

## Cell Ornamentation of *Cosmarium formosulum* Hoff. under Scanning Electron Microscope

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The ornamentation on the wall of desmid cells is of taxonomic importance and hence, it was thought desirable to study the surface ornamentation of these cells. *Cosmarium formosulum* Hoff. in Nordst was grown in Chu's 10 inorganic medium at a temperature of 18–22°C. Cells were fixed, dehydrated and studied, after critical-point-drying and coating under the Scanning Electron Microscope at 15 KV.

The cells within the margin very minutely granulate, granules in concentric and radiating series in the centre with a broad tumour furnished with 5–7 vertical series of granules.

**Key Words:** Scanning, Desmids, *Cosmarium formosulum*, Ornamentation, Taxonomy

### Introduction

The desmids comprise a very distinctive group in the order conjugales of the green algae. As in other fields, SEM may prove of value in the taxonomy of desmids, supplementing the data already obtained from light microscopy (West & West 1908, Waris & Kallio 1964). SEM reveals clearly, the plasticity of desmid morphology, which is of much importance to taxonomists.

### Material and Methods

*Cosmarium formosulum* Hoff. was kindly supplied by the Culture Centre of Algae and Protozoa, Cambridge (UK)

Cultures were maintained in Chu's 10,

kept at a room temperature of 18–20°C, receiving 8/16 alternate dark and light, respectively.

Cells from actively-growing cultures, were fixed in 3% glutaraldehyde made up in the culture medium, for one hr at room temperature. After washing once in the culture medium, these cells were post-fixed for one hr in 2%  $\text{OSO}_4$ , also made up in the culture medium. The cells were washed thrice with culture medium. After the fixation, cells were dehydrated in various grades of acetone, i.e., (30, 50, 70, 90, 100) and finally preserved in 100% acetone, kept in a desiccator. The cells were dried by CPD apparatus and mounted on

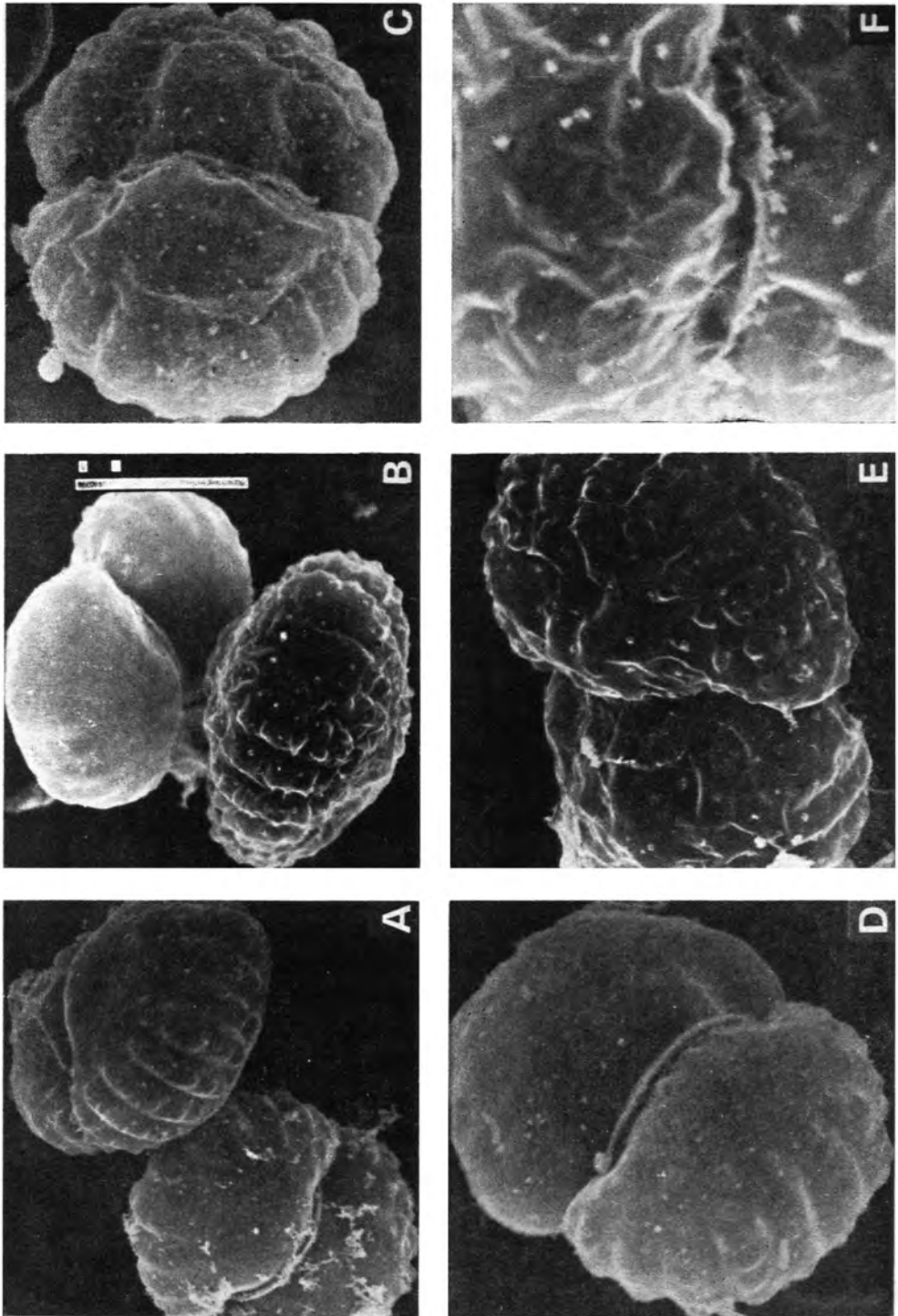


Figure 1 A-F *Cosmarium formosulum* Hott. A & B, Cells in front and top-views ( $\times 2520$ ); C & D, Cells in front-view ( $\times 3780$ ); E, Cell in lateral-view showing ornamentation ( $\times 3780$ ); F, Isthmus region and mucilage pores ( $\times 6880$ )

a double-sticking tape on a stub. Before observing through the Jeol-JSM-25s Scanning Electron Microscope at 15 KV, the cells were coated with carbon and gold.

Most desmids secrete copious quantities of mucilage and many species examined, were too thickly enshrouded with dried material to give good micrographs. Washing fixed cells with warm water helped remove this material on some occasions, but pre-treatment with the Glusulase preparation was usually effective in cleaning them up considerably and enhancing their appearance under the SEM (Pickett-Heaps 1973, 1974).

### Observations and Discussion

Figure 1 A-F, shows the cells of *Cosmarium formosulum* observed under SEM at various magnifications. The cells in the surface view show mucilage pores arranged in a regular pattern. The cells show 5-7 vertical series of granules which are more prominent in the lateral and top-

views. At the isthmus region of the cell there is a prominent mucilage ring. However, it was found that freshly sub-cultured cells were better fixed for such studies, compared to old cultures, which accumulates lot of mucilage and thus obscures most of the surface ornamentation. These observations may be further useful for the taxonomic identification of the species, under investigation.

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### References

- Pickett-Heaps J D 1973 Stereo-Scanning Electron Microscopy of desmids; *J. Micros.* **99** 119-116
- 1974 Scanning Electron Microscopy of some cultured desmids; *Trans. Am. Micros. Soc.* **93** 1-23
- Waris H and Kallio P 1964 Morphogenesis in *Microsterias*; *Adv. Morph.* **4** 45-82
- West W and West G S 1908 in *A Monograph of the British Desmidiaceae* III 196 pp