China Geology 8 (2025) 233−234

China Geology

Journal homepage: http://chinageology.cgs.cn
https://www.sciencedirect.com/journal/china-geology

Short Communications (Research Advances)

First report of theropod materials enriches the dinosaur assemblages in Guangxi and expands the dinosaur distribution to the southernmost China

Xu-ri Wang[a, b], Shu-bin Ju[c], Yan-nan Ji[d, b], Zhen Guo[b], Qiang Ji[b,*]

[a] *Key Laboratory of Stratigraphy and Paleontology of the Ministry of Natural Resources*, *Institute of Geology*, *Chinese Academy of Geological Sciences*, *Beijing* 100037, *China*
[b] *Hebei GEO University*, *Shijiazhuang* 050031, *China*
[c] *Dalian Natural History Museum*, *Dalian* 116023, *China*
[d] *Chinese Academy of Geological Sciences*, *Beijing* 100037, *China*

1. Objectives

Dinosaur fossils were first discovered from Guangxi Zhuang Autonomous Region in 1960s, mainly including fossil bones and teeth from the Cretaceous. Only one dorsal vertebra and one ischium were reported from the Late Jurassic at Jiangshan Island of Fangchenggang City in 2007. During the construction of high-speed railway project in June 2021, many dinosaur fossils were uncovered from the Upper Jurassic Dongxing Formation in Dongxing City of Guangxi, with dominated fossil bones, several tracks and a tooth. This is the first discovered dinosaur locality in Dongxing, and the first discovery of dinosaur tracks in Guangxi. This find represents the southernmost dinosaur distribution in China, and therefore is important to explore the evolution and distribution of dinosaurs in Guangxi, and even of the Late Jurassic dinosaurs in Asia. Herein, we only report the dinosaur tracks and tooth.

2. Methods

The theropod dinosaur materials of this study were uncovered from the Late Jurassic Dongxing Formation near Nanmushan village, Dongxing City, Guangxi Zhuang Autonomous Region (Fig. 1A). The Dongxing Formaiton is mainly composed of quartz sandstone in the lower part and argillaceous siltstone in the upper part. The dinosaur tracks were preserved in a huge rock of lithic quartz sandstone exposed in the fossil locality. It is difficult to transfer it back for further preparation. We measured the foot length and width, and divarication of digit of three exposed tracks in the field. The tooth was uncovered from the same layer of the tracks, and also preserved in the original rock without further preparation. We measured the tooth length and width, and counted the number of denticles in the distal carina.

3. Results

The exposed three dinosaur tracks are all medium-sized concave imprints (Fig. 1B). The morphology, foot length and width, and divarication of digit are similar of the three tracks (Table 1). However, it is eager to conclude that they belong to the same trackmaker due to the limited tracks. The tracks can be assigned into theropod dinosaur tracks for possessing the following characteristics: Foot length less than 30 cm; tridactyle or possible tetradactyl track; track longer than wide; divarication of digit small; digit Ⅲ robust and long; digit Ⅱ and Ⅳ unequal in length (Platt NH and Meyer CA, 1991). It is difficult to carry out further study since the only three tracks are incomplete, without pad nor trackway preserved.

The tooth is about 2 cm long and 1 cm wide based on the exposed portion (Fig. 1C). It can be assigned into the theropod dinosaur tooth based on the following characteristics: the knife-shaped tooth crown strongly compressed labiolingually, curved posteriorly and tapered towards the tip, and finely denticulated along the distal or possible the mesial carina; the denticles of the distal carina rectangular in labial or lingual view, and tightly arranged (about 20 denticles per 5 mm) (Smith JB et al., 2005; Mo JY et al., 2014).

4. Conclusions

The dinosaur tracks and tooth uncovered in Dongxing City of Guangxi belong to theropod dinosaurs. This find is the

First author: *E-mail address*: 147966459@qq.com (Xu-ri Wang).
* Corresponding author: *E-mail address*: jiqiang@hgu.edu.cn (Qiang Ji).

Literary editor: Xi-jie Chen
doi:10.31035/cg20230131
2096-5192/© 2025 China Geology Editorial Office.

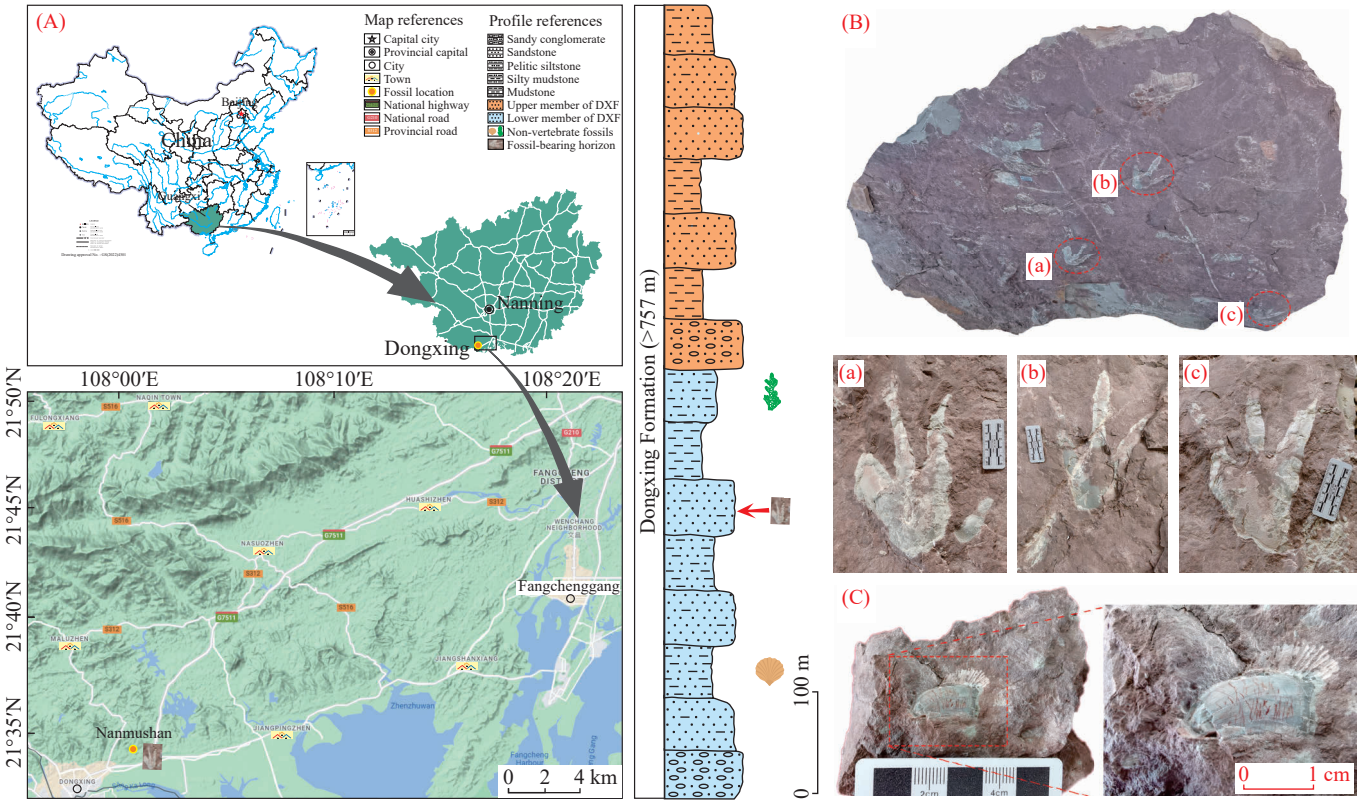

Fig. 1. Map showing the Nanmushan fossil locality (A), photos of the theropod dinosaur tracks (B) and tooth (C) from the Dongxing Formation of Dongxing City, Guangxi.

Table 1. Selected measurements of the theropod dinosaur tracks from the Dongxing Formation of Dongxing City, Guangxi. *represents the preserved length.

Track	Foot length/cm	Foot width/cm	Divarication of digit
a	22.02	11.67 (except digit Ⅳ) 16.67 (including digit Ⅳ)	Ⅱ 19°Ⅲ23°Ⅳ
b	22.54	13.72	Ⅱ 23°Ⅲ22°Ⅳ
c	17.14*	12.99	Ⅱ 22°Ⅲ21°Ⅳ

first discovery of dinosaur tracks in Guangxi and the southernmost dinosaur locality in China. It further enriches the dinosaur assemblages in Guangxi and expands the dinosaur distribution in China. Dinosaur tracks were usually preserved in special depositional environment and distributed in large scale. This find sheds new light on exploring more dinosaur materials in Guangxi, and on understanding the evolution and distribution of Late Jurassic dinosaurs in Asia.

CRediT authorship contribution statement

Xu-ri Wang: Writing - review & editing, Writing – original draft, supervision, project administration, investigation, funding acquisition, conceptualization. Shu-bin Ju: Writing – original draft, visualization. Yan-nan Ji: investigation. Zhen Guo: Investigation. Qiang Ji: Supervision, project administration, investigation, funding acquisition.

Declaration of competing interest

The authors declare no conflicts of interest.

Acknowledgements

This work is supported by China Geological Survey (DD20230221) and Department of Natural Resources of Guangxi Zhuang Autonomous Region (GXZC2022-C3-001314-GXCJ).

References

Mo JY, Huang CL, Xie SW, Buffetaut E. 2014. A megatheropod tooth from the Early Cretaceous of Fusui, Guangxi, southern China. Acta Geologica Sinica, 88(1), 6–12. doi: 10.3969/j.issn.10009515.2014.01.003.

Platt NH, Meyer CA. 1991. Dinosaur footprints from the Lower Cretaceous of northern Spain: Their sedimentological and palaeoecological context. Palaeogeography, Palaeoclimatology, Palaeoecology, 85(3–4), 321–333. doi: 10.1016/0031-0182(91)90165-N

Smith JB, Vann DR, Dodson P. 2005. Dental morphology and variation in theropod dinosaurs: Implications for the taxonomic identification of isolated teeth. The Anatomical Record A, 285A, 699–763. doi: 10.1002/ar.a.20206.