

Aceria malherbae Nuzzaci

INVASIVE SPECIES ATTACKED: Field bindweed (*Convolvulus arvensis* L.)

PREVIOUSLY KNOWN AS: *Aceria convolvuli*

TYPE OF AGENT: Leaf & bud galling agent

COLLECTABILITY: Not available for general distribution

ORIGIN: Greece

DESCRIPTION AND LIFE CYCLE

Adult:

Aceria malherbae mites are microscopic, yellow-white and worm-like. Their soft bodies have ring shaped parts (annulate) and have two pairs of legs on their combined head and thorax body. They are active May through November. Their activity slows during the hot summer months and later resumes when cooler weather returns. Eggs are laid in the galls created by their feeding. Multi-generations occur every 10 days during the summer.

Egg:

Eggs are round and translucent.

Larva/Nymph:

Immature mites have two developmental stages, larva and nymph, but lack genital openings. Feeding and development occur within the galls.

Overwintering stage:

Adults and nymphs overwinter below the soil surface on root buds.

EFFECTIVENESS ON HOST PLANT

Adults and nymphs feed on upper leaf surfaces, causing them to distort and curl tightly inward and enclose around the mites. Leaves thicken, become fuzzy-textured and develop a rough, grainy surface. Leaves may turn yellow or red and are often brown by November. *A. malherbae* attack prevents the natural elongated twining growth of the bindweed, which is replaced with shortened tightly curled leaves (Figure 2). Late season feeding reduces the plant's ability to store nutrients. Heavy attack can prevent flowering. The life cycle of *A. malherbae* is closely tied to its host plant development during the growing season.

HABITAT AND DISTRIBUTION

Native:

A. malherbae's distribution occurs in Greece, Italy, France, central and southern Europe and northern Africa.

North America:

A. malherbae requires high humidity for active development. Good establishment is occurring in Montana (Coombs, E. pers. comm. 2008).



Fig. 1. *A. malherbae* mite (credit USDA Agricultural Research Service, USDA Agricultural Research Service, Bugwood.org) See Notes.



Fig. 2. *A. malherbae* attack on field bindweed plant (credit Oregon Department of Agriculture)

British Columbia:

The preferred habitat for *A. malherbae* is unknown. *A. malherbae* releases have been made in the Bunchgrass, Interior Douglas-fir and Ponderosa pine biogeoclimatic zones. In the past, short-term establishment was found in the Bunchgrass zone and recently establishment was confirmed in the Ponderosa pine zone

BRITISH COLUMBIA RECORD

Origin:

The populations released in B.C. originate from Thessaloniki, Greece.

History:

In 1992, the first *A. malherbae* treatment was made in Kamloops. Two more releases were made in 1994 Keromeos/Cawston (one site with two release locations) and in 1998 at Grand Forks. Short term establishment was found only at one of the Keromeos/Cawston release locations. In 2008 another attempt to establish the mites was made in the north Okanagan near Armstrong. In 2016, two more field releases were placed in the Boundary area of B.C at Grand Forks and Midway. Subsequent monitoring carried out in 2017 has revealed establishment at Midway; the Grand Forks site status remains unknown at this time.



Fig. 3. *A. malherbae* galling on field bindweed at Midway

Field Results:

One year after the original release was made in Kamloops, fire went through the site and shortly after it was excavated. Field bindweed persists on the site, but no establishment of the mite has been found. At the release at Keremeos/Cawston, the plants are exhibiting some, but not all, symptoms of attack. Although the area is dry, microhabitat conditions provide shade and moisture. The adjacent drip irrigation also adds to the humidity of the site.

The third treatment in the Grand Forks area did not show any establishment when monitored. At this location a severe windstorm and a 'dust-devil' went through the site one day after the treatment was made. In 2008, another *A. malherbae* release was made near Armstrong. Extensive monitoring at this latest release site in the same year of release and one year after release was carried out, but, no mite attack was observed. Most recent attempts to establish colonies occurred in 2016. The first winter following the releases was very long and cold. Both sites were monitored the following, late spring. At that time there was speculation that both may have established, however, some of the leaf distortion was suspected to be caused by the early stages of powdery mildew attack. Additionally, despite the Midway site having been grazed earlier in the spring, some of the early spring growth appeared to have limited evidence of galling. The sites were revisited again in the fall of 2017 after a hot, dry summer to monitor for *A. malherbae* and to determine the level of powdery mildew present. Both sites had significant powdery mildew occurring. Thorough monitoring at both sites resulted in an approximate count of 30 plants with galls at Midway. No galls were found at the Grand Forks site.



Fig. 4. Established *A. malherbae* site at Midway (Ponderosa pine zone)

NOTES

- Figure 1 has been cited according to the contributor's specified requirements as of 2018-02-13 at www.invasive.org

REFERENCES

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