**Lathyrus tuberosus** L.

**Family:** Fabaceae, the Pea Family

**Common Names:** Tuberous vetchling, earthnut pea, tuberous sweet pea, everlasting pea, flat pea vine, perennial pea, cicerchia tuberosa (Italian), gesse tubéreuse (French), arveja tuberosa (Spanish), and knollenplatterbse (German) (1,4,7,8,9).

**Etymology:** *Lathyrus* is derived from the Greek *Lathyros*; the prefix *la-* meaning “very,” and suffix *–thyros* meaning “passionate.” *Tuberosus* is derived from Latin, meaning “with tubers” (2).

**Botanical synonyms** (5): None found.

**Quick Notable Features** (7):
- Tuberous rhizomes
- Bright pink to purple flowers
- Stems are wingless
- Only 2 leaflets per leaf, the leaf apex ending in a branched tendril

**Plant Height:** *L. tuberosus* can climb up to 1.2m in height (4).

**Subspecies/varieties recognized** (5): None found.

**Most Likely Confused with:** *Lathyrus pratensis*, *L. hirsutus*, *L. odoratus*, *L. latifolius*, *L. sylvestris*, *Pisum sativum*, and species of *Vicia*.

**Habitat Preference:** *L. tuberosus* prefers warm, slightly alkaline, aerated soils and grows best in partial shade. It can be found growing in fields, pastures, and disturbed areas (4,14).

**Geographic Distribution in Michigan:** *L. tuberosus* has escaped from cultivation into 12 counties throughout Michigan: 4 in the Upper Peninsula and 8 in the Lower Peninsula (1).

**Known Elevational Distribution:** The plant has been found growing between 500 and 2400m in China. In Russia, it grows at 1800m above sea level in mountainous areas (13,14).

**Complete Geographic Distribution:** Because *L. tuberosus* is widely cultivated, it has been collected in many countries outside of its native range. This species is native to most of Europe and Asia (AD, AL, AM, AT, AZ, BY, BE, BG, CN, CZ, EE, FR, DE, GE, GR, HU, IR, IQ, IT, KZ, KG, LV, LU, LT, MD, NL, PL, RO, RU, ES, SI, SK, CH, TJ, TR, TM, UA, UZ, and the former Yugoslavia). The introduced range includes parts of the North America, Europe, Africa, and Oceania (CA, DK, FI, GB, IE, MU, NO, NZ, SE and US), and may extend even further than the countries listed due to cultivation (10,11).
Vegetative Plant Description: *L. tuberosus* is a climbing, perennial, herbaceous vine with small, thickened tubers along the thin, branched rhizomes. The acutely angled stems are glabrous and wingless. Leaves are alternately arranged and two-foliate, with the leaf apex modified into a branched tendril. The glabrous leaflets are oblong, obovate or elliptic, and 2-4.5cm long by 0.7-1.3cm wide. The leaflet apices are broadly acute to rounded, with the midvein excurrent. Individual leaflets have entire margins and parallel venation. The petioles are costate and 8-14mm long. Two subulate to semi-sagittate stipules (0.5-2cm long by 1-4mm wide) are present at the base of each leaf. Each stipule has only one basal lobe (1,7,13,14).

Climbing Mechanism: *L. tuberosus* climbs by use of tendrils at the leaf apices. These tendrils are sensitive to contact, and allow the tuberous vetchling to hook onto neighboring plants or fences to climb (4).

Flower Description: The fragrant, bilateral flowers are borne in 2-7 flowered axillary racemes. Lanceolate-subulate, deciduous bracts are born on the pedicels. The calyx (6-7mm long) is glabrous and campanulate, with the 5 teeth shorter than the tube. The papilionaceous corolla is purple to pinkish-red and 1.5-2cm long, with 5 petals. The standard is subovate and clawed, the wings are obovate with auricles at the base, and the two keel petals are fused. The stamens are diadelphous, with 9 of the 10 filaments united and one free, all filaments glabrous. The superior ovary is linear and unilocular, with a twisted, flattened style that is hairy on one side. The stigma in *Lathyrus* ssp. can be terminal or capitate (7,12,13,14,15).

Flowering Time: June to July (4).

Pollinator: Members of the genus *Lathyrus* are bee-pollinated. *Lathyrus tuberosus* is also pollinated by specialized bruchids, called pea weevils (4,6,12).

Fruit Type and Description: The fruit is a legume (2-4cm x 4-7mm), linear and glabrous, brown at maturity. The style is persistent on the fruit. Pods contain 3-10 seeds (13,14).

Seed Description: Each seed is 3-4mm in diameter. The seeds are spherical to elliptic, and may appear to be slightly flattened laterally. They are dark brown in color, and almost smooth except for the small punctations. The hilum (attachment scar) is linear and covers about 1/10th of the seed. 1000 seeds weigh approximately 12g (13,14).
Dispersal Syndrome: The legumes are dehiscent, forcibly expel the seeds from the fruit (12).

Distinguished by: Like Lathyrus tuberosus, L. pratensis has bifoliate leaves with a modified tendril at the apex and unwinged stems. L. pratensis is differentiated by flower color (yellow in L. pratensis, red-purple in L. tuberosus) and shape of the stipules (hastate to sagittate with 2 basal lobes in L. pratensis, semi-sagittate with one basal lobe in L. tuberosus). The leaflets of L. pratensis are narrowly acute at the tip, while they are broadly acute to rounded in L. tuberosus. L. hirsutus, L. odoratus, L. latifolius, and L. sylvestris are also bifoliate, however the stems are winged (wingless in L. tuberosus) and the roots are not tuberous. The ovary and legume of L. hirsutus and L. odoratus are pubescent, not glabrous, and the flowers of L. hirsutus are <1.5cm long and scentless. The rachis in L. odoratus is also winged and the calyx teeth are longer than the tube (shorter in L. tuberosus). L. latifolius and L. sylvestris have winged petioles, and their flowers have no scent. The leaflets in L. latifolius generally are longer (>4cm long) than in L tuberosus, as are the legumes (6-9cm long). L. sylvestris has shorter leaflets (<1.5cm long), smaller flowers (~1.5cm long), and longer legumes (5-7cm long). Pisum sativum (garden pea) has 2-6 leaflets and toothed stipules. The corolla is most commonly white, although it may be purple. The legumes in P. sativum are inflated, are longer than the legumes of L. tuberosus (up to 12cm long), and wider (1-2.5cm wide).

Lathyrus spp. are generally very similar to Vicia. The flowers of Lathyrus can be differentiated by bearing mostly free wings, which are adherent to the keel petals in Vicia spp., and the widened, flattened style with hairs along the inner side, in comparison to the filiform style with apical hairs found in Vicia flowers. Without flowers, 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 (smaller stipules). Species in the genus Vicia have semi-sagittate to lanceolate stipules that are less than 7mm broad. Additionally, no species in Vicia have bifoliate leaves, instead each leaf has at least 4 leaflets (1,2,13).

Other members of the family in Michigan (number species): Amorpha (2), Amphilicarpae (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), Hylocharosum (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 (2), Securigera (1), Senna (2),

**Ethnobotanical Uses:** No reported medicinal uses of *Lathyrus tuberosus* were found, but the root is edible and may be eaten raw or cooked, the taste supposedly resembles sweet potatoes (4).

**Phylogenetic Information:** The genus *Lathyrus* is a member of the subfamily Papilionoideae (Faboideae) in the Fabaceae family, 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 (3).

**Interesting Quotation or Other Interesting Factoid not inserted above:** The larvae of the lesser pea weevil (*Bruchis affinis*), a pollinator of *Lathyrus tuberosus*, are considered to be pests. *L. tuberosus* serves as a host for the larvae, which feed on the seeds of their host plant (12). "Although no records of toxicity have been found for this plant, the seed of some species in this genus contain a toxic amino acid that can cause a severe disease of the nervous system known as 'lathyrism' if they are eaten in large amounts (although small quantities are said to be nutritious). Great caution is advised" (4). *L. tuberosus* has a symbiotic relationship with nitrogen-fixing soil bacteria and naturally fertilizes the soil for itself and other plants (4).

**Literature and websites used:**

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