

Plant Diversity Website

***Strophostyles helvula* (L.) Elliot**

Common Names: Amberique-bean, Wild bean, Trailing wild bean, Annual wooly-bean, Trailing fuzzy-bean, Sand bean, Trailing bean, Pink wild bean (2, 4, 10, 11).

Etymology: *Strophostyles* is derived from the Greek words *strophe*, meaning turning, and *stulos*, meaning style, and refers to the “curved style” (3). *Helvula* comes from the Latin word *helvus* and means yellowish (13).

Botanical synonyms: *Strophostyles helvola*, *Phaseolus helvolus* L. (2), *Glycine helvula* (L.) Elliott, *Cajanus helvulus* (L.) Spreng. (5).

FAMILY: Fabaceae (Pea Family) (2)



Quick Notable Features:

- ¬ Leaves three-foliate
- ¬ Leaflets with 2 or 3 lobes
- ¬ Flowers pink to purple in color, wings without a basal auricle
- ¬ Beak or sickle shaped keel does not twist and is longer than the wings
- ¬ Seeds are woolly and rectangular

Plant Height: Grows up to 2m (6,7,8).

Subspecies/varieties recognized:

Strophostyles helvula var.
missouriensis (S. Watson) Britton (4)



Most Likely Confused with: Possibly any member of the Fabaceae, the most closely related are *Strophostyles umbellata*, *Strophostyles leiosperma*, but also *Amphicarpaea bracteata*, *Apios americana*, *Desmodium rotundifolium*, *Lathyrus japonicus*, *Lathyrus latifolius*, *Lathyrus ochroleucus*, *Lathyrus palustris*, *Lathyrus pratensis*, *Lathyrus sylvestris*, *Lathyrus tuberosus*, *Lathyrus versus*, *Phaseolus olystachios*, *Phaseolus vulgaris*, *Pisum sativum*, *Pueraria lobata*, *Vicia americana*, *Vicia caroliniana*, *Vicia cracca*, *Vicia etrasperma*, and *Vicia villosa*.

Habitat Preference: Found in roadsides, sandy soil, disturbed areas, moist areas of rich woods with high light, open clearings and thickets (1,6,7,8). It also thrives along the beach shores of Lake Erie in fine lake sand (17).

Geographic Distribution in Michigan: Found in the following Michigan counties: Berrien, Van Buren, Monroe, Wayne, and Muskegon (1).

Known Elevational Distribution: no information found

Complete Geographic Distribution: The species is native to the eastern and central portions of the United States and Canada. (2, 8).

Vegetative Plant Description: *S. helvula* is an herbaceous annual with stems that branch mostly from the base and that range from glabrous to "spreading-pilose" (7). Leaves are compound, alternate, petioled, and stipulate. They range from glabrous to slightly strigose, and consist of three leaflets with concave sides. The leaflets are oblong to ovate, pandurate (fiddle-shaped), "often basally lobed", and come to a point at the tip (7). The number of lobes ranges from one to three. Leaflets range from 2 - 6.5cm long and 0.8 - 4cm wide. Leaflets also have persistent stipules that are small and striate (3, 6, 7, 8).

Climbing Mechanism: Stems either trailing or twining in a dextral orientation (left to right, see image; 6, 7, 8).



Flower Description: *S. helvula* has pink-purple to white flowers that are 8 - 14mm long. The inflorescence is borne on a long penduncle that is 50 - 200mm long. The flowers are then grouped into an axillary raceme that is 50 - 300mm long and forms a head-like inflorescence. Each raceme contains few to several flowers. The pedicels of each flower are about 1mm in length with linear striate bracts of 1-2mm subtending, although they are often described as nonexistent, with the flower sessile on the penduncle. The bracteoles of each flower are persistent, hairless, lanceolate, and acute. They range in length from 2-3mm. The calyx is irregular with 4 lobes, as the upper 2 lobes are fused. The bottom lobe is the longest, much

longer than the calyx tube. The calyx tube is bell-shaped and generally glabrous, but can have some appressed hairs. There are 5 petals: a standard, two wings and two fused keel petals. The standard is "broadly round-ovate" or orbicular with the sides folding over the other petals at the base and is 10-20mm wide. The keel is oblong and widest at the middle, just before it curves upward into a beak or sickle. However, the keel does not become coiled as in the genus *Vigna*. The wings are quite a bit shorter than the keel. The ten



stamens are curved along with the keel in two groups, one group of nine plus a single stamen. The ovary is sessile, with a curved style that is often bearded on the inside edge (3, 6, 7, 8).

Flowering Time: June-Sept.; Aug-Oct. [in Carolinas]” (7) “June-Oct.” [central and NE U.S. and Adj. Canada] (8)

Pollinator: Reported (12) to be visited a monolectic bee that pollinates only *S. helvula*.

Fruit Type and Description: The fruit of *S. helvula* ranges from 4 to 9cm long and contains 1 to 8 seeds. It is a dehiscent fruit that is linear, elongate, nearly cylindrical, and has a few appressed hairs. When mature, the valves become “laterally twisted” (6, 7, 8, 17).

Seed Description: Seeds are square or oblong with truncated ends and “covered with a deciduous felty drab coat.” They weigh 30-65mg each (17). The white hilum is linear, ranging from 4 to 10mm long (6, 7, 8).

Dispersal Syndrome: Seeds are forcibly ejected from the pods, with those at the distal end traveling furthest (16).



Distinguished by: Lobed leaflets and the calyx lobes that extend beyond the calyx tube distinguish *S. helvula* from the species of *Phaseolus*. *S. helvula* has three leaflets, which distinguishes them from species of *Lathyrus* and *Vicia*, as well as *Pisum sativum*. *S. helvula* has an excurrent vein that runs beyond the leaf tip, distinguishing it from *Desmodium rotundifolium* and *Amphicarpaea bracteata*. A long raceme and straight keel petals, and a glabrous style on *Pueraria lobata* distinguish it from *S. helvula*. *S. helvula* can be distinguished from *S. umbellata* by the lanceolate bracteoles that usually reach to the sinuses of the calyx tube on *S. helvula*. *S. leiosperma* has lanceolate leaflets that are not lobed, distinguishing it from *S. helvula*. The five calyx-lobes of *Apios americana* distinguish it from *S. helvula*.

Other members of the family in Michigan (number species): *Amorpha* (2), *Amphicarpaea* (1), *Anthyllis* (1), *Apios* (1), *Astragalus* (3), *Baptisia* (4), *Caragana* (1), *Cercis* (1), *Chamaecrista* (2), *Cladrastis* (1), *Colutea* (1), *Crotalaria* (1), *Cytisus* (1), *Dalea* (1), *Desmodium* (12), *Genista* (1), *Gleditsia* (1), *Glycine* (1), *Gymnocladus* (1), *Hedysarum* (1), *Kummerowia* (1), *Lathyrus* (10), *Lespedeza* (13), *Lotus* (1), *Lupinus* (2), *Melilotus* (2), *Mimosa* (1), *Orbexilum* (1), *Phaseolus* (2), *Pisum* (1), *Pueraria* (1), *Robinia* (3), *Securigera* (1), *Senna* (1), *Strophostyles* (1), *Tephrosia* (1), *Trifolium* (9), *Vicia* (8), *Vigna* (1), *Wisteria* (1) [1]

Ethnobotanical Uses: Some Native American tribes used the roots of *S. helvula* for food, mashing them up after boiling. Other Native American tribes used *S. helvula* to treat warts and poison ivy, as well as typhoid when mixed with Indian Coffee (*Cassia tora*) (10, 11).

Phylogenetic Information: *S. helvula* is a member of the family Fabaceae, subfamily Faboideae. Families Fabaceae, Polygalaceae, Quillajaceae, and Surianaceae form the Fabales order. The Fabales, Rosales, Cucurbitales, and Fagales form a monophyletic group within the Eurosids I within the larger Rosid group. All are eudicots are angiosperms (14).

Interesting Quotation or Other Interesting Factoid not inserted above:

S. helvula is listed as a plant of special concern in Michigan, which means that it is not under legal protection, but it is a rare plant in Michigan (9). The species was studied along the shore of Lake Erie in Ontario, Canada, where it was quite common in 1996 (17). The populations

were denser but seeds were heavier in the shifting sands at the top of the beach face where the heavier seeds were advantageous in helping the young seedlings emerge from the deep sands in the spring.

Although the official name of the species is *S. helvula*, it is frequently found in the literature using the synonym *S. helvola* (15).

Literature and websites used:

1. Voss, E.G. 1985. *Michigan Flora Part II: Dicots (Saururaceae – Cornaceae)*. Ann Arbor, Michigan, USA: Regents of the University of Michigan.
2. The PLANTS Database: USDA, NRCS, 1991-2007. Accessed January - March 2008. <http://plants.usda.gov/java/profile?symbol=STHE9>
3. Gleason, H.A. 1963. *Illustrated Flora of the Northeastern United States and Adjacent Canada*, Volume 2. New York, New York, USA: Hafner Publishing Company, Inc.
4. Song, H. 2006. Flora of Missouri. 5 February 2008. Accessed January through March 2008. http://www.efloras.org/florataxon.aspx?flora_id=11&taxon_id=242417331
5. Tropicos Beta. Missouri Botanical Garden. Last updated 5 February, 2008. Accessed January through March 2008. <http://test.tropicos.org/Name/13048661/Details>
6. Gleason, H.A. & A. Cronquist. 1991. *Manual of Vascular Plants of the Northeastern United States and Adjacent Canada*. Bronx, N.Y: New York Botanical Garden Press.
7. 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.
8. Fernald, M.L. 1950. *Gray's Manual of Botany*, 8th ed. New York, USA: American Book Company.
9. Michigan Natural Features Inventory. 2007. Rare Species Explorer (Web Application). Accessed Feb 12, 2008. <http://web4.msue.msu.edu/mnfi/explorer>.
10. Southeastern Woodlands Culture. Accessed 19 February 2008. http://www.fourdir.com/southeastern_woodlands_culture.htm
11. Immel, D. "Trailing Fuzzybean". USDA NRCS National Plant Data Center. Last modified: 4 June 2003. Accessed February and March 2008. <http://plants.usda.gov/java/profile?symbol=STHE9>
12. Ramel, Gordon. 2008 An Introduction to the Solitary Bees: (Hymenoptera, Apoidea) Last accessed March 2008. <http://www.earthlife.net/insects/solbees.html>
13. Brown, R.W. 1978. *Composition of Scientific Words*. Washington D.C.: Smithsonian Institution Press.
14. ANGIOSPERM PHYLOGENY GROUP 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Botanical Journal of the Linnean Society* 141(4):399-436.
15. Elliott, S. 1821. *A Sketch of the Botany of South Carolina and Georgia*. Charleston, South Carolina: J. R. Schenck Publ.
16. Maun, M.A. 2009. P. 49 in *The Biology of Coastal Sand Dunes*. Oxford University Press, Oxford.
17. Yanful, M. & M.A. Maun 1996. Spatial distribution and seed mass variation of *Strophostyles helvula* along Lake Erie. *Canadian Journal of Botany* 74:1313-1321.

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- 1) Flower image courtesy Tropicos Beta, Missouri Botanical Garden. [<http://www.tropicos.org>](http://test.tropicos.org/Name/13048661/Details). <http://test.tropicos.org/Name/13048661/Details>
- 2) Image of leaves courtesy Frank Dutton of Toledo-Bend.Com.
- 3) Image of climbing leaves courtesy of the Plant Resources Center and Bio406d at the University of Texas at Austin.
- 4) Flower close-up is courtesy Frank Dutton of Toledo-Bend.Com.

5) Image of seeds ©Robyn J. Burnham, University of Michigan, Ann Arbor

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