

European and Mediterranean Plant Protection Organization  
 Organisation Européenne et Méditerranéenne pour la Protection des Plantes

**EPPO Data sheets on quarantine pests**  
**Fiches informatives sur les organismes de quarantaine**

## *Apriona cinerea*

### Identity

**Scientific name:** *Apriona cinerea* Chevrolat, 1852

**Synonyms:** *Apriona cinerea* (Breuning, 1949)

*Apriona cinerea newcombei* (Gilmour, 1958)

**Taxonomic position:** Insecta: Coleoptera: Cerambycidae: Lamiidae

**Common Names:** Poplar stem borer (English)

Apple stem borer (English)

**EPPO Code:** APRICI

**Phytosanitary categorization:** EPPO A1 list no. 373

### Hosts

The major hosts of *A. cinerea* belong to the family Salicaceae (in particular *Populus* and *Salix*) and to *Morus*, *Ficus*, *Prunus* and *Pyrus* species.

### Geographical distribution

*A. cinerea* is indigenous to the west Himalayan ranges and adjoining areas of India and Pakistan.

**EPPO region:** absent

**Asia:** India (In the north western states of Jammu and Kashmir; Himachal Pradesh; Uttarakhand; Uttar Pradesh, Hariyana and Punjab) (Singh *et al.*, 2004) and Pakistan [Rawalpindi, Peshawar and Parachinar (Singh & Prasad, 1985), North West Frontier Province (Chaudhry & Gul, 1986)].

### Biology

In India, adults emerge between June and September and feed on the bark of green living shoots (Singh & Prasad, 1985). Eggs are laid either on branches or on the main stem. Eggs are laid under the bark, in oviposition slits chewed out by the female. Eggs hatch after 5–7 days. Larvae bore downward in the trunk but make tunnels to the periphery creating holes at regular intervals through which it periodically ejects frass. In the early stages of larval growth these frass expulsion holes are close to each other, but later as the larva matures and grows in size larger frass expulsion holes are formed which are further apart. When the larva enters the bole of large mature trees, the consecu-

tive frass expulsion holes are again closer together. In young plants, larvae may tunnel into the roots.

In the foothills of the Himalayas and the adjoining plains the larva continues feeding until October, but in hills in the Western Himalayas it feeds until November. It remains quiescent throughout winter. It resumes activity in March and continues feeding until winter sets in. In the winter of the second year it excavates a pupal chamber with coarse wood fibres around it and diapauses as a mature larvae. In the following spring the larva transforms into pupa and by May-June the pupa becomes an immature beetle. In June-September the beetle chews it way out through an emergence hole in the main bole. In the case of young plants where the pupation has taken place in the root the beetles come up to the ground level where they chew their emergence holes.

The life cycle is completed in 2 years. The adult (Fig. 1, part 1a) may live up to 35 days.

### Detection and identification

#### Symptoms

Adults feed on the bark of shoots which may be girdled and killed. The oviposition scar is conspicuous on an infested stem. Generally one crescent shaped scar is present on each branch of bigger trees. In young plants resin bleeds from oviposition holes and larval tunnels in the bark may be seen. Larval activity is recognized by the presence of galleries under the bark and, later, tunnels in the wood (Fig. 2B). Compared with other borers, larva of *A. cinerea* are easier to detect because of the presence of regular frass expulsion holes (Fig. 2A) down the trunk at regular distances of 10–15 mm through which it ejects frass. Each infested branch may possess 8–9 such holes.

The accumulation of a large amount of ejected frass at the base of the infested trees is a clearly visible sign of the presence of *Apriona* infestation (Fig. 2D).

#### Morphology

##### Eggs

Elongate oval in shape, 7–8 mm long and 3–3.2 mm wide, creamy white, rounded at both ends, front end

being broader than the rear end, with hexagonal sculpturing on the surface of the egg visible under the microscope (Fig. 1, parts 2a and 2b).

#### Larva

The larva is a creamy white legless grub, elongate and cylindrical in shape 60–70 mm long with maximum breadth at prothorax. i.e. 12 mm, cuticle is rather leathery especially on prothorax. Head of the larva is elongate, anterior margin of the head is chestnut brown, rather strongly depressed, widest at anterior third and converging posteriorly. There are three pairs of minute legs. Abdomen with dorsal ampullae non-tuberculate, but armed with small chestnut brown asperites. (Gardner, 1927; Duffy, 1968; Singh & Prasad, 1985; see Fig. 1, parts 3a to 3e).

#### Pupa

Length of the pupa is up to 50 mm and maximum width is up to 18 mm. Antennae extend to second abdominal segment where they are strongly curved downward, elytra and wings extending to abdominal segment 4 (Fig. 1, parts 4a and 4b).

#### Adult

The beetle is elongate, 26–50 mm in length, rather narrow, greyish to greyish yellow, due to a dense pubescence; the under surface of the insect is black. There is a median longitudinal impressed line on vertex of head, the front is cleft between the eyes; antenna is slightly longer than the body (Fig. 1, parts 1a and 1b).

#### Pathways for movement

There is not much data on the capacity for natural spread of *A. cinerea*. In India it was considered that new plantations more than 1 km from an infestation site are unlikely to be infested during the first 2 years (Singh & Prasad, 1985).

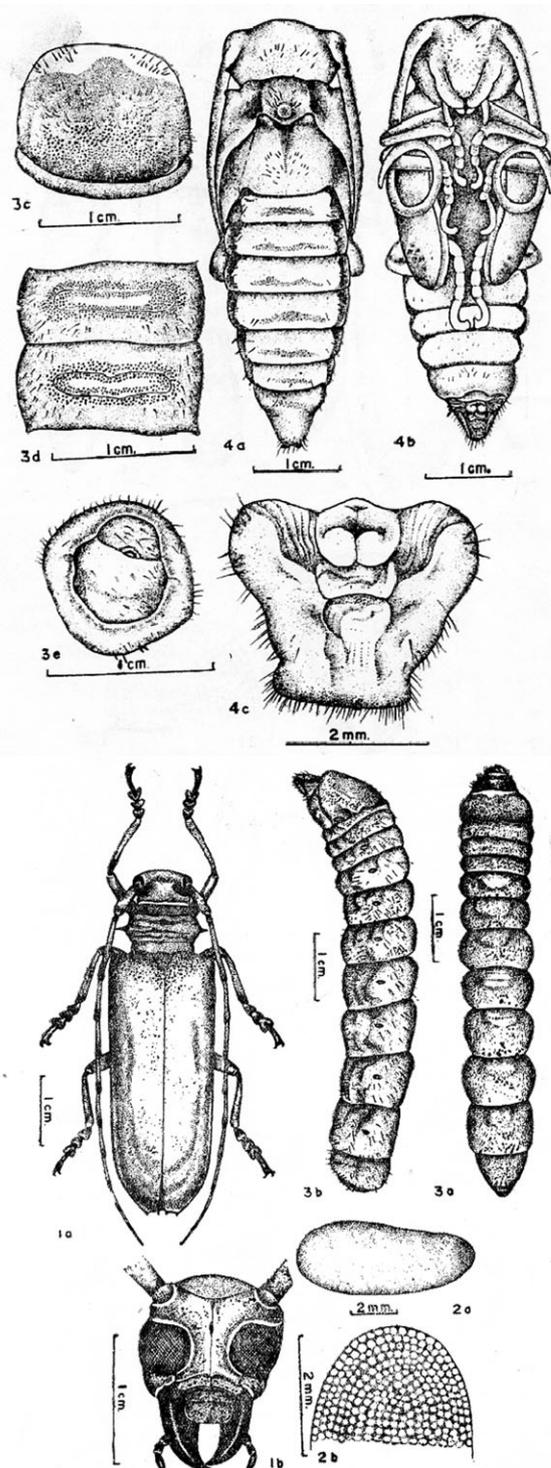
*A. cinerea* is not a dry wood borer. However, it survives in logs while wood retains moisture. The diapausing mature larva in the 2nd year may be transported while in its pupal chamber along with the felled logs in winter. If these logs are kept under moist conditions and not sawn, then beetles from these logs emerge in summer and colonize new areas.

This insect can be transported with plants (including eggs on cuttings) and wood products (including wood, wood packaging, wood chips, firewood) containing bark, moving in international trade.

#### Pest significance

##### Economic impact

The main damage associated with *Apriona* spp. is caused by the larvae, which bore into the wood soon after hatching, creating long tunnels. Several larvae may be found in a tree. This affects the growth of the trees and decreases the



**Fig 1** *Apriona cinerea*; From Singh & Prasad (1985). Parts 1–4c defined as follows: **1a** Adult, **1b** Head, frontal view; **2a** Egg, **2b** Egg magnified; **3** Larva, **3a** Dorsal view, **3b** Lateral view, **3c** Pronotum, **3d** Dorsal view of abdominal ampullae, **3e** Anal end; **4** Pupa, **4a** Dorsal view, **4b** Ventral view, **4c** Ventral view of abdominal segments (Caudal end) magnified.



**Fig. 2** (A) The lowest frass expulsion hole on a *Populus deltoides* tree, (B) Sawn bole showing larval gallery (tunneling) by larva and pupal chamber (C) Adult beetle feeding on branch (D) Accumulation of frass ejected by the borer at the base of the tree.

quantity and quality of the timber and longevity of the trees (Shui *et al.*, 2009; Li, 1996). Trees may die and stems/trunks may break. The timber becomes unsuitable for commercial use (e.g. plywood) and entry of fungi and pathogens into the galleries cause discoloration of the wood. The affected trees are much less resistant to wind and may be damaged or fall in moderate winds. Both young and adult trees may become infested. *A. cinerea* can cause major damage in apple, mulberry and poplar plantations. The adults feed on the bark (Fig. 2C) and cut the leaves and girdle young shoots thus killing them. (Singh & Prasad, 1985). Up to 60% tree mortality has been recorded in young plantations in Jammu, India (Singh *et al.*, 2004).

#### Control

Control measures include chemical control (including sprays or microcapsules targeting the adults or eggs and young larvae and fumigation or injections targeting older larvae in trunks and branches), physical control (removal of host trees such as mulberry or paper mulberry on which

maturation feeding could occur, or manually catching and killing adults), and biological control (injection of *Beauveria bassiana* into larval holes, use of parasitic nematodes such as *Steinernema prava* and *Heterorhabditis* spp.). Cultural practices such as sanitation felling (i.e. destruction of damaged and infested plants, or pruning), or use of trap trees, as well as methods to maintain tree vigour help reduce damage.

*A. cinerea* is a serious pest of apple, mulberry or poplar plantations, hence care should be taken not to raise mulberry or poplar in the vicinity of apple orchards. New plantations should also not be established near infested stands. Alternative/collateral hosts of the borer must be removed from areas up to 1 km from poplar plantations. In India the *Populus deltoides* clone G-48 is relatively tolerant to this pest (Singh *et al.*, 2004).

The natural enemies which have been identified are *Neoplectana* nematodes (Chaudhry & Gul, 1986) and Elatrid beetle, *Alaus* sp. (Chaudhry & Gul, 1992); *Aprostocetus fukutai* and *Beauveriana bassiana* (CABI, 2008) and *Dastarcus helophoroides* (Wei *et al.*, 2008).

*Phytosanitary risk*

In areas where *A. cinerea* could establish, the pest would attack poplars, apples, willows and other crops and plants in the natural environment, commercial orchards, gardens, plantations and urban areas. It is expected that the potential damage would be high in the southern part of the EPPO region where the pest is more likely to establish outdoors, especially if it established in the wild on hosts that occurred extensively with or without management (e.g. poplar). The environmental impact could be major if the pest reaches forests and other environments where poplar or willow are present. However, there is uncertainty as to the extent to which species belonging to host genera that are present in the PRA area, but not in the area of origin, might be attacked.

*Phytosanitary measures*

Experience with other cerambycid beetles in the EPPO region showed that their eradication once introduced is very difficult. Therefore priority should be given to prevent their entry.

Suggested phytosanitary measures for commodities of host plants include origin from a pest-free area, or a pest-free site under physical protection or treatment (heat or irradiation for wood and chipped to a size smaller than 3 cm for wood chips). Wood packaging material should be treated according to ISPM 15.

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