

Pale Swallow-wort

Cynanchum rossicum (Kleopov) Barbarich
Milkweed family (Asclepiadaceae)

NATIVE RANGE

Europe

DESCRIPTION

Pale or European swallow-wort (previously *Vincetoxicum rossicum*) is a long-lived perennial, twining herbaceous vine. The leaves are oval shaped with pointed tips, 3-4 in. long by 2-3 in. wide, and occur in pairs along the stem. The small five-petaled, star shaped flowers are creamy pink to reddish brown, about ¼ in. across, and are borne in clusters. The fruits are slender tapered pods, 2-3 in. long by about ¼ in. wide, that turn from green to light brown as they mature. When ripe, the fruits open along a seam and release flattened seeds equipped with a downy parachute that aids in wind dispersal. In contrast to its invasive relative the black swallow-wort (*C. louiseae*), pale swallow-wort does not have rhizomes. Plants tend to grow in clumps of several to many stems, forming extensive patches.



NOTE: There are many native species of *Cynanchum*, including honeyvine (*Cynanchum laeve*) which occurs throughout the eastern U.S. and could be confused with pale swallow-wort. Honeyvine has white flowers, and its leaves have a distinct heart-shaped base.

ECOLOGICAL THREAT

Pale swallow-wort can form extensive patches that crowd out native plant species and have various impacts on native wildlife. In some instances old-field habitats occupied by goldenrods and grasses are replaced almost exclusively by swallow-wort, disrupting natural succession and completely altering the physical structure of those habitats. A New York study on grassland birds indicated that as swallow-wort cover increases, grassland bird presence declines. In a study of ground and stem-dwelling insects in Ottawa, Ontario, diversity of these insects was found to be lower in pale swallow-wort infested areas than in non-invaded old-field sites and gall-makers and miners were completely absent. In New York, pale swallow-wort is displacing the federally listed Hart's tongue fern (*Asplenium scolopendrium*) at one site and poses a threat to additional populations in the state. Globally rare alvar habitats (limestone pavement barrens supporting unique plant communities) in New York are also threatened by expanding swallow-wort populations. Research indicates that pale swallow-wort modifies the soil microbial community, displacing native plant species that are adapted to the unique microbial associations of alvar.



DISTRIBUTION IN THE UNITED STATES

Pale swallow-wort has been reported to be invasive in natural areas in New Hampshire, New York, Rhode Island and Wisconsin. Small occurrences or infestations have been also been reported for urban areas in Pennsylvania, Maryland, and Indiana, presumably due to escapes from backyards and landscaped areas.

HABITAT IN THE UNITED STATES

Pale swallow-wort is associated exclusively with upland areas and is tolerant of a range of light and moisture conditions. Typical habitats include old fields, hedgerows, brushy areas and woodlands. Both natural and human-caused disturbance including ice-scoured river banks, talus slopes, transportation corridors, quarries and abandoned agricultural fields provide acceptable habitats. Pale swallow-wort is particularly competitive in areas with shallow soils over limestone bedrock that can be prone to summer droughts. There appears to be a distinct association with limestone soils. Pale swallow-wort can be a serious problem in perennial cropping systems such as pastures and Christmas tree plantations and has been noted in no-till corn fields in central New York State. It is not a weed of turf or annual crops.

BACKGROUND

Pale swallow-wort was likely introduced for ornamental purposes and was first collected in Monroe and Nassau counties in New York State in 1897. Subsequent records of occurrences include: Massachusetts (1919), Pennsylvania (1927), New Jersey (1938), Connecticut (1942), Indiana (1961), New Hampshire (1979) and Michigan (1985). Indications of naturalized populations include records of collections from roadsides (1897, 1917) and natural areas (1918, 1919 and 1921) in New York State.

BIOLOGY & SPREAD

Pale swallow-wort emerges in spring and flower from June to July followed by production of fruits (pods) which is directly related to the level of light available. The flowers are self-pollinating and it spreads primarily by seed. Thick infestations in full sun can produce up to 2,000 seeds per square meter. The seeds are polyembryonic (i.e., having one to four embryos per seed) which greatly increases the potential for establishment. Wind dispersal of seed occurs from late July and continues into the fall. Populations growing under dense wooded canopy may have inadequate resources to produce flowers or seeds. Pale swallow-wort dies back to the ground every winter. Pale swallow-wort root crown fragments support dormant buds that readily sprout if not destroyed.

MANAGEMENT OPTIONS

As with all invasive species, early detection and removal is the best approach for preventing the establishment and spread of this plant. If you find some black swallow-wort, look for more, and aim to remove all plants at a site. Stay out of patches that are actively dispersing seeds, unless you plan to collect and dispose of the seeds carefully. Clean all machinery that has traveled through swallow-wort patches that have maturing or dispersing pods. For large established infestations, chemical control is the most effective means.

Biological

There are no biological controls available for this plant.

Chemical

Two systemic herbicides - Garlon® 4 (triclopyr ester) and Roundup Pro® (glyphosate) – have been found to be effective in controlling pale swallow-wort. These herbicides should be applied when plants are actively growing, after flowering has begun. **DO NOT SPRAY TOO SOON.** Avoid the temptation to spray the plants as soon as they emerge in May. Only when the plants flower will they be large enough to receive enough spray on the exposed leaf surface to deliver a killing dose to the roots. Plants that are sprayed before pods form will probably not produce a viable seed crop that season. Be patient. Systemic herbicides do not cause a “burn down” of plants like contact herbicides do. Within 1-2 weeks the plants will look sick. There may be dead tissue spots on most leaves many yellowing leaves. Do not waste herbicide, money or effort by spraying plants twice. Sick plants cannot effectively absorb the herbicide through the leaf surface or move the herbicide to the roots. Swallow-wort control may take a few years and it is important not to use more herbicide than is necessary.



Cut stem application

For cut stem applications use a 50 to 100% solution of herbicide concentrate. Roundup Pro® is much more effective than Garlon® 4 for cut stem application. Apply the herbicide solution immediately to cut stem surfaces. As mentioned above with foliar applications, if treated plants have mature pods the seeds may ripen after treatment and disperse, leading to new infestations. If possible, cut plants low and bag and dispose of the portions with pods.

Foliar application

Experience shows that foliar sprays of systemic herbicides (i.e., herbicides absorbed into the plant and carried internally) only kill plants in the upper layers of the infestation, requiring repeated applications to effectively control the entire mass. It is important to treat plants before pods begin to form to ensure that viable seeds are not produced. If that is not possible, plants with pods should be cut or mowed first and then sprayed once they regrow. Regrowth will be rapid in summer.

Herbicide application to the new growth should be conducted from August through early September. If mowing is not possible, for example in wooded areas, cut plants by hand just below the lowest pods, and spray the new growth. In situations where foliar sprays are undesirable, for example when desirable native plants or other non-targets would be harmed, sponging the herbicide on individual plants, using the same concentration as foliar sprays is an option.

Manual

Remove pod-bearing plants from the site and destroy them. Eradication on a small scale must be very thorough and requires dedication. The complete root crown must be dug out before the seeds ripen. Plants bearing seeds should be burned or bagged and disposed of in a landfill. Infested land might be brought under control by plowing and planting an annual crop until the seed soil bank is depleted, possibly as long as five years.

Mechanical

Mowing, even several times a year, will not eradicate swallow-wort however, it can be employed to prevent a seed crop. Cutting is most effective at preventing a mature seed crop if done in early to mid-July, when there are small, immature pods on the plants. Cutting during the flowering period but before pod formation will allow plants to recover and still produce a viable seed crop. Monitor mowed areas and mow a second time if pods reach mature size in late summer or early fall. Hay cutters can contribute to the spread of swallow-wort if cutting is not timed correctly. Hay crops infested with swallow-wort and then sold elsewhere can be a means of introducing swallow-wort to new areas.

USE PESTICIDES WISELY: Always read the entire pesticide label carefully, follow all mixing and application instructions and wear all recommended personal protective gear and clothing. Contact your state department of agriculture for any additional pesticide use requirements, restrictions or recommendations.

NOTICE: mention of pesticide products on this page does not constitute endorsement of any material.

RESTORATION

Rehabilitation efforts will vary by habitat and age of infestation. Young infestations may have enough of the enduring seed bank and dormant plants of the displaced plant community to recover without active management. In degraded habitats, establishing cool season grasses will permit application of broad leaf herbicides to control swallow-wort plants recruited from the seed bank and from nearby infestations. Research on restoration of swallow-wort infested areas is on-going.

CONTACTS

For more information on the management of pale swallow-wort, please contact:

- Fran Lawlor, Swallow-wort Management Coordinator, Central and Western New York Chapter, The Nature Conservancy, 269 Ouderkirk Rd., Pulaski, NY 13142; (315) 387-3600, fax: (315) 387-3602, flawlor at tnc.org
- Sandra Bonanno, Stewardship Ecologist, Central and Western New York Chapter, The Nature Conservancy, 269 Ouderkirk Rd., Pulaski, NY 13142; (315) 387-3600, fax: (315) 387-3602, sbonanno at tnc.org

SUGGESTED ALTERNATIVE PLANTS

In the eastern U.S., the native honeyvine (*Cynanchum laeve*) can be substituted for the invasive pale swallow-wort. Other attractive native vines that are widely available in the East include trumpet creeper (*Campsis radicans*), trumpet honeysuckle (*Lonicera sempervirens*), Dutchman's pipe (*Aristolochia macrophylla*), Virginia creeper (*Parthenocissus quinquefolia*) and native wisteria (*Wisteria frutescens*). Check with your state or local native plant society for more information on alternative species and sources where you can obtain them.

OTHER LINKS

- <http://www.invasive.org/search/action.cfm?q=Cynanchum%20rossicum>
- <http://www.lib.uconn.edu/webapps/ipane/browsing.cfm?descriptionid=14>

AUTHOR

Fran Lawlor, Central and Western New York Chapter, The Nature Conservancy, Pulaski, NY

REVIEWERS

Gerry Rising and Ann Rhoads

EDITOR

PHOTOGRAPHS

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REFERENCES

- Cappuccino, N., MacKay, R. and Eisner, C. 2002. Spread of the invasive alien *Vincetoxicum rossicum*: tradeoffs between seed dispersability and seed quality. *Am. Mid. Nat.* 148: 263-270.
- Casagrande R. A. and Dacy, J. 2001. Monarch Butterfly (*Danaus plexippus*) oviposition on Black Swallowwort (*Vincetoxicum nigrum*). *Rhode Island Nat. Hist. Surv.* 8: 2-3.
- Christensen, T. 1998. Swallow-worts, the ecology and control of *Vincetoxicum* spp. *Wildflower*: 21-25.
- DiTommaso A. and Losey, J. E. 2003. Oviposition selection and larval feeding by Monarch Butterflies on two invasive swallow-wort species. *Proceeding of the Annual Meeting of the Northeastern Weed Science Society of America* 57:121.
- Ernst, C. and Cappuccino, N. 2003 The effects of an invasive vine, *Vincetoxicum rossicum*, (Asclepiadaceae) on old-field arthropod assemblages in Ottawa, Ontario. (Talk) New England Invasive Plant Summit, September 19-20, 2003, Framingham, Massachusetts
- Greipsson, S. and DiTommaso, A. 2002. Impact of the invasive plant *Vincetoxicum rossicum* on activity of arbuscular mycorrhizal fungal populations. *Ecological Society of America Meeting Abstracts* 87: 358.
- Haribal, M. and Renwick, J.A.A. 1998. Identification And distribution of oviposition stimulants for Monarch butterflies in hosts and nonhosts. *J. Chem Ecol.* 24: 891-904.
- Lawlor, F. M. 2000. Herbicidal treatment of the invasive plant *Cynanchum rossicum* and experimental post control restoration of infested sites. M.S. Thesis, State University of New York College of Environmental Science and Forestry, New York.
- Lawlor, F.M. and Raynal, D.J., 2002. Response of swallow-wort to herbicides. *Weed Science* 50:179-185.
- Lumer, C. and S. E. Yost. 1995. The reproductive biology of *Vincetoxicum nigrum* (L.) Moench (Asclepiadaceae), a Mediterranean weed in New York State. *Bulletin of the Torrey Botanical Club* 122:15-23.
- Markgraf, F. 1972. *Vincetoxicum* N .M. Wolf. Pages 71-73 in T.G. TUTIN, v. h. Heywood, N. A. Burgess, D.H. Valentine, S.M. Walters and D.A. Webb, eds. *Flora Europaea*. Vol. 3. Diapensiaceae to Myoporaceae. Cambridge University Press, Cambridge, UK.
- Moore, R.J. 1959. The dog-strangling vine *Cynanchum medium*, its chromosome number and its occurrence in Canada. *Can. Field-Nat.* 73: 144-147.
- Pobedimova, E. G. 1952. Family CXXXIII Asclepiadaceae Lindl. Pages 487-527 in B. K. Shiskin and E. G. Bobrov, eds. *Flora of the U.S.S.R.* Volume 18. Matachlamydeae. [Translation by N. Landau, 1967, Israel Program fro Scientific Translation, Jerusalem, for The Smithsonian Institution and The National Science Foundation, Washington, D.C.]
- Pringle, J.S. 1973. The spread of *Vincetoxicum* species (Asclepiadaceae) in Ontario. *Can Field-Nat.* 87:27-33.
- Sheeley, S. 1992. The distribution and life history characteristics of *V. rossicum* (*Vincetoxicum rossicum*). M.S. Thesis, State University of New York College of Environmental Science and Forestry,
- Sheeley, S. E. and D. J. Raynal. 1996. The distribution and status of species of *Vincetoxicum rossicum* in eastern North America. *Bulletin of the Torrey Bot. Club* 123(2):148-156.

Swearingen, J. 2006. WeedUS: Database of Plants Invading Natural Areas in the U.S.
<http://www.nps.gov/plants/alien/list/all.htm>