

Some Algae of Lake Galatia, Grant County, Indiana (exclusive of diatoms)

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Abstract

A qualitative algal survey of an 18 acre lake in central Indiana was conducted from July 23, 1975 through January 28, 1976. Eighty-seven algal species in 39 genera were collected and identified. Sixteen of the algae encountered are thought to be new reports for the state of Indiana. These new reports will be added to *A Check List of Algae from Indiana, 1929 to 1971 (inclusive)* compiled by F. K. Daily, 1972.

Introduction

An extensive review of the existing literature has failed to locate any detailed studies or appropriate species lists of the algal flora of Lake Galatia, Grant County, Indiana. Daily (3) did report a bloom of *Oscillatoria curviceps* Agardh 1824 on this lake. Drouet (4) in his *Revision of the Classification of the Oscillatoreaceae* cited an additional species, *Porphyrosiphon notarissii* (Meneghini) Kuetzing collected by Daily in 1939 but not previously reported by him.

The primary goal of this research was to qualitatively study the algae of Lake Galatia during a six month period and to compile a species list of the encountered algae.

Study Area

Lake Galatia is an 18 acre (1) body of water located at the intersection of County Roads 800 S/ 500 E (NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 23 Township 25 N R8E) in Grant County, Indiana. The lake measures 266 meters wide at its widest point and 500 meters long. The soil of the area is dark-colored Carlisle Muck (5) having a high moisture holding capacity which contributes to the boggy nature of the lake.

Methods and Materials

The survey was conducted over a six month period between July 23, 1975 and January 28, 1976. Sampling was done on a bi-weekly (every two weeks) basis during the first four months, with monthly samples collected during December and January.

In an effort to adequately sample all the niches of the lake, five stations were established as permanent collecting sites for the study. These stations were chosen to represent the various observed physical characteristics of the lake. Four of these stations were located in open water ranging in depths from 1.5 to 2.5 meters. The fifth station was located in the extreme northeast end of the lake, where a

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number of dead trees remain in the water along with several submerged and partially submerged logs. The maximum depth at this station was 1.0 meter.

The four open water stations were regularly sampled using a standard #20 or #25 plankton net. Grab samples, substrate scrapings and concentrated bulk water samples were the primary methods of collection at the fifth station.

All samples were collected in duplicate and preserved in Transeau's solution. Identifications were accomplished using both fresh and preserved materials. Laboratory identifications were carried out to the most specific taxon possible using existing taxonomic keys and following Prescott's (10) nomenclature. Portions of all samples were retained in 10 ml. vials and placed in the Herbarium at Ball State University, Muncie, Indiana.

Results and Discussion

During the study 87 algal species, varieties and forms in 39 genera³ were identified from samples collected during the six month period (July 23, 1975 through January 28, 1976). These species represent four phyla, four classes, 11 orders, and 22 families. The largest number of species encountered belonged to the phyla Chlorophyta, Cyanophyta, Pyrrophyta and Euglenophyta, respectively.

Seven families — Scenedesmaceae, Oocystaceae, Oscillatoreaceae, Desmidiaceae, Hydrodictyaceae, Chroococcaceae and Nostocaceae predominate in the flora of the lake and sixty-five of the total species encountered are in these seven families. The remaining twenty-two species are scattered in the remaining fifteen families. This illustrates the diversity of algae present in Lake Galatia but also illustrates that the flora is dominated by a few families.

Sixteen of the algae encountered are believed to be new reports for the state of Indiana, since they do not appear in the check lists provided by C.M. Palmer (6,7,8,9), the *Check List of Algae Recorded from Indiana, 1929 to 1971 (inclusive)* (2) or in any later literature. A qualified list of these algae appear in Table 1. In some instances it is the variety rather than the species which is new to the state. The author recognizes the fact that by using the nomenclature of other authorities in the field, certain algae would not be included in this list. For instance, Drouet (4) includes *Oscillatoria limnetica* Lemmerman and *Phormidium foveolarum* (Montagne) Gomont in the species *Schizothrix calcicola* (Ag.) Gomont which has been reported in the state.

A significant aspect of the algal flora of Lake Galatia is the periodic and intense blooms which occur. A series of fourteen algal blooms were noted during the study. Fifty percent of these blooms were blue-green species and generally occurred early in the summer while the greens appeared to proliferate in the fall and winter. When

³ A complete list of all taxa encountered may be obtained, upon request, from the author.

TABLE 1. Algae encountered in Lake Galatia, Grant County, Indiana (from July 23, 1975 through January 28, 1976) which are considered to be new reports for Indiana.

Species
Blue-greens:
<i>Chroococcus minor</i> (Kuetz.) Naegeli
<i>Chroococcus limneticus</i> var. <i>carneus</i> (Chod.) Lemmerman
<i>Nostoc paludosum</i> Kuetzing
<i>Oscillatoria limnetica</i> Lemmerman
<i>Oscillatoria subbrevis</i> Schmidle
<i>Phormidium foveolarum</i> (Montagne) Gomont
Desmids:
<i>Staurastrum chaetocerus</i> (Schroeder) G. M. Smith
Greens:
<i>Characium obtusum</i> A. Braun
<i>Franeia Droesheri</i> (Lemm.) G. M. Smith
<i>Glenodinium Gymnodinium</i> Penard
<i>Glenodinium pulvisculus</i> (Ehrenb.) Stein
<i>Lagerheimia quadriseta</i> (Lemm.) G. M. Smith
<i>Pediastrum duplex</i> var. <i>reticulatum</i> Lagerheim
<i>Scenedesmus abundans</i> var. <i>brevicauda</i> G. M. Smith
<i>Tetraëdron muticum</i> (A. Braun) Hansgirg
<i>Tetraëdron regulare</i> var. <i>torsum</i> (Turner) Brunnthaler

the sampling began on July 23, 1975 a bloom of *Coelosphaerium Naegelianum* Unger was in progress and continued without noticeable decline through August 20, 1975. The longest sustained blooms were those of *Tetraëdron minimum* and *T. muticum* (A. Braun) Hansgirg which were first recorded on September 3, 1975 and continued through the November 25, 1975 sampling date.

The species list resulting from this study is typical of that which one might find in a lake of this nature in central Indiana. It should not be considered a complete or exhaustive list as the study was only conducted over a six month period of time. The species list does, however, reflect the eutrophic nature of the lake.

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