

Accepted Manuscript

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PII: S0195-6671(17)30286-0

DOI: [10.1016/j.cretres.2017.09.009](https://doi.org/10.1016/j.cretres.2017.09.009)

Reference: YCRES 3698

To appear in: *Cretaceous Research*

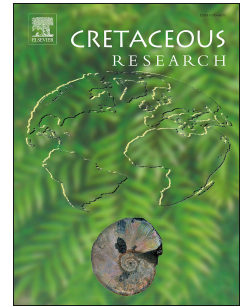
Received Date: 7 June 2017

Revised Date: 24 August 2017

Accepted Date: 12 September 2017

Please cite this article as: Lockley, M.G., Houck, K.J., Matthews, N., McCrea, R.T., Xing, L., Tsukui, K., Ramezani, J., Breithaupt, B., Cart, K., Martin, J., Buckley, L.G., Hadden, G., New theropod display arena sites in the Cretaceous of North America: Clues to distributions in space and time, *Cretaceous Research* (2017), doi: 10.1016/j.cretres.2017.09.009.

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New theropod display arena sites in the Cretaceous of North America: clues to distributions in space and time.

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Abstract

Previously-unknown large scale scrapes attributed to Cretaceous theropod dinosaurs from the Naturita Formation (formerly the Dakota Sandstone) of western Colorado were recently named as *Ostendichnus bilobatus* and interpreted as evidence of “nest scrape display,” a type of courtship behavior previously known only in extant avians. However, comparatively little is known of the morphology, distribution and preservation potential of either modern or ancient nest scrapes. Further study of the initially described samples combined with new discoveries brings the total number of known in Colorado sites to five, one with two scrape-bearing levels. Combined, these sites preserve a total of more than 100 recognizable scrapes from all these sites. We also identify the first *O. bilobatus*-like scrape from the Cretaceous of Canada. Although variable, a majority of the large sample of Colorado scrapes have the diagnostic characteristics of *O. bilobatus*, with two lateral troughs separated by a median ridge, and are sufficiently distinct to allow measurement of salient features such as scrape size, depth, and median ridge

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