

## *Terellia ruficauda* (Fab.)

**INVASIVE SPECIES ATTACKED:** Canada thistle (*Cirsium arvense* (L.) Scop.)  
Marsh plume thistle (*C. palustre* (L.) Scop.)

**PREVIOUSLY KNOWN AS:** *Orellia ruficauda* Fab.

**TYPE OF AGENT:** Seed feeding fly

**COLLECTABILITY:** Not permitted

**ORIGIN:** Adventive, unknown

### DESCRIPTION AND LIFE CYCLE

#### Adult:

The small flies are yellow-orange coloured. They have a dull black mark on their thorax and four large black marks on their abdomen, making them appear almost completely black. Females can be identified by their 3 mm long ovipositor. The leading edges of their wings have three black marks and another vague mark near the centre of the hindmost edges. Adults emerge from mid – to late summer. Females lay one or two eggs or clusters up to seven into female flower buds one day before they open. After the females oviposit, they mark the flowerhead with a fluid to discourage further attack. Eggs deposited into younger or older heads produce smaller larvae with poor survival rates. The females will lay 1 - 12 eggs/day, until 50 - 500 have been laid. The quantity of eggs depends on their size, larger females lay more eggs. Females test buds to determine if they are male or female. By depositing small batches of eggs into many heads, the females beat the odds of laying into flowers which may be too mature, too small or males. If eggs are mistakenly deposited into male flowers, the larvae starve with the absence of seed. Larger offspring tend to develop when male and female plants occur on the same site.



Fig. 1. *T. ruficauda* feeding damage in marsh plume thistle seedhead

#### Egg:

There is no specific information available regarding eggs or their incubation period.

#### Larva:

Larvae are white, 4 - 6 mm long, and grow to 5 - 7 mg over two weeks. There are three larval instars. The first instar feeds on the flower ovary, causing it to enlarge. The second and third instars browse through seeds, eating their entire contents. When thistle seed is ready to fly, the larvae surround themselves with seedhead papus and prepare to overwinter. The larvae will alternately overwinter in the receptacle when flowers have few seeds.



Fig. 2. *T. ruficauda* larva extracted from marsh plume thistle seedhead

#### Pupa:

Pupation normally occurs in the spring. In climates with no cold period, adults emerge in three months.

#### Overwintering stage:

Mature larvae overwinter in cocoons inside seedheads.

### EFFECTIVENESS ON HOST PLANT

Seed reduction caused by larvae feeding varies with pollination. Generally, 40% of seeds are reduced in each attacked flower head. The fly only attacks early flowers which reduce overall annual seed production by 2%.

### HABITAT AND DISTRIBUTION

#### Native:

*Terellia ruficauda* occurs in the northern Palaearctic region. This region encompasses all of Europe, the northwest coast of Africa and Asia north of the Himalaya Mountains.

## North America:

*T. ruficauda* is adventive to North America where it is found in a wide variety of Canada thistle habitats. In Canada, it has been found in B.C., Man., Ont., N.B., and Nfld. Its geographic range is all Palearctic except the south. Its United States distribution is similar, stretching from coast to coast, and into southern Calif., dating back to 1898.

## British Columbia:

Recorded sightings occur in the Interior cedar hemlock biogeoclimatic zone. *T. ruficauda* is known to exist as far north as the Peace River area in northern B.C., which is located in the Boreal white and black spruce zone. The first sighting near Merritt did not have the exact location recorded, therefore the zones it may have fallen into could be the Bunchgrass, Interior Douglas-fir, Engelmann spruce-subalpine fir, or Montane spruce zones. More recently it was identified as an attacking biocontrol agent on marsh plume thistle growing in the Interior cedar hemlock zone.



Fig. 3. *T. ruficauda* dispersal site on marsh plume thistle north of McBride (Interior cedar hemlock zone)

## BRITISH COLUMBIA RECORD

### Origin:

The origin of the *T. ruficauda* population found in B.C. is not known.

### History:

Although no releases were made, *T. ruficauda* has been found in B.C. It was confirmed to be established near Merritt where samples had been collected in 1931 (Canada thistle).

### Field results:

There has been very little field sampling of *T. ruficauda*. Sightings of it are mentioned in conversation, but most recorded information is not available. Recent observations indicate may be quite common on marsh plume thistle.

### Collection for redistribution:

Collections can be made by collecting infested seedheads prior to adult emergence in late spring or early summer and released to new sites by scattering heads over the site. Care should be taken to ensure that the same invasive plant species is the same as the infested seedheads to ensure that new invasive plants are not introduced to sites where the plants may not be already established. The fly has self-dispersed and probably requires little assisted distributions.



Fig. 4. *T. ruficauda* dispersal site on marsh plume thistle north of McBride (Interior cedar hemlock zone)



Fig. 5. *T. ruficauda* dispersal site on marsh plume thistle north of McBride (Interior cedar hemlock zone)

## NOTES

- *T. ruficauda* may not be able to compete against *Larinus planus*.
- Larvae are parasitized by *Crataepus marbis* and *Tetrastichus venustus*, which kill third instar larvae.
- An unknown pathogen has been described to infect the larvae, causing the larvae to become translucent and die just before pupation.
- *T. ruficauda* attacks globe artichoke, making it a non-desired species in California.

## REFERENCES

1. Harris, P. and R. B. Lalonde. 2005. Classical biological control of weeds established biocontrol agent *Terellia* (= *Orellia*) *ruficauda* (Fab.) Seed head fly. Agriculture and Agri-Food Canada. Updated August 3, 2005. [http://res2.agr.ca/lethbridge/weedbio/agents/aterruf\\_e.htm](http://res2.agr.ca/lethbridge/weedbio/agents/aterruf_e.htm) (Accessed February 21, 2007)
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3. McFadden, M. W. and R. H. Foote. 1960. The genus *Orellia* B.-D. in America north of Mexico. *In Proc. Entomol. Soc. Wash.* Vol. 62, No. 4: 253-261.