

Materials to the *Zygnemaceae* of Poland. I. Development cycle and supplementation of diagnosis of *Zygnema allorgei* Gauthier-Liévre 1965, a species new for the European flora

JOANNA Z. KADŁUBOWSKA

Department of Algology, Institute of Environmental Biology, University of Łódź,
Banacha 12/16, 90-237 Łódź, Poland

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Abstract

In the water sample taken on September 7, 1976 from the pond in Głowno (Łódź District) filaments of *Zygnema* were found in vegetative stage. In culture a full development cycle of this alga was observed: vegetative filaments, conjugation, zygotes and their germination. The taxon was identified as *Zygnema allorgei* Gauthier-Liévre. Its diagnosis was supplemented. It is the second site of occurrence of the species in the world. *Z. allorgei* was described for the first time in 1965 in Algeria.

Key words: development, new diagnosis, *Zygnema* species new for European flora

On the 7th of September, 1976 filaments of the genus *Zygnema* were collected from a pond in Głowno (Łódź District) in vegetative stage. The filaments were stored at about 10°C in a refrigerator. After three months scalariform conjugation was observed (Fig. 1) and zygote formation (Fig. 2). Part of the conjugating filaments was transferred to a thermostat and kept at 29°C for several days. The zygotes matured there. The mesospore sculpture was visible in the form of pits arranged in regular rows (Fig. 4). Part of the filaments was transferred back to the refrigerator, where after two days the zygotes began to germinate (Figs. 5, 6, 7). Before germination two stellate green chromatophores could be seen (Fig. 3). The alga was identified as *Zygnema allorgei* Gauthier-Liévre.

We present on the basis of comparison of the morphological features (Table 1) of this species from Algeria and from Poland the following diagnosis: width of vegetative cells 20-27 µm. Scalariform conjugation. Zygotes in gametangium inflated on the conjugating side. Zygotes compressed-globose, ellipsoidal or ovoid, yellow-brown or brown. Dimensions

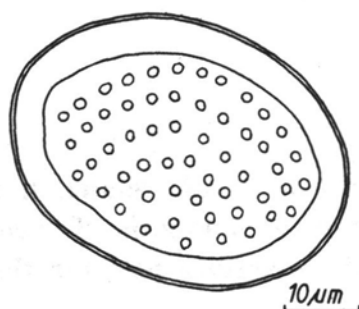


Fig. 4. Sculpturing of zygote

of zygotes: $26-34 \times 32-45 \times 28 \mu\text{m}$. Exospore thin, smooth, mesospore $5 \mu\text{m}$ thick with pits about of $2 \mu\text{m}$ diameter, $2-3 \mu\text{m}$ apart. Pits arranged in regular rows.

Z. allorgei has been described in 1965 by L. Gauthier-Liévre. The site in Głowno is the second site in the world where this taxon was found. These two sites differing in climatic conditions confirm the cosmopolitic occurrence of species of the genus *Zygnema* (Kadłubowska 1984, p. 37).

Table 1

Comparison of traits of *Zygnema allorgei* from Algeria and from Poland

Traits	Site: Algeria: Sersou Habitat: small puddle	Site: Poland: Głowno, Distr. Łódź Habitat: pond
Width of vegetative cells, μm	20-24	20-27
Conjugation type	scalariform	scalariform
Localisation of zygote	in gametangium	in gametangium
Shape of female gametangium	inflated on the conjugating side	inflated on the conjugating side
Colour and shape of zygote	brown compressed-globose or ovoid	yellow-brown compressed-globose or ellipsoid or ovoid
Zygote dimensions, μm	$30-32 \times 32-40 \times 28$	$26-34 \times 34-45 \times 26$
Zygote sculpturing	exospore thin, smooth, mesospore thick with little pits	exospore thin, smooth, mesospore $5 \mu\text{m}$ thick with pits, pit diameter $2 \mu\text{m}$
Distance between pits	no data	$2-3 \mu\text{m}$
Arrangement of pits	no data	in regular rows

PLATE I

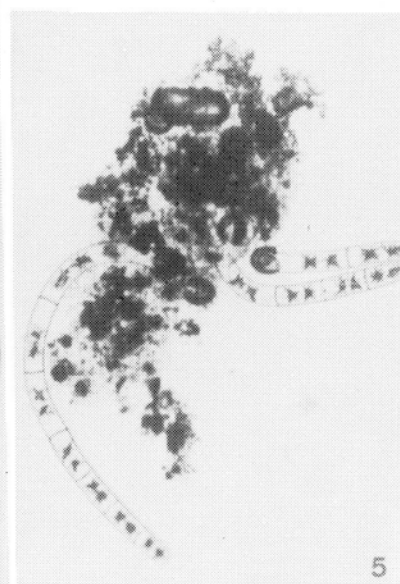
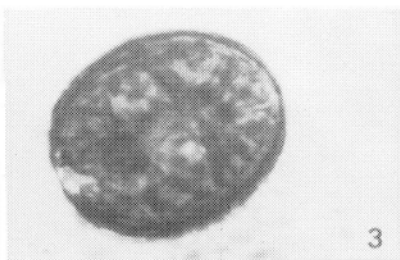
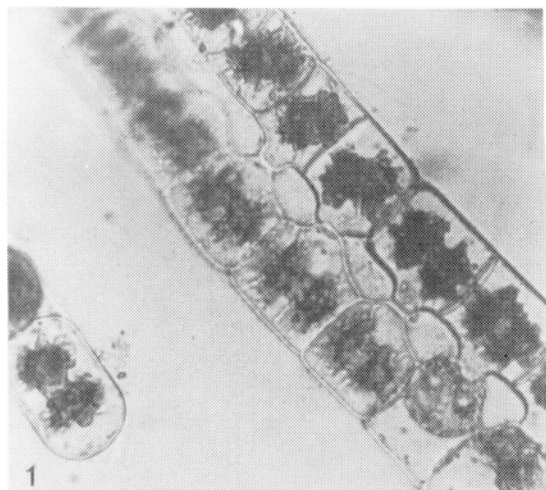


Fig. 1. Initial stages of scalariform conjugation. Fig. 2. Scalariform conjugation. Fig. 3. Zygote before germination, two stellate chromatophores are visible. Fig. 5. Germination of zygotes

PLATE II

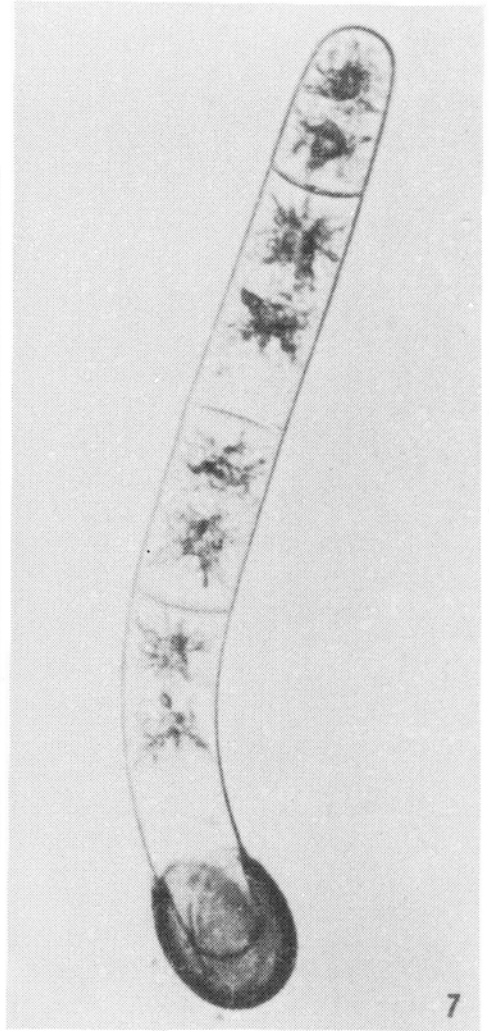
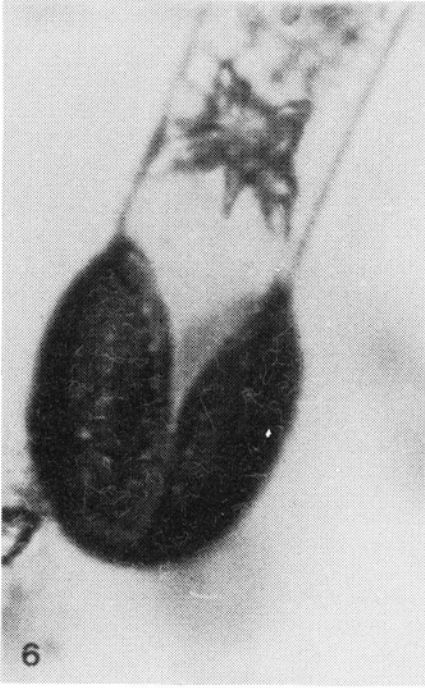


Fig. 6. Germination of zygote. Sculpturing of zygote. Fig. 7. Young vegetative filament

Acknowledgment

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Materiały do Zygnemaceae Polski. I. Cykl rozwojowy i uzupełnienie diagnozy Zygnema allorgei Gauthier-Liévre 1965, nowego gatunku dla Europy

Streszczenie

W próbie pobranej 7.09.1976 roku ze stawu w Głownie (woj. łódzkie), zaobserwowano nitki *Zygnema* w stanie wegetatywnym. W hodowli zaobserwowano pełny cykl rozwojowy tego taksonu: nitki wegetatywne, koniugację, zygoty i kielkowanie zygot. Zidentyfikowano ten takson jako *Zygnema allorgei*. Uzupełniono jego diagnozę. Jest to drugie stanowisko w świecie *Z. allorgei*, opisanego w 1965 roku w Algierii.