Materials to the Zygnemaceae of Poland. IV. *Spirogyra australica* Czurda — a species new in Poland

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Abstract

Spirogyra australica Czurda 1932 was identified in a sample taken from a small pond in the Arboretum in Rogowo (Skierniewice Voivodship) on June 17, 1986. The diagnosis of this species has been supplemented with data on the width of vegetative cells, the dimensions of zygotes and the development of the conjugation tube. *S. australica* has been reported in Europe only in the Federal Republic of Germany (Bock and Bock 1956, Arch. Hydrobiol. 52). The figures presented in this report are the first graphic documentation of this species.

Key words: *Spirogyra*, taxonomy

Möbius described algae from the vicinity of Brisbane, Australia, in 1892. He gave a description of an alga which he identified as *S. calospora* Cleve. This description was the basis on which Czurda created a new species, *Spirogyra australica*. In the justification for this, Czurda (1932 pg. 157) gives "Obgleich unvollständig bekannt, ist diese von Möbius 1892 gesehene, als *Sp. protecta* bezeichnete Probe als eigene Art hinreichend begründet" (the quote should read *Sp. calospora*, not *Sp. protecta*, in agreement with the data of Möbius (1892 pg. 439)).

The formation of this taxon is justified because the sculptures of *S. australica* and *S. calospora* zygote walls are different. *S. australica* zygote walls are characterized by a single-layered, smooth exospore and punctated mesospore while the exospore of *S. calospora* is double-layered, its inner layer is scrobiculate, and the mesospore is smooth.

Bock and Bock (1956) reported *S. australica* from the locations of Kranser and Steigerwald, however, they did not provide drawings or an exact description.

The lack of drawings was the probable reason why this species was not included in the monographies by Transeau (1951), Randhawa (1959) and Kadłubowska (1972, 1984).

S. australica Czurda was identified in a sample taken on June 17, 1986 from a small pond in the Arboretum in Rogowo (Skierniewice Voivodship). Its vegetative and generative stages were the basis for this identification. Table 1 gives the characteristics of *S. australica* according to Czurda (1932), Bock and Bock (1956) and this author's observations.

As can be seen from the comparison of characteristics (Table 1), Czurda's diagnosis should be supplemented by data on the width of vegetative cells, zygote dimensions and formation of the conjugation tube.

Table 1

A comparison of *Spirogyra australica* characteristics according to Czurda (1932) Bock and Bock (1956) and this author's observations

Characteristic	Czurda	Bock and Bock locality		Author's observations
		Krenser	Steigerwald	
Type of conjugation	scalariform	no data	no data	scalariform
Female gametangium	slightly inflated	no data	no data	cylindric or slightly inflated
Copulation canal	no data	no data	no data	formed by both gametangia
Zygote shape	long-axial ellipsoid	no data	no data	ellipsoid — rarely egg-shaped
Zygote dimensions in μm	30-36 $\times$ 64-70	length 58-64	27-34 $\times$ 54-74	36.6-40.0 $\times$ 55.2-84.0
Exospore	smooth, thin	no data	no data	smooth, thin, colorless
Mesospore	punctate	no data	no data	punctate 70-90 points in 100 μm
Number of chromatophores	1	no data	no data	1
End walls	replicate	no data	no data	replicate
Width of vegetative cells in μm	27	up to 32	24-25	28.6-35.0

Figs. 1-3. *Spirogyra australica*: 1 — scalariform conjugation, tube formed by both gametangia, gametangia cylindric and zygospore ellipsoid; 2 — female gametangia inflated on the inner side; 3 — zygospore ovoid, conjugation tube invisible

S. australica is species new to Poland (Kadłubowska 1986). The pH of the water on the day the sample was taken was 7.6. The sample also contained *S. weberi* Kütz. and *Chara* sp. *thalli*.

DESCRIPTION OF *S. AUSTRALICA* FROM ROGOWO

Vegetative cells 28.6-35.0 μm wide, on average 32.0 μm (95% confidence interval 31.6-32.4 μm). Replicate end walls. One chromatophore per cell. Scalariform conjugation (Fig. 1). Female gametangia not inflated or slightly inflated overall (to 40 μm), very rarely inflated only on the side of the tube (Fig. 2). The conjugation tube is formed equally by both gametangia. Zygotes are ellipsoid, 33.6-40.0 $\times$ 55.2-84.0 μm (95% confidence interval 37.79-38.43 $\times$ 74.5-76.0 μm), rarely egg-shaped (Fig. 3). The exospore is thin, smooth, colorless. The mesospore is thin, yellow-brown, punctate (Fig. 4).

Fig. 4. Sculpturing of zygote

Spirogyra australica is similar to *S. monodiana* Gauthier-Lièvre but differs from this species by the shape of its conjugation tube and mesospore thickness. The tube of *S. monodiana* is formed by the most part by the male gametangium, and the mesospore is 6-7 μm thick with delicate depressions-points (scrobiculée-punctuée, Gauthier-Lièvre 1965 pg. 176).

The following errors are found in the works of Czurda (1932), Kolkwitz and Krieger (1944) and Langer (1934):

1. Czurda (pg. 157, line 9 from bottom) and Kolkwitz and Krieger (pg. 458, line 20 from top) give *S. protecta* instead *S. calospora*;
2. Figures 191 and 192 in Langer (pg. 1282) refer to *S. austriaca*, not *S. australica*.

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Materiały do Zygnemaceae Polski. IV. Spirogyra australica
Czurda nowy dla Polski gatunek

Streszczenie

W próbie pobranej 17 czerwca 1986 r. z małego stawu Arboretum w Rogowie (woj. skierniewickie) zidentyfikowano *Spirogyra australica* Czurda 1932. Uzupełniono diagnozę tego gatunku danymi dotyczącymi szerokości komórek wegetatywnych, wymiarów zygot i wykształcenia kanału koniugacyjnego. *S. australica* podawana jest z Europy tylko z RFN (Bock i Bock 1956). Zamieszczone ryciny są pierwszą dokumentacją graficzną tego gatunku.