

# Plant Diversity Website

## ***Securigera varia*** (L.) Lassen

**Common Names:** Crown-vetch, trailing crown-vetch, axseed, purple crownvetch, axwort, field crownvetch (1,3,4,5).

**Etymology:** *Securigera*, in Latin means “armed with axe”, and *varia* means “variegated, colored, diverse” (9). The name of the genus refers to the shape of the fruit of *Securigera securidaca* (5).

**Botanical synonyms:** *Coronilla varia* L. (1).

**FAMILY:** Fabaceae, the Pea Family

**Quick Notable Features:**

- Mat-forming herb with glabrous, angular stems and alternate leaves
- Odd-pinnately compound leaves with 7-25 mucronate leaflets
- Axillary umbels of pink flowers
- Legumes with 3-12 segments, with a single brown seed per segment

**Plant Height:** Usually up to 0.3 m tall, but occasionally up to 1.2 m (6,8).

**Subspecies/varieties recognized(11):**

*Securigera varia* (L.) Lassen subsp. *hirta* (Bunge ex Boiss.) Czerep.

*Securigera varia* (L.) Lassen subsp. *orientalis* (Hrabětová) Czerep.

**Most Likely Confused with:** *Vicia* ssp., *Lathyrus* ssp., *Chamaecrista fasciculata*, *Lotus corniculatus*.

**Habitat Preference:** Although it prefers well-drained soils with neutral or alkaline pH and high sun exposure, the crown-vetch tolerates slightly acidic, nutrient poor soils, drought, and partial shade. *S. varia* grows along roads, in abandoned fields, and forest edges (7,8).

**Geographic Distribution in Michigan:** As of February 2014, *S. varia* has been reported in 24 counties scattered throughout the Lower Peninsula, and in 3 counties in the Upper Peninsula: Mackinac, Delta, and Marquette (3).

**Known Elevational Distribution:** In Bolívar, Ecuador, *S. varia* grows to elevations of 3609 meters (1).



**Complete Geographic Distribution:** Native to the Mediterranean region, *S. varia* was introduced in North America, and northern Europe. In the United States, it is found in every state but Alaska, North Dakota, Puerto Rico, and Virgin Islands. In Canada, it is found in AB, BC, MB, NB, NF, NS, ON, PE, QC, and SK (4,5).



**Vegetative Plant Description:** Crown-vetch is an herbaceous plant with trailing to ascending, mat-forming stems, and perennial rhizomes up to 3 m long. Branching angular stems (0.3-2 m long) bear longitudinal, parallel grooves and are often glabrous, although some plants are slightly pubescent. The deciduous leaves are alternate, pinnately compound with 7-25 leaflets, 4-16 cm long, sessile, and subtended by a pair of free stipules (1-6 mm long) that are thin, oblong, mucronate, and apically dark. The leaflets are sessile, oblong to ovate, basally narrow to round, apically obtuse and mucronate, 0.8-3 cm long, ~0.6 cm broad, and dark green with thin, entire margins (5,6,7,8,15,16,17,18).

**Climbing Mechanism:** *S. varia* climbs by scrambling over adjacent vegetation and rocks (7).

**Flower Description:** The inflorescences of *S. varia* (~ 2.5 cm across) are axillary umbels of 10-25 conspicuous papilionaceous flowers, rarely as few as 2, on 5-15 cm long peduncles that are usually longer than the subtending leaves. Each perfect flower is borne on a 0.3-0.7 cm pedicel and subtended by a minute scale-like bract. Calices are campanulate, glabrous, 0.2-0.3 cm long, and 5-parted: the 2 upper lobes are partially fused, and the 3 lower are free. Corollas (0.8-1.5 cm long) have 5 long-clawed petals: an orbicular, pink to lilac standard; 2 free, ovate to oblong, whitish wing petals; and 2 apically purple, curved, fused petals (the keel). Stamens are diadelphous, with 9 of the 10 stamens united by the filaments, and one free. The unilocular, superior ovary is sessile with a single style and stigma (5,6,7,15,16,17,18).



**Flowering Time:** In the U.S., *S. varia* flowers from May to September (7,8).

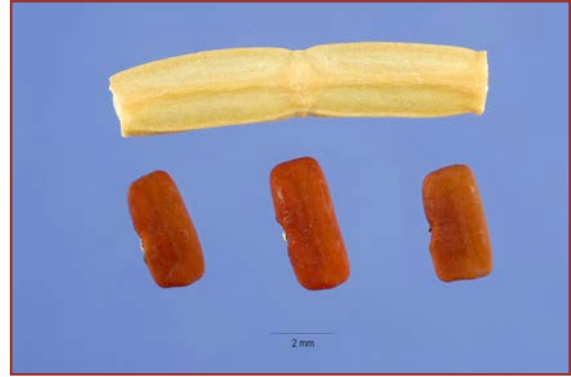
**Pollinator:** The showy and fragrant flowers of crown vetch are pollinated by honeybees and other insects (8,14).

**Fruit Type and Description:** The fruit of the crown-vetch is a slender legume divided into 3-12

single-seeded segments; each segment is 4-8 mm long. The indehiscent legumes are coriaceous, 4-angled, 1.5-10 cm long, and mature as they change from light green to brown (6,7,8,15,16,17).

**Seed Description:** The flattened-cylindrical seeds of *S. varia* are brown, approximately 3-4 mm long and 1-1.2 mm broad (7,8,18).

**Dispersal Syndrome:** The seeds are consumed by animals, such as deer, and remain viable after passing through their digestive tract. Animals are responsible for long distance dispersal. When the fruits of *S. varia* mature, the segments dry, break, and may fall near the parent plant. The species also spreads vegetatively by rhizomes (7,8,18).



**Distinguished by:** *Vicia* ssp. leaves are subtended by semi-sagittate to lanceolate stipules, and terminate in a tendril. The inflorescence of *Vicia* species are racemes of 1-many flowers, and the legumes are not segmented. *S. varia* leaves are subtended by oblong stipules and bear a terminal leaflet; tendrils are absent. The inflorescence of *S. varia* is an umbel of usually more than 10 flowers, and its legumes are segmented. *Lathyrus* species, like *Vicia* species, are also differentiated by a terminal tendril instead of a terminal leaflet, a raceme inflorescence, and non-segmented legumes. The stipules of *Lathyrus* ssp. are hastate to semi-sagittate and generally more than 7mm broad, while in *S. varia* they are only up to 6 mm long. *Chamaecrista fasciculata* leaves have an even number of leaflets, its flowers are yellow and caesalpinoid, the stamens are free, and the legumes not segmented. *S. varia* leaves have an odd number of leaflets (terminal leaflet present), and the flowers are whitish-pink to purple, papilionaceous, and stamens are diadelphous. *Lotus corniculatus* leaves have only 5 leaflets, 2 of which resemble stipules. The flowers of *L. corniculatus* are borne in umbels, however they are yellow and later produce dehiscent and non-segmented legumes. *S. varia* leaves have at least 7 leaflets, and the legumes are indehiscent (3,16).

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

**Ethnobotanical Uses:** The crown-vech is used for erosion control due to its extensive root system, as a green crop, nitrogen enhancer, ornamental plant, and as animal forage, although with caution as *S. varia* is poisonous to many species including humans, especially horses. Due to its toxicity, the species is not edible for humans, and it is used as insecticide. A few medicinal uses of the plant have been listed, but caution is advised because the plant is toxic. A tonic effect for the heart can be obtained by consuming the whole plant, fresh or dry. A tea can be prepared with the peels of the stem and used to induce vomiting. The plants can be mashed and applied to joints to alleviate rheumatism (5,10,13).

**Phylogenetic Information:** The genus *Securigera* 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 (2).

**Interesting Quotation or Other Interesting Factoid not inserted above:**

*S. varia* was first reported in the U.S. in New York in 1869. The species is especially invasive in the Midwest (8). The crown-vetch is also considered a high priority invasive species of the Fabaceae family in Mexico (12). Symstad (2004) studied the effects of the invasion of *S. varia* in a sand prairie on native species richness and abundance, soil nitrogen availability, and on the establishment of another non-native species, *Poa pratensis* (Kentucky bluegrass). *S. varia* caused a decrease in native species richness and abundance even after one year of reduction in *S. varia* populations. In spite of *S. varia* reductions, nitrogen availability in the soil remained relatively high. *P. pratensis* population did not decrease while *S. varia* was present, but after the population of *S. varia* was reduced, the non-native grass increased its covered area by almost 6 times. The author concluded that even after removal of *S. varia*, the species has effects on the ecosystem via creating improved conditions for other non-natives and thus has an indirect effect of decreasing native species richness and cover. These findings are important for ecosystem restoration where *S. varia* is present (13).

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