

## DISCOVERY OF ANNELID AND ARTHROPOD REMAINS FROM LOWER VINDHYAN ROCKS (PRECAMBRIAN) OF CENTRAL INDIA

This note records the first evidence of definite worm and arthropod remains from Lower Vindhyan rocks. Earlier, a worm trace fossil was reported by BEER (1919) from Rohta; Limestone (Lower Vindhyan), Rohtas, India. The Precambrian Vindhyan sequence of Central India attains a thickness of about 4,000 metres with varying lithology represented by sandstones, shales and limestones. The fossils recovered from Vindhyan have been reviewed by MISRA (1969).

The present collection consists of more than 200 worm and lone arthropod remains from a thinly bedded sequence of calcareous shales and argillaceous limestones in an open cast abandoned limestone quarry at Tikaria about 2 km SW of Katni railway station. The fossil zone could not be traced downwards as it is submerged under water. On the top of the quarry there is a band of about 4.5 metre thick laminated limestones and shales. Underlying these occurs the fossiliferous argillo-calcareous horizon. The rocks dip 15° W 20°N and belong to Rohtas Formation (Stage) of Semri Group (Semri Series of AUDEN, 1933). The systematic description is given below.

Phylum—Annelida; Class—Incertae sedis; Order—Incertae sedis; Family—Incertae sedis  
Genus—**Katnia** gen. nov. *Type species*—*Katnia singhi* gen. et sp. nov.

*Diagnosis*—The generic diagnosis is the same as for the type species.

**Katnia singhi** sp. nov. (Fig. 1).

Fifteen specimens preserved in ash-grey and white siltstone, shales and thinly laminated shaly brownish limestones. Holotype and five specimens with counterparts. Not a single complete worm remain could be recovered as they are covered with matrix, which when removed peels off the structure. The holotype specimen appears to be associated with more than one worm.

*Diagnosis*—Worm pale brown, cuticular, long, flat, thin, coiled and bent upon itself; animal differentiated into head and body, worm length traced up to 26.4 mm, maximum width 1.75 mm; narrow anteriorly, broad posteriorly; ventrally head differentiated into small almost equal sized, transversely elongate proboscis and prostomium, both having faint transverse ridges or wrinkles, an elliptical mouth within proboscis, four centrally placed curved slender jaw-like structures present; they vary in length from 0.1 mm to 0.13 mm; proboscis measures 0.32 mm × 0.87 mm and prostomium slightly broken on right side. Body divided into number of transverse elongate segments, each with a central white and ash-grey coloured lobulate transversely elongate area, junction of two adjoining segments slightly curved, length of successive posterior segments from head gradually increases, maximum in 12th and 13th, after that gradually decreases till 28th, beyond which cuticular part not well preserved; length of segments from 0.87 mm to 1.75 mm and width from 0.26 mm to 0.37 mm; 26 segments in a length of 7.4 mm (holotype); 14 segments in a length of 3.8 mm (paratype), 13 segments in a length of 4.0 mm (paratype).

*Katnia singhi* gen. et sp. nov. has been classified under Annelida due the presence of jawed head and segmented body. The movement of the worm was probably due to

spasmodic contraction of the muscles. A few of the segments probably have 6-8 very faint transversely arranged papillae-like structures.

The generic name has been derived after the type locality Katni and the species is named in honour of Professor S. N. Singh, Head of the Geology Department, Lucknow University.

*Horizon and type locality*—Rohtas Formation, Semri Group, Lower Vindhyan; Katni, M.P., India.

Holotype No. L.U.T.S. 35, Paratypes No. L.U.T.S. 40 and L.U.T.S. 51 in author's collection.

Phylum—Arthropoda; Class—Insecta; Order—Incertae sedis; Family—Incertae sedis

Genus—**Vindhyavasinia** gen. nov. *Type species*—*Vindhyavasinia misrai* gen. et sp. nov.

*Diagnosis*—The generic diagnosis is the same as for the type species.

**Vindhyavasinia misrai** sp. nov. (Figs. 2, 3)

Single carbonised, highly fragile, laterally preserved specimen in ash-grey siltstone.

*Diagnosis*—In lateral view body elongate, subquadrate, differentiated into head, thorax and abdomen; length 2.75 mm, height 1.42 mm; head broadly oval, probably hypognathus, broad dorsally, narrow ventrally, eye indistinct, below the middle of the antero-lateral margin of head a very short, finely segmented, antenna-like structure present, just below it a short, narrow, downwardly curved proboscis; mandible, maxilla and labium undifferentiated due to poor preservation, head measures 0.5 mm  $\times$  0.88 mm; postoccipital suture distinct on dorsal and mid region; thorax with three curved segments each bearing jointed leg arising ventrolaterally, prothorax narrowest and metathorax broadest, first leg broken

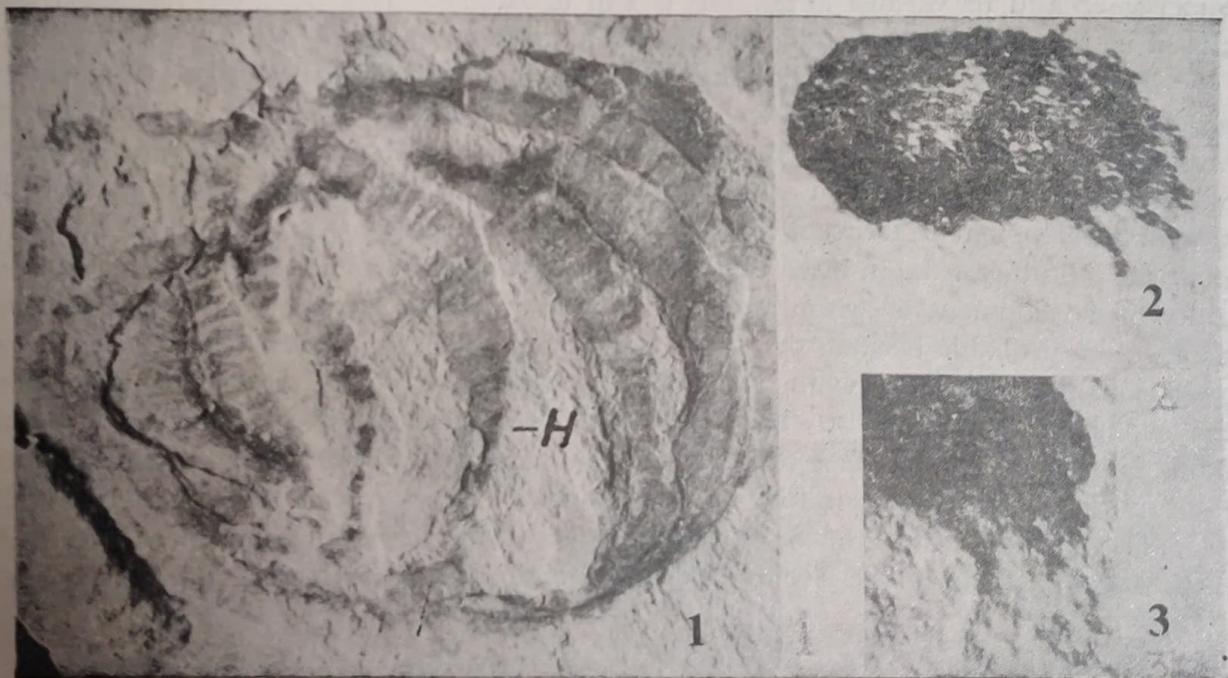


Fig. 1—*Katnia singhi* gen. et sp. nov. (H-Holotype, L. U. T. S. 35),  $\times$ 4.7

Fig. 2—*Vindhyavasinia misrai* gen. et sp. nov. (Holotype, L. U. T. S. 34), Lateral view,  $\times$  16.3

Fig. 3—An enlarged part of Fig. 2 showing the aurolium of third leg,  $\times$ 20.

distally, proximal part lies under the head, only a part of femur, small tibia and broken tarsus visible, 2nd leg broken, only a subtriangular stretched coxa present on mesothorax covering a part of prothorax, third leg arises from metathorax, well developed, differentiated into femur, small tibia and tarsus with a small segment bearing distally a long oar shaped aurolium and fine elongate poorly preserved tarsal claw; thorax measures 0.6 mm × 1.1 mm; abdomen probably has five segments, dorsal side more or less straight with faint overlapping of segments, ventral side has five lobes, first segment narrowest, fourth broadest, fifth, the last, broadly rounded posteriorly and has a very small anal opening on postero-ventral side; tergites and sternites not well marked; abdomen measures 1.42 mm × 1.7 mm.

*Vindhyavasinia misrai* gen. et sp. nov. has been assigned to Class Insecta due to incised, sclerotised body differentiated into head, thorax with three jointed legs and segmented abdomen. Presence of proboscis suggests that the form was most probably sucking type and it may or may not be a biting type also. The oar shaped aurolium of third leg suggests that the animal used to swim and hop. An egg 0.18 mm wide, partly broken on upper surface having carbonised animal inside has also been found within the shale which may either belong to this genus or to some other unknown form.

The generic name is after Goddess Vindhyasini and the species is named in honour of Professor R. C. Misra, retired Head of the Geology Department, Lucknow University.

*Horizon and type locality*—Rohtas Formation, Semri Group, Lower Vindhyan; Katni, M.P., India.

Holotype No. L.U.T.S. 34 in author's collection.

The age of glauconite from Glauconitic Sandstone, which underlies the Rohtas Formation, is given by TUGIRANOV AND VANIGRADOV (1964) as  $1110 \pm 60$  m. y. Thus the upper age of the Rohtas may be taken between 1000—1100 m.y. The age of Vindhyan Supergroup and its various formations is still debatable. This point has not been discussed in the present note but will be taken up later on.

The Fawn Limestone underlying the Glauconitic Sandstone (KUMAR, 1976) shows profuse development of *Conophyton garganicus* and *Colonella columnaris*. A preliminary investigation by the authors has revealed well preserved micro-organisms in bedded cherts of the Fawn Limestone which are under study. Even in the Basal Formation, there is a good development of forms of *Kussiella*, *Conophyton* and *Colonella* groups. This indicates that the Vindhyan basin was full of rich varied algal and bacterial life. The possibility of development of worm and arthropod-like animals feeding on organic material seems quite probable because the Vindhyan Sea was rich in organic debris. *Katmia* was gregarious and benthonic while *Vindhyavasinia* was nektonic and throws a new light on the evolution of arthropods. They lived in lagoon-mud-tidal flats environment. The fauna is indicative of the fact that Metazoa were present during Vindhyan times (Late Precambrian?) and very primitive forms would have been evolved in still older rocks.

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