

Plant Diversity Website

Vicia villosa Roth

Common Names: hairy vetch, winter vetch, wooly-pod vetch, large Russian vetch, tufted vetch.

Etymology: *Vicia* is Latin for vetch. *Villosa* from villus, Latin for 'shaggy hair' (10).

Botanical synonyms (15):

Cracca dasycarpa Alef.

Cracca varia Godr. & Gren.

Cracca villosa (Roth) Godr. & Gren.

Ervum villosum (Roth) Trautv.

Vicia ambigua Guss.

Vicia bivonae Ser.

Vicia boissieri Heldr. & Sartori

Vicia consentina Spreng.

Vicia dasycarpa Ten.

Vicia elegans Guss.

Vicia elegantissima R.J.

Shuttlew.

Vicia eriocarpa (Hauskn.)

Hal.

Vicia glabrescens A. Kern.

Vicia godronii A.W. Hill

Vicia littoralis Salzm.

Vicia microphylla d'Urv.

Vicia plumosa Martrin-Donos

Vicia polyphylla Waldst. & Kit.

Vicia pseudocracca Bertol.

Vicia pseudo-villosa Schur

Vicia reuteriana Boiss. & Buhse

Vicia salaminia Heldr. &

Sartori

Vicia vulcanica Huet.

Vicia varia Host

FAMILY: Fabaceae (the pea family)

Quick Notable Features:

- Annual, biennial, or rarely perennial clambering or climbing herb
- Corolla is violet to white in color
- Stems are covered in long shaggy hairs
- Leaves are pinnately compound and terminate in branched tendrils

Plant Height: stems are 0.5-2m long (2).

Subspecies/varieties recognized:

V. villosa ssp. *varia* (Host), *V. villosa*, ssp. *eriocarpa* (Hauskn.), *V. villosa* var. *glabrescens* Koch, *V. villosa* var. *alba* Y.Q. Zhu, *V. villosa* var. *eriocarpa* Hauskn., *V. villosa* ssp. *pseudocracca* (Bertol.), *Vicia villosa* var. *varia* (Host) Corb., *V. villosa* ssp. *villosa*, *V. villosa* subsp. *ambigua* (Guss.) Kerguelen, *V. villosa* subsp. *dasycarpa* (Ten.) Cavillier, *V. villosa* subsp. *microphylla* (d'Urv.) P.W. Ball, *V. villosa* subsp. *monantha* (Retz.) Bolòs & Vigo, *V. villosa* subsp. *semicretica* Ponert, and *V. villosa* subsp. *simulans* Maire. (1, 2, 24)



Most Likely Confused with: *V. cracca*, *V. sepium*, *V. americana*, and species of *Lathyrus*.

Habitat Preference: *V. villosa* grows in roadsides, fields, along railroads, and waste places. It is suited to cool temperature conditions and grows best in fertile loam soil, although it can grow in

sandy or clay soils. It is shade intolerant and prefers soil with pH levels between 6 and 7.5 (1, 3, 14).

Geographic Distribution in Michigan: It is found throughout Michigan, except in St. Clair, Sanilac, Eaton, Osceola, Missaukee, Iron, and Gogebic counties (1,22).

Known Elevational Distribution: A study by Nan et al. states that *V. villosa* can grow up to elevations of 3470m in China (17).

Complete Geographic Distribution: *V. villosa* was introduced to the United States and can be found in every state, including Alaska and Hawaii. It is present in Canada in the following provinces: BC, MB, NS, ON, QC, YT. The species is native to central and southern Europe, Asia, and North Africa (1, 3, 4).

Vegetative Plant Description: *V. villosa* is an annual, biennial, or rarely, perennial. *V. villosa* has fibrous, shallow taproots and a densely villous to smooth stem that is erect or ascending. Its leaves, which are 6 to 15 cm long, are alternately arranged and pinnately compound. They often terminate in branched tendrils. Each leaf has 10-20 entire leaflets, 1-3cm in length (0.3-0.7cm wide), that are narrowly oblong to linear-lanceolate, obtuse, and mucronate - acute at the tip. They are pubescent on both sides. Stipules are pubescent, 0.5-1.2cm long, lanceolate and semi-sagittate (2, 6, 7, 8, 23).



Climbing Mechanism: *V. villosa* uses forked tendrils at the tips of its leaves to climb (6).

Flower Description: The one-sided raceme inflorescences are axillary, from 2 to 7 cm in length, and bear 10 to 40 densely clustered flowers. The pedicels are 1 to 2 mm long. *V. villosa*'s calyx is irregular, villous and gibbous at the base below the upper lobe. The calyx tube is 2 to 4 mm long. The uppermost teeth are 0.8 to 1.5 mm long and lanceolate, while the lowermost teeth are 3 to 5 mm long and linear-acicular. *V. villosa* has a slender corolla that is 12 to 20 mm long, with petals that are generally violet, although pink and white forms

are also found. Like many members of the Faboideae subfamily, the species has 9 stamens fused by their filaments, and 1 free stamen in the androecium. A single carpel comprises the gynoecium. *V. villosa*'s style is threadlike with "a dense ring of hairs just below the stigma" (2, 3, 5, 6, 8, 19).



Flowering Time: In Illinois, *V. villosa* flowers from June to August (7).

Pollinator: *V. villosa* is cross-pollinated by insects. Self-pollination is possible, however, seed set is increased when bees pollinate the flowers (16).

Fruit Type and Description: Fruits are legumes: oblong, flattened, obliquely beaked, 2-3 cm long and 7-10 mm wide. They are dark to light straw colored, and pubescent or glabrous (2, 5, 6, 8).

Seed Description: Seeds are smooth, round, black or brown, 3.5 to 5 mm in diameter. Several seeds are found in each legume. The hilum extends around one seventh of the circumference of the seed (2, 5, 8, 14).

Dispersal Syndrome: *V. villosa* regenerates readily via seeds, however, seeds are large and not easily dispersed. While some sources suggest this is ballistically dispersed (21), game birds are mentioned as consuming the seeds in another report (14, 20).



Distinguished by: Unlike the leaflets of *V. cracca*, *V. villosa*'s leaflets are distinguished by a minute tip. In *V. cracca*, the leaflet tip has a more prominent small "spine", probably the extension of the midvein. Also, *V. cracca*'s calyx is nearly regular and not as conspicuously gibbous as *V. villosa*'s. *V. villosa*'s calyx teeth are longer and even "hair-like." *V. villosa*'s stem and pedicels are "usually covered with fine spreading hairs," whereas those of *V. cracca* are covered in "mostly appressed or incurved" hairs (3).

Vicia sepium is distinguished from *V. villosa* primarily by inflorescences, which are attached directly to the stem (no peduncle) and the former species bears 1-2 flowers vs. the 10-40 flowers per inflorescence of *V. villosa*.

Vicia americana has more than 10 pairs of lateral veins per leaflet and 3-8 flowers per inflorescence. In contrast, *V. villosa* has < 6 lateral veins per leaflet and 10-40 flowers per inflorescence. Also, *V. americana*'s stipules are toothed and *V. villosa*'s are entire.

V. villosa is distinguished from species of *Lathyrus* by narrow stipules and leaflets in *Vicia*. *V. villosa*'s stipules < 7 mm broad and leaflets less than 1 cm broad, whereas most members of *Lathyrus* have stipules at least 10mm broad and leaflets at least 1.2 cm broad. Also, some

members of *Lathyrus* have narrowly winged stems whereas *V. villosa*'s stems are wingless. *V. villosa*'s styles are threadlike with a "dense ring of hairs below the stigma" (2). Most members of *Lathyrus* have a flattened style, "with a line of hairs down the inner surface" (2,3,6).

Other members of the family in Michigan (number species): 97 species in 34 genera.

Genera: *Amorpha* (2), *Amphicarpa* (1), *Anthyllis* (1), *Apios* (1), *Astragalus* (3), *Baptisia* (3), *Caragana* (1), *Cassia* (4), *Cercis* (1), *Coronilla* (1), *Crotolaria* (1), *Cytisus* (1), *Dalea* (2), *Desmodium* (12), *Gleditsia* (1), *Glycine* (1), *Gymnocladus* (1), *Hedysarum* (1), *Lathyrus* (10), *Lespedeza* (8), *Lotus* (1), *Lupinus* (3), *Medicago* (3), *Melilotus* (3), *Pisum* (1), *Phaseolus* (2), *Psoralea* (1), *Robinia* (3), *Schrankia* (1), *Storophostyles* (1), *Tephrosia* (1), *Trifolium* (10), *Vicia* (9), and *Wisteria* (2) (source: 3).

Ethnobotanical Uses: The leaves of *V. villosa* can be made into an infusion called Rappahannock Drug that is used to alleviate stomach pains and heal skin sores. Seeds are toxic and if ingested can cause neuropathy, dermatopathy, and favism. The plant is also used as a cover crop because a mutualism with a bacterium (*Rhizobium*) in its roots allows it to fix nitrogen and because it can suppress weed growth (8, 11, 12, 13).

Phylogenetic Information: *Vicia villosa* is a member of the Fabaceae, subfamily Faboideae. Family Fabaceae. Polygalaceae, Quillajaceae, and Surianaceae form the Fabales order. The Fabales, Rosales, Cucurbitales, and Fagales form a monophyletic group within the Eurosids I, which is itself in the larger rosid group. All are eudicots and angiosperms (9).

Interesting Quotation or Other Interesting Factoid not inserted above: *V. villosa* is poisonous to cattle. Consumption of the vine or its seed is associated with a number of syndromes in cattle that cause rashes, pinkeye, and diarrhea, acute nervous derangement and often death (18).

1) Literature and websites used:

- 2) USDA, NRCS. 2010. The PLANTS Database, Version 3.1, National Plant Data Center, Baton Rouge, LA 70874-4490 USA. <http://plants.usda.gov/> (20 September 2010)
- 3) McGregor R.L. 1986. *Flora of the Great Plains*. Lawrence, Kansas, USA: The University Press of Kansas.
- 4) Voss, E.G. 1985. *Michigan Flora Part II: Dicots*. Ann Arbor, Michigan, USA: Cranbrook Institute of Science.
- 5) Plants For A Future, 1996-2003. Last modified: June 2004.
- 6) <http://www.pfaf.org/user/Plant.aspx?LatinName=Vicia%20villosa>
- 7) Fernald, M.L. 1950. *Gray's Manual of Botany*, 8th ed. New York, USA: American Book Company.
- 8) 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.
- 9) Illinois Plant Information Network (ILPIN) <http://www.fs.fed.us/ne/delaware/ilpin/ilpin.html>
- 10) Bryson, C.T. & M.S. DeFelice 2009. *Weeds of the South*. Athens Georgia, USA: University of Georgia Press.
- 11) 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.
- 12) Brown, R.W. 1956. *The Composition of Scientific Words*. Washington, D. C., USA: Smithsonian Institution Press.
- 13) Moerman, D. 2006. Native American Ethnobotany. *University of Michigan – Dearborn*. <http://herb.umd.umich.edu/>

- 14) Hartwig, N.L. & L.D. Hoffman 1975. Suppression of perennial legume and grass cover crops for no-tillage corn. *Proc. Northeast Weed Science Soc.* 29:82–88.
- 15) Hartwig, N.L. & H.U. Ammon 2002. Cover crops and living mulches. *Weed Science* 50(6): 688-699.
- 16) Invasive Fabaceae. University of Alaska, Fairbanks.
<http://www.uaf.edu/ces/aiswg/resources/InvasiveFabaceae.pdf>
- 17) Germplasm Resource Information Network. United States Department of Agriculture.
<http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?300669>
- 18) Gunn, C.R. 1979. Genus *Vicia* with notes about tribe Vicieae (Fabaceae) in Mexico and Central America. *Techn. Bull. U.S.D.A.* 1601:14.
- 19) Nan, Z.B., A.M. Abd El-Moneim, A. Larbi, & B. Nie. 2006. Productivity of vetches (*Vicia* spp.) under alpine grassland conditions in China. *Tropical Grasslands* 40:177-182.
- 20) Panciera, R.J., D.A. Mosier, & J.W. Ritchey 1992. Hairy vetch (*Vicia villosa* Roth) poisoning in cattle: update and experimental induction of disease. *Journal of Veterinary Diagnostic Investigation* 4(3):318-325.
- 21) Zomlefer, W.B. 1994. *Guide to Flowering Plant Families*. Chapel Hill, North Carolina, USA: The University of North Carolina.
- 22) Hilty, J. 2003-2010. Weedy Wildflowers of Illinois. Accessed November 16, 2010 at http://www.illinoiswildflowers.info/weeds/weed_index.htm
- 23) Cook, B.G., B.C. Pengelly, S.D. Brown, J.L. Donnelly, D.A. Eagles, M.A. Franco, J. Hanson, B.F. Mullen, I.J. Partridge, M. Peters, & R. Schultze-Kraft 2005. Tropical Forages: an interactive selection tool, [CD-ROM], CSIRO, DPI&F(Qld), CIAT and ILRI, Brisbane, Australia at <http://www.tropicalforages.info/>, accessed November 21, 2010.
- 24) MICHIGAN FLORA ONLINE. A. A. Reznicek, E.G. Voss, & B.S. Walters. February 2011. University of Michigan. Web. December 27, 2012.
<http://michiganflora.net/species.aspx?id=1367>
- 25) Bao, B. & N.J. Turland 2010. *Flora of China, Vol. 10*
http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200012356)
- 26) Tropicos.org. Missouri Botanical Garden. 27 Dec 2012
<<http://www.tropicos.org/Name/13035110>>

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PRIMARY AUTHOR: Colleen Smith, with editing by Robyn J. Burnham

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For additional information on Michigan Plant Diversity web pages please contact Robyn J. Burnham via email: rburnham@umich.edu