

## Short communication

## A new mammal track from the Laramie Formation (Maastrichtian) at the Fossil Trace locality, Golden, Colorado

Martin G. Lockley<sup>a, \*</sup>, Neffra A. Matthews<sup>b</sup>, Brent Breithaupt<sup>c</sup><sup>a</sup> Dinosaur Trackers Research Group, Campus Box 172, University of Colorado Denver, PO Box 173364, Denver, CO 80217-3364, USA<sup>b</sup> National Operations Center, USDOL-Bureau of Land Management, Denver, CO 80225, USA<sup>c</sup> Wyoming State Office, Bureau of Land Management, Cheyenne, WY 82009, USA

## ARTICLE INFO

## Article history:

Received 4 May 2017

Received in revised form

9 June 2017

Accepted in revised form 11 June 2017

Available online 20 June 2017

## Keywords:

Cretaceous

Maastrichtian

Mammals

Footprints

## ABSTRACT

A previously unknown and morphologically distinct pentadactyl mammal track was recovered from the Upper Cretaceous (Maastrichtian) Laramie Formation at the Fossil Trace site, a National Natural Landmark which is the type locality for *Schadipes crypticus*, the only named mammal track known from North America. The track is different, and larger than *S. crypticus*, and thus is evidence of a diversity of mammal trackmakers at this site. Although Cretaceous mammal tracks are very rare, preliminary indications are that those currently known are all morphologically distinct and therefore indicative of a global diversity of different trackmakers, as the body fossil record suggests. Lack of well-preserved mammal trackways with morphologically distinct manus and pes footprints hampers efforts to name diagnostic ichnotaxa.

© 2017 Elsevier Ltd. All rights reserved.

## 1. Introduction

Despite recent reports of well-preserved mammal remains from the Cretaceous of China, in which complete skeletons and soft tissue are preserved (Hu et al., 1997; Ji et al., 1999, 2002), the vast majority of Mesozoic mammalian skeletal fossils consist of teeth and jaws. The preservation of delicate foot bones is therefore the exception not the rule. As noted by Lockley and Foster (2003) in reference to two reports of mammal tracks from the Maastrichtian of Colorado, mammal tracks are otherwise extremely rare in the Cretaceous of North America and, with the exception of recent African discoveries (Contessi, 2013; Mateus et al., 2017), essentially unknown on any other continent in rocks of this age.

Traditionally, reports of true mammal (eutherian) tracks, from the Mesozoic, as distinct from tracks of small synapsids (therapsids) from dune facies (e.g., Buck et al., 2017 and references therein) have been confined to interesting occurrences from South America (Casamiquela, 1964; Leonardi, 1994; Rainforth and Lockley, 1996), scattered reports from southern Africa (Ellenberger, 1972, 1974, 1975) from North America (Olsen, 1980; Lockley et al., 1996; Lockley, 1999), and from Asia (Kim et al., 2017). All these reports

deal with Triassic and Jurassic material. With the exception of the large South American assemblages, recently re-studied by de Valais (2009) many of these reports deal with isolated footprints, some of which have only been illustrated with line drawings. Thus, many are of questionable value due to small sample size, indifferent quality of preservation, and the lack of any skeletal material of comparable age with which to compare the footprints.

The same problems arise when trying to interpret Cretaceous mammal tracks. Several reports deal with isolated specimens. The specimen reported by Sarjeant and Thulborn (1986) from the Lower Cretaceous of Canada as a possible example of a syndactylous marsupial track, appears not to be a track at all but rather an invertebrate trace (McCrea et al., 2014). More diagnostic mammal tracks from the Lower Cretaceous of Maryland (Stanford et al., 2007) are also isolated specimens.

Thus, on the basis of present knowledge, the material described from the Upper Cretaceous of Colorado (Laramie Formation and Mesaverde Group) represents almost the entire Upper Cretaceous mammal track sample, consisting of two partial trackways from the Laramie Formation near Golden Colorado and small assemblage of tracks without discernable trackway patterns, from the Mesaverde Group of western Colorado. The only other footprint evidence of Upper Cretaceous mammals is a report by Contessi (2013) of tracks from the Cenomanian of Tunisia, which is 30 million years older than the Colorado specimens. From an ichnotaxonomic viewpoint

\* Corresponding author.

E-mail address: [martin.lockley@ucdenver.edu](mailto:martin.lockley@ucdenver.edu) (M.G. Lockley).

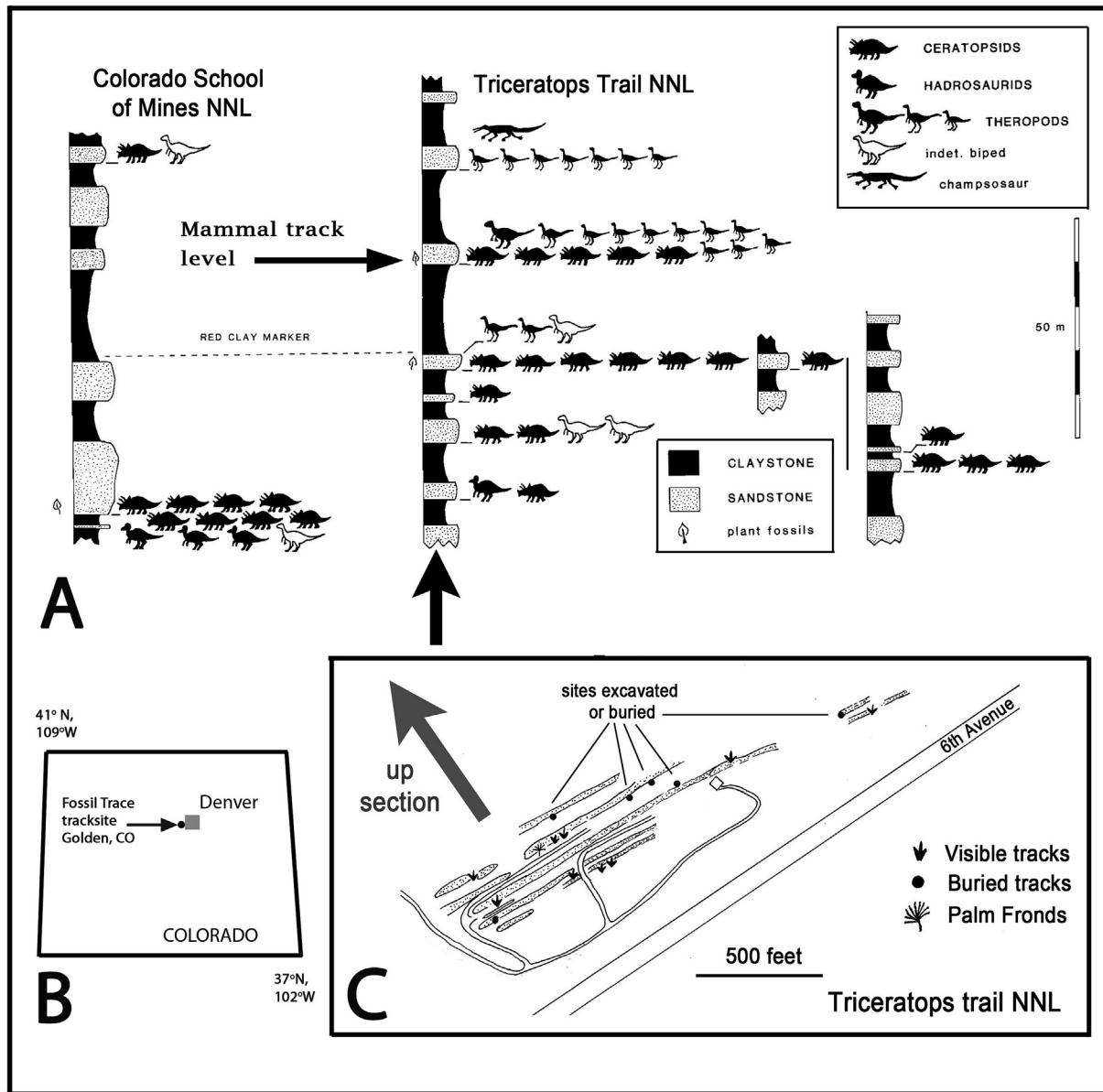
the Laramie trackway was assigned to *Schadipes crypticus*, and the Mesaverde tracks to *Schadipes isp. indet.* The new specimen here reported from the *S. crypticus* type locality represents a different ichnotaxon, and although only an isolated track, it is well preserved and provides evidence that an additional species of mammalian trackmaker was part of the Maastrichtian fauna of this area.

**2. Previous work**

Tetrapod tracks were first reported from the Laramie Formation in the Golden area, Colorado, in the 1980s (Lockley, 1986, 1988). At this time the main exposures of the Laramie Formation were exposed in “clay pits” that had been exploited for kaolinite and other clays used for brick making and ceramics (Fig. 1). At this time the clay pits, which were mostly privately-owned, were no longer being excavated and instead were being filled in as convenient land fill sites. At this time (1985–1986) paleontologists from the University of Colorado Denver, and other individuals, were invited to

collect or “rescue” footprints before they were buried. It was at this time that the track described here (Figs. 2 and 3) was discovered by Gary Upchurch, who subsequently donated to the University of Colorado Museum of Natural History where it was designated the number UCM 220.36. This initial activity resulted in the first very preliminary documentation of representative tracks in the local literature (Lockley, 1986, 1988). Later the rescued specimens and documentation formed the basis of more substantial reports of new ichnotaxa representing ceratopsian (*Ceratopsipes goldenensis*) and champsosaurian (*Champsosaurichus parfeti*) trackmakers (Lockley and Hunt, 1995a,b). These track types and associated tracks of theropod and ornithopod dinosaurs were shown to occur at multiple stratigraphic levels.

In the 2000s decade the ownership of much of the Laramie clay pits area changed hands and became the property of the City of Golden, which was developing much of the adjacent area into a golf course, now known as Fossil Trace Golf Course (Lockley and Tempel, 2014). As a result a state-mandated paleontological survey was



**Fig. 1.** A: Track-bearing units in the Laramie Formation, Fossil Trace, Golden, Colorado, situated just west of Denver (B). Note that level of *Schadipes* track is the same level from which the new mammal track was found. C: Map showing outcrop of main track-bearing sandstone layers that make up the Triceratops Trail portion of the Fossil Trace locality.

Download English Version:

<https://daneshyari.com/en/article/5787938>

Download Persian Version:

<https://daneshyari.com/article/5787938>

[Daneshyari.com](https://daneshyari.com)