# Plant Diversity Website

## ***Smilax rotundifolia*** Linnaeus

**Common Names**: Common greenbrier, bullbrier, roundleaf greenbrier, common catbrier, horsebrier (1,3).

**Etymology**: *Smilax* is the Greek word for "clasping" and curiously also the Greek name of an evergreen oak. *Rotundifolia* means "round-leaved" (5,10).

***Botanical synonyms****: Smilax caduca* L., *Smilax quadrangularis* Muhl. ex Willd. (7).

**FAMILY**: Smilacaceae, the Greenbrier Family

**Quick Notable Features** (10,12):
¬ High climbing woody vine with armed stems
¬ Alternate lustrous leaves with arching main veins
¬ Axillary umbellate inflorescences bearing either pistillate or staminate flowers only, on each plant
¬ Small flowers with 6 green tepals
¬ Glaucous, bluish-black berries

**Plant Height:** Usually 5-6 m tall, but up to 12 m (2,6).

**Subspecies/varieties recognized** (7):
*S. rotundifolia* var. *caduca* (L.) Prov.
*S. rotundifolia* var. *californica* A. DC.
*S. rotundifolia* var. *crenulata* Small & A. Heller
*S. rotundifolia* var. *engelmanniana* (Kunth) A. DC.
*S. rotundifolia* var. *missourensis*A. DC.
*S. rotundifolia* var. *parviflora* A. DC.
*S. rotundifolia* var. *quadrangulares* (Muhl. ex Willd.) Alph. Wood
*S. rotundifolia* var. *sprengelii* (Kunth) A. DC.

**Most Likely Confused with:** *Smilax ecirrhata*, *S. herbacea*, *S. hispida*, *S. lasioneura*, *Dioscorea villosa, Menispermum canadense, Vinca* spp.

**Habitat Preference:** The common greenbrier is most often found in forests with sandy, moist to dry soils (1,10).

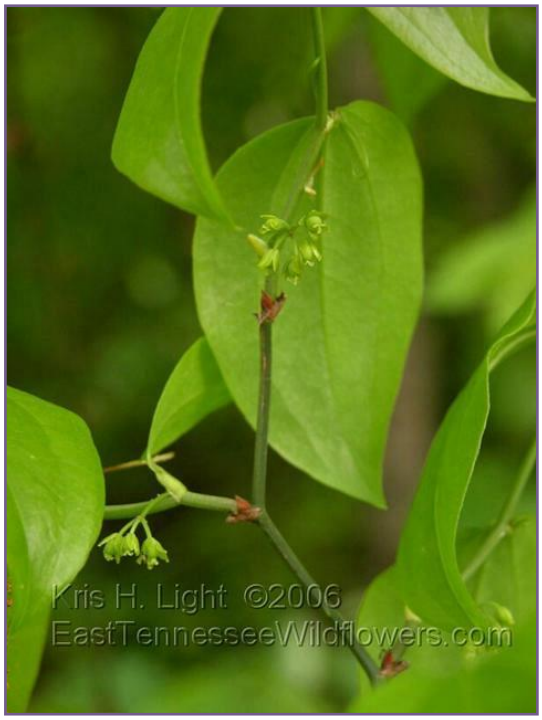
**Geographic Distribution in Michigan:** *S. rotundifolia* is mainly found in the

southwestern coastal counties of the Lower Peninsula: Muskegon, Ottawa, Allegan, Van Buren, and Berrien, but also in Kalamazoo, Cass, Newaygo, Washtenaw, and St. Clair (1).

**Known Elevational Distribution:** The species grows between 0 and 900 m above sea level. The highest elevation reported was in Graham Co., NC (2,14).

**Complete Geographic Distribution:** Native to North America, the roundleaf greenbrier is found in nearly every state east of Texas (except North Dakota, Nebraska, Vermont), and also in Canada in Ontario and Nova Scotia (3).

**Vegetative Plant Description:** *S. rotundifolia* is a perennial high climbing, thicket-forming woody vine with armed, glabrous, 4-angled green stems (especially the young branches), and linear rhizomes. The stout prickles are green and flattened at the base, dark reddish-brown at the apex, up to 1.2 cm long, and straight or slightly curved. A pair of sheathing stipules is adnate to the petiole, and tendrils originate from the petiole distal to where the stipules end. The petioles are glabrous and 0.5-1.5 cm long. The leaves (deciduous or semi-evergreen) are alternate, simple, ovate to broadly ovate or lanceolate with round to cordate bases, acute to acuminate apices, and entire margins. The glabrous leaf blades can bear minute prickles abaxially, are coriaceous, glossy dark green above, 4-17 cm long, 4-16 cm broad, and have 3-5 parallel veins that arch apically (1,2,8,10,12,14).




**Climbing Mechanism**: The species uses the paired tendrils emerging from near the base of the petioles to climb (10).

**Flower Description:** *S. rotundifolia* is a dioecious monocotyledon. The round umbels usually bear 5-12 unisexual flowers each, rarely up to 25. The flattened peduncles are 0.3-1.5 cm long, and axillary on the lower nodes of the branches. The inconspicuous flowers are radially symmetrical, with 6 tepals in two whorls that are green, yellowish, or bronze, apically pubescent, deciduous, and imbricate. Staminate flowers (6-7.2 mm in diameter) bear 6 stamens inserted on the base of the tepals; the filaments are 2-3x the length of the white anthers. Male flowers are borne on pedicels 5-12 mm long, while pedicels of pistillate flowers (4.1-5.8 mm in diameter) are 3-7 mm long. Pistillate flowers bear 6 staminodes, a 3-carpellate superior ovary with a very short style and 3 spreading stigmas; each locule produces 1 ovule (2,8,9,10,12,14).

**Flowering Time:** April-June (2).

**Pollinator:** *S. rotundifolia* is insect pollinated, most likely by bees and flies (9,14). “Its pollen is linked by viscin threads, effectively preventing wind dispersal” (9). *Smilax* ssp. flowers produce nectar at the base of the perianth and/or stamens (11).

**Fruit Type and Description:** The fruit is a globose berry, bluish-black with a waxy bloom, 0.5-0.8 cm across. The berries are persistent through the winter, producing 1-3 seeds (2,8,10,12).

**Seed Description:** The seeds are reddish-brown, 3-5 mm long, and contain a small, oblong embryo under a protuberance at the apex of the seeds (8,12).

**Dispersal Syndrome:** The fruits are consumed by birds, such as northern cardinals and white-throated sparrows. Small mammals also spread the seeds, or they can be carried by water. *S. rotundifolia* also spreads vegetatively by rhizomes (13,14).

**Distinguished by**: *S. ecirrhata* has unarmed erect stems usually no taller than 50 cm, the tendrils are absent, the leaves are cordate, and the petioles are usually longer than the peduncles. In contrast, *S. rotundifolia* is usually many meters tall, the stems are armed with stout prickles, tendrils are present, leaves are ovate, and petioles are at most the same length as the peduncles. *S. herbacea* and *S. lasioneura* have herbaceous and unarmed stems, and their inflorescences bear more than 20 flowers. *S. rotundifolia* has woody armed stems, its inflorescence usually bears 5-12 flowers. Additionally, the leaf blades of *S. lasioneura* are finely pubescent below, glabrous on *S. rotundifolia*. *S. hispida* has bristle-like prickles that are uniform in color: greenish when young, blackish when mature; in *S. rotundifolia* they are stout and green with a dark apex. Additionally, the fruit is not glaucous like the fruit of *S. rotundifolia*. *Dioscorea villosa* is herbaceous and climbs by twining around other plants (tendrils are absent), the leaf base is cordate, the inflorescence is paniculate, and the pistillate flowers have an inferior ovary that later develops into a capsule. *S. rotundifolia* inflorescences are umbellate and the pistillate flowers have a superior ovary that later develops into a berry. *Menispermum canadense* is a woody vine with alternate slightly peltate leaves that are basally cordate and can be shallowly lobed. The flowers have a 4-8-parted calyx and a 6-8-parted corolla, staminate flowers have 12-24 stamens, and pistillate flowers produce a dark glaucous drupe. *S. rotundifolia* leaves are neither peltate nor lobed, its flowers have 6 tepals, and the staminate flowers bear only 6 stamens. *Vinca* ssp. are usually trailing or creeping, but can reach 2 meters high. Although somewhat similar in shape and glossy, the leaves of *Vinca* ssp. are opposite, ciliate (on *V. major*), and its largest leaves are only as long as the smallest leaves of *S. rotundifolia*, which has alternate leaves and no cilia. *Vinca* ssp. flowers have male and female

organs on the same flower (perfect), are 5-merous with q blue-violet corolla, and produce follicles (1,2,10).

**Other members of the family in Michigan (number species):** *Smilax* (5) (source 1).

**Ethnobotanical Uses:** The root of *S. rotundifolia* is rich in starch and can be ground and used as flour, cooked and consumed as a "potato", or used to make beer. Young stems can be consumed raw in salads or cooked. The leaves and stems can be boiled into a tea used to treat rheumatism and alleviate stomach problems. A powder from the leaves can be applied to burns. The roots has been made into a tea to aid post labor placental expulsion (6).

**Phylogenetic Information**: *Smilax rotundifolia* is included in the *Smilax* section of the genus *Smilax* in the Smilacaceae family, which is in the Liliales order, part of the Monocotyledoneae clade of Angiosperms. The Smilacaceae is often classified as a subfamily in an expanded Liliaceae. The Liliales order includes 10 other families: Corsiaceae, Campynemataceae, Melanthiaceae, Petermanniaceae, Colchicaceae, Luzuriagaceae, Alstroemeriaceae, Rhipogonaceae, Philesiaceae, and Liliaceae. Smilacaceae is a family of vines and lianas; members of the family can be found in tropical and temperate regions in all continents except Antarctica. There are only two genera in the family: *Smilax* and *Ripogonum*, the latter only occurring in Oceania (4,10,11).

**Interesting Quotation or Other Interesting Factoid not inserted above:** *Smilax walteri* is considered the closest species to *S. rotundifolia* (11). There are only two woody monocots in southern Canada: *S. rotundifolia*, considered rare, and *S. tamnoides* (= *S.hispida*) (9,13). Although the common greenbrier is native to the U.S., because it tends to form very dense thickets it can be considered weedy and unwanted by humans. However, it offers refugia for small animals and birds (3,10,13), such as beaver, cottontail rabbit, and white-tailed deer, all of which consume woody and herbaceous parts of *S. rotundifolia* (14). The tendrils in *Smilax* originate from splitting petioles (15). "… it is concluded, on the grounds of anatomy and external morphology, that these tendrils are equivalent to the petiole in morphological value, and have arisen through chorisis or dédoblement of that organ" (16).

**Literature and websites used:**


1. Michigan Flora Online. A.A. Reznicek, E.G. Voss, & B.S. Walters. February 2011. University of Michigan. Web. December 17, 2013. http://michiganflora.net/species.aspx?id=2692.
2. Holmes, W.C. 2003. *Flora of North America, Vol. 26: 227. Smilacaceae*. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101941
3. USDA, NRCS. 2013. The PLANTS Database (http://plants.usda.gov, 12/17/2013). National Plant Data Team, Greensboro, NC 27401-4901 USA.
4. Stevens, P.F. Angiosperm Phylogeny Website. Version 12, July 2012. http://www.mobot.org/mobot/research/apweb.
5. Robert W. Freckmann Herbarium 2013. *Smilax Illinoensis*. University of Wisconsin, Stevens Point.http://wisplants.uwsp.edu/scripts/detail.asp?SpCode=SMIILL
6. Plants For A Future, 1996-2012. Accessed: 17 December 2013. http://pfaf.org/user/Plant.aspx?LatinName=Smilax+rotundifolia

7. Tropicos.org. Missouri Botanical Garden. 17 Dec 2013 <http://www.tropicos.org/Name/18401326>
8. Britton, N.L. & H.A. Brown 1970. *An Illustrated Flora of the Northern United States and Canada: Volume I*. New York, NY: Dover Publications, Inc.
9. Kevan, P.G., J.D. Ambrose, & J.R. Kemp 1991. Pollination in an understorey vine, *Smilax rotundifolia*, a threatened plant of the Carolinian forests in Canada. *Canadian Journal of Botany* 69(11): 2555-2559.
10. Fernald, M.L. 1950. *Gray's Manual of Botany,* 8th ed. New York: American Book Co.
11. Judd, W.S. 1998. The Smilacaceae in the southeastern United States. *Harvard Papers in Botany* 3(2): 147-169.
12. Radford, A.E., H.E. Ahles, & C.R. Bell 1968. *Manual of the Vascular Flora of the Carolinas*. Chapel Hill, North Carolina, USA: The University of North Carolina Press.
13. Carey, J.H. 1994. *Smilax rotundifolia*. In: Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/plants/vine/smirot/all.html [12/18/2013].
14. Hilty, J. 2004-2013. Trees, Shrubs, and Woody Vines of Illinois. http://www.illinoiswildflowers.info/trees/plants/rl_greenbrier.html
15. Mangaly, J.K. 1968. A cytotaxonomic study of the herbaceous species of *Smilax*: section Coprosmanthus. *Rhodora* 70(781): 55-82.
16. Arber, A. 1920. Tendrils of *Smilax*. *Botanical Gazette* 69: 438-442.

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