Occurrence of a solenoporoid alga in the Deccan Intertrappean beds of Mohgaonkalan, Chhindwara District, Madhya Pradesh

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A fossil red alga Solenopora Dybowski of Solenoporaceae has been described for the first time from the Deccan Intertrappean beds of Mohgaonkalan, Chhindwara District, Madhya Pradesh. Its occurrence supports the presence of marine conditions in this area during the Early Tertiary period.

Key-words—Solenopora, Red alga, Deccan Intertrappean beds, Early Tertiary (India).

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A NUMBER of algal remains, known from various Deccan Intertrappean localities, have been listed by Prakash (1960) and Lakhanpal (1973). Majority of them belongs to Charophytes. In addition, some more algal forms in the last decade have been described by several other workers (Shivarudrappa, 1972a, 1972b, 1977, 1981; Bhatia & Mannikeri, 1976; Biradar, 1977; Bande, Prakash & Bonde, 1981; Barlinge & Paradkar, 1982; Marathe, Barlinge & Paradkar, 1984; Mishra & Maithy, 1984; Trivedi, Baijap & Trivedi, 1985). Two of them, Distichoplax raog Varma and Peyssonnelia antiqua Johnson, are important. The former is indicative of Palaeocene-Eocene age while the later indicates marine conditions.

SYSTEMATIC DESCRIPTION

Family—Solenoporaceae

Genus—Solenopora Dybowski 1878

Solenopora sp.

Pl. 1, figs 1-6

Material—While studying the slides of the chert material, several algal specimens almost similar in structure but differing in thickness of the thallus were discovered. Three of them have been selected for the present study.

Description—The thalli are nodular and crustose ranging in thickness from 170-1200 µm (Pl. 1, figs 1, 2, 6). The thallus is undifferentiated into hypothallus and perithallus and in vertical section the tissue is occurring as vertical files or tubules of more or less rectangular cells, with prominent vertical walls (Pl. 1, figs 3, 4, 6). Sometimes, cells appear variously shaped due to poor preservation. Their size varies from about 17-120 µm in length and 13-95 µm in width. Septa are present in the tubules but at irregular intervals (Pl. 1, fig. 5). Reproductive structures are absent.

DISCUSSION

The family Solenoporaceae is an extinct group of fossil marine organisms, nodular or encrusting in habit and formed internally of closely packed
radially or vertically divergent rows of elongate cells. Occasionally referred to various animal groups, they are usually interpreted as calcareous algae related to the living Corallinaceae, which resemble closely in growth form and general internal structure. The thallus is undifferentiated into hypothallus and perithallus and the cell diameters are almost always greater than those of corallines. In Solenoporaceae, though the vegetative tissue is similar to that of the corallines, reproductive structures are relatively uncommon and almost doubtful and obscure except in Neosolenopora (Elliott, 1965). The family consists of four valid taxa, viz., Solenomertis, Parachaetetes, Solenopora and Neosolenopora. They are classified almost entirely on the types of cellular tissue. The important aspects considered are: (i) presence or absence of filament partitions (horizontal cell walls), (ii) regular or irregular spacing of partitions, and (iii) shape of cells in cross section (Wray, 1977).

Solenomertis is characterized by a marked irregularity in its cellular tissue. In vertical section individual cells appear to be irregular in shape, because cell partitions alternate in position with adjacent filaments giving a zig zag effect in Parachaetetes, filaments have well-defined, regularly spaced partitions between cells, which give the tissue a grid-like pattern in vertical section (Wray, 1977). There is no regularity in the occurrence of septum in the fossil, therefore, it may be either Solenopora or Neosolenopora. As the reproductive structures are very common in the latter, a Miocene genus, the present fossil has been kept under the genus Solenopora which was instituted by Dybowski in 1878 (Elliott, 1973; Flăgă, 1977).

The geologic range of Solenoporaceae is from Lower Palaeozoic to mid-Tertiary (Elliott, 1973). So far five species of Solenopora have been described from various parts of the country. These are Solenopora hookeri from the Upper Permian of North Sikim (Oakley, 1941), S. jurassica as well as S. coramondalensis from the Jurassic of Cullygoody Limestone, Trichinopoly, Tamil Nadu (Narayana Rao, 1946), and S. sahnii and S. tiruchienis from the Cretaceous of Trichinopoly, Tamil Nadu (Rama Rao & Gowda, 1954). However, due to poor preservation the present fossil could not be compared with the above species. Therefore, under the circumstances, it has been described as Solenopora sp. Besides, Parachaetetes asvapatli from the Ninijur (Upper Cretaceous) Group of Trichinopoly, Tamil Nadu (Rama Rao & Pia, 1936), Solenomertis (? douvillei) from the Lower Eocene (Laki) rocks of Nanmol Gorge, Salt Range (Narayana Rao & Varma, 1953) and Neosolenopora ramaraoi from the Miocene of Limestone Hut Bay Formation of Andaman Island (Gururaja, 1977) are also known from India.

The ecological distribution of the family Solenoporaceae is largely comparable to some modern coralline algae. The sedimentological record indicates that it occupied open-marine environments of normal salinities (Wray, 1977). The family Solenoporaceae has been described here for the first time from the Deccan Intertrappean beds of India. Based on the presence of fossils of coastal plants like Cocos, Nipa and Sonneretia from the Deccan Intertrappean beds of Mohgaonkalan in Chhindwara District, Lakhnapan (1970, 1974) has already envisaged the presence of an arm of Tethys sea in Central India during this period. A few years later, Bande, Prakash and Bonde (1981) described two marine red algal forms, Peyssonnelia and Distichoplax, from the same beds. Thus obviously the present finding of Solenopora of Solenoporaceae from the same beds gives further support to this theory.

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**PLATE 1**

1. Solenopora sp.—Section of chert in low power showing nature of thallus. x 15; Slide no. BSIP 35940 I.
2. Solenopora sp.—Section of chert in low power showing nature of another thallus. x 9; Slide no. BSIP 35940 II.
3. Solenopora sp.—Vertical section of thallus (shown in fig. 2) in high power showing nature of filaments. x 45; Slide no. BSIP 35940 II.
4. Solenopora sp.—Vertical section of thallus (shown in fig. 1) in high power showing nature of filaments. x 90; Slide no. BSIP 35940 I.
5. Solenopora sp.—Magnified view of thallus (fig. 4) showing nature of cells. x 175; Slide no. BSIP 35940 I.
6. Solenopora sp.—Vertical section of another thallus in high power showing nature of filaments. x 40; Slide no. BSIP 35940 III.
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