

Mini data sheet on *Polygraphus proximus*

Polygraphus proximus was added to the EPPO A2 List in 2014. 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 2011-deleted in 2014).

Polygraphus proximus (Coleoptera: Scolytidae) - Sakhalin-fir bark beetle

Why: *Polygraphus proximus* is a bark beetle, mainly feeding on firs (*Abies* spp.) which has been introduced from the Far East of Russia into the Western part of Siberia and European Russia. Currently, the pest has invaded Moscow and Leningrad regions in European Russia, and several areas in Siberia (Kemerov and Tomsk regions, Krasnoyarsk Territory - covering an area of approximately 30 000 ha). In Siberia, it has caused significant damage and tree mortality in forests of Siberian fir (*A. sibirica*). Because *P. proximus* may represent a major threat to European and Siberian fir species, the EPPO Panel on Quarantine Pests for Forestry recommended that *P. proximus* should be included in the EPPO Alert List.

Where: *P. proximus* is indigenous to Asia. It is commonly found in the Far East of Russia (including the Kuril Islands), Korea Democratic Peoples' Republic, Japan and the North-East of China. The native area of *P. proximus* more or less coincides with the distribution range of the Far Eastern species of *Abies*.

EPPO region: Russia - Central Russia (introduced - Leningrad region in 1999, Moscow region in 2006), Eastern Siberia (introduced - Krasnoyarsk), Far East (native - Khabarovsk, Primorye, Sakhalin including the Kuril Islands (Iturup, Kunashir, Shikotan)), Western Siberia (introduced; Altay, Kemerovo in the mid-1990s, Tomsk in 2009).

Asia: China (North-East), Japan (Hokkaido, Honshu, Kyushu, Shikoku), Korea Democratic Peoples' Republic, Russia (Far East).

On which plants: In Asia, the major hosts of *P. proximus* are Far Eastern firs: *Abies nephrolepis*, *A. holophylla*, *A. mariesii*, *A. firma* and *A. sachalinensis*, but it can develop in other species of *Abies*. In Russia, it was found in *A. sibirica* and *A. balsamea*. In its native area, other recorded hosts are pine trees (*Pinus* spp., including *P. koraiensis*), larches (*Larix* spp.), hemlocks (*Tsuga* spp.), spruces (*Picea abies* and *P. ajanensis*). For the moment, there is no data on the host status of other *Abies* species grown in the EPPO region (e.g. *A. alba*). More information would also be needed on the damage this pest may cause to other conifers recorded as hosts.

Damage: *P. proximus* is a bivoltine species that produces subcortical galleries. In its natural habitats, this bark beetle does not cause tree mortality, unless trees are weakened by other biotic or abiotic factors. Its biological characteristics in new habitats in Europe are yet unknown, but in invaded areas in Siberia tree mortality has been observed. The crowns of newly infested fir trees initially look healthy, but trunks are fully covered by drops and streams of oleoresin exuded from beetle entry holes. On infested firs, the crown turns light brown-red and finally yellow when the trees die. Affected firs usually die 1-2 years after infestation. After tree death, needles and bark start to fall off and typical bark beetle galleries can easily be seen. Under the bark each nest consists of two to three female galleries up to 8 cm long, horizontally oriented. Larval galleries are vertically oriented along the tree trunk and reach 7 cm in length.

In Siberia and European Russia, *P. proximus* is a primary pest, which can cause significant economic losses to forests. In addition to direct damage, *P. proximus* like other bark beetles, is associated with blue stain fungi which can cause wood discoloration and necrosis of vascular tissues. In Japan, two new *Ophiostoma* species were isolated from *P. proximus* and infested *Abies* trees: *Ophiostoma aoshimae* sp. nov. and *Ophiostoma rectangulosporium* sp. nov. In Russia, the presence of *Ophiostoma aoshimae* was recently reported on *A. sibirica*, probably transferred by *P. proximus* from its natural range into Siberian forests.

Further research is needed to better understand the relationships between *P. proximus* and blue-stain fungi, and to evaluate the pathogenicity of these fungi in areas where the insect has been introduced.

Dissemination: Because *P. proximus* may be hidden in the wood and therefore difficult to detect, it may be easily transported with conifer wood and wood products moving in trade. *P. proximus* could be transported as larvae, pupae or adults in round wood and wooden material with bark attached. The pest has been detected in traded wood (internal movement) by the Russian NPPO. As the adults can fly, they can ensure the pest spread over short distances, but no data is available on flying distances. The pest may also be carried as a hitchhiker on planting material.

Pathway: Wood and bark, wood products, plants for planting of host plants of *P. proximus* from countries where the pest occurs.

Possible risks: *Abies* species and other conifers are economically important forest and amenity trees in the EPPO region. Before 2009, there was no documented information on *P. proximus* in Siberia and it was generally believed that it could not develop on *A. sibirica*. The observation of two large outbreaks in Siberia (now covering 30 000 ha) in the taiga forest have clearly demonstrated that *P. proximus* could enter into new areas and damage species other than those reported in its native range. Although the pathway of introduction of *P. proximus* is not known, it is supposed that it has been introduced into Siberia during the mid-1990s with wood from the Far East. The possibility that *P. proximus* may transfer pathogenic fungi (e.g. *Ophiostoma* spp.) to living trees also adds to the risk. The aggressive and invasive behaviour observed in the forests of European Russia and Siberia indicate that *P. proximus* has the potential to become a serious pest of firs and possibly other conifers in the EPPO region and that it is desirable to prevent its further spread.

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