

NOTES ON THE LIFE HISTORIES OF FIVE SPECIES OF LEPIDOPTERA FROM SOUTHERN VANCOUVER ISLAND, BRITISH COLUMBIA

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The following notes deal with the complete life history of five species of Lepidoptera, from egg to pupa. These are: *Incisalia mossi* Hy. Edw., *Venusia pearsalli* Dyar, *Perizoma curvilinea* Hlst., *Spodolepis substriataria danbyi* Hlst. and *Xylomiges candida* Sm.

The food plants of the various species are either those given in "An Annotated Check List of the *Macrolepidoptera* of British Columbia" (Llewellyn-Jones, J. R. J., Ent. Soc. B.C. Occ. paper 1, 1951) or supplementary to them.

Incisalia mossi Hy. Edw.

Since little seems to have been published on the life history of this species, the following notes may be of interest to students of the genus.

I. mossi is one of four species recorded for British Columbia. It is a small, inconspicuous, dark brown butterfly, rather local, usually found on steep, rocky slopes that face west, where the food plant, *Sedum spathulifolium*, grows abundantly. It flies from late March to mid-May.

To secure ova, females were repeatedly caged over various shrubs and trees during several years, but without results. Eventually it was noticed that the stonecrop, *Sedum spathulifolium*, was always near the haunts of *I. mossi*, and after caging the butterflies with stonecrop, ova were finally obtained and the caterpillars readily reared. Several caterpillars of different ages were studied, and the data obtained averaged for the following sequences.

Ovum. Ova deposited, singly April 14 to May 2, on the tip of the bracts or at the base of the flower buds; sometimes on the underside of the

leaves near the inflorescence. Size, .75 by .33 mm. A somewhat flattened disc covered with fine reticulations that have raised hyaline margins giving the egg a hoary appearance and causing it to blend into the bloom-covered food plant. The micropylar area is deeply sunk below the surface and has smaller reticulations. Colour, a pale, pastel green matching the leaves. Hatched on or about May 1.

Larva. 1st Instar. Length 1.5 mm. Head piceous brown, large in proportion to the rest of the body, smooth, shiny. Body smooth, tapering from the head with no indication of the onisciform shape of the later stages; four longitudinal rows of small black dots each bearing a long, curved, white hair; the hairs on the thoracic segments directed forward, the remainder backward; length of hairs about equal to width of body. A small, dark brown plate on the dorsum of the first thoracic segment. The ninth abdominal segment flattened, rounded at the tip, held in a horizontal position; a small dark spot present on the dorsal surface at the base. Growth was comparatively slow at first; the caterpillars finally bored through the base into the heart of the bud where, hidden from view, they fed on the ovary and anthers.

2nd Instar. May 12. Length 5 mm. Head dark brown; body honey colour to greenish yellow, a faint lighter dorsal line, evenly covered with a short, dense, light brown pile. Onisciform shape now obvious, the head retracted within the first thoracic segment. Abdominal segments 1 to 7 with a pair of oblique, brownish stripes. Fragments of the bloom from the food plant entangled among the hairs helped to camouflage the caterpillars. At the conclusion of this

stage they could be seen half in, half out of the flowers, or partly curled round the stem at the base.

3rd Instar. May 20. Length 10 to 12 mm. Fully onisciform, segments much ridged, folded and overlapping. A prominent lateral fold. Head piceous to dark brown. Body pale greenish yellow, matching the colour of the flowers; spiracles pink ringed with black; oblique stripes as before. In some caterpillars the stripes are faint or absent.

4th Instar. May 25. Length 16 to 17 mm. Head dark brown. Body greenish yellow, some caterpillars with stripes edged dorsally with white, spiracular fold whitish in some cases. May 28. Length 18 to 20 mm. Caterpillars mature; pupated May 31. Before pupation the caterpillars left the food plant and sought a sheltered niche. In confinement one caterpillar chose the side of a flower pot under some dry moss; others chose the bottom of the rearing jar. First they spin a light silk mat then over the fore part of the body a silken girdle which is attached to the mat. The tip of the last abdominal segment is also attached to the mat.

Pupa. Size 11 by 7 mm. Short and squat; pale yellow to beige at first, eventually becoming dark chocolate; a pale dorsal line flanked by a double row of small fuscous dots on each side. Spiracles white.

Imago. One emerged April 3.

One group of caterpillars ate the leaves and parts of the stems when confined over a plant from which the flowers were faded or absent. Caterpillars reared on the flowers were yellow, but those with the varied diet ranged from a dark vinaceous red through flesh-pink to greenish-yellow, with the oblique stripes more prominently marked.

Venusia pearsalli Dyar.

Ovum. A female taken in Saanich laid several ova May 6 and 7, 1956. Size .6 by .5 mm., slightly flattened,

minutely reticulate, pale green, becoming darker just before hatching on May 14.

Larva. 1st Instar. Length 1.5 mm. Head pale translucent brown. Body semi-translucent pale, whitish-green. Very restless at first, nibbled at ocean spray, *Holodiscus discolor*, but finally fed on red alder, *Alnus rubra*.

2nd Instar. May 18. Length 4 mm. Head pale green, almost colourless, and translucent. Body pale green, with glaucous inter-segmental rings, and small, pale brown, tubercle-like dots, each bearing a short, white hair.

3rd Instar. May 24. Length 6 to 10 mm. Head translucent, greenish white. Body green, a dark, suffused, deep-seated dorsal line showing heart pulsations, thin white subdorsals, pale yellow intersegmental rings.

4th Instar. May 31. Length 15 to 17 mm. Head as before. Body apple green above, sage-green below, pale yellow, somewhat incomplete subdorsals, legs and claspers pale green, spiracles indistinctly greenish. Larvae hid among folded leaves when not feeding. Larvae full-fed on June 10, pupated between the leaves or in slight depressions in the soil.

Pupa. Size 8 by 3 mm. Shiny, lightly punctate, pale brown abdominal segments; cremaster about six spinous hairs, twisted together and set on a rugose base.

Perizoma curvilinea Hlst.

Ovum. Twenty ova from one female taken in Saanich, were laid irregularly on the bottom and sides of a chip box, August 13, 1956. Size, 1.0 by .75 mm., depressed oval, slightly larger at one end; smooth, with well defined reticulations; creamy white. Hatched August 22.

Larva. 1st Instar. Length 4 mm. Very slender. Head pale brown. Body colourless, semi-transparent with sparsely distributed short hairs. Did not eat the egg shell. Fed on ocean spray, *Holodiscus discolor*, after trying a number of herbs and shrubs.

2nd Instar. August 27. Length 7 mm. Head pinkish-brown. Body brownish-green blending into a lighter coloured, supra-spiracular line with its ventral border maroon; underside pinkish.

3rd Instar. September 3. Length 12 mm. Head milky-white with light brown feathering on sides and centre. Body light brown with short, scattered, black hairs.

4th Instar. September 9. Length 15 to 20 mm. Head sienna, with two vertical, whitish bars. Body pale rusty to sienna, with a faint pink tinge, spiracular line maroon, underside paler with a pale-bordered, dark, interrupted central line.

Full fed on September 18. Length 25 mm. Head as before. Body as before but with indistinct double dorsal, and single subdorsal lines; underside with two pale yellow lines slightly divergent on centre of each segment. Pupated September 22, within a slight cocoon among debris.

Pupa. Size 10 by 2.5 mm. Almost cylindrical, smooth, dull, red-brown; cremaster, two parallel spines recurved at tip in same plane and at top of a rugose conical base.

Spodolepis substriataria danbyi Hlst.

Ovum. A female taken in Saanich laid 14 ova April 23, 1956. Size, 1.0 by .9 mm. Oblong-oval, finely striate and cross-ribbed; pale cream, turning a salmon colour in a day or two. Hatched May 10.

Larva. 1st Instar. Length 4 mm. Slender, very active. Head light brown with darker mottlings. Body translucent purplish-brown, with two light lines; underside with two purplish stripes; body colour intensified on centre of some segments giving a ringed effect.

2nd Instar. May 15. Length 6 to 12 mm. Head square, pale pinkish, with three brown areas one on each side and one on the vertex. Body grey-green with several longitudinal

lines; a faint, dark green dorsal, a white subdorsal, and a broad whitish spiracular line; spiracles ringed with black; underside with a wide whitish central band and a thinner one on each side; a pair of black dots on dorsum of each of abdominal segments two to seven. Fed on willows, *Salix mackenzieana* and *S. scouleriana*.

3rd Instar. May 21. Length 12 to 15 mm. Head whitish, heavily speckled with dark, greenish-brown, leaving two white bars on each side of the face. Body sage green, four black dots on dorsum of each segment, two pairs forward and two backward, with fine lines connecting the outer dots; the dorsal space between darker, and tinged with green; a conspicuous black line just below the spiracles; underside grey with a broad whitish central line; Thoracic segments with a central, black line on dorsum. Some larvae bluish grey with several thin, white lines breaking up the ground colour; spiracles black, a tinge of yellow along the spiracular line.

4th Instar. May 23. Length 22 to 25 mm. Head pinkish, heavily spotted with black on sides and top, leaving a white bar on each side continuous with sub-dorsals. Body colour and markings intensified, general colour grey to warm brown, imparted by fine brown vermiculations on a white and ochre base; dorsum of first thoracic segment with a black line, a pair of black spots on the second and third, the spots joined by a dark oblique line; a transverse black bar on the seventh abdominal, which has a corresponding raised ridge; hour-glass fuscous outlines on dorsum of abdominal segments. Some larvae have underside concolorous with dorsum; spiracles pink, ringed with black.

5th Instar. June 5. Length 28 to 35 mm. Head pale blue-grey, heavily spotted with fuscous, leaving two parallel vertical bars on the sides; Thoracic segments as before, first to seventh abdominal segments with suffused, diamond-shaped marks on dorsum; general colour light grey to

sienna brown; underside pearl grey with wide, dark brown sub-spiracular line. Some larvae are uniformly sienna brown with no dark sub-spiracular line; dorsal pattern chiefly pale cream transverse marks between each segment. Larvae full-fed by June 8.

Pupa. Contained in a light cocoon spun on the surface of the ground under leafy debris. Size 14 by 4 mm. Slender, elongated, smooth, shiny; wing cases finely wrinkled; abdomen punctate around centre of each segment; dark, piceous brown. Cremaster, two stout spines, with recurved tips, subtended by 4 to 6 short, slender recurved hairs, all on a conical, rugose base.

Xylomiges candida Sm.

This is a Western American species, on the wing from March to May. It may be found at rest on tree trunks by day and is attracted to light by night. Wing expanse 35 to 38 mm. the primaries mottled with light and dark grey, the secondaries satiny white, hence the specific name which means shining white. No referable account is available to me, and no mention of the food plant is recorded in Jones' list.

Ovum. A captured female from Saanich, laid a group of about 110 ova May 10, 1955, piled together in three layers in a low pyramid. Size .5 to .3 mm., a flattened oval, vertically ribbed, shiny white with a light brown ring around the upper part, microplyar area marked with a brown dot, becoming darker at maturity; hatched May 30.

Larva. 1st Instar. Length 2 mm. Head light brown, dotted with black. Body translucent purplish, with a few short hairs. The larva consumed the egg shell. Young caterpillars very active, soon scattering in all directions. They commonly spin a suspensory thread.

2nd Instar. June 10. Length 8 to 10 mm. Head pale greenish dotted

with black. Body pale green to bluish, with black dots, each segment bearing a short hair; thin, white dorsal and sub-dorsal lines edged with fuscous. Spiracular line broad, white. Feeds preferably on broad leaved maple, *Acer macrophyllum*, but also feeds on *Salix scouleriana* and *Alnus rubra*.

3rd Instar. June 15. Length 20 mm. Head as before. Body varying shades of drab green, or brown. Thin, white dorsal and sub-dorsal lines sometimes present; spiracular line broad, white, edged dorsally with black.

4th Instar. June 22. Length 25 to 35 mm. Head pale brown with a small darker oblique stripe on each side of the vertex, and darker reticulations on the sides. Body red-brown with fine etchings and irrorations of fuscous. Dorsal and sub-dorsal as before; spiracular with a faint rusty tinge along the centre of the broad white band; spiracles white, ringed with black. Underside concolorous with the upper. Larvae full grown June 28; varying from pinkish-brown to dull, fuscous brown, with interrupted dark dorsal line, and little or no evidence of sub-dorsals. The fully fed larva was 40 mm. long. Larvae rest between the leaves, and curl into a ring when disturbed. July 9. Most of the larvae formed tough cocoons below the surface of the soil.

A larva taken on *Arbutus menziesii* July 3, 1953, matched the arbutus stems, a bright sienna. This one pupated on July 26 and emerged on April 15, 1954.

Pupa. Size 16 by 6 mm. Smooth, shiny, wing cases dark, piceous brown; abdomen light brown with short, dark streaks scattered over the segments. Cremaster, two stout, outwardly recurved, hooked spines, with four shorter, slender spines at the base; all placed directly on the tip of the last segment, and not on a raised tubercle as is commonly the case.

Imago. Emerged April 3 to 16, 1956.