EPPO Datasheet: *Cephalcia lariciphila*

Last updated: 2023-10-27

IDENTITY

Preferred name: *Cephalcia lariciphila*
Authority: (Wachtl)
Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Hymenoptera: Pamphiliidae
Other scientific names: *Cephaleia abietis var. intermedia* Hellén, *Cephaleia lariciphila* Wachtl, *Lyda lariciphila* (Wachtl)
Common names: European larch web-spinner, European web-spinning larch sawfly
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EU Categorization: PZ Quarantine pest (Annex III)
EPPO Code: CEPCAL

Notes on taxonomy and nomenclature

Cephalcia lariciphila is an insect of the order Hymenoptera from the family Pamphiliidae. Its taxonomic position has been reviewed by Shinohara (1997), together with other species of the same family feeding on larch across Europe and Asia. Shinohara (1997) described two subspecies within the nominal species *C. lariciphila* (Wachtl, 1898), named *C. lariciphila lariciphila* (Wachtl, 1898) and *C. lariciphila japonica* (Shinohara, 1997).

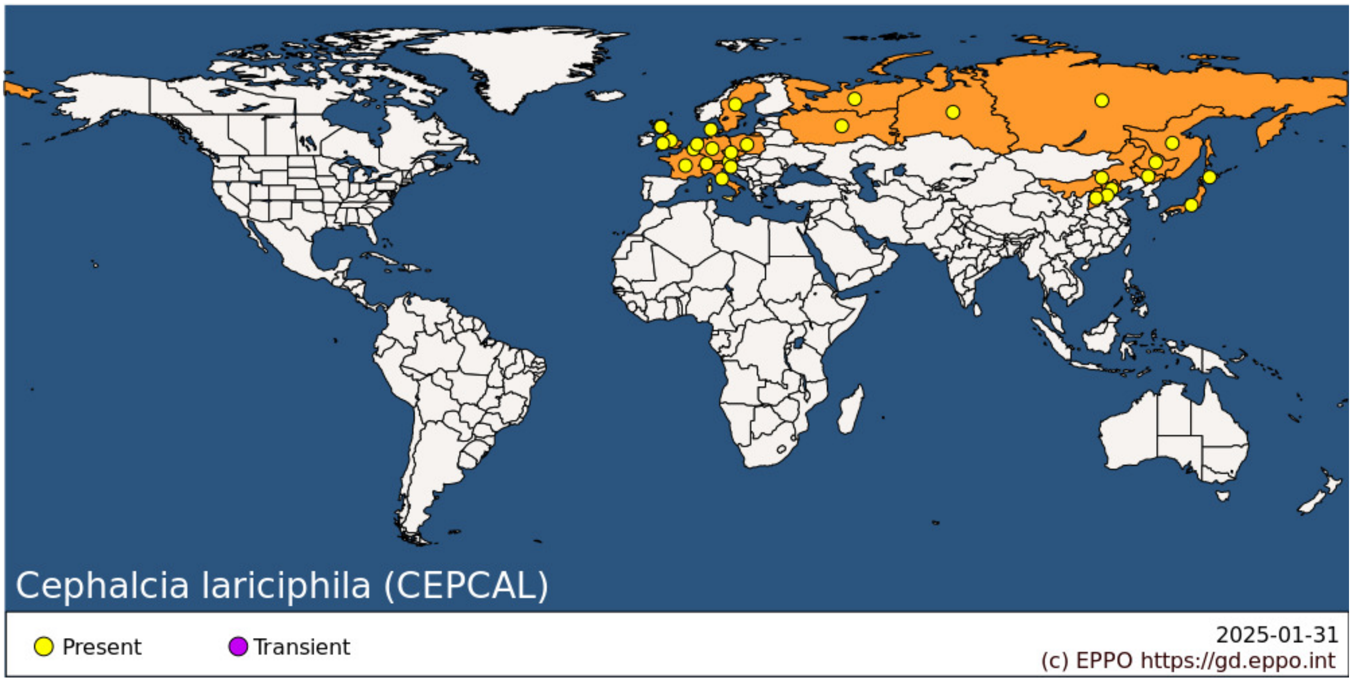
HOSTS

This insect attacks *Larix* spp., e.g. *L. decidua* and *L. leptolepis*. Interspecific hybrids are also attacked.

Host list: *Larix decidua*, *Larix gmelinii var. principis-ruprechtii*, *Larix kaempferi*, *Larix sibirica*, *Larix x marschlinsii*

GEOGRAPHICAL DISTRIBUTION

Cephalcia lariciphila likely had its original distribution confined to the Alps and Siberia, but it has since expanded its range to encompass the entire Palearctic region wherever larch is cultivated. Outside Europe, *C. lariciphila* is known from Japan, Eastern and Western Siberia.



EPPO Region: Austria, Belgium, Czech Republic, Denmark, France (mainland), Germany, Italy (mainland), Netherlands, Poland, Russia (Central Russia, Eastern Siberia, Far East, Northern Russia, Western Siberia), Slovenia, Sweden, Switzerland, United Kingdom (England, Scotland, Wales)
Asia: China (Beijing, Hebei, Heilongjiang, Jilin, Neimenggu, Shanxi), Japan (Hokkaido, Honshu)

BIOLOGY

During the last outbreak in Central Europe, adults flew from mid-April to mid-May (Holuša & Kuras, 2010). Females are relatively passive after emerging from the soil and attract males by releasing a pheromone (Borden *et al* ., 1978). The males live approximately 10 days, females for slightly longer. Adults can typically be found for a total of about 20 (–30) days (Holuša & Kuras, 2010). Eggs are deposited singly on needles on short shoots (brachyblasts). Females lay 30–40 eggs (Röhrig, 1953; Holuša, 2011).

Larvae spin a silk tube at the bases of the short shoots and remain in the web while consuming the needles. The first larvae appear in mid-May and the last ones at the beginning of June (although in other local outbreaks feeding was observed until July). The larval development lasts for about 20 days. When full-grown larvae drop or descend on silk and burrow to where the leaf litter meets the underlying soil. They remain free without a cocoon 5-20 cm below the surface (Röhrig, 1953; Holuša, 2011).

C. lariciphila overwinters as a prepupa and pupates in early spring. Pupation precedes adult emergence by about 2 weeks. Larvae may however remain in the soil for up to four winters before they pupate (Röhrig, 1953; Pschorn-Walcher, 1982). The adults of a single generation can therefore emerge over three or four different years (Luitjes & Minderman, 1959). The portion of individuals with prolonged diapause varies considerably, from 18 to 50% (Luitjes & Minderman, 1959; Billany & Brown, 1980; Pschorn-Walcher, 1982; Holuša, 2011).

The known outbreaks in the Czech Republic (Holuša, 2011), Germany (Rohrig, 1953), the Netherlands (Luitjies & Minderman, 1959), and the United Kingdom (Billany & Brown, 1980) involved only larch plantations at low elevations. They usually lasted up to five years (Billany & Brown, 1980; Pschorn-Walcher, 1982; Ozaki *et al.*, 2004; Holuša, 2011). Outbreaks were relatively short-lived, due to the fact that only a small proportion of the population remains in prolonged diapause. During the last outbreak in Central Europe in the 2000s, the proportion of individuals with prolonged diapause was 5-20% (Holuša, 2011). During outbreaks, 50-650 prepupae/m^2 of soil were found (Pschorn-Walcher, 1982; Holuša, 2011).

DETECTION AND IDENTIFICATION

Symptoms

C. lariciphila cuts the needle at the base and pulls it into the silk tube where it is eaten. This contrasts with all other sawfly larvae feeding on *Larix*, which leave part of the needle uneaten. *C. lariciphila* preferably feeds on short-shoot needles when they are available, otherwise long-shoot (auxiblast) needles can also be eaten. Trees at the edge of the stands seem less attacked than those in the middle of the stands.

Morphology

Eggs

Eggs are cylindrical, rounded at the ends; dark green when freshly laid, 1.7 x 0.9 mm; before hatching they turn grey-green and reach a 2.1 x 1.9 mm.

Larva

Mature larvae are 20-25 mm long; larger larvae are female, and smaller ones are male. Larvae have three pairs of thin, pointed thoracic legs and one pair of prolegs at the end of the body. Antennae have eight segments. Larvae go through four instars for males and five for females (Pschorn-Walcher, 1982; Holuša, 2011). The coloration of the body changes through the instars. The larva after hatching is yellow-green, later it develops alternating black and yellow-green stripes, mature larvae before diapause are yellow-orange in colour. The head is dark-brown to black-brown (Pschorn-Walcher & Zinnert, 1971).

Pupa

Pupae are golden-yellow in colour with black eyes. The shape of the last abdominal segments distinguishes future sex, size varies between 10-15 mm.

Adult

The body is flattened and 8.6-10.2 mm in length (male) and 16.5-21.5 mm (female). The head is relatively large, angular black with light-yellow spots, strongly contracted behind the eyes, conspicuous massive mandibles, with dark brown mouthparts. The thorax is black with yellowish spots; the abdomen is black with only narrow lateral margins of tergites and posterior margins of sternites whitish.

Detection and inspection methods

The presence of *C. lariciphila* in the forest is best detected by trapping adults from April to June using Malaise or yellow sticky traps (Holuša& Drapela, 2004; Holuša, 2011). Using five yellow sticky traps (or one Malaise trap) in up to ten hectares of forest is enough to detect flying adults. The yellow sticky boards can sometimes be rendered ineffective by dust deposits in the spruce forests (Holusa *et al.*, 2007). Males could be also caught in pheromone traps (plastic traps or red traps) hanging on trees. The lure contains ortho-aminoacetophenone, a component of the sex pheromone system of *C. lariciphila* (Baker *et al.*, 1983). At higher population densities, the traps can be substituted by visual observation when the air temperature is higher than 10°C. Observation should take place at 2–3 p.m. The soil emergence traps of different types can be also used (Holuša & Kuras, 2010). The pest can be identified at the species level using conventional entomological keys (Shinohara, 1997; Wiitassari, 2002; Macek *et al.*, 2020).

Although monitoring prepupae via soil counts is useful, enough, samples must be collected to obtain reasonably accurate estimates (e.g., 20 per ha). A total of 200 larvae per m^2 cause the total defoliation of 90% of larches (Holuša & Drápela, 2004). The presence of feeding larvae can be detected on the shoots by the appearance of tube-shaped webs.

PATHWAYS FOR MOVEMENT

The sawfly may spread naturally because both adult females and males fly (Holuša & Kuras, 2010). Females but not males have been trapped at mountain summits in the United Kingdom, indicating active long-distance dispersal (Liston, 1989). Trapping experiments have shown that males dispersed out of *Larix* into adjacent *Picea* forests up to 135 m distant from infested *Larix*. The preferred flight level of males was very near the ground (Borden *et al.*, 1978). However, the natural spread seems limited because during the expansion of outbreak areas, the establishment of satellite populations away from the core outbreak spot was not reported (Rohrig, 1954; Luitjies & Minderman, 1959; Billany & Brown, 1980). Eggs and larvae could be transported on plants of *Larix* for propagation, and nymphs and pupae could be transported in soil.

PEST SIGNIFICANCE

Economic impact

C. lariciphila is only a pest in the part of Europe where *Larix* is planted outside its natural distribution area. Feeding by the larch sawfly mainly damages needles on short shoots (brachyblasts), thus leaving the needles of the long shoots (auxiblast) intact. Larvae of *C. lariciphila* may quite frequently cause complete defoliation on larch, but larch trees re-grow even after repeated defoliation. This does not lead to tree death, although death of defoliated larch trees has been reported in young forest stands (Billany & Brown, 1980). Defoliation does reduce tree height and needle size (Billany & Brown, 1980) and radial growth. A loss of needles leads to a reduction in annual volume increments. A 20% needle loss reduces the normal yearly increment by 50% (Luitjes, 1958) while the repeated total defoliation of larches, recorded during the last local outbreak in Central Europe in the 2000s, resulted in a decrease in annual growth ring formation of about 70%. In addition, defoliation resulted in the formation of latewood with fewer cells and reduced cell wall thickness (Vejpustková & Holuša, 2006).

Control

In most cases, control is not necessary.If chemical intervention with larvicides is considered necessary, this should be carried out when all females have emerged and laid their eggs, e. g. in mid-May. Because larvae develop very rapidly, a later intervention date would fail to affect most of the larval population (Holuša & Kuras, 2010). In addition to chemical control, soil applications of the entomopathogenic nematode *Steinernema feltiae* (Filipjev) have the potential for biological control of sawfly prepupae (Georgis & Hague, 1988).

Phytosanitary risk

C. lariciphila is already widely distributed throughout the EPPO region where *Larix* is grown and only occasionally causes economic damage. This is mainly because defoliation occurs in spring and larches will grow back even after total defoliation at the beginning of June (Holuša & Drápela, 2004). For most parts of the EPPO region where the pest occurs, the phytosanitary risk is low. However, some parts of the EPPO region (e.g., islands in North-Western Europe) are still free from *C. lariciphila* and could be considered at risk (EFSA, 2017).

PHYTOSANITARY MEASURES

In order to protect areas which are still free from *C. lariciphila*, it could be recommended that plants for planting of *Larix* are produced in pest-free places of production and traded without soil during winter.

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CABI Datasheet on Pest *Cephalcia lariciphila* (European web-spinning larch sawfly). https://www.cabidigitallibrary.org/doi/10.1079/cabicompendium.12103

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Datasheet history

This datasheet was first published in 1997 in the second edition of 'Quarantine Pests for Europe', and revised in 2023. It is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', ‘Hosts’, and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

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