

Data Sheets on Quarantine Pests

*Dryocoetes confusus***IDENTITY**

Name: *Dryocoetes confusus* Swaine

Synonyms: *Dendroctonus abietis* (Hopkins)

Taxonomic position: Insecta: Coleoptera: Scolytidae

Common names: Western balsam bark beetle (English)

Bayer computer code: DRYOCN

EPP0 A1 list: No. 268

EU Annex designation: II/A1

HOSTS

Mainly *Abies* spp.; typically *A. lasiocarpa*, but occasionally *A. amabilis* and *A. concolor*. *Picea engelmannii* and *Pinus contorta* have been found infested.

GEOGRAPHICAL DISTRIBUTION

EPP0 region: Absent.

North America: Canada (British Columbia), USA (Arizona, Colorado, Idaho, Montana, New Mexico, Oregon, Washington).

EU: Absent.

BIOLOGY

D. confusus, like other scolytids (bark beetles), tunnels into the bark of its hosts. The adults and larvae are phloeophagous or bark-feeding. The larvae and adults of *Dryocoetes* are able to overwinter but only the adults of *D. confusus* do so in Canada (Bright, 1976). *D. confusus* is associated with the blue-staining pathogenic fungus *Ceratocystis dryocoetidis*. Little has been published on the biology of *D. confusus* as such, and the following account relates to scolytids in general and the genus *Dryocoetes* as appropriate.

Adults emerge from overwintering sites between February and June. Activity is resumed when subcortical temperatures become sufficiently high, about 7-10°C. The insects fly individually or in small groups, during the warmth of the day in spring or near nightfall in summer (at temperatures between 20 and 45°C), and infest further trees. Terpenes in the oleoresin are the primary source of attraction, guiding pioneer beetles in the selection of a new host. Pheromones are responsible for the secondary attraction of other members of the same species and are the means by which individuals communicate after colonization.

D. confusus is polygamous: the male excavates the entrance tunnel and nuptial chamber, and then admits two to five females. The females push their frass into the nuptial chamber. The male has the responsibility of ejecting their frass and of protecting the entrance hole. The number of larval instars is three. A 1 or 2-year life cycle is probable

(Furniss & Carolin, 1977). For further information on the biology of *D. confusus*, see Mathers (1931).

DETECTION AND IDENTIFICATION

Symptoms

The egg galleries are the radiate type which do not score the wood. The rather short, indiscriminately wandering larval galleries are entirely in the phloem.

Morphology

Eggs

Smooth, oval, white, translucent.

Larva

Larvae are white, legless, with lightly sclerotized head, like scolytid larvae generally. See Thomas (1957) for generic characters of *Gnathotrichus* larvae.

Pupa

Exarate; usually whitish; sometimes with paired abdominal urogomphi; elytra rugose or smooth; head and thoracic tubercles sometimes prominent; less well known than the larva.

Adult

Adult *D. confusus* are shiny brown/black cylindrical beetles (3.4-4.3 mm long). The thorax is evenly convex above and the elytra are abruptly rounded and unarmed behind. Antennae geniculate, funicle five-segmented with abrupt three-segmented club; obliquely truncate with basal area corneous. Head at least partly concealed in dorsal view, not prolonged into distinct rostrum, narrower than pronotum, with mouthparts directed downwards. Front of head of the female densely hairy. Pronotum weakly to strongly declivous anteriorly and usually with many asperate crenulations in anterior half. Scutellum large and flat. Elytra entire, concealing pygidium, with basal margin straight and without crenulations. Elytra terminate in a rounded or blunt slope (the declivity). Tibiae with small lateral spines externally (three to seven in *Dryocoetes*). Tarsal segment 1 not longer than 2 or 3, distinctly five-segmented. For generic and specific keys including *Dryocoetes*, see Wood (1982).

MEANS OF MOVEMENT AND DISPERSAL

No specific information is available, but *D. confusus* is presumably able to move and be moved in the same way as other scolytids, e.g. *Ips pini* (EPPO/CABI, 1996).

PEST SIGNIFICANCE

Economic impact

Furniss & Carolin (1977) describe *Dryocoetes* spp. as breeding in dying, dead or fallen trees, so they are essentially secondary pests. *D. confusus* is the only species which has been recorded sometimes to kill trees, and on this basis is the most destructive member of the genus. It has caused extensive mortality in *Abies lasiocarpa*, particularly in British Columbia, in association with the fungus *Ceratocystis dryocoetidis* which it vectors. The lower bole of standing trees is usually selected for attack. Most commonly the attack is made on one side or area of the bole, then successive generations girdle the remaining area over more than one season. *D. confusus* is moderately aggressive and capable of killing overmature or unthrifty trees. Less commonly, cut or fallen trees are attacked (Wood, 1982). In Colorado, James & Goheen (1981) found *D. confusus* in *A. lasiocarpa* trees dying from root diseases.

Control

There is little specific information published on the control of this species. The usual preventive control methods for scolytids can most probably be used for *D. confusus*. Stock *et al.* (1994) suggest that infestations can be contained by use of anti-aggregation pheromones.

Phytosanitary risk

D. confusus has been included in the EPPO quarantine pest category "non-European Scolytidae" (EPPO/CABI, 1992). Since it can make primary attacks on *Abies lasiocarpa*, it presents a certain risk to the EPPO region, where *Abies* spp. have some importance as forest trees. This risk can, however, be assessed as relatively minor, since *D. confusus* is fairly specific to *A. lasiocarpa*, a species which is not grown in the EPPO region. In addition, *D. confusus* is a much less important pest in North America than *Dendroctonus* spp. and some *Ips* spp., and has not given rise to major control problems. So there is no basis to consider that it presents a more than a minor risk for the EPPO region.

PHYTOSANITARY MEASURES

It is doubtful whether any specific measures are needed against *D. confusus*.

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