

Rare species of fungi parasiting on algae. II. Parasites of *Desmidiaceae*

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Investigations carried out on the *Desmidiaceae* revealed the following species of fungi parasitizing on desmids: *Myzocytium megastomum*, *Lagenidium closterii*, *Ancylistes closterii* and *Rhizophydium globosum*. *Lagenidium closterii* is new in Poland. It is the first information of this species as a parasite on the algae from the genus *Tetmemorus*. Figures of sporangia of *Rhizophydium globosum* on *Euastrum ansatum*, *Cosmarium botrytis*, *C. pseudamoenum* and a resting spore on *Staurastrum punctulatum* are the first graphic documentation of this species.

Key words: fungi parasites on desmids, aquatic fungi.

INTRODUCTION

Fungi described in the study occurred in samples that were collected in various parts of Poland in connection with investigations concerning the studies of the algae of family *Zygnemaceae* (K a d ł u b o w s k a 1972). In Poland fungi parasitizing on algae, particularly on desmids, have rarely been described. B a t k o (1975: 99) mentioned a few Polish studies dealing with fungal parasites. Further information is given as a supplement (K a d ł u b o w s k a 1975: 464–467). In this report *Rhizophydium globosum* is described as being a parasite on five *Desmidiaceae* species, which supplements data on this probably collective species. Information concerning this species and others was presented by K a d ł u b o w s k a (1981). Morphological features of the above species are in agreement with the descriptions of S p a r r o w (1960) and B a t k o (1975). Systematic order and families follow H a w k s w o r t h, K i r k, S u t t o n and P e g l e r (1995).

DESCRIPTION OF THE SPECIMENS

Myzocytyum megastomum de Wildeman
(Pythiales)

Thallus endobiotic, unbranched, divided by transverse septa $3\ \mu\text{m}$ wide into a linear series of linklike sporangia. Sporangia ellipsoidal $17-20 \times 15-17\ \mu\text{m}$. Discharge tube $20 \times 3\ \mu\text{m}$ distinctly expanded up to $6\ \mu\text{m}$, just beneath the host wall. Zoospores $4-5\ \mu\text{m}$ in diameter. Resting spores spherical $11\ \mu\text{m}$ in diameter with a thick smooth double wall (Figs 1a-d). Germination not observed.

Parasitic in *Closterium lunula* (Müll.) Nitzsch. Habitat of *Closterium lunula*: Pond Toporowy Stawek in the Tatra Mts., 22.09.1963. Figure of resting spores (Fig. 1d) presented in this report is the first graphic documentation of the species. It is often reported from Europe (S p a r r o w 1960; C e j p 1935).

Lagenidium closterii de Wildeman
(Pythiales)

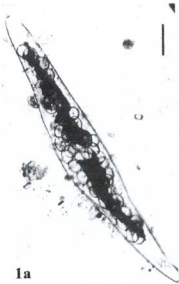
Thallus endobiotic, branched, more or less isodiametric or somewhat expanded, twisted, about $1-2\ \mu\text{m}$ in diameter; sporangia originate from these swollen cells, spherical or subspherical. $2-3\ \mu\text{m}$ in diameter. Gametangia expanded. Resting spore and zoospores not observed in the cell of *Tetmemorus brebissonii* (Menegh.) Ralfs. (Fig. 2).

Habitat of *T. brebissonii*: Lake Kociołek at Mrągowo, 1965. This species is new to Poland. It is the first record of the fungus being parasitic on the genus *Tetmemorus*. It is known from France, in *Closterium ehrenbergii* (S p a r r o w 1960).

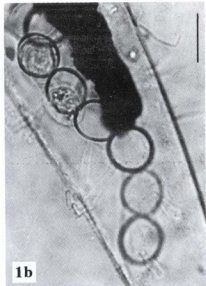
Ancylistes closterii Pfitzer
(Entomophthorales)

Resting spores smooth, brown, thick-walled, spherical $14-16\ \mu\text{m}$ in diameter, filled with refractive globules. In the cell of *Closterium*. Only resting spores observed (Fig. 3).

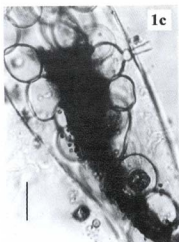
Habitat of *Closterium* Nitzsch: Pond Leśna Niwa (near Lubiec), 24.10.1966. This species is often reported from Europe (S p a r r o w 1960; C e j p 1935).



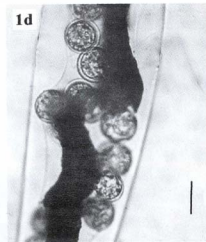
1a



1b



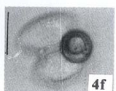
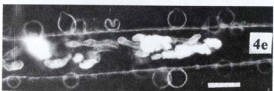
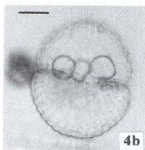
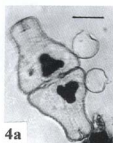
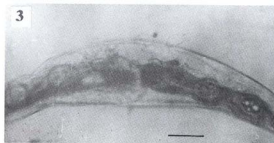
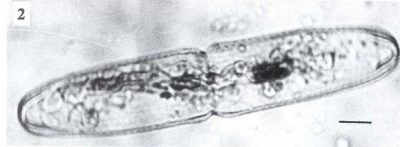
1c



1d

Figs 1 a-d: *Myzocytiium megastomum* in *Closterium lunula*. Fig. 1a - cell of host with parasite; Fig. 1b - part of the cell of host. Sporangia with discharge tube expanded just beneath host wall; Fig. 1c - numerous sporangia in cell of the host. Discharge tube swelling as in the genus *Oplidium*; Fig. 1d - resting spores in the host cell

Scale bars: 1a - 50 μm ; 1b, 1c - 20 μm ; 1d - 10 μm



Figs 2, 3, 4 a-f. Fig. 2. *Lagenidium closterii*. Endophytic branched mycelium and empty sporangia in the cell of *Tetmemorus brebissonii*; Fig. 3. *Ancylistes closterii* in *Closterium* sp. Resting spores in the *Closterium* cell; Fig. 4a. *Rhizophydium globosum* - two empty sporangia on *Euastrum ansatum*; Fig. 4b. - three empty sporangia on *Cosmarium botrytis*, surface view; Fig. 4c. three empty sporangia on *Cosmarium botrytis*, side view; Fig. 4d - sporangium with zoospores and two resting spores with globules on *Cosmarium pseudamoenum*; Fig. 4e - numerous sporangia, several with protruding discharge papillae on *Pleurotaenium trabecula*; Fig. 4f - resting spore on *Staurastrum punctulatum*

Scale bars: 2, 4d, 4e - 10 μ m; 3, 4b, 4c, 4f - 20 μ m; 4a - 25 μ m

Rhizophyidium globosum (Braun) Rabenhorst
(Chytridiales)

Thallus epi- and endobiotic; the epibiotic part forming the sporangium or resting spore, the endobiotic branched rhizoidal system; sporangia sessile; zoospores formed within the sporangium; resting spore thick-walled with one globule, borne like the sporangium. This collective species parasitic primarily on desmids. The fungus is often reported from Europe (S p a r r o w 1960).

The following five desmids are substrata for this species. *Euastrum ansatum* Rafs, habitat: Toporowy Stawek (Tatra Mts.), 22.09.1963. Two empty sporangia 18 μm in diameter (Fig. 4a). *Cosmarium botrytis* Meneghini, habitat: peat-bog in Lubiec (near Belchatów), 1.08.1966. Three empty sporangia 18 μm in diameter (Figs 4b and c). *Cosmarium pseudamoenum* Wille, habitat: peat-bog in Lubiec (near Belchatów), 1.08.1966. Sporangium 11 μm in diameter with zoospores and two resting spores thick walled 11 μm in diameter with one globule (Fig. 4d). *Pleurotaenium trabecula* (Ehr.) Naegeli, habitat: Toporowy Stawek (Tatra Mts.), 22.09.1963. Numerous sporangia 7–11 \times 7–10 μm with protruding discharge papillae and empty sporangia (Fig. 4e). Rhizoidal system branched. *Staurastrum punctulatum* Brébisson, habitat: Toporowy Stawek (Tatra Mts.), 22.09.1963. Resting spore 14 μm in diameter with globule (Fig. 4f).

DISCUSSION AND FINAL REMARKS

The algae of the *Desmidiiales* order are frequently invaded by fungi. S p a r r o w (1960: 1080–1082) reported several dozens of desmids, constituting substrata for the fungi. In the present study *Myzocytium megastomum* specimens were found in a high number of cells of *Closterium lunula*. The whole developmental cycle of this fungus was therefore recorded. It was collected from Toporowy Stawek on 22.09.1963. It is interesting that another fungus species, *Micromycopsis mirabilis* Canter parasitizing on the specimens of *Closterium lunula* as well, was also identified in the same sample collected on the same day (K a d ł u b o w s k a 1969).

Five desmids are substrata for *Rhizophyidium globosum*. S p a r r o w (1960: 230–231) stated that the genus *Rhizophyidium* Schenk was the largest and the complex genus of the chytrids, while *R. globosum*, the as several other species of the genus, is also a collective species. Despite the deliberation about many problems associated with their collectivity a tendency to adhere to the original concept of these species, i.e. to leave their the well-described forms without names, has dominated over another that attempted to solve with finality many problems associated with them.

The presently described fungi parasitizing on desmids, except *Myzocytyum megastomum*, were encountered only solitarily. All the fungi were recorded only in samples from peat-bogs, originating from various regions of Poland.

Lagenidium closterii, a species new to Poland and parasitizing on *Tetmemorus brebissonii*, is described. To the best of my knowledge, this fungus is known to occur only in France. The whole developmental cycle of *Myzocytyum megastomum* is described and illustrated. This species occurred and multiplied in a number of cells of *Closterium lunula*. The occurrence of *Rhizophyidium globosum* on five species of the family *Desmidiaceae* is notable. Empty sporangia were observed in *Euastrum ansatum*, *Cosmarium botrytis* and *Pleurotaenium trabecula*, while a sporangium with zoospores and a resting spore on *Cosmarium pseudamoenum* which were also recorded on *Staurastrum punctulatum*. These observations supplement data on *Rhizophyidium globosum*, which is a collective species.

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Rzadkie gatunki grzybów pasożytniczych na glonach II. Pasożyty *Desmidiaceae*

Streszczenie

Podano opisy kilku grzybów będących pasożytami desmidii: *Myzocytyum megastomum* na *Closterium lunula*, *Lagenidium closterii* (gatunek zaobserwowany po raz pierwszy w Polsce) na *Tetmemorus brebissonii*, *Ancylistes closterii* na *Closterium* sp., *Rhizophyidium globosum* na: *Euastrum ansatum*, *Cosmarium botrytis*, *C. pseudamoenum*, *Pleurotaenium trabecula* i na *Staurastrum punctulatum*. Gatunkiem nowym dla Polski okazało się *Lagenidium closterii*. Zamieszczone ryciny zarodni *R. globosum* na okazach *Euastrum ansatum*, *Cosmarium botrytis* i *C. pseudamoenum* oraz zarodni spoczynkowej na *Staurastrum punctulatum* stanowią pierwszą dokumentację graficzną powyższego gatunku.