

# *Microplontus edentulus* Schultz

**INVASIVE SPECIES ATTACKED:** Scentless chamomile (*Tripleurospermum perforatum* (Mérat) M. Lainz)

**TYPE OF AGENT:** Stem mining beetle (weevil)

**COLLECTABILITY:** Not available for general distribution

**ORIGIN:** Austria, Hungary and the former Yugoslavia.

## DESCRIPTION AND LIFE CYCLE

### Adult:

*Microplontus edentulus* females are 3.2 mm long x 2.1 mm wide and the slightly smaller males are 3 mm long x 2 mm wide. Their heads, thorax and upper wing covers are black and their wing-cover ends and sides are white with black lines. They have curved weevil rostrums (noses) about 1.5 mm long with antennae appearing about mid length on females and 2/3 down on males. Adults emerge from cocoons or litter in early spring, usually by the end of April. Mating and oviposition begins before the plants start flowering, usually by early May, continuing until mid-July. Females face downward on the plant and chew cavities the length of their rostrum into upper stems near a leaf base. A single egg is oviposited into each hole and covered with a secretion. Each female will repeat this process until 56-70 eggs are laid. Adults are capable of flight and are presumed to disperse readily.

### Egg:

Temperature greatly influences the incubation period, at 25°C they hatch in 6.2 days, but at 8°C hatching occurs in 46.5 days.

### Larva:

Upon hatching, new larvae begin to mine within the stems. There are three larval instars which complete development in 21 days. They continue to feed in stems or tunnel upward through branches to reach feeding points at the base of flowerheads, however, they do not feed on or damage seeds. When mature, the larvae chew through the stem walls and drop to the soil, burrow underground, and prepare soil particle cocoons.

### Pupa:

Development from larva to pupa takes about 19 days after the larva has entered the soil. The entire pupation period from larva to adult generally takes 30 days to complete.

### Overwintering stage:

Normally adults overwinter in the pupal cocoon, however, some adults emerge in the fall and overwinter in soil and litter.

## EFFECTIVENESS ON HOST PLANT

*M. edentulus* causes plants to produce thin stems, which reduces plant mass and has decreased seedheads from 24 to eight, therefore, affecting seed production. Early studies indicate that *M. edentulus* may have less impact on healthy, robust plants in Canada. In Alberta, a study recorded that in two years, 62% of scentless chamomile shoots had been attacked within a 100 m radius.

## HABITAT AND DISTRIBUTION

### Native:

Native distribution occurs in: Poland; eastern Austria; Hungary; and the former Czechoslovakia and Yugoslavia. It is also presumed to occur in Romania, Bulgaria and south Ukraine.

### North America:

Specific habitat requirements for *M. edentulus* are unknown. In Canada, it has established in B.C., Alta. and Sask.



Fig. 2. *M. edentulus* larva feeding evidence and exit hole



Fig. 3. *M. edentulus* larva feeding evidence inside stem

### British Columbia:

In B.C., *M. edentulus* was released and found established into the Boreal white and black spruce biogeoclimatic zone. It is not known if the recent southern or central B.C. release sites located in the Interior Douglas-fir zone will be too mild for this agent, given the fact that it is established on the Canadian prairies and its native distribution is in colder climates. Survival in these colder areas indicates its cold hardiness.

## BRITISH COLUMBIA RECORD

### Origin:

*M. edentulus* populations released in B.C. originate from eastern Austria, Hungary and the former Yugoslavia.

### History:

*M. edentulus* was introduced to north eastern B.C. at two locations in the Fort St. John and Hudson Hope areas in 1997 and again in 1998 and establishment was found in 1999. In 2010, 148 larvae and in 2014, 175 larvae infested stems were obtained from Alta. for release into the central and southern interior areas of B.C. The 2010 collection was held over the winter in a growth chamber for a scheduled spring (2011) release in the Chilcotin near Kleena Kleene and the 2014 population was released at a site near Savona within five days of being collected. No evidence of establishment has been found at either of the most recent releases near Kleena Kleene or Savona.



Fig. 3. *M. edentulus* larva exit hole on stem

### Field results:

In 1999, establishment was confirmed at both the two northern B.C. release sites. In 2008, an attempt was made to revisit the sites, however, they both proved inaccessible. As scentless chamomile is foremost an agriculture weed, rather than a rangeland weed, the older northern B.C. releases were made on private land which has restricted some monitoring efforts. In the fall of 2012 and 2013, the Kleena Kleene site was monitored by clipping and dissecting stems, however, no evidence or larvae were found. The 2014 site near Savona was revisited a few weeks after the release was made and stems were observed to have exit holes and evidence of larvae feeding, indicating the larvae were viable and had moved from the stems into the soil to pupate. At this time it is too early to determine if the weevils are adapted to the warmer climate in the southern half of B.C. Monitoring is ongoing at the southern B.C. sites with the intent to develop them into collection sites for future releases in the lower half of the province.

## NOTES

- Slow establishment at open field sites may be the result of quick dispersal.

## REFERENCES

1. Bowes, G., undated. The scentless chamomile stem weevil. Rural Councillor. <http://www.sarm.ca> (Accessed February 13, 2007).
2. McClay, A. and P. Harris. 2005. Classical biological control of weeds established biocontrol agent *Microplontus (Ceutorhynchus) edentulus* Schultze. Stem mining weevil. Updated August 3, 2005. Agriculture and Agri-Food Canada. Updated August 3, 2005. [http://res2.agr.ca/lethbridge/weedbio/agents/amicede\\_e.htm](http://res2.agr.ca/lethbridge/weedbio/agents/amicede_e.htm) (Accessed January 17, 2006).