119 - T112. Halo-Dash: The Deep and Shallow History of Aquatic Life's Passages between Marine and Freshwater Habitats

Monday, 10 October 2022
1:30 PM - 5:30 PM

119-9: ENIGMATIC VERTEBRATE TRACES FROM FLOOD DEPOSITS OF THE WAPITI FORMATION, NORTHERN ALBERTA, CANADA **KIMITSUKI, Ryusuke**[1], RODRIGUEZ, Maria[1], SULLIVAN, Corwin[2], SISSONS, Robin[2], BELL, Phil R.[3], CAMPIONE, Nicolás E.[3], FANTI, Federico[4], ZONNEVELD, John-Paul[1] and GINGRAS, Murray[1], (1)Earth and Atmospheric Sciences, University of Alberta, 1-26 Earth Sciences Building, Edmonton, AB T6G 2E3, Canada, (2)Biological Sciences, University of Alberta, CW405 Biological Sciences Building, Edmonton, AB T6G 2E9, Canada, (3)School of Environmental and Rural Science, University of New England, Armidale, NSW 2351, Australia, (4)Department of Biological, Geological, and Environmental Sciences, Università di Bologna, Via Zamboni, 33, Bologna, 40126, Italy
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Abstract

The Wapiti Formation of central Alberta is a non-marine deposit from the Upper Cretaceous (Campanian-Maastrichtian) and is well known for its superb preservation of vertebrate skeletons and tracks. In 2011, several sandstone blocks bearing enigmatic biogenic protrusions on their bases were collected from the Wapiti Formation at Red Willow Falls, approximately 80 km SSW of Grande Prairie, Alberta. In plan view, these protrusions are triangular to bell-shaped, with lengths and widths of ~2-5 cm. They penetrated into the underlying mud at a shallow angle to depths of ~0.5-1 cm and usually bear straight parallel striae on their surfaces. These traces are relatively numerous on the slabs and consistent in their general form. However, some of them have curved striae or are unusually elongated and shallow.

The trace fossils were emplaced in the underlying silty mudstone deposits and infilled by fine sandstone. The sand deposit infilling the traces is cross bedded and does not show evidence of interference by the action of the trace maker. Based on these sedimentary features, the traces were likely to have been made right before, or just as the sand was deposited. Based on the sedimentological settings and the overall consistency of the traces, they are interpreted as having been left by small vertebrates attempting to escape flooding in an overbank setting. Trace fossil orientation is bimodal: several of the traces are oriented opposite to the current direction inferred from the cross bedding, and the trace makers may pushed against the substrate occasionally as they struggled to swim forward; the other orientation is perpendicular to the current, suggesting some effort to escape the flow. Vertebrate swim traces are relatively common in the global record, but these are the first to show a clear association with a flooding event.

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