

NOTES ON THE DIATOM FLORA OF KANE COUNTY, ILLINOIS
I. THE FOX RIVER AT ELGIN

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Thirty-two diatom species are presented in a check list for Kane County, Illinois. Diatoms were collected using phyco-periphyton samplers and their abundance recorded.

The University of Illinois first opened their biological station at Havana, Illinois, during April, 1894. Shortly thereafter, Kofoed (1897) published an article pertaining to the methods and field apparatus which were commonly being used in the plankton studies. Kofoed, in subsequent years (1898, 1899), reported on new genera and species which occurred in the Illinois River at that time. It was his work that probably motivated Phycologists to further study the algae in the state of Illinois.

The first list of Illinois algae was published by Britton (1944). Later, in 1952, The Algae of Illinois (Tiffany and Britton, 1952) appeared, providing descriptions, keys, and figures for all forms. Since that time, work by Dillard, Weik, and Mohlenbrock (1963), and by Dillard and Tindall (1973) have added new species to the previous lists.

Dillard and Mohlenbrock (1962); Weik and Mohlenbrock (1963); Ricker, Mester, and Weik (1964); Weik (1966); and Grady (1974) have presented algal lists which are county specific, although nothing has appeared on the algae of Kane County, Illinois. For the most part the arrangement of the taxa in the check list follow a plan used by Prescott (1970). Along with each species cited, quantitative data will be presented which may benefit researchers in the future.

MATERIALS AND METHODS

Collections were made in June, July, and August of 1974 using a "phyco-periphyton collector" (Foerster, 1969). All samples collected were divided into separate slurries, whereupon subsamples were selected at random. Permanent diatom mounts were made as prescribed by Patrick and Reimer (1966). Diatom identification was performed using the following taxonomic keys: Hustedt (1930), Cleve-Euler (1951-1955), and Patrick and Reimer (1966).

Quantitative data were determined by using the following formula:

$$\# \text{ organisms/m}^2 = \frac{Ns}{(AB/C \times D \times 1/E) \times S} \times 10^4$$

where

A = volume of subsample analyzed
 B = area of slides (substrate)
 C = total volume of slurry in cm³
 D = area of one strip counted
 E = area of coverslip
 S = # of strips counted
 Ns = average # organisms counted per sweep

Checklist of Diatoms

Nomenclature follows that of Hustedt (1930) and Patrick and Reimer (1966). Taxa in checklist are arranged according to the plan used by Prescott (1970).

Phylum Chrysophyta

Class Bacillariophyceae

Order Centrales

Family Coscinodiscaceae

Melosira ambigua (Grun.) O. Mull.

7- 9-74	240.00 x 10 ⁷	cells/m ²
7-22-74	264.80 x 10 ⁷	cells/m ²
7-28-74	305.50 x 10 ⁷	cells/m ²
8-12-74	81.80 x 10 ⁷	cells/m ²

Melosira granulata (Ehrenberg) Ralfs.

7- 9-74	0.10 x 10 ⁷	cells/m ²
7-22-74	5.40 x 10 ⁷	cells/m ²
7-28-74	41.10 x 10 ⁷	cells/m ²
8-12-74	10.00 x 10 ⁷	cells/m ²

Melosira granulata var. angustissima Mull.

7- 9-74	9.80 x 10 ⁷	cells/m ²
7-22-74	127.40 x 10 ⁷	cells/m ²
7-28-74	83.50 x 10 ⁷	cells/m ²
8-12-74	15.60 x 10 ⁷	cells/m ²

Melosira varians C.A. Agardh

7- 9-74	1.30 x 10 ⁷	cells/m ²
7-28-74	0.10 x 10 ⁷	cells/m ²
8-12-74	0.10 x 10 ⁷	cells/m ²

Cyclotella atomus Hust.

7- 9-74	35.30	x	10^7	cells/m ²
7-22-74	94.80	x	10^7	cells/m ²
7-28-74	93.90	x	10^7	cells/m ²
8-12-74	17.20	x	10^7	cells/m ²

Cyclotella meneghiniana Kuetzing

7- 9-74	45.10	x	10^7	cells/m ²
7-22-74	382.80	x	10^7	cells/m ²
7-28-74	246.90	x	10^7	cells/m ²
8-12-74	43.40	x	10^7	cells/m ²

Cyclotella pseudostelligera Hust.

7-22-74	22.20	x	10^7	cells/m ²
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Family Coscinodiscaceae

Stephanodiscus hantzschii Grunow

7- 9-74	223.50	x	10^7	cells/m ²
7-22-74	266.40	x	10^7	cells/m ²
7-28-74	180.00	x	10^7	cells/m ²
8-12-74	40.90	x	10^7	cells/m ²

Stephanodiscus niagarae Ehrenberg

7- 9-74	42.10	x	10^7	cells/m ²
7-22-74	63.10	x	10^7	cells/m ²
7-28-74	28.20	x	10^7	cells/m ²
8-12-74	7.30	x	10^7	cells/m ²

Stephanodiscus minutus (Kutz.) Grun.

7- 9-74	8.90	x	10^7	cells/m ²
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Order Pennales

Family Diatomaceae

Diatoma hiemale (Lyngbye) Heiberg

7- 9-74	0.10	x	10^7	cells/m ²
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Diatoma vulgaris Bory

7-22-74	5.00	x	10^7	cells/m ²
7-28-74	2.00	x	10^7	cells/m ²

Family Fragilariaceae

Fragilaria brevistriata A-Boyer

7- 9-74	3.10	x	10^7	cells/m ²
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Fragilaria crotonensis Kitton

7- 9-74	1.50 x 10 ⁷	cells/m ²
7-28-74	3.00 x 10 ⁷	cells/m ²

Synedra vaucheriae Kutz.

7- 9-74	0.45 x 10 ⁷	cells/m ²
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Asterionella formosa Hassall

7- 9-74	11.60 x 10 ⁷	cells/m ²
7-22-74	11.50 x 10 ⁷	cells/m ²
7-28-74	5.90 x 10 ⁷	cells/m ²
8-12-74	2.60 x 10 ⁷	cells/m ²

Family Achnanthaceae

Rhoicosphenia curvata (Kuetzing) Grunow

7- 9-74	1.20 x 10 ⁷	cells/m ²
7-22-74	0.90 x 10 ⁷	cells/m ²
7-28-74	2.40 x 10 ⁷	cells/m ²
8-12-74	0.80 x 10 ⁷	cells/m ²

Cocconeis placentula (Ehr.)

7- 9-74	6.00 x 10 ⁷	cells/m ²
7-22-74	13.60 x 10 ⁷	cells/m ²
7-28-74	30.50 x 10 ⁷	cells/m ²
8-12-74	7.20 x 10 ⁷	cells/m ²

Family Naviculaceae

Navicula cryptocephala Kutz.

7- 9-74	0.94 x 10 ⁷	cells/m ²
7-22-74	6.83 x 10 ⁷	cells/m ²
7-28-74	4.60 x 10 ⁷	cells/m ²
8-12-74	1.90 x 10 ⁷	cells/m ²

Navicula cryptocephala var. veneta (Kutz.)
Grun.

7- 9-74	0.15 x 10 ⁷	cells/m ²
7-22-74	1.94 x 10 ⁷	cells/m ²
7-28-74	1.50 x 10 ⁷	cells/m ²

Navicula graciloides A. Mayer

7- 9-74	2.23 x 10 ⁷	cells/m ²
7-22-74	10.08 x 10 ⁷	cells/m ²
7-28-74	11.30 x 10 ⁷	cells/m ²
8-12-74	8.50 x 10 ⁷	cells/m ²

Navicula rhyncocephala Kutz.

7- 9-74	7.38 x 10 ⁷	cells/m ²
7-22-74	25.08 x 10 ⁷	cells/m ²
7-28-74	27.20 x 10 ⁷	cells/m ²
8-12-74	9.30 x 10 ⁷	cells/m ²

Family Gomphonemataceae

Gomphonema olivaceum (Lyngbye) Kuetzing

7- 9-74	0.84 x 10 ⁷	cells/m ²
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Gomphonema bohemicum Reichelt & Fricke

7- 9-74	0.05 x 10 ⁷	cells/m ²
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Family Cymbellaceae

Cymbella affinis Kutz.

7- 9-74	1.40 x 10 ⁷	cells/m ²
7-22-74	3.70 x 10 ⁷	cells/m ²
7-28-74	2.60 x 10 ⁷	cells/m ²
8-12-74	2.00 x 10 ⁷	cells/m ²

Amphora ovalis var. pediculus Kutz.

8-12-74	1.20 x 10 ⁷	cells/m ²
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Family Nitzschiaceae

Nitzschia acicularis (Kuetzing) Wm. Smith

7- 9-74	2.80 x 10 ⁷	cells/m ²
7-22-74	4.50 x 10 ⁷	cells/m ²
7-28-74	15.60 x 10 ⁷	cells/m ²
8-12-74	2.80 x 10 ⁷	cells/m ²

Nitzschia apiculata (Gregory) Grun.

7- 9-74	0.03 x 10 ⁷	cells/m ²
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Nitzschia palea (Kuetzing) Wm. Smith

7- 9-74	9.60 x 10 ⁷	cells/m ²
7-22-74	34.50 x 10 ⁷	cells/m ²
7-28-74	28.00 x 10 ⁷	cells/m ²
8-12-74	7.90 x 10 ⁷	cells/m ²

Nitzschia sigma (Kutz.) Wm. Smith

7-22-74	0.60 x 10 ⁷	cells/m ²
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Nitzschia sigmaidea (Nitzsch) Wm. Smith

7- 9-74	0.28×10^7	cells/m ²
7-28-74	0.60×10^7	cells/m ²

Family Surirellaceae

Suriella ovata Kuetzing

7- 9-74	0.03×10^7	cells/m ²
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DISCUSSION

The phyco-periphyton artificial substrate samplers were suspended in the main flow areas of the lotic environment and were left to be colonized for two weeks. Since the artificial substrates were placed in various positions, there was considerable variation in the number of cells from one sampling time to another.

The recorded estimates of periphytic production represent only colonization rates of the plankton diatoms. The ability of a diatom to colonize the sampler is in part dependent on the diatom's concentration in the water column. If a particular species is present in low concentrations, the chances of it colliding with and colonizing a sampler are reduced. As the concentrations of the plankton diatoms no doubt varied from one week to the next, differences in colonization rates occurred, thus varying cell numbers from one time to another. If a particular species were at a very low concentration, it would probably not be found on the sampler. This could explain the absence of some diatom species on particular sampling dates.

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