

# Plant Diversity Website

## ***Cuscuta epithymum* Murray**

**Common Names:** Clover Dodder, Lesser Clover Dodder, Lesser Dodder, Thyme Dodder (4, 10). Common names for the genus *Cuscuta*: are Dodder, Love Vine, Angel's Hair, Tangle Gut, Strangle Vine, Devil's Gut, Witches' Shoelaces (8).

**Etymology:** In Latin, *Cuscuta* means Dodder. However, *Cuscuta* is thought by some to have Arabic origins in the word "Kushkut." The specific epithet suggests the plant that this dodder was found growing on: Thyme. The Greek prefix "epi" means upon or over, and "thymum" is Latin for thyme (2,10,11,12).

**Botanical synonyms (14):**

*Cuscuta epithymum* Sievers ex Ledeb.  
*Cuscuta epithymum* Webb & Berthel.  
*Cuscuta epithymum* Thuill.  
*Cuscuta epithymum* Bové ex Choisy



**Family:** Convolvulaceae, the morning glory family. Some consider members of the genus

*Cuscuta* to form a separate family, the Cuscutaceae.

**Quick Notable Features:**

- Leafless, reddish-purple parasitic vine, usually found in a stringy mass over its host (8,10,18).
- Small white to pink flowers, even reddish (2,5,18).
- Herbaceous, usually an annual (5,8).
- Very small, rough seeds that are dull gray or light brown in color (3,4,5,8,18).

**Plant Height:** It has been reported that stems from a single dodder plant can reach a 0.5mile in length, if the host is large enough (9,18).

**Subspecies/varieties recognized (13):**

*C. epithymum* v. *alba* (J. Presl & C. Presl) Trab.  
*C. epithymum* v. *angustissima* (Engelm.) Yunck.  
*C. epithymum* v. *kotschyi* (Des Moul.) Engelm.

*C. epithymum* var. *macranthera* (Held. & Sartoni) Engelm.  
*C. epithymum* var. *obtusata* Engelm.  
*C. epithymum* var. *rubella* (Engelm.) Trab.  
*C. epithymum* var. *sagittanthera* Engelm.  
*C. epithymum* var. *scabrella* Engelm.  
*C. epithymum* var. *vulgaris* Engelm

**Most Likely Confused with:** *C. epithymum* can be confused with other species in the genus *Cuscuta*. Nine other species of *Cuscuta* occur in Michigan. Worldwide, *C. epithymum* is often

confused with *Cuscuta europea* and *Cuscuta epilinum*, its closest relatives (2,4,7). It might also be confused with morning glories (*Ipomoea*), especially the thinner-stemmed species.

**Habitat Preference:** *C. epithymum* is most commonly found growing on Red Clover or Thyme, but it may also parasitize other plants, including alfalfa. *C. epithymum* is most often found in agricultural areas throughout the warm and temperate regions of the world. However, it has also been reported in tropical areas such as Fiji and Tahiti, among others. *C. epithymum* occurs not only worldwide, but also in many habitats. Its optimal germination temperature in a greenhouse is 15° C. Under favorable conditions, this species is capable of living through winter (1,3,5,10).

**Geographic Distribution in Michigan:** *C. epithymum* is documented from Oceana, Calhoun, Hillsdale, Washtenaw, Macomb, and St. Clair counties (1).

**Known Elevational Distribution:** In the mountains of France, *C. epithymum* is found above 2000m (5).

**Complete Geographic Distribution:** Native to Europe, *Cuscuta epithymum* can now be found throughout the world. In North America, it is found in the United States (CA, CT, IA, KY, MA, MD, ME, MI, MO, MT, ND, NE, NJ, NM, NV, NY, OH, OR, PA, RI, SD, VA, VT, WA, WV, WY) and Canada (BC, NB, ON). *Cuscuta epithymum* is known for infesting crops – particularly legumes, in Europe and around the world. It was spread globally, introduced by the seed trade (3, 5,8,10).

**Parasitism:** Plant parasitism is a type of symbiotic relationship in which plants obtain nutrients directly from another plant. Although parasitic plants are commonly known to lack chlorophyll, some species have green organs, making them partially autotrophic. The physical link between the parasite and the host is called a “haustorium”, and often creates a xylem-to-xylem attachment. The parasite host can vary, ranging from the mycorrhizae of trees, to grasses and hardwood trees. The parasite often maintains open or partially open stomata, allowing transpiration to aid in extracting nutrients from the host. A parasitic plant may either be hemiparasitic, meaning it performs some photosynthesis and can survive on its own, or holoparasitic, meaning it performs no photosynthesis and depends entirely on the host for nutrients. Typically, holoparasitic plants do not contain chloroplasts (6,21,22).



**Vegetative Plant Description:** Upon germination, the seedlings, each with small anchorage roots, begin to actively bend around in a circle, in search of a host. Once a seedling finds a host, it attaches and begins to form haustoria. After locating a host, the anchorage roots die. The stems of *Cuscuta epithymum* are less than 0.4mm in diameter and vary from light red to dark purple. Very small alternate leaves may be present, but these do not serve a function. *Cuscuta epithymum* is holoparasitic and does not perform photosynthesis (3,5,8,21,22).

**Climbing Mechanism:** Stems of *Cuscuta epithymum* twine using their stems in a dextral orientation (3, KW pers. obs.). Although specific information for the climbing mechanism of *Cuscuta epithymum* was not found, the following information pertains to the genus of *Cuscuta* in general. Species of *Cuscuta* utilize two types of coiling: one in which the coils are tight with numerous haustoria, and the other in which coils are loose with few haustoria. Both types of coiling may be present in one individual plant (9). It has been observed that stems of *Cuscuta* species rarely twine more than three times around a single host branch (15).



**Flower Description:** The small flowers are sessile, 2-3mm long from base to corolla sinuses, white-pink to purplish, and borne in compact clusters. The calyx is shorter than or equal in length to the corolla tube, the corolla lobes are triangular and acute. The 5 stamens are shorter than the corolla lobes, with filaments longer than anthers. The ovary is globose, stigmas oblong, style and stigma are twice as long as the ovary (3,5,8,10,17).

**Flowering Time:** Mid-July to late September (21).

**Pollinator:** *Cuscuta epithymum* is capable of both cross-pollination and self-pollination. Many different species of insects may contribute to pollination. One study indicated that ants were some of the main pollinators, while another observed visits to the flowers by species of bees, wasps, flies and other insects, collectively from 8 families of insects (20, 21).

**Fruit Type and Description:** The fruit is a globose, circumscissile capsule, topped by the withered corolla. Fruits usually contain 4 seeds (3, 5, 8).

**Seed Description:** Seeds are very small, about 1mm in length. Rough, angled, and compressed-ovoid. The hilum is short, oblong, and transverse. The shape of a seed depends on how many seeds it developed with, because they develop alongside each other in the ovary. One *Cuscuta epithymum* plant was reported to produce 16,000 seeds (3,5,8,9).



**Dispersal Syndrome:** The genus *Cuscuta* is generally described as unspecialized or haphazard in dispersal. However, germination of the seeds of most parasitic plants require a signal from a suitable host; therefore, the dispersal syndromes of successful species of *Cuscuta* should ensure close proximity to the desired host (6, 9).

**Distinguished by:** *Cuscuta epithymum* can be distinguished from *Cuscuta europea* by its purplish stems and sessile stamens and the fact that *C. europea* does not occur in Michigan.



*Cuscuta epithymum* can be distinguished from *Cuscuta epilinum* by its pink to red flowers, triangular calyx-lobes, spreading corolla lobes and included stamens. Although *Cuscuta epithymum* may be confused with some thin-stemmed species of *Ipomoea* and *Fallopia*, it is important to note that the flowers of *C. epithymum* are very small, where flowers of *Ipomoea* species are large and bell shaped. Also, one of the most important traits of *C. epithymum* is that it has only very small, scale-like, non-functioning leaves. Species of both *Ipomoea* and *Fallopia* have functional leaves that are much larger in size (2,5,7,9,10).

**Other members of the family in Michigan** (number species): *Calystegia* (10), *Convolvulus* (2), *Cuscuta* (10) and *Ipomoea* (4) (source: 1).

**Ethnobotanical Uses:** In medieval times, the health benefits of dodders were believed to be determined by their respective hosts. *C. epithymum* occurred frequently on thyme. Thus, because thyme was considered – figuratively, not literally – a hot, dry plant, it was believed that *C. epithymum* was therapeutic because of its warm characteristics. It was also believed that when ground up and mixed with dog blood or other plants, *C. epithymum* would help keep an individual safe from evil spirits (12).

**Phylogenetic Information:** The Convolvulaceae are placed in the order Solanales. Solanales and Lamiales are a monophyletic group in the Asterid 1 clade. Within Convolvulaceae there are 3 - 4 distinct subfamilies. *Cuscuta* belongs to Convolvuloideae (16, 17).

**Interesting Quotation or Other Interesting Factoid not inserted above:** *Cuscuta* earned the common name “love vine” because of a Native American Pawnee belief. A girl would pluck part of a vine and throw it behind her while thinking of a certain someone. If, on the next day, the parasitic vine had reattached itself, it was a sign that the certain someone would be a good suitor. Perhaps similar to the “He loves me, he loves me not” idea in Western culture (21, 23).

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