

On a *Myzocitium* parasitic on *Spirogyra affinis*.

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(With 7 figures in the text.)

Introduction.

The fungus described in this paper was found growing parasitic on *Spirogyra affinis* in a lake in Hoshiarpur District of the Punjab. The material was preserved in 5% formalin. Glycerine jelly preparations after staining with cotton blue were made. Fig. 1 shows a photomicrograph of such a preparation.



Fig. 1. Photomicrograph of filaments of *Spirogyra affinis* showing zoosporangia in cells of the host as well as on the zygosporangium. E. C. emission collar.

The staining in these preparations does not keep well for a very long time as the stain slowly diffuses out into the jelly. Very good preparations were obtained by staining the filaments in Erythrosin Extra and later mounting in Canada-Balsam. For this, the material in mass, was put in 5% glycerine containing Erythrosin Extra in a watch glass and kept in a warm bath for a few days. When the glycerine thickened, the material was immersed in Absolute Alcohol

and then through the usual grades of Alcohol and Xylol was finally mounted in Canada Balsam. This fungus on the *Spirogyra* filaments

has been identified as a species of *Myzocitium*, SCHENK. Though this genus is widely distributed in Europe and has been collected from America (MARTIN (4), GRAFF (3)), this is the first time that it has been recorded in India.

Description.

The thallus in this genus consists of simple unbranched tubes. By the formation of transverse septa row of beaded cells are formed. Tubes may be very short consisting of one or two beaded cells or they may form long chains of cells (Figs. 4, 5). Occasionally non-septate portion of the thallus may be seen (Fig. 6). The photomicrograph in Fig. 1 shows such long and short chains of cells.

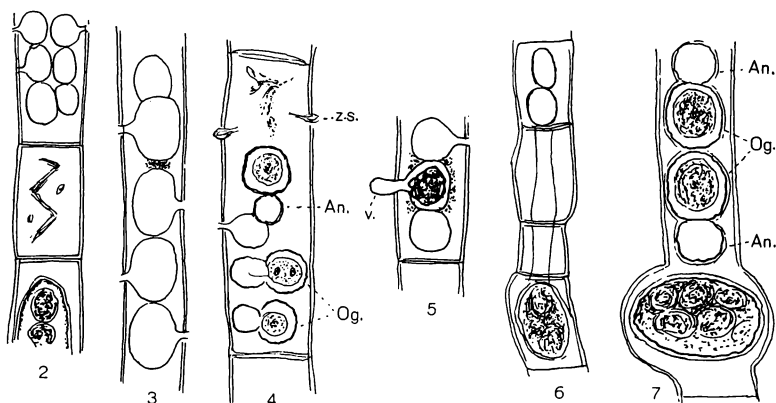


Fig. 2. Camera lucida drawing showing zoospores in the cells of the host as well as on the zygospore of *Spirogyra*. Here six sporangia are seen aggregated in one cell.

Fig. 3. Empty zoosporangia in a chain. The open mouths of the sporangia are seen.

Fig. 4. *Antheridia* and *oogonia* as well as sporangia. An. antheridia, Og. oogonia. Two zoospores (z. s.) are seen penetrating the wall of the host cell.

Fig. 5. Two empty and one young sporangia in which the zoospore initials are separating. The vesicle — v, is not yet complete.

Fig. 6. Unseptate tubular hypha is seen passing through the two middle cells. In one of the end cells two zoosporangia are formed.

Fig. 7. Two fertilised eggs (Og.). The empty antheridial cells (An.) are still attached. The Zygospore of *Spirogyra* l. c. Shows a number of *Myzocitium* cells inside.

Any cell may function as a zoosporangium, when contents are poured into a vesicle through an emission collar or exit tube (Fig. 1 E. c). When mature the zoospores escape by the rupture of the vesicle. No trace of the vesicle is left afterwards, only the emission collar

with its open mouth is seen (Fig. 3). The sporangia are usually cylindrical but very often globose or ellipsoidal. They are never irregularly contorted. In the host cells the sporangia may be arranged in a straight line or they may be aggregated (Fig. 2). These zoosporangia may be seen to form inside the zygospore of the host (Figs. 1, 2). In the formation of the zoosporangium, the protoplasm collects in the centre of the cell and splits into zoospore initials which pass out through the emission collar and assemble in the sac. Fig. 5 shows the formation of the vesicle and splitting of the protoplasm into zoospore initials. The zoosporangi measure 15—25 μ in diameter. Though often chains of zoosporangia only are seen in the host cell, antheridia and oogonia and as well as zoosporangia may be seen at the same time as in fig. 4. Two zoospores are here seen penetrating the wall of the host cell. This species is homothallic and when reproducing sexually, contiguous cells of the thallus form oogonia and antheridia (Figs. 4, 7). The oogonia are spherical and measure 15—25 μ in diameter. The antheridia are either spherical or cylindrical. No copulation tube is formed. By the dissolution of the walls, a pore is formed through which the contents of the antheridium pass into the oogonium where fusion takes place. A thick double wall is formed around the oospore (Fig. 7).

Discussion.

The following species of *Myzocitium* have been described so far (SACCARDO (7), OUDEMAN (5), FITZPATRIC (2)).

1. *M. proliferum* SCHENK.
2. *M. irregulare* H. E. PETERSEN.
3. *M. megastomum* DE WILDEM.
4. *M. globosum* SCHENK.
5. *M. lineare* CORNU.
6. *M. proliferum* var. *vermicolum* ZOPF and
7. *M. vermicolum* (ZOPF) FISCHER.

Of the above *M. irregulare* though mentioned as synonymous with *M. proliferum* (pro parte) is not a *Myzocitium* at all. PETERSEN (6) himself was very doubtful and thought it should have been placed as a new genus or under *Lagenidium*. It is perhaps a species of *Lagenidium* (FITZPATRIC (2)). *M. proliferum* var. *vermicolum* is now included in *M. vermicolum*. That means only five species of *Myzocitium* stand so far. Of these *M. vermicolum* which lives on Anguillules has very characteristic features. It has been described and

different stages of development sketched fully by DANGEARD (1). *M. globosum* which occurs on Algae has very large oospores, up to $150\ \mu$ and can be easily distinguished. The rest, viz., *M. proliferum*. *M. globosum* and *M. lineare* do not differ very much and are more or less similar. The oogonia and zoosporangia of these species vary between $15\text{--}20\ \mu$ in diameter. The oogonia and zoosporangia of the *Myzocitium* described in this paper vary between $15\text{--}25\ \mu$ in diameter and it possesses practically all the main characteristics and variations of those three species. As the measurements of the sporangia and oogonia of the three species are included within the range of variation of the fungus described and such differences, as the shape of the oogonia or antheridia being spherical, globose, oval or ellipsoidal or their arrangements whether in chains or in a straight line etc., are also found here, there is no justification in separating them into three different species. It is proposed that the three species as well as the one now described should be included under *Myzocitium proliferum* SCHENK.

Summary.

Myzocitium on *Spirogyra affinis* in the Punjab has been recorded and described. The species shows interesting variations regarding size and shape and arrangement of the zoosporangia and oogonia. The variations of this *Myzocitium* cover the characteristics of at least three species of *Myzocitium*, viz., *M. proliferum*, *M. globosum* and *M. lineare*. It is proposed to include these three species as well as the species described in this paper under *M. proliferum* SCHENK.

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