THE CONVOLVULACEAE OF INDIANA.

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The family Convolvulaceae is represented in Indiana by the genera Quamoclit, Ipomoea, Convolvulus and Cuscuta. The eight species of Cuscuta known to occur in our State have been discussed by the writer in recent papers[1] presented to this Academy. It is proposed, in the present paper, to present the species of the other three genera occurring in Indiana and indicate their distribution and prevalence. Eleven species may be recognized, one in the genus Quamoclit, four in the genus Ipomoea, and six in the genus Convolvulus. All of these eleven species present fairly definite and constant characters by which they may be identified, with the possible exception of *Convolvulus sepium* and its close relative *C. fraterniflorus*. A study of a larger number of collections of these two species gathered over a wider range may show the inadvisability of maintaining them as separate species. Most of the species show considerable variation in the shape of the leaves. In *Ipomoea lacunosa*, for example, one may discover leaves of two or three distinctly different shapes even on the same plant. Sketches are presented showing this variation in leaf form and size in the different species.

All of the specimens that could be obtained were studied and compared. Mr. C. C. Deam's extensive collection was generously placed at the writer's disposal and provided the largest number of specimens. All collections are listed and the county in which they were obtained is indicated. No collections or localities are included where the specimens were not seen by the writer.

KEY.

Corolla tubular, not expanded at the base, limb salverform; stamens and style exserted; flowers not subtended by bracts ..... 1. *Quamoclit coccinea.*

Corolla mostly funnelform, stamens and styles not exserted

Stigmas 2 or 3, grouped into a rounded, frequently papillate, knob; flowers not subtended by bracts ..... (Genus Ipomoea).

Stems, petioles and peduncles retrorsely hairy

Sepals mostly long, attenuate-caudate, tips spreading..... 2. *Ipomoea hederacea.*

Sepals ovate-oblong to lanceolate. 3. *Ipomoea purpurea.*

[1] Notes on our Indiana dodders. Proc. Ind. Acad. Sci. for 1919. pp. 157-163.

A Species of Cuscuta not hitherto reported from Indiana. Proc. Ind. Acad. Sci. for 1920. p. 229.

Stems, etc., not retrorsely hairy
  Sepals broadly ovate or oblong, smooth ..... 4. *Ipomoea pandurata.*
  Sepals ovate to lance-ovate or oblong, pointed, hairy..... 5. *Ipomoea lacunosa.*
Stigmas 2, oval or filiform, elongated; 2 bracts closely subtending each flower (they are some little distance from the flower in *C. arvensis*) ..... (Genus Convolvulus).
Petioles mostly less than one-fourth as long as the blade; plant short, upright, hairy..... 6. *Convolvulus spithamaeus.*
Petioles mostly more than one-fourth as long as the blade; plant trailing or twining
  Flowers double ..... 7. *Convolvulus japonicus.*
  Flowers single
    Bracts surrounding and enclosing the calyx
      Leaves smooth or, infrequently, hairy; peduncles mostly longer than the petioles. 8. *Convolvulus sepium.*
      Leaves hairy
        Leaves moderately hairy, hastate, peduncles not exceeding the petioles ..... 9. *Convolvulus fraterniflorus.*
        Leaves densely hairy, basal lobes rounded, peduncles exceeding the petioles ...10. *Convolvulus repens.*
    Bracts small and at some distance from the flower.....11. *Convolvulus arvensis.*

1. Quamoclit coccinea.

Figs. 1 & 2.

Quamoclit coccinea Moench, Meth. 453. 1794.

Plant smooth or slightly hairy at the nodes; leaves cordate, entire, or, infrequently, angled; peduncles one- to several-flowered and longer than the petioles; sepals bearing a prominent, dorsal projection; stamens and styles exserted.

Along roadsides and in cultivated fields.

Specimens examined:—Gibson Co. (Deam *18,306*); Harrison Co. (Deam *18,735*); Jefferson Co. (Coulter in 1874); Lawrence Co. (Deam *18,443*); Putnam Co. (Yuncker *1,353*); Sullivan Co. (Deam *32,922*); Warrick Co. (Mrs. Deam *33,117*).

2. Ipomoea hederacea.

Figs. 3 & 4.

Ipomoea hederacea Jacq. Icon. Rar. pl. 36. 1781.

Plants hairy, with the hairs on the stems, petioles and peduncles pointing downward; leaves three-lobed; sepals long, attenuate-caudate, tips curving, densely hairy at the expanded base.

Rather common in cultivated fields and waste places.

Specimens examined:—Clark Co. (Deam *5,433*); Crawford Co. (Deam in 1899); Franklin Co. (Deam in 1903); Greene Co. (Deam *37,711*); Hancock Co. (Deam *37,841*); Jefferson Co. (Coulter in 1875); Marion Co. (Deam *7,350*); Morgan Co. (Deam *2,692*); Perry Co. (Deam *37,419*); Posey Co. (Deam *37,698*); Putnam Co. (McDougall in 1888 and in 1889; Yuncker *1,355*); Vigo Co. (Deam *32,900*).

3. Ipomoea purpurea.

Figs 5 & 6.

Ipomoea purpurea (L.) Lam. Tabl. Encycl. 1:466. 1791.

Plants hairy, with the hairs on the stems, petioles and peduncles turned downward; leaves cordate, or, infrequently, angled; sepals ovate or oblong, acute, densely hairy at the base.

In cultivated fields, along roadsides and in waste places generally.

Specimens examined:—Putnam Co. (Bates in 1911; Grimes 778; Yuncker *1,354*); Shelby Co. (Deam *19,082*); Spencer Co. (Deam *37,492*).

Specimens collected in Kosciusko and Wells Counties by Deam (Deam *1,498* and *5,296*), have sepals similar to those of *I. purpurea*, but the leaves are lobed and in all respects are similar to those of *I. hederacea*, while a specimen collected in Putnam County showed the contrary condition, i.e., it had the calyx lobes of *I. hederacea* and the leaves of *I. purpurea*. These combinations of characters suggest a cross between these two closely related species. So far as I have been able to find, no mention has been made before of this combination of characters.

4. Ipomoea pandurata.

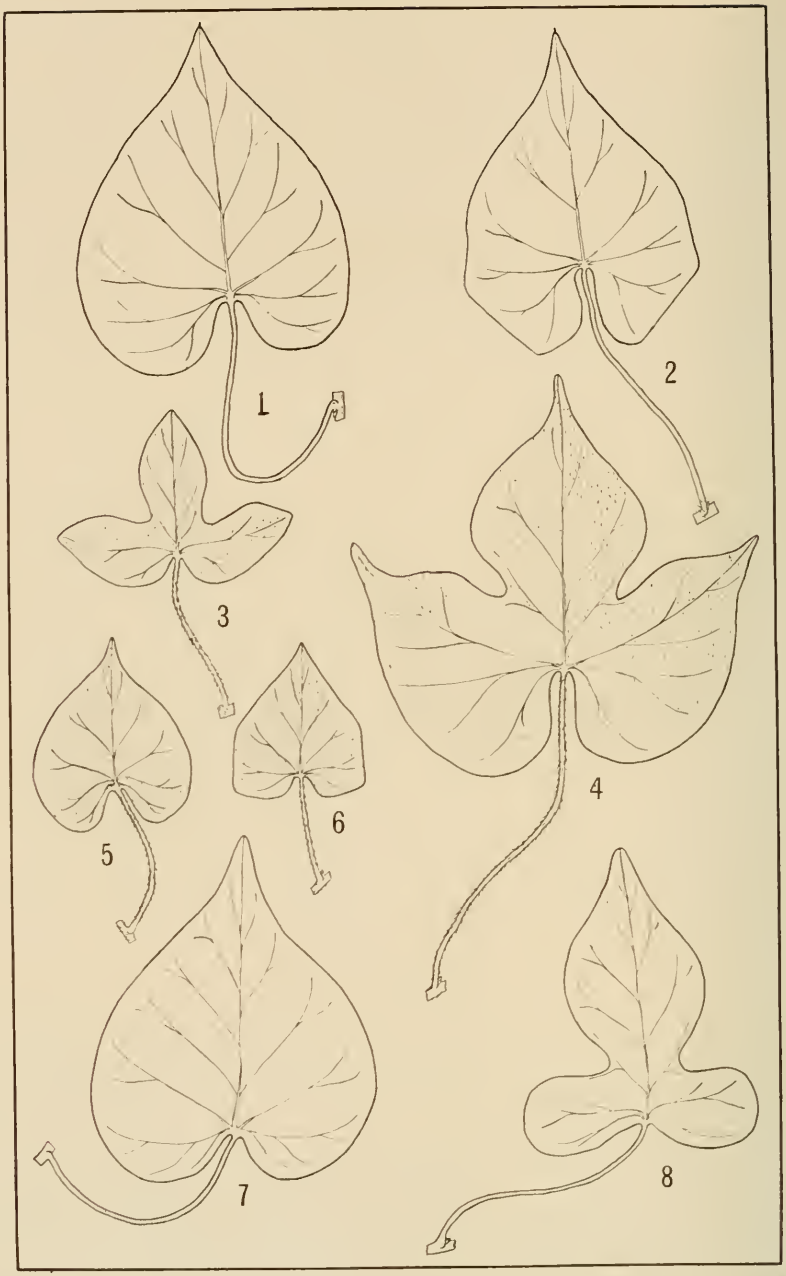
Figs. 7 & 8.

Ipomoea pandurata (L.) G.F.W.Mey. Prim.Fl.Esseq. 100. 1818.

Plant robust, smooth or, rarely, hairy; leaves ovate or, infrequently, constricted at the middle forming basal lobes; peduncles mostly longer than the petioles, 1-6 flowered.

Common in dry soil in waste places.

Specimens examined:—Allen Co. (Deam *1,358*); Blackford Co. (Deam *1,181*); Clark Co. (Deam *7,039*); Daviess Co. (Deam *25,643*); Dubois Co. (Deam *11,589*); Hamilton Co. (Mrs. Deam *12,151*); Harrison Co. (Deam *37,212*); Jefferson Co. (Coulter in 1875); Jennings Co. (Deam *37,021*); Knox Co. (Deam *17,006; 37,721*); Perry Co. (Deam *37,392A; 37,418*); Posey Co. (Deam *37,711*); Putnam Co. (Grimes *673;*



Figs. 1-8. Leaves of Convolvulaceae. 1 and 2, *Quamoclit coccinea;* 3 and 4, *Ipomoea hederacea;* 5 and 6, *I. purpurea;* 7 and 8, *I. pandurata.*

Yuncker in 1920); Shelby Co. (Mrs. Deam *11,580*); Spencer Co. (Deam *37,487*); Tippecanoe Co. (Dorner in 1900); Warrick Co. (Deam *37,661*); Wells Co. (Deam in 1897 and in 1903).

5. Ipomoea lacunosa.

Figs. 9-12.

Ipomoea lacunosa L., Sp. Pl. 161. 1753.

Plants smooth or hairy; leaves entire, or, more commonly, lobed or angled; flowers white or sometimes pink, red or purplish; sepals pointed and bristly hairy, chiefly along the margin; peduncles mostly shorter than the petioles, one to several flowered.

Common in cultivated fields, along river banks and low ground.

Specimens examined:—Clark Co. (Deam *5,432; 7,157; 12,095*); Clay Co. (Deam *37,781*); Floyd Co. (Deam *14,009*); Gibson Co. (Deam *9,934*); Greene Co. (Deam *37,751; 37,947*); Jackson Co. (Deam *38,063*); Jefferson Co. (Coulter in 1876; Deam *18,849*); Knox Co. (Deam *32,934*); Owen Co. (Mrs. Deam *10,204* in part with *Convolvulus sepium*); Perry Co. (Deam *33,223; 33,224; 37,344*); Posey Co. (Deam *22,337*); Putnam Co. (Grimes *251;* Yuncker in 1920); Spencer Co. (Deam *37,491*); Sullivan Co. (Deam *18,263*); Warrick Co. (Deam *37,660*); Washington Co. (Deam *18,978*).

6. Convolvulus spithamaeus.

Figs. 31-16.

Convolvulus spithamaeus L., Sp. Pl. 158. 1753.

Plants pubescent, usually not more than one foot high, erect, infrequently showing a tendency to twine; petioles mostly not more than one-fourth the length of the blade, in rare specimens slightly longer; peduncles exceeding the petioles; bracts mostly oval or, rarely cordate.

In dry soil on hillsides, river banks, etc.

Specimens examined:—Clarke Co. (Deam *6,481; 6,581*); Harrison Co. (Deam *23,399*); Noble Co. (Deam *6,776*); Porter Co. (Deam *20,060*); Steuben Co. (Deam in 1904); Tippecanoe Co. (Deam in 1901); Wells Co. (Deam in 1899); Whitley Co. (Deam *23,707*).

7. Convolvulus japonicus.

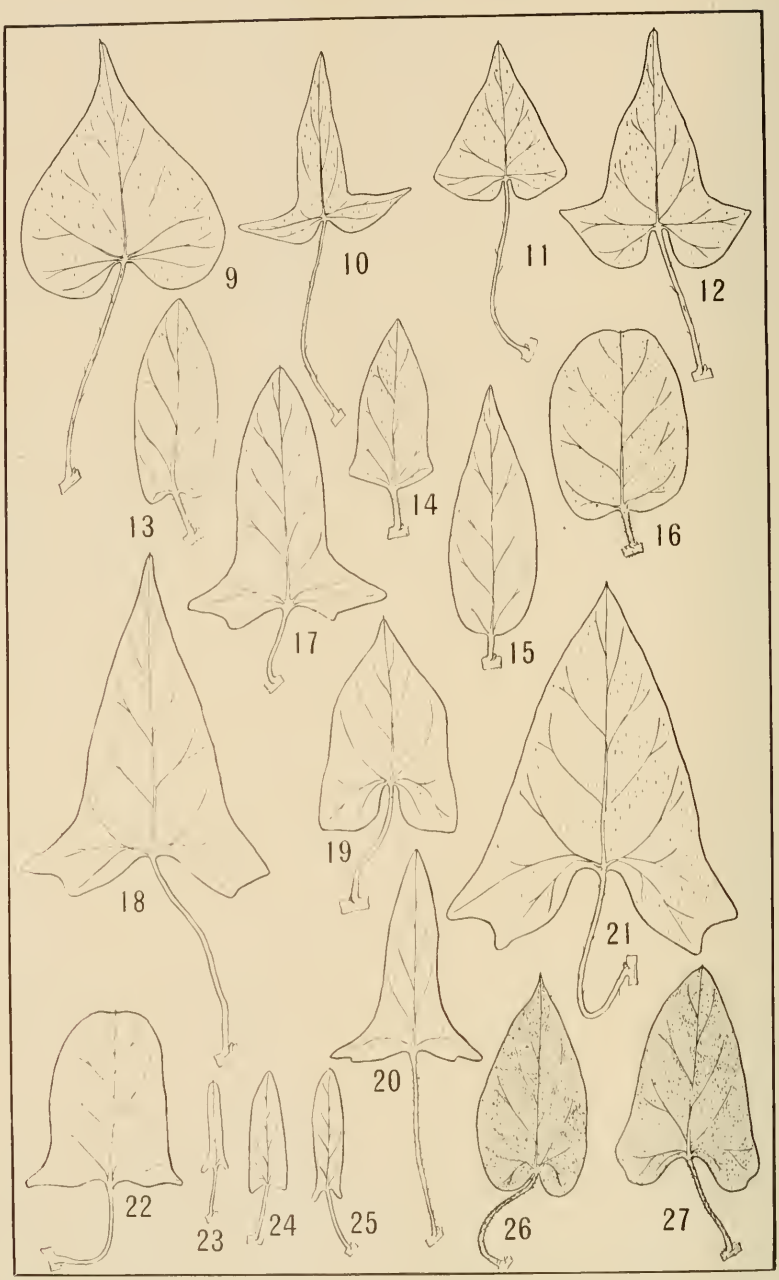
Fig. 17.

Convolvulus japonicus Thunb., Fl. Jap. 85. 1784.

Plants hairy; petioles much shorter than the blade; peduncles longer than the petioles; flowers double.

In moist, waste places. Rare.

Specimens examined:—Putnam Co. (Yuncker *1,352*); Tipton Co. (Grimes *942*).



Figs. 9-27. Leaves of Convolvulaceae. 9-12, *Ipomoea lacunosa;* 13-16, *Convolvulus spithamaeus;* 17, *C. japonicus;* 18 and 19, *C. sepium;* 20 and 21, *C. fraterniflorus;* 22-25, *C. arvensis;* 26 and 27, *C. repens.*

8. Convolvulus sepium.

Figs. 18 & 19.

Convolvulus sepium L., Sp. 153. 1753.

Plant smooth or slightly hairy; peduncles equal to or longer than the petioles and only one in each axil.

Common throughout the State in moist situations.

Specimens examined:—Allen Co. (Deam *1,359*); Brown Co. (Deam *11,200*); Floyd Co. (Deam *37,203*); Hamilton Co. (Mrs. Deam *8,711*); Hendricks Co. (Mrs. Deam *11,230*); LaPorte Co. (Deam *36,706*); Noble Co. (Deam *14,323*); Owen Co. (Mrs. Deam *8,966;* Mrs. Deam *10,204* in part with *Ipomoea lacunosa*); Perry Co. (Deam *37,388A*); Putnam Co. (Grimes *646;* McDougall in 1888; Yuncker *1,294*); Ripley Co. (Deam *13,801*); Shelby Co. (Mrs. Deam *11,365*); Steuben Co. (Deam *1,255*); Tipton Co. (Mrs. Deam *14,105*); Vermillion Co. (Deam *37,926*); Warrick Co. (Deam *37,593*); Wells Co. (Deam in 1901 and in 1903).

9. Convolvulus fraterniflorus.

Figs. 20 & 21.

Convolvulus fraterniflorus Mackenzie & Bush, Rept. Mo. Bot. Garden 16:104. 1905.

Plants commonly hairy; peduncles ordinarily two or more in each axil, mostly shorter than the petioles; bracts sparingly hairy.

Mackenzie and Bush differentiated this species from *Convolvulus sepium* chiefly on the following characters: *Plant pubescent; peduncles angled and winged, ordinarily more than one in each axil and commonly shorter than the petioles; floral bracts cordate.* This combination of characters is not at all constant in our Indiana specimens. The specimens here considered as being this species were chosen mainly on the number and length of the peduncles. It is believed that a study of a larger number of specimens collected from a more extended range would show that this species is at the most worthy of but varietal distinction.

In moist situations.

Specimens examined: Clay Co. (Deam *37,782*); Greene Co. (Deam *37,773*); Hancock Co. (Mrs. Deam *9,073*; Deam *37,840*); Knox Co. (Deam *17,059A*).

10. Convolvulus repens.

Figs. 26 & 27.

Convolvulus repens L., Sp. Pl. 153. 1753.

Plants trailing, densely hairy; petioles mostly more than one-fourth as long as the blade; basal lobes of the leaves rounded; peduncles exceeding the petioles; bracts mostly cordate.

This species may be confused with some specimens of *Convolvulus spithamaeus* showing a tendency to twine, but it differs mainly in the degree of pubescence, length of plant and of petioles and in the shape of the leaves and bracts.

Along roadsides and in fields.

Specimens examined: Crawford Co. (Deam *8,434; 20,443;* Schneck in 1893); Harrison Co. (Deam *23,318*).

11. Convolvulus arvensis.

Figs. 22-25.

Convolvulus arvensis L., Sp. Pl. 153. 1753.

Plants smooth; leaves and flowers mostly smaller than in the other Indiana species; the bracts small and at some distance from the flower; peduncles much exceeding the petioles.

Along roadsides and in waste places generally.

Specimens examined: Dearborn Co. (Deam *12,444*); Jefferson Co. (Deam *13,408*); Lake Co. (Deam *2,339*); Marion Co. (Deam *6,956*); Putnam Co. (Grimes *2,142;* Wilson in 1893; Yuncker *1,356*); Tipton Co. (Grimes *945*); Wells Co. (Deam in 1897).

Explanation of Plates.

The sketches were made by laying the leaves on paper and drawing their outline. The drawings have been reduced so that they are now about one-half the natural size of the leaves.