Rare species of fungi parasiting on algae
I. Parasites of Spirogyra and Mougeotia

JOANNA ZOFIA KADŁUBOWSKA

Department of Algology and Mycology, University of Łódź
Banacha 12/16, PL-90-237 Łódź, Poland


Investigations carried out on the genus Spirogyra Link and Mougeotia Agardh revealed the following species of fungi parasiting in the Spirogyra and Mougeotia cells: Olpidium endogenum, Blyttiomycetes helicus, B. spinulosus, Micromyces zygonii and Rhizophyllum ampullaceum. First information on B. helicus as parasitic on algae is presented.

Key words: fungi parasites, Spirogyra, Mougeotia, aquatic fungi.

INTRODUCTION

In the course of investigations concerning the studies of the family Zygnemaceae (Kadłubowska 1984) parasitic fungi of the cells of Spirogyra and Mougeotia were identified. First publication of the occurrence of eight fungus species on the Spirogyra cells was available thirty years ago (Kadłubowska 1968). Initial information concerning this topic was presented by Kadłubowska (1981).

Samples of algae from Denmark were sent to the present authoress by Prof. Dr Tyge Christensen and from Norway by Dr Anders Langangen during taxonomical elaborating of Zygnemataceae.

While identifying, comparing dimensions and determining morphological features, the use was made of the Skirgiełło (1954), Sparrow (1960) and Batko (1975).
DESCRIPTION OF THE SPECIMENS

**Olpidium endogenum** (Braun) Schroeter

Sporangium broadly ellipsoid, 41 × 14 μm, endobiotic. Its longer axis parallel with that of the *Spirogyra* cell. Wall smooth, colourless.

Discharge tube 5 μm long, arising from the end of the sporangium, cylindrical with a pronounced swelling up to 7 μm, where it meets the inner face of the *Spirogyra* wall, and terminating in a funnel-like apex 4 μm broad (Fig. 1). Zoospores not observed.

Resting spore ellipsoid 80 × 30 μm, contents with two oil globules (Fig. 2), in vegetative cells of *Spirogyra paludosa* Czurda.

Habitat of *S. paludosa*: Pond Lipowy (Experimental Pond Farm of the Laboratory of Water Biology of the Polish Academy of Sciences at Gólysz, near Cieszyń), 2.06.1965. Resting spore dimensions of this species differ significantly from those given by Sparrow (1960). This species is new for the Polish flora. *O. endogenum*, parasitic primarily in desmids, is also reported from Spain in the cells of *Spirogyra majuscula*. Figure of resting spore presented in this report is the first graphic documentation of this species.

**Blyttiomyces helicus** Sparrow et Barr

Sporangium epibiotic, globose, 24 μm high (including the apiculus), 27 μm in diameter. Sporangium wall brown, bearing narrow low 1 μm thick helical bands, apiculus 3 μm high by 4 μm in diameter (Fig. 3). Discharge pore not observed. Apophysis is endobiotic. Resting spore endobiotic, globose, smooth, thick-walled, 20 μm in diameter, in the zygote of *Spirogyra porticalis* (Fig. 3). Habitat of *Spirogyra porticalis*: a pond at Lutomiersk (near Łódź), 30.05.1975.

*Blyttiomyces helicus* is cited from the United States and Germany, saprophytic on pine-pollen (citation after Sparrow 1960). This species is new for the Polish flora. It is the first information on this species as parasitic on algae, namely on the zygotes of *Spirogyra*. Morphological features and dimensions of *B. helicus* from Lutomiersk are congruent with the description of Sparrow (1960).

**Blyttiomyces spinulosus** (Blytt) Bartsch

Sporangium with apiculus epibiotic, globose, 15–20 μm in diameter. Sporangium wall covered with short spines (Fig. 4). Apiculus hyaline, smooth walled, 3 μm high. Discharge pore lateral. Aphophysis endobiotic. Numerous immature sporangia on the surface of host (Fig. 5). Resting spore not observed, in zygote of *Spirogyra* sp.
Figs 1, 2. *Olpidium endogenum*: Fig. 1. Sporangium with discharge tube in the vegetative cell of *Spirogyra paludosa*, ×1000; Fig. 2. Resting spore with two oil globules in the vegetative cell of *Spirogyra paludosa*. Remnant of discharge tube, ×500
Figs 3, 4. Sporangia of *Blyttiomycetes*: Fig. 3. Sporangium epibiotic with helically banded wall in zygote of *Spirogyra* sp.. Resting spores endobiotic, × 500; Fig. 4. Sporangium with short spines on zygote of *Spirogyra* sp. (Phot. T. Christensen), × 250
Figs 5–7. *Blytiiomyces spinulosus*: Fig. 5. Immature sporangia on zygote of *Spirogyra* sp. (Phot. T. Christensen), ×250; Fig. 6. Two sporangia epibiotic with apiculus, on zygotes of *Spirogyra fluviatilis*, ×500; Fig. 7. Numerous sporangia on surface of zygotes of *Spirogyra fluviatilis*, ×500
Figs 8–10. Fig. 8. *Micromyces zygonii*. Prosorus with curved (A) and straight (B) spines, and sorus in slightly inflated cell of *Mougeotia* sp., ×500; Fig. 9. *Micromyces zygonii*. Prosorus and sporangia in inflated cell of *Mougeotia* sp., ×1000; Fig. 10. *Rhizophyidium ampullaceum*. Numerous sporangia on vegetative cells of *Mougeotia* sp., ×500
Habitat of *Spirogyra* sp.: Denmark (no other data).
Sporangium 25–28 μm in diameter, numerous on the surface of host (Fig. 6 and 7), in zygotes of *Spirogyra fluviatilis*.
Habitat of *S. fluviatilis*: Norway, river in Kongsberg, 17.08.1991.
Morphological features and dimensions of *B. spinulosus* from Denmark and Norway are congruent with the description of *Sparrow* (1960).

**Micromyces zygogonii** Dangeard

Prosorpus spherical, 15–18 μm (mostly 15) in diameter, with a colourless wall, the outer surface of which is covered with numerous sharp tapering straight or somewhat curved 5–7 μm long spines; sorus 13–19 μm mostly, 17 μm in diameter. Resting spore spherical, 10–14 μm in diameter, covered with 3–4 μm long spines, occurred in 27 vegetative slightly inflated cells of *Mougeotia* sp. (Fig. 8A and B). Dimensions and morphological features, except somewhat curved spines of prosorus, of *M. zygogonii* from Pond Okręt are congruent with the description of *Sparrow* (1960).
Habitat of *Mougeotia* sp.: Pond Okręt (near Łowicz), 21.06.1967.
Prosorpus spherical, 18–19 μm in diameter covered with sharp, straight up to 12 μm long spines, sorus ovoid with rounded base of 13 × 26 μm. Host cell pronounced, inflated up to 100% (Fig. 9), in vegetative cell of *Mougeotia* sp.
Habitat of *Mougeotia* sp.: Pond Leśna Niwa (near Lubiec), 23.06.1965.

**Rhizophydidum ampullaceum** (Braun) Fischer

Sporangium epibiotic, sessile spherical, 6–7 μm in diameter, with an apical discharge tube 4–5 μm long by 2–3 μm in diameter. Wall thin, smooth, colourless (Fig. 10). Zoospores and resting spore not observed, in vegetative cells of *Mougeotia* sp.
Clustered on *Mougeotia* sp.: a pond in Arturówek (Łódź), 12.10.1960 r. and Pond Chyliński (Experimental Pond Farm of the Laboratory of Water Biology of the Polish Academy of Sciences) at Gołysz (near Cieszyn), 2.06.1965. Morphological features and dimensions of *Rh. ampullaceum* from Arturówek and Pond Chyliński are congruent with the description of *Sparrow* (1960).

REFERENCES

Rządkie gatunki grzybów pasożytujących na glonach

I. Pasożyty Spirogyra i Mougeotia

Streszczenie

Opisano następujące gatunki grzybów pasożytujących na Spirogyra i Mougeotia: Olpidium endogenum, Blyttiomycetes helicus, B. spinulosus, Micromyces zygononii i Rhizophydom ampullaceum. Dane o B. helicus pasożytującym na zygotach Spirogyra sp. są pierwszą informacją w piśmiennictwie o występowaniu tego gatunku na glonach.