

## TRACE FOSSILS FROM THE BAGH BEDS—PART II

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ABSTRACT—The present paper records six more *species* of *trace fossils* including a new genus from the Nimar Sandstone (Lower Cretaceous) of Amba Donger (21° 59' : 74° 04')—area. *Rivularites*, if it is found to be an algal colony, would be the first algal record from the Nimar Sandstone, since all the algal remains from the Bagh Beds, reported till now, come from the limestones and the marl.

### INTRODUCTION

In the present note we report a few more *trace fossils* (Chiplonkar & Badve, 1969); they fall in the three categories, *trails* and *tracks*, *burrows*, and *trace fossils perhaps of inorganic origin*. The last two *species* are included here as being perhaps due to activity of some organisms, as done by Häntzschel (1962, p. W232), though otherwise they may have been described as sedimentary features like ripple marks, etc.

Among the collection described here presence of the *genera Merostomichnites* and *Rivularites* is of some interest. Because the former, possibly a phyllopod, adds one more to the several arthropodous trails that we have previously reported from these rock formations; while, *Rivularites*, if of algal origin (? Cyanophyceae) as Fliche & White consider it to be (Häntzschel, 1962, p. W236), is of interest because it comes from the Nimar Sandstone, while all the algal species till now reported from the Bagh Beds have come only

from the limestones and the marl. (Chiplonkar, 1944; Durge, 1965; Ghosh & Pal, 1968; 1969; Pal, 1968a, 1968b, 1969; Singh 1950).

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### SYSTEMATIC DESCRIPTION

#### 1. Trails and Tracks

Genus *Merostomichnites* Packard 1900  
*Merostomichnites* cf. *M. strandi* Stormer

Plate 1, Fig. 4

*Material.* One specimen; MOR 47/69.

*Dimensions.* Length of the limb-mark

... 5 mm to 10 mm



Distance between two consecutive limb-marks.....2.5 mm.

*Description.* It is a partially preserved trail having 5 mm to 10 mm long lobes, arranged in series. The lobes are long, thick and with narrow pointed ends. Considering the appearance of the longitudinal narrow space on the broader (presumably the proximal) side of the lobes, as compared to that on the pointed (presumably the distal) side of the lobes, we interpret that the other series of lobes is not preserved.

Triassic forms of this *genus* are attributed to phyllopoets, while the Palaeozoic forms are attributed in part to Trilobites and in part to Euripterids. (Häntzschel, p. W205).

*Remarks.* The lobes of our specimen characteristically resemble the lobes of *M. strandi* Stormer, from the Downtonian of Norway (Häntzschel, p. W205, Fig. 126.5), in dimensions and structure; but in the presumed incomplete state of preservation of our specimen we report it only as comparable to the Norwegianian *species*, which belongs to a much different age.

*Occurrence.* Shales representing beds from upper horizon of Nimar Sandstone at Mongra (22° 00' 30" : 74° 02' 30").

Genus *Protovirgularia* M'Coy 1850

*Protovirgularia mongraensis* sp. nov.

Plate 1, Fig. 2

*Material.* 5 specimens; MOR 21/69, MOR 33/69, MO 2/69, MO 13/69, MO 16/69.

*Dimensions.* Width of trail 2 mm to 3 mm.

*Description.* It is a narrow, slender and straight track with fine median axis flanked on either side by bract-like impressions. They are opposite to each other and meet at the median axis making with it only slightly less than a right angle.

It is probably an ear-like trail of the group *Ichnia spicea* Rudolf Richter (Häntzschel, p. W210). According to Nathorst it is a trail belonging to *Chordohypycaea* of Schimper (Häntzschel, p. W210; Bulman, p. V95; Montanaro-Gallitelli p. F230).

*Remarks.* Present species resembles *Protovirgularia dichotoma*, M'Coy 1850, from Upper Ordovician of Scotland, (Häntzschel, p. W210, fig. 130. 2a and b), in general pattern and dimensions; but its lobes are nearly at right angles to the axis.

*Occurrence.* Shales representing the beds from upper horizon of Nimar Sandstone at Moti Chikhali (22° 01' : 74° 19' 10") and Mongra.

## 2. Burrows

Genus *Discotomaculum* gen. nov.

*Diagnosis.* A zig zag burrow on upper surface of bedding plane filled by tiny discoid

## EXPLANATION OF THE PLATE 1

1 A. *Discotomaculum variabilis* gen. et sp. nov. showing arrangement of the discoid flakes. x4. 1 B. *D. variabilis*, showing nature of Burrow. x.1. 2. *Protovirgularia mongraensis* sp. nov. x.2. 3. *Riularites regularis* sp. nov. x.1. 4. *Merostomichinites* cf. *M. strandi* Stormer. x.1. 5. *Eophyton cretacea* sp. nov. x.1. 6 A, 6. B. *Kinneyia* cf. *K. simulans* Walcott 1914.

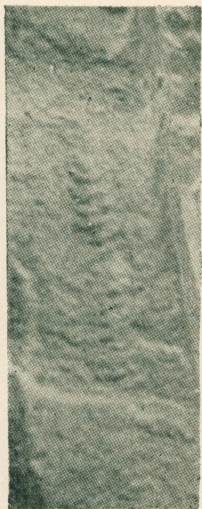




1 A



1 B



2



3



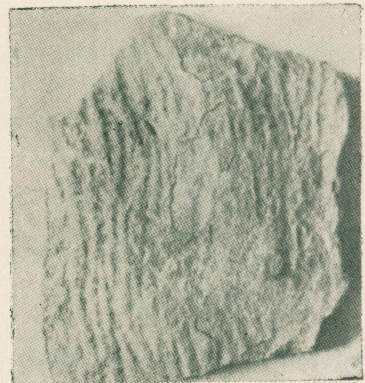
4



5



6 A



6 B



flakes arranged in variable manner, crisscross, parallel to sub-parallel or transverse to the length of the burrow.

*Comparison.* This *genus* at first sight may be confused with the Ordovician *genus Tomaculum* Groom, 1902 (Häntzschel, p. W218-W219, Fig. 133.1) which, however, is filled with ellipsoid fecal pellets, though arranged in a variable manner as in our present *genus*.

*Remarks.* The *genus* described by us as *Discotomaculum* is given this name to indicate its resemblance to *Tomaculum* from which, however, it differs as explained above. From the discoid nature of the flakes filling the burrow, and their proximate chemical composition Ca : 2 Mg these flakes are probably secreted by the animal as it moved ahead in the burrow, but they may not be fecal in nature.

*Discotomaculum variabilis* gen et sp. nov.

Plate 1, Fig. 1A-1B

*Material.* 2 specimens; MOR 55 and MOR 56.

*Dimensions.* Width of the burrow  
... 4 mm to 10 mm.

*Description.* The burrow is a zig zag narrow ridge found in the oyster bed. It is filled with tiny white discoid flakes of calcium magnesium carbonate arranged parallel to sub-parallel to the length in some portions of the burrow. The burrow shows slight widening over short distances at irregular intervals and the sub-parallel arrangement of the flakes tends to be almost transverse to the length of the burrow; while in some portions their arrangement is criss cross.

Another point that may be mentioned here is that the burrow has not revealed the presence of any lining along its wall. Also,

the flakes all along the length of the burrow extend right up to the margin of the burrow, so that there is no indication of even a thin lining along the wall ever secreted by the animal.

The burrow appears to be a *Domichnia* of Seilacher. (Häntzschel, p. W181).

*Occurrence.* In oyster bed of Mongra.

## 2. 'Fossils' probably of inorganic origin

Genus *Eophyton* Torrell 1868

*Eophyton cretacea* sp. nov.

Plate 1, Fig. 5

*Material.* 2 specimens; MO 20/69; MOR 57/69.

*Dimensions.* Width of the single tube...  
1 mm.

*Description.* Specimens in our collection show parallel tube-like straight markings arranged in a plane. Every marking is well in contact with the two on its sides. One of the specimens shows an elongate stick-like form while the other is a broad form. The pattern of the striations is similar on both.

*Eophyton* is interpreted as drag markings on bedding planes produced by organisms or comprising inorganic objects. (Häntzschel, p. W234, Fig. 147.1). We think that the definitely tubular nature and regularity of pattern of the striations on them are indicative of their origin due to activity of some organisms, rather than an inorganic structure.

*Remarks.* Our specimens resemble *Eophyton* sp. from the Cambrian (*Mickwitzia* Ss.) of Sweden in all respects (Häntzschel p. W 234; Fig. 147.1) *Eophyton* is known to occur from Cambrian to Recent.



*Occurrence.* Shales representing the upper beds of Nimar Sandstone at Moti Chikhali and oyster bed at Mongra.

Genus *Kinneyia* Walcott 1914

*Kinneyia* cf. *K. simulans* Walcott 1914

Plate 1, Figs. 6A-6B

*Material.* 2 slabs; MOR 12/69; MOR 1/69.

*Dimensions.*

Specimen nos.	No. of ripple marks in one cm	Width of ripple Crest to crest
MOR 12/69	6 to 8	2 mm.
MOR 1/69	8 to 9	1.5 mm.

*Description.* The structure represents fine ripple-like marks, with the markings almost parallel, but with slightly zig zag course. Often they coalesce, but maintain the general parallelism. Impressions are on the upper surface of the beds.

According to Häntzschel (p. W236), it is inorganic in origin.

*Remarks.* Our specimens agree with *Kinneyia simulans* Walcott, 1914, from the Permian of U.S.A. and the Silurian of North Africa (Häntzschel, p. W236, Fig. 146.3). But in view of the widely differing ages we report our material as only comparable to Walcott's species.

*Occurrence.* Shales representing beds from the upper horizon of Nimar Sandstone at Mongra.

Geus *Rivularites* Fliche 1905

*Rivularites regularis* sp. nov.

Plate 1, Fig. 3

*Material.* 2 slabs; MOR 42/69; MO 17/69.

*Description.* The specimens show roughly globular, small tubercles (from 3 mm to 6 mm across) arranged in parallel rows. They are essentially of more or less uniform size in any given row. The size of the tubercles decreases in successive rows over a short distance, after which again it increases to repeat the whole pattern in a cyclic manner.

These structures are explained as algal colonies (? Cyanophyceae) by Fliche and White (Häntzschel, p. W236). *Rivularites permiensis* White, is very similar to mud flow markings on bedding planes; while C. L. Fenton (1946) compares them with small ripple marks (Häntzschel, p. W236).

*Remarks.* When compared with *Rivularites permiensis* White (Häntzschel, p. W236, fig. 147.3) our specimens agree in dimensions but differ in having regular desposition of rows of the tubercles.

Similar but much larger structures are described as "Interference ripple marks" by Pettijohn & Potter (p. 314, Pl. 87A).

*Occurrence.* Shales representing beds from upper horizon of Nimar Sandstone at Moti Chikhali and Mongra.

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