

DALMATIAN TOADFLAX

Linaria genistifolia spp. *dalmatica* (L.)
Marie and Petitmengin

Family: *Scrophulariaceae* (Figwort).

Other Scientific Names: *Linaria dalmatica*.

Other Common Names: Broad-leaved toadflax, wild snapdragon.

Legal Status: Provincial Noxious.



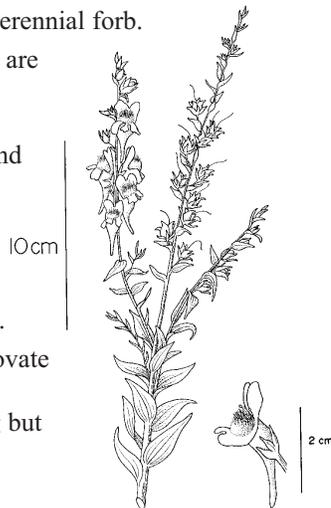
Identification

Growth form: Perennial forb.

Flower: Flowers are borne in loose, elongate, terminal racemes. Flowers are bright yellow and resemble snapdragons.

Seeds/Fruit: Fruits are egg-shaped to nearly round capsules. Seeds are sharply angular and slightly winged.

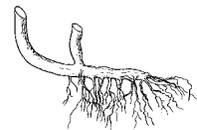
Leaves: Leaves are broad, ovate to ovate-lanceolate, and are alternate, generally clasping but crowded.



Stems: Mature plants are 0.6–1.2 m tall. A single toadflax plant contains 1–25 vertical floral stems.

Roots: The taproot may penetrate 1 m into the soil. Horizontal roots may grow to be several meters long and can develop adventitious buds that may form independent plants.

Seedling: No information available.



Similar Species

Exotics: Yellow toadflax (*Linaria vulgaris*) is similar in appearance but has more linear pointed leaves and is generally smaller.

Natives: None known.

Impacts

Agricultural: Low-till cultivation practices have contributed to the resurgence of toadflax populations on agricultural lands (McClay 1992). Dalmatian toadflax contains a glucoside, a quinoline alkaloid, and peganine, which make it toxic to livestock. However, it is generally considered unpalatable to livestock (Rees et al. 1996). Reports of livestock poisonings are rare.

Ecological: Dalmatian toadflax is a persistent, aggressive invader and capable of forming dense

populations through creeping root systems. Populations can compete with native grasses and other forbs, altering the species composition of natural communities. Infestations also can occur in small openings on excellent-condition rangeland (Lajeunesse 1999). Toadflax can also reduce forage production for livestock and other ungulates (Robocker 1974).

Human: No information available.

Habitat and Ecology

General requirements: In BC, grows at low- to mid-elevations in the Interior along roadsides and in disturbed areas, gardens, cultivated fields, grassland, and transitional forest-grassland (Powell et al. 1994). It can adapt to a wide range of environmental conditions and is tolerant of low temperatures and coarse, textured soils.

Distribution: Occurs widely throughout Canada and the US, but the heaviest infestations are found in BC,

Alberta, and the northwestern US (Lajeunesse 1999). It occurs throughout the Okanagan, Similkameen, Thompson, East Kootenay, Cariboo, Skeena, and Boundary areas (Powell et al. 1994). It is regarded as a major concern in all of the province's agricultural reporting regions except the Mainland.

Historical: Introduced from Europe, likely as an ornamental.

Life cycle: Plants emerge mid-April, depending on geographic location. During the first year the plant forms a rosette and develops a deep root system. Prostrate stems emerge in autumn and produce ovate leaves. These stems are tolerant to freezing and develop into floral stems the following year (Robocker 1974). Floral stems develop after winter dormancy and emerge about the same time as new seedlings in mid-April. A single plant can produce 1–25 floral stems. Flowering occurs from May to August and seeds mature from July to September. Dalmatian toadflax also reproduces vegetatively from root buds and

possibly from root fragments (Zimmerman 1996). The main taproot may penetrate 0.9–1.2 m into the soil, and lateral roots can extend up to 3.7 m.

Mode of reproduction: By seed and vegetatively from roots.

Seed production: A mature plant can produce up to 500,000 seeds annually (Morishita 1991).

Seed bank: Seeds may remain viable up to 10 years.

Dispersal: By wind and animals. Deer, elk, and birds eat seeds and seed heads.

Hybridization: No information available.

Management

Biocontrol: Five agents occur in BC: *Brachyterolus pulicarius* (beetle), *Calophasia lunula* (moth), *Eteobalea intermediella* (moth), *Gymnaetron antirrhini* (weevil), and *Mecinus janthinus* (beetle). *Mecinus janthinus* has established well in several areas of the province and reduction in toadflax populations have been recorded (Dr. R. DeClerk-Floate: Personal communication to Dr. Brian M. Wikeem).

Mechanical: Cutting plants reduces topgrowth seed reproduction but will not kill the plant. Hand-pulling toadflax before seed-set each year can be an effective management method for new and small populations, especially if a seed bank has not developed. On a local basis, sheep grazing can suppress infestations and reduce seed production (Lajeunesse 1999), but grazing should be applied before the plants set seed.

Fire: No information available.

Herbicides: Autumn applications of picloram and picloram mixed with 2,4-D have provided management on some sites. In a US study, diclorprop was also effective at management. Consult the most recent edition of BC Ministry of Agriculture, Food and Fisheries Crop Production Guides for specific recommendations. **Before applying herbicides, read the label for full use and precautionary instructions.**

Cultural/Preventive: Intensive disking can be an

effective management method on cropland under some circumstances. This method requires at least 2 years with 8–10 cultivations in the first year, and 4–5 cultivations in the second year (Morishita 1991). Follow-up seeding with appropriate perennial species is also required to provide competition with the weed. Hand-pulling can be effective for small infestations in a new area. Pull plants before seed-set to eliminate development of a seed bank.

Integrated Management Summary

Integrated management should focus on impeding vegetative spread and reducing seed production (Lajeunesse 1999). Successful control can be obtained by pulling or killing the plants with herbicide before toadflax seed production begins (Carpenter and Murray 1998). Since the plant also spreads vegetatively and viable seeds remain in the soil for up to 10 years, these treatments must be repeated for several years to eradicate the stand locally. Seed disturbed areas to perennial grasses and forbs to provide ground cover and competition.

References

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