CHRYSOSPHAERA SIEMINSKAE SPECIES NOVA, A NEW *CHRYSOSPHAERA* SPECIES FROM POLAND

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ABSTRACT

A new species of *Chrysosphaera* – *Ch. sieminskae* has been found in Poland. It is an alga forming compact colonies consisting of single cell structures settled down at *Testacea*'s translucent carapace (e.g. *Euglypha*, *Centropyxis*, *Diffugia*). The new species, which grows on specific animal host and is characterized by a peculiar organization of colonies, differs in shape and size of its cells from all other taxons belonging to the same genus. This new species has been found in the conditions of poor fen habitats, in water bodies at pH from 3.9 to 5.0.

KEY WORDS: *Chrysosphaera*, *Chrysophyceae*, new species, poor fen

INTRODUCTION

The studies on algae carried out in peat bog ecosystems of the Sudeten Mts. have revealed that three of them are the habitats of a new species, belonging to Chrysophyceae, inhabiting the carapace of *Testacea*. Its characteristic cell structure, sedentary way of life and organization of colonies indicate that the species belongs to the genus *Chrysosphaera*. So far, eight species of this genus have been known (Starmach 1985). The appearance and cell structure of the new alga resemble, to a great extent, the species described by Korschikov (1929), i.e. *Chrysosphaera paludosa* (Korsch.) Bourelly. However, the newly found taxon differs from others. It grows on a specific animal host, its colonies are formed in a different way and the shape of its cells is characteristically distinguishable.

Chrysosphaera paludosa grows epiphytically upon various filamentous algae forming small cell clusters, whereas the taxon described here forms large, regular aggregates anchored to the carapace of *Euglypha*, *Centropyxis* and *Diffugia*. The shape of the colonies of this newly found taxon depends on the shape of its host's carapace. Its cells viewed from the side are semi-circular in shape and slightly concave on the flattened part, while the cells of any other species described so far, are either spherical or oval.

The taxon described in this paper has been found on semi-oligomesotrophic habitats of poor fens overgrown by *Carex rostrata*, *C. curta*, *Eriophorum angustifolium*, *Calamagrostis villosa*, *Agrostis canina*, *Juncus effusus*, *J. filiformis*, *Sphagnum riparium*, and *S. fallax*, in water at pH from 3.9 to 5.0.

MATERIAL AND METHODS

The material was collected in the years 1986-88 from peat bogs located in the Karkonosze Mts., at altitude 1200 to 1300 m a.s.l = above sea level (fens Pielgrzymy and Słonecznik), and

(Topieliska-Zieleniec peat bog) at the foot of the Orlickie Mts (alt. 750 m) near Duszniki. More detailed floristic and ecological characteristics were given by Tołpa (1948, 1985), Pałczyński (1972), Fabiszewski (1978), and Matuła (1980, 1992).

The samples were collected from spring till late autumn at two-month intervals, using a plankton net No 25 (algae floating in water) or a spoon (for algae from wet peat surface). Gelatinous masses of algae settled on submerged mosses of *Sphagnum* and *Carex* were collected together with macrophyte hosts. The studies were carried out on living material kept at + 25°C in water collected from habitats and on material preserved with ethaform.

Chrysosphaera sieminskae Matuła sp. nova.

The cells are aggregated in more or less regular strata, but they can as well be one-layer structures, or can grow side by side slightly overlapping each other, therefore resembling roof-tiled structures. The colony coats the entire surface of the translucent carapace of *Euglypha*, *Centropyxis* or *Diffugia*. The cells are oval when viewed from above and semi-circular when viewed from the side. They are slightly concave on their flattened part, well settled on this side on their host's carapace. The chromatophore, golden brown in colour, is a single, disk-shaped plate, parietal, seen on the top of the cell. The contractile vacuole is one, often invisible. The cytoplasm contains of small spherical chrysolaminarine granules. Sometimes droplets of fat are additionally visible. The cell wall is thin and colourless. The occurrence of cysts, almost spherical in shape, was detected in a few cases. The walls of the cysts were smooth and the margin of the pore elevated into a flange-like collar. The width of the cells ranged from 3 to 6, and their height from 4 to 5 µm. The cysts were from 4 to 5 µm in diameter. The diameter of the hollows ranged from 1.5 to

Fig. 1-7. *Chrysosphaera sieminskae*.

1-4. Four examples of compact colonies settled on the translucent carapace of *Testacea*. 5. Part of colony with vegetative cells. 6. Structure of vegetative cells. 7. Single cysts.

Enlargement of Figs 1-4. – scale a; enlargement of Figs. 5-7. – scale b.

2.0 μm . Reproduction of the alga takes place by division of the protoplast into two autospores. No zoospores have been observed (Figs. 1-7).

Diagnosis: *Cellulae desuper spectatae ostendunt formam circularem aut ovalem, spectatae autem a latere sunt semicirculares, parte plana affixae ad Testaceae lorculam. Cellula in parte plana est modice cava. Membrana cellulae est tenuis et achromaticus. Chromatophorus unus ad superficiem superiorem locatus. Vacuola contractilis – una. In protoplasto parvae, globosae granulae chrisolaminariae et guttae oleosae conspiciuntur. In coloniis cellulae in uno strato confertae, magis minusve regulatim in ordinibus aut imbricatim compositae onsidunt in superficie praebitoris. Forma cistarum est fere globosa. Cistae cum angusto collari circum aperturam sunt lubricae. Latitudo cellulae 3-6 μm , altitudo 4-5 μm ; diameter aperturae cistarum 1.5-2.0 μm .*

Multiplicatio fit per divisum protoplastum in duas autosporas. Zoosporae non conspiciuntur.

Iconotypus: figurae 1-5.

Habitatis: in lorculis Diffugiæ, Centropyxis et Euglyphae in locis turfosis: Topieliska-Zieleniec (Montes Orlickie), Pielgrzymy et Słonecznik (Montes Corcontes Sudeti).

Species appellata est nomine professoris doctoris Hedvigis Sieminski, propter clarissimam Poloniae professorem honorandam, quae algis diu frugaliterque operam dedit.

Among the accompanying algae the most numerous were: *Chroococcus turgidus* (Kütz.) Nägeli, *Ch. minutus* (Keissler) Lemm., *Pinnularia viridis* (Nitzsch.) Ehr., *P. sudetica* (Hilse) Peragallo, *Eunotia exigua* (Bréb.) Rabh., *E. lunaris* (Ehr.) Grun., *E. tenella*, *Frustulia rhomboides* var. *saxonica* (Rabh.) De Toni, *Mesotaenium endliherianum* Näg., *Cylindrocystis brebissonii* Menegh., *Closterium striolatum* Ehrb., *Cl. idiosporum* var. *punctatum* (Skuja) W. Krieg., *Staurastrum punctu-*

latum Bréb., *St. punctulatum* var. *kjellmanii* Wille, *St. hirsutum* (Ehr.) Bréb., *St. margaritaceum* (Ehr.) Menegh..

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CHRYSPHAEA SIEMINSKAE – NOWY GATUNEK DLA NAUKI

STRESZCZENIE

W latach 1985-88 na trzech torfowiskach w Sudetach (Torfowisko Topieliska-Zieleniec koło Dusznik oraz torfowiska Pielgrzymy i Słonecznik w Karkonoszach) zebrano materiał algologiczny w którym opisano nowy dla nauki gatunek złotowiciowca *Chrysosphaera sieminskæ*. Glon ten występuje w postaci pojedynczej warstwy komórek osiadłych na przezroczystych pancerzykach przedstawicieli pełzakowców *Testacea* (*Euglypha*, *Centropyxis*, *Diffugia*). Nowy gatunek oprócz występowania na specyficznym zwierzęcym gospodarzu, różni się od znanych dotychczas taksonów z tego rodzaju kształtem i wielkością komórek. Opisany glon występuje w siedliskach oligominerotroficznych, z udziałem roślin trawiastych *Carex rostrata*, *C. curta*, *Eriophorum angustifolium*, *Calamagrostis villosa*, *Agrostis canina*, *Juncus effusus*, *J. filiformis*, oraz torfowców *Sphagnum riparium*, *S. fallax* w wodzie o pH 3.9 do 5.0.

SOWA KLUCZOWE: *Chrysosphaera*, *Chrysophyceae*, nowy gatunek, torfowisko oligominerotroficzne.