

Journal of the Arkansas Academy of Science

Volume 4

Article 11

1951

Preliminary Report on the Hepaticae of Arkansas

Eugene B. Wittlake

University of Arkansas, Fayetteville

Follow this and additional works at: <http://scholarworks.uark.edu/jaas>

 Part of the [Botany Commons](#)

Recommended Citation

Wittlake, Eugene B. (1951) "Preliminary Report on the Hepaticae of Arkansas," *Journal of the Arkansas Academy of Science*: Vol. 4 , Article 11.

Available at: <http://scholarworks.uark.edu/jaas/vol4/iss1/11>

This article is available for use under the Creative Commons license: Attribution-NoDerivatives 4.0 International (CC BY-ND 4.0). Users are able to read, download, copy, print, distribute, search, link to the full texts of these articles, or use them for any other lawful purpose, without asking prior permission from the publisher or the author.

This Article is brought to you for free and open access by ScholarWorks@UARK. It has been accepted for inclusion in Journal of the Arkansas Academy of Science by an authorized editor of ScholarWorks@UARK. For more information, please contact scholar@uark.edu, ccmiddle@uark.edu.

PRELIMINARY REPORT ON THE HEPATICAE OF ARKANSAS*

EUGENE B. WITTLAKE

University of Arkansas

The Hepaticae, occurring in Arkansas, have never received any particular attention from the various students in the field of Bryology. This became very obvious to me as soon as a search was made for more information about these plants, in national works on the Bryophytes. This survey, which embraces material from every county in the state, I hope, will serve to stimulate interest among the growing list of collectors in Arkansas. This will be facilitated considerably by the publication of an illustrated, identification manual on the Hepaticae of Arkansas, that will follow.

Before digressing further on the various aspects of this study, I wish to state that to inject any finality as to distribution data, or number of species would indeed be very premature at this time. I consider it rather as a mere start or beginning, for the manual itself will be a semi-technical one, purposely so prepared, that it may be available for use by a greater number of individuals.

The Hepaticae are usually considered our most primitive, green land plants. They are most frequently referred to as the Liverworts. They are considered less advanced than the mosses, due to the simplicity of their sporophytes and the general habit characteristics of the gametophytic phase toward dorsolventrality.

Among leading authorities of the group, there is great diversification of opinion as to their exact evolution and origin. Smith⁽⁴⁾ believes they originated from a ulotrichaceous line of Algae. Campbell⁽¹⁾ proposes that the origin of both Bryophytes and Pteridophytes arose from an Anthocerotean complex, and that Sphaerocarpus, Riccardia and Pellia are the living members of the Hepaticae which are the closest to ancestors of the Liverworts. Frye and Clark⁽³⁾ have proposed that both Chara, a green alga, and the Hepaticae arose from the same ancestral type; then in their evolution, a second and a hepatopterid ancestral type was involved, at which point the wide divergence of Hepaticae and Pteridophytes began. Evans⁽²⁾ and several others believe the ancestral types were leafy, erect, and that the present-day thalloid types are the result of a regressive evolution, but in the final analysis, they represent a polyphyletic group, derived from several to many ancestral algae types.

In the preliminary stages of a study of this kind, primarily taxonomic in nature, one usually concentrates on the appearance of new kinds or species of the plants sought, which have not yet come to the student's attention. In the next stage, one arrives at the point, where certain typical species of the various habitats, become an automatic association. The

* Research Paper No. 1003 Journal Series. University of Arkansas.

third stage comes when the whole Biological world crashes down around the group of intensive study, and all the organisms in their environment, suddenly take on new meaning, which at the beginning were totally in the background, and held no meaning. Finally, one notices in the search for new species, not only climatic, atmospheric and soil conditions, but also biotic factors involved. Due to the fact that these lowly plants grow in close association with the soil and have no specialized tissue to function as an effective water-conduction system, they are subjected to a great variety of minute organisms, both plant and animal, that live on them, feed on them, are parasitic on them, or live inside of them as parasites or symbionts.

Therefore, this taxonomic study has become a rich field for observations of many other groups of cryptogamic plants. Actually when one is in the field, there is many times the problem of trying to decide whether an organism is a lichen, a moss, an algal mass, a protonemal mass or a liverwort. The association of certain fungi and algae has been the most striking finding.

The State of Arkansas, with its variable topography including its mountains and valleys, the coastal plain, and the Mississippi River Basin, offers the maximum possibilities as to the number of species of Hepaticae. Already the number of species recorded in this study is very close to one hundred. Yet I feel that only the surface has been touched. Many of the areas visited were not intensively worked because time did not permit. The number of species of Hepaticae, reported for Arkansas in national works is 22. One of these is *Asterella echinella* not yet found in the present search. Another, *Marchantia domingensis*, has not been found. The latter was collected by Harvey, the first Professor of Biology at the University, in 1880; this specimen is now in the New York Botanical Garden Herbarium.

Comparing the number of species of Hepaticae here with the number, found in many other states, Arkansas is already high on the list. Certain liverworts have been found with sporophytes, which in Frye and Clark's work⁽³⁾ are reported "sporophytes unknown." These are among the species of *Frullania* which were collected last December in the southern counties of the State.

One of the most unusual finds was *Petalophyllum lamellatum*, collected in April of this year about $\frac{1}{4}$ mile north of the Arkansas-Louisiana line above Junction City. This liverwort has only been collected in one other state, Texas according to Frye and Clark.^{(3)*} Other sites of collection reported are Wales, Europe and Africa.

The 300 odd stations or places of collection range from Eudora to Bella Vista and from Piggott to Emerson in this study's coverage of Arkansas. (Fig. 1.) The greater part of the collecting was done in 1949. During the latter year, approximately 11,000 miles were travelled on specific collecting trips, in pursuit of a more complete coverage of the State; this was carried

^{(3)*} Page 150, Vol. VI, No. 1.

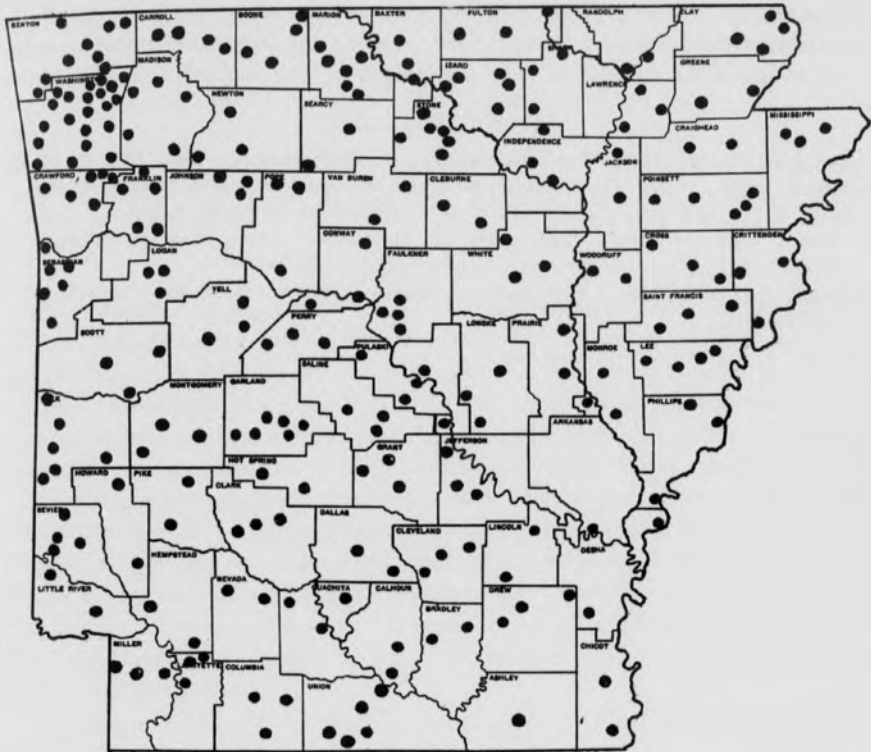


FIGURE 1. Distribution map of stations*

out by the author alone and does not represent the mileage of additional collectors. Such intensive coverage was aided considerably by a joint grant from the Institute of Science and Technology and the College of Arts and Sciences of the University of Arkansas.

Among the contributors of specimens for the work were Dr. D. M. Moore, Mr. Robert Whitmire of Fort Smith, Miss Inez Hartsoe of Piggott, and Mr. Robert French of Fayetteville who together have provided about 20 per cent of the total count. Important but fewer specimens have been sent in by Dr. Delzie Demaree of Jonesboro, Mr. John Pay of Des Arc, and Miss Frances Bruehl of Fayetteville to augment those already contributed before the study began by Dr. J. Buchholz of the University of Illinois and Professor A. D. Oxley of Lambeth College, Jackson, Tennessee.

Dr. A. W. Evans of Yale University has done confirmation work on the *Frullanias* collected. Dr. Ronald McGregor of the University of Kansas has worked on the identification and confirmation of *Riccias* collected. Dr. Margaret Fulford of the University of Cincinnati has additional specimens for confirmation work.

*Places where Hepaticae were collected.

In addition, Mrs. Wittlake has spent many hours boxing and preparing specimens for the Herbarium, compiling statistics which will appear in the Appendix of the published manual, and combing the literature for any mention of Arkansas in the Bryophyte field and preparing the supporting bibliography.

LITERATURE CITED

1. Campbell, D. H., 1936. The relationships of the Hepaticae. *Bot. Rev.* 2: 53-66.
2. Evans, A. W., 1939. The classification of the Hepaticae. *Bot. Rev.* 5: 49-96.
3. Frye, T. C. and Lois Clark, 1937-1947. Hepaticae of North America. *Univ. of Wash. Pub. in Biol.* University of Washington Press, Seattle, Wash. VI: Nos. 1-5.
4. Smith, G. M., 1938. Cryptogamic Botany. *Bryophytes and Pteridophytes.* II: 380 pp.