

CLYPEINA (DASYCLADACEAE) FROM THE CRETACEOUS OF SOUTH INDIA

CHANDRA PRAKASH VARMA

Birbal Sahni Institute of Palaeobotany, Lucknow

ABSTRACT

The genus *Clypeina*, so far known to occur only in the Eocene and Jurassic formations, is recorded here as *C. Sahnii* sp. nov. from the Cretaceous rocks. This is also the first record of the genus from India.

INTRODUCTION

CALCAREOUS marine algae were discovered by L. Rama Rao in the Cretaceous rocks of Trichinopoly district, South India, which were subsequently worked out in detail by J. Pia (see L. R. RAO & J. PIA, 1936). Both green and red algae were recorded. The fossils described were obtained from the Niniyur group of rocks of the same district, considered to be of uppermost Cretaceous (Danian) age. Jurassic algae from this district were described by S. R. N. Rao (1946).

The material was collected by S. R. N. Rao from Mattur ($11^{\circ} 11' : 79^{\circ} 2'$). This is of the same age, but a different locality from that studied by Pia. The specimens are cherts in which the original calcium carbonate fossils are cemented in a silicious matrix. The chert blocks, which looked unfossiliferous in surface view, yielded the algae and also foraminifera, when cut in thin sections. I examined about twenty slides very kindly passed on to me by Prof. S. R. N. Rao, in which I was able to recognize several of Pia's algae and in addition the new species of *Clypeina* described here.

GENUS CLYPEINA MICHELIN

The diagnostic characters of the genus as noted by L. and J. Morellet (1913) are: Pétits corpuscules calcaires en forme d'entonnoir ou de disque perforé en son centre, constitués par un verticille de chambres sporangiques allongées, soudées entre elles latéralement, au moins à leur base, et communiquant chacune par un pore avec la cavité axiale.

The genus is represented only in the fossil state. The type is *C. marginoporella* from

the French Eocene described by Michelin in 1845. Four other Eocene species, *C. infundibuliformis*, *C. stelliformis*, *C. helvetica* and *C. Pezanti* are known (L. & J. MORELLET, 1918, 1922, 1939). In addition there is *C. jurassica* known from the Jurassic (J. MORELLET, 1950). No Cretaceous species has hitherto been recorded.

The genus is classified by Pia (in HIRMER, 1927) in the Dasycladaceae, tribe Diploporeae, sub-tribe Macroporellinae, suggesting a closer affinity with *Physoporella* and *Actinoporella*. L. and J. Morellet, on the other hand, classify it in the tribe Acetabularieae of the Dasycladaceae.

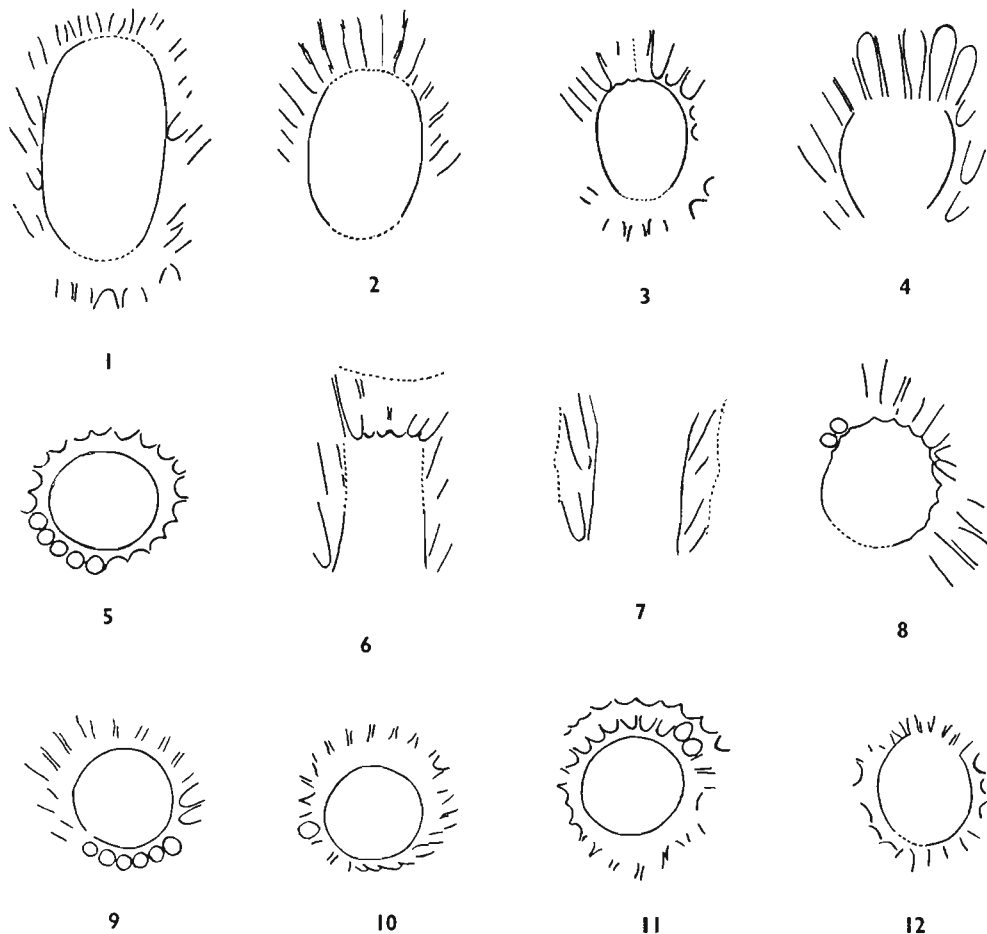
DESCRIPTION

CLYPEINA SAHNII SP. NOV.

Pl. 1, Figs. 1-6, type specimen, Fig. 6; Text-figs. 1-12

DIAGNOSIS—Length known to exceed 3 mm.; range of width 0.3-0.9 mm.; axial diameter 0.2-0.6 mm.; adjacent verticils separated by 0.2-0.5 mm.; each verticil having 20-26 sporangial chambers; sporangial chambers straight, closely packed and extend at an angle of about 25° , reaching 0.1 mm. in width at the tip but slightly narrower below; sporangial chambers reaching up to, or beyond, the base of the verticil above; each communicating below into the axial cavity separately.

This species which I have dedicated to the late Prof. B. Sahni is represented by many specimens cut in various planes. Most are in one slide but fragments occur in three other slides. Most of the sections are oblique, but two are very nearly transverse (TEXT-FIGS. 5, 8-10; PL. 1, FIGS. 1, 2) and a few tangentially longitudinal or nearly radial sections are also figured. The specimens are identified with each other because they are associated with no other alga in the slide where it is abundant, the measurement of the sporangial chambers is the same and in transverse oblique sections the measurements of the plant are fairly



TEXT-FIGS. 1-12 — 1-4, Obliquely longitudinal sections showing the sporangial chambers and the axial tube. 5, nearly transverse section cutting the sporangial chambers. The ones above have no outerwall preserved. 6, obliquely tangential longitudinal section passing through the surface at the top and nearly radial below. 7, nearly radial longitudinal section showing the angle of divergence of the sporangial chambers. 8-10, nearly transverse sections. 11, obliquely transverse section showing the tops of the sporangial chambers of a lower verticil outside those of the upper one. 12, obliquely transverse section passing through a region where some of the sporangial chambers communicate with the axial cavity. All figs. $\times 24$. (From Slide No. M 137.)

uniform. There is only one specimen (PL. 1, FIG. 6) long enough to give any information about the shape of the alga as a whole; and this specimen being a tangential section does not give much evidence. However, it shows 8 similar looking sporangial whorls of even size and at fairly equal distances apart. The specimen in the part preserved may well be cylindrical.

It was noted repeatedly that the sporangial chambers are open at their upper ends, as though the outer wall in this region was uncalcified.

COMPARISONS

C. Sahnii is nearest to *C. infundibuliformis* with which it agrees in the number of its sporangia (20-26). It is distinguished from that species by the slightly larger size of its axial tube (0.2-0.6 in *C. Sahnii*, 0.2-0.4 in *C. infundibuliformis*) but especially by the more diverging branches of *C. infundibuliformis* which arise at an angle of about 40° and thus give a larger external diameter. *C. marginoporella* with 12-20 sporangial chambers is otherwise like *C. infundibuliformis* and is also distinguished by its more

diverging sporangial chambers. All the other species have sporangial chambers diverging more than that of *C. Sahni* and most differ considerably in size or the number of sporangia.

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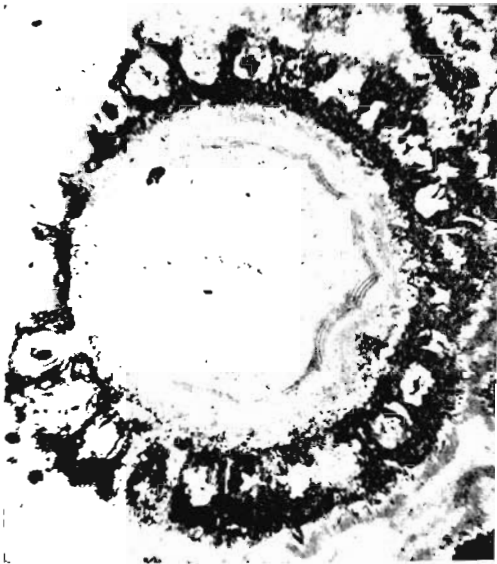
disposal and for the keen interest he evinced in my work and guidance which I have received from him. I am grateful to Prof. T. M. Harris, F.R.S., for his very valuable suggestions and help. I am also grateful to the U.P. Research Grant's Committee for the financial help that I received. My sincere thanks are due to Shrimati Savitri Sahni, President of the Governing Body, Birbal Sahni Institute of Palaeobotany, for laboratory and library facilities so kindly extended to me.

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EXPLANATION OF PLATE I

1. A transverse section showing twenty-six sporangial chambers cut across. $\times 90$.
2. An obliquely transverse section showing the sporangial chambers (estimated number in whorl 24) $\times 90$.
3. Oblique tangential section at the top and the axial cavity below. $\times 50$.
4. Tangential longitudinal section showing three rows of sporangial chambers. $\times 50$.
5. Another tangential longitudinal section showing four rows of sporangial chambers. $\times 50$.
6. Type specimen showing 8 verticils (of which the 7th counting from the base is obscure), seen in tangential longitudinal section. $\times 32$.



1



2



3



6



5



4