

Mini data sheet on *Agrilus fleischeri*

Agrilus fleischeri was added to the EPPO A2 List in 2019. A full datasheet will be prepared, in the meantime you can view here the data which was previously available from the EPPO Alert List (added to the EPPO Alert List in 2018 - deleted in 2019).

Agrilus fleischeri (Coleoptera: Buprestidae)

Why: *Agrilus fleischeri* (Coleoptera: Buprestidae) is an Asian wood borer of poplars (*Populus* spp.). In parts of China (e.g. Liaoning province), *A. fleischeri* has become a destructive pest causing tree mortality in poplar plantations, in particular on *Populus nigra* var. *italica* (Lombardy poplar). Considering the importance of poplar in the EPPO region, and the fact that its wood is commonly used to make pallets, the NPPO of the United Kingdom suggested the addition of *A. fleischeri* to the EPPO Alert List.

Where: *A. fleischeri* originates from East Asia.

EPPO region: Kazakhstan, Russia (Eastern Siberia, Far East).

Asia: China (Beijing, Hebei, Heilongjiang, Liaoning, Shaanxi, Sichuan, Tianjin), Japan (Hokkaido, Honshu), Kazakhstan, Korea (Dem. People's Republic of), Korea (Republic of), Mongolia, Russia (Eastern Siberia, Far East).

On which plants: *Populus* species, including *Populus davidiana* (Korean aspen), *P. laurifolia* (laurel-leaf poplar), *Populus nigra* var. *italica* (Lombardy poplar) and *P. sieboldi* (Japanese aspen). In the literature, *Salix* spp. (willows) are recorded as hosts but no data on damage could be found in the literature. Records of *A. fleischeri* on *Quercus* spp. are considered erroneous.

In China, the two most common poplar species used in plantations are *P. davidiana* (native to China) and *P. nigra* var. *italica* (non-native to China). A field study conducted in Liaoning province has shown that the non-native *P. nigra* var. *italica* was more vulnerable to *A. fleischeri* than the native *P. davidiana*.

Damage: Larvae develop under the cambium within the phloem of infested trees. Feeding activity disrupts the transportation of water and nutrients in the tree. When high populations are present, larval galleries can girdle the trunk and kill the tree within 2 to 3 years. Emerging adults leave a distinct D-shaped exit hole in the trunk (2 to 4 mm in length and 1.3 to 2.8 mm in width). In addition to tree debilitation or mortality, infestations can significantly reduce the ornamental value of poplar trees.

Studies on the life history of *A. fleischeri* have been conducted in Liaoning (Saima village near Fengcheng city) from April 2013 to September 2015 on plots of *P. nigra* var. *italica* and *P. davidiana*. Results showed that this wood boring beetle was univoltine on *P. nigra* var. *italica* and overwintered as mature larvae. On *P. davidiana*, *A. fleischeri* was semivoltine and overwintered as 2nd or 3rd instar larvae. The adult beetles emerged from late May to mid-August with a peak in early June. Adults (about 10.3-11.4 mm long) are dark brown to black, glabrous beetles with two white spots on each elytrum. Eggs (approximately 1 mm long) are oval and irregular in shape, and milky white. Larvae are milky white to light yellow, with dark brown mouthparts and urogomphi. Pupae are approximately 11 mm long. Pupation takes place inside the tree, in pupal chambers that are situated 4 to 14 mm from the surface of the sapwood.

Pictures can be viewed on the Internet

<https://www.flickr.com/photos/87155171@N08/35662783144>

<https://www.zin.ru/Animalia/Coleoptera/rus/agrflems.htm>

https://ars.els-cdn.com/content/image/1-s2.0-S1226861516302679-fx1_lrg.jpg

Dissemination: There is little information about the natural spread of the pest, but adults can fly. Over long distances, trade of infested plants, wood and wood products can disseminate *A. fleischeri*. During informal discussions, the NPPO of the United Kingdom has been informed that Canadian authorities have intercepted *A. fleischeri* (adult beetles) on two occasions: in 1992 in wood packaging material and in 2015 in dunnage originating from China; demonstrating that these types of commodities can transport the pest between continents.

Pathways: Plants for planting, wood, wood packaging material (including dunnage), wood chips? from countries where *A. fleischeri* occurs.

Possible risks: Poplars are widely present in the EPPO region, in forests and plantations, as well as in parks and gardens. Wood from poplar is used for many different purposes including lumber, wood panels, wood packaging material, bioenergy, and paper. In terms of surfaces of poplar plantations, China is the leading country (7.6 million ha), followed by France (236,000 ha), Turkey (125,000 ha), Spain (105,000 ha), and Italy (101,430 ha). In Northeastern China, *A. fleischeri* has been reported as a newly emerging pest causing severe damage and tree mortality in poplar plantations, especially on *P. nigra* var. *italica* which is also widely present in the EPPO region. Recent experience with another *Agrilus* species attacking ash trees (*A. planipennis*) has shown that control against this type of wood-boring insect when introduced into new areas (i.e. North America, European Russia) was difficult. In China, natural enemies of *A. fleischeri* have been recorded such as: *Oobius* sp. (Hymenoptera: Encyrtidae), *Euderus* sp. (Hymenoptera: Eulophidae), *Paramblynotus* sp. (Hymenoptera: Liopteridae), *Polystenus rugosus* and *Spathius* sp. (both Hymenoptera: Braconidae). The high parasitism rates observed in the field suggested that these parasitoids could efficiently limit populations of *A. fleischeri*, but this remains to be verified. The fact that poplar is commonly used for making pallets that are moved in trade adds to the risk of introducing this pest into the EPPO region. Despite the requirements made in ISPM 15, numerous cases of non-compliant wood packaging material from Asia have been recorded in the EPPO region. Although, data is generally lacking on its biology, host range, and economic impact, the emergence of *A. fleischeri* in parts of China as a serious pest of *P. nigra* var. *italica*, suggests that it could present a risk for the EPPO region.

Sources

INTERNET

- Pro-Populus. <http://www.pro-populus.eu/en/poplar>
- International Poplar Commission. <http://www.fao.org/forestry/ipc/en/>
- UK Risk Register details for *Agrilus fleischeri*.
<https://secure.fera.defra.gov.uk/phiw/riskRegister/viewPestRisks.cfm?cslref=27776>

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Jendek E, Grebennikov V (2011) *Agrilus* (Coleoptera: Buprestidae) of East Asia. Prague, Jan-Frakač, 362 pp.

Jendek E, Poláková J (2014) Host plants of world *Agrilus* (Coleoptera, Buprestidae): a critical review. Springer, 706 pp.

Lee JG, Ahn KJ (2012) Insect Fauna of Korea 12(10). Arthropoda: Insecta: Coleoptera: Buprestidae: Agrilinae: Agrilini: *Agrilus*. Jewel Beetles. National Institute of Biological Resources, Ministry of Environment, 98 pp.

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Zang K, Wang XY, Yang ZQ, Wei K (2017) [Differences of infestation and damage between *Populus davidiana* and *P. nigra* var. *italica* by *Agrilus fleischeri* Obenberger]. *Chinese Journal of Applied Entomology* 54(2), 255-264 (in Chinese).

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