# Plant Diversity Website

## ***Vicia sativa*** Linnaeus

**Common Names**: Vetch, common vetch, garden vetch, tare, spring-vetch, winter tare, arveja (Spanish) (2,5,8,15).

**Etymology**: *Vicia* is the Latin word for "vetch", and *sativa* means "planted, cultivated" (4).

**Botanical synonyms**: *Vicia alba*, *V. bacla*, *V. bobartii*, *V. canadensis*, *V. communis*, *V. cordata*, *V. cosentini*, *V. cuneata*, *V. erythosperma*, *V. glabra*, *V. globosa*, *V. incisa*, *V. intermedia*, *V. leucosperma*, *V. macrocarpa*, *V. maculata*, *V. melanosperma*, *V. morisiana*, *V. nemoralis*, *V. notota*, *V. pallida*, *V. pimpinelloides*, *V. subterranea*, and *V. vulgaris* (2).

**FAMILY**: Fabaceae, the pea family

**Quick Notable Features (5,7):**
¬ Herbaceous vine with pubescent to glabrescent stems
¬ Stipules with brownish-purple nectaries
¬ Leaves with 8-16 leaflets, ending in a forking tendril
¬ Conspicuous, paired reddish-purple flowers
¬ Constricted legumes containing globose seeds

**Plant Height:** The stems can grow up to 1m long (7).

**Subspecies/varieties recognized (2):**
*V. sativa* var. *abyssinica* (Alef.) Baker
*V. sativa* var. *angustifolia* (L.) Wahlenb.
*V. sativa* var. *cordata* Arcang.
*V. sativa* var. *ecirrhosa* J.Q. He
*V. sativa* var. *incisa* Arcang.
*V. sativa* var. *linearis* Lange
*V. sativa* var. *macrocarpa* Moris
*V. sativa* var. *minor* Ohwi
*V. sativa* var. *nigra* L.
*V. sativa* var. *normalis* Mak.
*V. sativa* var. *platysperma* Barulina
*V. sativa* var. *sativa*
*V. sativa* var. *segetalis* Ser. ex DC.
*V. sativa* subsp. *amphicarpa* Aschers & Graebn.
*V. sativa* subsp. *angustifolia* (L.) Asch. & Graebn.
*V. sativa* subsp. *consobrina* (Pomel) Quézel & Santa ex Greuter & Burdet
*V. sativa* subsp. *cordata* (Wulfen ex Hoppe) Asch. & Graebn.
*V. sativa* subsp. *cuneata* (Guss.) Maire
*V. sativa* subsp. *heterophylla* J. Duvign.
*V. sativa* subsp. *incisa* (M. Bieb.) Arcang.

*V. sativa* subsp. *macrocarpa* (Moris) Arcang.
*V. sativa* subsp. *nigra* (L.) Ehrh.
*V. sativa* subsp. *pilosa* Plitm. & D. Zoh.
*V. sativa* subsp. *sativa*
*V. sativa* subsp. *terana* (Losa) Benedi & Molero

**Most Likely Confused with:** *Vicia lathyroides*, *V. grandiflora*, *V. villosa*, *V. americana*, *V. cracca*, *V. faba*, or species of *Lathyrus*.

**Habitat Preference:** Open sites, abandoned fields, and roadsides (5,7).

**Geographic Distribution in Michigan:** *V. sativa* is found in 24 counties scattered throughout the upper and lower peninsulas (3).

**Known Elevational Distribution:** The species was collected at 3176m above sea level in Cotopaxi, Ecuador and up to 3700m in China (2, 19).

**Complete Geographic Distribution:** Native to Europe, *V. sativa* was introduced to the Americas, and has become established throughout the United States (except for Utah, Puerto Rico, and the Virgin Islands). It is also found in Canada (BC, MB, NB, NF, NS, ON, PE, QC, YT), Mexico, Jamaica, Haiti, Guatemala, Ecuador, Colombia, Peru, Chile, Brazil, Paraguay, Uruguay, and Argentina. Its native range includes all of Europe except Bosnia and Herzegovina, Liechtenstein, Monaco, Montenegro, and San Marino. This species is also present in most of Asia. In Africa, it is found in Angola, Burundi, Congo, Egypt, Eritrea, Ethiopia, Gabon, Morocco, Namibia, South Africa, Uganda, and United Republic of Tanzania. In Oceania, it is found in Australia, New Zealand, Papua New Guinea, and Norfolk Island (8,9).

**Vegetative Plant Description:** *V. sativa* is an annual, herbaceous vine or erect plant with stems that are finely pubescent to glabrate, with white trichomes. The stipules are coarsely toothed, 2-10mm long, with a dark purplish-brown nectary below. Each alternate pinnately compound leaf is made up of 8-16 leaflets; the terminal leaflet is modified as a forked tendril. The leaflets are oblong to elliptic, emarginate, mucronate, 1.5-5cm long and 0.5-1.3cm wide and short pubescent to glabrate (5,6,7,10,17).

**Climbing Mechanism**: The plant uses its foliar tendrils to climb (7).

**Flower Description:** The flowers of *V. sativa* (1.8-3cm long) are perfect, zygomorphic, and are borne in nearly sessile (pedicels are 2-6mm long), two-flowered clusters in the upper leaf axils. The calyx tube is campanulate (5-7mm long), and the 5 lobes

(3-9mm long) are nearly uniform, the three lower lobes bearing a brown-reddish nectary on the outside. The petals (5) are purple or rarely white; the wings are sometimes reddish-purple or violet. The standard (1.8-3cm long) is obovate and overlaps the wings. The wing petals are narrower than the standard, and adherent to the keel petals, which are shorter than the wings. The stamens are 10 (fused as 9+1). The ovary is sessile or nearly so, and pubescent; the style is filiform with trichomes at the apex, and the stigma is globular (5,6,7,17).

**Flowering Time:** *V. sativa* flowers in spring (April-June) (7).

**Pollinator:** *V. sativa* is insect pollinated, like other members of *Vicia*. Various bee species pollinate the plant, including *Bombus argillaceus, B. hortorum* and *B. humilis*. A few other species of *Bombus* and *Apis mellifera*, as well as ants, visit the extrafloral nectaries, but do not contribute to pollination (13).

**Fruit Type and Description:** The fruit is a partially flattened, dehiscent legume that is constricted between the 4-8 seeds, pubescent during its early stage, and brown at maturity (May-July). Each legume is usually 4-8cm long and 0.5-0.8cm wide (5,7,19).

**Seed Description:** The seeds are rounded-rectangular, slightly flattened, usually 5mm broad, occasionally over 6mm, varied in color and sometimes mottled. An attachment scar, the hilum, covers 10-20% of the seed's circumference (7,12).

**Dispersal Syndrome:** The seeds are ejected forcibly by the explosive dehiscence of the legumes, if animals do not ingest them first. A study measuring different aspects of ballistic seed projection found that the average projection height is 31cm, and the average speed of projected seeds is 4.65m/s. The maximum dispersal distance recorded was 9m (11).

**Distinguished by**: *Vicia lathyroides* only grows up to 20cm tall, while *V. sativa* can grow up to 1m tall. Additionally, *V. lathyroides* has unforked tendrils. The flowers of *V. lathyroides* are bluish to violet in color, solitary, and a lot smaller (<1cm long) than the flowers of *V. sativa*. *V. grandiflora* has about the same number of leaflets as *V. sativa*, occasionally a couple less, but the leaflets are shorter (1-2cm long) and linear to obovate. The flowers of *V. grandiflora* are roughly the same size as in *V. sativa*, also paired, but the corolla is yellowish and the lobes of the sepals are shorter than the calyx tube in length. *V. villosa*, *V. americana*, *V. cracca*, and *V. faba*'s inflorescences are pedunculate and racemose, bearing 3 to many flowers, with the calyx tube swollen at the upper side of the base. *V. villosa* and *V. cracca* have more numerous leaflets (16-24). *V. villosa*, as suggested by its name, has notably villous stems. Further, the calyx is irregular, and the corolla is usually violet with a smaller standard petal (1.2-

2cm long). The legume produced by *V. villosa* is much shorter than in *V. sativa*: only up to 3cm long. The corolla of *V. americana* is bluish-purple, and the legume is shorter (2.5-3.5cm long). *V. cracca* has entire stipules and blue, densely clustered flowers. *V. faba* only grows to 20cm in height, it does not have tendrils (not a climber), and the leaflets are less numerous (4-6) and longer (5-10cm long). *Lathyrus* spp. are generally similar to *Vicia*. The flowers of *Lathyrus* spp. can be differentiated by mostly free wings, which are adherent to the keel petals in *Vicia* spp., and the widened, flattish style with hairs along the inner side, in comparison to the filiform style with apical hairs found in *Vicia* flowers. Without flowers, species of *Lathyrus* can usually be distinguished from *Vicia* by the size and shape of the stipules. In the genus *Lathyrus*, the stipules are hastate to semi-sagittate and more than 7mm broad, with the exceptions of *L. palustris* and *L. venosus*, which have smaller stipules. Species in the genus *Vicia* have semi-sagittate to lanceolate stipules that are less than 7mm broad (5,6,7,16).

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

**Ethnobotanical Uses:** No medicinal uses for *V. sativa* were found in the literature, but the leaves are edible and can be made into tea, cooked, or consumed along with the young legumes. *V. sativa* seeds may be dried, ground, and ingested as a protein supplement (15), however, the seeds are known to contain toxic compounds, thus their ingestion is not recommended (18).

**Phylogenetic Information**: The genus *Vicia* is a member of the subfamily Faboideae in the Fabaceae family, which is in the order Fabales, part of the Rosids I, Core Eudicots. Members of the Fabaceae family are distributed worldwide, and the family contains approximately 9.4% of all eudicots and 16% of all known woody plants found in neotropical rainforests (1).

**Interesting Quotation or Other Interesting Factoid not inserted above:** *V. sativa* has very high economic importance as green manure and forage (18). It can also be cultivated alongside other crops to increase soil fertility, as *V. sativa* has a symbiotic relationship with nodule-forming bacteria that fix atmospheric nitrogen to a form that can be used by plants (15). *V. sativa* is able to hybridize with other *Vicia* species (17).

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