

Bruchidius villosus (F.)

INVASIVE SPECIES ATTACKED: Scotch broom (*Cytisus scoparius* L.)
French broom (*Genista monspessulana* (L.))

TYPE OF AGENT: Seed feeding beetle (weevil)

COLLECTABILITY: Not permitted

ORIGIN: Europe

DESCRIPTION AND LIFE CYCLE

Adult:

Bruchidius villosus adult weevils are black are 2-4 mm long, with parallel lines running the length of the wing covers. Overwintered, sexually immature adults emerge in March and April and a new generation occurs in July and August. To reach sexual maturity, adults are required to feed on broom pollen. If adults emerge before broom is in flower, they can first feed on gorse before moving back onto broom. Oviposition begins when young green pods begin to form. The females will lay eggs individually or in horizontal rows on young green pods and cement them into place. Adults are active walkers and quickly take flight once pods open.

Egg:

Eggs are 0.3 mm long, oval and pale green coloured. During incubation, the eggs change from the pale green to purple.



Fig. 1. *B. villosus* adults and Scotch broom seeds



Fig. 2. *B. villosus* and *Exapion fuscirostre* larva in seeds

Larva:

There are four larvae instars. The newly hatched larvae move across the pod, often leaving a very fine blue trail before chewing into the pod cavity where they attack soft green seeds. After they have entered the pod, their remaining development occurs within a single seed inside a closed pod. Several larvae can develop in each pod, but each will occupy their own seed.



Figure 3. *B. villosus* larva feeding trails on outside of Scotch broom pod

Pupa:

Pupation occurs in the seedpod. After a short pupation phase the new adults chew through the seed coat, but remain inside the pod until it splits open.

Overwintering stage:

Adults overwinter near the host plants seeking protection in plant litter or crevices.

EFFECTIVENESS ON HOST PLANT

B. villosus larvae feed on seeds. High populations can reduce seed production which decreases plant density and spread. Adults feed on pollen, foliage and stems.

HABITAT AND DISTRIBUTION

Native:

The weevil has an extensive native European range and can be found in Austria, Denmark, Germany, Hungary, Italy, Switzerland, United Kingdom, France, Portugal and Spain.

North America:

B. villosus is expected to survive in any area that the host plant establishes. Specific habitat requirements are currently being studied.

British Columbia:

Adventive populations of *B. villosus* have been found dispersed within the Coastal Douglas-fir and Coastal cedar hemlock biogeoclimatic zones. Successful establishment has occurred from collections taken from these zones and released into the Interior cedar hemlock zone.

BRITISH COLUMBIA RECORD

Origin:

B. villosus is an adventive agent that is believed to have entered B.C. from the Pacific North Western U.S.A. where releases began in 1998 from populations collected in N.C. The weevils released in N.C. originated from stock collected in the United Kingdom.

History:

B. villosus was first discovered on Vancouver Island in 2001. Recent investigation has found its dispersal within the Lower Mainland, in the Fraser Valley, on Vancouver Island and on some coastal islands. In 2006, adults were collected from Vancouver Island and transferred to the central Kootenays near Sanka. Subsequent collections were made in 2007 and 2008 from Fraser Valley sites of both *B. villosus* and *Exapion fuscirostre* and released once more into the Kootenays near Nakusp, Riondel and Nelson.

Field results:

B. villosus have been found on plants adjacent to tidal flats and in salt spray locations, which may indicate it has a high tolerance for saline conditions. It is commonly found sharing inland host plants with *E. fuscirostre*, another adventive agent. Field collections and redistribution began in 2006. Redistribution efforts have been limited to the Scotch broom sites in central Kootenays where *B. villosus* had not found its way from the U.S.A. Subsequent monitoring has shown that at all Kootenay release sites have successfully established. Based on the 2007 collection calculations, *B. villosus* outnumbered *E. fuscirostre* in Fraser Valley field populations. An estimated 2800 pods were collected and the weevils' ratio was 5680 *B. villosus* to 1400 *E. fuscirostre*, or 80/20% *B. villosus* to *E. fuscirostre* per pod. It is unknown at this time whether the same ratio will remain in the subsequent Kootenays' populations.

NOTES

- *E. fuscirostre* can be confused with *B. villosus* in the larvae and pupae stages.



Fig. 4. *B. villosus* release site near Sanka (Interior cedar hemlock zone)



Fig. 5. *B. villosus* dispersal location at Boundary Bay (Coastal Douglas-fir zone)



Fig. 6. *B. villosus* dispersal location near Hope (Coastal western hemlock zone)

- The size of the seed may influence the size of new adults. In test plots, larger seeds produced larger adults.

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