

SOME ALGAE FROM THE BLACK HILLS OF SOUTH DAKOTA AND THE TURTLE MOUNTAIN REGION OF NORTH DAKOTA¹

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During June, 1939, the writer came into possession of a series of algal samples collected by Dr. R. T. Wareham, of the Botany Department, The Ohio State University. The first eight in the series were from the vicinity of Spearfish in the Black Hills of South Dakota. Representative of stream habitats, these were the least interesting of the series, both in number and variety of species. The remaining twenty collections were from the Turtle Mts. of North Dakota in the vicinity of Bottineau, Lake Metigoshe, Dunseith, and Boundry Butte. These were of decided interest and were characteristic of the northern bog-lake areas in which desmids predominate.

The most comprehensive account of the algae of North Dakota is found in two papers, one by Moore (1917) and the other by Moore and Carter (1923). The first was a study of the algae in Devil's Lake, while the second dealt with the algae in numerous lakes of northeastern North Dakota, including some of the area concerned in the present report. The main objective, as summarized in the second paper, was to contrast the algal flora of the "freshwater" and "alkaline" lakes. This paper listed a total of 148 named species and varieties with their distribution in the two types of lakes. Nine additional species and varieties recorded only from Devil's Lake (1917) increased the records to 157 for the region.

Of the 73 forms in the present report, 12 have been previously listed, and are designated by an asterisk. The list, though not extensive, indicates that a study of the algal flora of the Turtle Mts. would be well worth the effort involved.

The writer wishes to thank Dr. Wareham for the time and effort expended in securing the collections.

SPECIES LIST

BLACK HILLS, SOUTH DAKOTA

Nostoc verrucosum Vauch.
Protococcus viridis Ag.
Ulothrix tenerrima Kütz.
Ulothrix zonata (Weber & Mohr) Kütz.
Cladophora glomerata (L.) Kütz.
Vaucheria borealis Hirn.
Closterium leibleinii Kütz.

TURTLE MOUNTAINS, NORTH DAKOTA

Cyanophyta

**Chroococcus turgidus* (Kütz.) Näg.
**Chroococcus limneticus* Lemm.
**Microcystis incerta* Lemm.
Aphanocapsa elachista var. *conferta* W. & W.
Aphanothece stagnina (Sprengel) A. Br.
**Merismopedia tenuissima* Lemm.
Nostoc commune Vauch.

Chrysophyta

Dinobryon sertularia Ehr.
Ophiocytium arbusculum (A. Br.) Raben.
Tribonema utriculosum (Kütz.) Hazen

¹Paper from the Department of Botany, The Ohio State University, No. 493.

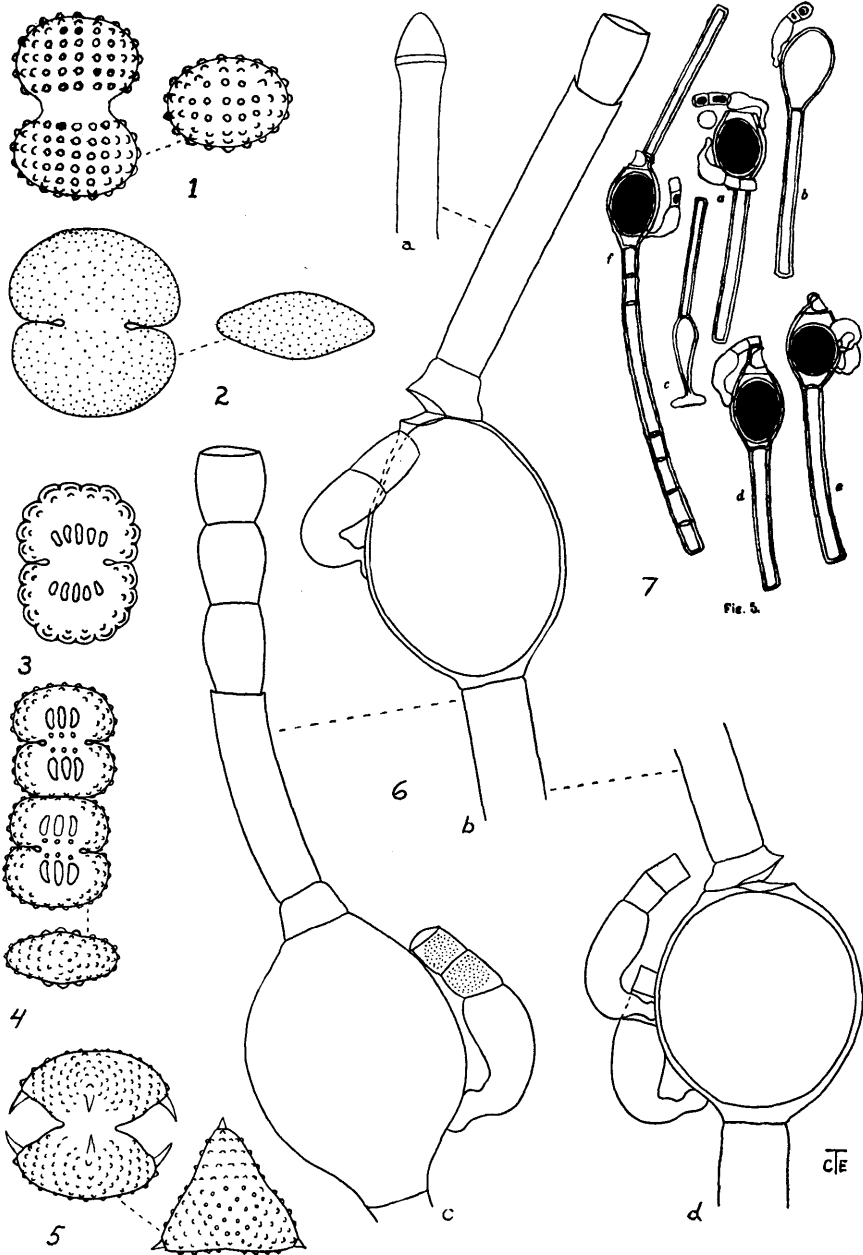


FIG. 1. *Cosmarium isthmium* West forma. FIG. 2. *Cosmarium lundellii* var. *corruptum* (Turner) W. & W. FIG. 3. *Cosmarium saxicolium* Kaiser. FIG. 4. *Cosmarium vogesiacum* Lemaire forma. FIG. 5. *Staurastrum dakotii* sp. nov. FIG. 6a-d. *Oedogonium hoersholmiense* Hallas. A, apical cell; b, c, d, fruiting filaments with androsporangia and dwarf males. FIG. 7. *Oedogonium hoersholmiense* Hallas. From the original figures by Hallas.

Chlorophyta

- **Pandorina morum* (Müll.) Bory
 **Eudorina elegans* Ehr.
Gloeocystis ampla Kütz.
Asterococcus limneticus G. M. Smith
 **Cylindrocapsa geminella* Wolle
Stigeoclonium subsecundum Hazen
Microthamnium kuetzingianum Näg.
Microthamnium strictissimum Raben.
 **Rhizoclonium hieroglyphicum* (Ag.) Kütz.
Oedogonium hoersholmiense Hallas. Figs. 6a-d, 7.
 Veg. cell 8-16 x 68-160 μ ; oogon. 42-48 x 60-72 μ ; oosp. 39-45 x 42-46 (-58) μ ; androsp. 13-19 x 16-21 μ ; dwarf male stipe 11-14 x 29-32 μ ; antheridium 9-11 x 9-16 μ .
 Lake Metigoshe, N. Dakota.
Oed. hoersholmiense appears to be a rarity. Tiffany (1930) lists its distribution as Denmark, where it was first described by Hallas (1905). Later (1937) Tiffany listed it as an extra-limital species in his work on the North American Oedogoniaceae. The North Dakota material has been assigned to this species with some trepidation although it agrees remarkably well with the figures published by Hallas. The dimensions, especially the breadth of the oogonia and oospores, are greater, but it is the writer's opinion that these are nearer the upper extremes for the species and therefore should be included in the description.
- **Pediastrum boryanum* (Turp.) Menegh.
Pediastrum araneosum var. *rugulosum* (G. S. West) G. M. Smith
 **Ankistrodesmus falcatus* (Corda) Ralfs
Tetraedron minimum (A. Br.) Hansg.
Scenedesmus armatus (Chod.) G. M. Smith
Scenedesmus arcuatus Lemm.
Scenedesmus acutiformis Schröder
 **Scenedesmus obliquus* (Turp.) Kütz.
 **Scenedesmus quadricauda* var. *quadrispina* (Chod.) G. M. Smith
Vaucheria hamata (Vauch.) D. C.
Spirogyra condensata (Vauch.) Kütz.
Spirogyra hassallii (Jenner) Petit
Cylindrocystis brebissonii var. *minor* W. & W.
Netrium digitus (Ehr.) Itzg. & Roth
Netrium digitus var. *naegelii* (Bréb.) Krieger
Pleurotaenium ehrenbergii var. *crenulatum* (Ehr.) Krieger
Closterium acerosum (Schrank) Ehr.
Closterium kutzingii Bréb.
Closterium moniliferum Näg.
Closterium parvulum Näg.
Euastrum abruptum Nordst.
Euastrum binale var. *hians* W. West
Cosmarium amoenum Ralfs
Cosmarium angulosum Bréb.
Cosmarium connatum Bréb.
Cosmarium impressulum var. *suborthogona* (W. & W.) Taft
Cosmarium isthmium West forma? Fig. 1.
 L. 40 μ , w. 29 μ , isth. 14 μ .
 Somewhat more compressed in vertical view but in agreement with the material figured by Wailes (1931) from British Columbia.
Cosmarium lundellii var. *corruptum* (Turn.) W. & W. Fig. 2.
 L. 41-43 μ , w. 44-45 μ , isth. 13-14 μ .

The dimensions of this material are somewhat less than those by Turner (1892) and decidedly less than those by West & West (1905). If this variety as proposed by the Wests, is a complex of three of Turner's species and varieties, then a great variation in size may be expected. Listed here as var. *corruptum*, the material resembles *Cos. corruptum* Turner more than *Cos. subcirculare* var. *rugosum* Turner or *Cos. rotundatum* which the Wests maintain are parts of the complex.

Cosmarium obtusatum Schmidle

Cosmarium ochlhodes Nordst.

Cosmarium punctulatum Bréb.

Cosmarium pyramidatum Bréb.

Cosmarium quadratum Ralfs

Cosmarium rectangulare var. *hexagonum* (Elfv.) W. & W.

Cosmarium saxicolum Kaiser. Fig. 3.

L. 30 μ , w. 24 μ , isth. 11 μ .

The North Dakota material agrees very closely with Gronblad's figures (1932).

The cells have less ornamentation and are smaller than those figured by Krieger (1938).

Cosmarium sexangulare Lund

Cosmarium speciosum Lund

Cosmarium subarcuatum (Lager.) Racib.

Cosmarium subcucumis Schmidle

Cosmarium vexatum West

Cosmarium vogesiacum Lemaire forma? Fig. 4.

L. 24–26 μ , w. 22–24 μ , isth. 8–9 μ .

This form differs from the species in having 3 parallel protuberances on the central face of each semicell. The dimensions are almost exactly those of the species as well as of var. *alpinum* (Schmidle) Laporte. (Laporte, 1931).

Staurastrum dakotii Taft sp. nov. Fig. 5.

Cells small, as broad as long, constriction deep, sinus opening wide; semicells roughly elliptic, apex depressed, margin granulate, lower margin rounded, smooth, slightly concave near the angles, angles truncate, each with a sharp, stout spine pointing downward; surface granulate, granules small and in series across the sides and top of the angles; vertical view triangular, sides slightly concave, wall granulate, granules in series across the angles, granules at center scattered.

L. 31–34 μ , w. 31–33 μ , isth. 9–10 μ .

Boundry Butte, North Dakota.

The depressed semicells, absence of spines on the cell wall, and the truncate apices of the angles distinguish this species from *St. arnellii* var. *spiniferum* W. & W. (West & Carter, 1923). The type of granulation, the absence of verrucae, and the truncate angles separate it from *St. oxyrhynchum* Roy & Biss. (Roy & Biss, 1886).

Staurastrum hirsutum Bréb.

Staurastrum punctulatum forma? Boldt. (Boldt, 1888).

Hyalotheca dissiliens (Sm.) Bréb.

Hyalotheca mucosa (Mert.) Ehr.

Desmidiium aptogonum var. *acutius* Nordst.

Desmidiium swartzii Ag.

Euglenophyta

Euglena pisciformis Klebs

Euglena sanguinea Ehr.

Phacus pleuronectes (Müll.) Duj.

Phacus triqueter (Ehr.) Duj.

Trachelomonas volvocina Ehr.

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