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MANUAL OF THE LEGUMES OF TENNESSEE¹

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ABSTRACT

The manual includes a general introduction to the floristic regions of Tennessee, a generic key, keys to the taxa, concise descriptions, selected synonymy, excluded taxa, illustrated glossary, distribution maps, and indexes to common and scientific names.

Native taxa not previously reported for the state included *Crotalaria purshii*, *Lathyrus palustris* var. *myrtifolius*, *Rhynchosia latifolia*, and *Trifolium reflexum*.

Native taxa previously reported for the state which were excluded because of specimen reidentification were *Desmodium canadense*, *D. glabellum*, *D. rhombifolia*, *Galactia mollis*, *G. regularis*, *Petalostemum purpureum*, and *Robinia viscosa*. The pink-flowered taxa of *Robinia* were regarded as hybrids which, in effect, excluded the previously reported taxa of *R. boyntonii*, *R. grandiflora*, *R. kelseyi*, and *R. pedunculata*.

In the 129 species in the treatment, 49 were introductions. The majority of the introduced taxa had become naturalized with only a few restricted to cultivation.

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INTRODUCTION

The legumes of Tennessee have been treated twice in state floristic studies: (1) Gattinger 1901 and (2) Sharp, et al. 1960. Since these were basically floristic studies, keys and descriptions of the taxa were not included.

Existing regional manuals inadequately cover Tennessee geographically. Several regional manuals are required in order to include all of the taxa reported for Tennessee. The northern taxa extending south into the state are included in Gray's Manual (Fernald 1950) and Manual of Vascular Plants (Gleason and Cronquist 1963). The Manual of the Southeastern Flora (Small 1933) includes the southeastern taxa extending northward into Tennessee. For cultivated taxa, Bailey's Manual of Cultivated Plants (1949) is required. The Leguminous Plants of North Carolina (Wilbur 1963) probably gives a more complete account than any of the regional manuals mentioned, but western taxa ranging eastward into the state are not included.

This study is an attempt to group the leguminous taxa of Tennessee under one cover, to provide keys and descriptions, to elucidate the status of certain taxa where possible, to clarify nomenclatural discrepancies, and to examine geographical patterns of distribution in conjunction with the floristic regions.

FOREST REGIONS

In Tennessee, five of the Forest Regions of the Deciduous Forest Formation of North America are represented (Braun 1950). These are: (1) Oak-Chestnut, (2) Oak-Pine, (3) Mixed Mesophytic, (4) Western Mesophytic, and (5) Southeastern Evergreen Forest. Each of these regions is considered to contain the climatic climax communities in mosaic with other physiographic and edaphic climaxes and seral communities (Fig. 1). Taxonomic nomenclature follows Gray's Manual (Fernald 1950) and the physiographic regions are those of Fenneman (1938).

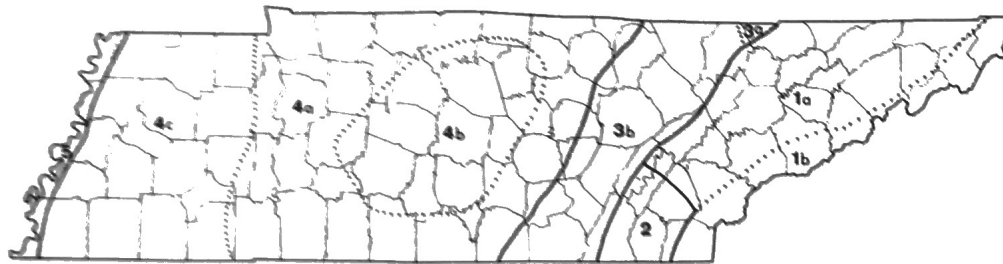


Fig. 1. Forest regions of the Deciduous Forest Formation in Tennessee. (1) Oak-Chestnut Forest Region, (1a) Ridge and Valley Section, (1b) Southern Appalachians, (2) Oak-Pine Forest Region-Gulf Slope Section, (3) Mixed Mesophytic Forest Region, (3a) Cumberland Mountains, (3b) Cumberland Plateau, (4) Western Mesophytic Forest Region, (4a) Mississippi Plateau Section, (4b) Nashville Basin, (4c) Mississippi Embayment Section, (5) Southeastern Evergreen Forest Region—Mississippi Alluvial Plain. Adapted from Braun, (1950).

Oak-Chestnut Forest Region. This region includes most of the Ridge and Valley Province and the Blue Ridge Province of East Tennessee. The climatic climax community is thought to be dominated by oaks and chestnut (formerly) but numerous other communities occur on certain sites. The mixed mesophytic cove forests are well-developed in the mountains with northern hardwood and spruce-fir communities occupying the higher elevations. Of the five sections recognized in this forest region, only part of two sections occur in the state. They are the Ridge and Valley section and the Southern Appalachians which correspond to the Appalachian Valley and Unakas, respectively, of Shanks (1958). In the Ridge and Valley Section the ridges support oak-chestnut forests with sheltered coves of mixed mesophytic communities. The valleys are predominantly oak with white oak the most characteristic taxon. In the Southern Appalachian Section the Unaka Range, including the Great Smoky Mountains, has three principal groups: northern forest, moist slope and cove forest, and dry slope and ridge forest. The higher elevations support northern hardwood forests and spruce-fir forests. The slightly lower elevations essentially have communities of oak or pine on the ridges and upper south-facing slopes while the north-facing slopes and sheltered coves support typically mixed mesophytic communities. Treeless mountain tops or ridges are known as "balds" and may be distinguished by their vegetation as either grassy balds or heath balds.

Oak-Pine Forest Region. The southern part of the Ridge and Valley Province includes this oak-pine vegetation most characteristic of the Piedmont Plateau (Gulf Slope Section). Oak is the dominant taxon of this belt but pines increase gradually southward.

Mixed Mesophytic Forest Region. The Mixed Mesophytic Forest Region includes the Cumberland Mountains, Cumberland Plateau, and Appalachian Plateau but only the first two occur in Tennessee. The Mixed Mesophytic climax community

has numerous dominant species occupying moist, well-drained sites; however, the composition and relative abundance of the dominants vary locally. Some of the taxa sharing the dominance are *Fagus grandifolia*, *Liriodendron tulipifera*, *Tilia heterophylla*, *Castanea dentata*, *Quercus rubra* var. *borealis*, *Q. alba*, *Acer saccharum*, *Aesculus octandra*, and *Tsuga canadensis*.

Western Mesophytic Forest Region. This region includes the Highland Rim, Central Basin, and West Tennessee westward to the loess bluffs of the Mississippi River. This area corresponds in part to Fenneman's (1938) Interior Low Plateau whose vegetation is a transition from the mixed mesophytic communities westward to oak and oak-hickory communities in addition to a mosaic of subclimax and secondary communities. Three sections occur in Tennessee: Nashville Basin, Mississippi Plateau, and the Mississippi Embayment. In the Nashville Basin (Central Basin) the "cedar glades" are the most distinctive feature with "hardwood glades" and cedar communities on the relatively shallow soils of the limestone outcrops. The rolling parts with sheltered slopes support more mesophytic forest communities. DeSelm (1959) divided the Central Basin into the Inner and Outer Basin (Fig. 2). Shanks (1958) distinguished the "Cedar Glades", centrally located in the Central Basin and equivalent of DeSelm's Inner Basin. The Mississippi Plateau Section (Highland Rim) is conspicuously dissected in the Cumberland River drainage and in the area adjacent to the Central Basin (the Dissected Rim of DeSelm 1959). Many portions are flat to gently rolling (the Undissected Rim of DeSelm 1959) and the portion adjacent to the Cumberland Plateau is higher, rolling, and edaphically different from either of the other two portions. Shanks (1958) distinguished three floristic subregions, the Kentucky Prairie Barrens, Barrens of the southwestern Rim, and Barrens of the southeastern Rim (Fig. 2). The term "barrens" was discussed by Braun and in early use was synonymous with "prairie". Shanks (1958) used it in the sense of an open forest with prairie elements. The Mississippi Embayment is a part of the East Gulf Coastal Plain. Shanks (1958) distinguished two floristic subregions in this section, the Mississippi River Bluffs with deep loess and the relatively dry Coastal Plain Uplands (Fig. 2).

Southeastern Evergreen Forest. This region includes only a narrow band of partially evergreen forest occupying the bottoms of the Mississippi River and tributaries in West Tennessee. The Southeastern Evergreen Forest is an enormous area of thousands of square miles in which many communities are held in subclimax state by fire. However, the Tennessee portion is largely hardwood and is flooded periodically. The Mississippi Alluvial Plain possesses vegetation similarities in its north-to-south orientation which intersects the pine uplands extending from Texas eastward. The bottomland forests, subdivided into swamp forest, hardwood bottoms, and ridge bottoms, are therefore included in the Southeastern Evergreen Forest.

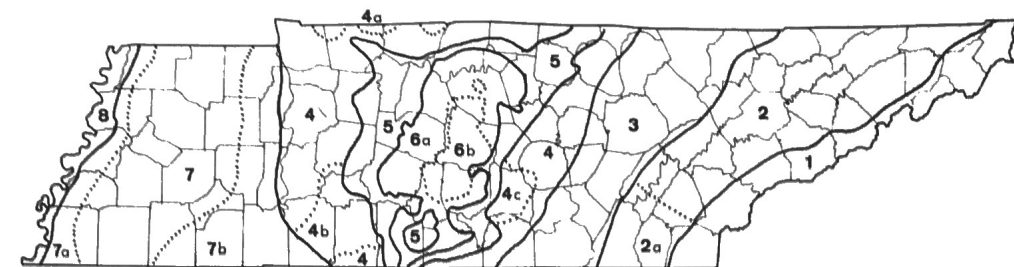


Fig. 2. Physiographic-floristic regions of Tennessee. (1) Unakas, (2) Appalachian Valley, (2a) Oak-Pine, (3) Cumberland Plateau, (4) Highland Rim, (4a) Kentucky Prairie Barrens, (4b) Barrens SW Rim, (4c) Barrens SE Rim, (5) Dissected Highland Rim, (6) Central Basin, (6a) Outer Basin, (6b) Inner Basin, (7) Mississippi Embayment, (7a) River Bluffs, (7b) Coastal Plain Uplands, (8) Mississippi Alluvial Plain. Adapted from DeSelm (1959) and Shanks (1958).

TAXONOMIC METHODS AND MATERIALS

The arrangement of the genera follows that of Dalla Torre and Harms (1900-1907). The tribes naturally follow in the same sequence; the tribal circumscription however, essentially is that of Schulze-Menz (1964). The only deviation is in regard to the Psoraleae which Rydberg (1919-1920) extracted from the Galegeae as a segregate tribe. The Psoraleae has been maintained as a distinct tribe. The subgeneric taxa are in alphabetical sequence.

The Contributors' Guide for the "Vascular Flora of the Southeastern United States" (Radford, et al. 1967) is used as a basis for the descriptions of the taxa although it has not been followed in all respects.

The bibliographic citations following the names of the taxa are in accordance with the Guide to the Citation of Botanical Nomenclature (Lanjouw 1966) when feasible. When the title page publication date is not the effective publication date as stipulated in Articles 29, 30, and 31 (Lanjouw 1966), the title page publication date is followed by the effective publication date in parenthesis.

Names occurring in the following publications as synonyms in this treatment are designated by letters as follows: Bailey, 1949—B; Fernald, 1950—F; Gleason and Cronquist, 1963 —G; Small, 1933—S; Tennessee authors —T. Additional synonym

and taxa previously reported (misidentifications, etc.) are included in the Appendix. Misidentifications are indicated by the omission of the author citation following the species epithet.

Distribution maps are presented for those taxa which are a part of the present flora. This includes native and introduced taxa which are naturalized. The introduced cultivated taxa which apparently do not become naturalized are not mapped because of a scarcity of herbarium specimens. The distribution maps are alphabetically arranged by genus in the Appendix.

Intraspecific taxa of the native species are treated, but no attempt is made to differentiate the infraspecific taxa of the introduced and cultivated species. Those taxa which have been introduced but are grown on an experimental basis or as occasional ornamentals and are not naturalized are listed in the Appendix; taxa currently cultivated are included in the study (Darter 1968, Williams 1966) even if not found outside of cultivation.

Chromosome numbers have been given in the diploid regardless of the manner in which they were reported (Cave 1958-1965, Darlington and Wylie 1956, Turner 1959, Ornduff 1967, Wilbur 1963). For those taxa which have not had chromosome numbers reported, a space has been provided for their inclusion as they become known.

The leguminous plants in the herbaria of Austin Peay State University, East Tennessee State University, Great Smoky Mountain National Park, the University of Tennessee, Knoxville, and Vanderbilt University have been examined as well as the author's own collections which are on deposit in the herbaria of the University of Tennessee, Knoxville and Southern Methodist University.

The author is deeply indebted to the curators of the herbaria, the librarians of the University of Tennessee, Knoxville, and the New York Botanical Garden, and the numerous individuals who have contributed to various phases of this project.

ARTIFICIAL KEY TO GENERA

	Page
1. Leaves simple or unifoliate.	
2. Trees; leaves cordate.	<i>Cercis</i> 70
2. Shrubs or herbs; leaves obovate, elliptic, or linear.	
3. Shrubs; leaves (or leaflets) ca. 1 cm. long.	<i>Cytisus</i> 73
3. Herbs; leaves 2 cm. long or more.	<i>Crotalaria</i> 73
1. Leaves compound.	
4. Leaves 3-foliate.	
5. Leaves palmately 3-foliate.	
6. Shrubs; stamens monadelphous, dimorphic.	<i>Cytisus</i> 73
6. Herbs; stamens distinct or united.	
7. Stipules adnate to petioles.	<i>Trifolium</i> 74
7. Stipules free from petioles.	
8. Legumes flattened; flowers yellow.	<i>Thermopsis</i> 72
8. Legumes inflated; flowers blue, white or yellow.	<i>Baptisia</i> 72
5. Leaves pinnately 3-foliate.	
9. Stipules adnate to petioles (or appear to be).	
10. Petioles jointed at apex of stipules.	<i>Stylosanthes</i> 79
10. Petioles not jointed.	
11. Stems usually 4-angled; fruit reniform or coiled.	<i>Medicago</i> 73
11. Stems terete; fruit straight.	
12. Flowers in umbels.	<i>Lotus</i> 75
12. Flowers in spikes or racemes.	
13. Flowers in elongate racemes.	<i>Melilotus</i> 74
13. Flowers in spikes or capitate racemes.	<i>Trifolium</i> 74
9. Stipules free from petioles.	
14. Plants erect.	
15. Herbage glandular-punctate; fruit one-seeded.	<i>Psoralea</i> 76
15. Herbage not glandular-punctate; fruit one to several-seeded.	
16. Petioles and leaflets up to 1 dm. or more long; legumes linear, 2 to 4-seeded.	<i>Glycine</i> 85
16. Petioles and leaflets less than 8 cm. long (if longer, fruit a loment).	
17. Leaflets stipellate (if estipellate, stamens monadelphous and fruit a loment).	
18. Flowers over 2 cm. long; legumes several-seeded.	<i>Clitoria</i> 85
18. Flowers less than 2 cm. long; fruit a loment.	<i>Desmodium</i> 79
17. Leaflets estipellate; fruit 1 or 2-seeded.	
19. Flowers white or purple; fruit one-seeded.	<i>Lespedeza</i> 81
19. Flowers yellow; fruits 1 or 2-seeded.	<i>Rhynchosia</i> 86
14. Plants trailing, prostrate, or twining vines.	
20. Plants trailing or prostrate, not twining.	
21. Leaflets stipellate.	
22. Flowers over 2 cm. long; legumes several-seeded.	<i>Clitoria</i> 85
22. Flowers less than 2 cm. long; fruit a loment.	<i>Desmodium</i> 79
21. Leaflets estipellate.	<i>Lespedeza</i> 81
20. Plants twining vines.	
23. Calyx cylindrical.	
24. Calyx about 2 cm. long.	<i>Clitoria</i> 85
24. Calyx less than 1 cm. long.	<i>Amphicarpa</i> 85
23. Calyx campanulate.	
25. Leaflets estipellate; legumes one or two-seeded.	<i>Rhynchosia</i> 86
25. Leaflets stipellate; legumes several-seeded.	
26. Leaflets with lateral veins straight, nearly parallel.	
27. Stipels 2 mm. or less long.	<i>Dioclea</i> 85
27. Stipels 3 mm. or more long.	<i>Pueraria</i> 86
26. Leaflets with lateral veins curved, not parallel.	

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28. Roots enlarged, carrot-shaped; keel of corolla nearly straight.	<i>Galactia</i> 85
28. Roots not enlarged and carrot-shaped; keel of corolla incurved or coiled.	
29. Keel of corolla coiled.	<i>Phaseolus</i> 86
29. Keel incurved.	
30. Standard at least twice the length of wings and keel.	<i>Centrosema</i> 85
30. Standard about equalling the wings and keel in length.	
31. Leaflets over 6 cm. long.	<i>Vigna</i> 87
31. Leaflets less than 6 cm. long.	<i>Strophostyles</i> 87
4. Leaves 2, 4, or many-foliate.	
32. Leaves pinnate with 2 or 4 leaflets.	
33. Leaves with 2 leaflets; stipules free from petioles.	<i>Lathyrus</i> 84
33. Leaves with 4 leaflets; stipules adnate to petioles.	<i>Arachis</i> 79
32. Leaves pinnately or palmately several-foliate.	
34. Leaves palmately compound.	<i>Psoralea</i> 76
34. Leaves pinnately compound.	
35. Leaves 2-pinnate.	
36. Trees or shrubs.	
37. Leaflets small, about 1 cm. long, midrib nearly marginal.	<i>Albizia</i> 70
37. Leaflets 2 cm. long or more, midrib medial.	
38. Leaflets entire, ovate, abruptly acuminate; plants unarmed.	<i>Gymnocladus</i> 71
38. Leaflets minutely crenulate, narrowly ovate to oblong, apically rounded; plants usually armed.	<i>Gleditsia</i> 71
36. Herbs.	
39. Plants armed with prickles.	<i>Schrankia</i> 70
39. Plants unarmed.	<i>Desmanthus</i> 70
35. Leaves 1-pinnate.	
40. Leaves even-pinnate.	
41. Tendrils absent.	
42. Leaves with less than 4 pairs of leaflets; flowers white to purple.	<i>Vicia</i> 83
42. Leaves with 20 or more pairs of leaflets; flowers yellow.	
43. Flowers papilionaceous; stamens diadelphous; petiolar glands absent.	<i>Sesbania</i> 78
43. Flowers slightly irregular; stamens distinct; petiolar glands present.	<i>Cassia</i> 70
41. Tendrils present.	
44. Stipules longer than leaflets.	<i>Pisum</i> 84
44. Stipules shorter than leaflets.	
45. Style bearded apically.	<i>Vicia</i> 83
45. Style bearded longitudinally.	
46. Wing petals free from keel; legumes several-seeded.	<i>Lathyrus</i> 84
46. Wing petals adherent to keel; legumes one or two-seeded.	<i>Lens</i> 83
40. Leaves odd-pinnate.	
47. Leaves glandular-punctate.	
48. Shrubs; stamens distinct above base.	<i>Amorpha</i> 76
48. Herbs; stamens monadelphous.	<i>Petalostemum</i> 76
47. Leaves not glandular-punctate.	
49. Twining vines.	
50. Leaves 5 to 7-foliate; ovary and fruits glabrous; keel of corolla coiled.	<i>Apios</i> 85
50. Leaves with 8 or more leaflets, if fewer, ovary and fruits pubescent; keel of corolla falcate.	<i>Wisteria</i> 77
49. Trees, shrubs, or herbaceous plants, non-twining.	
51. Trees or shrubs.	
52. Leaflets minutely crenulate; flowers less than 1 cm. long.	<i>Gleditsia</i> 71
52. Leaflets entire; flowers 1 cm. or more long.	
53. Stamens distinct.	
54. Flowers over 2 cm. long; legume flattened.	<i>Cladrastis</i> 72
54. Flowers less than 2 cm. long; legume terete, moniliform.	<i>Sophora</i> 72
53. Stamens diadelphous.	
55. Leaflets acute to obtuse.	<i>Robinia</i> 78
55. Leaflets attenuate.	<i>Wisteria</i> 77
51. Herbs.	
56. Leaflets serrate-dentate; stipules 3-lobed.	<i>Cicer</i> 82
56. Leaflets entire; stipules entire.	
57. Leaves sessile; inflorescence an umbel.	
58. Leaflets 5, lower pair resembling stipules.	<i>Lotus</i> 75
58. Leaflets more than 5.	<i>Coronilla</i> 78
57. Leaves petioled; inflorescence a raceme.	
59. Stipules linear.	<i>Tephrosia</i> 77
59. Stipules triangular to ovate.	<i>Astragalus</i> 78

TAXONOMY

Herbs, shrubs, vines or trees. Leaves alternate, pinnately compound or rarely unifoliate. Corolla regular to papilionaceous; stamens distinct, monadelphous, or diadelphous; ovary superior, 1-carpellate. Fruit a legume, loment, or a 1-seeded indehiscent type. Alternate name—Fabaceae.

1. Stamens numerous, mostly distinct, usually exserted; corolla regular; leaves 2-pinnately compound. I. MIMOSOIDEAE
1. Stamens 10 or less, distinct to variously united; corolla regular to strongly irregular; leaves simple, palmately or 1- to 2-pinnately compound. II. CAESALPINIOIDEAE
2. Corolla regular to irregular; stamens essentially distinct; leaves not palmately compound. III. PAPILIONOIDEAE
2. Corolla strongly irregular; stamens distinct, monadelphous, or diadelphous; leaves not 2-pinnately compound.

I. MIMOSOIDEAE

Perennial herbs or trees. Leaves bipinnately compound. Calyx united; corolla regular, petals distinct or united; stamens numerous, distinct or united basally, filaments usually exserted.

1. Trees or shrubs; midveins of leaflets marginal. 1. *Albizia*
1. Herbaceous plants; midveins of leaflets medial. 2. *Schrankia*
2. Stem and legumes with prickles. 3. *Desmanthus*
2. Stem and legumes unarmed.

1. *Albizia Durazz.*, Mag. Tosc. 3: 11. 1772.

Albizia julibrissin Durazz., Mag. Tosc. 3: 11. 1772. SILK-TREE, MIMOSA-TREE—Trees small with smooth bark, unarmed. Leaves bipinnate with 8-12 pairs of leaflets; leaflets 7-13 mm. long, midrib marginal; petiolar gland oblong-orbicular, flattened. Flowers numerous, clustered, reddish; calyx tubular, 5-toothed, ca. 2 mm. long; corolla funnelform, 5-lobed, ca. 7 mm. long; stamens numerous, filaments conspicuously exerted, united basally the length of the corolla tube. Legumes linear, flattened, ca. 15 cm. long, 2 cm. wide. $2n = 26, 52, 104$. July. Cultivated; naturalized along roadsides and abandoned fields; native of Asia. *Albizzia*—F, S. Map 1.

2. *Schrankia* Willd. nom. cons., Sp. Pl. 4: 1041. 1806.

Schrankia microphylla (Dryand. ex Smith) MacBride, Contrib. Gray Herb. II. 59: 9. 1919. LITTLE-LEAF SCHRANKIA—Decumbent, perennial herbs with recurved prickles broadened basally. Leaves bipinnate with 3-9 pairs of leaflets; leaflets 3-7 mm. long, 1-2 mm. wide. Inflorescence globose; flowers numerous, reddish; calyx 5-toothed, minute, ca. 0.5 mm. long; corolla funnelform, 5-cleft, 3-4 mm. long; stamens numerous, separate, filaments conspicuously exerted. Legumes 1-7 per peduncle, prickly, linear, essentially terete, 6-10 cm. long, 3-4 mm. wide. $2n = 16, 24$. June-Oct. Disturbed areas along roadsides, dry margins of wooded slopes and ridges; SE U.S.; *Leptoglottis microphylla* (Dryand.) Britt.—S; *S. uncinata*—T. Map 28.

3. *Desmanthus* Willd. nom. cons., Sp. Pl. 4: 1044. 1806.

Desmanthus illinoensis (Michx.) MacM. ex Robins. & Fern., Gray's New Man. Bot. 7th ed. 503. 1908. PRAIRIE MIMOSA—Perennial herbs. Leaves bipinnate with 11-28 pairs of leaflets; leaflets 3-5 mm. long, ca. 1 mm. wide, ciliate, oblique basally; petiolar gland sessile, between first pair of leaflets, flattened. Inflorescence axillary, pedunculate, flowers numerous, clustered, whitish; calyx campanulate, 5-toothed, ca. 1-1.5 mm. long; petals 5, separate, ca. 2.5 mm. long; stamens 5, distinct, filaments exerted. Legumes numerous, clustered apically on peduncles 2-5 cm. long, flattened, falcate, ca. 1.5 cm. long, 5 mm. wide. $2n = 28$. June-Aug. Prairie, abandoned fields, waste areas, and alluvium; Central Basin and Mississippi Embayment, localized elsewhere; plains species of C U.S.; *Acuan illinoense* (Michx.) Kuntze—S. Map 9.

II. CAESALPINIOIDEAE

Herbaceous plants, annuals or perennials, or trees. Leaves unifoliate to 1- or 2-pinnately compound. Flowers perfect or unisexual, plants monoecious or dioecious; floral tube present or absent; corolla regular or irregular to appearing papilionaceous, standard enclosed by the two lateral petals; stamens 5-10, distinct.

1. Herbaceous plants 2. *Cassia*
1. Trees
2. Leaves simple; corolla strongly irregular 1. *Cercis*
2. Leaves 1- to 2-pinnately compound; corolla nearly regular
3. Leaflets narrowly ovate-oblong, apices rounded; legumes stipitate, flat, less than 4 mm. thick; usually armed 3. *Gleditsia*
3. Leaflets ovate, abruptly acuminate; legumes sessile, 5 mm. or more thick; unarmed trees 4. *Gymnocladus*

1. *Cercis* L., Sp. Pl. 374. 1753.

Cercis canadensis L., Sp. Pl. 374. 1753. REDBUD—Trees, small with smooth bark, unarmed. Leaves simple, alternate, entire, palmately net-veined, cordate, apices abruptly acuminate; blades glabrous above, soft hairs on under surface at least along the lower part of the main veins, 6-13 cm. long, 7-15 cm. wide. Flowers fascicled, pedicellate, ca. 1 cm. long, appearing before the leaves; calyx zygomorphic with 1 lobe larger than the other 4 lobes, tube ca. 2-3 mm. long; corolla zygomorphic appearing papilionaceous; petals 5, distinct, reddish; stamens 10, distinct, enclosed by the 2 lower petals which are larger than the other 3. Legumes flattened, 6-9 cm. long, 1-1.5 cm. wide, placental margin winged. $2n = 12, 14$. Mar.-May. Moist calcareous slopes, alluvial lake and stream beds; SE U.S. Map 7.

2. *Cassia* L., Sp. Pl. 376. 1753.

Annual or perennial herbs. Leaves pinnately compound; petiolar glands stipitate or sessile. Flowers axillary and solitary, fascicled, or racemose, slightly irregular, 5-merous; petals yellow, distinct; stamens 5 or 10, distinct, anthers basifixed, dehiscing by terminal pores. Legumes oblong or linear, flattened, terete, or 4-angled.

1. Leaflets usually 3 cm. or more long; petiolar glands narrowly conical—clavate; 3 upper anthers non-fertile.
2. Leaflets obovate; flowers solitary in leaf axils; legumes terete or 4-angled 5. *C. obtusifolia*
2. Leaflets narrowly broadly elliptical; flowers in axillary racemes; legumes flattened.
3. Ovary villous with spreading hairs; legume partitions square; stipules usually ciliate 2. *C. hebecarpa*
3. Ovary with appressed pubescence; legume partitions rectangular; stipules usually glabrous 3. *C. marilandica*
1. Leaflets 2 cm. or less long; petiolar glands disc-shaped; anthers all fertile.
4. Flowers and legumes pedicellate; flowers ca. 1 cm. or more long; stamens 10 1. *C. fasciculata*
4. Flowers and legumes essentially sessile; flowers ca. 5 mm. long; stamens 5 4. *C. nititans*

1. *Cassia fasciculata* Michx., Fl. Bor. Am. 1:262. 1803. PARTRIDGE PEA—Annuals, 7 dm. tall or less, pubescence generally of incurved hairs. Leaves with 6-11 pairs of leaflets; leaflets oblong, 8-18 mm. long, 2-6 mm. wide; petiolar gland depressed, cup-like, usually stipitate; stipules narrowly ovate, subulate, striate, 1 cm. or less long. Flowers axillary, pedunculate, slightly irregular, 2 cm. long or less; sepals 5, distinct, narrowly ovate, ca. 1 cm. long; petals 5, distinct, 2 upper and 3 lower with the largest petal being one of the 2 upper, yellow; anthers 10, all fertile, nearly sessile, slender, tapering gradually to the terminal pores. Legumes pedunculate, flattened, 6.5 cm. or less long, 6 mm. or less wide. $2n = 16$. June-Oct. Occurs in a wide variety of habitats, forest to prairie, old fields to swamps; E U.S.; *Chamaecrista fasciculata* (Michx.) Green—S; *Chamaecrista robusta* Polard—S. Map 5.

2. *Cassia hebecarpa* Fern., Rhodora 39: 413. 1937. WILD SENNA—Perennial herbs, ca. 1 m. or less tall, pubescence of scattered, spreading hairs. Leaves with 6-10 pairs of leaflets; leaflets elliptical, 3-5 cm. long, 1-2 cm. wide; petiolar glands usually clavate; stipules linear-subulate, ciliate, somewhat persistent, less than 8 mm. long. Flowers numerous, in axillary racemes, only slightly irregular; sepals 5, distinct, obovate-ovate, ca. 5 mm. long; petals 5, distinct, yellow, 1 cm. or less long; stamens 10, fertile anthers tapering to blunt apices; ovary densely villous with spreading hairs. Legumes flattened, ca. 7 cm. long, 1 cm. wide with segments as wide as long (spear-shaped); seeds flat, orbicular quadrate. $2n =$. July-Aug. Wooded moist barrens and alluvium; Tenn. northward, Map 5.

3. *Cassia marilandica* L., Sp. Pl. 378. 1753. WILD SENNA—Perennial herbs, ca. 1 m. or less tall, essentially glabrous. Leaves with 6-10 pairs of leaflets; leaflets elliptical, 3-7 cm. long, 8-22 mm. wide; petiolar glands usually conical; stipules linear-subulate, glabrous, somewhat persistent, less than 8 mm. long. Flowers usually numerous in axillary racemes, only slightly irregular; sepals 5, distinct, obovate-ovate, ca. 5 mm. long; petals 5, distinct, yellow, 1 cm. or less long; stamens 10, fertile anthers tapering to blunt apices, ovary with dense, appressed pubescence. Legumes flattened, ca. 7 cm. long, 1 cm. wide, with segments wider than long (rectangular); seeds plump, oblong. $2n = 28$. July-Aug. Dry or moist, open, waste areas, calcareous bluffs, or alluvial bottomland; SE U.S.; *Ditremexa medseri* (Shaffer) Britton & Rose—S; *Ditremexa marilandica* (L.) Britton & Rose—S. Map 5.

4. *Cassia nititans* L., Sp. Pl. 380. 1753. WILD SENSITIVE SENNA—Annuals, usually less than 5 dm. tall, pubescence usually of incurved hairs. Leaves with 10-19 pairs of leaflets; leaflets oblong, 12 mm. or less long, 4 mm. or less wide; petiolar glands depressed, cup-like, stipitate to sessile; stipules narrowly ovate, subulate, striate, 8 mm. or less long. Flowers essentially sessile, slightly irregular, 7 mm. or less long; sepals 5, distinct, narrowly ovate, ca. 6 mm. long; petals 5, distinct, 2 upper and 3 lower with the largest petal being one of the 2 upper, yellow; anthers 5, all fertile, nearly sessile, linear with flared apical pores. Legumes essentially sessile, flattened, 3.5 cm. or less long, ca. 5 mm. wide, pubescence of short appressed incurved hairs. $2n = 16$. June-Oct. Occurs in various types of habitats; S & E U.S.; *Chamaecrista procumbens* (L.) Green—S. Map 6.

5. *Cassia obtusifolia* L., Sp. Pl. 377. 1753. SICKLEPOD—Annuals, 1 m. or less tall, essentially glabrous, sometimes flowering when only 1 dm. tall. Leaves with 4-8 obovate, sessile leaflets, 2-6 cm. long, 1.5-3 cm. wide; slender glands stipitate between lower pair of leaflets; stipules deciduous, narrowly elliptical, up to 1.5 cm. long. Flowers solitary in leaf axils, pedicelled, only slightly irregular; sepals 5, distinct, obovate, ciliate margined, ca. 6 mm. long; petals 5, distinct, yellow, 1-1.5 cm. long, standard obovate, usually emarginate; stamens 10, filaments shorter than the anther length, fertile anthers appendaged apically, dehiscing through appendage pores. Legumes essentially terete or 4-angled, 15 cm. or less long, 5 mm. broad. $2n = 24, 26, 28$. July-Oct. Open areas of roadsides, old fields, and bottomland; SE & C U.S.; *C. tora*—F, G; *Emelista tora*—S. Map 6.

3. *Gleditsia* L., Sp. Pl. 1056. 1753.

Trees, usually with simple or branched thorns. Leaves bipinnate or pinnate with narrowly ovate-oblong leaflets; perigynous, unisexual or bisexual flowers in catkin-like axillary racemes; sepals and petals 5 or less, greenish; stamens several, exerted. Legumes stipitate, flattened.

1. Legumes oval to elliptic, 5 cm. or less long; thorns usually simple 1. *G. aquatica*
1. Legumes linear, up to 30 cm. long; thorns usually branched but varying from nearly absent to dense in abundance 2. *G. triacanthos*

1. *Gleditsia aquatica* Marsh., Arbust. Am. 54. 1785. WATER LOCUST—Trees, usually with simple thorns. Leaves with 10-12 pair of opposite to somewhat alternate leaflets; leaflets narrowly ovate-oblong, apically rounded, indistinctly crenate, 2-3.7 cm. long, 6-11 mm. wide. Flowers in axillary racemes resembling catkins, staminate, pistillate, or perfect, greenish; floral tube ca. 3 mm. long; sepals ca. 5, narrowly ovate, ca. 2.5 mm. long; stamens several, exerted; ovary glabrous. Legumes stipitate, flat, oval to elliptic, 5 cm. or less long (excluding stipe), pulp absent. $2n = 28$. June. Alluvium, swamps, and bottomland; SE coastal plain and Mississippi Valley. Map 15.

2. *Gleditsia triacanthos* L., Sp. Pl. 1056. 1753. HONEY LOCUST—Trees, usually with branched thorns. Leaves of 2 types, pinnate and bipinnate; leaflets narrowly ovate-oblong, apically rounded, entire to minutely crenate, 5 cm. or less long, ca. 1 cm. or less wide. Flowers in axillary racemes resembling catkins, staminate, pistillate, or perfect, greenish; floral tube ca. 3 mm. long; sepals 5 or less, narrowly obovate, ca. 2.5 mm. long; stamens several, exerted. Legumes stipitate, flattened, linear, up to 30 cm. long (excluding stipe), pulp present. $2n = 28$. Apr.-May. Wooded bottomland, moist wooded slopes; C U.S.—Appalachians. Map 16.

Thorn development varies widely within this group resulting in nearly thornless trees (particularly in cultivation) to individuals densely covered with long branched thorns (Isely, 1958).

Distribution maps for *G. aquatica* and *G. triacanthos* include the counties given by Gordon (1966).

4. *Gymnocladus* Lam., Encycl. Meth. Bot. 1: 733. 1785.

Gymnocladus dioica (L.) K. Koch, Dendrol. 1: 5. 1869. KENTUCKY COFFEE-TREE—Trees, dioecious or monoecious, unarmed. Leaves bipinnate with ovate leaflets; leaflets 2.5-8 cm. long, mostly alternately arranged on rachis; flowers unisexual and bisexual with erect, whitish lobes and petals; staminate flowers in panicles, bisexual flowers in racemes; staminate flowers 5-merous, 1-1.5 cm. long, floral tube present, stamens 10, distinct, not exerted; perfect flowers 5-merous, 1.5-2.5 cm. long, floral tube and stamens present, ovary pubescent. Legumes sessile, ca. 12 cm. long, ca. 4 cm. wide, flattened and ca. 1 cm. broad. $2n = 28$. May-June. Swamps, flood-plains, cedar glades, and limestone out-crops; Tenn. northward. Map 16.

III. PAPILIONOIDEAE

Herbs, shrubs, vines, or trees. Leaves 1-pinnately to palmately compound (rarely unifoliate). Flowers papilionaceous, perfect, standard enclosing other petals in bud; stamens 10, distinct, monadelphous, or diadelphous. Legume indehiscent or dehiscent, a loment, or a 1-seeded indehiscent type.

1. Stamens distinct 1. SOPHOREAE
2. Leaves pinnately compound; trees 2. PODALYRIAE
2. Leaves simple or palmately compound; plants herbaceous 3. GENISTEAE
1. Stamens united, at least basally
3. Leaves simple or palmately compound; stamens monadelphous, dimorphic 4. TRIFOLIARAE
3. Leaves pinnately 3 to several-foliate, or if palmate, stamens diadelphous; stamens monadelphous or diadelphous
4. Leaflets dentate; stipules adnate to petioles 9. VICIARAE
4. Leaflets entire to dentate; stipules distinct or if united to petioles, leaflets entire
5. Tendrils present in place of terminal leaflet (except *Cicer*); leaflets entire to dentate 6. PSORALEAE
5. Tendrils absent; leaflets entire
6. Leaves pinnately compound or palmately 5- to 7-foliate; leaflets usually glandular-punctate; fruit one-seeded 8. HEDYCARAE
6. Leaves pinnate or trifoliate; leaflets not glandular-punctate; fruit 1 to several-seeded
7. Fruit segmented, segments separating at maturity or 1-seeded
7. Fruit non-segmented, several-seeded

8. Inflorescence umbellate; leaves pinnately 5-foliolate; (lower pair of leaflets resembling stipules)..... 5. LOTREAE
 8. Inflorescence racemose, or of solitary flowers; leaves pinnately 3- or several-foliolate..... 10. PHASEOLAEAE
 9. Herbaceous or woody twining vines; leaves 3-foliolate (except *Apia* with coiled keel)..... 7. GALEGEAE
 9. Herbaceous or woody erect plants (except *Wisteria* with incurved keel); leaves pinnately several-foliolate.....

1. SOPHOREAE

1. Inflorescence a raceme or panicle; flowers over 2 cm. long; legume flattened, linear..... 2. *Cladrastis*
 1. Inflorescence a panicle; flowers less than 2 cm. long; legume moniliform, terete..... 1. *Sophora*

1. *Sophora* L., Sp. Pl. 373. 1753.

Sophora japonica L., Mant. Pl. 1: 68. 1767. JAPANESE PAGODA-TREE—Trees, unarmed. Leaves odd-pinnate; leaflets essentially opposite, narrowly ovate-ovate, lateral veins inconspicuous, green above, whitish beneath, ca. 5 cm. long, ca. 2 cm. wide. Inflorescence a panicle; flowers yellowish-green, ca. 1-1.5 cm. long; calyx 5-toothed; stamens 10, distinct. Legumes terete, moniliform, indehiscent, 3-5 cm. long with unconstricted portion ca. 8 mm. in diameter, partially winged. $2n =$. Aug. Cultivated; native to China;

2. *Cladrastis* Raf., Cincinnati Lit. Gaz. 1: 60. 1824.

Cladrastis lutea (Michx. f.) K. Koch, Dendrol. 1: 6. 1869. YELLOW-WOOD—Trees, unarmed. Leaves odd-pinnate; leaflets alternate, ovate to obovate, lateral veins ascending, essentially parallel, ca. 15 cm. or less long, 11 cm. or less wide. Inflorescence a raceme or panicle; flowers white, ca. 2.5 cm. long; calyx ca. 1 cm. long, obtusely lobed; petals 5, distinct, clawed; stamens 10, distinct. Legumes essentially linear, upper suture narrowly winged, 10 cm. or less long, ca. 1 cm. wide, flattened, attenuate, sessile although appearing stipitate when immature. $2n = 28$. May. Rich woods and coves; W side of the S Apalachians. Map 7.

2. PODALYRIAE

1. Flowers yellow; legumes essentially flat, linear, 4-9 cm. long..... 3. *Thermopsis*
 1. Flowers blue, white, or yellow (if yellow, legumes less than 2 cm. long); legumes inflated..... 4. *Baptisia*

3. *Thermopsis* R. Br., Ait., Hort. Kew. ed. 2. 3: 3. 1811;

Perennial herbs with palmately trifoliolate leaves and prominent stipules. Raceme type of inflorescence with yellow flowers approximating 2 cm. long. Calyx united, irregular; petals 5, distinct, clawed; stamens 10, distinct. Legumes linear, flattened, with persistent styles.

1. Stipules ovate, clasping; legumes tomentose and erectly appressed to rachis..... 3. *T. villosa*
 1. Stipules narrowly ovate—linear; legumes pubescent and spreading.....
 2. Calyx tube glabrous, lobes usually shorter than tube.....
 2. Calyx tube pubescent, lobes equalling to longer than tube.....

1. *Thermopsis fraxinifolia* M. A. Curtis, Am. J. Sci. 44: 81. 1843. Perennial herbs. Leaves petioled, ca. 2-3 cm. long; stipules narrowly ovate-linear, usually rounded basally, ca. 3 cm. or less long; leaflets rhombic to narrowly obovate, 8 cm. or less long, 3.5 cm. or less wide. Flowers in racemes, yellow; calyx ca. 8 mm. long, glabrous, lobes shorter than tube; petals 5, distinct, clawed; stamens 10, distinct; ovary usually with appressed pubescence. Legumes stipitate with appressed pubescence, linear, up to 9 cm. long, ca. 5 mm. wide, flattened. $2n =$. Apr.-Aug. Mountains; N. Car., S. Car., Ga., SE Tenn. Map 30.

2. *Thermopsis mollis* (Michx.) M. A. Curtis in Gray, Mem. Am. Acad. II. 3(1): 47, tab. 9. 1848. BUSH-PEA—Perennial herbs. Leaves petioled, ca. 2-3 cm. long; stipules narrowly ovate to linear, usually rounded basally, ca. 3 cm. or less long; leaflets rhombic to narrowly obovate, 8 cm. or less long, 3.5 cm. or less wide. Flowers in racemes, yellow; calyx ca. 8 mm. long with sparse to dense appressed pubescence, lobes equalling to longer than tube; petals 5, distinct, clawed; stamens 10, distinct; ovary usually with appressed pubescence. Legumes stipitate with appressed pubescence, linear, up to 9 cm. long, ca. 5 mm. wide, flattened. $2n =$. Apr.-May. Dry woods, barrens; Va., Ga., Ala., Tenn. Map 31.

3. *Thermopsis villosa* (Walt.) Fern & Schub., Rhodora. 50: 201. 1948. Perennial herbs. Leaves petioled, stipules cordate, distinctly lobed basally, up to 7 cm. long; leaflets broadly elliptical, up to 12 cm. long, 5.5 cm. wide. Flowers in dense spike-like racemes, yellow; calyx ca. 8 mm. long, tomentose, lobes ovate-triangular and unequal; petals 5, distinct, clawed; stamens 10, distinct; ovary tomentose. Legumes sessile, appressed, erect, linear, 4-5 cm. long, 4-6 mm. wide, flattened, tomentose, with persistent styles. $2n =$. May-June. Central Basin; N. Car., Ga., Ala., Tenn.; *T. caroliniana* M. A. Curtis—S. Map 31.

4. *Baptisia* Vent., Dec. Gen. Nov. 9. 1808.

Perennial herbs. Leaves palmately trifoliolate, sessile to petioled; stipules deciduous or persistent; leaflets elliptical to obovate to cuneate. Inflorescence of 1 to several racemes; flowers white, yellow, or blue; calyx united, irregular with 3 lower lobes and 1 upper lobe entire—emarginate; petals 5, distinct, clawed; stamens 10, distinct. Legumes stipitate, inflated, papery to woody, beaked.

1. Flowers blue; petioles usually less than 1 cm. long or absent; legumes 3-5 cm. long..... 2. *B. australis*
 1. Flowers white or yellow; leaves definitely petioled, or if not, legumes less than 2 cm. long.....
 2. Flowers 1-1.5 cm. long; petals yellow, usually drying yellowish; legumes globose, ca. 1 cm. long; petioles usually less than 1 cm. long to absent.....
 2. Flowers 1.5 cm. long or more; petals white; legumes over 2 cm. long; leaves definitely petioled..... 4. *B. tinctoria*
 3. Flowers ca. 1.5 cm. long, usually drying yellowish; legumes cylindrical.....
 3. Flowers ca. 2 cm. long, usually drying purplish; legumes elliptical—oblong..... 1. *B. alba*
 The taxa within this genus are in need of a critical biosystematic study..... 3. *B. lactea*

1. *Baptisia alba* (L.) Vent., Dec. Gen. Nov. 9. 1808. Leaves definitely petioled; petioles of older leaves ca. 12 mm. long; leaflets narrowly obovate to broadly elliptical, 2.5-5 cm. long, 0.5-2 cm. wide. Flowers ca. 1.5 cm. long on elongated racemes; calyx 4-6 mm. long, upper lobe entire—emarginate; petals white usually drying yellowish. Legumes stipitate, cylindric, ca. 3 cm. long, 1 cm. broad, beaked. $2n =$. May-June. Roadsides; Va.-Fla.-Tenn.; includ. *B. albescent* Small—S. Map 3.

2. *Baptisia australis* (L.) R. Br. in Ait., Hort. Kew. ed. 2. 3: 6. 1811. BLUE WILD-INDIGO—Leaves sessile to short petioled; petioles of older leaves less than 8 mm. long; leaflets narrowly obovate—cuneate, 2-5 cm. long, 0.8-2 cm. wide. Flowers ca. 2 cm. long on elongated racemes; calyx 6-11 mm. long, upper lobe entire—emarginate; petals blue. Legumes stipitate, oblong-elliptical, 3-5 cm. long, 1.5-2 cm. broad, beaked. $2n = 18$. Apr.-June. River banks, cedar glades and barrens; SC & NE U.S.; includes *B. minor* var. *aberrans* Larisey—T. Map 4.

3. *Baptisia lactea* (Raf.) Thieret, Sida 3: 446. 1969. WHITE WILD-INDIGO—Leaves definitely petioled; petioles 8-12 mm. long; leaflets obovate—elliptic, 2.5-5 cm. long, 1-2.5 cm. wide. Flowers ca. 2 cm. long on elongated racemes; calyx ca. 8 mm. long, upper lobe entire—emarginate; petals white, drying purplish. Legumes stipitate, oblong—elliptic, ca. 3 cm. long, 1.8 cm. broad, beaked. $2n = 18$. May-June. Bottomland, barrens; C U.S. *B. leucantha* T. & G.—F, G, S, T. Map 4.

4. *Baptisia tinctoria* (L.) Vent., Dec. Gen. Nov. 9. 1808. YELLOW WILD-INDIGO—Leaves sessile to short petioled; petioles less than 8 mm. long; leaflets obovate—broadly cuneate, 1.5-3 cm. long, 7-11 mm. wide. Flowers ca. 1.5 cm. long on short racemes at apex of numerous lateral branches, racemes usually less than 1 dm. long; calyx 4-5 mm. long, upper lobe entire—emarginate; petals yellow. Legumes stipitate, globose—elliptic, 5-13 mm. long, 5-10 mm. broad, beaked. $2n = 18$. June-July. Dry woods, cedar glades, barrens, creek banks; E U.S.; includ. *B. gibbesii* Small—S, *B. tinctoria* var. *crebra* Fern.—T, F. Map 4.

3. GENISTEAE

1. Herbs; calyx parted; legumes inflated..... 5. *Crotalaria*
 1. Shrubs; calyx toothed; legumes flat..... 6. *Cytisus*

5. *Crotalaria* L., Sp. Pl. 714. 1753.

Annuals or perennials. Leaves unifoliolate, petioles short, less than 0.5 cm. long, at least in our unifoliolate species; stipules often conspicuously decurrent, inversely sagittate. Inflorescence usually terminal or axillary racemes; calyx irregular, 5-parted; corolla yellow; standard suborbicular, short clawed with a pair of basal sacs, wings oblong, keel petals falcate enclosing the stamens; stamens 10, monadelphous, sheath split on upper side, anthers dimorphic, basifixed, long filaments with oval anthers alternating with linear anthers on short filaments. Legumes sessile, inflated, coriaceous, abruptly apically beaked.

1. Leaves narrowly ovate; floral bracts linear—narrowly ovate..... 1. *C. purshii*
 2. Stems and branches with appressed pubescence..... 2. *C. sagittalis*
 2. Stems and branches with spreading pubescence..... 3. *C. spectabilis*
 1. Leaves obovate; floral bracts ovate—cordate.....

1. *Crotalaria purshii* DC., Prodr. 2: 124. 1825. RATTLEBOX—Perennials, ca. 3.5 dm. tall, pubescence appressed. Leaves narrowly elliptical—linear, 4-8 cm. long, 0.8-1 cm. wide; petioles short, 2 mm. or less long; stipules narrowly ovate, decurrent and conspicuous. Flowers ca. 1 cm. long; calyx 6-9 mm. long; petals yellow. Legumes essentially oblong, 1.5-3 cm. long. $2n =$. Aug. Great Smoky Mtns.; SE U.S.

Only one collection was seen from the Great Smoky Mountain National Park in Blount County, Tennessee.

2. *Crotalaria sagittalis* L., Sp. Pl. 714. 1753. ARROW CROTALARIA—Annuals or perennials, 1-5 dm. tall with dense, spreading pubescence. Leaves linear—elliptic, 2-7 cm. long, 0.4-1.3 cm. wide; petioles short, 2 mm. or less long; stipules narrowly ovate—linear, decurrent and conspicuous. Flowers ca. 1 cm. long; calyx 6-10 mm. long; petals yellow. Legumes oblong, 2-3 cm. long. $2n = 32$. June-Sept. Open woods, barrens, abandoned fields and waste areas, bottomland; C & E U.S.; S Amer. Map 8.

3. *Crotalaria spectabilis* Roth, Nov. Pl. Sp. 341. 1821. SHOWY CROTALARIA—Annuals, ca. 1 m. tall. Leaves obovate, 7-9 cm. long, 3.5-5 cm. wide, glabrous above, pubescence appressed beneath; petioles short, 5 mm. or less long; stipules ovate—cordate. Racemes terminal, 2.5-4 dm. long; flowers 2-2.5 cm. long; calyx glabrous, 11-13 mm. long; petals yellow. Legumes narrowly obovate, 2.5-4 cm. long, 1-1.5 cm. broad near apex, beak apically lateral. $2n =$. Aug.-Oct. Cultivated; introduced from India; SE U.S.; *C. retzii* A. Hitchc.—S. Map 8.

6. *Cytisus* L., Sp. Pl. 739. 1753.

Cytisus scoparius (L.) Link, Enum. Hort. Berol. 2: 241. 1822. SCOTCH BROOM—Shrubs with numerous stiffly erect ascending branches, stems strongly angled. Leaves palmately trifoliolate or unifoliolate; leaflets linear—elliptic, ca. 1 cm. or less long; petioles, when present, narrowly winged. Flowers axillary, solitary or clustered, peduncled; calyx campanulate, upper lobe 2-toothed, the lower 3-toothed; corolla showy, yellow, ca. 2 cm. long; standard orbicular; wing petals clawed, auricled with sac into which lateral keel lobes project; keel petals clawed, distinct below, united above; stamens monadelphous, dimorphic; anthers linear, 5 anthers basifixed on short filaments, 5 versatile on long filaments; ovary and basal portion of style with pubescence, style spirally incurved. Legumes oblong, flattened, elastically dehiscent, 3-5 cm. long, 8-9 mm. wide. $2n =$. May. Cultivated; introduced from S & C Eur., naturalized. Map 9.

4. TRIFOLIEAE

1. Fruit coiled or reniform; stems usually 4-angled..... 7. *Medicago*
 1. Fruit straight; stems terete..... 8. *Medicago*
 2. Inflorescence an elongated raceme..... 9. *Trifolium*
 2. Inflorescence a globose to cylindrical spike or raceme.....

7. *Medicago* L., Sp. Pl. 778. 1753.

Annual or perennial herbs, erect to decumbent; young stems and branches usually 4-angled. Leaves pinnately trifoliolate; leaflets cuneate to obovate, dentate at least apically; stipules conspicuous, adnate to petioles. Inflorescence an elongated or oblong raceme; flowers pedicelled, purplish or yellow; calyx nearly regular, campanulate, 5-cleft; stamens diadelphous; style shorter than ovary, stigma capitate. Fruits reniform to tightly coiled, 1 to several-seeded.

1. Flowers purplish, over 6 mm. long; fruits coiled; stipules usually entire..... 4. *M. sativa*
 1. Flowers yellow, less than 6 mm. long; fruits reniform or coiled; stipules toothed—laciniate.....

2. Stipules with few teeth; fruits reniform; flowers ca. 2 mm. long. 1. *M. lupulina*
 2. Stipules parted or divided; fruits coiled; flowers 4-5 mm. long. 2. *M. orbicularis*
 3. Fruits spineless, 10-15 mm. in diameter; stipules divided. 3. *M. polymorpha*
 3. Fruits spiny, less than 10 mm. in diameter; stipules parted. 3. *M. polymorpha*
1. *Medicago lupulina* L., Sp. Pl. 779. 1753. BLACK MEDICK—Annual or biennial herbs, 1-7 dm. tall, usually decumbent. Leaflets obovate-orbicular, 0.8-2 cm. long, 4-15 mm. wide; stipules ovate, usually toothed, 4-7 mm. long. Flowers ca. 2 mm. long, in oblong axillary racemes; calyx 1.5-2 mm. long; corolla yellow. Fruits reniform, reticulate, 1-seeded, ca. 2 mm. in diameter, becoming black, glabrous or with glandular multicellular hairs. $2n = 16, 32$. Apr.-Sept. Old fields, roadsides; introduced from Eurasia, naturalized. Map 22.
2. *Medicago orbicularis* (L.) Bartalini, Cat. delle Piant. Citta di Siena. 60. 1776. BUTTON CLOVER—Annual herbs, 3-6 dm. tall, spreading to decumbent. Leaflets obovate-obdeltoid, cuneate, 0.7-2 cm. long, 4-14 mm. wide; stipules lacerated to the base, 5-7 mm. long. Flowers 4-5 mm. long, in few-flowered axillary racemes; calyx 2.5-3 mm. long; corolla yellow. Fruits spirally coiled, flattened, spineless, 9-12 mm. in diameter. $2n = 16$. May. Roadsides, old fields; native of Mediterranean area. Map 22.
3. *Medicago polymorpha* L., Sp. Pl. 779. 1753. BUR CLOVER—Annuals, up to 5 dm. tall, decumbent to ascending. Leaflets obovate, up to 1.5 cm. long; stipules lacerated more than half the length. Flowers ca. 4 mm. long; corolla yellow. Fruits spirally coiled, spiny, ca. 6 mm. in diameter. $2n = 14, 16$. June-July. Cultivated; native of Europe; *M. hispida* Gaertn.—G, S, F.
4. *Medicago sativa* L., Sp. Pl. 778. 1753. ALFALFA—Perennial herbs, 6-9 dm. tall. Leaflets elliptic—narrowly obovate, 1-3 cm. long, 3-10 mm. wide; stipules narrowly ovate, usually auricled, mostly entire, 6-12 mm. long. Flowers 7-10 mm. long, in axillary racemes; calyx 4-6 mm. long; corolla bluish-purple. Fruits spirally coiled, flattened, several-seeded, spineless, 4-5 mm. in diameter. $2n = 16, 32, 64$. May-June. Roadsides, waste areas; cultivated; introduced from Mediterranean area. Map 22.
8. *Melilotus* Mill., Gard. Dict. Abr. ed. 4. 1754.
- Biennial herbs, usually 1 m. or more tall. Leaves pinnately trifoliate, petioled; leaflets obovate—elliptic, dentate; stipules adnate to the petioles only ca. 2 mm. or less, subulate, ca. 1 cm. long. Inflorescence an elongated raceme, axillary; flowers white or yellow; calyx essentially regular with the lobes equalling the tube in length; stamens diadelphous, style longer than the ovary. Fruit oblong, ca. 3 mm. long, 1.5-2 mm. broad, reticulate, with persistent style.
1. Flowers white; standard distinctly exceeding wings; mature fruit irregularly reticulate. 1. *M. albus*
 1. Flowers yellow; standard equalling or slightly exceeding wings; mature fruit reticulations prominently transversely ridged. 2. *M. officinalis*
1. *Melilotus albus* Desr. in Lam., Encycl. Meth. Bot. 4: 63. 1796. WHITE SWEET CLOVER—Usually tall, biennial herbs. Leaflets obovate—oblong, dentate; stipules subulate, ca. 1 cm. long. Flowers white, 2-5 mm. long. Fruits 2.5-3 mm. long. $2n = 16, 24, 32$. May-Oct. Roadsides, waste areas; introduced, native of Eurasia. Map 23.
2. *Melilotus officinalis* (L.) Lam., Fl. Fr. 2: 594. 1778. YELLOW SWEET CLOVER—Usually tall, biennial herbs. Leaflets obovate—oblong, dentate; stipules subulate, ca. 1 cm. long. Flowers yellow, 4-6 mm. long. Fruits glabrous, 2.5-3 mm. long. $2n = 16$. May-July. Roadsides, waste areas; introduced, native of Eurasia. Map 23.
9. *Trifolium* L., Sp. Pl. 764. 1753.
- Annual or perennial herbs, prostrate, decumbent or erect. Leaves palmately or pinnately trifoliate; leaflets cuneate to obovate to orbicular; stipules adnate to petiole, usually entire, ovate—broadly linear, free part ovate-subulate. Inflorescences usually dense, globose—cylindrical; flowers yellow, white, red, or purplish with tendency to change color with age or upon drying; calyx nearly regular to strongly irregular, united, campanulate; stamens diadelphous or monadelphous; ovary stipitate to sessile. Fruits enclosed by calyx and persisting corolla, usually several-seeded.
1. Flowers yellow. 1. *T. aureum*
 2. Leaves palmately trifoliate. 1. *T. aureum*
 2. Leaves pinnately trifoliate. 1. *T. aureum*
 3. Heads up to 10-flowered; petals non-striate. 4. *T. dubium*
 3. Heads dense, more than 15-flowered; petals striate. 3. *T. campestre*
1. Flowers pink to purplish, or white. 3. *T. campestre*
 4. Flowers pedicellate, pedicels more than 2 mm. long. 3. *T. campestre*
 5. Heads large, ca. 3 cm. or more in diameter, calyx 10-ribbed; lobes twice the tube length or more. 10. *T. reflexum*
 5. Heads smaller, less than 2 cm. in diameter; calyx 5 to 7 or 10-ribbed, lobes less than twice the tube length. 10. *T. reflexum*
 6. Stems prostrate; rooting at the nodes; stipules usually less than 1 cm. long; calyx 10-nerved. 11. *T. repens*
 6. Stems erect, not rooting at the nodes; stipules usually 1-3.5 cm. long; calyx 5 to 7-nerved. 6. *T. hybridum*
4. Flowers essentially sessile, pedicels less than 2 mm. 6. *T. hybridum*
 7. Inflorescence cylindrical—conical, up to 8 cm. long; corolla reddish-purple. 7. *T. incarnatum*
 7. Inflorescence globose—oblong, less than 2 cm. long. 7. *T. incarnatum*
 8. Inflorescence oblong; flowers whitish. 7. *T. incarnatum*
 8. Inflorescence essentially globose; flowers usually colored. 2. *T. arvense*
 9. Heads subtended by leaves; flowers reflexed after anthesis or heads pedunculate; calyx, if not inflated, 20-nerved. 9. *T. pratense*
 10. Calyx irregular with upper lobe inflated, hyaline, bifid; standard inverted. 12. *T. resupinatum*
 10. Calyx regular—slightly irregular, not inflated; standard untwisted, adjacent to upper lobe. 12. *T. resupinatum*
 11. Calyx tawny villous, ribs obscure. 5. *T. hirtum*
 11. Calyx glabrate; ribs evident. 8. *T. lappaceum*
1. *Trifolium aureum* Pollich., Hist. Pl. Palat. 2: 344. 1777. YELLOW HOP CLOVER—Usually erect annual herbs with appressed antrorse hairs, ca. 7 dm. tall. Leaflets elliptical—narrowly obovate, obtuse—emarginate, 0.7-2 cm. long, 3-10 mm. wide; stipules narrowly ovate. Inflorescence globose—oblong; flowers yellow, 5-6 mm. long; calyx 5-nerved, lobes unequal, narrowly ovate—linear, longer than tube; petals striate. $2n = 14$. June. Fields and waste areas; native of Eur. & adj. Asia. *T. agrarium* L.—F, G, S, T.

Only one specimen has been seen from Knox Co., Tennessee.

2. *Trifolium arvense* L., Sp. Pl. 769. 1753. RABBIT-FOOT CLOVER—Erect annual herbs with dense pubescence, mostly antrorsely appressed. Leaflets cuneate—narrowly obovate, 1-1.5 cm. long, 2-5 mm. wide; stipules 6-8 mm. long, free part longer than adnate part, narrowly ovate with setaceous tip. Inflorescence cylindrical, oblong, 1-2.3 cm. long, 1 cm. wide;

flowers whitish, ca. 5 mm. long; calyx densely pubescent obscuring the 10 nerves, lobes nearly equal, setaceous, longer than tube; petals exceeded by the pubescent calyx lobes. $2n = 14$. June-July. Old fields and roadsides; native of Eurasia. Map 31.

3. *Trifolium campestre* Schreb. in Sturm, Deut. Fl. 1 (16): pl. 13. 1804. BIG HOP CLOVER—Erect to decumbent annual herbs with spreading and appressed antrorse hairs; stems 7-35 cm. long. Leaflets cuneate—obovate, 6-14 mm. long, 3-7 mm. wide; stipules ovate, free part equalling fused part in length. Inflorescence globose—oblong; flowers yellow, 4-5 mm. long; calyx 5-nerved, lobes unequal becoming setaceous, longer ones exceeding tube; petals usually striate-sulcate. $2n = 14$. Apr.-Aug. Old fields and roadsides; native of Eur.; *T. procumbens* L.—F, S, G. Map 32.

4. *Trifolium dubium* Sibth., Fl. Oxon. 231. 1794. LITTLE HOP CLOVER—Erect to decumbent annual herbs with spreading antrorse hairs; stems 7-25 cm. long. Leaflets cuneate—obovate, 5-9 mm. long, 2-4 mm. wide; stipules ovate, free part equalling fused part in length. Inflorescence essentially globose; flowers yellow, 3-3.5 mm. long; calyx 5-nerved, lobes unequal becoming setaceous, longer ones exceeding tube; petals non-striate. $2n = 14, 16, 28$. Apr.-May. Waste areas and roadsides; native of Eurasia. Map 32.

5. *Trifolium hirtum* All., Auct. ad Fl. Pedem. 20. 1789. Erect annual herbs with spreading, mostly retrorse pubescence. Leaflets obovate, 8-12 mm. long, 4-9 mm. wide; stipules 1-1.2 cm. long, ovate with free part linear, subulate and longer than fused part. Inflorescence globose, subtended by leaves which become reflexed and obscure in fruiting heads; flowers 8-10 mm. long, reddish-purple; calyx ca. 8 mm. long, ca. 20-nerved, pubescence dense, tawny, lobes slightly unequal, setaceous, longest lobe twice the tube length; standard narrow, longer than the wings and keel; stamens diadelphous above, connate basally. $2n = 10$. May-June. Cultivated; native of S Eur.

6. *Trifolium hybridum* L., Sp. Pl. 766. 1753. ALSIKE CLOVER—Erect perennial herbs, nearly glabrous. Leaflets obovate—broadly elliptical, 1.5-2.9 cm. long, 1-2.3 cm. wide; stipules ovate, up to 2 cm. long, attenuately tipped into awn, free part over twice as long as adnate part. Inflorescence globose on naked, axillary peduncles exceeding leaves; flowers pinkish-white, 7-9 mm. long; calyx whitish with lobes green along midvein, 5 to 7-nerved, lobes unequal, narrowly ovate, longer than tube; standard exceeding wings and keel in length. $2n = 16$. May-Aug. Old fields, disturbed areas; native of east. Eur. Map 32.

7. *Trifolium incarnatum* L., Sp. Pl. 769. 1753. CRIMSON CLOVER—Erect annual herbs with clustered stems; pubescence tawny, dense, mostly antrorsely appressed. Leaflets obovate, 1-3 cm. long, 1-2.6 cm. wide; stipules 1-2 cm. long, with free part foliaceous or scarious, deltoid—ovate, shorter than fused part. Inflorescence conical—cylindrical, up to 8 cm. long and 2 cm. wide; flowers red, 9-11 mm. long; calyx tawny strigose, obscuring the 10 nerves, lobes nearly equal, setaceous, longer than tube; standard exceeding the wings and keel. $2n = 14$. Apr.-July. Roadsides and waste areas; native of Eur. Map 33.

8. *Trifolium lappaceum* L., Sp. Pl. 768. 1753. BURDOCK CLOVER—Erect to spreading annual herbs, stems glabrous, foliage and inflorescence with tawny hairs. Leaflets obovate—elliptic, 1-2.5 cm. long, 5-10 mm. wide; stipules 1.1-1.5 cm. long, narrow with free part linear, subulate, at least equalling the fused part. Inflorescence globose—slightly oblong, subtended by leaves which become reflexed and obscure in fruiting heads; flowers 8-9 mm. long, tube usually glabrous, yellowish, prominently 20-nerved, lobes narrowly ovate, subulate-tipped, twice the tube length; corolla reddish. $2n = 16$. June. Cultivated; native of Mediterranean area.

9. *Trifolium pratense* L., Sp. Pl. 768. 1753. RED CLOVER—Erect biennial or perennial herbs with clustered stems; pubescence spreading. Leaflets ovate—obovate, 2-4.5 cm. long, 1.5-3 cm. wide, appearing entire, teeth minute; stipules 1-2.8 cm. long, free part ovate, abruptly terminating in awn, shorter than adnate part. Inflorescence nearly globose, flowers up to 1.5 cm. long, erect after anthesis, subtended by leaflets and conspicuous ovate, purplish-veined stipules; calyx 10-nerved at least basally, lobes unequal, shortest equalling tube with longest lobe twice the tube length, lobes setaceous; petals whitish to purplish. $2n = 14, 28, 56$. May-Sept. Old fields, roadsides; native of Eur. Map 33.

10. *Trifolium reflexum* L., Sp. Pl. 766. 1753. BUFFALO CLOVER—Erect, herbaceous, glabrous annuals with clustered stems. Leaflets narrowly obovate—obovate, ca. 2 cm. long and 1 cm. wide; stipules ovate, 9-18 mm. long, free part equalling—exceeding the fused part in length. Inflorescence globose; flowers reddish, 10-12 mm. long; calyx 10-nerved, lobes unequal, twice the length of the tube or more, linear—setaceous; petals striate. $2n = 16$. May. Fields, roadsides; native of C & E U.S. Map 33.

11. *Trifolium repens* L., Sp. Pl. 767. 1753. WHITE CLOVER—Procumbent perennial herbs, essentially glabrous. Leaflets obovate to ovate, often as wide as long, 1.2-2.4 cm. long, 1-1.8 cm. wide; stipules ovate, ca. 7 mm. long, free part abruptly tipped and longer than fused part. Inflorescence globose, on naked axillary peduncles exceeding the leaves; flowers white to pinkish, 6-10 mm. long; calyx whitish with lobes green along midvein, 10-nerved, lobes unequal, narrowly ovate, shorter than tube; standard exceeding the wings and keel in length. $2n = 32, 48, 64$. Apr.-Aug. Fields, roadsides, lawns; native of N Eur. Map 34.

12. *Trifolium resupinatum* L., Sp. Pl. 771. 1753. PERSIAN CLOVER—Erect to decumbent, glabrous annuals. Leaflets obovate, 9-16 mm. long, 4-10 mm. wide; stipules 5-7 mm. long, free part ovate—narrowly ovate, attenuate, longer than adnate part. Inflorescence essentially globose, on leafless peduncles; flowers 5-6 mm. long; calyx irregular, ca. 3 mm. long, lower lobes 3, green, narrowly ovate, glabrous exteriorly, upper lobes 2, hyaline, setaceous, pilose exteriorly; corolla pink—purplish, standard basally twisted to ventral side; stamens diadelphous; style longer than the ovary. Fruits enclosed by the inflated hyaline, setaceous, 2-lobed half of the calyx. $2n = 16$. May. Lawn weed; native of SE Eur. Map 34.

5. LOTEAE

10. *Lotus* L., Sp. Pl. 773. 1753.

Lotus corniculatus L., Sp. Pl. 775, 776. 1753. BIRDSFOOT TREFOIL—Perennial herbs; stems decumbent to erect, sparsely pubescent to glabrate. Leaves pinnately 5-foliate, lower pair of leaflets appearing to be stipules; leaflets narrowly obovate, 8-13 mm. long. Flowers 1-1.5 cm. long in pedunculate umbels; calyx ca. 6 mm. long, campanulate, 5-cleft, lobes linear; corolla yellow, keel incurved, beaked; stamens diadelphous, unequal, free filament short, 5 longer filaments dilated apically; style incurved. Legumes linear, ca. 2 cm. long, ca. 2.5 mm. in diameter, beak slender, up to 4 mm. long. $2n = 12, 24$. June-Aug. Cultivated; native of Eur.

6. PSORALEAE

1. Shrubs; corolla of one petal (standard); stamens distinct above base. 12. *Amorpha*
 1. Herbaceous plants; corolla papilionaceous; stamens united. 11. *Psoralea*
 2. Leaves palmately compound. 13. *Petalostemon*
 2. Leaves pinnately compound. 11. *Psoralea*
 3. Anthers 5; "petals" 5, inserted at apex of staminal tube. 13. *Petalostemon*
 3. Anthers 10; petals basal, not attached to staminal tube. 11. *Psoralea*

11. *Psoralea* L., Sp. Pl. 762. 1753.

Erect to acaulescent perennial herbs; roots thick, woody; leaves pinnately trifoliate or palmately compound, usually glandular-punctate. Inflorescence a pedunculate raceme; flowers 2-3 per bract, bluish to purple or white; calyx united, irregular; corolla free from staminal tube; stamens diadelphous. Fruits usually exserted, 1-seeded.

1. Leaves pinnately 3-foliate; stipules 6 mm. long or less. 1. *P. onobrychis*
 2. Leaflets broadly ovate, 1.5 cm. wide or more. 2. *P. psoraloides*
 2. Leaflets narrowly ovate, less than 1.5 cm. wide. 3. *P. subcaulis*
 1. Leaves palmately compound; 5 to 7-foliate; stipules ovate, up to 2 cm. long. 3. *P. subcaulis*
 1. *Psoralea onobrychis* Nutt., Gen. N. Am. Pl. 2: 104. 1818. Stems erect, sparsely pubescent with antrorsely appressed hairs. Leaves pinnately trifoliate; petioles 4.5-7.5 cm. long; stipules linear, 2-5 mm. long; leaflets inconspicuously glandular-punctate, ovate, 5-9 cm. long, 1.5-4 cm. wide. Inflorescence an axillary raceme, 5-12 cm. long on peduncles 4-13 cm. long; flowers 6-7 mm. long; calyx ca. 2 mm. long, lobes shorter than tube; corolla bluish. Fruits ovate, compressed, ca. 8 mm. long, ridged, tuberculate. 2n = . June-July. Along railroad tracks, disturbed areas; Ind.—Mo.—Tenn.; *Orbexilum onobrychis* (Nutt.) Rydb.—S. Map 25.

2. *Psoralea psoraloides* (Walt.) Cory var. *eglandulosa* (Ell.) Freeman, Rhodora 39: 426. 1937. SAMPOSON'S SNAKE-ROOT—Stems erect, densely pubescent with antrorsely appressed hairs. Leaves pinnately trifoliate, long petioled basally, gradually becoming sessile apically; stipules narrowly ovate, 5-6 mm. long; leaflets glandular-punctate to eglandular, narrowly ovate, 3.5-6.5 cm. long, 6-13 mm. wide. Inflorescence an axillary raceme, 2-7 cm. long on peduncles 4-15 cm. long; flowers 5-6 mm. long; calyx 2.5-3 mm. long, lobes equalling the tube or longer; corolla bluish-purple. Fruits orbicular, compressed, 3-4 mm. long, transversely ridged. 2n = 22. Apr.-June. Habitats various, woodland, barrens, roadsides; Ill.—Tex.—Ga.—Va.; *P. pedunculata* (Mill.) Vail—T.; *Orbexilum pedunculatum* (Mill.) Rydb.—S. Map 25.

3. *Psoralea subcaulis* T. & G., Fl. N. Am. 1: 302. 1838. Plants acaulescent, petioles and peduncles usually velutinous and whitish; root enlarged, fusiform, up to 2.5 cm. in diameter. Leaves long petioled, 5-7 foliolate, palmately compound; stipules ovate, bifid, 1.8-2 cm. long; leaflets glandular-punctate, narrowly obovate, 2-4 cm. long, 5-14 mm. wide. Inflorescence a dense spike-like raceme, long peduncled; flowers 1.5-2 cm. long, floral bracts ovate, 9-12 mm. long; calyx gibbous, 8-9 mm. long, lower lobe elliptical-ovate, 3 mm. long, lateral and upper lobes narrowly ovate, 1.5-2 mm. long; corolla bluish-purple to white; stamen filaments free apically, dilated. Fruits oblong, beak curved, body 5 mm. long, 3 mm. in diameter, beak ca. 3 mm. long with remainder of style slender, contorted, persistent, 1-seeded. 2n = . Apr.-May. Rocky limestone soil, cedar glades; Tenn., Ala.; *Pediometum subcaulis* (T. & G.) Rydb.—S. Map 25.

White and nearly colorless forms are included in this treatment.

12. *Amorpha* L., Sp. Pl. 713. 1753.

Shrubs; foliage glandular-punctate. Leaves odd-pinnate; stipules linear—setaceous, caducous. Inflorescence of terminal or axillary racemes; flowers blue-purple; calyx slightly irregular, united; petals 1, wings and keel absent; stamens 10, filaments united basally, upper filaments free and exserted; ovary 2-ovuled, stigma capitate. Fruits usually exserted, 1 to 2-seeded.

1. Fruits curved; calyx and inflorescence pubescent; leaflets usually drying greenish. 1. *A. fruticosa*
 1. Fruits straight; calyx and inflorescence glabrous; leaflets usually drying blackish. 2. *A. glabra*

The genus *Amorpha* has ca. 20 species described for the southeastern United States. A critical study of these taxa is needed and this treatment is tentative.

1. *Amorpha fruticosa* L., Sp. Pl. 713. 1753. FALSE INDIGO—Shrubs up to 6 m. tall; pubescence dense on young stems and foliage becoming glabrate with age. Leaves with 20-40 leaflets, petioles 1-2 cm. long; leaflets usually elliptic, rounded apically, 1.5-5 cm. long, 0.5-2.5 cm. wide; stipules 4 mm. long or less, early deciduous; stipels ca. 1 mm. long. Inflorescence a spike-like raceme, 12-17 cm. long, 1-1.4 cm. in diameter, rachis pubescent; flowers ca. 5 mm. long excluding the exserted stamens, purplish; calyx 5-toothed, with few to several raised glands around the teeth, pubescent to glabrate. Fruits ca. 8 mm. long, curved, glabrous, glandular. 2n = 40. June. Old fields, bottomland; E U.S.; includ. *A. tennesseensis* Shuttleworth—S. Map 1.

Only a few specimens show the smaller leaflets of *A. tennesseensis* with intermediate specimens indistinguishable.

2. *Amorpha glabra* Desf. ex Poir. Lam., Encycl. Meth. Bot. Suppl. 1: 330. 1810. MOUNTAIN INDIGO—Shrubs 1 to 2 m. tall, young stems and foliage usually glabrous. Leaves with 10-20 leaflets; leaflets oblong to elliptical, often retuse, glabrous to pubescent below along midribs. Inflorescence a spike-like raceme 1-2 dm. long, ca. 1.5 cm. in diameter, usually glabrous; flowers purplish; calyx 5-toothed usually glandular, glabrous. Fruits up to 8 mm. long, usually straight on upper suture, glabrous, sparsely glandular. 2n = . May-June. Old fields, swamp margins; E U.S. Map 1.

13. *Petalostemon* Michx. nom. cons. (-on), Fl. Bor. Am. 2: 48. 1803.

Erect perennial herbs with glandular-punctate, pinnately compound leaves. Inflorescence a spike; floral bracts conspicuous in young buds, caducous to somewhat persistent; flowers white-purple; calyx united, slightly irregular, 5-lobed; standard clawed, basally attached, "petals" 4, clawed, produced at the apex of the staminal tube; stamens 5, monadelphous. Fruits enclosed by the calyx, little exserted, 1-seeded.

1. Flowers white; leaflets elliptical, over 1 cm. long. 1. *P. candidum*
 1. Flowers purplish; leaflets linear if over 1 cm. long. 2. *P. foliosum*
 2. Leaflets oblong, less than 1 cm. long; floral bracts and legumes glabrous. 2. *P. foliosum*
 2. Leaflets linear; floral bracts and legumes with pubescence. 3. *P. gatlingeri*

1. *Petalostemon candidum* (Willd.) Michx., Fl. Bor. Am. 2: 49. 1803. WHITE PRAIRIE CLOVER—Erect, glabrous, perennial herbs. Stipules subulate, ca. 2 mm. long; petioles and rachises greenish appearing narrowly winged; leaflets glandular-punctate beneath, narrowly obovate—elliptic, 1-2 cm. long, 2-6 mm. wide. Inflorescence a spike, 1-3 cm. long, 7-9 mm. in diameter; floral bracts ovate, acuminate, subulate-tipped, glabrous; flowers white; calyx obconic, tube with a row of glands near summit, lobes narrowly ovate. 2n = 14. July. Prairies and barrens; E U.S. Map 23.

2. *Petalostemon foliosum* Gray, Proc. Am. Acad. 7: 336. 1868. Erect, glabrous, perennial herbs. Stipules subulate, ca. 4 mm. long; petioles and rachises greenish appearing narrowly winged; leaflets glandular-punctate beneath, oblong—narrowly obovate, obtuse, 7-9 mm. long, 1.5-2.5 mm. wide. Inflorescence a spike, 1-5 cm. long, ca. 9 mm. in diameter; floral bracts narrowly ovate—ovate, attenuate, glabrous; flowers purplish; calyx obconic, tube glabrous, glandless to inconspicuously glandular, lobes ovate. 2n = . July-Oct. Cedar glades, barrens; Tenn., N Ill., Ala. Map 24.

3. *Petalostemon gatlingeri* (Heller) Heller, Bull. Torr. Bot. Club. 26: 593. 1899. Erect perennial herbs. Stipules subulate, 3-5 mm. long; petioles and rachises greenish appearing narrowly winged; leaflets usually 7-9, glandular-punctate beneath, involute, linear, 1-2 cm. long, 1-2 mm. wide. Inflorescence a spike, 2-8 cm. long, 1-1.2 cm. in diameter; floral bracts ovate, usually evenly pubescent, linear tips dark and recurved in young pubescent spikes; flowers purplish; calyx obconic, tube pilose. 2n = . May-Aug. Cedar glades and barrens; Tenn., Ala.; *P. purpureum*—T. Map 24.

Two sheets, Baskin and Caudle 454 and 455, bear specimens of which the leaves are slightly broader and the spikes, two of which are bifurcate, persistently tighter because of the persistent nature of the uncurved caudate floral bracts. These are considered to be abnormal variations of *P. gatlingeri* which tend toward some of the characteristics of *P. purpureum*.

7. GALAGEAE

1. Trees, shrubs, or woody climbers. 16. *Robinia*
 2. Erect, trees or shrubs. 15. *Wisteria*
 2. Twining shrubs or vines. 17. *Sesbania*
 1. Herbaceous plants. 14. *Tephrosia*
 3. Leaves even-pinnate. 18. *Astragalus*
 3. Leaves odd-pinnate. 14. *Tephrosia*
 4. Standard orbicular; legumes flat. 18. *Astragalus*
 4. Standard obovate; legumes subcylindric-inflated. 18. *Astragalus*

14. *Tephrosia* Pers. nom. cons., Syn. Pl. 2: 328. 1807.

Erect to decumbent, herbaceous, villous perennials. Leaves odd-pinnate; stipules linear; leaflets less than 3 cm. long, oblong—linear. Inflorescences terminal or axillary appearing opposite the leaves; flowers whitish, yellowish or purplish, petals short-clawed, keel fused along outer margin; stamens diadelphous, style shorter than ovary. Legumes linear, villous, elastically dehiscent, several-seeded.

1. Leaflets oblong—obovate; inflorescence long-pedunculate, exceeding leaves. 1. *T. spicata*
 1. Leaflets linear—narrowly elliptical; inflorescence not exceeding leaves. 2. *T. virginiana*

1. *Tephrosia spicata* (Walt.) T. & G., Fl. N. Am. 1: 296. 1838. Decumbent to weakly ascending, villous, perennial herbs. Stipules 5-7 mm. long, linear; leaflets oblong—obovate, obtuse, mucronate, 1.2-2.7 cm. long, 6-14 mm. wide, villous beneath, glabrous above. Inflorescence axillary, peduncles usually exceeding leaves; flowers whitish—purplish, 1.3-1.8 cm. long; calyx lobes exceeding tube. Legumes villous, linear, flattened, slightly curved, 4-5 cm. long, 5-6 mm. wide. 2n = 22. June-Sept. Roadsides, dry woods; SE U.S.; *Cracca spicata* (Walt.) Ktze.—S. Map 30.

2. *Tephrosia virginiana* (L.) Pers., Syn. Pl. 2: 329. 1807. GOAT'S-RUE—Erect, villous, perennial herbs. Stipules 5-7 mm. long, linear; leaflets linear—narrowly elliptical, mucronate, 1.4-2.7 cm. long, 3-10 mm. wide, villous beneath, usually glabrous above. Inflorescences terminal, usually not longer than leaves; flowers yellowish-pink—purplish, 1.4-2 cm. long; calyx lobes exceeding tube. Legumes villous, linear, flattened, 4-5 cm. long, 5-6 mm. wide. 2n = 22. May-Oct. Dry woods, barrens, cedar glades, or sandy areas; E U.S.; *Cracca virginiana* L.—S. Map 30.

15. *Wisteria* Nutt. nom. cons., Gen. 2: 115. 1818.

Woody twining vines or shrubs. Leaves odd-pinnate; leaflets stipellate. Inflorescence an elongated raceme, 1-2 dm. long. Flowers bluish-purple; calyx campanulate, 5-lobed or toothed, the 2 upper lobes often connate; standard clawed with 2 appendages above claw, wings auricled basally, keel falcate; stamens diadelphous; ovary glabrous or pubescent. Legumes flattened, elastically dehiscent, irregularly swollen, several-seeded.

1. Ovary and legume glabrous; pedicels less than 1 cm. long. 2. *W. frutescens*
 1. Ovary and legume pubescent; pedicels slender more than 1 cm. long. 3. *W. sinensis*
 3. Leaflets 3-6 pairs; lower and upper flowers opening at the same time; calyx tube width equalling length on mature flowers. 1. *W. floribunda*
 3. Leaflets 6-9 pairs; lower flowers opening before upper; calyx tube broader than long on mature flowers. 1. *W. floribunda*
 1. *Wisteria floribunda* (Willd.) DC., Prodr. 2: 390. 1825. JAPANESE WISTERIA—Leaflets 6-9 pairs, attenuate. Racemes ca. 1.5 dm. long; pedicels 1.5-2 cm. long; older, lower flowers opening before the younger apical ones; flowers bluish-purple; calyx pubescent, eglandular, broadly campanulate, tube broader than long on open flowers, 4-5 mm. long, teeth triangular; ovary pubescent. Legumes pubescent, 1-1.5 dm. long. 2n = 16, 24. Apr. Moist wooded slopes; native of Japan; *Kraunhia floribunda* (Willd.) Taub.—S. Map 36.

2. *Wisteria frutescens* (L.) Poir. in Lam., Tabl. Encycl. . . Bot. 3: 674. 1823. AMERICAN WISTERIA—Leaflets 4-5 pair, 4-7 cm. long. Racemes up to 1.2 dm. or less long; pedicels usually less than 1 cm. long; flowers bluish-purple; calyx pubescent, glands absent—sparse—dense, campanulate, 8 mm. or less long, lobes triangular, shorter than tube; ovary glabrous. Legumes glabrous, oblong—linear, flattened. 2n = 16. May-June. Creek banks, river bottoms; SE U.S.; *Kraunhia frutescens* (L.) Britton—S. Map 36, 37.

1. Calyx 8 mm. or less long, lobes triangular; inflorescence 1 dm. long or less. var. *frutescens*
 1. Calyx 9 mm. or more long; lobes narrowly ovate; inflorescence usually over 1 dm. long. var. *macrostachya* T. & G.

Duncan (1967) has maintained *W. frutescens* and *W. macrostachya* as two distinct species.

3. *Wisteria sinensis* (Sims) Sweet, Hort. Brit. ed. 1: 121. 1827. CHINESE WISTERIA—Leaflets 3-6 pair, 6-8 cm. long. Racemes 1.5-2 dm. long; pedicels 1.5-2 cm. long; lower and apical flowers opening at the same time; flowers whitish-bluish-purple;

calyx pubescent, eglandular, broadly campanulate, width equalling length, 3-5 mm. long, teeth triangular; ovary pubescent. Legumes pubescent, 1-1.5 dm. long. $2n = 16$. Apr. Cultivated; native of China. Map 37.

No specimens have been seen from Tennessee and the treatment is based on the literature. Duncan (1967) reported *W. sinensis* from Tennessee and his distribution reports are given.

16. *Robinia* L., Sp. Pl. 722. 1753.

Deciduous trees or shrubs. Leaves odd-pinnate; stipules often spiny; leaflets entire, stipellate. Racemes axillary; flowers white, pink, or purple; calyx campanulate, 5-merous; petals clawed; stamens diadelphous. Legumes oblong-linear, flat, dehiscent, several-seeded.

1. Flowers white; calyx lobes obtuse 2. *R. pseudo-acacia*
1. Flowers purple; calyx lobes subulate-tipped 1. *R. hispida*

1. *Robinia hispida* L., Mant. 101. 1767. ROSE LOCUST—Shrubs, 4.5 dm. to 1.5 m. tall, densely hispid on young growth and persisting on previous year's growth, rhizomatous. Leaves with 3-6 pairs of leaflets, opposite or alternately arranged; leaflets oblong-elliptic-orbicular, 3-7 cm. long. Racemes axillary, 8 cm. or less long, 2 to 10-flowered, sparsely to densely glandular-hispid, hairs usually up to 4 mm. or longer; flowers purple, 2-2.3 cm. long; calyx campanulate, 1-1.3 cm. long, lobes narrowly ovate, acute-acuminate, subulate-tipped, longer than tube, glandular-hispid with stellate and simple silky hairs. Legumes brownish, densely hispid, linear-oblong, ca. 5 cm. long. $2n = 20, 30$. May-June. Edges and openings of dry woods; Ga.—Ala.—Ky.—Va. Map 27.

2. *Robinia pseudo-acacia* L., Sp. Pl. 722. 1753. BLACK LOCUST—Trees, becoming 20-30 m. tall, bark furrowed, branches glabrous. Leaves with 3-10 pairs of leaflets, opposite or alternately arranged; stipular spines usually present; leaflets elliptic-oblong, 2.5-7.5 cm. long. Racemes axillary, 1.2 dm. long or less; flowers white, 1.5-2 cm. long; calyx campanulate, 7-9 mm. long, lobes triangular, obtuse-acute, shorter than tube, usually with appressed pubescence. Legumes glabrous, linear-narrowly oblong, short stipitate, upper suture narrowly winged. $2n = 20$. Apr.-May. Roadsides, uplands and bottomlands; E & C U.S. Map 27.

The pink-flowered and white-flowered forms are apparently hybrids between *R. pseudo-acacia* and *R. hispida* or of various back crosses. The complex is in need of a critical biosystematic study involving breeding experiments and this treatment is tentative based upon field observations and available herbarium specimens. The various forms have been annotated as hybrids for disposition in the herbarium.

17. *Sesbania* Scop. nom. cons., Intr. 308. 1777.

Sesbania macrocarpa Muhl., Cat. Pl. Am. Sept. 65. 1813. COFFEE BEAN—Erect, glabrous, annual herbs ca. 2m. tall. Leaves even-pinnate, 20-40 pairs of leaflets; stipules narrowly ovate, 1 cm. or more long; leaflets linear, mucronate, 1.1-2.8 cm. long, 2-5 mm. wide. Racemes axillary; flowers yellow, 1-1.5 cm. long; calyx broadly campanulate, 5-6 mm. long, lobes slightly unequal, triangular-deltoid, attenuate; petals clawed; stamens diadelphous. Legumes linear, 1-2 dm. long; seeds partitioned. $2n = 12$. July-Sept. Dry, open areas, old fields; Coastal Plain and Mississippi Embayment; *Sesban exaltata* (Raf.) Rydb.—S.; *Sesbania exaltata* (Raf.) Cory—F, G. Map 28.

18. *Astragalus* L., Sp. Pl. 755. 1753.

Perennial herbs; leaves odd-pinnate, stipulate. Racemes axillary; flowers white, yellow, or purplish; calyx united, 5-merous, slightly irregular; petals clawed; stamens diadelphous. Legumes inflated, elliptic-oblong, several-seeded.

1. Herbage strigose, at least some hairs dolabriform; stipules triangular; legumes ca. 1 cm. long, glabrous 1. *A. canadensis*
1. Herbage villous, hairs basifixed; stipules ovate; legumes ca. 3 cm. long, villous 2. *A. tennesseensis*

1. *Astragalus canadensis* L., Sp. Pl. 757. 1753. CANADA MILK VETCH—Erect to ascending perennial herbs, glabrous—strigose, hairs basifixed with some scattered dolabriform hairs. Leaves with 8-11 pairs of leaflets; stipules triangular, attenuate; leaflets elliptic-oblong, obtuse—emarginate, 1.5-4 cm. long, 6-17 mm. wide. Racemes axillary; flowers yellowish-greenish-white, 1-1.4 cm. long, erect—spreading—reflexed; calyx cylindrical, 6-8 mm. long, lobes slightly unequal, linear-triangular, attenuate—subulate; ovary glabrous. Legumes erect, elliptic-oblong, 1-1.4 cm. long, glabrous, inconspicuously transversely ridged. $2n = 16$. June-Aug. Upland, bottomland, woods, prairie; E U.S.; includ. *A. carolinianus* L.—S, *A. canadensis* var. *carolinianus* (L.) Jones—G, F. Map 3.

2. *Astragalus tennesseensis* Gray in Chapman, Fl. South. U.S. 98. 1860. Decumbent to ascending perennial herbs, villous, hairs basifixed. Leaves with 10-15 pairs of leaflets; stipules ovate, conspicuous; 1-1.5 cm. long; leaflets elliptical-oblong, obtuse—emarginate, 0.8-2.1 cm. long, 4-7 mm. wide. Racemes axillary; flowers whitish-yellow, 1.4-1.6 cm. long, erect—spreading—reflexed; calyx cylindrical, 9-11 mm. long, lobes slightly unequal, narrowly triangular, acute; ovary pubescent. Legumes elliptic-oblong, usually curved slightly, 2-3 cm. long, villous, conspicuously reticulate. $2n =$. Apr.-May. Cedar glades, limestone; Ill., Tenn., Ala.; *Geopbrummon tennesseense* (Gray) Rydb.—S. Map 3.

8. HEDYSAREAE

1. Leaves pinnately 4- to several-foliolate 19. *Coronilla*
2. Inflorescence umbel; leaves odd-pinnate; leaflets 15 or more 21. *Arachis*
1. Inflorescence axillary; flowers solitary to few, sessile; leaflets usually 4 22. *Desmodium*
1. Leaves pinnately 3-foliolate 23. *Lespedeza*
3. Leaflets stipulate (if stipellate, anthers of one kind and stamens monadelphous); loment usually of several segments 20. *Stylosanthes*
3. Leaflets stipellate; fruits of 1-2 segments 23. *Lespedeza*
4. Stamens monadelphous; anthers of 2 kinds; stipules adnate to petioles 20. *Stylosanthes*
4. Stamens diadelphous; anthers of 1 kind; stipules free 23. *Lespedeza*

19. *Coronilla* L., Sp. Pl. 742. 1753.

Coronilla varia L., Sp. Pl. 743. 1753. CROWN VETCH—Erect—ascending, glabrous, perennial herbs. Leaves odd-pinnate, essentially sessile; stipules narrowly elliptical, 2-3 mm. long; leaflets elliptical-linear, leaflets of lower leaves up to 2 cm. long and 7 mm. wide, upper leaves narrower, elliptical-linear, ca. 1 cm. long, 2 mm. wide. Umbels axillary, pedunculate;

flowers pinkish-purplish-whitish, 8-10 mm. long; calyx campanulate, 2-3 mm. long, 5-lobed with upper 2 partially united, lobes deltoid; standard orbicular, keel incurved; stamens diadelphous; ovary glabrous. Legumes glabrous, terete, segmented, body 1-2 cm. long with persistent style. $2n = 24$. May-July. Roadsides, old fields; native of Eur. & adj. Asia.

20. *Stylosanthes* Sw., Prod. Fl. Ind. Occ. 108. 1788.

Stylosanthes biflora (L.) BSP., Prelim. Cat. Anth. & Pter. 13. 1888. PENCIL-FLOWER—Erect to decumbent perennial herbs. Leaves pinnately trifoliolate, jointed at the apex of the stipules; stipules connate basally, adnate to petioles, persistent after leaf fall, free tip narrowly ovate, subulate-tipped; leaflets narrowly elliptical, veins whitish beneath, 1-3 cm. long, 3-6 mm. wide. Flowers in axillary clusters, yellowish, ca. 9 mm. long including floral tube; floral tube ca. 4 mm. long, calyx lobes obtuse, upper 2 partially united; petals clawed, adnate to staminal tube; stamens monadelphous, dimorphic, free filaments of two lengths; 5 long filaments with globular anthers and 5 short filaments terminated by linear basifixed anthers; style exceeding glabrous ovary. Legumes ovoid, reticulate, short beaked, 3-4 mm. long. $2n =$. Feb.-Oct. A variety of habitats; old fields, woods; E U.S.; includ. *S. riparia* Kearney—F, G, S. Map 29.

21. *Arachis* L., Sp. Pl. 741. 1753.

Arachis hypogaea L., Sp. Pl. 741. 1753. PEANUT—Perennials, erect to decumbent, pilose—glabrate. Leaves even-pinnate; stipules adnate to petiole; leaflets usually 2 pair, obovate, rounded—emarginate. Flowers solitary to few, axillary, sessile, yellow, ca. 1.5 cm. long; calyx tube filiform, up to 3 cm. long resembling a pedicel; stamens 10, monadelphous. After flowers wither, pedicels elongate with ovaries developing underground. Legumes subterranean, oblong, 1 to 4-seeded, constricted between seeds. $2n = 40$. Summer. Cultivated; native of S. Am.

22. *Desmodium* Desv. nom. cons., Journ. Bot. Desv. II. 1: 122. 1813.

Perennial herbs; leaves pinnately trifoliolate, usually stipulate. Racemes axillary or terminal; flowers white to purplish; calyx united, upper 2 lobes partially to completely fused, slightly irregular; wings and keel clawed; stamens monadelphous or diadelphous. Loment stipitate or sessile, flattened, 1 to several-segmented, pubescence uncinata, segments angled to rounded.

1. Stamens monadelphous; loment long-stalked usually ca. 1 cm., calyx lobes shorter than tube 12. *D. pauciflorum*
2. Flowers white; leaves distant 4. *D. glutinosum*
2. Flowers purplish; leaves usually clustered near stem apex 7. *D. nudiflorum*
3. Inflorescence terminal; leaflet apex attenuate 4. *D. glutinosum*
3. Inflorescence on separate basal branch; leaflet apex obtuse 7. *D. nudiflorum*
1. Stamens diadelphous; loment short-stalked to sessile; calyx lobes equalling or longer than tube 1. *D. canadensis*
4. Stipules cordate 1. *D. canadensis*
5. Plants erect 1. *D. canadensis*
5. Plants procumbent, vines 1. *D. canadensis*
6. Flowers purplish; leaflets orbicular 13. *D. rotundifolium*
6. Flowers white to yellowish; leaflets ovate 10. *D. ochroleucum*
4. Stipules linear to ovate 10. *D. ochroleucum*
7. Loment 1 to 4-segmented, segments rounded ventrally; flowers 6 mm. or less long 14. *D. sessilifolium*
8. Leaflets linear—narrowly elliptical; leaves essentially sessile, petioles less than 4 mm. long 14. *D. sessilifolium*
8. Leaflets ovate—narrowly ovate; petioles usually over 5 mm. long 14. *D. sessilifolium*
9. Leaflets usually 3 cm. or less long; flowers usually 3-4 mm. long; loment segments 4-5 mm. long 2. *D. ciliare*
10. Stems and petioles pilose; leaflets elliptic 6. *D. marilandicum*
10. Stems and petioles usually glabrous; leaflets ovate 6. *D. marilandicum*
9. Leaflets over 3 cm. long; flowers 4-6 mm. long; loment segments 5-7 mm. long 9. *D. obtusum*
11. Stem and petioles uncinata—pubescent 9. *D. obtusum*
11. Stem and petioles pilose 8. *D. nuttallii*
7. Loment 4 to several-segmented; segments angled ventrally; flowers usually over 6 mm. long 15. *D. viridiflorum*
12. Leaflets thick, tomentose beneath, rhombic-deltoid 15. *D. viridiflorum*
12. Leaflets glabrous—pilose, ovate to narrowly ovate 3. *D. cuspidatum*
13. Leaflets ovate, attenuate 3. *D. cuspidatum*
13. Leaflets broadly ovate—narrowly ovate, rounded apically 5. *D. laevigatum*
14. Leaflets ovate, glabrous and glaucous beneath 5. *D. laevigatum*
14. Leaflets narrowly ovate, glabrate—pilose, non-glaucous beneath 11. *D. paniculatum*

This treatment is adapted from Isely (1951, 1953, 1955).

1. *Desmodium canadensis* (L.) DC., Prodr. 2: 328. 1825. HOARY TICK CLOVER—Plants erect, ca. 1 m. tall; stems densely pubescent with short uncinata and long spreading hairs. Leaves with petioles 2-8 cm. long; stipules cordate, conspicuous, 7-11 mm. long; leaflets ovate, acute—obtuse, mucronate, 4-10 cm. long, 2.5-7 cm. wide. Flowers 9-11 mm. long, pink to whitish; stamens diadelphous. Loment stipules shorter than calyx and staminal tube; segments 3-6, 7-9 mm. long, longer than wide, upper suture convex, lower somewhat angled, pedicels 1-1.4 cm. long. $2n = 22$. June-Sept. Roadsides, old fields, barrens, bottomland; E U.S.; *Meibomia canadensis* (L.) Kuntze—S. Map 9.

2. *Desmodium ciliare* (Muhl. ex Willd.) DC., Prodr. 2: 329. 1825. Plants erect, 6-7 dm. tall, stems with short uncinata and few—numerous long spreading hairs. Leaves sessile to short petioled, petioles usually less than 1 cm. long; stipules narrowly ovate, often subulate-tipped, 3-4 mm. long; leaflets elliptical, usually 1-2 cm. long, 8-15 mm. wide. Flowers 3-4 mm. long, purplish; stamens diadelphous. Loment stipules ca. equalling calyx length, shorter than staminal tube; segments 1-3, nearly orbicular, 4-5 mm. long; pedicels 4-6 mm. long. $2n = 22$. Aug.-Sept. Woods, barrens; E U.S., C. Am.; *Meibomia ciliaris* (Muhl.) Blake—S. Map 10.

3. *Desmodium cuspidatum* (Muhl. ex Willd.) Loud., Hort. Brit. 309. 1830. Plants erect, ca. 1 m. or more tall, essentially glabrous below the inflorescence. Leaves with petioles 3-8 cm. long; stipules early deciduous; leaflets ovate, acute—acuminate, mucronate, 6-16 cm. long. Flowers 8-10 mm. long, reddish; stamens diadelphous. Loment stipules equalling to exceeding calyx, shorter than staminal tube; segments 4-5, upper suture slightly convex, lower suture angled, 8-10 mm. long; pedicels 3-10 mm. long. $2n = 22$. Aug. Wooded slopes; E U.S.; *Meibomia bracteosa* (Michx.) Kuntze—T; *Meibomia grandiflora* (Walt.) Kuntze—T. Map 10.

4. *Desmodium glutinosum* (Muhl. ex Willd.) Wood, Classbook. 120. 1845. Plants erect, ca. 1 m. tall, stems pilose above, glabrate below. Leaves clustered near apex of vegetative shoot; stipules linear, subulate, ca. 1 cm. long; leaflets with petioles 5-17 cm. long, ovate, attenuate, 7-15 cm. long, 5-14 cm. wide. Inflorescence terminal from cluster of leaves at vegetative

apex; flowers ca. 8 mm. long, reddish; calyx toothed, teeth less than 0.5 mm. long; stamens monadelphous. Loment stipes 4-5 mm., equalling to slightly exceeding the staminal tube; loment deeply divided, isthmus less than 1 mm. wide; segments 2-3, 8-9 mm. long, upper suture concave; pedicels 4-6 mm. long. 2n = 22. June-Sept., sporadic after July. Moist woodland, bottomland; E U.S.—Mex.: *D. acuminatum* (Michx.) DC.—T; *Meibomia acuminata* (Michx.) Blake—S. Map 10.

5. *Desmodium laevigatum* (Nutt.) DC., Prodr. 2: 329. 1825. SMOOTH TICK CLOVER—Plants erect, 7-15 dm. tall, glabrous to slightly pubescent. Leaves essentially glabrous, glaucous beneath; stipules early deciduous; leaflets with petioles 2-8 cm. long, ovate, rounded apically, 4-9 cm. long, 2-5.5 cm. wide. Flowers 8-10 mm. long; reddish to purplish; stamens diadelphous. Loment stipes exceeding calyx, shorter than staminal tube; segments 2-5, upper and lower sutures angled, 5-8 mm. long; pedicels 5-12 mm. long. 2n = 22. July-Sept. Open woods, roadsides; E U.S.; *Meibomia laevigata* (Nutt.) Kuntze—S. Map 11.

6. *Desmodium marilandicum* (L.) DC., Prodr. 2: 328. 1825. MARYLAND TICK CLOVER—Plants erect, 4-7 dm. tall, essentially glabrous, pubescent with uncinat hairs, long spreading conspicuous hairs absent. Leaves with petioles 5-15 mm. long; stipules narrowly ovate, early deciduous; leaflets ovate, usually glabrous, 1-3.5 cm. long, 9-20 mm. wide. Flowers 3-4 mm. long, purplish; stamens diadelphous. Loment stipes shorter than calyx; segments 1-3, irregularly orbicular, ca. 5 mm. long; pedicels ca. 1 cm. long. 2n = 22. Aug.-Sept. Roadsides, open woods; E U.S.; *Meibomia marylandica* (L.) Kuntze—S. Map 11.

7. *Desmodium nudiflorum* (L.) DC., Prodr. 2: 330. 1825. Plants erect, 4.5-10 dm. tall, glabrous—pubescent. Leaves usually clustered near apex of vegetative shoot; stipules early deciduous; leaflets with petioles 4-9 cm. long, ovate, apically rounded, 4-10 cm. long, 2-6 cm. wide. Inflorescence on separate, usually naked aerial axis (1 or more) originating at subterranean base of vegetative stem; flowers 7-9 mm. long, reddish-purple; calyx toothed, teeth less than 0.5 mm. long; stamens monadelphous. Loment stipes 7-15 mm. long; loment deeply divided, isthmus less than 1 mm. wide; segments 2-3, 7-8 mm. long, upper suture straight to concave; pedicels 1-2 cm. long. 2n = 22. June-Sept. Woods and moist barrens; E U.S.; *Meibomia nudiflora* (L.) Kuntze—S. Map 11.

8. *Desmodium nuttallii* (Schindl.) Schub., Rhodora 52: 142. 1950. NUTTALL TICK CLOVER—Plants erect, ca. 1 m. tall, pubescent. Leaves petioled; stipules narrowly ovate, 5-6 mm. long with appressed pubescence; leaflets ovate, tomentose beneath with white hairs, 5-8 cm. long, 2.7-4.5 cm. wide. Flowers 5-6 mm. long, reddish; stamens diadelphous. Loment stipes exceeding calyx, shorter than staminal tube; segments 3-4, upper suture convex, lower suture rounded, 4-6 mm. long; pedicels 5 mm. or less long. 2n = . Aug.-Oct. Roadsides and open woodland; Appalachians—E Tex. Map 12.

9. *Desmodium obtusum* (Muhl. ex Willd.) DC., Prodr. 2: 329. 1825. RIGID TICK CLOVER—Plants erect, ca. 1 m. tall, stems clustered, dense pubescence of uncinat hairs, long hairs sparse to absent. Leaves petioled; stipules narrowly ovate; leaflets ovate—elliptical, 3-8 cm. long, 1.5-5 cm. wide. Flowers 4-5 mm. long, purplish; stamens diadelphous. Loment stipes exceeding calyx, shorter than staminal tube; segments 3-4, upper suture rounded to angled, lower rounded, 6-7 mm. long; pedicels less than 1 cm. long. 2n = 22. Sept. Old fields and edges of wooded areas; E U.S.; *D. rigidum* (Ell.) DC.—F, G; *Meibomia rigida* (Ell.) Kuntze—S. Map 12.

Some of the small-leaved specimens may be confused with large-leaved *D. marilandicum* and *D. ciliare* specimens. The tendency of some loment to be 4-segmented on most plants helps to separate this taxon from the others.

10. *Desmodium ochroleucum* M. A. Curtis, Proc. Acad. Phil. 1864. 17. 1864. Plants decumbent, ca. 1 m. long, stem with short uncinat and long spreading hairs. Leaves petioled; stipules ovate, cordate, persistent; leaflets ovate, rounded apically, 2.5-6 cm. long, 1.5-4 cm. wide. Flowers 6-8 mm. long, white to yellowish; stamens diadelphous. Loment stipes shorter than calyx; segments 3-4, upper suture convex, lower suture essentially rounded, 7-8 mm. long, reticulate; pedicels 1.2-2.1 cm. long. 2n = . Aug.-Sept. Roadsides, woodland; E U.S.; *Meibomia ochroleuca* (M. A. Curtis) Ktze.—S. Map 12.

11. *Desmodium paniculatum* (L.) DC., Prodr. 2: 329. 1825. PANICLED TICK CLOVER—Plants erect, ca. 1 m. tall, pubescence various with at least some spreading hairs, glabrate to densely hairy. Leaves petioled; stipules narrowly ovate, subulate-tipped; leaflets ovate to narrowly ovate. Flowers usually 6-8 mm. long, purplish; stamens diadelphous. Loment sessile to short stipitate, stipe often exceeding the calyx, shorter than the staminal tube; segments 4-5, upper suture angled, lower rounded to angled, 5-7 mm. long; pedicels 5-12 mm. long. 2n = 22. June-Sept. Woods, abandoned fields, roadsides, E U.S. Map 13.

According to Isely (1955), *D. paniculatum* represents a highly variable complex in regard to leaf shape and pubescence. Isely (1953) recognized the following two varieties (synonymy, in part, from Isely, 1955). This particular complex is in need of a critical biosystematic study.

1. Terminal leaflets lanceolate, usually more than 3 times as long as wide. 11a. var. *paniculatum*
1. Terminal leaflets ovate, usually less than 3 times as long as wide. 11b. var. *dillenii*

11a. *Desmodium paniculatum* (L.) DC. var. *paniculatum*—syn.: *Meibomia chapmani* (Britt.) Small—S.

11b. *Desmodium paniculatum* (L.) DC. var. *dillenii* (Darl.) Isely—syn.: *M. dillenii* (Darl.) Kuntze—S, in part; *D. perplexum* Schub.—F; *Meibomia pubens* (T. & G.) Young—S; *M. paniculata* (L.) Kuntze—S.

12. *Desmodium pauciflorum* (Nutt.) DC., Prodr. 2: 330. 1825. Plants erect, 3-6 dm. tall, pubescence usually sparse. Leaves non-clustered, petioled; stipules caducous; leaflets ovate-rhombic, 4-9 cm. long, 2.5-6 cm. wide. Flowers 4-5 mm. long, white; calyx lobes 1 mm. or less long; stamens monadelphous. Loment stipes 6-8 mm. long, exceeding both calyx and staminal tube; loment deeply divided, isthmus less than 1 mm. wide; segments 1-3, 9-10 mm. long, upper suture straight to concave; pedicels 8-10 mm. long. 2n = . July-Sept. Moist, wooded slopes and bottoms; C & SE U.S.; *Meibomia pauciflora* (Nutt.) Kuntze—S. Map 13.

13. *Desmodium rotundifolium* (Michx.) DC., Prodr. 2: 330. 1825. PROSTRATE TICK CLOVER—Plants procumbent, up to a meter or more long, glabrate to densely pilose. Leaves petioled; stipules cordate, persistent; leaflets orbicular—deltoid, 3-6 cm. long, 3-6 cm. wide. Flowers 7-8 mm. long, purplish; stamens diadelphous. Loment stipes exceeding calyx, shorter than staminal tube; segments 3-4, upper suture rounded, lower angled, 7-9 mm. long, reticulate; pedicels 1-2 cm. long. 2n = 22. June-Sept. Open woodlands, roadsides; E U.S.; *Meibomia michauxii* Vail—S. Map 14.

14. *Desmodium sessilifolium* (Torr. in M. A. Curtis) T. & G., Fl. N. Am. 1: 363. 1840. SESSILE-LEAVED TICK CLOVER—Plants erect, ca. 1 m. tall, stem pubescence dense with uncinat hairs. Leaves essentially sessile, petioles 3 mm. or less long; stipules narrowly ovate, subulate-tipped, deciduous; leaflets narrowly elliptical, 2.5-6 cm. long, 4-15 mm. wide, reticulate, pubescent below. Flowers 4-5 mm. long, purplish; stamens diadelphous. Loment stipes exceeding calyx, shorter than staminal

tube; segments 2-3, upper suture convex, lower rounded, 4-5 mm. long; pedicels 3-4 mm. long. 2n = 22. July-Oct. Open areas of woodland, roadsides, prairies; E U.S.; *Meibomia sessilifolia* (Torr.) Kuntze—S. Map 14.

15. *Desmodium viridiflorum* (L.) DC., Prodr. 2: 329. 1825. VELVET-LEAF TICK CLOVER—Plants erect, up to 2 m. tall, stem often becoming glabrous below, villous above. Leaves petioled; stipules triangular, acuminate, deciduous; leaflets rhombic—deltoid, whitish tomentose beneath, 4-10 cm. long, 2.5-8 cm. wide. Flowers 6-8 mm. long, reddish, reportedly turning greenish; stamens diadelphous. Loment stipes exceeding calyx, shorter than staminal tube; segments 4-5, upper suture slightly angled, lower suture angled, 6-7 mm. long; pedicels 4-7 mm. long. 2n = 22. Aug. Open woodland, roadsides; E U.S.; *Meibomia viridiflora* (L.) Kuntze—S. Map 14.

23. *Lespedeza* Michx., Fl. Bor. Am. 2: 70. 1803.

Erect to prostrate annual or perennial herbs from woody rhizomes; leaves pinnately trifoliate, stipulate; leaflets estipellate. Racemes terminal or axillary, spicate or capitate; flowers of 2 kinds, chasmogamous and cleistogamous; chasmogamous flowers: papilionaceous, purplish to whitish; style long, filiform, persistent—cleistogamous flowers: when present, smaller; corolla reduced; style short, recurved, persistent. Calyx irregular, persistent; stamens diadelphous. Fruits 1-seeded, ovate to orbicular, partially compressed.

This treatment is based upon Clewell's *Lespedeza* studies (1966a, 1966b) and includes his county distribution reports.

1. Shrubs
 2. Leaflets elliptical to orbicular, ca. 3 cm. long or less. 2. *L. bicolor*
 2. Leaflets elliptical—ovate, ca. 5 cm. long. 12. *L. thunbergii*
1. Herbs
 3. Stipules ovate—narrowly ovate. 9. *L. stipulacea*
 4. Stem hairs antrorse. 10. *L. striata*
 4. Stem hairs retrorse. 10. *L. striata*
 3. Stipules setaceous. 10. *L. striata*
 5. Plants prostrate; petaliferous flowers long pedunculate exceeding subtending leaves. 7. *L. procumbens*
 6. Stem hairs spreading. 7. *L. procumbens*
 6. Stem hairs appressed. 13. *L. violacea*
 7. Plants much branched, weakly erect; calyx less than $\frac{1}{4}$ the fruit length (cleistogamous flowers). 13. *L. violacea*
 7. Plant without numerous lateral branches, procumbent; calyx over $\frac{1}{4}$ the fruit length (cleistogamous flowers). 8. *L. repens*
 5. Plants erect; petaliferous flowers short pedunculate, not greatly exceeding leaves. 8. *L. repens*
 8. Inflorescence spike-like, globose, or cylindrical. 1. *L. angustifolia*
 9. Leaflets narrowly linear, rachis shorter than petiole. 1. *L. angustifolia*
 9. Leaflets elliptical to ovate, if linear, rachis longer than petiole. 3. *L. capitata*
 10. Leaflets narrowly elliptical; rachis longer than petiole. 3. *L. capitata*
 10. Leaflets ovate or if narrower, rachis shorter than petiole. 5. *L. hirta*
 8. Inflorescence axillary, racemose, not appearing spike-like. 4. *L. cuneata*
 11. Leaflets spatulate; flowers whitish. 4. *L. cuneata*
 11. Leaflets linear to ovate; flowers purplish. 11. *L. stuevei*
 12. Leaflets strigose—short pilose above, oblong; stems densely short-pilose. 11. *L. stuevei*
 12. Leaflets glabrate to sparsely appressed—pubescent above, linear to oval. 14. *L. virginica*
 13. Leaflets linear to narrowly oblong, sparsely strigose above. 14. *L. virginica*
 13. Leaflets broadly elliptical to obovate, glabrous to sparsely strigose above. 6. *L. intermedia*
 14. Peduncles of petaliferous flowers not exceeding subtending leaves; plants strict, erect. 6. *L. intermedia*
 14. Peduncles of petaliferous flowers exceeding subtending leaves; plants trailing. 13. *L. violacea*

1. *Lespedeza angustifolia* (Pursh) Ell., Sk. Bot. S. Car. & Ga. 2: 206. 1824. Stems erect, 6-10 dm. tall. Leaves with rachis usually shorter than the petiole; stipules broadly linear to linear, subulate. Leaflets linear to narrowly elliptical, glabrate above, strigose and silvery below, 2-4.5 cm. long, 2-4 mm. wide. Racemes dense, oblong to globose; flowers whitish; calyx cleft, 6-9 mm. long; corolla ca. equalling the calyx in length. Fruits usually exceeded by calyx lobes, strigose, elliptical, ca. 5 mm. long. 2n = . Aug.-Sept. Prairie, barrens; Coastal Plain, SE U.S. Map 17.

This taxon is represented as a coastal disjunct occurring in only two counties in Middle Tennessee.

2. *Lespedeza bicolor* Turcz., Bull. Soc. Nat. Moscou 13: 69. 1840. Shrubby, up to 1.5 m. tall. Leaves sessile to long petioled; stipules broadly linear to linear, subulate. Leaflets elliptical to orbicular, sparsely strigose, 2-5 cm. long, 1-3 cm. wide, prominently mucronate. Racemes axillary; flowers purplish, 10-11 mm. long; calyx lobed, 4-5 mm. long, less than $\frac{1}{4}$ the length of the mature fruit; corolla exceeding calyx in length. Fruits strigose, oval, 5-6 mm. long. 2n = 18, 22. June-Sept. Roadsides; native of Japan. Map 18.

3. *Lespedeza capitata* Michx., Fl. Bor. Am. 2: 71. 1803. Stems erect, 7-9 dm. tall. Leaves short petioled, rachis usually longer than petiole; stipules linear, subulate. Leaflets oblong to elliptical, strigose; 2-4 cm. long, 0.5-1.5 cm. wide. Racemes dense, capitate; flowers whitish; calyx cleft, 6-9 mm. long; corolla equalling to slightly exceeding the calyx. Fruits usually exceeded by calyx lobes, strigose, elliptical, ca. 5 mm. long. 2n = 20. Sept.-Oct. Prairie, barrens; E U.S. Map 18.

4. *Lespedeza cuneata* (Dumont) G. Don, Dichlam. Pl. 2: 307. 1832. SERICEA LESPEDEZA—Stems erect, up to 1 m. tall, striate. Leaves short-petioled; stipules linear, subulate. Leaflets cuneate, broadest apically, mucronate, glabrate above, strigose below; 1-2 cm. long, 2-6 mm. wide. Flowers axillary, 2-4 per cluster, whitish, drying yellowish or brownish, ca. 6 mm. long; calyx cleft, ca. 2-4 mm. long; corolla exceeding calyx length. Fruits of chasmogamous flowers equalling calyx length, strigose, elliptical, ca. 4 mm. long. 2n = 18. Aug.-Oct. Open woodland, roadsides, disturbed areas, cultivated; native to E Asia; SE U.S. Map 18.

5. *Lespedeza hirta* (L.) Hornem., Hort. Reg. Bot. Hafn. 2: 699. 1815. HAIRY BUSH CLOVER—Stems erect, ca. 1 m. tall. Leaves with rachis usually shorter than petiole; stipules linear, subulate. Leaflets ovate to obovate, sparsely strigose above; strigose below, 1.5-4 cm. long, 1-3 cm. wide. Racemes dense, oblong—globose; flowers white-yellowish; calyx cleft, 6-9 mm. long; corolla ca. equalling to slightly exceeding calyx in length. Fruits exceeded by calyx lobes, strigose, elliptical, 4-5 mm. long. 2n = 20. Aug.-Sept. Open woodland; E U.S.; *L. polystachya* Michx.—T. Map 19.

6. *Lespedeza intermedia* (S. Wats.) Britt., Trans. N. Y. Acad. Sci. 12: 63. 1893. Stems erect, 6-10 dm. tall, stems strigose. Leaves petioled; stipules linear, subulate. Leaflets obovate—elliptical, essentially glabrous above, strigose below, 1-3 cm. long, 0.7-1.5 cm. wide. Inflorescence leafy, racemes numerous, axillary, peduncles usually not exceeding subtending leaves; flowers purplish, keel equalling—shorter than wings; calyx of chasmogamous flowers lobed, 2-3 mm. long; corolla exceeding

calyx. Fruits elliptical, 5-6 mm. long, reticulate, sparsely strigose; calyx of cleistogamous fruits less than 2 mm. long, calyx of chasmogamous fruits ca. 4 mm. long. 2n = 20. Aug.-Oct. Open woodland, roadsides; E U.S.; *L. frutescens* (L.) Britt.—S. Map 19.

7. *Lespedeza procumbens* Michx., Fl. Bor. Am. 2: 70, 71. 1803. TRAILING BUSH CLOVER—Stems procumbent, ca. 1 m. long, with spreading pubescence. Leaves petioled, stipules linear, subulate. Leaflets essentially elliptical, sparsely strigose-pilose, 1-2 cm. long, 0.7-1.5 cm. wide. Racemes usually 8-12-flowered, pedunculate, peduncles 1.5-3 cm. long, greatly exceeding the subtending leaves; flowers purplish, keel ca. equalling the wings; corolla exceeding calyx. Fruits of cleistogamous flowers elliptical, 3-4 mm. long, reticulate, hairs appressed to spreading, pedunculate or axillary. 2n = 20. Aug.-Sept. Roadsides, open woodland; E U.S. Map 19.

8. *Lespedeza repens* (L.) Bart., Comp. Fl. Phil. 2: 77. 1818. CREEPING BUSH CLOVER—Stems procumbent, ca. 1 m. long, with appressed pubescence. Leaves petioled, stipules linear, subulate. Leaflets essentially elliptical, sparsely strigose to glabrous above, strigose beneath, 1-1.5 cm. long, 6-10 mm. wide. Racemes usually 4-8-flowered, pedunculate, peduncles 1.5-3 cm. long, exceeding the subtending leaves; flowers purplish, keel ca. equalling the wings; corolla exceeding calyx. Cleistogamous fruits usually pedunculate and calyx over $\frac{1}{4}$ the length of the fruit, fruits elliptical, 3-4 mm. long, reticulate, hairs appressed. 2n = 20. May-Oct. Open woodland; E U.S. Map 20.

9. *Lespedeza stipulacea* Maxim., Prim. Fl. Amur. 85. 1859. KOREAN BUSH CLOVER—Procumbent to erect annuals, stems antorsely strigose; stipules ovate to narrowly ovate, striate, 4-8 mm. long, brownish, conspicuous. Leaflets obovate, entire, glabrate, ciliate on margins and midveins when immature, lateral veins parallel. Flowers purplish, axillary. 2n = 22. Aug.-Sept. Disturbed areas; native of E Asia; naturalized in E U.S. Map 20.

10. *Lespedeza striata* (Thunb.) H. & A., Bot. Beech. Voy. 262. 1841. JAPANESE BUSH CLOVER—Procumbent to erect annuals; stems retrorsely strigose; stipules ovate to narrowly ovate, striate, 4-8 mm. long, brownish, conspicuous. Leaflets narrowly obovate to obovate, glabrate, sparsely ciliate on margins and midveins when immature, lateral veins parallel. Flowers purplish, axillary. 2n = 22. Aug.-Sept. Disturbed areas; native of E Asia; naturalized in SE U.S. Map 20.

11. *Lespedeza stuevei* Nutt., Gen. N. Am. Pl. 2: 107. 1818. STUEVE BUSH CLOVER—Stems erect, ca. 1 m. or more tall; pubescence densely short pilose to appressed. Leaves petioled; stipules linear, subulate. Leaflets oblong, glabrate—strigose—pilose above, strigose and grayish beneath, 1.5-2.5 cm. long, 7-10 mm. wide. Inflorescence leafy, racemes numerous, axillary, peduncles not exceeding subtending leaves; flowers purplish, keel ca. equalling wings; calyx of chasmogamous flowers lobed, ca. 3 mm. long; corolla exceeding calyx. Fruits elliptical, 6-7 mm. long, inconspicuously reticulate, densely strigose—pilose; calyx of cleistogamous fruits ca. 2 mm. long; calyx of chasmogamous fruits ca. 4 mm. long. 2n = 20. Sept.-Oct. Open woodland, disturbed areas; E U.S. Map 21.

12. *Lespedeza thunbergii* (DC.) Nakai, *Lespedeza* of Japan & Korea. 15. 1927. Shrubs, up to 4 m. tall, pubescent. Leaves petioled; stipules linear, subulate. Leaflets elliptic, sparsely strigose, 3-5 cm. long, apiculate. Inflorescence of long panicle racemes, drooping or flexuous; flowers purplish, 1-1.5 cm. long; calyx lobes longer than tube. Fruits ca. 1-1.5 cm. long, pubescent. 2n = . Late summer, autumn. Cultivated; native of China, Japan.

13. *Lespedeza violacea* (L.) Pers., Syn. 2: 318. 1807. Stems weakly erect to trailing, usually branched, ca. 1 m. long, pubescence appressed. Leaves petioled, generally of two sizes, small leaves in axils of larger leaves; stipules linear, subulate. Leaflets essentially elliptical, glabrous to sparsely strigose above, strigose beneath, 1.5-3.5 cm. long, 1-2.8 cm. wide. Racemes pedunculate, exceeding subtending leaves, peduncles up to 4 cm. long or more; flowers purplish, keel usually longer than wings; corolla exceeding calyx. Cleistogamous fruits usually axillary and calyx less than $\frac{1}{4}$ the fruit length; fruits elliptical, 3.5-6 mm. long, reticulate, sparsely strigose. 2n = 20. July-Aug. Open woodland; mostly west of Mississippi River and north of the Ohio River. Map 21.

14. *Lespedeza virginica* (L.) Britt., Trans. N. Y. Acad. Sci. 12: 64. 1893. SLENDER BUSH CLOVER—Stems erect, 6-9 dm. tall, densely strigose to short pilose. Leaves petioled; stipules linear, subulate. Leaflets linear to narrowly oblong, glabrate to sparsely strigose above, strigose beneath, 1-3 cm. long, 4-10 mm. wide. Inflorescence leafy, racemes numerous, axillary, peduncles not exceeding subtending leaves; flowers purplish; keel usually shorter than wings; calyx of chasmogamous flowers ca. 4 mm. long; corolla exceeding calyx. Fruits elliptical, 4-6 mm. long, reticulate, sparsely strigose; calyx of cleistogamous fruits less than 2 mm. long; calyx of chasmogamous fruits ca. 4 mm. long. 2n = 20. Aug.-Sept. Open woodland, roadsides, prairie; E U.S. Map 21.

Clewell (1966a) reinterpreted previous species and varietal concepts with additional evidence of hybridization. He reported the following hybrids pertinent to Tennessee. *L. capitata* X *hirta* = *L. longifolia* DC., *L. capitata* X *violacea* = *L. manniana* Mackenz., *L. hirta* X *intermedia* = *L. nuttallii* Darl., *L. stuevei* X *virginica* = *L. neglecta* Mackenz. & Bush; *L. virginica* f. *deamii* M. Hopkins, *L. angustifolia* X *hirta*, *L. hirta* X *violacea*, *L. capitata* X *repens*, *L. procumbens* X *repens*, *L. capitata* X *stuevei*, *L. procumbens* X *virginica*, *L. hirta* X *procumbens*, *L. violacea* X *virginica*.

9. VICIEAE

1. Leaves with terminal leaflets; leaflets serrate to dentate.....24. *Cicer*
1. Leaves with tendrils or bristles present; leaflets not prominently serrate to dentate.
2. Stipules longer than leaflets; calyx lobes foliaceous.....28. *Pisum*
2. Stipules shorter than leaflets; calyx lobes non-foliaceous.
3. Style nearly terete apically with a tuft of hairs around apex.....25. *Vicia*
3. Style dilated or flattened, pubescent laterally on inner surface, smooth on outer surface.
4. Corolla exceeding calyx; leaflets more than 1.5 cm. long; seeds several to many.....27. *Lathyrus*
4. Corolla shorter than to equalling the calyx; leaflets less than 1.5 cm. long; seeds 1 or 2.....26. *Len*

24. *Cicer* L., Sp. Pl. 738. 1753.

Cicer arietinum L., Sp. Pl. 738. 1753. CHICK-PEA—Annual, pubescent with gland-tipped hairs. Leaves odd-pinnate; stipules 3-lobed, up to 1 cm. long, lobes essentially triangular. Leaflets broadly elliptical, serrate—dentate, lower third of leaflets entire, 1-2 cm. long, 4-13 mm. wide, terminal leaflets foliaceous, normal. Flowers ca. 1 cm. long; calyx enlarging with fruit,

lobes narrowly ovate and exceeding the tube; corolla white, rose, or yellowish. Fruits inflated, coriaceous, sessile, irregularly oblong, up to 3 cm. long, 1.5 cm. in diameter, pubescent, short-beaked. 2n = 16, 32, 33. June. Cultivated; native of W Asia.

25. *Vicia* L., Sp. Pl. 734. 1753.

Trailing to climbing herbs, annuals or perennials. Leaves pinnate, rachis tip naked or terminating in a branched tendril, stipulate; leaflets estipellate. 4-9 pairs. Racemes few to many-flowered, axillary. Calyx persistent, symmetrical or gibbous basally, lower lobes longest, narrowly ovate to subulate, upper lobes triangular to subulate. Corolla white, yellow, or purple; stamens diadelphous; style nearly terete, bearded apically on side adjacent to standard or in a tuft about the apex. Legumes elastically dehiscent, 2 to several-seeded, linear to oblong, essentially flat to torulose.

1. Tendrils absent; tip of rachis 1 cm. or less long.....4. *V. faba*
1. Tendrils present, branched or unbranched.
2. Peduncles short, inconspicuous, 5 mm. or less long; style bearded below stigma.
3. Corolla yellowish.....5. *V. grandiflora*
3. Corolla purplish.
4. Flowers 1-2 cm. long; legumes terete.....1. *V. angustifolia*
4. Flowers 2-3 cm. long; legumes flattened.....7. *V. sativa*
2. Peduncles more than 5 mm. long; style bearded apically.
5. Racemes 1-flowered; calyx 1-2 mm. long.....6. *V. minutiflora*
5. Racemes several to many-flowered; calyx ca. 2 mm. or more long.
6. Corolla white, drying yellowish, keel apically bluish; calyx lobes triangular.....2. *V. caroliniana*
6. Corolla purplish; calyx lobes attenuate to narrowly ovate.
7. Hairs of stem and inflorescence spreading.....8. *V. villosa*
7. Hairs of stem and inflorescence appressed to glabrate.....3. *V. dasycarpa*

1. *Vicia angustifolia* (Bauhin) L., Amoen. Acad. 4: 105. 1759. NARROW-LEAVED VETCH—Annuals, stipules usually incised. Leaflets 5-6 pairs, usually linear to narrowly elliptic, truncate to obtuse, 1-2 cm. long, 4-9 mm. wide; tendrils branched. Flowers essentially sessile, axillary, usually 1-2 per node, ca. 1.5 cm. long; calyx cylindrical with symmetrical base, 8-10 mm. long, lobes shorter than tube and linear, subulate; corolla purplish. Legumes terete, nearly glabrous, 4-5 cm. long, ca. 5 mm. wide, several-seeded. 2n = 12. Apr.-May. Disturbed areas; native of Eur. Map 34.

2. *Vicia caroliniana* Walt., Fl. Car. 182. 1788. CAROLINA VETCH—Perennials; stems essentially glabrous; stipules linear—ovate, usually auricled. Leaflets 4-7 pairs, elliptic, obtuse, 1-2 cm. long, 3-7 mm. wide; tendrils branched or unbranched. Racemes pedunculate, axillary, several-flowered. Flowers uncrowded, ca. 1 cm. long, white; calyx with symmetrical base, sparsely pubescent, ca. 2 mm. long, teeth triangular. Legumes oblong, glabrous, 1.5-2 cm. long, 5-6 mm. wide, several-seeded. 2n = . Mar.-May. Open woodland, roadsides; E U.S. Map 35.

3. *Vicia dasycarpa* Ten., Viagg. Abruzz. 81. 1829. WINTER VETCH—Annuals, stems appressed to spreading pubescent; stipules linear—oblong, auricled. Leaflets 7-9 pairs, linear to narrowly elliptic, 1-2.5 cm. long, 2-4 mm. wide; tendrils usually branched. Racemes pedunculate, axillary, several-flowered. Flowers 1-1.5 cm. long, purplish; calyx gibbous, ca. 6 mm. long, pubescence appressed to glabrate, lower lobes narrowly ovate, subulate. Legumes oblong, 2-2.5 cm. long, ca. 8 mm. wide, essentially flattened, short-stipitate, 1 to few-seeded. 2n = 14. May-June. Roadsides and waste areas; native of S Eur. Map 35.

4. *Vicia faba* L., Sp. Pl. 737. 1753. BROAD BEAN—Erect, glabrous annual, up to 1 m. tall. Leaves pinnate; leaflets 1-3 pairs, alternate to opposite, elliptical to obovate, up to 7 cm. long, 3 cm. wide; rachis extended ca. 1 cm. or less; stipules ca. 1 cm. long, ovate, commonly with 2 lower teeth. Flowers ca. 3 cm. long, 3-5 in short axillary racemes; calyx tubular, ca. 1.5 cm. long, lobes ca. 5 mm. long, narrowly ovate; corolla white with purplish blotch. Legumes glabrous, oblong to linear, nearly terete, ca. 4 cm. long, 1 cm. in diameter with short curved beaks, several-seeded (some varieties have legumes over 3 cm. long). 2n = 12, 24. Cultivated; native of Eurasia.

5. *Vicia grandiflora* Scop., Fl. Carn. . . Vien. ed. 2: 65. 1772. YELLOW VETCH—Annuals; stipules auricled, entire-toothed. Leaflets 4-7 pairs, linear—elliptical, 1-2.5 cm. long, 1.5-8 mm. wide; tendrils usually branched. Flowers essentially sessile, axillary, 1-2 per node, ca. 2.5 cm. long; calyx cylindrical, base nearly symmetrical, 1-1.2 cm. long, lobes shorter than tube and narrowly ovate, subulate; corolla yellow. Legumes linear, essentially glabrous, ca. 4 cm. long, 6-7 mm. wide, several-seeded. 2n = 14. Apr.-May. Cultivated; native of Eur.

This taxon has only been collected in two Tennessee counties, Carter and Knox.

6. *Vicia minutiflora* Dietr., Syn. Pl. 4: 1107. 1847. Annuals; stipules narrowly ovate, auricled, entire to toothed. Leaflets 2-4 pairs, linear—narrowly elliptic, 1-2.5 cm. long, 1-4 mm. wide; tendrils usually branched. Flowers pedunculate, axillary, solitary, 5-6 mm. long; calyx campanulate, symmetrically based, 2-2.5 mm. long, lobes shorter than tube; corolla purplish. Legumes oblong, glabrous, on pedicels 2-3 mm. long, ca. 2.5 cm. long, 6-7 mm. wide, several-seeded. 2n = . Mar.-Apr. Open woodland; Central Basin W to Tex., Okla.; *V. micrantha* Nutt.—S. F. Map 35.

7. *Vicia sativa* L., Sp. Pl. 736. 1753. COMMON VETCH—Annuals. Leaflets 4-8 pairs, oblong—obovate, truncate to emarginate, 1.5-3 cm. long, 5-12 mm. wide. Flowers essentially sessile, axillary, usually 2 per node, 2-3 cm. long; calyx cylindrical, symmetrical basally, 1-1.5 cm. long, lobes shorter than tube and linear, subulate; corolla purplish. Legumes oblong, glabrate, 4-8 cm. long, 7-8 mm. wide, torulose, several-seeded. 2n = 12, 24, 48. July-Sept. Cultivated; native of Eur.

8. *Vicia villosa* Roth, Tent. Fl. Ger. 2 (2): 182. 1793. HAIRY VETCH—Annuals; stems and peduncles with spreading pubescence; stipules narrowly ovate—ovate, usually entire, auricled. Leaflets 6-8 pairs, essentially elliptical, 1-3 cm. long, 3-5 mm. wide; tendrils branched. Racemes pedunculate, axillary, several-flowered. Flowers ca. 1.5 cm. long, purplish; calyx gibbous, 7-8 mm. long, sparsely villous, lower lobes linear, subulate. Legumes oblong, 2-3 cm. long, ca. 1 cm. wide, essentially flattened, short-stipitate, 1 to few-seeded. 2n = 14. May-July. Open areas, roadsides; native of Eur. Map 36.

26. *Lens* Mill. nom. cons., Gard. Dict. Abr. ed. 4. 1754.

Lens culinaris Medikus, in Vorles Churpf. Phys.-oekon. Gesellsch. 2: 361. 1787. FLAT GARDEN PEA, LENTIL—Annual, sparsely pubescent. Stipules obliquely elliptical—narrowly ovate, entire; leaves pinnate. Leaflets 4-5 pairs, broadly linear, 1-1.5 cm. long, 2-3 mm. wide, tendrils unbranched. Flowers usually 2 near apex of axillary peduncle which terminates in an uncoiled short tendril; flowers 5-6 mm. long; calyx 4-5 mm. long, tube ca. 1 mm. long, lobes linear, ca. 4 mm. long, much exceeding

tube; corolla whitish, ca. 4-5 mm. long. Legumes flattened, angularly orbicular—broadly elliptical, 1.4-1.7 cm. long, 10-11 mm. wide, seeds 1-2. $2n = 12$. June-July. Cultivated; native of S. Eur.

27. *Lathyrus* L., Sp. Pl. 729. 1753.

Trailing to climbing herbs, annuals or perennials. Leaves pinnate, rachis terminating in a branched tendril; stipules semi-sagittate, usually persistent and conspicuous; leaflets estipellate, 1-4-paired. Racemes few to many-flowered, axillary, pedunculate. Calyx essentially symmetrical basally, lobes triangular—narrowly ovate; corolla white, pink or purple; stamens diadelphous; style dilated and flattened, pubescent on side adjacent to keel. Legumes elastically dehiscent, several-seeded, essentially linear, relatively thickened.

1. Leaves with 2 leaflets.
 2. Roots tuberous; stems angled, unwinged. 4. *L. tuberosus*
 2. Roots not tuberous; stems winged. 2. *L. latifolius*
 3. Flowers 2-2.5 cm. long; stems broadly winged. 1. *L. hirsutus*
 3. Flowers 10-13 mm. long; stems narrowly winged. 3. *L. palustris*
1. Leaves with more than 2 leaflets.
 4. Flowers few, less than 10; leaflets 4-6; stipules ovate. 5. *L. venosus*
 4. Flowers numerous, usually more than 10; stipules narrowly ovate. 1. *L. hirsutus*

1. *Lathyrus hirsutus* L., Sp. Pl. 732. 1753. ROUGH PEA—Annuals, essentially glabrous; stems narrowly winged, decumbent or climbing. Stipules auriculate, narrowly elliptical, ca. 8-10 mm. long, shorter than the petiole, auricle 3-5 mm. long. Leaflets 2, narrowly elliptical, up to 6 cm. long, 8 mm. wide; tendrils branched. Flowers 10-13 mm. long, 1-3 terminating axillary pedunculate racemes; calyx ca. 5 mm. long, lobes exceeding tube and ovate, acuminate; corolla purplish, keel incurved. Legumes broadly linear, hirsute with pustular-based hairs, ca. 4 cm. long, 7 mm. wide, several-seeded. $2n = 14$, 28. May-June. Cultivated; native of Eur.

2. *Lathyrus latifolius* L., Sp. Pl. 733. 1753. EVER-LASTING PEA—Perennials, decumbent or climbing, glabrous; stems winged, wings 2 mm. or more wide. Leaves 2-foliolate, petioles winged; stipules narrowly ovate, semi-sagittate; leaflets narrowly—broadly elliptical, 3-11 cm. long, 1-3.5 cm. wide. Racemes with stout peduncles, axillary; flowers purplish, pink, or white, 1.8-2.5 cm. long; ovary glabrous. Legumes glabrous, essentially linear, ca. 8 cm. long, 8 mm. wide. $2n = 14$. June-Sept. Roadsides & disturbed areas; native of Eur. Map 16.

3. *Lathyrus palustris* L., var. *myrtifolius* (Muhl. ex Willd.) Gray, Man. Bot. ed. 2. 104. 1857. Perennials, trailing to climbing, essentially glabrous; stems usually unwinged. Leaves 4 to 6-foliolate; petioles unwinged; stipules ovate, semi-sagittate; leaflets narrowly elliptic to elliptic, 2.5-3 cm. long, 8-13 cm. wide. Racemes with slender peduncles, axillary; flowers purplish; 1-1.5 cm. long; ovary glabrous. Legumes glabrous, linear, ca. 5 cm. long, 5 mm. wide. $2n = 14$, 42. May-June. Open woodland, prairie; Tenn. N & W in E U.S., circumboreal species extending S to Tenn; *L. myrtifolius* Muhl.—S. Map 17.

4. *Lathyrus tuberosus* L., Sp. Pl. 732. 1753. VETCHLING—Plants perennial, glabrous; stems wingless, decumbent or climbing; tubers spheroidal—oblong, ca. 7-10 mm. in diameter. Stipules auriculate, narrowly elliptical, 1-1.5 cm. long, equalling to exceeding petiole, auricle ca. 3 mm. long. Leaflets 2, elliptical—narrowly obovate, up to 4 cm. long, 1.5 cm. wide, tendrils branched or unbranched. Flowers ca. 1 cm. long, 3-4 terminating axillary pedunculate racemes; calyx ca. 5 mm. long, lobes ca. equalling the tube, lobes essentially triangular; corolla purplish, keel incurved. Legumes linear, essentially terete, torulose, 2-3 cm. long, ca. 5 mm. in diameter, several-seeded. $2n = 16$. June-July. Cultivated; native of Eur., W Asia.

5. *Lathyrus venosus* Muhl. ex Willd., var. *intonsus* (T. & G.) Butters & St. John, Rhodora 19: 158. 1917. Perennials, trailing to climbing, glabrous—short pubescent; stems unwinged. Leaves 6 to 8-foliolate, petioles unwinged; stipules narrowly ovate, semi-sagittate; leaflets broadly elliptical, obtuse, 4-6 cm. long, 1.5-2.5 cm. wide. Racemes with stout peduncles, axillary; flowers purplish, ca. 1.5 cm. long. Legumes glabrous—short pubescent, essentially linear, ca. 5 cm. long, 6 mm. wide. $2n = 28$. May-Aug. E U.S.; incl. *L. venosus* var. *meridionalis* (T. & G.) Butters & St. John—F. Map 17.

28. *Pisum* L., Sp. Pl. 727. 1753.

Pisum sativum L., Sp. Pl. 727. 1753. GARDEN PEA—Annuals, glabrous, glaucous, and climbing. Leaves pinnate, 1-3 pairs; tendrils pinnately branched; stipules large, leaf-like, up to 6 cm. long, auricles toothed basally. Leaflets elliptical—oblong, mostly entire but occasionally toothed, ca. 4 cm. long and usually shorter than stipules. Flowers 1-3, ca. 2 cm. long, in axillary racemes; calyx ca. 1 cm. long, lobes longer than tube length and foliaceous; corolla white-purplish, keel incurved; stamens diadelphous. Legumes flattened, dehiscent, several-seeded. $2n = 14$, 28. May. Cultivated; native of Eur., Asia.

10. PHASEOLEAE

1. Leaves pinnately 5 to several-foliolate. 33. *Apios*
1. Leaflets 3-foliolate.
 2. Standard greatly exceeding keel and wings.
 3. Calyx tube short, lobes linear; legumes ca. 10 cm. long, sessile. 30. *Centrosema*
 3. Calyx tube cylindrical, lobes ovate, attenuate; legumes less than 5 cm. long, stipitate. 29. *Clitoria*
 2. Standard equalling or shorter than keel and wings.
 4. Style bearded.
 5. Keel of corolla spirally coiled; seeds reniform. 38. *Phaseolus*
 5. Keel of corolla incurved.
 6. Leaflets over 6 cm. long; seeds essentially globose. 40. *Vigna*
 6. Leaflets less than 6 cm. long; seeds angularly square to oblong. 39. *Strophostyles*
 4. Style beardless.
 7. Plant erect; flowers fasciated at nodes; legumes several-seeded. 32. *Glycine*
 7. Plants without the above combination.
 8. Calyx cylindrical; lobes triangular. 31. *Amphicarpha*
 8. Calyx campanulate; cleft to parted.
 9. Legumes ca. 1.5 cm. long, 1-2 seeded; corolla yellow. 37. *Rhynchosia*
 9. Legumes 3 cm. or more long, several-seeded; corolla non-yellow.
 10. Leaflets entire to 3-lobed; stipels ca. 1 cm. long; legumes hirsute. 36. *Pueraria*
 10. Leaflets unlobed; stipels 1-2 mm. long; legumes pubescent.
 11. Leaflets over 6 cm. long; legumes elliptic. 35. *Dioeclea*
 11. Leaflets less than 6 cm. long; legumes linear. 34. *Galactia*

29. *Clitoria* L., Sp. Pl. 753. 1753.

Clitoria mariana L., Sp. Pl. 753. 1753. SPOON-FLOWER—Erect to trailing, becoming twining vines, perennials. Leaves pinnately 3-foliolate; petioles 1.5-4 cm. long; stipules narrowly ovate, persistent, 4-5 mm. long; leaflets ovate to narrowly ovate, 3.5-8.5 cm. long, midrib prominent with smaller lateral veins, not distinctly reticulate beneath; stipels persistent, linear, subulate, 4-5 mm. long. Racemes axillary, 1 to 2-flowered; flowers purplish, up to 5 cm. long; calyx cylindrical, up to 2 cm. long, lobes 5, ovate, attenuate, 4-6 mm. long; keel shorter than wings, incurved; style incurved. Legumes linear—oblong, torulose, 3-8 cm. long, 7-8 mm. wide, stipels ca. equalling calyx, beak persistent. $2n =$. June-Aug. Open woodland; E & C U.S.; *Martiusia mariana* (L.) Small—S. Map 7.

Late season inflorescences may have cleistogamous flowers.

30. *Centrosema* (DC.) Benth. nom. cons., Comm. Legum. Gen. 53. 1837.

Centrosema virginianum (L.) Benth., Ann. Wien. Mus. Naturgesch. 2: 120. 1838 (1837). BUTTERFLY PEA—Twining vines, perennials. Leaves pinnately 3-foliolate; petioles 2-4 cm. long; stipules narrowly ovate, 3-4 mm. long; leaflets ovate—narrowly ovate, 3-5.5 cm. long, midribs prominent with smaller lateral veins, usually strongly reticulate beneath; stipels persistent, 1-2 mm. long. Racemes axillary, 1 to 4-flowered, peduncles subtended by ovate bracts; flowers purplish, up to 3.5 cm. long subtended by ovate bracts; calyx campanulate, cleft, tube ca. 4 mm. long, lobes linear, subulate, 8-11 mm. long; standard with a spur on back near base, wing and keel petals ca. equal, short clawed. Legumes linear, 7-14 cm. long, ca. 4 mm. wide, essentially sessile, beak persistent, 1-2 cm. long. $2n = 18$. July-Aug. Open woodland, disturbed areas; E U.S.-Mex; *Bradburja virginiana* (L.) Kuntze—S. Map 6.

31. *Amphicarpha* Ell. nom. cons. (-aea), Journ. Acad. Nat. Sci. Phila. 1: 372. 1818.

Amphicarpha bracteata (L.) Fern., Rhodora 35: 276. 1933. HOG PEANUT—Twining vines, perennials. Leaves pinnately 3-foliolate; petioles predominantly retrorsely strigose—pilose, 2-4 cm. long; stipules ovate, usually 4-5 mm. long; leaflets deltoid—ovate, midrib most prominent vein with first pair of lateral veins nearly as prominent, 3-6 cm. long; stipels subulate, ca. 1 mm. long. Aerial racemes axillary, pedunculate, rachis short, crowded, up to ca. 15-flowered; flowers purplish, 10-12 mm. long, subtended by ovate bracts; calyx cylindrical, tube 4-5 mm. long, lobes triangular, attenuate—subulate, 1-2 mm. long; keel straight; legumes oblong—linear, slightly falcate, flattened, dehiscent, ciliate on the sutures, usually glabrous otherwise, ca. 3 cm. long, 5-6 mm. wide, stipe ca. equalling calyx, beak stout, ca. 2 mm. long. Basal racemes of distant apetalous flowers; legumes fleshy, often subterranean, strigose, and 1-seeded. $2n = 20$, 22, 40. Aug.-Sept. Woodland; E U.S. & Canada; *Falcata monoica* (L.) Ell.—T; *F. fitcheri* (T. & G.) Kuntze—S, T; *F. comosa* (L.) Kuntze—S, T. Map 2.

32. *Glycine* L., Sp. Pl. 753. 1753.

Glycine max (L.) Merr., Interpr. Rumph. Herb. Amboin. 274. 1917. SOYBEAN—Erect annuals, densely villous. Leaves pinnately 3-foliolate; petioles 1 dm. or longer; stipules narrowly ovate; leaflets ovate—narrowly ovate, 1 or more dm. long; stipels ca. 2 mm. long, inconspicuous. Racemes typically axillary; flowers fasciated, purplish, ca. 7 mm. long; calyx campanulate, lobed, lobes narrowly ovate; subulate; stamens diadelphous; style beardless, stigma globose. Legumes linear, usually falcate, densely villous, ca. 4 cm. long, 2 to 4-seeded. $2n = 40$, 80. July. Cultivated; native of China.

33. *Apios* Fabricius nom. cons., Enum. 176. 1759.

Twining vines, perennials; tubers solitary or moniliform. Leaves pinnately 5 to 7-foliolate, petiolate, stipulate; leaflets ovate—narrowly ovate, stipellate. Racemes axillary, pedunculate; calyx campanulate, shallowly toothed, teeth nearly absent, lower lobe longest and triangular, subulate; petals short-clawed, greenish-white to purple; standard rounded or appendaged apically, keel coiled; stamens diadelphous; style coiled. Legumes linear, glabrous, dehiscent, ca. 8 cm. long.

1. Standard rounded apically; tubers moniliform. 1. *A. americana*
1. Standard appendaged apically with a fleshy knob; tuber solitary. 2. *A. priceana*

1. *Apios americana* Medikus, in Vorles., Churpf. Phys.—oekon Gesellsch. 2: 355. 1787. AMERICAN POTATO BEAN—Tubers oblong to globose, moniliform, 1-2 cm. in diameter. Leaflets ovate—narrowly ovate, 3-8 cm. long. Flowers purplish, ca. 9 mm. long; floral bracts minute, ca. 1 mm. long; calyx shallowly toothed, lower lobe triangular, subulate; standard unappendaged apically. $2n = 22$, 40. June-Sept. Lowland, creek bottoms and swamps; C & E U.S.; *A. tuberosa* Moench.—T; *Glycine apios* L.—S; *A. apios* (L.) McM.—T. Map 2.

2. *Apios priceana* Robins., Bot. Gaz. 25: 451. 1898. Tuber solitary, 1-2 cm. in diameter. Leaflets ovate, 4-9 cm. long. Flowers greenish-white to purplish, ca. 1.5 cm. long; floral bracts equalling calyx tube in length, ca. 4 mm. long; calyx shallowly toothed, lower lobe triangular, subulate; standard with fleshy apical appendage. $2n =$. July-Sept. Woodland; Ky. & Tenn.; *Glycine priceana* (Robins.) Britt.—S. Map 2.

34. *Galactia* P. Br., Hist. Jam. 298. 1756.

Galactia volubilis (L.) Britt., Mem. Torr. Bot. Club 5: 208. 1894. DOWNY MILK PEA—Prostrate or twining perennials; stems with spreading pubescence; root enlarged, carrot-shaped. Leaves pinnately 3-foliolate, petioled; stipules linear, subulate, 3-4 mm. long; leaflets ovate—elliptical, 1.5-5 cm. long; stipels linear, subulate, ca. 1 mm. long. Racemes axillary, pedunculate; flowers purplish 7-8 mm. long; calyx campanulate, 5-6 mm. long, lobes narrowly ovate, attenuate—subulate, equalling to longer than the tube, pubescence of spreading hairs; keel essentially straight. Legumes linear, 3-5 cm. long, 5-6 mm. wide, flattened, strigose to pilose, essentially sessile. $2n = 20$. June-Aug. Open woodland, roadsides; C & E U.S. Map 15.

35. *Dioeclea* H.B.K., Nov. Gen. Sp. 6: 437. 1823.

Dioeclea multiflora (T. & G.) Mohr., Contrib. U.S. Nat. Herb. 6: 580. 1901. Twining vines; pubescent perennials. Leaves pinnately 3-foliolate, petioles predominantly antorsely strigose to pilose; leaflets orbicular to ovate, abruptly acuminate; acuminate tip rounded, mucronate; lateral veins essentially equal in size and parallel, nearly straight; blades 8-12 cm. long and wide; stipels inconspicuous, ca. 2 mm. long. Inflorescence axillary, pedunculate; flowers purplish, ca. 1.5 cm. long;

calyx campanulate, ca. 7 mm. long, 4-toothed, teeth ovate with upper 2 lobes united, equalling tube length; standard sub-orbicular, keel straight. Legumes sessile, elliptic, sparsely strigose, 4-5 cm. long, 1.5 cm. wide, flattened. $2n = 24$. July. River banks; SE U.S. Map 15.

36. *Pueraria* DC., Ann. Sci. Nat. 1. 4: 97. 1825.

Pueraria lobata (Willd.) Ohwi, Bull. Tokyo Sci. Mus. 18: 16. 1947. KUDZU-VINE—Woody vines, densely hirsute, becoming woody and glabrous. Leaves pinnately 3-foliolate; petioles usually hirsute (brownish) with appressed white pubescence; leaflets ovate to orbicular, often tri-lobed, apex acuminate, usually spinose; lateral veins essentially equal in size and parallel, nearly straight; blades 1-1.5 dm. long; stipels conspicuous, equalling or longer than the petiolules, ca. 1 cm. long. Inflorescence axillary, pedunculate; flowers purplish, ca. 1.5 cm. long; calyx campanulate, 8-10 mm. long, 4-lobed, lobes narrowly ovate, subulate, longer than the tube; standard suborbicular, keel essentially straight. Legumes sessile, linear, densely hirsute, 4-5 cm. long, flattened. $2n = 22$, 24. Sept. Roadsides; native of E Asia. Map 26.

Introduced for erosion control but has become an obnoxious weed which is probably very common throughout the state even though it is poorly represented in herbaria.

37. *Rhynchosia* Lour. nom. cons., Fl. Cochinch. 460. 1790.

Perennials, twining vines or erect herbs, pubescent. Leaves pinnately 3-foliolate, petiolate, stipulate; leaflets elliptical to orbicular, estipellate. Racemes elongate or short and dense; calyx campanulate, parted, lobes narrowly ovate, subulate, longer than tube; corolla yellow; wing petals auricled basally; stamens diadelphous. Legumes oblong, flattened, pubescent, dehiscent.

1. Stems twining or decumbent; peduncles 4 cm. or more long. 1. *R. latifolia*
1. Stems erect; peduncles less than 1 cm. long. 2. *R. tomentosa*
1. *Rhynchosia latifolia* Nutt. in T. & G., Fl. N. Am. 1: 285. 1838. BROADLEAF RHYNCHOSIA—Stems trailing to decumbent, densely short pilose. Stipules linear to narrowly ovate, subulate, ca. 6 mm. long; leaflets ovate to orbicular, 4-7 cm. long. Flowers distant on elongate racemes, 8 cm. or more long; calyx campanulate, 1-1.5 cm. long, lobes narrowly ovate, abruptly subulate, longer than tube. Legumes pubescent, oblong, ca. 1.5 cm. long, dehiscent. $2n = 22$. July. Open woodland, prairies; Mo., La., Tex. Map 26.

2. *Rhynchosia tomentosa* (L.) H. & A., Comp. Bot. Mag. 1: 23. 1835. Stems erect, densely pilose to antrorsely strigose. Stipules narrowly ovate, 4-5 mm. long; leaflets elliptic to oblong, 2.5-7 cm. long. Flowers clustered in axillary racemes; calyx campanulate, ca. 6 mm. long, lobes narrowly ovate, longer than tube. Legumes pubescent, oblong, ca. 1.5 cm. long, dehiscent. $2n = 22$. June-Sept. Open woodland; SE U.S.; incl. *R. erecta* (Walt.) DC.—S. Map 26.

38. *Phaseolus* L., Sp. Pl. 723. 1753.

Annuals or perennials grown as annuals; twining vines, bushes, or decumbent forms cultivated. Leaves pinnately trifoliolate, stipulate; leaflets narrowly to broadly ovate, stipellate. Racemes axillary, pedunculate, shorter than to longer than subtending leaves; calyx 5-toothed or cleft, usually irregular; corolla white, cream-colored, red, or purplish; keel and style coiled 1 to several spirals; stamens diadelphous. Legumes usually falcate, several-seeded, dehiscent.

1. Flowers 1.3-2.5 cm. long. 4. *P. vulgaris*
2. Flowers 1.3-2 cm. long; calyx bracts ovate, strongly nerved. 4. *P. vulgaris*
2. Flowers 2-2.5 cm. long; calyx bracts linear-broadly linear. 1. *P. coccineus*
1. Flowers 1-1.3 cm. long. 2. *P. lunatus*
3. Flowers white to yellowish; calyx bracts 3-nerved. 2. *P. lunatus*
3. Flowers purplish; calyx bracts 1-nerved to obscurely nerved. 3. *P. polystachios*

1. *Phaseolus coccineus* L., Sp. Pl. 724. 1753. SCARLET RUNNER—Grown as annuals. Leaflets 8-13 cm. long, broadly ovate. Flowers 2-2.5 cm. long in axillary racemes; calyx bracts linear to narrowly ovate, usually equalling the calyx length; corolla scarlet. Legumes 1-3 dm. long, linear to broadly linear; seeds 2-2.5 cm. long. $2n = 22$. Cultivated; native of trop. Am.

2. *Phaseolus lunatus* L., Sp. Pl. 724. 1753. SIEVA BEAN—Annuals, pubescent to glabrate. Leaflets 7-10 cm. long, narrowly ovate, falcate, basally unsymmetrical, acute—attenuate. Flowers many, ca. 1 cm. long, in axillary racemes; calyx bracts usually over $\frac{1}{2}$ the calyx length up to equalling the calyx length, prominently 3-nerved; calyx ca. 2 mm. long; corolla white to yellowish. Legumes 6-7 cm. long, ca. 1.5 cm. wide, flattened, narrowly oblong, beaked, dehiscent. $2n = 22$. Cultivated; native of trop. Am.

3. *Phaseolus polystachios* (L.) BSP., Prelim. Cat. N. Y. Pl. 15. 1888. WILD BEAN—Twining vines, perennials, pubescence uncinata. Leaves pinnately 3-foliolate, petioled; stipules narrowly ovate, 3-5 mm. long; leaflets deltoid—ovate—orbicular, lowest pair of lateral veins nearly equalling midrib in size, lateral veins curving upward, 6-12 cm. long; stipels 1-1.5 mm. long, inconspicuous. Flowers 1-1.2 cm. long, in axillary racemes; calyx short and broad, 2-3 mm. long, teeth as wide or wider than long; corolla purplish. Legumes linear to oblong, falcate, glabrous, ca. 6 cm. long, 8 mm. wide, flattened, several-seeded. $2n = 11$, 22. Aug.-Sept. Woodland; E U.S. Map 24.

4. *Phaseolus vulgaris* L., Sp. Pl. 723. 1753. KIDNEY BEAN—Annuals, pubescent. Leaflets 10-15 cm. long, ovate, attenuate. Flowers few, 13-20 mm. long, in axillary racemes; calyx bracts ovate, usually equalling the calyx length, strongly nerved; corolla white—yellowish—purplish. Legumes 10-20 cm. long, linear; seeds ca. 1.5 cm. long. $2n = 22$. Cultivated; native of trop. Am.

39. *Strophostyles* Ell., Sk. Bot. S.C. & Ga. 2: 229. 1824 (1822).

Annuals or perennials; twining or trailing vines; glabrous to pubescent. Leaves pinnately 3-foliolate, petiolate, stipulate; leaflets ovate—narrowly ovate, entire or 3-lobed, stipellate. Racemes axillary, long pedunculate; calyx campanulate, toothed, the lower lobe longest; petals short-clawed, usually purplish; keel strongly incurved; stamens diadelphous; style curved. Legumes linear, sessile, dehiscent, 3-8 cm. long.

1. Calyx tube densely hairy; flowers 5-6 mm. long; legumes ca. 3 cm. long. 2. *S. leiosperma*
1. Calyx tube glabrous—sparsely hairy; flowers 7 mm. or more long; legumes 4-8 cm. long. 1. *S. helvola*
2. Floral bracts equalling or exceeding calyx tube; legumes ca. 8 cm. long. 3. *S. umbellata*
2. Floral bracts shorter than calyx tube; legumes ca. 4-5 cm. long. 3. *S. umbellata*

1. *Strophostyles helvola* (L.) Ell., Sk. Bot. S.C. & Ga. 2: 230. 1824 (1822). AMBERIQUE BEAN—Annual twining vines, glabrous—pilose. Leaflets ovate, usually 3-lobed, sparsely strigose, 3-5 cm. long, 1.5-3.5 cm. wide. Peduncles 5-18 cm. long; flowers purplish, 9-12 mm. long; floral bracts longer than calyx tube, usually glabrous, striate; calyx ca. 5 mm. long including longest lobe, essentially glabrous with lower lobe pilose and subulate, other teeth attenuate; keel incurved, darkened apically. Legumes sessile, sparsely strigose—glabrous, linear, 7-8 cm. long, 6-7 mm. wide, partially flattened, dehiscent, several-seeded; seeds oblong—rectangular, covered with a thick felty layer. $2n = 22$. June-Sept. Open woodland, abandoned fields; E U.S. Map 28.

2. *Strophostyles leiosperma* (T. & G.) Piper, Contrib. U.S. Nat. Herb. 22: 668. 1926. Annual twining vines, pilose. Leaflets linear—narrowly ovate, obtuse, pilose, 2.5-4 cm. long, 5-8 mm. wide. Peduncles 6-8 cm. long; flowers purplish, 5-6 mm. long; floral bracts shorter than calyx tube, strigose, striate; calyx pilose, 2-3 mm. long, including longest lobe, lower lobe subulate; keel incurved. Legumes sessile, strigose—pilose, linear, ca. 3 cm. long, 5-6 mm. wide, flattened, dehiscent, several-seeded; seeds square, shiny. $2n =$. Aug. Lowlands; C U.S.; *S. pauciflora* (Benth.) Wats.—T, S. Map 29.

3. *Strophostyles umbellata* (Muhl. ex Willd.) Britt., Illus. Fl. 2: 339. 1897. Perennial twining vines, pilose. Leaflets ovate, usually unlobed, sparsely strigose to glabrate, 2-4 cm. long, 7-20 mm. wide. Peduncles up to 2 dm. long; flowers purplish 9-11 mm. long; floral bracts shorter than calyx tube, striate, glabrous; calyx ca. 4 mm. long, including longest lobe, tube glabrous—sparsely strigose, lower lobe pilose and subulate, other teeth ovate, obtuse; keel incurved, darkened apically. Legumes sessile, sparsely strigose, linear, 4-5 cm. long, 3-4 mm. wide, partially flattened, dehiscent, several-seeded; seeds oblong with a thin felty layer. $2n = 22$. June-Oct. Open woodland, prairie; E U.S. Map 29.

40. *Vigna* Savi, Mem. Phas. 3: 7. 1824.

Vigna unguiculata (L.) Walp., Rep. Bot. 1: 779. 1842. COWPEA, BLACK-EYED PEA—Trailing to climbing annuals; stems essentially glabrous. Leaves pinnately trifoliolate; stipules ca. 1 cm. long, auricled; leaflets ovate, ca. 7-13 cm. long. Racemes axillary; flowers purple—white, keel curved inward; stamens diadelphous; style bearded along inner side, stigma lateral. Legumes linear, 2-3 dm. long, pendent, uninflated; seeds ca. 6-11 mm. long, mottled or solid with various color shades and markings. $2n = 22$, 24. Summer. Cultivated; native of Afr., Asia; *V. sinensis* (L.) Endl. —S, B.

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