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INTRODUCTION

The name “toadflax” is applied to several closely related plant species in the genus *Linaria*, which includes approximately 98 species that are all native to areas outside of North America. All species of *Linaria* have smooth-margined leaves that usually attach directly to the stem without a supporting stalk (petiole). *Linaria* flowers are arranged in long clusters at stem tips and bloom from the bottom upwards. Toadflaxes are in the family Plantaginaceae, along with their close relatives the snapdragons. Toadflaxes and snapdragons share a unique five-petal flower with distinct upper and lower lips and a long spur (Fig. 1).

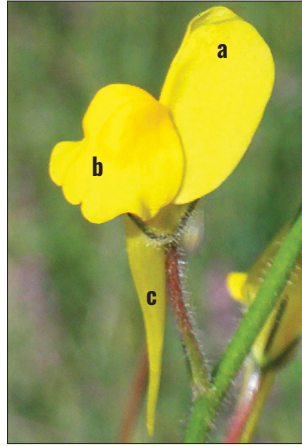


Figure 1. Typical toadflax and snapdragon flower with an (a) upper and (b) lower lip and (c) long downward-pointing spur (Javier Martin CCO)

Approximately 13 *Linaria* species and hybrids of two different pairs of *Linaria* occur in the USA and Canada. Of these, Dalmatian toadflax (*Linaria dalmatica*), yellow toadflax (*Linaria vulgaris*), and their hybrids are by far the most common and problematic for land managers, and are the focus of this publication.

TAXONOMIC ISSUES

The taxonomy and distribution of Dalmatian toadflax have long been a point of contention, primarily due to large variations in leaf appearance. This is compounded by the fact that Dalmatian and yellow toadflax can hybridize, further increasing variability in plant appearance. Dalmatian toadflax continues to be referred to by a range of scientific names, and two general forms of Dalmatian toadflax are often mentioned (narrow-leaved and broad-leaved). These two forms may correspond to two subspecies (*L. dalmatica* ssp. *macedonica* and *L. dalmatica* ssp. *dalmatica*), or they may just represent variation in the leaves of one, all-encompassing Dalmatian toadflax species throughout its range. This publication follows the interpretation that *Linaria genistifolia*

(L.) Mill. is distinct from what we are referring to as North American Dalmatian toadflax, *L. dalmatica* (L.) Mill., and that *L. dalmatica* consists of two subspecies, of which only *L. dalmatica* ssp. *dalmatica* is invasive and weedy in North America. The taxonomy of this group is under review.

CLASSIFICATION

RANKING	SCIENTIFIC NAME	COMMON NAME
Kingdom	Plantae	Plants
Subkingdom	Tracheobionta	Vascular plants
Superdivision	Spermatophyta	Seed plants
Division	Magnoliophyta	Flowering plants
Class	Magnoliopsida	Dicotyledons
Subclass	Asteridae	
Order	Lamiales	
Family	Plantaginaceae	Plantain family
Genus	<i>Linaria</i>	Toadflax
Species	<i>Linaria dalmatica</i> (L.) Mill.	Dalmatian toadflax
Species	<i>Linaria vulgaris</i> Mill.	Yellow toadflax
Species	<i>Linaria dalmatica</i> x <i>L. vulgaris</i>	Hybrid toadflax

SYNONYMS

Dalmatian toadflax: broad-leaved toadflax

Yellow toadflax: common toadflax, butter-and-eggs

HISTORY AND DISTRIBUTION

Dalmatian toadflax was introduced to eastern North America from southeastern Europe by the late 1800s, reportedly as an ornamental plant used by horticulturists in private gardens. Yellow toadflax was introduced to North America from Eurasia by the late 1600s, likely as an ornamental plant, and for use in fabric dye and folk remedies. Hybrids of these species were first reported in North America in 2009. As of 2021, Dalmatian toadflax has been reported in 31 states, nine Canadian provinces, and one Canadian territory (Fig. 2a). Yellow toadflax has been reported in all 49 continental states, 10 Canadian provinces, and two Canadian territories (Fig. 2b). Their hybrids have been recorded in five western states and one Canadian province (Fig. 2c).

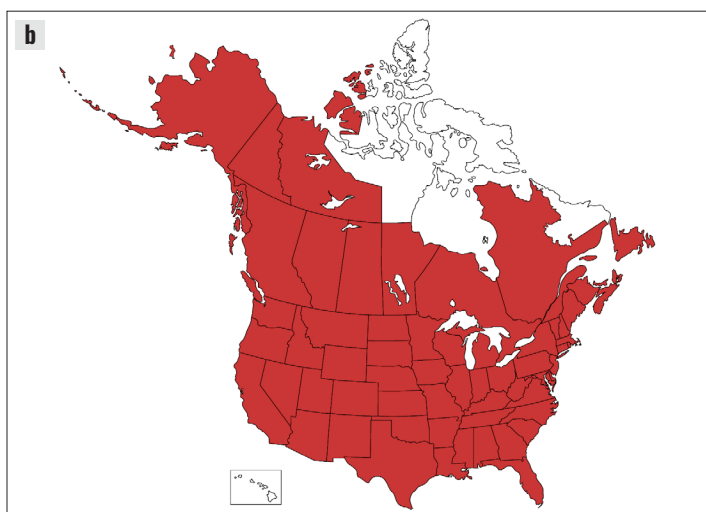
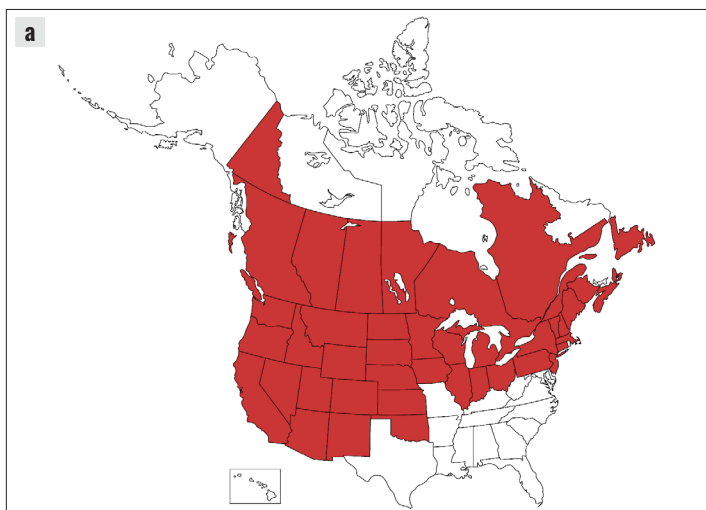


Figure 2. North American distribution of (a) Dalmatian toadflax; (b) yellow toadflax; (c) hybrid toadflax. Some states and provinces are more heavily infested than others (Credit: EDDMapS, www.eddmaps.org; USDA PLANTS Database, plants.usda.gov [both accessed 16 September 2021]; Sing et al. 2016; Toševski et al. 2018)

IMPACT

Because Dalmatian and yellow toadflax compete aggressively for light, water, and nutrients, both toadflaxes (and likely their hybrids) can displace native and/or more desirable plant species in natural areas. Unlike Dalmatian toadflax, yellow toadflax also affects cropland and is a serious management concern on both cultivated and uncultivated sites. Large yellow toadflax infestations have caused economic injury to crops as diverse as grain, oil seed, berries/small fruits, and oil mint.

Dalmatian toadflax

Linaria dalmatica (L.) Mill.

IDENTIFICATION

AT A GLANCE

Dalmatian toadflax (Fig. 3) is an erect, herbaceous perennial with one or more robust, straight stems growing 1–4 ft (0.3–1.2 m) tall from a deep taproot with lateral roots. Leaves are alternate, thick (succulent to leathery), green in color (sometimes blue-green), and often with a waxy surface. Leaves are heart-shaped at the base, clasp the stem, and are typically 1–2 in (2½–5 cm) long and nearly as wide. Flowers are bright yellow and snapdragon-like with an obvious upper and lower lip and a long spur pointing downward. Each has a fuzzy, yellowish-orange throat. Flowers occur in spiked clusters emerging from leaf axils. Each flower produces a round capsule holding 60–300 small, somewhat triangular seeds.



Figure 3. Dalmatian toadflax plant (K. George Beck & James Sebastian, Colorado State University, Bugwood.org CC BY-3.0 US)

Roots

Dalmatian toadflax develops taproots that are large, contorted, and deep (often 4–10 ft or 1.2–3 m long). Roots have lateral branches that can extend over 10 ft (3 m) from the parent plant, giving rise to vegetative buds that produce new stems (Fig. 4a). Over time, these shoots form their own roots and eventually become independent plants. Very small, severed root segments can develop into new plants.

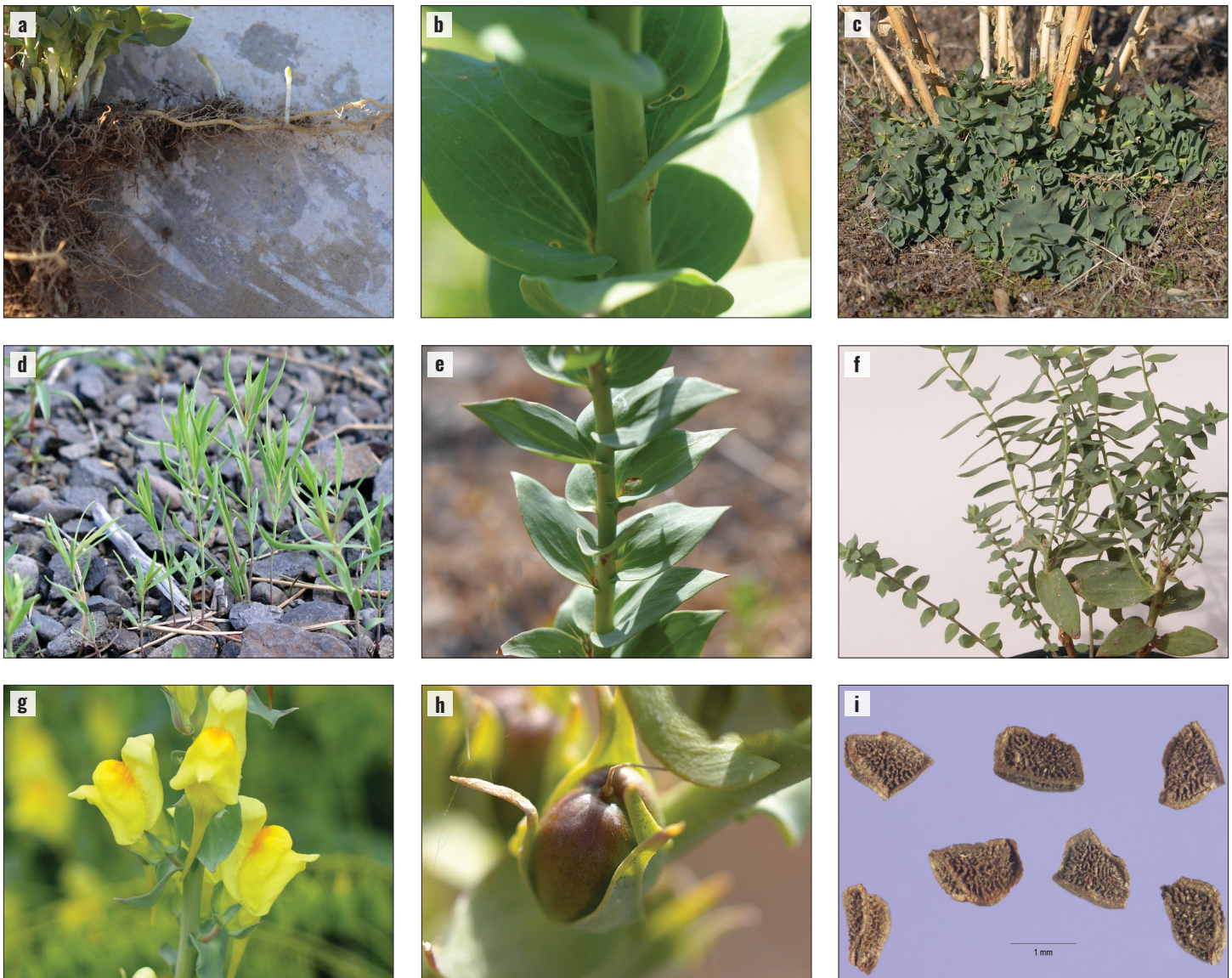


Figure 4. Dalmatian toadflax (a) lateral roots with new stems arising from nodes; (b) erect stem; (c) prostrate stems; (d) seedling leaves; (e) mature leaves; (f) narrow and wide leaves on same plant due to drought stress and grazing; (g) flowers; (h) fruit; (i) seeds (a–c,e,h: Travis McMahon, MIA Consulting; d: Linda Wilson, University of Idaho, Bugwood.org CC BY 3.0 US; f: Sarah M. Ward, Montana State University; g: Duane A. Dyer, iNaturalist.org CC BY-NC 4.0; i: Steve Hurst, USDA NRCS PLANTS Database, Bugwood.org CC BY 3.0 US)

STEMS AND LEAVES

Plants typically grow 1–4 ft tall (0.3–1.2 m) and have 1–25 erect flowering stems that are leafy, thick-walled, fibrous, and waxy in appearance and texture (**Fig. 4b**). The group of prostrate stems produced by a single plant is called a rosette (**Fig. 4c**), the form in which the plant persists over winter until new reproductive stems are produced in the following growing season. Leaves are long and narrow on seedlings (**Fig. 4d**), but grow significantly wider with age. Mature leaves are heart-shaped at the base, clasp the stem, and are typically 1–2 in (2½–5.0 cm) long and nearly as wide (**Fig. 4e**). Upper leaves are smaller and oval or lance-shaped. Drought-stress and grazing can result in both broad and narrow leaves on the same plant (**Fig. 4f**). All leaves are alternate, thick, green (sometimes blue-green), often waxy, and have multiple prominent veins.

FLOWERS

Flowers occur in spiked clusters emerging from leaf axils. Flowers are bright yellow and snapdragon-like with an obvious upper and lower lip and a long spur pointing downward (**Fig. 4g**). Each flower is 0.8–1.6 in (2–4 cm) long and has a fuzzy, yellowish-orange throat.

FRUITS AND SEEDS

Each flower produces a round capsule fruit (**Fig. 4h**) that is 0.2–0.4 in (½–1 cm) long and 0.2–0.3 in (½–¾ cm) wide. Each capsule contains 60–300 seeds. Seeds are small, triangular or pyramidal in shape, rough-textured, minimally winged, and approximately 0.04 in (1 mm) long (**Fig. 4i**).

ECOLOGY

Dalmatian toadflax spreads by seeds and root fragments. Seeds are dispersed fall through winter, and typically spread by humans and animals. Seeds can be caught on motorized equipment, mud on tires or clothing, hay, or animal fur. Because seeds ingested by animals often remain viable upon defecation, livestock, birds, elk, and deer grazing toadflax fruits in autumn is one of the primary modes of toadflax long distance seed dispersal. Many Dalmatian toadflax seeds germinate within one year; however, the soil seed bank can at times yield seedlings ten years after seed drop. The highest rates of germination have been recorded for seeds buried shallowly in loamy or sandy soil.

Some Dalmatian toadflax seeds germinate in fall, but most germinate in spring. Seedlings (Fig. 4e) grow quickly, and can establish a 20-in (51 cm) long taproot within eight weeks of germination. Plants produce 2–5 erect flowering stems and prostrate non-flowering stems the first season (Fig. 4c,d). The prostrate stems sprout in summer or early autumn and remain green throughout the winter, especially under snow cover. In the second year and subsequent years, there can be up to 25 flowering stems and up to 40 non-flowering stems arranged in a loose rosette at the base of the plant. Seasonal growth of stems can begin as early as February in warm areas, or as late as April in cooler, northern or high elevation areas. Flowering occurs throughout summer and fall (May to hard frost, depending on site conditions). Flowers are cross-pollinated by bumblebees and other large bees, and seeds are produced from summer to fall. A mature plant can annually produce up to 500,000 seeds that are gradually released through the fall and winter. Plants re-sprout each spring from adventitious

buds on the root crown. Vegetative buds on lateral roots can produce new stems as early as three weeks after germination. Dalmatian toadflax plants live 3–5 years on average.

HABITAT

Soil disturbance is a very important contributor to Dalmatian toadflax seedling establishment. This weed is often found along railroads, riverbanks, and roadsides, as well as in fallow fields, slash piles, abandoned lots, and overgrazed rangeland (Fig. 5). A variety of habitat types and plant communities can be invaded or become dominated by Dalmatian toadflax following heavy grazing, tunneling or burrowing by wildlife, trampling, cultivation, road or fire line construction, flooding, erosion, logging, and burning. This weed thrives in cool, semiarid conditions and on poor quality, coarse-textured soils.

Yellow toadflax

Linaria vulgaris Mill.

IDENTIFICATION

AT A GLANCE

Yellow toadflax (Fig. 6) is an erect, herbaceous perennial typically growing numerous stems 1–3 ft (0.3–1 m) tall from a taproot with spreading lateral roots. Leaves are alternate, green, pointed at both ends, and may have small petiole-like stalks. Older leaves are narrow and typically 1–2 in (2.5–5 cm) long with a large central vein on the underside. Flowers are pale yellow and snapdragon-like with an obvious upper and lower lip and a spur pointing downward. Each has a fuzzy, bright orange throat. Flowers occur in spiked clusters at the top of the stem. Each flower produces an oval capsule fruit holding 10–40 viable, flat, disc-shaped seeds.



Figure 6. Yellow toadflax plant (Travis McMahon, MIA Consulting)

Roots

Yellow toadflax develops taproots that can grow up to 3.3 ft (1 m) deep. Roots have lateral branches that can extend several yards (meters) from the parent plant. Lateral roots have vegetative buds that produce new stems (Fig. 7a). Very small, severed root segments can develop into new plants.

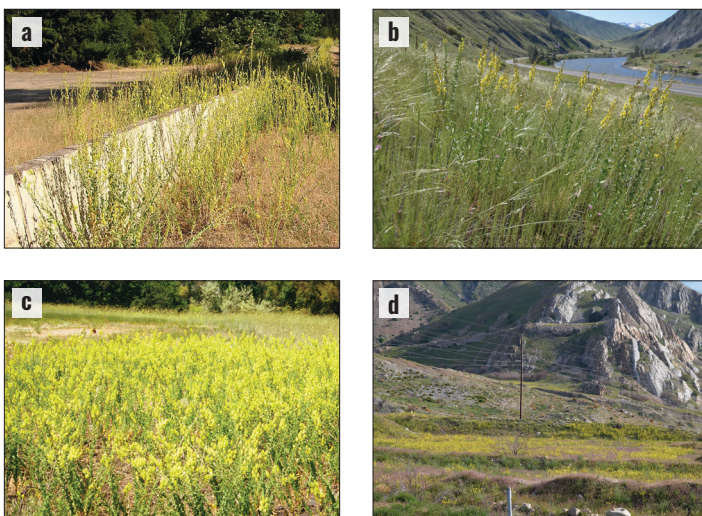


Figure 5. Dalmatian toadflax is frequently found in or along (a) roadsides, (b) riversides, (c) fallow fields, and (d) overgrazed rangeland (a: Eric Coombs, Oregon Department of Agriculture, Bugwood.org CC BY-3.0 US; b,d: Travis McMahon, MIA Consulting; c: Steve Dewey, Utah State University, Bugwood.org CC BY-3.0 US)

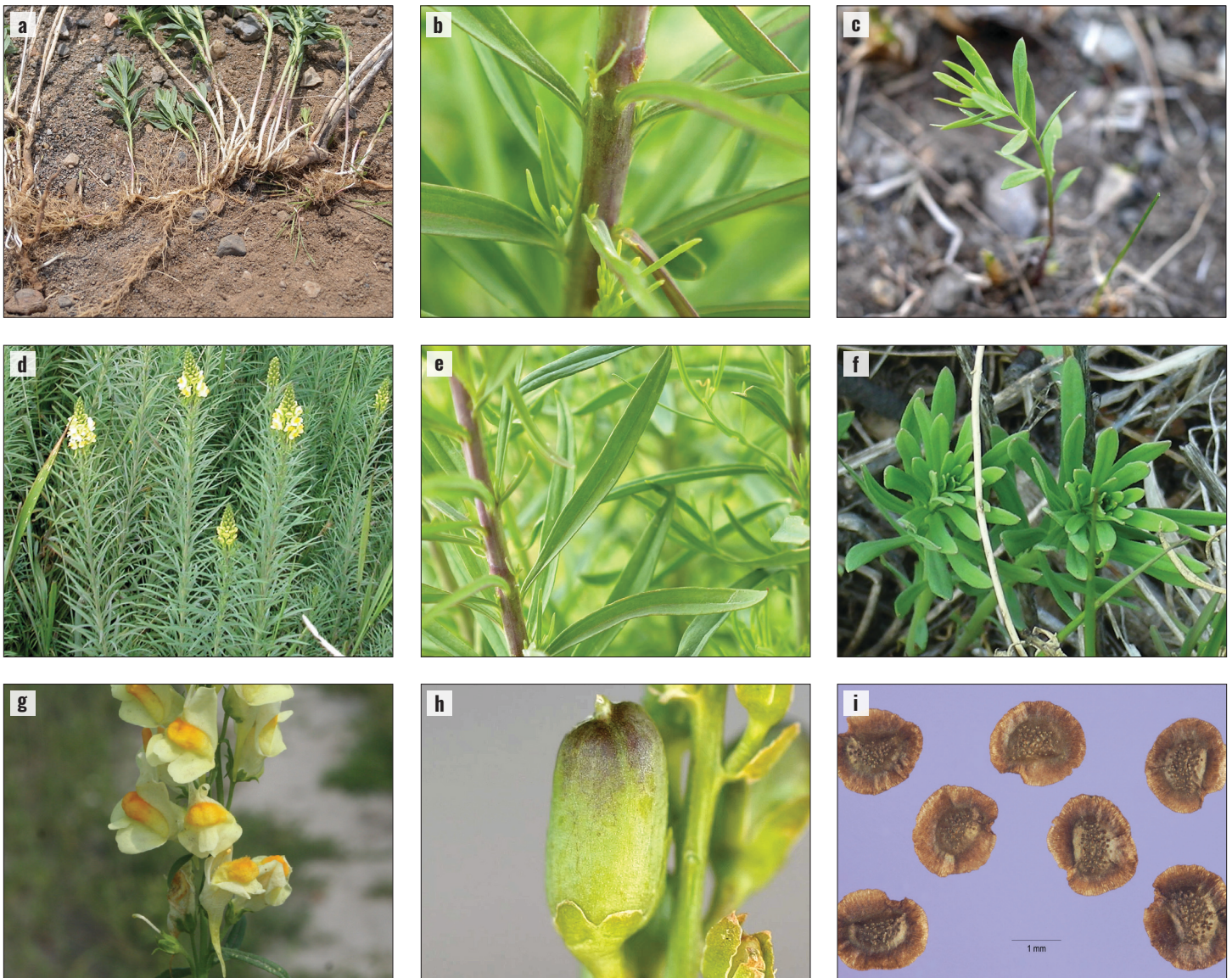


Figure 7. Yellow toadflax (a) lateral roots with new stems arising from nodes; (b) stem; (c) young plant; (d) mature leaves that are long and feathery; (e) leaves that are moderately robust but pointed at the tip; (f) leaves that are wider and more rounded at the tip; (g) flowers; (h) fruit; (i) seeds (a–c,e,h: Travis McMahon, MIA Consulting; d: Michael Shephard, USDA Forest Service, Bugwood.org CC BY 3.0 US; f: Sharlene E. Sing, USDA Forest Service RMRS; g: Alexander Baransky, iNaturalist.org CC BY-NC 4.0; i: Steve Hurst, USDA NRCS PLANTS Database, Bugwood.org CC BY 3.0 US)

STEMS AND LEAVES

Plants typically grow 1–3 ft (0.3–1 m) tall, though stem height can vary dramatically, even for plants growing in the same vicinity. Plants produce a few to many erect, leafy stems. Most mature stems are woody and somewhat reddish at their base, becoming more slender, succulent, and greener toward the growing tip (**Fig. 7b**). Yellow toadflax stems die back completely in winter; unlike Dalmatian toadflax, yellow toadflax does not produce an overwintering rosette. Leaves are alternate, pointed at both ends, and may be attached to the stem by small petiole-like stalks, though these are sometimes absent. Leaves of seedlings are often slightly wider (**Fig. 7c**) than Dalmatian toadflax seedling leaves (**Fig. 4d**) and not quite as smooth or waxy. Mature yellow toadflax leaves are narrow and typically 1–2 in (2½–5 cm) long with

an obvious central vein on the underside. Leaves are green, often with a silvery tinge. Though all yellow toadflax leaves are linear and have a consistent width along their length, the overall leaf width can vary significantly between infestations, ranging from slender and feathery (**Fig. 7d**), to moderately more robust but still pointed at the tip (**Fig. 7e**), to somewhat wider with rounded tips (**Fig. 7f**). Experienced observers may find that yellow toadflax leaves give off a distinctive “cat urine” odor.

FLOWERS

Flowers occur in tightly grouped, spiked clusters at the tops of stems in groups of 6–30. Flowers are pale yellow and snapdragon-like with an obvious upper and lower lip and a spur pointing downward. The spur on yellow toadflax flowers

is reduced compared to that on Dalmatian toadflax. Each flower is 0.8–1.6 in (2–4 cm) long with a fuzzy, bright orange throat that functions as a nectar guide to entice pollinators (Fig. 7g).

FRUITS AND SEEDS

Each flower produces an oval capsule fruit (Fig. 7h) that is 0.2–0.5 in ($\frac{1}{2}$ – $1\frac{1}{4}$ cm) long. Seed capsules have the potential to produce a maximum of 250 seeds, though most contain only 10–40 viable seeds. Seeds are very small, lightweight, flat, prominently winged discs (Fig. 7i), and are approximately 0.06 in ($1\frac{1}{2}$ mm) in diameter.

ECOLOGY

Yellow toadflax spreads by seeds, creeping roots, and root fragments. Seeds are dispersed from late summer through winter, and typically spread by humans and animals. Seeds can be caught on motorized equipment, mud on tires or clothing, hay, or animal fur. Because seeds ingested by animals often remain viable upon defecation, livestock, birds, elk, and deer grazing toadflax fruits in autumn is one of the primary modes of toadflax long distance seed dispersal. Yellow toadflax seeds have low viability, with germination rates commonly less than 50%. Some researchers have reported that seed capsules maturing late in the season (November) contained more viable seeds than those maturing earlier in the season (September), though this may not be true for all yellow toadflax populations. While some yellow toadflax seeds germinate immediately, many can remain dormant but viable in the soil for eight years or more.

Yellow toadflax seeds germinate in spring. Seedlings grow quickly, developing lateral roots capable of vegetative reproduction within three weeks of germination. Plants can produce up to 100 stems from the root system during the first growing season, then up to 250 new shoots during the second year. Because all yellow toadflax stems die back completely in winter, spring re-growth in established plants occurs only from sub-soil root buds and not, as is the case for Dalmatian toadflax, from an overwintered rosette. Spring stem growth begins as early as March in warm regions, or in April or even later in cooler, more northerly or high elevation sites. Flowering occurs throughout summer and into fall (May to November, depending on site conditions). Flowers are cross-pollinated by bumblebees and other large bees, and seeds are produced from summer to fall. A mature plant can produce 1,500 to 30,000 seeds annually, on average. These are gradually released from the seed capsules throughout fall and winter. Established, mature plants re-sprout each spring from adventitious buds in their roots. Yellow toadflax plants live four years on average.

HABITAT

Soil disturbance can be an important contributor to yellow toadflax seedling establishment. The weed is often found at chronically disturbed sites such as roadsides, railroads, cultivated fields, pastures, and rangeland. Yellow toadflax has also been found in backcountry locations where there has been very little to no disturbance, indicating it also has the ability to invade healthy ecosystems. It is a common weed across North America, occurring in a variety of habitat types and plant communities (Fig. 8), and it is frequently found in more fertile and moist soil than Dalmatian toadflax.

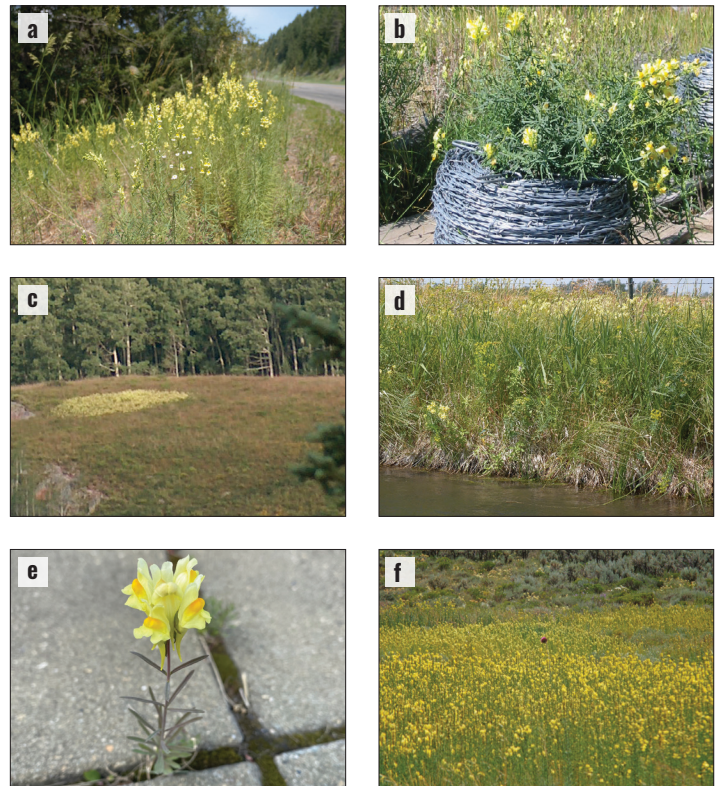














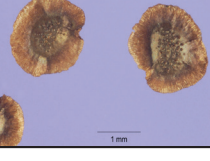


Figure 8. Yellow toadflax growing (a) along a roadside, (b) in a roll of barbed wire, (c) in a montane forest opening, (d) along an irrigation canal, (e) between landscaping pavers, and (f) in a field in sagebrush steppe (a,d: Travis McMahon, MIA Consulting; b,c: Hal Pearce, US Forest Service; e: Nikitadubov2000, iNaturalist.org CC BY-NC 4.0; f: Mark Schwarzländer, University of Idaho, Bugwood.org CC BY-3.0 US)

DIFFERENTIATING DALMATIAN AND YELLOW TOADFLAX

Key traits for differentiating Dalmatian and yellow toadflax are given in Table 1. Please keep in mind these species exhibit extensive variation in the field, and the descriptions stated in Table 1 correspond to the most typical characteristics observed in the field. Dalmatian and yellow toadflax also hybridize in the field in North America (see next section), and their hybrids may strongly resemble either parent or be intermediate in form.

Table 1. Comparison of select features of Dalmatian toadflax and yellow toadflax. For image credits, see captions of figures 4 and 7.

FEATURE	DALMATIAN TOADFLAX	YELLOW TOADFLAX
ROOTS Dalmatian: Deeper taproot, shorter lateral roots Yellow: Shorter taproot, longer lateral roots		
STEMS Dalmatian: Taller, thicker, typically solid green Yellow: Often shorter, thinner, may be reddish-tinged near base		
PROSTRATE STEMS Dalmatian: Often has several non-flowering stems that persist over winter Yellow: Not produced		NA
SEEDLING LEAVES Dalmatian: Long and thin, waxy Yellow: Often slightly thicker, but can be variable		
MATURE LEAVES Dalmatian: Waxy, heart-shaped, clasping, multiple veins Yellow: Not waxy or clasping, linear, short stalk, single vein		
FLOWERS Dalmatian: Bright yellow, yellow-orange throat, long spur Yellow: Pale yellow, bright orange throat		
FRUIT Dalmatian: More round Yellow: More oval, slightly longer		
SEEDS Dalmatian: Triangular Yellow: Winged, rounded		

Hybrid toadflax

Linaria dalmatica x *L. vulgaris*

IDENTIFICATION

Due to the many possible combinations of genetic contributions of either parental toadflax species, a set description for hybrid toadflax is not possible. Hybrids may very closely resemble

Dalmatian toadflax if the genetic contribution from yellow toadflax was only minor, or vice versa (Fig. 9). In the most clear-cut cases, hybrid toadflax presents traits that are truly intermediate between both parent species. In particular, hybrid leaves are generally wider than yellow toadflax leaves, usually do not clasp the stem, and may have a prominent midvein. Hybrid leaves may also have multiple, less prominent side veins, and show intermediate leaf characteristics in terms of thickness and waxy texture (Fig. 9a-c). Because both Dalmatian and yellow toadflax leaves can vary considerably depending on local population genetics, site conditions (Fig. 4d-f, Fig. 7d-f), and drought stress or grazing damage, intermediate leaf forms are not always a reliable characteristic for identifying hybrid individuals.

ECOLOGY

Hybrid toadflax spread is similar to both parent species. Its ecology is also similar, although seasonal growth of stems has been observed as beginning earlier in the spring for hybrid toadflax compared to either parent species.

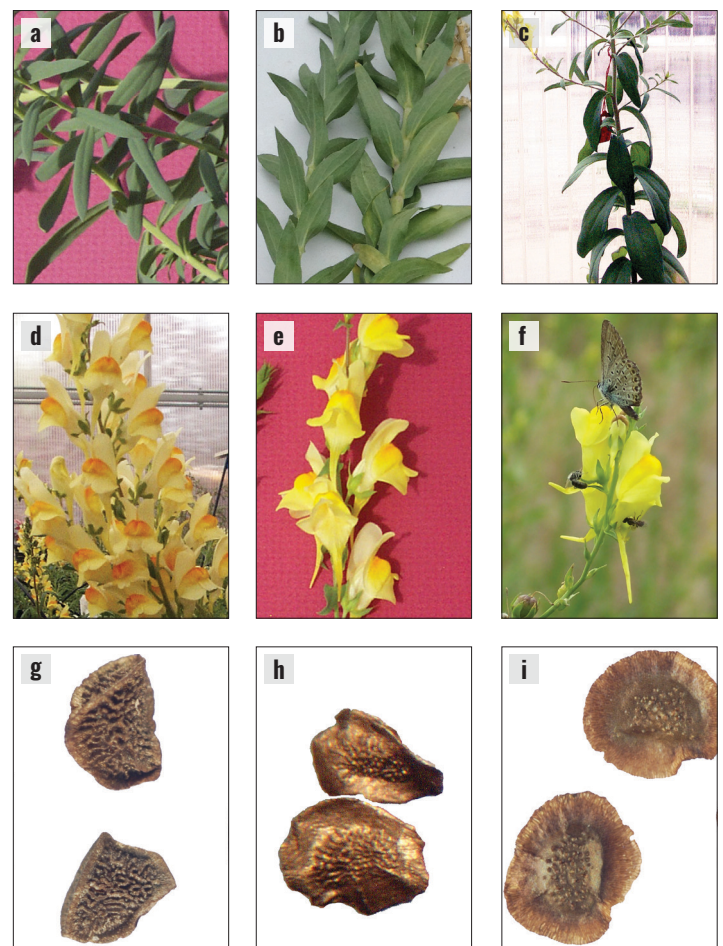


Figure 9. Hybrid toadflax leaves (a-c) and flowers (d-f) exhibit marked variation depending on site conditions and the genetic contributions of parental species. Hybrid seeds are also variable; they may resemble (g) Dalmatian toadflax, (i) yellow toadflax, or (h) be intermediate in form (a-e, h: Sarah M. Ward, Montana State University; f: Sharlene E. Sing, USDA Forest Service RMRS; g,i: Steve Hurst, USDA NRCS PLANTS Database, Bugwood.org CC BY 3.0 US)

HABITAT

Hybrid toadflaxes have been found in chronically disturbed sites suitable for either parent species, including roadsides, riverbanks, slash piles, abandoned lots, pastures, and rangeland in a variety of soils and climatic conditions (Fig. 10). The presence of both Dalmatian and yellow toadflax on-site increases the possibility that hybridization has taken place, although on some sites, either or both parental species may have been eliminated by competitively superior hybrid offspring.

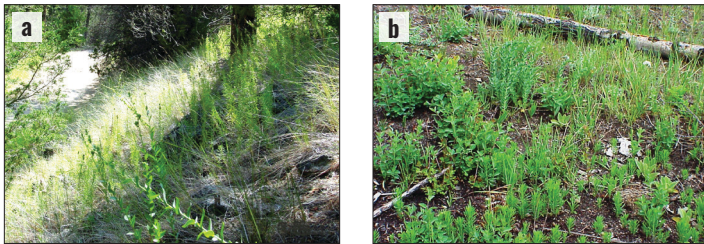


Figure 10. Hybrid toadflax infestations (a) in a forest understory, with Dalmatian toadflax uphill, hybrid toadflax mid-slope, and yellow toadflax downhill; (b) following a prescribed burn for aspen regeneration (a,b: Sharlene E. Sing, USDA Forest Service RMRS)






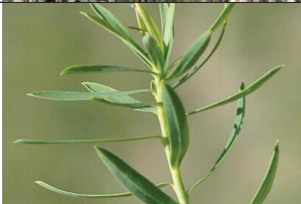


SIMILAR SPECIES

Their large, yellow snapdragon-like flowers help differentiate Dalmatian and yellow toadflax from most potential look-alikes. The majority of the 13 *Linaria* species and hybrids present in North America (all of them exotic) have pink, purple, or bi-colored flowers. There are two *Linaria* species present in North America and one cultivated yellow snapdragon (*Antirrhinum majus*) with similar yellow flowers that could be confused with yellow toadflax. These are described in greater detail in Table 2. Other, unrelated species present in North America have a few foliage and growth traits similar to Dalmatian or yellow toadflax, and could be confused for these species, especially when observed prior to flowering. These are also listed in Table 2, along with key characteristics that can be used to differentiate the look-alikes.

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Table 2. Comparison of species present in continental North America that are either related to or resemble toadflaxes, and key traits for differentiation.

SPECIES	IMAGE	CHARACTERISTICS
<p>Ballast toadflax <i>Linaria spartea</i> Plantaginaceae Exotic annual forb</p>		<p>Ballast toadflax, an exotic <i>Linaria</i> reportedly present only in Connecticut and Michigan, is weedy along roadsides, fields, and waste areas. It is similar to yellow toadflax with its snapdragon-like flowers and narrow leaves. It differs by lacking lateral roots, having tiny but obvious hairs present on upper stems, and having narrower leaves (less than 1 mm wide).</p>
<p>Prostrate toadflax <i>Linaria supina</i> Plantaginaceae Exotic annual forb</p>		<p>Prostrate toadflax is a rare, exotic <i>Linaria</i> ornamental that could escape into disturbed, waste areas, similar to yellow toadflax. It has similar yellow, snapdragon-like flowers and long, narrow leaves. It differs in that does not have lateral roots, its upper stems have tiny hairs, its leaves are narrower, its stems are more sprawling, and its maximum plant height is 8 in (20 cm).</p>
<p>Yellow snapdragon <i>Antirrhinum majus</i> Plantaginaceae Exotic annual to perennial</p>		<p>Yellow snapdragon is often planted as an ornamental. It could co-occur with yellow toadflax where it has escaped cultivation or where yellow toadflax invades gardens and fields. It has similar flowers as well as alternate, long, and narrow leaves. Yellow snapdragon differs in that its flowers and leaves are larger, it has multiple leaves per axil, and its roots are typically fine and not creeping.</p>
<p>Bastard toadflax <i>Comandra umbellata</i> Santalaceae Native perennial forb or subshrub</p>		<p>Bastard toadflax is similar to Dalmatian and yellow toadflax in the habitats it occupies and its leaf and growth form. Similar to yellow toadflax, its stems have a reddish-colored base. It differs from both toadflaxes by its shorter height (maximum 1 ft or 30 cm) and having rhizomes and parasitic roots. Its rhizomes turn a robin's-egg blue when cut, and its leaves are drier, not waxy to the touch with obvious lateral veins on the underside. It has tiny, whitish-pink, 5-petal flowers that only appear at the tip of the stem.</p>
<p>Goldenbanner <i>Thermopsis</i> spp. Fabaceae Native perennial forbs</p>		<p>Goldenbanner often occurs in similar habitats and has large, showy yellow flowers similar to Dalmatian toadflax, especially when viewed from afar. Closer inspection reveals that goldenbanner leaves are always 3-parted and not succulent, and goldenbanner flowers do not have long spurs.</p>
<p>Leafy spurge <i>Euphorbia esula</i> Euphorbiaceae Exotic perennial forb</p>		<p>Leafy spurge, also frequently listed as a noxious weed, inhabits many of the same habitats as yellow toadflax. Similar to yellow toadflax, leafy spurge is an exotic perennial forb with creeping lateral roots and similar linear leaves and overall growth form. Leafy spurge differs by producing a milky sap when the foliage or stems are damaged, and it has inconspicuous green flowers surrounded by yellow-green bracts.</p>
<p>Myrtle spurge <i>Euphorbia myrsinites</i> Euphorbiaceae Exotic biennial to perennial forb</p>		<p>Myrtle spurge is a noxious weed that occurs in similar habitats to Dalmatian toadflax and has similar waxy, wedge- or heart-shaped leaves that clasp the stem. Myrtle spurge differs in that its stems often lean over instead of growing upright, its foliage produces a milky sap when wounded, and it has typical spurge-type flowers that are green, inconspicuous, and surrounded by yellow-green bracts.</p>
<p>Stoneseed <i>Lithospermum ruderale</i> Boraginaceae Native perennial forb</p>		<p>Stoneseed grows in similar habitats to yellow toadflax in western North America. It grows to a similar height and produces numerous stems, and leaves have a similar shape and form of attachment to the plant stem. It differs from yellow toadflax in that it does not have lateral roots, its leaves and stems are covered with fine hairs, and it has small, star-shaped flowers with 5 whitish-yellow petals.</p>

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