

Plant Diversity Website

Humulus japonicus Sieb. & Zucc.

Common Names: Japanese hops

Etymology: *Humulus* is a Latin name of uncertain origin; it may have come from the Low German word “humela” for hop. “*Japonicus*” means of or belonging to Japan (6).

Botanical synonyms: *Humulus scandens* (Louriero.) Merrill.

FAMILY: Cannabaceae, the Hemp Family (also called Cannabidaceae, Cannabiaceae, and Cannabinaceae).

Quick Notable Features:

- ↪ dioecious plant with opposite leaves
- ↪ small, white staminate flowers and pistillate flowers arranged in pairs in aments
- ↪ aggressively twining with the apical part of the plant

Plant Height: Annual stems of up to 10m, usually 0.5m to 2.5m

Subspecies/varieties recognized:
none found

Most Likely Confused with:

Humulus lupulus and *Rubus* spp.,
Echinocystis lobata.

Distinguished by: This species is similar in appearance, and keys closely, to the related *Humulus lupulus*. They differ in that *H. japonicus* is 5-7 lobed and has stiff hairs on the main veins while *H. lupulus* is 3(to 5) lobed with only soft hairs on leaf undersurfaces. *H. lupulus* also has a petiole that is shorter than its leaf blade, while *H. japonicus* has a petiole as long or longer than the leaf blade. The leaves are similar to *Echinocystis lobata*, a member of the Cucurbitaceae, but the axillary tendrils on *Echinocystis* are not found in *Humulus*, and the presence of downward prickles is only found in *Humulus japonicus*. It may be confused with



Rubus spp. due to similar leaves, but *Humulus* leaves are opposite, while the *Rubus* species leaves are alternate.

Habitat Preference: Found along “roadsides, waste places and fence-rows” (1).



Geographic Distribution in Michigan: found in Cass, Washtenaw, Wayne, and St. Clair counties, most likely escaped from cultivation (9).

Known Elevational Distribution: Found as high as 1,800m in eastern Yunnan province and as high as 2,100m on the Loess-Plateau, both in China (10, 11).

Complete Geographic Distribution: In the United States it is found in all states east of Kansas, Nebraska and the Dakotas except Louisiana, Mississippi and Florida as well as areas of Canada adjacent to the United States (9).

Vegetative Plant Description: This is a weedy annual vine with opposite “leaves that are mostly 5-7 lobed, with deep, narrow sinuses. The scabrous surfaces lack waxy granules and the petioles are often longer than blade” (1). The vine has a rough stem, that bears prickles pointed downward and is much rougher than *H. lupulus* (1, 2 and 5).

Climbing Mechanism: The stem apices strongly twine around other plants as they climb (4). In addition, the downward pointing prickles no doubt aid in anchoring the plant to its host or substrate.

Flower Description: The species is dioecious. The staminate flowers are in “loose axillary panicles, with 5 sepals and 5 erect stamens” and are up to 40cm long; there are no petals. The pistillate flowers are borne in pairs in short axillary and solitary spikes or aments; the aments are compact. The bracts along the herbaceous ament are attenuate and narrower than the achenes. The style is prolonged into 2 filiform stigmas (1, 2).

Flowering Time: July to September in the northeastern United States (7).

Pollinator: The presence of pistillate catkins and apetalous, reduced flowers suggests wind pollination (7).

Fruit Type and Description: The fruit is an achene enclosed by the persistent calyx and bracts. In the picture of the fruit to the right, the lines on the ruler are 1mm apart, so each achene is 3-5mm.

Seed Description: Because the fruit is an achene (a single-seeded fruit that does not



open), the seed is dispersed with the achene. No reports of the seeds were found for this species.

Dispersal Syndrome: The small, light achenes are most probably dispersed by mechanical means, such as strong winds or water currents (11).

Other members of the family in Michigan (number species): *Humulus* - 2, *Cannabis* – 2 (9)

Ethnobotanical Uses: The seed oil can be used to make soap, the whole plant can be used as a diuretic and the young shoots and stems are edible (10). It lacks the glands present in *H. lupulus* and cannot be used to brew beer (5).

Phylogenetic Information: Judd, et. al. (3) explain the following about the Urticales, in which the Cannabaceae belongs:

Ulmaceae, Celtidaceae, Cannabaceae, Urticaceae, Moraceae and Cecropiaceae probably constitute a clade, which is diagnosed by globose to elongate cystoliths (concretions of calcium carbonate) within specialized cells (lithocysts), reduced, inconspicuous flowers with five or fewer stamens, and two-carpellate, unilocular ovaries, with a single, apical (to basal) ovule.

They go on to explain that they are “closely related to Rosaceae and Rhamnaceae, and therefore are placed within Rosales (as the suborder Urticineae). However, phylogenetic placement of *Cannabis* and *Humulus* is not certain because, as stated before, they possess laticifers, which would place them with the Urticales, but “*rbcL* sequences places them with Celtidaceae.”

Interesting Quotation or Other Interesting Factoid not inserted above:

- Pollen may cause dermatitis or hayfever (7)
- Unlike the related *H. lupulus*, only the leaves and young shoots are edible
- Can be used as a diuretic (9)
- Very closely related to *H. lupulus*, which lends beer its distinctive flavors.
- It is also in the same family, Cannabaceae, as *Cannabis sativa*; marijuana.

Literature and websites used:

- 1) Fernald, M.L. 1950 *Gray's Manual of Botany*, Fourth Edition. New York: American Book Company, p. 556.
- 2) Gleason, H.A. 1963. *Illustrated Flora of the Northeastern United States and Adjacent Canada*. New York and London: Hafner Publishing Company, Inc.
- 3) Judd, W.S., C.S. Campbell, E.A. Kellogg & P.F. Stevens 1999. *Plant Systematics: A Phylogenetic Approach*. Sunderland, Massachusetts: Sinauer Associates, Inc.
- 4) Hitchcock, C. L. & A. Cronquist 1973. *Flora of the Pacific Northwest*. Seattle and London: University of Washington Press.
- 5) Gleason, H. A. & A. Cronquist 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*, Second Edition. Bronx, NY: The New York Botanical Garden.
- 6) Charters, M. L. 2006. Latin and Greek meanings and Derivations. In *calflora – California Plant Names*. http://www.etymologie.info/~e/u/_us-__ca__.html
- 7) Iverson, L.R., D. Ketzner, & J. Karnes 1999. Illinois Plant Information Network. Database at <http://www.fs.fed.us/ne/delaware/ilpin/ilpin.html> Illinois Natural History Survey and USDA Forest Service.
- 8) Small, E. 1997 Cannabaceae Endlicher, Hemp Family. In: *Flora of North America*. Vol 3., New York and Oxford http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=10154
- 9) PLANTS Profile for *Humulus japonicus* (Japanese Hop) <http://plants.usda.gov/java/profile?symbol=HUJA>

10) Plants For A Future, Charity No. 1057719, Company No. 3204567

<http://www.pfaf.org/database/plants.php?Humulus+japonicus>

11) Mehrhoff, L.J., J.A. Silander, Jr., S.A. Leicht, E.S. Mosher & N. M. Tabak 2003. IPANE: Invasive Plant Atlas of New England. Department of Ecology & Evolutionary Biology, University of Connecticut, Storrs, CT, USA.

URL: <http://www.ipane.org>

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1) male flower image is from Delaware Wildflowers at <http://www.delawarewildflowers.org>

2) Image of foliage close-up is from TNC weeds (Global Invasive Species Team)
<http://tncweeds.ucdavis.edu/esadocs/humujapo.html> © John Randall/The Nature Conservancy

3) Image of plant habit is from TNC weeds (Global Invasive Species Team)
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4) Image of bracted achenes is from Missouri Weed Seeds at
<http://extension.missouri.edu/explore/agguides/pests/ipm1023cannabaceae.htm>
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