transmitted and the percentage of transmission was 12 and 41 respectively.

Based on host range, physical properties, aphid and seed transmission, viruses 1, 2 and 3 were identified as potato Y (PVY), tobacco ring spot (TRSV) and tobacco mosaic viruses (TMV). For quick identification of these three viruses, a key having a set of four differential hosts (*Physalis floridana* Rydb; *Cucumis sativus* L; *Phaseolus vulgaris* var. Pinto and *Vigna unguiculata* (L.) Walp Sub sp. *Cylindrica* van–Eseltine) was developed and their reactions are given in table 1.

From India, Sastry *et al.*[1] reported a strain of PVY which had thermal inactivation point between 55–60° C, dilution end point between 1/1000 to 1/10,000 and ageing *in vitro* for 24 hr. The present PVY isolate has close resemblence with this isolate. Tobacco ring spot virus under study differs with the earlier report of Sastry and Nayudu[2] both in host range and physical properties. Hence it is a new strain of TRSV occurring on brinjal, which is not reported from India[3]. The third virus, TMV differs with the report of Sharma[4] in having higher thermal inactivation point and also in host range; and is a first report from Karnataka State.

In the present studies, *P. floridana*, *C. sativus*, *P. vulgaris* var. Pinto and *V. unguiculata* were found to be good differential hosts for PVY, TRSV and TMV strains infecting brinjal. *P. florida* produced necrotic local lesions only with PVY. *C. sativus* and *V. unguiculata* reacted to TRSV and produced necrotic local lesions followed by chlorotic rings; and reddish brown necrotic local lesions respectively. Pinto beans produced necrotic local lesions with TRSV and TMV on inoculation. With the help of these four differential hosts, the three viruses under study can easily be identified during the germplasm screening in the breeding programme.

The author is grateful to Dr. K. L. Chadha, Director, Indian Institute of Horticultural Research, Bangalore for providing necessary facilities.

23 September 1981

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CELL ORNAMENTATION IN *COSMARIUM BIOCULATUM* BREB. UNDER SEM.

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SURFACE ornamentation is useful to study the taxonomic identification of Desmids. The present study was undertaken to study the surface ornamentation in *Cosmarium bioculatum* Breb.

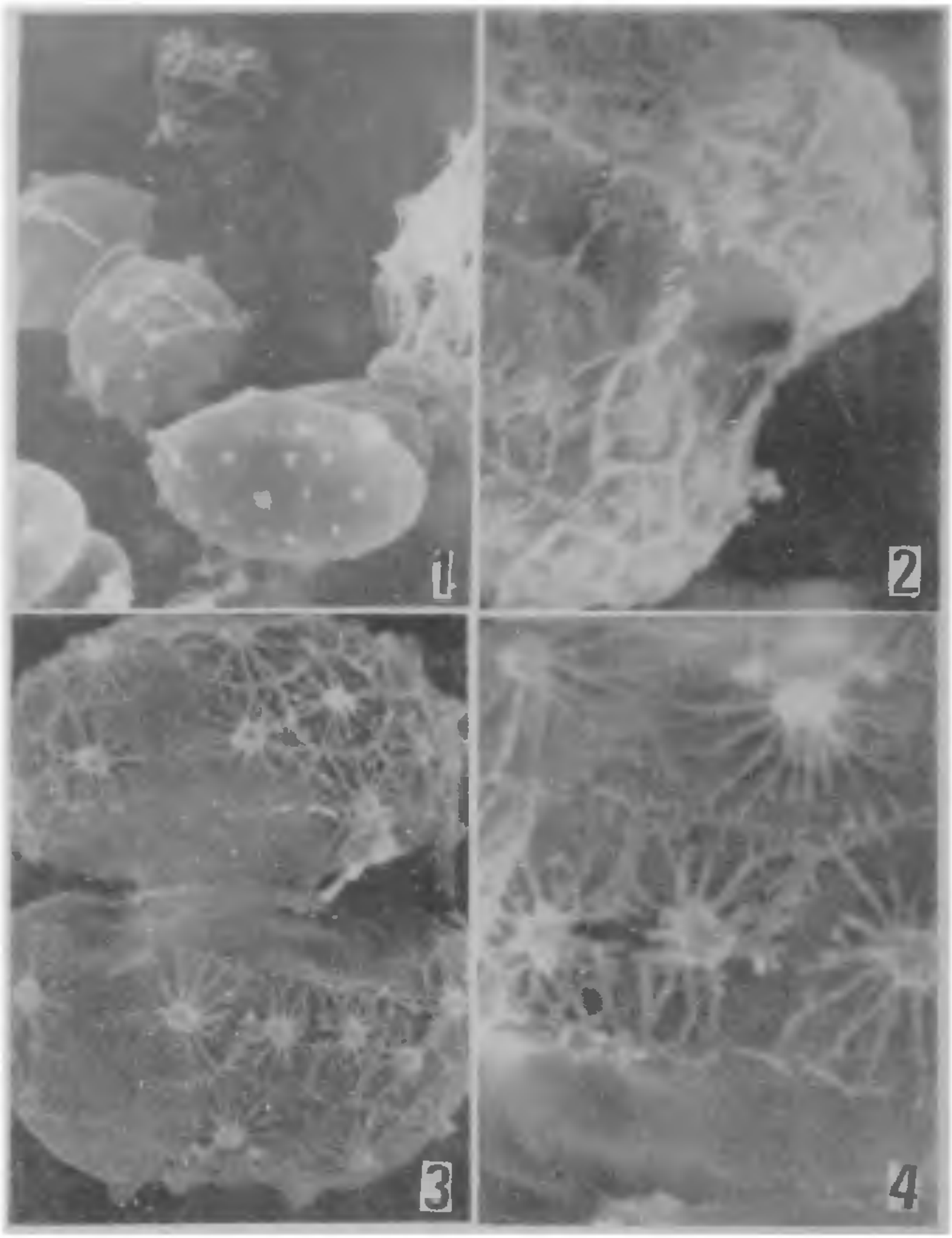
Cosmarium bioculatum culture was kindly supplied from the Cambridge culture collection. The alga was growing in Chu's inorganic medium, (18-22° C) receiving an illumination of 16/8 hr light and dark, respectively. The cells were isolated and unialgal cultures were raised. The populations thus raised from single cells were fixed for scanning electron microscopy. The cultures immediately after their subculturing were selected for fixation. It was observed that old cultures showed a lot of mucilage accumulation, which would obscure the cell surface. Previous reports on the scanning of Desmids were mostly by Pickett-Heaps[1-4], who successfully removed the mucilage covering in most of the species by repeated washing. But incubation of specimens in a solution of the polysaccharidase preparation Glusulase was better. Pickett-Heaps used 1:50 v/v dilution in distilled water for 90 min at room temperature. However, during the present study, repeated subculturing was found useful to eliminate excess mucilage from the cell surface.

Cells were fixed by standard glutaraldehyde/osmium procedures and then dehydrated by various grades of acetone. Finally, they were dried and shadowed with gold and carbon, before being examined at 15 kV in a Jeol-JSM-25S scanning microscope.

Cells of *C. bioculatum* Breb. were minute, as long as broad, deeply constricted, sinus narrow towards the apex and widening outwards, semi-cells transversely oblong-elliptic both base and apex flattened, sides rounded West & West[5]. Side-view of semicell subcircular. Vertical-view oblong-elliptic.

C. bioculatum is one of the most well distributed of the small smooth species of the genus. The cell surface shows thick mucilage strands, arranged hexagonally (figure 2). Frequently, it was observed that these strands were arranged circularly (figures 3 and 4). For the taxonomic identification of Desmid species, it is necessary to study cell in surface, top and lateral-views (figure 1). The mucilage strands are quite thick and robust in the older cultures compared to the young. Such observations will help in the taxonomic identification of the species.

The author is grateful to Prof. Jafar Nizam, Vice-Chancellor, Kakatiya University, for his constant encouragement. Thanks are also due to Prof. John-D.



Figures 1–4. *Cosmarium bioculatum* Breb. **1.** Cells in top and lateral view (×3360) **2.** Showing hexagonally-arranged mucilage strands.(×7870) **3, 4.** Arrangement of mucilage pores and strands on cell surface (×5070 & 7870)

Dodge, Head, Department of Botany, Royal Holloway College, U.K. for his guidance. The author is also thankful to U.G.C. and British Council, for the award of Commonwealth Academic Staff Fellowship for U.K.

1 February 1982

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