

## Life Histories of New Zealand Lepidoptera.

By A. V. CHAPPELL.

[Received by Editor, 10th October, 1929;  
issued separately, 31st March, 1930].

*Lepidoptera (Heterocera).*—

1. *Geometridae.*

*CHLOROCLYSTIS BILINEOLATA*, Walk.

*Mature larva.*—Length about  $\frac{5}{8}$  of an inch; rather vivid yellowish-green, finely speckled and pencilled with pale white; fine darker green dorsal line; fairly broad white lateral line with a dark reddish-brown line along the lower edge; short, fine black hairs; head small and pale green; ventral surface pale whitish-green; 10 legs.

Protective coloration fairly good.

*Habits.*—Nocturnal; sluggish; when disturbed lies “doggo”; very difficult, almost impossible, to make it move; during day clings firmly to underside of leaf, near where it has been feeding.

*Foodplant.*—*Urtica ferox*; in captivity will feed on *U. incisa*.

*Cocoon.*—Compact; rather flimsy; attached to underside of paper in breeding-box.

*Pupa.*—Golden-brown; length about  $\frac{1}{4}$  of an inch.

Larvae obtained in September.

*DASYURIS PARTHENIATA*, Guen.

*Larva.*—About  $\frac{1}{3}$  of an inch long; very light brown; narrow paler dorsal region, raggedly and palely edged with black; light blackish-brown dorsal line, edged with black; pale ochreous subdorsal line, edged with black, becoming creamy-yellow on posterior segments; darkish-brown lateral line, edged above with black; broad creamy-yellow lateral line; short dark hairs; spiracle pale ochreous, finely ringed with black; head rather small; whitish, marked with brown; sublateral surface pale cinnamon; ventral surface very pale; darkish-brown and pale grey ventral lines, slightly edged with black; 10 legs.

*Mature larva.*—Length about  $1\frac{1}{8}$  inches; coloration as above.

*Variation*, in depth of colouring, is considerable; in some the subdorsal line continues ochreous on posterior segments; in others the darkish-brown lateral line is rather broad; lateral line sometimes very pale yellow; some specimens tinged with grey-green.

*Protective coloration.*—Sometimes very difficult to distinguish larvae among blades of foodplant, but effectiveness of coloration depends very largely on the position of the larva.

*Habits.*—In captivity both diurnal and nocturnal; fairly active; during day remains amid foliage of plant, usually well out towards the end of a blade; eats the limited amount of fleshy tissue, between the prominent, tough, ridgy veins, present on the blades of the foodplant; in order to get at the fleshy tissue the larva is obliged to feed

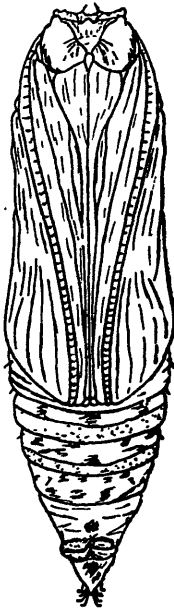


Fig. 1

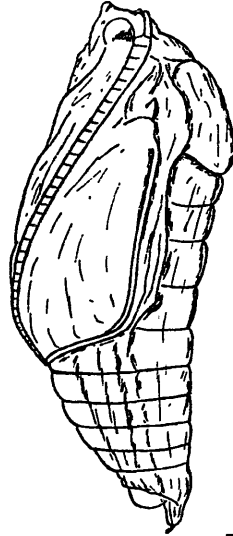


Fig. 2

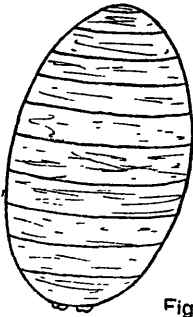


Fig. 7

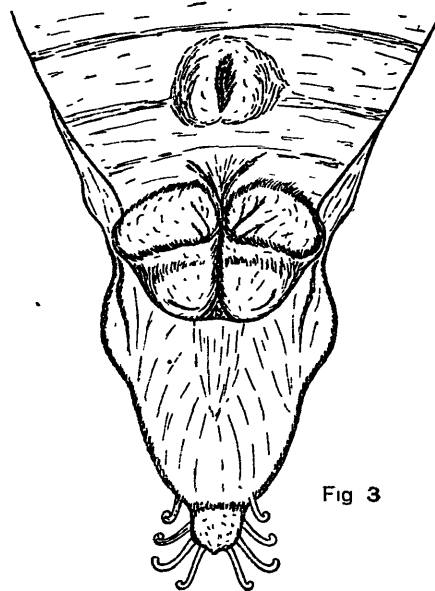


Fig 3

FIG. 1.—Pupa of *Musotima nitidalis*, ventral aspect.  
 FIG. 2.—Pupa of *Musotima nitidalis*, lateral aspect.  
 FIG. 3.—Pupa of *Musotima nitidalis*, abdominal extremity.  
 FIG. 7.—Puparium of *Phorocera marginata*, ventral aspect.

with head twisted sideways; eats long grooves, often right through blade, leaving the veins untouched.

*Foodplant.*—*Aciphylla squarrosa*; in captivity will feed very sparingly on parsley.

*Cocoon.*—Slight; amid debris, paper and sand in breeding-box.

*Pupa.*—Pale yellow; darkening to golden-brown (darker on abdomen, particularly on dorsal surface; wings slightly darker) to dark brown; length about  $\frac{1}{2}$  an inch.

Larvae obtained in May.

Attention was drawn to this species by the movements of a larva which was gripping a blade of the foodplant with prolegs and beating vigorously with body, thus causing the blade to swing in a fairly wide arc. There was a large Ichneumon-wasp a few inches away.

## 2. *Noctuidae.*

### *MELANCHRA INFENSA*, Walk.

*Egg.*—Earth-grey; later becoming ringed with brown near the top; finely sculptured.

*Larva.*—On hatching about one-tenth of an inch long; dirty grey, tinged with ochreous; transparent; very hairy, hairs springing singly from black spots; head large, dark brown.

Loses grey colouring, becoming very pale ochreous.

Very pale green; very shiny; faint whitish dorsal, subdorsal and lateral lines; black spots still present; hairs much shorter; ventral surface same as upper surfaces but lacking black spots; 16 legs.

*Mature larva*—a few days before pupation.—Length about  $1\frac{1}{4}$  inches; yellowish-brown with a very broad reddish dorsal line and fine subdorsal lines of the same colour; head dark brown.

*Habits.*—Nocturnal.

*Foodplant.*—A grass (*Bromus unioloides*).

*Cocoon.*—Amid debris and paper in breeding-box; rather slight.

*Pupa.*—Dark brown.

Eggs obtained in December, mature larva in September.

### *LEUCANIA BLENHEIMENSIS*, Fer.

*Egg.*—Pale cream; light brownish with brown ring and central spot on top; dark brown; pale blackish; finely sculptured.

*Larva.*—Pale dusky yellow; transparent; numerous stout black hairs rising singly from black spots; head large, pale amber speckled with black.

Palish yellow; faint dorsal and lateral lines.

Light green; broad creamy lateral line; faint creamy dorsal and subdorsal lines.

Pale yellowish-brown; pale dorsal and subdorsal lines; broad dark brown line above creamy lateral line; ventral surface same as upper surfaces; 16 legs.

*Habits.*—Nocturnal.

*Foodplant.*—N.Z. flax (*Phormium tenax*); the very young larvae ate grass (*Bromus unioloides*) readily but would not eat *Phormium*.

Larvae obtained in June.

*BITYLA DEFIGURATA*, Meyr.

*Mature larva.*—Length about  $1\frac{3}{8}$  inches; darkish-brown, faintly suffused with pinkish and finely pencilled with black; dorsal surface greyish-brown; faint tinge of green on anterior segments; fine broken whitish dorsal line, broadly edged with deep black on segments 2-4; beyond segment 4 the dorsal line is very broken, being in places merely a series of spots, and finely edged with deep black; on segmental divisions 4-5 to 11-12 the black broadens into elongated and, in most cases, roughly elliptical patches, some with the whitish line traceable along the centre; the patches 10-11, 11-12 are very large and almost unite; the posterior half of each of patches 4-5, 5-6, 6-7 is broadly edged with deep pinkish; patches 7-8, 8-9 have a smudgy patch of deep pinkish at each end; patch 9-10 is smudged at anterior end with deep pinkish and has a trace of the same colour at the posterior end; patches 10-11, 11-12 have smudgy patches of deep pinkish at anterior ends and traces of the same colour right round; fine broken black subdorsal line, marked slightly with whitish, fading gradually beyond the anterior segments; on segments 2-10 and 12 is a small irregular deep pinkish patch on the black subdorsal line; on segments 4 and 5 these patches are larger and very distinct, on some of the other segments they are barely discernible; broken, indistinct, lightish-brown subdorsal line, fading beyond the anterior segments; 2nd segment slightly paler than rest of body on dorsal and subdorsal surfaces; anal segment slightly darker on dorsal surface and lighter on subdorsal surface; broad light brown lateral line, becoming very pale on anterior segments, finely edged above with white and then smudgily with black; black patches on lower edge of lateral line on segments 3-6; several series, dorsal, subdorsal and lateral, of whitish spots edged above with black; sublateral series of light yellow spots, edged with black, very conspicuous on segments 3 and 4, less so on segments 7-10, and very pale on remaining segments; on segments 3, 4, 7, 8, 9 and 10 these spots are immediately above the legs; a few very short fine hairs; spiracles coral-red finely ringed with black; head darkish-brown, greyish-brown facially, two conspicuous yellow marks, interrupted with black, on crown; ventral surface light brown faintly suffused with pinkish; broad, transparent, blackish ventral line; 16 legs.

*Habits.*—Nocturnal; during day remains amid matted growth of foodplant; sluggish.

*Foodplant.*—*Mühlenbeckia australis*; in captivity will feed readily on dock.

*Cocoon.*—Strong and compact; of silk and sand; immediately below surface of sand in breeding-box.

*Pupa.*—Golden-brown.

Larva obtained in March.

3. *Pyralidae*.*MUSOTIMA NITIDALIS*, Meyr.

*Mature larva.*—Length about  $\frac{1}{2}$  an inch; light green; very shiny; transparent; internal organs clearly visible, showing through creamy-

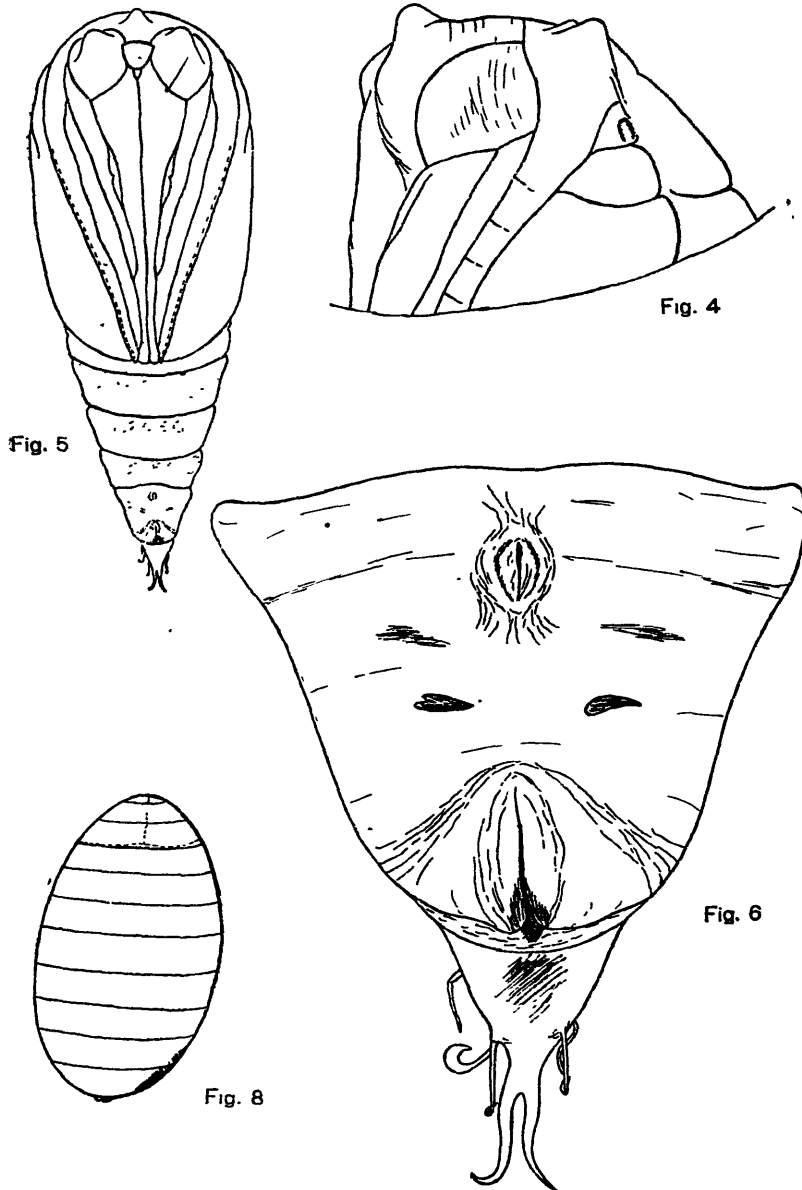


FIG. 4.—Pupa of *Musotima nitidalis*, head, lateral aspect.  
 FIG. 5.—Pupa of *Dasyuris partheniata*, ventral aspect.  
 FIG. 6.—Pupa of *Dasyuris partheniata*, abdominal extremity.  
 FIG. 8.—Puparium of *Phorocera marginata*, lateral aspect, lines of dehiscence marked in dots.

white; golden-brown hairs; head pale ochreous-green, speckled with pale golden-brown; ventral surface same as upper surfaces; 16 legs. After feeding contents of crop show darker green.

*Habits.*—Nocturnal and diurnal; sluggish; body considerably contracted when larva is resting; feeds on undersides of leaves; eats sporangia and fleshy tissue of leaf, usually leaving the upper epidermis; spins numerous threads of fine white silk over fronds of food-plant; portions of sporangia (so far as I could see, always the annulus) clearly discernible in the fresh excrement.

*Foodplant.*—A fern (*Pteris incisa* (?)).

*Cocoon.*—Edges of pinna of frond drawn together slightly and a few strands of white silk spun across opening.

Immediately preparatory to pupation the larva loses much of its transparency; internal organs faintly discernible.

*Pupa.*—Of peculiar shape, particularly the head and thorax; these portions bear a number of small rounded projections; light green; creamy on abdominal portions and extending internally into the thorax; dark brown, marked slightly with yellowish, more particularly on head and thorax; blackish-brown; length about  $\frac{1}{4}$  of an inch.

Larvae obtained in April.

## Diptera.

### 1. Tachinidae.

#### PHOROCERA MARGINATA.

*Mature larva.*—From 10-12 mm. long; creamy white; posterior spiracles and mouthparts black.

*Puparium.*—Light golden; deepens to reddish; wine colour; purplish-black; some have a very dusty appearance which cannot be removed; size 7-12 mm.

*Host-species.*—*Leucania purdii* (Lepidoptera, Noctuidae).—Parasitism of this host-species is very heavy. In rearing *L. purdii* in 1927 the percentage of parasitism was 71; the following year the percentage was 54. It is possible that some of the parasites were not of this species, but the exceptions would, I think, be very few.

*Host-larva* lives till parasite is almost ready to emerge and pupate, but it ceases feeding and is very sluggish, seeming to be incapable of much movement; very often the host is quite helpless for several days before death. Parasite usually emerges from host when host itself is about due to pupate. Sometimes it emerges from the pupa of the host-species. The parasite pupates after leaving the host. After the emergence of the parasites the host-larva is dry and, with the exception of a little matter remaining in the posterior segments, reduced to empty skin. Owing to the size of the parasites the skin of the host becomes stretched and after emergence of *Phorocera* it remains "ballooned up." Two *Phorocera* larvae per host, usually one large and one small; the large one always in the anterior segments. The large one always emerges from the host first; the small one emerges a day or so later and uses the hole made by the previous emergent. The parasites pupated, with but few exceptions, in the immediate vicinity of the host.

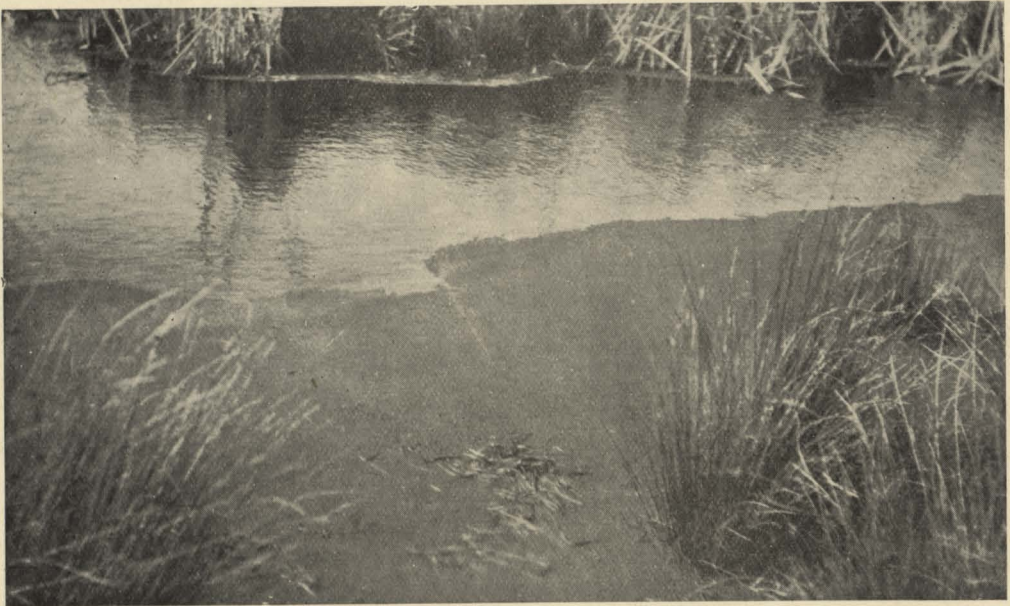


FIG. 1.—Pond partly covered by *Lemna oligorrhiza*.



FIG. 2.—*Lemna oligorrhiza*. About natural size.

