

THE SPERMATOPHYTA OF OKLAHOMA COUNTY, OKLAHOMA
EXCLUSIVE OF THE GRASSES, SEDGES AND RUSHES
A THESIS APPROVED FOR THE DEPARTMENT OF BOTANY AND
BACTERIOLOGY
UNIVERSITY OF OKLAHOMA GRADUATE SCHOOL

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CHAPTER I INTRODUCTION

This paper represents a preliminary taxonomic study of the flowering plants indigenous to Oklahoma County. Collections during the springs, summers and falls of 1939, 1940, and 1941 and also during the spring of 1942.

After the first general but extensive collections were made a number of special stations of widely varying ecological structures were selected. Collections were made from these at regular intervals of about two weeks throughout the growing season, or at a corresponding time during the next year. In addition a search was made for stations containing different, ecological elements. Thus the finding of a maximum number of species over a limited period of time was assured by a combination of extensive and intensive methods of collection. The specimens were pressed in the standard way used in the leading herbaria. Duplicates were obtained in nearly every case and were deposited in the Bebb Herbarium of the University of Oklahoma.

Among the most outstanding of the recent investigations, which may be applied to the flora of this region, are Fernald's series of "Virginia" papers published annually in *Rhodora* since 1935. Fernald reported¹ that a number of wide-ranging continental plants were first

collected in Virginia by John Clayton. They were described by the Italian botanist Gronovius in his *Flora Virginica* (1739), and later given binomial designation by Linneaus in the *Species Plantarum*. Thus the type locality for these Linnean species, which are based on Clayton's material, is in southeastern Virginia. Collections from that region were often found to differ from the wider-ranging inland plants referred erroneously, by most botanists, to the Linnean species. Fernald's restudy of many of these types has shown that the variety occurring in a restricted range along the coast is usually the typical one, i.e., the variety which Gronovius had before him when writing the description upon which Linneaus based his generic and specific name, while the wide-ranging plant of the interior must, in the large majority of cases, be given a new varietal name. A similar situation has been found to be true for plants collected along the coast and named by other botanists. This will help to account for the appearance of many of the varietal designations in this paper that are not found in the existing floras and manuals pertaining to Oklahoma.

¹Fernald and Griscom, Three Days of Botanizing in Southwestern Virginia, *Rhodora* 37, pp. 129-131, 1935.

CHAPTER II HISTORY

One of the first Americans to traverse what is now Oklahoma County was Washington Irving, who with Charles Latrobe and his fellow travelers, made a trip through this region in the fall of 1832. Irving, in his *Tour on the Prairies*, recorded the events and his impressions of this trip. His companion, Latrobe¹, may have had some botanical training as he mentioned various genera of plants seen on the journey.

The Party approached the present site of Edmond on the 23rd of October. Their line of search took them past the sites Arcadia, Spencer, Oklahoma City and, on the 28th, over what is now the southern boundary of Oklahoma County in the direction of Moore². Irving gave a good description of the post oak-blackjack woods, even mentioning the dwarf oak, *Quercus prinoides*, although not by name³, and of the prairies he saw when emerging from the woodland near Oklahoma City⁴. He also tells of the cottonwoods, sycamores and willows found along the streams⁵.

Josiah Gregg, a Santa Fe trader, in *Commerce of the Prairies* (1844), told of eight expeditions across the prairies. Two of these were along the course of the Canadian River, hence probably through Oklahoma County. He also described the "Cross Timbers" (post oak-blackjack associates), dwarf oaks and prairie fires.⁶ [See editor's note at end.]

Sitgraves and Woodruff, with S. W. Wodehouse as naturalist, surveyed the northern boundary of the Creek Indian country in 1849 and 1850, returning to Ft. Gibson by way of the North Canadian.⁷

Bigelow (1856) discussed the vegetation of Oklahoma as seen in traveling from east to west. He

also mentioned briefly the "Cross Timbers."⁸

A large number of plants from Oklahoma County have undoubtedly been collected by Thomas R. Stemen and W. Stanley Meyers in the course of their investigations on which the *Oklahoma Flora*⁹ is based. These have not been available for study by the author.

¹Charlee Latrobe, *Rambler in North America*, (excerpts in Irving's *Tour on the Prairies*, edited by Joseph B. Thoburn and George C. Wells. xxv. Harlow Publishing Company, Oklahoma City, Oklahoma, 1930).

²Washington Irving, *Tour on the Prairies*, (l.c.), pp. 240-243.

³*Ibid.*, p 145.

⁴*Ibid.*, p. 173.

⁵*Ibid.*, p. 151.

⁶W. E. Bruner, *The Vegetation of Oklahoma, Ecological Monographs* Vol. 1., No. 2, p. 128, April, 1931.

⁷*Ibid.*

⁸*Ibid.*

⁹Thomas R. Stemen and W. Stanley Myers, *Oklahoma Flora*, Harlow Publishing Corporation, Oklahoma City, Oklahoma, 1937.

CHAPTER III PHYSICAL FEATURES*Location and Size*

Oklahoma County is in Central Oklahoma, being a part of the region known before the run as "Old Oklahoma". It is bounded on the north by Logan County, on the east by Lincoln and Pottawatomie Counties, on the south by Cleveland County and on the west by Canadian County. It is rectangular in shape, extending thirty miles from east to west, and twenty-four miles from north to south. It covers an area of 720 square miles.

The total population of the county is 224,159. Oklahoma City has a population of 204,424.

Edmond is next with 4,002, while Bethany has 2,590 and Britton 2,239. Other towns in the county, all under 1,000 in population, are Harrah, Arcadia, Luther, Nicoma Park, Newalla and Marion.

Topography

The county is drained chiefly by the North Canadian River and its tributaries. The majority of the creeks, especially the small ones in this drainage system have water running in them only during the spring and after rains during the rest of the year. Especially in the hot summer and early fall months one is apt to find them dried up.

A tier of sections along the southern boundary south and southwest of Oklahoma City are in the watershed of the South Canadian River. The North Canadian enters the county west of Oklahoma City. Here it has been dammed to form Lake Overholser, which furnishes the city's water supply. It runs through the southern part of Oklahoma City, then swings northeast, through Spencer into the central part of the county. It then bends southeast, to leave the county near Harrah, 18 miles east of Oklahoma City, having curved 10 miles north between these two places.

The eastern part of the county is made up of sandy oak-covered hills and small prairies, together with outcroppings of red sandstone. The western townships are, for the most part, rolling prairie. Near Bethany there is a region of aeolian sand hills¹, which support a vegetation similar to that found on the sandy soils in the eastern part of the county.

Geology and Soils

Oklahoma County is in the Permian System of rocks,² which has been called the Permian Redbeds. The western half of the county is in the lower part of the Enid formation of the Permian system.³ This system consists of layers of thin red sandstones and soft red shales.

The soil in the western part of the county is a prairie⁴, which is a mature soil composed mostly of clay, but containing some sand. Near Bethany and the northern part of Lake Overholser there is a small area of aeolian sandhills.⁵ The eastern part of the county is covered with a residual sandy soil.⁶ Running through the prairie⁴s and the sandy soils is another type of transported soil. This is alluvial soil⁷ found chiefly along the North Canadian River and its tributary creeks.

¹C. E. Thornwaite, *Map of Soils*, University of Oklahoma (unpublished).

²Hugh D. Miser, *Geologic Map of Oklahoma*, U.S. Geologic Survey, 1926.

³*Ibid.*

⁴C. W. Thornwaite, *op. cit.*

⁵*Ibid.*

⁶*Ibid.*

⁷*Ibid.*

CHAPTER IV CLIMATE

The Climate of Oklahoma County is of the continental type modified to some extent by winds from the Gulf of Mexico. The annual range in temperature is, therefore, rather marked. The summer temperatures are quite high, while in winter there are often cold spells when the thermometer hovers near zero for several days. In summer there are often droughts of several weeks duration.

The prevailing winds are from the south with an average velocity at Oklahoma City of 11.3 miles per hour.¹ The monthly average at this station varies from slightly more than 9 miles per hour in August to nearly 14 miles per hour in March and April. The highest wind velocity recorded here for a five-minute period was 57 miles per hour on June 24, 1915, and again on June 29, 1918.

Temperature records have been kept in Oklahoma City since 1891. Between that year and 1941 inclusive, the average temperature for January was found to be 37.5 degrees F. For July it was 81.3 degrees. The maximum temperature recorded over this fifty-one year period was 113 degrees on August 11, 1936, and the minimum was -17 on February 12, 1899. The average date of the last, killing frost is March 29, while in the fall the average date of the first killing frost is November 5, giving a growing season of 221 days.

The average annual precipitation is 31.37 inches. February is the driest month of the year, having an average precipitation of 1.13 inches, while May is the wettest month with an average of 4.89 inches. The largest total monthly precipitation was in June 1932, when 14.12 inches were recorded. This was 10.40 inches more than the average for this month, and 2.13 inches more than May 1902, the wettest month previous to this time. The wettest year was 1902 when there were 52.03 inches of precipitation.

¹Annual Meteorological Summary with Comparative Data, 1941, Compiled under the direction of H.F. Walgren, Weather Bureau Office, Oklahoma City. Published in Oklahoma City, 1942.

CHAPTER V ECOLOGY

Oklahoma County has two principal vegetational regions. The eastern three-fifths of the county is occupied by a post oak-black jack post [sic] climax, while the western part supports a mixed grass formation. In addition there is to be found a flood-plain forest of a distinct nature running along the streams through both the prairie and the savanna. The range of the latter two is determined by the type and texture, as well as by the pH of the soil. The oak savanna is found in sandy soil, which would show a high pH value, while the mixed-grass prairie begins abruptly in the finer-textured clay soils of a lower pH value. Since these soils occur in intermixed spots, zones and belts where they merge together, their resulting vegetational expressions are similarly interrupted, although separated from one another.

The dominants in the savanna are *Quercus marilandica* and *Q. Stellata*. There is not much hickory associated with these two oaks although some plants of *Carya Buckleyi* var. *arkansana* may be found.

The association of grasses in the true prairie in the western part of the county has been called by Bruner¹ the *stipa-Koeleria* association after the grasses that are dominant in the prairie states farther north. In our area, however, their places have been taken to a large extent by the bluestems of southern origin.² The chief dominants are species of *Andropogon* and *Bouteloua*.

The flood-plain forests are characterized by a *Populus-Salix* associates*. In association with these is often found *Cephalanthus occidentalis*, while farther from the water *Ulmus americana* and *U. fulva* always occur, often with *Celtis laevigata* and rather scattered specimens of *Prunus mexicana*.

The forests often merge into the prairie with a narrow band of chaparral consisting of characteristic shrubs. Between the flood-plain forests and the grassland these are usually *Rhus glabra*, *R. copallina* var. *latifolia*, *Diospyros virginiana*, *Symphoricarpos orbiculatus*, and *Prunus angustifolia* if any sand is present.

The ecotone between the post oak-black jack associates and the prairie is characterized by *Quercus prinoides*, *Symphoricarpos orbiculatus*, *Rhus copallina* var. *latifolia*, *Rhus glabra*, and *Prunus angustifolia* var. *Watsoni*. Some of these shrubs are common to both ecotones, but *Sambucus canadensis* is characteristic of the transition from flood-plain forest to prairie, while *Quercus prinoides* is found only in the ecotone between the post oak-black jack associates and the prairie.

There are two common disclimaxes, or disturbance climaxes, present. One is made up of cultivated crops.³ Here man determines what the climax vegetation shall be. The second consists of overgrazed pasturelands. Where this condition exists in the prairies the taller grasses are replaced by *Bouteloua hirsuta* and *B. gracilis* associated with *Buchloe dactyloides*. Thus the pasture assumes the aspect of the short-grass plains farther west.

Between the two disclimaxes there is often very little of the original vegetation left. The botanist is often confined to following railroad tracks or searching for out-of-the-way corners if he is to find much of interest. Even in the post oak-black jack woods overgrazing has played a destructive part. In some cases about all that remains is buck brush.

The overgrazed prairies are characterized not only by the short grass species already mentioned, but also by such weedy inedible species as *Vernonia Baldwinii* var. *interior*, *Achillea lanulosa*, *Gutierrezia dracunculoides*, *Artemisia gnaphalodes*, and *Cirsium undulatum*. In fact these species always serve as indicators of overgrazing. Their prominence in a pasture or field should be a warning to the farmer or cattleman to decrease the number of cattle pastured in a given area, or to change pastures long enough to allow the original vegetation to assume its normal dominance.

It is interesting to note that different species of the same genus may be used as indicators of soil types. Thus *Tradescantia occidentalis* is found, in the prairieerths while *T. canaliculata* grows in the sands. *Liatrus punctata* may grow in clay soil, but *L. squarrosa* var. *intermedia* is found in sandy soil or on sandstone outcroppings of soils that may contain some clay. *Lithospermum incisum* is found in clay, but *L. carolinense* grows only in sandy soil in the post oak-black jack associates. Other species, characteristic of sandy soil, are *Psoralea cuspidata*, *P. villosum*, *Ipomoea leptophyllum*, and *Penstemon laxiflorus*.

Prevernal societies on the prairies include *Anemone caroliniana*, *Claytonia virginica*, *Houstonia minima*, *Lithospermum incisum*, *Draba brachycarpa*, *D.*, *reptans*, *Northoscordum bivalve*, and *Androsace occidentalis*. Forming a succession on previously cultivated soil one finds *Stellaria media*, *Viola Kitabeliana* var. *Rafinesquii*, *Capsella Bursa-pastoris*, *Taraxacum laevigatom*, and *Lamium amplexicaule*. In the post oak-black jack region the common plants of this society are *Antennaria fallax*, *Sagina decumbens*, and a small sedge, *Carex microrynchia*. Scattered

individuals of *Viola papilionacea* grow along the creeks through such environments but there is not the abundance of forbs which may be found in the prairie.

Some of the conspicuous components of the vernal societies on the prairies are *Sisyrinchium Bushii*, *Baptisia leucophaea*, *B. australis* var. *minor*, *Senecio plattensis*, *Valerianella stenocarpa* var. *parviflora*, *Tradescantia occidentalis*, *Callirhoe involucrata*, *Specularia biflora*, *Linum Lewisii* var. *pratense*, and *Achillea lanulosa*. Forbs now form a more conspicuous component of the postoak-black jack flora. They include *Lithospermum caroliniense* and *Astranthium integrifolium* var. *ciliatum*. In more open spots and along fields and roadways *Coreopsis grandiflora*, *Schrankia uncinata*, *Penstemon laxiflorus* and *Tradescantia canaliculata* are often found abundance. In succession on disturbed soils often occur *Linaria canadensis* var. *texana*, *Lepidium densiflorum*, *L. virginicum*, *Silene antirrhina*, *Descurainia pinnata* var. *brachycarpa*, and *Chaerophyllum Tainturieri* var. *floridanum*.

Prairie aestival societies include *Petalostemum purpureum*, *P. candidum*, *Psoralea floribunda*, *Sabatia campestris*, *Coreopsis tinctoria*, *Rudbeckia hirta* var. *sericia*, *Rudbeckia amplexicaulis*, *Oenothera serrulata*, *Ruellia caroliniensis*, *Krameria secudiflora*, *Amorpha canescens*, *Acacia angustissima* var. *hirta*, *Ratibida columnifera*,⁴ *Asclepiodora decumbens*, *Thelesperma trifidum*, *Physalis mollis*, *Solanum eleagnifolium* and *Solanum Torreyi*. In the oak postclimax are found *Petalostemum villosum*, *Psoralea cuspidata*, *Galium pilosum* var.

punctulosum, and *Ruellia caroliniensis*. In succession on disturbed areas are found *Helianthus annuus*, *H. petiolaris*, *Croton monanthogynous*, *C. capitatus*, *C. texense* and several species of *Polygonum* including *P. punctatum*, *P. opelousanum*, and *P. Muhlenbergii*. *Cardiospermum Halicacibum* is also abundant here. Several species of *Vitis* in combination with *Ampelopsis cordata*, and *Parthenocissus quinquefolia* form lianas. *Commelina erecta* var. *typica* is a species tolerant of shade, which can be found under those layers.

Some of the serotinal prairie dominants are *Euphorbia marginata*, *Gutierrezia dracunculoides*, *Liatrus punctata*, *Chrysopsis Berlandieri*, *Aster ericoides*, *Aster oblongifolius* var. *rigidulus*, *Vernonia Baldwinii* var. *interior*, *Solidago radula*, *Artemisia gnaphalodes*, *Ambrosia Coronopifolia*, *Helianthus Maximilianus* and *Heterotheca aubaxillaria*. Growing in the post oak-black jack associates one finds *Desmondium marilandicum*, *D. paniculatum*, *Aster patens* var. *gracilis* and *Acalypha gracilens*. Common along the wooded creek sides are *Acalypha rhomboidea*, *Ambrosia trifida* var. *texana*, *Aster Drummondii*, *Aster exilis*, *Verbesina virginica*, *Solidago petiolaris*, *Irensine rhizomatosa* and *Euphorbia heterophylla*.

In summing up the ecological aspects of the county one finds that it lies in a climate favorable to the development of a grassland formation, but due to the presence of sand the eastern three-fifths of the area is largely covered by a post oak-black jackpost climax. A second post climax is the flood- plain forest found along the North Canadian River and its tributaries. Two disclimaxes are present, one caused by overgrazing, the other by cultivation.

¹W. E. Bruner, The
Vegetation of Oklahoma,
Ecological Monographs, Vol. 1,
No. 2, pp. 110-111, April, 1931.

²W.E. Bruner, *The
Vegetation of Oklahoma*,
Ecological Monographs, Vol. 1,
No. 2, l.c.

³Weaver and Clements,
Plant Ecology, pp. 86-89,
McGraw-Hill Book Company, Inc,
New York, 1938.

⁴W. W. Fernald, *New
Species, Varieties and
Transfers*, *Rhodora* 40: 353,
1938.

CHAPTER VI RANGE EXTENSIONS AND PLANTS NEW TO THE COUNTY

In the course of the investigations on which this study is based several plants were collected which have been previously unrecorded from the state. These include *Typha truxillensis*,¹ *Medicago minima*, *Gaura filiformis* var. *typica*², *Achillea lanulosa* forma *rubicunda* and *Tragopogon major*.³ The latter has since been found in several sections of the state. The pink-rayed form of *Achillea lanulosa* is fairly common, but apparently has escaped previous notice.

Elocharis parvula, var. *anachaeta* was collected near Oklahoma City, definitely establishing its occurrence within the state. In his monograph⁴ Svenson included Oklahoma in the mapped range of var. *anachaeta* (Map 3, page 387) but no specimens we recited from our area. This leads one to conclude that Svenson assumed the presence of the variety in Oklahoma, but had no actual specimens from the state. Herbarium sheets were cited by him from Iowa, Colorado, New Mexico and Texas, but from Kansas, Nebraska, Missouri and

Oklahoma he had seen no material.

Cyperus rivularis was found in the eastern portion of the county. It seems to be a rarely collected species. Dr. F. J. Hermann of the U.S. Department of Agriculture has seen no material from Oklahoma. Dr. Hugh O'Neill of the Catholic University of Washington, D.C., writes⁵ that he has seen only two sheets from the state, both of which are in the Gray Herbarium of Harvard University. This station is west of the range as given in all the published floras and manuals.

Xyris torta was an unusual "find". My station in the southeastern part of the county seems to be the identical one from which Dr. Milton Hopkins of the University of Oklahoma collected this species two years earlier. At any rate this appears to be the most northwestern station in the state.

Acer Negundo var. *interior*, previously unrecorded from the state was found along the North Canadian River in the extreme eastern part of the county near Harrah.

Bergia texana, collected north of Oklahoma City, is neither listed by Jeffs and Little in their *Check List*, nor by Stemen and Myers in the *Oklahoma Flora*. However, its occurrence was to be expected as it falls within the range as given by Rydberg's *Flora*. Professor M. L. Fernald wrote⁶ that there is a sheet in the Gray Herbarium "from Arkansas, Indian Territory, September 28, 1894, B.F. Bush, No. 33".

In an investigation of *Ambrosia aptera* and *Ambrosia trifida*⁷ the author came to the conclusion that all of our specimens should be reduced to varietal rank. Professor Fernald⁸ agreed that this entity should be accorded varietal status as *Ambrosia trifida* var. *texana* Scheele, the first available varietal designation.

Some highly localized species were found in the southeastern part of the county. One station where several were found was in marshy springy soil surrounding a small lake about three miles south of Harrah. The lake had been made by damming a small creek, but presumably the spring and marsh, and hence the species characterizing them, were inexistence previously. Here were found *Cyperus rivularia*, *Agrimonia parviflora*, *Rotala ramosier* var. *interior*, *Prunella vulgaris* var. *lanceolata*, *Mimulus ringens*, and *Mimulus glabratus* var. *oklahomensis*.

Growing in alluvial soil in the wooded valley of the North Canadian River about a mile south of Harrah were found *Acer Negundo* var. *interior*, *Ampelopsis arborea*, *Polymnia Uvedalia* var. *densipilis*, *Pluchea purpurascens*, and again *Prunella vulgaris* var. *lanceolata*.

Most of these were probably at the western limit of their range. *Mimulus glabratus* var. *oklahomensis* however is found farther west⁹, but this is the only station the author has found in the county. *Pluchea purpurascens* may be found elsewhere. In their extreme forms, it and *P. camphorata* (*P. petiolata*) seem distinct, but there are several sheets in the Bebb Herbarium of the University of Oklahoma which appear difficult positively to assign to either species.

¹M. L. Fernald, Midsummer Vascular Plants of Virginia. *Rhodora* 37: 385-387, 1935.

²U. T. Waterfall, Interesting Plants of Oklahoma. *Rhodora* 42: 499-502, 1940.

³*Ibid.*

⁴H. K. Svenson, Monographic Studies in Eleocharis III. *Rhodora* 36: 386-389, 1934.

⁵Correspondence with the author.

⁶Correspondence with Dr. Milton Hopkins.

⁷U. T. Waterfall. *Interesting Plants of Oklahoma*, l. c

⁸M. L. Fernald, as editor of *Rhodora*, in editor's footnote to Waterfall's paper.

⁹Norman C. Fassett, Notes from the Herbarium of the University of Wisconsin - XVII. *Rhodora*, 41: 525, 1939

**Ed. Note:*

According to J.E. Clements and F.E. Weaver, Plant Ecology (p46) McGraw Hill 1929; the term associes is "the developmental equivalent of the association ... used where the community is not permanent but is replaced by another in the process of development of succession". [B.H.]

**CHAPTER VII SPERMATOPHYTA OF
OKLAHOMA COUNTY, OKLAHOMA
EXCLUSIVE OF THE GRASSES,
SEDGES AND RUSHES**

(Based on Collections of the Author)

ANGIOSPERMAE

Monocotyledonae

Typhaceae

Typha truxillensis HBK
Typha latifolia L.

Alismaceae

Echinodorus cordifolius (L.)
Griseb. forma *lanceolatus*
Engelm.) Fernald.

Xyridaceae

Xyris torta J. E. Smith

Commelinaceae

Commelina communis L. var. *ludens*
(Miquel) Clark.
Commelina diffusa Burm. F.
(*C. nudiflora* of authors,
C. longicaulis Jacq.).
Commelina erecta L. var. *typica*
Fern.
Commelina erecta L. var. *typical*
Fern., forma *intercursa*
Fern.
Commelina erecta L. var.
angustifolia (Michx.) Fern.
forma *crispa* (Wooton) Fern

Pontederiaceae

Heteranthera limosa (Sw.) Willd.

Liliaceae

Allium canadense L.
Allium mutabile Michx.
Allium Nuttallii Wats.
Androstephium coeruleus
(Scheele) Greene.
Asparagus Officinalis L.
Nothoscordium bivalve (L.)
Britton
Smilax Bona-nox L.
Smilax hispida Muhl.
Yucca glauca Nutt.

Amaryllidaceae

Cooperia Drumondii Herb.

Iridaceae

Sisyrinchium Bushii Bickn.
Sisyrinchium campestre Bickn.
Sisyrinchium graminoides
Bickn.
Sisyrinchium varians Bickn.

Orchidaceae

Spiranthea cernuus L.

Dicotyledoneae

Salicaceae

Populus deltoides Marsh.
Salix interior Rowlee.
Salix interior Rowlee var. *Wheeleri*
Rowlee.
Salix nigra Marsh.

Juglandaceae

Carya Buckleyi Durand var.
arkansana Sarg.
Carya Pecan (Marsh) Engler and
Graebner.
Juglans nigra L.

Fagaceae

Quercus bicolor Willd.
Quercus macrocarpa Michx.
Quercus Marilandica Moench.
Quercus prinoides Willd.
Quercus stellata Wang.

Urticaceae

Boehmeria cylindrica (L.) Sw. var.
Drummondiana Weddell.
Celtis laevigata Willd.
Celtis reticulata Torr.
Maclura pomifera (Ref.) Schneider.
Morus Alba L., var. *tatarica* (L.)
Loud.
Morus rubra L.
Parietaria pennsylvanica Muhl.
Ulmus americana L.
Ulmus fulva Michx.

Loranthaceae

Phoradendron flavescens (Pursh)
Nutt.

Polygonaceae

Eriogonum annuum Nutt.
Eriogonum longifolium Nutt.
Polygonum buxiforme Small.
Polygonum convolvulus L.
Polygonum cristatum Engelm. & Gray.
Polygonum dumetorum L.

Polygonum exsertum Small.
Polygonum lapathifolium L.
Polygonum longistylus Small.
Polygonum Muhlenbergii (Meisn.)
 Wats.
Polygonum opelousanum Riddell.
Polygonum pennsylvanicus L. var.
laevigatum Fernald.
Polygonum punctatum Ell.
Polygonum scandens L.
Polygonum tenue Michx.
Tovaria virginiana (L.) Adams.

Chenopodiaceae

Atriplex argentea Nutt.
Chenopodium ambrosioides L., ss.
Eu-ambrosioides Aellen.
Chenopodium gigantospermum
 Aellen. (C. hybridum of
 Am. Authors).
Chenopodium pratericola Rydb.
 (C. leptophyllum of most
 authors).
Chenopodium Standleyanum Aellen.
 (C. Boscianum moq.in
 part).
Cycloloma atriplicifolium
 (Spreng.) Coult.
Monolepis Nuttalliana (R. & S.)
 Wats.
Salsola kali L. var. *tenuifolia*
 G.F.W. Mey
Saueda linearis (Ell.) Moq.

Amaranthaceae

Acnida tamariscina (Nutt.) Wood.
Amaranthus blitoides Wats.
Amaranthus graeciszans L.
Amaranthus Palmeri S. Wats.
Amaranthus spinosus L.
Amaranthus Torreyi (Gray) Benth.
Froelichia floridana (Nutt.)
 Moq. var. *campestris*
 (Small) Fern.
Froelichia gracilllis Moq.
Iresine rhizomatosa Standley.

Phytolaccaceae

Phytolacca americana L.

Nyctaginaceae

Oxybaphus albidus (Walt.) Sweet.
Oxybaphus floribundus Chois.
Oxybaphus hirsutus (Pursh.)
 Robinson.

Illecebraceae

Paronychia Jamesii T. & G.
Paronychia Wardii Small.

Aizoaceae

Mollugo verticillata L.

Caryophyllaceae

Cerastium brachypodum (Engelm.)
 Robinson
Cerastium nutans Raf.
Sagina decumbens (Ell.) T. & G.
Silene antirrhina L.
Silene antirrhina L. var.
divericata Robinson.
Stellaria media (L.) Cyrill.

Portulacaceae

Claytonia virginica L.
Claytonia virginica L. forma
robusta (Somes) Palmer &
 Steyermark.
Portulaca oleraceae L.
Portulaca parvula Gray. (*P. pilosa*)
Talinum parviflorum Nutt.

Nymphaeaceae

Castalia odorata (Ait.) Woodville &
 Wood.
Nelumbo pentapetala (Walt.)
 Fernald.

Ranunculaceae

Anemone caroliniana Walt.
Clematis Pitcheri T. & G.
Delphinium virescens Nutt. Var.
camporum (Greene) Martin.
Myosurus minimus L.
Ranunculus pusillus Poir.
Ranunculus sceleratus L.

Menispermaceae

Cocculus carolinus (L.) DC.
Menispermum canadense L.

Papaveraceae

Argemone intermedia Sweet.

Fumariaceae

Corydalis aurea Willd. Var.
occidentalis Engelm.
Corydalis campestris (Britton)
 Buckholz & Plamer.

Cruciferae

Arabis virginica (L.) Poir.
Brassica campestris L.
Camelina microcarpa Andrz.
Capsella Bursa-pastoris (L.)
Medic.
Cardamine parviflora L. var.
arenicola (Britt.)
O.E. Schultz.
Chorispora tenella DC.
Descursinia pinnata (Walt.)
Britton. var. *brachycarpa*
(Richardson) Fern.
Draba brachycarpa Nutt.
Draba cuneifolia Nutt.
var. *Helleri* (Small) O. E.
Schultz.
Draba reptans (Lam.) Fernald.
Erysimum repandum L.
Lepidium difflorum Schrad. (L.
apetalum)
Lepidium oblongum
Small. *Lepidium virginicum* L.
Rorippa islandica (Oeder ex
Murr) Borbas.
Rorippa sessiliflora (Nutt.)
Hitchc.
Rorippa sinuata (Nutta.) Greene.
Sisymbrium altissima L.
Sisymbrium officinale Scop.
Streptanthus hyacinthoides Hook.
Thlaspi arvense L.

Capparidaceae

Cleomella angustifolia Torr.
Polansia trachysperma T. & G.

Saxifragaceae

Ribes odoratum Wendl.

Platanaceae

Platanus occidentalis L.

Rosaceae

Agrimonia parviflora Ait.
Crataegus sp.
Fragaria virginiana Duchesne,
var. *illinoensis* (Prince)
Gray.
Geum canadense Jacq.
Prunus angustifolia Marsh.
var. *Watsoni* (Sarg.)
Waugh.
Prunus gracilis Engelm. Gray.
Prunus mexicana Wats.
Rosa foliosa Nutt.

Rubus sp.
Sanguicorba annua Nutt.

Leguminosae

Acacia angustissima (Will.) Kuntze.
var. *hirta* (Nutt.) Robinson.
Amorpha canescens Pursh.
Amorpha fruticosa L. var.
angustifolia Pursh.
Apios americana Medic.
Astragalus canadensis L.
Astragalus Nuttallianus DC.
Astragalus plattensis Nutt.
Baptisia australis (L.) R. Br.
var. *minor* (Lehm.) Fernald.
Baptisia leucantha T. & G.
Baptisia leucophaea Nutt. (B.
bracteata)
Cassia fasciculata Michx. (C.
chamascripta)
Cassia marilandica L. (C. *Medsgeri*)
Cercis canadensis L.
Desmanthus illinoensis (Michx.)
MacM.
Desmodium ciliare DC.
(*D. obtusum*).
Desmodium Dillenii Darl.
Desmodium illinoense Gray.
Desmodium paniculatum (L.) DC. var.
pubens T. & G.
Desmodium sessilifolium (Torrey) T.
& G.
Galactia volubillis (L.) Britton.
var. *mississippiensis* Vail.
Gleditsia tricanthos L.
Gleditsia tricanthos L. forma
inermis C.K. Schneider
Glycyrrhiza lepidota (Nutt.) Pursh.
Gymnocladus dioica (L.) Koch.
Hosackia Americana (Nutt.) Piper.
Indigofera leptosepala Nutt.
Krameria lancolata Torr.
Lespedeza capitata Michx.
Lespedeza intermedia (L.) Britton.
Lespedeza intermedia (L.) Britton,
forma *Hahnii* (Blake) Hopkins.
Lespedeza procumbens Michx.
Lespedeza repens (L.) Barr.
Lespedeza striata (Thub.) H. & A.
Lespedeza Stuevei Nutt.
Lespedeza Stuevei Nutt, forma
angustifolia (Britt.)
Hopkins.
Medicago lupulina L.
Medicago minima L.
Medicago sativa L.

Melilotus alba Desv.
Melilotus officinalis (L.) Lam.
Neptunea lutea (Leavenw.) Benth.
Oxytropus Lambertii Pursh.
Parosela aurea (Nutt.) Britton.
Parosela enneandra (Nutt.)
 Britton.
Petalostemum candidum Michx.
Petalostemum occidentale (Gray)
 Fernald.
Petalostemum purpureum (Vent.)
 Rydb.
Petalostemum purpureum (Vent.)
 Rydb. Forma *pubescens*
 Fassett.
Petalostemum villosum Nutt.
Psoralea digitata Nutt.
Psoralea floribunda Nutt.
Rhynchosia latifolia Nutt.
Robinia pseudo-acacia L.
Schrankia Nuttallii (DC.)
 Standley.
Strophostyles helvola (L.)
 Britton
Strophostyles pauciflora
 (Benth.) Wats.
Stylosanthes biflora (L.) BSP.
 var. *hispidissima* (Michx.)
 Pollard & Ball.
Tephrosia virginiana (L.) Pers.
Tephrosia virginiana (L.) Pers.
 var. *holosericia* (Nutt.)
 T. & G.
Trifolium carolinianum Michx.
Trifolium pratense L.
Vicia caroliniana Walt.
Vicia ludoviciana Nutt.
Vicia villosa Roth.

Linaceae

Linum Berlandieri Hook.
Linum Lewisii Pursh. var.
pratense Norton.
Linum rigidum Pursh.
Linum sulcatum Riddell.

Oxalidaceae

Oxalis stricta L.
Oxalis violacea L.

Geraniaceae

Geranium carolinianum L.

Zygophyllaceae

Kallstroemia intermedia Rydb.
Tribulus terrestris L.

Rutaceae

Ptelea trifoliata L.
Zanthoxylum americanum Mill.

Polygalaceae

Polygala alba Nutt.
Polygala incarnata L.
Polygala verticillata L. var.
isocycla Fernald.

Euphorbiaceae

Acalypha gracilens Gray
Acalypha ostryaefolia Ridd.
Acalypha rhomboidea Raf. (A.
virginica L.)
Croton capitatus Michx.
Croton glandulosus L. var.
septentrionalis Muell. Arg.
Croton Lindheimerianus Scheele.
Croton monanthogyhous Michx.
Croton texensis (Klotzsh) Muell.
 Arg.
Euphorbia arkansana Engelm. & Gray.
Euphorbia Chamaesyche L. (*E. malaca*
 (Small) Little).
Euphorbia corollata L.
Euphorbia corollata L. var. *mollis*
 Millsp.
Euphorbia Geyeri Engelm.
Euphorbia heterophylla L.
Euphorbia hexagona Nutt.
Euphorbia humistrata Engelm. ex.
 Gray.
Euphorbia maculata L. (*E. Preslii*
 Guss.)
Euphorbia marginata Pursh.
Euphorbia missurica Raf. (*E.*
zygophylloides Boiss.)
Euphorbia missurica Raf. Var.
intermedia (Engelm.) L.
 C.Wheeler. (*E. petaloidea*
 (Engelm.) L. C.
Euphorbia obtusata Pursh.
Euphorbia serpens HBK.
Euphorbia strictospora Engelm.
Euphorbia supine Raf. (*E. maculata*
 L.)
Jatropha texana Muell Arg.
Stillingia sylvatica L.

Anacardiaceae

Rhus copallina L. var. *latifolia*
 Engelm.
Rhus glabra L.
Rhus radicans L.

Celastraceae

Celastrus scandens L.
Evonymis atropurpureus Jacq.

Aceraceae

Acer Negundo L.
Acer Negundo L. var. *interior*
(Britton) Sarg.
Acer Negundo L. var. *texanum*
Pax.

Sapindaceae

Cardiospermum Hallicacabum L.
Sapindus Drummondii H. & A.

Rhamnaceae

Ceanothus evatus Desf. var.
pubescens Wats.

Vitaceae

Ampelopsis arborea (L.) Rusby.
Ampelopsis cordata Michx.
Parthenocissus quinquefolia (L.)
Planchl.
Vitis cinerea Engelm.
Vitis palmata Vahl.
Vitis riparia Michx. (*V. vulpina*
auth.)
Vitis vulpina L. (*V. cordifolia*
Michx.)

Malvaceae

Callirhoe alcaeoides (Michx.) Gray.
Callirhoe involucrate (T. & G.)
Gray.
Hibiscus trioneum L.
Sida spinosa L.
Sphaeralcea coccinea (Pursh.)
Rydb.

Hypericaceae

Ascyrum hypericoides L. var.
multicaule (Michx.) Fern.
Hypericum multilum L.
Hypericum punctatum Lam. var.
pseudomaculatum (Bush)
Fern.

Elatinaceae

Bergia texana (Hook.) Seubert.

Cistaceae

Lechea tenuifolia Michx. var.
occidentalis Hodgdon.

Lechea villosa Ell.

Violaceae

Viola Kataibeliana Roem. &
Schultes, var. *Rafinesquii*
Greene) Fern.
Viola missourienses Greene.
Viola papilionaceae Pursh.
Viola primulifolia L. var. *villosa*
A. Eaton.

Passifloraceae

Passiflora incarnata L.

Loasaceae

Mentzelia oligosperma Nutt.

Cactaceae

Mamillaria similes Engelm.
Opuntia humifusa Raf.

Lythraceae

Ammannia coccines Rottb.
Lythrum lanceolatum Ell.
Rotala ramosior (L.) Koehne.

Onagraceae

Gaura filiformis Small. Var. *typica*
Munz.
Gaura parviflora Dougl. Var. *typica*
Munz.
Garua parviflora Dougl. var *typica*
Munz. forma *glabra* Munz.
Gaura tripetala Cav. var.
triangulata (Buckl.) Munz.
Jussiaea diffusa Forsakal.
Ludwigia alternifolia L.
Ludwigia palustris (L.) Ell. var.
Americana (DC.) Fern. &
Grisc.
Oenothera canovirens Steele (Oe.
biennis in part).
Oenothera lacinata Hill.
Oenothera lacinata Hill, var.
grandiflora (Walt.)
Robinson.
Oenothera linifolia Nutt. Var.
typica Munz.
Oenothera missourienses Sims. Var.
oklahomensis (Norton) Munz.
Oenothera rhombipetala Nutt.
Oenothera serrulata Nutt. Var.
typica Munz.
Oenothera serrulata Nutt. Var.
Drummondii T. & G. forma
flava Munz.
Oenothera speciosa Nutt.

Oenothera triloba Nutt.
Stenosiphon linifolium (Nutt.)
Britton.

Umbelliferae

Ammoselinum Butleri (Engelm.) Coult
& Rose.
Chaerophyllum Tainturieri Hook.
var. *floridanum* Coult. &
Rose.
Chaerophyllum texanum Coult. &
Rose
Cicuta maculata L.
Daucus pusillus Michx.
Lomatium daucifolium (Nutt.)
Coutl. & Rose.
Lomatium foeniculaceum (Nutt.)
Coult. & Rose.
Pastinaca sativa L.
Polytaenia Nuttallii (DC.)
Britton.
Ptilimnium capillaceum (Michx.)
Raf.
Sanicula Canadensis L.
Spermolepis divericata (Watt.)
Britton.
Spermolepis echinata (Nutt.)
Heller.
Spermolepis inermis (Nutt.)
Mathias & Constance (*S.*
patens).
Torilis japonicus (Houtt.) DC.
(*T. anthriscus* (L.)
Bernh.)

Cornaceae

Cornus Drummondii Meyer. (*C.*
asperifolia of authors).

Primulaceae

Androsace occidentalis Pursh.
Samolus pauciflorus Raf. (*S.*
floribundus HBK.)

Sapotaceae

Bumelia lanuginose (Michx.)
Pers.

Ebenaceae

Diospyros virginiana L.
Diospyros virginiana L. var.
platycarpa Sarg.

Oleaceae

Fraxinus pennsylvanica Marsh.
var. *Americana* (Borkh.)
Sarg.

Loganiaceae

Polypremum procumbens L.

Gentianaceae

Sabatia angularis (L.) Bursh.
Sabatia campestris Nutt.

Apocynaceae

Apocynum cannabinum L. var.
glaberrimum A. DC.
Apocynum cannabinum L. var.
pubescens (R. Br.) A. DC.
Apocynum sibiricum Jacq.
Apocynum sibiricum Jacq. Var.
Farwellii (Greene) Woodson.

Asclepiadaceae

Acerates auriculata Engelm.
Acerates viridiflora (Rar.) Eaton.
Ampelamus albidus (Nutt.) Britt.
(*Gonolobus laevis* sensu
Vail).
Asclepias amplexicaulis J.E. Smith.
Asclepias galioides HBK.
Asclepias incarnata L.
Asclepias speciosa Torr.
Asclepias stenophylla Gray.
Asclepias tuberosa L.
Asclepias tuberosa L. forma *lutea*
Clute.
Asclepiodora decumbens (Nutt.)
Gray.
Asclepiodora viridis (Walt.) Gray.
Gonolobus gonocarpos (Walt.) Perry.

Convolvulaceae

Convolvulus ambigens House.
Convolvulus sepium L.
Cuscuta arvensis Bevrich.
Evolvulus Nuttallianus Schultze.
(*E. pilosus* Nutt.)
Ipomoea lacunosa L.
Ipomoea leptophylla Torr.
Ipomoea longifolia Benth.

Hydrophyllaceae

Ellisia nyctelea (L.)
Nemophila phacelioides Nutt.
Phacelia hirsute Nutt.

Boraginaceae

Hackelia virginiana (L.) I. M.
Johnston. (*Lappula virginiana*
(L.) Greene.
Heliotropum tenellum (Nutt.) Torr.
Lappula texana (Scheele) Britton.
Lithospermum arvense L.

Lithospermum caroliniense
(Walt.) MacM. (*L. Gmeleni*
in part).
Lithospermum incisum Lehm. (*L.*
angustifolium Michx.)

Verbenaceae

Lippia cuneifolia (Torr.)
Steud.
Lippia lanceolata Michx. var.
recognita Fern. & Grisc.
Verbena bipinnatifida Nutt.
Verbena bracteata Lag. & Rodr.
Verbena canadensis (L.) Britton.
Verbena hastata L.
Verbena pumila Rydb.
Verbena stricta Vent.
Verbena urticaefolia L.

Labiataeae

Hedeoma camporum Rydb.
Hedeoma hispida Pursh.
Lamium amplexicaule L.
Lycopsus americanus Muhl.
Mondarda clinopodioides Gray.
Monarda mollis L.
Prunella vulgaris L. var.
lanceolata (Barton) Fern.
Salvia Pitcheri Torr.
Scutellaria lateriflorus L.
Scutellaria parvula Michx. var.
australis Fassett.
Teucrium canadense L. var.
virginicum (L.) Eaton.

Solanaceae

Datura Stramonium L.
Physalis heterophylla Nees.
Physalis ixiocarpa Brot.
Physalis lobata Torr.
Physalis macrophysa Rydb.
Physalis mollis Nutt.
Physalis pendula Rydb.
Physalis pumila Nutt.
Physalis subglabrata Mack. &
Bush.
Solanum carolinense L.
Solanum elaeagnifolium Cav.
Solanum nigrum L.
Solanum rostratum Dunal.
Solanum Torreyi Gray.

Scrophulariaceae

Buchnera americana L.
Gerardia densiflora Benth.
Gerardia grandiflora Benth. var.

serrata (Torr.) Robinson.
Gerardia heterophylla Nutt.
Llysanthus anagallidea (Michx.)
Robinson.
Leucospora multifida (Michx.) Nutt.
(*Conobea multifida*).
Linaria canadensis (L.) Dumont.
Var. *texana* Pennell.
Mimulus glabratus HBK. var.
Oklahomensis Fassett.
Mimulus ringens L.
Penstemon cobaea Nutt.
Penstemon laxiflorus Pennell.
Penstemon oklahomensis Pennell.
Verbascum Thapsus L.
Veronica arvensis L.
Veronica peregrina L. var.
xalapensis (HBK.) Pennell.

Bignoniaceae

Catalpa speciosa Warder

Acanthaceae

Dicliptera brachiata (Pursh)
Spreng.
Ruellia caroliniensis (Walt.)
Steud. (*R. ciliosa* Pursh.)
Ruellia strepens L.

Plantaginaceae

Plantago aristata Michx.
Plantago Purshii R. & S.
Plantago pusilla Nutt.
Plantago rhodosperma Dcne.
Plantago Rugelii Dcne.
Plantago virginica L.

Rubiaceae

Cephalanthus occidentalis L.
Cephalanthus occidentalis L. var.
pubescens Raf.
Diodia teres Walt. var. *setifera*
Fern. & Grisc.
Galium aparine L. var. *Vaillantii*
(DC.) Koch.
Galium circaezans Michx. var.
hypomalacum Fern.
Galium obtusum Bigel.
Galium pilosum Ait. var.
puncticulosum (Michx.)
T. & G.
Galium virgatum Nutt.
Houstonia nigricans (Lam.) Fern.
H. angustifolia Michx.)
Houstonia minima Beck.

Caprifoliaceae

Sambucus canadensis L.
Symphoricarpos orbiculatus
Moench.
Virburnum rufidulum Raf.

Valerianaceae

Valerianella amarelle (Lindl.)
Krok.
Valerianella radiata (L.) Dufr.
Valerianella stenocarpa (Engelm.)
(Krok.) var. *parviflora*
Dyall.

Cucurbitaceae

Cucurbita foetidissima HBK.
Melothria pendula L.

Campanulaceae

Specularia biflora (R. & P.)
F. & M.
Specularia leptocarpa (Nutt.)
Gray.
Specularia perfoliata (L.) A.
DC.

Lobeliaceae

Lobelia splendens Willd.

Compositae

Achillea lanulosa Nutt.
Achillea lanulosa Nutt. forma
rubicunda Farwell.
Actinea linearifolia (Hook.)
Kuntze.
Actinomeris alternifolia (L.)
DC.
Agoseris cuspidata (Pursh)
Steud.
Ambrosia artemesifolia L. var.
elatior (L.) Descourtils.
Ambrosia coronopifolia T. & G.
Ambrosia trifida L. var. *texana*
Scheele (A. *aptera* DC.)
Antennaria fallax Greene.
Anthemis Cotula L.
Aphanostephus skirrobasis (DC.)
Trel.
Aplopappus ciliatus (Nutt.) DC.
Aplopappus divericatus (Nutt.)
Gray
Artemisia gnaphalodes Nutt.
Aster azureus Lindl.
Aster Drummondii Lindl.
Aster ericoides L. (A.
multiflorus)
Aster exilis Ell.

Aster oblongifolius Nutt. Var.
rigidulus Gray.
Aster patens Ait. Var. *gracilis*
Hook.
Aster praealtus Poir. (A.
salicifolius)
Astranthium integrifolium
(Michx.) Nutt. Var. *ciliatum*
Larsen.
Baccharis salicina T. & G.
Bidens bipinnata L.
Bidens cernua L.
Bidens involucrate (Nutt.) Britton.
Bidens vulgata Greene.
Chaetopappa asteroides DC.
Chrysopsis Berlandieri Greene.
Chrysopsis pilosa Nutt.
Cirsium undulatum (Nutt.) Spreng.
Cirsium virginianum (L.) Michx.
Coreopsis cardaminefolia (DC.)
T. & G.
Coreopsis grandiflora Hogg. ex
Sweet.
Coreopsis tinctoria Nutt.
Echinacea angustifolia DC.
Eclipta alba (L.) Hassk.
Elephantopus carolinianus
Raeuschel.
Erigeron canadensis L.
Erigeron diverticatus Michx.
Erigeron philadelphicus L.
Erigeron ramosus (Walt.) BSP.
Eupatrorium coelestinum L.
Eupatorium perfoliatum L.
Eupatorium serotinum Michx.
Evax multicaulis DC.
Gaillardia lanceolata Michx.
Gaillardia suavis (Gray) Britt. &
Rusby.
Gaillardia trinervata Small
Gnaphalium obtusifolium L.
Gnaphalium purpureum L.
Gutierrezia dracunculoides (DC.)
Blake. *Amphiachyris*
dracunculoides).
Helenium tenuifolium Nutt.
Helianthus annuus L.
Helianthus hirsutus Raf.
Helianthus Maximiliani Schrad.
Helianthus mollis Lam.
Helianthus petiolaris Nutt.
Helianthus tuberosus L.
Heterotheca subaxillaris (Lam.)
Britt. & Rusby.
Hieracium Gronovii L.
Hieracium longipilum Torr.
Hymenopappus tenuifolius Pursh.

- Iva ciliata* Willd.
Krigia occidentalis Nutt.
Kuhnia eupatorioides L.
Kuhnia eupatorioides L. var.
 corymbulosa T. & G.
Lactuca campestris Greene.
Lactuca canadensis L. var.
 latifolia O. Ktze.
Lactuca Canadensis L. var.
 longifolia (Michx.) Farwell.
Lactuca floridana (L.) Gaertn.
Lactuca scariola L.
Liatrus acidota Engelm. & Gray.
Liatrus punctata Hook.
Liatrus squarrosa Willd. var.
 intermedia (Lindl.) DC.
Matricaria matricarioides
 (Less.) Porter.
Parthenium Hysterophorus L.
Pluchea marilandica (Michx.)
 Cass.
Pulchea purpurascens (Sw.) DC.
Polymnia Uvedalia L. var.
 densipilis Blake.
Polypteris macrolepis (Rydb.)
Pyrrhopappus carolinianus
 (Walt.) DC.
Pyrrhopappus scaposus DC.
Ratibida columnifera (Nutt.)
 Woot. & Standl.
Ratibida columnifera (Nutt.)
 Woot. & Standl. forma
 pulcherrima (DC.) Fern.
 & Standl. forma *pulcherrima*
 (DC.) Fern.
Rudbeckia hirta L. var. *sericea*
 (T.V. Moore) Fernald.
Senecio glabellus Poir.
Senecio plattensis Nutt.
Serinia oppositifolia (Raf.)
 Kuntze.
Silphium asperrimum Hook.
Silphium laciniatum L.
Solidago Canadensis L.
Solidago Hellari Small.
Solidago leptoccephala T. & G.
Solidago petiolaris Ait.
Solidago radula Nutt.
Solidago rigida L.
Solidago serotina Ait.
Solidago ulmifolia Muhl.
Sonchus asper (L.) Hill.
Taraxacum laevigatum (Willd.) DC.
Taraxacum palustre (Lyons) Lam. &
 DC. var. *vulgare* (Lam.) Fern.
Thelesperma trifidum (Poir)
 Britton.
Tragopogon major Jacq.
Verbesina encelioides (Cav.) Gray.
Verbesina virginica L.
Vernonia Baldwinii Torr. var.
 interior (Small) Schuberr.
Xanthisma texanum DC.
Xanthium italicum Moretti.

CHAPTER VIII TABULAR VIEW OF THE FAMILIES OF THE SPERMATOPHYTA

Classes, Families, etc.	Genera	Species/ Var-form			
Monocotyledonae			25. Ranunculaceae	5	5/1
1. Typhaceae	1	2	26. Menispermaceae	2	2/1
2. Alismaceae	1	1	27. Papaveraceae	1	1
3. Xyridaceae	1	1	28. Fumariaceae	1	1/1
4. Commelinaceae	2	5/3	29. Crucifera	14	18/3
5. Pontederiaceae	1	1	30. Capparidaceae	2	2
6. Liliaceae	6	9	31. Saxifragaceae	1	1
7. Amaryllidaceae	1	1	32. Platanaceae	1	1
8. Iridaceae	1	4	33. Rosaceae	8	8/2
9. Orchidaceae	1	1	34. Leguminosae	31	52/12
Dicotyledonae			35. Linaceae	1	3/1
10. Salicaceae	2	3/1	36. Oxalidaceae	1	2
11. Juglandaceae	2	3	37. Geraniaceae	1	1
12. Fagaceae	1	5	38. Zygophyllaceae	2	2
13. Urticaceae	6	7/2	39. Rutaceae	2	2
14. Loranthaceae	1	1	40. Polygalaceae	1	2/1
15. Polygonaceae	3	15/1	41. Euphorbiaceae	5	23/3
16. Chenopodiaceae	6	9/1	42. Anacardiaceae	1	2/1
17. Amaranthaceae	4	9/1	43. Celastraceae	2	2
18. Phytolaccaceae	1	1	44. Aceraceae	1	1/2
19. Nyctaginaceae	1	3	45. Sapindaceae	2	2
20. Illecebraceae	1	2	46. Rhamnaceae	1	1/1
21. Aizoaceae	1	1	47. Vitaceae	3	7
22. Caryophyllaceae	4	5/1	48. Malvaceae	4	5
23. Portulacaceae	3	4/1	49. Tamaricaceae	1	1
24. Nymphaeaceae	2	2	50. Hypericaceae	2	1/2

51. Elatinaceae	1	1	74. Solanaceae	3	14
52. Cistaceae	1	1/2	75. Scrophulariaceae	9	11/4
53. Violaceae	1	2/2	76. Bignoniaceae	1	1
54. Passifloraceae	1	1	77. Acanthaceae	2	3
55. Loasaceae	1	1	78. Plantaginaceae	1	6
56. Cactaceae	2	2	79. Rubiaceae	4	5/5
57. Lythraceae	3	3	80. Caprifoliaceae	3	3
58. Onagraceae	5	12/6	81. Valerianaceae	1	2/1
59. Umbelliferae	11	14/1	82. Cucurbitaceae	2	2
60. Cornaceae	1	1	83. Campanulaceae	1	3
61. Primulaceae	2	2	84. Lobeliaceae	1	1
62. Sapotaceae	1	1	85. Compositae	60	95/15
63. Ebenaceae	1	1/1	Total**	15	26/3
64. Oleaceae	1	1/1	Monocotyledonae		
65. Loganiaceae	1	1	Total**	283	449/84
66. Gentianaceae	1	2	Dicotyledonae		
67. Apocynaceae	1	1/3	Total**	298	475/87
68. Asclepidaceae	4	12/1	ANGIOSPERMAE		
69. Convolvulaceae	5	7	Total**	298	475/87
70. Hydrophyllaceae	3	3	SPERMATOPHYTA		
71. Boraginaceae	4	6			
72. Verbenaceae	2	8/1			
73. Labiateae	8	8/3			

**Ed. Note: While numbering of species in the chart has been edited, errors in totals have not been corrected. Editor counts 25 species of monocots and 456 species of dicots making angiosperm and spermatophyte totals of 481. Also, a total of 85 varieties or forms of dicots and 3 monocot varieties total 88 varieties and forms. Author did not have the benefit of an electronic calculator. [S.S.]

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**Ed. Note:*

For historical purposes much of Waterfall's original format has been retained. Species epithets derived from a person's name are capitalized and margins are left-justified only. A similar font has been used. However, we have edited the thesis for readability. Footnotes have been moved from the bottom of each page to the end of each chapter. Italics have been substituted for underscoring of scientific names and the text has been formatted in two columns. [S.S.]