

THE NATIVE AND CULTIVATED VICIÆ AND PHASEOLEÆ OF OHIO.

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In the following study of the native, introduced and cultivated Viciæ and Phaseoleæ of Ohio, an attempt has been made to find the most evident differences so that the species may be the most easily determined, and also to give a phyletic arrangement in so far as this is possible in plants so closely related.

The species of the Ohio State Herbarium were studied for characters and distribution, and most of the cultivated species were grown in the greenhouse, in order that definite data might be obtained, both of the vegetative parts and flowers. The actual measurements were taken from herbarium specimens and from the living plants and compared with those of Britton's Manual. The keys are based upon leaf, stem and flower characteristics present at the time of flowering. The habitat is usually given, also the distribution by Counties as represented in the Ohio State Herbarium. Economic notes and other miscellaneous facts are added, because of the great importance of these plants in agriculture and household economy.

FABATÆ, VICIÆ AND PHASEOLEÆ.

Erect or trailing herbs, or climbing vines either twining or with tendrils, ours always herbaceous.

Leaves compound, pinnate or trifoliate, rarely reduced to one leaflet, alternate with stipules frequently having nectar glands. Leaves often ending in a simple or branched tendril, or in a short point. Roots with large or small tubercles. Flowers bisporangiate, hypogynous, pentacyclic pentamerous except the gynecium, zygomorphic, the two outer lower petals, more or less united forming a structure called the keel, which encloses the stamen column. Calyx of five united sepals, its lobes sometimes obscured. Stamens diadelphous, sometimes monadelphous. Carpel one with two lateral sutures, one of which is the placenta. Ovules one to many. Fruit a legume, dehiscent by two valves, often twisting spirally or indehiscent. Seeds with little or no endosperm. Cotyledons large and thick.

KEY TO THE TRIBES.

1. Leaves evenly pinnate with tendrils or bristles, or if odd-pinnate, then the stem 4-angled or with leaflets 9-25 and deeply serrate. Viciæ.

1. Leaves odd-pinnate without tendrils, the leaflets not serrate and the stem round, or roundish, frequently twining. Phaseoleæ.

VICIÆ.—Pea Tribe.

Herbs or vines erect or climbing by tendrils, usually glabrous and gray-green. Leaves pinnately compound, leaflets two to many; flowers axillary usually racemose though sometimes capitate or solitary; cotyledons remaining underground during the sprouting and growth of the seedling.

Many of the Viciæ are cultivated for soiling, pasture, hay and seed.

Key to the Genera.

1. Leaves with terminal leaflet. 2.
1. Leaves ending in a tendril, spine or bristle; style usually more or less hairy. 3.
2. Peduncle one flowered, leaves serrate. *Cicer*. (1).
2. Peduncle two to several flowered, leaves not serrate. *Vicia* (2).
3. Stamen tube diagonal at the summit; style slender with a tuft of hairs or merely pubescence at the summit; veining of the leaves not prominent, veins pinnate. 4.
3. Stamen tube with a flat top; style flattened, bearded along the inner side; stipules usually large; veins on the under side of the leaf prominent; veins branched or parallel. 5.
4. Calyx lobes elongated; style flat; pod 2-seeded. *Ervum* (3).
4. Calyx lobes short; style threadlike; pod generally more than 2-seeded. *Vicia* (2).
5. Style without a groove; stipules mostly much smaller than the leaflets. *Lathyrus* (4).
5. Style grooved on the underside; stipules nearly as large or larger than the leaflets. *Pisum* (5).

1. Cicer L. Chick-pea.

Pubescent herbs or shrubs with evenly or odd pinnate leaves and more or less serrate leaflets. Flowers pedicelled, few or solitary, white to purple.

There are several species of *Cicer*, but only one has been generally introduced into the United States.

1. *Cicer arietinum* L. Chick-pea. An upright, very glandular pubescent annual, 9-20 in. high. Leaves odd-pinnate; leaflets 9-25, $\frac{1}{4}$ - $\frac{1}{2}$ in. long, $\frac{1}{8}$ - $\frac{1}{4}$ in. wide; stipules ovate-lanceolate, toothed. Peduncle one flowered; flowers $\frac{1}{4}$ - $\frac{1}{2}$ in. long, white to purple; pods very pubescent, 1-2 in. long; the seed light brown, angular, the micropylar point very prominent.

2. Vicia (Tourn.) L. Vetch.

Herbs or vines usually tendril-bearing, but sometimes with a terminal leaflet. Leaves nearly sessile evenly or odd-pinnate. Stipules sometimes with nectar glands. Flowers axillary, in twos or threes or racemose; style filiform, pod dehiscent, two to many seeded.

Key to the Species.

1. Stem erect, quadrangular. *Vicia faba* (1).
1. Stem climbing, weak or trailing. 2.
2. Peduncle very short or wanting, flowers 1 or 2, axillary. 3.
2. Peduncle elongated, flowers racemed or spicate. 4.
3. Leaflets oblong, oval or obovate; stipules broad; flowers $\frac{1}{2}$ - $\frac{3}{4}$ in. long, bluish purple. *Vicia sativa*. (8).
3. Leaflets, except those of the lower leaves, linear or linear oblong. *Vicia angustifolia* (9).
4. Spikelike raceme, dense, secund, or one-sided, 15-40 flowered. 5.
4. Flowers in a loose raceme, not one-sided, 1-20 flowered. 6.
5. Stem, leaves and flowers villous pubescent; annual or biennial. Cultivated. *Vicia villosa*. (3).
5. Plant glabrous or very finely pubescent; perennial. *Vicia cracca*. (2).
6. Stipules rather broad, foliaceous, triangular ovate, sharply toothed. *Vicia americana*. (4).
6. Stipules linear or linear oblong, entire. 7.
7. Flowers 8-24; white, keel tipped with blue. *Vicia caroliniana*. (5).
7. Flowers 1-6; bluish purple. 8.
8. Calyx glabrous, ovules 3-6, flowers $\frac{1}{8}$ to $\frac{1}{4}$ in. long. *Vicia tetrasperma*. (6).
8. Calyx pubescent ovules 2; flowers $\frac{1}{8}$ in. long. *Vicia hirsuta* (7).

1. *Vicia faba* L. Horse Vetch. An erect cultivated annual with a green, more or less reddish, 4-angled stem, 2-6 ft. high and $\frac{1}{8}$ - $\frac{1}{4}$ in. in diameter. Leaves with a terminal leaflet or bract; leaflets oval, 2 in. long, $1\frac{1}{2}$ in. wide, stipules $\frac{1}{2}$ in. broad, having prominent nectar glands. Flowers sessile, light-blue to purple; pods thick, broad, curved, pendent, the reddish brown seeds usually nearly circular, 1 inch broad, and the hilum $\frac{1}{8}$ of the circumference. Some varieties resemble the common bean in shape.

Vicia Faba is the bean of Roman history. It was often used as a counter in their mathematical calculations. The cool, wet climate of England is well suited for its cultivation, and it is there used for the food of man as well as for horses and cattle. It is cultivated in Ohio as an ornamental plant and occasionally for food. The seeds are used green or dried, boiled or roasted. It is also called Horse Bean, Broad Bean, Broad Windsor, English Broad Bean and English Dwarf Bean.

2. *Vicia cracca* L. Cow Vetch. A weak trailing glabrous, or very finely pubescent perennial, 2-4 ft. long and $\frac{1}{16}$ in. in diameter. Leaflets 4-12 pairs, linear $\frac{2}{3}$ - $\frac{5}{8}$ in. long, $\frac{1}{12}$ - $\frac{1}{8}$ in. wide, tendrils branched, the stipules linear, $\frac{1}{2}$ - $\frac{2}{3}$ in. long. Flowers bluish-purple to white, $\frac{1}{2}$ in. long, arranged in a dense, secund, 15-40 flowered raceme 1-4 in. long; pods $\frac{3}{4}$ -1 in. long; seeds 3-8, round and velvety black.

It is generally found in dry soil. Columbiana, Wayne, Lake, Huron, Seneca, Cuyahoga. The Cow Vetch is also called Bird Vetch, Blue Vetch and Tufted Vetch.

3. ***Vicia villosa*** Roth. Hairy Vetch. A villous pubescent much branched, weak and trailing, cultivated annual, or biennial, with a stem 2-6 ft. long and $\frac{1}{16}$ in. in diameter. Leaflets 8-24, linear, $\frac{3}{8}$ - $\frac{1}{2}$ in. long, $\frac{1}{8}$ - $\frac{3}{16}$ in. wide, obtuse at the base, acute at the apex; tendrils branched. Peduncle shorter than, or equalling the leaves; the flowers purple to white; the pod $\frac{3}{4}$ to 1 in. long; $\frac{1}{6}$ - $\frac{1}{4}$ in. wide; seed round and black.

The seed of *Vicia villosa* may be distinguished by the lemon-yellow beneath the outside coating from the *Vicia sativa*, which is an orange-yellow. *Vicia villosa* is able to withstand the northern climate, while *Vicia sativa* is often winter-killed, so the ability to distinguish the seed is of importance. The Hairy Vetch is being experimentally used by many farmers over Ohio, as a soiling and hay crop.

4. ***Vicia americana*** Muhl. American Vetch. A glabrous, or very finely pubescent weak trailing perennial, 2-3 ft. long and $\frac{1}{16}$ in. in diameter. Leaflets 1 in. long, $\frac{3}{8}$ - $\frac{3}{16}$ in. wide, the tendrils branched, the stipules broad and foliaceous, or triangular-ovate and sharply toothed. Flowers in a loose raceme, with 1-20 flowers, blue to purple; pod glabrous, $\frac{1}{2}$ - $\frac{3}{4}$ in. long, seeds 2-5.

It has been reported only from the northern part of the State. Cuyahoga, Geauga, Erie, Ottawa and Lucas. It is also called Purple Vetch.

5. ***Vicia caroliniana*** Walt. Carolina Vetch. A weak trailing glabrous perennial with the stem 1-2 ft. long and $\frac{1}{16}$ in. in diameter. Leaflets, 4-9 pairs, $\frac{5}{8}$ -1 in. long, $\frac{1}{4}$ - $\frac{3}{8}$ in. wide, the tendrils simple or compound, the stipules linear or linear-oblong entire. Racemes loose, 8-20 flowered, with a white keel tipped with light blue, pod glabrous, $\frac{3}{4}$ in. long, $\frac{3}{16}$ in. wide, the seed round and brown.

Washington, Gallia, Lawrence, Jackson, Scioto, Ross, Pike, Darke, Williams, Lorain, Ottawa and Cuyahoga. It is also called Pale Vetch.

6. ***Vicia tetrasperma*** (L) Moench. Slender Vetch. A small trailing glabrous annual, the stem 6-24 in. long and $\frac{1}{16}$ in. in diameter. Leaflets 6-12, $\frac{3}{8}$ in. long, $\frac{1}{8}$ in. wide; the tendrils branched, the stipules linear or linear oblong, entire. Peduncle equalling or shorter than the leaves, raceme loose with 1-6 flowers, $\frac{1}{6}$ - $\frac{1}{4}$ in. long, pale blue to purple; calyx glabrous, pod glabrous, $\frac{1}{2}$ in. long, the seeds 3-6, spherical, dark brown. Lake County.

7. ***Vicia hirsuta*** (L) Koch. Hirsute Vetch. A small glabrous or finely pubescent annual, 1-2 ft. long, the diameter of the stem $\frac{1}{16}$ in. Leaflets 8-16, $\frac{1}{2}$ - $\frac{5}{8}$ in. long, $\frac{1}{16}$ - $\frac{1}{8}$ in wide, linear or linear oblong, emarginate, the tendrils branched, the stipules linear. Flowers in a loose raceme with 1-6 flowers $\frac{1}{8}$ in. long, pale blue to purple, the calyx pubescent; pod slightly pubescent, $\frac{1}{4}$ in. long, $\frac{1}{8}$ in. wide, seeds 2, brown.

Introduced from Europe. Lake, Sandusky and Knox.

8. *Vicia sativa* L. Common Vetch. A three to five-branched climbing annual, 1-4 ft. high, with the stem $\frac{1}{8}$ in. in diameter. Leaves 4-6 in. long, oval or obovate, $\frac{3}{8}$ - $\frac{1}{2}$ in. long, $\frac{1}{8}$ - $\frac{1}{4}$ in. wide, mucronate; tendrils branched; stipules broad. Peduncle short or wanting; flowers axillary 1-2, $\frac{1}{2}$ - $\frac{3}{4}$ in. long, purple, pod pubescent, 2-3 in. long, $\frac{3}{16}$ in. wide, the 5-10 seeds brown to black.

Beneath the outer coat the seed of *Vicia sativa* is orange-yellow. It may readily be distinguished from *Vicia villosa*, which is lemon-yellow under the seed coat. *Vicia sativa* has been introduced from Europe, and is used as a forage or cover crop. Care must be observed in feeding this plant to pigs as cases of poisoning have been reported. It is also called Spring Vetch and Smooth Vetch.

9. *Vicia angustifolia* L. Narrow-leaf Vetch. A small climbing glabrous annual, 1-2 ft. long, the diameter of the stem $\frac{1}{16}$ in. Leaves 2 in. long, leaflets, except the lower ones linear or linear oblong, $\frac{7}{8}$ -1 in. long, $\frac{1}{16}$ in. wide; tendrils branched, the stipules half-sagittate, entire. Peduncle very short or wanting the flowers, 1-2 in the upper axils, purple; pods linear, glabrous, 1-2 in. long, $\frac{1}{8}$ - $\frac{1}{4}$ in. broad.

Vicia angustifolia has been introduced from Europe and is found escaped in Lake County.

3. *Ervum* L. Lentil.

Weakly erect herbaceous annuals with angled stems. Leaves pinnate, the leaves two to many; tendrils simple or compound, stipules semisagittate. Flowers small, racemose or solitary on axillary peduncles; calyx lobes elongated; style usually more or less hairy, flat; stamen tube diagonal at the summit; pod two-seeded.

1. *Ervum lens* L. Lentil. A glabrous or finely pubescent annual with a 4-angled stem 1-2 ft. high and $\frac{1}{2}$ - $\frac{1}{8}$ in. in diameter. Leaflets oblong, $\frac{3}{4}$ -1 in. long, $\frac{3}{16}$ - $\frac{5}{8}$ in. wide; tendrils branched, stipules semi-sagittate. Flowers $\frac{1}{2}$ - $\frac{3}{4}$ in. long, white to purple; pod 2-seeded, the seeds orbicular, gray or red.

The lens of optical instruments is named from its resemblance to this seed. The mess of pottage for which Esau sold his birthright to his brother Jacob is said to have been made of lentils. They are very commonly used for soup.

4. *Lathyrus* L.

Climbing or trailing vines with tendril-bearing leaves and often with a winged stem. Leaves ending in a simple or branched tendril; the leaflets 1-6 pairs; veining on the underside prominent; stipules generally smaller than the leaflets. Flowers racemose or solitary, generally showy, purple, yellow or white; stamen tube with a flat top; style without a groove, bearded along the inner side; pods dehiscent, the seeds brown to black.

Key to the Species.

1. Leaflets 1 pair. 2.
1. Leaflets 2-6 pairs. 3.
2. Stems wingless, flowers yellow. *Lathyrus pratensis*. (6).
2. Stems winged, flowers usually purple to white. 4.
3. Flowers purple. 5.
3. Flowers yellowish-white. *Lathyrus ochroleucus*. (5).
4. Stems broadly winged glabrous, perennial. *Lathyrus latifolius*. (7).
4. Stems narrowly winged, annual *Lathyrus odoratus*. (8).
5. Stipules broad, foliaceous, regularly halberd shaped, leaflets ovate. *Lathyrus maritimus*. (1).
5. Stipules narrow, half sagittate or wanting leaflets obovate. 6.
6. Inflorescence with 10-20 flowers. *Lathyrus venosus*. (2).
6. Inflorescence with 2-6 flowers. 7.
7. Leaflets linear or linear oblong, stems winged. *Lathyrus palustris*. (3).
7. Leaflets oblong or oval, stems wingless. *Lathyrus myrtifolius*. (4).

1. *Lathyrus maritimus* (L) Bigel. Beach Pea. A glabrous climbing or erect perennial with a grooved angled stem, 1-2 ft. high and $\frac{1}{8}$ in. in diameter. Leaflets 2-6 pairs, oval, $1\frac{1}{2}$ in. long, 1 in. wide, tendrils branched, stipules broad, foliaceous, and regularly halberd shaped. Peduncle shorter than the leaves; flowers 6-10, racemose, purple, $\frac{3}{4}$ -1 in. long; pod glabrous, $1\frac{1}{2}$ -3 in. long, $\frac{1}{4}$ - $\frac{1}{2}$ in. wide, seeds 3-10, light brown.

Ashtabula, Lake, Cuyahoga and Erie. It is also called Sea-pea, Sea-side-pea and Everlasting-pea.

2. *Lathyrus venosus* Muhl. Veiny Pea. A trailing or climbing glabrous, or finely pubescent perennial, with a 4-angled stem, 2-3 ft. long and $\frac{1}{8}$ in. in diameter. Leaflets 2-6 pairs, obovate, 1-2 in. long, $\frac{1}{2}$ -1 in. wide; tendrils compound, stipules narrow, half sagittate or wanting. Peduncles shorter than the leaves; flowers 10-20, $\frac{1}{2}$ - $\frac{5}{8}$ in. long, purple; pod linear, 1-3 in. long, $\frac{3}{16}$ - $\frac{1}{4}$ in. wide; seeds 3-8, brown.

The Veiny Pea usually grows near rivers or lakes. Erie and Williams.

3. *Lathyrus palustris* L. Marsh Pea. A climbing, slightly pubescent or glabrous perennial with an angled, usually winged stem, 1-3 ft. long and $\frac{1}{16}$ in. in diameter. Leaflets 2-6 pairs, linear or linear oblong, 1-2 $\frac{1}{2}$ in. long, $\frac{3}{8}$ - $\frac{5}{8}$ in. wide; tendrils branched, stipules narrow, half sagittate or wanting. Flowers 2-6, $\frac{1}{2}$ in. long, purple; pod linear, 2-2 $\frac{1}{4}$ in. long, $\frac{1}{8}$ - $\frac{1}{4}$ in. wide, the seeds 3-6, brown.

The Marsh Pea is found in moist or wet soil. Lake, Cuyahoga, Summit, Erie, Madison and Greene. It is also called Wild Pea.

4. *Lathyrus myrtifolius* Muhl. Myrtle-leaf Marsh Pea. A slender climbing, glabrous, or slightly pubescent perennial, with a wingless, angled stem, 1-3 ft. long, and $\frac{1}{16}$ in. in diameter. Leaflets 2-6 pairs, oblong or oval, 1-2 in. long, $\frac{1}{4}$ - $\frac{1}{2}$ in. wide; tendrils branched; stipules $\frac{1}{4}$ - $\frac{3}{8}$ in. long, narrow, half sagittate or wanting. Flowers 2-6, purple, $\frac{1}{2}$ - $\frac{5}{8}$ in. long; pod linear, 2 in. long, $\frac{3}{16}$ in. wide, the seeds 3-8, brown.

This species is found in moist or wet localities. Lake, Stark, Erie, Lucas, Defiance and Auglaize.

5. *Lathyrus ochroleucus* Hook. Cream-colored Pea. A climbing, or trailing glabrous perennial, the winged angled stem, 1-3½ ft. long, and ⅛ in. in diameter. Leaflets 6-10 acuminate or mucronate at the apex, rounded at the base, 1-3 in. long, ½-1 in. wide; tendrils simple or compound; stipules broad, foliaceous. Peduncles shorter than the leaves, the flowers 5-10, yellowish white, ½-¾ in. long; pod linear, glabrous, 1-2 in. long.

Lake, Cuyahoga, Lorain and Ottawa.

6. *Lathyrus pratensis* L. Meadow Pea. A weak trailing or climbing glabrous or slightly pubescent perennial with an angled stem 1-3 ft. long, and ⅙ in. in diameter. Leaflets 1 pair, linear-oblong, acute, 1½-2 in. long; tendrils usually simple; stipules foliaceous, halberd-shaped. Flowers 4-12, ½-¾ in. long, yellow, seeds small, brown.

The Meadow Pea is found in Lake County. It is also called Mouse Pea, Tom Thumb and Crow-peas.

7. *Lathyrus latifolius* L. Everlasting Pea. A climbing, glabrous perennial, with a broadly winged stem 3-10 ft. high and ⅛ in. in diameter. Leaflets 1 pair, 2-4 in. long, ½ in. wide, with prominent veining; tendrils branched; stipules lanceolate, 1 in. long. Peduncles stout, curved, longer than the leaves; the flowers purple to white, 1 in. long; pod 2-3 in. long, ¼ in. wide, the seeds 4-8, dark brown.

This plant is cultivated thruout Ohio for the beauty of the foliage and flowers, and is of especial value for ornamental gardening.

8. *Lathyrus odoratus* L. Sweet Pea. A rough hairy annual, with an angled, narrowly winged stem, 2-6 ft. long and ⅛ in. in diameter. Leaflets 1 pair, obovate acuminate, 2-4 in. long, ½-1 in. wide; tendrils many branched; stipules narrow. Flowers showy, ¾-1½ in. long, white to purple and often with many combinations of color; pod 1½-2 in. long, ¼ in. wide, the seeds 3-6 globular, brown.

The Sweet Pea is much cultivated on account of the beauty and odor of its flowers. They are raised in great numbers in greenhouses in winter, as well as in gardens in the summer. The cut flowers are used for general decoration and are universal favorites.

5. *Pisum* L. Pea.

Erect or climbing, glabrous, glaucous annuals with angled stems. Leaves ending with branching tendrils, the veining prominent; stipules larger or equalling the leaflets; flowers white to purple, the style usually more or less hairy, flattened, grooved on the under side, the stamen tube with a flat top; pod glabrous, the seeds globular or angular, smooth or wrinkled.

The Pea is cultivated to a large extent as a food for man and animals.

Key to the Species.

1. Flowers white, seeds globular. *Pisum sativum*. (1).
1. Flowers bluish to dull white with purple on the wings, seeds slightly angular, usually gray. *Pisum arvense*. (2).

1. *Pisum sativum* L. Common Pea. An erect or climbing glabrous annual with a hollow angular stem $\frac{1}{2}$ -6 ft. high and $\frac{1}{8}$ in. in diameter. Leaflets 1-3 pairs, 1-2 in. long, $\frac{1}{2}$ - $\frac{3}{4}$ in. wide, the stipules as large, or larger than the leaflets. Flowers $\frac{1}{4}$ - $\frac{1}{2}$ in. long, white; pods 2-3 in. long, $\frac{1}{4}$ - $\frac{3}{4}$ in. wide, the seeds globular, green to yellow, smooth or wrinkled.

The Common Pea has been cultivated for food for many hundred years. The seed is used in the green or dry condition. By the use of a machine called the viner, the green peas are ready for the cans in a few hours after being cut, making it possible for the canned product to be in good condition. The ripe seed is used for split-pea soup.

2. *Pisum arvense*. L. Field Pea. A climbing or erect glabrous annual with an angular stem, 2-5 ft. high and $\frac{1}{8}$ in. in diameter. Leaflets 1-3 pairs, 1-2 in. long, $\frac{1}{2}$ - $\frac{3}{4}$ in. wide, the stipules as large or larger than the leaflets. Flowers $\frac{1}{4}$ - $\frac{1}{2}$ in. long, blue to dull white with purple on the wings; pods $1\frac{1}{2}$ -2 in. long, $\frac{1}{4}$ - $\frac{3}{4}$ in. wide, the seed angular, usually gray.

The Field Pea is cultivated in Ohio for soiling, pasturage and dry feed. It thrives best in a cool, moist climate. For this reason, Canada has made the greatest advance in Field Pea culture. It is often called Canada Pea.

PHASEOLEÆ. Bean Tribe.

Dark-green herbs or vines usually pubescent, the stem round or roundish, erect or twining counter-clockwise. Leaves odd-pinnate, usually trifoliate, but leaflets sometimes 1-7. Flowers axillary, usually racemose, but sometimes capitate or solitary.

The cotyledons are usually pushed above ground during sprouting. The Phaseoleæ are cultivated for soiling, hay and seed. They supply an important part of the food of man.

Key to the Genera.

1. Leaves pinnate with 5-7 leaflets. *Glycine*. 2.
1. Leaves trifoliate or unifoliate. 2.
2. Style bearded along the inner side. 3.
2. Style glabrous or pubescent only at the upper end or at the base. 4.
3. Flowers racemed, the keel of the corolla spirally coiled. *Phaseolus*. (5).
3. Flowers capitate, or if somewhat racemose, then the keel of the corolla only slightly incurved. 6.
4. Style bearded at the summit about the stigma. *Dolichos* (1).
4. Style glabrous at the upper end, sometimes pubescent at the lower part. 5.
5. Stem erect; annual; cultivated. *Soja*. (3).
5. Stem trailing; perennial; native. *Falcatia*. (4).
6. Flowers capitate or in peduncle heads; corolla purple, keel of the corolla strongly incurved; native. *Strophostyles*. (6).
6. Flowers capitate or somewhat racemose, corolla yellow, white or purple. Keel of the corolla short, slightly incurved; cultivated. *Vigna*. (7).

1. *Dolichos* L.

Sparsely pubescent, erect, or twining annuals, the stem round, the leaves trifoliate, the stipules small. Flowers racemose, purple to white, the style bearded at the summit about the stigma; pod broad, the seeds black with a white raphe.

There is only one species generally cultivated in Ohio.

1. *Dolichos lablab* L. Hyacinth Bean. A pubescent twining annual with a reddish or green stem 2-8 ft. long and $\frac{1}{8}$ in. in diameter. Leaflets 2-3 in. long, $1\frac{1}{2}$ -2 in. broad, minutely stipellate. Flowers showy, light purple, $\frac{1}{2}$ -1 in. long; pods broadly incurved, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long, 1 in. broad; the seeds black with a prominent white raphe.

The Hyacinth Bean is cultivated for the showy flowers. It is very hardy and will grow in almost any kind of soil. Escaped in Franklin County.

2. *Glycine* L.

Trailing or climbing pubescent or glabrous perennials. Leaflets 5-7. Roots tuberous or having prominent tubercles. Flowers axillary, racemose, capitate, showy, brownish purple to red.

1. *Glycine apios* L. Ground-nut. A slender trailing perennial, 2-10 ft. long and $\frac{1}{16}$ in. or less in diameter. Leaflets 5-7, 1-4 in. long, $\frac{1}{2}$ - $1\frac{1}{2}$ in. wide. Flowers $\frac{1}{4}$ - $\frac{1}{2}$ in. long, loosely racemose; pod linear, 3-5 in. long, $\frac{1}{4}$ in. wide, the seeds 5-9, reddish brown.

The roots are tuberous necklace-like, hence the name Ground-nut. Stark, Auglaize, Clark, Harrison, Cuyahoga, Adams, Warren and Wayne. It is also called Wild Bean.

3. *Soja* Moench.

Erect pubescent annuals. Leaves trifoliate. Roots with many tubercles. Flowers greenish-white to purple, minute and inconspicuous; style glabrous at the upper end, sometimes pubescent at the lower part; pods brown, very pubescent.

1. *Soja soja* (L) Karst. Soy Bean. A pubescent annual 2-5 ft. high, the stem $\frac{1}{8}$ in. in diameter. Leaflets $2\frac{1}{2}$ - $3\frac{1}{2}$ in. long, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. wide. Flowers axillary, very minute, the parts early deciduous, greenish white to purple; pods $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long, very pubescent; seeds white, green, yellow, brown, black or variegated, elliptical to spherical, $\frac{1}{8}$ - $\frac{3}{8}$ in. in diameter.

The Soy Bean has been introduced into the United States from China and is cultivated to a large extent for forage, hay, soiling and seed. The beans are now used both in the green and in the dry state, as food for man and animals.

4. *Falcata* Gmel.

Slender, glabrous or pubescent twining perennials. Leaves trifoliolate. Flowers axillary racemose, white to purple, the style glabrous; pods linear oblong or obovoid, many to one seeded.

Key to the Species.

1. Glabrate or somewhat pubescent, the bracts small. *Falcata comosa*. (1).
1. Villous-brown pubescence, the bracts prominent. *Falcata pitcheri*. (2).

1. *Falcata comosa* (L) Ktz. Hog-Peanut. A slender, twining, glabrous or slightly pubescent perennial, the stem $\frac{1}{2}$ ft. long, and less than $\frac{1}{16}$ in. in diameter. Leaflets thin, acute at the apex, rounded at the base, $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. wide, the bracts small. Flowers $\frac{1}{2}$ - $\frac{3}{4}$ in. long, purple to white; pod 1 in. long, $\frac{3}{4}$ in. broad, the seeds 3-6, dark brown.

This plant is found in moist thickets. General. It is also called Pea Vine.

2. *Falcata pitcheri* (T. & G.) Ktz. Pitcher's Hog-peanut. Similar to the preceding, but generally stouter and villous-pubescent thruout, with reflexed brown hairs; leaflets larger and thicker; subterranean fruit less abundantly produced. In moist thickets; rather general in the State.

5. *Phaseolus* (Tourn.) L. Bean.

Twining or erect annuals, or perennials, leaves trifoliolate. Flowers racemose axillary, white to purple, the style bearded along the inner side, the keel of the corolla spirally coiled; pod linear with a persistent style; the seed generally rounded at the ends.

Beans are almost universally cultivated for food of man. The dry and the green seed, as well as the green pods are used.

Key to the Species.

1. Flowers in racemes longer than the leaves. 2.
1. Flowers in racemes shorter than the leaves. 3.
2. Flowers small, 1-3 in. long, purple; native. *Phaseolus polystachyus*. (1).
2. Flowers large, $\frac{1}{2}$ to 1 in. long, bright scarlet to white; cultivated. *Phaseolus coccineus*. (5).
3. Flowers greenish, white, pods, broad, seeds flat. *Phaseolus lunatus*. (4).
3. Flowers white to purple, pods linear, straight, seed usually oval. 4.
4. Stem erect. *Phaseolus nanus*. (3).
4. Stem twining, *Phaseolus vulgaris*. (2).

1. *Phaseolus polystachyus* (L) B. S. P. Wild Bean. A trailing or climbing perennial with the stem 4-15 ft. long and $\frac{1}{16}$ in. in diameter. Leaflets broadly ovate, 2 in. long, $1\frac{1}{2}$ in. wide, the stipules lanceolate. Flowers loosely racemose upon peduncles, longer than the leaves, the pedicels with minute bracts, each flower $\frac{1}{6}$ - $\frac{1}{3}$ in. in length, purple; pods curved, drooping, stalked flat $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long; the seeds chocolate-brown.

2. Phaseolus vulgaris L. Common Pole Bean. A twining annual with the stem 4-10 ft. long, $\frac{1}{16}$ - $\frac{1}{8}$ in. in diameter. Leaflets 2-4 in. long, 1-3 in. wide. Flowers in racemes shorter than the leaves, $\frac{1}{4}$ - $\frac{1}{2}$ in. in length, white to purple; pods linear, 2-10 in. long, $\frac{3}{4}$ -1 $\frac{1}{4}$ in. wide, the seeds generally rounded at the ends, white, purple, brown, black and many combinations of color.

There are two general classes, green pod varieties and yellow or wax pod varieties. The common names for the different varieties are so confused that it is necessary to know the seed-house from which they come in order to know what they actually represent. Green snaps, green shelled and dry shelled are different forms used as food.

3. Phaseolus nanus L. Common Bush Bean. An erect, much branched annual, 1 $\frac{1}{2}$ -3 ft. high, $\frac{1}{16}$ - $\frac{1}{8}$ in. in diameter. Leaflets 2-4 in. long, 1 $\frac{1}{2}$ -3 in. wide. Flowers in racemes, shorter than the leaves, $\frac{1}{4}$ - $\frac{1}{2}$ in. in length, white to purple; pods linear, 2-8 in. long, $\frac{3}{4}$ -1 $\frac{1}{2}$ in. wide, green or yellow when young, the seeds oval tumid, white, purple, brown, black or variegated.

There are two general types, green pod and wax or yellow pod varieties. The extensive cultivation of the green pod varieties as a field crop for the dry seed probably accounts for the fact that many of these are of the tough shelled type. Beans are a popular article of diet, and owing to their high proteid content are used as a substitute for meat, but they should probably not be employed as a continuous, daily diet.

4. Phaseolus lunatus L. Lima Bean. An erect or twining annual, 1-10 ft. high, $\frac{1}{16}$ - $\frac{1}{12}$ in. in diameter. Leaflets usually acute at the apex, broad at the base, some linear, usually 2-4 in. long, 1-3 in. wide. Flowers $\frac{1}{4}$ - $\frac{1}{2}$ in. in diameter, greenish white pods, 3-7 in. long, 1-1 $\frac{1}{2}$ in. wide, somewhat pubescent, never edible at any stage of development; seeds generally flat, moon-shaped, the veining usually prominent, generally white, but some varieties with purple markings; $\frac{1}{2}$ - $\frac{3}{4}$ in. long, in the small bush varieties, to 1-2 in. in the large bush or climbing varieties.

The Lima Bean is widely cultivated for the seed as food in the green and the dry state.

5. Phaseolus coccineus L. Scarlet Runner Bean. A twining annual with a reddish-brown stem, 4-12 ft. long, $\frac{1}{16}$ - $\frac{1}{8}$ in. in diameter. Leaflets 2-6 in. long, 1-3 in. wide. Flowers in racemes, longer than the leaves, prominently scarlet, each flower $\frac{1}{2}$ -1 in. long; pods 2-5 in. long, $\frac{1}{2}$ -1 $\frac{1}{4}$ in. wide, the seeds 3-4, purple with black markings.

In sprouting, the cotyledons generally remain underground, altho in a few cases they are pushed above. It is usually cultivated on account of the beauty of the foliage and the flowers. The beans are said to be eaten by people of Europe and South America.

6. *Strophostyles* Ell.

Twining pubescent annuals, or perennials in pedunculate heads or sessile, purple; the keel of the corolla strongly incurved; style bearded along the inner side, the pods linear and straight.

1. *Strophostyles helvola* (L.) Britt. Trailing Wild Bean. A twining pubescent annual with the stem 2-8 ft. long and $\frac{1}{16}$ in. in diameter. Leaflets lobed or regular, ovate at the base, acute at the apex, 1-3 in. long, 1-2 in. wide. Peduncles longer than the leaves, axillary; flowers 3-10, capitate, $\frac{1}{8}$ - $\frac{1}{2}$ in. long, purple; pod pubescent, the seed brown to black.

The range of territory from which this species is reported shows the distribution general over the state. Erie, Ottawa, Cuyahoga, Tuscarawas, Washington, Athens, Meigs, Hocking and Scioto.

7. *Vigna* Savi.

Twining or erect annuals. Leaves trifoliate. Flowers capitate or somewhat racemose, the keel of the corolla short, slightly incurved, yellow or white to purple; pods long, linear, the seeds small, light or dark, usually with a different coloring about the hilum.

Key to the Species.

1. Stem erect or slightly twining, 2-4 ft. long, pod 6-9 in. long. *Vigna sinensis*. (1).
2. Stem twining, 5-10 ft. long, pod 10-36 in. long. *Vigna sesquipedalis*. (2).

1. *Vigna sinensis* (L.) Endl. China Bean. A twining or erect herbaceous annual, 2-4 ft. high, $\frac{1}{16}$ - $\frac{1}{8}$ in. in diameter. Leaflets 2-6 in. long, 1-3 in. wide, the stipules ovate or ovate lanceolate. Flowers $\frac{3}{8}$ - $\frac{5}{8}$ in. long, capitate or racemose, white or yellow to purple; pods 6-9 in. long, the seeds white to brown, having a contrasting ring of color around the hilum; seeds 4-20, separated in the pod by a coriaceous tissue.

The China Bean is being cultivated in Ohio for pasturage and as a soiling crop. It is also used for the food of man in the green and dry state. The China Bean has recently been called Cow Pea quite generally, especially in Agricultural Literature. But this name is confusing, since the plant is a typical species of the beans and is not at all like any of the peas.

2. *Vigna sesquipedalis* (L.) Wight. Yard Bean. A climbing annual 5-10 ft. long, $\frac{1}{16}$ - $\frac{1}{8}$ in. in diameter. Leaflets 2-6 in. long, 1-3 in. wide. Flowers $\frac{3}{8}$ -1 in. long, yellow or white to purple; pod 10-36 in. long, $\frac{1}{2}$ in. wide; seeds 10-20, light brown.

The Yard Bean is often cultivated for an ornament or curiosity, on account of its long pods. It is now generally used for food, when in the snap stage. It is also called Asparagus Bean.