

Comments on a Check List of Indiana Algae: Purpose and Problems

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Abstract

A check list of Indiana algae by county has been compiled from the literature appearing from 1929 to 1971. This is the fifth in a series of publications initiated by C. M. Palmer who covered the algal reports of 1875 to 1928. A few additions to this period have been made. The purpose of the check list and some problems in its use and preparation are discussed.

In 1929, C. M. Palmer (1) provided a check list of Indiana algae based upon his own research and publications appearing from 1875 to 1928. Additions were included in three later papers (2, 3, 4). Distribution maps for each taxon were filed at Butler University. When Dr. Palmer moved to Ohio in 1950, the work was continued by the present author and William A. Daily. The first check list since then covering the 1929 to 1971 period has been compiled and will be distributed by the author upon request.

In the interest of continuity, algae are listed essentially in the same style as that used by Palmer except for literature citations. The genus, species and infraspecific names are followed by the county where the algae were found and with the literature citation in parenthesis (Table 1).

TABLE 1. *Indiana algae listed by county and bibliographic reference number.*

GROUP 1. BLUE-GREEN ALGAE

AGMENELLUM Breb. *Agmenellum thermale* (Kütz.) Dr. & Da.:

Fulton (43), Grant (43), Kosciusko (43), LaGrange (43), Marion (43), Morgan (43), Parke (43), Putnam (50). *A. quadruplicatum* Bréb.:

The purpose of this work is to inventory the algae occurring in the state and to give distribution by county. This information is useful as an historical document and may help relocate specimens in herbaria or in nature. The latter is possible because some algae may persist in the same or nearby habitats for many years. The interest in geographical occurrence anticipates possible reflected ecological patterns. A. C. Smith (5) summed up the value of systematics as follows: "Agriculture, medicine and all phases of human economy ultimately depend upon natural living organisms of which no real understanding can be had without a basic inventory and knowledge of spatial and environmental relationships."

Nomenclature in the check list is the same as in the literature cited. This was necessary because specimens are not available as a basis for all reports. This precludes restudy to produce a uniform,

modern classification. There is also a lack of agreement on the classification of many algae. Herbarium specimens are not available, in part, because of the following differing concepts or methods in taxonomy.

Specimens preserved by drying and storing in an herbarium are sometimes criticized as worthless, so none were kept by the authors. Others prepared liquid-preserved specimens which have dried and have been discarded. However, some taxonomists have studied the effects on algal morphology of varying conditions of the habitat, differing methods of collecting, handling and restoring specimens, and can recognize most algae from well-preserved dried specimens demonstrating the necessary stages for identification. This ability is necessary for a monographer employing the type method or in applied microscopy.

Various techniques have been applied to algal taxonomy during the 1929 to 1971 period. These include the study of cultured algae, the use of scanning and electron microscopes and various advances in genetics, physiology and biochemistry. Many of these studies have made substantial contributions.

However, some methods require cultured algae free of contaminating organisms, and only cultures are cited. It has been found that algal morphology is sometimes different after isolation in artificial media. It has been suggested that this may be due to genetic changes induced by shock of isolation or unnatural growing conditions, undetected contamination by a second alga which may become dominant later, the mixed genetic constitution of the original isolate or other undetermined factors. If the mechanisms of inheritance and genetics have not been compared in cultured algae and natural populations, genetic studies based on cultured algae alone may result in classification without general application due to the above difficulties.

On the other hand, algal morphology may be very uniform under the cultural conditions employed. Results from the study of a few of these specimens may not reveal the wide range of morphological variation that is apparent in a study of a large number of specimens from nature under varying habitat conditions.

It is, therefore, recommended that herbarium specimens of natural collections (or soil collections, if applicable) be prepared as a basis for all algal reports. Comparison of adult forms can be made with cultured material to detect morphological change. Resting forms can be recultured from soil for comparison. Classification based on culture characteristics should indicate the specimens seen by the code of the culture collection.

Literature Cited

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5. SMITH, A. C. 1969. Systematics and appreciation of reality. *Taxon* 18:5-12.