

Plant Diversity Website

***Cardiospermum halicacabum* L.**

Common Names: Balloon Vine (2,3), Heart-seed (4), love in a puff (11), and in its native Mexico as froilitos (little lanterns) (19).

Etymology: *Cardiospermum* is the combination of the Latin words *cardio*, meaning heart, and *sperma*, meaning seed and refers to the white heart-shaped pattern on the seed (19).

Halicacabum is derived from the Latin word *halicacabus*, a plant with inflated fruits (7).

Botanical synonyms: none found

FAMILY: Sapindaceae, the Soapberry family (1).

Quick Notable Features:

- Inflated, papery, balloon-like fruits
- Large teeth and lobes found on leaflets of the compound leaves
- Forked tendrils borne at the base of inflorescences

Plant Height: *C. halicacabum* can grow up to 3m in height (10).

Subspecies/varieties recognized:

Cardiospermum halicacabum var. *angustisectum* Griseb., *Cardiospermum halicacabum* var. *microcarpum* (Kunth) Blume (8).

Most Likely Confused with: *Physalis* spp. (ground cherry) (13), *Clematis occidentalis*, *Clematis virginiana*, *Campsis radicans*, *Adlumia fungosa*.

Habitat Preference: Prefers moist thickets, waste places (2, 4), and riverbanks (2).

Geographic Distribution in Michigan: *C. halicacabum* has been reported only in Wayne County (1).

Known Elevational Distribution: Found primarily in low elevation disturbed sites (14).

Complete Geographic Distribution: Native to tropical America (3, 6), *C. halicacabum* has been introduced throughout the southern and southeastern United States (Virginia to Georgia to



Texas) as well as Michigan, New Jersey, Ohio, Illinois, and Montana (6). It is reported as a noxious weed or weed-seed in many southern states. (It can also be found in East Asia, India, Africa, and Southern Europe [16].)

Vegetative Plant Description: Woody (2) annual, many-branched vine with bi-fid (forked) axillary tendrils that are used for climbing (3). Leaves are alternate and twice ternately compound (3). Leaflets bear toothed margins (4), are lanceolate in shape, 2-4cm in length, 1-2cm wide, and faintly pubescent with pinnate venation (2).



Climbing Mechanism: Uses the two-branched axillary tendrils often found at the base of the inflorescences (1,6).

Flower Description: Irregular flowers are borne in panicles (3, 6). Each flower bears four sepals, two large and two small, four whitish petals 4mm long, and eight stamens. Petaloid appendages are at the base of each flower. The 3-celled ovary bears one ovule per cell (3).

Flowering Time: *C. halicacabum* flowers from July to August (4).

Pollinator: Pollinated by bees, wasps, flies, and butterflies (14).



Fruit Type and Description: An “inflated, green, papery capsule” (9), with 3 chambers, 3-4.5cm in diameter (3).

Seed Description: Black, opaque, smooth with a white, finely porous heart-shaped spot at the micropyle (9). Measures 5mm in diameter (3). Seeds ripen from August to October (10).

Dispersal Syndrome: Nothing found in the literature, although it should be noted that capsules are dehiscent, suggesting the possibility of self-dispersal.

Distinguished by: The compound leaflets of *C. halicacabum* are lobed while all species of *Physalis* spp. have simple, unlobed leaves (13). *C. halicacabum* may be distinguished from *Clematis* spp. by its flowers (*Clematis* spp. are apetalous with bisexual flowers), by its climbing mechanism (*Clematis* spp. climb with axillary petioles, and does not have forked tendrils), or by its leaves (*Clematis* spp. are once compound). *Adlumia fungosa*, a biennial vine, can be distinguished via its flowers (which are showy, pink and sympetalous) or its climbing mechanism (prehensile leaves with no tendrils present). *Campsis radicans* can be distinguished from *C. halicacabum* by its leaves, which are pinnately compound with 11-17 leaflets per leaf or by its 5-merous flower structure.

Other members of the family in Michigan: None in the narrowly defined Sapindaceae (1), however, Sapindaceae has been expanded (17) to include the temperate maples and buckeyes (Aceraceae and Hippocastanaceae), thus technically the family now includes all the *Acer* species and *Aesculus* species.

Ethnobotanical Uses: *C. halicacabum* has been used in the treatment of rheumatism, nervous diseases, stiffness of the limbs and snakebite. Leaves are crushed and made into a tea, which aids itchy skin. Salted leaves are used as a poultice on swellings. Young leaves can be cooked as vegetables. The leaf juice has been used as a treatment for earache as well (10,12).

Phylogenetic Information: Sapindaceae is a member of the order Sapindales; other members in this clade in Michigan include Aceraceae, Anacardiaceae, Hippocastanaceae, Rutaceae, and Simaroubaceae. Within the Sapindales, Sapindaceae is closely related to Simaroubaceae, as well as Meliaceae, a tropical family. Sapindales are members of the class Magnoliopsida (17).

Interesting Quotation or Other Interesting Factoid not inserted above: *C. halicacabum* is a problem plant for soybean seed producers because of seed size and shape similarities between the two plants. Furthermore, because of *C. halicacabum*'s ability to form a thick mats, it has become a problem in the Southern United States, where it smothers and kills native vegetation (15).

Literature and websites used:

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- 3) McGregor R.L. 1986. *Flora of the Great Plains*. Lawrence, Kansas, USA: The University Press of Kansas.
- 4) Fernald M.L. 1950. *Gray's Manual of Botany*. New York, New York, USA: American Book Company
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- 7) Brown R.W. 1954. *Composition of Scientific Words*. Washington, D.C., USA: Smithsonian Institution Press.
- 8) The International Plant Names Index (2004). Published on the Internet <http://www.ipni.org> [accessed 10 January 2008]
- 9) Johnston S.K., Murray D.S., and Williams J.C. 1979. Germination and emergence of balloon vine (*Cardiospermum halicacabum*) *Weed Science* 27(1): 73-76.

- 10) Plants For A Future, 1996 -2003. Last modified: June 2004.
<http://www.pfaf.org/database/plants.php?Cardiospermum+halicacabum>
- 11) USDA, NRCS. 2001-2008 The PLANTS Database, Version 3.1, National Plant Data Center, Baton Rouge, LA 70874-4490 USA. <http://plants.usda.gov/>
- 12) Illinois Plant Information Network (ILPIN) <http://www.fs.fed.us/ne/delaware/ilpin/ilpin.html>
Invasive Species. Last modified: July 2006.
- 13) California Department of Food and Agriculture, 2008.
<http://www.cdffa.ca.gov/phpps/ipc/weedinfo/physalis.htm>
- 14) Hawaiian Ecosystems at Risk project, 1997. Last modified: February 25, 2005.
http://www.hear.org/pier/wra/pacific/cardiospermum_halicacabum_htmlwra.htm
- 15) Texas Invasive Species, 2004-2007. Last modified: September, 2006.
http://www.texasinvasives.org/Invasives_Database/Results/Detail.asp?Symbol=CAHA13
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- 17) Judd, W.S., C.S. Campbell, E.A. Kellogg and P.F. Stevens. 1999. *Plant Systematics: A Phylogenetic Approach*. Sunderland, Massachusetts, USA: Sinauer Associates, Inc.
- 18) Germplasm Resources Information Network (USDA) Taxonomy for Plants Website, accessed March 13, 2008 <http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?9014>

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- 1) Image of fruit is courtesy of Daniel Mosquin
http://www.ubcbotanicalgarden.org/potd/2007/10/cardiospermum_halicacabum.php
- 2,3) Image of flower close-up and flowers with leaves from a class project on plants of Central Texas from UT Austin, Bio 406d Native Plants at the University of Texas at Austin.
http://www.sbs.utexas.edu/bio406d/PlantPics_archive.htm
- 4) Image of branched tendril from John D. Byrd, Mississippi State University, Bugwood.org
- 5) Image of seeds courtesy Steve Hurst @ USDA-NRCS PLANTS Database.
<http://plants.usda.gov/java/profile?symbol=CAGR13>

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