

NOTES ON THE LIFE HISTORIES OF TWO BUTTERFLIES AND ONE MOTH FROM VANCOUVER ISLAND

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Colias occidentalis Scud.

A specimen taken at Royal Oak on June 4, 1958, laid about 50 ova by June 12. They were placed on the upper side of the leaves of *Lathyrus nuttallii* Wats. over which the butterfly was confined.

Ovum

Size 1.5 mm. by 0.5 mm., fusiform, truncate at the base at the point of attachment, shiny, with about 14 ribs, whitish at first, becoming rosy-red with an ivory-white tip. Hatched June 11.

Larva—1st Instar

Length 2 mm. Head black, dull with short, sparse, white-knobbed hairs. Body fuscous green, covered with glandular-tipped hairs, A.8 and A.9 bearing a few long, backwardly directed, white hairs. The chorion was partly, or entirely, consumed by the larva.

2nd Instar

June 17. Length 5 mm. Head grey-green, body green matching the leaves. Both head, and body, with a hoary look due to a covering of close-set, glandular-tipped hairs, each arising from a small, black tubercle.

3rd Instar

June 23. Length 7 mm. Appearance similar to second instar larva. From this date until April, 1959, the caterpillars remained quiescent in the fold of a shrivelled leaf.

4th Instar

April 18, 1959. Length 10 mm. The larva showed signs of life on April 3. Head pale green, thickly dotted with short, black, non-glandular hairs arising from black bases. Body dark, velvety green, closely dotted with white, black-centred spots, each bearing a short, white, non-glandular seta. Segments with six transverse wrinkles.

5th Instar

April 25. Length 18 mm. Appearance as before, but with white hairs thickly distributed on the sides of the body but not on the dorsum. Spiracular line thin but conspicuously white, the white ring round the black dots replaced with green.

April 29. Length 25 mm. Appearance as before, with a faint pink suffusion along the spiracular line, underside glaucous - green minutely black-dotted.

When disturbed the larvae raised the thoracic segments in a sphinx-like attitude. Just before pupation they were 30 mm. long. Pupated May 4. Thirty-six hours elapsed between the first attachment by the last segment to a silken mat, and pupation with the head up and a girdle round the thorax.

Pupa

Size 23 mm. by 6 mm. The head was produced into a projecting beak, and there was a decided hump on the dorsum of thorax. Smooth, emerald green at first, becoming darker and assuming a yellowish colour towards maturity. The beak was dark green above and yellow below. The wing-cases showed faint dark lines of the venation beneath. The three abdominal segments beyond the tip of the wing-cases each had two small black dots. Spiracular line distinctly yellowish.

Imago

Emerged May 21, 1959, after 17 days' pupation.

The continuation of aestivation without a break into hibernation, both covering nearly ten months, is noteworthy. It would be of interest to know if this is the rule throughout the insect's wide range.

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Coenonympha inornata insulana
McD.

This butterfly has a long period of flight on Vancouver Island, from May to October, with a marked gap in July, suggesting the occurrence of two broods per season. With the idea of clearing up this point, the life history was investigated during 2 years. Ova were obtained from specimens taken at Royal Oak on May 26, 1958.

Ovum

Size 1 mm. by 0.9 mm. Barrel-shaped, having a slight hollow in the upper end, with a distinct boss or umbo in the centre of the depression. Smooth, shiny, faintly ribbed and cross-ribbed, white, lightly flecked and streaked with brown to form an irregular band round the middle of the egg.

Larva—1st Instar

June 7. Length 2 mm. Head pale dull flesh coloured. Body tapering from head and of the same colour, with darker dorsal and subdorsals, and two fleshy anal processes directed backwards in line with the body.

2nd Instar

June 18. Length 4 mm. Appearance as before, with the addition of numerous small, white, mushroom-like protruberances covering both head and body, and seven dark green lines on dorsum, one dorsal and three on each side of it.

3rd Instar

June 25. Length 8 mm. Appearance as before.

4th Instar

July 3. Length 15 mm. Appearance as before.

5th Instar

July 12. Length 20 mm. Head grass-green, thickly covered with white mushroom-like protruberances. Body grass-green, with the mushroom-like bodies giving a glaucous bloom. The dorsal line and the three lines on each side of it dark green, spiracular line yellow, highlighting the lateral fold,

spiracles evident as very small black dots, anal processes tinged with pink.

The larva was well camouflaged. As it rested along the edge of a blade of grass the tapering body merged into the blade and the large head simulated a tear or break in the edge. Various grasses are the food of this species. The succulence of the grass evidently affects the rate of metamorphosis.

July 16. Length 22 mm. at maturity. The larva suspended itself by the cremaster from a grass stem, and pupated on July 21.

Pupa

Size 10 mm. by 3 mm. Rather short and broad, smooth, grass-green, with a fuscous line on the costal and hind margins of the wing-cases, and two short fuscous lines on the underside of the last abdominal segment, converging to form a V at the base of the cremaster.

By August 1 the wing-cases had turned a light brownish colour, while the green of the rest of the body assumed a dull, muddy look, an indication that the imago was about to emerge. It died before doing so. Some larvae of the same age group grew very slowly. One of these was only 10 mm. long on October 9 and showed signs of hibernating for the winter.

In 1959 three imagos of a second brood were obtained; two were from ova laid on June 13. They emerged on August 24. One was from an ovum laid on July 2. It emerged on September 15. In 1953 an ovum laid on September 4 hatched on September 20; another laid on September 14 hatched on October 15. One of these larvae hibernated, and resumed feeding in April 1954.

From the foregoing it would appear that *insulana* is at least partially two-brooded. There is disparity in growth of the same age group, and the winter is passed by larvae of various ages and sizes. The largest of these give rise to the spring adults, the smaller ones to

the late summer contingent. The latter are augmented by individuals of the second brood. *C. inornata insulana* would seem to be midway between the single-brooded *C. kodiak* of northern regions and *C. californica* in the south where two broods is the rule.

Orthosia transparens Grt.

A specimen taken at Royal Oak, on April 22, 1959, laid about 215 ova, singly, or in irregular groups, on the sides of the container.

Ovum

Size .75mm. by .5 mm. A depressed sphere with about 40 vertical ribs whose sides have a bright sheen, varying in intensity with the incidence of the light, a small light brown dot in the micropylar area, and a fine broken ring of the same colour on the shoulder of the egg. Hatched on May 1.

Larva—1st Instar

Length 2.5 mm. Head light brown, sparsely but strongly dotted with black. Body whitish, transparent, with prominent, black, seta-bearing tubercles. The larva consumed part of the chorion, then fed on *Arbutus menziesii* Pursh penetrating into the leaf-bases of the expanding buds.

2nd Instar

May 8. Length 8 mm. Head semi-transparent suffused with white, and dotted with black. Body olive or bluish-green, thin, milky-white dorsal and subdorsal lines, tubercles prominent, black-ringed with white bases, each bearing a stiff hair, spiracular line a vague whitish band, underside concolorous with the upper.

3rd Instar

May 12. Length 15 mm. Appearance as before.

4th Instar

May 16. Length 20 mm. Head near white, blending into a pinkish purple on the vertex, finely reticulated and spotted with brown. Body pinkish brown, thin white dorsal and subdorsal lines, spiracular line light grey centred with an irregular, pale, rust-

coloured suffusion, underside a sordid flesh colour, the whole body finely spotted with black.

5th Instar

May 20. Length 28 mm. Appearance similar to 4th instar larva. Body a general sienna brown matching the twigs of the arbutus, tubercles black, edged with white. The larvae fed at night, hiding by day among the debris at the bottom of the container.

6th Instar

May 27. Length 40 mm. Head pale sienna brown, dorsal and subdorsal lines indicated by very thin whitish lines, spiracular line inconspicuous, body finely speckled with white and fuscous dots.

May 31. Length 45 mm. The larva by now full grown, general colour a drab flesh, faintly tinged with reddish-purple, without noticeable markings except suffused dark dorsal and subdorsal lines.

During the period between May 31 and June 14 the larvae became restless and moved continually feeding lightly now and then, but obviously having an urge to travel before pupation. Some larvae had made pupal cells by June 6, in which they lay quiescent without pupating until a week later.

Pupa

Size 15 mm. by 5 mm. Smooth, shiny, the wing cases finely etched with minute, close-set lines. Abdominal segments finely punctate on the anterior margins, light mahogany brown. Cremaster consisting of two very thin, nearly straight spines with four short hairs with knobbed tips at the base, all set upon a shiny boss partly sunk into the tip of the last segment.

In 1958 the preferred food plant was unknown until too late; one or two larvae were reared to the 5th instar on Garry oak, which was evidently not relished. By the time arbutus was provided the survivors were too weak to complete their metamorphoses.