

## NOTES ON THE LIFE HISTORIES OF FOUR MOTHS FROM SOUTHERN VANCOUVER ISLAND

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### *Prosperpinus clarkiae* Bdv.

This beautiful little sphinx has a wing expanse of 35 to 40 mm., the females usually the larger. The forewings are banded with varying shades of green, the most prominent a broad band across the centre. The hind wings are bright orange with a contrasting black border.

In my experience this species is not common. The years 1957 and 1958 were the first times I had seen it under natural conditions, after more than thirty years of searching. Individuals were seen in bright sunshine, flying low over beds of sea-blush, *Valerianella congesta*.

Two females of this species were taken in Saanich on April 29, 1958. They were confined over a flower-pot containing a sprig of *Galium aparine* which was thought to be one of its food plants as it was growing plentifully in the neighbourhood in which the adults were flying. By May 4 seven ova were obtained, one laid singly on a leaf, and six in a pile on the plant. The adults died after five days.

### Ovum

Size 1 by .90 mm., a slightly depressed sphere, smooth, shiny, pale translucent green. On May 11 the embryo could be seen through the shell, curled round the vertical axis of the ovum. Head pale greenish white, body green showing distinct segmentation. Hatched May 12.

### Larva—1st Instar

Length 3 mm. Head dull, whitish. Body smooth, yellowish, faintly tinged with green, intersegmental rings pale yellow. It ate most of the egg shell. The larva would not touch the galium, but readily ate *Epilobium angustifolium*. Of the various herbs tried, this was the only one upon which it was successfully reared. Just prior to the first moult the larva was 5 mm. long, the body a dull glaucous-

green, matching the mid-vein of the leaf along which it rested.

### 2nd Instar

May 21, length 6 mm. Head dull, pale flesh colour. Body slightly rough due to minute raised close-set white dots. Glaucous green, a slight indication of a tubercle on the dorsum of A. 8. May 24. Length 12 mm. with signs of approaching moult. A. 9 was a pinkish flesh colour matching the head, giving a two-headed effect. There was a faint pink suffusion along the spiracular line.

### 3rd Instar

May 26. Length 15 mm. Head light pastel purple. Body slightly rough as before, several transverse wrinkles on each segment. T. 1 and A. 9, purple, matching the head, a dull purple spot on dorsum of A. 8. Legs, dark brown, claspers purple with the same colour extending slightly on to the body. Underside green tinged with purple. When alarmed the larva reared the T. segments in the characteristic sphinx-like pose.

May 29. Length 20 mm. Head dull, smooth, sparsely short haired, pale purple. Body glaucous green, with white dots as before. T. 1 and part of T. 2 light purple. A. 9 pale purple, as were the legs, claspers and adjoining parts of the body. A light whitish line just above the spiracles. Spiracles white, ringed with black, about eight transverse wrinkles on each segment. Underside, light purple.

### 4th Instar

June 1. Length 20 mm. General colour and markings as before with the following additions: The purple on A. 9 had a tendency to increase and extend along the dorsum as far back as A. 6, or further. There was a faint dark dorsal and a clearly marked lemon yellow subdorsal line, with a distinct purple boss on the dorsum of A. 8. where the horn occurs in most

Sphingid larvae. The body tapered slightly towards the head.

### 5th Instar

June 9. Length 30 mm. Head purplish brown, covered with sparse, short hairs. Body with a wide dorsal band, black or dark fuscous having a tinge of purple. A. 1. to 5. with a pair of small, creamy dots. A. 8. with a round pink boss on dorsum, sides yellowish with ten thick, elongate, slightly oblique black bars, containing the spiracles in the centre of the row of bars. The whole body dotted minutely with black, and the underside a light purple colour. By June 13 the length was 45 mm. Head dull purplish-brown. Body fuscous above as before. A. 8. with a black-rimmed pink boss centred with an elliptical black spot. Sides yellow with a broad wavy black band running along and including the line of spiracles. Back and sides thickly dotted with black, the dots closely grouped at the juncture of the segments. Legs and claspers flesh colour. The underside purple. June 19. Length 55 mm. Full grown. By June 24 it had descended to the soil for pupation.

### Pupa

Size 25 mm. by 7 mm. Smooth, dull, wing cases etched with a feathered pattern of fine lines. A. segments coarsely punctate on the anterior border, light brown, spiracles black. Cremaster a stout bifid spine terminating a narrow rugose protuberance on the last segment. Length of base and spine 2 mm. The pupa was widest at the middle of the A. segments, with the wing cases proportionally short and narrow.

### *Lacinipolia petalis fletcheri* Grt.

This is a rather common moth during June and July when it comes to light. The wing expanse averages 30 mm. and the general colour is light grey superimposed with darker lines and markings. A characteristic feature is the juncture of the orbicular and reniform spots at their lower edges, which readily separates this species from the very similar *L. pen-*

*silis* Grt. in which these spots are separate.

The following notes cover two years. Difficulties arose during the winter with the first group, so that the sequence is a blending of two groups, each supplying deficiencies in the other.

One batch of ova consisted of 95 eggs laid on or about June 24, 1955, placed indiscriminately on the sides and bottom of the container. The other was a similar number laid on July 7, 1957.

### Ovum

Size, 1 mm. by .90 mm. Conical, finely ribbed, white; the apex and a ring slightly below, brown.

### Larva—1st Instar

July 9. Length 2mm. Head light brown. Body pale translucent brown, with small tubercles bearing setae. The egg-shell was not eaten. After trying various plants the caterpillar accepted *Alnus rubra*.

### 2nd Instar

July 18. Length 4 mm. Head honey-coloured, short haired. Body olive-brown, smooth with scattered short setae. It ate small round holes in the epidermis on the underside of the leaf.

### 3rd Instar

July 28. Length 7 mm. Head as before. Body olive-brown, a thin white dorsal line with faint white suffused patches on each side of it on the centre of the A. segments. Tubercles black, each with a short seta. The larva kept out of sight by day under the dead leaves that lay at the bottom of the pile accumulated as fresh ones were added. It was very sluggish, hardly moving if touched.

### 4th Instar

August 7. Length 10 mm. Head as before. Body a drab fuscous brown, dorsum with grey lozenge-shaped saddles on the centre of each A. segment. Spiracular line broad, pale honey colour. Spiracles black. Underside pale fuscous, finely flecked with grey dots and etchings.

**5th Instar**

August 13. Length 17 mm. Much as before but darker, two white tubercles on the dorsum of A. 8.

**6th Instar**

August 29. Length 20 mm. Head pale brown, a dark V on front, sides freckled with fuscous. Body pale yellow-brown, heavily flecked with fuscous. Markings as before. By September 9 the body colour varied in individuals from dark fuscous to light grey-green, and the markings were not so evident. Some of the dark forms had two light ticks on the anterior margin of each segment. The lighter ones had a Y mark in the centre of A. segments. On October 19 they were very sluggish; evidently the winter diapause was imminent. The larvae were placed in a 10-inch flower-pot with moss and alder leaves. During the following winter they nibbled at slices of carrot.

February 9, 1958. Length 25 mm. The larvae came through the winter in good condition. No moult was observed after hibernation. Head shiny, smooth, dark brown mottled with lighter brown, sparsely short haired. Body fuscous-brown tinged with pink, having a thin broken white black-edged dorsal line with a suffused fuscous spot on the intersegmental region. T. segments darker. A dark spot on each side of A. 8. Spiracular broad, indistinct and broken, pale luteus. Underside similar to the upper but lighter in colour. The whole body covered with minute grey dots. Claspers flesh coloured with a dark spot on the outer side. A. 9. fuscous. The body tapered slightly towards the head. Just before pupation on March 29 the larva was 25 mm. in length. T. segments and A. O. darker than the rest. Dorsum showed two faint, dark dashes on the centre of the segments.

**Pupa**

Size 15 mm. by 4 mm. Smooth with a dull gloss, light reddish brown. Spiracles black. Cremaster consisting of about six stiff, straight hairs bunched together on a smooth knob at the end of the last segment.

**Imago**

Emerged May 17 to 21.

***Xylomiges cognata* Sm.**

This is a regular visitor to my porch light during March. The wing expanse is 35 mm. The forewings have a light grey background, on which are fine black lines and etchings, leaving a noticeably oblique lighter area across the centre. The hind wings are whitish with a conspicuous black dot in the centre and a thin black border on the hind margin.

A female taken at light in Saanich, on February 8, 1958, had laid 65 ova by February 13. The eggs were deposited on the side of the container in a single batch of one layer.

**Ovum**

Size 1 mm. by .50 mm. A flattened sphere, smooth, shiny with about 45 faint vertical ribs. Micropylar area depressed, reticulate. Pale cream colour, turning through light pink, pinkish-brown, to lead colour at hatching time. Hatched March 18, 1958

**Larva—1st Instar**

Length 2 mm. Head large in proportion, shiny, jet black. Body with a black cervical plate on T. 1. Rest of body a sordid bluish-white, short haired. They did not eat the egg-shell. They were very restless, wandering ceaselessly with a pronounced tendency to climb upwards and showing no desire to eat for several days. Finally they nibbled at the buds of *Salix mackenziana* into which they burrowed out of sight.

**2nd Instar**

March 29. Length 6 mm. Head and cervical plate shiny, yet black. Body blue-black, semi-translucent. Dorsal and subdorsals thin, faint, milky-white; tubercles noticeably black. Legs black, claspers concolorous with the underside and upper part of the body.

**3rd Instar**

April 1. Length 12 mm. Head shiny, jet black. Body fuscous green, dorsal and subdorsals milky-white. Spiracular line consisting of two whitish lines

enclosing pale green mottled with fuscous; spiracles black, underside light dusky green including the claspers, legs dark brown; black tubercles on the dorsum and sides very evident. As the *Salix* buds expanded the larvae tied the leaves together with silk, remaining out of sight within the leafy tent.

#### 4th Instar

April 5. Length 15 mm. Head black with lighter mottling on sides. Body with a broad light fuscous green band including the white dorsal, bordered by the white subdorsals. Between the sub-dorsals and the spiracular line the ground colour is a darker shade of the dorsum. Spiracular line broad, white, flecked along the centre with pale green, which included the black spiracles.

April 9. Length 25 mm. They rested concealed in a folded leaf.

#### 5th Instar

April 14. Length 30 mm. Head dark brown, with light mottlings on vertex and sides. Body with cervical plate shiny, dark brown mottled with lighter brown; rest of body grey-green between the white dorsal and sub-dorsals, darker below the latter, spiracular line a sordid grey, dorsum of A. segments with a dark U shaped line becoming more marked toward the last segment. Whole surface of body dotted with minute white spots.

April 20. Full grown. Length, 40 mm. Head pale flesh-brown, two oblique dark brown bars on front, vertex and sides faintly reticulated with dark brown. Body with shiny cervical plate concolorous with body, three white bars an extensions of dorsal and sub-dorsal lines which were white edged with fuscous; spiracular line less evident than before though broad and nearly concolorous with the sordid flesh of the underside, centred by a pale green suffusion, edged above with black, below with white. Spiracles black, legs pale brown, claspers the same colour as the underside. A. 4-9 with narrow fuscous U marks as before, the open end of the U directed forward. About April

30 the larvae spun light silken cells among the debris, where they lay quiescent until May 6 before the final change to the pupa was effected.

#### Pupa

Size 17 mm. by 5 mm. Smooth, shiny, wing cases minutely etched with wrinkles. A. segments finely punctate on the anterior margin, dark mahogany brown. Cremaster with 2 parallel hairs slightly recurved at the tips.

#### *Semiothisa teucaria* Stkr.

This fairly common geometer has a wing expanse of 30 mm. Both fore and hind wings are light grey heavily dusted with fuscous. The forewings have three dark lines crossing them while the hindwings have but two.

It is closely associated with Garry oaks, and may be disturbed by day among the grass and herbage beneath the trees. It flies up quickly and alights as suddenly in the grass after a short flight, a manoeuvre that is repeated as often as it is disturbed. At Saanich 8 ova were obtained from a captive female on July 24, 1957. The eggs were laid singly on an oak leaf and on the sides of the container.

#### Ovum

Size .90 mm. by .50 mm. Oval, minutely reticulate, green turning dark at maturity. Hatched August 3, 1957.

#### Larva—1st Instar

Length 3 mm. Head shiny, pale brown. Body pale brownish green to nearly colourless, translucent, with 6 very fine lines on dorum and sides, more pronounced on T. segments, underside darker. Fed upon Garry oak, *Quercus garryana*.

#### 2nd Instar

August 11. Length 5 mm. Head and body as before, less translucent.

#### 3rd Instar

August 17. Length 7 mm. Head pale whitish green, dull, with a few short setae. Four vertical bars of light brown feathering. Body smooth, with a rather prominent spiracular fold, grey-green, with 6 more faint light

lines on dorsum and a broader whitish spiracular line. Underside striped with alternate light and fuscous lines.

#### 4th Instar

August 23. Length 16 mm. General colour and markings as before. Some individuals dark fuscous green with a broken whitish spiracular line, dark intersegmental rings and a pair of black spots on sides of A. 1 and A. 2.

#### 5th Instar

August 31. Length 23 mm. Head milky green, mottled and feathered with light brown. Body grey-green with a tinge of cinnamon on ring joints, dorsum and sides with closely spaced pale brown lines, underside with black dots on segments. Some

had a black mark on the centre of sides, in others the black was replaced with yellow. The cinnamon tinge varied among the larvae. The overall effect was to simulate the oak twigs, even to a thin short pubescence. They were full grown by September 4. Head pale beige with brown feathering as before. Body yellowish-brown with many fine lines and pale yellow dashes on sides of segments. September 12. All larvae pupated among the dead leaves at the bottom of jar.

#### Pupa

Size 11 mm. by 3 mm. Slender, smooth, slightly shiny, finely wrinkled on wing cases, punctate on A. segments, dark piceous brown. Cremaster a bifid spine with straight tips.

#### On Mounting Lice by the Ris Lambers Method for Aphids

In the spring of 1958 Mr. Ron Forbes of the Federal Crop Insect Laboratory on the Campus showed me some microscope slides of aphids—the finest and clearest preparations of their kind that I had ever seen. He stated that they were made by the Hille Ris Lambers method and I immediately wondered if Mallophaga and Anoplura could be enlaid by the same technique.

Through the efforts of Miss Eleanor Higham, student technician, I now have about 1000 slides of these 2 Orders made by this method. For practical purposes it is nearly as good as the standard KOH-Canada balsam method with the advantage that it is very much faster; one can have finished slides in about 45 minutes.

The method is as follows:

Place the insects in 90 per cent alcohol in a just-boiling water-bath until soft and soggy-looking i.e. in from 2-5 minutes. Then remove them and place in 10 per cent KOH in hot water-bath for from 1 to 5 minutes; experience tells how long. Transfer to Chloralphenol solution in the hot bath for 2 to 3 minutes to clear and mount in Hille Ris Lambers medium.

The formula for the mounting medium is:

Gum arabic, clean white powdered ..... 12 grams

Concentrated pure glycerine ..... 6½ cc  
Chloralhydrate ..... 20 grams  
Distilled water ..... 40 cc

Dissolve the gum arabic with the other reagents in the water and filter through glass wool two or three times until crystal clear. Place in a dust-free oven at 40° C in a flat dish and let the medium evaporate to half its original volume. Cool, and keep in dropping bottle.

The chloralphenol is made from equal parts by weight of chloralhydrate and crystals of pure phenol or carboic acid, heated over a water-bath for 5 to 10 minutes.

This technique works better for Mallophaga than for Anoplura whose tough hide sometimes prevents penetration of chemicals and clearing. It is a curious thing that some sucking lice will clear and make perfectly transparent mounts and others from the same batch become only semi-transparent: the same trouble occurs with the KOH-balsam method, and is not the fault of the Hille Ris Lambers technique.

#### Reference

D. Hille Ris Lambers. 1950. On mounting aphids and other soft-skinned insects. Entom. Berichten 13:55-58.

—G. J. Spencer, University of British Columbia, Vancouver.