

Data Sheets on Forest Pests

Agelastica alni orientalis

IDENTITY

Name:	<i>Agelastica alni orientalis</i> Baly
Synonyms:	<i>Agelastica orientalis</i> Baly
Taxonomic position:	Insecta: Coleoptera: Chrysomelidae
Common name:	Oriental leaf beetle (English); восточный листоед (Russian).
Bayer computer code:	AGLAOR

HOSTS

A. alni orientalis attacks *Salix*, *Populus*, *Prunus dulcis* (= *Amygdalus communis*), *Malus* and *Betula* (Pavlovskii & Shtakelberg, 1955; Makhnovskii, 1955; Medvedev, 1983; Maslov, 1988).

GEOGRAPHICAL DISTRIBUTION

EPPO region: Kyrgyzstan; Kazakhstan (potential EPPO member), Kyrgyzstan (potential EPPO member), Uzbekistan (potential EPPO member), Tajikistan (potential EPPO member), Turkmenistan (potential EPPO member).

Asia: China, South-Eastern Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Turkmenistan, Iran, probably Afghanistan (Vassiliev, 1912; Pavlovskii & Shtakelberg, 1955; Medvedev, 1983; Maslov, 1988).

EU: Absent.

BIOLOGY

The mass flight of *A. alni orientalis* occurs when leaves open (March – April). Adult overwintering beetles move from their winter refuges (cracks in the bark, leaves of the forest litter, etc.) to crowns of trees for additional feeding on leaves. At the same time, females lay eggs, usually 25 to 35 at the same place – usually on the underside of leaves, sometimes on the upper side. Larvae appear 12-15 days later and, several hours after hatching, begin to feed on the parenchyma of leaves, causing skeletonizing of the leaves. Big larvae eat complete leaves except for the larger veins. The larval development takes about one month. During this time the larvae moult four times. They then come down from trees and prepare pupation cells 1-3 cm deep in the soil and pupate there. The pupation cell is 8-9 mm long and 4-5 mm wide. Young beetles usually appear in July. Some individuals stay in the pupation cells until the spring, others feed on leaves until August and then search for refuges for overwintering. The full life cycle takes one year (Vassiliev, 1912; Makhnovskii, 1955; Maslov, 1988).

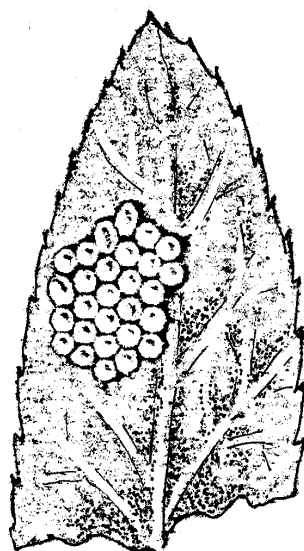


Fig. 1. Egg mass *Agelastica alni orientalis* on the underside of a leaf (Vassiliev, 1912)

DETECTION AND IDENTIFICATION

Symptoms

Damaged leaves are usually easily recognized by holes made by beetles of *A. alni orientalis* during additional feeding or by the skeletonization by larvae. Beetles and larvae of the pest are easily detected on leaves during their feeding (Vassiliev, 1912; Makhnovskii, 1955; Maslov, 1988).

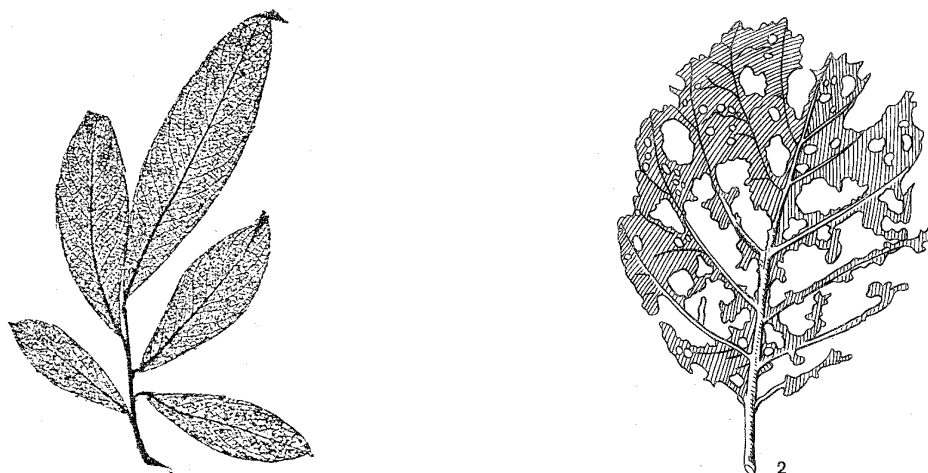


Fig. 2. Leaves (left) skeletonized by larvae of *Agelastica alni orientalis* and (right) damaged by beetles during additional feeding (Vassiliev, 1912)

Morphology

Eggs

The egg is oval-elongated, 1.5 mm long and 1.0 mm wide, orange-yellow when laid, and then turns dark to brownish (Vassiliev, 1912; Makhnovskii, 1955).

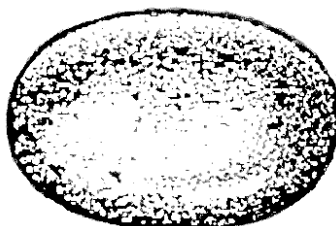


Fig. 3. Egg of *Agelastica alni orientalis* (Vassiliev, 1912)

Larva

The neonate larva of *A. alni orientalis* is orange-yellow, 2.00-2.25 mm long with a big bright dark-brown head, brownish legs and first tergite, covered by dense light hairs based on dark points-warts, forming transversal rows; the last abdominal segment and the last leg segments have suckers. The big larva of *A. alni orientalis* before pupation is 11-12 mm long, covered by light hairs. Its dorsal and lateral sides are black and bright. The underside of the body is dark brown. The head is heart-shaped, bright and black, divided by fissures into three parts. The dorsal side of the body is covered by transverse prominent plicae: two pairs of plicae on each of three thoracic tergites, one pair of plicae separated by a transverse wrinkle on each abdominal tergite except the last segment, one plica on the last tergite. On the lateral sides of the body, there are three longitudinal rows of warts with a bundle of hairs on each. The upper row is composed of warts which are smaller than the other two rows. These warts secrete green haemolymph for protection in case of danger. Between the upper and middle rows of warts, there is a row of spiracles situated on special conical-cylindrical warts. On the last segment of the body, there is a yellowish or greenish sucker, characteristic for many *Chrysomelidae*. This sucker and those (similar, but smaller) on the legs help the larva to move on the leaf (Vassiliev, 1912; Makhnovskii, 1955).

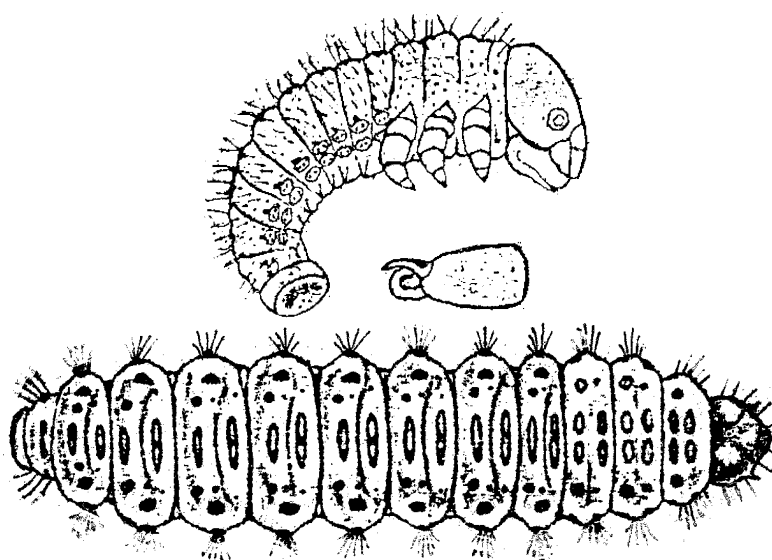


Fig. 4. Larvae of *Agelastica alni orientalis*: (above) neonate larva and the last segment of its leg with a sucker and (below) larva before pupation (Vassiliev, 1912)

Pupa

The pupa of *A. alni orientalis* is orange-yellow, 6.5-7.5 mm long. The thorax and abdominal tergites are covered by long dark hairs directed to the end of the body. On the first to the fifth segments, there are spiracles in the form of dark circles. On the last segment there is a pair of appendages in the form of hooks with sharp chitinized tops directed each to other (Vassiliev, 1912).

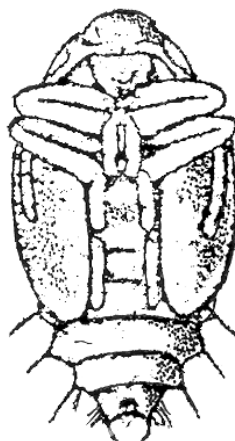


Fig. 5. Pupa of *Agelastica alni orientalis* (Vassiliev, 1912)

Adult

The beetle of *A. alni orientalis* is monochrome dark blue, sometimes with a violet nuance, bright, 6.0-7.5 mm long, oval-elongated, prominent. The head is three-cornered, with a depression on the frons. The antennae are black and filiform, approximately equal to half of the body length. The third antennal segment is much longer than the second segment and shorter than the fourth segment. The pronotum has rounded back corners. The pronotum and elytra are punctuated by small points-pits. The elytra are slightly widened at the top. The beetle differs from the close European species *Agelastica alni* L. by larger size, more bright colours, less widened at the top of the elytra, and a different shape of the pronotum, which is longer and has more rounded corners (Vassiliev, 1912; Makhnovskii, 1955).

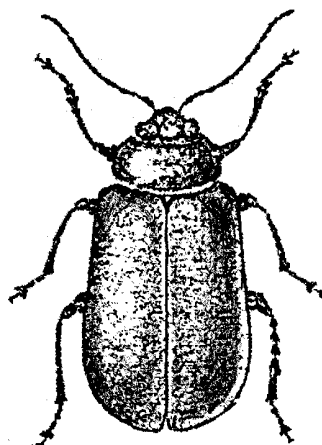


Fig. 6. Adult of *Agelastica alni orientalis* (Vassiliev, 1912)

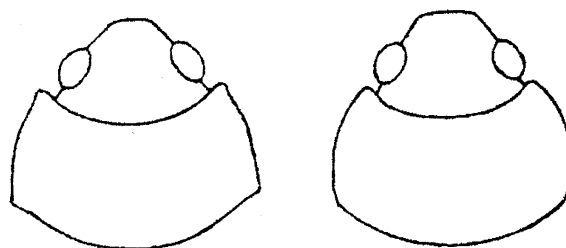


Fig. 7. Pronotums of (left) *Agelastica alni* L. and (right) *Agelastica alni orientalis* (Vassiliev, 1912)

MEANS OF MOVEMENT AND DISPERSAL

A. alni orientalis can slowly spread with flights of the adult beetles. Larvae can be transported with host plants for planting and cut branches moving in trade with leaves. Pupae (cocoons) may be associated with soil. Beetles may be associated with wood containing bark and may be hitchhikers on other products.

PEST SIGNIFICANCE

Economic Impact

A. alni orientalis is an important pest of poplars, willows, almonds, apple trees and birch in countries of its present distribution. The impact is especially important because the pest damages young leaves at the beginning of the growing season, often causing 100% defoliation. It attacks both stressed and healthy trees of different ages. Its outbreaks occur throughout large areas, often resulting in losses in vigour, sometimes lead to the death of trees. Defoliated fruit trees do not form fruits or have considerably reduced yield. For these reasons, *A. alni orientalis* is considered a serious pest both of forests and orchards of almond and apple (Vassiliev, 1912; Makhnovskii, 1955; Maslov, 1988).

Environmental Impact

A. alni orientalis considerably reduces grows of mountain poplar, willow and birch forests, which may result in changes of mountain environment including problems of erosion of mountains. The pest also damages field-protecting forest shelter belts causing problems of soil erosion in valleys. It also damages plantations in cities causing aesthetic damage and problems for the city environment (Vassiliev, 1912; Makhnovskii, 1955).

Control

In countries of its present distribution chemical and microbiological control of *A. alni orientalis* is used with treatments against overwintered beetles in spring and against larvae in May-June. It is also recommended to plough soil under crowns of trees in the period of pupal development or/and to irrigate in the same period (Vassiliev, 1912; Makhnovskii, 1955; Maslov, 1988).

Phytosanitary risk

A. alni orientalis is not declared a quarantine pest by any regional plant protection organization. It is considered as a serious pest in many southern countries of the former USSR. It is very likely to be able to establish in many EPPO countries particularly those in the south and east of the European part of the EPPO region where its host plants are important forest and fruit trees.

PHYTOSANITARY MEASURES

To prevent introduction of *A. alni orientalis* to other countries, the effective measure would be to prohibit import of plants for planting and cut branches of its host plants with leaves from the infested areas as well as of soil, which may contain pupae and young beetles of the pest. Inspection of wood products and other commodities can detect overwintering beetles.

DECISION OF THE EPPO PANEL ON QUARANTINE PESTS FOR FORESTRY

The EPPO Panel on Quarantine Pests for Forestry provided the Pest Risk Assessment for *Agelastica alni orientalis* at the meeting in Vilnius, (LT, 2002-03-12/14). The general opinion of the Panel was that *Agelastica alni orientalis* might present a risk to European and Mediterranean part of the EPPO region but mainly to ornamental and not to forest trees. The conclusion of the Panel was not to propose *A. alni orientalis* as a quarantine pest for forestry but to recommend it to be considered by other EPPO Panels, which deal with pests of ornamental trees.

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