

SPRING AND AUTUMN FLORA IN EDWARDS COUNTY, KANSAS

by

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INTRODUCTION

In 1898, Hitchcock made a survey of the flora of Edwards County, Kansas, and found representatives of 48 families, 124 genera, and 180 species of plants. His observations, however, were somewhat limited, as his visit was confined to the summer months, and facilities for travel probably prevented his visiting all parts of the county. In order to bridge this seasonal gap and to determine the subsequent history of the species named by Hitchcock and the origin of such species as might have migrated into Edwards County since 1898, the present work, which lists the autumn and spring flora, was undertaken. The observations herein recorded were made during the period 1931-1933, inclusive.

HISTORY OF EDWARDS COUNTY

On March 7, 1874, Governor Osborn approved an act creating several new counties and defining the boundaries of some previously specified. By this act Edwards County came into existence.

Edwards County is located in the southwest part of the State of Kansas, between the 37th and 39th meridians and the 99th and 100th parallels, and is bounded by Pawnee County on the north, Stafford and Pratt Counties on the east, Kiowa County on the south, and Ford and Hodgeman Counties on the west.

By the act of March 5, 1875, which abolished Kiowa County, two tiers of townships were added to Edwards on the south, giving the enlarged county an area of 972 square miles. Kiowa County was re-established by the act of February 10, 1886, when the original boundaries of Edwards County were restored, so that the present area of the county is 612 square miles. It was named for W. E. Edwards, one of the early settlers, who erected the first brick block in the county, a building which was occupied as a courthouse for several years before the county erected such a building.

Lieut. Zebulon M. Pike's expedition passed through the county in 1806, following closely the route which afterwards became historic as the Santa Fe Trail. In the fall of 1872, the Atchison, Topeka and Santa Fe railroad was completed as far as Edwards County, and in March, 1873, a colony from Massachusetts settled where Kinsley now stands.

The grasshopper scourge of 1874 "totally destroyed" all grains and vegetables. The short crops of 1878 retarded for a time the settlement of the county, but in 1885 the reports of abundant crops and cheap land brought hundreds of new settlers to southwestern Kansas, and the population of Edwards County was nearly doubled during the year.

Droughts in Edwards County have been frequent. Samuel I. Steward, in writing of the early days of Kansas in 1851, says: "There was an overflow of creeks in May; then the rains ceased to fall and by the fourth of July, all the little branches we had believed 'flowed on forever' were entirely dry. By August all the springs were no more, and we suffered from lack of water. Sickness came and a few died; others turned their faces to the east."

It was the summer of 1860, however, which gave Kansas its reputation for droughts. During the fall and winter of 1859-1860, but little rain fell.

The account of Hartman Lichtenhan, one of the early settlers, as given by Andreas in his History of the State of Kansas is as follows: "During the year 1860, not a drop of rain fell from the fifteenth of May until the following January. Nothing was raised, and in consequence provisions were very high." The legislatures of 1869, 1871, and 1872 each made appropriations for the relief of drought sufferers. In 1874 came the long dry spell which gave the state the name of "Droughty Kansas." Only eighteen inches of rain fell in eighteen months.

The most damaging winds are the "hot winds." These usually occur during a prolonged heat period with shade temperatures from 100° to 116° F. and often have a high velocity and thus cause great injury to growing crops, in extreme cases having been known to kill the foliage and bark on the south side of trees. The hot dry winds

are very irregular in their occurrence, and data relative to them are insufficient to determine whether there has been any marked increase or decrease in their frequency within historic times. Great damage is often caused in a dry season in winter or early spring from high winds blowing loose soil of wheat fields. The roots of some plants are exposed, while others are injured by the mechanical action of the blowing dust particles, and others are buried under drifted soil. The extent to which drifting soil could accumulate was shown during the nine months' drought of the winter and spring of 1932-1933, when in the region of the sand hills south of Centerview, drifted dust and sand had covered all but 12 to 18 inches of the fence posts.

Along the Arkansas River, which enters the county from the west near the southwest corner and flows northeast, the "bottoms" are about three miles wide, constituting about one-fourth of the area of the county. The remaining surface is generally level or undulating prairie. Narrow belts of cottonwood trees are found along the Arkansas River and Rattlesnake Creek, which flows west across the southeast corner of the county. These comprise about all of the native timber, but many fine artificial groves have been planted. Outcroppings of limestone, practically the only mineral found thus far in the county, are found on the hills.

The county is transversed from east to west by two railroad lines, the Atchison, Topeka, and Santa Fe, and the Wichita Northwestern,

while from Kinsley a small branch line of the Santa Fe runs north-east to Great Bend. As the Santa Fe line is transcontinental in scope, hay and bedding from distant regions have undoubtedly been lost from the freight cars and thus many new species have probably been introduced, since its construction in 1872, that otherwise would have failed to get a foothold in the county.

PHYSIOGRAPHIC CHARACTERISTICS OF EDWARDS COUNTY

The soil of Edwards County apparently has originated from geologic material known as tertiary formation in the eastern extension of the tertiary formations. The basic minerals have a distinctly reddish tinge, which has persisted in the soils formed from them. The soils so characterized, called the Pratt series, are all found throughout the county. The various members of the Pratt series have a distinctive texture as well as a common color. The sands are composed to a large extent of feldspars and minerals other than quartz, and wherever the sandy soils have been exposed to weathering, they have become rather loamy in texture. This is indicated by the sticky character of the very sandy soils, where weathering has been undisturbed. In this series the soil types which are distinctive and extensive enough to enumerate are a loamy sand, a gravelly sandy loam and coarse sandy loam, a sandy loam, and a loam.

Pratt loamy sand is a reddish-yellow or brown loamy sand which is rather loose in structure down to a depth of about 18 inches whence it grades into a reddish-colored loamy sand that is slightly heavier in texture and contains some clay, which causes it to become somewhat sticky and more compact than the surface soil. The sub-soil becomes heavier and more compact and sticky with increase in depth. This soil is easily cultivated, but unless great care is taken, it blows badly when loosened by the plow.

The general topography of that portion of the county that contains the loamy soil varies from level to rolling and hilly, with the latter verging on the sand dune type. Some of the areas contain modified sand dunes but few, if any, are now in motion. It is a soil that, although draining well, has a large moisture-holding capacity. Even in the driest weather, it contains a large amount of moisture due in a large measure to the extremely fine texture of the subsoil.

The native grasses found on the loamy sand are bluestem, sage, bunch-grass, tickle-grass, and a small amount of buffalo-grass. Wheat, corn, and some sorghums are grown successfully due to the high moisture content of the soil. The soil varies considerably in value, some of it bringing as little as \$10 an acre.

Pratt gravelly sandy loam and coarse sandy loam, to a depth of from 14 to 18 inches, is a loose yellowish-brown soil. The sand content varies considerably, the medium and coarse grades being present in greatest abundance.

The native vegetation is similar to that of the other loose sandy soil of the areas, consisting of sage and bunch-grass, blue-stem, and some buffalo and grama-grass. The yucca is occasionally seen on the sandier bodies. A large proportion of the land containing this soil type is too rough to be farmed and is utilized for grazing.

Pratt sandy loam is a slightly reddish-brown, medium to fine sandy loam with a depth of from 20 to 24 inches. The subsoil is a lighter reddish-brown and contains more sand which is coarser in texture than that of the surface soil, becoming redder with increase in depth. The subsoil contains some clay, which makes it more compact and gives it a slightly sticky nature. This clay, which is derived by weathering from the feldspar constituent of the sand, increases with depth and makes the soil more compact. In Edwards County there are numerous sand dunes consisting of soil of this type. Heavier spots are found in the depressions which probably represent the material deposited by washing from the surrounding higher lands.

Most of the land made up of this soil type is farmed. The crops grown are wheat, corn, and sorghums. Wheat yields 18 to 20 bushels to the acre, although in some places, under careful cultivation, larger yields are secured.

Pratt loam is quite variable and ranges from a silt loam to a sandy loam. The typical loam is brown in color and contains considerable silt to a depth of 18 inches. From 18 to 36 inches it

is a reddish-brown, rather sticky, sandy loam, grading into a more pronounced reddish color with increase in depth. The subsoil sometimes contains a small amount of fine gravel, which thus gives it a looser texture. Sometimes the subsoil becomes very compact with increase in depth, but this variation is seldom found, the greater part of the type having a light subsoil. This soil may be easily and deeply cultivated due to the absence of any hardpan layer. This is good wheat land, although not so good for corn as the more sandy soil. Wheat yields of 10 to 12 bushels per acre are secured.

GENERAL SURVEY OF THE FLORA OF EDWARDS COUNTY

Taxonomic Relationships

Up to date, 280 species have been collected from the county. The 13 orders containing the largest number of species, with the number of the latter they contain, are as follows:

Graminales	72
Asterales	61
Rosales	32
Caryophyllales	31
Geraniales	11
Polemoniales	11
Brassicales	10
Lamiales	9
Gentianales	7
Liliales	7
Scrophulariales	6
Malvales	6
Campanulales	5

Summer Flora of Edwards County

The following species were reported by A. S. Hitchcock, but were not found by the writer:

<i>Ambrosia trifida</i>	<i>Heleranthera limosa</i>
<i>Amorpha fruticosa</i>	<i>Homalocenchrus oryzoides</i>
<i>Andropogon hallii</i>	<i>Iva ciliata</i>
<i>Andropogon scoparius</i>	<i>Isopappus divaricatus</i>
<i>Aristida purpurea</i>	<i>Kuhnia eupatorioides</i>
<i>Asclepias pumila</i>	<i>Kuhnistera purpurea</i>
<i>Aster epilis</i>	<i>Kuhnistera villosa</i>
<i>Astragalus mollissimus</i>	<i>Lactuca ludoviciana</i>
<i>Baccharis salicina</i>	<i>Lemna perpusilla</i>
<i>Berula erecta</i>	<i>Pespedeza capitata</i>
<i>Bidens frondosa</i>	<i>Linum rigidum</i>
<i>Bouteloua curtipendula</i>	<i>Lobelia cardinalis</i>
<i>Bouteloua oligostachya</i>	<i>Lotus americanus</i>
<i>Chaetochloa glaucus</i>	<i>Mollugo verticillata</i>
<i>Chrysopogon avenaceus</i>	<i>Monarda punctata</i>
<i>Chrysopsis stenophylla</i>	<i>Munroa squarrosa</i>
<i>Cleome serrulata</i>	<i>Onagra biennis</i>
<i>Corispermum hyssopifolium</i>	<i>Oreocarya suffruticosa</i>
<i>Cristatella jamesii</i>	<i>Panicum capillare</i>
<i>Cucurbita foetidissima</i>	<i>Panicum colonum</i>
<i>Cuscuta cuspidata</i>	<i>Panicum dichotomiflorum</i>
<i>Cyperus acuminatus</i>	<i>Paronychia jamesii</i>
<i>Cyperus esculentus</i>	<i>Parosela dalea</i>
<i>Cyperus speciosus</i>	<i>Parosela enneandra</i>
<i>Dyssodia papposa</i>	<i>Paspalum ciliatifolium</i>
<i>Engelmannia pinnatifida</i>	<i>Pentstemon acuminatus</i>
<i>Erigeron bellidiastrum</i>	<i>Populus deltoides (tree)</i>
<i>Eriochloa punctata</i>	<i>Polygonum camporum</i>
<i>Eragrostis pectinacea</i>	<i>Polygonum hydropiperoides</i>
<i>Eratrostis pilosa</i>	<i>Polygonum littorale</i>
<i>Eragrostis secundiflora</i>	<i>Redfieldia flexuosa</i>
<i>Eragrostis trichodes</i>	<i>Rhus radicans</i>
<i>Euphorbia nuttallii</i>	<i>Sagittaria latifolia</i>
<i>Euthamia graminifolia</i>	<i>Salix amygdaloides (tree)</i>
<i>Flaveria angustifolia</i>	<i>Salix fluviatilis (tree)</i>
<i>Gaertneria tomentosa</i>	<i>Sideranthus spinulosum</i>
<i>Gaillardia aristata</i>	<i>Sieglelingia purpurea</i>
<i>Gaura parviflora</i>	<i>Spartina michauxiana</i>
<i>Gerardia aspera</i>	<i>Spirodela polyrhiza</i>
<i>Glycyrrhiza lepidata</i>	<i>Sporobolus airoides</i>

Solidago mollis
Sophora sericea
Syntherisma sanguinalis
Ulmus americana (tree)
Ulmus occidentalis (tree)

Of these 85 species, some may have been missed by the writer due to the difference in the flowering season when collected, while others may have disappeared due to such factors as the extensive cultivation of the land, to the early prairie fires, and to the dust storms and hot winds which accompanied extended droughts. Also, the character of the flora may have been changed by the introduction of new agricultural practices, such as the shipping of cattle into the country in large numbers for summer grazing, a practice which may have affected the plant growth by limiting some species and making conditions more favorable for others.

Apparent Migrational Trends

Of the 100 species not listed by Hitchcock that were found by the writer, the majority were probably present in Edwards County at the time of the earlier survey (1898) but were missed because they matured in the spring or autumn months and thus were overlooked during the summer. Some of the species, however, may have come into the county since that time, as there have been established during the past four decades several artificial factors, such as railroad and automobile travel that might have promoted the migration and establishment of foreign species. In order to determine which of these

might have been comparatively recent immigrants and to learn the direction from which they probably migrated, a two-fold study was made: This was done (1) by comparing the occurrence of the species in Kansas with their distribution throughout the Central Plains as a whole as listed by Rydberg, and (2) by comparing the location of the species as reported by Hitchcock in other counties with their present occurrence in Edwards County. In employing the latter method, two zones were artificially set up, the first zone consisting of the six counties immediately bordering Edwards County, and the second zone, of the 12 counties more or less surrounding the original six counties. Thus, those species formerly listed by Hitchcock as occurring in counties to the south, but not to the north of Edwards, were assumed to have come into the county from the south. Those species not previously reported as occurring in Edwards County that were present in most of the counties of the first zone, were thought to have been overlooked by Hitchcock in his visits to Edwards County.

The counties constituting the first zone are Pawnee to the north, Stafford and Pratt to the east, Kiowa to the south, Ford and Hodgeman to the west. The second zone of surrounding counties includes Ness, Rush, and Barton to the north; Rice, Reno, and Kingman, to the east; Barber, Comanche, and Clark to the south; and Gray, Finney, and Lane to the west. Their specific location with respect to Edwards County is shown in Figure 1.

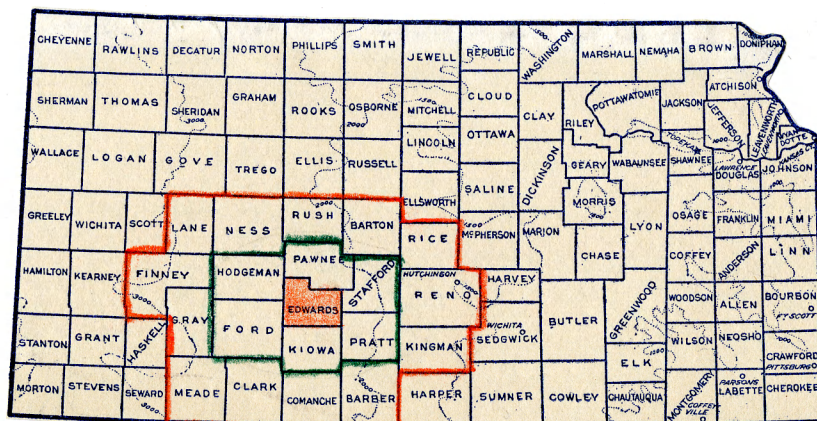


Fig. 1. Diagram showing the counties included in the two zones surrounding Edwards County, Kansas.

Zone 1. - Counties included within green line.

Zone 2. - Counties included between green and red lines.

The occurrence of species recently found in Edwards County, but previously reported for adjoining counties, is shown in the following tables:

Table I. Species that apparently have migrated into Edwards County from the west or southwest.

<u>Species</u>	<u>Reported in follow- ing Counties</u>	<u>Range as Reported by Rydberg</u>
<i>Carex festucacea</i>	Ford, Pawnee	S.D.-N.M.-Ariz.-Nev.
<i>Carex muhlenbergii</i>	Ford	Me.-Fla.-Tex.Minn.
<i>Eatonia obtusata</i>	Ford	Ariz.-Mex.-Fla.-Mont.
<i>Hibiscus trionum</i>	Ford	Utah-Ore.-Fla.-N.D.
<i>Medicago sativa</i>	Ford	Me.-Va.-Calif.
<i>Poa compressa</i>	Clark	N.H.-N.C.-Calif.
<i>Poa pratensis</i>	Ford	Fla.-Calif.
<i>Portulaca pilosa</i>	Rush, Lane	Mo.-Colo.-Calif.
<i>Specularia leptocarpa</i>	Ford, Hodgeman	Iowa-Ark.-Tex.-Colo.
<i>Sorghum halepense</i>	Hodgeman, Kiowa	Fla.-Tex.-Colo.-Mex.
<i>Verbena bipinnatifida</i>	Pawnee, Hodgeman	S.D.-Tex.

Table II. Species that apparently have migrated into Edwards County from the east or northeast.

<u>Species</u>	<u>Reported in follow- ing Counties</u>	<u>Range as Reported by Rydborg</u>
<i>Achillea millefolium</i>	Rice, Reno	Va.-Colo.
<i>Anemone caroliniana</i>	Kingman	Wis.-Ga.-Tex.-S.D.
<i>Amaranthus hybridus</i>	Kingman	Ind.-Colo.-Fla.-Calif.
<i>Callirrhoe alceoides</i>	Kingman	Ky.-Nebr.-Tex.-Tenn.
<i>Elymus virginicus</i>	Reno	Fla.-Tex.
<i>Eragrostis capillaris</i>	Stafford	R.I.-Iowa-Tex.-Ga.
<i>Pentstemon cobaea</i>	Kingman, Reno	Mo.-Tex.-Ark.
<i>Polygonum aviculare</i>	Rice	Va.-Calif.
<i>Solidago serotina</i>	Stafford, Kiowa, Reno, Rice	Ark.-Colo.-Ga.

Table III. Species that apparently have migrated into Edwards County from the north or northwest.

<u>Species</u>	<u>Reported from follow- ing Counties</u>	<u>Range as Reported by Rydberg</u>
<i>Carex festucacea</i>	Ford, Pawnee	S.D.-N.M.-Ariz.-Nev.
<i>Erigeron ramosus</i>	Barton	Fla.-Calif.
<i>Hedeoma hispida</i>	Pawnee	Wis.-Ky.-Colo.
<i>Ribes aureum</i>	Barton	Wash.-S.D.-Calif.
<i>Solidago serotina</i>	Stafford, Rice, Rush, Reno	Ark.-Colo.-Ga.
<i>Sorghum halepense</i>	Hodgeman, Rush	Fla.-Tex.-Colo.-Mex.
<i>Verbena bipinnatifida</i>	Pawnee, Hodgeman	S.D.-Tex.

Table IV. Species that apparently have migrated into Edwards County from the south.

<u>Species</u>	<u>Reported from follow- ing Counties</u>	<u>Range as Reported by Rydberg</u>
<i>Acerates auriculata</i>	Iowa	Nebr.-Utah.-N.M.-Tex.
<i>Malvastrum coccineum</i>	Kiowa, Ford, Pratt	Iowa-Tex.-Utah-Ore.

There were a few species reported by Hitchcock as occurring in practically all of the surrounding counties. It was assumed that these were present in Edwards County at the time of the earlier survey, but were overlooked. These species are shown in the following table:

Table V. Species in all surrounding counties at the time of Hitchcock's survey (1898).

<u>Species</u>	<u>Reported from follow- ing Counties</u>	<u>Range as Reported by Rydberg</u>
<i>Allium nuttallii</i>	Ford, Stafford	S.D.-Ariz.
<i>Apocynum cannabinum</i>	Pratt, Pawnee, Finney, Comanche	Wis.-Ohio-N.M.-Nebr.
<i>Astragalus plattensis</i>	Ford, Clark	Ind.-Ala.-Tex.-N.D.
<i>Distichlis spicata</i>	Pawnee, Clark	Tex.-Ariz.-Wash.
<i>Gaura coccinea</i>	Rush, Pawnee, Ford, Finney	Tex.-Ariz.-Mont.-Mex.
<i>Lithospermum angustifolium</i>	Stafford, Hodgeman	Ill.-Tex.-Ariz.
<i>Specularia perfoliata</i>	Ford, Stafford	Me.-Fla.-Ariz.-Ore.
<i>Yucca glauca</i>	Kiowa, Pawnee, Hodgeman, Pratt	Me.-Fla.-Ariz.-Ore.

The extent and direction of plant migration into Edwards County is shown in the following summary:

Species formerly found only in counties to the west	-----	11
" " " " " " " " east	-----	9
" " " " " " " " north	-----	7
" " " " " " " " south	-----	2

These data indicate that the majority of the species that have come into the county during the past 35 years have migrated from regions west and southwest of Edwards County. This probably is due to the blowing in of seeds by prevailing southwest winds and to the bringing in of seeds or other plant parts by the Arkansas River, which arises in Colorado and flows across Edwards County from the southwest to the northeast. The rather heavy apparent migration from east to west can probably be explained by the continued breaking up of virgin pasture land and the production of wheat, corn, and sorghums in those counties which were settled at an earlier date.

Annotated List of Plants of Edwards County

In the following annotated list, the species collected by the author during the course of her work are arranged in alphabetical order by families. Authority for identification is based on the second edition of "Illustrated Flora of the Northern States and Canada" by Britton and Brown and by comparison with the Kansas State College herbarium specimens.

"The tabular view of families" is arranged according to
(1915)
Bessey's [^]phylogenetic classification of flowering plants.

EQUISETACEAE

Equisetum laevigatum, A. Br.

Herb, common on low moist creek banks, flowering June to August.

LILACEAE

*Allium canadense, L.

Herb, few in number, growing on roadsides, flowering May to June.

*Allium nuttallii, Watson

Similar in stature, habit and flowering to preceding species,

though somewhat more abundant.

*Allium stellatum, Fras.

Herb, most abundant on rocky slopes near roads, flowering May

to June.

*Yucca glauca, Nutt.

Herb, abundant on rocky sandy hills, flowering May to June.

COMMELINACEAE

Commelina virginica angustifolia, Michx.

Herb, a frequenter of wet places, flowering May to June.

* Species thus marked have not been reported heretofore from
Edwards County.

* Tradescantia bracteata, Small

Herb, rare on roadsides, flowering in May.

RANUNCULACEAE

* Anemone caroliniana, Walt.

Herb, frequently white as well as purple in color, growing abundantly according to locality, near roadsides and meadows, and flowering in early May.

MALVACEAE

Callirrhoe involucrata, Nutt.

Herb, abundant in dry prairies, flowering in May.

* Cirriarrhoe acaedoides, (Mich.) A. Gray

Herb, considered rare, found only in special habitats on rich prairie, flowering May to June.

Hibiscus trionum, L.

Herb, found growing abundantly over the greater portion of the county, flowering in May.

* Malvastrum coccineum (Pursh.) A. Gray

Herb, found abundantly on sandy soil, especially along roadsides and dry prairies, flowering in May.

OXALIDACEAE

Oxalis comiculata, L.

Creeping herb, found in abundance and flowering in May and June.

*Oxalis violaceae, L.

Low lying herb, found frequently in rich, shaded portions of comparatively damp soil, flowering in early May.

ZYGOPHYLLACEAE

*Tribulus terrestris, L.

Low spreading herb, abundant on waste prairie, flowering in early September and fruiting in August.

CYPERACEAE

*Carex festucacea, Schlubr.

Herb, found on dry or rocky soil and flowering in late May to August.

Carex filiculmis, Vahl.

Herb, found occasionally in dry soil and flowering in May.

Carex muhlenbergii, Schk.

Herb, growing in dry fields, not overly abundant, flowering from late May to July.

Scirpus americanus, Pers.

Herb, found near small streams, flowering in September and October.

*Scirpus caespitosus, L.

Small herb, found in low marshy soil near creek, flowering in early April.

POACEAE

*Agropyron glaucum, R. & S.

Herb, rare, roadsides, flowering in May.

*Airopsis aristulatus, Mx.

Herb, common on low prairie, flowering in May.

Andropogon furcatus, Muhl.

Herb, common on roadsides, flowering in September.

*Andropogon nutans, Benth.

Herb, common on dry soil along roads, flowering in September.

Bouteloua hirsuta, Lag.

Herb, common on sandy plains, flowering in September.

*Bromus tectorum, L.

Herb, seen occasionally along roadsides, flowering in May.

Bulbilis dactyloides, Eng.

Herb, common on dry prairies, flowering in early April.

Cenchrus pauciflorus, Benth.

Herb, frequently seen on sandy soil, flowering in May.

Chloris verticillata, Nutt.

Herb, common on roadsides, flowering in May.

*Eatonia obtusata, Gray.

Herb, common in dry soil, flowering in May.

*Eleusine indica, Gaertn.

Herb, common on waste grounds, flowering in September.

Elymus canadensis, L.

Herb, common in sandy soil, flowering in July.

Elymus striatus, Willd.

Herb, common in sandy soil, flowering in late August.

*Elymus virginicus, L.

Herb, common on dry ground, flowering in April.

*Eragrostis abyssinica, Jacq.

Herb, common on roadside, flowering in September.

*Eragrostis capillaris, Nees.

Herb, common on sandy soil of dry prairie, flowering in
September.

*Eragrostis cilianensis (All.) Link.

Herb, common on roadsides, flowering in September.

*Eragrostis curtipedicellata, Buckley

Herb, common in sandy soil, flowering in September.

Eragrostis major, Host.

Herb, abundant along center of infrequently traveled roads,
flowering in September.

*Eragrostis oxylepis. Torr.

Herb, common in dry soil, flowering in September.

*Eragrostis reptans, Nees.

Herb, common in moist prairie, flowering in early May.

*Distichlis spicata, (L.) Kuntze

Herb, common on roadsides, flowering in September.

Panicum crus-galli, L.

Herb, common in dry sandy soil, flowering in September.

*Panicum scoparium, Lam.

Herb, common on roadsides, flowering in September.

Panicum virgatum, L.

Herb, common in sandy soil, flowering in September.

*Poa annua, L.

Herb, common on dry prairie, flowering in early April.

*Poa compressa, L.

Herb, common in pasture land and sterile soil, flowering in May.

*Poa pratensis, L.

Herb, common in fields and meadows, flowering in May.

*Setaria flava, Kth.

Herb, common on roadsides, flowering in September.

*Setaria glauca, Beauv.

Herb, common in waste places, flowering in September.

*Setaria viridis, Beauv.

Herb, common in cultivated grounds and waste places, flowering
in September.

Schedonnardus paniculatus (Nutt.) Trelease.

Herb, common along seldom used roads, flowering in September.

*Sitanion elymoides, Rab.

Herb, common in fields and along road, flowering in September.

Sporobolus argutus, L.

Herb, common along roads, flowering in September.

Sporobolus asperifolius, Junth.

Herb, common on dry prairie, flowering in May.

Sporobolus cryptandrus, Gray

Herb, common along roads, flowering in September.

*Sorghum halapense, (L.) Pers.

Herb, found frequently along sandy roadbeds, flowering in September.

EUPHORBIACEAE

*Chamaesyce preslii, (Guss.) Arthur

Herb, seen occasionally in fertile prairie, flowering in June.

Croton texensis, Mull.

Herb, abundant on sandy prairie, flowering in September.

Euphorbia dentata, Michx.

Herb, found occasionally in waste places, flowering in September.

Euphorbia glyptosperma, Engelm.

Spreading herb, abundant in waste places, flowering in April and May.

Euphorbia marginata, Pursh.

Herb, abundant in dry prairie, flowering in September.

PAPAVERACEAE

Argemone alma, Listib.

Herb, common in fields and waste places, flowering in September.

*Argemone intermedia, Sweet.

Herb, common in fields and waste places, flowering in September.

CAPPARIDACEAE

*Cleome lutea, Hook.

Herb, rare on sandy, rocky banks, flowering in May.

*Capsella bursa-pastoris, (L.) Britton.

Herb, common in waste places, flowering in early April and May.

*Lepidium virginicum, L.

Herb, common in waste places, flowering in May.

*Nasturtium obtusum, Nutt.

Herb, fairly common on dry prairies, flowering in May.

*Nasturtium sinuatum, Nutt.

Herb, common to waste places, flowering in May.

Sisymbrium canescens, Nutt.

Common in waste places, flowering in May.

PORTULACEAE

Froelichia floridana, Nutt.

Herb, common to the sand hills of the northern townships,
flowering in September.

*Portulaca pilosa, L.

Herb, common to waste places of special habitat, flowering in
September.

*Saponaria officinalis, L.

Herb, probably escaping from gardens, flowering in September.

TAMARICACEA

Tamarix gallica, Linn.

Forb, common near streams, flowering in May.

SALICACEA

*Salix discolor, Muhl.

Forb, common as to special habit near streams, flowering in March.

AMARANTHACEAE

*Amaranthus hybridus, L.

Herb, common in waste places, flowering in September.

Amaranthus torreyi, L.

Herb, common in waste places, flowering in October.

CHENOPODIACEAE

Chenopodium album, L.

Herb, common to waste places, flowering May.

Chenopodium berlandieri, L.

Herb, common along roadsides, flowering in September.

Cycloloma atriplicifolium, (Spring.) Coult.

Herb, common to waste places and fields, flowering in October.

*Salsola kali-tragus, Moq.

Herb, abundant in fields and along fence rows, flowering in September.

Eriogonum annuum, Nutt.

Herb, abundant in sandy soil of dry prairie, flowering in September.

*Polygonum aviculare, L.

Herb, common in waste places, flowering in September.

Polygonum pennsylvanicum, L.

Herb, common to damp waste places, flowering in September.

Rumex altissimus, Wood.

Herb, especially abundant in damp waste places along rivers and fence rows, flowering in May.

NYCTAGINACEAE

Allionia albida, Walt.

Herb, not common, found along roads, flowering in May.

Allionia linearis, Pursh.

Herb, found occasionally in waste places, flowering in May.

PLANTAGINACEAE

*Plantago major, L.

Herb, common in waste places, flowering in September.

*Plantago patagonica, Jacq.

Herb, found abundantly in moist sandy soil, flowering in April.

*Plantago virginica, L.

Herb, found abundantly in special habit near creeks which overflow, flowering in May.

CONVOLVULACEAE

Convolvulus arvensis, L.

Low, running herb of climbing nature, found in dry prairies, flowering in September.

*Convolvulus sepium, R. Br.

Low, climbing herb, found in fields occasionally, flowering from early summer to September.

Ipomoea leptophylla Tarr.

Herb of bush type, seen occasionally in dry prairie, fruiting in September and October.

BORRAGINACEAE

*Echinosperrum rudawskii var. occidentalis, Watson

Herb, common in waste places, flowering in April.

*Lithosperrum angustifolium, Michx.

Herb, common in fields and prairies, flowering in May.

SOLANACEAE

Solanum rostratum, Dunal.

Herb, common in fields and dry prairie, flowering in September.

APOCYNACEAE

*Apocynum cannabinum, L.

Herb, found occasionally in sandy or gravelly soil near streams,
flowering in May.

ASCLEPIADACEAE

*Acerates auriculata, Engelm.

Herb, found commonly in dry sandy soil, fruiting in October.

*Acerates nudiflora, (Raf.) Eaton.

Herb, common to sandy soil, fruiting in October.

*Gomphocarpus cordifolius, Gray

Herb, rare, native to fertile prairie, flowering in May.

SCROPHULARIACEAE

*Pentstemon cobaea, Nutt.

Herb, found only occasionally along roadsides, flowering in May.

*Veronica peregrina, L.

Herb, common to dry prairie, flowering in May.

*Verbascum thapsus, L.

Herb, common to special habitats, flowering in late June.

MARTYNIACEAE

Martynia louisiana, Mill.

Vine-like herb, common in fields, flowering in May and fruiting
in October.

VERBENACEAE

*Verbena bipinnatifida, Nutt.

Herb, common in woods, flowering in late April and May.

Verbena stricta, Vent.

Herb, common to dry prairies, flowering in late June.

Lippia cuneifolia, Steud.

Herb, common along roads and prairies, flowering in May.

Lippia lanceolata, Michx.

Herb, seen occasionally in waste places, flowering in May.

LAMIACEAE

*Hedeoma hispida, Pursh.

Herb, not common, in fields and waste places, flowering in July.

Salvia lanceolata, Poir.

Herb, common in prairies and fields, flowering May to August.

Salvia pitcheri, Torr.

Herb, common along roads, flowering in September.

PRUNACEAE

Prunus angustifolia, Marsh.

Forb, very abundant on sand hills of entire county, flowering in early April.

MIMOSACEAE

Acuan illinoensis, (Michx.) Kuntze.

Herb, common to dry prairie, flowering in June.

CASSIACEAE

Cassia chamaecrista, L.

Herb, common on roadsides, flowering in June.

FABACEAE

Astragalus latiflorus, Hook.

Herb, common on roadsides and prairies, flowering in May.

*Astragalus plattensis, Nutt.

Herb, not common, found in rocky soil, flowering in May.

*Astragalus triphyllus, Pursh.

Herb, common on roadsides and prairie, flowering in May.

*Astragalus scobinatulus, Sheld.

Herb, seen occasionally on rocky roadsides, flowering in late May.

Baptisia australis, R. Br.

Herb, common along roads and dry prairies, flowering in May and fruiting in July.

Melilotus alba, L.

Herb, common along roads and waste places, flowering in June.

*Melilotus officinalis, (L.) Lam.

Herb, seen occasionally along roads and waste places, flowering in June.

*Medicago sativa, L.

Herb, found along roadsides, probably escaped from cultivation, flowering from May to September.

Psoralea tenuiflora, Pursh.

Herb, common to dry prairie, flowering in June.

*Ribes aureum, Pursh.

Forb, common near woods or moist land, flowering in early April.

Strophostyles pauciflora, (Benth.) S. Wats.

Vine-like herb, common to sandy and gravelly soil, flowering in September.

OENOTHERACEAE

*Glaura coccinea, Nutt.

Herb, abundant in sandy, dry prairie, flowering in April.

*Oenothera pinnatifida, Nutt.

Herbs, not common, found along roadsides, flowering in May.

Oenothera laciniata, Hill.

Herb, found occasionally in waste places, flowering in June.

*Megapterium missouriensis, (Sims) Spach.

Herb, rare, found on dry prairie, flowering in June.

Meriolix serrulata, (Nutt.) Walp.

Herb, abundant on dry, sandy prairie and along roads, flowering in May.

LOASACEAE

Mentzelia stricta, Torr. & Gray

Herb, found abundantly according to special habitat, flowering in September.

CASTACEAE

Opuntia fragilis, Haw.

Herb, found occasionally on dry, sandy prairie, flowering in July.

Opuntia humifusa, Raf.

Herb, found abundantly on dry, sandy prairie, flowering in July.

* Mamillaria vivipara, Haw.

Herb, rare, found in sandy, dry prairie, flowering in July.

APIACEAE

* Angelia leporina, S. Watson

Herb, rare, found along roadsides, flowering in May.

CAPRIFOLIACEAE

* Symphoricarpos vulgaris, Michx.

Forb, found in abundance on sand hills and prairie, fruiting in October.

CAMPANULACEAE

* Specularia leptocarpa, (Nutt.) A. Gray. (Legouzia, Britton)

Herb, common to dry prairie, flowering in May.

* Achillea millefolium, L.

Herb, common to waste places, flowering in September.

* Specularia perfoliata, (L.) A. DC.

Herb, common along roads and prairies, flowering from May to September.

*Actinella scaposa, Nutt.

Herb, rare, found on prairies, flowering in May.

HELIANTHACEAE

*Coleosanthus brachyhlyllus, (Gray) O. Ktze.

Herb, found occasionally on open prairie, flowering in September and fruiting almost at once.

Coreopsis tectoria, Nutt.

Herb, found in abundance on prairies, especially those of a dry, sandy soil, flowering from June to September.

Helianthus annuus, L.

Herb, common in waste places and fields, flowering in September.

Thelesperma gracile, Gr.

Herb, common on sandy prairie, flowering in September.

Ratibida columnaris, (Sims) D. Don.

Herb, common to dry prairies, flowering from July to September.

*Ambrosia artemisiaefolia, L.

Herb, common to waste places, flowering in May.

Ambrosia psilostachya, DC.

Herb, common in waste places, flowering in May.

*Franseria tomentosa, Gray.

Herb, common on dry, sandy prairie, flowering in September.

Xanthium canadense, Mill.

Herb, abundant in moist fields near rivers, fruiting in September.

HELENIACEAE

*Dysodia chrysanthemoides, Lag.

Herb, abundant along roads, flowering in September.

Gaillardia pulchella, Foug.

Herb, abundant on dry prairies, flowering in May.

Hymenopappus tenuifolius, Pursh.

Herb, common to waste places, flowering in May.

*Aplopappus spinulosus, DC.

Herb, rare, found along road, flowering in September.

Aster multiflorus, Ait.

Herb, abundant in waste places and along roads, flowering in September.

Aster paniculatus, Lam.

Herb, abundant in waste places, flowering in September.

*Aster salicifolius, L.

Herb, considered rare, found along roads, flowering in October.

*Erigeron canadensis, L.

Herb, common in waste places and fields, flowering in May.

*Erigeron ramosus, (Walt.) B. & P.

Herb, seen occasionally on open prairie, flowering in May.

Gutierrezia sarothrae, Pursh.

Herb, common on rocky hills, flowering in May.

Grindelia squarrosa, Dunal.

Herb, common on dry prairies, flowering in September.

Heterotheca subaxillaris, (Lam.) Britton and Rusby.

Herb, common on dry prairies, flowering in October.

Prinopsis ciliata, Nutt.

Herb, found abundantly along roads and on dry prairie, flowering in October.

Solidago canadensis, L.

Herb, common on dry prairie, flowering in September.

*Solidago lindheimeriana, Scheele.

Herb, considered rare, found on dry prairies, flowering in September.

Solidago missouriensis, Nutt.

Herb, common on dry prairies, flowering in September.

*Solidago radula, Nutt.

Herb, found occasionally along roads and on dry prairie, flowering in late September.

Solidago rigida, L.

Herb, common to dry prairie regions, flowering in September and October.

*Solidago serolina, Ait.

Herb, found occasionally on dry prairie and roadsides, flowering in September.

*Solidago tortifolius, Ell.

Herb, found occasionally on dry prairie, flowering in late August and early September.

EUPATORIACEAE

Lacinaria punctata, Hook.

Herb, found in abundance on dry prairie, flowering in late September.

ANTHEMIDACEAE

*Tanacetum vulgare, L.

Herb, considered rare, found on fertile comparatively moist soil.

SENECIONIDACEAE

Senecio douglasii, DC.

Herb, common to waste places and dry prairie, flowering in September.

*Senecio eremophilus, Richards.

Herb, found rarely on dry prairies, flowering in May.

CARDUACEAE

Cirsium ochrocentrus, Gr.

Herb, abundant to prairies and fields, flowering from July to September.

LACTUCACEAE

*Lactuca scariola, S.

Herb, found occasionally along roads, flowering in May and fruiting within a few days.

*Tragopogon pratensis, L.

Herb, considered rare, along roads, flowering in May and fruiting at once.

*Taraxacum officinale, Weber.

Herb, common to fields and lawns, flowering in April and May.

*Troximon cuspidatum, Ph.

Herb, occasionally found on dry prairie, flowering in May.

Table VI. Tabular View of Families Treated in this Paper.

Orders	Families	:Species :Addition- :collect--:al species :ed or :reported :observed: by : by :Hitchcock author
Equisetales	Equisetaceae	1
Alismatales	Alismataceae	1
Liliales	Lilaceae	4
	Pontederiaceae	1
	Commelinaceae	2
Arales	Lemnaceae	2
Graminales (Poales)	Cyperaceae	7
	Poaceae	37 25
Ranales	Ranunculaceae	1
Malvales	Malvaceae	4
	Ulmaceae (trees)	2
Geraniales	Oxalidaceae	2
	Linaceae	1
	Euphorbiaceae	6 1
Brassicales	Papaveraceae	2
	Capparidaceae	1 2
	Brassicaceae	5
Caryophyllales	Caryophyllaceae	1
	Portulacaceae	2
	Aizoaceae	1

Table VI Continued

Caryophyllales (cont.)	Tamaricaceae	1	
	Salicaceae (trees)	1	4
	Amaranthaceae	6	
	Chenopodiaceae	4	1
	Polygonaceae	5	3
	Nyctaginaceae	2	
Primulales	Plantaginaceae	3	
Polemoniales	Convolvulaceae	3	1
	Borraginaceae	2	1
	Solanaceae	4	
Gentianales	Apocynaceae	1	
	Asclepiadaceae	5	1
Scrophulariales	Scrophulariaceae	3	2
	Martyniaceae	1	
Lamiales	Verbenaceae	5	
	Lamiaceae	3	1
Rosales	Prunaceae	2	
	Mimosaceae (Leguminosae)	1	
	Cassiaceae (Leguminosae)	11	10
	Oenotheraceae	5	2
Cactales	Cactaceae	3	
Loasales	Loasaceae	1	
	Cucurbitaceae		1
Sapindales	Anacardiaceae		1
Umbellales	Apiaceae		1
Rubiales	Caprifoliaceae	2	
Campanulales	Campanulaceae	4	1
Asterales (Compositae)	Helianthaceae	6	2
	Ambrosiaceae	5	3
	Heleniaceae	3	3
	Asteraceae	18	8
	Vernoniaceae	1	
	Eupatoriaceae	1	2
	Anthemidaceae	1	
	Senecionidaceae	2	
	Carduaceae	1	
	Lactucaceae	4	1

SUMMARY

Edwards County covers an area of 612 square miles, situated in the southwestern third of the State of Kansas. Practically the only survey of the flora of Edwards County was that made in 1898 by W. W. Hitchcock who listed 180 species belonging to 48 families.

In the present paper, there are listed 100 new species, making a total of 280 plants collected and identified to date in Edwards County. Of these, the most numerous are members of the two orders, Graminales and Asterales.

Of the 85 species reported by Hitchcock in 1898 that were not found, some may have been missed, due to a difference in the flowering season, while others may have disappeared due to extensive cultivation of the land, to new agricultural practices, to early prairie fires and to dust storms and hot winds which accompanied extended droughts. On the other hand, several of the species found by the writer and not reported by Hitchcock have apparently migrated into the county during the past 35 years. From studies along this line, it was learned that most of the immigrants have come into Edwards County from regions to the west, with east to west migration ranking second. An annotated list of the species identified by the writer and maps showing the location of the species newly reported are included in the body of the thesis.

ACKNOWLEDGMENT

The writer wishes to acknowledge her indebtedness to Dr. H. H. Haymaker for valuable suggestions and criticisms, and to express her thanks to others who have aided in the preparation of this manuscript.

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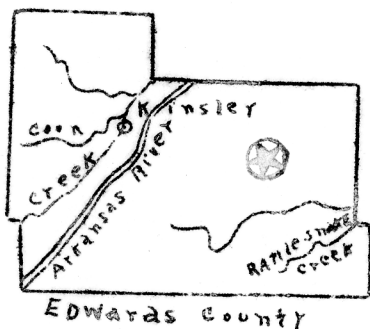
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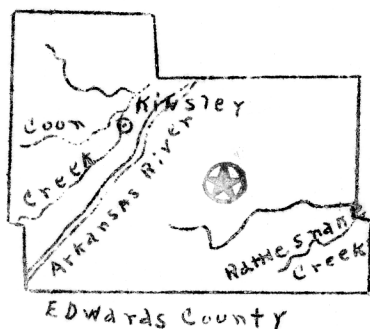
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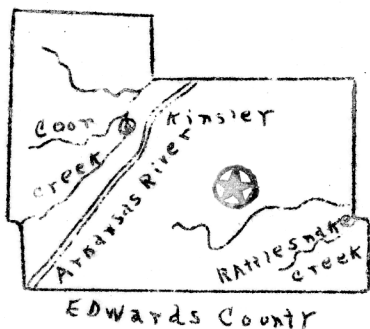
APPENDIX



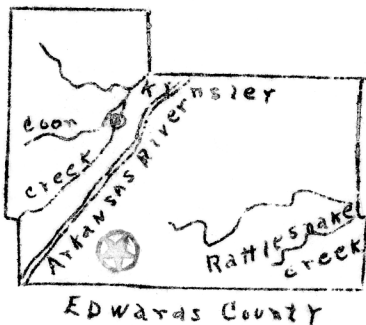
Liliaceae
Allium canadense, L.



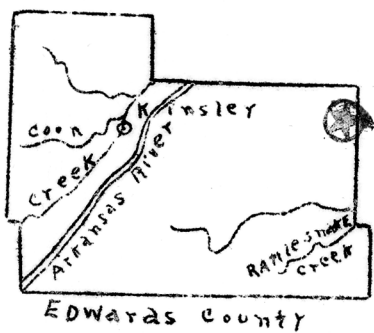
Liliaceae
Allium nuttallii, Watson



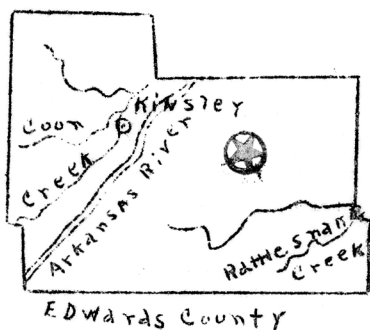
Liliaceae
Allium stellatum, Fras.



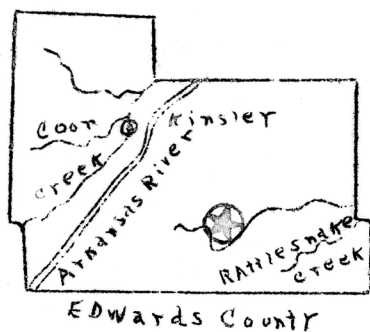
Liliaceae
Yucca glauca, Nutt.



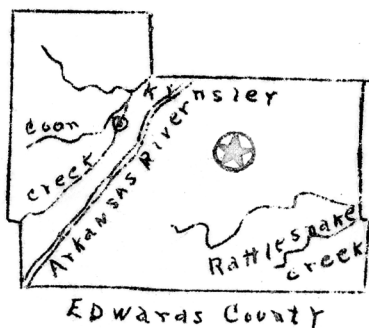
Commelinaceae
Tradescantia bracteata, Small



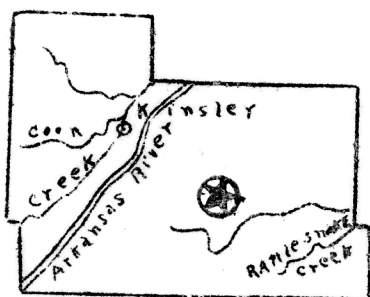
Ranunculaceae
Anemone caroliniana, Walt.



Malvaceae
Callirrhoe aeceoides, (Michx.) A.Gray

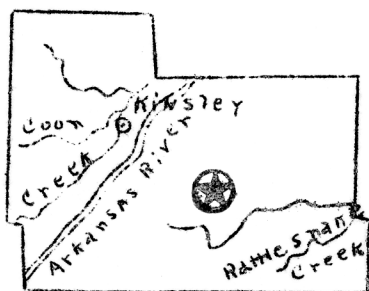


Malvaceae
Malvastrum coccineum, (Pursh) A.Gray



Edwards County

Oxalidaceae
Oxalis violaceae, L.



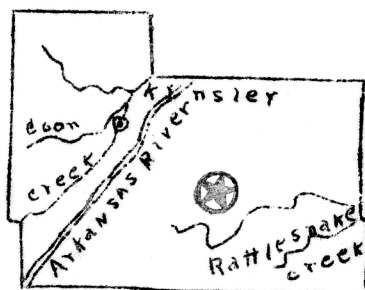
Edwards County

Zygophyllaceae
Tribulus terrestris, L.



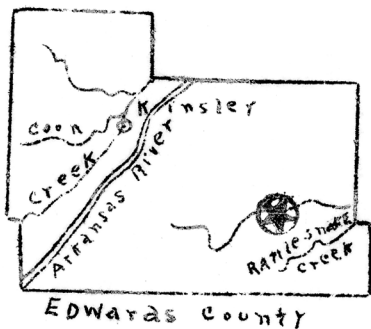
Edwards County

Cyperaceae
Carex muhlenbergii, Schk.

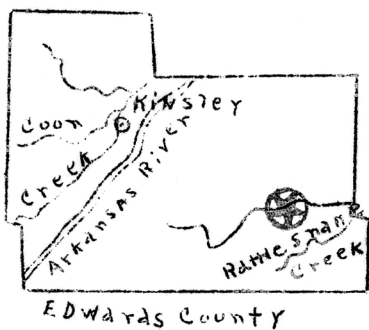


Edwards County

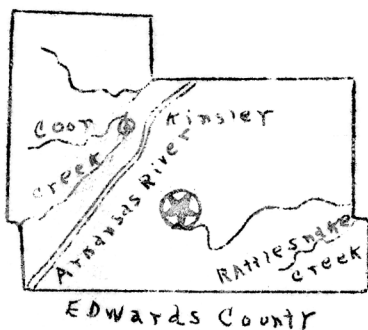
Cyperaceae
Carex festucacea, Schk.



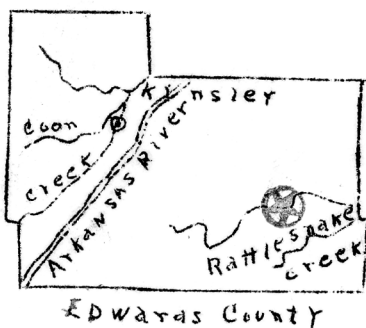
Cyperaceae
Scurpus caespitosus, L.



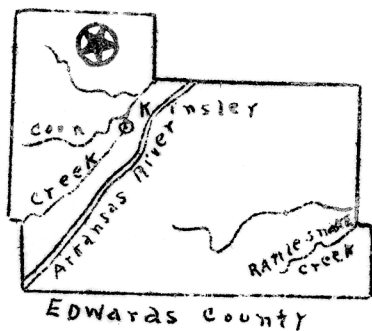
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Scurpus pungens, Vahl.



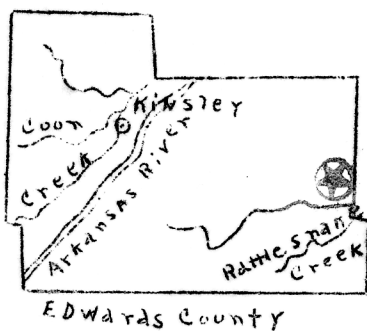
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Agropyron glaucum, R. & S.



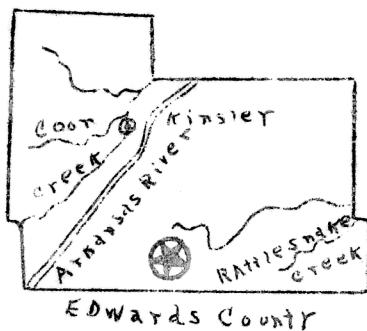
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Airopsis aristulatus, Michx.



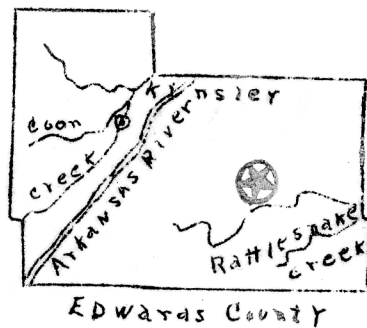
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Andropogon nutans, Benth.



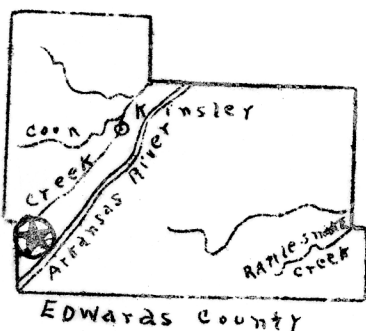
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Bromus tectorum, L.



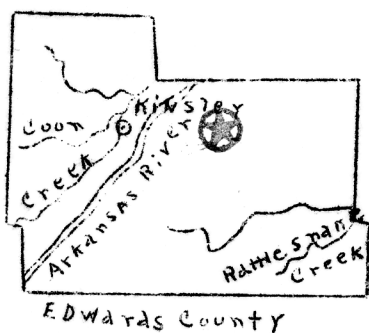
Poaceae
Eatonia obtusata, Gray



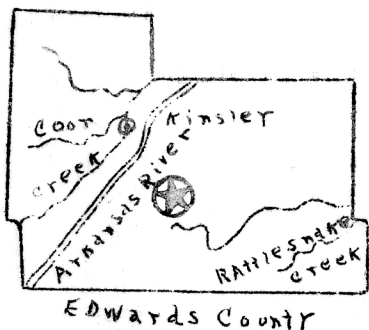
Poaceae
Elusine Indica, Gaertn.



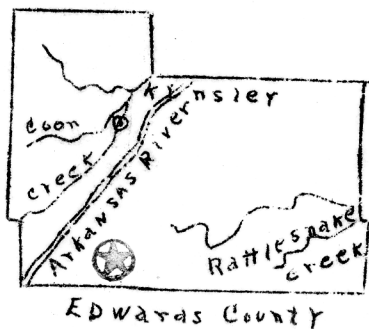
Poaceae
Elymus virginicus, L.



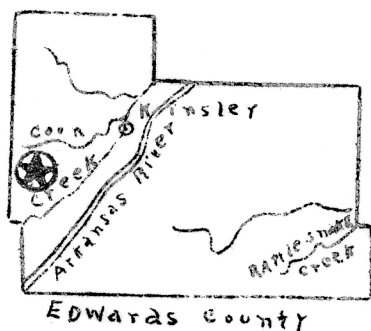
Poaceae
Eragrostis abyssinica, Jaeg.



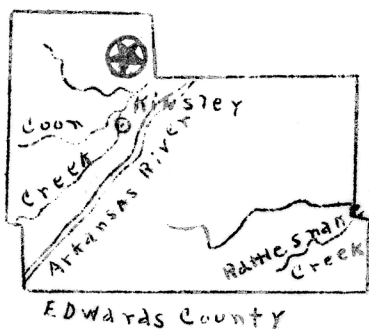
Poaceae
Eragrostis capillaris, Nees.



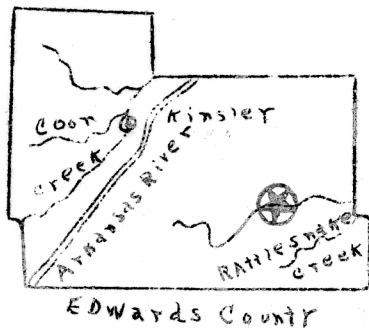
Poaceae
Eragrostis cilianensis, (All.) Link.



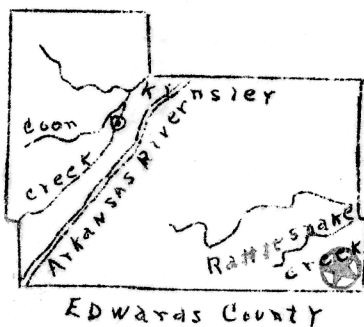
Poaceae

Eragrostis curtipedicellata, Buckley

Poaceae

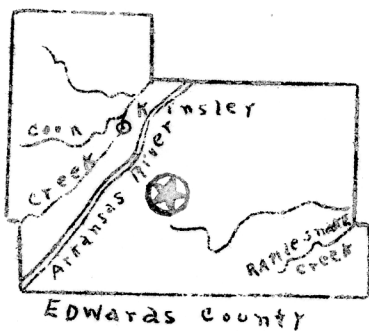
Eragrostis oxylepis, Torr.

Poaceae

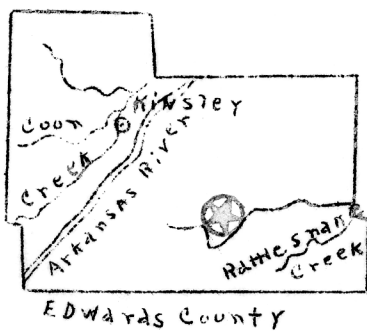
Eragrostis reptans, Nees.

Poaceae

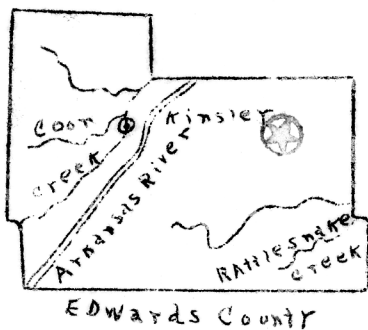
Distichlis spicata, (L.) Kuntze



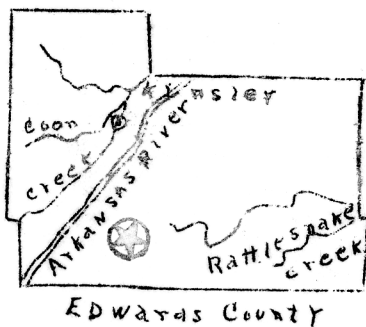
Poaceae
Panicum scoparium, Lam.



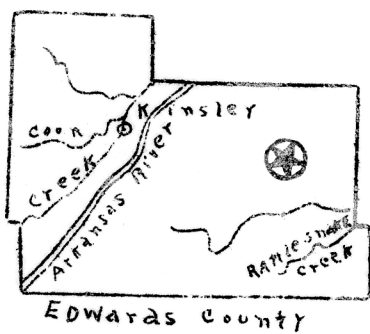
Poaceae
Poa annua, L.



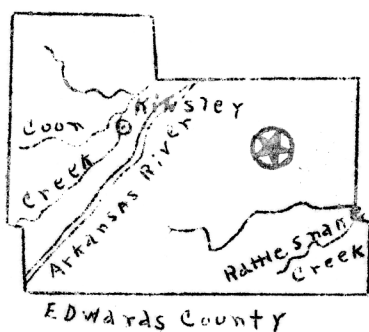
Poaceae
Poa compressa, L.



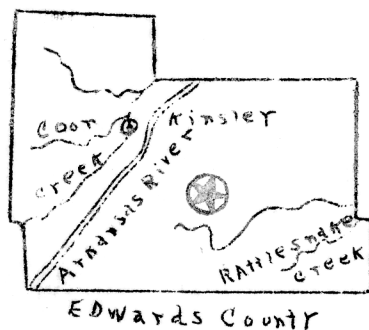
Poaceae
Poa pratensis, L.



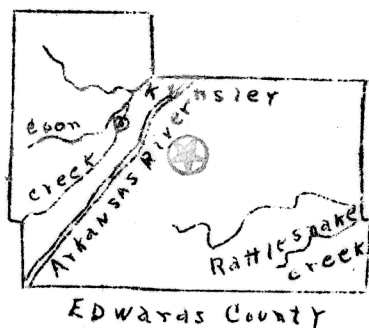
Poaceae
Setaria flava, Kth.



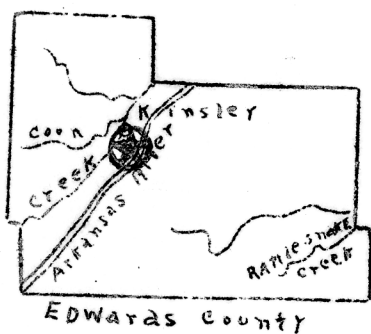
Poaceae
Setaria glauca, Beauv.



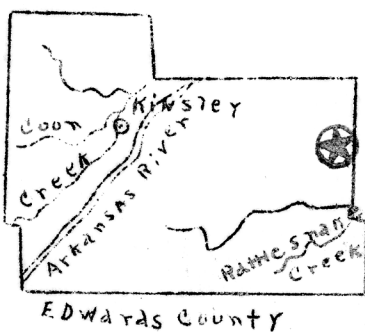
Poaceae
Setaria viridis, Beauv.



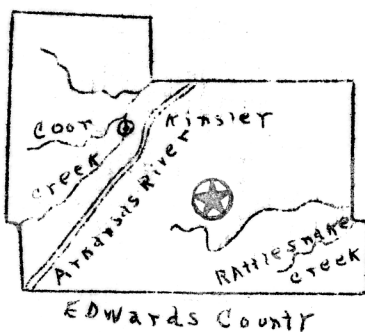
Poaceae
Sitanion elymoides, Raf.



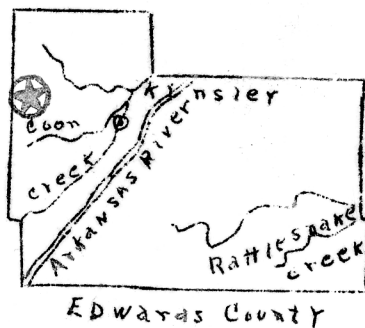
Poaceae
Sorghum halapense, (L.) Pens.



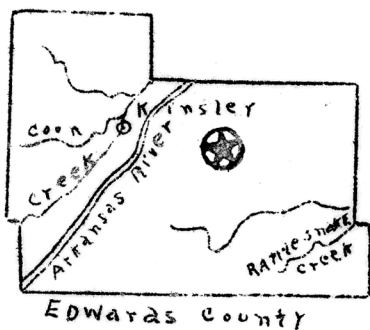
Euphorbiaceae
Clamaesyce preslii, (Guss) Arthur



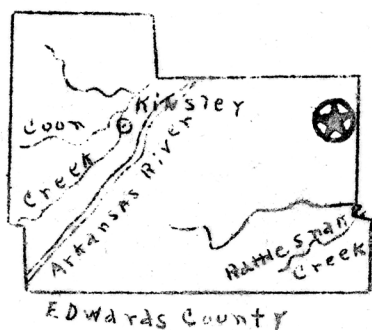
Papaveraceae
Argemone intermedia, Sweet



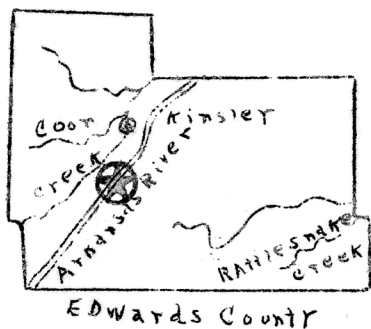
Capparidaceae
Cleome lutea, Hook



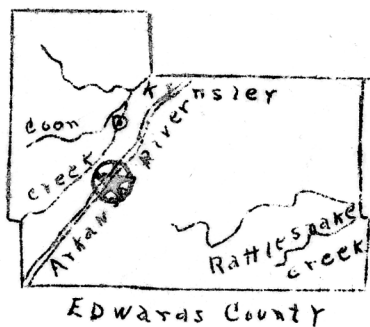
Brassicaceae
Capsella Bursa-pastoris, (L.) Britton



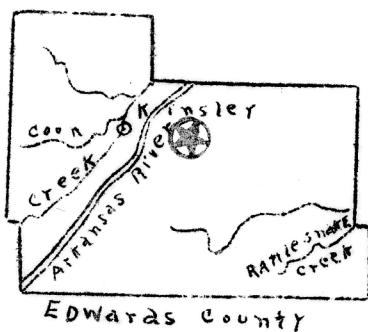
Brassicaceae
Lepidium virginicum, L.



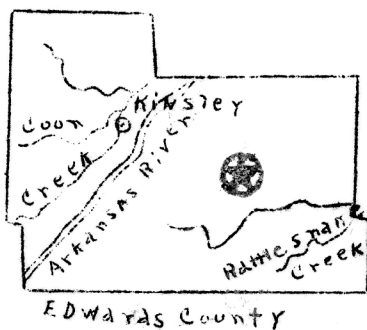
Brassicaceae
Nasturtium obtusum, Nutt.



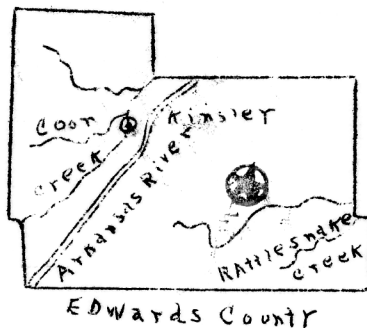
Brassicaceae
Nasturtium sinuatum, Nutt.



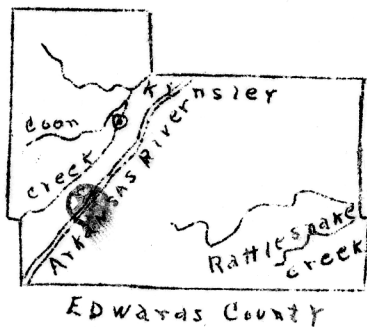
Brassicaceae
Sisymbrium canescens, Nutt.



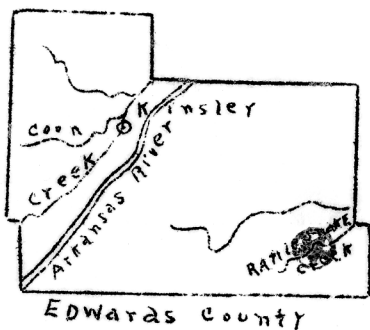
Portulacaceae
Portulaca pilosa, L.



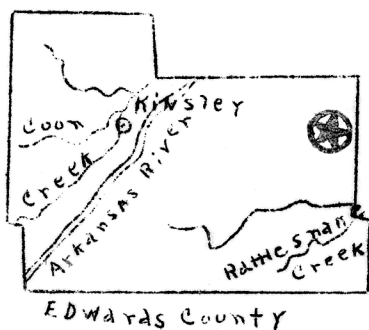
Portulacaceae
Saponaria officinalis, L.



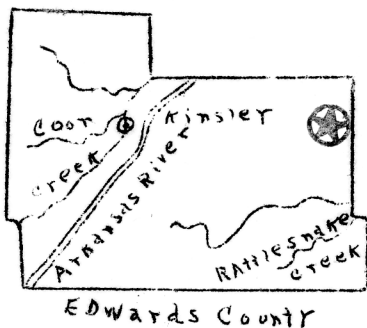
Salicaceae
Salix discolor, Muhl.



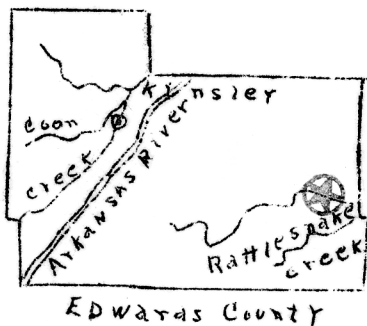
Amaranthaceae
Amaranthus hybridus, L.



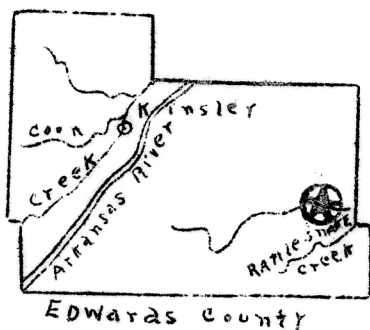
Chenopodiaceae
Salsola Kali-tragus, Moq.



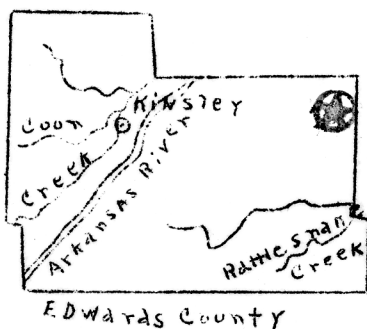
Polygonaceae
Polygonum aviculare, L.



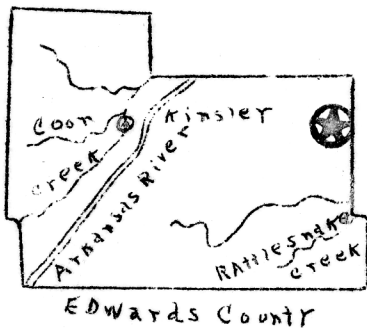
Plantaginaceae
Plantago major, L.



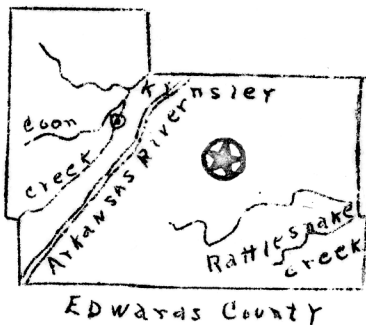
Plantaginaceae
Plantago Patagonica, Jacq.



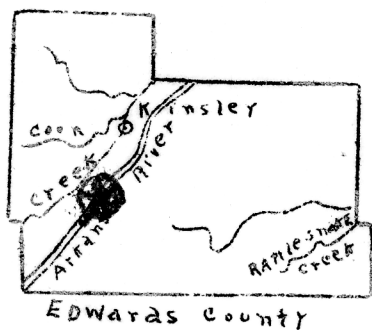
Plantaginaceae
Plantago virginica, L.



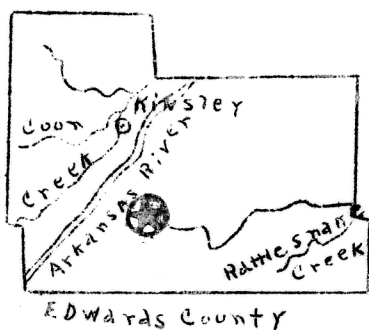
Convolvulaceae
Convolvulus sepium, L.



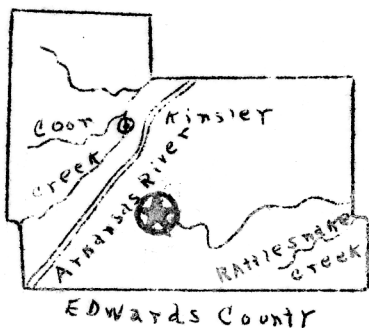
Borraginaceae
Echinosperrum Rudawskii, L. var.
occidentalis, Watson



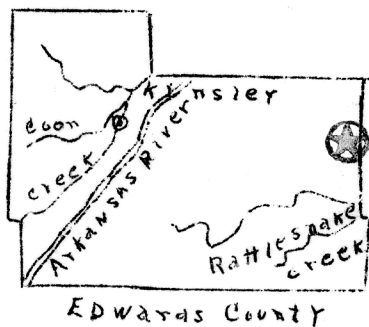
Borraginaceae
Lithospermum angustifolium, Michx.



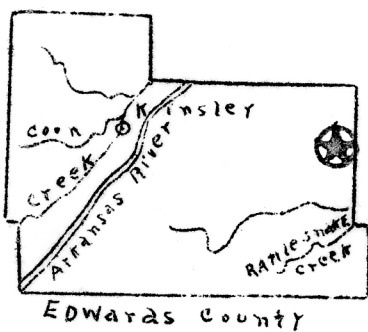
Apocynaceae
Apocynum camabinium, L.



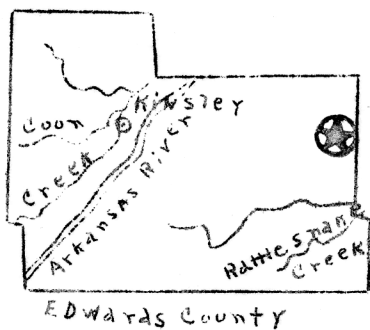
Asclepiaceae
Acerates auriculata, Engelm.



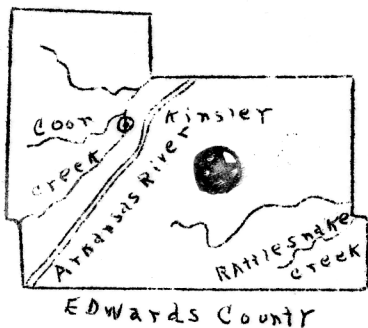
Asclepiaceae
Acerates midiflora, (Raf.) Eaton



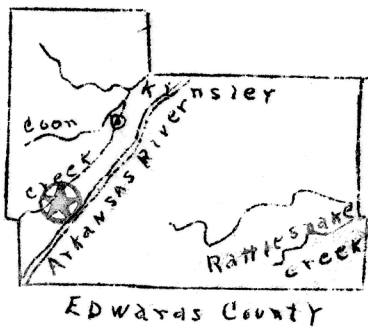
Asclepiaceae
Gompheocarpus cordifolius, Gray



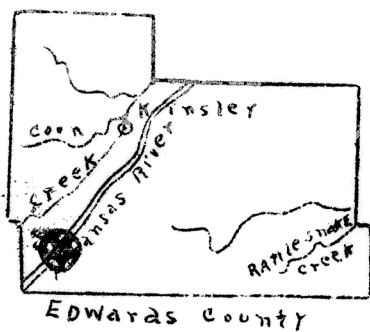
Scrophulariaceae
Penstemon cobaea, Nutt.



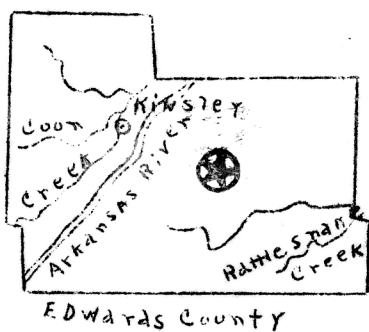
Scrophulariaceae
Veronica perigrina, L.



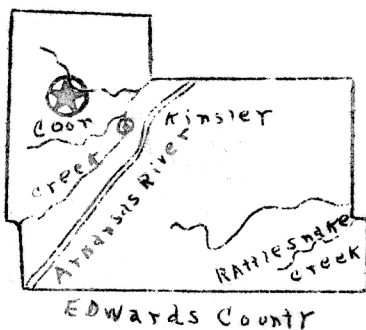
Scrophulariaceae
Verbascum thapsis, L.



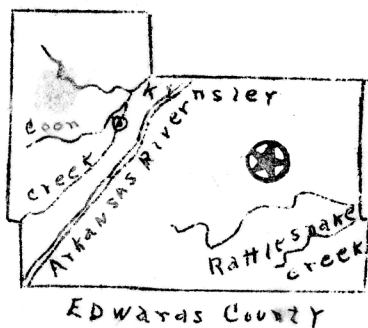
Verbenaceae
Verbena bipinnatifida, Nutt.



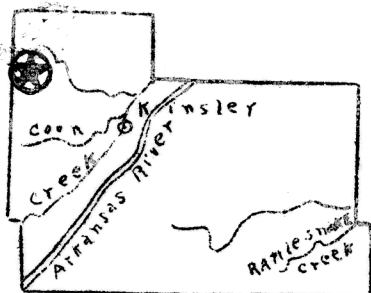
Lamiaceae
Hedeoma hispida, Pursh.



Fabaceae
Astragalus plattensis, Nutt.

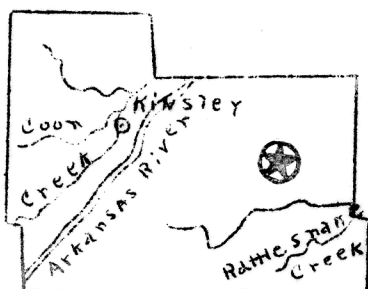


Fabaceae
Astragalus triphyllus, Pursh.



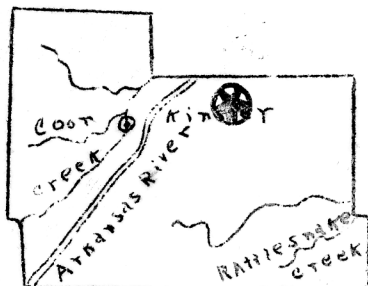
Edwards County

Fabaceae
Astragalus scobinatulus, Sheld.



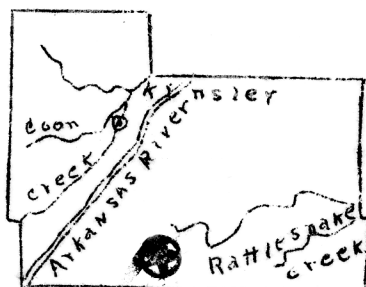
Edwards County

Fabaceae
Melilotus officinalis, (L.) Lam.



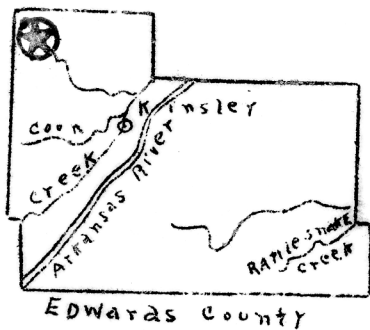
Edwards County

Fabaceae
Medicago sativa, L.

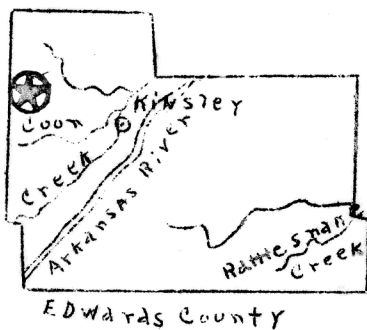


Edwards County

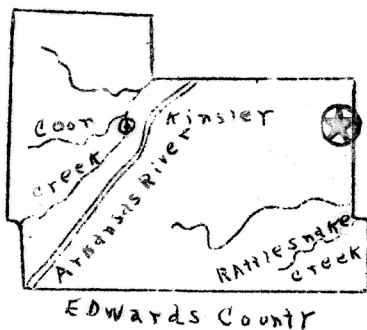
Fabaceae
Ribes aureum, Pursh.



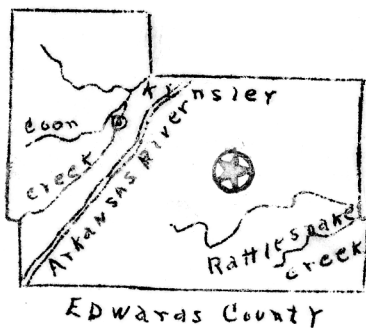
Oenotheraceae
Gaura coccinea, Nutt.



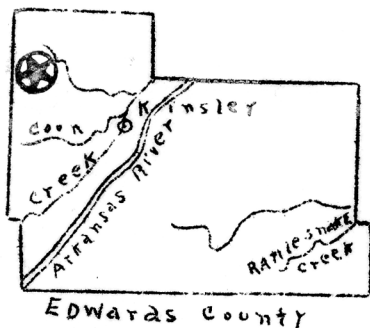
Oenotheraceae
Oenothera pinnatifida, Nutt.



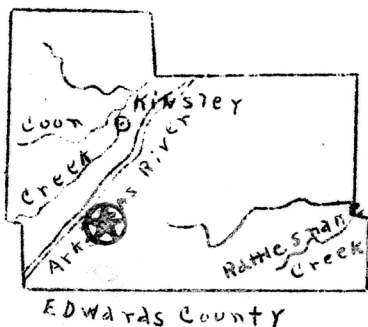
Oenotheraceae
Megapterium missouriensis, (Sims)
 Spach.



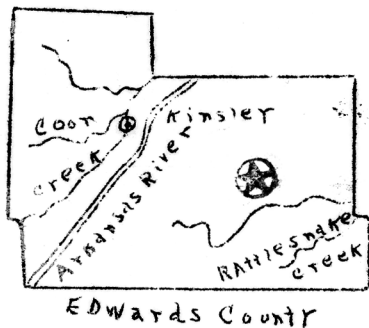
Cactaceae
Mamillaria vivipara, Haw.



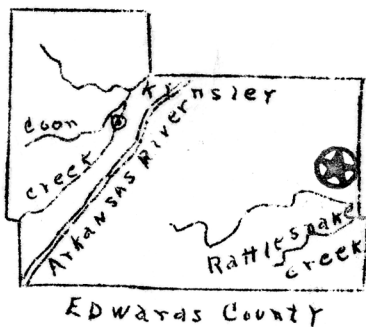
Apiaceae
Augelia leporina S. Watson



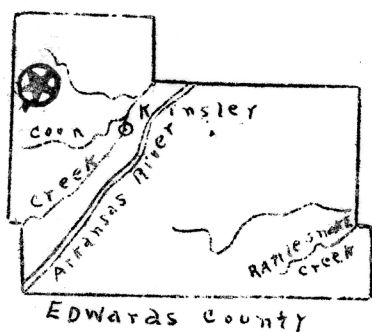
Caprifoliaceae
Symphoricarpos vulgaris, Michx.



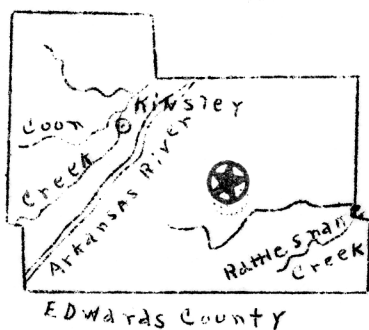
Campanulaceae
Specularia leptocarpa, (Nutt.) A. Gray
(Legouzia Britton.)



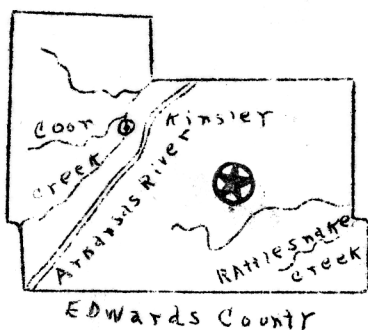
Campanulaceae
Achillea millefolium, L.



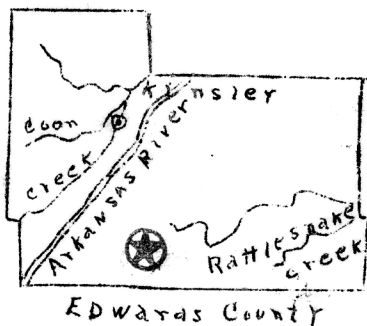
Campanulaceae
Specularia perfoliata, (L.) A. DC.



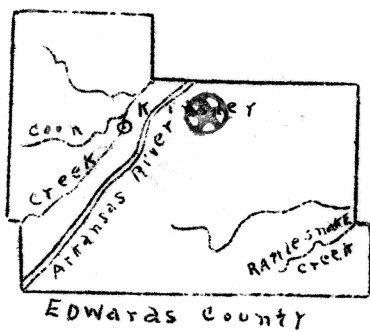
Campanulaceae
Actinella scaposa, Nutt.



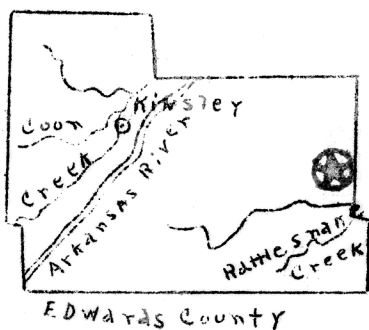
Helianthaceae
Coleosanthus brachyhyllyllus, (Gray)
 O. Ktze.



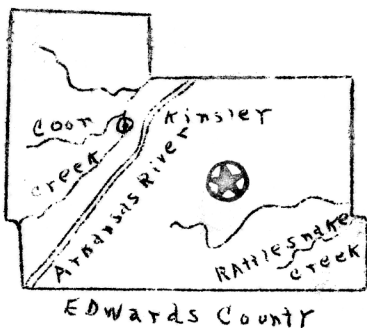
Ambrosiaceae
Ambrosia artemisiaefolia, L.



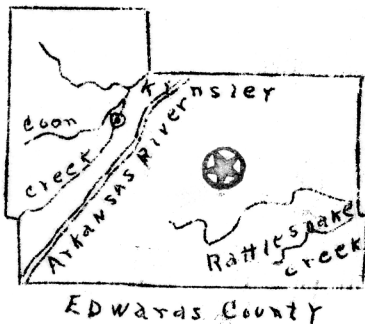
Ambrosiaceae
Franseria tomentosa, Gray



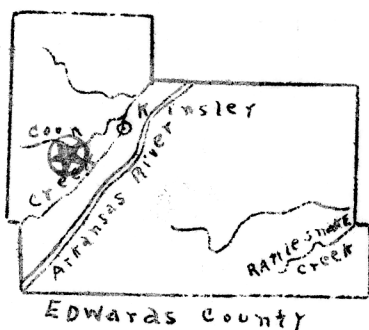
Heleniaceae
Dysodia chrysanthemoides, Lag.



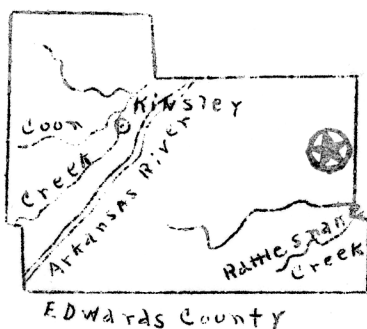
Asteraceae
Aplopappus spinulosus, DC.



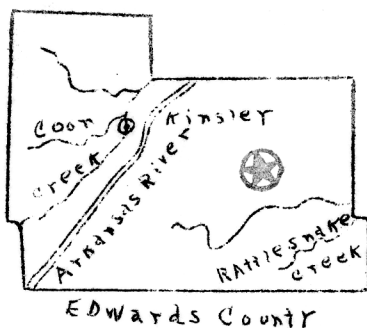
Asteraceae
Aster salicifolius, L.



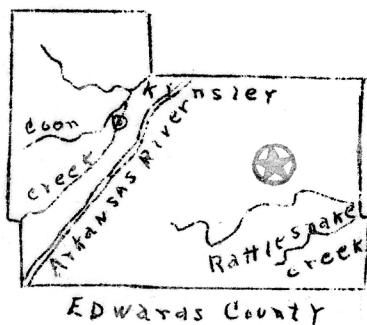
Asteraceae
Erigeron canadensis, L.



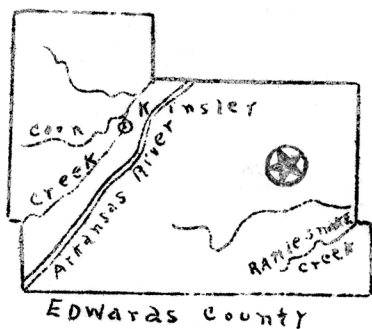
Asteraceae
Erigeron ramosus, (Walt.) BSP.



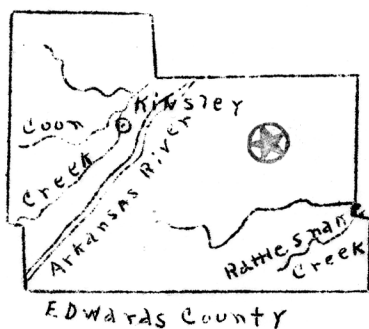
Asteraceae
Solidago lindheimeriana, Scheele



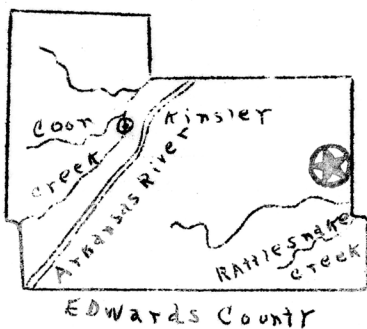
Asteraceae
Solidago radula, Nutt.



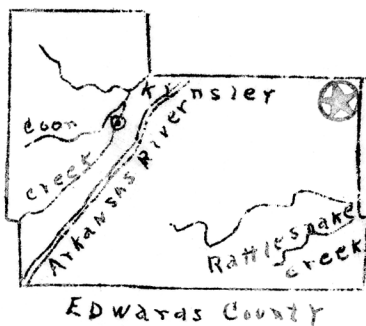
Asteraceae
Solidago serotina, Ait.



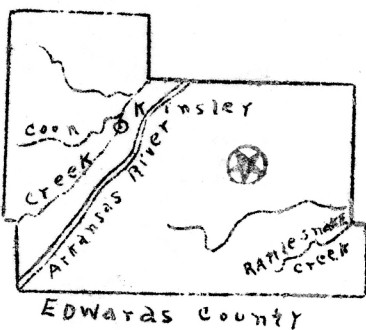
Asteraceae
Solidago tortifolius, Ell.



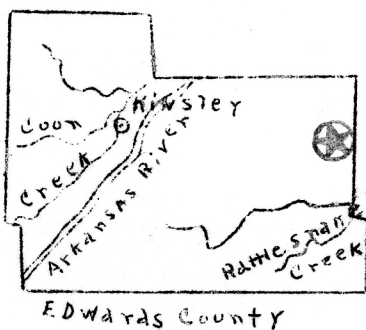
Anthemidaceae
Tanacetum vulgare, L.



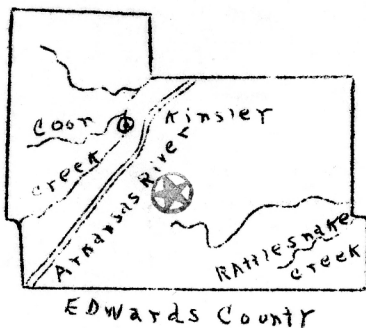
Senecionidaceae
Senecio eremophilus, Richards



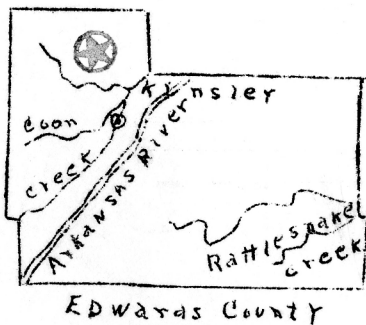
Lactucaceae
Lactuca scariola, L.



Lactucaceae
Tragopogon pratensis, L.



Lactucaceae
Taraxacum officinale, Weber



Lactucaceae
Tropimon cuspidatum, Ph.