

Data sheets on quarantine pests
Fiches informatives sur les organismes de quarantaine

Sirex ermak

Identity

Name: *Sirex ermak* Semenov-Tian-Shanskii

Synonyms: *Paururus ermak* Semenov

Taxonomic position: *Insecta: Hymenoptera: Siricidae*

Common name: blue-black horntail, blue-black woodwasp (English); чёрно-синий рогохвост (Russian)

Notes on taxonomy and nomenclature: Benson (1963) considers that *S. ermak* is a subspecies of *Sirex juvencus* Linnaeus, which is widespread in Europe

EPPO code: SIRXER

Phytosanitary categorization: EPPO A2 action list no. 327

Hosts

The preferred hosts of *S. ermak* are species of *Larix* (especially *Larix gmelinii* and *Larix sibirica*). Other conifers are also attacked: *Pinus* (especially *P. sibirica*), *Abies* and *Picea* (Pavlovskii & Shtakelberg, 1955; Issaev, 1966; Stroganova, 1968; Vorontsov, 1995).

Geographical distribution

EPPO region: Russia (only in the Asian part, see below)

Asia: Russia (All Siberia, Transbaikalia and the Far East including Sakhalin) (Pavlovskii & Shtakelberg, 1955; Issaev, 1966; Stroganova, 1965, 1968). *S. ermak* is probably spreading westwards because it was found in Western Siberia only in the late 1950s, whereas previously it was not observed there (Krivolutskaya, 1965; Stroganova, 1965). *S. ermak* is found both in valleys and mountains up to an altitude of 2000 m (Stroganova, 1978)

EU: absent.

Biology

The flight period of *S. ermak* is in July/August (to September in the Far East), with the most intensive flight period depending on the area. During this period, adult insects usually stay in shadow in humid parts of the forest. During the day, intensive

flight is observed in the afternoon from 15:00 to 18:00. Adults do not need additional maturation feeding. 2–4 h after mating, females insert their flexible ovipositors deeply into the wood and lay their eggs. They lay mainly in the part of trunks with medium or deep bark. A female lays one egg in each hole made with the ovipositor, to a total of more than 50 (up to 100). Females usually make many more holes with their ovipositors than they lay eggs. At the same time, they infest trees with spores of symbiotic basidiomycete fungi (*Amylostereum* spp.), which are usually present in special organs ('mycangiae') at the base of the ovipositor. Neonate larvae usually hatch 12–14 days later (in cold weather conditions, much later) and continue their development in wood for 1.5–2 years, sometimes up to 3 years. They make galleries in wood, and fill them with thin borings. The total length of one larval gallery varies from 4 to 25 cm. Larvae also have mycangiae in which they accumulate fungal spores, which are collected by the neonate female. Pupation usually occurs in June. Larvae prepare pupation cells deep in the wood (30–40 mm from the surface). Pupae usually develop for 10 days. Emergence holes are free from borings. The life cycle of *S. ermak* usually takes two years (Krivolutskaya, 1965; Stroganova, 1965, 1968; Mamaev, 1985; Vorontsov, 1995).

Detection and identification

Symptoms

S. ermak causes branch and tree dieback, which is easily detected by seeing wilting and drying needles. Emergence holes in trunks are indications of the presence of the pest. *S. ermak* often attacks trees together with *Serropalpus barbatus* (Coleoptera: Melandryidae), and this widespread insect may be used as indicator of the presence of *S. ermak*. It is not unusual to see adults resting on tree trunks.

Morphology

Eggs

The egg of *S. ermak* is white, oval-elongated, with semitransparent cover (Stroganova, 1968).

Larva

Larvae of *S. ermak* are white, cylindrical, 15–28 mm long, slightly S-form curved, with a slightly sclerotized round yellowish head. The head is covered with dense bristles. Abdominal legs are not developed. Antennae with 4–9 bristles. On the anal tergite there is a longitudinal fissure between two small protuberances. The lateral part of the anal segment is half-covered with bristles. A sclerotized thorn is situated on the top of the abdomen (Stroganova, 1968; Verzhutskii, 1973).

Pupa

Pupae of *S. ermak* are free, elongated, narrowed backward, with a small sclerotized thorn at the top of the abdomen (Stroganova, 1968).

Adult

The adult of *S. ermak* is a large thick-waisted cylindrical insect with a black body and black round head with metallic blue-green reflections on the back part, covered by long dense hairs. The thorax is black with metallic blue reflections, wrinkled and covered by long dense hairs. The front angles of the pronotum are acute, the back end of the pronotum is rounded. Mesopleurae are bright and punctuated. Antennae are black and have 20 segments; the 1st segment is a little widened and flattened at the top. Wings are transparent slightly brown-darkened at the top especially close to the pterostigma. Legs are black with metallic blue reflections except apexes of femora and bases of tibiae. Femora are widened, and back tibiae are narrowed in the middle. The abdomen is slightly wrinkled; the 1st tergite has a deep transversal fissure. Females have a stinger-like ovipositor that extends straight back when not in use. The following ratios have been determined: length of forewing/ovipositor: 1.15–1.38. Distance between ridges 4 and 5/diameter of ovipositor: 2.20–2.30, distance between ridges 9 and 10/diameter of ovipositor: 1.75–1.85 (Fig. 2). The lateral pits are deeper and more distinct. The female of *S. ermak* is 15–25 mm long; the male is 15–17 mm long (Stroganova, 1968; Viitasaari, 1988).

Pathways for movement

Natural spread of the pest by flying adults is rather active. Because *S. ermak* may be hidden deep in the wood for long periods (2-year life cycle), it is difficult to detect in wood, and may easily be transported with untreated wood moving in trade, including dunnage and wood packaging. It is unlikely, however, to be transported with plants for planting, since it does not attack small branches, trunks or root stocks which constitute planting material.

Pest significance

Economic impact

S. ermak is an important pest of *Larix* in Siberia and the Far East, and is also found on other conifers. It attacks mainly

stressed trees (usually after 3–4 years of stress) but also healthy trees (or healthy trees with stressed parts of trunks) of different ages as well as cut trees and wood with bark. The rate of infested trees in the forest may reach 50% in three years after the first attack. At the same time, the pest infests trees with fungal spores from the mycangiae at the base of the female ovipositor. Two or three years after the first attack of *S. ermak*, wood becomes unusable because of fungal infestation. *S. ermak* often attacks forests after defoliation by *Dendrolimus sibiricus* (OEPP/EPPO, 2005), sometimes causing the death of trees. As a significant number of pests can attack the same tree and develop inside wood for 2 years, tree death usually occur within 2–3 years (Pavlovskii & Shtakelberg, 1955; Krivolutskaya, 1965; Stroganova, 1965, 1968; Rozhkov *et al.*, 1966; Verzhutskii, 1973; Mamaev, 1985; Vorontsov, 1995).

Control

Official control efforts are undertaken in the area of present distribution of *S. ermak*. Control measures include silvicultural and sanitary measures (improving the resistance of forests, cutting and elimination all infested trees, use of trap-trees), treatments with chemical and biological preparations. Natural enemies may play an important role in control of *S. ermak* populations, especially the hymenopterous parasitoids *Rhyssa persuasoria*, *Rhyssa superba* and *Xylonomus* sp., a parasitoid fly *Erinna cincta*, certain birds (*Dryobates* sp., *Dryocopus* sp., *Picus* sp., etc.). Nevertheless the use of natural enemies in *S. ermak* control is not well developed.

Phytosanitary risk

S. ermak is considered as a serious pest of *Larix* and other conifers in the area of its present distribution. *Sirex* spp. generally have a wide and relatively unspecific host range (Schwenke, 1982). The range of climatic conditions in the area of origin and present distribution of *S. ermak* is large, and it is likely to establish in almost all coniferous forests of the EPPO region where any European conifer could be a host plant.

Phytosanitary measures

S. ermak was added in 2004 to the EPPO A2 action list, and endangered EPPO member countries are thus recommended to regulate it as a quarantine pest. Recommended phytosanitary measures, for wood of host species, could include origin from a pest-free area, or debarking, or freedom from grub holes greater than 3 mm, or heat treatment, or other treatment. Wood packaging should respect ISPM no. 15 (ICPM, 2003).

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