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FLORA OF KIOWA COUNTY, OKLAHOMA

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NOV 11 1938

FLORA OF KIOWA COUNTY, OKLAHOMA

By

Lottie Opal Baldock

Bachelor of Arts

Southwestern State Teachers College

Weatherford

1937

Bachelor of Science

Southwestern State Teachers College

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In Partial Fulfillment of the Requirements

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1938

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Approved:

N. J. Featherly
Advisor

K. Stan Cheshe
Head of Department of Botany and Plant Pathology

W. C. Winters
Dean of the Graduate School

PREFACE

The main value of studies such as this is to establish the distribution of species and to observe the varying ecological conditions in which the plants under consideration are growing.

Plants considered in this study and included in the list are native wild species and mainly indigenous to the county; however, a few species of cultivated plants are listed in cases where they have escaped cultivation and seem to have established themselves in the new habitat.

The author does not aim to give a complete list of the vascular plants of the county as the time was limited, and such a survey is a fit subject for more advanced graduate work.

The writer wishes to express her appreciation to the following people for their services in preparing this paper: Dr. H. I. Featherly of the Oklahoma Agricultural and Mechanical College, under whose direction this study was made, for constant advice and criticism; Dr. K. Starr Chester, head of the department of botany, and Professor R. H. Stratton of the same department for their aid in securing materials; Dr. Elbert L. Little, Jr., in the United States Forest Service at Flagstaff, Arizona, for suggestions; and to her family for assistance in collecting and preparing specimens.

LOTTIE OPAL BALDOCK

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INTRODUCTION

This paper presents the results of taxonomic and ecological studies of the plants of Kiowa County, Oklahoma. The collections were begun in 1933 and continued until the summer of 1938; however, little intensive collecting was done until the spring and summer of 1938. More systematic work has been done with the spring and summer flowering plants than with those flowering in the fall. In most cases the nomenclature is that of "Gray's Manual (11); however, the "Oklahoma Flora" by Stemen and Meyers (15) was used as a check and in some cases plants were listed in the latter publication only. For the grasses Hitchcock (7) was the final authority.

LOCATION AND SIZE

Kiowa County is in southwestern Oklahoma. It comprises an area of 1,025 square miles, or 656,000 acres. The county is bounded by Washita on the north, Greer and Jackson on the west, Tillman on the south, and Comanche and Caddo Counties on the east. Hobart, the county seat and largest town, is located in the northwestern part, about one hundred thirty-six miles southwest of Oklahoma City. The elevation at Hobart is 1,536 feet. (16)

HISTORY

In 1834 a large military expedition was sent out from Forts Gibson and Towson to stop the warfare among the Indians and to pay a visit to the wild bands of Kiowas, Wichitas, and Comanches who lived among the Wichita Mountains. This was probably the first official expedition to reach any part of Kiowa County. They explored the region about the Wichita Mountains going as far west as North Fork Red River. George Catlin, the famous painter of Indian pictures, was with this expedition and left many pictures of things he observed.

The county was opened to settlement by a proclamation of President McKinley on July 4, 1901. The land was allotted by drawing for a choice. This county was formerly a part of the Kiowa, Comanche, and Apache Indian Reservation. In 1910 a part of the county was taken with a part of Comanche County to form Swanson County (6), but the creation

of Swanson County was declared illegal by a decision of the Supreme Court of Oklahoma, August 9, 1911, and the territory was restored to the former counties. A part was annexed to Tillman county.

The main industry is farming with cotton and wheat as the leading crops. Quarrying of granite is carried on to a small extent.

Original dominant vegetation in the county consisted of grasses, a scattered growth of mesquite Prosopis juliflora glandulosa, and cactus Opuntia humifusa. Along the streams cottonwood Populus deltoides, elm Ulmus americana and pecan Carva illinoensis were in predominance. During the winter the grasses in the valley provide the chief source of feed for livestock. Before the land was open for settlement, these valleys were highly prized among the Indians for grazing purposes.

TOPOGRAPHY

The Wichita Mountains in the south central and eastern portion rise abruptly above the gently rolling plains which are characteristic of the prairies. The mountains are composed of igneous rocks surrounded by sedimentary formations. The igneous rocks are pre-cambrian, but younger than the Proterozoic rocks which they have intruded. Most of the rock is medium to fine grained pink granite, except those of the northern range in the eastern part of the county which are made up of limestone. The granite mountains are covered with a scrubby growth of oaks but the limestone hills are

comparatively barren. The southward facing escarpment which crosses the northern part of the county shows a distinctly different physical feature. This escarpment is composed of calcareous ledges of the Blaine formation. (13)

STREAMS AND DRAINAGE

North Fork Red River, bounding the county on the west, and Washita River, along the northeastern edge are the two largest streams. Most of the drainage waters flow through them from their several tributaries. East Fork of Deep Red Creek and its tributaries with East, West, and Middle Otter Creeks drain the lower southern section. North Fork Red River with Elk Creek and their tributaries drain the western section. The northeastern section of the county is drained by Washita River, Rainy Mountain, Saddle Mountain and Stinking Creeks.

SOIL

The soils of 95 per cent of the area of Kiowa County are heavy in texture either in the surface soil or subsoil, clay loam mainly in both, and the rest, which occur in irregularly shaped areas in different parts of the county are sandy. The sandy soils are found along the two rivers mentioned, at the western boundary, and the northeastern corner. The outstanding difference between the sandy soils and the clay loam soils is that the material of the sandy areas is much more friable throughout the surface soil and subsoil, continuing to a depth of several inches.

Foard silt loam comprises about 128,896 acres (6) or 19.6 per cent of the total. This type has a dark-brown surface soil that extends to a depth of six inches, where it gradually passes downward to a dark-brown or brown heavy plastic subsoil. The color in this layer gradually changes to a yellowish brown. At a depth of eighteen inches lime is present in sufficient quantities to effervesce in acid.

Tillman clay loam is next in importance with 112,064 acres or 17.1 per cent. It has a chocolate-brown friable surface soil that passes at a depth of six inches into a dark-brown friable subsurface soil. At about twelve inches this changes to a chocolate-brown or reddish-brown clay subsoil which is tough and plastic when wet and very hard and dense when dry. At a depth of about twenty-four inches lime is first reached in the form of hard concretions or in a finely disseminated form.

The third important type of soil is Vernon clay loam which covers 65,536 acres or 10.0 per cent of the land. The surface soil of Vernon clay loam consists of reddish-brown, brown, or chocolate-brown friable material to a depth of four inches. The subsoil is reddish-brown granular clay loam which continues to a depth of about twelve inches where it changes into a reddish-brown clay which is plastic when wet but very hard when dry. This soil is found chiefly on slopes along the valleys and in areas that are cut by many drainage channels. Both Tillman and Vernon clay loams are best suited for pasture (6) as showed by the severely eroded areas over the county where these soils have not been

cultivated carefully. In many places erosion is quite severe although the land has been cultivated little more than thirty years. Foard silt loam belongs to the better productive group of soils and is more suited to cultivation.

CLIMATE

The average yearly rainfall for Hobart from 1903 to 1930 was 28.13 inches. The months April, May and June received the most rainfall while December, January, and February proved to be the driest months for those years. The lowest average rainfall came in the year of 1910 which was 12.72 inches. The other extreme was 45.33 for 1908 (16); however, the year 1938 has proved a record one for moisture. From January to May the average precipitation was from an inch to an inch and one-half above the average for each month.

Prevailing winds are from the south in all months except December when they are from the north. The lowest temperature recorded over a period of twenty-eight years is -11 degrees; the highest is 114 degrees with an average minimum temperature of 48.0 degrees and an average maximum of 74.6 degrees for the period. The average date of the last killing frost comes November second. There is an average growing season of two hundred thirteen days.

PREVIOUS COLLECTORS

Dr. G. G. Shumard (2, 3) was perhaps the first person to make a collection of plants in this vicinity. He was with Captain R. B. Marcy on his expedition of 1852 to the course of the North Fork of the Red River. The expedition entered the state near the center of the southern border and passed through the Wichita Mountains and into the panhandle of Texas. About one hundred plants were collected within the present boundaries of Oklahoma.

Probably the largest single collection was made by the late Dr. G. W. Stevens in 1913 while he was preparing his "Flora of Oklahoma". This complete collection is now in the Gray Herbarium at Harvard. Oklahoma Agricultural and Mechanical College has more specimens from the Stevens collection than any other herbarium within the state.

Professor Robert Stratton of Oklahoma Agricultural and Mechanical College has collected in the vicinity to add to his personal herbarium of Leguminosae and for the college herbarium. In 1932 Miss Rotha Bull made a collection of the plants of Greer County which is separated from Kiowa County on the west by North Fork Red River. Mr. C. T. Eskew made a collection of plants in 1937, of the Wichita National Forest, within the boundaries of Comanche County, which adjoins Kiowa County on the east.

ECOLOGY

The most common pre-vernal plants are Claytonia virginica, Verbena canadensis, Viola rafinesquii, Viola papilionacea, Erysimum asperum, Anemone caroliniana, A. decapetala, Lithospermum angustifolium, Cercis canadensis, Verbena bipinnatifida, Allium mutabile, A. nuttallii, Nothascordum bivalve, and Physalis lobata. All of these were to be found on the streams and ravines. The prairie communities have fewer flowering plants, the outstanding one are Verbena bipinnatifids, Allium nuttallii, Nothascordum bivalve, Physalis lobata, Anemone, and Lepidium apetalum. Liliaceae and Violaceae have more representatives at this time than other families.

Among the spring plants are: Tradescantia reflexa; T. occidentalis; Baptisia bracteata; B. australis; Corydalis; Oxalis; and a great percent of Cruciferae, all of which appear on mountain and stream with the budding trees and other woody plants. Cruciferae are in more abundance on the prairies along with Malvastrum coccineum, Opuntia humifusa, Oenothera laciniata, Hordeum pusillum, Bromus unioloides, Festuca octoflora, Aristida purpurea, Yucca glauca, and Oxalis. Grasses begin flowering in late spring and early summer when they become predominant.

Leguminosae is another family which flowers mainly in the summer. Other plants which become predominant at this time are: Argemone alba; A. intermedia; Cirsium discolor; Centaurea americana; Gaillardia; Tribulus terrestris;

Plantago purshii; Krameria secundiflora; Erigeron ramosus; Chloris verticillata; Solanum elaeagnifolium; S. rostratum; Polygonum; Salsola kali and the greatest percent of Euphorbiaceae.

During the latter part of the summer the composites begin to gain predominance as for number of species in flower but the grass family is still the most important as to the amount of space it covers. During the autumn the outstanding plants are Helianthus, Rhus, Vernonia, Euphorbia marginata, Liatris punctata, Solidago, Aster, Ambrosia, Xanthium, Sorghastrum nutans and others of the tall grass group.

Annual and biennial plants on the mountains and streams are not so different from those of the prairies in the summer and fall as they are in the spring. The fall grasses are more adapted to the former habitat. Many woody plants are seeding in the autumn and in the latter part of the year the mountainsides are colorful with the brilliant foliage of the trees and shrubs.

Along the streams trees and woody plants are dominant. Carya illinoensis, Juglans nigra, Rhus glabra, Ulmus americana, Vitis, Fraxinus, Toxicodendron, Sapindus drummondii, and Salix nigra are the outstanding plants in this type of vegetation. These same genera are found on the mountains, but species of Quercus become dominant in the eastern section of the county. Other mountain plants are Rhus trilobata, Ptelia trifoliata, Ribes aureum, Baptisia, Sedum, Caenothus americanus, Rubus, Galium aparine, and Poa arachnifera.

nifera.

Plants in dry sand and along the rivers form another distinctly different type. Artemisia, Mentzelia, Sporobolus, and species of Prunus form the dominant covering on the sand hills and Tamarix gallica is found in abundance in damp sandy soil. Other outstanding plants here are: Verbena canadensis, Comandra pallida, Lithospermum angustifolium, Cenchrus, and species of Gaura.

The types of vegetation mentioned above are all connected by the prairie type which covers the greatest percent of the area of the county. Here is found one main association in the undisturbed pastures. Prosopis juliflora var. glandulosa forms an orchard type of growth and under the trees the dominant vegetation is Buchloe dactyloides interspersed with Opuntia humifusa.

LIST OF SPECIES

PTERIDOPHYTES

Polypodiaceae

Cheilanthes eatoni Baker. Eaton's Lip-fern.

Mountainside

Cheilanthes lanulosa (Michx) Watt. Hairy Lip-fern.

Mountainside

Notholaena standleyi Maxon. Standley's Notholaena.

Mountainside

Pellaea atropurpurea (L) Link. Purple Cliff-brake.

Mountainside

Woodsia obtusa (Spreng.) Torr. Blunt-lobed Woodsia.

Mountainside

Marsileaceae

Marsilea vestita Hook & Grev. Water fern. Hairy Pepperwort.

Low places, pastures.

SPERMATOPHYTES

Gymnospermae

Pinaceae

Juniperus virginiana L. Red Cedar.

Hillsides

Angiospermae

Monocotyledonae

Typhaceae

Typha latifolia L. Broad-leaved Cat-tail.

Pond.

Summer.

Gramineae

Agropyron repens (L.) Beauv. Couch Grass.

Fields. Summer.

Agropyron smithii Rydb. Western Wheat-grass.

Prairies. Spring and summer.

Agrostis hyemalis (Walt.) BSP. Ticklegrass.

Mountainside.

Alopecurus geniculatus L. Marsh Foxtail.

Stream

Andropogon saccharoides S. W. Andropogon.

Creek. Summer.

Andropogon furcatus Muhl. Forked Beard-grass. Big Blue-stem.

Mountainside.

Andropogon scoparius Michx. Prairie Beard-grass.

Roadside.

Aristida dichotoma Michx. Aristida.

Prairie. Summer.

Aristida oligantha Michx. Few-flowered Aristida.

Pastures. Summer.

Aristida purpurea Nutt. Purple Three-awn.

Prairie. Spring.

Aristida purpurescens Poir. Purplish Aristida.

Pastures and roadsides.

Bouteloua breviseta Vasey. Bouteloua.

Creek. Spring and summer.

Bouteloua curtipendula (Michx.) Torr. Tall Grama-grass.

Prairie. Summer.

Bouteloua gracilis (HBK.) Lag. Blue Grama-grass.

Pastures. Summer and fall.

Bouteloua hirsuta Lag. Hairy Mesquite-grass.

Pastures. Summer.

Bromus arvensis L. Field Chess.

Roadside. Summer.

Bromus commutatus Schrad. Brome Grass.

Roadside. Common. Summer.

Bromus unioloides HBK. Brome Grass.

Pastures and roadsides. Spring.

Buchloe dactyloides (Nutt.) Engelm. Buffalo Grass.

Pastures. Summer.

Cenchrus pauciflorus Benth. Field Sandbur.

River. Summer.

Chloris verticillata Nutt. Windmill Grass.

Prairies. Common. S Spring.

Cynodon dactylon (L.) Pers. Bermuda Grass.

Roadsides. Common. C

Digitaris sanguinalis (L.) Scop. Large Crab-grass.

Fields.

Echinochloa crusgalli (L.) Beauv. Barnyard Grass.

Streams.

Eleusine indica (L.) Gaertn. Goosegrass.

Pastures.

Elymus canadensis L. Birginia Wild-rye.

Streams and ravines.

Elymus virginicus var. glabriflorus (Vasey.) Bush.

Streams.

Eragrostis capillaris (L.) Nees. Lace-grass.

Prairie. Summer.

- Eragrostis cilianensis (All.) Link. Stinkgrass.
Fields and roadsides Summer.
- Eragrostis curtipendicellata Buckl. Short-stalked Love-grass.
Roadsides and pastures. Summer.
- Eragrostis secundiflora Presl. Love-grass.
Near river. Summer.
- Eragrostis trichodes (Nutt.) Nash. Eragrostis.
Near river Summer.
- Festuca octoflora Walt. Six-weeks Fescue.
Fields and pastures. Spring.
- Hordeum pusillum Nutt. Little Barley.
Prairie. Spring.
- Leptoloma cognatum (Schult.) Chase. Diffuse Crab-grass.
Fields. Fall.
- Melica nitens (Scribn.) Nutt. Three-flower Melic.
Mountainside. Spring.
- Panicum agrostoides Spreng. Panicum.
Streams.
- Panicum anceps Michx. Panicum.
Along river.
- Panicum capillare L. Witch-grass. Tumble-weed.
Fields. Summer.
- Panicum dichotomiflorum Michx. Fall Panicum.
Streams. Fall.
- Panicum obtusum H. B. K. Blunt Panic-grass. Range-grass.
River.
- Panicum tennesseeense Ashe. Panicum.

- Mountain ravine.
- Panicum virgatum L. Switch-grass. Wild Red-top.
Creek. Fall.
- Paspalum pubescens chl. Paspalum.
Along river.
- Phalaris caroliniana Walt. Carolina Canary-grass.
Moist places, roadside. Spring.
- Poa arachnifera Torr. Texas Blue Grass.
Highways and hillsides. Spring.
- Schedonnardus paniculatus (Wutt.) Trel. Texas Crab-grass.
Wire-grass.
Prairies. Common. Summer.
- Setaria geniculata (Lam.) Beauv. Knot-root Bristle-grass.
Creek and roadsides. Spring.
- Setaria lutescens (Weigel) Stuntz. Yellow Fox-tail.
Roadsides. Common. Late spring.
- Setaria viridis (L.) Beauv. Green Foxtail-grass.
Fields. Summer.
- Sorghastrum nutans (L.) Nash. Indian-grass.
Mountain. Fall.
- Sorghum halepense (L.) Pers. Johnson Grass.
Roadside ditches. Summer.
- Sphenopholis obtusata (Michx.) Scribn. Prairie Wedge Grass.
Streams.
- Sporobolus cryptandrus (Torr.) Gray. Sand Dropseed.
River. Summer and fall.
- Triodia flava (L.) Smyth. Purpletop.
Mountain ravine.

Triodia pilosa (Buckl.) Merr. Hairy Triodia.

Mountainside. Spring.

Uniola latifolia Michx. Broadleaf Uniola.

Mountain. Autumn.

Cyperaceae

Carex vulpinoidea Michx. Fox Sedge.

Mountain ravine. Summer.

Cyperus esculentus L. Yellow Nut-grass.

River.

Cyperus feax Rich. Coarse Cyperus.

Damp soil. Pasture.

Cyperus ovularis (Michx.) Torr. Globase Cyperus.

River.

Cyperus strigosus L. Straw colored Cyperus.

Mountain ravine.

Eleocharis acuminata (Muhl.) Nees. Flat-stemmed Spike-rush.

Pond. Summer.

Fuirena simplex Vahl. Western-umbrella-grass.

River. Late summer.

Hemicarpha micrantha (Vahl) Britton. Dwarf Sedge.

Riverside. Summer and fall.

Scripus americanus Pers. Three-cornered Bulrush. Sand-

bar Bulrush.

Damp ravine. Summer.

Scirpus lineatus Michx. Reddish Bulrush.

Damp ravine. Summer.

Commelinaceae

Commelina crispa Wooton. Crinkle-leaved Day-flower.

Mountainside. Summer.

Commelina erecta L. Slender Day-flower.

Creek. Spring to fall.

Commelina hirtella Vahl. Bearded Day-flower.

Stream. Summer.

Commelina virginica L. Virginia Day-flower.

Mountain ravine. Summer.

Tradescantia occidentalis (Britton) Smyth. Western

Spiderwort. Trinity.

Mountainside. Spring.

Juncaceae

Juncus aristulatus Michx. Large Grass-leaved Rush.

Riverside.

Juncus brachysarpus Engelm. Rush.

Roadside ditch. Summer.

Juncus interior Wiegand. Indian Rush.

Roadside ditch. Summer.

Juncus marginatus var. setosus Coville. Awn-petaled Rush.

River. Summer.

Juncus torreyi Coville. Torrey's Rush.

River. Summer.

Liliaceae

Allium nutabile Michx. Wild Onion.

Damp soil. Roadside. Spring.

Allium nuttallii S. Wats. Nuttall's Wild Onion.

- Roadside. Spring.
- Allium reticulatum Don. Wild Onion.
Mountain ravine. Late spring.
- Androstephium coeruleum (Schelle) Greene. Androstephium.
Prairies. Rare. Early spring.
- Camassia esculenta (Ker) Robinson. Hyacinth. Eastern
Camass.
Mountain ravine.
- Nothoscordum bivalve (L.) Britton. Yellow False Garlic.
Pastures and fields. Spring and fall.
- Polygonatum commutatum (R. & S.) Dietr. Great Solomon's
Seal.
Damp shady place. Summer.
- Smilax bona-nox (L.) Britton. Spiny-leaved Greenbrier.
Creek. Spring.
- Smilax herbacea L. Carrion Flower.
Mountain ravine. Summer.
- Smilax rotundifolia L. Common Greenbrier. Horse-brier.
Creek. Spring.
- Yucca glauca Nutt. Yucca. Bear-grass. Soap Weed.
Pastures and roadsides. Spring.

Amaryllidaceae

- Cooperia drummondii Herb. Prairie Lily.
Mountain ravine. Spring.

Iridaceae

- Sisyrinchium angustifolium Mill. Blue-eyed Grass.

Creek. Spring.

Sisyrinchium gramineum Curtis. Stout Blue-eyed Grass.

Prairie. Spring.

Sisyrinchium varians Bicknell. Variable Blue-eyed Grass.

Prairie. Spring.

Dicotyledoneae

Salicaceae

Populus deltoides Marsh. Cottonwood. Necklace Poplar.

Creek. Pre-vernal.

Salix nigra Marsh. Black Willow.

Damp soil, streams. Spring.

Juglandaceae

Carya illinoensis (Wang.) K. Koch. Pecan.

Streams. Spring.

Juglans nigra L. Black Walnut.

Creek. Spring.

Juglans rupestris Engelm. Little Walnut.

Creek. Spring.

Fagaceae

Quercus macrocarpa Michx. Bur Oak. Mossy-cup Oak.

Mountainside. Pre-vernal.

Quercus marilandica Muench. Black Jack Oak.

Mountain. Pre-vernal.

Quercus prinus L. Cow Oak. Swamp Oak.

Mountain. Spring.

Quercus schumardii Buckl. var. schneckii (Britton) Sarg.

Schneck's Red Oak. Spotted Oak.

Mountain. Spring.

Quercus stellata Wang. Post Oak.

Mountain. Spring.

Quercus virginiana Mill. Live Oak.

Mountain. Pre-vernal.

Urticaceae

Celtis laevigata Willd. Southern Hackberry.

Creek. Spring.

Celtis occidentalis var. crassifolia (Lam.) Gray. Rough-leaved Hackberry.

Mountain and stream. Early spring.

Morus rubra L. Red Mulberry. Wild Mulberry.

Creek. Spring.

Ulmus americana L. White, American, or Water Elm.

Creek. Early spring.

Ulmus fulva Michx. Slippery or Red Elm.

Mountain ravine. Spring.

Santalaceae

Comandra pallida A. D. C. Bastard Toad-flax.

Dry sandy soil, near river. Spring.

Polygonaceae

Eriogonum annuum Nutt. Annual Gray-weed.

- Prairie. Summer.
- Eriogonum longifolium Nutt. Long-leaved Gray-weed.
River. Summer and fall.
- Polygonum acre HBK. Water Smart-weed. Dotted Water Pepper.
Mountain ravine. Summer and fall.
- Polygonum aviculare L. Joint-weed. Pink-weed.
Near dwellings. Summer.
- Polygonum hydropiper L. Common Smart-weed.
Lake. Late summer.
- Polygonum lapathifolium L. Dock-leaved Joint-weed.
Ravine. Summer.
- Polygonum pennsylvanicum L. Showy Joint-weed.
Stream. Summer.
- Polygonum ramosissimum Michx. Bushy Joint-weed.
River. Summer.
- Polygonum tenue Michx. Slender Joint-weed.
Mountain. Summer.
- Rumex altissimus Wood. Tall Dock.
Roadside. Summer.
- Rumex crispus L. Dock. Curly Dock.
Roadside ditches. Common. Summer.
- Rumex elongatus Guss. Dock.
Damp soil, mountain. Spring and summer.

Chenopodiaceae

- Chenopodium album L. Lamb's Quarters.
Roadside. Common. Summer.
- Chenopodium album var. viride (L.) Moq. Lamb's Quarters.

- Roadside. Summer.
- Cyclolops atriplicifolium (Spreng.) Coult. Sand Tumbleweed.
- River. Summer.
- Monolepis nuttalliana (R. & S.) Greene. Monolepis.
- Common near dwellings. Spring.
- Salsola kali L. Russian Thistle.
- Roadside and cultivated soil. Summer.

Amaranthaceae

- Amaranthus blitoides S. Wetts. Prostrate Amaranth.
- Common, fields and pastures. Summer.
- Amaranthus hybridus L. Dark Green Pig-weed.
- Pastures. Spring to fall.
- Amaranthus retroflexus L. Red Root.
- Roadside. Spring and summer.
- Acnida tamariscina (Nutt.) Wood. Western Water-hemp.
- Pastures. Summer.
- Froelichia floridana (Nutt.) Moq. Prairie Froelichia.
- River. Summer.

Phytolaccaceae

- Phytolacca americana L. Pokeweed.
- Creek bank. Summer.

Nyctaginaceae

- Oxybaphus albidus (Walt.) Sweet. White Oxybaphus.
- Roadside, dry sand. Summer.

Oxybaphus hirsutus (Pursh) Sweet. Hairy Oxybaphus.

Dry soil, roadside. Summer.

Oxybaphus linearis (Pursh) Robinson. Oxybaphus.

Prairie. Summer.

Oxybaphus nyctagineus (Michx.) Sweet. Petioled Wild Four-
o'clock.

Creek. Spring.

Illecebraceae

Paronychia jamesii T. & G. James's Whitlow-wort.

Prairie. Summer.

Aizoaceae

Mullugo verticillata L. Carpet-weed.

Common, pastures. Summer.

Caryophyllaceae

Cerastium brachypodum (Engelm.) Robinson. Short-stalked
Chickweed.

Prairies. Spring.

Cerastium nutans Raf. Long-stalked Chickweed.

Mountainside. Spring.

Silene antirrhina L. Sleepy Catchfly.

Roadside. Spring.

Stellaria media (L.) Cyrill. Common Chickweed. Starwort.

Low damp place. Early spring.

Portulacaceae

Claytonia virginica L. Spring Beauty.

Common, Creeks and pastures. Early spring.

Ranunculaceae

Anemone caroliniana Walt. Carolina Anemone.

Common, pastures. March and April.

Anemone decapetala Ard. Ten-petaled Anemone.

Pastures. Spring.

Clematis pitcheri T. & G. Virgin's Bower. Leather-flower.

Creek and mountain ravines. Spring.

Delphinium penardi Huth. Larkspur.

Mountain and roadside. Spring.

Myosurus minimus L. Mouse Tail.

Streams and fields. Early spring.

Menispermaceae

Cocculus carolinus (L.) DC. Carolina Moonseed.

Streams. Summer.

Papaveraceae

Argemone alba Lestib. White Prickly Poppy.

Roadside. Spring and summer.

Argemone intermedia Seet. Prickly Poppy.

Roadside. Summer.

Fumariaceae

Corydalis aurea Willd. Golden Corydalis.

Prairie. Spring.

Corydalis campestris Britton. Plains Corydalis.

Creeks and in pastures near moisture. Spring.

Cruciferae

Arabis virginica (L.) Trel. Cut-leaved Rock-cress.

Mountainside. Early spring.

Capsella bursa-pastoris (L.) Medic. Shepherd's Purse.

Fields and meadows. Spring.

Dithyreaa weslizeni Engelm. Spectacle Pod.

Dry sandy soil, near river. Summer.

Draba brachycarpa Nutt. Short-fruited Whitlow-grass.

Fields and pastures. Early Spring.

Draba cuneifolia Nutt. Wedge-leaved Whitlow-grass.

Common in fields. Early spring.

Erysimum asnerum DC. Yellow Phlox.

Mountainside. Spring.

Lepidium apetalum Willd. Wild Pepper Grass.

Common. Roadsides. Spring.

Lepidium virginicum L. Wild Pepper Grass.

Abundant. Spring.

Lesquerella auriculata (Engelm. & Gray.) Wats. Hairy

Bladder-pod.

Prairies. Early spring.

Lesquerella densiflora (A. Gray.) S. Watts. Bladder-pod.

Near river. Spring.

Lesquerella ovalifolia Rydb. Slender Bladder-pod.

Rocky hillside. Spring.

Radicula sessiliflora (Nutt.) Greene. Sessile-flowered

Cress.

- Mountain ravine. Spring.
- Radicula nasturtium-aquaticum (L.) Britton & Rendle.
Water Cress.
Stream. Spring.
- Sisymbrium canescens Nutt. Tansy-mustard.
Hillside. Spring.
- Sisymbrium incisum Engelm. Western Tansy-mustard.
Prairie roadsides. Spring and summer.

Capparidaceae

- Cleome serrulata Pursh. Pink Cleome. Stinking Clover.
Prairies. Summer.
- Cleomella angustifolia Torr.

Crassulaceae

- Sedum nuttallianum Raf. Nuttall's Stonecrop.
Rocks on mountainside. Spring.

Saxifragaceae

- Ribes aureum Pursh. Missouri or Buffalo Currant.
Hillsides and streams. Spring.

Rosaceae

- Crataegus crus-galli L. Cock-spur Haw. Red Haw.
River. Spring.
- Crataegus viridis L. Southern Thorn.
Streams. Early spring.
- Gaum canadense Jacq. White Avens.

- Mountain ravine. Summer.
- Prunus americana Marsh. Wild Yellow or Red Plum.
River. Spring.
- Prunus angustifolia Marsh. Chickasaw Plum.
Roadside ditch, near river. Spring.
- Rubus argutus Link. Bramble.
River. Spring.
- Rubus baileyanus Britton. Bailey's Blackberry.
Mountainside. Spring.

Leguminosae

- Acacia angustissima (Mill.) Ktze. Acacia.
Sandy soil, near river. Summer.
- Amorpha canescens Pursh. Lead-plant. Devil's Shoe-string.
Creek. Summer.
- Amorpha fruticosa L. River-locust. False Indigo.
Stream. Summer.
- Astragalus canadensis L. Tall Astragalus.
Prairies. Summer.
- Astragalus caryocarpus Ker. Ground Plum.
Creek and pastures. Spring.
- Astragalus lotiflorus Hook. Low Astragalus.
Prairie. Spring.
- Astragalus nuttallianus DC. Annual Astragalus.
Prairies. Spring.
- Baptisia australis (L.) R. Br. Blue False Indigo.
Mountainside. Spring.
- Baptisia bracteata (Muhl.) Ell. False Indigo.

- Mountainside. Spring.
- Cassia chamaecrista L. Partridge Pea.
Fields and pastures. Summer.
- Cercis canadensis L. Redbud. Judas Tree.
Creeks and Mountain ravines. Pre-vernal.
- Desmanthus illinoensis (Michx.) MacM. Illinois Desmanthus.
River. Summer.
- Desmodium grandiflorum (Walt.) DC. Pointed-leaved Tick Trefoil. Sticktight.
Prairie. Summer.
- Desmodium sessilifolium (Torr.) T. & G. Sessile-leaved Tick-trefoil.
Mountain. Summer.
- Glycyrrhiza lepidota (Nutt.) Pursh. Wild Liquorice.
Dry sand, roadside. Summer.
- Gymnocladus dioica (L.) Koch. Kentucky Coffee-tree.
Ravine. Spring.
- Hoffmanseggia falcaria Cav. Blue-weed.
Prairie. Spring.
- Hoffmanseggia jamesii T. & G. James' Hoffmanseggia.
Prairie. Early summer.
- Lesackia americana (Nutt.) Piper. Prairie Bird's foot Trefoil.
Prairies. Summer.
- Indigofera leptosepala Nutt. Western Indigo Plant.
Prairie. Summer to fall.
- Krameria secundiflora DC. Bank-bur.
Prairie roadside, common. Summer.

- Lathyrus pusillus Ell. Low Wild Pea.
River. Spring.
- Medicago sativa L. Alfalfa. Escaped cultivation.
Fields and roadsides. Spring and summer.
- Melilotus alba Desv. White Sweet-clover.
Prairie roadsides. Summer and fall.
- Melilotus officinalis (L.) Lam. Yellow Melilot. Sweet Clover.
Abundant, roadside. Summer.
- Neptunia lutea (Leavenw.) Benth. Neptunia.
Mountain ravine. Summer.
- Parosela aurea (Nutt.) Britton. Golden Parosela.
Hillside. Summer.
- Parosela eneandra (Nutt.) Britton. Slender Parosela.
River. Summer.
- Petalostemum candidum Michx. White Prairie Clover.
Near river. sandy soil. Summer.
- Petalostemum gracile Nutt. Slender White Prairie-clover.
Prairies. Summer.
- Petalostemum multiflorum Nutt. Round-headed Prairie-clover.
Prairies. Summer.
- Petalostemum purpureum (Vent.) Rydb. Purple Prairie-clover.
Prairie. Summer.
- Prosopis juliflora glandulosa (Torr.) Cook. Prairie mesquite.
Common. Prairies. Late spring.
- Psoralea cuspidata Pursh. Large-bracted Psoralea.
Prairies. Spring.
- Psoralea tenuiflora Pursh. Few-flowered Psoralea.
Prairies. Spring to fall.

Psoralea tenuiflora var. floribunda (Nutt.) Rydb. Many-flowered Psoralea.

Prairies. Summer and fall.

Robinia pseudo-acacia L. Black or Yellow Locust.

Low waste places and cultivated. Summer.

Schrankia angustata T. & G. Sensitive Brier.

Roadside ditch, common. Summer.

Schrankia uncinata Willd. Sensitive Brier.

Roadside. Summer.

Vicia caroliniana Walt. Pale Vetch.

Prairies. Spring.

Linaceae

Linum lewisii Pursh. Lewis's Wild Flax.

Roadside. Spring.

Linum rigidum Pursh. Large-flowered Yellow Flax.

Prairies. Spring.

Linum sulcatum Riddell.

Prairies. Summer.

Oxalidaceae

Oxalis corniculata (L.) Small. Yellow or Procumbent Wood-sorrel.

Damp soil, Mountainside. Spring.

Oxalis stricta L. Upright Yellow Wood-sorrel.

Damp soil, Mountainside. Spring.

Oxalis violacea L. Violet Wood-sorrel.

Damp soil. Creek and mountainside. Spring.

Geraniaceae

Geranium carolinianum L. Wild Geranium.

Mountain and stream. Spring.

Zygophyllaceae

Kallstroemia maxima (L.) T. & G. Greater Caltrop.

River. Summer.

Tribulus terrestris L. Caltrop.

Roadsides, common. Summer.

Rutaceae

Ptelea trifoliata L. Three-leaved Hop-tree.

Mountainside. Spring.

Polygalaceae

Polygala alba Nutt. White Milkwort.

Prairie. Summer.

Euphorbiaceae

Croton capitatus Michx. Goat-weed Hogwort.

Roadside. Spring to fall.

Croton glandulosus L. var. septentrionalis Muell. Arg.

Creek. Summer.

Croton lindheimerianus Scheele. Lindheimer's Croton-weed.

Pastures. Summer.

Croton texensis (Klotzsch.) Muell. Arg. Texas Croton.

Roadsides. Mid-summer.

Euphorbia dentata Michx. Toothed Spurge.

- Stream. Summer.
- Euphorbia dictyosperma Fisch & Mey. Reticulate-seeded Spurge
Plains. Summer.
- Euphorbia geyeri Engelm. & Gray. Geyer's Spurge.
River. Summer.
- Euphorbia maculata L. Spurge.
Prairies. Spring to fall.
- Euphorbia marginata Pursh. Snow-on-the-mountain.
Hillside and river. Summer and fall.
- Euphorbia petaloidea Engelm. White-flowered Spurge.
Prairies. Summer.
- Euphorbia preslii Guss. Large Spotted Spurge. Upright
Spotted Spurge.
Mountain. Spring to fall.
- Euphorbia serpens HBK. Round-leaved Spreading Spurge.
Prairies. Spring to fall.
- Jatropha stimulosa Michx. Spurge Nettle.
River. Spring and summer.
- Stillingia sylvatica L. Queen's Delight.
Prairies. Spring to fall.
- Tragia nepetaefolia Cav. Catnip-leaved Tragia.
River. Summer.
- Tragia ramosa Torr. Branching Tragia.
Mountainside. Summer.

Anacardiaceae

- Rhus canadensis Marsh. Cragrant Sumach.
Mountain. Spring.

- Rhus glabra L. Smooth Upland Sumach.
Common on creeks and hillsides. Summer.
- Rhus trilobata Nutt. Sumach.
Streams and mountains. Summer.
- Toxicodendron radicans. (L.) Kuntze. Poison Ivy.
Streams and mountains. Summer.

Sapindaceae

- Sapindus drummondii H. & A. Wild China-tree. Drummond's
Soapberry.
Creeks. Spring.

Rhamnaceae

- Ceanothus americanus L. New Jersey Tea.
Mountain and stream. Spring.

Vitaceae

- Cissus ampelopsis Pers. Simple-leaved Cissus.
River. Spring.
- Cissus incisa (Nutt.) Des Moulins. Rock-grape.
Mountain. Summer.
- Parthenocissus quinquefolia (L.) Planch. Virginia Creeper.
Five-leaved Ivy.
Creek. Summer.
- Vitis cinerea Engelm. Ashy or Downy Grape.
Stream. Spring.
- Vitis cordifolia Michx. Frost-grape.
Creek. Spring.

Vitis vulpina L. Sweet-scented Grape.

River. Spring.

Malvaceae

Callirhoe involucrata (T. & G.) Gray. Purple Poppy Mallow.

Roadside ditch, Common. Spring.

Callirhoe papaver (Cass.) A. Gray. Larger Purple Poppy
Mallow.

Creek. Spring and summer.

Malvastrum coccineum (Pursh.) A. Gray. Red False-mallow.

Roadsides. Common. Spring.

Tamaricaceae

Tamarix gallica Michx. Tamarish.

Damp sandy soil. Summer.

Violaceae

Viola papilionacea Pursh. Violet.

Damp sandy soil. Early spring.

Viola rafinesquii Greene Pansy or Heart's Ease.

Streams and pastures. Early spring.

Loasaceae

Mentzelia decapetala (Pursh.) Urban & Gilg. Stick-Leaf.

Sand, near river. Summer.

Mentzelia oligosperma Nutt. Stick-leaf. Few-seeded

Mentzelia.

River. Summer.

Cactaceae

Echinocereus caespitosus Engelm. Lace Cactus.

Mountainside.

Opuntia humifusa Raf. Western Prickly-pear.

Pastures. Common. Spring.

Lythraceae

Ammannia coccinea Rottb. Long-leaved Ammannia.

Mountain ravine. Summer.

Onagraceae

Gaura biennis L. Biennial Gaura.

River. Summer.

Gaura coccinea Pursh. Scarlet Gaura.

Roadside ditches. Mountainside. Spring.

Gaura parviflora Dougl. Gaura.

Dry sandy soil. Summer.

Gaura sinuata Nutt. Wavy-leaved Gaura.

Hillside. Summer.

Gaura villosa Torr. Woolly Gaura.

Creek. Summer.

Jussiaea diffusa Forsk. Creeping Primrose-willow.

Pond. Summer.

Oenothera hartwegii Benth. Evening-primrose.

Plains. Summer.

Oenothera humifusa Nutt. Evening-primrose.

Near river. Summer.

- Oenothera laciniata Hill. Evening-primrose.
Sand, near river. Summer.
- Oenothera laciniata var. grandiflora (Walt.) Robinson.
Evening-primrose.
Hillsides. Spring.
- Oenothera missouriensis Sims. Missouri Evening-primrose.
Hillside. Summer.
- Oenothera oakesiana Robbins. Evening-primrose.
Sandy soil, near river. Summer.
- Oenothera rhomboidata Nutt. Evening-primrose.
Near river. Summer.
- Oenothera serrulata. Nutt. Tooth-leaved Primrose.
Pastures and roadsides. Summer.
- Oenothera speciosa Nutt. Showy Evening-primrose.
Prairies. Spring.
- Oenothera triloba Nutt. Three-lobed Evening-primrose.
River. Summer.
- Stenosiphon linifolius (Nutt.) Britton. Flax-leaved
Stenosiphon.
Sandy soil near river. Summer.

Umbelliferae

- Chaerophyllum teinturieri Hook. Teinturieri's Chervil.
Roadsides. Common. Spring.
- Daucus pusillus Michx. American Carrot.
Fields and pastures. Spring.
- Lomatium daucifolium (Nutt.) Coult & Rose. Carrot-leaved
Parsley.

River. Summer.

Ptilimnium nuttallii (DC.) Britton. Nuttall's Mock Bishop-weed.

Low place near mountain. Summer.

Sanicula canadensis L. Short-styled Snake-root.

Mountainside. Summer.

Spermolepis echinata (Nutt.) Heller. Bristly-fruited

Spermolepis.

Mountainside. Spring.

Spermolepis patens (Nutt.) Robinson. Spreading Spermolepis.

River. Spring.

Cornaceae

Cornus asperifolia Michx. Rough-leaved Dogwood.

Streams. Spring.

Cornus florida L. Flowering Dogwood.

Mountainside. Spring.

Primulaceae

Androsace occidentalis Pursh. Androsace.

Pastures and fields. Early spring.

Samolus floribundus HBK. Water Pimpernel. Brookweed.

Stream. Summer.

Sapotaceae

Bumelia lanuginosa (Michx.) Pers. Chittim-wood. Woolly Buck-thorn.

Mountainside. Summer.

Ebenaceae

Diospyros virginiana L. Persimmon.

Mountain ravine.

Spring.

Oleaceae

Fraxinus americana L. White Ash.

Creek.

Spring and summer.

Fraxinus pennsylvanica Marsh Red Ash.

Mountain ravine.

Spring.

Gentianaceae

Eustoma russellianum (Hook.) Griseb. Russell's Eustoma.

Creek.

Summer.

Sabatia angularis (L.) Pursh. Rose Pink. Bitter Bloom.

Creek.

Summer.

Sabatia campestris Nutt. Prairie Sabatia.

Prairies.

Summer.

Apocynaceae

Amsonia tabernaemontana Walt. Broad-leaved Amsonia.

Mountain ravine.

Spring.

Apocynum cannabinum L. Dogbane. Indian Hemp.

Roadsides.

Common.

Summer.

Asclepiadaceae

Acerates angustifolia (Nutt.) Decne. Milkweed.

Prairies.

Summer.

Acerates auriculata Engelm. Green Milkweed.

- Roadside. Summer.
- Acerates viridiflora (Raf.) Eaton. Green Milkweed.
Prairies. Summer.
- Asclepias amplexicaulis Sm. Milkweed. Silkweed.
Near river. Spring and summer.
- Asclepias latifolia (Torr.) Raf. Broad-leaved Milkweed.
Dry sandy soil. Summer.
- Asclepias stenophylla Gray. Narrow-leaved Milkweed.
Prairies. Summer.
- Asclepias tuberosa L. Butterfly Weed.
Sand, near river. Spring and summer.
- Asclepias verticillata L. Whorled Milkweed.
Mountainside. Spring and summer.
- Asclepiodora decumbens (Wutt. A. Gray. Milkweed.
Mountainside. Spring.
- Asclepiodora viridis (Walt.) Gray. Oblong-leaved Milkweed.
Prairies. Summer.
- Vincetoxicum gonocarpos Walt. Large-leaved Angle-pod.
River. Early Summer.

Convolvulaceae

- Cuscuta cephalanthii Engelm. Button-bush Dodder.
Parasite. Summer.
- Cuscuta cuspidata Engelm. Cuspidate Dodder.
Pastures and ragweeds. Summer.
- Cuscuta indecora Choisy. Pretty Dodder.
On composites. Summer.
- Evolvulus argenteus Pursh. Dwarf Morning-glory.

Prairies. Summer.

Ipomoea leptophylla Torr. Bush Morning-glory.

Roadside. Early summer.

Ipomoea paadurata (L.) G. P. W. Mey. Wild Potato Vine.

Roadside ditch. Summer.

Polemoniaceae

Gilia rubra (L.) Heller. Red Gilia.

Mountainside. Summer.

Phlox villosa L. Phlox.

Prairie roadside. Spring and summer.

Hydrophyllaceae

Phacelia cubia (L.) Small. Small-flowered Phacelia.

Prairies. Spring.

Phacelia hirsuta Nutt. Hairy Phacelia.

Prairies. Spring.

Roraginaceae

Heliotropium convolvulaceum (Nutt.) Gray. Sand Heliotrope.

River. Late summer.

Heliotropium indicum L. Indian Heliotrope.

Pasture and creek. Spring to fall.

Lappula redowskii (Hornem.) Greene. var. occidentalis

(Wats.) Rydb. Western Stick-seed.

Mountainside. Spring.

Lithospermum angustifolium Michx. Puccoon.

Dry sandy soil. Spring.

Myosotis virginica (L.) BSP. Spring or Early Scorpion-grass.

Sand near river. Spring.

Onosmodium occidentale Mackenzie. Western False Gromwell.

Prairie. Summer.

Verbenaceae

Lippia cuneifolia (Torr.) Steud. Wedge-leaved Fog-fruit.

Hillside. Summer.

Lippia lanceolata Michx. Gog-fruit.

Creek. Summer.

Lippia nodiflora (L.) Michx. Statulate-leaved Fog-fruit.

Stream. Summer.

Verbena bipinnatifida Nutt. Small-flowered Verbena.

Creek and pasture. Early spring and
summer.

Verbena bracteosa Michx. Large-bracted Verbena.

Prairies. Summer.

Verbena canadensis (L.) Britton. Large-flowered Verbena.

Sandy soil, near river. Spring.

Verbena pumila Rydb. Dwarf Verbena.

Roadside. Summer.

Verbena stricta Vent. Hoary Vervain.

Mountainside. Summer.

Labiatae

Hedeoma hispida Pursh. Rough or Little Pennyroyal.

Plains. Summer.

Lamium amplexicaule L. Henbit. Dead Nettle.

- Fields and roadside. Early spring.
- Monarda dispersa Small. Purple Lemon Mint.
Prairies. Summer.
- Monarda fistulosa L. Horse Mint. Wild Bergamot.
Ravine. Early summer.
- Monarda punctata L. Horse Mint.
Dry sandy soil. Summer.
- Salvia azurea Lam. var. grandiflora Benth. Tall Blue Sage.
Plains. Spring and summer.
- Salvia lanceaefolia Poir. Lance-leaved Sage.
Creek. Spring and summer.
- Scutellaria drummondii Benth. Drummond's Skullcap.
Common in roadside ditches. Spring.
- Scutellaria wrightii Gray. Wright's Skullcap.
Hillside. Spring.
- Teucrium canadense L. Germander. Wood-sage.
Ravine. Summer

Solanaceae

- Chamaesarachia sordida (Dunal.) A. Gray. Hairy Chamaesarachia.
Roadside. Summer.
- Datura stramonium L. Jimson Weed.
Roadside. Summer.
- Physalis lobata Torr. Purple-flowered Ground-cherry.
Roadside, prairie. Spring and early s.
- Physalis longifolia Nutt. Smooth Ground Cherry.
Creek. Spring.

Physalis mollis Nutt. Velvety Ground-cherry.

Roadside. Summer.

Physalis subglabrata Mackenzie and Bush. Smooth Ground-cherry.

Sandy soil, near river. Summer.

Physalis viscosa L. Ground-cherry.

Creek. Spring.

Solanum carolinense L. Horse Nettle.

Common on prairies. Spring and summer.

Solanum elaeagnifolium Cav. Horse Nettle.

Common. Pastures and roadsides. Spring and summer.

Solanum nigrum L. Nightshade.

Dry sandy soil. Summer.

Solanum rostratum Dunal. Buffalo Bur.

Abundant. Summer and fall.

Scrophulariaceae

Castilleja lindheimeri A. Gray. Indian Paint Brush.

Mountain and pasture. Spring.

Castilleja sessiliflora Pursh. Downy Painted-cup.

Mountainside. Summer.

Collinsia violacea Nutt. Violet or Narrow-leaved Collinsia.

Mountainside. Spring.

Linaria canadensis (L) Dumont. Linaria.

Mountain. Spring.

Pentstemon acuminatus Dough. Sharp-leaved Beard-tongue.

Hillside. Summer.

Pentstemon cobaea Nutt. Beard-tongue.

- Prairie. Late spring.
Pentstemon tubiflorum Nutt. Funnel-shaped Beard-tongue.
 Creek. Summer.
Veronica grestis L. Field Speedwell.
 Fields and pastures. Spring.
Veronica perigrina L. Neckweed Purslane. Speedwell.
 Along creek. Early spring.

Martyniaceae

- Martynia louisiana Mill. Unicorn Plant.
 In cultivated soil. Summer.

Acanthaceae

- Ruellia ciliosa Pursh. Hairy Ruellia.
 River. Summer and fall.
Ruellia pedunculata Torr. Stalked Ruellia.
 Mountainside. Summer and fall.

Phrymaceae

- Phryma leptostachya L. Lop-seed.
 Mountain. Summer.

Plantaginaceae

- Plantago aristata Michx Ribwort.
 Common, prairies. Spring.
Plantago purshii R. & S. Pursh's Plantain.
 Pastures and roadsides. Spring.
Plantago rodosperma Decne. Red-seeded Plantain.
 River. Early spring.

Plantago virginica L. Dwarf Plantain.

Creek.

Spring.

Rubiaceae

Cephalanthus occidentalis L. Button-bush.

Streams and mountains.

Late spring.

Diodia teres Walt. Rough Button-weed.

River.

Summer.

Galium aparine L. Cleavers.

Mountain and stream.

Spring.

Galium pilosum Ait. Hairy Bedstraw.

Mountain and stream.

Summer.

Houstonia angustifolia Michx. Narrow-leaved Houstonia.

Mountain.

Spring.

Houstonia missilliana Beck. Bluets.

Creek and pastures.

Early spring.

Caprifoliaceae

Symphoricarpos orbiculatus Moench. Coral-berry Indian

Current.

Streams.

Summer.

Viburnum rufidulum Raf. Southern Black-haw.

Mountainside.

Spring.

Valerianaceae

Valerianella radiata (L.) DuRoi. Beaked Corn Salad.

Creek.

Spring.

Curcubitaceae

Pepo foetidissima (HBK.) Britton. Missouri Gourd.

Fields and streams.

Summer.

Campanulaceae

Specularia perfoliata (Nutt.) A. Gray. Western Venus'

Looking-glass.

Pastures.

Spring and summer.

Specularia perfoliata (L.) A. DC. Venus' Looking-glass.

Prairie stream.

Spring and summer.

Lobeliaceae

Lobelia cardinalis L. Cardinal Flower. Red Lobelia.

Mountain ravine.

Summer.

Lobelia leptostachys A. DC. Spiked Lobelia.

Mountainside.

Summer.

Compositae

Achillea lanulosa Nutt. Wolly Common Yarrow.

Creek.

Summer.

Achillea millefolium L. Common Yarrow.

roadsides, prairie.

Summer.

Actinea linearifolia (Hook.) Kuntze. Pine-leaved Actinea.

Hillside.

Summer.

Actinea scapoza (Nutt.) Kuntze. var. linearis (Nutt.)

Robinson. Narrow-leaved Actinea.

River.

Summer.

Ambrosia artemisiifolia L. Ragweed.

Ravines.

Summer and fall.

Ambrosia psilostachya DC. Western Ragweed.

Roadsides and pastures. Fall.

Ambrosia trifida L. Great Ragweed.

Creeks. Summer and fall.

Amphischyris dracunculoides (DC.) Nutt. August Flower

Kindling-weed.

Roadside. Fall.

Aphanostephus humilis (Benth.) A. Gray. Sand-daisy.

Hillside. Summer.

Aphanostephus skirrobasis (DC.) Trelease. White-flowered

Sand-daisy.

River. Summer.

Antennopus ciliatus (Nutt.) DC. Rosin-weed.

Prairie roadside. Spring to fall.

Artemisia ludoviciana Nutt. Dark-leaved Mugwort.

Dry hillsides near river. Late summer.

Aster commutatus (T. & G.) Gray. Aster.

Prairies. Spring.

Aster ericaefolius Rothr. Aster.

Hillsides. Summer.

Aster exilis Ell. Slim Aster.

Creek. Summer.

Aster fendleri A. Gray. Flendler's Aster.

Pastures. Summer.

Aster multiflorus Ait. Many-flowered Aster.

Prairies. Summer and fall.

Baccharis salicina T. & G. Willow Baccharis.

River. Early summer.

- Berlandiera texana DC. Texas Berlandiera.
Stream. Summer.
- Brauneria angustifolia (DC.) Heller Narrow-leaved Purple
Cone-flower.
Hillside. Spring to fall.
- Centaurea americana Nutt. Centaurea.
Roadside. Summer.
- Chaetopappa asteroides DC. Chaetopappa.
River. Spring.
- Chrysopsis pilosa Nutt. Nuttall's Golden Aster.
Mountainside. Summer and fall.
- Chrysopsis villosa var. hispid Gray. Hispid Golden Aster.
River. Summer.
- Cirsium discolor (Muhl.) Spreng. Field Thistle.
Common on roadside. Summer.
- Cirsium ochrocentrum A. Gray. Yellow-spined Thistle.
Prairie pastures. Summer.
- Coreopsis grandiflora Hogg. Large-flowered Coreopsis.
River. Summer.
- Coreopsis tinctoria Nutt. Golden Coreopsis. Garden Tickseed.
Streams. Spring and summer.
- Coreopsis verticillata L. Whorled Tickseed.
River. Late summer.
- Engellmania pinnatifida L. Engellmania.
Hillside. Summer.
- Erigeron canadensis L. Horsetail. Horse-weed.
Pastures. Summer and fall.
- Erigeron ramosus (Walt.) BSP. Daisy Fleabane.

- Pastures. Spring.
- Evax multicaulis DC. Rabbit Tobacco.
Common on roadsides and pastures. Spring and early
summer.
- Evax prolifera Nutt. Rabbit Tobacco.
Roadsides and pastures. Spring and summer.
- Flaveria campestris Johnston. Plains Flaveria.
Dry plains. Late summer.
- Gaillardia aristata Pursh. Gaillardia.
Common on roadsides. Summer.
- Gaillardia pulchella Foug. Showy Gaillardia.
Hillsides. Summer and fall.
- Gaillardia suavis (Gray.) Britton & Rusby. Cut-leaved
Rayless Three-nerved Gaillardia.
Prairie roadsides. Spring.
- Grindelia squarrosa (Pursh.) Dunal. Broad-leaved Gum
Plant. Rosin-weed.
River. Summer and fall.
- Helianthus annuus L. Common Sunflower.
Common. Prairies. Summer.
- Helianthus hirsutus Raf. Stiff-haired Sunflower.
Mountainside. Summer.
- Helianthus maximiliani Schrad. Maximilian's Sunflower.
Prairies. Late summer.
- Helianthus petiolaris Nutt. Sunflower.
Common on roadsides. Summer.
- Helenium autumnale L. False or Swamp Sunflower.
Creek. Late summer.

- Helenium tenuifolium Nutt. Fine-leaved Sneezeweed.
Creek. Summer.
- Helenium tenuifolium var. badium Gray. Fine-leaved Sneezeweed.
Stream. Summer.
- Heterotheca subaxillaris (Lam.) Britt. & Rusby. Heterotheca.
Hillside. Summer.
- Hymenopappus carolinensis (Lam.) Porter. Carolina Hymenopappus.
Roadside. Spring.
- Hymenopappus corymbosus T. & G. Corymbed, Smooth Hymenopappus.
Roadside ditch. Summer.
- Hymenopappus tenuifolius Pursh. Woolly White Hymenopappus.
Prairies. Spring to fall.
- Iva ciliata Willd. Rough Marsh Elder.
Creek. Late summer.
- Kuhnia eupatoroides L. False Boneset.
Prairies. Summer and fall.
- Lactuca ludoviciana (Nutt.) Riddell. Western Lettuce.
Prairies. Common. Summer to fall.
- Lactuca virosa L. Prickly Lettuce.
Fields and pastures. Late summer.
- Lepachys columnaris (Sims.) T. & G. Lepachys. Cone-flower.
Common. Late spring and summer.
- Liatris punctata Hook. Dotted Button Snakeroot. Small Blazing Star.

- Prairies. Late summer.
- Liatris squarrosa Willd. Scaly Blazing Star.
- Roadsides. Summer.
- Pyrrhopappus carolinianus (Walt.) DC. Leafy-stemmed False
Dandelion.
- Fields. Infrequent. Spring.
- Pyrrhopappus scaposus DC. Rough False Dandelion.
- Roadside. Prairie. Spring.
- Rudbeckia amplexicaulis Vahl. Cone Flower.
- Stream. Late spring.
- Senecio plattensis Nutt. Prairie Ragwort.
- Pastures, prairie. Spring.
- Senecio riddellii T. & G. Riddell's Ragwort.
- Prairies. Late summer.
- Silphium integrifolium Michx. Entire-leaved Rosin-weed.
- Prairies. Late summer.
- Silphium laciniatum L. Compass-plants.
- Common, prairies. Summer.
- Solidago altissima L. Tall Goldenrod.
- Hillside. Late summer.
- Solidago bootii Hook. Boot's Goldenrod. Wreath Goldenrod.
- Mountain. Summer and fall.
- Solidago gymnospermoides (Greene) Fernald. Viscid Bushy
Goldenrod.
- Prairies. Late summer.
- Solidago missouriensis Nutt. Missouri Goldenrod.
- Mountainside. Summer.
- Solidago petiolaris Ait. Downy Ragged Goldenrod.

- Fields. Fall.
- Solidago radula Nutt. Western Rough Goldenrod.
- Prairies. Summer.
- Solidago serotina Ait. Late Goldenrod.
- Creek. Late summer.
- Sonchus asper (L.) Mill. Spiny Snow-thistle.
- Roadside. Spring to fall.
- Taraxacum vulgare (Lam.) Schrank. Common Dandelion.
- Fields and pastures. Spring to fall.
- Thelesperma gracile (Torr.) Gray. Rayless Thelesperma.
- Prairies. Summer.
- Thelesperma trifidum (Poir.) Britton. Thelesperma. Tick-seed.
- Common on prairies and mountains. Summer to fall.
- Vernonia altissima Nutt. Tall Ironweed.
- Stream. Summer.
- Vernonia baldwini Torr. Baldwin's Ironweed.
- River. Summer.
- Vernonia missurica Raf. Missouri Ironweed.
- Prairies. Fall.
- Xanthisma texanum DC. Texas Xanthisma. Sleepy Daisy.
- Prairie. Summer.
- Xanthium pennsylvanicum Wallr. Cocklebur.
- Common. Roadside. Late summer.
- Xanthium speciosum Kearney. Great Cocklebur.
- Ravine. Summer and fall.

Tabular List of the Families

Divisions, Orders, Families, Etc.	Genera	Species	Varieties
PTERIDOPHYTA			
Filicales			
Polypodiaceae.....	4	5	
Marsileaceae.....	1	1	
SPERMATOPHYTA			
Gymnospermae			
Coniferales			
Pinaceae.....	1	1	
Angiospermae			
MONOCOTYLEDONEAE			
Pandales			
Typhaceae.....	1	1	
Graminales			
Gramineae.....	31	58	2
Cyperaceae.....	6	11	
Xyridales			
Commelinaceae.....	2	6	
Liliales			
Juncaceae.....	1	6	
Liliaceae.....	7	11	
Amaryllidaceae.....	1	1	
Iridaceae.....	1	3	
DICOTYLEDONEAE			
Salicales			

Tabular List of the Families

Divisions, Orders, Families, Etc.	Genera	Species	Varieties
Salicaceae.....	2	2	
Juglandales			
Juglandaceae.....	2	3	
Fagales			
Fagaceae.....	1	6	
Urticales			
Urticaceae.....	4	5	1
Santalales			
Santalaceae.....	1	1	
Polygonales			
Polygonaceae.....	3	12	
Chenopodiales			
Chenopodiaceae.....	4	5	1
Amaranthaceae.....	3	5	
Phytolaccaceae.....	1	1	
Myrtaginaceae.....	1	4	
Illecebraceae.....	1	1	
Aizoaceae.....	1	1	
Caryophyllales			
Caryophyllaceae.....	3	4	
Portulacaceae.....	1	1	
Ranunculales			
Ranunculaceae.....	4	5	
Menispermaceae.....	1	1	

Tabular List of the Families

Divisions, Orders, Families, Etc.:	Genera:	Species:	Varieties:
Paperales			
Papaveraceae.....	1	2	
Fumariaceae.....	2	2	
Cruciferae.....	8	16	
Capparidaceae.....	2	2	
Rosales			
Crassulaceae.....	1	1	
Saxifragaceae.....	1	1	
Rosaceae.....	4	7	
Leguminosae.....	25	42	20
Geraniales			
Linaceae.....	1	3	
Oxalidaceae.....	1	3	
Geraniaceae.....	1	1	
Zygophyllaceae.....	1	2	
Rutaceae.....	1	1	
Polygalaceae.....	1	1	
Euphorbiaceae.....	5	16	1
Sapindales			
Anacardiaceae.....	2	4	
Sapindaceae.....	1	1	
Rhamales			
Rhamnaceae.....	1	1	
Vitaceae.....	3	6	
Malvales			

Tabular List of the Families

Divisions, Orders, Families, Etc.	Genera	Species	Varieties
Malvaceae.....	2	3	
Tamaricales			
Tamaricaceae.....	1	1	
Violales			
Violaceae.....	1	2	
Loasaceae.....	1	2	
Opuntiales			
Cactaceae.....	2	2	
Myrtales			
Lythraceae.....	1	1	
Onagraceae.....	4	17	1
Umbellales			
Umbelliferae.....	6	7	
Cornaceae.....	1	2	
Primulales			
Primulaceae.....	2	2	
Ebenales			
Sapotaceae.....	1	1	
Ebenaceae.....	1	1	
Gentianales			
Oleaceae.....	1	2	
Gentianaceae.....	2	3	
Apocynaceae.....	2	2	
Asclepiadaceae.....	4	11	

Tabular List of the Families

Divisions, Orders, Families, Etc.	Genera	Species	Varieties
Polemoniales			
Convolvulaceae.....	3	6	
Polemoniaceae.....	2	2	
Hydrophyllaceae.....	1	2	
Boraginaceae.....	5	6	1
Verbenaceae.....	2	8	
Labiatae.....	6	11	1
Solanaceae.....	4	12	
Scrophulariaceae.....	5	9	
Martyniaceae.....	1	1	
Acanthaceae.....	1	2	
Phrymaceae.....	1	1	
Plantaginales			
Plantaginaceae.....	1	4	
Rubiales			
Rubiaceae.....	4	6	
Caprifoliaceae.....	4	2	
Valerianaceae.....	1	1	
Campanulales			
Curcubitaceae.....	1	1	
Campanulaceae.....	1	2	
Lobeliaceae.....	1	2	
Compositae.....	42	86	2

SUMMARY

The Flora of Kiowa County, Oklahoma includes six species of pteridophytes, one species of gymnosperms, and four hundred eighty-nine species of angiosperms. More than one third of these are in Compositae, Gramineae, and Leguminosae. There are eighty-one families represented. The eleven largest families, with the number of species are: Compositae, 86; Gramineae, 58; Leguminosae, 41; Onagraceae, 17; Euphorbiaceae, 16; Cruciferae, 16; Polygonaceae, and Solanaceae, 12 each; Asclepiadaceae, Cyperaceae, and Labiatae, 11 each. The three largest families comprise 57.4 per cent of the total number of species.

The county lies in the plains region. The prairies of which are broken by the Wichita Mountains and a few streams, of these the North Fork Red River is the largest. The vegetation is mainly that adapted to the prairies. Tall grass is found near mountain or stream; it is predominately a short-grass area. Trees are to be seen along streams or on mountainsides. The only native trees on the prairies are mesquite Prosopis juliflora glandulosa which grow in association with cactus Opuntia humifusa and buffalo grass Buchloe dactyloides.

ADDENDA

The following plants were counted in the tabular list but are not given in the list of species:

Artemisia filifolia

Aster oblongifolius

Desmodium obtusum

Draba caroliniana

Eleocharis obtusa

Gaillardia triervata

Juncus tenuis

Physalis virginiana

Rudbeckia hirta

Scutellaria parvula

Vicia micrantha

Xanthisma texanum

The following plants listed in the Stevens' collection were not found by the author:

Artemisia mexicana

Beta vulgaris

Blafoxia sphaceolata

Bouteloua texana

Carex gravida

Distichlis spicata

Dyssodia tagetoides

Eleocharis rostellata

Muhlenbergia arenicola

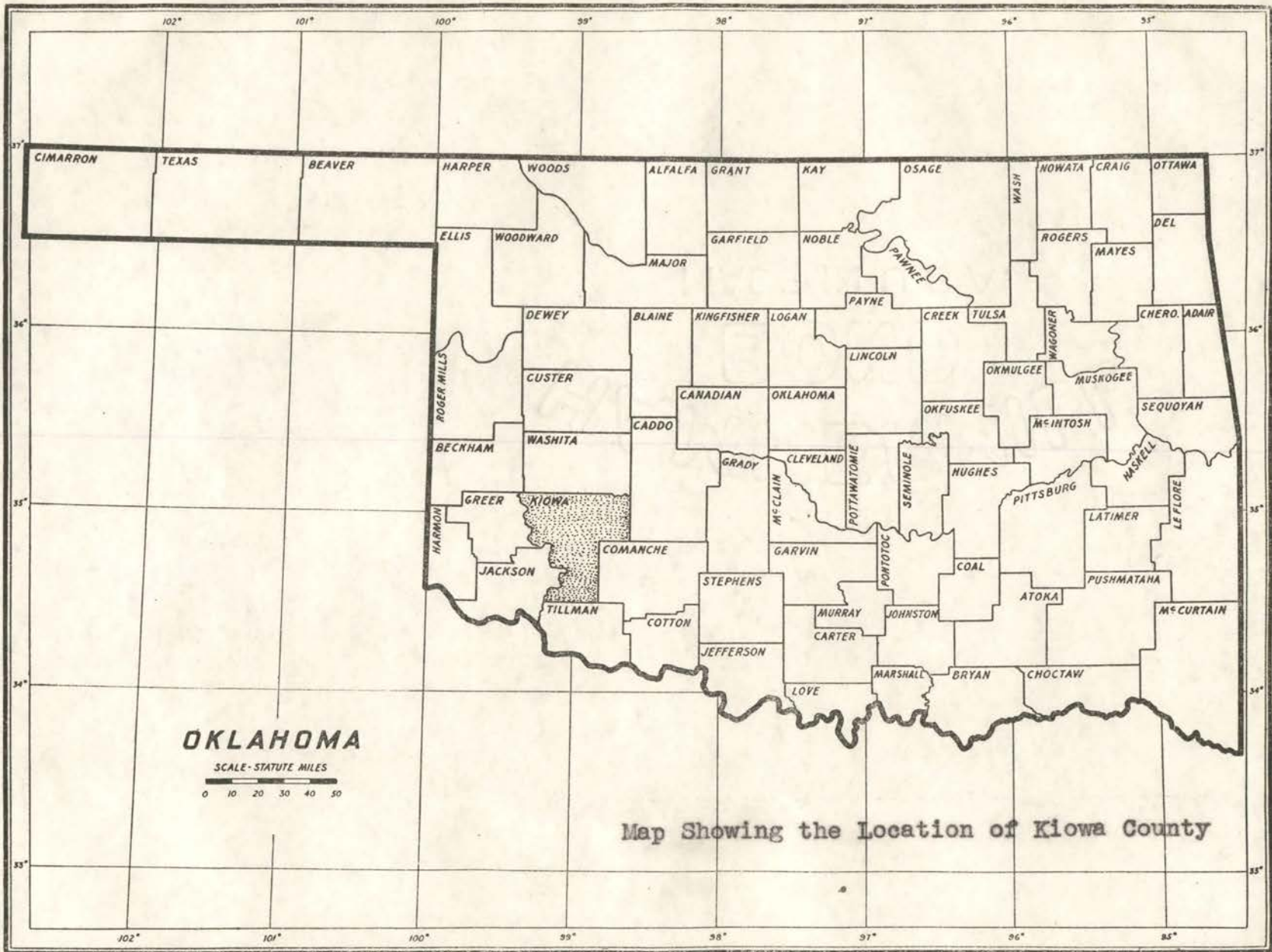
Samolus ebracteatus

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anceps	14	purshii	44
capillare	14	rodosperma	44
dichotomiflorum	14	virginica	45
obtusum	14	Poa	15
tennesseense	14	arachnifera	15
virgatum	15	POLEMONIACEAE	40
RRPAVERACEAE	24	Polygala	31
Paronychia	23	alba	31
jamesii	23	POLYGALACEAE	31
Parosela	29	Polygonatum	18

commutatum	18	pseudo-acacia	30
POLYGONACEAE	20	ROSACEAE	26
Polygonum	21	RUBIACEAE	45
acre	21	Rubus	27
aviculare	21	argutus	27
hydropiper	21	baileyanus	27
lapathifolium	21	Rudbeckia	51
pennsylvanicum	21	amplexicaulis	51
remosissimum	21	hirta	59
tenuis	21	Ruellia	44
POLYPODIACEAE	11	ciliosa	44
Populus	19	pedunculata	44
deltoides	19	Rumex	21
PORTULACACEAE	23	altissimus	21
PORTULACACEAE	23	cripus	21
PRIMULACEAE	37	elongatus	21
Prosopis	29	RUTACEAE	31
juliflora	29	Sabatica	38
glandulosa	29	angularis	38
Prunus	27	campestris	38
americana	27	SALICACEAE	19
angustifolia	27	Salix	19
Psoralea	29	nigra	19
cuspidata	29	Salsola	22
tenuiflora	29	kali	22
floribunda	30	Salvia	42
Ptelea	31	azurea	42
trifoliata	31	lanceaeifolia	42
Ptilimnium	37	Samolus	37
nuttallii	37	ebracteatus	59
Pyrrhopappus	51	floribundus	37
carolinianus	51	Sanicula	37
scaposus	51	canadensis	37
Quercus	19	SANTALACEAE	20
macrocarpa	19	SAPINDACEAE	33
marilandica	19	Sapindus	33
prinus	19	drummondii	33
shumardii	20	SAPOTACEAE	37
stellata	20	SAXIFRAGACEAE	26
virginiana	20	Schedonnardus	15
Radicula	25	paniculatus	15
nasturtium	26	Schrankia	30
aquaticum	26	angustata	30
sessiliflora	25	uncinata	30
RANUNCULACEAE	24	Scirpus	16
RHAMNACEAE	33	americanus	16
Rhus	32	lineatus	16
canadensis	32	SCROPHULARIACEAE	43
glabra	32	Scutellaria	42
trilobata	33	drummondii	42
Ribes	26	parvula	59
aureum	26	wrightii	42
Robinia	30		

Sedum	26	obtusata	15
nuttallianum	26	Sporobolus	15
Senecio	51	cryptandrus	15
plattensis	51	Stellaria	23
riddellii	51	media	23
Setaria	15	Stenosiphon	36
geniculata	15	linifolius	36
lutescens	15	Stillingia	32
viridis	15	sylvatica	32
Silene	23	Symphoricarpos	45
antirrhina	23	orbiculatus	45
Silphium	51	TAMARICACEAE	34
integrifolium	51	Tamarix	34
laciniatum	51	gallica	34
Sisymbrium	26	Taraxacum	52
canescens	26	vulgare	52
incisum	26	Teucrium	42
Sisyrinchium	18	canadense	42
angustifolium	18	Thelesperma	52
gramineum	18	gracile	52
varians	18	trifidum	52
Smilax	18	Toxicodendron	33
bona-nox	18	redicans	33
herbacea	18	Tradescantia	17
rotundifolia	18	occidentalis	17
SOLANACEAE	42	virginiana	17
Solanum	43	Tragia	32
carolinense	43	nepetaefolia	32
eleagnifolium	43	ramosa	32
nigrum	43	Tribulus	31
rostratum	43	terrestris	31
Solidago	51	Triodia	15
altissima	51	flava	15
bootii	51	pilosa	16
gynnospermoides	51	Typha	11
missouriensis	51	latifolia	11
petiolaris	51	TYPHACEAE	11
radula	52	Ulmus	20
serotina	52	americanus	20
Sonchus	52	fulva	20
asper	52	UMBELLIFERAE	36
Sorghastrum	15	Uniola	16
nutans	15	latifolia	16
Sorghum	15	URTICACEAE	20
halepense	15	VALERIACEAE	45
Specularia	46	Valerianella	45
leptocarpa	46	radiata	45
perfoliata	46	Vertena	41
Spermolepis	37	bipinnatifida	41
echinata	37	bracteosa	41
patens	37	canadensis	41
Sphenopholis	15	pumila	41

stricta	41	rafanesquii	34
VERBENACEAE	41	VIOLACEAE	34
Vernonia	52	VITACEAE	33
altissima	52	Vitis	33
baldwini	52	cinerea	33
missurica	52	cordifolia	33
Veronica	44	vulpina	34
agrestis	44	Woodsia	11
perigrina	44	obtusa	11
Viburnum	45	Xanthium	52
rufidulum	45	pennsylvanicum	52
Vicia	30	speciosum	52
caroliniana	30	Xanthisma	59
micrantha	59	texanum	59
Vincetoxicum	39	Yucca	18
gonocarpos	39	glauca	18
Viola	34	ZYGOPHYLLACEAE	31
papilionaceae	34		

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