SECOND RECORD OF *ACTINOTAENIUM PERMINUTUM* (DESMIDIACEAE) FROM POLAND

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Actinotaenium perminutum (G. S. West) Teiling was found in Jezioro Skrzynka lake situated in the central part of Wielkopolski National Park, several km SW of the city of Poznań, West Poland (Fig. 1). In a water sample taken on 1 July 1999, this green alga was very numerous and caused light green water bloom in the lake.

Jezioro Skrzynka lake is a small (area 1.7 ha, volume $2.4 \cdot 10^4$ m^3) and quite shallow water body (max. depth 2.9 m, mean depth 1.43 m) (Szyper & Gołdyn 2002). It is classified as a dystrophic and polymictic lake (Brzęk 1948; Dąmbska *et al.* 1978; Burchardt *et al.* 1998). *Sphagnum* mosses form dense mats floating on the lake surface along its margins. As a result, the margins of the lake have been partly overgrown and the lake surface has diminished about 42% over the last century (Schubert 1994).

Jezioro Skrzynka lake is the second locality of *A. perminutum* reported from Poland. The species was recorded for the first time in Poland in a Lower Silesian peat bog by Matuła (1995). According to Krieger and Gerloff (1969), who reported that species under its synonym *Cosmarium perminutum* G. S. West, it is a cosmopolitan species occurring in many European countries, as well as in Africa, Asia and South America. Růžička (1981) also believes that it is a cosmopolitan species, but it is rarely recorded in Central Europe. However, it can be overlooked easily because of its small size and delicate cell walls.

The cell length of *A. perminutum* found in Jezioro Skrzynka lake varied from 7.6 to 8.8 μm, the width from 5.1 to 6.2 μm, and the ratio of cell length to width from 1.4 to 1.7. Isthmus breadth ranged from 4.3 to 4.9 μm. The cell shape was rather invariable: cylindrical with a shallow sinus in front view and circular in apical view (Fig. 2). The cells were surrounded by a delicate gelatinous sheath several micrometers in width. The specimens from Jezioro Skrzynka lake were relatively smaller, as their cells were shorter than the 9–15 μm reported in the literature, while cell width was at the lower limit of the reported 5–11 μm range (Grönblad 1921; Teiling 1954; Krieger

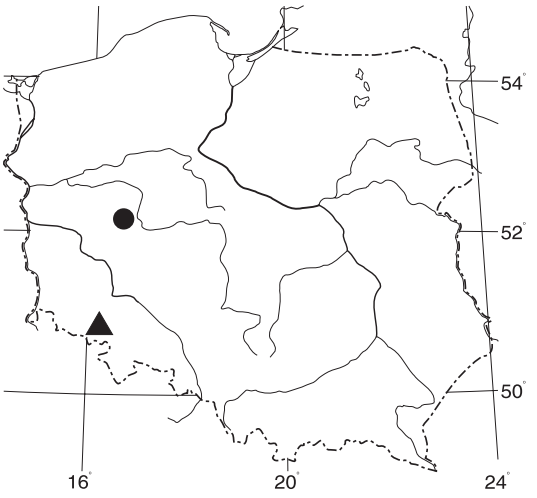

Fig. 1. Distribution of *Actinotaenium perminutum* (G. S. West) Teiling in Poland. ▲ – previously known locality, ● – new locality.

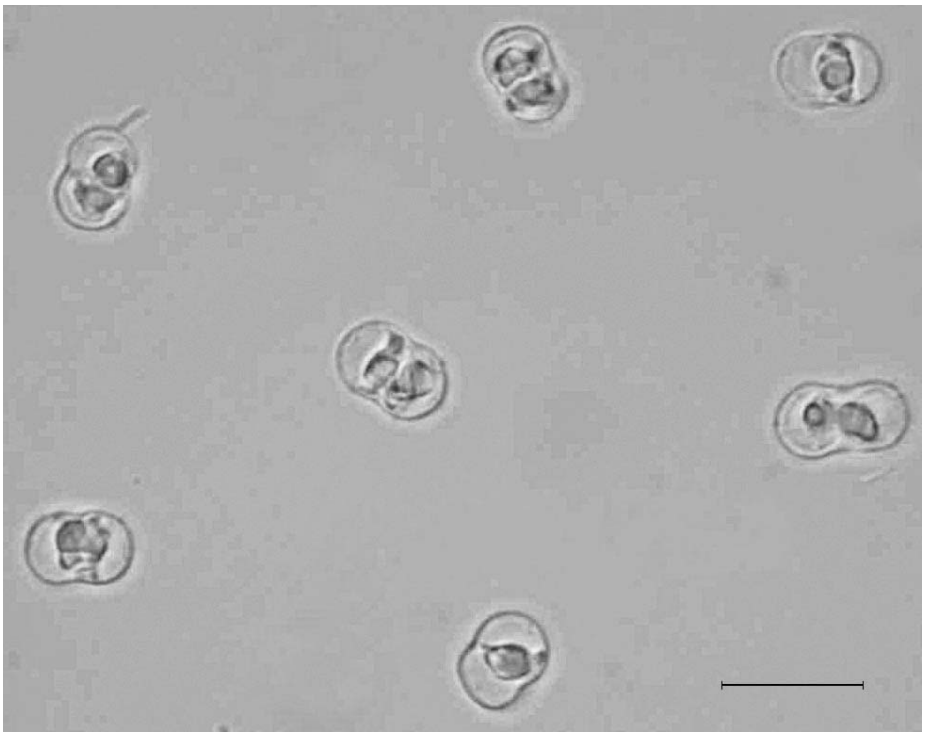

Fig. 2. Light micrograph of *Actinotaenium perminutum* (G. S. West) Teiling. Scale bar = 10 μm.

& Gerloff 1969; Růžička 1981; Palamar-Mordvintseva 1982).

According to Růžička (1981), *A. perminutum* occurs in small acidic or moderately acidic water bodies and rarely in waters with pH 6.0–7.5. Coesel (1998) reports that the species is found in meso-oligotrophic habitats with water pH up to 6.5, and that it can be assigned to the aerophytes, benthophytes and tychoplanktonic species. Matuła (1995) recognized *A. perminutum* as a mesotrophic species occurring in water with pH 5.01–5.50, ammonium nitrogen 0.101–0.300 mg N/l, nitrate nitrogen 0.061–0.100 mg N/l, calcium 2.0–5.5 mg Ca/l, and potassium 1.0–4.0 mg K/l. In the present study the physical and chemical parameters of the water were not analyzed, but investigations carried out in 1996–1999 by Klimaszyk *et al.* (2002) indicated that the water pH was 6.48 ± 0.2, while the mean concentrations of nutrients were as follows: ammonium nitrogen 0.76 ± 0.74 mg N/l, nitrate nitrogen 0.14 ± 0.18 mg N/l, calcium 4.7 ± 1.4 mg Ca/l, and potassium 2.2 ± 0.59 mg K/l.

Within the water sample, which was analyzed with an inverted microscope in settling chambers according to the method of Wetzel & Likens (1991), *A. perminutum* was accompanied by 18 taxa of 8 classes and 15 genera. Most of the species belong to the division of Chlorophyta (9 species, i.e., 47% of the total phycoflora), whereas the other four divisions were represented by 1–5 species each. *Actinotaenium perminutum* reached a very high density and accounted for as much as 99.2% of the total number of phytoplankton. All the other taxa were much less abundant. The most frequent among them were *Teilingia excavata*, *Gymnodinium* sp. and *Peridinium inconspicuum* (Table 1). Because of the great abundance of *A. perminutum* in Jezioro Skrzynka lake, this newly discovered locality is particularly valuable. The lake is surrounded by woodland and protected as

Table 1. Species composition and density of phycoflora (cell numbers per 1 ml) in Jezioro Skrzynka lake on 1 July 1999.

Species	Density
CYANOPHYTA	
CYANOBACTERIA	
Aphanocapsa incerta (Lemmerm.) Cronberg & Komárek	108
Microcystis aeruginosa Kütz.	21
EUGLENOPHYTA	
EUGLENOPHYCEAE	
Trachelomonas hispida (Perty) F. Stein *ex* Deflandre	4
PYRROPHYTA	
CRYPTOPHYCEAE	
Cryptomonas marssoni Skuja	78
Cryptomonas ovata Ehrenb.	31
DINOPHYCEAE	
Gymnodinium sp.	152
Peridinium cinctum (O. F. Müll.) Ehrenb.	+
Peridinium inconspicuum Lemmerm.	119
CHRYSOPHYTA	
BACILLARIOPHYCEAE	
Fragilaria tenera (W. Smith) Lange-Bert.	44
XANTHOPHYCEAE	
Centritractus balanophorus Lemmarm.	2
CHLOROPHYTA	
CHLOROPHYCEAE	
Ankistrodesmus fusiformis Corda	77
Ankistrodesmus spiralis (W. B. Turner) Lemmerm.	31
Crucigenia tetrapedia (Kirchner) W. West & G. S. West	42
Monoraphidium contortum (Thur.) Komárkova-Legnerova	47
Pediastrum tetras (Ehrenb.) Ralfs	+
Scenedesmus spp.	16
Tetraedron caudatum (Corda) Hansg.	16
CONJUGATOPHYCEAE	
Actinotaenium perminutum (G. S. West) Teiling	151413
Teilingia excavata (Ralfs) Bourr.	461

+ – the species was observed in the sample in areas other than those covered by counting

a nature reserve, so the lack of strong human impacts offers some chance of preserving this population.

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