Immature stages of Curculionoidea – the weevils of The Snares islands, New Zealand

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The following weevil species are known from The Snares islands: Anthribidae – *Cacephatus aucklandicus, Lichenobius littoralis*; Curculionidae – *Exeiratus laqueorum, Pentarthrum spadiceum, Notacalles planidorsis, Lyperobius* sp., *Hadramphus stilbocarpae, Phrynixus laqueorum, Gromilus laqueorum, Nestrius laqueorum, Catoptes brevicornis australis, Oclandius vestitus*. The larvae and pupae are described and figured, and keys for their separation are given.

Keywords: The Snares islands; Curculionidae; Anthribidae; larvae; pupae; descriptions; illustrations; keys; habitat

INTRODUCTION

The Snares islands (Fig. 1), situated at latitude 48°07'S 110 km south of Stewart Island, comprise a narrow, roughly triangular main island with numerous offshore islets and rocks, among which only Broughton Island is of substantial size. In my report on weevil immature stages of the southern islands of New Zealand (May 1971) I was able to include only one larva and one pupa collected on The Snares.

Between January 1971 and February 1977 (including the whole of 1972) Dr D. S. Horning Jr and Mrs Carol J. Horning, assisted by other entomologists from the University of Canterbury, Christchurch, collected intensively at The Snares. Twelve weevil species are now known to occur, increasing Kuschel's (1971) list by 3. The larvae of 10 species and pupae of 6 are represented in the collection. With the exception of one subspecies the missing immatures are not endemic, and specimens from other sources have been co-opted to provide key characters and descriptions, as follows. Larvae and pupae of *Notacalles planidorsis* (Kirsch) from the Auckland Islands and Campbell Island; *Lyperobius* sp. from southern areas of the mainland; pupae of *Cacephatus aucklandicus* (Brookes) from the Auckland Islands; and *Lichenobius littoralis* Holloway, *Pentarthrum spadiceum* Broun, and *Catoptes brevicornis brevicornis* (Broun) from Big South Cape Island, south-west of Stewart Island.

The Snares are small, steep-sided, granitic islands invested with only 21 vascular plant species (Fineran 1969). They are set in a notoriously turbulent ocean. Hence, the chances of establishment of phytophagous insects, whether airborne or transported by driftwood ,are small. Having landed, they must survive long enough to find a suitable habitat and a mate.

Certain weevils shared by Stewart Island, the Auckland Islands, and, in some instances, Campbell Island (Kuschel 1971) do not occur on The Snares (Table 1). *Notinus cordipennis* (Broun), a leaf-miner in *Coprosma* and *Nertera* (Rubiaceae), *Peristoreus innocens* Kirsch, associated with *Dracophyllum* (Epacridaceae), and *Pactolotypus subantarcticus* Kuschel, developing in dead twigs of shrubby coprosmas, would not survive in the absence of their food plants. However, the less selective dead wood feeders *Pachyderris punctiventris* Broun and five species of *Notacalles* are not represented either. *Hebe elliptica* is common and at times abundant (Fineran 1969), and elsewhere is host to both *Notacalles planidorsis* and *Pactolotypus depressirostris* (Kirsch), species of similar size and habitat requirements, yet only the former is present on The Snares.

Because the Snares weevils are represented by only a single species in each genus, the immatures have presented few difficulties in identification, despite the lack of reared material. The discovery of *Nestrius laqueorum* Kuschel larvae has led to the recognition of the larvae of other *Nestrius* species in samples from forested areas of the mainland, where small soil-dwelling weevils are numerous and their immature stages are still poorly known.

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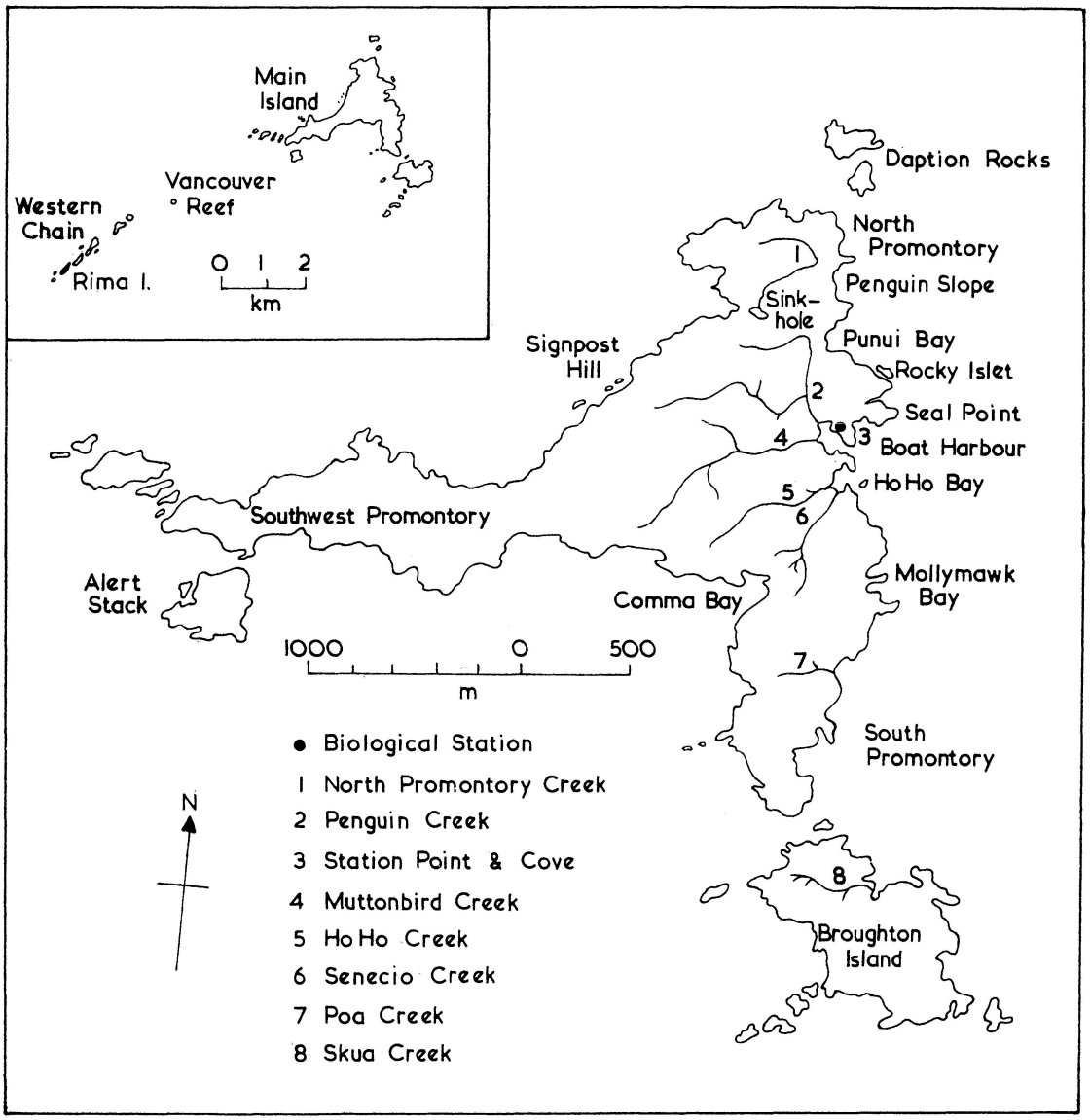


Fig. 1. The Snares islands. Nomenclature after Horning (1978).

The methods of dissection, preparation, and examination used for larval specimens and the systems of nomenclature are given in May (1971). Descriptions of genera and species covered in that monograph are here revised, but subfamily definitions and related comments are not repeated. New descriptions are accompanied by a comprehensive series of diagrams, but where reference can be made to May (1971) key characters only are illustrated, together with a lateral view of the larva. Numbers of setae (referring to one side only) are summarised in Table 2 for larvae and in Table 3 for pupae. Full details of synonymy are given in Kuschel (1964). Collectors are identified by their initials: Mr J. S. Dugdale; Miss Charlotte E. Holmes; Mrs Carol J. Horning; Dr D. S. Horning, Jr; Mr P. M. Johns; Mr J. McBurney; Mrs Brenda M. May; Mr J. I. Townsend; Dr J. C. Watt; Mr G. F. Woods. Material is deposited in the N.Z. Arthropod Collection, held at Entomology Division, DSIR, Auckland.

KEY TO LARVAE OF SNARES ISLANDS CURCULIONOIDEA

1 Legs (lacking claws) present. Frons bearing numerous setae. Tormae (labral bracons) consisting of lateral sclerome (Fig. 4) ..... ANTHRIBIDAE ... 2
—Legs absent. Frons bearing 10 or fewer setae. Tormae a pair of paramedian rods (as in Fig. 58) ..... CURCULIONIDAE ... 3

2 (1) Head with epicranium paler than frons. Maximum length 7.0 mm. Habitat dead wood. ..... *Cacephatus aucklandicus*
—Head with epicranium darker than frons. Maximum length 3.0 mm. Habitat crustose lichen on rocks in spray zone ..... *Lichenobius littoralis*

3 (1) Antennae hemispherical to conical; as long as wide or longer (as in Fig. 14), circular in cross-section ..... Phanerognatha ... 4
—Antennae transverse, much shorter than wide (Fig. 83, 95), oval in cross-section ..... Adelognatha ... 11

4 (3) Labrum heavily pigmented, longer than wide (Fig. 14, 50). Epipharyngeal lining with anterolateral setae arranged longitudinally, removed from margin (Fig. 15, 48) 5
—Labrum lightly pigmented, wider than long. Epipharyngeal lining with anterolateral setae arranged transversely, along margin 6

5 (4) Antennal cone short; length/width ratio 3:2 (Fig. 14). Frons with 4 major setae (Fig. 17a). Abd VIII spiracle lateral ..... *Exeiratus laqueorum*
—Antennal cone elongate; length/width radio 4:1 (Fig. 50). Frons with 2 major setae (Fig. 44a). Abd VIII spiracle dorsal ..... *Phrynixus laqueorum*

6 (4) Posterior pair of postlabial setae less widely separated than median pair (as in Fig. 71a). Alimentary canal with proventriculus slender 7
—Posterior pair of postlabial setae more widely separated than median pair (Fig. 22a). Alimentary canal with proventriculus expanded, turnip-shaped (Fig. 23) ..... *Pentarthrum spadiceum*

7 (6) Frons with 5 setae. Labral tormae united in basal half (Fig. 29) ..... *Notacalles planidorsis*
—Frons with 2 or 1 setae. Labral tormae separate 8

8 (7) Spiracles conspicuous; airtubes pigmented (Fig. 33, 38). Larger larvae; length up to 22.0 mm ... 9
—Spiracles inconspicuous; airtubes unpigmented. Smaller larvae; length less than 7.0 mm 10

9 (8) Spiracles (peritreme plus airtubes) oval in outline; orifice oval (Fig. 38). Associated with *Stilbocarpa robusta* ..... *Hadramphus stilbocarpae*
—Spiracles pear-shaped in outline; orifice circular (Fig. 33). Associated with *Anisotome acutifolia* ..... *Lyperobius* sp.

10 (8) Frons with *fs* 5 distinct. Antennae broadly conical (Fig. 74). Abdominal segments with minor dorsal setae slender. Smaller larvae; maximum length 3.0 mm ..... *Nestrius laqueorum*
—Frons with *fs* 5 minute or absent. Antennae hemispherical (Fig. 59). Abdominal segments with minor dorsal setae stout, spinelike. Larger larvae; maximum length 6.5 mm ..... *Gromilus laqueorum*

11 (3) Abd. IX with pleural lobes heavily sclerotised and extended ventrad; median ventral plate with 2 setae each side (Fig. 89). Ventral folds of abdomen each with transverse rows of coarse spinules (Fig. 88b) ..... *Catoptes brevicornis australis*
—Abd. IX with pleural lobes unmodified; median ventral plate with 3 setae each side (Fig. 98). Ventral folds of abdomen without transverse rows of coarse spinules ..... *Oclandius vestitus*

KEY TO PUPAE OF SNARES ISLANDS CURCULIONOIDEA

1 Antennae not elbowed, without scape, set at about right angles to rostrum ANTHRIBIDAE ... 2
—Antenna elbowed, with scape, set at an acute angle to rostrum ..... CURCULIONIDAE ... 3

2 (1) Abdomen with dorsal setae. Spiracular areas of Abd. I–V with 4–8 setae. Femora with 3 or 4 elbow setae (Fig. 7) ..... *Cacephatus aucklandicus*
—Abdomen without dorsal setae. Spiracular areas of Abd. I–V with 1 seta. Femora with 2 elbow setae (Fig. 12) ..... *Lichenobius littoralis*

3 (1) Pronotum with a group of 3 tuberculate setae each side of apex (Fig. 90b, 100). Mandibles with setae (Fig. 99). Cuticle pubescent 4
—Pronotum with a single seta each side of apex. Mandibles without setae. Cuticle glabrous 5

4 (3) Head (including rostrum) with 15 setae (Fig. 99). Mesonotal setae distinct (Fig. 100) ..... *Oclandius vestitus*
—Head with 7 setae (Fig. 90a). Mesonotal setae minute or absent (Fig. 90b) *Catoptes brevicornis*

5 (3) Femora with 1 elbow seta (Fig. 25, 30) 6
—Femora with 2 elbow setae 7

6 (5) Rostrum reaching fore tibiae. Abd. IX with pseudocerci stout, spinelike, recurved (Fig. 52) ..... *Notacalles planidorsis*
—Rostrum reaching middle tibiae. Abd. IX with pseudocerci slender, hairlike, straight (Fig. 25) ..... *Pentarthrum spadiceum*

7 (5) Mesonotum with 2 or 3 setae. Primary pterotheca armed with longitudinal rows of spinules (Fig. 40). Larger pupae—maximum length >15.0 mm ..... *Hadramphus stilbocarpae* or *Lyperobius* sp.
—Mesonotum with 1 seta or none. Primary pterotheca not armed with spinules. Smaller pupae—maximum length <7.0 mm 8

8 (7) Pseudocerci with associated seta reaching beyond apex (Fig. 65, 78). Abd. I–VI each with 2 major setae 9
—Pseudocerci with associated seta not reaching apex. Abd. I–VI each with 1 major seta 10

9 (8) Spiracular area lacking distinct setae. Metanotum with 2 setae (Fig. 76). Setae pallid ..... *Nestrius laqueorum*
—Spiracular area with 1 distinct seta. Metanotum with 1 seta (Fig. 63). Setae dark ..... *Gromilus laqueorum*

10 (8) Pseudocerci longer than dorsal seta of Abd. VIII (Fig. 20). Femora with elbow setae equal in length ..... *Exeiratus laqueorum*
—Pseudocerci shorter than dorsal seta of Abd. VIII (Fig. 52). Femora with elbow setae unequal in length ..... *Phrynixus laqueorum*

Table 1. Weevils of The Snares: distribution and habitat (+, present; –, absent; E, endemic)

	South I.	Stewart I.	The Snares	Auckland Is	Campbell I.	Larval habitat
ANTHRIBIDAE						
Cacephatus aucklandicus	–	+	+	+	–	dead wood (dry)
Lichenobius littoralis	–	+	+	–	–	crustose lichen on shore rocks
CURCULIONIDAE						
COSSONINAE						
Exeiratus laqueorum	–	–	E	–	–	dead wood (damp)
Pentarthrum spadiceum	+	+	+	+	–	dead wood
CRYPTORHYNCHINAE						
Notacalles planidorsis	+	+	+	+	+	*Hebe elliptica*, recently dead branchlets
HYLOBIINAE						
Hadramphus stilbocarpae	–	+	+	–	–	*Stilbocarpa robusta*, living rhizomes
Lyperobius sp.	+	–	+	–	–	*Anisotome acutifolia*, living crowns
PHRYNIXINAE						
Phrynixus laqueorum	–	–	E	–	–	dead wood (damp)
RHYTIRHININAE						
Gromilus laqueorum	–	–	E	–	–	free-living among roots
Nestrius laqueorum	–	–	E	–	–	free-living among roots
LEPTOPIINAE						
Catoptes brevicornis australis	–	–	E	–	–	free-living among roots
Oclandius vestitus	–	–	E	–	–	free-living among roots

Table 2. Weevils of The Snares: setal indices for larvae (excluding Anthribidae and *Lyperobius* sp.). Numbers of setae are stated only where they differ from modal number; they refer to one side only of a specimen. Italics represent minute setae; v, variable. *(Continued on following page.)*

	Modal numbers	*Exeiratus laqueorum*	*Pentarthrum spadiceum*	*Notacalles planidorsis*	*Hadramphus stilbocarpae*	*Phrynixus laqueorum*	*Gromilus laqueorum*	*Nestrius laqueorum*	*Catoptes brevicornis*	*Oclandius vestitus*
PROTHORAX										
pronotal	v	10–11	10	11	10	4+*3*	3+5	3+*5*	11	8
dorsopleural	0–3	0	0	0	0	0	0	0	3	3
ventropleural	2									
mediosternal	1					*1*				
pedal area	v	6	6	6	6	1+5	6	6	6+*1*	6
MESO-, METATHORAX										
prodorsal	1					*1*				
postdorsal	4		3			1+*3*				
dorsolateral	1–2	1	1	1	1	*1*	1	1	2	2
alar area	1–3	*2*	2	2	2	2	1	1	3	3
dorsopleural	1					*1*				
ventropleural	1					*1*				
mediosternal	1					*1*				
pedal area	v	6	6	6	6	1+5	6	6	6+*1*	6
ABDOMEN I–VIII										
prodorsal I–VII	1					*1*				
VIII	1		0			*1*				
					VII		VI, VII	VI, VII		
postdorsal I–VII	5		4		4	1+*4*	4	4		
VIII	v	1+*2*	4	5	3	1+*1*	3	3	4	4
					VII			VI, VII		
spiracular I–VII	2				1			1		

	Modal numbers	*Exeiratus laqueorum*	*Pentarthrum spadiceum*	*Notacalles planidorsis*	*Hadramphus stilbocarpae*	*Phrynixus laqueorum*	*Gromilus laqueorum*	*Nestrius laqueorum*	*Catoptes brevicornis*	*Oclandius vestitus*
spiracular VIII	1				0	0			1+*1*	
dorsopleural	2									
ventropleural	2					*2*				
laterosternal	1					*2*				
mediosternal	2					*2*				
ABDOMEN IX										
dorsal	v	1+*1*	2	5	2	1+*1*	3	3	2	3
pleural	2									
sternal	2						*2*			
ABDOMEN X										
anal lateral	1-3	1+*2*	2	1+*2*	*1*	*2*	3	1	1+*1*	2+*1*
HEAD										
dorsal	5					4	4	4	3+*1*	4
posterior	*4*									
lateral	2									
ventral	2									
frontal	5				2	2	1	2	2	2
clypeal	*2*									
labral	3									
mandibular	2									
EPIPHARYNGEAL LINING										
anterolateral	3									
anteromedian	1+*1*									
median	3									
MAXILLA										
lacinia dorsal	v	7	5	7	7	10	7	8	8	7
lacinia ventral	v	4	5	5	3	4	5	3	4	4
palpal	*1*									
stipital	1									
palpiferal	2					3				
LABIUM										
postlabial	3									
prelabial	1									
ligular	*2*									

Table 3. Weevils of The Snares: setal indices for pupae (excluding Anthribidae and *Lyperobius* sp.). Italics represent minute setae

	Exeiratus laqueorum	*Pentarthrum spadiceum*	*Notacalles planidorsis*	*Hadramphus stilbocarpae*	*Phrynixus laqueorum*	*Gromilus laqueorum*	*Nestrius laqueorum*	*Catoptes brevicornis*	*Oclandius vestitus*
Head + rostrum	3	6	5	9+2	3+3	4+*1*	4	5+*1*	7+*6*
Mandibles	0	0	0	0	0	0	0	1	2
Pronotum	8	9	8	9	4+*2*	8	7	11	13
Mesonotum	0	2	2	2	0	1	1	? *4*	3+*1*
Metanotum	1	2	2	2	1	1	2	? *4*	3+*1*
Abdomen I-V	1	3+*1*	3	5+*2*	1+*6*	3+*1*	2+*1*	3+*2*	5+*2*
Abdomen VI	1	3+*1*	3	2+*4*	1+*6*	3+*1*	2+*1*	4+*1*	5+*2*
Abdomen VII	1	3+*1*	3	2+*4*	1+*5*	3+*1*	3	6	5+*3*
Abdomen VIII	*1*	pc+3	0	1	1	4	4	4	4
Abdomen IX	pc+*1*	2	pc+0	pc+0	pc+2	pc+2	pc+1	pc+3	pc+4
Legs – femoral	2	1	1	2	2	2	2	2	2
tarsal	0	0	0	1	0	0	0	0	0

FAMILY ANTHRIBIDAE

Genus *Cacephatus* Blackburn

Blackburn, 1900, Transactions of the Royal Society of South Australia 24: 143, 151. –Holloway. 1971, Pacific Insects Monograph 27: 262.

TYPE SPECIES *Cacephatus sericeus* Blackburn, 1900.

LARVA. Body robust with strong musculature, especially in thorax. Setae numerous on lobes and folds. Head free; sides rounded, widest before middle; posterior margin entire. Anterior ocellus distinct, posterior one smaller; a third ocellar spot usually visible, situated ventrally. Endocarinal line present. Antennae minute, conical. Clypeus quadrate, pigmented basally. Hypopharyngeal bracon with characteristic median sclerome. Mandibles with incisor section elongate, bearing 2 apical teeth; molar part with serrate cutting edge. Labrum subcircular, heavily pigmented, bearing 4 setae. Epipharyngeal lining with 4 marginal setae, 3 short *mes*, and proximally with fan-shaped clusters of coarse hairs. Tormae lateral, Y-shaped. Premental sclerite broken medially, lacking extensions. Maxilla with lacinia acute, carrying 1 large basal spine. Thoracic spiracle ovate, its air-tubes simple, dorsad; abdominal spiracles smaller, circular. Legs with 2 segments of equal length. Anus terminal, 4-lobed.

Cacephatus aucklandicus (Brookes) (Fig. 2–8)

Brookes, 1951, Cape Expedition Series Bulletin 5: 43 (*Anthribus*). –Holloway, 1971, Pacific Insects Monograph 27: 263 (*Cacephatus*).

LARVA (Fig. 2–5. Maximum size 7.0 × 2.5 mm; head width 1.75 mm. Body evenly curved, slightly wider than head. Cuticle minutely asperate, with coarse spinules on Abd. IX sternal fold. Head deep yellow-brown, paling to creamy white posteriorly; epistoma, genae, and mandibles red-brown. Endocarinal line one-quarter as long as frons. Hypopharyngeal bracon rectangular, with a median projection, heavily pigmented. Maxilla dorsally with 6–8 strong setae on lacinia; 6–8 short, stout setae on spinal area in addition to finer setae.

PUPA (Fig. 6–8). Maximum length 7.0 mm. Cuticle with minute skin points. Setae pallid, fine, moderately long, mostly set on small tubercles. Pronotum with paramedian apical combs of 10–12 setae. Elbows with a group of 6 setae. Spiracular areas with a chalaza of 6–8 setae. Pseudocerci on Abd. IX pigmented, bifurcate at apex, curved ventrad. Antennae tuberculate on apical segments, reaching back to Abd. I. Primary pterotheca smooth, with a bifurcate nodule at apex; secondary pterotheca as long as primary, even though adult wing (visible inside) is greatly atrophied.

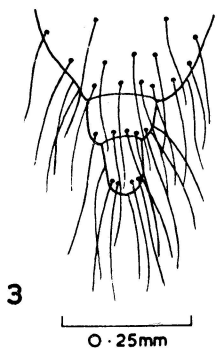
MATERIAL EXAMINED. THE SNARES: Biological Stn – under bark of dead *Senecio stewartiae*, 5 Jun 1972, 1 larva; dead *Hebe elliptica*, 7 Jan 1973, 1 larva; Muttonbird Ck – wet rotten *Olearia lyalli*, 24 Jun 1972, 3 larvae; Station Pt – under bark of dead *Hebe elliptica*, 8 July 1972, 3 larvae (CJH). AUCKLAND IS: Ewing I. – dry dead branch of *Olearia lyalli*, 8 Feb 1973, 2 pupae (CJH). STEWART I: Big South Cape I. – dead *Dracophyllum longifolium*, 8 Nov 1968, 1 larva (JCW); alt. 200 m, 10 Nov 1968, 13 larvae (JMcB); rotten *Olearia* wood on ground, 14 Feb 1969, 9 larvae (BMM).

Abbreviations used in text and figures

Abd., abdominal segment
als, anterolateral setae
ams, anteromedian setae
ant, antenna
as, alar setae
av, anterior ventriculus
cls, clypeal setae
cnp, cryptonephridium
des, dorsoepicranial setae
dlcs, dorsal lacinial setae
dls, dorsolateral setae
dpd, dorsopleural depression
dpls, dorsopleural setae
fs, frontal setae
gc, gastric caeca
hb, hypopharyngeal bracon
les, lateral epicranial setae
lig, ligula
lrms, labral setae
lsts, laterosternal setae
mes, median epipharyngeal setae
Mpto, origin of Malpighian tubules
msts, mediosternal setae
oc, ocelli
oec, oenocyte clusters
pc, pseudocerci
pda, pedal area
pds, postdorsal setae
pes, postepicranial setae
pf, palpifer
plbs, postlabial setae
pmsc, premental sclerite
poc, postoccipital condyle
prn, pronotum
prs, prodorsal setae
prv, proventriculus
ps, pleural setae
pv, posterior ventriculus
rb, rectal bracon
ss, spiracular setae
st, stipes
sts, sternal setae
t, tormae
Th, thoracic segment
ves, ventral epicranial setae
vlcs, ventral lacinial setae
vpls, ventropleural setae

Structures to which most of these abbreviations refer are annotated on Fig. 54–61.

Fig. 2–8. *Cacephatus aucklandicus*. (2–5) Larva: 2, habitus, lateral view; 3, leg; 4, epipharyngeal lining; 5, head, dorsal view. (6–8) Pupa: 6, 7, habitus, ventral and dorsal views; 8, secondary pterotheca, showing outline of wing inside.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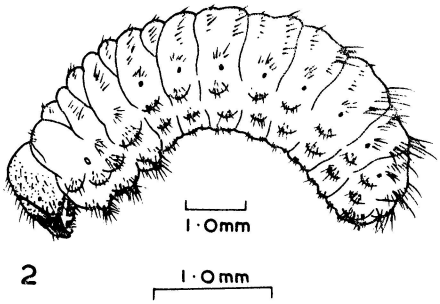
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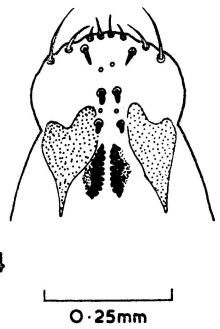
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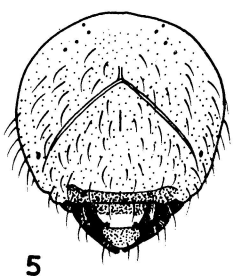
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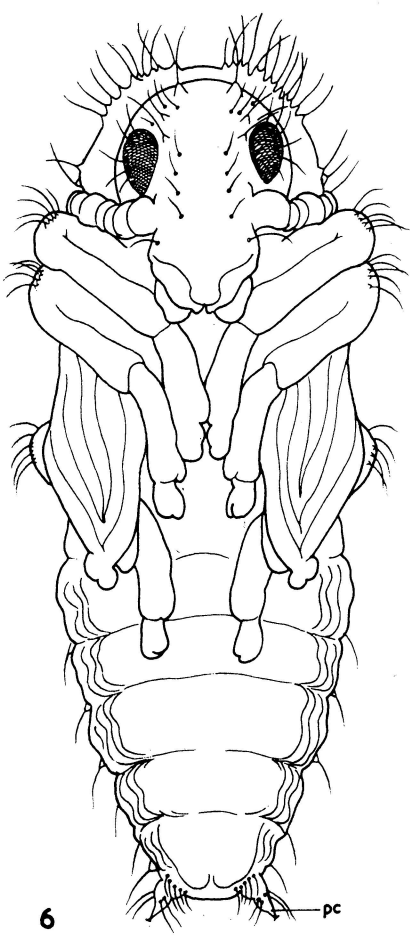
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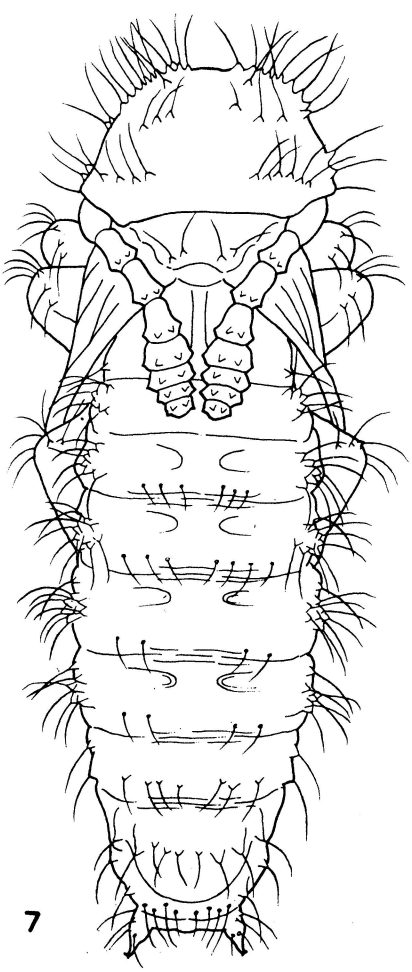
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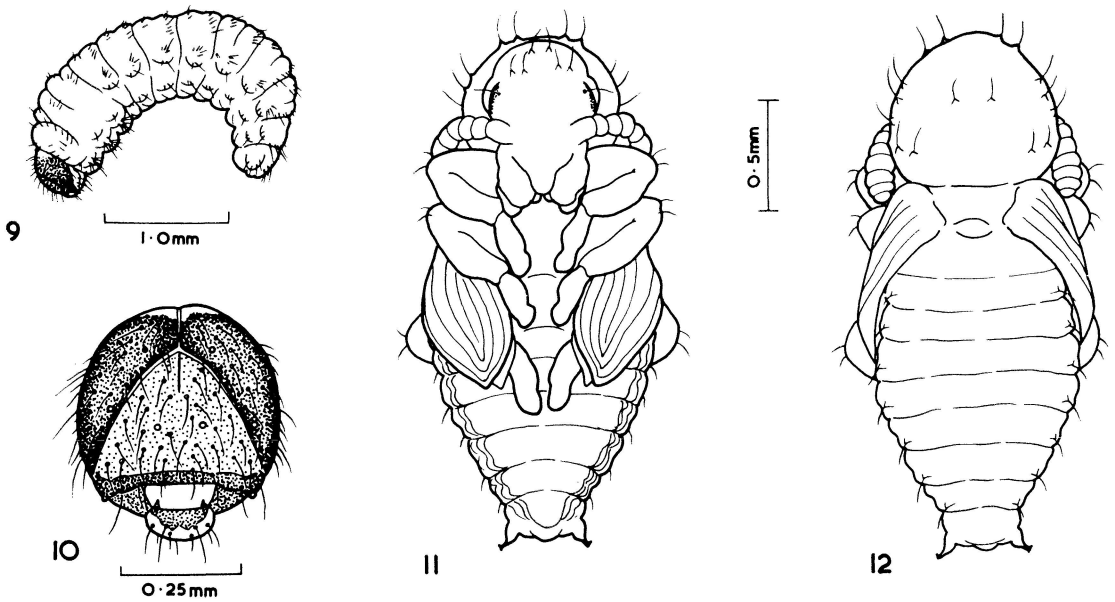


Fig. 9–12. *Lichenobius littoralis.* (9, 10) Larva: 9, habitus, lateral view; 10, head, dorsal view. (11, 12) Pupa: habitus, ventral and lateral views.

Genus *Lichenobius* Holloway

Holloway, 1970, N.Z. Journal of Science 13: 438; –1971, Pacific Insects Monograph 27: 266–8.

TYPE SPECIES *Lichenobius silvicola* Holloway, 1970.

LARVA. Body compact, densely white (fat body). Head almost as wide as thorax, evenly rounded, with posterior margin entire, bearing numerous long, fine setae; sutures narrow but distinct. Ocelli not visible. Endocarinal line present. Antennae minute, conical. Mandibles tricuspid; outer tooth longest; 2 setae aligned obliquely. Labrum transverse, with 3 setae; tormae lateral, acute. Epipharyngeal setae as in typical Curculionidae. Premental sclerite scarcely visible. Maxilla with lacinia acute, bearing 11 or 12 dorsal and 5 ventral strong setae; basal spine slender, almost as long as lacinia. Spiracles minute, circular; airtubes separated, dorsad. Legs 2-segmented; proximal segment shorter. Anus terminal, with 4 equal lobes.

Lichenobius littoralis Holloway (Fig. 9–12)

Holloway, 1970, N.Z. Journal of Science 13: 443; –1971, Pacific Insects Monograph 27: 270.

LARVA (Fig. 9, 10). Maximum size 3.0 × 0.75 mm; head width 0.5 mm. Body tapering, strongly curved behind middle, yellow (fading in ethanol). Cuticle smooth. Setae pallid, short, sparse except on head; legs bearing 6 setae on each segment. Head smoky brown, with epicranium darker than frons; epistoma, mandibles ,and labrum red-brown; setal bases clear; sensilli dark-rimmed. Frontal suture with apex rounded. Endocarinal line half as long as frons. Hypopharyngeal sclerome heavily pigmented, transverse, with distal part quadrate, proximal part bifurcate.

PUPA (Fig. 11, 12). Maximum length 2.25 mm. Cuticle smooth. Setae few, short, fine; basal tubercles minute or absent; pronotum lacking apical combs; elbows with 2 setae; abdomen with pleural setae only. Pseudocerci on Abd. IX unpigmented, bifurcate. Antennae short, reaching back to shoulders. Spiracles obsolete. Primary pterotheca smooth, its apex simple; secondary pterotheca slightly shorter than primary (wings reduced in adult).

REMARKS. *Lichenobius* larvae and pupae are more simplified in all respects than those of *Cacephatus.* The setae on most body lobes and folds are reduced in number to a level close to that typical of Curculionidae.

MATERIAL EXAMINED. THE SNARES: Skua Pt – in lichen, 25 Aug 1972, 6 larvae (DSH). STEWART I: Big South Cape I – in crustose lichen on coastal rocks 1–7 m above HWM, 20 Nov 1968, 2 pupae (JSD).

FAMILY CURCULIONIDAE

Subfamily COSSONINAE

Genus *Exeiratus* Broun

Broun, 1914, Bulletin of the N.Z. Institute 1: 128. –Kuschel 1964, Pacific Insects Monograph 7: 428.

TYPE SPECIES *Exeiratus setarius* Broun, 1914.

LARVA. Body robust, evenly curved. Cuticle thin, finely asperate, but more coarsely on sternal lobes of Abd. VIII and IX. Head subspherical; endocarinal line present. Anterior ocelli large, with corneae. Antennae conical, pubescent. Mandibles bidentate, without accessory teeth; molar part strongly produced to form cutting edge; setae aligned longitudinally. Labrum diamond-shaped, longer than wide, completely pigmented; tormae bowed, their apices divergent. Epiharyngeal lining with anterolateral setae arranged longitudinally, away from margin. Hypopharyngeal bracon dark brown. Premental sclerite trident-shaped. Posterior and median pairs of postlabial setae equally spaced. Thoracic spiracle circular, bicameral, its airtubes obliquely dorsad; abdominal spiracles much smaller, unicameral, caudad, those of Abd. VIII lateral. Anus terminal, 4-lobed.

Alimentary canal with proventriculus slender. Anterior mycetomes absent. Anterior ventriculus smooth; posterior portion abruptly narrowed, coiled as in Fig. 16. Gastric caeca slender, as long as twice width of posterior ventriculus. Malpighian tubules arising from simple ring within final coil. Hind gut proceeding caudad through coils. Cryptonephridium asymmetrical, with a caudoventral extension. Rectal bracon an unpigmented loop.

Exeiratus laqueorum Kuschel (Fig. 13–20)

Kuschel, 1964, Pacific Insects Monograph 7: 430.

LARVA (Fig. 13–17). Maximum size 5.0 × 1.5 mm; head width 1.0 mm. Setal index as in Table 2. Body of even width, terminating abruptly. Cuticle minutely asperate in transverse series, coarsely asperate on sternal folds of Abd. VIII and IX. Setae pallid, short, fine. Head mainly colourless; frons pale red, epistoma, genae, labrum, and mandibles darker. posterior margin not pigmented. *fs* 4 and 5 subequal, other *fs* shorter. Inner *cls* twice as long as outer.

PUPA (Fig. 18–20). Maximum length 4.0 mm. Setal numbers as in Table 3. Cuticle smooth. Setae redbrown, moderately long, strong, tapering, on small tubercles. Abdominal segments with *pds* reduced to 1. Pseudocerci on Abd. IX prominent, pigmented, minutely bifurcate caudad, with 1 short seta. Antennal club tuberculate. Spiracles inconspicuous. Primary pterotheca smooth, its apex simple; secondary pterotheca half as long as primary (wings vestigial in adult).

REMARKS. The heavily sclerotised mouthparts in *Exeiratus* larvae reflect their feeding habits in the unrotted parts of dead wood; they do not indicate a close relationship with Phyrnixinae. The larva and pupa are inseparable from those of *E. setarius* from Big South Cape Island.

MATERIAL EXAMINED. THE SNARES: Station Pt – 8 Jan 1967, 1 pupa (PMJ); penguin colony – 19 Jan 1971, 1 pupa; Penguin Ck – damp rotting trunk of *Olearia lyalli*, 11 Mar 1971, 67 larvae, 5 pupae; 29 Jun 1972, 2 larvae; 2 pupae; 21 Dec 1972, 1 larva; peat under dead branches, 15 Dec 1974, 1 larva, 2 pupae; 5 Jan 1975, 1 larva, 5 pupae; Mollyhawk Bay – old pine nest peg in peat, 11 Jan 1972, 9 larvae, 2 pupae (DSH); 5 May 1972, 2 larvae, 1 pupa; 31 Jan 1975, 4 larvae, 2 pupae (CJH); Comma Bay – 20 Oct 1972, 1 larva, 1 pupa (DSH); penguin rookery 17 – 29 June 1972, 3 larvae, 5 pupae; Muttonbird Ck – dead *O. lyalli*, 6 Jul 1972, 1 pupa (CJH); S. Promontory – dead root of *Anisotome acutifolia*, 6 Feb 1977, 1 larva, 1 pupa (DSH).

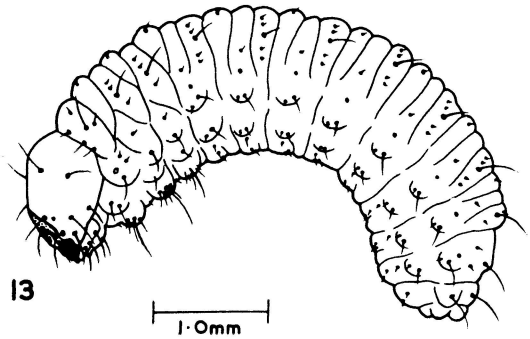
Genus *Pentarthrum* Wollaston

Wollaston, 1854, Annals and Magazine of Natural History (2) 14: 129. –Kuschel, 1964, Pacific Insects Monograph 7: 426.

TYPE SPECIES *Pentarthrum huttoni* Wollaston, 1854.

LARVA. Body robust, widest at thorax, strongly curved behind middle. Head partially retracted into thorax; endocarinal line absent; hind margin entire; *des* 1 and 2 situated well forward, level with apex of frons; *fs* 1 absent. Antennae broadly conical, pubescent. Mandibles with median grinding ridge; setae aligned longitudinally. Labrum with lateral setae as long as anterior setae. Epipharyngeal lining with innter *als* away from margin; tormae subparallel. Labial palpi with unusually elongate apical process. Premental sclerite broken before middle. Postlabium with posterior pair of setae wider apart than median pair. Abdomen with oenocyte clusters conspicuous (Fig. 30). Abd. I–VII with *pds* reduced to 4. Spiracles circular, bicameral, those of Abd. VIII lateral. Anus terminal, 4-lobed.

Alimentary canal with proventriculus simple or expanded. Anterior mycetomes absent. Posterior ventriculus 2-coiled, bearing vermiform caeca in a single row each side. Malpighian tubules arising from a thickened ring. Cryptonephridium asymmetrical, with a laminate caudoventral extension. Rectal bracon an elongate loop.



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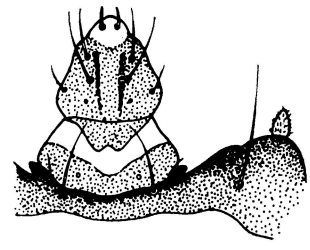

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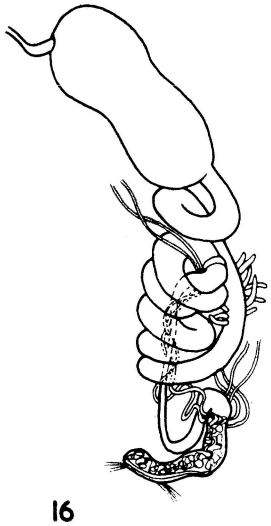

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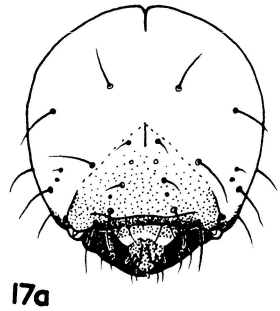

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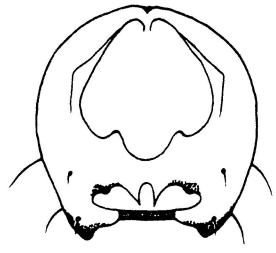

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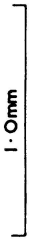

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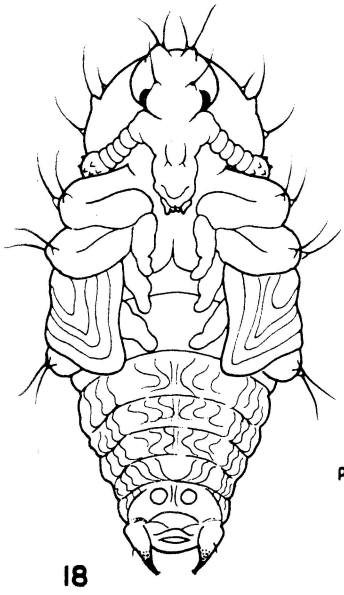

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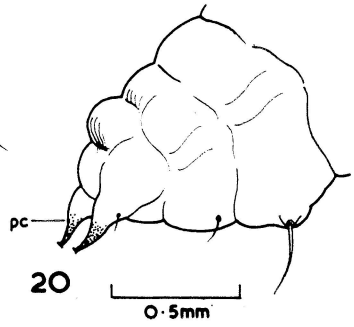

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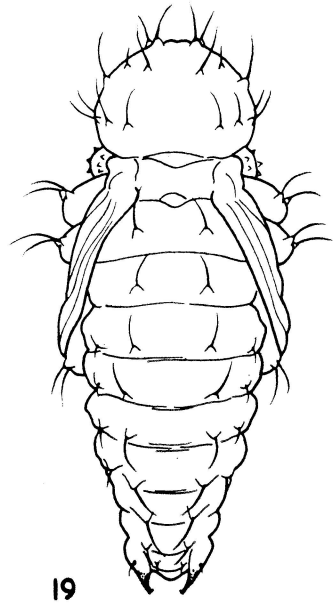

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Pentarthrum spadiceum Broun (Fig. 21–26)

Broun, 1886, Manual of N.Z. Coleoptera 4: 911. –Kuschel, 1964, Pacific Insects Monograph 7: 427.

LARVA (Fig. 21–24). Maximum size 3.0 × 1.0 mm; head width 0.5 mm. Setal index as in Table 2. Cuticle coarsely spiculate. Setae pallid, rather short, slender. Head longer than wide, its posterior margin produced. Epicranium pallid; frons and parietal areas yellow-brown; epistoma, genae, and mandibles red-brown. Anterior ocelli distinct. Antennae partially overhung by frontal projection. Hypopharyngeal bracon pigmented medially.

Alimentary canal with proventriculus subspherical (as in Phrynixinae), wider than ventriculus. Gastric caeca 8 each side, as long as twice width of posterior ventriculus. Rectal bracon pigmented.

PUPA (Fig. 25, 26). Maximum length 3.5 mm. Setal numbers as in Table 3. Cuticle glabrous. Setae pallid, slender, on minute tubercles. Elbows with only 1 seta. Abdominal segments with *pds* reduced to 2. Abd. VII with major *pds* short, spinose, on enlarged tubercle, modified to function as pseudocerci (contact points for rotatory movements in pupal cell). Abd. VIII and IX reduced. Antennal club minutely tuberculate. Primary pterotheca long, narrow, striate, reaching beyond hind tarsi; secondary pterotheca longer than primary (wings functional in adult). Rostrum reaching fore tarsi.

MATERIAL EXAMINED. THE SNARES: near penguin colony – in rotten *Olearia lyalli*, 19 Jan 1971, 1 larva; near penguin colony 3 – litter of *O. lyalli*, 11 Mar 1971, 1 larva; Penguin Ck – under dead bark of *O. lyalli*, 17 Dec 1972, 1 larva (DSH). STEWART I: Big South Cape I. – dead wood of *O. lyalli*, 14 Feb 1969, 13 larvae, 4 pupae (BMM).

Subfamily CRYPTORHYNCHINAE

Genus *Notacalles* Kuschel

Kuschel, 1964, Pacific Insects Monograph 7: 435.

TYPE SPECIES *Acalles planidorsis* Kirsch, 1877.

LARVA. Body robust, scarcely curved. Head free, widest behind middle, somewhat depressed, emarginate behind; setae complete (numbers modal); *fs* 4 and 5 subequal. Anterior ocelli distinct. Endocarinal line present. Antennae obtusely conical, pubescent, partially or completely overhung by frontal projection. Hypopharyngeal bracon clear. Mandibles with supplementary teeth; setae aligned transversely. Labrum with lateral and anterior setae subequal; tormae united at base. Spiracles circular, bicameral, those of thorax and abdomen of similar size, those of Abd. VIII lateral. Anus terminal, 4-lobed; dorsal lobe largest.

Alimentary canal similar to that of *Pentarthrum*, but with proventriculus narrow. Posterior ventriculus lacking gastric caeca.

Notacalles planidorsis (Kirsch) (Fig. 27–32)

Kirsch, 1877, Deutsche Entomologische Zeitschrift 21: 172 (*Acalles*). –Kuschel, 1964, Pacific Insects Monograph 7: 437 (*Notacalles*).

LARVA (Fig. 27–29). Maximum size 3.0 × 1.25 mm; head width 0.75 mm. Setal index as in Table 2. Cuticle minutely asperate. Setae pallid, long, slender. Head red-brown, with a pale epicranial stripe; epistoma, genae, and mandibles darker. Sutures distinct; endocarinal line three-quarters as long as frons. Antennae covered by frontal projection. Clypeus with inner setae twice as long as outer. Labral tormae united on proximal one-third; stem thickened, its base expanded. Premental sclerite trident-shaped.

PUPA (Fig. 30–32). Maximum length 3.0 mm. Setal numbers as in Table 3. Cuticle glabrous. Setae pallid, long, slender, on minute tubercles. Elbows with only 1 seta. Abdominal segments with *pds* reduced to 2. Pseudocerci dorsad, their tips recurved, lacking associated setae. Antennal club minutely tuberculate. Spiracles inconspicuous. Primary pterotheca striate, reaching hind elbows; secondary pterotheca absent.

REMARKS. Although the numbers and arrangement of setae in pupae of *Notacalles* and *Pentarthrum* are strikingly similar, the larvae show considerable divergence.

MATERIAL EXAMINED. CAMPBELL I: Camp Cove – subcortical and in pith of *Hebe elliptica* twigs, 16 Nov 1975, 16 larvae, 3 pupae; S.E. Harbour – in *H. elliptica*, 12 Dec 1975, 28 larvae, 4 pupae (BMM).

Subfamily HYLOBIINAE

Genus *Lyperobius* Pascoe

Pascoe, 1876, Annals and Magazine of Natural History (4) 17: 54.

TYPE SPECIES *Lyperobius huttoni* Pascoe, 1876.

Fig. 13–20. *Exeiratus laqueorum.* (13–17) Larva: 13, habitus, lateral view; 14, labrum, clypeus, frontal margin, and antenna; 15, epipharyngeal lining; 16, alimentary canal; 17, head (a, dorsal view; b, ventral view). (18–20) Pupa: 18, 19, habitus, ventral and dorsal views; 20, terminal segments, lateral view.

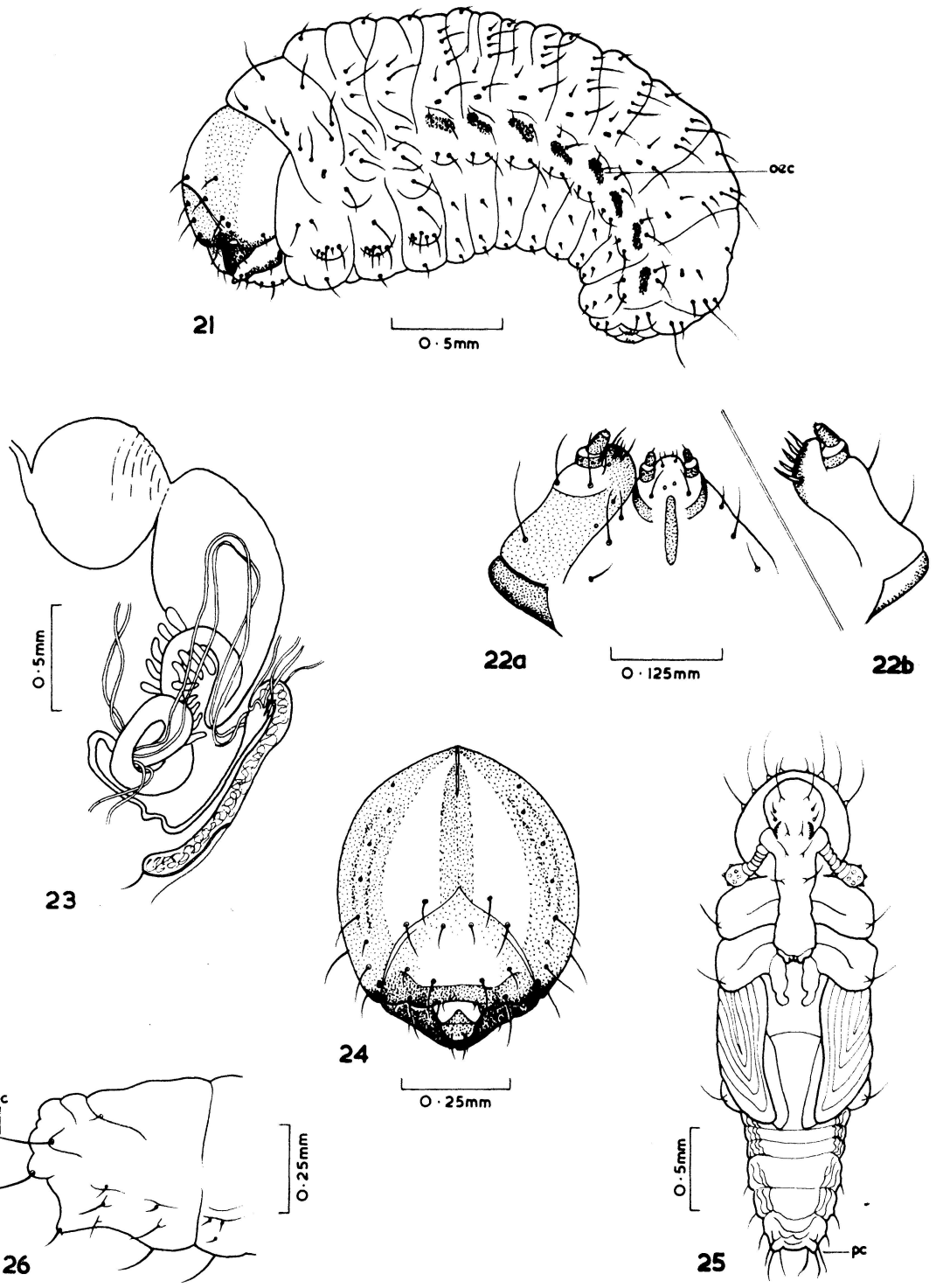


Fig. 21–26. *Pentarthrum spadiceum.* (21–24) Larva: 21, habitus, lateral view; 22, maxilla and labium (a, ventral view; b, maxilla, dorsal view); 23, alimentary canal; 24, head, dorsal view. (25, 26) Pupa: 25, habitus, ventral view; 26, terminal segments, lateral view.

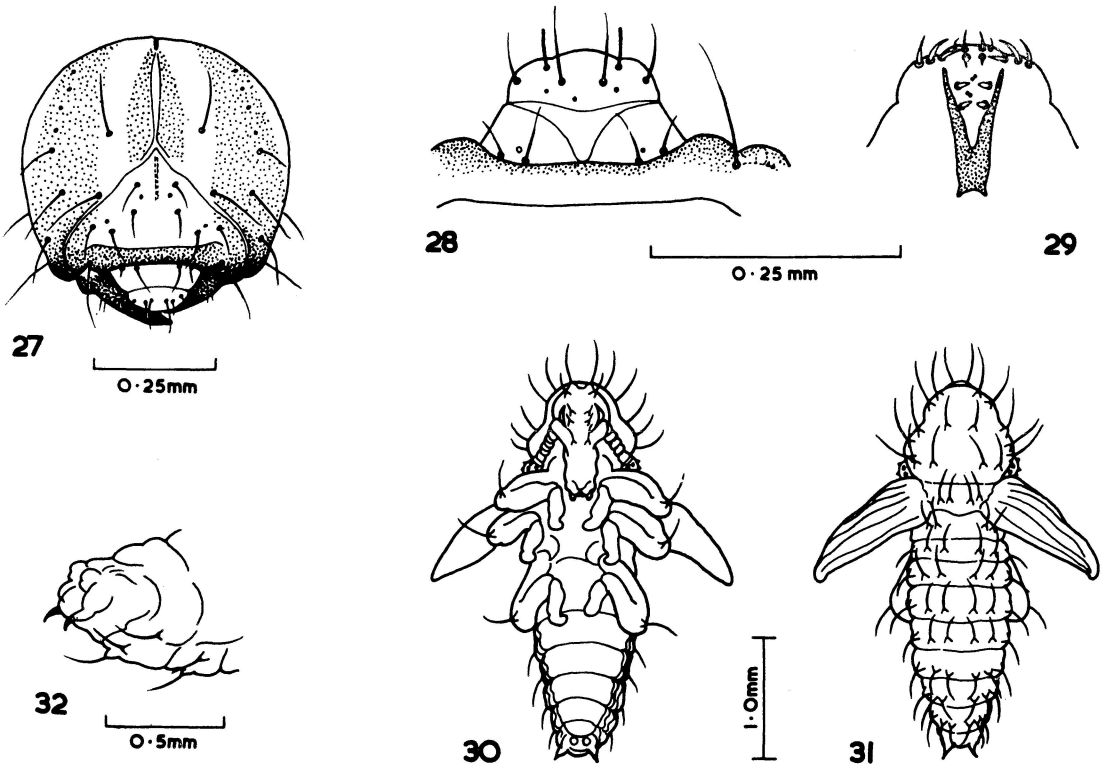


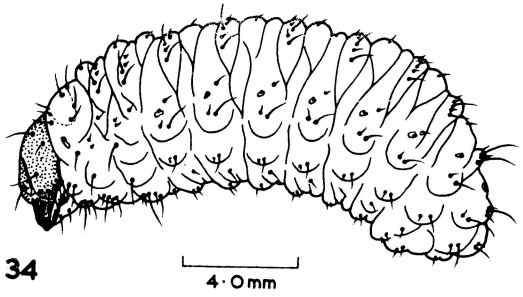
Fig. 27–32. *Notacalles planidorsis.* (27–29) Larva: 27, head, dorsal view; 30, labrum, clypeus, frontal margin, and antenna; 29, epipharyngeal lining. (30–32) Pupa: 30, 31, habitus, ventral and dorsal views; 32, terminal segments, lateral view.

LARVA. Body very robust, dense creamy white; pronotum pigmented; Abd. IX transverse, depressed. Head partially retracted, evenly rounded in outline, emarginate behind; endocarinal line present; *fs* 4 slightly longer than *fs* 5, other *fs* obsolete; anterior ocelli strong, with corneae; post-occipital condyles obtuse-angled. Antennae acute, laterad on raised cushions, partly covered by frontal projection. Hypopharyngeal bracon clear. Mandibles with incisor section bifid at apex, projecting at base (supplementary tooth); setae aligned longitudinally. Labrum transverse, pigmented; lateral setae short; tormae bowed. Spiracles (Fig. 33) pear-shaped, conspicuous, with circular orifice; airtubes large, annulated, pigmented, excavate on outer side. Abd. VIII spiracles as large as thoracic, on dorsum. Anus subterminal, 4-lobed.

Alimentary canal with proventriculus simple. Anterior ventriculus smooth, bulky; posterior portion half as wide, 2-coiled. Gastric caeca finger-shaped. Malpighian tubules 4 + 2, arising from thickenings on either side of ileo-colic valve. Cryptonephridium well developed, symmetrical. Rectal bracon an unpigmented ring.

PUPA. Setal numbers as in Table 3. Cuticle glabrous. Setae dark, tapering, mounted on small tubercles, strongest on head and pronotum. Elbows with 2 subequal setae. Pseudocerci on Abd. IX short, strongly curved, pigmented, without associated setae. Antennal club smooth. Spiracles circular, prominent. Primary pterotheca striate, with spinules along ridges and on dorsal (sutural) margin; secondary pterotheca slightly shorter than primary.

MATERIAL EXAMINED (all specimens undetermined). S. WESTLAND: Gertrude Saddle – 1600 m, ex *Aciphylla congesta,* 5 Feb 1963, 1 larva (JIT); Olivine Ra. – Limbo Ridge, in leaf bases and crowns of *A. congesta,* Feb 1975, 5 larvae, 2 pupae (JSD). N. CANTERBURY: Mt Harper – ex *A. aurea,* 14 Feb 1962, 4 larvae (GFW). NELSON: Mt Owen – 1700 m, ex *Anisotome* sp., 29 Dec 1963, 1 larva (JIT); Mt Arthur – 1700 m, roots of *Aciphylla ferox,* 16 Nov 1969, 3 larvae, 1 pupa (BMM); Mt Murchison – 1400 m, ex *A. colensoi,* 21 Nov 1971, 2 larvae (JSD).



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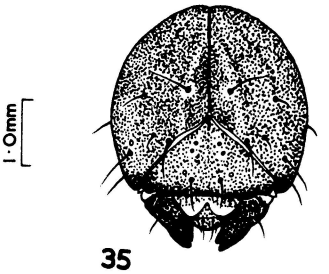

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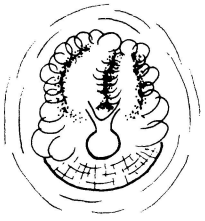

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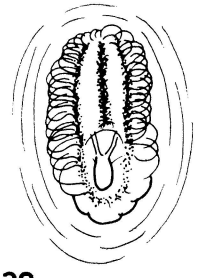

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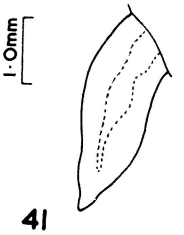

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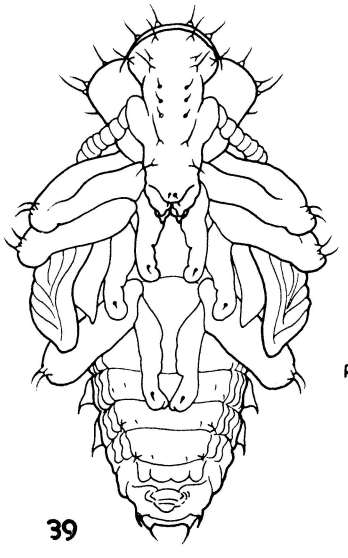

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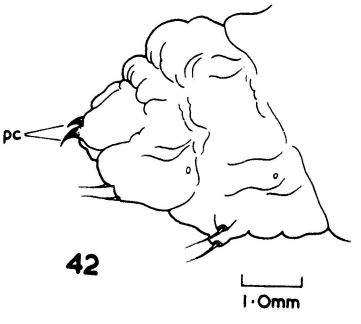

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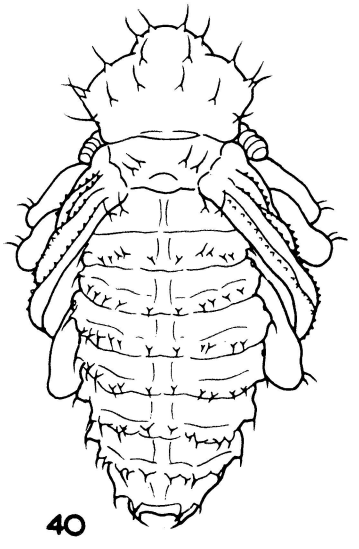

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Genus *Hadramphus* Broun

Broun, 1910, Transactions and Proceedings of the N.Z. Institute 43: 104. –Kuschel, 1971, Pacific Insects Monograph 27: 240.

TYPE SPECIES *Hadramphus spinipennis* Broun, 1910.

LARVA. The only difference from *Lyperobius* at the generic level that I can see is in the shape of the spiracles. The airtubes in *Hadramphus* are longer and more parallel, and the orifice ovate. I have not examined larvae of either *H. spinipennis* from the Chatham Islands or *H. tuberculatus* (Pascoe) from Banks Peninsula, South Island.

Hadramphus stilbocarpae Kuschel (Fig. 34–42)

Kuschel, 1971, Pacific Insects Monograph 27: 240.

LARVA (Fig. 34–38). Maximum size 17.5 × 6.5 mm; head width 3.25 mm. Setal index as in Table 2. Cuticle closely spiculate. Head dark black-brown. Anterior ocelli distinct, posterior ones faint. Endocarinal line short, one-fifth as long as frons. Ecdysial sulcus dark, half as long as coronal suture. Epipharyngeal lining with all setae red-brown. Premental sclerite dark; anterior median arm truncate, posterior acute. Maxilla dark greenish-brown except around setae. Alimentary canal with gastric caeca finger-shaped, short, clustered on lower part of coil.

PUPA (Fig. 39–42). Maximum length 17.0 mm. Setal numbers as in Table 3. Similar to *Lyperobius* pupa except that primary pterotheca somewhat bullate, and secondary pterotheca three-quarters as long as primary.

MATERIAL EXAMINED. THE SNARES: in *Stilbocarpa* roots, 10 Jan 1967, 5 larvae (PMJ); Signpost Hill – litter sample 71/40, 11 Mar 1971, 1 larva; Station Pt – live stem of *Stilbocarpa*, 4 May 1972, 1 larva (DSH); Hoho Bay – S side, woody stem of *Stilbocarpa*, 8 Jun 1972, 6 larvae (CJH); Sinkhole Drain – in peat under rotten *Olearia lyalli*, 5 Nov 1972, 2 larvae; penguin colony 16, E end of Sinkhole Flat – in peat under *Stilbocarpa*, 3 Dec 1974, 1 pupa; 4 Dec 1974, 3 larvae (DSH); 4 Dec 1974, 1 pupa (CJH).

Subfamily PHRYNIXINAE

Genus *Phrynixus* Pascoe

Pascoe, 1875, Annals and Magazine of Natural History (4) 16: 221. –Kuschel, 1964, Pacific Insects Monograph 7: 476.

TYPE SPECIES *Phrynixus terreus* Pascoe, 1875.

LARVA. Body moderately slender, evenly curved, with thin cuticle; pronotal shield unpigmented. Head free, depressed in front, colourless or lightly pigmented; anterior extremities and hind margin dark brown; sutures not visible; endocarinal line short, dark; *fs* 4 and 5 subequal, other *fs* obsolete; anterior ocelli distinct. Antennae elongate, narrowly conical, pubescent, on a raised cushion. Mandibles bidentate, with raised, corrugated molar section. Labrum longer than wide; lateral setae small; tormae bowed inward. Epipharyngeal lining with *als* arranged longitudinally, away from margin; major *ams* strongly curved. Maxilla with lacinia acute, bearing 9 or 10 *dlcs*; basal *vlcs* situated on papifer. Spiracles circular; those of thorax and Abd. VII and VIII bicameral, with annulate airtubes; others with airtubes often rudimentary; that of Abd. VIII on dorsum. Anus subterminal, 6-lobed.

Alimentary canal with proventriculus grossly enlarged. Mycetomes present around cardiac valve. Anterior ventriculus short, smooth; posterior portion one-third as wide, arranged as in Fig. 45. Gastric caeca elongate, narrow, tapering. Malpighian tubules arising from a simple ring. Cryptonephridium short, extended ventrally. Rectal bracon not visible.

Phrynixus laqueorum Kuschel (Fig. 43–53)

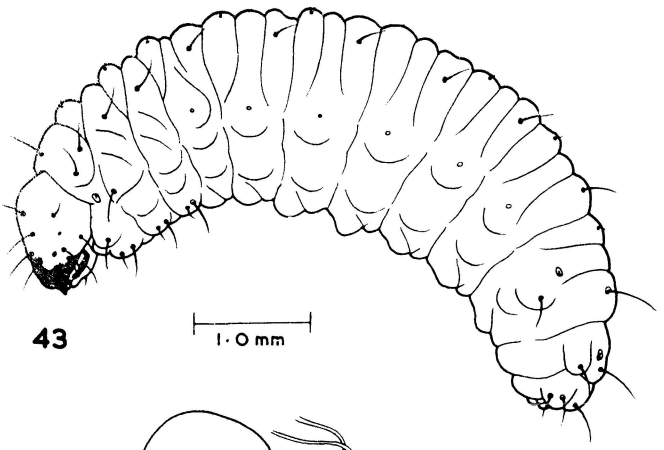
Kuschel, 1964, Pacific Islands Monograph 7: 477.

LARVA (Fig. 43–50). Maximum size 6.0 × 2.0 mm; head width 1.0 mm. Setal index as in Table 2. Cuticle smooth except for a series of minute asperities. Labrum with anterior lobe unpigmented. Spiracles of Abd. I–VI with airtubes rudimentary. Alimentary canal with a gastric caecum on either side of lower coil, four times longer than width of posterior ventriculus.

PUPA (Fig. 51–53). Maximum length 5.0 mm. Setal numbers as in Table 3. Cuticle glabrous. Setae black, strong, mounted on elongate tubercles, some on head and pronotum weakly hooked. Abd. I–VIII with 1 major seta, the others minute. Elbow setae unequal. Pronotum nodulose. Pseudocerci weak, acute, with 1 short seta, over-reached by large, tuberculate setae of Abd. VIII. Antennal club tuberculate. Scutellum obsolete. Primary pterotheca striate–bullate; secondary pterotheca represented by a skin-flap, one-tenth as long as primary (adults apterous).

MATERIAL EXAMINED (from dead wood of *Olearia*

Fig. 33. *Lyperobius* sp. larva, spiracle of Abd. IV. **Fig. 34–42.** *Hadramphus stilborcarpae*. (34–38) Larva: 34, habitus, lateral view; 35, head, dorsal view; 36, epipharyngeal lining; 37, antenna; 38, spiracle of Abd. IV. (39–42) Pupa: 39, 40, habitus, ventral and dorsal views; 41, secondary pterotheca, showing outline of wing inside; 42, terminal segments, lateral view.



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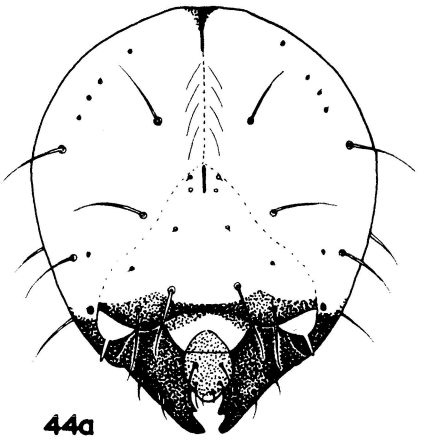
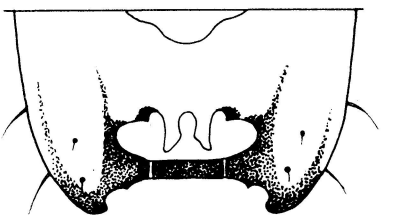
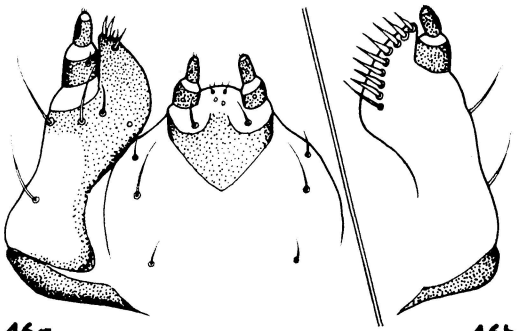


44a



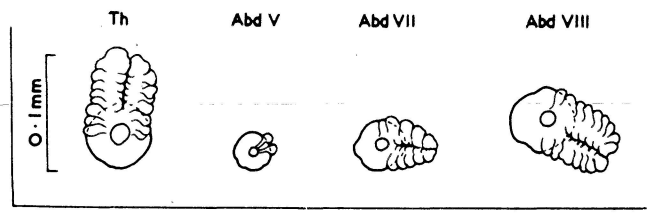
44b



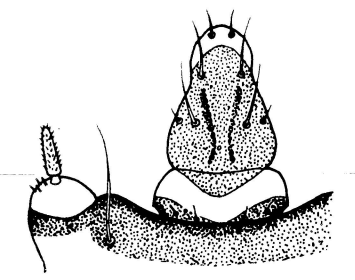
46a 46b

47

48



49



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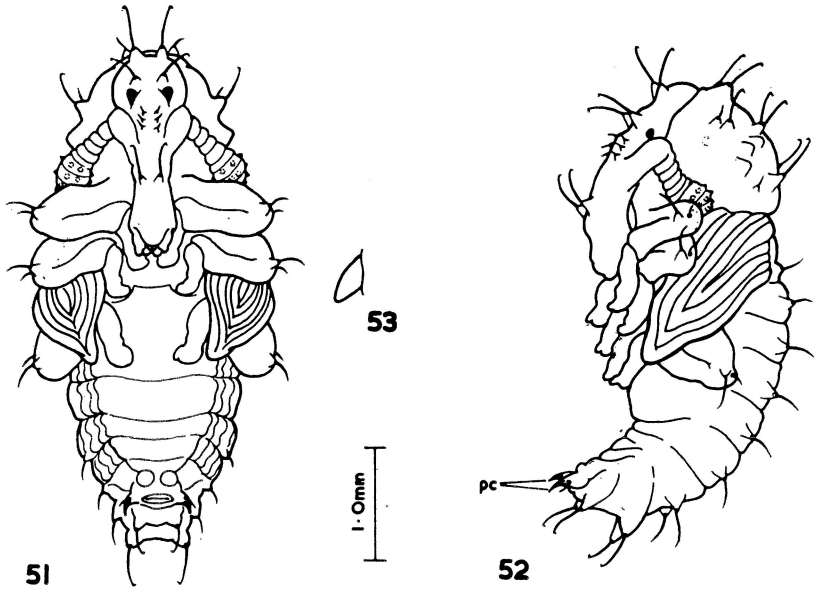


Fig. 43–50. *Phrynixus laqueorum*, larva: 43, habitus, lateral view; 44, head (a, dorsal view; b, ventral view, anterior part); 45, alimentary canal; 46, maxilla and labium (a, ventral view; b, maxilla, dorsal view); 47, mandible; 48, epipharyngeal lining; 49, spiracles, showing alignment; 50, labrum, clypeus, frontal margin, and antenna. **Fig. 51–53.** *P. laqueorum*, pupa: 51, 52, habitus, ventral and lateral views; 53, secondary pterotheca.

lyalli, unless otherwise stated). THE SNARES: Broughton I. – in *O. lyalli* litter, 18 Feb 1971, 1 larva; Penguin Ck – 11 Mar 1971, 8 larvae, 5 pupae (DSH); Muttonbird Ck – 24 Jun 1972, 3 larvae (CJH); penguin rookery 16 – 29 Jun 1972, 11 larvae (DSH); penguin rookery 17 – 29 Jun 1972, 8 larvae (CJH); Comma Bay – 20 Oct 1972, 6 larvae (DSH); Mollyhawk Bay – 31 Jan 1975, 12 larvae (CJH).

Subfamily RHYTIRHININAE

Genus *Gromilus* Blanchard

Blanchard, 1853, Voyage au Pôle Sud et dans l'Océanie sur les corvettes l'Astrolabe et la Zélé 4: 208. –Kuschel, 1964, Pacific Insects Monograph 7: 477.

TYPE SPECIES *Gromilus insularis* Blanchard, 1853.

LARVA. Body moderately robust, evenly curved. Head free, slightly emarginate behind; endocarinal line absent; sutures distinct, *fs* 4 long, other *fs* obsolete; *des* 3 within frontal suture; clypeal setae minute. Anterior ocelli distinct. Antennae subglobose. Hypopharyngeal bracon with paramedian triangular maculae. Labrum pigmented; lateral seta minute. Tormae convergent, not joined at base. Major abdominal setae very long, slender; minor setae coarse, spinelike. Abd. VI and VII with *pds* reduced to 4. Spiracles small, circular, bicameral. Anus terminal, 4-lobed, with 3 lateral setae.

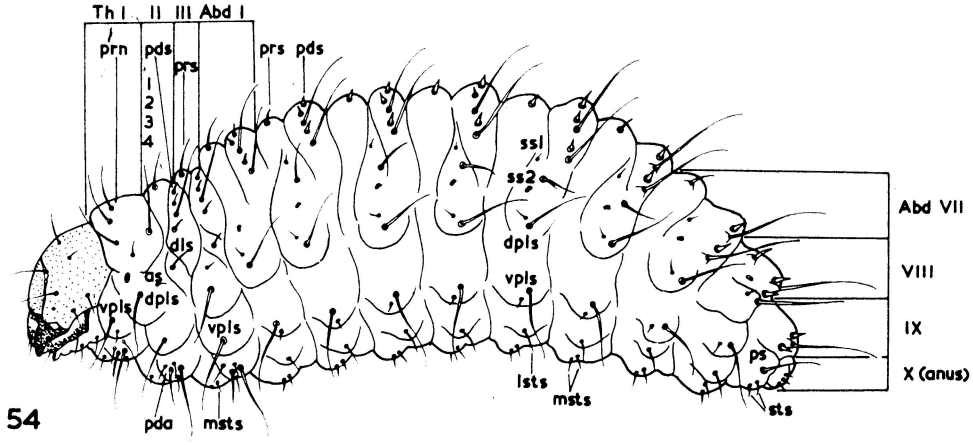
Alimentary canal with proventriculus striate internally. Mycetomes usually present around cardiac valve. Ventriculus with 2 coils; gastric caeca usually present. Malpighian tubules 4 + 2. Cryptonephridium weakly developed. Rectal bracon an unpigmented ring.

Gromilus laqueorum Kuschel (Fig. 54–65)

Kuschel, 1964, Pacific Islands Monograph 7: 461.

LARVA (Fig. 54–61). Maximum size 6.5 × 2.5 mm; head width 1.0 mm. Setal index as in Table 2. Cuticle coarsely spiculate, strongly sclerotised around all setal groups. Head yellow, unpatterned, small in relation to body size, widest before middle. Premental sclerite indistinct anteriorly; posterior extension acute. Alimentary canal with a ring of 8 small, globose mycetomes around cardiac valve; gastric caeca as long as width of posterior ventriculus, tapering, 3 each side of lower coil.

PUPA (Fig. 62–65). Maximum length 5.0 m. Setal numbers as in Table 3. Cuticle glabrous. Setae black on proximal one third, pallid distally, long, finely tapering, on small tubercles. Mesonotum and meta-



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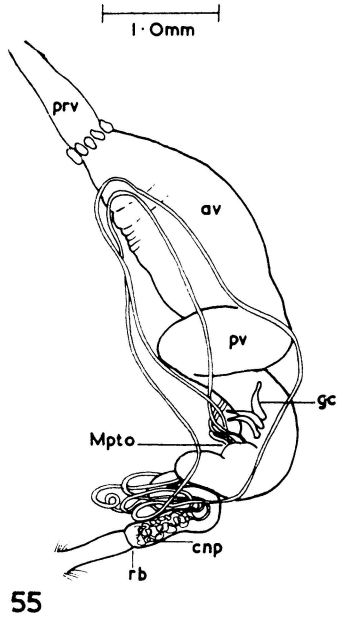

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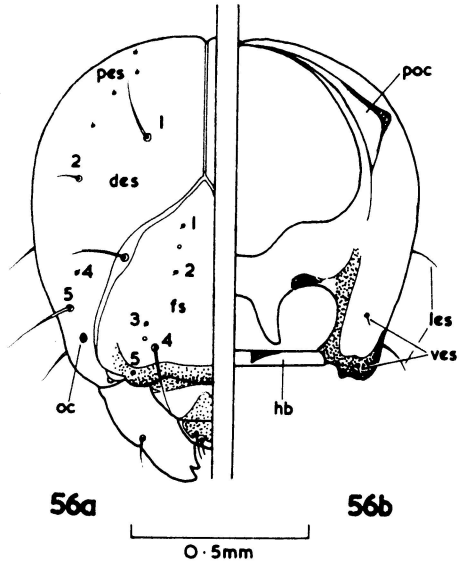
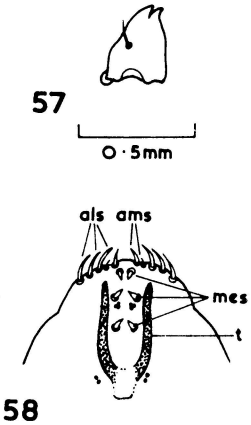


56a

0·5mm

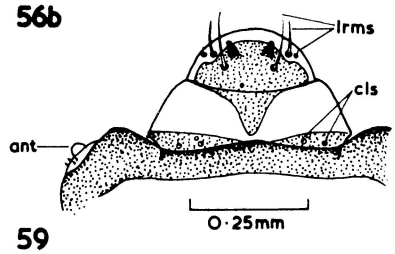
56b



58

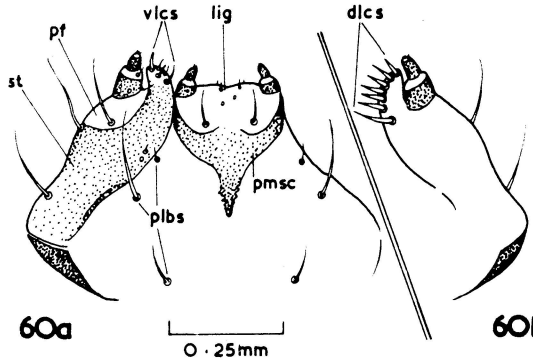
57

0·5mm



0·25mm

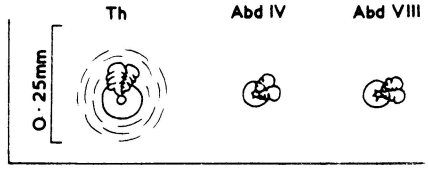
59



60a

0·25mm

60b



61

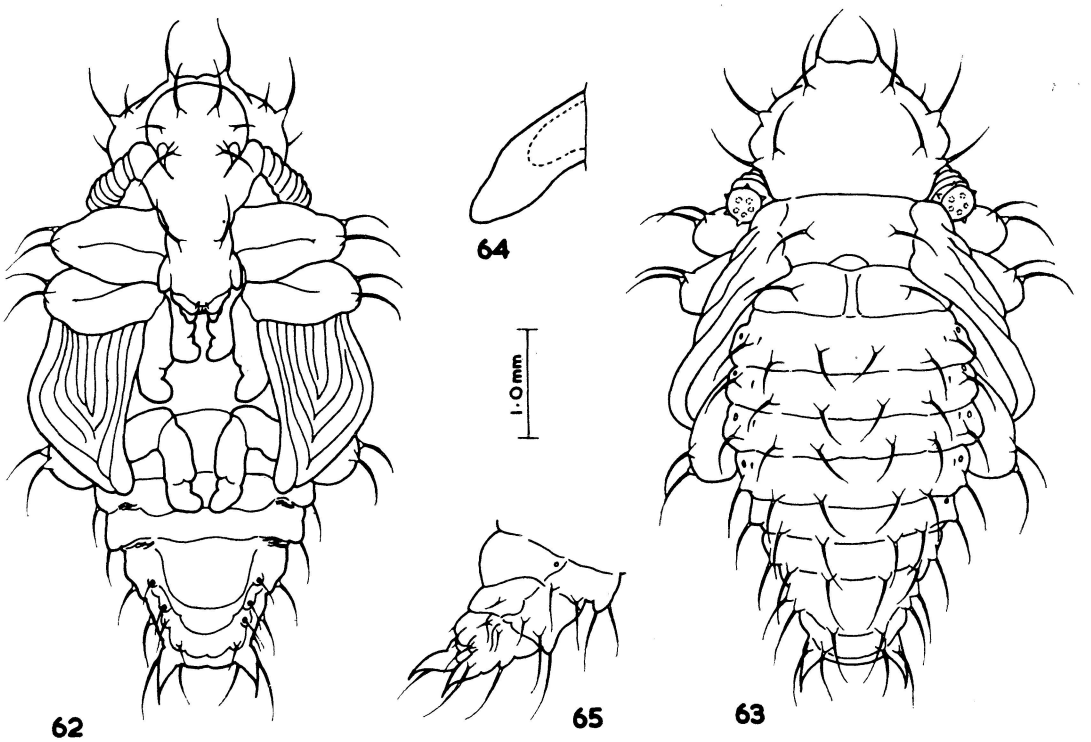


Fig. 54–61. *Gromilus laqueorum,* larva: 54, habitus, lateral view; 55, alimentary canal; 56, head (a, dorsal view; b, ventral view); 57, mandible; 58, epipharyngeal lining; 59, labrum, clypeus, frontal margin, and antenna; 60, maxilla and labium (a, ventral view; b, maxilla, dorsal view); 61, spiracles, showing alignment. **Fig. 62–65.** *G. laqueorum,* pupa: 62, 63, habitus, ventral and dorsal views; 64, secondary pterotheca, showing outline of wing inside; 65, terminal segments, lateral view.

notum each with 1 strong seta. Abd. I–VI with major spiracular setae as long as dorsal setae. Paired femoral setae similar in length but of unequal thickness. Pseudocerci black tipped, thorn-like, overreached by associated seta. Antennal club tuberculate. Primary pterotheca finely striate, with a small apical tubercle; secondary pterotheca reduced, half as long as primary.

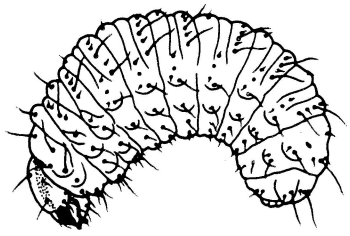
REMARKS. Among the southern, insular species *G. laqueorum* shows no obvious divergence in larval characters from *G. insularis* or from an as yet undescribed species on Big South Cape Island. *G. exiguus* (Brookes) has longer, darker setae with more distinct sclerotisation. In *G. veneris* (Kirsch) this sclerotisation is lacking and the cuticle is without spicules. Species separation is easier with *Gromilus* pupae than with the larvae. In *G. exiguus,* for instance, the major spiracular seta is short, whereas in the northern *G. thoracicus* (Broun) it is obsolete. In *G. insularis robustus* (Brookes) the femoral setae are unequal in length; in *G. thoracicus* the proximal one is both short and pallid.

MATERIAL EXAMINED. THE SNARES: Daption Rocks – on *Tillaea moschata,* 22 Feb 1971, 11 larvae (DSH); Biological Stn – *Olearia lyalli* rootlets, 27 Jan 1972, 2 larvae; 1 Feb 1972, 3 larvae (DSH, CJH); 15 Mar 1972, 3 pupae (DSH); Signpost Hill – under *Stilbocarpa robusta,* 26 Jun 1972, 2 larvae, 3 pupae; penguin rookery 16 – *O. lyalli* rotten wood on peat, 29 Jun 1972, 4 larvae, 3 pupae (DSH); 3–4 Dec 1974, 46 larvae, 23 pupae (DSH, CJH); Muttonbird Ck – 6 July 1972, 2 pupae (CJH); Sinkhole Drain – 5 Nov 1972, 4 larvae, 3 pupae; Rima I., Western Chain – mats of *Tillaea,* 26 Nov 1974, 19 larvae, 1 pupa (DSH).

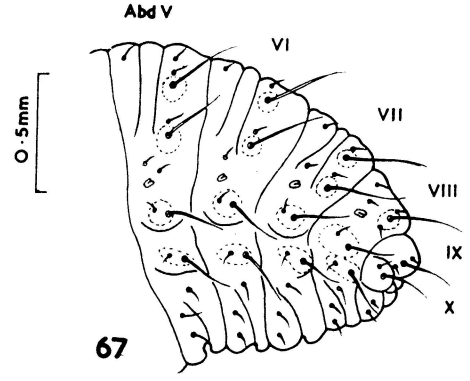
Genus *Nestrius* Broun

Broun, 1893, Manual of N.Z. Coleoptera (7): 1480. –Kuschel, 1964, Pacific Insects Monograph 7: 468.

TYPE SPECIES *Nestrius serripes* Broun, 1893.



66



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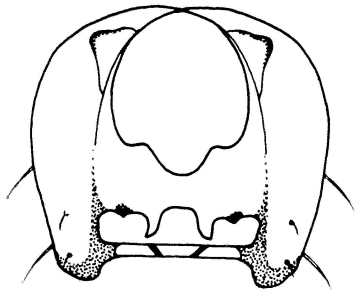
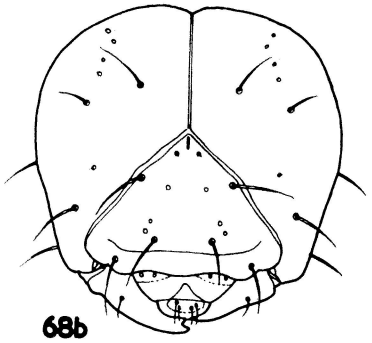
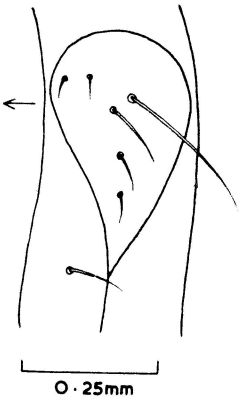


68a



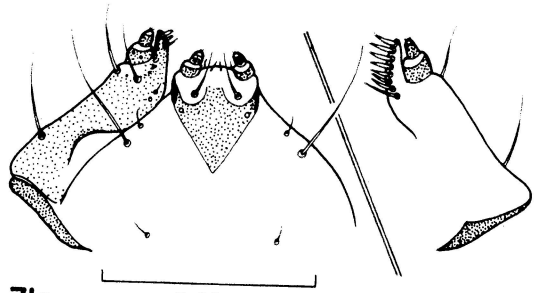
68b

0·5mm



69

0·25mm



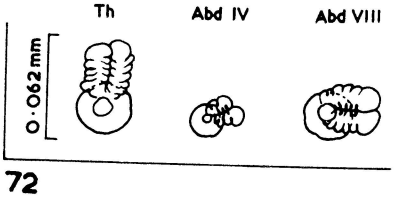
71a

0·25mm

71b

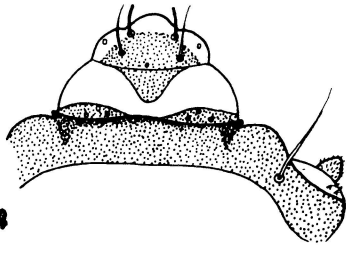
70

0·125mm



72

73



74

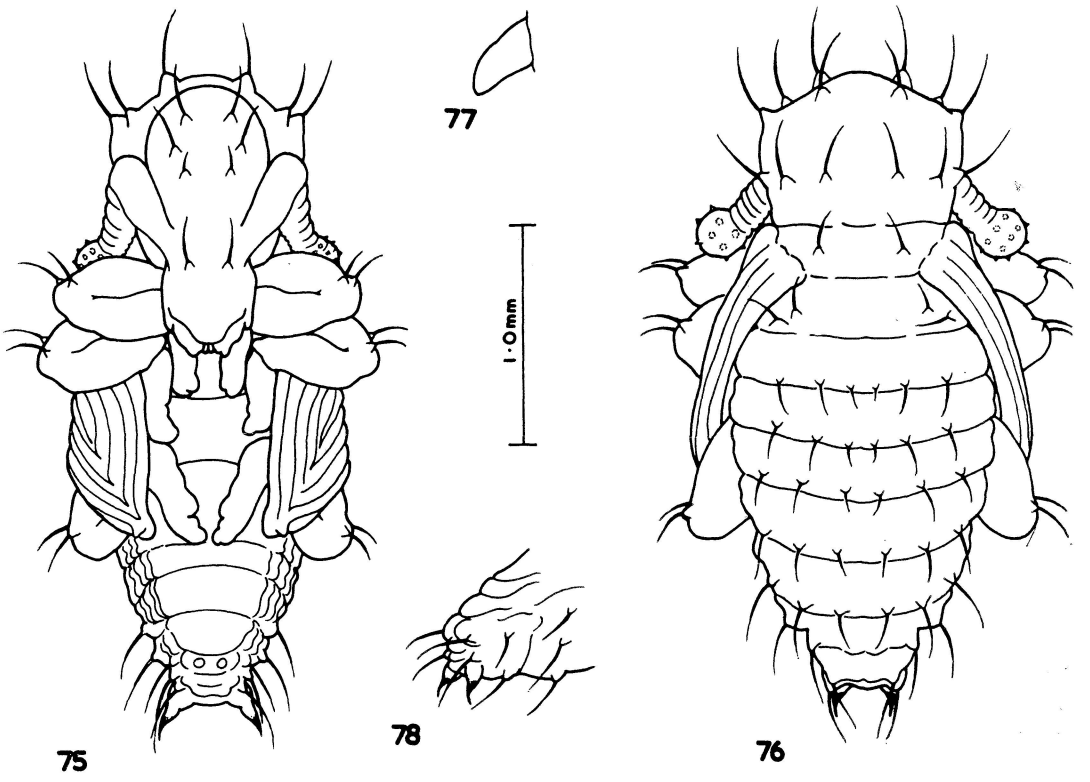


Fig. 66–74. *Nestrius laqueorum*, larva: 66, habitus, lateral view; 67, terminal segments, lateral view, showing sclerotised areas; 68, head (a, ventral view; b, dorsal view); 69, pedal lobe; 70, epipharyngeal lining; 71, maxilla and labium (a, ventral view; b, maxilla, dorsal view); 72, spiracles, showing alignment; 73, mandible; 74, labrum, clypeus, frontal margin, and antenna. **Fig. 75–78.** *N. laqueorum*, pupa: 75, 76, habitus, ventral and dorsal views; 77, secondary pterotheca; 78, terminal segments, lateral view.

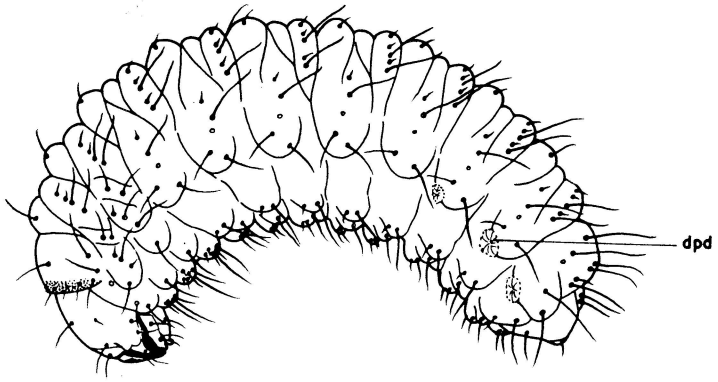
LARVA. Body moderately robust, of even width. Head partially retracted, depressed, widest behind middle, emarginate behind; sides convergent; endocarinal line absent; *fs* 5 usually obsolete; *des* 3 just on frontal plate. Antennae broadly conical. Mandibles bidentate, wide, compressed. Hypopharyngeal bracon usually clear. Labrum pigmented, its lateral setae minute; tormae short, thick, subparallel. Major abdominal setae long, minor setae short, all slender. Pedal lobes with 1 major seta. Anus terminal, 4-lobed. Alimentary canal not examined.

Nestrius laqueorum Kuschel (Fig. 66–78)

Kuschel, 1964, Pacific Insects Monograph 7: 469.

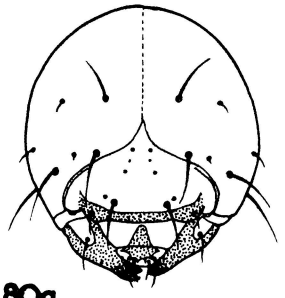
LARVA (Fig. 66–74). Maximum size 3.0 × 0.75 mm; head width 0.6 mm. Setal index as in Table 2. Cuticle coarsely but not densely spiculate. Head pale yellow-brown; anterior extremities reddish. *fs* 5 well developed. Both ocelli faint. Hypopharyngeal bracon with paramedian diagonal maculae. Premental sclerite indistinct anteriorly; posterior extension acute. Maxilla with lacinia reaching apex of palpi. Abdomen with *pds* 1 as short as *pds* 2 on Abd. I–V, absent on Abd. VI and VII (as in *Gromilus*).

PUPA (Fig. 75–78). Maximum length 2.75 mm. Setal numbers as in Table 3. Cuticle glabrous. Setae pallid, long, tapering, on short tubercles. Mesonotum with 1 seta, metanotum with 2 setae. Abd. I–VI with 2 dorsal setae; spiracular setae obsolete. Paired femoral setae long, subequal. Pseudocerci strong, pigmented, acute, dorsad, over-reached by associated seta. Antennal club minutely tuberculate. Scutellum not visible. Primary pterotheca finely striate, its apex



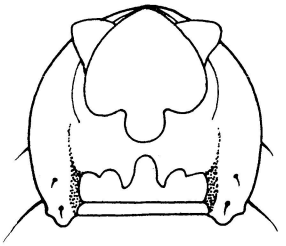
79

2·0mm

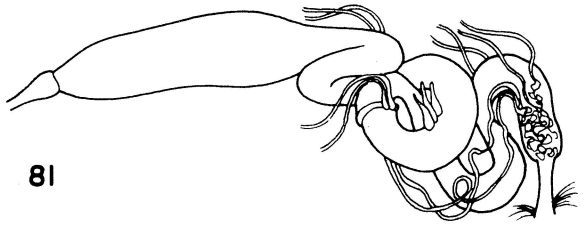


80a

1·0mm



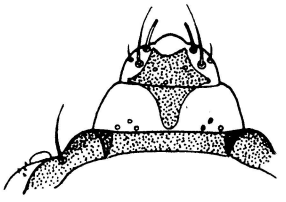
80b



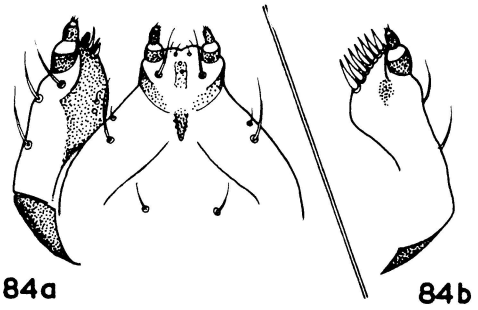
81

82

0·5mm



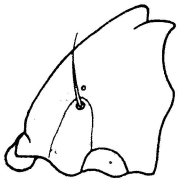
83



84a

84b

0·5mm



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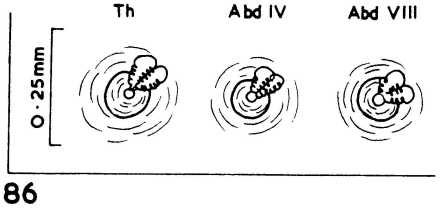
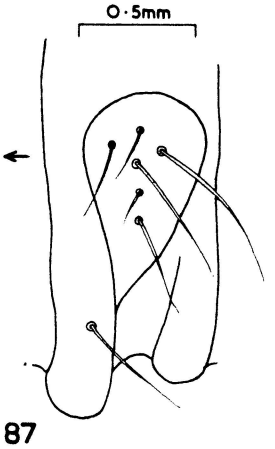


86

0·5mm



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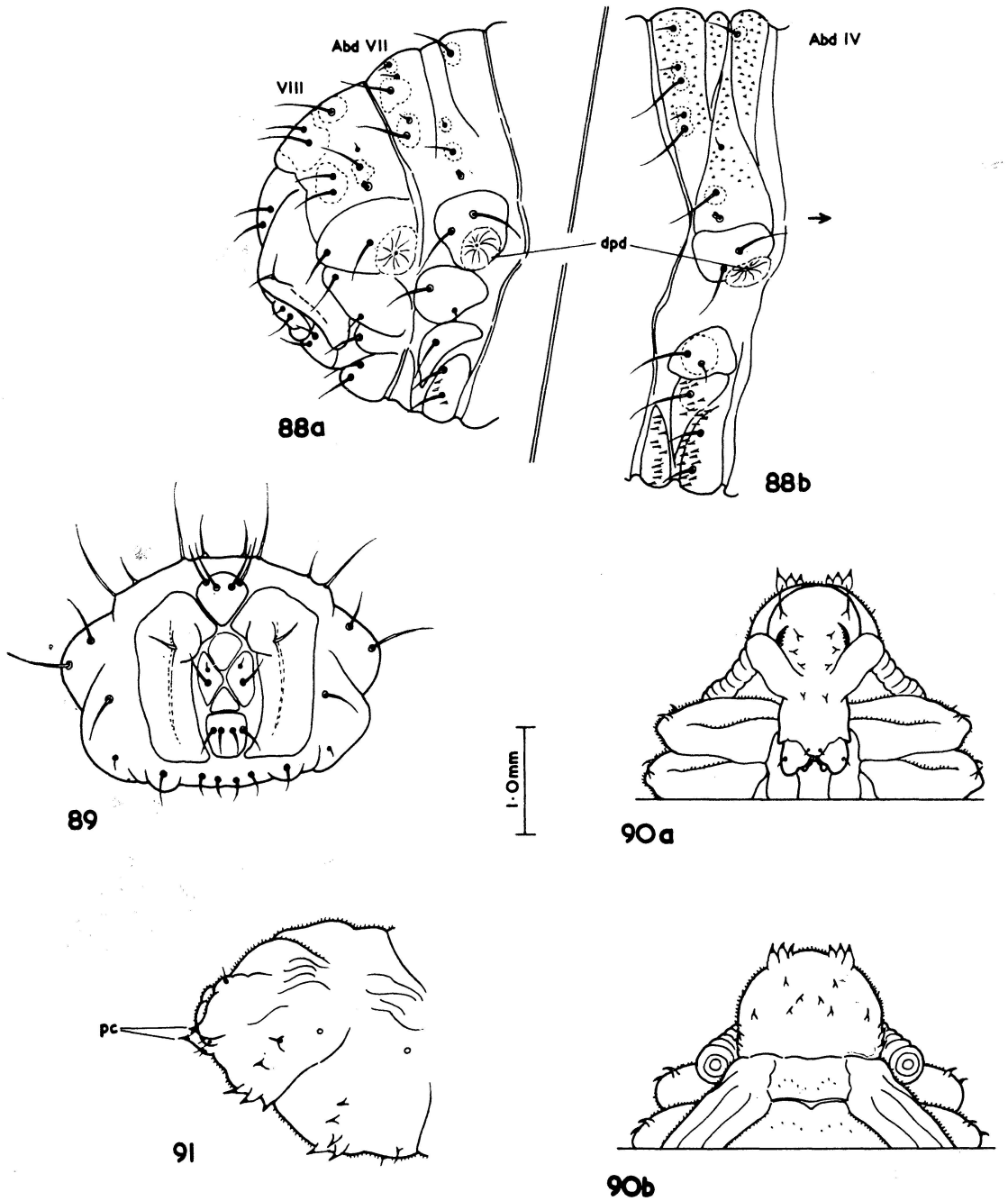
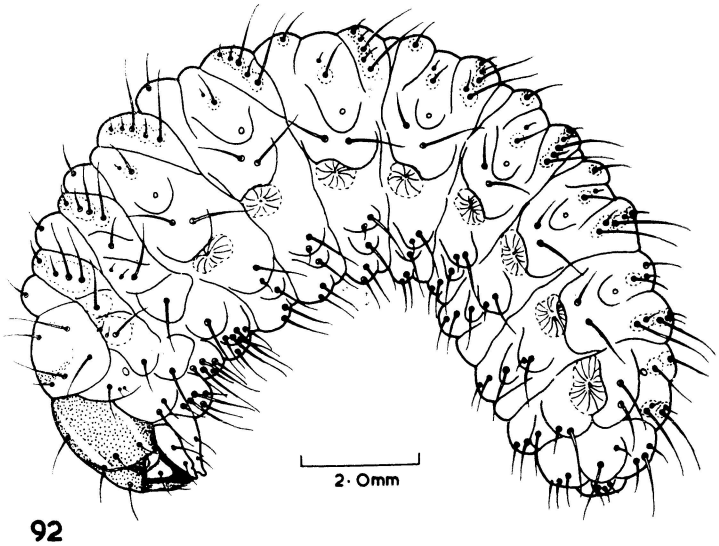
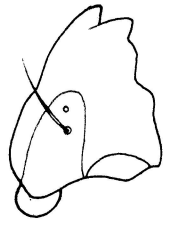


Fig. 79–87. *Catoptes brevicornis australis*, larva: 79, habitus, lateral view; 80, head (a, dorsal view; b, ventral view); 81, alimentary canal; 82, epipharyngeal lining; 83, labrum, clypeus, frontal margin, and antenna; 84, maxilla and labium (a, ventral view; b, maxilla, dorsal view); 85, mandible; 86, spiracles, showing alignment; 87, pedal lobe. **Fig. 88–91.** *C. brevicornis*. (88, 89) Larva, *C. b. australis*: 88, detail of cuticle (a, Abd. VII–X; b, Abd. IV); 89, terminal segments, caudal view. (90, 91) Pupa, *C. b. brevicornis*: 90, habitus, head and thorax (a, ventral view; b, dorsal view); 91, terminal segments, lateral view.

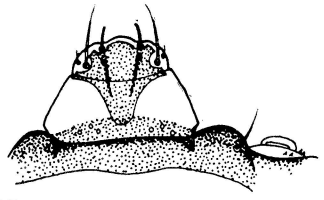


92



93

94



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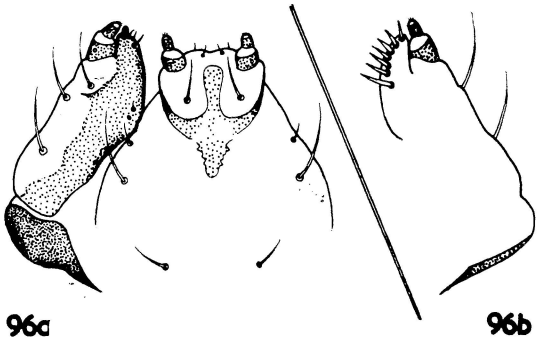
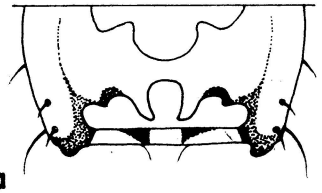
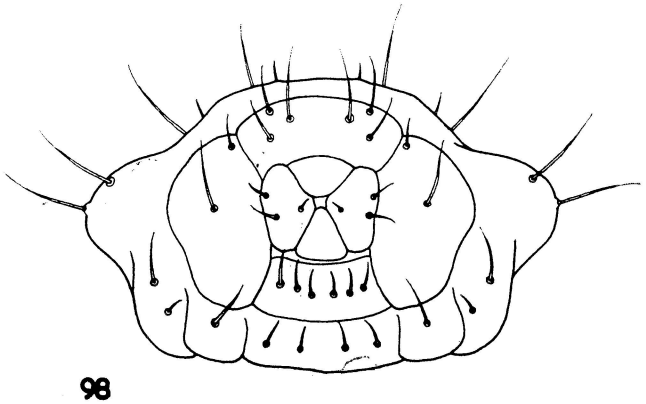


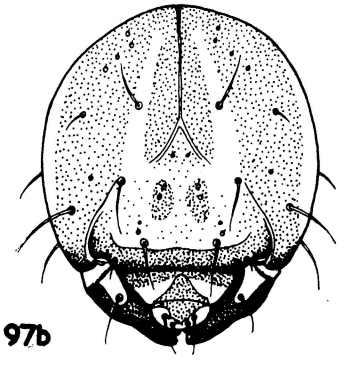
96a 96b



97a



98



97b

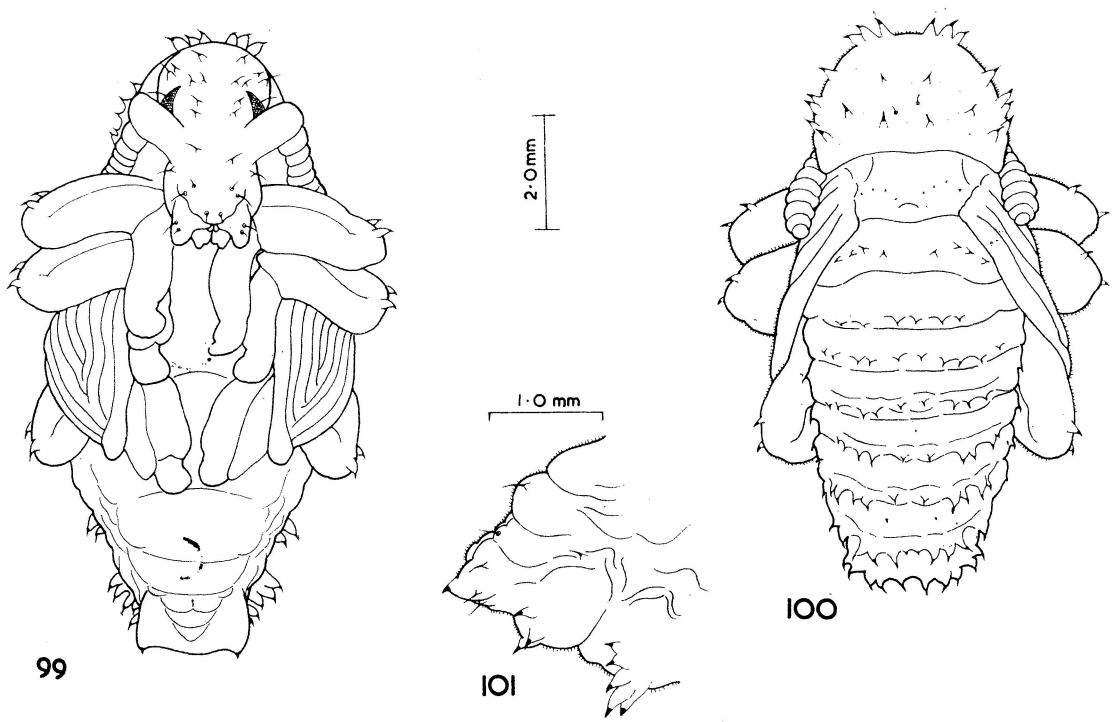


Fig. 92–98. *Oclandius vestitus,* larva: 92, habitus, lateral view; 93, mandible; 94, epipharyngeal lining; 95, labrum, clypeus, frontal margin, and antenna; 96, maxilla and labium (a, ventral view; b, maxilla, dorsal view); 97, head (a, ventral view, anterior part; b, dorsal view; 98, terminal segments, caudal view. **Fig. 99–101.** *O. vestitus,* pupa: 99, 100, habitus, ventral and dorsal views; 101, terminal segments, lateral view.

acute; secondary pterotheca a small skin-flap (wings greatly atrophied in adult).

MATERIAL EXAMINED. THE SNARES: Biological Stn – in peat, 15 Mar 1972, 1 pupa (DSH); under hepatic sward, 15 Jan 1975, 2 larvae; under hepatic at base of *Olearia lyalli,* 3 Feb 1975, 1 pupa (CEH); W coast – among rootlets of *Stilbocarpa robusta*/*O. lyalli,* 26 Jun 1972, 1 pupa; Penguin Ck – under dead branches of *O. lyalli,* 15 Dec 1974, 1 pupa; 4 Jan 1975, 1 pupa (DSH).

Subfamily LEPTOPIINAE

Genus *Catoptes* Schoenherr

Schoenherr, 1842, Genera et species Curculionidum cum synonymia hujus familiae 6 (2): 243. –Lacordaire, 1863, Histoire naturelle des Insectes: Genera des Coléoptères 6: 38. –Kuschel, 1969, N.Z. Journal of Science 12: 790–2.

TYPE SPECIES *Catoptes obliquesignatus* Boheman, 1842.

LARVA. Body robust, with coarse musculature, widest behind thorax; cuticle sclerotised around setal groups and on all lobes of Abd. VIII and IX; dorsopleural disc-shaped depressions ("epipleural discs" of Emden (1952)) present (Fig. 88a). Head depressed, evenly rounded in outline, emarginate behind; *fs* 5 never longer than *fs* 4; *fs* 1–3 obsolete. Antennae oval, shallow, symmetrical. Hypopharyngeal bracon with paramedian triangular maculae. Premental sclerite with posterior median arm truncate, anterior acute. Labral tormae subparallel. Mandibles wide, smooth, concave inwardly, bearing 1 seta only, near apex of scrobe. Maxilla with apical lacinial seta dark, broad, blunt; stipes with pigment not reaching side. Abd. I–VIII with major spiracular seta on middle fold above spiracle; ventral folds with transverse rows of large, usually pigmented spinules. Spiracles circular, bicameral. Terminal segments strongly modified—Abd. VIII with dorsopleural lobe enlarged, Abd. IX with pleural lobe grossly enlarged and elongated ventrally to form a sclerotised plate supporting wide bands of musculature, its dorsal and ventral areas reduced.

Alimentary canal with proventriculus simple. Anal segment (Abd. X) compressed, 4-lobed, ventral. Mycetomes absent. Posterior ventriculus in 2 coils. Vermiform gastric caeca usually present. Cryptone-

phridium weakly developed. Rectal bracon an unpigmented ring.

Catoptes brevicornis australis (Kuschel) (Fig. 79–87)

Kuschel, 1964, Pacific Insects Monograph 7: 480 (*Platyomida*).

LARVA (Fig. 79–87). Size of single mature specimen 10.5 × 4.5 mm; head width 2.0 mm. Setal index as in Table 2. Cuticle coarsely spiculate on all folds of Abd. I–V; ventral, larger spinules in irregular rows. Head yellow-brown; anterior extremities and labral pattern red-brown. Clypeal setae obsolete. Labrum with lateral seta much shorter than anterior seta. Spiracles with airtubes 3–5-annulate, obliquely dorsad, all similar in size. Abd. IX with dorsum trapezoidal, anterior and median setae subequal, sternal area almost square. Alimentary canal with gastric caeca as long as width of posterior ventriculus, tapering, 3 on neither side of lower coil. Malpighian tubules 4 + 2.

PUPA (Fig. 88–91). No pupae of *C. brevicornis australis* were available. The characters figured are those of *C. b. brevicornis*, used in the key for separation from *Oclandius vestitus*.

REMARKS. In the few mainland *Catoptes* larvae examined and in *C. brevicornis brevicornis* from Stewart Island the lateral seta of the labrum is longer, equal in length to the anterior seta. The Snares subspecies is thus linked with the southern element of Leptopiinae, all of which have the lateral seta very short. The dorsopleural discs are comparable with those of *Elytrurus niuei* Zimmerman, though smaller.

MATERIAL EXAMINED. THE SNARES: Sinkhole area – litter of *Olearia lyalli*, 25 Jan 1971, 3 larvae; Broughton I. – litter of *Senecio stewartiae*, 18 Feb 1971, 2 larvae (DSH); Sinkhole Flat – litter sample 71/42, 11 Mar 1971, 5 larvae (CJH); entire plant of *Poa tennantiana*, 26 Feb 1972, 3 larvae; Biological Stn – in peat amongst *O. lyalli*, 1 Feb 1972, 1 mature larva (DSH).

Genus *Oclandius* Blanchard

Blanchard, 1853, Voyage au Pôle sud et dans l'Océanie sur les corvettes l'Astrolabe et la Zélé 4: 202. –Kuschel, 1964, Pacific Insects Monograph 7: 485.

TYPE SPECIES *Oclandius cinereus* Blanchard, 1853.

LARVA. Generic definition similar to that for *Catoptes* except: premental sclerite complete; posterior extension acute, anterior extension longer, spatulate. Ventral folds lacking transverse rows of spinules. Terminal segments unmodified. Abd. IX with median pair of dorsal setae less widely separated than anterior and posterior pairs, usually with 3 sternal setae. Anus terminal, with 4 subequal lobes.

Oclandius vestitus (Broun) (Fig. 92–101)

Broun, 1909, Subantarctic Islands of New Zealand 1: 109–10 (*Catodryobius*). –Kuschel, 1964, Pacific Insects Monograph 7: 486 (*Oclandius*).

LARVA (Fig. 92–98). Maximum size 18.0 × 5.0 mm; head width 2.5 m. Setal index as in Table 2. Cuticle minutely asperate on Abd. I–V; major setae moderately long, pallid, not dark at base. Head pale brown; frontal margin, genae, mandibles, labral pattern, and palpi dark red-brown; mandibular scrobes pallid. Labrum with lateral seta minute. Spiracles all of similar size; airtubes slightly protruding beyond peritreme, 3-annulate, obliquely dorsad. Alimentary canal with 16–20 vermiform setae in a single row on either side of lower coil of ventriculus.

First instar: abdomen with major *pds* very long, minor *pds* short, spinelike; spiracles with airtubes twice as wide as peritreme, 6–8-annulate, caudad. Second and 3rd instars similar to 4th (final) instar. Head capsule widths, instars 1–4: 0.5–0.7 mm, 0.9–1.2 mm, 1.4–1.75 mm, 2.0–2.5 mm

MATERIAL EXAMINED. THE SNARES: Boat Harbour, S side – 1971–72, 9 larvae; E Punui Bay – 18 Feb 1972, 1 larva; penguin rookery – in nest, 7 Jun 1972, 2 larvae (CJH); Sinkhole area – litter, 27 Jan 1971, 1 larva; W coast – litter, 24 Jan 1971, 1 larva; 26 Nov 1972, 1 larva; S.W. Promontory – 13 Feb 1972, 1 larva; 3 Jul 1972, 1 larva; N. Promontory – 3 Jun 1972, 9 larvae, 4 pupae; Broughton I. – 4 Nov 1972, 1 larva (DSH); Biological Stn – 1971–75, 13 larvae, 1 pupa; Penguin Ck – 1972–75, 19 larvae, 2 pupae (CEH, CJH, DSH). First-instar larvae were in litter; other stages were from peat, associated with rotten wood or live rootlets.

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