CHRYSPHAEA SIEMINSKAЕ SPECIES NOVA, A NEW CHRYSPHAEA SPECIES FROM POLAND

JAN MATULA

Department of Botany and Plant Physiology, Agricultural Academy, University of Agriculture
Cybulskiego 32, 50-205 Wroclaw, Poland

(Received: March 5, 1994. Accepted: April 26, 1994)

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, Diffugiа). 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 Mt{s. 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 (Star- mach 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.) Bourell. 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 Diffugiа. 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 semiioligomesotrophic 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 Mt{s., 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 Mt{s (alt. 750 m) near Duszni. More detailed floristic and ecological characteristics were given by Tolpa (1948, 1985), Palczynski (1972), Fabiszewski (1978), and Matula (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 masses 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 Matula 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 Diffugiа. 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 proplast into two autosporas. No zoosporas have been observed (Figs. 1-7).

**Diagnosis:** Cellulae desuper spectatae ostendunt formam circularem aut ovalum, spectatae autem a latere sunt semicirculares, parte plana affixa ad Testaceae loriculum. Cellula in parte plana est modice cava. Membrana cellulae est tenuis et aechromaticus. Chromatophorius unus ad superficiem superiorem locatus. Vacuola contractiha – una. In protoplasto parvae, globosae granulae chrisolaminariae et gutae oleosae conspicuientur. In colonis cellulae in uno strato confertae, magis minusve regulatim in ordinibus aut imbricatim compositae onsidunt in superficie praebitoris. Forma cistarae est fere globosa. Cistae cum angusto collari circum aperturae sunt lubraces. Latitudo cellulae 3-6 μm, altitudo 4-5 μm; diameter aperturae cystarum 1.5-2.0 μm.

**Multiplicatio** fit per divitum protoplastum in duas autosporas. Zoosporae non conspicuuntur.

**Iconotypus:** figurae 1-5.

**Habitat:** in loriculis Diffugiae, Centropyxis et Euglyphae in locis turfosi: Topielska-Zieleniec (Montes Orlickie), Pielgrzymy i Stólcznik (Montes Corcones Sudeti).

**Species appellatae** est nomine professoris doctoris Hedvigis Sieminski, propeter clarissimam Poloniam professoress 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*, *Frustula rhomboides var saxonica* (Rabh.) De Toni, *Mesotaenium endlicherianum* Näg., *Cylindrocystis brebissonii* Menegh., *Closterium striolatum* Ehrb., Cl. idiosporum var. punctatum (Skuja) W. Krüg., *Staurastrum punctatum* Bréb., *St. puctulatum* var. kjellmanii Wille, *St. hirsutum* (Ehr.) Bréb., *St. margaritaceum* (Ehr.) Menegh..

**ACKNOWLEDGEMENTS**

In the present study the collection of algal illustrations from the Polish Academy of Sciences – Institute of Botany, Physiological Laboratory, Cracow, was used.

I wish to thank Prof. Dr. Jerzy Fabiszewski for his help and valuable remarks while carrying out my physiological investigations. The author is very much indebted to Dr. Wilczyński for translating the Latin diagnosis.

**LITERATURE CITED**


**CHRYSOSPHAERA SIEMINSKAE – NOWY GATUNEK DLA NAUKI**

**STRESZCZENIE**


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