

Aceria chondrillae (G. Can)

INVASIVE SPECIES ATTACKED: Rush skeletonweed (*Chondrilla juncea* L.)

PREVIOUSLY KNOWN AS: *Eriophyes chondrillae* (G. Can)

TYPE OF AGENT: Gall forming mite

COLLECTABILITY: Mass

ORIGIN: South central Eurasia

DESCRIPTION AND LIFE CYCLE

Adult:

Aceria chondrillae males are 0.16 to 0.18 mm and females are 0.19 to 0.26 mm long. The yellow-orange, soft bodied, worm-like adults have two pairs of legs. Full grown gall forming mites emerge in the spring when the plant begins to bolt. Their feeding on the rapid spring growth causes the plant cells to enlarge. Females begin oviposition when the plant buds begin to enlarge. Each female will lay between 60 and 100 eggs inside the gall they inhabit. Generally there are far more females than males. To compensate for this disproportion, females will go on to produce males, increasing the opportunity for the females to encounter the males. As the galls dry, the mites exit them and crawl to adjacent host plants or are wind-blown to distant patches. Multiple generations overlap, each completing every 10 days during the summer and continuing until plant growth slows from declining moisture or fall frosts. Adults live 3-5 weeks.

Egg:

The eggs are spherical, 0.04 mm, and translucent when laid. During their short incubation period the eggs change to pale orange.

Nymph:

A. chondrillae do not have a larva stage, instead they develop through two nymph stages. The first stage measures 0.08 to 0.10 mm long, enlarging to 0.17 mm by the end of the second stage. Both nymph stages are pale yellow-orange, have four legs, appear hump-backed and do not have genital openings. Each gall can be infected with several hundred feeding mites in all stages.

Overwintering stage:

In its native distribution area in Europe, *A. chondrillae* overwinters as a non-feeding adult. In Canada and the Pacific Northwest, with the onset of early frost they develop into a dark brown overwintering stage (deutogyne). The deutogynes travel downward on the stem and remain in plant crevices or in the soil and are inactive until the following spring.



Fig. 3. Multiple *A. chondrillae* galls



Fig. 1. Green *A. chondrillae* galls



Fig. 2. Drying *A. chondrillae* galls

EFFECTIVENESS ON HOST PLANT

All stages of *A. chondrillae* attack axillary and terminal buds. In Eurasia, the overwintering adults attack spring bolting shoots and cause contorted leaf-like galls, which can expand to 5 cm. By the end of the growing season the galls will have generally destroyed the flower buds, therefore, reducing seed production. Heavy attack creates deformed, stunted growth and leaf yellowing. Eventually, the plant becomes a weak competitor. First year rosettes and seedlings can be killed by *A. chondrillae* attack. Galls range from 1.5-2 cm in diameter. On rare occasions, when conditions are ideal, galls have been known to reach 3-5 cm in diameter. By late September, about 10% of the flowerheads are distorted and damaged by *A. chondrillae*.

HABITAT AND DISTRIBUTION

Native:

A. chondrillae has an extensive native distribution in Europe. It occurs west from Portugal, through central Mediterranean Europe, north to Germany, and east through the most southerly portion of the former Soviet Union.

North America:

A. chondrillae accepts a wide variety of habitats wherever rush skeletonweed is found. It readily establishes on south and west facing aspects where plants grow in undisturbed, well-drained soils.

British Columbia:

A. chondrillae has been released into and found established in the Interior cedar hemlock and Interior Douglas-fir biogeoclimatic zones. It is also freely dispersing itself within these zones. The mite's dispersal in B.C. is likely restricted by the limited distribution of the host plant.

BRITISH COLUMBIA RECORD

Origin:

The *A. chondrillae* released in B.C. is presumed to have evolved from a variety found in south central Eurasia (South Caucasus, also known as Transcaucasus).

History:

In 1993, the first *A. chondrillae* treatments made in BC occurred in the North Okanagan in Spallumcheen. Releases continued until 1996 in the Vernon/Spallumcheen areas and the central Kootenays near Passmore. The mites were found the following year at all the release sites and they have remained established. *A. chondrillae* is now self-dispersing into most of the host plant infestations within the geographic areas of the releases. In 1995, the first field collections began. However, the mite's ability to redistribute itself over time combined with integrated pest management practices has decreased the need to continue to collect and re-release.

Field results:

A single release site near Passmore, that was previously determined established, lately has not produced galls at the immediate release point, however, plants established in this same geographic area are often found heavily attacked by the mite. The plants growing near Passmore exhibit a different growth habit and are being investigated to determine if they are a different strain than the others found in the province. With the exception of the site at Passmore, *A. chondrillae* has self-dispersed and is widespread on the rush skeletonweed infestations growing in B.C. However, the mite is occasionally absent at isolated rush skeletonweed patches that occur a substantial distance away from the release sites. The absence of galls in these instances may likely be attributed to the patches lacking a corridor of plants upon which the mite may travel. *Puccinia chondrillina* readily establishes to varying degrees on the same plants with *A. chondrillae*.



Fig. 4. *A. chondrillae* habitat in the North Okanagan at Spallumcheen (Interior Douglas-fir zone)

NOTES

- *A. chondrillae* disperses freely within an infestation, but usually requires distribution assistance to become widely established.

REFERENCES

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