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Data Sheets on Quarantine Pests

Anoplophora malasiaca and *Anoplophora chinensis*

IDENTITY

Taxonomic position: Insecta: Coleoptera: Cerambycidae
Notes on taxonomy and nomenclature: There is some overlap in the synonymy of the two species, which are very closely related. It has been suggested that they are simply forms of a single species. For example, Sorauer (1954) treats the forms in China and Japan as the single species *Melanauster chinensis* Forster, as does Duffy (1968) under the generic name *Anoplophora*.

- ***Anoplophora malasiaca***

Name: *Anoplophora malasiaca* (Thomson)
Synonyms: *Calloplophora macularia* Thomson
Melanauster chinensis var. *macularius* Bates
Melanauster macularius Kolbe
Melanauster chinensis Matsumura
Anoplophora macularia Breuning
Common names: White-spotted longicorn beetle (English)
Capricorne à points blancs (French)
Gomadara-kamikiri, hosi-kamikiri (Japanese)
Bayer computer code: ANOLMA
EPPO A1 list: No. 188
EU Annex designation: I/A1

- ***Anoplophora chinensis***

Name: *Anoplophora chinensis* (Forster)
Synonyms: *Cerambyx farinosus* Houttuyn
Cerambyx chinensis Forster
Cerambyx punctator Olivier
Melanauster chinensis Thomson
Anoplophora chinensis Bates
Anoplophora chinensis Breuning
Common names: Citrus-root cerambycid, black and white longhorn, citrus longhorn (English)
Bayer computer code: ANOLCN
EPPO A1 list: No. 187
EU Annex designation: I/A1

HOSTS

A. malasiaca is polyphagous on woody hosts, having been recorded on at least 68 species of host trees belonging to 19 families. These include *Alnus*, *Casuarina*, *Citrus*, *Litchi*, *Melia*, *Morus* and *Salix*. *A. chinensis* behaves similarly, being recorded for example on

Acer, *Citrus*, *Cryptomeria japonica*, *Malus*, *Populus* and *Salix*. Probably, the host ranges of the two species practically coincide. *Ficus*, *Hibiscus*, *Mallotus*, *Platanus*, *Pyrus* and *Rosa* are mentioned as hosts of either species (Gressitt, 1951; Anon., 1986).

GEOGRAPHICAL DISTRIBUTION

- ***Anoplophora malasiaca***
  EPPO region: Absent.
  Asia: Japan (Honshu, Kyushu, Shikoku, less common in Hokkaido), Korea Democratic People's Republic, Korea Republic (including Cheju Island), Taiwan.
  EU: Absent.
- ***Anoplophora chinensis***
  EPPO region: Absent.
  Asia: China (subtropical areas, including Fujian, Jiangsu), Hong Kong, Korea Republic, Malaysia (Hill, 1983), Myanmar (Gressitt, 1951), Viet Nam.
  North America: USA (Hawaii; interceptions on mainland, according to Sorauer (1954)).
  EU: Absent.

BIOLOGY

In tropical and subtropical regions, there is a single generation per year, but the life cycle occasionally takes two years depending on climatic and feeding conditions. The adults live about a month between May and August. They feed on leaves, petioles and young bark of various trees. Egg deposition begins a week after copulation. The eggs, about 70 per female, are laid one by one under the bark of the trunk, from just above the soil surface to 60 cm higher. The feeding larva tunnels in the branches and trunk just under the bark and later enters the woody tissues of the lowest portions of the trunk and roots. Pupation takes place in the wood, often in the upper part of the feeding area. See Adachi (1988) and Mitomi *et al.* (1990) for more details on *A. malasiaca* in Japan, and Chang (1975) for details from Taiwan.

DETECTION AND IDENTIFICATION

Symptoms

Larval tunnels are found under the bark and in the wood. Frass and woodpulp extruding from holes are signs of infestation.

Morphology

Eggs

About 5 mm, elongate, subcylindrical and tapering towards both ends. Creamy-white in colour but towards hatching gradually turning yellowish-brown.

Larva

The larva is a legless grub up to 45 mm long when fully grown. It is creamy-white in colour, with some yellow, chitinized patterns on the prothorax. The head is brown, moderately depressed with parallel sides and about half the width of the prothorax. The antennae are very short, three-segmented. The ocelli, one on each side, are ventro-lateral to the antennae (Lieu, 1945; Nakamura, 1981).

Adult

Typically cerambycid in shape, 25 (male) to 35 (female) mm long. Antennae 1.7-2 times length of body in male; 1.2 times length of body in female. The beetle is black with several white hair spots on the elytra. The pronotum has a prominent pointed process on both sides. *A. malasiaca* has two bluish-white hair spots on either side of the pronotum, whereas the

pronotum of *A. chinensis* is entirely black. The male has the elytra narrowed distally. The sides of the female elytra are parallel and rounded distally. The joints of the antennae are black with a blue-grey base.

MEANS OF MOVEMENT AND DISPERSAL

The adults fly readily, like other Cerambycidae. In international trade, *Anoplophora* spp. are most likely to move as eggs, larvae or pupae in woody planting material, including bonsai plants, and possibly in packing material. Individuals (larvae and adults) have entered Germany and Netherlands on bonsai plants of *Acer buergeranum*, *A. palmatum*, *Celastrus*, *Cydonia sinensis*, *Malus micromalus* and *Sageretia* from China and Japan (Anon., 1986, 1988) and have been found in unheated glasshouses and even out of doors, damaging trees and shrubs in summer.

PEST SIGNIFICANCE

Economic impact

Both species can cause serious damage to healthy fruit, ornamental and amenity trees. In Asia, they are the most important cerambycids in citrus orchards. Trees are weakened by larval attack and more readily susceptible to diseases and wind damage. They may often be killed. Damage to small young trees is most serious (Kojima & Hayashi, 1974; Lieu, 1945). The adults can also cause damage by feeding on leaves, petioles and bark. Damage to the fruiting shoots of fruit trees results in particular economic loss.

Control

Insecticide treatments are used against *A. malasiaca* in citrus orchards in Japan, e.g. 3 treatments per season with methidathion (Komazaki *et al.* 1989). Protecting trunks with fine wire mesh to prevent oviposition has also shown promise in trials (Adachi, 1990). In China, the following recommendations are made to control *A. chinensis* (Hill, 1983): cut and burn heavily infested branches; inject a mixture of dieldrin and kerosene into the frass holes to kill the larvae.

Biological control of *A. malasiaca* has been tried out in Japan with the nematode *Steinernema feltiae* (Kashio, 1982, 1986), and with the fungi *Beauveria bassiana* and *B. brongniartii* (Kashio & Ujiye, 1988). In China, chemical control of *A. chinensis* was found to be unnecessary when colonies of the ant *Oecophylla smaragdina* are present in citrus orchards (Yang, 1984).

Phytosanitary risk

Both *A. malasiaca* and *A. chinensis* were added to the EPPO A1 list in 1994, but neither is declared as of quarantine significance by any other regional plant protection organization. They present a significant risk to citrus growing in Mediterranean countries. In the Netherlands, individual adult beetles have been found causing damage to trees and shrubs in the open air during summer (see above), but it seems unlikely that either species would survive, establish or cause great damage in the cold conditions of Northern Europe (*A. malasiaca* does occur in Hokkaido, the northern island of Japan).

PHYTOSANITARY MEASURES

Importation of *Citrus* plants for planting is already prohibited or restricted on account of more important pests. However, these *Anoplophora* species may well be introduced on many other woody hosts. When imported from infested countries, planting material of woody plants, or bonsai plants, should have been grown under carefully supervised conditions in registered nurseries. Suitable precautions would, for example, be to grow the

plants for at least two years before dispatch in an insect-proof enclosure, inspecting them at least 6 times a year for the presence of *A. malasiaca* and *A. chinensis*.

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