The Characeae of Indiana - A Preliminary Report

Fay Kenoyer Daily

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Butler University
Botanical Studies
(1929-1964)

Edited by

Ray C. Friesner
The *Butler University Botanical Studies* journal was published by the Botany Department of Butler University, Indianapolis, Indiana, from 1929 to 1964. The scientific journal featured original papers primarily on plant ecology, taxonomy, and microbiology. The papers contain valuable historical studies, especially floristic surveys that document Indiana’s vegetation in past decades. Authors were Butler faculty, current and former master’s degree students and undergraduates, and other Indiana botanists. The journal was started by Stanley Cain, noted conservation biologist, and edited through most of its years of production by Ray C. Friesner, Butler’s first botanist and founder of the department in 1919. The journal was distributed to learned societies and libraries through exchange.

During the years of the journal’s publication, the Butler University Botany Department had an active program of research and student training. 201 bachelor’s degrees and 75 master’s degrees in Botany were conferred during this period. Thirty-five of these graduates went on to earn doctorates at other institutions.

The Botany Department attracted many notable faculty members and students. Distinguished faculty, in addition to Cain and Friesner, included John E. Potzger, a forest ecologist and palynologist, Willard Nelson Clute, co-founder of the American Fern Society, Marion T. Hall, former director of the Morton Arboretum, C. Mervin Palmer, Rex Webster, and John Pelton. Some of the former undergraduate and master’s students who made active contributions to the fields of botany and ecology include Dwight. W. Billings, Fay Kenoyer Daily, William A. Daily, Rexford Daudenmire, Francis Hueber, Frank McCormick, Scott McCoy, Robert Petty, Potzger, Helene Starcs, and Theodore Sperry. Cain, Daubenmire, Potzger, and Billings served as Presidents of the Ecological Society of America.

Requests for use of materials, especially figures and tables for use in ecology text books, from the *Butler University Botanical Studies* continue to be granted. For more information, visit www.butler.edu/herbarium.
It has been demonstrated by others that the study of algae of Indiana in general has been neglected. In 1929 in an introduction to a classified check list of the algae of Indiana, Dr. C. M. Palmer (5) remarked, "Few papers have been published giving the names of the algae of Indiana." Also in 1932 after giving a phycological history of Indiana, Dr. B. H. Smith (7) observed, "This review of literature shows very clearly the meager amount of work which has been done on the algae in the state since the beginning fifty-five years ago." These statements are especially true of the Characeae, during the study of which group Dr. B. W. Everman and H. W. Clark (3) noted, "Indeed there have been so few workers in the field and relatively little material collected over the country generally that classification is exceedingly difficult." This statement was made almost twenty-five years ago, but the same condition still exists.

Recently a study of the Characeae of Nebraska was made by Dr. Walter Kiener (4) and the author (2). Dr. Kiener made an important contribution in collecting many new specimens from that state, and he also made available herbarium specimens located at the University of Nebraska. After a study of the available material, a key and descriptions were published. An attempt is now being made by the author to make a similar taxonomic study of the Characeae of Indiana. One hundred and ten specimens have been assembled and identified, but it is desirable to have considerably more before attempting to prepare a key and descriptions. Since there is a wide divergence in form with many intermediates within some species of the Characeae, and since the division of these species complexes into new species, varieties and forms seems to have caused a great deal of confusion in the past, the present paper uses only the species complex name in such instances. Further division may be made at a later date if deemed justifiable in the light of future study.

*A contribution in recognition of the 25th Anniversary of the Botany Department of Butler University.
The three-fold purpose of this paper, then, is to report the data concerning collections made in Indiana which have not already been published; to make an appeal for any specimens of the Characeae now extant; and to stimulate the collection of new material.

Concerning the latter, it might be well to make a few comments upon collection of this group. The plants are generally found in ponds and lakes or sluggishly flowing streams. They are usually growing in less than ten feet of water and quite often are about the edge of the water upon the moist soil of the shore. The whole plant should be obtained if it can be reached from the shore or by wading. This includes the rhizoidal portion which must be obtained by digging it out of the mud. This is not always possible, however, because some of the plants may be reached only by use of a “Chara rake” similar to the one recommended by Nordstedt (in Allen, 1). After collection, the material should be washed gently to free it from debris, and should be laid out on paper to dry. Crowding should be avoided when arranging the collection as some of the more brittle forms are crushed by grinding of stem against stem if they are overlapped a great deal. Specimens may be dried by first pressing the material lightly for a short time to somewhat flatten the mount and then storing in a warm, airy place to dry rapidly. However, they may be placed in a drier, used for the flowering plants if too much pressure is not applied to cause collapse of the cortex in the corticated forms. The Nitelleae are best prepared by floating out the more delicate forms on suitable paper and covering with cotton cloth or wax paper. To speed drying, when using the latter, all excess moisture should be removed by blotting lightly.

If it were more convenient for the collector, any of the usual laboratory reagents for preserving the algae, such as two per cent formalin, etc., could be used. However, one disadvantage of this method is that usually one can only make small collections. The color and natural appearance of such collections are also impaired, making the material less desirable for herbarium mounts when finally dried. The chief advantage of this method is that tissue is preserved in a more natural state for microscopic examination. If too much pressure and heat are avoided in the former method, however, it is preferred as the tissue will resume its normal condition when soaked in water or vinegar or any other suitable dilute acid usually used in removing the lime on incrusted forms.
In reporting the new collections below, the herbaria in which they may be found are indicated as follows:—BU, Butler University; CM, Chicago Natural History Museum; IU, Indiana University; DU, DePauw University. (Duplicates of some collections are available for further distribution.)

When specimens are listed as "probably" C. contraria, etc., this means that the condition of the material is such that complete observations were impossible. However, enough characteristics have been observed to be reasonably sure of the identification.

The author wishes to acknowledge the aid of Dr. Ray C. Friesner for making available the facilities of the Butler University Botany Department; Dr. Francis Drouet of the Chicago Natural History Museum, Dr. Charles C. Dean of Bluffton, Indiana, Dr. Winona H. Welch of DePauw University, Dr. Naomi Mullendore of Franklin College, and Miss Rosalie Weikert of the New York Botanical Garden for the loan or gift of specimens; Dr. C. Mervin Palmer, Dr. John E. Potzger, and Mr. William A. Daily, all of Butler University, for many kindnesses rendered.

**NITELLA**

*Nitella flexilis* Ag. **MARION COUNTY:** Fall Creek Water Works, Indianapolis, C. M. Palmer Jd. 18, Apr. 26, 1931 (BU); probably *N. flexilis,* in a large pond near Keystone av. and Fall creek, Indianapolis, W. A. Daily, Mar. 15, 1941 (BU), W. A. Daily, F. K. Daily, F. Drouet, E. R. Hupp, C. M. Palmer 929, Aug. 16, 1942 (CM, BU), W. A. & F. K. Daily 40 Oct. 25, 1942 (BU). **STEUBEN COUNTY:** Margin of Lake James, W. H. Welch, July 18, 1935 (DU, BU).

*Nitella opaca* Ag. **WAYNE COUNTY:** Drainage ditch (by N. S. road), Elliott's Mills Bog south of Richmond, L. J. King 384, May 11, 1941 (CM, BU).

**CHARA**

*Chara aspera* Willd. (Nearest var. *Macounii* Allen or *Chara Macounii* Allen as Robinson, 6. considered it). **KOSCIUSKO COUNTY:** Abundant in Beaver Dam lake, W. A. Daily 79, June 10, 1939 (CM, BU).

*Chara Brittonii* Allen. (As nearly as it has been possible to determine, this species has been known only until the present only from the type specimen.) **LA PORTE COUNTY:** In standing water forming a "mat" on the surface, Mill Creek Bog, Mill Creek, W. A. Daily 89,
a in which University; University; are availa-
ple obser-
s have been
Friesner
nr. History
Winona H.
of Franklin
University, for
er forming a
July 22, 1939 (BU). RANDELPH COUNTY: Raised bog along High-
way 1 where it crosses Cabin creek 6.3 mi. north of Modoc, in water
from second artesian well, J. E. Potzger, July 22, 1944 (BU), R. C.

Chara contraria A. Br. BARTHOLOMEW county: Probably C.
contraria in ponds near overpass on Highway 31, north of Columbus,
west of Logansport on U. S. Highway 24, W. A. & F. K. Daily 39,
Sept. 10, 1942 (BU). DEKALB COUNTY: In Indian lake, sec. 29, 2
mi. west of Corunna, C. C. Dean 32272, July 13, 1932 (IU, BU).
ELKHART COUNTY: Probably immature C. contraria, St. Joseph river
near Bristol, C. C. Dean 55184, July 18, 1934 (IU, BU). FULTON
COUNTY: Probably C. contraria, abundant in 6 ft. of water, Lake
Manitou, C. C. Dean 56495, Aug. 8, 1935 (IU, BU). HANCOCK
COUNTY: Common in old channel of the Kankakee river north of
Tefft, C. C. Dean 42227, Aug. 19, 1934 (IU, BU). JOHNSON
COUNTY: N. Mullendore, July 12, 1937 (BU). KOSCIUSKO COUNTY:
In 3 feet of water in outlet of Tippecanoe lake, C. C. Dean 49265, in
21/2 ft. of water, C. C. Dean 19276, July 24, 1930 (IU, BU); in 1/2
ft. of water in the Tippecanoe river at the outlet of Tippecanoe lake,
C. C. Dean 49283; July 24, 1930 (IU, BU); Big Tippecanoe lake,
Oswego, W. H. Welch 2086, July 20, 1935 (DU); not abundant,
Loon lake adjoining Silver Lake Bog, Silver Lake, W. A. Daily 78,
June 10, 1939 (CM, BU). LAGRANGE COUNTY: In ditch beside tam-
arack swamp and road, very abundant, on Road 20 about 7 mi. west
of county line, C. M. Palmer 1028, July 29, 1933 (BU). LAKE
COUNTY: Slough at Pine, O. E. Lansing Jr. 1718, June 4, 1903 (CM); in
drainage ditch along U. S. Highway 12 near boundary of Lake
county and Porter county, D. Richards 390, July 14, 1939 (CM).
MARION COUNTY: Aquarium in Conservatory of Jordan Hall, Butler
University, Indianapolis, C. M. Palmer Id. 116, Aug. 1930 (BU);
probably C. contraria, Ind. State Fish Hatchery, Indianapolis, C. M.
Palmer Id. 78, Aug. 4, 1931 (BU); swampy pool north of Broad
Ripple and just east of interurban tracks and College av., south of
White river, C. M. & S. M. Palmer B 137, Oct. 18, 1934 (BU); in
large pond near Fall creek at Keystone av., Indianapolis, W. A. &
F. K. Daily, F. Drouet, E. R. Hupp, & C. M. Palmer 530, Aug. 1942
(BU); ponds at Keystone and Fall creek, Indianapolis, F. Drouet,


enoyer, W. A. fragilis, ponds

1. Noble county: In water Oct. 11, 1942


LITERATURE CITED


sand dunes north of Miller Station, P. D. Voth & F. Druet 2562, Sept. 28, 1938 (CM).

Noble county: In 2 ft. of water in Elkhart river just below Jones lake and just before Wallen lake, students of Will Scott (C. C. Deam 6), Aug. 25, 1930 (IU, BU).


Spencer county: Artificial pond at Lincoln City, C. C. Deam 22343, Oct. 11, 1916 (IU, BU).

Steuben county: In the outlet of Crooked lake, C. C. Deam 20924, Aug. 19, 1916 (IU, BU).

Sullivan county: In old coal strip mine at margin of the water 5 mi. south of Sullivan, C. M. Palmer B 25, Sept. 7, 1933 (BU).