

Exapion fuscirostre (F.)

INVASIVE SPECIES ATTACKED: Scotch broom (*Cytisus scoparius* (L.) Link)

PREVIOUSLY KNOWN AS: *Apion fuscirostre* (Fabricius)

TYPE OF AGENT: Seed feeding beetle (weevil)

COLLECTABILITY: Not permitted

ORIGIN: Italy

DESCRIPTION AND LIFE CYCLE

Adult:

Exapion fuscirostre adults are 2-3 mm long weevils that have gray bodies and light brown legs. A wide, dark coloured band extends down the back. Their rostrum (nose) is long and curved. Overwintered adults emerge in early spring to coincide with the plants' new spring growth and feed on flowers, foliage and stems. The females need to feed on the spring flowers to stimulate egg production. Oviposition begins shortly after the blossoms fall. Each female will lay between five and 10 small white to yellowish eggs into the plants green seed pods. From this oviposition period, the new adults emerge in mid to late summer when the pods dehiscence (open) and then prepare to overwinter.

Egg:

Eggs hatch in 5-15 days.

Larva:

The larvae are white with brown head capsules. There are three larval instars that feed for 20-40 days on developing seeds inside closed seedpods. The first instars move about inside the pod, seeking a developed seed if the one they hatch nearest is not sufficiently developed. Once they reach their preferred seed, they penetrate through the seed wall and feed on the cotyledons. Their first moult occurs and the resulting second instars continue to feed. Usually by the first week of July, the larvae will be in their third instars and most of the seed embryo will have been consumed. The larvae may then begin to feed on the seed coat and continue until the entire upper half is consumed. If an adjacent seed is nearby, the larvae will also feed on it. The larvae prepare for pupation by collecting remaining seed parts and their own fecal pellets to build a "cement" cocoon. They chew and position the particles while adding saliva to help build the "cement".



Fig. 4. *E. fuscirostre* and *Bruchidius villosus* larvae feeding in Scotch broom seeds

Pupa:

By the third week in July, pupation begins. The creamy coloured pupae resemble the adults with their legs held tightly against their body. The developing pupae gradually darken as they mature. Pupation completes in 10-20 days inside the pods.

Overwintering stage:

Adult weevils overwinter in litter near the plants, on stem crevices and niches, in partially opened seedpods, or on other plants growing in the Scotch broom community. In warm climates the adults can remain active all winter.

EFFECTIVENESS ON HOST PLANT

The larvae feed on seeds inside the seedpod. Studies in the US found that the larvae destroy an average of 85% of the seeds. The adults feed on flowers, foliage and stems. In large populations, adults can damage tip growth.

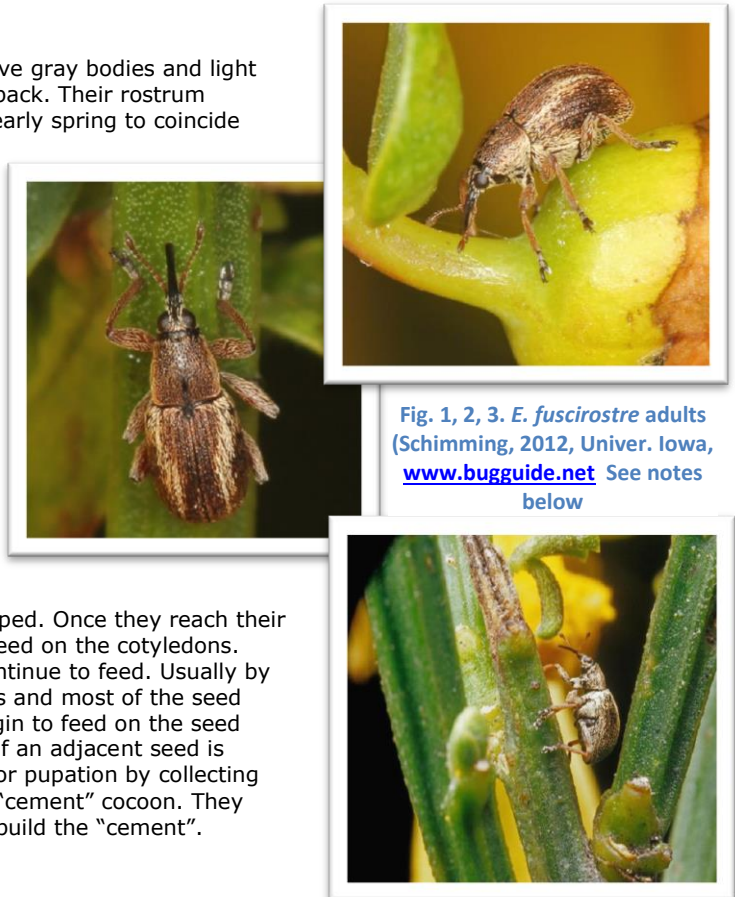


Fig. 1, 2, 3. *E. fuscirostre* adults (Schimming, 2012, Univer. Iowa, www.bugguide.net See notes below



Fig. 5. *E. fuscirostre* emerging from seeds (credit Parsons, 2012, Univer. Idaho, PSES, Bugwood.org)



Fig. 6. Adult *E. fuscirostre* feeding evidence on stems (credit Coombs, 1990, Oregon Dept. Agric., Bugwood.org)

HABITAT AND DISTRIBUTION

Native:

E. fuscirostre prefers meadows and hillsides on south aspects. Cold, damp, heavy shaded sites, north aspects or areas near the ocean are not desirable. High temperatures can cause mortality of adults trapped in mature pods which have not yet split.

North America:

E. fuscirostre establishes well in mild climate areas west of the Cascade Mountains. By 1995, the weevil was well established in Calif., Oreg., and Wash.

British Columbia:

Adventive populations of *E. fuscirostre* have been found dispersed within the Coastal Douglas-fir and Coastal cedar hemlock biogeoclimatic zones. Successful establishment has occurred from collections taken from the Fraser Valley and released into the Interior cedar hemlock zone. At this time, *E. fuscirostre* has not been found on Vancouver Island, the gulf islands or areas near the ocean.

BRITISH COLUMBIA RECORD

Origin:

E. fuscirostre is believed to have crossed the Canadian border sometime since its first introduction into Calif., U.S.A. in 1964. It is presumed the population source now in B.C. is from the well-established colonies in the U.S.A. Pacific Northwest that originate from Italy.

History:

During the fall of 2006, the first attempt by MFLRNO to locate *E. fuscirostre* in B.C. began. The first collection was made in 2007 from a population mixed with *Bruchidius villosus*. The adults were collected in unopened pods from established *E. fuscirostre* infested sites near Hope and were released in the central Kootenays along an abandoned road at Riondel. From 2008 to 2010, three more collections were taken from the same Hope area and moved into the Kootenays; one release was put near Nakusp and two were put near Nelson. All releases have established.

Field results:

E. fuscirostre and *B. villosus* are frequently found co-existing on plants and in the same seedpods. In the 2007 Hope collection, *B. villosus* was found to outnumber *E. fuscirostre*. An estimated 2800 pods were collected and the ratio was 5680 *B. villosus* to 1400 *E. fuscirostre* weevils, or 80/20% per pod. Dispersal sampling shows *E. fuscirostre* established as far inland as Yale. The frequency of sightings decreased towards the coastline. The weevils have not yet been found



Fig. 7. *E. fuscirostre* and *B. villosus* site near Riondel (Interior cedar hemlock zone)



Fig. 8. *E. fuscirostre* and *B. villosus* site near Hope (Coastal western hemlock zone)

on Vancouver Island nor on the Gulf Islands at any Scotch broom sites sampled. In 2008, monitoring at the Riondel site revealed the weevils had survived the winter and successfully produced a generation. Subsequent monitoring at all the release sites made in the Kootenays have shown positive establishment. Future efforts will focus on the dispersal range of *E. fuscirostre* in the Coast Forest Region and the subsequent population ratio of *E. fuscirostre* and *B. villosus* in the Kootenays.

NOTES

- *E. fuscirostre* adults are active walkers and do so readily when pods open. They have been known to disperse up to 2 km a year from a release point. However, they are not as active as *B. villosus*. *E. fuscirostre* can be confused with *B. villosus* in the larvae and pupae stages.
- The egg stage of *E. fuscirostre* is less prone to experience ill effects because it is laid into the developing green seedpods, whereas *B. villosus* is laid on the outer surface of pods.
- *E. fuscirostre* have been found at Scotch broom sites where the broom is also being attacked by the adventive *Aceria genistae* gall mite.
- Figures 1, 2, 3, 5, and 6 has been cited according to the contributors specified requirements as of 2015-03-10.

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