Available online at www.sciencedirect.com

ScienceDirect

Palaeoworld 27 (2018) 179–187

Palaeoworld

www.elsevier.com/locate/palwor

First report of dinosaurian claws from the Late Triassic of India

Nibedita Rakshit [a,*], Mohd Shafi Bhat [a], Sanghamitra Ray [a], P.M. Datta [b]

[a] *Department of Geology and Geophysics, Indian Institute of Technology Kharagpur, Kharagpur 721302, India*
[b] *Greenwood Housing Cooperative Society Limited, 315B Upen Banerjee Road, Kolkata 700060, India*

Received 27 October 2017; received in revised form 8 December 2017; accepted 5 January 2018
Available online 13 January 2018

Abstract

The Late Triassic Tiki Formation has yielded five isolated nearly complete claws or ungual phalanges from a fossil locality, which are described in detail and compared with other Late Triassic tetrapods. Of these, four ungual phalanges are slender, asymmetric, ventrally recurved, transversely compressed, and contain deep collateral grooves on either side, a low median keel on the proximal articular surface and a prominent proximoventral flexor tubercle showing their high similarity to the theropod dinosaurs. The remaining claw is unlike that of any theropods in terms of high robusticity and near symmetry. However, as in dinosaurs it is ventrally recurved and contains deep lateral grooves, a small flexor tubercle, lateromedially extended proximal articular surface with a distinct median keel and is considered as belonging to an indeterminate dinosaur. Although it is not possible to ascertain whether the unguals belong to a single taxon or multiple taxa, this new find points towards the presence of small dinosaurs in the Late Triassic Tiki fauna.
© 2018 Elsevier Ireland Ltd Elsevier B.V. and Nanjing Institute of Geology and Palaeontology, CAS. Published by Elsevier B.V. All rights reserved.

Keywords: Dinosaurs; India; Late Triassic; Phalanges; Theropoda

1. Introduction

The Late Triassic is marked by the first appearance of mammals, dinosaurs, lepidosaurs, pterosaurs, turtles, crocodiles, and lissamphibians (Benton, 2004), of which the dinosaurs became one of the most important tetrapod groups of Mesozoic terrestrial ecosystems (Nesbitt et al., 2009; Ezcurra, 2012). Sporadic occurrences of the Late Triassic dinosaurs are known mostly from the different stratigraphic horizons of the Gondwanan countries such as Argentina, Brazil, South Africa, and India (Nesbitt et al., 2009; Ezcurra, 2012; Sereno, 2012), though basal forms are also known from Germany, Switzerland, France, England, and North America (Sander, 1992; Nesbitt et al., 2007; Spielmann et al., 2007; Rinehart et al., 2009). Most of these Late Triassic dinosaurs were quadrupedal and facultatively bipedal, small in size ranging from 2 to 9 m in body length and were essentially omnivores and herbivores (Brusatte et al., 2010; Langer et al., 2010; Galton, 2014; Baron et al., 2017).

In India, several isolated and discrete Gondwana basins of the peninsular India such as the Pranhita-Godavari (PG), Damodar, Satpura, and Son-Mahanadi basins (Fig. 1A) are rich in vertebrate fossils (Bandyopadhyay, 1999). Late Triassic dinosaurs are known only from PG and Rewa basins, the latter being a sub-basin of the Son-Mahanadi Basin. From PG Basin, a basal saurischian dinosaur, *Alwalkeria maleriensis*, is known from the Carnian lower Maleri Formation (Chatterjee, 1987) based on a right femur and an astragalus (Remes and Rauhut, 2005; Novas et al., 2011; Ezcurra, 2012). On the other hand, the upper Maleri Formation (Norian) has yielded a more diverse assemblage, including different sauropodomorphs, a plateosaurian, and a guaibasaurid (Kutty et al., 2007; Novas et al., 2011). The overlying lower Dharmaram Formation (Latest Norian–Rhaetian) contains a basal sauropodomorph and neotheropod remains (Novas et al., 2011). Fragmentary remains of a basal saurischian dinosaur have been reported from the Late Triassic (Carnian) Tiki Formation of the Rewa Basin (Ray et al., 2016) but there has yet been no further study on these materials. In recent years, systematic extraction of vertebrate microfossils has resulted in the collection of several isolated ungual phalanges from this formation. The present paper attempts a comprehensive description

* Corresponding author.
E-mail address: nibeditarakshit91@gmail.com (N. Rakshit).

https://doi.org/10.1016/j.palwor.2018.01.001
1871-174X/© 2018 Elsevier Ireland Ltd Elsevier B.V. and Nanjing Institute of Geology and Palaeontology, CAS. Published by Elsevier B.V. All rights reserved.