Cystiphora sonchi (Bremi)

INVASIVE SPECIES ATTACKED: Perennial sow thistle (*Sonchus arvensis* L.)

PREVIOUSLY KNOWN AS: *Liriomyza sonchi* Hendel, *Cedidomyia sonchi* Bremi

TYPE OF AGENT: Leaf gall forming fly **COLLECTABILITY:** Not established

ORIGIN: Austria

DESCRIPTION AND LIFE CYCLE

Adult:

Cystiphora sonchi adults are delicate flies that measure 5 mm long. Females can be identified by their red abdomen. Mating and oviposition begins immediately, but, they are also capable of unisexual reproduction. Females lay an average of 86 eggs onto the underside of rosette and stem leaves, often in a row formation, avoiding youngest and oldest leaves. The eggs are squeezed individually through plant's pore openings (stomata), which are smaller than the egg. Adults remain non-feeding their entire life span which is 2-10 hours for males and 9-16 hours for females. In Canada there can be three generations/year which peak in June, August and September. The male/female ratio is 2:1.

Egg:

Eggs incubate for six days at 27^{0}C (day) and 19^{0}C (night). Green galls appear in five days.

Larva:

Larvae emerge six days after oviposition. On the eighth day, two days after their emergence, the galls (enlarged leaf cells) created during development are visible from the upper leaf surface as the tissue above the larvae dies. On the tenth day, the leaf structure breaks down, becoming a food source for the larvae. After 10-17 days, mature larvae spin a white silken cocoon and pupate.

Fig. 1. *C. sonchi* larva (credit http://www.discoverlife.org M. Storey / Discover Life) see notes below

Pupa:

Pupation occurs either in the gall or the larvae exit through the lower leaf surface stomata and move into the soil. The pupation period is short, lasting 1-2 days within the silken cocoon.

Overwintering stage:

It is unknown at this time how *C. sonchi* prepares itself for overwintering. Some observations indicate mature larvae rest in cocoons until the following spring, resuming development when higher temperatures return.

EFFECTIVENESS ON HOST PLANT

Gall formations interrupt plant and leaf development and are a nutrient sink. High populations can weaken perennial sow-thistle.

Figures 2, 3, 4. *C. sonchi* galls (credit http://www.discoverlife.org M. Storey / Discover Life) see notes below

HABITAT AND DISTRIBUTION

Native:
C. sonchi is commonly found in sunny locations throughout its European habitat. Its native distribution includes areas between Scotland and western Russia and from Finland to south Italy.

North America:
In Canada, *C. sonchi* has established in Alta., Sask., Man., and N.S., but not in B.C., N.B., or Que. It has become widely distributed in Saskatchewan.

British Columbia:
C. sonchi habitat preferences in B.C. are not known. Treatments have been made into the Coastal western hemlock and Sub-boreal spruce biogeoclimatic zones. No evidence of establishment has been found at either location. It may be possible to establish populations in B.C. in climates similar to established in Saskatchewan.

BRITISH COLUMBIA RECORD

Origin:
C. sonchi released in B.C. originate in Austria from populations reared on *Sonchus oleraceus*.

History:
C. sonchi was introduced into the Fraser Valley in 1984, however the exact release location is not known at this time. A second treatment was made in the northern interior near Telkwa in 1992. No establishment has been found at either location or in the near vicinity of the release sites.

Field results:
In 2008, the release in northern B.C. near Telkwa was monitored, but no evidence of galls was found.

NOTES

- Larvae are susceptible to high parasitic attack by *Aprostocetus spp.* near *atticus* Graham. High parasitism may be partially responsible for the bioagent's ineffectiveness.
- A greenhouse pest, *Thrips tobaci*, is attracted to the galled area and its feeding on the gall is fatal to the larvae. The feeding thrips indicate the galls are a nutrient sink.
- A study in Russia determined that seed production was reduced by 35-85% when *C. sonchi* was combined with other insects.
- Figures 1 through 4 have been cited according to the contributor's specified requirements as of April 7, 2015.

REFERENCES

1. Discover Life. 2008. *Cystiphora sonchi*. Updated November 26, 2007. www.discoverlife.org (Accessed 2015-04-01)
2. Harris, P. and D.P. Peschken. 2005. Classical biological control of weeds established biocontrol agent *Cystiphora sonchi* (Bremi). Leaf-gall midge. Agriculture and Agri-Food Canada. Updated August 3, 2005. http://res2.agr.ca/lethbridge/weedbio/agents/acyson_e.htm (Accessed Jan. 11, 2006).
3. Peschken, D.P. 1982. Host specificity and biology of *Cystiphora sonchi* (low) (Diptera: Cecidomyiidae), a candidate for the biological control of *Sonchus species*. Entomphaga 27(4) 405-415.