# ALGAE OF MONROE COUNTY, INDIANA, III

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Since the appearance of a paper on the "Algae of Monroe County, Indiana" in "The Proceedings of the Indiana Academy of Science" for 1926, the writer has found in this region a considerable number of forms not previously listed. Most of the forms mentioned here have been found out of doors by means of methods indicated in my former studies, but a good many others have been obtained, often in large numbers, from laboratory cultures. Material obtained from apparently very unfavorable locations has frequently produced an exceedingly vigorous growth when placed under favorable laboratory conditions. Often the presence of forms which were not indicated by immediate study of collections taken from streams and ponds later appeared in the laboratory cultures and sometimes in large numbers. Such a method will therefore act as a safeguard concerning the presence of certain species. Considerable experimentation has been carried on by the writer in other ways with certain of the forms observed. In one set of these experiments the specimens were grown in a series of nutrient solutions often with excellent results. In another set of experiments the forms were subjected to water pressure, varying in intensity from .25 to 3 atmospheres. This experiment extended over a period of from a few hours in some instances to several months in others. When good light conditions were maintained the vigor and development of specimens such as diatoms were apparently not different from the controls. More forms of desmids have been found and recorded in this list than any of the other forms. The following specimens were found:

Oedogonium Pringsheimii
Dictyosphaerium Ehrenbergianum
Mesocarpus parvulus
Spirogyra Weberi
Cladophora oligoclona
Staurospermum capucinum
Tetraspora bulbosa
Conferva bombycinia
Mongeotia minnesotensis
Lygogonum pectinatum
Stigeoclonium tenue
Ulothrix compacta
Cosmarium margaritiferum
Cosmarium Hammeri
Cosmarium schliephackeanum
Cosmarium conspersum
Cosmarium nitidulum
Closterium venus
Closterium lineatum
Closterium lanceolatum
Closterium acuminatum
Closterium juncidum
Sphaerozosma pulchellum
Docidium Rectum
Docidium giganteus
Micrasterias denticulata
Micrasterias furcata
Staurastrum Dickiei
Staurastrum Cerastes
Staurastrum arctiscon
Pediastrum Ehrenbergii
Tetmemorus Brebiasonii
Arthrodesmus fragalis
Enastrum gemmatum
Enastrum interme
Eunotia cygnus
Nitzschia bilobata
Navicula dactylis
Navicula hemiptera
Navicula cardinalis
Navicula mesolepta
Lynedra acus
Lynedra Chasei
Cymbella excisa

Penuim margaritaceum
Penuim interruptum
Desmidium aptogium
Desmidium Baileyi
Bambusina Brebissonii
Amphora Clevia
Gomphonema dichotomum

## STUDIES IN POLLEN, V

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The methods previously reported in these studies on pollen have been improved as the work has been continued. The apparatus mentioned in the writer's fourth paper on this subject showed that the petri-dish method for pollen cultures was very convenient and excelled all others employed. This method was further improved on in the present investigations by using petri dishes, or low crystallizing dishes, of wide diameter. Petri dishes 12 cm. in diameter make possible the arranging and growing of 40 cultures on the under side of a single lid. These cultures were grown either with or without a cover glass, which, however, should be round and small so as to occupy as little space as possible. This arrangement enables one to make an observation ont only of a rather large number of cultures, but it conveniently places them in a small space for rapid comparison, and what is also of great importance surrounds each culture with precisely the same conditions for developing. In order to avoid possible confusion and for ease and convenience of correctly placing the cultures, it is advisable to cover the outside of the lid of the petri dish with a thin layer of paraffin and then, beginning near the periphery and moving toward the center, to make four concentric circles each one cm. apart. Ten radii equidistant from each other should be made across these four concentric circles. At the intersections of the concentric circles and radii the paraffin removed should be restored to a diameter of .5 cm. The figures showing the kind and strength of the ten solutions used should be placed on the peripheral end of the radii and then the paraffined side of the lid dipped for a minute in hydrofluoric acid. On the removal of the paraffin the desired figures and lines are left. It also affords the additional advantage that the peripheral figures serve for each circle of the different cultures under observation. The water used in the bottom of the petri dish, to maintain the necessary conditions of moisture, should be distilled water which has acquired a suitable temperature to avoid condensation. It is advisable to use petri dishes of good clear glass, free from waves, and with closely fitting lids which are provided with shims to prevent any lateral movement of the lid The word "tap water," so generally used, is also employed in these studies. By "tap water," however, as used in these investigations, is to be understood, not water as is available from the pipes in the laboratories, but suitable fresh water as is obtainable from wells or springs in the country and at places where contamination is not possible. Such water should be subjected to inspection and brought to the desired temperature before use. Of the pollen of more than 700 species of plants examined to date, only that of 180 different species germinated and grew to a greater or less extent in both tap water and distilled water. Among these may be mentioned *Trillium nivale* among monocots and *Dicentra canadensis* among dicots, in each of which only one pollen grain in 100 germinated in water. The pollen of 28 other species reacted in the same way. While the pollen of by far the greater number of species showed no germination in water, a good many