

Some Algae of the Cabin Creek Raised Bog, Randolph County, Indiana

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The Cabin Creek Raised Bog, located 6 miles north of Modoc in Randolph County, was described and named in 1946 by the late Drs. Ray C. Friesner and John E. Potzger of Butler University (1).

Raised bogs are chiefly limited to coastal areas in North America, however, these unusual physiographic features have been found in the interior at Urbana, Ohio, Itasca Park, Minnesota, and Yellowstone National Park. Of the three general types of raised bogs in America the Cabin Creek Bog represents those inland bogs due to artesian spring water, high in calcium, with mosses, sedges and grasses as chief peat formers. Of two variations, the Cabin Creek Bog is an example of those having weakly expressed hydrostatic pressure which gives rise to wet areas favorable to luxuriant growth of mosses as well as sedges and grasses. The Cabin Creek Bog has risen at least ten feet above the floodplain at the maximum elevation, and covers an area of approximately 15 acres. There is no open water in or beneath the raised portion of the bog. The deepest boring in the bog indicated 32 feet of peat beneath the raised portion.

The algae of raised bogs have been neglected in study, because to our knowledge, besides the three species of *Chara* cited for the Cabin Creek Bog in 1946 (1), F. B. Chapman's algal list for the Ohio raised bog (2), remains the only study to date in the United States in which identifications to species are noted.

The following list of algae, comments and illustrations are based upon collections and observations made during the years 1939, 1944, 1960 and 1961. The diatoms, treated by Dr. Charles W. Reimer, appear in another paper in this issue of the Proceedings.

Algal Habitats

The surface of the Cabin Creek Bog is covered with a black mucky soil. The vegetation is still much the same as reported by Friesner and Potzger, *loc. cit.*, with a few exceptions. There are three general areas in which the algae were collected, the Spring Areas in the west part of the bog, and the Grassy-Sedge Knoll in the eastern part of the bog.

Spring Areas

Spring 1, in the north section, has at least one visible flowing source of water. The water is ponded over an area of several square meters to a depth of 2-4 inches, before flowing slowly down the slopes in two small streamlets.

1. I wish to express my appreciation to Mr. and Mrs. Robert Holliday for their hospitality and collecting privileges on the raised bog; their son, Michael, who aided with collecting (1960-1961); Mrs. Fay K. Daily, Dr. Francis Drouet, and Dr. G. W. Prescott for aid in identification of certain species; the curators of the Chicago Natural History Museum and Earlham College Herbaria for the loan of herbarium specimens; Mrs. E. J. Cejnar, Butler University Library, and Mrs. Lois Burton, Indiana State Library for providing pertinent literature and Mr. W. E. Kruse, Eli Lilly & Co., who prepared lantern slides and plate.

Spring 2, in the south section, is somewhat similar to Spring 1 with the exception that the water flowing away from the source has formed a moderately steep-sided channel which separates the Spring Areas from the Grassy-Sedge Knoll. On May 28, 1961, the acidity of the spring water at its immediate source from the ground was pH 6.9, the temperature was 52° F. and the temperature of the air was 72° F. Approximately 100 feet downstream from the spring the pH of the water had risen from 6.9 to 7.5 and the temperature from 52° to 55° F. The mucky soil in the springs and streams contained much fine and coarse granular marl.

Grassy-Sedge Knoll

This grass and sedge covered marshy area is wet in varying degrees throughout the year. No flowing springs are evident in this area. One shallow streamlet bed (with occasional flowing water) which lies in an east-west direction on the west slope of the knoll, has sides and bottom covered with a light grey granular marly soil layer. The pH of one of the numerous small puddles of stagnant water was 7.3 and the temperature was 62° F.

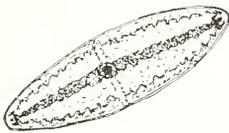
THE ALGAE

Charophyceae

Three species, *Chara Brittonii* Allen; *C. contraria* A. Br., and *C. vulgaris* Vaill. ex L. were found in 1944 and again during this study. *C. Brittonii* has been collected only once before in Indiana (in a bog), once in Michigan, and the type locality. The other two species are rather widely distributed in Indiana, however, *C. vulgaris* is confined to the glaciated region chiefly in the northern half of the state and to bodies of water fed by springs or artesian wells indicating the importance of mineral nutrition in distribution.

Chlorophyceae and Heterokontae

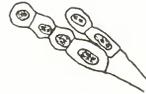
Spirogyra varians (Hass.) Kütz., *Tribonema minus* (Wille) Hazen, *Oedogonium* sp. (sterile) *Chaetophora elegans* (Roth) Ag. and *Stigeoclonium lubricum* (Dillw.) Kütz. were found in the springs area. The first



1. *Nectrium digitus* var. *rectum*



2. *Palmogloea protuberans*



3. *Chlorotylum cataractum*



4. *Scytonema involvens*



5. *Nostoc foliaceum*

three were found floating in shallow pools; the last two species were attached to substrates in flowing streamlets. The cytoplasm of random cells of *S. varians* contained a purple pigment. *Chlorotylum cataractum* Kütz. (Plate 1, fig. 3), apparently a new report for Indiana, was found as a green encrusting layer on marl pebbles in the springs area in flowing water. A submerged moss plant in the springs area was partially covered with a copious mass of the saccoderm desmid, *Netrium digitus* var. *rectum* (Turner) Krieger (Plate 1, fig. 1). This variety is a new report for Indiana, however, the species is reportedly common in elevated boggy moorlands of Europe. *Palmogloea protuberans* (Sm. & Sow.) Kütz. (Plate 1, fig. 2), a coccoid form, was found intermingled with various Myxophyceae in gelatinous masses on the Grassy-Sedge Knoll. *Vaucheria* sp. (sterile) was abundant in a drainage ditch bordering the north edge of the raised bog, but was not found on the raised portion.

Myxophyceae

One collection, no. 2946, composed of *Gomphosphaeria lacustris* Chod., *G. aponina* Kütz., *Anacystis dimidiata* (Kütz.) Dr. & Da. and *Oscillatoria tenuis* var. *tergestina* Rabenh., was of unusual interest because it was found in ponded water scarcely 2-3 inches in depth in one of the spring pools. *G. lacustris* is generally an open-water plankter at least in Indiana and found chiefly in our lakes of glacial origin (4). Here atop the bog, the irregularly lobed plants are composed of a large number of closely packed protoplasts, slightly reminiscent of those found in small ponds and shallow water. The other three species are also found in the open or deep water, but more generally in shallow water of lakes, ponds and rivers. It would be interesting if these coccoid species are members of a relict community and remnants of the now extinct lake.

Calothrix parietina (Näg.) Thur. was found attached to a submerged board in the flowing water of Spring 1.

The remaining Myxophyceae were collected from the Grassy-Sedge Knoll on the streamlet bed previously described. They are: *Anacystis thermalis* (Menegh.) Dr. & Da. f. *thermalis*, *Coccochloris stagnina* Spreng., *Microcoleus acutissima* Gard., *M. paludosus* (Kütz.) Gom., *Nostoc ellipso-sporum* (Desmaz.) Rabenh., *N. foliaceum* Moug. (Plate 1, fig. 5), *Schizothrix lacustris* A. Br., *Scytonema mirabile* (Dillwyn) Born. and *S. involvens* Rabenh. (Plate 1, fig. 4). *N. foliaceum* apparently has not been reported previously for the United States. On the Grassy-Sedge Knoll it was found on the streamlet bed as small, foliose, pale green gelatinous masses. The spongy and lacunose nature of the plants was quite evident. In collection no. 2957, mature spores are evident and they remain the chief diagnostic characteristic of the species. Of the four specimens on file in the Chicago Natural History Museum, only one contains mature spores (Remiremont, ex herb. Lenormand).

Scytonema involvens, a new report for Indiana, is closely related to *S. crustaceum* Rabenh., and F. Drouet believes it may be an ecological variant of the latter species. King (3) reported *S. crustaceum* for Wayne County, Indiana, which adjoins Randolph County.

Chapman lists 38 species for the Urbana raised bog, of which 2 were charophytes, 3 were Myxophyceae and the remainder were diatoms, Chloro-

phyceae and heterokontae. Many of these occurred in the ditch encircling the bog.

In this paper, the Cabin Creek Raised Bog algal flora is as follows: 3 charophytes, 14 Myxophyceae, 8 Chlorophyceae and one heterokont. No efforts were made to collect intensively from the drainage ditches which partially surround this bog in preparation for this preliminary study.

This study is based upon collections on file in the Ray C. Friesner Memorial Herbarium, Butler University, and are numbered as follows: *F. K. and W. A. Daily* 89, 2843, 2845, 2946-2959, 2961-2964, 2969-2971, 2973-2975, 2977, 2978, 2980-2983, 3006-3008, *Tribonema minus* coll. by *F. K. Daily*; 471B (Mich.) *W. A. & F. K. Daily*, Fish Lake, Barry Co., Sept. 5, 1955.

Literature Cited

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