ISBN 0-662-24462-1 Cat. No. Fo 29-6/69-1996E

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FOREST Pest LEAFLET

Pacific Forestry Centre

Common Pitch Moths of Pine in British Columbia

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Introduction

Pitch formations and associated damage caused by the sequoia pitch moth or the northern pitch twig moth are frequently encountered on lodgepole pine and other pine species in British Columbia forests.

The sequoia pitch moth, *Synanthedon sequoiae* (Hy. Edwards) (Lepidoptera: Sesiidae), may attack any suitable host trees over 2 m in height. The damage caused by this insect is easily located by the large pitch masses found on the main stem and branches (Fig. 1). In most situations, this insect causes little permanent damage, but occasionally serious damage to young trees results if the trees are sufficiently weakened at the point of attack to cause later breakage.

The northern pitch twig moth, *Petrova albicapitana* (Busck) (Lepidoptera: Tortricidae), is primarily a pest of pine saplings 0.3 to 3.0 m in height. The visible evidence of this moth consists of pitch nodules on terminal shoots formed by first-year larvae or larger pitch masses, located in branch crotches (Fig. 2), produced by second-year larvae. Feeding damage by this insect can kill terminal shoots or produce weakened and crooked trunks.

Fig. 1. Sequoia pitch moth damage.

Sequoia Pitch Moth

Hosts and distribution

The principal host of the sequoia pitch moth in British Columbia is lodgepole pine. Other host trees include ponderosa pine, various species of ornamental pines having needles in bundles of two or three and rarely spruce. This moth occurs from the coast to the Rocky Mountains and from central British Columbia southward into California.

Description

Egg: Oblong and slightly flattened, about 1.5 mm long and 0.7 mm in diameter. The reddish brown surface has a fine reticulate pattern.

Larva: A mature larva is about 25 mm long (Fig. 3). The larva has a reddish brown head and an off-white or yellowish abdomen.

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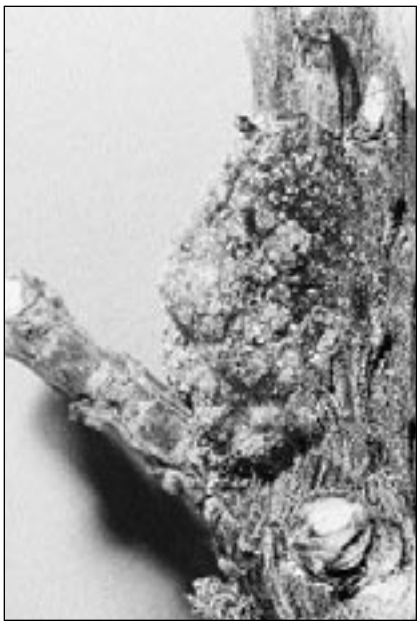

Fig. 2. Northern pitch twig moth damage.

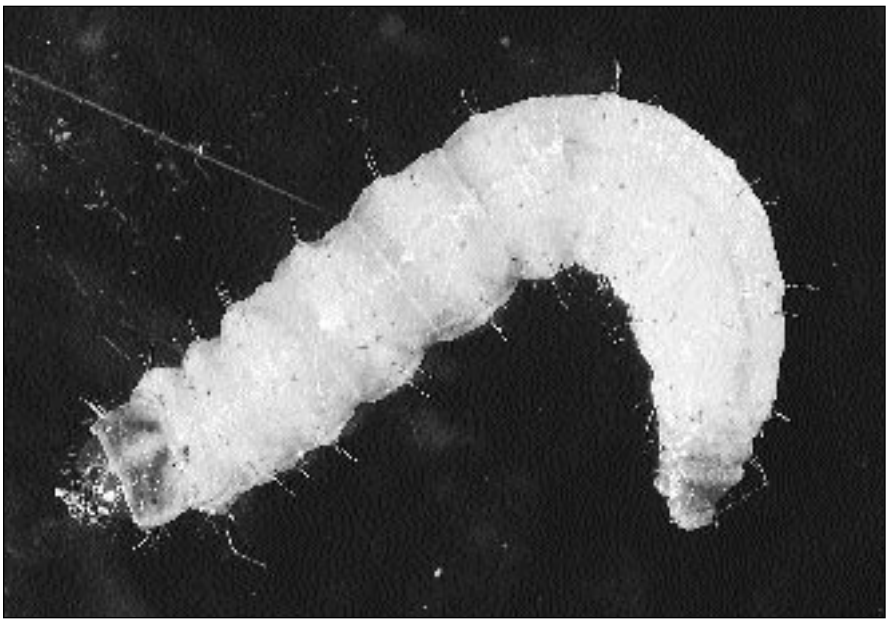

Fig. 3. Sequoia pitch moth larva.

Pupa: 15 to 20 mm long; brown with prominent spines extending across the top of each abdominal segment.
Adult: The adult is a clear-wing moth (Fig. 4) superficially resembling a yellow-jacket wasp. The head and thorax are black with yellow markings; the abdomen is black with yellow bands. The female is about 16 mm long and the male somewhat smaller. The wingspread varies from 18 to 30 mm.

Life history and habits

The flight period occurs during June and July. After mating, the female deposits eggs singly in bark crevices or in wounds on the host tree. Eggs may be laid at any height on the trunk or on the branches. The eggs hatch within two weeks. The newly emerged larva bores into the inner bark and the outer sapwood where its feeding activity continues for two years. Winding mines are produced at the feeding site, causing copious flows of pitch to accumulate at the point of entrance. The mature larva pupates during June in a silk-lined chamber at the end of a tunnel in the pitch mass close to the outer surface (Fig. 5). The pupal stage lasts about 30 days. Just before adult emergence, the pupa forces half of its length through the thin shell of pitch. The newly emerged adult mates and then dies within a few days after oviposition has been completed.

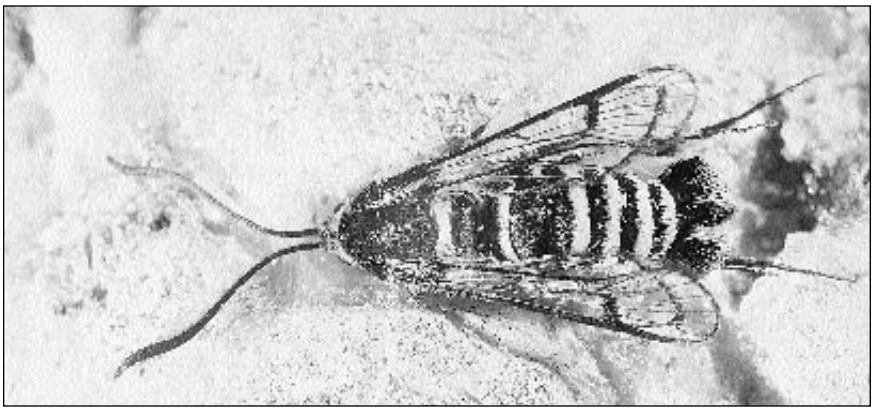

Fig. 4. Sequoia pitch moth adult on pitch mass.

Damage and detection

The sequoia pitch moth attacks all sizes of trees, from regeneration to mature. Trees growing in open situations such as those in landscape plantings, parks, roadsides, spaced plantations or along the edges of forests are most susceptible to attack. Trees suffering recent wounding of the stem by pruning, mechanical injury (increment borer hole, axe blade, etc.) as well as those damaged by previous pitch moth attack are particularly susceptible.

Permanent damage rarely occurs. Occasionally, small trees are severely weakened by repeated attacks at the same location on a tree, predisposing it to breakage under the stress of high winds or heavy snow.

Attack sites are made conspicuous by the large pitch masses accumulated over the wounds in the second year. Pitch masses caused by first-year larvae are less noticeable. Pitch accumulations are unsightly and may remain evident for several years after attack.

Control

The preference by the sequoia pitch moth for open-growing host trees greatly reduces the importance of this moth as

an economic pest in timber stands, so control measures are not needed there. Injury to high value trees such as those in parks, boulevards, seed orchards or landscape plantings can be reduced by removing the pitch masses and larvae as soon as they are noticed. Mechanical injury or pruning of live branches should be avoided as this increases susceptibility of host trees. No practical chemical control is available.

Northern Pitch Twig Moth

Hosts and distribution

The northern pitch twig moth feeds principally on lodgepole pine in British Columbia. Other trees attacked by this insect include ponderosa pine, jack pine and Scots pine. This moth occurs throughout British Columbia east of the coast range. A similar species, *Petrova metallica* (Busck), occurs on the coast and in the interior of the province.

Description

Egg: Oval, about 0.5 mm long and 0.4 mm wide, lemon yellow.
Larva: A mature larva is about 17 mm long. It is pale yellow to orange-brown with head and thoracic shield reddish brown (Fig. 6).
Pupa: 10 to 13 mm long, brown.
Adult: Wingspread, 14 to 21 mm; forewings are mottled light brown and silver; rear wings are greyish silver. The abdomen is banded brown and silver (Fig. 7).

Fig. 5. Exposed pitch mass tunnel with sequoia pitch moth pupa.

Life history and habits

The northern pitch twig moth has a 2 year life cycle. The adult lays its eggs singly at the bases of needle sheaths near the tips of terminal shoots or branches from early June to mid-July. Trees 0.3 to 3.0 m high are preferred, although trees up to 10 m may be attacked.

The newly emerged larva feeds on succulent terminal growth near the egg-laying site. By late summer, the larva has formed a small circular excavation in the cortex and covered it with a layer of silk and pitch, forming a nodule. The larva continues to feed in the nodule until late fall and resumes feeding the following spring, enlarging the excavation. About June, the larva leaves its nodule and migrates down the branch to a new feeding site at a crotch on the branch or main stem. Here it forms a second nodule where it feeds on bark, cambium and outer xylem. This nodule attains a diameter of about 18 mm and a thickness of about 6 mm. The larva continues to feed until October, when it becomes dormant for the winter. The following April or May, the larva becomes active and feeds for two or three weeks. Before pupating, it produces a silk-lined pupal chamber in the nodule with one end closed by a thin layer of silk and pitch. Pupation occurs during April and May and lasts for about three weeks.

Damage and detection

Two types of injury result from larval feeding. First-year larvae feed on the cortex of the growing terminal shoots and occasionally girdle and destroy the tips. First-year larval feeding on vigorous terminals rarely causes damage.

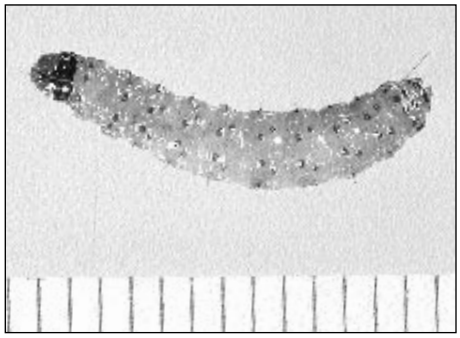

Fig. 6. Northern pitch twig moth larva.

Fig. 7. Northern pitch twig moth adult.

Second-year larvae feed more extensively (Fig. 8). If they are feeding on older portions of the stem or branches, only superficial injury results, which is soon repaired by scar tissue. However, if the larva feeds at the base of a growing terminal shoot, the shoot may be girdled and killed or

Fig. 8. Northern pitch twig moth larva and damage under pitch mass.

weakened such that breakage may occur later when the tree is subjected to the stress of high winds or heavy snow. A branch in the uppermost whorl usually assumes apical dominance producing a crook in the main stem Fig. 9. Less extreme crooks may straighten gradually as new growth occurs.

Infestations in regeneration or plantations are made conspicuous by the numerous pitch nodules on the branches or stems, and by the crooked stems and broken tops caused by previous infestations (Fig. 9).

Control

As the larvae are protected under pitch nodules, it is difficult to apply any form of direct control against them. Silvicultural practices appear to be the most promising method of reducing populations.

The availability of suitable host material for several successive generations favors the development of high populations. To reduce the level of attack, avoid the establishment of a succession of plantings of susceptible species of pine in the same area. An area entirely planted in 1 or 2 years will receive much less damage than one planted in small blocks over a number of years.

Natural control factors include parasitism, predation, and climate. Population increases, however, have not been shown to be controlled by these factors. The single most effective factor reducing population buildup is the growth of host trees beyond susceptible size.

Fig. 9. Crook in stem caused by previous northern pitch twig moth feeding.

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PDF Version, January 2001