

Plant Diversity Website

Echinocystis lobata (Michaux) Torr. & Gray

FAMILY: Cucurbitaceae, the gourd family (3)

Common Names: Wild-cucumber, Prickly Cucumber, Wild Balsam Apple, Balsam Apple, Wild mockcucumber (3, 6).

Etymology: *Echino*- from the Latin *echinus* meaning “hedgehog” which is covered with spines. The second portion, *-cystis*, comes from the Greek *kystis*, which means “a sac or bladder.” *Lobata* is modern Latin meaning “with lobes” (12).

Botanical synonyms: *Micrampelis lobata* (Michx.) Greene, *Momordica echinata*, *Sicyos lobata* Michx (3, 11)

Quick Notable Features:

- climbing vine with trifid tendrils 90 degrees from petiole insertion (not axillary)
- lobed, alternate leaves
- 6-petalled white flowers, either male or female
- unusual spiky green fruit resembling a small cucumber

Plant Height: climbs within trees reaching 6m or more (5,18).

Subspecies/varieties recognized: None found.

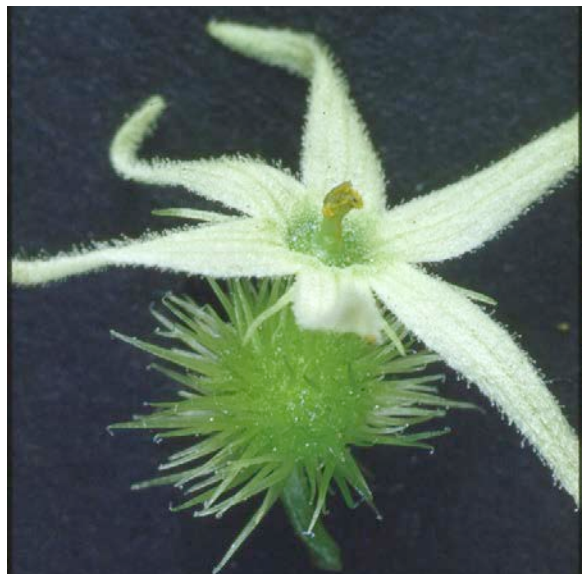
Most Likely Confused with: *Menispermum canadense*, *Sicyos angulatus*, and *Marah macrocarpus* (3, 9, 10).

Habitat Preference: “Swamps (deciduous), floodplains, river banks, streamsides, marshy ground, thickets, borders of woods, fencerows, roadsides, railroad embankments, gravel pits, waste ground such as alleys and refuse areas” (1). Requires moist soil and cannot grow in the shade (4), but can be cultivated in shady areas (RJB personal observation).

Geographic Distribution in Michigan: Throughout the Upper and Lower Peninsulas, with the exception of a few counties, particularly inland in the northern half of the Lower Peninsula and the eastern side of the Upper Peninsula (1).

Known Elevational Distribution (and source): Known up to 1400m in Utah (15).

Complete Geographic Distribution: It is found through most of the continental United States excluding CA, NV, LA, MS, AL, FL, SC and TN. Also present in southeastern Canada (2, 13).





Vegetative Plant Description: The stems are soft, hairless (sometimes hairy at the nodes), fleshy, and grooved lengthwise. Leaves are thin, bright green, usually smooth-margined to very finely serrated, with five deep lobes and the petiole attaching on the rounded leaf base. The leaves are palmately veined with the main veins extending out of the leaf margin at the apex of each lobe (3, 5, 14).

Climbing Mechanism: The species uses long, curling 3-forked tendrils arising 90° to leaves at the same node. The tendrils are sensitive to touch and a coil forms when they touch any support. The coils are formed by contraction of the cells in contact with the support and expansion of the cells on the opposite side (3, 5, 12, 14). The homology of the tendrils has been disputed but the most recent interpretation is that they are stem analogs (19).

Flower Description: Upright racemes of six-petalled unisexual white flowers approximately 1cm across (3). Monoecious and self-fertile (4). Male flowers occur on long, branching panicles borne in the axil of each leaf. They have small petals, white or greenish-white, with yellow anthers

and no ovary and three stamens, united by their filaments into a column, with connivent anthers (16). The female flowers have a small, rounded spiny ovary below the yellow-green petals (5).

Flowering Time: July through August (3) (site not specified)

Pollinator (and evidence): The colorful and sweet-smelling flowers suggest insect pollination, while the tubular flowers make it evident that the plant is not wind-pollinated. The monoecious plant is capable of self-fertilization, which is actually rather common in this species (4).

Fruit Type and Description: The fruit is soft and prickly, spherical to oblong in shape. When unripe, the fruit is green and fleshy, 2.5 - 5cm in length. When ripe, the fruit becomes dry and brown, opens at the bottom and the seeds spill out. It is inflated and loosely resembles a cucumber covered in soft spines, but its contents are mostly air (1, 3, 5). The small fruit is seen at the beginning of this website and a more mature fruit is seen to the right.



Seed Description: "Seeds large, flat with a thick hard and roughened coat" (14).

Dispersal Syndrome: Birds and rodents eat the fruits and disperse the seeds. The seeds are also expelled from the fruit at over 11.5m/sec by hydrostatic pressure (7, 12).



Distinguished by: It most closely resembles *Menispermum canadense* (common moonseed) whose leaves are less deeply and sharply lobed. It could also be confused with various *Sicyos spp.* (burr cucumbers) whose fruits are smaller and with a single seed instead of many. The fruits are also arranged in clusters, not solitary and the flowers have five

petals. *Marah macrocarpus* is another impostor possibility and is also known as the wild cucumber; it occurs in southern California, growing in chaparral. The fruit, leaves, and form are similar to *E. lobata* but the flower has five petals rather than six (3, 9, 10).

Other members of the family in Michigan and number species: Citrullus-1 (watermelon), Cucurbita-2 (gourd, squash, pumpkin), Cucumis-2 (cucumber and melon), Sicyos-1 (1)

Ethnobotanical Uses: Cultivated as an ornamental annual vine (1). Can be used as a poultice for headaches by pulverizing the root. A bitter-tasting tea can be brewed from the roots and used as an analgesic, love potion, and a tonic for stomach troubles, kidney ailments, rheumatism, chills and fever. The seeds have been used as beads (4). Used by the Cherokee for “obstructed menses”, rheumatism, chills, fevers, kidneys, headache, love potion, tonic, stomach troubles, and beads (8).

Phylogenetic Information: Zhang and colleagues (17) explain the following about the order Cucurbitales: “The Cucurbitales are a clade of rosids with a worldwide distribution and a striking heterogeneity in species diversity among its seven family members: the Anisophylleaceae (29-40 species), Begoniaceae (1400 spp.), Coriariaceae (15 spp.), Corynocarpaceae (6 spp.), Cucurbitaceae (800 spp.), Datisceae (2 spp.), and Tetramelaceae (2 spp.).”

They further explain the group: “Cucurbitales are strongly supported as monophyletic and are closest to Fagales, albeit with moderate support; both together are sister to Rosales. The deepest split in the Cucurbitales is that between the Anisophylleaceae and the remaining families; next is a clade of Corynocarpaceae and Coriariaceae, followed by Cucurbitaceae, which are sister to a clade of Begoniaceae, Datisceae, and Tetramelaceae. Based on this topology, stipulate leaves, inferior ovaries, parietal placentation, and one-seeded fruits are inferred as ancestral in Cucurbitales; exstipulate leaves, superior ovaries, apical placentation, and many-seeded fruits evolved within the order. Bisexual flowers are reconstructed as ancestral, but dioecy appears to have evolved already in the common ancestor of Begoniaceae, Cucurbitaceae, Datisceae, and Tetramelaceae, and then to have been lost repeatedly in Begoniaceae and Cucurbitaceae.”

Interesting Quotation or Other Interesting Factoid not inserted above:

- This vine is considered an invasive plant in Poland (6)

- When ripe, the fruit explodes via hydrostatic pressure, expelling the seeds at over 11.5m/sec

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