Georgiacetus vogtlensis is one of the most primitive archaeocetes from North America. Discovered in the northern Atlantic Coastal Plain of Georgia in 1983, it has been interpreted as semi-aquatic, but shows important adaptations toward fully aquatic behavior, including the lack of articulation between the pelvis and sacral vertebrae. Among all protocetids, *Georgiacetus* is most closely related to the clade Pelagiceti, which includes the common ancestor of all fully aquatic archaeocetes and their descendants, including modern whales. The goal of this study is to elucidate aspects of *Georgiacetus* locomotion and behavior and investigate changes in skeletal morphology that occurred during the land-to-sea transition of whale evolution. This goal will be achieved via multivariate analyses (Discriminant Function and Canonical Variates Analyses) of 17 measurements of lumbar vertebrae from more than 30 modern and extinct mammals. Lumbar vertebrae are used because they likely underwent the most drastic changes during the early stages of whale evolution, as dorsomobile archaeocetes evolved from dorsostable artiodactyls. Discriminant Function Analysis (DFA) will first be used to classify *Georgiacetus* into a semi-aquatic or fully aquatic group based on comparison with modern mammals of known lifestyle. Canonical Variates Analysis (CVA) will then be used to illustrate differences in the morphology of lumbar vertebrae among modern and extinct fully aquatic, semi-aquatic, and terrestrial species, including *Georgiacetus* and other archaeocetes. Based on previous studies, we hypothesize that *Georgiacetus* will be classified as semi-aquatic using DFA. However, based on its close phylogenetic relationship with Pelagiceti, we anticipate that it will be most like the fully aquatic group than any other member of the semi-aquatic group in the CVA.

Session No. 221--Booth# 258

Paleontology: New Discoveries in Vertebrate Trace and Body Fossils (Posters)

Tuesday, 21 October 2014: 9:00 AM-6:30 PM

Vancouver Convention Centre-West Exhibition Hall C

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