

First report of mammal-like tracks from the Cretaceous of North Africa (Tunisia)

Michela Contessi*

Dipartimento di Scienze Biologiche, Geologiche e Ambientali, Alma Mater Studiorum, Università di Bologna, via Zamboni 67, 40126 Bologna, Italy

ARTICLE INFO

Article history:

Received 21 August 2012

Accepted in revised form 12 January 2013

Available online 8 February 2013

Keywords:

Mammalia
Cenomanian
Footprints
North Africa
Ichnology

ABSTRACT

This paper describes Cretaceous mammal-like tracks from southern Tunisia. The tracks, referred to the Cenomanian Kerker Member of the Zebbag Formation, are the first mammal-like footprints reported from the Cretaceous of North Africa. The good preservation of the two tracks and their distinctive morphology support their attribution to a mammalian trackmaker, although the limited available data prevents attribution to a specific ichnotaxon. Morphologically, the Tunisian tracks resemble those of modern Mustelidae, however, based on mammalian faunas in the Cretaceous of Africa, they probably have affinity with members of Multituberculata family. Theropod dinosaur and bird tracks occur on the same track-bearing layer. The sediments are interpreted as an arid tidal flat environment, suggesting that African mammals might have shared their environment with a diverse fauna of larger animals.

© 2013 Elsevier Ltd. All rights reserved.

Institutional abbreviations: MGGC, Museo Geologico Giovanni Capellini, Bologna, Italy.

1. Introduction

The origin of mammals is still poorly understood, and only limited skeletal remains are known from the Mesozoic of Asia (e.g. Hu et al., 1997; Wang et al., 1998; Ji et al., 1999; Lopatin and Averianov, 2007), North and South America (Jaillard et al., 1993; Cifelli et al., 1999; Kielan-Jaworowska and Cifelli, 2001; Rougier et al., 2011) and Africa (Nessov et al., 1998; Hahn and Hahn, 2003). Similarly mammal tracks are exceptionally rare occurrences in the Mesozoic fossil record. Only a handful of true mammal tracks are reported from the Mesozoic of Argentina, Brasil, Canada, Europe and southern Africa (Casamiquela, 1964; Ellenberger, 1970; Sarjeant, 1975; Olsen and Galton, 1984; Sarjeant and Thulborn, 1986; Leonardi, 1994; Lockley et al., 1996; Schultz-Pittman et al., 1996; McCrea and Sarjeant, 2001; Stanford and Lockley, 2002; Lockley and Foster, 2003; Gierliński et al., 2004).

Although Tunisian Cretaceous bonebeds have yielded a diverse vertebrate fauna (Benton et al., 2000; Srarfi et al., 2004; Fanti et al., 2012), mammals have not previously been reported from the Cretaceous of Tunisia. This paper describes small, well-preserved pentadactyl tracks from a recently discovered vertebrate tracksite at the Jebel Boulouha locality in southern Tunisia (Fig. 1). The J. Boulouha

site presents a diverse assemblage of non-avian dinosaur and bird tracks from late Cenomanian deposits (Contessi and Fanti, 2012a, b). Here I report the first discovery of Cretaceous mammal-like footprints in Africa. The available track and body fossil record is used to define the affinity of the possible tracemaker and implications of paleoenvironments in mammal-like tracks distribution is discussed.

2. Geological settings

Cretaceous sediments cropping out at the Jebel Boulouha locality belong to the Douiret, Aïn el Guettar and Zebbag formations (Fig. 1 and 2). Vertebrate remains, including fishes, turtles, crocodiles and dinosaurs, are reported only from Aptian Douiret Fm. (Benton et al., 2000; Srarfi et al., 2004; Fanti et al., 2012), whereas the tracks occur in the Kerker Member of the younger Zebbag Formation (Kerker and Gattar mbrs.) (Ben Ismail, 1991; Fanti et al., 2012). The Kerker Member has been dated as late Cenomanian on the basis of the occurrence, in the northern part of the Tataouine Basin, of the ammonite *Neolobites medeninensis* (Busson, 1967). Sediments of this Member consist of alternating marls and carbonates deposited in a lagoonal to shallow marine environment (Bodin et al., 2010). Rare gastropods and some bivalves *tempestite* layers are the only fossils that occur in the Zebbag Formation.

2.1. Tracksite description

A set of tracks was discovered on an isolated and uncollected block of fine sandstone (Fig. 2A and B), referable to a defined layer

* Tel.: +39 051 2094565; fax: +39 051 2094522.

E-mail addresses: michela.contessi2@unibo.it, contessi.m@gmail.com.

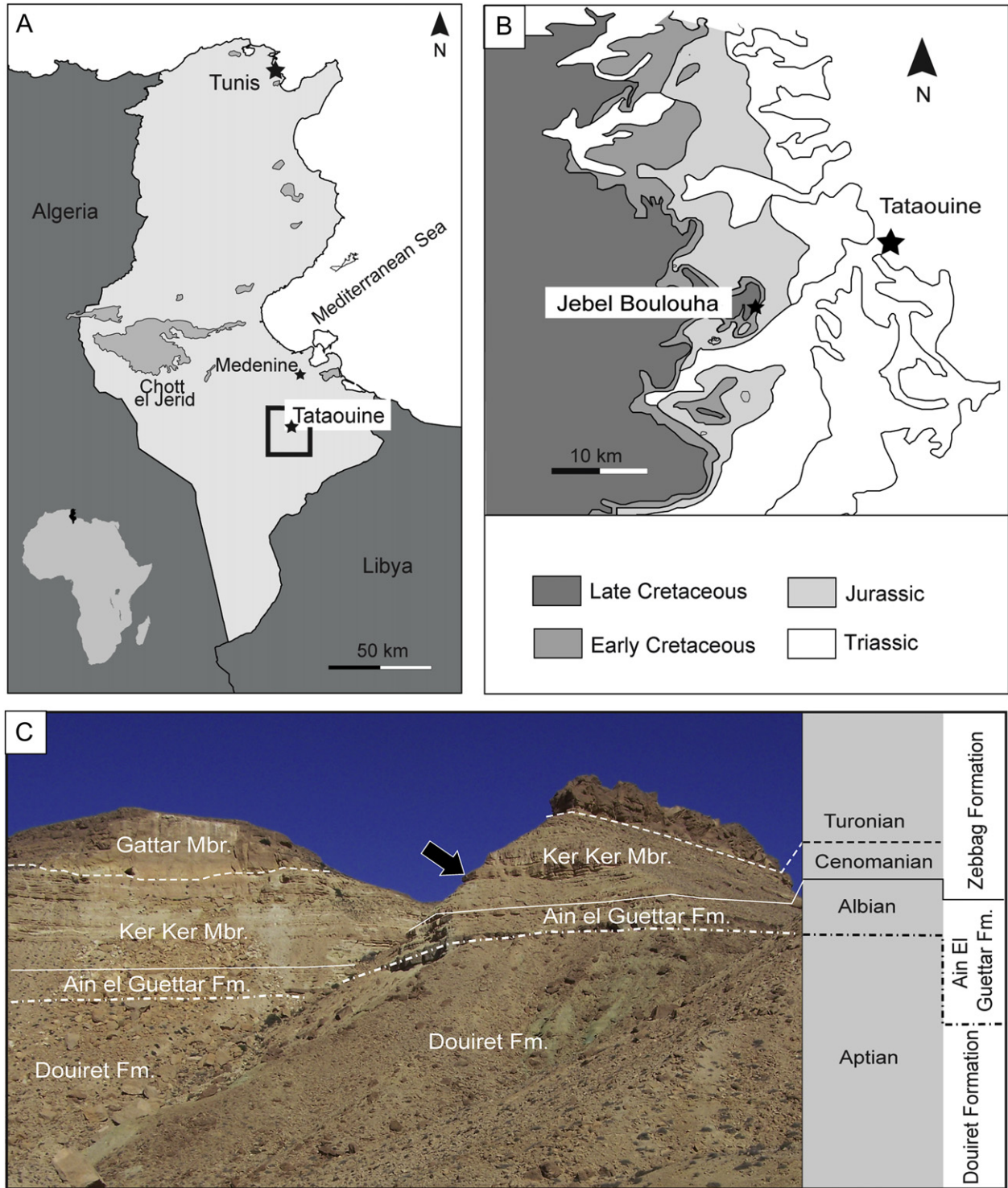


Fig. 1. Locality map of the study area. A) Map of Tunisia, the black box indicates the Tataouine area. B) Locality map showing Mesozoic outcrops in the studied area. C) Field picture and schematic stratigraphic column. Black arrow indicates the track-bearing layer.

located 15 m below the top of the Kerker Member (Figs. 1 and 2). The track-bearing layer is characterized by a light to yellowish, fine-grained and biolaminated sandstone, showing early dolomitization and birds eye structures in thin section. The track-bearing surface presents a characteristic structure associated with the drying out of ancient microbial mats (Flügel, 2010; Fig. 3A and B). This feature, together with the early dolomitization, is indicative of arid tidal flat

environments, and may have aided in the preservation of the tracks (Marty et al., 2009; Petti et al., 2011). Deeply impressed, non-avian theropod tracks occur on the block (Contessi and Fanti, 2012b), suggesting a high water content in the sediment. As all tracks in the track-bearing layer are preserved as a negative relief and display mud rims, they are interpreted as true tracks (*sensu* Thulborn, 1990).

Download English Version:

<https://daneshyari.com/en/article/4747350>

Download Persian Version:

<https://daneshyari.com/article/4747350>

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