

Plant Diversity Website

Calystegia sepium (L.) R. Br.

Common Names: hedge false bindweed, hedge bindweed, hedgebell, bear bind, devil's guts, devil's vine, old man's cap, great bindweed, hedge-lily, hedge morningglory, lily-bind, Rutland beauty, bracted bindweed (1, 15)

Etymology: *Calystegia* is derived from Greek for "a covering cup," two words: *kalux*, "cup" and *stegos*, "a covering." *Sepium* means "of hedges" or "of fences" (4, 18).

Botanical synonyms: see "Subspecies" heading for the synonyms of sections of this broadly defined species.



FAMILY: Convolvulaceae, the bindweed or morning glory family.

Quick Notable Features (15):

- hastate leaves coming to a sharp point
- pink or white funnel-shaped flowers
- large bracts enclosing the base of each flower
- creeping rhizomes that can grow over 3m long

Plant Height: In addition to the rhizome produced by prostrate shoots, the flower-producing stems usually twine to about 3m, but can go up to 4m (2, 20).

Subspecies/varieties recognized (1): The species is very widespread and this may be the reason for the many recognized subspecies.

C. sepium (L.) R. Br. ssp. *appalachiana* Brummitt

C. sepium (L.) R. Br. ssp. *erratica* Brummitt

C. sepium (L.) R. Br. ssp. *limnophila* (Greene) Brummitt

C. sepium (L.) R. Br. ssp. *sepium* [syn.: *Convolvulus nashii* House, *Convolvulus sepium* L., *Convolvulus sepium* L. var. *communis* R. Tryon]

C. sepium (L.) R. Br. ssp. *angulata* Brummitt [syn: *Calystegia sepium* (L.) R. Br. var. *angulata* (Brummitt) N. Holmgren, *Calystegia sepium* (L.) R. Br. var. *repens* (L.) Gray, *Convolvulus repens* L., *Convolvulus sepium* L. var. *repens* (L.) Gray]

C. sepium (L.) R. Br. ssp. *americana* (Sims) Brummitt [syn: *C. inflata* Sweet, *C. sepium* (L.) R. Br. var. *americana* (Sims) Matsuda, *Convolvulus americanus* (Sims) Greene, *Convolvulus sepium* L. var. *americanus* Sims]

C. sepium (L.) R. Br. ssp. *binghamiae* (Greene) Brummitt [syn: *Convolvulus binghamiae* Greene, *Convolvulus sepium* L. var. *dumetorum* Pospichal]



Most Likely Confused with: *Calystegia spithamea*, *Convolvulus arvensis*, and *Polygonum convolvulus*

Habitat Preference: Commonly found in thickets, along shores, marshes, meadows, ditches, and in generally disturbed sites with little or no shade in the temperate regions of North America, Europe, New Zealand, and Asia. It can survive in most soils, but prefers rich, lowland areas and does not do well in dense shade (2, 4, 15, 16).

Geographic Distribution in Michigan: Each subspecies of *Calystegia sepium* is found in Michigan except *Calystegia sepium* (L.) R. Br. ssp. *binghamiae* (Greene) Brummitt (only found in California) and *Calystegia sepium* (L.) R. Br. ssp. *limnophila* (Greene) Brummitt. Those subspecies which are found in Michigan cover half the state in a scattered pattern. The 8 Upper Peninsula counties in which they are found border Lake Michigan, while the 42 Lower Peninsula counties are in the south or border the Great Lakes (1).

Known Elevational Distribution: In Utah, *Calystegia sepium* has been found up to 1,310 m elevation (11).

Complete Geographic Distribution: All subspecies of *Calystegia sepium* are native to the United States except *Calystegia sepium* (L.) R. Br. ssp. *sepium*. Some authors suggest it is native also to Europe (3) or New Zealand (17, 21). At least one of the subspecies is found in each of the contiguous United States and the District of Columbia (1, 7).

Vegetative Plant Description: This perennial vine has a freely branching stem that twines, creeps or occasionally trails, usually forming “tangled masses on other plants” (4). The alternately arranged, long-petioled leaves are cordate- or deltoid-ovate to narrowly sagittate-lanceolate and 5-10cm long. The entire margined leaves are pinnately veined and glabrous to pubescent. The pubescence comprises short hairs on both surfaces (1, 2, 4, 5, 6, 7, 12). Some also consider the plant a “pseudo-annual” since “it produces rhizomes and seeds that survive the winter.” It does not produce underground stolons (16).

Climbing Mechanism: According to Darwin, *Convolvulus sepium*, a synonym for *Calystegia sepium*, moves “against the sun.” This is taken to mean that it apically twines in a sinistral direction. However, most images found on the web and personal observation of University of Michigan herbarium specimens seems to indicate that *Calystegia sepium* twines dextrally. Darwin did note that the plant, on average, made two revolutions every 1 hour and 42 minutes, with the semi-circle moving away from the sun taking 14 minutes longer than the semi-circle moving toward the sun (15, 16, 19).

Flower Description: The inflorescence comprises solitary, perfect flowers. These flowers are borne on 5-15 cm long, square or angled pedicels that arise from leaf axils. Just below the calyx, and usually covering it, are two 1-2cm ovate or oblong, sepaloid bracts that are usually cordate at the base (often called an epicalyx). Within the bracts are five, free, often unequal sepals and five white to pink, sometimes rose-purple petals fused into a pleated funnel. The regular corolla is 4-7cm long and wide. The five stamens are usually epipetalous. The superior ovary is unilocular and topped by a single style with an oblong, cylindrical stigma (2, 5, 12, 15, 16, 20).



Flowering Time: In the central and northeastern United States this species flowers from mid-May to September. The same applies in adjacent parts of Canada (7). It has been noted that in Illinois, ssp. *americana* and ssp. *angulata* flower from June to August, while ssp. *erratica* starts flowering a month earlier (12).

Pollinator: “Hedge bindweed flowers are produced sequentially on the twining stems, each open for a day. This forces pollinators (bumble and honey bees, and syrphid flies) to visit other stems... since in Europe (and presumably North America) clones are self-infertile. However, in Japan, where the plant is near its geographic limit, clones are self-compatible. In spite of a short life, the flowers have a rich insect community, perhaps attracted by temperatures 2.7 °C above ambient.”
Raised temperatures provide shelter for pollen- and nectar-feeding insects, as well as other insects seeking shelter on cold or overcast days. It was also shown that most pollen in flowers in Japan is gone by noon (16).



Fruit Type and Description: The fruit is an egg-shaped capsule (12, 15).

Seed Description: Each fruit contains 2-4, blackish brown, 5mm long seeds. The seeds are 3-angled with two sides flat and one side rounded, like a segment of an orange (15, 16).

Dispersal Syndrome: This species is reported to commonly spread vegetatively via its rhizomatous stem after winter has passed. However a specific dispersal agent for its seeds was not found (12, 16).

Distinguished by: *Calystegia sepium* is distinguished from *C. spithamea* by its twining habit, growth up to 3m, and the hastate or sagittate leaves. *C. spithamea* grows only to 50cm, has triangular leaves (and apparently does not twine). The easiest way to distinguish *Convolvulus arvensis* from *Calystegia sepium* is by the small bracts well below the inflorescence compared to the large bracts that obscure the calyx in *Calystegia sepium*. Another tell-tale sign is that most parts of *Calystegia sepium* are markedly larger than those in *C. arvensis*, as is seen in the image of the flowers. For example, in *Calystegia sepium*, the corollas are 4-7cm long and the leaf blades are 5-12cm long, while in *Convolvulus arvensis*, the corollas are 1.5-2.5cm long and the leaf blades are 2.5-5cm long.

The foliage of *C. sepium* is very similar to *Polygonum convolvulus*, however the inflorescences are markedly different. In *C. sepium* the flowers are large, white, showy and prominent, while those of *P. convolvulus* are small, green, apetalous and barely noticeable. The flowers may lead some to misidentify *C. sepium* as part of the genus *Ipomoea*, and although the leaves of that genus vary greatly, they are not hastate or sagittate (13, 14).

Other members of the family in Michigan (number of species): *Calystegia* - 3, *Convolvulus* - 1 and *Ipomoea* - 5

Ethnobotanical Uses: The stalks and shoots, as well as the young shoots, are edible when washed and steamed and have a pleasant sweet taste, due to being rich in starch and sugars. Although very nutritious, the species should not be eaten in large quantities due to its purgative

effects. The purgative effects can also be used for medicinal purposes as a diuretic. It is also believed that use of the root will increase the flow of bile (17).

Phylogenetic Information: Within the family Convolvulaceae, the genus *Calystegia* is placed in the tribe Convolvuleae according to recent molecular studies. Also included in this tribe are the species of *Convolvulus*, in which *Calystegia* previously was included, and the genus *Polymeria*, endemic to Australia. Within the family, this tribe is closest to the tribe Jacquemontieae (only consisting of the genus *Jacquemontia*), and both tribes are close to the tribe Aniseieae (including *Aniseia*, *Iseia*, *Odonellia*, and *Tetralocularia*). The family Convolvulaceae is part of the Solanales, which is one of the four clades of the Euasterids I, which is in turn part of the Core Asterids. Finally, of course, they are Tricolpate Angiosperms (8, 9).

Interesting Quotation or Other Interesting Factoid not inserted above:

- The species is endangered in New Jersey, yet considered a noxious weed in Texas and Arkansas (1).
- "It has been suggested that unwinding the main stem and rewinding it in the opposite direction will kill the plant" (15).
- The seeds are toxic in large quantities, and the roots appear to be toxic to pigs, yet the pigs still eat them (15).

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- 4) Image of white flower showing calyx copyright Steve Baskauf, 2002-2005

PRIMARY AUTHOR: Marko Melymuka

For additional information on Michigan Plant Diversity web pages please contact Robyn J. Burnham via email: rburnham@umich.edu