

SOME ALGAL MICROFOSSILS ISOLATED FROM SONDA COAL DEPOSITS, THATTA DISTRICT, SIND, PAKISTAN

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Abstract

Unicellular, colonial and filamentous forms of algae represented by *Cephalia globata*, *Coelastrum cambricum*, *Dinogymnium acuminatum*, *Pinnularia denticulata* sp. nov., *Stichococcus bacillaris*, *Myxococcoides muricata* and *Synechococcus aeruginosus*, *Chaetomorpha akineta* sp. nov., *Genecularia* sp., *Zygnema terrestre* and *Oscillatoria vizagapatensis* isolated for testing coal of Sonda are described.

Introduction

The brown coal of Sonda coal field (Lat. 68° 15' N, long. 25° E) lower paleocene (Shah, 1977) is rich in microfossils. From this coal some algal filaments, trilete spores, winged pollen grains and fungal spores were identified (Sahito *et al.*, 1986, 1987a, b). This paper reports some additions to the algal fossils of marine and fresh water in origin from the coal of Sonda.

Material and Method

Coal samples greyish black in colour were obtained at 681, 722, 729, 782, 790, 806 and 830 ft depths from the core of exploratory bore holes drilled in the area. These samples were macerated under Schultz's (1928) method of maceration and the slides prepared following the standard techniques of Kisser (1935).

Results and Discussion

The description of algal microfossils isolated from Sonda coal is as follows:

Cephalia globata Sah and Kar, 1972. Marine Microplankton, unicellular ± oval to circular 55 x 49 µm in diam., with numerous oil globules forming pseudoreticulate appearance. Wall 2-2.5 µm thick, with a small projection emerging from the cell wall (Fig. 1 A).

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Chaetomorpha akineta sp. nov. Filament cylindrical and long, cells cubical 7.5-15 x 7.5-10 μm broad, on both ends of the filament, cell resembling like akinete, basal cell 7.5-10 x 10 μm and terminal cell 16.25 x 10 μm in diam. (Fig. 1 B).

Dinogynium acuminatum (Evitt, Clark & Verdier, 1967) Scott & Srivastava, 1984. Marine phytoplankton, 80 μm long, 24-30 μm broad with slightly curved sides running over the surface of the body giving loop like appearance at one region. Body surface granulated due to deposition of some reserve products (Fig. 1 C, D).

Pinnularia denticulata sp. nov. Fresh water phytoplankton, frustula rectangular 18 x 52 μm in diam., with thick wall, striae broad opposite forming dental structure straight and parallel, 10-12 in number, 2-5 μm diam., spaced 1.5-2 μm from each other (Fig. 1E).

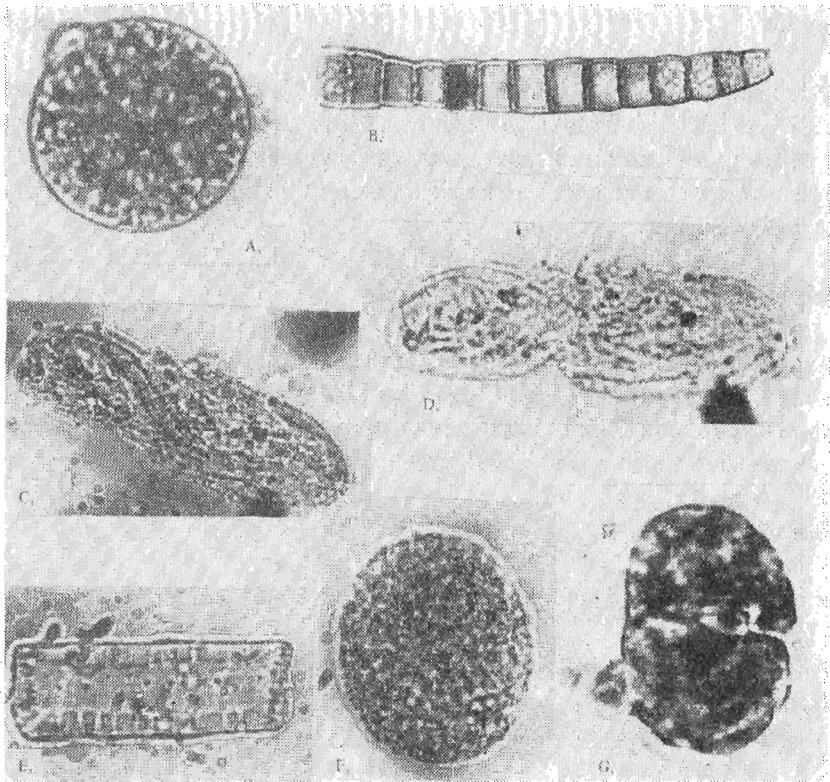


Fig. 1. A-G. A. *Cephalia globata*, B. *Chaetomorpha akineta* sp. nov., C, D. *Dinogynium acuminatum*, E. *Pinnularia denticulata*. sp. nov., F. *Myxococcoides muricata*., G. *Synechococcus aeruginosus*.

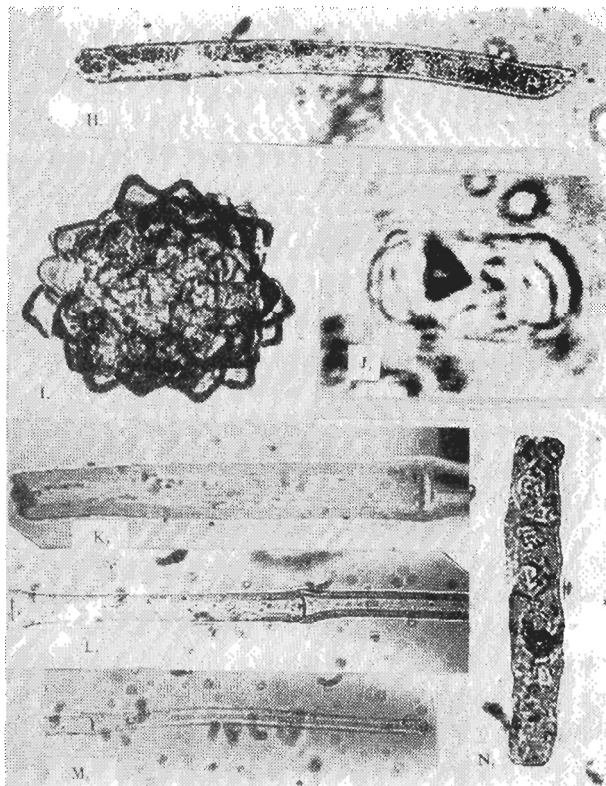


Fig. 1. (Cont'd) H-N. H. *Oscillatoria vizagapatensis*. I. *Coelastrum cambricum*, J. *Stichococcus bacillaris*, K, L, M. *Genecularia* sp., N. *Zygnema terrestre*.

Myxococcoides muricata Schopf & Barghoorn, 1969. Fresh water, cells commonly spherical or spheroidal, ellipsoidal, unicellular. Surface texture coarsely reticulate and muricate, cell diam., 10-14.5 μm . Cell wall opaque forming variable thickness commonly 1 μ thick (Fig. 1 F).

Synechococcus aeruginosus Naegeli, 1849. Fresh water, cells medium size with a slight constriction in the middle, ends broad rounded, wider towards the apices. Cell 16-18 μm in diam., cell wall thick dark brownish in colour. Chloroplast type structure present with large central pyrenoid in each semi cell, sides somewhat curved (Fig. 1 G).

Oscillatoria vizagapatensis (Rao, 1938) Leghari & Nizamani, 1985. Fresh water. Filament nonseptate unbranched, measuring 10.5 x 12.5 μm in diam., tubular in structure without sheath, apical end curved (Fig. 1 H).

Coelastrum cambricum Archer, 1978. Fresh water, colonies ovoid 33-119 μm in diam., composed of 32-64 conical cells. Cells 17.5-22 x 14-17.5 μm in diam. The narrow end of the cell directed outward. Cell wall 1.9-2.5 μm thick (Fig. 1 I)

Stichococcus bacillaris Naegeli, 1849. Fresh water. Body composed of short cylindrical single cell, giving the indication about the presence of parietal type of chloroplast lying by the side of cell wall. Cell 2-3.5 x 38 μm in diam., (Fig. 1 J).

Genecularia sp. Filament unbranched, cells cylindrical each measuring 28-35 x 280-297.5 μm in diam., adjoined end to end, septa slightly enlarged at the end of the cell. Cell wall 2.5-3 μm in thickness with minute granular dots (Fig. 1 K, L, M).

Zygnema terrestre Randhawa, 1938. Filament uniseriate, measuring 25 x 130 μm in diam., cells short 7.5-25 x 30.5 μm in diam., each cell with 2-3 spherical type chloroplast, measuring 12.5-19 μm in diam., (Fig. 1N).

The microplankton *Cephalia*, *Dinogymnium* are free floating while *Chaetomorpha* (filamentous algae) occur attached to rocks and shells found in marine water (Sah & Kar, 1972; Scott & Srivastava, 1984, Bold & Wynne, 1978.) *Coelastrum*, *Pinnularia*, *Synechococcus*, *Myxococcoides* are unicellular and colonial fresh water microplanktons. While *Genecularia* and *Zygnema* are filamentous forms, commonly occur in fresh water and more particularly favours slow flowing or stagnant ponds or ditches, the *Stichococcus* and *Oscillatoria* are often found in association with other algae to form films on floating wood (Prescott, 1968). From the study of algal microfossils, it is concluded that the place of deposition of Sonda coal beds was coastal, probably deltaic. This is evidenced by the presence of brackish water algal bodies which have been described here.

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