

APHANOCHAETE MAGNA GODWARD—A NEW ADDITION TO INDIAN FLORA

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ABSTRACT

Aphanochaete magna Godward has been recorded as a new addition to the Indian flora. Its developmental morphology and some reproductive stages are described.

INTRODUCTION

While working on fresh-water chaetophoralean algae, the authors came across an interesting *Aphanochaete* species. It was collected from Telibagh, Lucknow, throughout the year (except in extremely hot season). It is a very rare alga, since after its establishment by GODWARD in 1934, it seems to have been recorded only once from any part of the world (TUPA, 1974). As far as we are aware, there are no other records of its occurrence. As *Aphanochaete magna* Godward is a controversial taxon (cf. PRINTZ, 1964) and the present report is a new record to the Indian flora, it is proposed to describe it here on the basis of observations over a period of one year.

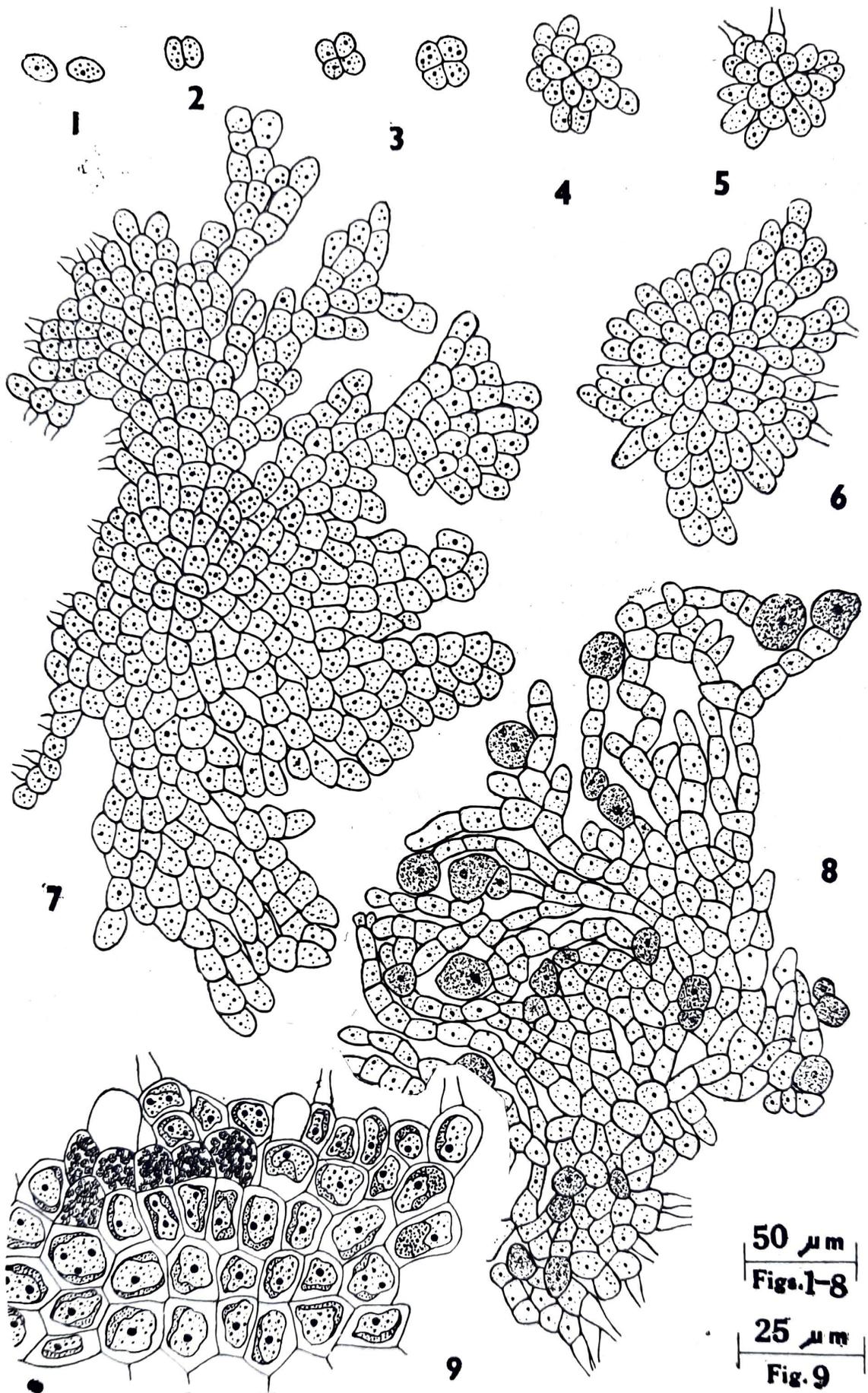
OBSERVATIONS

Aphanochaete magna Godward grows epiphytically on submerged leaves of *Hydrilla* and *Ceratophyllum* in ponds forming light green discs of different shapes ranging from oval or circular (young thalli) to irregular (older thalli). The thallus of the alga is composed of closely branched prostrate filaments, producing ultimately an irregular, somewhat pseudoparenchymatous disc. Filaments forming the disc compactly coalesce in the central area of the disc but are relatively free at the margins (Text-fig. 7).

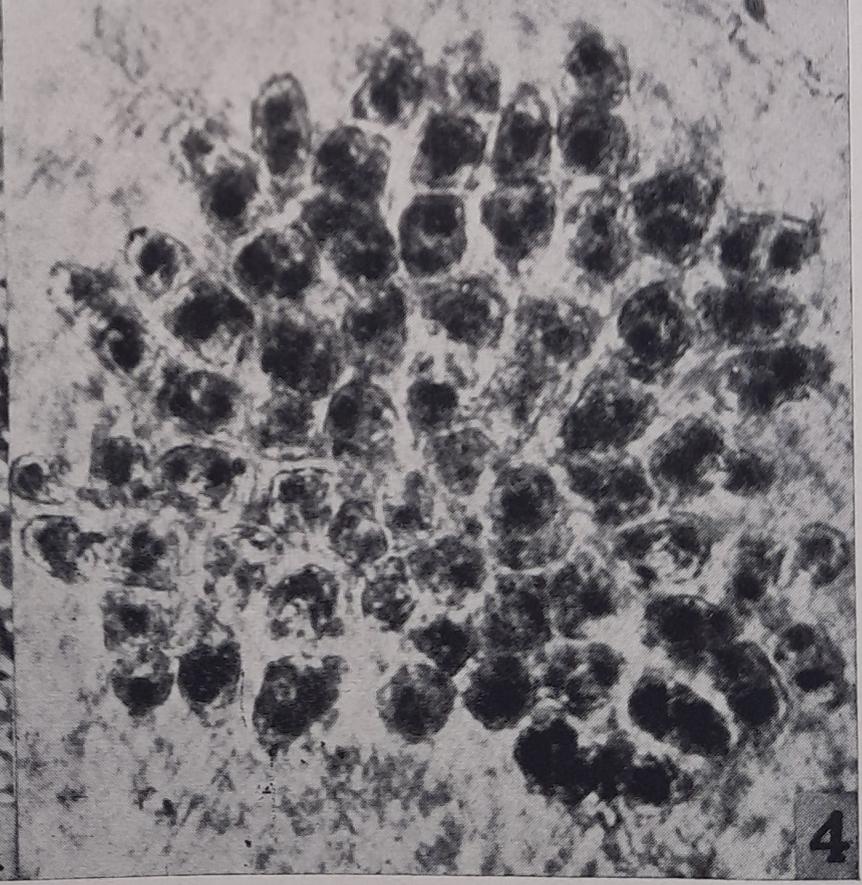
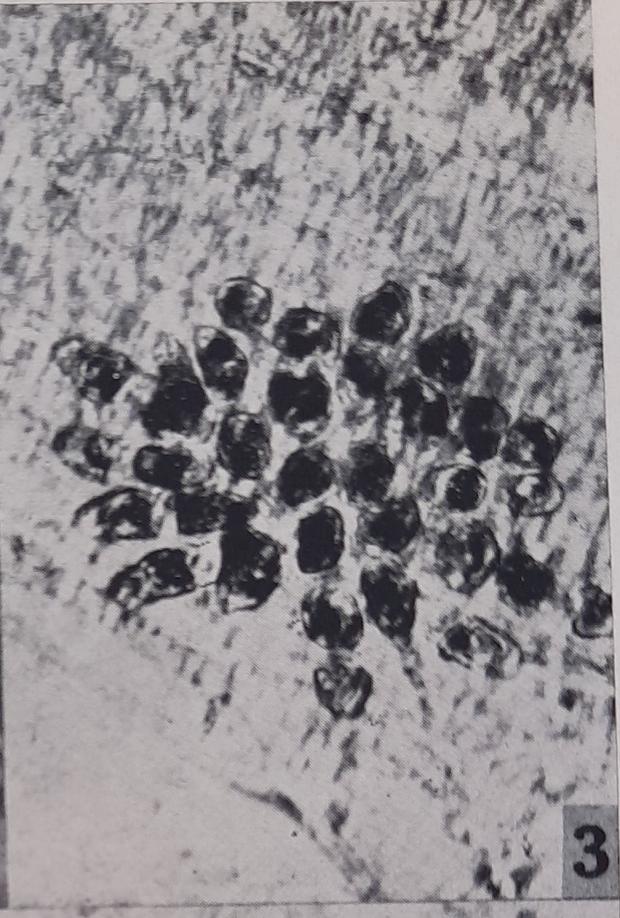
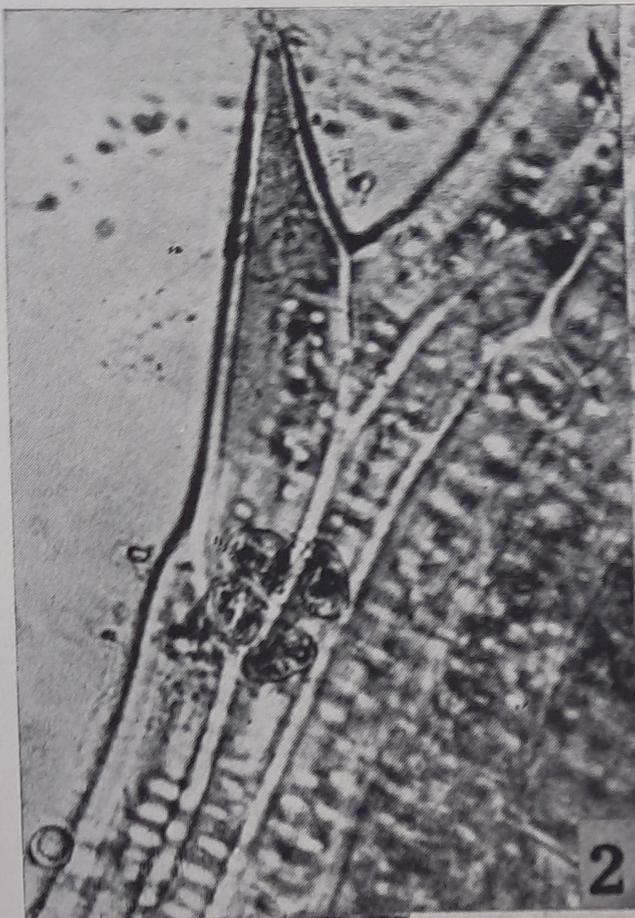
Cells are 4-12 μm in diam. and 6-20 μm long and contain a single parietal chloroplast with 1-3 pyrenoids. Most of the cells possess hairs with characteristic bases measuring 3-8 μm in diameter.

Growth of the thalli was traced from single-celled stages (Text-fig. 1). The first division results in two cells (Text-fig. 2 ; Pl. 1, Fig. 1), which soon divide producing four cruciately arranged cells (Text-fig. 3 ; Pl. 1, Fig. 2). This is a characteristic and important stage that has been emphasized by TUPA (1974) as diagnostic of the species. Subsequent divisions occur in each of the four cells resulting in a multicellular pseudoparenchymatous, prostrate, discoid thallus (Text-figs. 4-7 ; Plate 1, Figs. 3-4). However, the original four cruciate cells remain recognisable up to very late or advanced stages of thallus growth and occupy a central or sub-central position. Further growth, chiefly at the margins, results in a fully-developed thallus (Text-fig. 7).

During winter months, some terminal and sub-terminal cells accumulate starch, develop a thick wall and become oval to spherical with a relatively larger size (Text-fig. 8). According to TUPA (1974), these thick-walled structures are akinetes, possibly formed to withstand unfavourable conditions. Beside these, some empty cells and some



Text figs. 1-9 : *Aphanochaete magna*. Figs. 1-7 Developmental stages of the thallus. Fig. 8. Mature thallus with akinetes. Fig. 9. Thallus with some cells having divided contents (swarmers?) and some empty cells.



with divided contents were observed during monsoon season (Text-fig. 9). As the material was studied in preserved condition only, and attempts at culturing it in the laboratory were not successful, the fate of these structures could not be followed up.

DISCUSSION

Aphanochaete magna was erected by GODWARD (1934) based on its typical discoid habit coupled with *Aphanochaete* type of setae. She observed neither zoospores nor sexual structures. However, PRINTZ (1964) placed *A. magna* with *A. pascheri* indicating that, in his opinion, it might be the latter form. He has given no reasons, however, for doing so. Later on, TUPA (1974), based on her studies on material from culture and nature, did not agree with PRINTZ that *A. pascheri* and *A. magna* are synonymous. Besides vegetative stages, she also studied zoospores and akinetes. In her opinion, the most pronounced difference between *A. magna* and other species of *Aphanochaete* is the unique "cruciate" method of germination of zoospores and akinetes, resulting in the formation of a disc-like thallus. The four first-formed cells of the thallus always remain central and prominent throughout the development of the disc. However, it may be pointed out that in the present material, two differences from TUPA's material occur: (i) the mode of germination of cruciate cells forming an x-pattern (cf. TUPA 1974, Figs. 188-195) is not found here and (ii) the cruciate four cells, though recognisable till quite late stages, are not as prominent as in TUPA's material.

The present alga agrees closely with *Aphanochaete magna* Godward in all essential features and, hence, has been identified as such.

ACKNOWLEDGEMENT

One of the authors (TF) is thankful to U.G.C. for financial assistance as J.R.F.

REFERENCES

- GODWARD, M. B. E. (1934). An investigation of the causal distribution of algal epiphytes. *Beih. bot. Centralbt.*, **52** : 506-539.
- PRINTZ, H. (1964). Die Chaetophorales der Binnengewässer. *Hydrobiologia*, **24** : 1-376.
- TUPA, D. (1974). An investigation of certain Chaetophoralean algae. *Nova Hedwigia*, **46** : 80-90.

EXPLANATION OF PLATE 1

Figs. 1-4. *Aphanochaete magna*. Developmental stages of thallus (Fig. 1 \times 870 ; Figs. 2-4 \times 720).