

Remarks

From the evidence it would appear that ova laid in September hatch in late December or early January; the larvae feed or become dormant ac-

ording to the state of the weather. A larva taken at large in June pupated June 6 and emerged September 17.

References

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ANNOTATED LIST OF FOREST INSECTS OF BRITISH COLUMBIA PART XII, BOARMIINI AND MELANOLOPHIINI (GEOMETRIDAE)¹

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Larvae of these tribes are often twig-like, marked with shades of grey, red or brown with prominent tubercles or humps; some are green with no prominences. They are defoliators of coniferous trees and broad-leaved trees or shrubs. Infestations of two species have been recorded, however the other British Columbia members of these tribes have not been considered as economically important. Some species overwinter as naked pupae in the duff while others overwinter as small larvae.

Four species of *Stenoporpia*, occurring in British Columbia will be dealt with in a later paper.

Boarmiini

Hesperumia sulphuraria Pack. — *Salix* spp., *Prunus* spp., *Pseudotsuga menziesii* (Mirb.) Franco, *Betula papyrifera* Marsh. (4 records), *Alnus* sp. (1), *Populus trichocarpa* Torr. and Gray (1), *Larix occidentalis* Nutt. (1), *Tsuga heterophylla* (Raf.) Sarg. (1). Distributed generally throughout British Columbia south of latitude 54°. LARVA: 1 $\frac{3}{8}$ inches;

head, pale pinkish buff marked with brown or reddish-brown except along cleavage lines; body, yellowish-green, orange or brown; broad reddish-brown or dark brown subdorsal stripe, darkest on thoracic segments; reddish-brown or brown middorsal stripe finely outlined with yellow or pale buff, somewhat obscure on thoracic segments and occasionally on the abdominal segments of paler specimens; prominent subdorsal tubercles on second abdominal segment dark brown, particolored dark brown and yellow or dark brown and orange; spiracles outlined with black; pale yellow or buff ventral stripe.

Anavitrinella pampinaria Gn. — *P. menziesii*, *Salix* spp., *L. occidentalis* (4 records), *Picea glauca* (Moench) Voss (4), *Populus tremuloides* Michx. (3), *Pinus ponderosa* Laws. (2), *Thuja plicata* Donn (2). Throughout the Interior of British Columbia south of latitude 54°. LARVA: 1 $\frac{5}{8}$ inches; head moderately bilobed, pale cream or buff marked with reddish-brown or dark brown; body, pale reddish-brown or pale grey with dark reddish-brown or dark brown and black markings; dark brown addorsal lines on thoracic segments and at the posterior margin of the first, second

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and third abdominal segments; prominent dark brown or black subdorsal tubercles on the second abdominal segment, and addorsal tubercles on the eighth abdominal segment; spiracles, pale yellow outlined with black; indistinct reddish-brown or pale grey ventral stripe.

Glena nigricaria B. & McD. — *P. ponderosa*, *P. menziesii*, *Pinus contorta* Dougl. Throughout the southern Interior south of 51° latitude; common. LARVA: 1¼ inches; head, medium green with dark reddish-brown blotches on sides, white markings above frons bordered on inside by reddish-brown; body medium green with white addorsal lines; reddish-brown subdorsal blotches on first thoracic segment; fine reddish-brown supra-spiracular lines, white subspiracular lines; reddish-brown blotches below the subspiracular line on thoracic and first abdominal segments; venter marked with series of small, reddish-brown dots.

Anacamptodes emasculata Dyar — *Alnus rubra* Bong., *Salix* spp., *Alnus tenuifolia* Nutt. (4 records), *Acer circinatum* Pursh (4), *Shepherdia canadensis* Nutt. (4) and occasionally on other broad-leaved trees and shrubs. South of 55° latitude in British Columbia; common. LARVA: 1½ inches; head, pale yellow or buff, heavily marked on the sides to the vertex with bright reddish-brown and a reddish-brown triangle on frons; body color variable, yellowish-green, yellow or orange, dorsum blotched with orange or reddish-brown and marked with a diamond pattern on abdominal segments two to five, dark brown lateral tubercles on second abdominal segment, dark brown to black addorsal tubercles on eighth abdominal segment; spiracles pale yellow outlined with pale orange; venter pale yellow or pale orange.

Aethalura anticaria Wlk. — *Betula* spp., *Alnus* spp., *Salix* sp. (1 record). Central to southern British Columbia, common in the Interior. LARVA: 1 inch; head, purplish-brown with pale buff markings, or pale green marked by light tan; two color phases, pale green or purplish-brown, narrow white addorsal and subdorsal lines; dark phase broadly banded with dark purplish-brown fading towards the venter; some green specimens marked by a broken subdorsal stripe of dark purplish-brown; venter immaculate on green phase, narrow pale buff central line on dark phase.

Ectropis crepuscularia Schiff. — *T. heterophylla*, *P. menziesii*, *T. plicata*, *P. glauca*, *Abies lasiocarpa* (Hook.) Nutt., *Picea engelmanni* Parry, *L. occidentalis*, *Picea mariana* (Mill.) BSP., *Picea sitchensis* (Bong.) Carr., *Salix* spp., *Alnus* spp., *P. tremuloides*; also feeds less frequently on other species of trees and shrubs. Common south of latitude 56°; infestations recorded in 1952 at Blue River and Kidd, and in 1960 near Kitimat. LARVA: 1¾ inches; head, pale yellowish buff marked with dark brown or reddish-brown, black inverted "V" on frons; second thoracic segment swollen; body, pale yellowish-buff or buff; color of markings on dorsum variable, pale yellow or buff middorsal stripe outlined with indistinct brown lines and obscured by a diamond pattern on second to sixth abdominal segments; pale orange or dark brown inverted "V" on dorsum of second abdominal segment occasionally extending below spiracle on darker specimens; orange or brown supraspiracular stripes excepting first thoracic segment; two oval, dark brown subdorsal spots on second thoracic segment united on heavily marked individuals to form a dorsal band; dark reddish-brown or dark brown oblique blotch on abdominal segments two to five, caudad of spiracles, extending to venter; spiracles, pale yellow enclosed by a fine black line.

Melanolophiini

Melanolophia imitata Wlk.—*P. menziesii*, *T. heterophylla*, *P. sitchensis*, *P. engelmanni*, *P. glauca*, *T. plicata*, *Pinus monticola* Dougl., *Abies amabilis* (Dougl.) Forb., *Abies grandis* (Dougl.) Lindl., *A. lasiocarpa*, *L. occidentalis*, *Alnus* spp., *Salix* spp.; feeds less frequently on many other trees and shrubs. Central and southern British Columbia, Vancouver Island, and Queen Charlotte Islands; common. Infestations occurred in 1952 and 1960 on Vancouver Island, at Mile 7 north of Revelstoke and near Downie Creek in 1952 and on the Queen Charlotte Islands in 1963. LARVA: 1¾ inches; head, green; body, green, broad white addorsal and subspiracular stripes; spiracles, pale tan each enclosed by a fine brown line; narrow white ventral and subventral lines.

Protoarmia porcelaria indicataria Wlk.—*P. menziesii*, *T. heterophylla*, *T. plicata*, *A. lasiocarpa*, *P. engelmanni*, *L. occidentalis*, *P. glauca*, *P. mariana*, *P. sitchensis*, *Juniperus scopulorum* Sarg., *P. ponderosa*, *Salix* spp.; feeds, less frequently, on the foliage of other trees and shrubs. Throughout British Columbia, Vancouver Island and Queen Charlotte Islands; common. LARVA: 1¼ inches; head, pinkish-buff, marked with dark brown; body, pale buff suffused with pinkish-buff on dorsum, dark brown "Y" shaped markings on dorsum of thoracic segments and a diamond pattern bordered by dark brown on dorsum of abdominal segments; prominent dark brown tubercles caudad of spiracles on each abdominal segment; spiracles, buff outlined with black in a pale buff patch, venter pale buff suffused with pinkish-brown, banded by dark brown between the third thoracic and first abdominal segments and first to fifth abdominal segments.

Nealcis californiaria Pack. — *P. menziesii*, *T. heterophylla*, *T. plicata*, *A. grandis* and less frequently on other western conifers. South of 55° latitude on the Coast and Vancouver Island and rarely in the extreme southwestern Interior. LARVA: 1¼ inches; head, brown or pale reddish-brown marked with dark brown or reddish-brown, venter banded by dark brown or reddish-brown, frons with two small, irregular, dull white spots; body, pale buff or pinkish-buff; pale dorsal line bordered by thin dark brown or reddish-brown lines on thoracic segments, dark brown or reddish "V" markings on thoracic segments two and three; pale inverted "V" pattern separated by dark brown or reddish-brown bands on abdominal segments one to six; indistinct diamond pattern on abdominal segments seven and eight; prominent dark brown or reddish-brown dorsal tubercles on abdominal segments one to six, less prominent on segments seven and eight; subspiracular tubercles, particularly prominent on second abdominal segments; spiracular area blotched with dark brown and reddish-brown; venter with a diamond pattern on abdominal segments one to five.

Hypagyrtis nubecularia Gn. — *B. papyrifera*, *Salix* spp., *Prunus virginiana* L. (3 records), *Corylus* sp. (2), *P. tremuloides* (2), *Amelanchier* sp. (2). Central and southern Interior; uncommon. LARVA: 1¼ inches; head, pale brown marked with dark brown; body, reddish-brown; broken pale buff dorsal line on third thoracic and abdominal segments, indistinct on first two thoracic segments; two pale buff spots bordering dorsal line on abdominal segments one to six; indistinct diamond pattern bordered by dark brown on dorsum, pattern obscured on abdominal segments four and five by dark brown bands separated by a yellowish buff band extending to venter; small irregular

yellowish buff patch above and caudad of spiracle on first abdominal segment; spiracles yellowish buff outlined in black; venter, pale buff marked with dark brown, venter of fourth abdominal segment broadly banded with dark brown.

Hypagyrtis piniata Pack.—*P. menziesii*, *T. heterophylla*, *L. occidentalis*, *P. contorta*, *P. engelmanni*, *T. plicata*, *A. lasiocarpa* (3 records), *P. ponderosa* (3). Central to southern Interior; common. LARVA: 1½ inches; head, bright reddish-brown with transverse dark brown bands; body light reddish-brown, pale yellow or buff, diamond pattern on dorsum except on first thoracic and ninth abdominal segments; dark brown "V" markings on dorsum extending diagonally to the venter; spiracles, pale reddish-brown out-

lined with black, located centrally in the dark brown diagonal band; venter marked by irregular bands of dark brown.

Eufidonia notataria Wlk.—*P. contorta*, *A. lasiocarpa* (1 record), *Larix laricina* (Du Roi) K. Koch (1). Central Interior; rare. LARVA: 1 inch; head, green with grey dots forming a herringbone pattern on vertex and sides; body, yellowish-green, fine grey green dorsal, addorsal and subdorsal lines; white spiracular stripe; thin red subspiracular line; spiracles pale yellow outlined with red; venter pale green with yellowish-green mid ventral line.

Eufidonia discospilata Wlk.—*Salix* spp.; *Alnus* sp. (1 record). Central Interior and central coastal regions; rare. LARVA: similar to *E. notataria*.

OCCURRENCE OF THE SMALL BLACK ROOT WEEVIL, *Trachyphloeus bifoveolatus* (BECK) (COLEOPTERA: CURCULIONIDAE), ON STRAWBERRY IN BRITISH COLUMBIA¹

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In mid-June 1964, a large adult population of a European root weevil, *Trachyphloeus bifoveolatus* (Beck)², was discovered³ near Abbotsford in the Fraser Valley, feeding voraciously on the foliage of a newly set, 24-acre planting of strawberry (var. Northwest). This soil received a pre-planting treatment with insecticide at the recommended rate for the control of *Brachyrhinus* root weevils (Cram, 1962). The adults of *T. bifoveolatus* were found in groups of up to 50 on the surface of the dry, light soil, usually beneath leaves but sometimes fully exposed to the sun

and drying wind. Some adults were feeding on the leaflets during the daytime which indicates that they can tolerate desiccating conditions. The foliage was so damaged that often only the mid-ribs of trifoliolate leaves remained. Feeding notches were also noted in leaves of clovers, narrow leaf plantain and sheep sorrel or sour grass. Many adults were taken beneath these other plants. The evidence suggests that this introduced weevil has become established in old pastures and attacks strawberry when the pastures are broken up and planted. The field in question had been in oats for the two previous years and in pasture for many years before that. This occurrence is the first record of the species as a pest of strawberry in British Columbia.

Rosenstiel (1963) reported that in recent years this weevil, which he

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