

Longitarsus flavicornis Steph.

INVASIVE SPECIES ATTACKED: Tansy ragwort (*Senecio jacobaeae* L.)

TYPE OF AGENT: Root feeding flea beetle

COLLECTABILITY: Not established

ORIGIN: England and Italy

DESCRIPTION AND LIFE CYCLE

Adult:

Longitarsus flavicornis and *L. jacobaeae* closely resemble one another. There are no reliable external differences between the two flea beetles to tell them apart except *L. flavicornis* may appear a bit more reddish than the paler brown *L. jacobaeae*. The differences between the two are discernible following dissection. Newly emerged *L. flavicornis* adults are reddish brown and occasionally may be clear red. They are 2.5-4.0 mm long. They have enlarged rear legs that enable them to leap great distances. Adults emerge in early summer, feed and oviposit three weeks after their emergence. *L. flavicornis* females lay most of their eggs in the soil up to 4 cm deep near a rosette while less than 1% will be laid on plant petioles. The females do not appear to have a preference for a particular sized plant when ovipositing. In BC, egg laying is expected to be complete by January³.

Egg:

L. flavicornis and *L. jacobaeae* eggs are similar. The eggs are oval and measure 0.66 x 0.3 mm. They are initially yellow and darken over time. The eggs are vulnerable to desiccation in dry conditions. Surface laid eggs may experience partial dehydration. Overall, *L. flavicornis* eggs are less vulnerable to dry conditions than those of *L. jacobaeae*. At 8°C, eggs hatch in 88 days or in 14 days at 25°C³.

Larva

White, slender, comma-shaped larvae hatch from eggs and begin to feed on the root crown. Their head capsules are dark brown and the thoracic shields and anal plates are brown^{3,6}. Newly emerged larvae are 1.5 mm long, growing to 2-4 mm long over 8-14 weeks while feeding on the cork-like outer layers of the root crown and lateral roots³. *L. flavicornis* does more external root feeding than *L. jacobaeae*, often consuming the entire outer layer and root cortex. They feed into the root crown cortex, but seldom feed into the core. In crowded or flooded conditions, they will feed on crowns and within the petioles of lower leaves. Mature larvae typically overwinter (November through May) in plant petioles, root crowns, and roots⁷. In late winter (March), the majority of the larvae will be in their third instar³. Larvae will move to the soil to pupate the following June⁷.

Pupa:

The pupae are white and 2.5 to 3 mm long⁶. In Tasmania, the pupation period occurs from spring to early summer³.

Overwintering stage:

Mature larvae typically overwinter in plant roots and will move to the soil to pupate the following June, doing so up to 5 cm from the plant⁷. In Canada, they are expected to also overwinter as eggs³.

EFFECTIVENESS ON HOST PLANT

Adults create ragged shot-hole feeding. Larvae feeding on roots can kill small rosettes; heavy attack is required to impact large plants. Long grooved formations within the roots are the result of feeding on the outer layers⁷. *L. flavicornis* feed more aggressively on external root layers than *L. jacobaeae*. It is presumed *L. flavicornis* can be as effective as *L. jacobaeae* when in their ideal habitat. In moist areas, where the



Fig. 1. *L. flavicornis* adult (credit Powell et al. 1994)



Fig. 2. *L. flavicornis* adults, male (left) female (right). (credit University of Wroclaw, Poland). See notes.

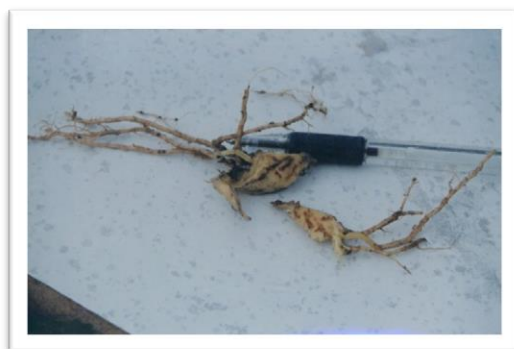


Fig. 3. Typical *Longitarsus* spp. larva feeding exposed on scraped root.

annual mean precipitation is 700 mm, tansy ragwort plants with 44 larvae present have declined by 90%. In suitable habitat, tansy ragwort can be controlled in eight years³. *L. flavicornis* is an important biocontrol agent for the control of tansy ragwort in Australia⁵.

HABITAT AND DISTRIBUTION

Native:

L. flavicornis has a native distribution area south of latitude 52°N in England². It occurs in coastal areas of Morocco and Algeria, throughout Spain and southwest France. It co-exists with *L. jacobaeae* from south England to Paris, France. *L. flavicornis* primarily occurs in climates where winter temperatures average 0°C, coinciding with the most southern native range of tansy ragwort³.

North America:

L. flavicornis requires sunny locations with high density plants growing in well drained soils. It does not tolerate flooding, heavy shade or elevations over 400 m. Areas with long, moist autumns are required. It requires higher temperatures and a milder climate than *L. jacobaeae*. Areas that receive 700 mm of annual precipitation (mean) and 170 mm of summer precipitation may be considered suitable habitat. Areas that receive soil compaction occurring during the moist months are not suitable. Warm and dry conditions, even when occurring in a coastal environment, may also be unsuitable. Non-grazed areas appear to be favoured over those that are grazed³.



Fig. 4, 5. Typical *Longitarsus* spp. adult “shot-hole” foliar feeding



Fig. 6. *L. flavicornis* and *L. jacobaeae* mixed population release site near Nanaimo

British Columbia:

L. flavicornis was released in B.C. in the Coastal Douglas-fir biogeoclimatic zone. On Vancouver Island, the northern end of the Garry oak-arbutus vegetation zone falls within the Coastal Douglas-fir zone which may be the flea-beetle’s most northern limit³.

BRITISH COLUMBIA RECORD

Origin:

L. flavicornis released in B.C. was from stock that originated from England.

History:

It was determined that *L. flavicornis*, a very closely related flea-beetle species to *L. jacobaeae*, was included in one of the original *L. jacobaeae* releases made near Nanaimo in a mixed population. Harris and Crozier have concluded the *L. flavicornis* population may have arrived in the 1974 population

from England. It is estimated approximately 10% of the population released in Nanaimo was *L. flavicornis*³. Subsequent collections were made from the Nanaimo site and placed on the lower mainland. There was no attempt to separate the collected specimens to determine if one or both species were established. It was acceptable to consider the field populations collected from this site and redistributed elsewhere may be of a mixed species.

Field results:

Some information sources indicate *L. flavicornis* never established at Nanaimo³. In 1981, the Nanaimo site was monitored and 97% of the plants examined were attacked by *Longitarsus* spp². The site is also host to other tansy ragwort biocontrol agents including the adventive seedhead fly *Botanophila seneciella* and the defoliating moth *Tyria jacobaeae*. Today this site has very few plants remaining, which may be due to the biocontrol agents released and dispersed onto the site combined with good management and integrated control.



Fig. 7. *L. flavicornis* adult (credit Jones, 2006) See notes.

NOTES

- Combined efforts with *T. jacobaeae* offer excellent control as each agent has a preference for plant size, therefore, attacking the multiple generations of tansy ragwort on a site.
- Figures 2 and 7 have been cited according to the contributor's specified requirements as of 2015-03-12.

REFERENCES

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