

POSSIBLE ANNELID TRACE FOSSILS IN THE LOWER PROTE-ROZOIC BIJAWAR GROUP OF CENTRAL INDIA

S. M. MATHUR¹ & K. K. CHHATRI²

Centre of Advanced Study in Geology, University of Saugar, Saugar 470 003, India

Abstract

A new ichnofossil *Puratanichnus bijawarensis*, possibly traces made by an annelid, is described from the Amronia Quartzite of the Lower Proterozoic Bijawar Group.

Introduction

It has been thought for a long time that Metazoan life first appeared on the Earth during a period just before the start of the Phanerozoic. A trace fossil possibly of an annelid is reported here for the first time from the Lower Proterozoic Bijawar Group of central India. Its importance lies in the fact that it is probably one of the earliest geological records of multicellular life, though not in the form of a body fossil.

The Bijawar Group of Bundelkhand has been dated isotopically by Crawford and Compston (1969) at about 2,500 Ma ago, but on the basis of field evidence and its relative position with respect to the more reliably dated underlying Bundelkhand Granite and the overlying Vindhyan Supergroup rocks Mathur (1981) considers that the Bijawar is younger around 2,000 Ma old. The Bijawar Group is made up of the following sequence (Mathur & Mani, 1970):

Gangau Formation
Bajna Dolomite
Amronia Quartzite
Dargawan Trap
Malhera Breccia

The trace fossil specimens described here were collected from the slope of the hill south of the Pathar Lake, about seven kilometers east of Bijawar town, in the Ghhatarpur District of Madhya Pradesh. Systematic description of the ichnofossil is as follows:

Systematic Description

Ichnogenus—*PURATANICHNUS* Mathur nov.

Ichnospecies—*Puratanichnus bijawarensis* Mathur nov.

Derivation of name—The generic name is derived from the Sanskrit word "Puratan" which means ancient. The specific name is given after the stratigraphic group—which

Present Address :

1. C-6, Mandir Park, Mahanagar Extension, Lucknow 226 006.
2. Geological Survey of India, Kashmir Project, Srinagar 190 001.

is also the name of the nearest important locality, in which the trace fossils have been found.

Horizon—The traces occur on slabs of the Amronia Quartzite of the Bijawar Group.

Repository—Department of Applied Geology, University of Saugar; two specimens.

Description—The slabs contain several markings in the form of simple trails, most of which are clearly impressed on the bedding surface of the quartzite. Two prominent markings are illustrated and described here (Fig. 1). The upper trail A is a slightly curving epichnial groove, 10 cm long; it must have been longer, as one end is broken off. The narrow end is about 5 mm wide and widens to 11 mm on the other end. The trail is ornamented with slightly curved, closely spaced, parallel ridges which lie transverse to its sides. The thickness of each ridge is unequal, slightly greater on one end and tapering on the other. The lower trail B in the figure is similar, but occurs as a hypichnial ridge on the undersurface of the superjacent layer of the rock. It is also about 11 cm long—though the full length is not visible in the photograph—and only 5 to 8 mm wide. The furrows on the surface of this ichnofossil are similar to those on trace A but are more closely spaced.

Diagnosis—The *Puratanichnus* is 5-11 mm wide; characterised by slightly curved, closely spaced, parallel segments, lying transverse to its sides. The segments are separated by ridges in the case of epichnial trails and by grooves in hypichnial markings. The ridges or grooves are slightly wider on one end and tapering on the other.

Remarks—The *Puratanichnus* trails were possibly made by an Annelid having its body contact with the substrate surface during rest. The transverse furrows point to the animal having metameric segmented body, possibly made by an oligochaete annelid. No body fossils have been discovered in these beds possibly because of the extreme difficulty of the preservation of a soft-bodied animal in a sediment, particularly of such an antiquity.

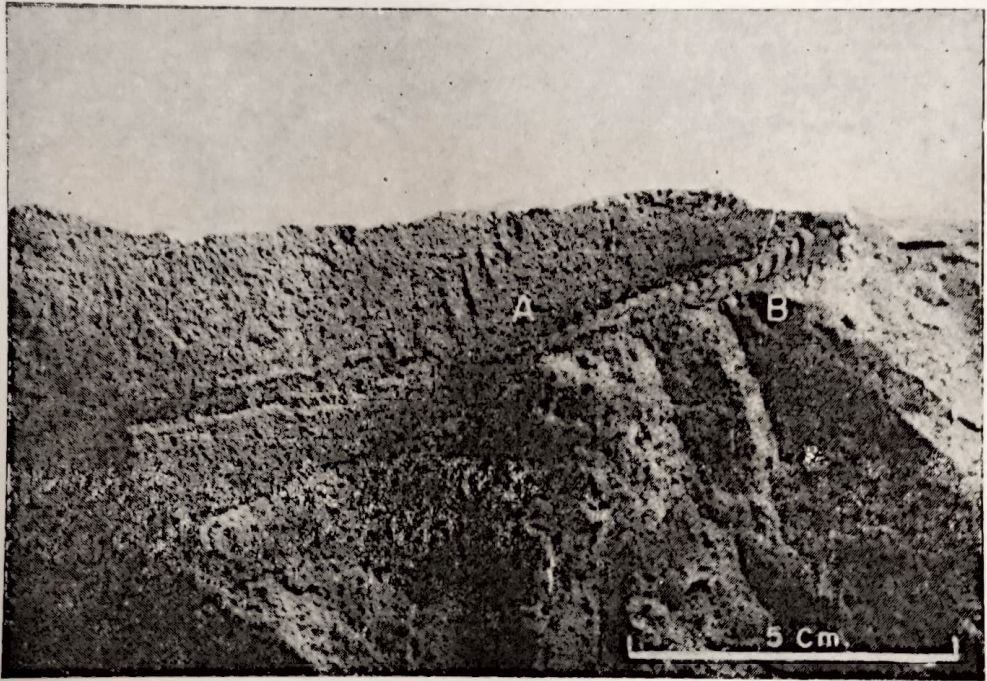
Discussion

If these indeed are ichnofossils made by annelid, as the available evidence indicates, their importance in tracing the evolution of life on the Earth can not be underrated. They are yet another evidence that multicellular life came into existence much before the early Cambrian. The examples described here are possibly the oldest trace fossils attributable to Metazoa on record. They would also point to the existence of an atmosphere almost two billion years ago which was favourable for supporting such forms of developed life.

Professor A. Seilacher of Tübingen University after examining the text and the photograph of these markings is of the opinion that they could be the inorganic sedimentary structures known as *Manchuriophycus*. In the light of his comments the material was carefully reexamined and it was concluded that the markings under study were no doubt ichnofossils and were unrelated to *Manchuriophycus* (see Häntzschel, 1975, p. W176). He also remarked that "the publication of this new discovery would certainly arise a lot of discussion and in fact may be useful in this sense."

Acknowledgements

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Explanation of Plate

Fig. 1. *Puratanichmus bijawarensis* Mathur, 1986 ichnogenus et ichnospecies nov.

(A) Epichnial trail, (B) Hypichnial ridge.