J. Phytol. Res. (1 & 2), 1990

MICRACTINIUM PUSILLUM (FRESENIUS) — A NEW ECORD FROM RAJASTHAN, INDIA

GAJENDRA PAL SINGH and PUSHPA SRIVASTAVA
Department of Botany, University of Rajasthan, Jaipur 302004, India.

Micractinium pusillum (Fresenius) is studied in nature and laboratory and being reported for the first time from Rajasthan – India.

Keywords : *Micractinum*; Coenobium; Spines; Autospores; Semi-arid environment.

Micractinium, a Chlorococcalean genus, first established by Fresenius in 1858, is known to have about six species. Of these, only *M. bornhemiense* and *M. pusillum* have been reported from certain states of India i.e. Bhopal and Raipur in M.P. Cuttack in Orissa and Hyderabad in A.P. as quoted by Philipose 1967. However, their description and references pertaining to them have not been cited in the monograph.

In the present study, *M. pusillum* is being reported for the first time from the State of Rajasthan. It has been studied *in vivo* as well as *in vitro*. The alga was collected from the water in the vicinity of Jal Mahal lake at Jaipur during May-June months. It was the dominating genus of the sample. In some collections, it was almost in unialgal form. The water temperature was $30 \pm 2°C$ and pH varied from 8.2 to 8.5. It was unique of its kind that in several collecitons, over a period of four weeks, *Micractinium* remained dominating alga of the habitat. It was isolated and raised into Biphasic soil water medium The cultures were placed in North window receiving natural day and dark periods at a temperature range $32 \pm 3°C$. The life cycle was studied in natural sample and laboratory cultures as well.

The coenobia were mostly 8-celled (Fig. 1-A) and rarely 4-celled. (Fig. 1-B) Even solitary cells were not uncommon (Fig. 1-C). However, 2-celled organisation (Fig. 1-D) were rerely encountered. The 8-celled coenobia measured 18-32 μm in diameter and individual cell 10-15 μm. The cell size for the same species has been reported variously; 6-8 μm

(Tiffany, 1934), 3-7 μm (Korshikov, 1953), 3-10 μm (Philipose, 1967) and 5-10μm (Hindak, 1910 a & c). This clearly pin points to the fact that present species is having larger cells than on record so far.

Although the number of spines per cell varied from 4-8 but 8 spines in a cell were most frequent (Fig. 1-C). These were hyaline and broad the base, gradually attenuated towards the tip. The length of the spines altered from 40 to 72μm. Philipose (1967) observed it to be usually up to 30 μm long, rarely up to 60 μm, while Tiffany (1934) recorded spine length to be 65 μm and Hindak (1984) found the spine length up to 70μm. The present species thus showed highest length limit and larger number of spine per cells. It is worth mentioning that an interesting phenomenon pertaining to the spines has been observed by Hortobagyi (1979). He found thick spines like *M. pusillum* and thin like *M. Crassisetum*, both types on the same cells. Both the species were present in the same habitats when the collections were made by him. Hortobagyi (1979) presumed it to be a hybrid and named it *M. extremon*. However, presently studied *M. pusillum* had spines of the same thickness, of course, varying in length.

The cells of the coenobium were spherical with a smooth hyaline cell wall. The chloroplast was cup shaped with a prominant pyrenoid. Each cell produced 5-8 autospores. All the cells of the coenobium produced autospores simultaneouly (Fig. 1-F). Even unicells and bicells were capable of forming autospores.

Oogamous sexual reproduction has been described in this species of *Micractinium* (Smith, 1958; Philipose, 1967). The oospores formed had spinous wall measuring 14-15 μm in diameter. However, further development of the oospore has not been recorded, so far. In the present study (Fig. 1-E) cell contents have divided into equal tetrads giving an impression of zygotic division of cell contents. Studies on this line are in progress in this laboratory. According to Prof. Bourelly (personal communication) by all means present alga is *Micractinium pusillum*, although it differs with described species in cell size, spine length and number per cell. These changes may be attributed to the semi-arid environmental conditions prevailing in this city of the state of Rajasthan.

The authrs are grateful to Prof. P. Bourrelly, Museum National D'Histoire Naturelle Laboratoire De Cryptogamic, Paris for rendering the taxonomic position of the alga and for his advice and help and to the Head, Department of Botany for extending laboratory facilities.

Accepted July, 1990.

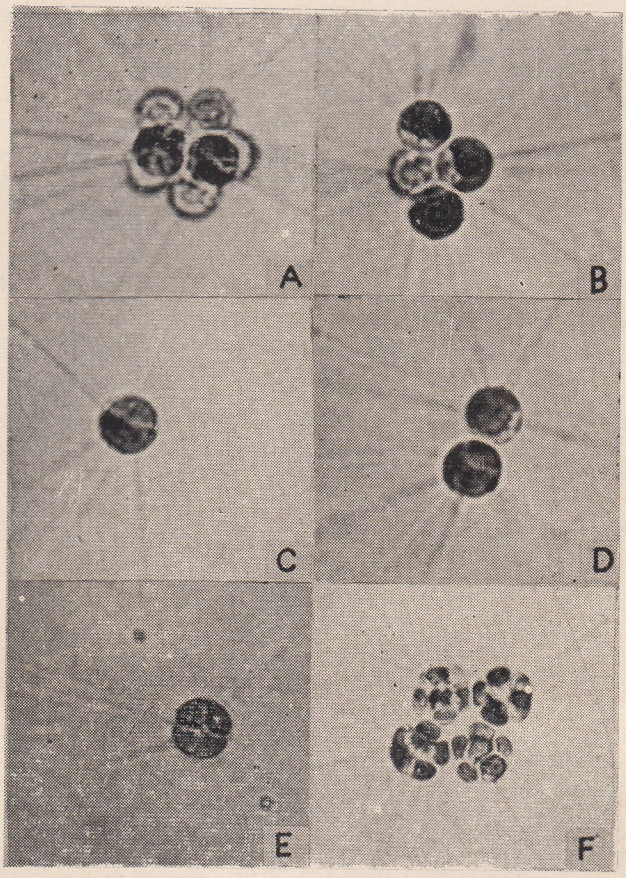

Fig.—1-A-F *Micractinium pusillum* (X 1600)

A— 8 celled coenobiun; B— 4 celled coenobiun; C— Single cell with 8 spines; D— 2-celled stage; E— Single cell forming tetrad; F— All the cells of the coenobium forming autospores simultaneously.

References

Bourrely P 1966, Les *Algues D' ean Docuce*, (ed) I Les Algues verles N. Boubee and Cie, Paris p 511

Hindak F 1980 a, *Bratislava, Veda Biol. Prace.* 26, 6, 1-196

Hindak F 1980 c, *Chlorophyceae/Presgia* **52** 289

Hindak F 1984 *Bratislava, Veda Biol. Prace.* 41-46

Hortobagyi T. 1979 *Acta Biol. Szeged* **25**

Korshikova O A 1953 *Pidktas protokovi/Protococcinae Vizu. Prisnovodu. Vodor.* USRE, **5** 1

Philipose M.T. 1967 *Chlorococcales* ICAR Publication, New Delhi

Smith G M 1958 *The fresh water algae of the United States* McGraw Hill

Tiffany L H 1934 Ohio State University, **6** 1