

On the New Desmids Parasite — *Lagenidium podbielkowskii* sp. nov.

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Below is a description of the new fungus parasitizing on *Micrasterias denticulata* Bréb. The fungus has been named *Lagenidium podbielkowskii* sp. nov. and the taxonomic relationships with the most closely allied species, namely — *L. closterii* de Wildeman are discussed.

Owing to the kindness of doc. dr Zbigniew Podbielkowski, I was enabled to examine a considerable number of samples containing freshwater algae fixed in 4% formaline, gathered by him in connection with research into the plant life of peat ditches of Warsaw voivodeship. In the majority of cases, the material contained fragments of bog mosses, as well as numerous species of algae (*Cladophora*, *Oedogonium*, *Bulbochaete*, *Mougeotia*, *Zygnema*, *Spirogyra*, various *Cyanophyceae* etc.). Particularly abundant were in the samples desmids which were to be found in almost every sample and distinguished themselves by their great diversity. Less numerous were diatoms, green algae from the orders *Chlorococcales* and *Volvocales*, as well as dinophycean algae.

My main aim in examining dr Podbielkowski's materials was to look for parasitic chytrids, as well as for aquatic *Phycomycetes* subsisting on pollen grains, spores etc. Various algae showed in fact of infection by water fungi, but in the majority of cases, and owing to the paucity of the material I was unable to indentify this fungi more precisely. All the more surprising therefore was the finding, in the sample made at July 27-th, 1957 in a big peat ditch at Celestynów near Warsaw of a considerable number of *Micrasterias* cells, containing perfectly preserved thalli of parasitic aquatic phycomycetes.

The peat ditch whence the material come, was located in an intermediate peat bog and was filled with slightly acid water (pH ca 6). At the moment of taking the sample numerous populations of freshwater

algae vegetated in it; predominant among filamentous algae was *Tribonema* sp. div., while two species of *Micrasterias*: *M. denticulata* Bréb. and *M. rotata* (Grev.) Ralfs. predominated among the one-celled algae. The populations of these two desmids at the moment of sampling were very strongly attacked by parasitic fungi; the number of *M. rotata* stricken cells attained 70%, and exceeded 50% in the case of *M. denticulata*. A different fungus was parasitizing on each of these species; despite a painstaking examination of several hundred sick cells I have not stated any case of cross-infection. This constituting a contribution to the

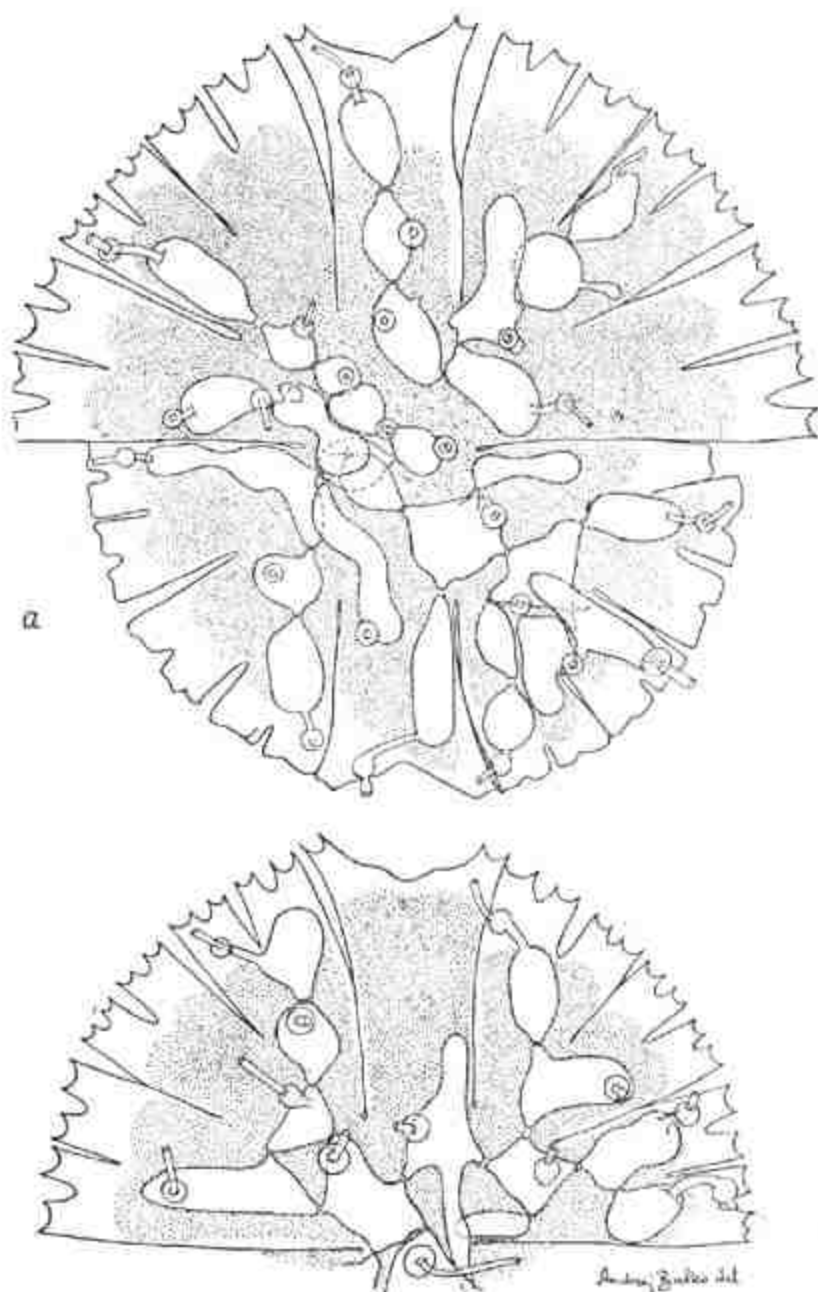


Fig. 1. Morphology of the thalli of *Myzocyttium irregulare* parasitizing on *Micrasterias rotata* in the Celestynów sample

problem of host specificity at freshwater phycomycetes. I have identified the *M. rotata* parasite as *Myzocyttium irregulare* H. E. Petersen (Fig. 1). On the other hand more problems of a taxonomic nature were caused by a parasite of *M. denticulata*, which seems to me to be a so far undescribed member of the genus *Lagenidium*. I am describing this fungus in the present paper, naming it *L. podbielkowskii* in honour of the collector.

Lagenidium podbielkowskii sp. nov.

Thallus polycentricus, tubuliformis, ramosus, paene lobatus, ca 3,9-5,2 μm diam.; sporangiis elongatis, variabilis, saepe lobatis vel irregularibus in unum tubulum extentibus, quid sub membrana hospitis sphaerice dilatata (max. 10,5 μm diam.) supra membrana oblonge-dilatata et apice ad diam. 1,3-1,8 μm constricta est; longitudo totis partis extramatrix 19,0-31,5 μm. Zoosporae non visae, in vesiculum ad tubulis evacuationibus orificem formatae. Oogonia 40-72 μm longa, lagunculiformia, ad 19-25 μm lata, apice angustata. Antheridia tubuliformia, rare fusiformia vel paene irregularis, saepe paene dilatata in locus conjugationis cum collis oogoniis. Oosporae globosae, 15,5-21,3 μm diam. vel ovalis, ad 25 μm longae et 18,2 μm latae, hyalinae, laevis. Parasitus Micrasteriatidis denticulatae. Habitat in aqua uliginosa in Celestynów prope Varsovia, Polonia.

Typus: in Herbario Universitatis Varsoviensis depositus est.

Thallus extensive, richly branched and somewhat lobed, more or less isodiametric during vegetative growth and becoming here and there expanded when the sexual organs are formed, about 3.9-5.2 μm in diameter, sporangia of variable shape and length, delimited by thin septa, discharge tubes produced as the apical or lateral outgrowths, wide in its intramatrix parts, with big spherical expansion up to 10.5 μm in diameter just beneath the host's wall, strongly and abruptly constricted when piercing the host's wall, above the wall somewhat dilated and tapering off to the apex or narrow throughout (about 1.3-1.8 μm in diameter); length of whole extramatrix part of the evacuation tubes varies from 19.0 to 31.5 μm. Zoospores not seen, are forming at the orifice of a discharge tube in thinwalled vesicle of 9.1-12.5 μm in diameter (which persist in a formaline-preserved material). Female gametangium 40.0-72 μm long, flask-shaped, expanded at one end to a diameter of 19-25 μm, abruptly narrowing to the basal septum and gradually tapering off at the opposite end to a long neck, which makes contact with male gametangium; sometimes female gametangium fusiform or somewhat irregular or branching. Male gametangium — an ordinary segment of the thallus, cylindrical or lobed, often somewhat expanded at the point of insetion of the tip of female gametangium neck. Resting spores spherical, 15.5-21.3 μm in diameter or oval, up to 25×18.2 μm, hyaline, smooth, with

a wall 2.3–4.6 μm thick, with dense, granular content. Parasite of desmid *Micrasterias denticulata* Bréb.

Type locality: *Sphagnum* bog in Celestynów near Warsaw, Poland.

Type: preserved material in the Herbarium of University of Warsaw.

Iconotype: Figs. 2 and 3.

I consider *L. podbielkowskii* as a species close to *L. closterii* de Wildeman (1893). Both species have similarly organized vegetative thalli, zoosporangia and discharge tubes, and even gametangia, but differ in the dimensions of all these elements. According to Cęjpa (1959) and Sparrow (1960), the diameter of the cylindrical segments of the thallus and zoosporangia of *L. closterii* does not exceed 2.8–3 μm , but the diameter of the oospores amounts to 10–12 μm . What is more, the oospo-

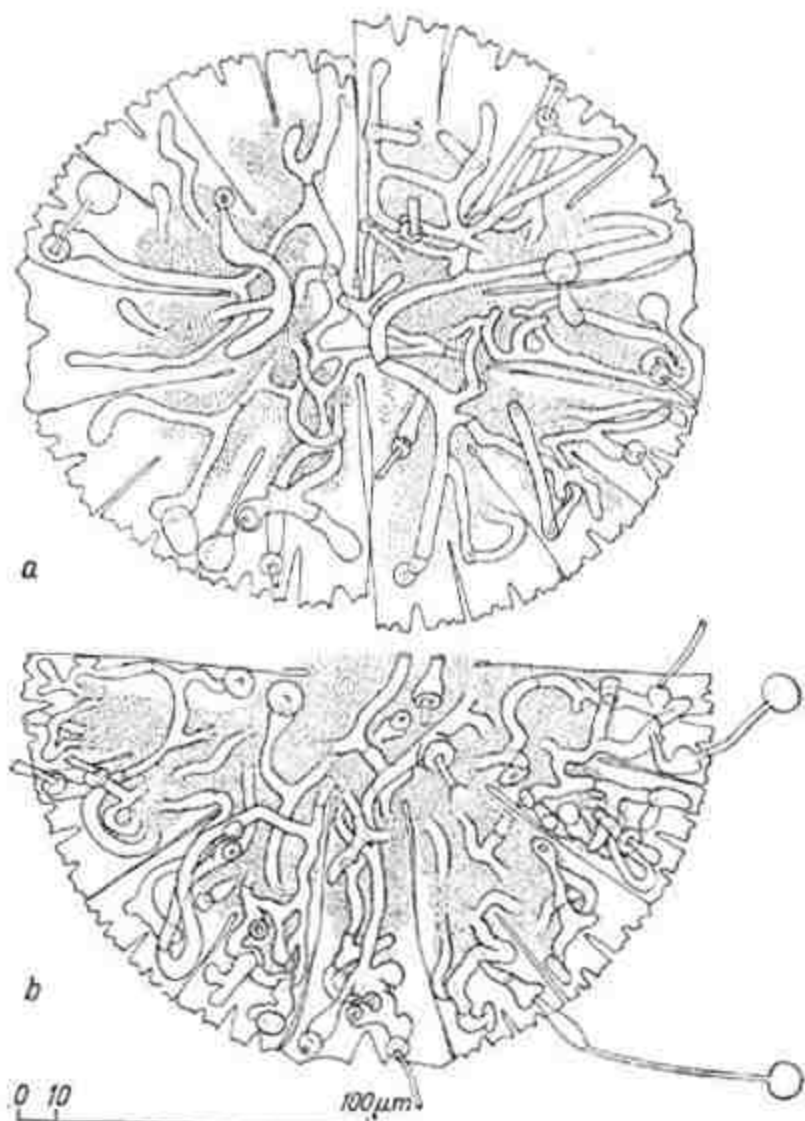


Fig. 2. Zoosporangial morphology of *Lagenidium podbielkowskii* parasitizing on *Micrasterias denticulata*.

res of *L. closterii* are irregularly papillate. Worthy of emphasis are also minor but characteristic morphological features of *L. podbielkowskii* differentiating it from *L. closterii*: pear-shaped rather than spherical form of the swelling of discharge tube beneath the wall of the host's cell, flattened and even concave distal surface of that swell, which in *L. closterii* is convex, spherical or oval; secondly — in the *L. podbielkowskii* there is a thin, narrow down tip of the neck of the female gametangium enters into the widened end of the male gametangium, and even slightly penetrates it, while in the *L. closterii*, as writes Sparrow "male gametangium cylindrical, with a prolongation which makes contact with the female gametangium..." (p. 1001), which means that the relations

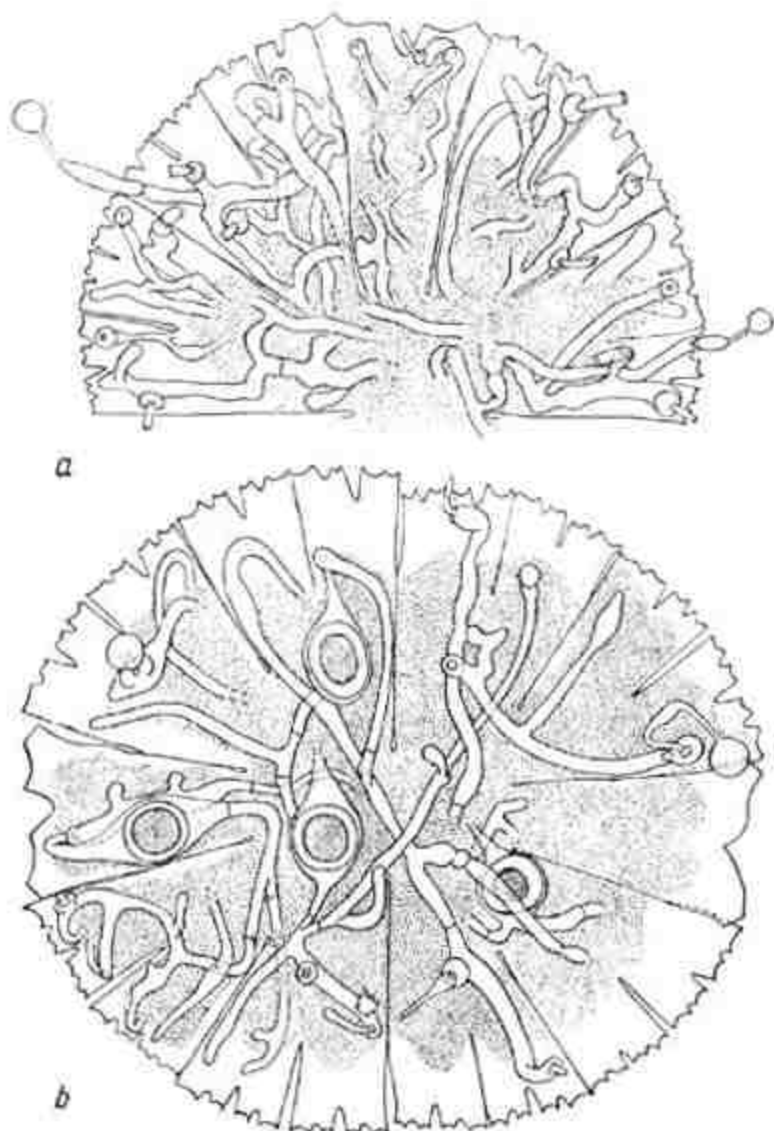


Fig. 3. Morphology of *Lagenidium podbielkowskii* parasitizing on *Micrasterias denticulata*

a — zoosporangia of the parasite in halfcell of *Micrasterias*; b — sexual reproduction of *L. podbielkowskii*

are here inverse. C e j p, who observed the sexual reproduction in three strains of *L. closterii* from Czechoslovakia (Fig. 160a in his book) showed a female gametangium somewhat recalling the female gametangium of my fungus, but other pairs of gametangia shown by him on Fig. 160c are of quite different structure. True, the intercalary zoosporangium of C e j p's „*Lagenidium closterii*” shown on Fig. 160b has a thin, cylindrical discharge tube, which is contradictory to his description of this fungus published on page 402 of the same book and which suggests the possibility of the misdetermination of the part of a material.

The most essential differences between the two species discussed here could be conveyed in the form of an appropriate supplement to S p a r r o w's „Key to the species of *Lagenidium*” (1960). The text below should replace the first three lines on p. 986.

In Green Algae

Discharge tube strongly expanded beneath the host wall

Resting spore smooth, over 15 μm in diam.; zoosporangia over 3.5 μm in diam.; female gametangium with tapering, prolonged neck which makes contact with the wide end of male gametangium; discharge tube expansion obpyriform or transverse-ellipsoidal, somewhat flattened or concave at the side of the host's cell wall; in *Micrasterias*

L. podbielkowskii

Resting spore irregularly papillate, up to 12 μm in diam.; thallus up to 2.8 μm in diam.; male gametangium with prolongation which makes contact with the female gametangium; discharge tube expansion spherical, more or less convex at the side of the host's cell wall; in *Closterium*

L. closterii

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Nowy pasożyt wstężnic — *Lagenidium podbielkowskii* sp. nov.

Streszczenie

Autor opisuje nowy gatunek grzyba wodnego, *Lagenidium podbielkowskii* sp. nov., pasożyta *Micrasterias denticulata*. Grzyb znaleziono w zbiorach glonów doc. dr Z. Podbielkowskiego, w próbie pobranej z dołu potorfowego pod Celestynowem koło Warszawy. Nowy gatunek jest zbliżony do *L. closterii* de Wildeman, lecz różni się od niego większymi wymiarami wszystkich elementów plechy, gładkimi przetrwałnikami i innymi szczegółami budowy.