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Glony z Toporowego Stawu Wyżniego w Tatrach

Algae from the Toporowy Staw Wyżni Lake in the Tatra Mts

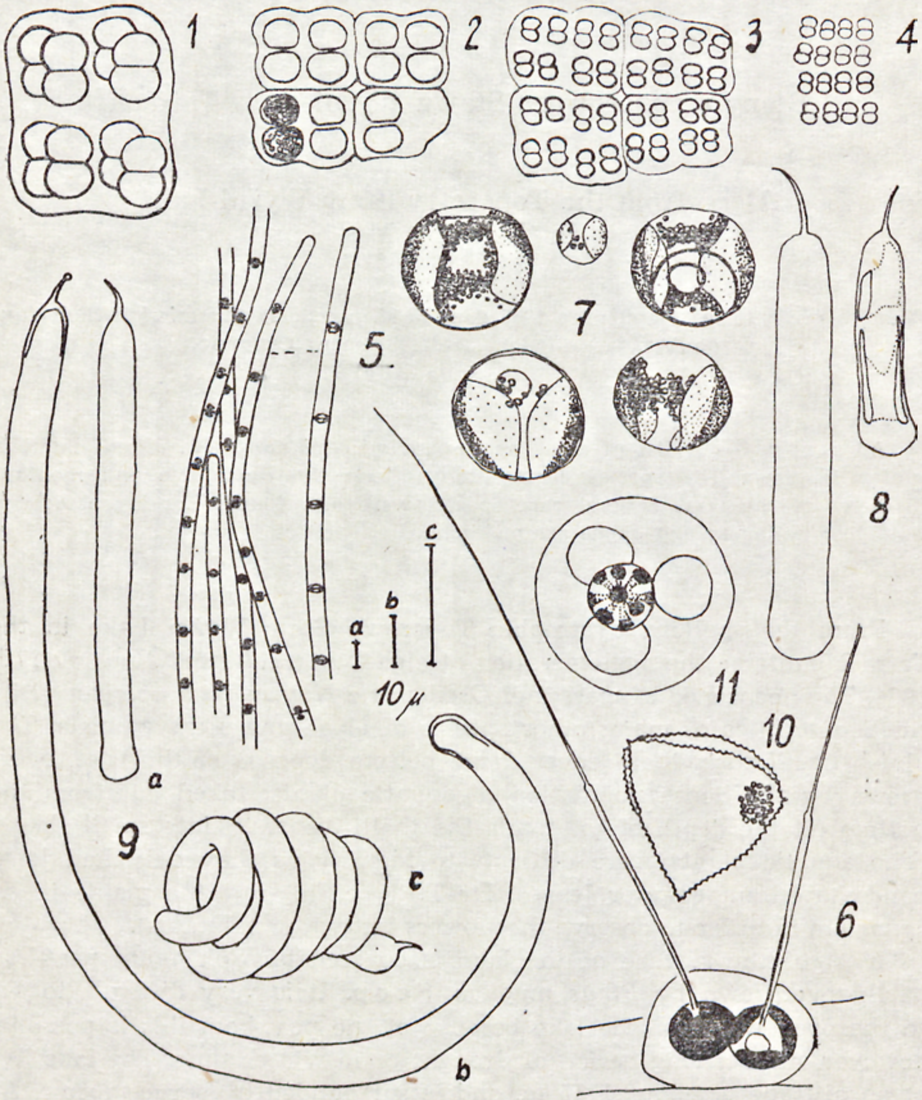
Mémoire présenté le 3 septembre 1966 dans la séance de la Commission Biologique de l'Académie Polonaise des Sciences, Cracovie

Abstract — A list of algae accompanying *Oscillatoria Komarovii* thalli in winter is given. The species composition reflects the dystrophic and montane character of the lake. Several rare species were also found. Besides, associated *Tendipedidae* larvae and pupae are mentioned.

From the shallow, dystrophic Toporowy Staw Wyżni Lake in the Tatra Mountains the agglomeration of algae were collected January 17th 1964. They consisted of masses of *Oscillatoria Komarovii* accompanied by small quantities of many other species of algae and some animals. The bluish *Oscillatoria* thalli covered the bottom deposits of the lake, overgrown by the dense population of aquatic plants; taken out from the bottom (at the depth of ca. 1 m.), the thalli dispersed into small flocks. (The aquatic plants were difficult to identify as they only had long, band-shaped underwater leaves. Dr T. Tacik grew the plants in an aquarium in order to observe the flowers but without success).

Most of the surface of the lake is covered by *Sphagnum* peat-bog partly overgrown by *Pinus mughus* Scop. It is very difficult to get to the open water of the lake because of the peat-bog; this is possible, however, after a long period of drought or in winter time. The lake lies at an altitude of about 1115 m. and is surrounded by spruce forest. At the time of the investigation its surface was covered by a layer of ice and snow; the pH of the water was 5.2.

Some of the organisms were identified from the live material, some from that preserved in formalin. The most important monograph used for identification is given with each species of algae. The collection of algal drawings completed since 1959 by my sister A. Siemińska was very helpful during the work. The author is much indebted to Mr and Mrs A. Kownacki for the kind identification of the *Tendipedidae* larvae and pupae.



Figs 1—11. 1 — *Eucapsis alpina*, 2 — *Merismopedia elegans*, 3 — *M. glauca*, 4 — *M. punctata*, 5 — *Oscillatoria Komarovii*, 6 — *Gloeochaete Wittrockiana*, 7 — *Chromulina spectabilis*, 8 — *Ophiocytium cochleare*, 9 a, b, c — *O. majus*, 10 — *Tetraëdriella acuta*, 11 — *Asterococcus limneticus*. Figs 9 a, b magnification a; Figs 1—4, 7, 8, 9 c, 11 magnification b; Figs. 5, 6, 10 magnification c

Explanation of the abbreviations used in the text: br. = broad, l. = long, diam. = diameter, isthm. = isthmus, proc. = processes, sp. = spines.

Cyanophyta

Aphanothece microscopica Näg. (Geitler 1932). Cells 5.5—6 μ l., 3.5—4 μ br.; colonies 45—60 μ l., 36—50 μ br. In small numbers.

Eucapsis alpina Clem. et Shantz (Geitler 1932) (Fig. 1). Cells 7 μ high, 8—9 μ br.; colony 35—43 μ in diam. Cells slightly larger than is given in the literature. Singly.

Gloeocapsa turgida (Kütz.) Hollerb. (= *Chroococcus turgidus* (Kütz.) Näg.) (Starmach 1966). Cells 16—20 μ l., 24—30 μ br., with envelopes 25—34 μ in diam. Fairly numerous.

Merismopedia elegans A. Braun (Geitler 1932) (Fig. 2). Cells 6—7 μ high, 7.5—8 μ in diam., with large and numerous gas vacuoles whose presence is explained by the lack of oxygen at the bottom of the lake. In small numbers.

M. glauca (Ehr.) Näg. (Geitler 1932) (Fig. 3). Cells 3—4 μ in diam. In small numbers.

M. punctata Meyen (Geitler 1932) (Fig. 4). Cells 2.5—3 μ in diam. In small numbers.

Oscillatoria Komarovii Aniss. (Starmach 1966) (Fig. 5). Trichomes yellow-green. Cells 1.3—1.8 μ in diam., 4.7—8.2 μ l.; end cells rounded at the apex. Trichomes similar to *O. quasiperforata* Skuja but the cells do not reach such great length. In masses.

Oscillatoria sp. In small numbers.

Glaucophyta

Glaucocystis Nostochinearum (Itzigson) Rabh. (Starmach 1966). Fairly numerous.

Gloeochaete Wittrockiana Lagerh. (Starmach 1966) (Fig. 6). Cells 5 μ in diam. Singly.

Chrysophyta

Chrysophyceae

Chromulina spectabilis Scherffel (1911) (Fig. 7). Only cysts were found, spherical, (11)—23—29 μ in diam., with or without the eye-spot. The species was first described from the southern part of the Tatra Mts where it was found in peat-bog pits. In small numbers.

Mallomonas sp. In small numbers.

Bacillariophyceae

Anomoeoneis serians (Bréb.) Cleve var. *brachysira* (Bréb.) Hust. fo. *thermalis* (Grun.) Hust. Valvae 26 μ l., 7 μ br., ca. 25 striae in 10 μ. Singly.

Cymbella gracilis (Rabh.) Cleve. Valvae 35—40 μ l., 5—6 μ br., 12 striae in 10 μ at the dorsal part, 14 at the ventral part. In small numbers.

Diatoma elongatum Ag. var. *tenuis* (Ag.) Kütz. Singly.

Eunotia alpina (Näg.) Hust. Valvae 50—80 μ l., 2 μ br. Singly.

E. flexuosa Kütz. Valvae 70 μ l., 3 μ br., at the apices 4 μ br.; 18 striae in 10 μ. Singly.

E. pectinalis (Kütz.) Rabh. var. *minor* (Kütz.) Rabh. fo. *impressa* Ehr. Valvae 17 μ l., 4 μ br., 20 striae in 10 μ. Singly.

E. robusta Ralfs var. *tetraodon* (Ehr.) Ralfs. Valvae 36 μ l., 16 μ br.; 12—13 striae in 10 μ. Singly.

E. septentrionalis Oestrup. Valvae 22—32 μ l., 2 μ br. Singly.

E. lunaris (Ehr.) Grun. Singly.

E. veneris (Kütz.) O. Müll. Valvae 22 μ l., 4 μ br.; 15 striae in 10 μ. Singly.

Frustulia rhomboides (Ehr.) de Toni var. *saxonica* (Rabh.) de Toni. Numerous, in clusters.

F. rhomboides var. *saxonica* fo. *capitata* A. Mayer. Valvae 38 μ l., 10 μ br. Singly.

Gomphonema constrictum Ehr. Singly.

Nitzschia paleacea Grun. Singly.

Pinnularia gibba Ehr. Numerous, in clusters.

P. gibba fo. *subundulata* Mayer. Singly.

P. interrupta W. Smith. In small numbers.

Stauroneis phoenicentron Ehr. Singly.

Stenopterobia intermedia Lewis. Valvae 166 μ l., 9 μ br.; 5 carinal pores in 10 μ. In small numbers.

Tabellaria flocculosa (Roth.) Kütz. Numerously, forming zigzag colonies.

Xanthophyceae

Ophiocytium cochleare A. Braun (Pascher 1939) (Fig. 8). Cells with a sp. 55—100 μ l., 9—13 μ in diam.; sp. 10—14 μ l. The diam. is greater than is given in the description of the species approaching *O. maius*. In small numbers.

O. maius Näg. (Pascher 1939) (Fig. 9). Cells straight, curved or, rarely, spirally bent, 14—18 μ in diam., 57—279 μ (rarely up to 3 mm) l.; sp. 15—17 μ l., mostly with a spherical enlargement at the end. In small numbers.

Rhizochloris tatrica Siemińska (1964 b). In small numbers.

Tetraëdriella acuta Pascher (1939) (Fig. 10). Cells 10—14 μ in diam. Singly.

Chlorophyta

Volvocales

Asterococcus limneticus G. M. Smith (Prescott 1962) (Fig. 11). Colonies 2- and 4-celled, 25—38 μ in diam.; cells 13—14 μ in diam. In small numbers.

A. superbus (Cienk.) Scherffel (Koršikov 1953) (Fig. 12). Only palmelloid stages were found. Cells connected into colonies similar in shape to *Gloeocystis ampla*. Cells spherical, 12—20 μ in diam., or elipsoid, 17—20 μ l., 14—17 μ br., with individual envelopes 25—37 μ in diam.; colonies 45—73 μ in diam. The size of cells is smaller than is given by Lemermann (1915; 25—37 × 20—37 μ) and Prescott (1962; 36—43 μ); Koršikov gave no size data. In small numbers.

Chlorococcales

Ankistrodesmus densus Koršikov (1953) (Fig. 13). Cells 50—75 μ l., 2.5—3 μ in diam. Fairly numerous.

A. falcatus (Corda) Ralfs (Koršikov 1953) (Fig. 14). In small numbers.

Chlorococcales non det. Sphaerical cells, 13—15 μ in diam. with dark green, dense, granular chloroplasts. Numerous.

Dictyosphaerium sp. (Fig. 15). Cells spherical, ca. 5 μ in diam.; chloroplast cup-shaped, without pyrenoid. Colony 4-celled. It differs from *D. pulchellum* Wood and var. *minutum* Deflandre (1929) in having no pyrenoid, and from *D. anomalum* Koršikov (1953) in the spherical shape of cells and different disposition of the chloroplast. Only one colony was seen.

Oocystis solitaria Wittrock (Koršikov 1953) (Fig. 16). Cells 13 μ l., 6—7 μ br.; colony 56 μ l., 34 μ br. The envelope was strongly detached. Singly.

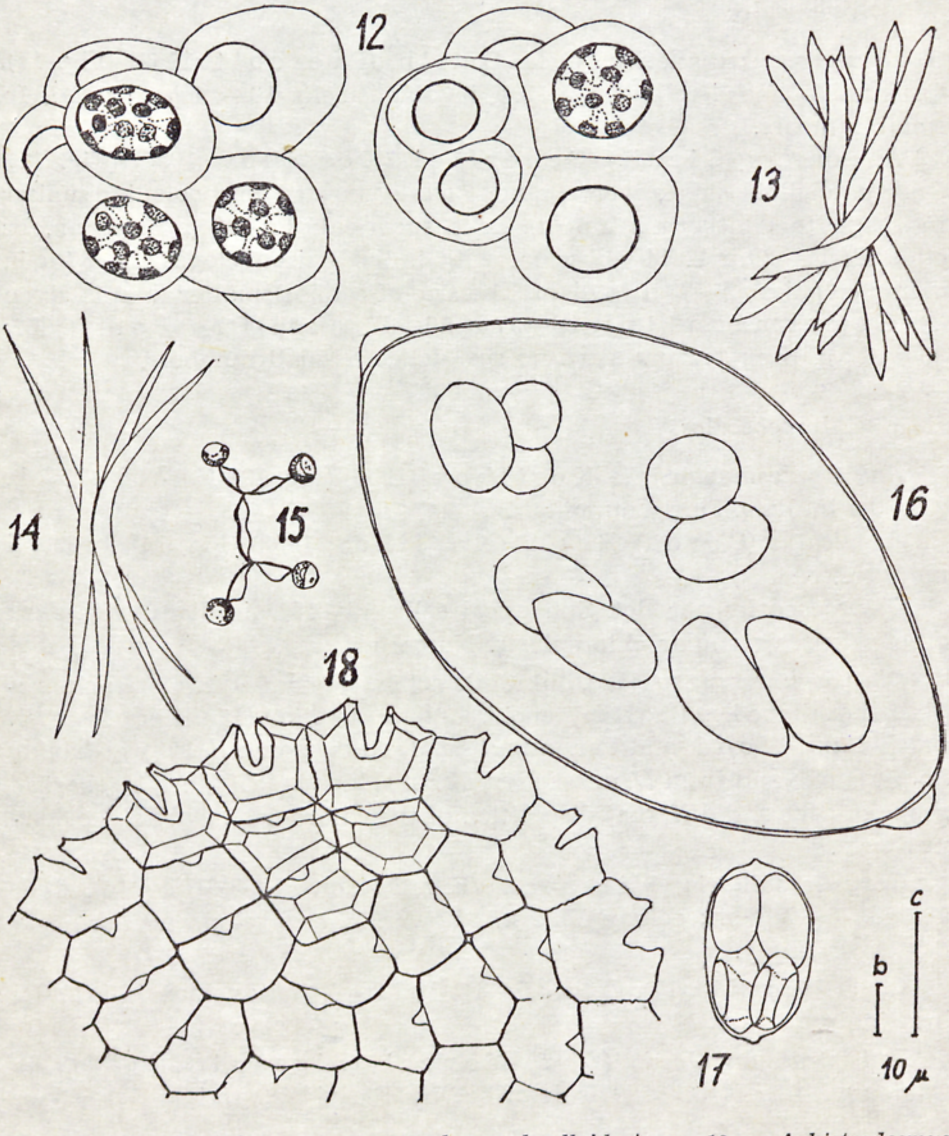
Oocystis sp. (Fig. 17). Cells 6.5—8 μ l., 3.2—4 μ br.; colony 15 μ l., 8 μ br. Singly.

Pediastrum angulosum (Ehr.) Menegh. (Bigeard 1933) (Fig. 18). Colony with the type of cells described by Raciborski (1889) as var. *araneosum*. Singly.

P. Taylori Siemińska (1965). Cells with proc. 8—9 μ l., 8—10 μ br.; cell wall puntate. Colony 24—26 μ in diam. Only two 8-celled colonies were seen. Wołoszyńska (1925) identified similar specimens from the Tatra Mts and Czarnohora Mts (in East Carpathians) as *P. tricornutum* Borge and *P. biradiatum* Meyen?.

P. teras (Ehr.) Ralfs (Bigeard 1933). Singly.

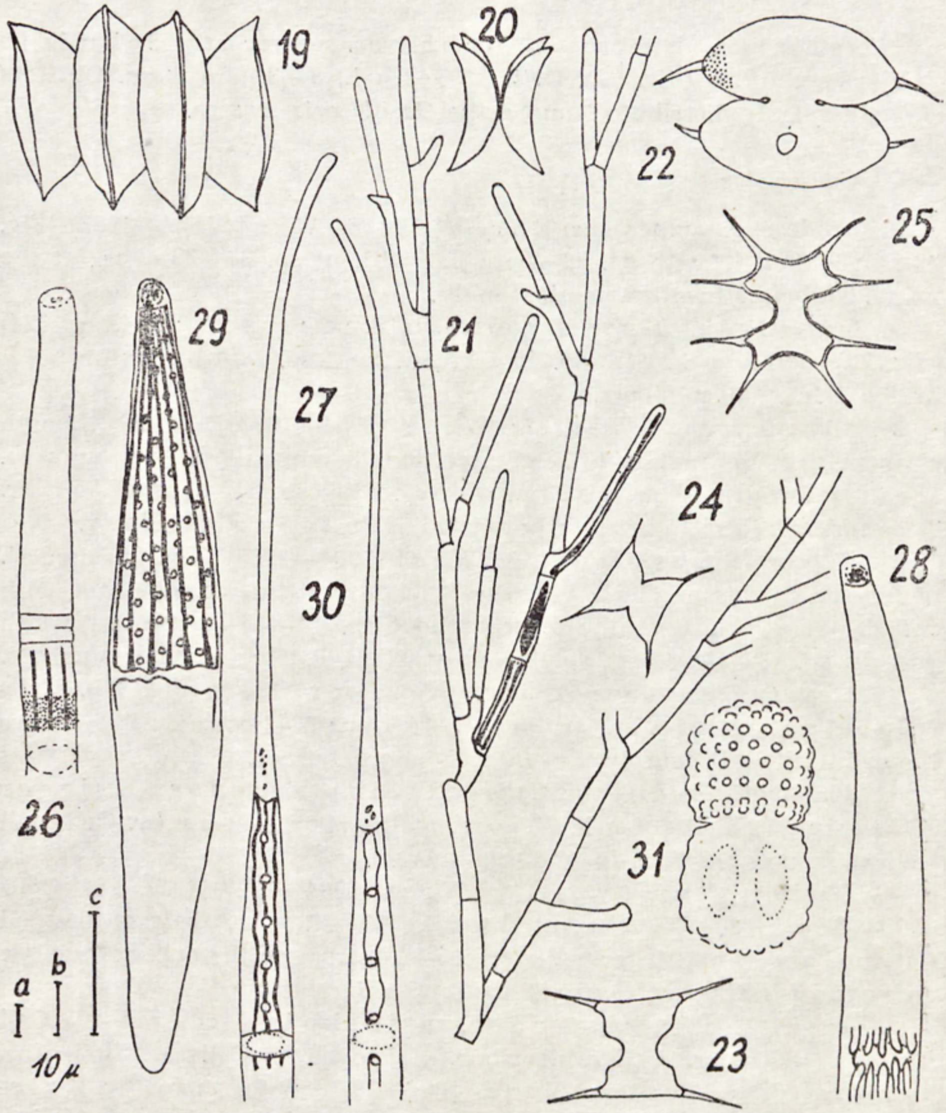
Scenedesmus acutiformis Schroder (Prescott 1962) (Fig. 19). Cells 15—17 μ l., 5—6 μ br. Single.



Figs 12—18. 12 — *Asterococcus superbus*, palmelloid stages, 13 — *Ankistrodesmus densus*, 14 — *A. falcatus*, 15 — *Dictyosphaerium* sp., 16 — *Oocystis solitaria*, 17 — *Oocystis* sp., 18 — *Pediastrum angulosum*. Figs 12—15, 18 magnification b; Figs 16, 17 magnification c

S. bijugatus (T u r p.) K ü t z. (P r e s c o t t 1962). Cells 13—14 μ l., 3—4 μ br. Fairly numerous.

S. quadricauda (T u r p.) B r é b. (P r e s c o t t 1962). Single.



Figs 19—31. 19 — *Scenedesmus acutiformis*, 20 — *Tetradesmus wisconsinensis*, 21 — *Microthamnion strictissimum* var. *macrocystis*, 22 — *Arthrodesmus convergens*, 23 — *A. Incus* var. *extensus*, 24 — *A. Incus* fo. *minor*, 25 — *A. octocornis*, 26 — *Closterium angustatum*, 27 — *C. Kützingii* var. *laeve*, 28 — *C. lineatum*, 29 — *C. Lunula*, 30 — *C. setaceum*, 31 — *Cosmarium amoenum*. Figs 26, 28, 29 magnification a; Figs 21—25, 27, 30, 31 magnification b; Figs 19, 20 magnification c

Tetradesmus wisconsinensis G. M. Smith (Prescott 1962) (Fig. 20). Cells 10.5 μ l., 3 μ br. Cells sickle shaped touching each other at one point; the size is slightly smaller than is given in the diagnosis. Singly.

Chaetophorales

Microthamnion strictissimum Rabh. var. *macrocystis* Schmidle (Heering 1914) (Fig. 21). Cells 18—42 μ l., 2—3 μ in diam. Clusters of thalli sparsly distributed among the *Oscillatoria* masses.

Conjugales

Arthrodesmus convergens Ehr. (West & West 1904—1923) (Fig. 22). Cells 35 μ l., with sp. 52—56 μ br., without sp. 37—38 μ br., at the isthm. 9 μ br. Cell wall punctate. Singly.

A. Incus (Bréb.) Hass var. *extensus* Andersson (Smith 1924) (Fig. 23). Cell 20 μ l., with sp. 40 μ br., without sp. 18 μ br.; isthm. 7.5 μ br. 8 μ l. In small numbers.

A. Incus fo. *minor* West & West (1904—1923) (Fig. 24). Length of the cell in the middle 13 μ, greatest length without sp. 15 μ, with sp. 18—20 μ; width without sp. 18 μ, with sp. 26 μ; sp. 5 μ l.; isthm. 5 μ br. The semicells seem to be slightly twisted against each other. Singly.

A. octocornis Ehr. (West & West 1904—1923) (Fig. 25). Length of the cell in the middle 19 μ, greatest length without sp. 22—23 μ, with sp. 38—41 μ; width at the apex without sp. 14—15 μ, greatest width without sp. 18—19 μ, with sp. 40—41 μ; isthm. 6 μ br. In small numbers.

Closterium angustatum Kütz. (Krieger 1937) (Fig. 26). Cells 450—514 μ l., 19—22 μ br., at the apex 14 μ br.; 3—4 costae visible across the cell. Cell wall densely punctate. Fairly numerous.

C. Kützingii Bréb. var. *laeve* (Racib.) Krieger (Krieger 1937) (Fig. 27). Cell 362 μ l., 10 μ br., at the apex 1.5—2 μ br. Cell wall colourless, not punctate. In small numbers.

C. lineatum Ehr. (West & West 1904—1923) (Fig. 28). Cells 390—424 μ l., 30—35 μ br., at the apex 10—12 μ br. Ends of the cell flattened and with thicker cell wall. 15—17 striae on the cell wall visible across the cell. Chloroplasts with about six ridges. In small numbers.

C. lunula (Müll.) Nitzsch (Kossinskaja 1960) (Fig. 29). Cell 324 μ l., 46 μ br. Cell wall smooth, colourless. Cells of that size, distinguished by West & West (1904—1923) as fo. *minor* (by Krieger, 1937, as. var. *minus* West & West), are included by Kossinskaja into the type. Singly.

C. setaceum Ehr. (Krieger 1937) (Fig. 30). Cell 334 μ l., 10 μ br., at the apex 2 μ br. Because of the smooth cell wall the specimens are similar to var. *Rollii* Kossinskaja (1960). The shape and size of the cells were nearly identical to *C. Kützingii* found in the same material, the shape of the chloroplasts, however, number of pyrenoids and number of gypsum cristals in the vacuoles being different. In small numbers.

Cosmarium amoenum Bréb. (West & West 1904—1923) (Fig. 31). Cells 48—51 μ l., 25—27 μ br., 19 μ thick; isthm. 13—15 μ br. Semicells slightly narrower towards the middle of the cell; vertical view broad elliptic. Lower row of granules is doubled. Two pyrenoids in each semicell. The ornamentation and the size of the cells is also in agreement with *C. pseudamoenum* Wille var. *basilare* Nordst.; because of the number of pyrenoids the specimens were included in *C. amoenum*. Singly.

C. cucurbita Bréb. (West & West 1904—1923) (Fig. 32). Cells 40 μ l., 20 μ br.; isthm. 18 μ br. Singly.

C. margaritiferum Menegh. (West & West 1904—1923) (Fig. 33). Cells 50—55 μ l., 42—45 μ br., 24—31 μ thick; isthm. 10—13 μ br. In small numbers.

C. ornatum Ralfs (West & West 1904—1923) (Fig. 34). Cell 36 μ l., 32 μ br., in the middle of semicell 20 μ thick; isthm. 10 μ br. In small numbers.

C. pseudopyramidatum Lund. var. *carniolicum* Lütkem.? (Fig. 35). Cell strongly flattened, 54 μ l., 30.5—32 μ br., at the isthm. 9 μ br. Cell wall punctate. Only one dead cell was seen, corresponding in shape and size to the specimen found by Messikommer (1965). As Lütkemüller's original diagnosis was not availlable, and it was, besides, hard to establish how many pyrenoids there were in a semicell, this identification is not certain.

C. quadratum Ralfs (West & West 1904—1923) (Fig. 36). Cell 58 μ l., 33 μ br., at the isthm. 19.5 μ br. Cell wall seems to be punctate. Singly.

Desmidium cylindricum Grev. (West & West 1904—1923). Cells 25—26 μ l., 47—52 μ br., 37 μ thick, at the isthm. 40—45 μ br. In small numbers.

D. Swartzii Ag. (West & West 1904—1923). Cells 16—17 μ l., 36—37 μ br.; isthm. 27—28 μ br. In small numbers.

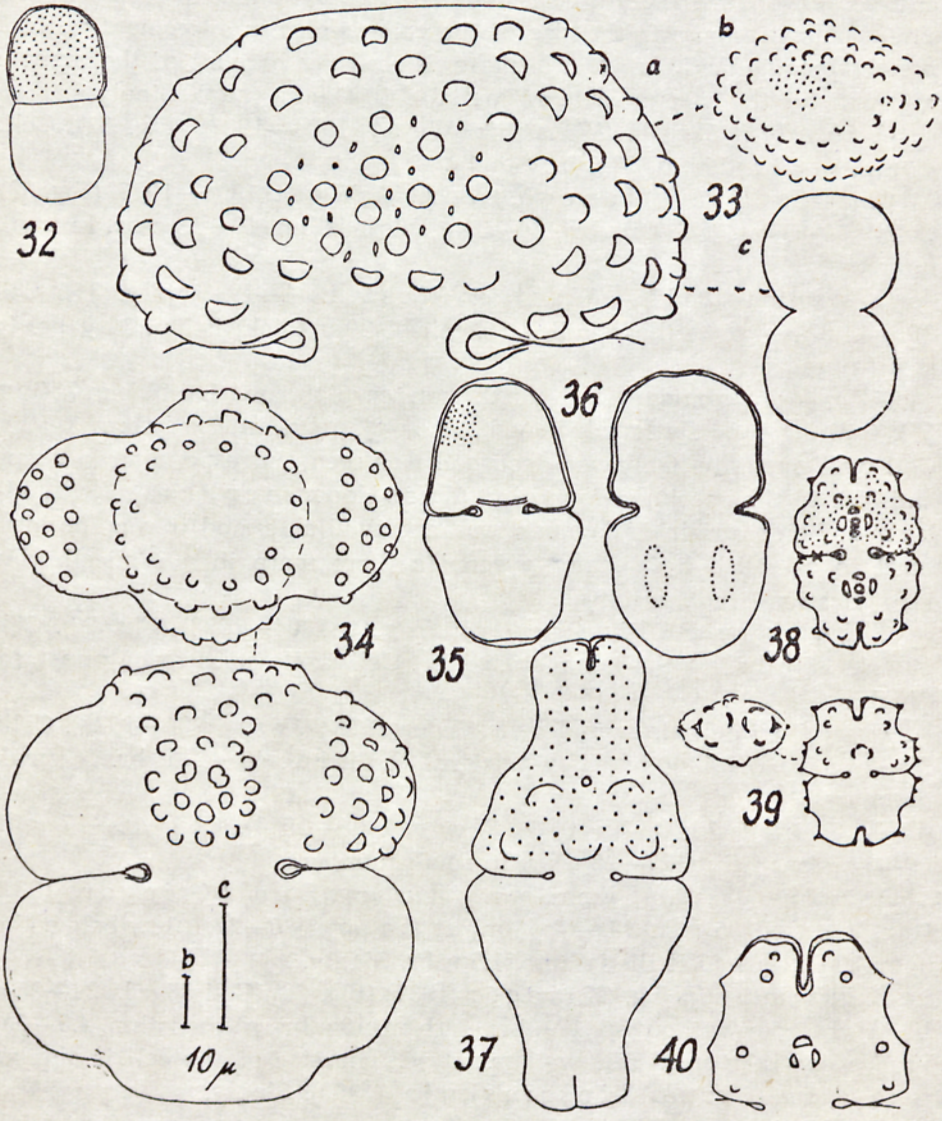
Euastrum ansatum Ehr. var. *robustum* Duc. (Krieger 1937) (Fig. 37). Cell 95 μ l., 43—45 μ br., at the apex 20—22 μ br., below the apex 20—21 μ br., at the isthm. 11.5 μ br. Singly.

E. bidentatum Näg. (Krieger 1937) (Fig. 38). Cell 38 μ l., 24—25 μ br., at the apex without sp. 17 μ br., with sp. 19 μ br., at the isthm. 4.5—5 μ br. No central pores. Cell wall punctate. The size of the cell is similar to fo. *minus* (Elenk.) Kossinskaja (1960). Singly.

E. denticulatum (Kirchn.) Gay var. *angusticeps* Grönbl. (Krieger 1937, Kossinskaja 1960) (Fig. 39). Cell 29 μ l., at the apex 15—17 μ br., at the base of the semicell 23 μ br., at the isthm. 4 μ br.; ca. 13 μ thick; apical incision 2.5—3 μ deep. The apex is not flat but slightly convex. In small numbers.

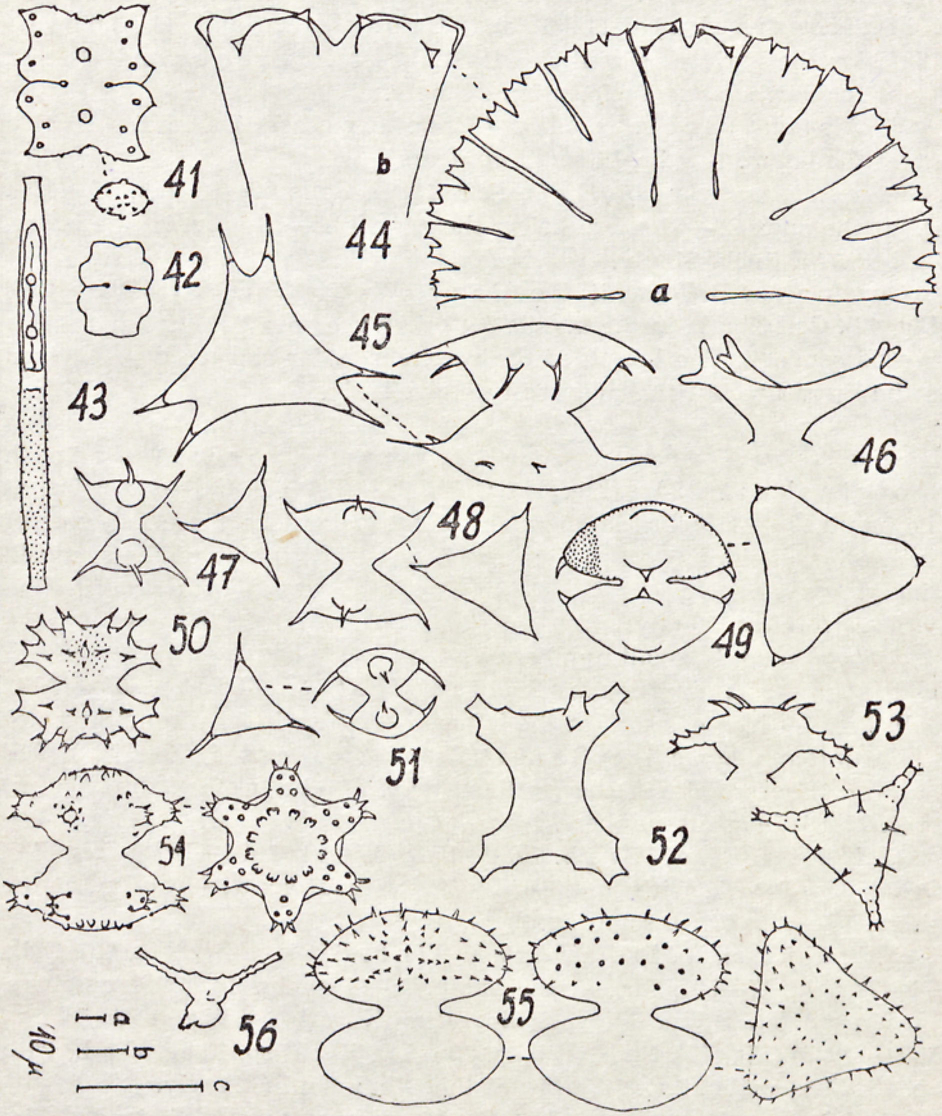
E. elegans (Bréb.) Kütz. (Krieger 1937) (Fig. 40). Cell 28 μ l., 16 μ br., at the apex 8.5 μ br., in the upper part of semicell 14 μ br., at the isthm. 5.5 μ br. Singly.

E. Gayanum de Toni (Krieger 1937, Kossinskaja 1960) (Fig. 41). Cell 12 μ l., in the middle only 10.5 μ l., at the apex 9.5 μ br.



Figs 32—40. 32 — *Cosmarium cucurbita,* 33 a, b, c — *C. margaritiferum,* 34 — *C. ornatum,* 35 — *C. pseudopyramidatum* var. *carniolicum* ?, 36 — *C. quadratum,* 37 — *Euastrum ansatum* var. *robustum,* 38 — *E. bidentatum,* 39 — *E. denticulatum* var. *angusticeps,* 40 — *E. elegans.* Figs 32, 33 b, c, 35—39 magnification b; Figs 33 a, 34, 40 magnification c

at the base of the semicell 10.5 μ br., with the central nodules 8 μ thick, without central nodules 6 μ thick. Singly.



Figs 41—56. 41 a, b — *Euastrum Gayanum*, 42 — *E. insulare* var. *silesiacum*, 43 — *Gonatozygon Brebissonii*, 44 a, b — *Micrasterias Thomasiana* var. *notata*, 45 — *Staurastrum bifidum*, 46 — *S. brachiatum*, 47 — *S. cuspidatum* var. *divergens*, 48 — *S. dejectum* var. *dejectum* fo. *angustatum*, 49 — *S. Dickiei* var. *circulare*, 50 — *S. furcatum* var. *subsenarium*, 51 — *S. glabrum* ?, 52 — *S. inconspicuum* var. *crassum*, 53 — *S. oxyacanthum*, 54 — *S. margaritaceum*, 55 — *S. pilosum*, 56 — *S. tetracerum*. Fig. 44 a magnification a; Figs 41 b, 42, 43, 44 b, 45—51 magnification b; Figs 41 a, 52 magnification c

E. insulare (Wittr.) Roy var. *silesiacum* Grönbl. (Fig. 42). Cell 20 μ l., 15 μ br., at the apex 10.5—11 μ br., at the isthm. 3 μ br.; 9 μ thick. The dimensions of the specimen agree with those given by Krieger (1937), Kossinskaja (1960) and Croasdale and Grönblad (1964) for the variety as well as with those of Prescott and Scott (1945) for var. *silesiacum* fo. *minus*. Singly.

E. oblongum (Grév.) Ralfs (Krieger 1937). Cell 186 μ l., 87 μ br., at the isthm. 13 μ br. In small numbers.

E. pectinatum Bréb. (Krieger 1937). Cells 56—65 μ l., 40—48 μ br., at the apex 28—31 μ br., below the apex 18.5—20 μ br., at the isthm. 7 μ br.; 27 μ thick. Singly.

Gonatozygon Brébissonii De Bary (West & West 1904—1923) (Fig. 43). Cell 84 μ l., in the middle 5 μ br., at the apex 3 μ br.; 2 pyrenoids in each semicell. The length of the specimen is far shorter than is given in the literature but the shape is typical. Singly.

Micrasterias Thomasiana Arch. var. *notata* (Nordst.) Grönbl. (Kossinskaja 1960) (Fig. 44). Cells 222—254 μ l., 202—212 μ br., at the isthm. 30—34 μ br. At the apex of the polar lobe there is a pair of teeth on each side of the median notch and of each side of the semicell. Singly.

Mougeotia sp. Singly.

Spirogyra sp. In small numbers.

Sphaerozosma excavatum Ralfs (West & West 1904—1923). Cells 9—11 μ l., 6—7 μ br., at the isthm. 4—5 μ br. In small numbers.

Staurastrum Arachnae Ralfs (West & West 1904—1923). Cell 21 μ l., with proc. 38—40 μ br., without proc. 17 μ br., at the isthm. 7 μ br.; proc. 15 μ l. In small numbers.

S. bifidum (Ehr.) Bréb. (West & West 1904—1923) (Fig. 45). Cells 33.5—35 μ l., with sp. 50—55 μ br., without sp. 30—34 μ br., at the sithm. 15—16 μ br. In small numbers.

S. brachiatum Ralfs (West & West 1904—1923) (Fig. 46). Cells 28—32 μ l., 47—50 μ br., at the isthm. 10—11 μ br. In small numbers.

S. cuspidatum Bréb. var. *divergens* Nordst. (West & West 1904—1923) (Fig. 47). Cells with sp. 23 μ l., without sp. 18.5—20 μ l., with sp. 23 μ br., without sp. 18 μ br.; at the isthm. 4 μ br. Singly.

S. dejectum Bréb. var. *dejectum* fo. *angustatum* Teiling (1954) (Fig. 48). Cells with sp. 25—26 μ l., without sp. 25 μ l., with sp. 27—30 μ br., without sp. 24—26 μ br., at the isthm. 6 μ br.; sp. 3—4 μ l. Not having in hand the original diagnosis of Teiling, I compared the specimens with the description and drawing given by Grönblad, Scott and Croasdale (1964). The specimens were also similar to those shown by West and West (1904—1923; Pl. 129, fig. 7), and by Prescott (1931; fig. 6, 6a) identified as *S. apiculatum* Bréb. I supported the opinion of Teiling because the semicells had divergent spines but not directed vertically upwards. Singly.

S. Dickiei Ralfs var. *circulare* Turn. (West & West 1904—1923) (Fig. 49). Cell 34 μ l., with sp. 36—37 μ br., without sp. 33—34 μ br., at the isthm. 8 μ br. Cell wall densely porous. Singly.

S. furcatum (Ehr.) Bréb. var *subsenarium* West & West (1904—1923) (Fig. 50). Cell with proc. 30 μ l., without proc. 23 μ l., with proc. 27 μ br., without proc. 20 μ br., at the isthm. 11 μ br. Cell wall granulate. Singly.

S. glabrum (Ehr.) Ralfs (West & West 1904—1923). Cells 20—25 μ l., with sp. 38—41 μ br., without sp. 26—31 μ br., at the isthm. 6—7 μ br.; sp. 8—9 μ l. Singly.

S. glabrum (Ehr.) Ralfs ? (Fig. 51). Cell 18 μ l., with sp. 27 μ br., without sp. 17 μ br., at the isthm. 5 μ br.; sp. 8 μ l. The size agrees with the diagnosis but the semicells are distinctly convex at the apex instead of being straight or slightly concave. In shape the specimen recalls *S. Dickiei* var. *rhomboideum* West & West but it is much smaller. Singly.

S. inconspicuum Nordst. var. *crassum* Gay (West & West 1904—1923) (Fig. 52). Cell with proc. 16 μ l., without proc. 12 μ l., with proc. 13 μ br., at the isthm. 5.5 μ br. Singly.

S. oxyacanthum Arch. (West & West 1904—1923) (Fig. 53). Cell without sp. 28 μ l., with proc. 40 μ br. without proc. 21 μ br., at the isthm. 6—7 μ br.; apical sp. 4 μ l., proc. with terminal sp. 10—12 μ long. Singly.

S. margaritaceum (Ehr.) Menegh. (West & West 1904—1923) (Fig. 54). Cells 33—35 μ l., with sp. 35—38 μ br., without sp. 32—34 μ br., at the isthm. 11 μ br. In small numbers.

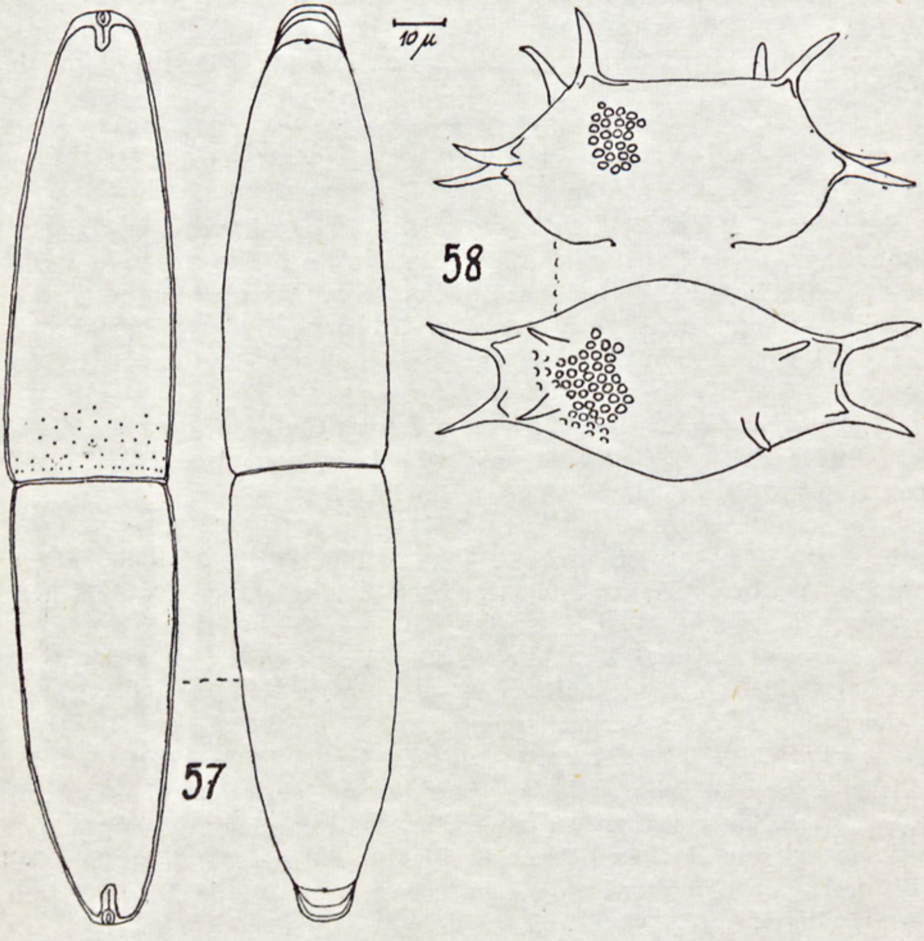
S. pilosum (Näg.) Arch. (West & West 1904—1923) (Fig. 55). Cells without sp. 40—41 μ l., 38—39 μ br., at the isthm. 11—12 μ br.; sp. ca. 2 μ l. Sinus distinctly rounded. In small numbers.

S. tetracerum Ralfs (West & West, 1904—1923) (Fig. 56). Cell with proc. 21 μ l., without proc. 11 μ l., with proc. 30 μ br., at the isthm. 6 μ br. Singly.

Tetmemorus granulatus (Bréb.) Ralfs (Krieger 1937) (Fig. 57). Cell 190 μ l., 33 μ in diam. Singly.

Xanthidium antilopaeum (Bréb.) Kütz. var. ? (West & West 1904—1923) (Fig. 58). Cell with sp. 98 μ l., without sp. 66 μ l., with sp. 95 μ br., without sp. 67 μ br. at the isthm. 25 μ br. Cell wall everywhere distinctly scrobiculated. The scrobiculation of the entire cell wall has not hitherto been observed in the species or its varieties. Only one dead cell was seen.

X. armatum (Bréb.) Rabenh. (West & West 1904—1923) (Fig. 59, 60). Cell with sp. 120 μ l., without sp. 108 μ l., with sp. 93 μ br., without sp. 75 μ br., at the isthm. 33 μ br.; 56 μ thick. Cell wall punctate. One specimen had no teeth on the central wart (Fig. 59). On some dead, empty cells the cell wall was distinctly scrobiculate. Some specimens were surrounded by a thick layer of mucilage. In small numbers.

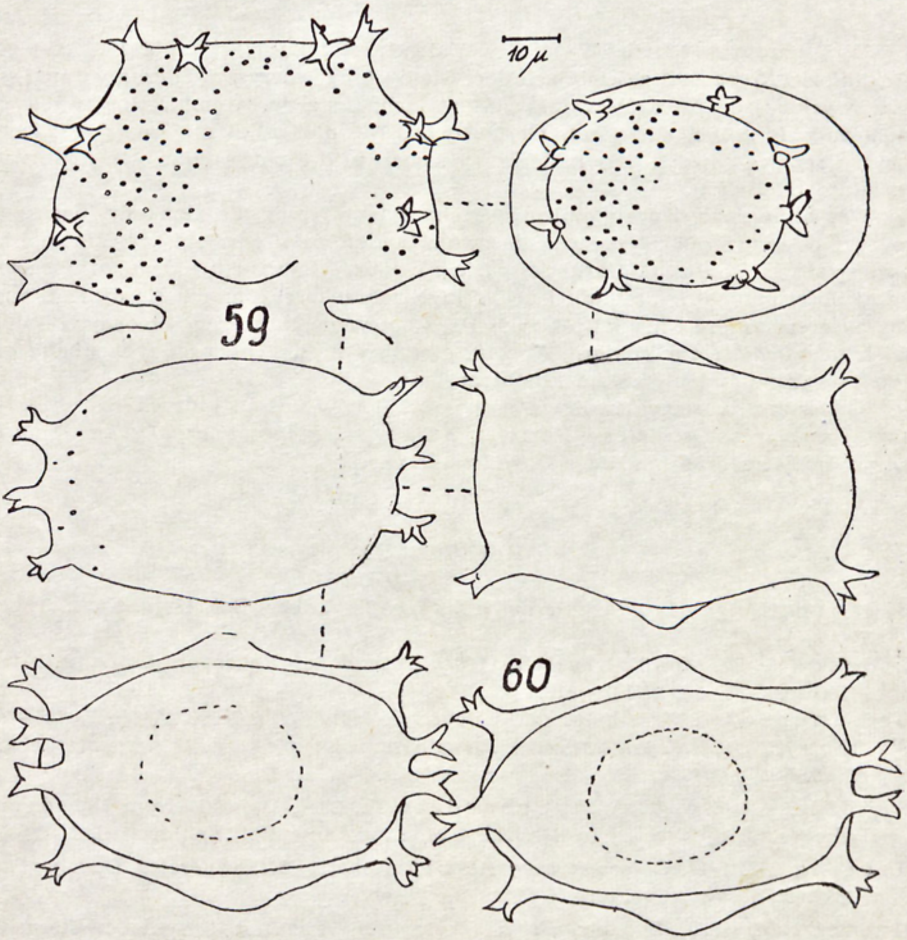


Figs 57—58. 57 — *Tetmemorus granulatus*, 58 — *Xanthidium antilopaeum* var. ?

Among the microscopical animals living in the *Oscillatoria* masses there were *Protozoa*, *Rotatoria*, *Gastrotricha*, *Nemtodes*, *Tardigrada*, and *Cladocera*.

Macroscopical animals were mostly small larvae and pupae of *Tendipedidae*: *Orthocladius Korosiensis* ? Tschern. singly, *Polypedilum* sp. (ex gr. *constrictum* Walk. ?) singly, *Procladius* sp. singly, *Psectrocladius* ex gr. *psilopterus* Kieff. numerous (ca. 4 larvae in 1 ccm of algae), *Tendipes plumosus* L. in small numbers. Most of the larvae were 1—1.5 mm long, the greatest reaching up to 6 mm length. Besides, small, white *Pisidium* (*Mollusca*) was found fairly numerously.

All organisms found are characteristic for sessile fresh-water communities; the only alga which might be considered as planctonic is a single specimen of *Dictyosphaerium* sp. *Oscillatoria Komarovii*,



Figs 59—60. 59 — *Xanthidium ornatum*, 60 — *X. ornatum*, teratologic specimen

appearing here in masses, was originally found in mineral lakes in the Ukraine (Starmach 1966) also on the mud. The great number of desmids and acidophilous diatoms is explained by the dystrophic type of the lake and low pH of the water. The occurrence of species of northern or alpine character (e.g. *Pediastrum Taylori*, *Eunotia alpina*, *E. septentrionalis*, *Cymbella gracilis*) is connected with the montane climate of the Tatra.

The finding of several rare species is to be stressed, among which *Oscilatoria Komarovii*, *Chromulina spectabilis*, *Stenopterobia intermedia*, *Tetraedriella acuta*, and *Tetradesmus wisconsinensis* are the most interesting.

STRESZCZENIE

W Toporowym Stawie Wyżnim w Tatrach zebrano 17 stycznia 1964 r. plechy *Oscillatoria Komarovii* zaścielające dno. Sinicy tej towarzyszyły liczne gatunki glonów występujące na ogół w małych ilościach. Ze zwierząt mikroskopowych występowały *Protozoa*, *Rotatoria*, *Gastrotricha*, *Nematodes*, *Tardigrada* i *Cladocera*. Licznie reprezentowane były małe larwy i poczwarki *Tendipedidae* oraz małe okazy *Pisidium* (*Mollusca*).

Wszystkie znalezione organizmy są charakterystyczne dla słodkowodnych zbiorowisk osiadłych. Występująca masowo *Oscillatoria Komarovii* została opisana z mineralnych jezior na Ukrainie, gdzie również żyła na mule dennym. Obecność dużej ilości gatunków desmidii i acidofilnych okrzemek tłumaczy się dystroficznym charakterem jeziora i niskim pH wody. Występowanie gatunków północnych i alpejskich (np. *Pediastrum Taylorii*, *Eunotia alpestris*, *E. septentrionalis*, *Cymbella gracilis*) związane jest z górskim klimatem Tatr.

Znaleziono tu szereg rzadkich gatunków glonów, wśród których na szczególną uwagę zasługują: *Oscillatoria Komarovii*, *Chromulina spectabilis*, *Stenopterobia intermedia*, *Tetraëdriella acuta* i *Tetradesmus wisconsinensis*.

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