

Data Sheets on Forest Pests

Polyphylla alba

IDENTITY

- Name:** *Polyphylla alba* Pallas
- Synonym:** *Xerasiobia alba* (Медведев, 1951)
Polyphylla hololeuca Pallas
- Taxonomic position:** Insecta: *Coleoptera*, *Scarabaidae*
- Common name:** White June beetle (English), Белый хрущ (Russian)
- Bayer computer code:** POLHAL

HOSTS

Larvae of *Polyphylla alba* feed on roots of many plants including forest trees. Among agricultural crops, they most often damage roots of fruit trees, grape wine, potato, beet and strawberry (Zverozomb-Zubovskii, 1938; Dobrovol'skii, 1951; Maslov, 1988).

GEOGRAPHICAL DISTRIBUTION

EPPO region: Azerbaijan (potential EPPO member), Armenia (potential EPPO member), Georgia (potential EPPO member), Kazakhstan (potential EPPO member), Russia (South and Centre of European part, South of Southern Siberia), North of Turkmenistan (potential EPPO member), Uzbekistan (potential EPPO member), Ukraine (Pavlovskii & Shtakelberg, 1955; Smol'yannikov, 1977; Tsendsuren, 1979; Maslov, 1988; Vorontsov, 1995).

Asia: Azerbaijan, Armenia, Georgia, Kazakhstan, northern and central China (Djungaria, Gobi Desert, Guansi), Mongolia, North of Turkmenistan, Uzbekistan (Medvedev, 1951; Pavlovskii & Shtakelberg, 1955; Maslov, 1988).

EU: Absent.

On the territory of the former USSR, *P. alba* is mainly spread in steppes of European Russia and Ukraine (Fig. 1). In Russia it occurs in the steppe area of southern Ural and in European Russia including central regions. It also occurs in the Transcaucasus, especially in Azerbaijan, Uzbekistan, Kazakhstan, northern Turkmenistan, Mongolia and China (from northern borders to central regions) (Medvedev, 1951; Pavlovskii & Shtakelberg, 1955; Smol'yannikov, 1977; Tsendsuren, 1979; Maslov, 1988; Vorontsov, 1995).

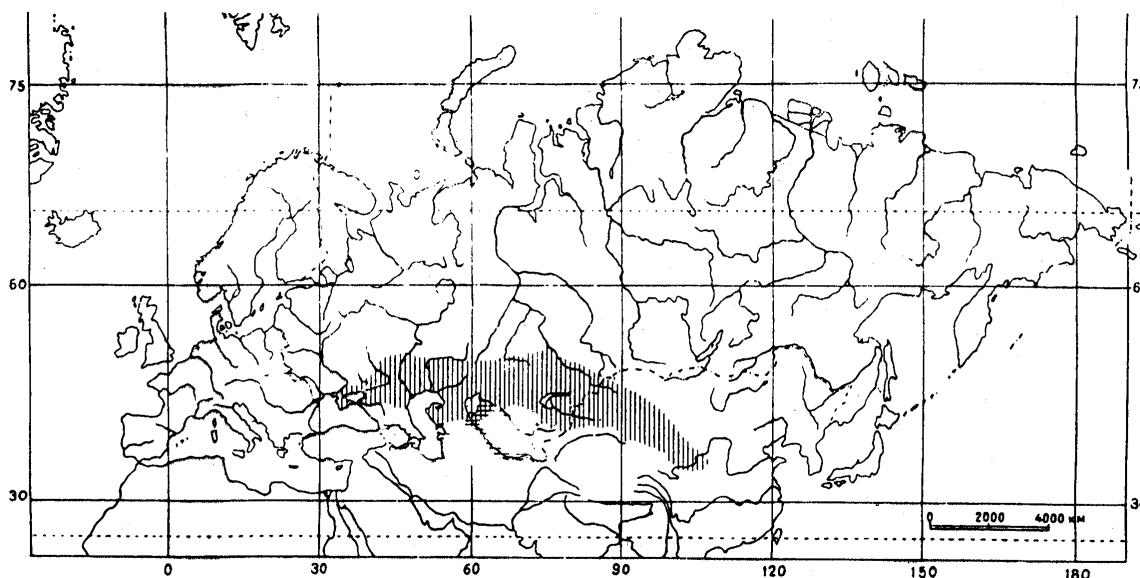


Fig. 1 Area of distribution of *Polyphylla alba* (Medvedev, 1951)

BIOLOGY

P. alba prefers sandy soils of dry steppes and semi deserts. It occurs on sands of river terraces, on dunes of seashores and barkhan sands of semi deserts. S.I. Medvedev (1951) notes that the pest lives on sandy soils on low-lying lands covered by *Chryzopogon gryllus* Trin. and *Scirpus maritimus* L. Adult flights occur from the middle of June till the end of July. Adults don't feed. Males actively fly in the twilight (about one hour after the sunset), may reach high altitudes and cover long distances. During the day, they stay in the soil. Females don't fly much. They mainly stay on the surface of the soil and fly sometimes to short distances. Eggs are laid on the depth of 30 cm and more. One female may lay till 30 eggs. Larvae hatch in July and feed first on small roots and humus. Then they begin to feed on thick roots. Larvae overwinter three times in the soil and pupate in May. One generation lasts 3 years (Shreiner, 1911; Dobrovol'skii, 1951; Medvedev, 1951; Maslov, 1988).

DETECTION AND IDENTIFICATION

Symptoms

Adults are big and are easily detected and identified during the flight period. Feeding of larvae on roots leads to the stress of plants. Ill plants, dieback of branches, dying planting material in nurseries and field-protecting forest shelter belts are easily detected (Tsendsuren, 1979; Maslov, 1988).

Morphology

In general, beetles of *P. alba* are similar to those of *Polyphylla fullo*, but they are a little thinner and smaller (Fig. 2). Larvae are very similar to those of *Polyphylla fullo*, but the number of small horns in the symmetric rows on the back part of anal sternite reach 8 to 10 in each row. Two subspecies of *P. alba* are known: *P. alba alba* Pallas, *P. alba vicaria* Sem., the first one living in the western part of the distribution area, the second – in China (Fig 1).

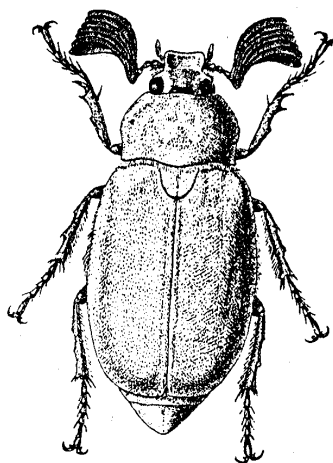


Fig. 2 - The male of *Polyphylla alba* (Medvedev, 1951)

Eggs

One female of *P. alba* may lay till 30 eggs (Maslov, 1988).

Larva

The number of small horns in the symmetric rows on the back part of anal sternite reach 8 to 10 in each row. Nevertheless, larvae of all *Polyphylla* species are very similar to each other and identification is very complicated and not reliable.

Pupa

No information available.

Adult

The beetle of *P. alba* is clear, yellowish or cream coloured. The male body is thinner, 25,5 – 33,2 mm long with parallel sides, covered by dense white or yellowish scales. Last maxillary palpus segment (Fig. 3a) is of elongated egg form. The third segment of male antenna is triangularly widened at the top (Fig. 3b). The antennal club is big, rather much curved, as long as pronotum. The 4th segment of female antenna (Fig. 3c) has a prominence on its front side, the 5th segment is elongated into a tooth-form appendix. Male clypeus (Fig. 3d) is not clearly transversal (seen from above), rectangular, with almost right front border (with very small groove) and well-developed front angles. Female clypeus (Fig. 3e) is very short, clearly transversal, with rounded front angles and strong groove in the middle of the front border. The upper border of female clypeus (Fig. 3f) seen from the front is right with raised exterior angles. The pronotum is widest in the middle. It is more narrowed frontwards than backwards and is slightly narrower than the base of elytrae. Front angles of the pronotum are obtuse, rounded; its lateral border is angled-rounded-prominent, slightly grooved at the back angles, covered by short whitish-brown bristles. Hind angles of the pronotum (Fig. 3g) are obtuse, with slightly rounded tops. The back side is of common form and is not edged. Elytrae have a slightly prominent sutural interval, limited by striae, and almost not developed and not visible intervals. All the upper side of elytrae is covered by very dense white scales completely masking the colour of male elytrae. The scales on male elytrae are narrow lancet formed, the scales on female elytrae (Fig. 3h) are elongated egg formed. The thorax is covered by long dense yellowish-white hairs. The abdomen is covered by very dense white scales. Male legs are thin, female legs are short and thick. They are also covered by scales and hairs. Male femora are thin, back female femora are much widened. Front male and female tibiae have three sharp teeth on the dorsal side, the tooth in the middle is closer to the tooth at the top; the tibial spur on the ventral side of male tibiae is opposite the middle tooth. The tibial spur on the ventral side of female tibiae is opposite the interval between middle and main teeth. Middle and back male tibiae are thin and have two transversal rows of thorns which are seen from above as small teeth on the dorsal side of the tibia. Female tibiae are thicker and shorter, back tibiae are widened towards the top. Teeth on their dorsal side are better developed. Male tibial spurs are thin, female upper spur of back tibiae is much widened in a leaf form. Tarsi are short, front and middle tarsi are as long as tibiae, back tarsi are much shorter. Claws (Fig. 3i) are similar to those of *P. fullo* but stronger and irregularly curved. Vertex is black, centre of

pronotum, elytrae and legs are red-brown. Palpi and antennae are yellow-brown, female club is dark brown. Male head, pronotum, scutellum, pygidium and abdomen are covered by very dense white or slightly yellowish scales completely masking the main body colour. Only vertex, small spots on the both sides at the middle of pronotum, narrow longitudinal stripe in the middle of the scutellum and narrow stripes at the base of middle abdominal sternites are scale less. Scales are most dense on the head, on the sides and along the middle line of the pronotum, on the scutellum and on shoulder prominences of elytrae. Female scales are less dense and don't completely mask the main body colour. That is why females don't seem white or yellowish-brown, like males, but reddish-brown. Spots of more dense scale concentration on the head, the pronotum and elytrae are more visible on females. The subspecies *P. alba vicaria* differs from *P. alba alba* by smaller beetles and shorter male antennal club (Medvedev, 1951).

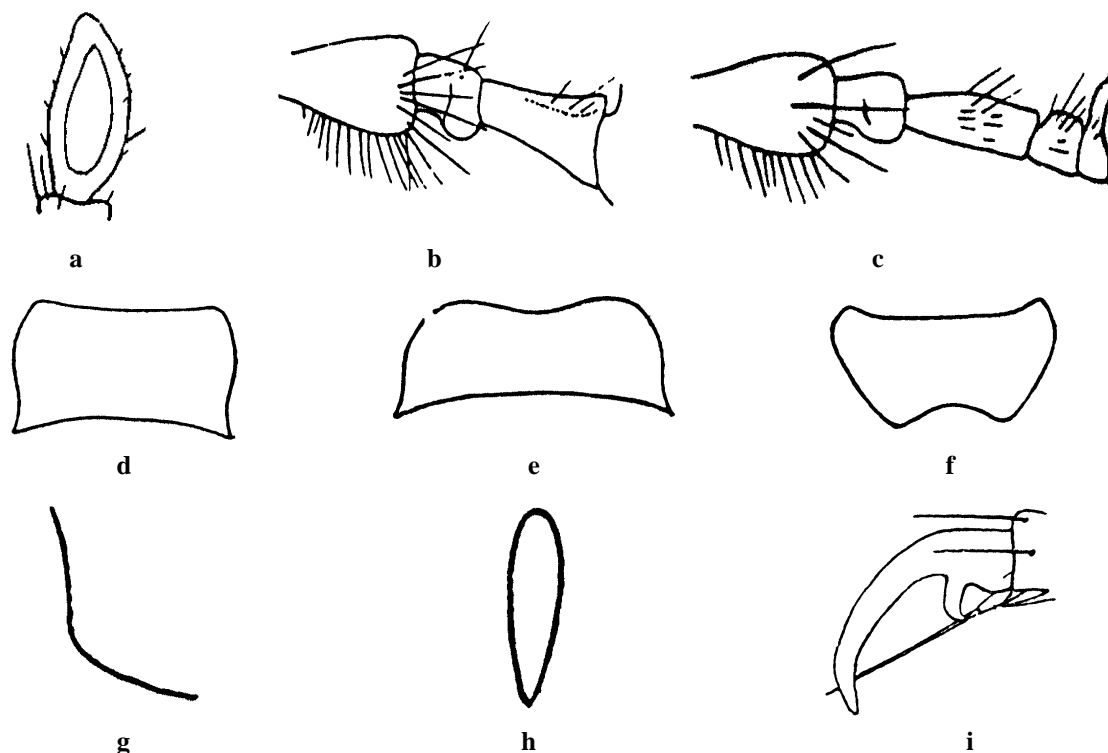


Fig. 3 - Adult of *Polyphylla alba* (Medvedev, 1951): last maxillary palpus segment (a), 3rd segment of male antenna (b), 4th and 5th segments of female antenna (c), male clypeus (d), female clypeus (e), upper border of female clypeus (f), back angles of the pronotum (g), form of scales on female elytrae (h), claw (i)

MEANS OF MOVEMENT AND DISPERSAL

Means of movement of *P. alba* were not studied. The introduction of the pest to new areas is possible with soil or plants for planting accompanied by soil originating in areas of its distribution.

PEST SIGNIFICANCE

Economic Impact

P. alba stresses much forest and cultivated plants because its larvae damage much small and big roots making deep holes and fissures. This reduces the vitality of young plants for planting and productivity of fruit orchards, makes it difficult to create forest plantations and field protecting shelter belts in dry conditions. The heavy infestation may lead to the death of young plants in nurseries and plantations (Tsenduren, 1979; Maslov, 1988; Vorontsov, 1995).

Environmental Impact

Damaging large range of ornamental plants, *P. alba* disturbs city ecology and city environment, leading to the death of plants and different kinds of planting material. The pest makes it difficult to plant and grow sand- and soil- protecting plantations (Tsendsuren, 1979; Maslov, 1988).

Control

The chemical control against adult beetles of *P. alba* is not used because pest adults don't feed. The measures used are the same as for other *Melolonthinae*: the use of soil pesticides before the planting and between rows in forest plantations (Fadeev 1971; Pavlinov, 1971; Troitskii, 1971; Maslov, 1988).

Phytosanitary risk

As far as it is known, *P. alba* is not declared a quarantine pest by any regional plant protection organization. The pest causes serious damage to fruit, subtropical, forest and ornamental plants in countries and areas where it occurs. The pest is able to establish in many EPPO countries, first of all in the Mediterranean region, and very likely to cause serious damage to many cultivated and forest trees and shrubs, which are economically and ecologically important plants there.

PHYTOSANITARY MEASURES

To prevent introduction of *P. alba* to many EPPO countries, the effective measure would be to prohibit import of soil and plants for planting accompanied by soil from countries and areas of its present distribution. Phytosanitary inspection at the borders can detect larvae and adults of the pest on the imported regulated articles.

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