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*Aceria drabae*  
Hoary cress gall mite

*Aceria drabae* is a biological control agent approved in the USA for release against [hoary cress](#).

CLASSIFICATION

RANKING	SCIENTIFIC NAME	COMMON NAME
Kingdom	Animalia	Animals
Phylum	Arthropoda	Arthropods
Class	Arachnida	Arachnids
Subclass	Acari	Mites and ticks
Superorder	Acariformes	
Order	Trombidiformes	
Family	Eriophyidae	Gall mites
Genus	<i>Aceria</i>	
Species	<i>Aceria drabae</i> (Nalepa)	Hoary cress gall mite

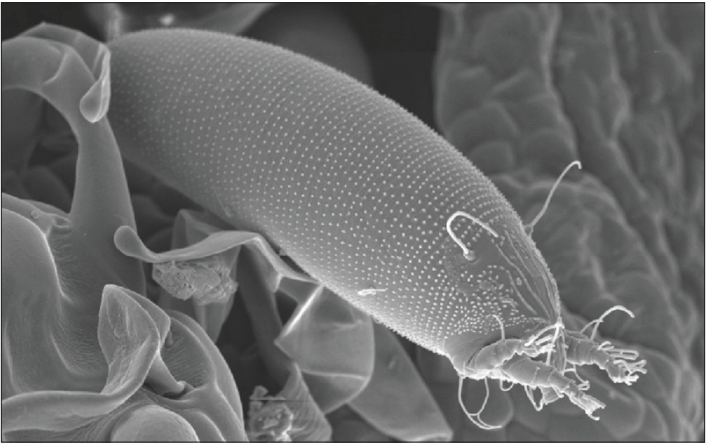


Figure 1. Scanning electron microscope image of *Aceria drabae* (Annie de Meij, Montana State University)

DESCRIPTION

All stages of this species are tiny and best viewed through a microscope. Eggs are spherical and white but turn slightly yellow with age. While adults of many other mite species have eight legs, *Aceria draba* nymphs and adults have only

two pairs of legs; these are located near their heads and have feather claws at their tips (**Fig. 1**). Nymphs and adults are elongated and translucent to opaque white, but may turn yellowish-orange at maturity. First-instar nymphs are smaller and have reduced features, while second-instar nymphs are similar to adults but lack a genital opening. Adults are 0.2–0.3 mm long.

LIFE CYCLE

As hoary cress plants bolt in spring, mite nymphs and adults feed on plant tissue, inducing the formation of contorted galls on stem buds and nodes, as well as floral buds (**Fig. 2a–f**). Females lay eggs within the gall tissue, and there are two nymphal stages prior to the adult stage. One generation can be completed in 10–14 days, depending on temperature, and there are multiple generations per year. As hoary cress plants senesce during summer, mites migrate down to the roots where they overwinter. Throughout the growing season, mites primarily spread via wind, although some are also carried on the bodies of visiting insects.

DAMAGE

Galls induced by mite feeding create a characteristic deformed appearance (**Fig. 2a–f**). The galls stunt shoot growth and reduce or eliminate seed production.

FIELD IDENTIFICATION

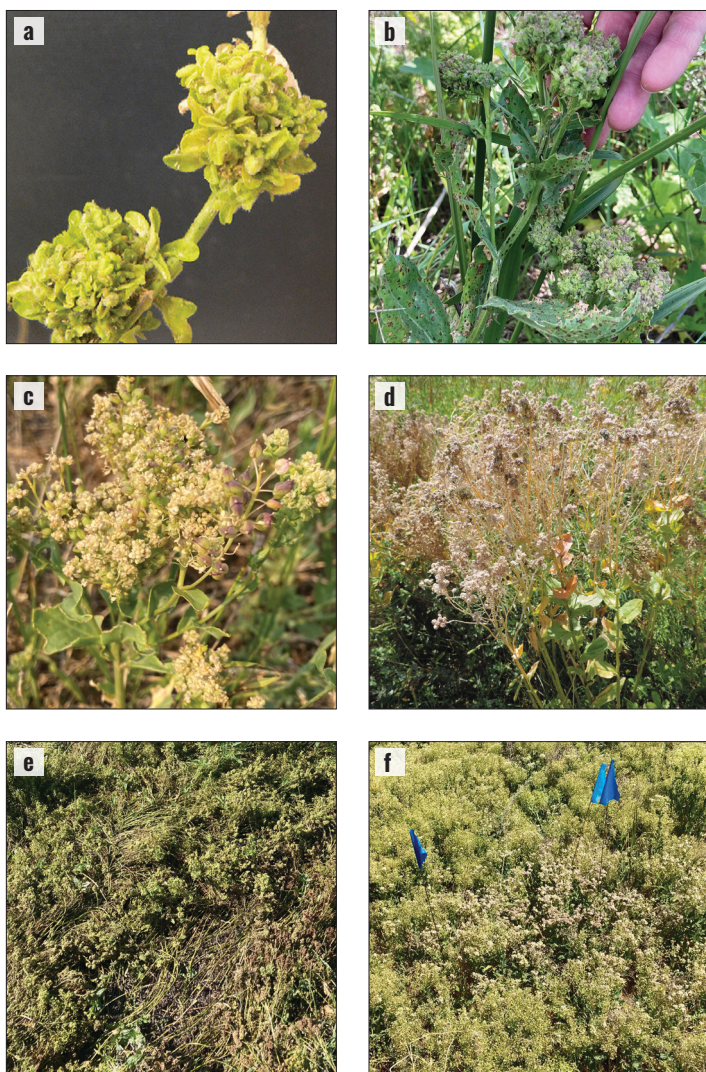
Hoary cress plants attacked by the gall mite can be identified by the presence of clumps of contorted gall tissue (**Fig. 2a–f**), especially in the inflorescences, and by their stunted growth. *Aceria drabae* galls are very distinctive and should not be confused with damage caused by arthropods, diseases, or other potential biocontrol species. No native gall mite species are known to occur on this weed in North America.

PREFERRED HABITAT

The habitat preferences of the hoary cress gall mite are not yet known. In its native range, this mite is well adapted to a variety of environmental conditions.

HISTORY AND CURRENT STATUS

*Aceria drabae* is native from Europe to Central Asia. A population sourced from Greece was released in Montana,

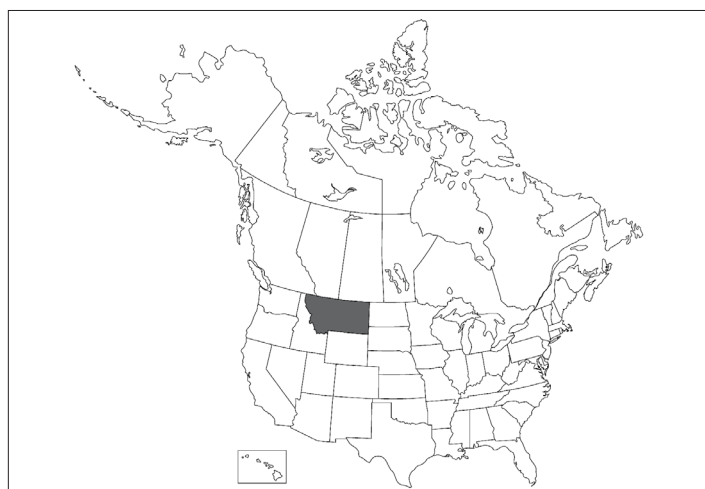


**Figure 2.** *Aceria drabae* feeding causes (a–e) the formation of contorted galls which stunt plant growth and reduce seed production. (f) Hoary cress plants galled by *A. drabae* can be seen around the blue release flags and are surrounded by unattacked, ungalled hoary cress plants. (a–c,e,f: Jeffrey Littlefield, Montana State University; d: Marco Schmidt, iNaturalist.org CC BY-NC-SA 4.0)

USA beginning in 2019 and in Colorado, Idaho and Wyoming beginning in 2022. The mite has successfully established in Montana (**Fig. 3**), though it is still too early to determine its abundance and impact. **This species has not been approved for release in Canada.**

## NOTES

**Hoary cress** in North America is currently regarded as a complex of three species: *Lepidium draba* (hoary cress), *L. appelianum* (globe-podded hoary cress), and *L. chalepense* (lens-podded hoary cress), of which *L. draba* is the most widespread. *Lepidium appelianum* is the most distantly related and is not a good host for *Aceria drabae*, at least under laboratory conditions. *Lepidium draba* and *L. chalepense* are sometimes reported as subspecies of *L. draba* and can overlap morphologically. As of 2023, releases of *A. drabae* have been



**Figure 3.** *Aceria drabae* reported establishment in the USA

recorded on *L. draba* but may have occurred on a mix of *L. draba* and *L. chalepense*.

## NONTARGET EFFECTS

Nontarget impacts are being actively monitored.

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## SUGGESTED CITATION

Littlefield, J., C.B. Randall, and J. Milan. 2023. Hoary Cress Biocontrol Agents: History and Ecology in North America. *In*: R.L. Winston, Ed. Biological Control of Weeds in North America. North American Invasive Species Management Association, Milwaukee, WI. NAISMA-BCW-2023-31-HOARY CRESS-A.

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