

johnny jumpup

Viola tricolor L.

Synonyms: *Viola macedonica* Boiss. & Duet, *V. tricolor* var. *hortensis* Candolle.

Other common names: garden violet, pansy, pansy violet, wild pansy

Family: Violaceae

Invasiveness Rank: 34 The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description

Johnny jumpup is an annual or biennial herb that grows from 10 to 30 cm tall. Stems are erect, branched, angled, and glabrous or covered in short, downward-pointing hairs. Leaves are alternate, petiolated, glabrous or covered in short hairs, and oblong to lanceolate with blunt-toothed margins and large, 8 to 40 mm long, leaf-like, pinnately lobed stipules. Flowers are solitary in the leaf axils, nodding, five-petaled, 1 to 3.5 cm long, and bilaterally symmetrical. Petals are longer than sepals and have variable color patterns of violet, white, and yellow. Often, the upper petals are dark violet and the lower petals are white, yellow, or pale violet with dark violet streaks and yellow towards the base of the lowest petal. Sepals are green, oblong-lanceolate, 12 to 22 mm long, and 3 to 5 mm wide. Capsules are ellipsoid, 5 to 12 mm long, glabrous, and three-valved. Seeds are light brown (DiTomaso and Healy 2007, eFloras 2008, Nadochij 2009, Klinkenberg 2010, NatureGate 2010).



Viola tricolor L. Photo by K. Lenes.

Similar species: Eight *Viola* species are native to Alaska and could be confused with johnny jumpup due to their similar yellow, white, or violet flowers. Johnny jumpup can be distinguished from native species by the presence of large, leaf-like, pinnately lobed stipules and petals that are longer than sepals. Johnny jumpup is the only non-native *Viola* species known to occur in Alaska (Hultén 1968, DiTomaso and Healy 2007, AKEPIC 2010).



Viola tricolor L. Photo by J. Hempel.

Ecological Impact

Impact on community composition, structure, and interactions: Johnny jumpup grows in roadsides and disturbed areas at low densities (AKEPIC 2010, Klinkenberg 2010), where it may increase the density of colonizing plants and cause modest reductions in moisture and nutrients available to native species. However, infestations do not appear to persist in Alaska (Carlson pers. obs.). Johnny jumpup is insect pollinated (Lankinen 2000), and its presence may alter native plant-pollinator interactions.

Impact on ecosystem processes: Johnny jumpup may reduce the moisture and nutrients available to native

species.

Biology and Invasive Potential

Reproductive potential: Plants reproduce by seeds, and each plant is capable of producing up to 3,020 seeds (Nadtochij 2009). Seeds can remain viable in the soil for up to six years (Nadtochij 2009).

Role of disturbance in establishment: In its native range, johnny jumpup grows on semi-natural grasslands, dry hillsides, flat rocks, rocky outcrops, sand dunes, and cultivated soils (Lankinen 2000, Kiviniemi 2008, NatureGate 2010). It is intolerant of shade and establishes in open areas (Nadtochij 2009). In North America, this species grows in disturbed areas and roadsides (Klinkenberg 2010). All infestations in Alaska are associated with either fill importation or material extraction (AKEPIC 2010).

Potential for long-distance dispersal: Seeds are ejected explosively from the fruits and are further dispersed by ants (Beattie and Lyons 1975). They have elaiosomes, fleshy-oily protuberances that attract ants (Kiviniemi 2008).

Potential to be spread by human activity: Johnny jumpup is commonly cultivated in gardens, and in Alaska it may escape from cultivation into disturbed areas (DiTomaso and Healy 2007, eFloras 2008). It is recommended in Alaska as a fire resistant plant for use in landscaping around homes (Alaska Community Forestry Program 2005).

Germination requirements: Seeds have innate dormancy and remain dormant for 6 to 8 months after maturation. Seedlings will not emerge when seeds are buried deeper than 5 cm. The optimum temperature range for germination is 18°C to 24°C, but seeds can germinate at temperatures as low as 2°C (Nadtochij 2009).

Growth requirements: Johnny jumpup has high light requirements and is intolerant of shading. It grows best on mesic, nutrient-rich soils with pH between 6 and 7.5. This species does not grow well in sand, clay, nutrient-poor, or acidic soils (Nadtochij 2009).

Congeneric weeds: No *Viola* species are considered noxious in the U.S. or Canada (Invaders 2010, USDA 2010). Field violet, *V. arvensis*, can be a problematic weed in agricultural crops, and heavy infestations can reduce crop yields (Crop Compendium 2010). Field violet and English violet (*V. odorata*) are considered weeds in some parts of the U.S. (DiTomaso and Healy

2007, USDA 2010).

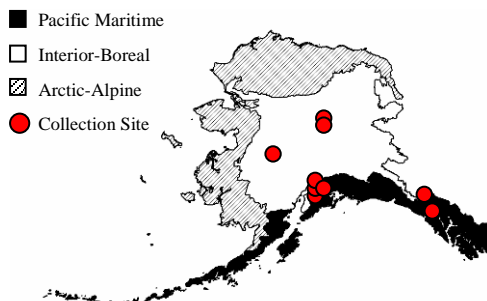
Legal Listings

- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states
- Federal noxious weed
- Listed noxious in Canada or other countries

Distribution and Abundance

In North America, johnny jumpup grows in disturbed sites, cultivated areas, and roadsides (DiTomaso and Healy 2007, Klinkenberg 2010).

Native and current distribution: Johnny jumpup is native to Europe. It has been introduced to China, Japan, Australia, New Zealand, South America, and North America (Mito and Uesugi 2004, eFloras 2008, GBIF New Zealand 2010, Tropicos 2010, USDA 2010). It has been collected from arctic regions in Norway and western Russia (Nadtochij and Budrevskaya 2003, Vascular Plant Herbarium Oslo 2010). This species grows in 40 states of the U.S. (USDA 2010). It has been documented from the Pacific Maritime and Interior-Boreal ecogeographic regions of Alaska (AKEPIC 2010, UAM 2010).



Distribution of johnny jumpup in Alaska

Management

Mechanical methods and herbicide applications have been successful at controlling johnny jumpup in cultivated fields in Russia (Nadtochij 2009). Annually-repeated, mechanical removal of plants has been successful in controlling johnny jumpup in Glacier Bay National Park and Preserve (Rapp 2009).

References:

- AKEPIC database. Alaska Exotic Plant Information Clearinghouse Database. 2010. Available: <http://akweeds.uaa.alaska.edu/>
- Alaska Community Forestry Program. 2005. Protect Your Home from Wildfire, Fire Resistant Vegetation and Landscaping. Community Forestry Program, Division of Forestry, Alaska

- Department of Natural Resources. [27 October 2010] <http://forestry.alaska.gov/pdfs/05FireResistVeg.pdf>

- Beattie, A., and N. Lyons. 1975. Seed Dispersal in *Viola* (Violaceae): Adaptations and Strategies. *American Journal of Botany*. 62(7). 714-722 p.

- Carlson, M., Associate Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.
- Crop Compendium. 2010. Bayer CropScience AG, Bayer. Available at <http://compendium.bayercropscience.com>
- DiTomaso, J., and E. Healy. 2007. Weeds of California and Other Western States. Vol. 2. University of California Agriculture and Natural Resources Communication Services, Oakland, CA. 974 p.
- eFloras. 2008. Published on the Internet <http://www.efloras.org> [accessed 19 October 2010]. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA.
- GBIF New Zealand, New Zealand National Plant Herbarium (CHR). 2010. Accessed through GBIF (Global Biodiversity Information Facility) data portal (<http://data.gbif.org/datasets/resource/474>, 2010-10-26).
- Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 pp.
- Invaders Database System. 2010. University of Montana. Missoula, MT. <http://invader.dbs.umt.edu/>
- ITIS – Integrated Taxonomic Information System. 2002. Available: <http://www.itis.gov/> [19 October 2010].
- Kiviniemi, K. 2008. Effects of fragment size and isolation on the occurrence of four short-lived plants in semi-natural grasslands. *Acta Oecologica*. 33(1). 56-65 p.
- Klinkenberg, B. (Editor) 2010. *Viola tricolor* L. In: E-Flora BC: Electronic Atlas of the Plants of British Columbia. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia. Vancouver, BC. [27 October 2010] Available: <http://www.geog.ubc.ca/biodiversity/eflora/index.shtml>
- Lankinen, Á. 2000. Effects of soil pH and phosphorous on in vitro pollen competitive ability and sporophytic traits in clones of *Viola tricolor*. *International Journal of Plant Sciences*. 161(6). 885-893 p.
- Mito, T., and T. Uesugi. 2004. Invasive Alien Species in Japan: The Status Quo and the New Regulation for Prevention of their Adverse Effects. *Global Environmental Research*. 8(2). 171-191 p.
- Nadtochij, I. 2009. Weeds, *Viola tricolor* L. – Garden violet. AgroAtlas. Interactive agricultural ecological atlas of Russia and neighboring countries: Economic plants and their diseases, pests, and weeds. [27 October 2010] http://www.agroatlas.ru/en/content/weeds/Viola_tricolor/
- Nadtochij, I., and I. Budrevskaya. 2003. Weeds, Area of distribution and harmfulness of *Viola tricolor*. AgroAtlas. Interactive agricultural ecological atlas of Russia and neighboring countries: Economic plants and their diseases, pests, and weeds. [27 October 2010] http://www.agroatlas.ru/en/content/weeds/Viola_tricolor/map/
- NatureGate. 2010. Finland Nature and Species. Helsinki, Finland. [27 October 2010] Available: <http://www.luontoportti.com/suomi/en/>
- Plants for a Future. 2010. [27 October 2004] Available: <http://www.pfaf.org/user/default.aspx>
- Rapp, W. 2009. Invasive Plant Management in Glacier Bay National Park and Preserve, Summer 2009 Field Season Report. Report on file with Glacier Bay National Park and Preserve, National Park Service. Gustavus, AK. 164 p.
- Tropicos. 2010. *Viola tricolor* L. Missouri Botanical Garden. St. Louis, MO. [27 October 2010] <http://www.tropicos.org/Name/33800045>
- UAM. 2010. University of Alaska Museum, University of Alaska Fairbanks. Available: <http://arctos.database.museum/home.cfm>
- USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2010. The PLANTS Database <http://plants.usda.gov> [19 October 2010]. National Plant Data Center, Baton Rouge, LA 70874-4490 USA
- Vascular Plant Herbarium, Oslo. 2010. Accessed through GBIF (Global Biodiversity Information Facility) data portal (<http://data.gbif.org/datasets/resource/1078>, 2010-10-20). Natural History Museum, University of Oslo. Oslo, Norway.
- Vascular Plants Field Notes, Oslo. 2010. Accessed through GBIF (Global Biodiversity Information Facility) data portal (<http://data.gbif.org/datasets/resource/1079>, 2010-10-20). Natural History Museum, University of Oslo. Oslo, Norway.
- Vascular Plant Field Notes, Trondheim. 2010. Accessed through GBIF (Global Biodiversity Information Facility) data portal (<http://data.gbif.org/datasets/resource/8064>, 2010-10-20). Natural History Museum, University of Oslo. Trondheim, Norway.