

ZOOFLAGELLATES FROM THE WATER STORAGE AREA OF KISKÖRE (HUNGARY)

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Abstract

Author reports on the zooflagellates of the water storage area established on the middle reach of the Tisza river at Kisköre. On the effect of impoundment planktonic species appeared in the area under examination.

Introduction

The impoundment of the middle reach of the Tisza was started in 1973. Impounding has essentially changed the ecological conditions of the river (ÁDÁMOSI et al. 1974, VÉGVÁRI 1976, HAMAR 1976). This is exemplified, among others, by the fact that mostly during summer there was an invasion of planktonic zooflagellates, which were either free-swimming ones, or epiphytic living attached to planktonic algae or to suspended organic detritus.

The zooflagellates were classified according to the system proposed by HONIGBERG (1963), HONIGBERG, BALAMUTH et al. (1964) and on the basis of other more important taxonomical works (BOURRELLY 1957), BÜTSCHLI 1883–1887, CALKINS 1926, DOFLEIN, REICHENOV 1972, 1952, GRASSÉ 1952, HALL 1953, JIROVEC 1953, LEMMERMANN 1914, LEPSI 1965, STARMACH 1968, ZHOUKOV 1971).

Phylum	Protozoa GOLDFUSS
Subphylum	Sarcomastigophora HONIGBERG et BALAMUTH
Class	Mastigophora DIESING
Order	<i>Rhizomastigida</i> BÜTSCHLI emend. HONIGBERG
Family	<i>Helioflagellidae</i> DOFLEIN–REICHENOV
Genus	<i>Pteridomonas</i> PENARD

Pteridomonas pulex PENARD (Fig. 1).

The solitary cells of $9\text{--}12 \times 7 \mu$ size are spherical to semispherical. The anterior part bears a flagellum of 2–3 fold body-length. The base of the flagellum is ring-like encircled by fine axopodia. From the basal part of the cell a long attaching stalk projects. Nucleus median, vacuoles of different numbers are located dispersedly in the plasm.

It occurred in the summer plankton of the impounded reach of the Tisza.

Pteridomonas scherffelii LEMMERMANN (Fig. 2).

The cell varies in shape from spherical to semispherical. From the middle of the anterior part, a flagellum of 1–2 fold body-length projects. From the basal part a shorter-longer stalk originates. Thin axopodia project from different parts of the body. Nucleus median, numerous vacuoli in the plasm. The cell is of 6.5–0 μ size.

It occurred during summer in the impounded water of the Tisza as well as in the main canals originating from the impounded reach.

Family *Multiciliidae* POCHE
Genus *Multicilia* CIENKOWSKY

Multicilia palustris PENARD (Fig. 4).

The solitary cell without stalk is naked, polygonal and metabolic. Its diameter is 17–19 μ . The flagella originating from the peaks of the polygon are 32–36 μ long. In the plasm, there are numerous vacuoli and granules. Motion slow, rotating.

It was found in the autumn plankton of the impounded Tisza.

Family *Mastigamoebidae* GOLDSCHMIDT
Genus *Mastigella* Frenzel emend. Goldschmidt

Mastigella sp. (Fig. 3).

The cell measuring 10 μ in diameter is spheroid, the flagellum is of body-length. When creeping on the substrate, lobopodes may project from any part of the cell. Nucleus central, not connected with the flagellar base. It has a contractile vacuole. Plasm is strongly granulated.

It was found during the period of summer water bloom in the marshy place of the future reservoir.

Order *Choanoflagellida* KENT
Family *Monosigidae* KENT
Genus *Codosiga* CLARK

Codosiga florea STOKES? (Fig. 5).

Cells 5–6 μ long, oval with funnel-like collar. Nucleus anterior, contractile vacuole basal. On each occasion only one cell was observed on the thin stalk of 2–3 fold body-length. STOKES (1888) found more cells on one stalk.

It occurred on diatoms or suspended detritus in the summer plankton of the impoundment at Kisköre.

Genus *Salpingoeca* CLARK emend. ELLIS

Salpingoeca brunnea STOKES (Fig. 6).

Lorica of 24×6 μ size, broadly rounded at the bottom narrowing upwards and ending in a slightly overhanging neck. The cell does not fill in the lumen completely, but coincides with the shape of the lorica. The funnel-like collar projects from the lorica. Nucleus central. It has two contractile vacuoli.

The species was found on planktonic diatoms in the summer plankton of the impounded Tisza water at Kisköre.

Table I.

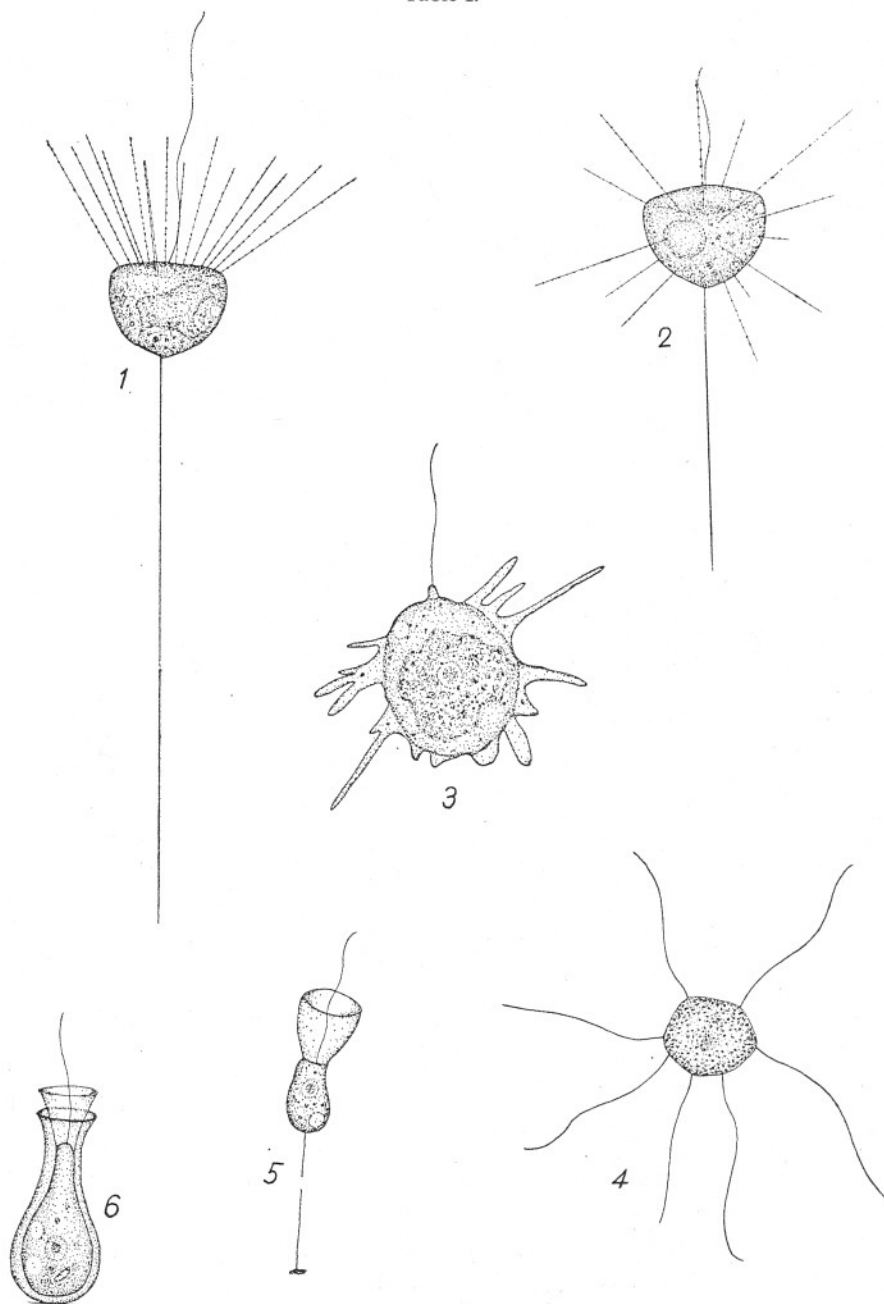


Fig. 1. *Pteridomonas pulex*
Fig. 2. *Pteridomonas scherffellii*
Fig. 3. *Mastigella* sp.
Fig. 4. *Multicilia palustris*
Fig. 5. *Codosiga florea?*
Fig. 6. *Salpingoeca brunnea*

Salpingoeca gracilis CLARK (Fig. 8).

Lorica is long vase-shaped, widened funnel-like in front, spherical in the middle, and ending in a narrowed bottom part. Lorica of $46 \times 8 \mu$ size is hyaline, sessile. The cell is oval, with a continuation of a narrowing neck, which has a funnel-like collar at its peak. The flagellum projects from the lorica. Nucleus central, the cell has one contractile vacuole.

It occurred during autumn in the impounded water of the Tisza at Kisköre.

Salpingoeca bütschlii LEMMARMANN (Fig. 9).

The lorica is vase-shaped, widened funnel-like above, spherical in the middle, and narrowing at the bottom. Lorica hyaline, sessile, of $10 \times 3 \mu$ size. The cell is similar to the lorica in shape, but seldom fills in the lumen. Flagellum of body-length, the collar projects from the lorica. Nucleus central, contractile vacuole basal.

It was found on *Cyclotella* species during autumn in the impounded Tisza water at Kisköre.

Genus *Diploeca* ELLIS

Diploeca elongata (FOTT) BOURRELLY (Fig. 7, 10).

The species is sessile, the external envelope of the doublewalled lorica is spherical, broadly rounded or cut at the bottom. The internal envelop overreaches the external one, and ends in a thin neck which is widened on top. Lorica yellowish-brown, $10-11 \times$ one, and ends in a thin neck which is widened on top. Lorica yellowish-brown $10-11 \times 5-6 \mu$ -sized.

It occurred on diatoms in the summer plankton of the impounded Tisza water at Kisköre.

Diploeca flava (KORSCHIKOV) BOURRELLY (Fig. 11).

The species is sessile, the external envelope of the double-walled lorica is semi-spherical, outside strongly granulated, yellowish-brown. The internal wall coincides in shape with the external one, then becomes cylindrical and ends in a slightly overhanging neck. The size of the lorica is $13 \times 10 \mu$.

It was found attached to filamentous algae in the experimental area impounded with Tisza water.

Order *Bicoecida* HOLANDE
Family *Bicoecidae* KENT
Genus *Bicoeca* (CLARK) STEIN

Bicoeca plantktonica KISSELEV (Fig. 12).

Plantktonic, free-swimming. Lorica conical or wide bell-shaped, colourless or yellow. The anterior end is broader, cylindrical, concave in the middle. There is a verruca at its base. The lorica is ornamented with transversal rings which number 10-15. The size of the lorica is $11-13 \mu$, the width of the opening is $13-14 \mu$, and in it an oval cell is situated, which is attached to the base by a contractile flagellum. In the anterior part of the cell there is a lip-like extuberance, from the base of which a swimming-flagellum of about 3-4 fold body-length projects. Nucleus central, contractile vacuole is situated in the basal part of the cell.

Frequent in the summer plankton of the impounded Tisza at Kisköre.

Table II.



Fig. 7., 10. *Diploeca elongata*
 Fig. 8. *Salpingoeca gracilis?*
 Fig. 9. *Salpingoeca bütschlii*
 Fig. 11. *Diploeca flava*
 Fig. 12. *Bicoeca planktonica*
 Fig. 13—14. *Bicoeca cylindrica*
 Fig. 15. *Bicoeca turrigera*
 Fig. 16—19. *Bodo caudatus*

Bicoeca cylindrica (LACKEY) BOURRELLY (Fig. 13-14).

Planktonic species, free-swimming. Lorica cylindrical, cut anteriorly, posteriorly narrowing, rounded. The wall of the lorica is irregularly granulated. In older specimen the wall may thicken. It measures $17-20 \times 7-8 \mu$.

Cell spherical, situated in the posterior third of the lorica, attached to the bottom. Anteriorly, the swimming-flagellum originates from a slightly widened lip, and seldom projects from the lorica. Periplast thin, nucleus central. There are 1-2 contractile vacuoli.

Frequent species in the impounded Tisza at Kisköre, particularly during summer.

Bicoeca turrigera NYGAARD (Fig. 15).

Planktonic, free-swimming species. Lorica thin, hyaline, urn-shaped, extremely variable. Widened anteriorly, cylindrical or widened in the middle, the posterior part is conical or subconical. At the base of the lorica, there is a verruca. On the lorica, there are transversal rings, due to which the rim of the lorica is finely indented in frontal view. Size of lorica is $16-20 \times 10.5-13.5 \mu$. The cell is spherical or oval $5-7 \mu$, pellicula thin, nucleus central. Swimming-flagellum of 2-3 fold body-length, the attaching flagellum contractile.

It occurred in great individual number among suspended and submerged aquatics in the experimental area filled with impounded Tisza water at Kisköre. Diagnosis and place of occurrence of the species is similar to those reported by Nygaard (Nygaard 1949).

Order	<i>Kinetoplastida</i> HONIGBERG
Family	<i>Bodonidae</i> BÜTSCHLI
Genus	<i>Bodo</i> STEIN

Bodo caudatus DUJARDIN (Fig. 16-19).

The cell is naked, elongated spindle-shaped, strongly metabolic, $13-20 \times 5-9$ - sized. The anterior part is rounded, the posterior one strongly metabolic, broadly rounded to obliquely tapering. The swimming-flagellum is of one fold body-length, the trailing flagellum of 1,5-2 fold body-length. Nucleus and contractile vacuole are anteriorly situated. The plasm is finely granulated. It moves along with a characteristic nonrotating, trembling motion.

Frequent in wastes and polluted waters, polysaprobic.

It was found in the water of the marshy part of the future reservoir. It occurred in large numbers around destroyed Tardigrada specimens.

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Zooflagelláták a Kiskörei Vízlépcső környékéről (Magyarország)

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Kivonat

A dolgozat a Tisza középső szakaszán létesült Kiskörei Vízlépcső környékének zooflagellátáit mutatja be. A duzzasztás hatására megjelentek a planktonikus fajok a vizsgált szakaszon.

Zooflagellate sa područja brane na Tisi kod Kisköre (Madjarska)

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Abstract

U radu se prikazuju zooflagellate sa područja brane Kisköre sa srednjeg toka reke Tise. Pod uticajem akumulacije pojavile su se planktonske vrste na ispitivanoj deonici.

Зоофлагеллаты из района водного каскада у Кишкёре (Венгрия)

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Резюме

В работе описываются зоофлагеллиты района водного каскада, сооружённого по среднему течению Тисы у Кишкёре. В исследуемый период под влиянием запружения появились планктонические виды.