Houndstongue
Cynoglossum officinale L.

History and Ecology in North America

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SYNONYMS
Beggar's lice, dog's tongue, dog bur, sheep lice

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	Boraginales	
Family	Boraginaceae	Borage family
Genus	*Cynoglossum*	Hound's tongue
Species	*Cynoglossum officinale* L.	Houndstongue

HISTORY AND DISTRIBUTION
Houndstongue is native to Europe and Asia. It was introduced to North America (Ontario, Canada) by 1859, likely as a contaminant in crop seed. Its barbed fruits readily adhere to fur, wool, feathers, and clothing, and the plant quickly spread throughout North America. Houndstongue is currently present in 43 U.S. states (**Fig. 1**) and 9 Canadian provinces.

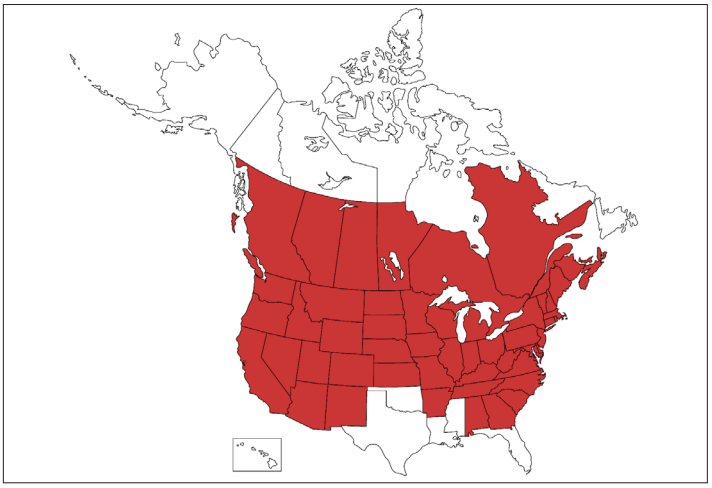

Figure 1. Houndstongue reported distribution in North America (Credit: EDDMapS, www.eddmaps.org; USDA PLANTS Database, plants.usda.gov; both accessed 18 May 2022)

IMPACT
Houndstongue competes with other plants for limited resources and produces compounds that can inhibit the growth of some species. It forms monocultures that displace native species, and it reduces forage production in rangelands and pastures. All parts of the plant contain alkaloids that are toxic to livestock and humans and have resulted in numerous deaths of cattle and horses. Houndstongue's barbed fruits readily adhere to animal fur and wool, decreasing livestock market value, causing eye and skin infections, and sometimes resulting in significant weight loss due to stress from infections.

IDENTIFICATION
At a Glance
Houndstongue (**Fig. 2**) is a terrestrial forb that grows as a biennial or short-lived perennial from a taproot. Plants typically remain rosettes the first year and bolt the second year, growing 1–4 ft (30–120 cm) tall with ridged, hairy stems. Rosette leaves are hairy, elliptical, and up to 12 in (30 cm) long with long stalks. Stem leaves are smaller, stalkless, and alternate. Flowers are ¼–½ in (0.6–1.2 cm) across, have five reddish-purple petals, and are produced in fiddleneck clusters (= coiled at the tip). Each flower produces up to four nutlets covered in tiny barbed hooks.

Figure 2. Houndstongue in flower (Travis McMahon, MIA Consulting)

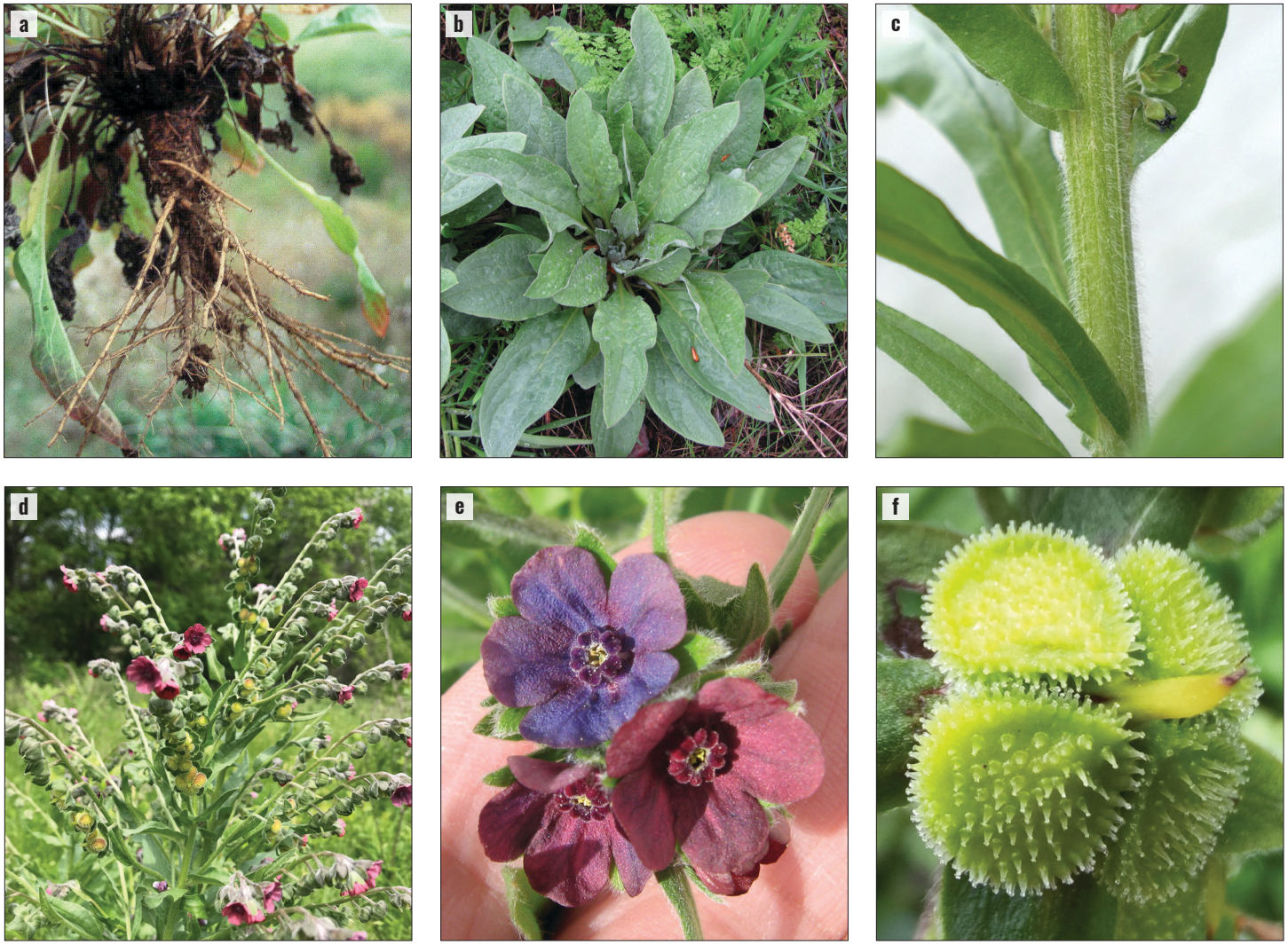

Figure 3. Houndstongue has (a) stout branching taproots, (b) oval to elliptical rosette leaves with long stalks, (c) stalkless alternate stem leaves and a hairy stem, (d) fiddleneck flower clusters with (e) reddish-purple flowers, and (f) nutlets covered in barbed hooks (a: John M. Randall, The Nature Conservancy, Bugwood.org, CC BY-3.0 US; b: Jennifer Andreas, Washington State University Extension; c: Travis McMahon, MIA Consulting; d: PatFojut, iNaturalist.org, CC BY-NC-SA 4.0; e: Vladimir Travkin, iNaturalist.org CC BY-NC 4.0; f: Andreas Berger, iNaturalist.org CC BY-NC 4.0)

Roots

Houndstongue develops a stout, fleshy, and branching taproot capable of extending more than 3 ft (90 cm) deep (**Fig. 3a**). An individual plant consists of one to several rosettes on a single root system.

Stems and Leaves

Plants remain as rosettes the first year, and sometimes for two or more consecutive years, before bolting and flowering. Rosette leaves are oval-shaped or elliptical, at times resembling a hound's tongue (**Fig. 3b**). They are up to 12 in (30 cm) long by 2 in (5 cm) wide with long stalks and smooth margins. They may vary from green to grayish-green and have small, dense hairs on both surfaces. Bolting plants reach heights of 1–4 ft (30–120 cm) tall. Stems are densely hairy (**Fig. 3c**). Stem leaves are smaller than rosette leaves, grow alternately up the stem, and don't have stalks.

Flowers

Flowers are produced in elongated fiddleneck arrangements (**Fig. 3d**) containing 10–35 flowers, though usually only a few flowers are open at once. Flowering begins at the base of the fiddleneck, progressing outwards. Flowers are ¼–½ in (0.6–1.2 cm) across and have five reddish-purple petals that turn blue with age (**Fig. 3e**). To some, the open flowers smell like buttered popcorn.

Fruits and Seeds

Each flower produces up to four nutlet fruits. Nutlets are rounded-triangular and ¼ in (0.6 cm) across and each contain a single seed. Nutlets are green, turning grayish-brown with ripening, and are densely covered with small barbed hooks (**Fig. 3f**). A mature plant can produce between 50 and 2,000 nutlets, though 300–600 is more typical.

ECOLOGY

Houndstongue spreads by seed only. In North America, seeds germinate in early spring and rapidly develop taproots to ensure their survival during drier summer months. Plants remain as rosettes the entire first year, and often longer depending on whether they grow large enough to bolt the following year. Rosette leaves die after autumn frosts and grow again from the root the following spring. If rosettes attained a sufficiently large size during the first year, they will bolt and flower the second year. If they did not, they will remain rosettes until large enough and flower the following year. Flowers are produced from early to late summer and are regularly pollinated by bumblebees, honeybees, and butterflies. Seed abortion is common (**Fig. 4**), reducing seed production by 30–80%. This selective seed abortion may increase the quality and survivability of remaining houndstongue seeds. Typical plants still produce 300–600 nutlets. The barbed hooks on nutlets readily attach to animal fur (e.g., cattle), feathers, and human clothing (**Fig. 5**), thereby allowing long distance seed dispersal. Seeds remain viable for up to three years. The majority of plants die after flowering and setting seed, though some may flower again for a second or third year.

Figure 4. A large proportion of houndstongue seeds are frequently aborted (red arrows) (Travis McMahon, MIA Consulting)

HABITAT

In North America, houndstongue can be found in rangeland, pastures, abandoned cropland, roadsides, and other waste places, but it does especially well in forest clearings created by logging operations and road construction (**Fig. 6**). It has proven to be invasive under a wide variety of conditions including soils that are gravelly, high in organic matter, alkaline, or related to pine forests, and from elevations spanning 2800–9900 ft (850–3000 m). Houndstongue is capable of growing in full sun or partial shade and is found at moist sites as well as those with prolonged drought. Although seed germination is aided by an extended period of moist chilling, this does not limit houndstongue's distribution throughout North America. The one factor most houndstongue sites have in common is their soil disturbance, which aids in houndstongue seedling establishment.

SIMILAR SPECIES

Houndstongue rosettes can sometimes be confused with rosettes of common mullein (*Verbascum thapsus*), though common mullein leaves are usually larger, lighter green and more fuzzy. After bolting, common mullein is easily differentiated by its tall (6.6 ft or 2 m) flower spike covered in yellow flowers. In North America, most other potential look-alike species lack the fiddleneck flower arrangement and barbed fruit characteristic of houndstongue. Other species in the same family (Boraginaceae) have some of these features. They can be differentiated by being smaller plants, having different-colored flowers, or by having differently-shaped nutlets. Species most closely resembling houndstongue are listed in **Table 1**, along with key characteristics that can be used for differentiation.

Figure 5. Houndstongue seeds adhering to shoelaces (inset: close-up of mature seeds) (main image: K. George Beck and James Sebastian, Colorado State University, Bugwood.org, CC BY 3.0 US; inset: Jennifer Andreas, Washington State University Extension)

Figure 6. Houndstongue growing in a logging clearcut (Todd Pfeiffer, Klamath County Weed Control, Bugwood.org, CC BY 3.0 US)

Table 1. Key traits for differentiating houndstongue from similar species.

SPECIES	SIMILARITIES	DIFFERENCES	PLANT	LEAVES	FLOWER
Common mullein *Verbascum thapsus* Scrophulariaceae	Biennial, remains as rosette first year; stout taproot; leaves fuzzy, gray-green, oval to elliptical; stem leaves alternate; stem hairy	Leaves much fuzzier and more gray; stems up to 6.6 ft (2 m) tall; flowers occur on spikes; flowers yellow; fruits capsules that split to release thousands of tiny seeds			
Pacific hound's tongue *Adelinia grande* (=*Cynoglossum grande*) Boraginaceae	Taproot; similar height; basal leaves with stalks; flowers with five purplish petals; barbed nutlet fruits	Perennial; leaves mostly basal; leaves typically wider and hairless; flowers more bluish with white centers; nutlets more sparsely barbed			
Western hound's tongue *Andersonglossum occidentale* (=*Cynoglossum occidentale*) Boraginaceae	Taproot; similar height; leaves and stems roughly hairy; flowers with five purplish petals; barbed nutlet fruits	Perennial; leaves mostly basal; leaves typically narrower, more pointed at the tip; flowers more brown or maroon and tubular at base			
Wild comfrey *Andersonglossum virginianum* (=*Cynoglossum virginianum*) Boraginaceae	Taproot; leaves similar shape and size; leaves and stems roughly hairy; flowers in fiddleneck arrangement; flowers with five petals; barbed nutlet fruits	Perennial; leaves mostly basal; fewer flowers per fiddleneck; flowers white to very pale blue			
Leafy bluebells *Mertensia longiflora* Boraginaceae	Shape similar from a distance and early in season; flowers with five purplish petals; nutlet fruits	Perennial; tuber-like root; leaves smaller, hairy, stalkless, clasp the stem; stems succulent; flowers more blue and never reddish; flowers tubular and drooping; nutlets not barbed			
Common bugloss *Anchusa officinalis* Boraginaceae	Rosette first year; deep taproot; leaves roughly hairy and alternate; stems hairy; flowers in fiddleneck arrangement; five purplish petals; nutlet fruits	Perennial; typically only 2 ft (60 cm) tall; leaves narrower; stem hairs glandular and dark; flowers more purplish with white centers; nutlets not barbed			
Viper's bugloss *Echium vulgare* Boraginaceae	Biennial or short-lived perennial; thick taproot; leaves roughly hairy and alternate; stems hairy; flowers in fiddleneck arrangement; five purplish petals; nutlet fruits	Leaves narrower; stem hairs glandular and dark; flowers subtended by folded bracts; flowers more purplish blue; stamens extend beyond petals; nutlets not barbed			

Photos: common mullein plant, leaves, flowers (Travis McMahon, MIA Consulting); Pacific hound's tongue plant and flower (Ken-ichi Ueda, iNaturalist.org, CC BY 4.0), Pacific hound's tongue leaves (lotusmorning, iNaturalist.org, CC BY-NC-SA 4.0); western hound's tongue plant and leaves (Belinda Lo, iNaturalist.org, CC BY-NC-SA 4.0); western hound's tongue flowers (Alex Abair, iNaturalist.org, CC BY-NC 4.0); wild comfrey plant (Suzanne Cadwell, iNaturalist.org, CC BY-NC 4.0), wild comfrey leaves (bevruegsegger, iNaturalist.org, CC BY-NC 4.0), wild comfrey flowers (Rob Curtis, iNaturalist.org, CC BY-NC-SA 4.0); leafy bluebells plant (Travis McMahon, MIA Consulting), leafy bluebells leaves (Damon Tighe, iNaturalist.org, CC BY-NC 4.0), leafy bluebells flowers (Mhays, iNaturalist.org, CC BY-NC 4.0); common bugloss plant (Isko, iNaturalist.org, CC BY-NC 4.0), common bugloss leaves (Denis Makhnovsky, iNaturalist.org, CC BY-NC 4.0), common bugloss flowers (Almantas Kulbis, iNaturalist.org, CC BY-NC 4.0); viper's bugloss plants, leaves, and flowers (Travis McMahon, MIA Consulting)

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SUGGESTED CITATION

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