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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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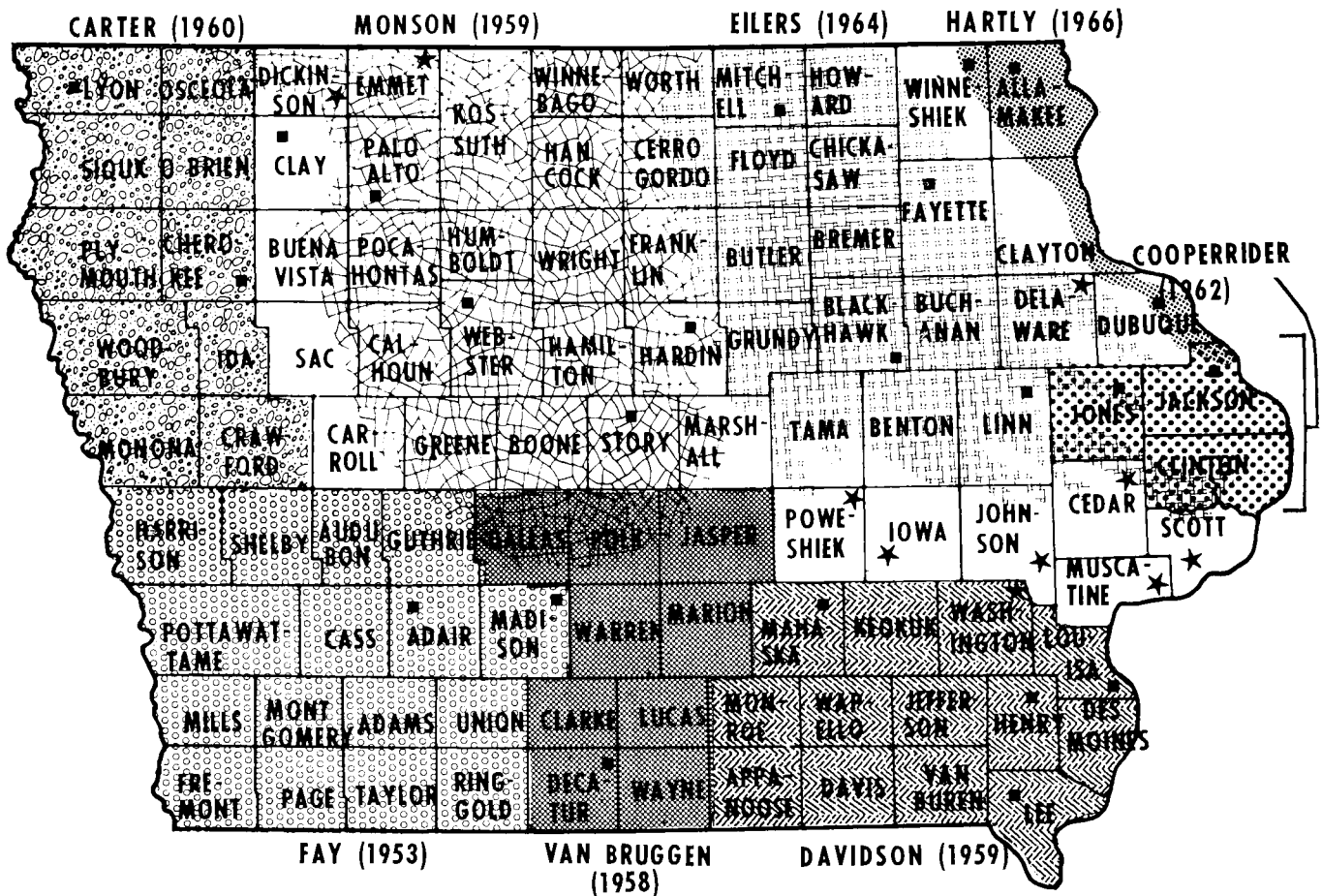


Figure 1. Floristic surveys completed in Iowa. The various background designs each indicate the area covered by the closest author cited at the periphery. ☆ County flora since 1950. □ County flora before 1950.

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.

- ADAMS, R. P. 1930. Notes on Iowa grasses. *Proc. Iowa Acad. Sci.* 37:91-94.
- AIKMAN, J. M., and A. HAYDEN. 1938. Iowa trees in winter. *Iowa State Coll. Ext. Circ.* 246.
- AIKMAN, J. M., and C. L. GILLY. 1948. A comparison of the forest floras along the Des Moines and Missouri rivers. *Proc. Iowa Acad. Sci.* 55:63-73.
- ANDERSON, D. E. 1961. Taxonomy and distribution of the genus *Phalaris*. *Iowa State Jour. Sci.* 36:1-96.
- ANDERSON, J. P. 1904. Plants new to the flora of Decatur County, Iowa. *Proc. Iowa Acad. Sci.* 12:133-138.
- ANDERSON, J. P. 1906. Additions to the flora of Decatur County, Iowa. *Iowa Nat.* 2:7-8.
- ARTHUR, J. C. 1876. *Contributions to the flora of Iowa: A catalogue of the phanerogamous plants*. Charles City, Iowa, *Intelligencer*.
- ARTHUR, J. C. 1877. Contributions to the flora of Iowa—No. II. *Proc. Davenport Acad. Nat. Sci.* 2:126.
- ARTHUR, J. C. 1878. Contributions to the flora of Iowa—No. III. *Proc. Davenport Acad. Nat. Sci.* 2:258-261.
- ARTHUR, J. C. 1882. Contributions to the flora of Iowa—No. IV. *Proc. Davenport Acad. Nat. Sci.* 3:169-172.
- ARTHUR, J. C. 1884a. Contributions to the flora of Iowa—No. V. *Proc. Davenport Acad. Nat. Sci.* 4:27-30.
- ARTHUR, J. C. 1884b. Contributions to the flora of Iowa—No. VI. *Proc. Davenport Acad. Nat. Sci.* 4:64-75.
- AUGUSTINE, D. W. 1939. Iowa species of *Agropyron*. *Proc. Iowa Acad. Sci.* 46:97-104.
- AUGUSTINE, D. W. 1940. Plants of Mahaska County, Iowa. *Proc. Iowa Acad. Sci.* 47:135-154.
- AUGUSTINE, D. W. 1941. Additions to the flora of Mahaska County, Iowa. *Proc. Iowa Acad. Sci.* 48:129-131.
- BALL, C. R. 1899. The genus *Salix* in Iowa. *Proc. Iowa Acad. Sci.* 7:141-159.
- BARNES, W. D., F. REPPERT, and A. A. MILLER. 1900. The flora of Scott and Muscatine counties. *Proc. Davenport Acad. Nat. Sci.* 8:199-287.
- BASS, L. N. 1943. The Labiatae of Iowa. *Proc. Iowa Acad. Sci.* 50:209-219.
- BEAL, E. O., and P. H. MONSON. 1954. Marsh and aquatic angiosperms of Iowa. *Univ. Iowa Studies Nat. Hist.* 19(5):1-95.
- BENNETT, H. D. 1948. Notes on the Cyperaceae of Iowa. *Proc. Iowa Acad. Sci.* 55:77-82.
- BESSEY, C. E. 1871. Contributions to the flora of Iowa. *Iowa Agric. Coll. 4th Bienn. Rept.* pp. 90-127.
- BLICKENSTAFF, C. C., and C. L. GILLY. 1948. A preliminary report on biosystematic studies of Iowa smartweeds (*Polygonum* spp.). *Proc. Iowa Acad. Sci.* 55:83-85.
- BODE, I. T., and G. B. MACDONALD. 1928. *A handbook of native trees of Iowa*. Ames, Iowa.
- BOOT, D. H. 1914. Comparison of field and forest floras in Monona County, Iowa. *Proc. Iowa Acad. Sci.* 21:53-58.
- BROWN, M. E., and R. G. BROWN. 1939. A preliminary list of the plants of the sand mounds of Muscatine and Louisa counties, Iowa. *Proc. Iowa Acad. Sci.* 46:167-178.
- BROWN, R. G. 1949. Jones County flora: A preliminary survey. M.S. thesis. The University of Iowa, Iowa City.
- BURK, M. M. J. 1931. Flowering plants of Black Hawk County. *Proc. Iowa Acad. Sci.* 38:135-149.
- CAMERON, J. E. 1898. The forest trees of Delaware County, Iowa. *Geol. Survey Ann. Rpt.* 8:193-199.
- *CARTER, J. L. 1960. The flora of northwestern Iowa. Ph.D. thesis. The University of Iowa, Iowa City.
- CARTER, J. L. 1962. The vascular flora of Cherokee County. *Proc. Iowa Acad. Sci.* 69:60-70.
- COFFEY, V. J. 1966. The Scrophulariaceae of Iowa. M.S. thesis. The University of Iowa, Iowa City.
- COLEMAN, V. W. 1950. The Liliaceae of Iowa. M.S. thesis. The University of Iowa, Iowa City.
- CONARD, H. S. 1905. The waterlilies: A monograph of the genus *Nymphaea*. *Carnegie Inst. Wash. Publ.* No. 4. 1-279.
- CONARD, H. S. 1918. The general classification of higher plants. *Proc. Iowa Acad. Sci.* 25:237-240.
- CONARD, H. S. 1922. A manual of gymnosperms ("evergreens") of Iowa, both native and cultivated. *Proc. Iowa Acad. Sci.* 29:328-338.
- CONARD, H. S. 1951. *Plants of Iowa*. 7th edit. Author, Iowa City.
- CONARD, H. S. 1952. The vegetation of Iowa. *Univ. Iowa Studies Nat. Hist.* 19(4):1-166.
- CONARD, H. S., and E. D. HUBBARD. 1944. *Oxalis europaea* and *Oxalis stricta* in Iowa. *Proc. Iowa Acad. Sci.* 51:177-183.
- COOPERRIDER, T. S. 1955. The Ophioglossaceae of Iowa. *Am. Fern Jour.* 45:156-159.
- COOPERRIDER, T. S. 1959a. The ferns and other pteridophytes of Iowa. *Univ. Iowa Studies Nat. Hist.* 20(1):1-66.
- COOPERRIDER, T. S. 1959b. New county records for marsh and aquatic tracheophytes in Iowa. *Proc. Iowa Acad. Sci.* 66:163-168.
- COOPERRIDER, T. S. 1960. The Lycopodiaceae and Selaginellaceae of Iowa. *Am. Fern Jour.* 50:267-269.
- *COOPERRIDER, T. S. 1962. The vascular plants of Clinton, Jack-

- son and Jones counties, Iowa. *Univ. Iowa Studies Nat. Hist.* 20(5):1-80.
- CRATTY, R. I. 1896. Notes on the aquatic phenogams of Iowa. *Bull. Lab. Nat. Hist. Univ. Iowa* 3:136-152.
- CRATTY, R. I. 1898. The Iowa sedges. *Bull. Lab. Nat. Hist. Univ. Iowa* 4:313-375.
- CRATTY, R. I. 1903. The flora of Emmet County, Iowa. *Proc. Iowa Acad. Sci.* 11:201-251.
- CRATTY, R. I. 1905a. The flora of Emmet County, II. *Iowa Nat.* 1:36-38.
- CRATTY, R. I. 1905b. The Juncaceae of Iowa. *Iowa Nat.* 1:71-74.
- CRATTY, R. I. 1919. The genus *Lactuca* in Iowa. *Proc. Iowa Acad. Sci.* 26:239-248.
- CRATTY, R. I. 1924. The genus *Rumex* in Iowa. *Proc. Iowa Acad. Sci.* 31:213-216.
- CRATTY, R. I. 1929. Immigrant flora of Iowa. *Iowa State Coll. Jour. Sci.* 3:247-269.
- CRATTY, R. I. 1933. The Iowa flora. An annotated list of the ferns, fern allies and the native and introduced flowering plants of the state represented in the Iowa State College Herbarium. *Iowa State Coll. Jour. Sci.* 7:177-252.
- CRATTY, R. I. 1934. Notes on the immigrant flora of Iowa, I. *Iowa State Coll. Jour. Sci.* 8:309-311.
- CRAWFORD, D. J. 1970. The Umbelliferae of Iowa. *Univ. Iowa Studies Nat. Hist.* 21(4):1-36.
- DAVIDSON, R. A. 1953. The Senecioneae, Cynareae, and Cichorieae of Iowa. *Proc. Iowa Acad. Sci.* 60:98-111.
- *DAVIDSON, R. A. 1959. The vascular flora of southeastern Iowa. *Univ. Iowa Studies Nat. Hist.* 20(2):1-102.
- DE LISLE, D. G. 1963. Taxonomy and distribution of the genus *Cenchrus*. *Iowa State Jour. Sci.* 37:259-351.
- DIEHL, G. D. 1929. The distribution of the genus *Tradescantia* in Iowa. *Proc. Iowa Acad. Sci.* 36:143-146.
- *DREXLER, R. V. 1944. Botany index. In Index to volume 1-50 (1887-1944). *Proc. Iowa Acad. Sci.* 51:487-546.
- EASTERLY, N. W. 1951. The flora of Iowa County. *Proc. Iowa Acad. Sci.* 58:71-95.
- EILERS, L. J. 1969. The flora of Iowa revived. *Proc. Iowa Acad. Sci.* 76:105-108.
- *EILERS, L. J. 1971. The vascular flora of the Iowan area. *Univ. Iowa Studies Nat. Hist.* 21(5):1-137.
- ELLSWORTH, W. 1922. Parry's catalogue of Iowa plants of 1848. *Proc. Iowa Acad. Sci.* 29:339-344.
- ERDMAN, K. S. 1965. Taxonomy of the genus *Sphenopholis* (Gramineae). *Iowa State Jour. Sci.* 39:289-336.
- FAY, M. J. 1951. The flora of Cedar County, Iowa. *Proc. Iowa Acad. Sci.* 58:107-131.
- *FAY, M. J. 1953. The flora of southwestern Iowa. Ph.D. thesis. The University of Iowa, Iowa City.
- FAY, M. J., and R. F. THORNE. 1953. Additions to the flora of Cedar County, Iowa. *Proc. Iowa Acad. Sci.* 60:122-130.
- FINK, B. 1893. Some additions to the flora of Iowa. *Proc. Iowa Acad. Sci.* 1(4):103-104.
- FINK, B. 1896. Spermatophyta of the flora of Fayette, Iowa. *Proc. Iowa Acad. Sci.* 4:81-107.
- FITZPATRICK, T. J. 1897. Notes on the flora of northeastern Iowa. *Proc. Iowa Acad. Sci.* 5:107-133.
- FITZPATRICK, T. J. 1898. Forest trees and shrubs of Decatur County, Iowa. *Iowa Geol. Survey Ann. Rpt.* 8:309-314.
- FITZPATRICK, T. J. 1899. *Manual of the flowering plants of Iowa. 1. Polypetalae. 2. Gamopetalae.* Author. Lamoni, Iowa.
- FITZPATRICK, T. J. 1905a. The Helianthaceae of Iowa. *Iowa Nat.* 1:75-81.
- FITZPATRICK, T. J. 1905b. The Iowa bladderworts. *Iowa Nat.* 1:30-33.
- FITZPATRICK, T. J. 1905c. The Melanthaceae of Iowa. *Iowa Nat.* 1:75-81.
- FITZPATRICK, T. J. 1906a. The Iowa gentians. *Iowa Nat.* 2(1):11-19.
- FITZPATRICK, T. J. 1906b. The Liliales of Iowa. *Proc. Iowa Acad. Sci.* 13:115-160.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1897. The flora of southern Iowa. *Proc. Iowa Acad. Sci.* 5:134-173.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1898. The flora of southern Iowa, Part II. *Proc. Iowa Acad. Sci.* 6:173-202.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1899a. The genus *Viburnum* in Iowa. *Proc. Iowa Acad. Sci.* 7:197-199.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1899b. The Orchidaceae of Iowa. *Proc. Iowa Acad. Sci.* 7:187-196.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1900a. Betulaceae of Iowa. *Proc. Iowa Acad. Sci.* 8:169-177.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1900b. The Fagaceae of Iowa. *Proc. Iowa Acad. Sci.* 8:177-196.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1900c. The Juglandaceae of Iowa. *Proc. Iowa Acad. Sci.* 8:160-169.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1901. The Ranunculaceae of Iowa. *Bull. Lab. Nat. Hist. Univ. Iowa* 5:87-137.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1902. The scrophulariaceae of Iowa. *Proc. Iowa Acad. Sci.* 10:136-176.
- FITZPATRICK, T. J., and M. F. L. FITZPATRICK. 1903. The fern flora of Iowa. *Fern Bull.* 11(3):65-71.
- FOX, W. B. 1945. The Leguminosae in Iowa. *Amer. Midl. Nat.* 34:207-230.
- FULTS, J. L. 1934. A botanical survey of Lee County, Iowa. *Iowa State Coll. Jour. Sci.* 8:251-293.
- GILLY, C. L. 1937. A provisional list of the Cruciferae of Henry, Jefferson and Van Buren counties. *Proc. Iowa Acad. Sci.* 44:75-77.
- GILLY, C. L. 1946. The Cyperaceae of Iowa. *Iowa State Coll. Jour. Sci.* 21:55-151.
- *GILLY, C. L. 1947. The flora of Iowa—a progress report based on past contributions. *Proc. Iowa Acad. Sci.* 54:99-106.
- GILLY, C. L., and M. E. McDONALD. 1936. Rare and unusual plants from southeastern Iowa. *Proc. Iowa Acad. Sci.* 43:143-149.
- GILLY, C. L., and M. E. McDONALD. 1947. A preliminary report on the flora of southeastern Iowa—Part I. *Proc. Iowa Acad. Sci.* 54:107-126.
- GILLY, C. L., and M. E. McDONALD. 1948. Preliminary report on the flora of southeastern Iowa—Part II. *Proc. Iowa Acad. Sci.* 55:115-133.
- GILLY, C. L., and E. K. O'BRIAN. 1948. The family Boraginaceae in Iowa—a preliminary report. *Proc. Iowa Acad. Sci.* 55:135-150.
- GOODMAN, G. J. 1939. Plants new to Iowa. *Proc. Iowa Acad. Sci.* 46:105-106.
- GOODMAN, G. J. 1942. Notes on Iowa plants. *Proc. Iowa Acad. Sci.* 49:207-209.
- GOODMAN, G. J., and P. J. LEYENDECKER. 1942. The genus *Lysimachia* in Iowa. *Proc. Iowa Acad. Sci.* 49:211-212.
- GOW, J. E. 1898. Forest trees of Adair County, Iowa. *Proc. Iowa Acad. Sci.* 6:56-63.
- GOW, J. E. 1900. A preliminary list of flowering plants of Adair County. *Proc. Iowa Acad. Sci.* 8:152-159.
- GRANT, M. L. 1950. Dickinson County flora. *Proc. Iowa Acad. Sci.* 57:91-129.
- GRANT, M. L. 1953a. Additions to and notes on the flora of Dickinson County, Iowa. *Proc. Iowa Acad. Sci.* 60:131-140.
- GRANT, M. L. 1953b. Notes on Iowa vascular plants. *Proc. Iowa Acad. Sci.* 60:141-149.
- GREENE, W. (Ed.) 1907. Plants of Iowa. A preliminary list of the native and introduced plants of the state, not under cultivation. *Bull. State Hort. Soc.* pp. 1-264.
- GULDNER, L. F. 1960. The vascular plants of Scott and Muscatine counties. *Davenport Pub. Mus. Publ's in Botany* No. 1.
- GUNN, C. R. 1968. The *Vicia Americana* complex (Leguminosae). *Iowa State Jour. Sci.* 42:171-214.
- HAGGE, H. P. 1929. Flora of northeastern Iowa and southwestern Wisconsin. M.S. thesis. Iowa State University, Ames.
- HALSTEAD, D. B. 1888. Preliminary list of the weeds of Iowa. *Bull. Bot. Dept. State Agr. Coll. Ames, Iowa.* pp. 34-54.
- HARRINGTON, H. D. 1934. The woody plants of Iowa in winter condition. *Univ. Iowa Studies Nat. Hist.* 16:1-116.

- HARRINGTON, H. D. 1940. Keys to the woody plants of Iowa in vegetative condition. *Univ. Iowa Studies Nat. Hist.* 17:371-489.
- *HARTLEY, T. G. 1966. The flora of the "Driftless Area." *Univ. Iowa Studies Nat. Hist.* 21(1):1-174.
- HAYDEN, A. 1940. A supplement to the catalogue of Iowa plants in the Iowa State College Herbarium. *Iowa State Coll. Jour. Sci.* 14:199-213.
- HAYDEN, A. 1943. A botanical survey in the Iowa lake region of Clay and Palo Alto counties. *Iowa State Coll. Jour. Sci.* 17:277-416.
- HAYDEN, ADA. 1945. A second supplement to the catalogue of Iowa plants in the Iowa State College Herbarium. *Iowa State Coll. Jour. Sci.* 19:111-132.
- *HIPPLER, SR. MARY IMELDA. 1951. An annotated bibliography of the taxonomic and ecological literature of the vascular plants of Iowa. M.S. thesis. The University of Iowa, Iowa City.
- HITCHCOCK, A. S. 1887. Our goldenrods. *Aurora.* 16(8):209. Ames, Iowa.
- HITCHCOCK, A. S. 1889. Additions to the Iowa flora. *Bull. Torrey Club* 16:69-70.
- HITCHCOCK, A. S. 1892. A catalogue of Anthophyta and Pteridophyta of Ames, Iowa. *Trans. Acad. Sci. St. Louis* 5:477-532.
- ISELY, D. 1951. The Leguminosae of the north-central United States: I. Loteae and Trifolieae. *Iowa State Coll. Jour. Sci.* 25:439-482.
- ISELY, D. 1955. The Leguminosae of the north-central United States: II. Hedysareae. *Iowa State Coll. Jour. Sci.* 30:33-118.
- ISELY, D. 1958. The Leguminosae of the north-central United States: III. Mimosoideae and Caesalpinioideae. *Iowa State Coll. Jour. Sci.* 32:355-393.
- ISELY, D. 1962. The Leguminosae of the north-central United States: IV. Psoraleae. *Iowa State Jour. Sci.* 37:103-162.
- ISELY, D. 1970. Legumes of the United States: II. *Desmanthus* and *Neptunia*. *Iowa State Jour. Sci.* 44:495-511.
- JAMES, E. 1823. *Account of an expedition from Pittsburgh to the Rocky Mountains*. March of America Facsimile Series No. 65. 2 vols. Ann Arbor University Microfilms, Inc.
- JOHNS, M. R. 1929. Some Iowa Heliantheae, I. *Proc. Iowa Acad. Sci.* 36:147-184.
- JOHNS, M. R. 1930. Heliantheae of Iowa, II. *Proc. Iowa Acad. Sci.* 37:161-208.
- JOHNS, M. R. 1935. Heliantheae of Iowa, III. *Univ. Iowa Studies Nat. Hist.* 16:333-416.
- KELLOGG, G. E. 1946. The asters of Iowa. *Proc. Iowa Acad. Sci.* 53:153-166.
- KWANG, YAO-WEN. 1951. The Polemoniales of Iowa (Convolvulaceae to Verbenaceae). M.S. thesis. The University of Iowa, Iowa City.
- LARSEN, J. A., and J. R. DILWORTH. 1939. Notes on the forests of southern Iowa. *Proc. Iowa Acad. Sci.* 46:141-147.
- LAZELL, F. J. 1927. The flora and blooming time of plants of Linn County, Iowa. M.S. thesis. Iowa State University, Ames.
- LEYENDECKER, P. J., JR. 1940. A taxonomic study of the genus *Galium* in Iowa. *Proc. Iowa Acad. Sci.* 47:101-113.
- LINDLY, J. M. 1904. Flowering plants of Henry County. *Proc. Iowa Acad. Sci.* 12:157-164.
- LINDLY, J. M. 1911. Flowers of Story County. *Proc. Iowa Acad. Sci.* 18:19-24.
- LINDLY, J. M. 1927. Flowering plants of Henry County—II. *Proc. Iowa Acad. Sci.* 34:133-137.
- LINDLY, J. M. 1929. Flowering plants of Henry County—III. *Proc. Iowa Acad. Sci.* 36:185-188.
- LYNESS, A. S. 1933. Notes on the fern flora of Iowa. *Am. Fern Jour.* 23:39-49.
- LYNESS, A. S. 1938a. Keys to the ferns of Iowa. I. A vegetative key to the genera of Iowa ferns and fern-allies. *Am. Fern Jour.* 27:132-135.
- LYNESS, A. S. 1938b. Keys to the ferns of Iowa. II. A vegetative key to the species of Iowa ferns and fern-allies. *Am. Fern Jour.* 28:16-25.
- MACBRIDE, T. H. 1895. Notes on the forest distribution in Iowa. *Proc. Iowa Acad. Sci.* 3:96-101.
- MACBRIDE, T. H. 1896. Forest trees of Johnson County. *Iowa Geol. Survey Ann. Rpt.* 7:105-108.
- *MACBRIDE, T. H. 1897. The president's address. *Proc. Iowa Acad. Sci.* 5:12-23.
- *MACBRIDE, T. H. 1912. Twenty-five years of botany in Iowa. *Proc. Iowa Acad. Sci.* 19:43-62.
- MCDONALD, M. E. 1937. The woody plants of southeastern Iowa. *Proc. Iowa Acad. Sci.* 44:65-74.
- MELHUS, I. E. 1936. Native ferns of Iowa. *Iowa State Coll. Ext. Cir.* 225. Ames, Iowa.
- MOBBERLEY, D. G. 1956. Taxonomy and distribution of the genus *Spartina*. *Iowa State Coll. Jour. Sci.* 30:471-574.
- *MONSON, P. H. 1959. Spermatophytes of the Des Moines lobe in Iowa. Ph.D. thesis. Iowa State University, Ames.
- MUELLER, H. A. 1899. Trees and shrubs of Hamilton County. *Proc. Iowa Acad. Sci.* 7:204-209.
- MUELLER, H. A. 1903. A preliminary list of the flowering plants of Madison County. *Proc. Iowa Acad. Sci.* 11:261-279.
- MURLEY, M. R. 1944a. *Paspalum* in Iowa. *Proc. Iowa Acad. Sci.* 51:237-239.
- MURLEY, M. R. 1944b. A seed key to fourteen species of Geraniaceae. *Proc. Iowa Acad. Sci.* 51:241-246.
- MURLEY, M. R. 1945. Distribution of Euphorbiaceae in Iowa with seed keys. *Iowa State Coll. Jour. Sci.* 19:415-427.
- MURLEY, M. R. 1946. Fruit key to the Umbelliferae in Iowa, with plant distribution records. *Iowa State Coll. Jour. Sci.* 20:349-364.
- MURLEY, M. R. 1947. *Apocynum* in Iowa. *Iowa State Coll. Jour. Sci.* 21:229-235.
- NAGEL, J. J., and J. G. HAUPT. 1876. List of phaenogamous plants collected in the vicinity of Davenport, Iowa, during the years 1870 to 1875, inclusive. *Proc. Davenport Acad. Nat. Sci.* 1:153-164.
- NEWBRO, G. E. 1936. The Violaceae of Iowa. *Univ. Iowa Stud. Nat. Hist.* 17:49-76.
- NICOLET, I. N. 1843. Report intended to illustrate a map of the hydrographical basin of the upper Mississippi River. *Senate Document* No. 237, 26th Congress, 2nd Session.
- NICOLSON, D., and N. H. RUSSELL. 1955. The genus *Asclepias* in Iowa. *Proc. Iowa Acad. Sci.* 62:211-215.
- NICHOLSON, H. 1925. The genus *Antennaria* in Iowa. M.S. thesis. The University of Iowa, Iowa City.
- OLESON, O. M., and M. P. SOMES. 1906. A flora of Webster County, Iowa. *Proc. Iowa Acad. Sci.* 13:25-58.
- PAMMEL, L. H. 1895a. Conifers in Iowa. *Gard. and For.* 8:279.
- PAMMEL, L. H. 1895b. Notes on the flora of western Iowa. *Proc. Iowa Acad. Sci.* 3:106-135.
- PAMMEL, L. H. 1898. Flora of Story County, Iowa. *Iowa Geol. Survey Ann. Rpt.* 9:239-245.
- PAMMEL, L. H. 1899. The forest flora of Hardin County, Iowa. *Iowa Geol. Survey Ann. Rpt.* 10:306-313.
- PAMMEL, L. H. 1900. The thistles of Iowa with notes on a few other species. *Proc. Iowa Acad. Sci.* 8:214-239.
- PAMMEL, L. H. 1902. The forest trees and shrubs of Monroe County. *Iowa Geol. Survey Ann. Rpt.* 13:423-433.
- PAMMEL, L. H. 1915. Native shrubs of Iowa. *Trans. Iowa Hort. Soc.* 49:34-43.
- PAMMEL, L. H. 1916. The oaks. *Trans. Iowa Hort. Soc.* 51:96-102.
- PAMMEL, L. H. 1917. The Iowa birches and maples. *Trans. Iowa Hort. Soc.* 52:101-110.
- PAMMEL, L. H. 1918. The willows and poplars of Iowa. *Trans. Iowa Hort. Soc.* 53:163-178.
- PAMMEL, L. H. 1920. Flora of Jackson and Dubuque counties. *Iowa Parks*. Des Moines, Iowa.
- *PAMMEL, L. H. 1924. A century of botany in Iowa. *Proc. Iowa Acad. Sci.* 31:45-68.
- PAMMEL, L. H. 1925a. The flora of Hardin County. *Iowa State Board Conserv. Park Booklet Series* 2:16-29.

- PAMMEL, L. H. 1925b. Our native plants. *Proc. Iowa Acad. Sci.* 32:115-121.
- PAMMEL, L. H., and E. D. FOGEL. 1907. A catalogue of the poisonous plants of Iowa. *Proc. Iowa Acad. Sci.* 14:147-176.
- PAMMEL, L. H., and C. M. KING. 1901. The vascular cryptogams of Iowa and the adjoining parts of southeastern Minnesota and western Wisconsin. *Proc. Iowa Acad. Sci.* 9:134-151.
- PAMMEL, L. H., C. R. BALL, and F. LAMSON-SCRIBNER. 1905. Grasses of Iowa. Part II. *Iowa Geol. Survey Suppl. Rpt.*
- PAMMEL, L. H., C. M. KING, and M. H. BURNS. 1926. Handbook of Iowa weeds. *Iowa State Coll. Extension Service Bul.* No. 139.
- PAMMEL, L. H., C. M. KING, et al. 1913. The weed flora of Iowa. *Iowa Geol. Survey Bull.* No. 4:6-62.
- PAMMEL, L. H., C. M. KING, et al. 1930. Honey plants of Iowa. *Iowa Geol. Survey Bull.* No. 7.
- PAMMEL, L. H., G. B. MACDONALD, and H. B. CLARK. 1915. The native and cultivated forest trees and shrubs of the Missouri River basin. *Proc. Iowa Acad. Sci.* 22:23-56.
- PAMMEL, L. H., J. B. WEEMS, and F. LAMSON-SCRIBNER. 1901. The grasses of Iowa. Part I. *Iowa Geol. Surv. Bul.* 1:1-525.
- PARIS, C. D. 1939. The genus *Arabis* in Iowa. *Proc. Iowa Acad. Sci.* 46:161-165.
- PARRY, C. C. 1852. Systematic catalogue of plants of Wisconsin and Minnesota. Art V, pp. 606-622. In Owen, D. D. *Report of a geological survey of Wisconsin, Iowa, and Minnesota*. Lippincott, Grambo & Co., Philadelphia.
- PARRY, C. C. 1889. The North American genus *Ceanothus* L. *Proc. Davenport Acad. Nat. Sci.* 5:162-174.
- PECK, M. E. 1904. The flowering plants of Hardin County. *Proc. Iowa Acad. Sci.* 12:193-241.
- PICK, SR. M. A. 1952. *Solidago* in Iowa. M.S. thesis. The University of Iowa, Iowa City.
- PIKE, Z. M. 1810. *Sources of the Mississippi and the western Louisiana Territory*. March of America Facsimile Series No. 57. Ann Arbor University Microfilms. Inc.
- POHL, R. W. 1951. The genus *Setaria* in Iowa. *Iowa State Coll. Jour. Sci.* 25:501-508.
- POHL, R. W. 1959. Introduced weedy grasses in Iowa. *Proc. Iowa Acad. Sci.* 66:160-162.
- POHL, R. W. 1966. The grasses of Iowa. *Iowa State Jour. Sci.* 40:341-573.
- POHL, R. W. 1975. *Keys to Iowa Vascular Plants*. Kendall-Hunt Publishing Company, Dubuque, Iowa.
- PYRAH, G. L. 1969. Taxonomic and distributional studies in *Leersia* (Gramineae). *Iowa State Jour. Sci.* 44:215-270.
- RICKEY, M. D. 1964. A floristic survey of Delaware County, Iowa. M.S. thesis. The University of Iowa, Iowa City.
- RUSSELL, N. H. 1953. A resurvey of the violets of Iowa. *Proc. Iowa Acad. Sci.* 60:217-227.
- RUSSELL, N. H. 1955. The taxonomy of the North American acaulescent white violets. *Am. Midl. Nat.* 54:481-494.
- RUSSELL, N. H. 1956. A checklist of the vascular flora of Poweshiek County, Iowa. *Proc. Iowa Acad. Sci.* 63:161-176.
- RUSSELL, N. H. 1965. Violets (*Viola*) of central and eastern United States: An introductory survey. *Sida* 2:1-113.
- SCHADT, C. 1909. Flora of Iowa County. In S. W. Stookey, *Geology of Iowa County*. *Iowa Geol. Survey Ann. Rpt.* 20:186-198.
- SHIMEK, B. 1896. Notes on the flora of Iowa. *Bull. Lab. Nat. Hist. Univ. Iowa* 3:195-215.
- SHIMEK, B. 1899a. The distribution of forest trees in Iowa. *Proc. Iowa Acad. Sci.* 7:47-59.
- SHIMEK, B. 1899b. The flora of Lyon County. *Iowa Geol. Survey Ann. Rpt.* 10:157-184.
- SHIMEK, B. 1901a. Addenda to the flora of Lyon County. *Bull. Lab. Nat. Hist. Univ. Iowa* 5:215-216.
- SHIMEK, B. 1901b. Iowa Pteridophyta in the herbarium of the State University of Iowa. *Bull. Lab. Nat. Hist. Univ. Iowa* 5(2): 145-170 and 213-215.
- SHIMEK, B. 1902. The Iowa oaks. *Tran. Iowa Hort. Soc.* 37:228-232.
- SHIMEK, B. 1903. The native shrubs of Iowa. *Tran. Iowa Hort. Soc.* 38:453-468.
- SHIMEK, B. 1905. The plants of Winneshiek County. *Iowa Geol. Survey Ann. Rpt.* 16:147-211.
- SHIMEK, B. 1912. Iowa pteridophyta (continued). *Bull. Lab. Nat. Hist. Univ. Iowa* 5:213-215.
- SHIMEK, B. 1915. Early Iowa locality records. *Proc. Iowa Acad. Sci.* 22:105-119.
- SHIMEK, B. 1917. The sand flora of Iowa. *Bull. Lab. Nat. Hist. Univ. Iowa* 7(4):6-24.
- SHIMEK, B. 1921. The genus *Ceanothus* L. in Iowa. *Proc. Iowa Acad. Sci.* 28:230-243.
- SHIMEK, B. 1930. *Keys to the woody plants of Iowa*, 2nd ed. Author, Iowa City.
- SHIMEK, B. 1948. The plant geography of Iowa. (H. S. Conard, Ed.) *Univ. Iowa Studies Nat. Hist.* 18(4):1-178.
- SOMES, M. P. 1913. Notes on the flora of Johnson County, Iowa. *Proc. Iowa Acad. Sci.* 20:27-101.
- SONS, E. R. 1941. A taxonomic study of the genera *Elymus* and *Hordeum* in Iowa. M.S. thesis. Iowa State University, Ames.
- SPENCE, W. L. 1959. The Salicaceae of Iowa. M.S. thesis. The University of Iowa, Iowa City.
- STEWART, K. L. 1913. The Astereae of Iowa. M.S. thesis. The University of Iowa, Iowa City.
- THORNE, R. F. 1951. Herbarium of the State University of Iowa. *Proc. Iowa Acad. Sci.* 58:215-219.
- THORNE, R. F. 1953. Notes on rare Iowa plants. *Proc. Iowa Acad. Sci.* 60:260-274.
- *THORNE, R. F. 1954. Present status of our knowledge of the vascular plant flora of Iowa. *Proc. Iowa Acad. Sci.* 61:177-183.
- THORNE, R. F. 1955. Flora of Johnson County, Iowa. *Proc. Iowa Acad. Sci.* 62:155-196.
- THORNE, R. F. 1956. Notes on rare Iowa plants—II. *Proc. Iowa Acad. Sci.* 63:214-227.
- THORNE, R. F. 1963. Some problems and guiding principles of angiosperm phylogeny. *Am. Nat.* 97:287-305.
- THWAITES, R. G. (Ed.) 1904-05. Original journals of the Lewis and Clark Expedition, 1804-1806. 8 vols. Dodd, Mead & Company, New York.
- TOLSTEAD, W. L. 1938. A flora of Winneshiek and Allamakee counties and Clayton County in the vicinity of McGregor. *Iowa State Coll. Jour. Sci.* 12:321-384.
- TUTTLE, F. M. 1919. Flora of Mitchell County. *Proc. Iowa Acad. Sci.* 26:269-299.
- *VAN BRUGGEN, T. 1958. The flora of southcentral Iowa. Ph.D. thesis. The University of Iowa, Iowa City.
- VERINK, E. D. 1914. A preliminary report on the flora of Linn County. *Proc. Iowa Acad. Sci.* 21:77-99.
- WAGENKNECHT, B. L. 1954. The flora of Washington County, Iowa. M.S. thesis. The University of Iowa, Iowa City.
- WELSH, S. L. 1960. Legumes of the north-central states: Galegeae. *Iowa State Coll. Jour. Sci.* 35:111-250.
- WEMPLE, D. K. 1970. Revision of the genus *Petalostemon*. *Iowa State Jour. Sci.* 45:1-102.
- WITTER, F. M. 1889. Ferns of Muscatine County, Iowa. *Proc. Iowa Acad. Sci.* 1(1):96-97.
- WITTROCK, G. L. 1923a. *Cuscuta* in Iowa. *Proc. Iowa Acad. Sci.* 30:351-354.
- WITTROCK, G. L. 1923b. *Polygonum* in the state of Iowa. *Proc. Iowa Acad. Sci.* 30:345-349.
- WOLDEN, B. O. 1911. Asters. *Am. Bot.* 17:100-102.
- WOLDEN, B. O. 1926. A bog flora of northern Iowa. *Am. Bot.* 32:6-10.
- WOLDEN, B. O. 1932. The plants of Emmet County, Iowa. *Proc. Iowa Acad. Sci.* 39:89-132.
- WOLDEN, B. O. 1956. The flora of Emmet County, Iowa. *Proc. Iowa Acad. Sci.* 63:118-156.
- WOOD, M. E. 1883. Ferns of Iowa. *Bot. Gaz.* 7:73.