

Development and morphology of *Micromyopsis mirabilis* Canter

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In 1949 Canter described *Micromyopsis mirabilis* on the basis of material from the water bodies in Great Britain. He found *M. mirabilis* parasitizing in the cells of *Closterium lunula*, *C. costatum*, *C. dianae*, *C. kützingii* and *Closterium* sp.; however he could not investigate the whole cycle of development but only the prosorus and sorus stages of this fungus.

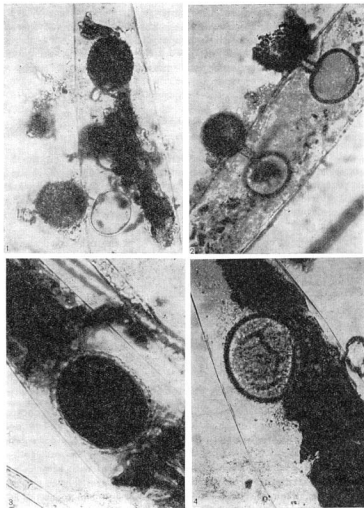
In the samples taken on 13 May, 1966 from the peat bog Przerębiec near Lubiec (Belchatów district in the Łódź region) parasitic *Micromyopsis mirabilis* Canter were noticed multiplying in a number of cells of *Closterium lunula* (Müll.) Nitzsch. In the samples taken from the same site on 12 June, 1967, only resting spores in one cell of *Closterium* sp. were found. Material gathered from Toporowe Stawki (Tatra Mts.) on 22 September, 1963 revealed one resting spore in the cell of *Closterium lunula*.

Morphological features

1. Samples from the peat bog Przerębiec

Prosori (Figs 1, 2) ellipsoidal, surrounding cell wall with concentric short spines. Prosorus length 30—57 μ (mean length 40 μ , confidence interval 28—38 μ). Diameter of prosorus discharge tube about 5 μ length of discharge tube dependent on the distance of the prosorus from the host cell wall. Sori spherical (Figs 1, 2), surrounded with brownish cell wall bearing short spines. The sorus consists of several tens of sporangia about 5 μ in diameter. Sorus diameter 30—50 μ (mean diameter 36 μ , confidence interval 31—41 μ). Resting spores (Fig. 3) surrounded with a three-layer cell wall: endosporium dark-brown thin, mesosporium also thin colourless, exosporium colourless, thick, bearing numerous verrucae.

In the sample of 13 May, 1966 only two resting spores were found, 62 \times 68 μ and 68 \times 64 in size.



Figs 1—4. *Micromycopsis mirabilis*: 1 — two prosores in *Closterium lunula* cell; on the right: one prosorius with developed discharge tube, the other with a sorus outside of the host sporangium; 2 — two prosores with discharge tubes and sori. Figs 3 and 4 — resting spore in *Closterium lunula* cell; 3 — thick verrucous exosporium is clearly seen; 4 — septa on the resting spore cell wall are well visible

In the sample of 12 June 1967 the stage of resting spores was solely noticed. In the middle of the *Closterium* sp. cell three ellipsoidal resting spores occurred. Because of the deformation of *Closterium* chromatophores the species could not be identified. Resting spores were surrounded with a dark-brown thin layer of endosporium, with colourless thin layer of mesosporium and a thick colourless layer of exosporium bearing numerous verrucae. Resting spores $40 \times 42 \mu$, $45 \times 50 \mu$ and $50 \times 65 \mu$ in size.

2. Sample from Toporowe Stawki

The preserved material revealed only one resting spore in a *Closterium* cell. On the spore cell wall some septa could be seen (Fig. 4). It was not clear, however, whether the septa penetrated into the spore or only divided the cell wall into several segments. Resting spore size was $60 \times 67,2 \mu$.

Development cycle

The sample taken from the peat bog Przerębiec on 13 May 1966 was placed in a glass vessel at room temperature. On the first day of observation brownish prosori were noticed in the cells of *Closterium lunula*. The chromatophores were slightly damaged and pushed towards the cell wall. In the host cells generally two prosori occurred. After 7 days the discharging tubes began to develop on the prosori (Fig. 1) and perforated the host cell wall. At the tips of discharge tubes just by the *Closterium* cell wall sori consisting of several tens of spherical spores were formed (Figs 1, 2). The contents of prosori escaped through the discharge tube into the sori. The prosori turned almost colourless and the relief of their cell wall became conspicuous. On the tenth day of observation some sori split (Fig. 2), and discharged spores. After a fortnight in the middle of *Closterium lunula* cells resting spores formed in place of the nucleus occurrence (Fig. 3).

DISCUSSION

Micromycopsis mirabilis Canter is a new genus and species for Polish flora. To the authors knowledge the peat bog at Przerębiec and Toporowe Stawki are so far, beside Great Britain, the only places of *Micromycopsis mirabilis* occurrence in the world.

Micromycopsis mirabilis during its development cycle produces not only prosori and sori described by Canter but also resting spores (Figs 3, 4). Resting spores are surrounded by three-layer cell wall: brown, thin, smooth-walled endosporium; colourless, thin, smooth-walled meso-

sporium, and colourless, thick, verrucous exosporium. Septa divide the cell wall of resting spores into several segments (Fig. 4). The relief of the cell wall bears a close resemblance to that of *Synchytrium endobioticum* (Schilb.) Perc (figure in Curtis's paper, 1921). Such a sculpture of the cell wall provides evidence that the development cycle of *M. mirabilis* includes also the stage of resting spores.

Sparrow (1960) included genus *Micromycopsis* Scherffel 1926 in the genus *Micromyces* Dangeard 1889. This does not seem correct since in genus *Micromycopsis* the prosorus content is discharged into the sorus outside the host, whereas in genus *Micromyces* the prosorus is deprived of the discharge tube and the sporangia or sorus are formed inside the host. Cejp (1957) and Skirgiello (1954) distinguish both these genera.

The materials are to be found in the Institute of Algology, Department of Taxonomy and Geography of Plants, University of Łódź.

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Rozwój i morfologia *Micromycopsis mirabilis* Canter

Streszczenie

Opisano z okolicy Łodzi *Micromycopsis mirabilis* Canter, grzyb wodny pasożytujący na przedstawicielach rodzaju *Closterium*. Grzyb ten znany był dotychczas tylko w Wielkiej Brytanii, obecnie stwierdzono jego występowanie również w Polsce.