Plant Diversity Website

Cuscuta indecora Choisy

Common Names: Dodder, bigseed alfalfa dodder, bigseed dodder, largeseed dodder, pretty dodder, showy dodder (2,5,8,9).

Etymology: With Arabic origins, *Kushkut*, means dodder plant or parasitic plant; in New Latin, *Cuscuta* directly translates as dodder. The species name, *indecora*, means "non-ornamental" in Latin (3,16,17).

***Botanical synonyms** (1):*
Cuscuta decora Choisy ex Engelm.
C. decora var. *indecora* Engelm.
C. hispidula (Engelm.) Engelm.
C. neuropetala var. *minor* Engelm. & A. Gray
C. parviflora var. *vestita* Progel
C. verrucosa var. *hispidula* Engelm.
Epithymum indecorum (Choisy) Nieuwl. & Lunell

FAMILY: Convolvulaceae, the morning glory family

Quick Notable Features (4)**:**
¬ Yellow-orange stems, parasitic
¬ Small white flowers with 5 apically inflexed petals
¬ Capsules enclosed by remnant corolla
¬ Fringed, ovate scales subtend the stamens

Plant Height: The height of *Cuscuta indecora* depends on the host; H.L. Dean measured the length of a single plant of the genus *Cuscuta* at nearly half a mile (19).

Subspecies/varieties recognized (1):
C. indecora var. *attenuata* (Waterf.) Costea
C. indecora var. *bifida* Yunck.
C. indecora var. *hispidula* (Engelm.) Yunck.
C. indecora var. *indecora*
C. indecora var. *integriuscula* (Engelm.) Yunck.
C. indecora var. *longiselapa* Yunck.
C. indecora var. *neuropetala* (Engelm.) Hitchc.
C. indecora var. *portoricensis* Urb.
C. indecora var. *subnuda* (Engelm.) Yunck.

Most Likely Confused with: *Cuscuta glomerata*, *C. cephalanthi*, *C. coryli*, *C. polygonorum*, *C. gronovii*, and *C. pentagona* (2).

Habitat Preference: In Michigan, the species grows on *Ambrosia artemisiifolia* (2). C. indecora, as suggested by the common name bigseed alfalfa dodder, also parasitizes alfalfa crops (*Medicago sativa*), *Asclepias sp.*, *Artemisia sp.* and other herbs and low shrubs (4,6,7). It thrives in moist pine forests, sandy openings, disturbed areas, along roads, and even in salty marshes (3,18).

Geographic Distribution in Michigan: *C. indecora* is found in Cass, Oceana, St. Clair, Wayne counties (2).

Known Elevational Distribution: The species was collected at 2750m in Tilcara, Argentina (1).

Complete Geographic Distribution: Native to North America, the species is found in these states of the U.S.: AL, AR, AZ, CA, CO, CT, FL, GA, IA, ID, IL, IN, KS, KY, LA, MD, MI, MN, MO, MS, MT, NC, ND, NE, NJ, NM, NV, OK, OR, SC, SD, TN, TX, UT, VA, WV, WY,PR, VI; it is also present in Canada (SK), Mexico, Belize, Cuba, Jamaica, Costa Rica, Ecuador, Venezuela, Colombia, Paraguay, Brazil, Argentina, and Morocco (1,5,9).

Parasitism: Parasitism is a type of symbiotic relationship in which one organism obtains nutrients directly from a host organism. This has a detrimental effect on the host, but benefits the parasite. Although parasitic plants are commonly known to lack chlorophyll, some species have green organs, making them partially photoautotrophic. The physical link between the parasite and the host is called a “haustorium,” and often occurs through xylem-to-xylem attachment. The host can vary, ranging from the mycorrhizae of trees, to grasses and hardwood trees. A parasite can maintain open or partially open stomata, allowing transpiration to aid in extracting nutrients from the host (14).

Vegetative Plant Description: As *Cuscuta spp*. germinate, they develop a short anchoring root, while a stem forms and nutates (rotates) in search of a host. When an attachment with a host has been created, the anchorage root dies (15). Additional means of finding a host have been suggested in the literature, such as positive photoautotrophy or growth toward a source of moisture or specific chemicals (10). The stems of *C. indecora* are fleshy, yellowish to light orange, filiform, and 0.4-0.7mm in diameter; they coil around the host plant in a dextral orientation. Leaves are absent, instead the plant bears very small scales that are ovate and erect (3,4,8,18).

Flower Description: The inflorescences are dense-panicled cymes bearing pedicellate, small, fragrant,

fleshy, papillose white flowers (2-5mm long). The naked gamosepalous calyx is 5-parted, and shorter than the corolla; the lobes are ovate to lanceolate and apically acute. The corolla is campanulate and 5-lobed; the lobes are triangular, apically acute and inflexed, slightly shorter than the tube, and very finely serrate. The five epipetalous stamens can be faintly exerted or included, and bear a fringed scale at the base. The superior ovary is subglobose and 2-locular, the two distinct styles have an enlarged base, yellow or purple, and shorter than the ovary; the stigma is capitate (2,3,4,18).

Flowering Time: July-September (3,8).

Pollinator: Yuncker observed visits by wasps and other species of the order Hymenoptera to the genus *Cuscuta* (11).

Fruit Type and Description: The fruit is an indehiscent oblong to subglobose capsule bearing a persistent style, enclosed by the corolla. Each capsule bears 4 seeds (3,4).

Seed Description: In the genus *Cuscuta*, the defining characteristic of the mature embryo is the absence of cotyledons. This may be attributable to the fact that the first job of the young stem is to search for a host, not to photosynthesize. Each ovary bears four ovules, but one or more may abort, which causes variation in seed size and shape; a dodder seed may have zero, one, or two flat surfaces. *C. indecora* seeds are 1.2-2.1mm long and 1mm across (3,10,18).

Dispersal Syndrome: In unspecified members of the genus *Cuscuta* both germination in the capsule and seeds falling to the ground were observed, leaving water dispersal or other means a possibility for dispersal. Additionally, *Cuscuta* spp. seeds may be able to pass through the intestinal tract of a sheep and remain viable. Although this method of dispersal is unlikely, it extends the potential dispersal mechanisms to include zoochory (10).

Distinguished by: *C. epithymum* has a slender stigma, not capitate as in *C. indecora*, the style is longer than the ovary, and the circumscissile fruit is dehiscent, while that of *C. indecora* is indehiscent. *C. glomerata* has dense, sessile flowers subtended by bracts and free sepals, not pedicelled, bractless, and gamosepalous like *C. indecora*. *C. cephalanthi*, *C. coryli*, and *C. polygonorum* are 4-merous, *C. indecora* is 5-merous. The sepals of *C. cephalanthi*, *C. gronovii*, and C*. polygonorum* have rounded apices, not acute like in *C. indecora*. In *C. coryli* and *C. polygonorum*, the calyx is as long as or longer than the corolla, unlike in *C. indecora*. The calyx of *C. pentagona* is the same length as the corolla tube, and the corolla is not papillate (2).

Other members of the family in Michigan (number species): *Calystegia* (5), *Convolvulus* (1), *Cuscuta* (8), and *Ipomoea* (4) (source 2).

Ethnobotanical Uses: While no specific information has been located on species use of

Cuscuta indecora, the following information unattributed to species is presented: “An Indian proverb states that the person finding the root of dodder will have access to all the riches of the earth” (10). This statement pertains to the wide use of *Cuscuta* spp. for medicinal purposes across Asia, from herbal mixtures to treat ovarian cancer and postmenopausal osteoporosis to antifungal and insecticidal applications (13). From another perspective, “The dodder’s rapid development and its stranglehold on and damage to the host have earned it a place in the superstition of many Western countries. The German “Teufelsxwirn” and Dutch “Duivelsnaaigaren” are vernacular names of this sort,” highlights *Cuscuta’s* standing as a noxious weed in many places (10).

Phylogenetic Information: Convolvulaceae joins four other families in the order Solanales (Montiniaceae, Sphenocleaceae, Hydroleaceae, and Solanaceae), which encompasses 165 genera and 4,080 species. The distribution of Convolvulaceae is extensive worldwide, excluding areas of extreme temperatures—the Sahara and Gobi Deserts, and areas of high latitude (Canada, Greenland, Russia, Antarctica, as well as the southern tip of South America). Convolvulaceae has been noted as the only Asterid I family whose seeds exhibit physical dormancy (10). *Cuscuta spp*., belonging to the subfamily Cuscutoideae, is the only genus within the family that is parasitic. Its placement in Convolvulaceae is openly debated, but is supported by similar flower morphology (10,11,12) as well as the twining habit.

Interesting Quotation or Other Interesting Factoid not inserted above: As much as 90% of alfalfa crops in the high deserts of southern California were infested with *C. indecora* in 1992 (6). Some sources place the genus *Cuscuta* in its own family, Cuscutaceae (5,8,9). *Cuscuta indecora* can parasitize more than one host at a time (18). Similar to other members of the genus *Cuscuta*, this species is considered a noxious weed in the United States (5).

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