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Discussion

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Comment on "A new Arctic hadrosaurid from the Prince Creek Formation (lower Maastrichtian) of northern Alaska" by Hirotsugu Mori, Patrick S. Druckenmiller, and Gregory M. Erickson

ANTHONY R. FIORILLO

Recently Mori et al. (2016) published a paper describing a new taxon of hadrosaurid dinosaur from the Upper Cretaceous Prince Creek Formation of the North Slope Alaska, a rock unit that has recently proven to be a productive source of scientific insights into the workings of an ancient Arctic terrestrial ecosystem (Fiorillo and Gangloff 2001; Gangloff et al. 2005; Fiorillo et al. 2009, 2010; Gangloff and Fiorillo 2010; Flaig et al. 2011, 2013, 2014; Fiorillo and Tykoski 2012, 2014). Although thorough testing of the systematics of this proposed taxon will occur over the next few years, one statement in the Mori et al. (2016) paper warrants comment now. In their section on "Geologic setting and taxonomic composition", the authors state "The hadrosaurid remains are almost entirely disarticulated, show little evidence of weathering, predation, or trampling and are typically uncrushed and unpermineralized." As evidence for this statement, the authors cite two papers: Gangloff and Fiorillo (2010) and Fiorillo et al. (2010). These two papers discuss the taphonomy and depositional setting of the Liscomb Bonebed, which is the source of the materials used by Mori et al. (2016).

It is puzzling that Mori et al. (2016) state the bones are "typically uncrushed and unpermineralized" because these bones are indeed permineralized. As stated by Gangloff and Fiorillo (2010: 300) there is common to abundant occurrence of minerals such as pyrite, calcite, and chalcedony (microcrystalline quartz) within the dinosaur bones collected. All of these minerals are commonly introduced during the permineralization process. Further, Gangloff and Fiorillo (2010) discussed fractures of bones resulting from freeze-thaw dynamics present along boundaries of permafrost, and the paper included figures illustrating the degree of crushing in some of the bones (2010: fig. 5C, D). The bones from the Liscomb Bonebed are remarkable but they are indeed fossilized and they are indeed permineralized. Fiorillo et al. (2010), did not focus on any of the mineralogical aspects of bone preservation so the use of this paper in support of Mori et al.'s (2016) claim is baffling. As a co-author of the two papers that are being misused, several colleagues have now contacted me requesting clarification on the state of fossilization of dinosaur bones from northern Alaska. The Mori et al. (2016) paper serves as a reminder that scientists are not only obligated to provide the supporting data for their conclusions, they are also obligated to cite their sources accurately.

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