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History of Studies on the Iowa Vascular Flora

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Although a manual of the vascular plants of Iowa has yet to be written, many botanists have contributed to a thorough floristic survey of the state, and most of the difficult plant families have

been studied taxonomically. The number of vascular plant species is estimated at over 1,800. It would probably require five or more years of concentrated effort to produce an accurate, comprehensive manual of the Iowa flora. A listing of 238 selected references on the Iowa vascular flora is presented.

INDEX DESCRIPTORS: Vascular Flora of Iowa, Iowa Vascular Plants, References on Iowa Flora.

A comprehensive review of the work published on the Iowa vascular flora during the past 100 years could result in a book-length publication. Most of the early papers by Iowa botanists pertained to the Iowa flora, and this interest, though diminished, continued well into the last decade. Hippler (1951) found 485 papers dealing with the taxonomy and ecology of Iowa plants, and in searching the literature I located another 50 or so recent papers, plus a few older publications that Hippler did not cite.

Because of this large quantity of literature, I have summarized and edited extensively in preparing this paper. I concluded that a fairly extensive list of references on the Iowa vascular flora would be of more value to contemporary botanists than a long narrative discussion. The paper is thus divided into: a historical summary of the literature on vascular plants of Iowa, a brief report on the present status of the flora of Iowa, and a bibliography of selected references on the Iowa flora.

HISTORICAL SUMMARY

Early Explorations

After the Louisiana Purchase of 1803, the U.S. government dispatched a series of expeditions to explore the little-known interior of the continent. Frequently, one or more of the members was a naturalist who recorded what he saw of the flora and fauna and collected specimens as he could. Of necessity these early expeditions followed the major rivers. Thus, the Missouri River was the route of the Lewis and Clark Expedition of 1804-1806 (Thwaites, 1904), the Long Expedition of 1819 (James, 1823), and the Nicollet Expedition of 1839 (Nicollet, 1843). Unfortunately, most of the records of Iowa plants in the reports of these travels were in the form of notes with indefinite localities, with the exception of a list of 11 plants from the Spirit Lake vicinity in the report of the Nicollet Expedition. (See Shimek [1915] for a more detailed account.) Although Zebulon Pike led an expedition up the Mississippi in 1805 (Pike, 1810), there are no specific references to Iowa plants in his report. Other botanists undoubtedly visited Iowa at an early time, e.g., Nuttall, Watson, and Gray, but, to my knowledge, they left no significant records of Iowa plants.

Iowa Naturalists

Regrettably, it is necessary to summarize briefly the endeavors of botanists who spent large portions of their lives either in the field studying and collecting plants, or in publishing what they had learned. They deserve better, for they were pioneers. Many were partially self-taught, and yet several of them became international authorities.

The early Iowa authors could more properly be called "naturalists," for they had broad interests and responsibilities. In addition to their publications on Iowa vascular plants, they frequently wrote authoritatively in one or more additional fields. C. E. Bessey, interested primarily in vascular plants, published also in the areas of algology, mycology, and plant pathology. J. C. Arthur published extensively on the Iowa phanerogamous plants before moving to Purdue University, where he became an international authority on the rusts. Macbride was known world-wide for his work on the myxomycetes, but he was also a geologist, paleobotanist, and plant taxonomist. Fink, who was primarily interested in the lichens, also published at least two papers on the plants of Iowa. Probably the most prolific author was Dr. Pammel, with a very lengthy bibliography of papers on Iowa weeds, honey plants, plant parasites, plant ecology, conservation, etc., in addition to his many papers on the Iowa flora. Shimek was an untiring field botanist, prodigious collector, and prolific author. He published as a geologist, malacologist, and ecologist, as well as a plant taxonomist. Dr. H. S. Conard was probably the last Iowa naturalist. Internationally known as a bryologist, he was equally at home studying the ecology and systematics of the vascular plants.

Iowa Floras

The earliest significant record of Iowa vascular plants appears to be the listing of 205 species from Iowa by Dr. C. C. Parry (1852) as a part of the report on D. D. Owen's geological survey of Wisconsin, Iowa, and Minnesota. The first effort toward a flora of Iowa was a partial checklist of vascular plants by Bessey (1872). Arthur published a catalogue of the phanerogamous plants in 1876 and a series of additions in 1877, 1878, 1882, and 1884. This was followed by an extensive series of papers on the vascular flora of Iowa by T. J. and M. F. L. Fitzpatrick, beginning in 1897. Greene (1907) edited the only attempt at a flora of the entire plant kingdom native to Iowa. This was a joint effort by a number of prominent Iowa botanists, and included synoptic keys. Of the more than 3,000 species listed, 1,585 were vascular plants.

The last attempt to publish a comprehensive vascular flora of the state was the annotated list of Cratty (1933), based on collections in the Iowa State University herbarium. He

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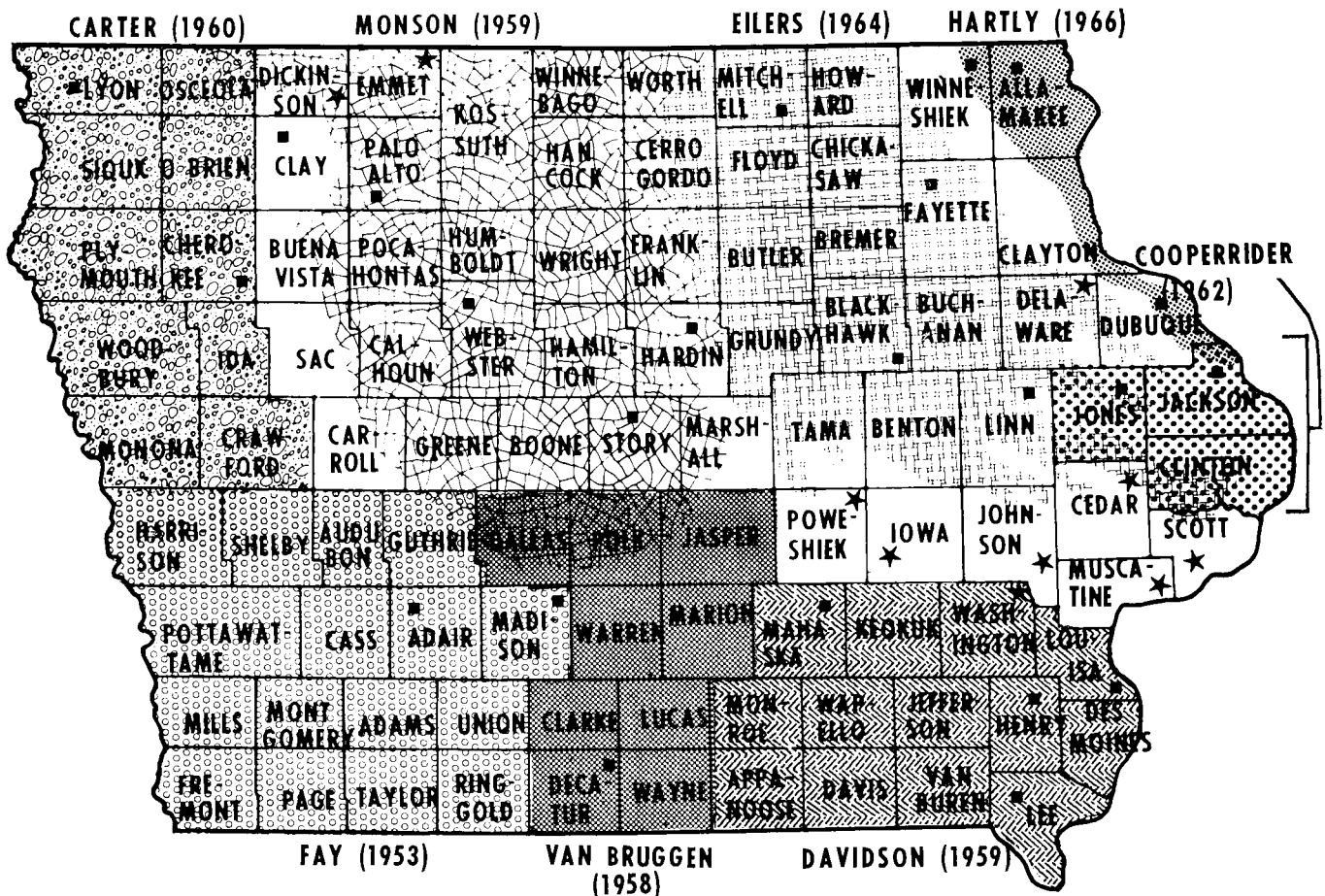


Figure 1. Floristic surveys completed in Iowa. The various background designs each indicate the area covered by the closest author cited at the periphery. ☆ County flora since 1950. □ County flora before 1950.

listed 1,608 species, 1,315 of which were native. Goodman (1939, 1942) and Hayden (1940, 1945) added 75 additional species in supplementary lists. The keys in Conard's useful *Plants of Iowa* were based on Cratty's flora, with the addition of a number of cultivated plants and the elimination of the rare species.

I have mentioned only those papers which aimed at an entire flora for the state, but a good many investigators have published taxonomic studies of various plant groups (e.g., Bass, Beal and Monson, Conard, Cooperrider, Davidson, Gilly, Isely, Murley, Pohl, and Russell), and/or floristic studies of areas ranging from a few acres to large sections of the state (e.g., Grant, Pammel, Shimek, Wolden, and others mentioned below). These works are too numerous to cite individually, but the majority of them can be found in the list of selected references.

PRESENT STATUS

In 1947 Gilly wrote that in only 11 of the 99 Iowa counties was the flora "reasonably well known," that only 37 of approximately 125 plant families had been adequately studied, and that "no adequate flora of the state of Iowa can be pre-

pared in the near future." By 1954 Thorne could write that 21 additional counties were well-known floristically; about 800 species of vascular plants had been the subjects of various taxonomic studies; and the Iowa flora would probably exceed 1,800 species. Dr. Thorne was much interested in the Iowa flora. He was a very active field man, and stimulated a rejuvenation of floristic research in Iowa. The hatched areas in Figure 1 indicate major floristic studies completed by seven of Dr. Thorne's students at The University of Iowa, and one by P. H. Monson, a student of Dr. Pohl at Iowa State University. County floras completed since 1950 are indicated in Figure 1 by the symbol ☆ and earlier county floras by the symbol □. It is clear that Iowa has been adequately botanized since Gilly's 1947 paper. Of the taxa mentioned by Thorne (1954) as needing careful taxonomic study, the Rosaceae, Ranunculaceae, Cruciferae, *Hypericum*, *Cornus*, Gentianales, Solanaceae, Caprifoliaceae, and parts of the Heliantheae, Astereae, Eupatoriaceae, and Caryophyllales remain to be revised. To these, I would add *Quercus* and *Potamogeton*. Also remaining are the tedious tasks of checking the identification of easily-confused taxa and revising the synonymy used by the various authors.

In summary, a great deal of work has been published on the flora of Iowa and we now have an adequate floristic sur-

vey of the state. Some groups still need taxonomic study, the identifications of certain specimens need checking, and some of the synonymy needs revision. I estimate that it would take a taxonomist familiar with Iowa plants at least a year of concentrated effort to produce an accurate checklist of the vascular plants of the state, and probably five years or more to publish a manual of the Iowa vascular flora.

THE ROLE OF THE ACADEMY

Most of the contributors to our knowledge of the vascular flora of Iowa have been members of the Academy. Some have held important positions in it for long periods. Most of them published in the *Proceedings*, and this is reflected in the fact that 97 of the references cited in the paper, or 41 percent are from there.

The Academy has not provided only a forum for investigators to present their results. The first edition of Conard's *Plants of Iowa*, published in 1939, was made possible by a \$300 grant provided by the Academy to help pay for publication costs. In addition, the Academy has for many years, under the auspices of the American Association for the Advancement of Science, provided small grants for research projects. Many of these have aided taxonomic study of Iowa plants.

SELECTED REFERENCES ON THE IOWA FLORA

The following listing includes 238 major papers that I have selected from the very large number that have been published on the vascular plants of Iowa. I have eliminated many floristic papers which were incomplete, or concerned areas smaller than a county, and most studies of taxa below that of the genus. These decisions were arbitrary, of course, and allowances were made for the historic value of a paper and for various other reasons. Early papers that were subsequently incorporated into the author's later publications were generally eliminated, as were most studies that were primarily ecological, economic, phenological, anatomical, or morphological in nature. For those desiring additional information, the papers preceded by an asterisk contain extensive bibliographies.

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