

Jimsonweed, *Datura stramonium* L.

Solanaceae

Wilbur L. Mountain

I. Nomenclature: A) *Datura stramonium* L. (Fig. 1); B) Jimsonweed, Jamestown weed, thorn apple, indian apple, mad apple, devils trumpet, stinkweed, moon-lily.

Datura is derived from the Arabic name *Tatorah* or the Hindustani *Dhatura*.

Stramonium is the old generic name, said to be from *struma* or *stroma*, a swelling (Fernald 1970).

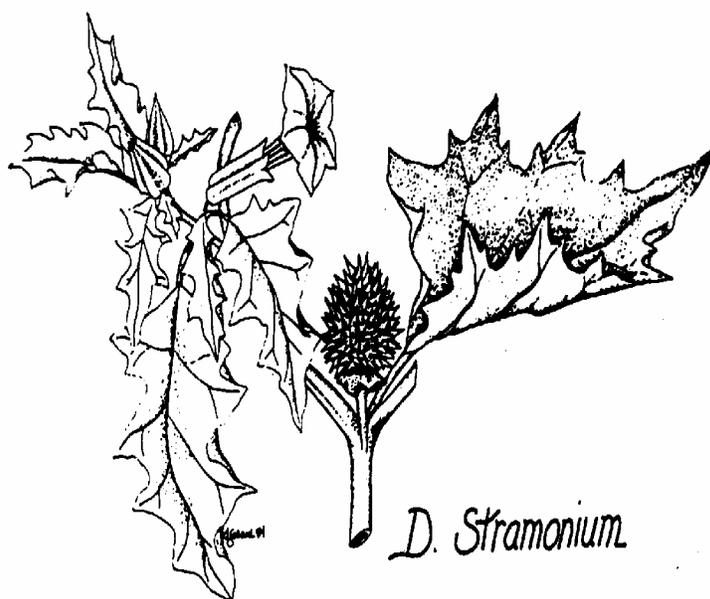


Fig. 1. Jimsonweed. Note trumpet-shaped flower and spiny seed capsule in branch fork (from Hill and Folland 1986).

II. History: Conflicting opinions exist as to the origin of *D. stramonium*. Linnaeus described the plant as American in origin, but Fernald (1970) declared it to be of Asiatic origin. In addition, some botanists say var. *stramonium* is native to Asia and var. *tatula* to America. Rousseau (1968) states the earliest North American collection was from Virginia in 1739. However, jimsonweed is thought to be a short form of "James Town Weed," commemorating Jamestown, Virginia, where ingestion of the plant was reputed to have a narcotic effect on British soldiers during Bacon's Rebellion of 1676 (Avery et al. 1959).

III. Technical Evaluation: An annual, strong-scented, poisonous herb, 0.3 to 1.5 meters in height, reproducing by seeds; **Roots** are thick, shallow, extensively branched; **Stems** hollow, dichotomously branched, glabrous, green or purple; **Leaves** alternate, simple, ovate, unevenly coarse-toothed and glabrous, 7-20cm long on short petioles; **Flowers** borne singly on short peduncles in axils of the branches; **Corolla** white to violet, 5-12 cm long, trumpet-shaped with 5 teeth; **stamens** barely exert from corolla tube; **Style** somewhat surpassing stamens; **Stigma** 2-lipped; **Ovary** 2-celled, or becoming 4-celled by false septums; **Calyx** prismatic, about half as long as the corolla and 5-toothed, separating transversely above the base of the fruit, the upper part falling away, the base persisting as a collar below the capsule; **Capsule** elongate-globular, about 2.5 cm in diameter, erect, 4-valved, 4-locular, covered

with short, sharp spines, except in var. *inermis*; **Seeds** dark brown to black, kidney-shaped, flattened, surface irregular and pitted.

The most common chromosome number is $2n = 24$. Three varieties of *D. stramonium* are recognized:

1. Capsule spineless var. *inermis* (Juss.) Hupka
1. Capsule with spines
 2. Stem green, corolla white, lower spines on fruit mostly shorter than upper ones var. *stramonium*
 2. Stem purple or purplish, corolla lavender or pale-violet, spines on fruit nearly all equal var. *tatula* (L.) Torr.

IV. Diagnostic Characteristics: A large ill-scented annual weed. Leaves are simple, broad, unevenly and largely toothed. Flowers are long, trumpet-shaped, white or lavender to violet in the stem forks, followed by large prickly fruit capsules (except var. *inermis*).

V. Confused Taxa: The genus *Datura* consists of 10 species (Avery 1959) of poisonous plants. *Datura stramonium* may be confused with *Datura innoxia* Mill. (*D. meteloides* DC.), which is from the Southwest and Mexico and is sometimes cultivated. *Datura innoxia*: perennial, flowers 10-20 cm long and 10-angled, capsule nodding to inclining, not valvate, dehiscent irregularly, leaf margins entire or only slightly angled, calyx tube circular in cross-section, plant pubescent. Another species, *Datura metel* L., is similar to *D. innoxia* but is glabrous and has very short capsule spines. This species is rare in the Commonwealth. Jimsonweed seedlings (Fig. 2) are sometimes mistaken for common cocklebur (*Xanthium pennsylvanicum* Wallr.). However, common cocklebur seedlings are hairier, lighter in color, and lack the rank odor of jimsonweed.



Fig. 2. Jimsonweed seedling showing start of coarse-toothed dentation on first true leaf (courtesy of Penn State University Agronomy Extension).



Fig. 3. Jimsonweed (background) in a pumpkin field, Lancaster County, PA.

VI. Natural History: Being of tropical origin, *D. stramonium* is a cosmopolitan weed of the warmer regions of North, Central and South America, Europe, Asia, and Africa. It grows nearly throughout the United States except for the Northwest and northern Great Plains, and as such is found throughout Pennsylvania.

An annual, *D. stramonium* overwinters only as seeds. Seedlings continue to emerge intermittently during the growing season, providing there is adequate soil moisture. Flowering ordinarily begins in July and continues until frost. Plant vigor determines seed production, which can vary from 3 or 4 capsules totaling 1,500 seeds to 50 or more capsules and 30,000 or more seeds. Seeds are dispersed 1-4 meters from the dry capsules. Disturbing the plants at harvest greatly facilitates seed dispersal, but dispersal is also accomplished by water, on farm machinery, or as an impurity of commercial seeds. Seeds can remain viable in the soil for more than a century.

The roots release various alkaloids that are allelopathic to other plants.

VII. Economic Importance: A) Beneficial. *D. stramonium* has been used in human and veterinary medicine as a source of alkaloids for pharmacological purposes. Historically, it has been used in folk medicines as an antiasthmatic, anesthetic, and ointment for burns and rheumatism.

D. stramonium has been the subject of many studies in genetics and plant development. It is also susceptible to more than 60 viruses and is frequently used as a host plant in pathological studies (Thornberry 1966).

B) Detrimental. *D. stramonium* is a weed of cultivated fields, waste places, barnyards, and other disturbed habitats. It is especially a problem in soybeans, corn, and solanaceous crops such as tomatoes, peppers, potatoes, and tobacco.

All parts of the plant are poisonous, especially the seeds and leaves. Tropane alkaloids are the poisonous agents, and *Datura* is one plant reported by the U.S. National Clearinghouse for Poison Control Centers as the cause of human death. Livestock generally avoid eating jimsonweed unless other vegetation is unavailable, but may be poisoned by ingesting it as a contaminant of hay or silage. In addition, the large, coarse plants interfere with harvesting and are hosts for many plant diseases and insects.

VIII. Control: Preventing infestation is important. Buy clean seed and after working in an infested field clean all equipment. Special effort should be made to prevent plants from going to seed. The reason jimsonweed is considered a problem weed should perhaps be sought in the erratic germination of its seeds over a number of years, thus evading common control practices such as **cultivation and clipping**. If individual plants are pulled, wear gloves to avoid contact with skin and eyes.

Crop rotation from soybeans or corn to small grains or alfalfa alters environmental conditions enough to reduce jimsonweed problems.

Chemical control of jimsonweed in corn can be achieved with most preemergence treatments. Jimsonweed in soybeans can be effectively controlled by most post-emergence treatments. For specific cropping or habitat recommendations, consult your county extension agent or the most recent weed control publications such as *The Penn State Agronomy Guide and Vegetable Production Guide*, or *Weed Control Manual and Herbicide Guide*, available through Meister Publishing Company, 37841 Euclid Avenue, Willoughby, Ohio 44094.

Always read and follow label instructions for all herbicides and observe restrictions on grazing and harvesting.

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