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

EPPO datasheet on pests recommended for regulation
Fiches informatives sur les organismes de quarantaine

Aromia bungii

Identity

Name: *Aromia bungii* (Faldermann, 1835)
Synonyms: *Aromia cyanicornis* Guérin-Méneville, 1844; *Aromia ruficollis* Redtenbacher, 1868.
Taxonomic position: Insecta: Coleoptera: Cerambycidae: Cerambycinae: Callichromatini.
Common names: Red neck longhorn beetle, Peach red necked longhorn, Plum and peach longhorn, Peach longicorn beetle, Peach musk beetle, Peach borer (EN), Cerambice cinese delle drupacee (IT), Asiatischer moschusbock (DE).
EPPO code: AROMBU.
Phytosanitary categorization: EPPO A1 List no. 380.

Hosts

Aromia bungii is an oligophagous wood-borer of *Prunus* species. In China its main hosts are: *Prunus armeniaca* and *P. persica. Prunus americana, P. domestica domestica, P. grayana, P. japonica, P. mume, P. pseudocerasus, P. salicina* and *P. yedoensis* are also confirmed hosts (Gressitt, 1942, 1951; Matsushita, 1941; AICD, 1975; Hua *et al.*, 1993; Zhao *et al.*, 1997; Liu *et al.*, 1999; Hua, 2002; Shandong Ecological Afforestation Project (SEAP), 2009; Huang *et al.*, 2012). In Italy *A. bungii* has been found on *Prunus avium* (also found on this host in Japan) (Anonymous, 2013; EPPO, 2013) and *P. cerasifera* (Garonna, 2012; R Griffo & F Nugnes, pers. comm.). *Prunus domestica institia* is a host in Germany (Burmeister, 2012).

Some other hosts are reported occasionally in China: e.g. *Diospyros kaki, D. lotus, D. virginiana* and *Punica granatum,* but these records needs to be confirmed (Hua, 2002; Shandong Ecological Afforestation Project (SEAP), 2009; Smith, 2009).

Geographical distribution

Aromia bungii is native from the southeastern Palaearctic ecozone with an expansion in the Oriental region.

EPPO region

Italy: Outbreaks (under eradication) in Campania and Lombardia (Garonna, 2012; EPPO, 2012b; Bariselli & Bugiani, 2013; Garonna *et al.*, 2013; EPPO Reporting Service, 2013). Germany: Outbreak in Bavaria (under eradication) (Schrader & Schröder, 2012; Burmeister, 2012; Burmeister *et al.*, 2012; EPPO, 2012a), intercepted in Baden-Wuerttemberg in 2008–11 (G Schrader, pers. comm.). UK: Intercepted (Reid & Cannon, 2010).

Asia

China (Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hong Kong, Hubei, Hunan, Inner Mongolia, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang) (Faldermann, 1835; Guérin-Méneville, 1844; Redtenbacher, 1868; Ganglbauer, 1887; Podaný, 1971; Qi, 1999; Hua, 2002; Hua *et al.*, 2009; Yiu, 2009; Löbl & Smetana, 2010), Democratic People's Republic of Korea 1927; Matsushita, 1933; Lee, 1982), Republic of Korea (Okamoto, 1927; Matsushita, 1933; Lee, 1982; Li *et al.*, 2013), Mongolia (Plavilstshikov, 1934; Faldermann, 1835; Podaný, 1971; Namkhaidorzh, 2007) and Vietnam (Ha Jiang), records reported in some blogs/forums. Although this has not been confirmed in a scientific publication, it is considered that the pest is probably present in this country.

Records from Taiwan (Smith, 2009; Ostojá-Starzewski & Baker, 2012) need to be confirmed. Kolbe (1886) reported the species in the Russian Federation from areas close to China and Mongolia.

Japan: recently introduced (Anonymous, 2013; EPPO, 2013).

Biology

The biology of *A. bungii* is not well-known. The beetle lives in forests, urban areas and orchards (Gressitt, 1942; Yang & Chen, 1999; Wen *et al.*, 2010). The life cycle is 2–4 years depending on the latitude and the climate. The flight period occurs from March to August with a maximum from mid-May to mid-July (Gressitt, 1942; Ma *et al.*, 2007).

Eggs are laid in crevices in the bark especially in the first 30 cm of the trunk above the soil level (Wu & Li, 2005), but also in the larger branches of healthy or stressed living trees (Gressitt, 1942). Females can lay eggs on the graft scar of young trees (≥6 cm diameter)

(EWG observation in Campania, 2013). Larvae bore galleries under bark, in the sapwood and heartwood and eject frass from their galery at least once a day during their period of activity which starts a few days after hatching (Gressitt, 1942; Liu *et al.*, 1999). The complete gallery can reach 50–60 cm in length (Gressitt, 1942; Duffy, 1968; Wu & Li, 2005; Yu & Gao, 2005; Griffo, 2012). Last instar larvae and pupae can survive several weeks or months in logs after cutting and so are likely develop into adults (E Ucciero, pers. comm.). Eggs and early stages can continue their development in logs after the felling of the tree but research to investigate whether they can develop into adults is on-going (A Garonna, pers. comm.). There is no record of infestation in the roots. Pupation occurs in the heartwood.

Adults are diurnal and live 15–20 days. Females have been reported to lay between 91 and 734 eggs under artificial conditions (Wang *et al.*, 2007; R Griffo, pers comm.).

Detection and identification

Symptoms

Detection of infested trees is possible during the larval activity period by observation of the frass emitted which may be observed, mainly at the base of the trunk (although some may be seen on the bark). This reddish sawdust is ejected by young larvae some days after hatching and its volume increases with the age and size of the larvae. This sign is difficult to detect at the beginning of infestation, but becomes easier to see month after month because there is accumulation of frass on the soil. This sign can be confused with frass ejected by *Cossus cossus* (Linnaeus 1758) (Lepidoptera: Cossidae) or *Capnodis tenebrionis* (Linnaeus 1758) (Coleoptera: Buprestidae) two common pests on *Prunus* spp. in the EPPO region.

Exit holes at the base of the trunk show that a first generation has completed its development but younger living larvae can still occur in the wood, which will emerge 1 or more years later.

Adults can also be observed easily because of their diurnal activity, their large size (23–37 mm), and their shiny black colour.

Morphology

Egg

Eggs of *A. bungii* are 6–7 mm length and whitish (Fig. 1). They are laid in crevices of the bark.

Larva

Mature larvae of *A. bungii* reach 38–50 mm. The body is whitish with blackish tips and bases of mandibles. The prothorax has an irregular and symmetrical reddish strip on the front. The shape of this strip is specific and useful to identify the pest at the larval stage.

The number of larval instars is not known. Larvae are shown in Figs 2 and 3.

Fig. 1 Eggs of *Aromia bungii*. Courtesy of A. Garonna.

Pupa

The pupa is also whitish and 26–36 mm long. The pupation occurs in a pupa cell in the heartwood.

Adult

Adult length is from 23 to 37 mm. Antennae are strong and much longer than the body in males and as long as the

Fig. 2 Larva and galleries of *Aromia bungii*. Courtesy of R. Griffo – Plant Health Service of Campania Region, Napoli (IT).

Fig. 3 Larva of *Aromia bungii*. Courtesy of B. Espinosa – Dipartimento di Entomologia e Zoologia agraria 'Filippo Silvestri' – Facoltà di Agraria, Portici (Napoli) (IT).

body in females (Fig. 4). The typical adult form of *A. bungii* is easily recognizable with its shiny black elytrae and its bright red prothorax which is the reason of its common name 'red neck longhorn beetle' (Figs 4 and 5).

The chromatic variety *cyanicornis* Guérin-Méneville, 1845 is entirely shiny black.

Fig. 5 Female *Aromia bungii.* Courtesy of A. Garonna Università degli Studi di Napoli, Federico II (IT).

Pathways for movement

The main introduction pathway of *A. bungii* in the EPPO region is probably wood packaging. Other pathways possible are wood or wooden products of *Prunus* species which are large enough to sustain live larvae until adult emergence. Plants for planting and bonsais can also sustain eggs or young larvae. Living adults may hitch-hike in imported goods but this is probably only occasional.

In the absence of specific information on the flight distance, the natural spread of adults is considered as similar to *Anoplophora glabripennis* (Motschulsky 1853), another longhorned invasive species introduced into the EPPO region (average 560 m with maximum 2500 m). This distance could be longer because *A. bungii* is oliphagous on *Prunus* spp., and is probably able to fly as far necessary to find its host plants which are less common than those of *A. glabripennis*.

Fig. 4 Male and Female *Aromia bungii.* Courtesy of A. Garonna Università degli Studi di Napoli, Federico II (IT).

Pest significance

Economic impact

The economic importance of *A. bungii* is mainly known in China on cultivated apricot, peach and plum trees in orchards. It is considered to be very destructive on peach and apricot but it also causes considerable damage to plums and can be a serious pest of cherry. The production of wood of wild cherry (*P. avium*) may also be affected. *A. bungii* is also considered as an emerging pest (Gressitt, 1942; Duffy, 1968; Zhang *et al.*, 2000; Wu & Li, 2005; Shandong Ecological Afforestation Project (SEAP), 2009; Huang *et al.*, 2012). A recent outbreak in Italy showed that *A. bungii* infestations may kill 20–30 year old peach, apricot, plum and cherry trees within three or four years.

A. bungii is also considered as a pest for forest *Prunus* (Yang & Chen, 1999; Wen *et al.*, 2010).

The damage is only caused by the larvae, which bore into the wood soon after hatching, producing tunnels in the branches and the trunk (Gressitt, 1942). Galleries in the cambium zone stop the circulation of the sap, killing the associated tissues, weakening the tree and reducing the fruit production. Extensive infestations result in tree death (Duffy, 1968; Wu & Li, 2005; Yu & Gao, 2005; Griffo, 2012). *A. bungii* mainly attacks old, stressed or trees with existing bacterial or fungal infestations, but these are always living trees. The observations in Italy show that the pest can also affect young and healthy trees.

Control

Control of *A. bungii* is difficult because the larva penetrate rapidly under the bark, where they can not be controlled by non-systemic insecticides.

The main control measures are similar to those used against *Capnodis tenebrionis* (Linnaeus, 1758) (Coleoptera: Buprestidae). They include prophylactic measures such as the destruction and the removal of damaged trees and the use of entomopathogenic nematodes such as *Steinernema carpocapsae* (del Martinez de Altube *et al.*, 2007) which is used in China against *A. bungii* (Liu *et al.*, 1993; 1997; 1998).

Some insecticides currently used against other pests in orchards in IPM programmes are likely to also be effective against adults of *A. bungii*.

In addition, some generalist parasitoids and predators could probably adapt to the different immature stages of *A. bungii* although they are unlikely to control the pest to prevent economic damage.

Phytosanitary risk

Aromia bungii is native from the southeastern Palaearctic ecozone with an expansion in the Oriental region. In the EPPO region it is only known from three limited outbreaks, which are under eradication. Reports from China and the recent outbreak in Campania confirm that it is a serious pest of *Prunus* trees mainly peach, apricot, plum and cherry trees in cultivated orchards. It is likely to be an important pest for ornamental and wild trees or forestry production.

Based on its current distribution and those of its main host plants, it is predicted that the limits of the potential distribution for EPPO regions are the southern part of Scandinavia and the eastern part of the Russian Federation, therefore the zone at risk covers a huge area. The risk of establishment, spread and damage is greater in southern countries because the life cycle is shorter and the main host trees (peach, apricot) are abundant.

The most likely pathway for introduction is wood packaging and plants for planting. The import of *Prunus* plants for planting is already prohibited in many EPPO countries. Since 1998, wood packaging material should be submitted to ISPM 15 treatments and should therefore be free of pests. Interceptions of live cerambicids in pallets marked with the ISPM 15 sign questioned whether the efficacy of the heat treatment is insufficient, or if is the treatments are badly implemented.

Phytosanitary measures

Aromia bungii was added in 2014 to the EPPO A1 List of pests recommended for regulation and EPPO member countries are thus recommended to regulate it as a quarantine pest. Suggested phytosanitary measures are specified in the PRA performed by EPPO in 2013; they are as follows.

Plants for planting of *Prunus* should originate from areas free from the pest or be grown under insect-proof conditions.

Prunus wood commodities should originate from areas free from the pest or undergo heat treatment, irradiation, or chipping. Alternatively they may be imported for processing at specific time of the year.

Wood packaging material should be treated according to ISPM 15.

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