

NOTES ON OUR INDIANA DODDERS.

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Dodder is the popular or common name ordinarily applied to species of *Cuscuta*. This genus belongs naturally to the Convolvulaceae. The remarkable embryogeny; the structure of the mature plants; the manner in which they secure their nourishment and their peculiar ecological relationships make them subjects of particular scientific interest.

There are in North America about fifty known native and five introduced species. Of the natives less than a half dozen are reported as harmful to economically important crops, and, of these, but one or two are of much importance. Of the introduced species four are distinctly harmful. Because of the trouble caused by this minority the whole genus is frequently considered in ill repute. Some authors, however, attempt to show that the harm done by a few members of the group is offset by the good done by the others in parasitizing harmful weeds and thus retarding their growth.

In the state of Indiana we have seven native and possibly two introduced species. Of these, one native, *C. pentagona*, and both of the introduced species are harmful to crops. The amount of harm caused by these parasites becomes considerable if they are not checked, in some cases causing nearly the total loss of the crop. The grower finding these plants in his fields should take immediate steps to destroy them.

In the proper identification of the species one must ordinarily make a careful dissection of the flowers. After the flowers have been pressed and dried this usually means that they require softening by boiling and the subsequent dissection in water. Because of the lack of other vegetative characters of diagnostic value and the trouble attendant on the flower dissection many of the collections show no attempt at all towards identification. Certain species frequently show wide specific limitations that is apt to confuse one not perfectly familiar with the genus. The nomenclature of the group is also quite confused.

It is believed that a key using those characters that are ordinarily visible with the aid of a hand lens will be of value. The following key aims at the identification of the species found in Indiana without the necessity of making flower dissections.

1. Stigmas capitate. (Native species). 2.
Stigmas linear. (Introduced species). 8.
2. Flowers subtended by numerous bracts and ordinarily in a close, compact inflorescence. 3.
Flowers not subtended by bracts and ordinarily in a more loosely clustered inflorescence. 4.
3. Inflorescence dense, rope-like, tightly wound about the host; bracts acute with recurved tips1. *Cuscuta glomerata*.
Inflorescence less dense and not particularly rope-like; bracts obtuse, closely appressed2. *Cuscuta compacta*.
4. Flowers commonly 4-parted (or 3-parted). 5.
Flowers commonly 5-parted. 7.
5. Withered corolla remaining more or less persistent as a cap at the apex of the capsule; infrastaminal scales well developed3. *Cuscuta Cephalanthi*.
Withered corolla remaining at the base of the capsule, about it, or early deciduous; infrastaminal scales rudimentary. 6.

6. Flowers fleshy, with the cells convex-lens shaped; corolla lobes upright, tips inflexed4. *Cuscuta Coryli*.
 Flowers not as above.....5. *Cuscuta Polygonorum*.
 7. Capsules globose or depressed-globose (not pointed); corolla lobes reflexed, acute, with inflexed tips.....6. *Cuscuta pentagona*.
 Capsules ovoid or globose-pointed; corolla lobes upright to spreading, obtuse7. *Cuscuta Gronovii*.
 8. Usually found parasitizing legumes (ordinarily clover or alfalfa); styles, including the stigma, exceeding the length of the ovary 8. *Cuscuta Epithymum*.
 Usually parasitizing flax; styles, including the stigma, not exceeding the length of the ovary.....9. *Cuscuta Epithymum*.

1. *CUSCUTA GLOMERATA* Choisy. Glomerate dodder.



Fig. 1.—*Cuscuta glomerata*. x4.

[FIGURE 1.]

C. glomerata Choisy, Mem. Soc. Phys. et Hist. Nat. Genève, 9:280, pl. 1, fig. 1. 1811

Indiana marks the eastern limits of this, the most conspicuous of our species. The yellow, rope-like clusters of the flowers are not infrequently one to one and a half inches in thickness. It produces but few seeds, most of the ovules being abortive. Bessey (Amer. Nat. 18: 1145, 1884) pointed out the fact that the flowers are produced endogenously breaking forth in two more or less parallel lines. This species favors tall Compositae.

Specimens examined:—Lake Co., Whiting (Chase 122); Floyd Co., New Albany (Clapp); Marshall Co., Lake Maxinkuckee (Clark in 1909); Wells Co. (Dean in 1901); McCallon's (Clapp in 1837).

2. CUSCUTA COMPACTA Jussieu. Compact dodder.

C. compacta Jussieu in Choisy, Mém. Soc. Phys. et Hist. Nat. Genève, 9:281. pl. D, fig. B. 1841.

The flowers of this well marked species are often produced endogenously like those of *C. glomerata* and, while they are usually formed into dense, compact clusters about the host, the inflorescence does not have the rope-like appearance of the former. The flowers of this are usually of a much darker color than are those of *C. glomerata*. This species prefers woody hosts such as *Cephalanthus*, *Sassafras*, *Salix*, etc., and seems to be limited to the southwestern part of the state.

Specimens examined:—Gibson Co. (*Schneck* in 1904); Lawrence Co., Mitchell (*Deam* 18,499); Sullivan Co., Grayville (*Deam* 29,369); Posey Co., Mt. Vernon (*Deam* 24,280, 29,076); Dubois Co., Huntingburg (*Deam* 28,253); Jackson Co., Chestnut Ridge (*Deam* 9,520).



Fig. II.—*Cuscuta Cephalanthi*. x4.

3. CUSCUTA CEPHALANTHII Engelmann. Buttonbush dodder.

[FIGURE II.]

C. Cephalanthi Engelmann, Amer. Journ. Sci. & Arts, 43:336. pl. 6, figs. 1-6. 1842.

This little dodder is commonly mistaken for *C. Gronovii*, an error that should not occur, however, if one compares the capsules which are pointed with *C. Gronovii* and depressed with this species. It is frequently found

with the flowers formed endogenously. It grows on *Cephalanthus*, *Salix*, Compositae and numerous other hosts.

Specimens examined:—Lake Co., Clarke (*Unbach* in 1898), Whiting (*Hill* in 1891); Dune Park (*Chase* 1,982); Wells Co. (*Deam* in 1899, 1903 & 1905), Murray (*Deam* 490); Porter Co., Baum Bridge (*Deam* 26,382); Adams Co., Decatur (*Deam* 5,363, 5,364 in part); Randolph Co., Deerfield (*Deam* 15,382); Parke Co. (*Deam* 9,889); Steuben Co., Lake James (*Deam* 15,476); Allen Co., Robinson Park (*Deam* 1,582); Carroll Co. (*Deam* 15,304).



Fig. III.—*Cuscuta Coryli*. x1.

4. *CUSCUTA CORYLI* Engelm. Hazel dodder.

[FIGURE III.]

C. Coryli Engelm., Amer. Journ. Sci. & Arts, 43:337. pl. 6, figs. 7-11. 1842.

This species is sometimes confused with *C. indecora* which has never, to the writer's knowledge, been found so far east as Indiana. The flowers of this, the smallest of our Indiana species, are not infrequently formed endogenously. It seems to prefer shrubby hosts.

Specimens examined:—Blackford Co., (*Deam* 190), Hartford City (*Deam* 512); Lake Co., (*Hill* 95-1897, 124-1897); Wilsons (*Hill* 100-1897); Dune Park (*Chase* 522); Kosciusko Co., Winona Lake (*Deam* 444); Lagrange Co., Adam's Lake (*Deam* 14,856); Vermilion Co., Hillsdale (*Deam* 9,817).

5. *CUSCUTA POLYGONORUM* Engelm. Smartweed dodder.

C. Polygonorum Engelm., Amer. Journ. Sci. & Arts, 43:342. pl. 6 figs. 26-29. 1842.

This species does not appear common in collections from Indiana. Num-

erous collections of it have been made in adjacent states and it is to be expected anywhere in Indiana. It is a less conspicuous plant than some of the other dodders which may account for the lack of collections. It is ordinarily found most predominant on species of *Polygonum*.

Specimens examined:—Lake Co., Whiting (*Hill* in 1891); Vigo Co. (*Deam* 22, 182); Franklin Co., Brookville (*Deam* in 1903); Grant Co., Lake Galacia (*Deam* 15, 269).



Fig. IV.—*Cuscuta pentagona*. x4.

6. *CUSCUTA PENTAGONA* Engelman. Field dodder.

[FIGURE IV.]

C. pentagona Engelman, Amer. Journ. Sci. & Arts, 43:340. pl. 6 figs, 22-24. 1842.

This species is ordinarily treated in the Manuals under the name of *C. arvensis* Beyr. It is one of the most widespread of our North American species doubtless due to the introduction of the seeds with those of clover and alfalfa. This species becomes a troublesome weed in some localities where it becomes established in clover or alfalfa fields. It is thought by some that it is capable of wintering over in the crowns of the host plants thus obtaining an early start in the spring.

Specimens examined:—Gibson Co. (*Schneck* in 1906); Lake Co., Clarke (*Umbach* in 1898); Putnam Co., Greencastle (*Yuncker* in 1919); Bartholomew Co., Columbus (*Deam* 12,403); Spencer Co., Lake (*Deam* 28,370), Enterprise (*Deam* 28,400); Posey Co., Mt. Vernon (*Deam* 25,430); Ripley Co., Versailles (*Deam* 7,101); Vermillion Co., Hillsdale (*Deam* 9,871); Orange Co., Paoli (*Deam* 17,384).

7. CUSCUTA GRONOVII Willdenow. Common dodder.

[FIGURE V.]

C. Gronovii Willdenow in Roemer & Schultes Syst., 6:205. 1820.

This is the commonest of our Indiana species. It is frequently found in low wet places forming large mats of entangled, yellow stems. It seems to prefer *Impatiens* or *Salix*, but will utilize any host within reach having been found on one occasion coiling about and penetrating the stems of *Equisetum*. It has been reported as causing slight damage to onions grown in muck soil.

Fig. V.—*Cuscuta Gronovii*. x4.

Specimens examined:—Delaware Co., Muncie (*Brady* in 1896); St. Joseph Co., Notre Dame (*Nieuwland* 11,500), Clear Lake (*Deam* 26,391); Ohio (*Wilson* in 1897); Jefferson Co., Hanover (*Coulter* in 1876), Manville (*Deam* 18,784); Franklin Co., Brookville (*Deam* in 1903); Posey Co., Mt. Vernon (*Deam* 22,339); Vigo Co., Atherton (*Deam* 24,014); Dubois Co., Huntingburg (*Deam* 28,267); Jackson Co., Vullonia (*Deam* 30,249); Knox Co., Vollmer (*Deam* 26,575); Marion Co., Indianapolis (*Yunker* in 1916); Porter Co., Waverly Beach (*Deam* 29,812); Wayne Co., Richmond (*Deam* 23,869); Clark Co., (*Deam* 5,473 & 7,600), Jeffersonville (*Deam* 23,800); Harrison Co., Elizabeth (*Deam* 26,831); Adams Co., Decatur (*Deam* 5,364, in part); Whitley Co., Shriner Lake (*Deam* in 1897), Blue River Lake (*Deam* 21,696); Steuben Co., Clear Lake (*Deam* in 1904), Gage Lake (*Deam* in 1906); Brown Co., Helmsburg (*Deam* 12,225); Noble Co., Albion (*Deam* 14,701); Lagrange Co., Pretty Lake (*Deam* 14,888); Hamilton Co., Noblesville (*Deam* 12,129); Decatur Co., St. Paul (*Deam* 9,535); Carroll Co., Monticello (*Deam* 15,339).

8. CUSCUTA EPITHYMUM Murray. Clover dodder.

C. Epithymum Murray, Linn. Syst., 13 ed., p. 140, 1774.

This species is usually found parasitic on leguminous crops, principally

alfalfa and clover. In herbaria it is commonly labelled as *C. trifolii*, a species that is now considered as being either synonymous with or at most but a variety of *C. Epithimum*. It is also confused with *C. pentagona* because of the fact that both species show a predilection for the same kind of hosts. This species has become very wide spread in North America having been found from the Atlantic to the Pacific and from Canada to Mexico. Its wide distribution is accounted for by the fact that its seeds are frequently found as a contaminant of those of leguminous crops. While collections of this species have been made in adjoining states none have been seen by the writer from Indiana.



Fig. VI.—*Cuscuta Epilinum*. x4.

9. *CUSCUTA EPILINUM* Weihe. Flax dodder.

[FIGURE VI.]

C. Epilinum Weihe, Archiv d. Apoth., 8:50-51. 1824.

This species, so far as known to the writer, has never been found in Indiana. It has been seen from Ohio and Michigan and is to be looked for wherever flax is grown. All of the specimens have been parasitic on flax.

The private herbarium of Mr. Chas. C. Deam of Bluffton, Indiana, was the largest single collection of Indiana dodders seen by the writer. I desire to express my thanks for the loan of this and other collections which were sent me for study.

DEPAUW UNIVERSITY,
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