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A NOTE ON *ULOTHRICHOPSIS VIRIDIS* GEN. ET SP. NOV.

By M. O. P. Iyengar, M.A., Ph.D. (Lond.), F.L.S.
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S. Kanthamma, B.Sc. (Hons.), M.Sc.

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This alga was found in a culture of soil algæ growing along with *Chlorococcum humicolum*. The culture was made by inoculating 5 grams of paddy-field soil from Tambaram near Madras in Moore's solution. Since the alga looked very interesting an attempt was made to study it in further detail by growing it in hang-drop cultures.

The alga consists of very short unbranched filaments made up of one to three or occasionally four cells placed in a row. Its cells are 15·8–33·3 μ long and 6·2–7·9 μ broad. At first sight it looks like a *Stichococcus* but an examination of the cell-contents shows that it is not a *Stichococcus*. Each cell has one or more plate-like chloroplasts, in which are embedded one or more pyrenoids. The usual number of chloroplasts is one, two or four (Figs. 1–5, 13), but occasionally 8 chloroplasts are seen in some of the cells. The number of chloroplasts is largest just before cell division. A single nucleus is situated in the centre of the cell (Figs. 10–12). The cell-wall is thin and uniform.

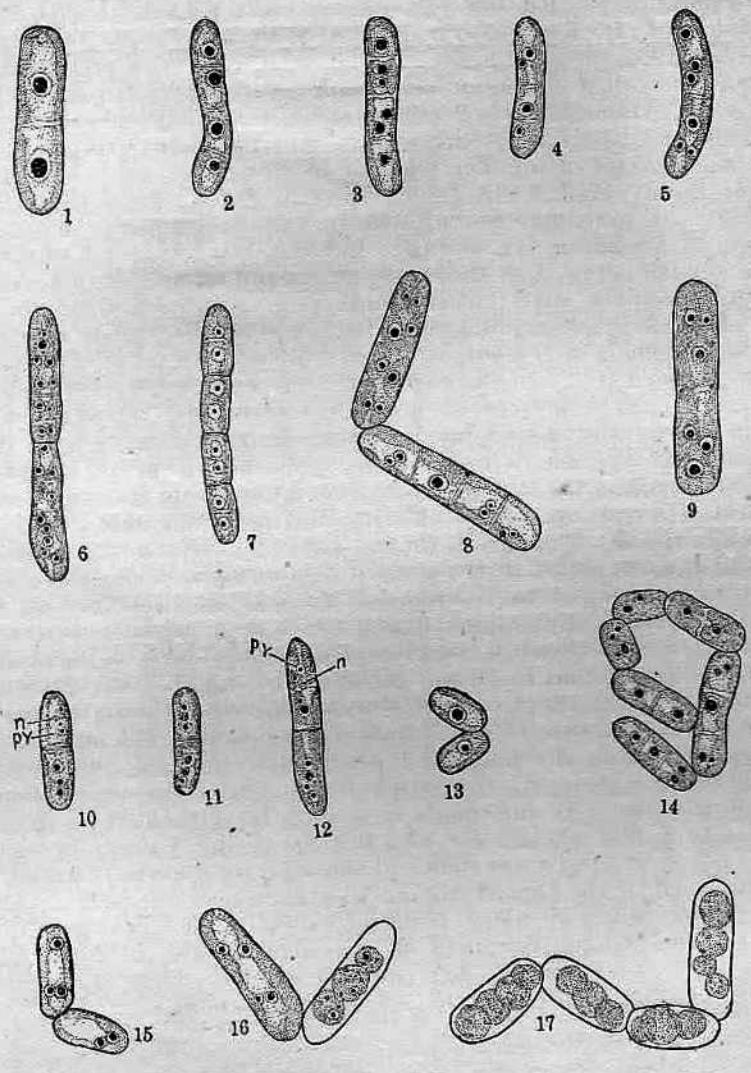
The normal method of multiplication of the alga is by fragmentation. The filaments, after reaching the 4 or 3-celled stage, were observed to break up very rapidly into shorter lengths of one or more cells (Figs. 8, 13–17).

No zoospores or gametes were observed in the living material, though it was kept under observation in culture for over 3 months. Very occasionally the contents divided into a few round masses inside the cell wall. Quite a number of cells showing these round masses were found in the material (Figs. 16–17). These masses did not escape outside, though they were watched for a long time. They are evidently aplanospores of the alga.

Systematic Position of the Alga

The alga with its bright green plate-like chloroplasts containing one or more pyrenoids in each looks at first sight very much like an Ulotrichaceous alga. On closer examination, it is found that each cell usually contains several (1–8) chloroplasts (Fig. 8). But no member of the Ulotrichaceæ is known to possess more than a single

* From the University Botany Laboratory, Madras.



Text-figs. 1–17. *Ulothrichopsis viridis* gen. et. sp. nov. Fig. 1. A single cell with two chloroplasts, each with a pyrenoid. Figs. 2–4. Cells with 3 or 4 chloroplasts; Fig. 3. shows 2 pyrenoids in the two central chloroplasts. Fig. 5. Cell showing 3 pyrenoids in each chloroplast. Fig. 6. A short 2-celled filament. Fig. 7. A four-celled filament. Fig. 8. A 2-celled filament; the upper cell shows 8 plate-like chloroplasts. Fig. 9. A single cell with chloroplasts just divided. Figs. 10–12. Stained preparation showing the nucleus and pyrenoid. Figs. 13–15. Filaments breaking apart into individual cells. Figs. 16 and 17. Formation of aplanospores. (Figs. 1, 8, 9, 16 & 17 × 800; rest × 430).

chloroplast in each cell.† The alga shows a close resemblance to *Heterothrix exilis* Pascher (*Bumilleria exilis* Klebs), (Klebs, 1896, p. 389, Taf. II, Figs. 15–30; Bristol, 1920, pp. 78–79, Text-fig. 1; Pascher 1932, p. 344, Figs. 22*b*–28*c*). Only, in the present alga, pyrenoids with a starch sheath are present, whereas in *Heterothrix exilis* no pyrenoids are present as in all the Xanthophyceæ. But Korshikov (1930) has recently shown that pyrenoids are present in the chloroplasts of another member of this genus, *viz.*, *Bumilleria sicula* Borzi. And Klebs (1896, pp. 224, Taf. I, Figs. 17–19) has shown that pyrenoids are present in the chloroplasts of young plants of *Botrydium granulatum*. But the pyrenoids of both these algæ do not show any starch sheath round them. Printz (1927, p. 409), however, says that in Xanthophyceæ in general, pyrenoids and starch are absent. Pascher (1925, p. 116) also, when referring to the pyrenoids in *Botrydium*, writes " Ebenso bedarf die Pyrenoid-frage dringendst ". In the case of the present alga, a very definite starch sheath is present around the pyrenoids. Testing with iodine shows the starch layer clearly stained dark blue. And preparations stained in iron-hæmatoxylin show a white unstained ring representing the starch sheath around the darkly stained pyreno-crystal. In the face of the current view regarding the absence of starch in the Xanthophyceæ, the presence of a definite starch sheath around the pyrenoids in the present alga forms an insuperable difficulty in referring it to *Heterothrix*, an accepted member of the Xanthophyceæ. But, since pyrenoids, though without a starchy layer, have been shown to be present in young plants of *Botrydium* by Klebs (1896) and in *Bumilleria sicula* by Korshikov (1930), the possibility of the occurrence of starch also round the pyrenoids in some of the members of the Xanthophyceæ should not be ignored. But unfortunately the main point which ought to decide the position of the present alga, *viz.*, the nature of the cilia of the swarm-spores, is still unknown. If this should be known, then it would be an easy matter to decide whether the alga belongs to the Xanthophyceæ or not. So, until the swarm-spores of the alga are known, it would be best to consider the alga as only an Ulotrichaceous one and to place it in a new genus by name *Ulothrichopsis* close to *Ulothrix*. If, at a later date, the swarm-spores of the alga should be found and prove to be heterokonton, then the alga will have to be transferred to the Xanthophyceæ as a new species of *Heterothrix*.

† The genus *Sphaeroplea*, which has been recently included by Fritsch (1935, p. 222–26) in the Ulotrichales, would appear to form an exception to the rule, since it contains a large number of ring-shaped chloroplasts in each cell. But this is a special case. The larger number of chloroplasts has been explained as probably due to a failure of cross-wall formation between the several cells, each containing a single chloroplast. *Sphæroplea* according to this view should be considered as having been derived from a septate Ulotrichaceous type which has ceased to form a septa except at rare intervals.

Description

Ulothrichopsis gen. nov.

Thallus filamentous and unbranched, consisting of a few cells only placed in a row; each cell containing a single nucleus and one or more parietal plate-like chloroplasts with one or more pyrenoids in each. Vegetative reproduction by fragmentation of the filaments into shorter lengths consisting of one or more cells. Asexual reproduction by aplanospores. Zoospores or gametes unknown.

Ulothrichopsis viridis sp. nov.

General characters same as those of the genus. Filaments one to four cells placed in a row; cells 6·2–7·9 μ broad, 15·8–33·3 μ long. Chloroplasts 1–8 (usually 2–4) in each cell.

Hab.—In a laboratory culture of soil algæ from Tambaram, near Madras.

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