

The occurrence of Charophyta in Late Quaternary sediments of Calcutta

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Abstract

The well preserved fossilized oogonia and 'Stems' of Charophytes, a specialised and advanced group of green algae, have been studied from the Late Quaternary sediments of Calcutta and identified as *Chara fragilis* related to fossils of *C. globularis* in its morphological features. It is mostly restricted to fresh water. It tends to disappear in marine environment.

Introduction

Charophytes have for a long time been considered as a group unchanged in gross morphological features since their rather ancient origin. In recent years a more complete knowledge of the extinct representatives has allowed the recognition of a clear phylogenetic trend which has affected the group since Silurian.

The extant Charophytes are generally included in an order Charales with one family Characeae. The Characeae are usually divided into two subfamilies, Nitelloideae and Charoideae respectively. It is a very specialised and advanced group of green algae (Chlorophyceae). Fossils are known from Devonian, some even from Silurian. Genera in which the spherical oogonia are surrounded by five spiral shells occur frequently in the Cretaceous and Cenozoic, although Gyrogonites, which is one of the best known genera dates from the Late Triassic. Palaeochara is a Late Carboniferous genus with six spiral shells.

Many species have encrustations of calcium carbonate on the surface of the stalks. They are very delicate and very rarely preserved as whole 'branches'. However, the oospores have a thick wall and are sometimes hardened by siliceous matter. So, in the fossil stage, mostly the resistant oospores are found. It is possible to show a regular utricular structure. Only the members of the sub-family Charoideae have encrusted oospores and stalks.

In most fossilized specimens, the stem fragments are usually lost as they are extremely brittle and thus no detailed investigation could be made in the present study. However, it seems that there is evidence of its being corticated in nature in the fragments recovered in the present case. No fossilized oospores attached to the stem fragments have been recovered. Thus in case both the stem fragments and the oospores belong to the same species, the species would belong to a corticate species of *Chara*.

Results and Discussion

The oospores are more or less oval in outline and slightly encrusted with calcium carbonate (Figs. 2 and 3). The measurements of the grains are given below in Table I. It is 450-600 μm in length; 390-525 μm in width and provided with 8-10 spiral ridges, each ridge being 45-75 μm in thickness. The oospores are too limited in number and it has not been sectioned. However, from the samples so far collected, the species has been identified as *Chara fragilis* Desvaux which is widely distributed in India and is reported to occur in Dhakuria, Garia, Baruipur, Sonarpur, Port Canning (Pal *et al* 1962); Bansdrani, Dum Dum, Bongaon, Champadanga (Chatterjee - unpublished) in West Bengal. In West Bengal habitats,

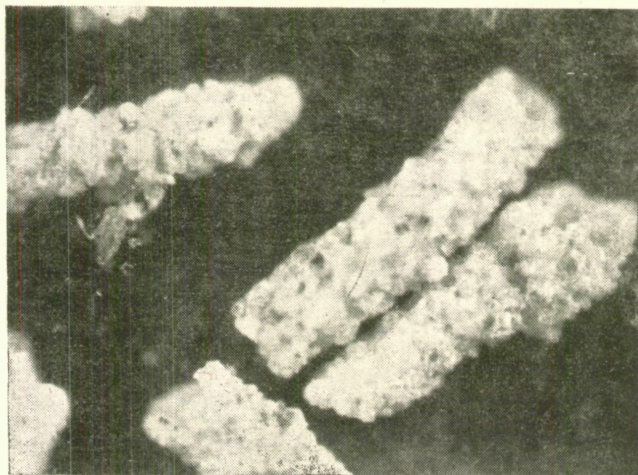


Fig.1

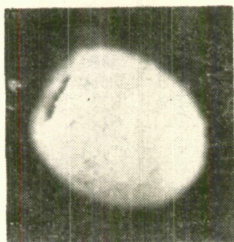


Figure 2.



Figure 3.

Figure 1. An assemblage of utricles of *Chara fragilis* ($\times 40$).

Figure 2. Lateral view of *Chara fragilis* ($\times 40$).

Figure 3. Apical view of *Chara fragilis* ($\times 40$).

TABLE I.

Sp No.	Length (μm)	Width (μm)	Thickness of the rim (μm)	Number of rims	Remarks
1	600	465	75	10	Rims convex
2	Fragment	-	45-60	-	„
3	450	400	60-75	8	„
4	570	525	60-75	10	„
5	510	405	45-60	10	„
6	585	390	45-60	10	Rims concave

the species make their appearance in the month of October and flourish till the early part of April each year. It tolerates a wide range of pH from 6.5 to 8.4 (Chatterjee, unpublished data). Fossils of *Chara globularis* related to *C. fragilis* in its morphological features have been discovered by Daily (1970) from the glacial lacustrine deposit of Edmunds Co., South Dakota covered with mineral incrustation and its age was estimated to be about 10,000 to 11,000 years (Lee, 1957; Steece, 1961).

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