

# Plant Diversity Website

## *Ipomoea purpurea* (L.) Roth

**Common Names:** Tall Morning-glory, Common Morning-glory (2)

**Etymology:** *Ipomoea* comes from the Greek words *ips* which means “worm”, and *homois*, which means “similar to.” This refers to the species’ wormlike twining habit. *Purpurea* means “purple” which refers to the color of the flowers (6).

**Botanical synonyms:**

*Convolvulus purpureus* L.

*Ipomoea hirsutula* Jacq. f.

*Ipomoea purpurea* var. *diversifolia* (Lindl.)  
O'Donell

*Pharbitis purpurea* (L.) Voigt (6,8)

**FAMILY:** Convolvulaceae, the bindweed or morning glory family (7)

**Quick Notable Features:**

- Twines with its apex in a dextral direction (6)
- Blue or purple flowers with white within the funnelform corolla (6)
- 6 valvate, subglobose to ovoid capsules containing 3-6 seeds each (6,8)
- Wedge shaped seeds with a horseshoe-shaped scar (6,8)



**Plant Height:** Usually 2 - 5m (2,8), but the stems can grow to many meters in length (2).

**Subspecies/varieties recognized:** *Ipomoea purpurea* var. *diversifolia* (Lindl.) O'Donell (6).

**Most Likely Confused with:** Species of the genus *Hedera*, *Ipomoea coccinea*, *Ipomoea hederacea*, and *Ipomoea lacunosa* (8,9).

**Habitat Preference:** *Ipomoea purpurea* is common in agricultural, horticultural, nursery crops, and fallow fields. It is also found along roadsides, waste places, in landscapes, non-crop areas, and in thickets. Tall Morning-glories are frost intolerant. They prefer well-drained, rich, moist, light or sandy loam soils, but are tolerant of most soil conditions (2,9).

**Geographic Distribution in Michigan:** *I. purpurea* is found mostly in the southern two tiers of Michigan counties. This species is found in Berrien, Cass, Calhoun, Emmett, Hillsdale, Kalamazoo, Kent, Lenawee, Monroe, Oakland, Kalamazoo, St. Clair, Washtenaw, and Wayne counties (9).

**Known Elevational Distribution:** In California, this species is found between 15 and 100m (3).

**Complete Geographic Distribution:** The species is native to Central America, but has adapted to tropical, subtropical, and warm temperate regions of the world (1, 2). *Ipomoea purpurea* is

found in every state, except Idaho and Wyoming. It is also found in Puerto Rico. In Canada, it is found in Ontario and Quebec (7).

**Vegetative Plant Description:** This annual plant has simple, alternate, pinnately veined leaves with entire margins. Leaves are ovate with cordate bases and acute or acuminate tips, ranging from 1-11 cm in length and 1-12 cm in width. The stems are branched or simple, loosely pubescent to tomentose with short appressed trichomes. They are sparsely hirsute to glabrate. The petioles range from 1-14 cm long (4,8).

**Climbing Mechanism:** The stems twine in a dextral fashion as shown by the picture to the right (5,6).



**Flower Description:** Inflorescences with 1-5 flowers are borne in a cymose cluster. The calyx is 5-lobed, densely hirsute at the base, and more glabrous toward the tips. The sepals are sub-equal. The outer sepals are narrowly ovate to elliptic ranging from 0.8-1.5cm long and 2.5-4.5mm wide. The inner sepals are ovate, 0.8 to 1.5cm long and 2.5 to 3mm wide. The glabrous, funnel-shaped corollas range from white to blue to purple, however white is always found within the corolla. The flowers vary from 2.5-5cm long and 2.4-5cm wide. The five epipetalous stamens range from 8-10mm long with anthers that are 1.5-2mm long. The 3-locular glabrous ovary is superior. The shape varies from ovoid to conic. The glabrous style ranges from 14-22mm long and there are 3 stigmas (6,8,9).

**Flowering Time:** In the northeastern United States, the plant flowers from July-September (2).

**Pollinator:** *Ipomoea purpurea* relies primarily on insect pollination, but is also capable of self-fertilization. About 30% of the flowers are self-pollinated. This 30% consists of lighter colored flowers. Cross-pollination occurs mostly by bumblebees and small butterflies (6).

**Fruit Type and Description:** The fruit is a subglobose to ovoid capsule that is approximately 1cm in diameter and up to 2.5cm long. It is 6-valvate and contains 3-6 seeds (6,8).



**Seed Description:** The seed surface is granular, dull brown to black in color, and densely covered with small, brown hairs. The seeds are from 4 to 5.7 mm long. They are wedge shaped, with a horseshoe-shaped scar (6,8).

**Dispersal Syndrome:** Seed dispersal is by wind, rain, and gravity. Seeds also can be spread by birds and by human activities via contaminated crop and flower seeds (8).

**Distinguished by:** *Ipomoea coccinea* grows to a similar height and can grow tangled in amongst other *Ipomoea* species. Once in flower, *I. coccinea* and *I. purpurea* are easily

distinguished by dark orange to red salverform corollas of *I. coccinea*, however both *I. purpurea* and *I. hederacea* have light blue to purple funnelform corollas. *Ipomoea purpurea* and *Ipomoea hederacea* are distinguishable by sepal characteristics: *I. purpurea*'s sepals are ovate-lanceolate with an acute to abruptly acuminate apex. The lobes are shorter to slightly longer than the body. In contrast, *I. hederacea*'s sepals are lanceolate, long-attenuate, and caudate with lobes that are much longer than the body. Species in the genus *Hedera* have two leaf types: palmately lobed juvenile leaves and unlobed cordate adult leaves. The green-yellow flowers produced in late autumn are borne in 3–5 cm diameter umbels unlike *Ipomoea hederacea* (purple, white, or rosy large funnelform corollas). It is very easy to distinguish *Hedera* from *Ipomoea* because *Hedera* grows using adventitious roots. Fruits of species from the genus *Hedera* are small black berries, while *I. purpurea*'s are capsules. *Ipomoea lacunosa* typically has a white corolla with pink to purple anthers. Flowers of *I. lacunosa* are usually fewer per inflorescence than those of *I. purpurea* (7,9).

**Other members of the family in Michigan (number species):** *Calystegia* (10 species), *Convolvulus* (2 species), and *Ipomoea* (4 species) (9).

**Ethnobotanical Uses:** The flowers, seeds, roots, and stems of *I. purpurea* have been used as a laxative, hallucinogen, purgative, and for treatment of syphilis (1).

**Phylogenetic Information:** The Convolvulaceae belong to the order Solanales. Solanales forms a monophyletic group with Lamiales and belongs to Asterid 1. Within Convolvulaceae there are 3 or 4 distinct subfamilies. *Ipomoea* belongs to the Convolvuloidae (5, 10).

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

The presence of *Ipomoea purpurea* among crops results in stunted growth and reduced yield during the harvest (7).

*Ipomoea purpurea* was brought to the American colonies about 1700, and was spread by way of garden peddlers and small-town milliners throughout the countryside (6).

One Tall morning-glory plant can produce 26,000 seeds (6).

Tall morning-glory seeds are believed to contain hallucinogenic alkaloids that can be toxic depending on the dose ingested. The seeds have some history of use as a psychedelic.

They contain LSA whose effects are reported to be comparable to LSD (1,6,8).

“A morning-glory at my window satisfies me more than the metaphysics of books”, from *Song of Myself*, Walt Whitman 1855 (6).

**Literature and websites used:**

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- 5) Stevens, P.F. Angiosperm Phylogeny Website. Version 7, May 2006. <http://www.mobot.org/MOBOT/research/APweb>
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- 7) USDA, NRCS. 2008. The PLANTS Database, Version 3.1, National Plant Data Center, Baton Rouge, LA 70874-4490 USA. <http://plants.usda.gov/> (October 28,2008)
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- 9) Voss, E.G. 2004. *Michigan Flora Part III: Dicots Concluded*. Ann Arbor, Michigan, USA: Cranbrook Institute of Science.
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- 1) Image of flower courtesy of Robyn Burnham, University of Michigan, Ann Arbor, MI.
- 2) Image of twining from Ted Bodner, Southern Weed Science Society, Bugwood.org
- 3) Image of seeds from Steve Hurst, USDA NRCS PLANTS Database, Bugwood.org from

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