Journal of the Arkansas Academy of Science

Volume 23 Article 26

1969

Freshwater Algae of Arkansas

Richard L. Meyer
University of Arkansas, Fayetteville

Arkansas Academy of Science Proceedings, Vol. 23, 1969

THE FRESHWATER ALGAE OF ARKANSAS

Richard L. Meyer
Department of Botany and Bacteriology
University of Arkansas, Fayetteville, Arkansas

I. INTRODUCTION AND RECENT ADDITIONS

This paper presents an initial annotated inventory of the freshwater algae of Arkansas. These collections include one-hundred forty-eight new records. Thirty-three Cholorophyceae, 11 Xanthophyceae, 33 Chrysophyceae, 6 Bacillariophyceae, 11 Pyrrhophyceae, 27 Euglenophyceae, 6 Cryptophyceae, 20 Cyanophyceae and 1 Rhodophyceae are newly reported. A brief description of the habitat and sub-community position is given with each organism. A review of previously published literature is included.

This paper presents the first in a series of annotated inventories of Freshwater algae collected in Arkansas. These collections were made for the most part by the author. These collection were taken during the fall and winter of 1968-69; therefore, the numerous spring and summer organisms were not studied.

Published literature on the algae of Arkansas is limited. A partial search of the literature produced only three papers. Drs. Hoffman and Causey (1952) and Hoffman (1952) reported certain members of the phytoplankton in Lake Fort Smith. In a short paper of Bacillariophyceae from two ponds in Izard County Robinson, Jr. (1953) recorded 25 species. Further published records of Arkansas algae will be included in future papers.

The annotation accompanying the inventory gives a brief description of the habitats and principle aquatic sub-community in which the species was collected. The aquatic freshwater sub-communities used are those described by Round (1965) and indicated by the letters in parenthesis. There are: euplankton (P), neuston (N), epipelic (EP), epilithic (EL), epiphytic (ET) and epizooic (EZ). Those algae which are in close association with epiphytes but not attached to them are the metaphyton (M) (Behre, 1956).

A total of 148 species and varieties previously unreported are listed. Thirty-three Chlorophyceae, 11 Xanthophyceae, 33 Chrysophyceae, 6 Bacillariophyceae, 11 Pyrrhophyceae, 27 Euglenophyceae, 6 Cryptophyceae, 20 Cyanophyceae and 1 Rhodophyceae are newly reported. The new records for the State of Arkansas are indicated with an asterisk (*).

ACKNOWLEDGEMENTS

The author wishes to express his appreciation to Mr. J. H. Wheeler for collecting many of the samples. The samples contributed

by Drs. J. Brown and J. Rakes, R. Gearheart and W. Smith included interesting algae. This research was supported by the Water Resources Research Center, University of Arkansas grant No. A-001-ARK and National Institutes of Health grant No. FR107101-02.

Division Chlorophyta

Class Chlorophyceae

Order Volvocales

The nomenclature used within this order is that of Huber-Pestalozzi (1961).

Eudorina elegans Ehr.
Organically rich pools, Eutrophic lakes and ponds. (P)

Gonium pectorale Mul. *
Organically rich ponds. (P)

Pandorina morum (Mull.) Bory *
Eutrophic lake and organically rich pools. (P)

Phacotus lenticularis (Ehr.) Stein *
Eutrophic lake. (P)

Pteromonas agulosa Lemm. *
Organically rich vernal pool. (P)

Order Tetrapsporales

Apiocystis brauniana Nag. *
Organically rich pond. (ET)

Asterococcus limneticus Smith *
Eutrophic lakes. (P)

Tetraspora gelatinosa (Vauch.) Desvaux. *
Organically rich pools and ditchs. (ET & P)

Order Chlorococcales

Ankistrodesmis falcatus (Cor.) Ralfs *
Organically rich pool and ditchs, eutrophic lakes. (P)

Botryococcus braunii Kutz. *
Organically rich ponds. (P)

Chlorella vulgaris Bej. *
Organically rich ponds. (P)

Closteriopsis longissima Lemm.
Organically rich ponds. (P)

Dictyosphaeridium ehrenbergianum Nag. *
Moderately eutrophic lakes. (P)

D. punchella Wood *
Slightly eutrophic lakes. (P)

Kirchneriella lunaris (Kirch.) Mob. *
Eutrophic ponds and lakes, rivers. (P)

Micractinium pusillum Fres. *
Eutrophic lake. (P)

M. quadrisetosum (Lemm.) Smith *
Organically rich ponds. (P)

Pediastrum boryanium (Turp.) Menegh. *
River. (P)

P. duplex *var.* graciliumum W. & W.
Slightly eutrophic lakes. (P)

P. simplex (Mey.) Lemm. *
Eutrophic lakes. (P)

Planktosphaeria gelatinosa Smith
Eutrophic lakes. (P)

Scenedesmus acuminatus (Lag.) Chod. *
Organically rich ponds. (P)

S. dimorphus (Turp.) Kutz. *
River. (P)

S. incrassatulus Boh. *
Organically rich ponds. (P)

S. quadracaudata (Turp.) deBreb. *
Eutrophic lakes. (P)

Sphaerocystis schroeteri Chod.
Eutrophic lakes. (P)

Tetraedron minimum (Braun) Hansg. *
Eutrophic lakes. (P)

Tetrallantos lagerheimii Teil. *
Eutrophic lakes and ponds. (P)

Tetrastrun staurogeniaforme (Schroed.) Lemm. *
Eutrophic lakes.

Order Ulotrichales

Binuclearis tatrana Witt. *
Organically rich roadside ditch. (ET)

Geminella mutabilis (deBreb.) Willie *
Moderately eutrophic lake. (EL)

Microspora floccosa (Vauch.) Thur. *
Eutrophic ponds. (EP)

Stichococcus bacillifera Nag. *
Eutrophic pond. (ET)

Order Chaetophorales

Aphanochaete polychaete (Hansg.) Fritsch *
Organically rich pond. (ET)

Chaetophora elegans (Roth) C. Ag. *
Organically rich roadside ditch. (ET)

C. incrassata (Huds.) Haz. *
Organically rich pond. (ET)

Draparnaldia glomerata (Vauch.) C. Ag. *
Seepage pool. (ET)

D. mutabilis (Roth) Bory *
Organically rich seeps and ditches. (ET)

Class Conjugatophyceae

Order Zygnematales

Desmidium baileyi (Ralfs) Nords.
River, tychoplanktor. (P)

D. schwartzii C. Ag.
River, tychoplanktor. (P)

Staurastrum furcigerum deBreb.
Eutrophic lake. (P)

Division Chrysophyceae

Class Xanthophyceae

The nomenclature used within this class is that of Pascher (1939).

Order Heterotrichales

Chloridella simplex Pasch. *
Organically rich pond. (P)

Chlorobotrys simples Pasch. *
On damp clay soil. (EL)

Goniochloris fallax Fott *
Organically rich pond. (M)

Monallantus brevicylindrus Pasch. *
Organically rich pond. (M)

Ophiocytium cochleare A. Br. *
Organically rich pond. (M)

Order Heterococcales

Tribonema affine West
Moderately eutrophic lake. (M)

T. ambiguum Skuja *
Organically rich pond. (M)

T. minus Haz. *
Seepage pool. (M)

T. viride Pasch. *
Organically rich pond. (M)

T. vulgare Pasch. *
Seepage pool. (M)

Class Chrysophyceae

Order Chrysomonadales

Anthophysa vegetans (Mul.) Stein *
River, tychoplanktor. (P)

Chromophyton rosanoffii Wor. *
Organically rich vernal pool. (N)

Chromulina gonoides Skuja *
Seepage pool. (M)

C. tenera Matv. *
Organically rich vernal pool. (P)

Chrysochromulina parvum Lack. *
Eutrophic lake. (P)

Chrysococcus minutus (Fritsch) Nyg. *
Eutrophic lake. (P)

C. rufescens Klebs *
Organically rich roadside ditch and eutrophic lakes. (P)

C. triporus Matv. *
Organically rich pool. (P)

Dinobryon divergens Imn.
Eutrophic lakes. (P)

D. elegans Korsch. *
River, tychoplanktor. (P)

D. sertularia Ehr. *
Eutrophic lakes and ponds. (P)

Epipyxis utriculus Ehr. *
Organically rich pond. (ET)

Kephyrion capuliforme Con. *
Eutrophic lakes. (P)

K. inconstans Schm. *
Eutrophic lakes. (P)

K. rubri-claustri Con. *
Eutrophic lakes. (P)

K. spirale (Lack.) Con. *
Eutrophic Lakes and ponds. (P)

Mallomonas acaroides Petry *em.* Kreig. *
Eutrophic lakes. (P)

M. caudata Iwan. *em.* Kreig. *
Mesotrophic lake. (P)

M. coronata Boloch. *
Eutrophic ponds and vernal pools. (P)

M. elliptica (Kiss.) Con. *
Organically rich roadside ditch. (P)

M spinifera Con. *
Organicaly rich roadside ditch. (P)

M. tonsurata Teil. *
River. (P)

Pseudokephyrion pilidum Schil. *
Eutrophic lake. (P)

P. schilleri Con. *
Eutrophic lake. (P)

Stenokalyx cylindrica Schm. *
Eutrophic lake (P)

S. laticollis Con. *
Eutrophic lake. (P)

Synura petersenii Kor. *
River and lakes. (P)

S. sphagnicola Kor. *
Mesotrophic lake. (P)

S. uvella Ehr. *em.* Kor. *
Eutrophic ponds. (P)

Order Rhizochrysidales

Chrysoamphitrema brannea Scher. *
Eutrophic lake. (ET)

Chrysopyxis ascendens Wisl. *
Organically rich pond. (ET)

C. bipes Stein *
Organically rich pond. (ET)

Order Chrysocapsales

Phaeoplaca thallosa Chod. *
Creek. (ET)

Class Bacillariophyceae

Order Centrales

Melosira granulata (Ehr.) Ralfs *
Eutrophic lakes. (P)

M. italica Kutz.
Eutrophic lakes. (P)

Order Pennales

Eutrophic lakes. (P)
Asterionella formosa Hass. *

Fragillaria crotonensis Kitt. *
Eutrophic lakes. (P)

Synedra acus Kutz.
Eutrophic lakes. (P)

Tabellaria fenestrata (Lyngb.) Kutz. *
Mesotrophic lake. (P)

T. floccusosa (Roth) Kutz. *
Eutrophic lake. (P)

Division Pyrrhophyta

Class Dinophyceae

The nomenclature followed within this class is that of Schiller (1933)

Order Gymnodiniales

Gymnodinium obesum Schil. *
Organically rich pond. (P)

Massartia musei (Danysz.) Schil.
Organically rich pond. (P)

Order Peridinales

Ceratium cornutum Ehr. *
Mesotrophic lake. (P)

C. hirundinella Mull. *
Mesotrophic lake. (P)

Hemidinum natusum Stein *
Organically rich pond. (P)

Peridinium bipes Stein
Organically rich pond. (P)

P. cinctum Mull. *
Eutrophic lake. (P)

P. palustre (Lind.) Lefev. *
River. (P)

P. pusillum (Pen.) Lemm. *
Mesotrophic lake. (P)

P. willei Huit.-Kass. *
Eutrophic lake. (P)

P. wisconsinense Eddy. *
Mesotrophic lake. (P)

Division Euglenophyta

The nomenclature used within this division is that of Huber-Pestalozzi (1955).

Class Euglenophyceae

Order Euglenales

Colacium vesiculosum Ehr. *
Vernal pool. (EZ)

Euglena agilis Cart. *
Organically rich vernal pool. (P)

E. piciformis Klebs *
On damp clay soil and in eutrophic lakes. (P)

E. sangunea Ehr. *
Organically rich pond. (P)

E. sangunea var. furcata Hub. *
On damp clay soil. (EL)

E. schmitzii Goj. *
Organically rich pond. (P)

E. spirogyra Ehr. *
Mesotrophic lake. (P)

E. van gooi Defl. *
Vernal pool. (P)

E. variabilis Klebs *
Seepage pool. (M)

E. viridis Ehr. *
Creek. (P)

Monomorphina pyrum (Ehr.) Mereschk. *
Vernal pool. (P)

Phacus acumunatus Stokes *
Vernal pool. (P)

P. brevicaudata (Klebs) Lemm. *
Mesotrophic lake. (P)

P. curvicaudata Swir. *
Organically rich pond. (P)

P. tortus (Lemm.) Skv. *
Vernal pool. (P)

Strombomona deflandrei (Rool) Defl. *
Organically rich pond. (P)

S. longicauda (Swir.) Defl. *
Organically rich pond. (P)

Trachelomonas helvetica *var.* cordiformis (Roll) Pop. *
Organically rich pond. (P)

T. hispida *var.* austrilica Playf. *
Eutrophic lake. (P)

T. hispida *var.* punctata Lemma. *
Organically rich pond. (P)

T. intermidia Dang. *
Organically rich pond. (P)

T. rugulosa Stein *
Organicall rich pond. (P)

T. scabra Playf. *
Organically rich pond. (P)

T. sydnensis Playf. *
Organically rich ponds and vernal pools. (P)

T. volvocina Ehr.
Mesotrophic and eutropic lakes. (P)

T. volvocinopsis Swir. *
Mesotrophic and eutrophic lakes and ponds. (P)

Order Heteronematales

Peranema inflexum Skuja *
Organically rich pasteur pool. (P)

P. trichophora (Ehr.) Stein *
Organically rich pasteur pool. (P)

Class Cryptophyceae

Order Cryptomonadales

Chroomonas acuta Uter. (?) *
Organically rich pond. (P)

Cryptomonas caudata Schil. *
Seepage pool. (M)

C. erosa Ehr. *
Organically rich ponds and mesotrophic lakes. (P)

C. oblonga Playf. *
River. (P)

C. obovata Skuja *
Organically rich pools. (P)

C. ovata Ehr. *
Mesotrophic lakes. (P)

Division Cyanophyta

Class Cyanophyceae

The nomenclature used within this class is that of Geitler (1932).

Order Chroococcales

Anphanocapsa biformis A. Br. *
On limestone seep. (EL)

A. grevellei (Hass.) Rab. *
River. (P)

Chroococcus turgidus (Kutz.) Nag. *
River (P)

Dactylococcopsis smithii Chod. *et* Chod. (?) *
Eutrophic lake. (P)

Gomphosphaera aponina Kutz. *
River. (P)

Merismopedia marsonii Lemm. *
Organically rich pond. (P)

M. punctata Mey. *
Organically rich pond. (P)

M. tenussima Lemm. *
Organically rich, slow flowering stream. (P)

Polycystis aeruginosa Kutz. *
Organicaly rich ponds and eutrophic lakes. (P)

Order Chamaesiphonales

Chamaesiphon incrustans Grun. *
On *Cladophora* sp. in creek. (ET)

Order Oscillatoriales

Aphanizomenon flos-aquae (L.) Ralfs *
Eutrophic lakes and ponds. (P)

Nostoc planctonicum Por. *et* Tschern. *
Organically rich vernal pool. (P)

Oscillatoria agardhii Gom. *
Organically rich pond. (P)

O. amoena Gom. *
Seepage pool. (EL)

O. chlorina Kutz *
Seepage on clay soid. (EL)

O. ornata Kutz. *
Organically rich pond. (P-EL)

O. principees Vauch. *
Organically rich pond. (P)

O. rubescens deCand. *
Mesotrophic lake. (P)

O. tenuis C. Ag. *
Mesotrophic lake. (P)

O. tenuis *var.* natans Gom. *
Organically rich vernal pool. (P)

Division Rhodophyta

Class Rhodophyceae

Order Nemalinionales

Audouinella violacea (Kutz.) Ham. *
Stream. (EL)

LITERATURE CITED

Behre, K., 1956

Die Algen besiedlund einiger Seen um Bremen und Bremerhaven. Ver. Inst. Meersk. Bermmerhaven 4:221-283

Hoffman, C. E., 1952

Limnological studies in Arkansas II. The effect of Intense Rainfall on the Abundance and Vertical Distribution of Plankton in Lake Fort Smith, Arkansas. Ark. Acad. Sci., Proc. 5:83-89.

_____ and D. Causey, 1952

Limnological Studies in Arkansas I. Physico-chemical and net Plankton Studies of Lake Fort Smith in its Fourth Year of Impoundment. Ark. Acad. Sci., Proc. 5:55-72.

Huber-Pestalozzi, G., 1955

Das Phytoplankton des Susswasser Bd. 16, T. 4 Euglenophyceae. E. Schweizerbart'sche Verlag. Stuttgart. 606 pp.

_____, 1961

Das Phytoplankton des Susswasser Bd. 16, T. 6 Volvocales. E. Schweizerbart'sche Verlag. Stuttgart. 644 pp.

Pascher, A., 1939

Heterokonten. *In* L. Rabenhorst, Kryptogamen-Flora Deutschlands, Osterreich und der Schweiz. Bd. 11. 1092 pp.

Robinson, Jr., A., 1953

Comments on the Bacillariophyceae of North Central Arkansas Ark. Acad. Sci., Proc. 6:51-52.

Round, F. E., 1965
The Biology of Algae. E. Arnold, Ltd. London, 269 pp.

Schiller, J., 1933-5
Dinoflagellatae. *In* L. Rabenhorst, Kryptogamen-Flora Deutschland, Osterreich und der Schweiz. Bd. 10, T. 3(1-2). 579 and 617 pp.