Vascular Flora of a Red Sandstone Hills Site  
Canadian County, Oklahoma

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This article reports the results of an inventory of the vascular plants from a site in central Oklahoma. Three hundred thirty-four species of vascular plants in 237 genera and 76 families were collected. The most species were collected from the families Poaceae (56) and Asteraceae (54). The genera with the most species were *Euphorbia* and *Eragrostis*, both with six species. One hundred six species were annuals, 227 perennials, and 1 biennial. Forty-nine species of woody plants were present. Forty-one species, or 12.3% of the flora, were exotic to Oklahoma. No species listed as threatened or endangered by the U.S. Fish and Wildlife Service were encountered, but two species (*Escobaria vivipara* and *Muhlenbergia bushii*) are tracked by the Oklahoma Natural Heritage Inventory.

INTRODUCTION

Canadian County has been the focus of botanical research for several decades. The first plant collections from the county were made by Shultz and Sawyer on January 10, 1917, when they collected *Helianthus maximiliani*, *Oenothera rhombipetala*, *Salsola iberica*, and *Senecio riddellii*. There was no further collecting until 1926, but in the 1930s botanical studies began in ernst. Botanical collections in Canadian County have focused on the “Caddo Canyons” in the western third of the county. Of the 1,121 species recorded in the Oklahoma Vascular Plants database (Hoagland et al. 2006) for Canadian County, 964 are from canyons such as Devil’s / Methodist, Grocket, Waters, and Widowmaker. On 29 May 1933, J. C. Shirley collected 38 specimens from Devil’s Canyon. Elbert Little collected 87 species from Devil’s Canyon in September, 1936. Several collectors visited Devils Canyon in 1937, but the most prolific was Milton Hopkins, who collected 145 in April and September of 1937 (Hoagland et al. 2006). Although collecting continued in Devil’s Canyon, emphasis shifted to nearby Water Canyon when Connie Taylor gathered 321 specimens (see Taylor [1961] for a complete species list). Botanical collections outside the canyons have not focused on a particular locale in the county. Although 1,121 taxa of vascular plants have been reported from Canadian County, it is fewer than the taxa reported from adjacent Oklahoma (1,399) and Cleveland (1,426) counties. The current project was initiated on the assumption that focused collection effort at a given site would yield additional county records. It will also provide land managers with a working species list to help guide their activities.

STUDY AREA

The study area encompasses 64.7 ha in Canadian County (Figure) along the Canadian River. Latitudinal extent ranges from 35.34°N to 35.36°N and longitudinal extent from 97.67°W to 97.68°W. The study area is located within the subtropical humid (Cf) climate zone (Trewartha 1968). Summers are
warm (mean July temperature = 27.8°C) and humid, whereas winters are relatively short and mild (mean January temperature = 1.78°C). Mean annual precipitation is 87.6 cm, with periodic severe droughts (Oklahoma Climatological Survey 2006).

Physiographically, the study area is located within the Osage Plains section of the Central Lowlands province (Hunt 1974) and the Central Redbed Plains province of Oklahoma (Curtis and Ham 1979). The surface geology is primarily Permian red sandstone and shale with Quaternary silt, sand, and clay along the Canadian River floodplain (Branson and Johnson 1979). Elevation ranges from 411.5 m to 358.7 m. The predominant potential vegetation types are Tallgrass Prairie and Bottomland vegetation (Duck and Fletcher 1943).

METHODS

Collections were made monthly from March to June during the 2005 and 2006 growing seasons. The predominant vegetation association at the site were ascribed according to Hoagland (2000) and attributed to each collection. Vouchers for species exotic to North America were made from naturalized populations only, thus excluding cultivated and ornamental plants. Specimens were processed at the Robert Bebb Herbarium of the University of Oklahoma (OKL) following standard procedures. Manuals used for specimen identification included Waterfall (1969), Barkley (1986), and Diggs et al. (1999). Origin, either native or introduced, was determined by using Taylor and Taylor (1991) and US Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS 2006). Nomenclature follows the USDA-NRCS (2006). Voucher specimens were deposited at OKL.

RESULTS AND DISCUSSION

Three hundred thirty-four species of vascular plants in 237 genera and 76 families were collected (appendix 1). The greatest numbers of species were from the Asteraceae (56) and Poaceae (54). The largest genera were Euphorbia and Eragrostis each with 6 species. There were three species of ferns, two gymnosperm, 78 monocots, and 252 dicots (Table). One hundred and six species were annuals, 227 perennials, and one biennial. Forty-nine species of woody plants were present. The absence of Q. stellata at the site is noteworthy. This study contributed an additional 84 species to the flora of Canadian County for a total of 1,205 species.

Forty-one species or 12.3% of the flora was non-native to North America. The Poaceae and Fabaceae had the greatest number of exotic species, 12 and 7 respectively. There were three exotic species in the genus Bromus and two in Ulmus. These values are consistent with other floristic studies from Oklahoma, in which exotic species constitute 9% - 15% of the flora (Hoagland and Buthod 2003, Hoagland and Buthod 2004, Hoagland and Johnson 2001, Hoagland and Johnson 2004a, Hoagland and Johnson 2004b, Hoagland et al. 2004a, Hoagland et al. 2004b, Hoagland and Wallick 2003,). An exception is Red Slough and Grassy Slough, where exotic species constituted 6.6% (Hoagland and Johnson, 2004b).

No species listed as threatened or endangered by the U.S. Fish and Wildlife Service were encountered. However, Esocharia vivipara (G5S2S3) and Muhlenberia busbi (G5S1S2), which are tracked by the Oklahoma Natural Heritage Inventory (2006), were present. Species are ranked by the ONHI according to level of imperilment at the global [G] and state [S] level on a scale of

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species that is imperiled and 5 a species that is secure [Groves et al. 1995]).

Four vegetation associations/land cover types occurred at the study area. Each is described below with a brief list of associated species.

1. Schizachyrium scoparium - Bouteloua curtipendula herbaceous association occurred on shallow sandstone derived soils and was the predominant grassland vegetation at the site. Associated species included Argythamnia mercurialiana, Baptisia australis, Bouteloua hirsuta, Dalea aurea, D. enneandra, D. multiflora, D. purpurea, Euphorbia corollata, Hedeoma drummondii, Ipomoea leptophylla, Krameria lanceolata, Lesquerella ovalifolia, Linum rigidum, Paronychia jamesii, Penstemon cobaea, Polygala alba, Stillingia sylvatica, and Tradescantia occidentalis.

2. Quercus muehlenbergii - Juniperus virginiana forest association is a vegetation type not described in Hoagland (2000), but was the predominant forest vegetation at Camp Kickapoo. Two subtypes most likely exist, although further analysis is necessary. The first occupies drier habitats and is characterized by associated species such as Carex albicans, Cornus drummondii, Opuntia macrohiza, Q. marilandica, Rhus aromatica, Ruellia humilis, Sideroxylon lanuginosum, Symphoricarpos orbiculatus, Tridens flavus, and Viburnum rugosum. The moist or mesic subtypes occurred along streams and deep gullies. Associated species include Arisaema dracontium, Bromus inermis, Chasmanthium latifolium, Desmodium glutinosum, Eleutheropus tomentosus, Juglans nigra, Phryma leptostachya, Polygonatum biflorum, Q. macrocarpa, Sanicula canadensis, Sapindus drummondii, and Verbesina alternifolia.

3. Wetland and aquatic vegetation was of restricted to a small human-made pond and swales on the Canadian River floodplain. Associated species included Amorpha fruticosa, Cephalanthus occidentalis, Echinocloa crus-galli, Polygonum lapathifolium, Symphyotrichum subulatum, and Typha domingensis.

4. Disturbed areas and old-field vegetation included roadides and areas exhibiting signs of physical disruption. Associated species included Capsella bursa-pastoris, Chaenactis maculata, C. missurica, Erodium cicutarium, Geranium carolinianum, Lamium amplexicaule, Mollugo verticillata, Oenothera biennis, O. laciniata, Oxalis stricta, Phytolacca americana, Portulaca pilosa, Sherardia arvensis, Solanum dimidiatum, S. elaeagnifolium, Sorghum halepense and Viola bicolor.

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Table  Summary of floristic collections from a study site in Canadian County, Oklahoma.*

| Taxonomic group      | Species | Native spp. | Introduced spp. |
|----------------------|---------|-------------|-----------------|
| Pteridophyta         | 3       | 3           | 0               |
| Coniferophyta        | 2       | 1           | 1               |
| Magnoliophyta        | 329     | 289         | 40              |
| Magnoliopsida        | 250     | 222         | 28              |
| Liliopsida           | 79      | 67          | 12              |
| Total                | 334     | 293         | 41              |

* Table format follows Palmer et al. (1995).
Figure  Location of the Canadian County study area.

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APPENDIX

Annotated species list. The first entry is habitat (QMJV-M = Quercus muehlenbergii - Juniperus virginiana forest association, mesic subtype; QMJV-X = Q. muehlenbergii - J. virginiana forest association, xeric subtype; SSBC = Schizachyrium scoparium - Bouteloua curtipendula herbaceous association, WETL = wetland and aquatic vegetation, DAOF = disturbed areas and old-field vegetation), followed by life history (A=annual, B=biennial, P=perennial), and collection number. Exotic species are denoted with an asterisk. Voucher specimens were deposited at the Robert Bebb Herbarium at the University of Oklahoma (OKL).

PTERIDOPHYTA

Dryopteridaceae

*Woodsia obtusa* (Spreng.) Torr. (bluntlobe cliff fern) - QMSJV-M; P; H; AB-6788

Ophioglossaceae

*Botrychium virginianum* (L.) Sw. (Rattlesnake fern) - QMJV-M; P; H; AB-6766

Pteridaceae

*Pellaea atropurpurea* (L.) Link (purple cliffbreak) - QMJV-X; P; H; AB-6639

CONIFEROPHYTA

Cupressaceae

*Juniperus virginiana* L. (Eastern redcedar) - QMJV-X; P; T; AB-6206

*Thuja occidentalis* L.* (arborvitae) - DAOF, QMJV-X; P; S; AB-6204

Apocynaceae

*Anacardiaceae*

*Rhus aromatica* Ait. (fragrant sumac)- QMJV-X; P; S; AB-6887

*R. glabra* L. (smooth sumac) - DAOF, QMJV-X; P; S; AB-6204

*Toxicodendron radicans* (L.) Kuntze (poison ivy) - QMJV-M; P; S; AB-6252

*Apiaceae*

*Chaerophyllum tainturieri* Hook. (hairyfruit chervil) - DAOF; A; H; AB-6922

*Sanicula canadensis* L. (blacksnakeroot) - QMJV-M; P; H; AB-6198

*Sanguinaria canadensis* Nutt. ex DC. (bristly scaleseed) - SSBC; A; H; AB-6861

*Torilis arvensis* (Huds.) Link* (spreading hedgeparsley) - DAOF; A; H; AB-7148

*Magnoliophyta*

*Magnoliopsida*

*Acanthaceae*

*Ruellia humilis* Nutt. (wild petunia)- QMJV-X, SSBC; P; H; AB-6559

*Aceraceae*

*Acer negundo* L. (boxelder) - QMJV-M, WETL; P; T; AB-6209

*Amaranthaceae*

*Amaranthus palmeri* S. Wats. (Carlessweed) - DAOF; A; H; AB-6608

*Iresine rhizomatosa* Standl. (Juda’s bush) - QMSJV-M; P; H; AB-6584
Ambrosia psilostachya DC. (Plains ragweed) - DAOF, SSBC; P; H; AB-6551
A. trifida L. (giant ragweed) - DAOF; A; H; AB-6233
Amphiachyris dracunculoides (DC.) Nutt. (prairie broomweed) - DAOF; A; H; AB-6254
Aphanostephus skirrhobasis (DC.) Trel. (Arkansas dozedaisy) - SSBC; A; H; AB-6800
Artemisia ludoviciana Nutt. (white sagebrush) - SSBC; P; H; AB-6631
Bidens bipinniata L. (false willow) - QMJV-M; P; S; AB-6548
B. bipinniata L. (Spanish needles) - DAOF, QMJV-m; A; H; AB-6585
Carduus nutans L.* (nodding thistle) - DAOF; B; H; AB-6801
Chrysopsis pilosa Nutt. (goldenaster) - SSBC; A; H; AB-6889
Cirsium altissimum (L.) Hill (tall thistle) - QMJV-M; P; H; AB-6599
C. undulatum (Nutt.) Spreng. (wavyleaf thistle) - SSBC; P; H; AB-7166
Conyza canadensis (L.) Cronq. (Canadian horseweed) - DAOF; A; H; AB-6894
C. ramosissima Cronq. (dwarf horseweed) - DAOF; A; H; AB-6244
Elephantopus carolinianus Raeusch. (Carolina elephantfoot) - QMJV-M; P; H; AB-6811
Elephantopus carolinianus (Walt.) H. Rock (lanceleaf blanketflower) - SSBC; P; H; AB-6633
G. suavis (Gray & Engelm.) Britt. & Rusby (perfume balls) - DAOF, SSBC; P; H; AB-6218
Ganococha purpurea (L.) Cabrera (purple everlasting) - DAOF; P; H; AB-6769
Grindelia papposa Nesom & Sun (Spanish gold) - SSBC; A; H; AB-6553
Guizotia sarothrae (Pursh) Britt. & Rusby (broom snakeweed) - DAOF, SSBC; P; H; AB-6588
Helianthus annuus L. (common sunflower) - DAOF; A; H; AB-6219
H. petiolaris Nutt. (prairie sunflower) - SSBC; A; H; AB-6590
Heterotheca subaxillaris (Lam.) Britt. & Rusby (camphorweed) - SSBC; A; H; AB-6616
Hieracium longipilum Torr. (hairy hawkweed) - QMJV-X; P; H; AB-6872
Hymenopappus tenuifolius Pursh (Chalk Hill hymenopappus) - SSBC; P; H; AB-6592
Iva annua L. (annual marshelder) - WETL; A; H; AB-6202
Lactuca canadensis L. (Canada lettuce) - DAOF; A; H; AB-6900
Liatis mucronata DC. (cusp blazing star) - SSBC; P; H; AB-6596
L. squarrosa (L.) Michx. (scaly blazing star) - SSBC; P; H; AB-6595
Macaranta pinnatifida (Hook.) Shinners (Lacy tansyaster) - SSBC; P; H; AB-6278
Oligoneuron rigidum (L.) Small var. rigidum (stiff goldenrod) - QMJV-M; P; H; AB-6598
Palacoxa rosea (Bush) Cory (rosy palacox) - SSBC; A; H; AB-6549
Pyrrhopappus grandiflorus (Nutt.) Nutt. (tuberous desert-chicory) - DAOF; P; H; AB-6919
Ratibida columnifera (Nutt.) Woot. & Standl. (upright prairie coneflower) - SSBC; P; H; AB-6269
Rudbeckia hirta L. (blackeyed susan) - SSBC; P; H; AB-6257

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**Silphium laciniatum** L. (compassplant) - SSBC; P; H; AB-6223

**Solidago missouriensis** Nutt. (Missouri goldenrod) - SSBC; P; H; AB-6550

**Sonchus asper** (L.) Hill* (spiny sowthistle) - DAOF; A; H; AB-6852

**Symphyotrichum drummondii** (Lindl.) Nesom var. *drummondii* (Drummond's aster) - QMJV-M; P; H; AB-6597

*S. subulatum* (Michx.) Nesom (annual saltmarsh aster) - WETL; A; H; AB-6273

**Taraxacum officinale** G. H. Weber ex Wiggers* (common dandelion) - DAOF; P; H; AB-7155

**Thelesperma filifolium** (Hook.) Gray var. *filifolium* (stiff greenthread) - SSBC; P; H; AB-6617

**Tragopogon dubius** Scop.* (yellow salsify) - DAOF; A; H; AB-6907

**Verbesina alternifolia** (L.) Britt. ex Kearney (wingstem) - QMJV-M; P; H; AB-6601

**V. encelioides** (Cav.) Benth. & Hook. f. ex Gray (golden crownbeard) - DAOF, SSBC; P; H; AB-6222

**V. virginica** L. (white crownbeard) - QMJV-M; P; H; AB-6597

**Vernonia baldwinii** Torr. (Baldwin’s ironweed) - SSBC; P; H; AB-6600

**Xanthium strumarium** L. (rough cocklebur) - DAOF, WETL; A; H; AB-6225

**Bignoniaceae**

**Campsis radicans** (L.) Seem. ex Bureau (trumpet creeper) - DAOF; P; V; AB-7152

**Catalpa bignoniioides** Walt. (southern catalpa) - DAOF; P; T; AB-6790

**C. speciosa** (Warder) Warder ex Engl. (northern catalpa) - DAOF; P; T; AB-6611

**Boraginaceae**

**Hackelia virginiana** (L.) I. M. Johnston (beggarslice) - QMJV-M; P; H; AB-6201

**Lithospermum caroliniense** (Walt. Ex J. F. Gmel.) MacM. (Carolina puccoon) - SSBC; P; H; AB-6916

**L. incisum** Lehm. (narrowleaf stoneseed) - DAOF, SSBC; P; H; AB-7168

**Myosotis macrostema** Engelm. (largeseed forget-me-not) - QMJV-M; A; H; AB-6842

**Brassicaceae**

**Brassica rapa** L.* (field mustard) - DAOF; A; H; AB-6816a

**Camelina microcarpa** DC.* (littlepod false flax) - DAOF; A; H; AB-6823

**Capsella bursa-pastoris** (L.) Medik.* (shepherd’s purse) - DAOF; A; H; AB-6924

**Descaria pinnata** (Walt.) Britt. (western tansymustard) - DAOF; A; H; AB-6942

**Draba brachycarpa** Nutt. ex Torr. & Gray (shortpod draba) - DAOF; A; H; AB-6943

**Lepidium virginicum** L. (Virginia pepperweed) - DAOF; A; H; AB-6935

**Lesquerella ovalifolia** Rydb. ex Britt. subsp. *alba* (Goodman) Rollins & Shaw (roundleaf bladderpod) - SSBC; P; H; AB-6840

**Cactaceae**

**Escholzia missouriensis** (Sweet) D. R. Hunt (spinystar) - SSBC; P; H; AB-6960

**Opuntia macrohiza** Engelm. (twistspine pricklypear) – QMJV-X, SSBC; P; S; AB-6954

**Campanulaceae**

**Triodanis biflora** (Ruiz & Pavón) Greene (clasping Venus’ looking-glass) - DAOF, SSBC; A; H; AB-6940

**Caryophyllaceae**

** Arenaria serpyllifolia** L.* (thymeleaf sandwort) - DAOF; A; H; AB-6911

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Cerastium pumilum W. Curtis* (European chickweed) - DAOF; A; H; AB-6948
Paronychia jamesii Torr. & Gray (James’ nailwort) - SSBC; P; H; AB-6567
Stellaria media (L.) Vill.* (Common chickweed) - DAOF, QMJV-M; A; H; AB-6918

Celastraceae
Celastrus scandens L. (American bittersweet) - QMJV-M; P; S; AB-6634

Chenopodiaceae
Chenopodium murale L.* (nettleleaf goosefoot) - DAOF; A; H; AB-6565
C. pratericola Rydb. (desert goosefoot) - DAOF; A; H; AB-6606
C. simplex (Torr.) Raf. (mapleleaf goosefoot) - DAOF; A; H; AB-6566

Convolvulaceae
Ipomoea leptophylla Torr. (bush morning-glory) - SSBC; P; H; AB-6893

Cornaceae
Cornus drummondii C. A. Mey. (roughleaf dogwood) - DAOF, QMJV-X; P; T; AB-6871

Cucurbitaceae
Cucurbita foetidissima Kunth (Missouri gourd) - DAOF; P; H; AB-6883
Melotria pendula L. (Guadeloupe cucumber) - DAOF; P; H; AB-6253

Elaeagnaceae
Elaeagnus angustifolia L.* (Russian olive) - DAOF; P; T; AB-6558

Euphorbiaceae
Acalphya virginica L. (Virginia threeseed mercury) - DAOF; A; H; AB-6876
Argyranthemum mercuriliana (Nutt.) Muell.-Arg. var. mercurilaiana (tall silverbush) - SSBC; P; H; AB-6815
Chamaesyce glyptosperma (Englem.) Small (ribseed sandmat) - SSBC; A; H; AB-6618
C. maculata (L.) Small (spotted sandmat) - DAOF; A; H; AB-6576
C. missurica (Raf.) Shinners (prairie sandmat) - DAOF; A; H; AB-6897
C. nutans (Lag.) Small (eyebane) - DAOF; A; H; AB-6247
Croton glandulosus L. (Vente comnigo) - SSBC; A; H; AB-6258
C. lindheimerianus Scheele (threeseed croton) - SSBC; A; H; AB-6615
C. monanthogynus Michx. (prairie tea) - DAOF, SSBC; A; H; AB-6614
C. texensis (Klotzsch) Muell.-Arg. (Texas croton) - SSBC; A; H; AB-6593
Euphorbia corollata L. (flowering spurge) - SSBC; P; H; AB-6260
E. cyathophora Murr. (fire-on-the-mountain) - DAOF; A; H; AB-6604
E. dentata Michx. (toothed spurge) - DAOF; A; H; AB-6241
E. hexagona Nutt. ex Spreng. (sixangle spurge) - DAOF; A; H; AB-6249
E. marginata Pursh (snow-on-the-mountain) - DAOF; A; H; AB-6216
E. spathulata Lam. (warty spurge) - DAOF; A; H; AB-6844
Stillenia sylvatica Garden ex L. (Queen’s delight) - SSBC; P; H; AB-6767

Fabaceae
Amorpha canescens Pursh (leadplant) - WETL; P; S; AB-6772
A. fruticosa L. (desert false indigo) - SSBC; P; S; AB-6272
Amphicarpaea bracteata (L.) Fern. (American hogpeanut) - QMJV-X; A; H; AB-7158
Astragalus lotiflorus Hook. (lotus milkvetch) - QMJV-X; P; H; AB-6945
Baptisia australis (L.) R. Br. ex Ait. f. (blue wild indigo) - SSBC; P; H; AB-6773
Cercis canadensis L. (eastern redbud) - QMJV-M, QMJV-X; P; T; AB-6279
Dalea aurea Nutt. ex Pursh (golden prairie clover) - SSBC; P; H; AB-6268
D. enneandra Nutt. (nineanther prairie clover) - SSBC; P; H; AB-6229

Hoagland & Buthod
D. multiflora (Nutt.) Shinners (roundhead prairie clover) - SSB; P; H; AB-6577
D. purpurea Vent. (purple prairie clover) - SSB; P; H; AB-6881
Desmanthus illinoensis (Michx.) MacM. ex B. L. Robins. & Fern. (prairie bundleflower) - DAOF, WETL; P; H; AB-6230
Desmodium canescens (L.) DC. (hoary ticktrefoil) - QMJV-M; P; H; AB-6568
D. glutinosum (Muhl.) ex Willd. Wood (pointedleaf ticktrefoil) - QMJV-M; P; H; AB-6568
D. sessilifolium (Torr.) Torr. & Gray (sessileleaf ticktrefoil) - SSBC; P; H; AB-6571
Gleditsia triacanthos L. (honeylocust) - DAOF; P; T; AB-7159
Gymnocladus dioicus (L.) K. Koch (kentucky coffeetree) - QMJV-M; P; T; AB-6896
Indigofera miniata Ortega (coastal indigo) - SSB; P; H; AB-7164
Kummerowia stipulacea (Maxim.) Makino* (Korean clover) - DAOF; A; H; AB-3232
Lespedeza cuneata (Dum.-Cours.) G. Don* (Chinese lespedeza) - DAOF; P; H; AB-6265
L. stuevei Nutt. (tall lespedeza) - QMJV-X; P; H; AB-6562
Medicago minima (L.)* (burr medick) - DAOF; A; H; AB-6846
Melilotus officinalis (L.) Lam.* (yellow sweetclover) - DAOF; A; H; AB-6792
Mimosa nuttallii (DC.) B. L. Turner (Nuttall's sensitive-briar) - SSB; P; H; AB-6774
Neptunia lutea (Leavenw.) Benth. (yellow puff) - SSB; P; H; AB-6959
Oxytropis lambertii Pursh (purple locoweed) - SSB; P; H; AB-6822
Pisum sativum L.* (garden pea) - DAOF; A; H; AB-6816
Psoralidium tenuiflorum (Pursh) Rydb. (Slimflower scurfpea) - SSB; P; H; AB-6828
Robinia pseudoacacia L.* (black locust) - DAOF, QMJV-X; P; T; AB-6899
Strophostyles helvula (L.) Ell. (trailing fuzzybean) - DAOF; P; H; AB-6573
Vicia villosa Roth* (winter vetch) - DAOF; A; H; AB-6817

Fagaceae
Quercus macrocarpa Michx. (bur oak) - QMJV-M; P; T; AB-6275
Q. marilandica Muenchh. (blackjack oak) - QMJV-X; P; T; AB-6771
Q. muehlenbergii Engl. (chinkapin oak) - QMJV-M, QMJV-X; P; T; AB-6207

Geraniaceae
Erodium cicutarium (L.) L'Hér. ex Ait.* (redstem stork's beak) - DAOF; A; H; AB-6913
Geranium carolinianum L. (Carolina geranium) - DAOF; A; H; AB-6786
G. pusillum L.* (small geranium) - DAOF; A; H; AB-6850

Juglandaceae
Juglans nigra L. (black walnut) - QMJV-M; P; T; AB-7147

Krameriaceae
Krameria lanceolata Torr. (trailing krameria) - SSB; P; H; AB-6803

Lamiaceae
Hedeoma drummondii Benth. (Drummond's false pennyroyal) - SSB; P; H; AB-6610
H. bispida Pursh (rough false pennyroyal) - SSB; P; H; AB-6858
Lamium amplexicaule L.* (henbit) - DAOF; A; H; AB-6926
Salvia azurea Michx. ex Lam. (azure blue sage) - SSB; P; H; AB-6271
S. lyrata L. (lyreleaf sage) - QMJV-M; P; H; AB-6886

Hoagland & Buthod
Teucrium canadense L. (Canada germander) - QMJV-M; P; H; AB-6215

Linaceae
Linum rigidum Pursh (stiffstem flax) - SSBC; A; H; AB-6845

Loasaceae
Mentzelia oligosperma Nutt. ex Sims (chickenthief) - SSBC; P; H; AB-6221

Malvaceae
Callirhoe involucrata (Torr. & Gray) Gray (purple poppymallow) - DAOF; P; H; AB-6799

Menispermaceae
Cocculus carolinus (L.) DC. (Carolina coralbead) - QMJV-M; P; H; AB-6199
Menispermum canadense L. (common moonseed) - QMJV-M; P; H; AB-6797

Molluginaceae
Mollugo verticillata L. (carpetweed) - DAOF; A; H; AB-6888

Moraceae
Maclura pomifera (Raf.) Schneid. (Osage orange) - DAOF, QMJV-X; P; T; AB-6195
Morus rubra L. (red mulberry) - QMJV-M; P; T; AB-6620

Nyctaginaceae
Mirabilis albida (Walt.) Heimerl (white four o’clock) - SSBC; P; H; AB-6578
M. nyctaginea (Michx.) MacM. (heartleaf four o’clock) - DAOF; P; H; AB-6833

Oleaceae
Fraxinus pennsylvanica Marsh. (green ash) - QMJV-M; P; T; AB-6560

Onagraceae
Calypbophus berlandieri Spach (Berlandier’s sundrops) - SSBC; P; H; AB-6825
Gaura sinuata Nutt. ex Ser. (wavyleaf beeblomosom) - SSBC; P; H; AB-6827
Oenothera biennis L. (common evening-primrose) - DAOF; P; H; AB-6213
O. laciniata Hill (cutleaf evening-primrose) - DAOF; P; H; AB-6785
O. macrocarpa Nutt. (bigfruit evening-primrose) - SSBC; P; H; AB-6781
O. speciosa Nutt. (pinkladies) - SSBC; P; H; AB-6851
Stenosiphon linifolius (Nutt. ex James) Heynh. (false gaura) - SSBC; P; H; AB-6234

Oxalidaceae
Oxalis stricta L. (common yellow oxalis) - DAOF, SSBC; P; H; AB-6923

Papaveraceae
Argemone polyanthemos (Fedde) G. B. Ownbey (crested pricklypoppy) - SSBC; A; H; AB-6793

Passifloraceae
Passiflora lutea L. (yellow passionflower) - QMJV-M; P; H; AB-6264

Phytolaccaceae
Phytolacca americana L. (American pokeweed) - DAOF; P; H; AB

Plantaginaceae
Plantago heterophylla Nutt. (slender plantain) - SSBC; A; H; AB-6937
P. patagonica Jacq. (wooly plantain) - SSBC; A; H; AB-6859
P. rhodosperma Dcne. (redseed plantain) - SSBC; A; H; AB-6837

Polymastaceae
Polygala alba Nutt. (white milkwort) - SSBC; P; H; AB-6224

Polygonaceae
Eriogonum annuum Nutt. (annual buckwheat) - SSBC; A; H; AB-6256
E. longifolium Nutt. (longleaf buckwheat) - SSBC; P; H; AB-6262
Polygonum aviculare L. (prostrate knotweed) - DAOF; A; H; AB-6609
P. lapathifolium L. (curlytop knotweed) - WETL; A; H; AB-6895

Hoagland & Buthod
P. punctatum Ell. (dotted smartweed) - WETL; A; H; AB-6563
P. scandens L. (climbing false buckwheat) – QMJV-M; P; H; AB-6605
P. virginianum L. (jumpseed) - QMJV-M; P; H; AB-6214
Rumex crispus L.* (curly dock) - DAOF, WETL; P; H; AB-6780

Portulacaceae
Portulaca pilosa L. (kiss me quick) - DAOF; A; H; AB-6304

Ranunculaceae
Clematis pitcheri Torr. & Gray (bluebill) - QMJV-M; P; H; AB-6819
Delphinium carolinianum Walt. subsp. viridescens (Nutt.) Brooks (Carolina larkspur) - SSBC; P; H; AB-6802

Rosaceae
Geum canadense Jacq. (white avens) - QMJV-M; P; H; AB-6809
Prunus angustifolia Marsh. (Chickasaw plum) - DAOF, SSBC; P; S; AB-6277
P. mexicana S. Wats. (Mexican plum) - QMJV-X; P; T; AB-6557

Rubiaceae
Cephalanthus occidentalis L. (buttonbush) - WETL; P; S; AB-6228
Galium aparine L. (stickywilly) - QMJV-M; A; H; AB-6765
G. circaea Michx. (licorice bedstraw) - QMJV-M; P; H; AB-6810
G. virgatum Nutt. (southwestern bedstraw) - DAOF; A; H; AB-6856
Hedyotis nigricans (Lam.) Fosberg (diamondflowers) - SSBC; P; H; AB-6240
Honstania pusilla Schoepf (tiny bluet) - DAOF; A; H; AB-6912
Sherardia arvensis L.* (blue fieldmadder) - DAOF; A; H; AB-6843

Rutaceae
Ptelea trifoliata L. (common hoptree) - SSBC; P; T; AB-6770
Zanthoxylum bissutum Buckl. (Texas Hercules’ club) - QMJV-M; P; T; AB-6820

Salicaceae
Populus deltoides Bartr. ex Marsh. (eastern cottonwood) - WETL; P; T; AB-6200
Salix exigua Nutt. (sandbar willow) - WETL; P; T; AB-6561
S. nigra Marsh. (black willow) - WETL; P; T; AB-6267

Santalaceae
Comandra umbellata (L.) Nutt. subsp. pallida (A. DC.) Piehl (pale bastard toadflax) - SSBC; P; H; AB-6866

Sapindaceae
Sapindus drummondii Hook. & Arn. (soapberry) - QMJV-M; P; T; AB-6280

Sapotaceae
Sideroxylon lanuginosum Michx. (gum bully) - QMJV-X; P; T; AB-6890

Scrophulariaceae
Agalinis densiflora (Benth.) Blake (Osage false foxglove) - SSBC; A; H; AB-6570
A. heterophylla (Nutt.) Small ex Britt. (prairie false foxglove) - SSBC; A; H; AB-6569
Castilleja indivisa Engelm. (Indian paintbrush) - SSBC; A; H; AB-6259
Nuttallanthus texanus (Scheele) D. A. Sutton (Texas toadflax) - DAOF, SSBC; A; H; AB-684

Penstemon cobaea Nutt. (cobaea beardtongue) - SSBC; P; H; AB-6783
Veronica arvensis L.* (corn speedwell) - DAOF; A; H; AB-6941
V. peregrina L. (neckweed) - DAOF; A; H; AB-6857
**Solanaceae**

*Physalis cinerascens* (Dunal) A. S. Hitchs.  
(smallflower groundcherry) - DAOF; P; H; AB-6814

*P. heterophylla* Nees (clammy groundcherry) - DAOF; P; H; AB-6835

*P. longifolia* Nutt. (longleaf groundcherry) - DAOF; P; H; AB-6859

*Solanum dimidiatum* Raf. (western horseradish) - DAOF; A; H; AB-6831

*S. elaeagnifolium* Cav. (silverleaf nightshade) - DAOF; P; H; AB-6197

**Ulmaceae**

*Celtis laevigata* Willd. var. *reticulata* (Torr.) L. Benson (netleaf hackberry) - QMJV-X, SSBC; P; T; AB-6591

*C. laevigata* Willd. var. *texasana* Sarg. (Texan sugarberry) - QMJV-M; P; T; AB-6838

*Ulmus americana* L. (American elm) - QMJV-M; P; T; AB-6266

*U. parvifolia* Jacq.* (Chinese elm) - DAOF; P; T; AB-7153

*U. pumila* L.* (Siberian elm) - DAOF; P; T; AB-6789

*U. rubra* Muhl. (slippery elm) - DAOF; P; T; AB-6208

**Valerianaceae**

*Valerianella radiata* (L.) Dufr. (beaked cornsalad) - WETL; A; H; AB-6863

**Verbenaceae**

*Phryma leptostachya* L. (American lopseed) - QMJV-M; P; H; AB-6898

*Phyla nodiflora* (L.) Greene (whitemouth dayflower) - QMJV-M; P; H; AB-6575

*Tradescantia occidentalis* (Britt.) Smyth (prairie spiderwort) - SSBC; P; H; AB-6829

**Liliopsida**

**Agavaceae**

*Yucca glauca* Nutt. (soapweed) - SSBC; P; T; AB-6796

**Araceae**

*Arisaema dracontium* (L.) Schott (green dragon) - QMJV-M; P; H; AB-6782

**Commelinaceae**

*Commelina erecta* L. var. *angustifolia* (Michx.) Fern. (whitemouth dayflower) - QMJV-M; P; H; AB-6782

**Cyperaceae**

*Carex albicans* Willd. ex Spreng. (whitetinge sedge) - QMJV-X; P; G; AB-6952

*C. blanda* Dewey (eastern woodland sedge) - QMJV-M; P; G; AB-6950

*C. brevior* (Dewey) Mackenzie (shortbeak sedge) - QMJV-M; P; G; AB-6951

*C. leavenworthii* Dewey (Leavenworth’s sedge) - QMJV-M; P; G; AB-6870

Hoagland & Buthod
C. *oligocarpa* Schkuhr ex Willd. (richwoods sedge) - QJSV-M; P; G; AB-6869

*Cyperus acuminatus* Torr. & Hook. ex Torr. (tapertip flatsedge) - DAOF, SSBC; P; G; AB-6868

*C. hypulinus* (Spreng.) Marcks (Great Plains flagsedge) - DAOF, SSBC; P; G; AB-7165

*C. schweinitzii* Torr. (Schweinitz’s flatsedge) - SSBC; P; G; AB-6579

*Fimbristylis puberula* (Michx.) Vahl (hairy fimbry) - SSBC; P; G; AB-6949

**Iridaceae**

*Sisyrinchium angustifolium* P. Mill. (narrowleaf blue-eyed grass) - DAOF; P; H; AB-6864

**Juncaceae**

*Juncus bufonius* L. (toad rush) - WETL; A; G; AB-6867

*J. tenuis* Willd. (poverty rush) - QMJV-M; P; G; AB-7157

**Liliaceae**

*Allium canadense* L. var. *fraseri* Ownbey (fraser meadow garlic) - SSBC; P; H; AB-6807

*Polygonatum biflorum* (Walt.) Ell. (smooth Solomon’s seal) - QMJV-M; P; H; AB-6794

**Orchidaceae**

*Spiranthes lacera* (Raf.) Raf. (northern slender ladies’-tresses) - SSBC; P; H; AB-6581

**Poaceae**

*Agrostis byemalis* (Walt.) B. S. P. (winter bentgrass) - WETL; P; G; AB-6936

*Andropogon gerardii* Vitman (big bluestem) - SSBC; P; G; AB-6892

*Aristida longetica* Poir. var. *geniculata* (Raf.) Fern. (slimspike threeawn) - DAOF; A; G; AB-6594

*A. oligantha* Michx. (prairie threeawn) - DAOF, SSBC; A; G; AB-6622

*Bothriochloa laguroides* (DC.) Herter (silver beardgrass) - DAOF; P; G; AB-7163

*Bouteloua curtipendula* (Michx.) Torr. (sideoats grama) - SSBC; P; G; AB-6884

*B. hirsuta* Lag. (hairy grama) - SSBC; P; G; AB-6245

*Bromus catharticus* Vahl* (rescuegrass) - DAOF; A; G; AB-6910

*B. japonicus* Thumb. ex Murr.* (Japanese brome) - DAOF; A; G; AB-6826

*B. pubescens* Muhl. ex Willd. (hairy woodland brome) - QMJV-M; P; G; AB-6778

*B. tectorum* L.* (cheatgrass) - DAOF; A; G; AB-6920

*Cenchrus spinifex* Cav. (coastal sandbur) - DAOF; A; G; AB-6612

*Chasmanthium latifolium* (Michx.) Yates (Indian woodoats) - QMJV-M; P; G; AB-6235

*Chloris verticillata* Nutt. (tumble windmill grass) - DAOF; P; G; AB-6231

*Cynodon dactylon* (L.) Pers.* (bermudagrass) - DAOF; P; G; AB-6891

*Dactylis glomerata* L.* (orchardgrass) - DAOF; P; G; AB-6798

*Diephanthelium aciculare* (Desv. ex Poir.) Gould & C. A. Clark (needleleaf rosette grass) - QMJV-M; P; G; AB-6586

*D. malacophyllum* (Nash) Gould (softleaf rosette grass) - QMJV-M; P; G; AB-6836

*D. oligosanthes* (J. A. Schultes) Gould var. *scribnerianum* (Nash) Gould (Scribner’s rosette grass) - SSBC; P; G; AB-6946

*Digitaria cognata* (J. A. Schultes) Pilger (Carolina crabgrass) - DAOF; WETL; P; G; AB-6626

*Echinochloa muricata* (Beauv.) Fern.* (rough barnyardgrass) - WETL; A; G; AB-6587

*Elymus canadensis* L. (Canada wildrye) - QMJV-M; P; G; AB-7162

*Eragrostis curtipedicellata* Buckl. (gummy lovegrass) - SSBC; P; G; AB-6879

*E. intermedia* A. S. Hitchc. (plains lovegrass) - SSBC; P; G; AB-6944

*E. secundiflora* J. Presl. subsp. *oxylepis* (Torr.) S. D. Koch (red lovegrass) - DAOF; P; G; AB-6613

*E. sessilispica* Buck. (tumble lovegrass) - SSBC; P; G; AB-6878

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Hoagland & Buthod
E. spectabilis (Pursh) Steud. (purple lovegrass) - SSBC; P; G; AB-6904
E. tricobes (Nutt.) Wood (sand lovegrass) - SSBC; P; AB-6602
Hordeum pusillum Nutt. (little barley) - DAOF; A; G; AB-6779
Leersia virginica Wild. (whitegrass) - QMJV-M; P; G; AB-6628
Lolium perenne L.* (perennial ryegrass) - DAOF; P; G; AB-6824
Muhlenbergia busbii Pohl (nodding muhly) - QMJV-M; P; G; AB-6624
M. sylvatica Torr. ex Gray (woodland muhly) - QMJV-M; P; G; AB-6603
Panicum anceps Michx. (beaked panicgrass) - QMJV-M; P; G; AB-6227
P. capillare L. (witchgrass) - DAOF; A; G; AB-6903
P. virgatum L. (switchgrass) - DAOF, WETL; P; G; AB-6720
Paspalum dilatatum Poir.* (Dallisgrass) - SSBC; P; G; AB-6621
P. setaceum Michx. (thin paspalum) - WETL; P; G; AB-6621
Phalaris caroliniana Walt. (Carolina canarygrass) - WETL; A; G; AB-6925
Phragmites australis (Cav.) Trin. Ex Steud.* (common reed) - WETL; P; G; AB-7160
Poa annua L.* (annual bluegrass) - DAOF; A; G; AB-6928
P. arachnifera Torr. (Texas bluegrass) - SSBC; P; G; AB-6909
P. chapmaniana Scribn. (Chapman’s bluegrass) - SSBC; A; G; AB-6808
Saccharum giganteum (Walt.) Pers. (sugarcane plume grass) - WETL; P; G; AB-6953
Schedonorus paniculatus (Nutt.) Trel. (tumblegrass) - DAO; SSBC; P; G; AB-6682
Schedonorus phoenix (Scop.) Holub.* (tall fescue) - DAOF; P; G; AB-6813
Schizachyrium scoparium (Michx.) Nash (little bluestem) - QMJV-X, SSBC; P; G; AB-6251
Setaria punicea (Poir.) Roemer & J.A. Schultes (yellow foxtail) - DAOF; A; G; AB-6583
S. viridis (L.) Beauv.* (green bristlegrass) - DAOF; A; G; AB-6873
Sorghastrum nutans (L.) Nash (Indiangrass) - SSBC; P; AB-6248
Sorghum balepense (L.) Pers.* (Johnsongrass) - DAOF; P; AB-7151
Spartina pectinata Bosc ex Link (prairie cordgrass) - WETL; P; G; AB-6203
Sporobolus cryptandrus (Torr.) Gray (sand dropseed) - DAOF, SSBC; P; G; AB-6627
S. vaginiflorus (Torr. ex Gray) Wood var. ozarkanus (Fern.) Shinners (Ozark dropseed) - SSBC; P; G; AB-6625
Tridens flavus (L.) A. S. Hitchc. (purpletop tridens) - DAOF, QMJV-X; P; G; AB-6242
Vulpia elliotea (Raf.) Fern. (squirreltail fescue) - DAOF; A; G; AB-6935a
Smilacaceae
Smilax bona-nox L. (saw greenbriar) - QMJV-M, QMJV-X; P; H; AB-6211
S. rotundifolia L. (roundleaf greenbriar) - QMJV-M, QMJV-X; P; H; AB-7154
S. tamnoides L. (bristly greenbriar) - QMJV-M; P; H; AB-6556
Typhaceae
Typha domingensis Pers. (Southern cattail) - WETL; P; H; AB-6875