

MISRAEA, A NEW BODY FOSSIL FROM THE LOWER VINDHYAN SUPERGROUP (LATE PRECAMBRIAN) AROUND CHOPAN, MIRZAPUR DISTRICT, U.P.

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Abstract

Misraea gen. nov., a keel shape spongy body-fossil is recorded from the Semri Group of Vindhyan exposed around Chopan. Two species have been identified. *Misraea vindhyanensis* sp. nov. is characterised by the presence of perforations on the wall, whereas *M. psilata* sp. nov. has psilate wall.

Introduction

In recent years scores of literature on different body fossils, possibly of animal origin have been published from the Late Precambrian of Russia and China (Missarzhevsky, 1969; Yuelun *et al.*, 1980). These remains from Russia and China belong to Chiolites, Gastropods, Chiolitelmites, Camenids and Miscellaneous remains. Uptill now, body fossils have so far not been recorded from the Vindhyan Supergroup. However, Tandon and Kumar (1977) reported impressions of animal fossils belonging to annelid and arthropod from the Rohtas Formation, Lower Vindhyan. The present paper deals with the occurrence of body fossils from the Lower Vindhyan succession exposed around Chopan.

General Geology

The Vindhyan Supergroup in this area has been recently mapped by Mathur (1981). The geological succession in the area is detailed below:

Group	Formation
Kaimur	Dhandraul Quartzite
	Bijaigarh Shale
	Markundi Quartzite
	Ghurma Shale
	Ghaghar Quartzite
Semri	Rohtas Limestone
	Basuhari Sandstone
	Bargawan Limestone
	Kheinjua Shale
	Chopan Porcellanite
	Kajrahat Limestone
	Arangi Formation

The material for the present study comes from the areas and formations as detailed in Table-1.

Table 1

Formation	Location	Lithology
Chopan	Exposed along the road and railway	Grey, greenish to brownish
Porcellanite	cutting from Dala to Ghurma	finely laminated porcellanite
Kheinjua	Section exposed along the junction	Olive, fine grained compact
Shale	of Ghagar and Son rivers. 4½ km NE of Chopan Dak Bungalow	shale
Rohtas	Exposed east of Markundi (about	Light grey, fine grained, argillaceous
Limestone	1½ km NE of junction of Ghagar and Son rivers)	shale bands interbedded between limestone bands.

The material described in the present paper has been isolated by treating pieces of rocks in hydrochloric acid for three hours and subsequently by hydrofluoric acid till complete disintegration of rocks. Afterwards the sample was repeatedly washed in distilled water. After completely removing the traces of acid, body-fossils were picked up with the help of brush. The body fossils were stored in formaldehyde in glass vial.

Age of Vindhyan

Radiometric data are available on the rocks of Semri and Kaimur groups. Mathur (1964) by Rb-Sr method reported an age 1130±20 m.y. for the Majhagawan diamond bearing pipe rock which is an intrusive into the Kaimur. Vingradov *et al.* (1964) on the basis of K-Ar method estimated that Semri Group to be between 1400-1100 my whereas Kaimur Group to be 940-910 my. Crawford and Compston (1970) on the basis of Rb-Sr method proposed that the age of the Vindhyan Supergroup extends over a long period from at least 1200 my and possibly 1400 m.y. to perhaps 550 m.y. or even later. The base of Upper Vindhyan is dated to be about 1150 m.y. or more. Balasundaram and Balasubramanyam (1973) gave a date 940 m.y. for Lower Kaimur host rock of Panna Kimberlite. Srivastava, Saini and Rajagopalan (1983) have dated Basuhari Sandstone Formation of Chopan area to ±1200 m.y.

Description

MISRAEA gen. nov.

Diagnosis—Spongy body-fossil, keel form, outline triangular to sub-triangular, surface convexly raised with inner concave hollow depression, body margin curved inward forming a rim, rim area smooth or with transverse thickenings, overall outline smooth, body either psilate or with distinct perforations.

Genotype—*Misraea vindhyanensis* sp. nov.

Description—Several spongy boat shape body-fossils were recovered. In section, it will appear as in Text-fig. A, i. e. the surfaces raised outwardly with inner hollow area, margin curved inwards to form a distinct rim, rim extending upto 1/8 to 1/6 dimension of the overall body size. Surface smooth or with distinct perforations. Perforations in wall continuous. Marginal rim may have transverse striae like thickenings or totally smooth.

Comparison—The Vindhyan body fossil, *Misraea* compares in its triangular shape to *Sunnagina* Missarzhevsky (1969). *Sunnagina* differs due to extremely small size and the siliceous nature of body. Moreover, the margins in *Sunnagina* are not forming rim. *Discinella* Hall (in Missarzhevsky, 1969) compares in outline but differs in the presence of concentric growth lines on the surface of body.

The affinity of this Vindhyan fossils is quite obscure, hence it is extremely difficult to place them in any known animal group with certainty. Therefore, they are classed here 'Miscellaneous fossils of uncertain status' as proposed by Missarzhevsky (1969).

Misraea vindhyanensis sp. nov.

Pl. 1, figs. 1-6; Text-fig. 1A-C

Diagnosis—Boat shape, measuring 1-1.8 cm, surface raised with inner distinct hollow area, wall with several rounded perforations, measuring 0.04 mm, closely placed, margin curved inwards forming rim outline entire, +0.2 cm broad, with transverse thickenings.

Holotype—Pl. 1, Fig. 1, Specimen no. 35820, B. S. I. P. Lucknow.

Locality—Road cutting along Dala-Chopan and Obra crossing

Horizon—Chopan Porcellanite Formation.

Misraea psilata sp. nov.

Pl. 1, fig. 7

Diagnosis—Outline subtriangular, measuring 2-2.5 cm, body raised with inner hollow area, surface smooth, body curved inwardly forming a rim, measuring 0.2-0.5 mm broad, thickening absent.

Holotype—Pl. 1, Fig. 7, Specimen no. 35825, B. S. I. P. Lucknow.

Locality—East or Markundi (1.5 km North-East of Ghagar and Son River Junction.

Horizon—Rohtas Limestone Formation.

Comparison—*Misraea psilata* sp. nov. differs from *M. vindhyanensis* sp. nov. in the absence of perforations on wall and thickenings on rim.

Discussions

At present the distribution of *Misraea* seems to be significant stratigraphically in the present area. *Misraea vindhyanensis* sp. nov. is known from the Chopan Porcellanite Formation and the overlying Kheinjua Shale Formation, whereas *M. psilata* sp. nov. is only known from the Rohtas Limestone Formation. In between Kheinjua Shales and Rohtas Limestone Formation, Bargawan Limestone and Basuhari Sandstone Formations are present. This indicates that they may be time marker.

References

- BALASUNDRAM, M. S. & BALASUBRAMANYAM, M. N. (1973). Geochronology of the Indian Precambrian. *Bull. geol. soc. Malaysia*, **6** : 213-226.
- CRAWFORD, A. R. & COMPTON, W. (1970). The age of the Vindhyan system of Peninsular India. *Q. Jl. geol. Soc. Lond.*, **125**(3) : 351-371.
- MATHUR, S. M. (1964). Coaly matter in the Vindhyan System. *Indian miner.*, **18** : 158-165.
- MATHUR, S. M. (1981). A revision of the stratigraphy of the Vindhyan Supergroup in the Son Valley Mirzapur District. *G. S. I. Misc. Publ.*, **50** : 7-20.
- MISSARZHEVSKY, V. V. (1969). Description of Hyolithids, Gastropods, Hyolithelminths, Camendies and Form of an Ubscure taxonomic position, In Ed. Raaben, M. E. *The Tommotian Stage and the Cambrian Lower boundary problem* : 105-174 (In Russian).
- SRIVASTAVA, A. P., SAINI, H. S. & RAJAGOPALAN, G. (1983). Dating of Glauconite from three sedimentary formations of Peninsular India. *Proc. of the 3rd National SSNTDS conference* (ed. H. S. Virk) : 15-19.
- TANDON, K. K. & KUMAR, S. (1977). Discovery of annelid and arthropod remains from Lower Vindhyan rocks (Precambrian) of Central India. *Geophytology*, **7**(1) : 126-129.
- YUELUN, W., ZONGBIN, L., YUSHENG, X., ZHENJIA, G., WEIXING L., GUOGAN M., LUYI Z. & SOGNIAN, L. (1980). Subdivisions and correlation of the Upper Precambrian in China. In: Yuelang, W. (Editor) — *Research on Precambrian Geology Sinian suberathem in China, Tianjin*.
- VINGRADOV, A., TUGARINOV, A., ZHYKOV, C., STAPNIKOVA, N. & BIBIKOVA, E. (1964). Geochronology of Indian Precambrian. *Intern. geol. cong. 22nd New Delhi, India., Pt.*, **10** : 553-567.

Explanation of Plate

(All figured specimens are preserved in the Museum of Birbal Sahni Institute of Palaeobotany, Lucknow.)

PLATE 1

Misraea vindhyanensis gen. et. sp. nov.

1. Raised surface showing distinct perforations; Holotype specimens no. 35820, Chopan Porcellanite Formation; $\times 5$.
2. The same specimen photographed from the hollow side, note distinct rim area with thickenings; $\times 5$.
3. Specimen showing distinct rim; specimen no. 35821, Chopan Porcellanite Formation; $\times 5$.
4. Incomplete specimen showing perforations; specimen no. 35822; Chopan Porcellanite Formation; $\times 5$.
5. Specimen showing distinct perforations on entire surface, specimen no 35823; Kheinjua Shale Formation; $\times 5$.
6. Incomplete specimen showing perforations; specimen no. 35824; Kheinjua Shale Formation; $\times 4$.
7. *Misraea psilata* sp. nov.; Two specimens showing smooth surface; specimen no. 35825; Rohtas Limestone Formation; $\times 2$.

