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Fauna of New Zealand
Ko te Aitanga Pepeke o Aotearoa

Number / Nama 29

Cryptorhynchinae
(Insecta: Coleoptera: Curculionidae)

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United Kingdom



Manaaki
Whenua
P R E S S

Lincoln, Canterbury, New Zealand
1993

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Cataloguing in publication

LYAL, C.H.C.

Cryptorhynchinae (Insecta: Coleoptera: Curculionidae) C.H.C. Lyal. – Lincoln, N.Z.: Manaaki Whenua Press, 1993.

(Fauna of New Zealand, ISSN 0111-5383 ; no. 29).

ISBN 0-478-04518-2

I. Title II. Series

UDC 595.768.23(931)

Prepared for publication by the Series Editor using computer-based text processing, layout, and printing at Landcare Research New Zealand Ltd, Mt Albert Research Centre, Private Bag 92170, Auckland, N.Z.

Maori text by UniServices Translation Centre, Auckland

Published by Manaaki Whenua Press, Landcare Research New Zealand Ltd
P.O. Box 40, Lincoln, Canterbury, New Zealand

Printed by GP Print Ltd, Wellington

Front cover The weevil depicted is *Andracalles spurcus*, male. Illustrator: Des Helmore.

Uhihanga maa Ko te wiiwara nei a *Andracalles spurcus*, taane. Kai-whakaahua: Des Helmore.

Class / karaaihe **Insecta**
Order / oota **Coleoptera**

Subfamily / whaamere-iti

Cryptorhynchinae

Weevils / wiiwira

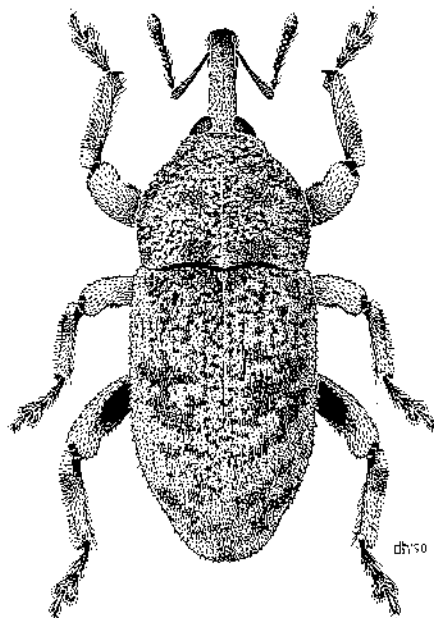
Illustration / Whakaahua: *Strongylopterus hylobioides*, male / taane.
Illustrator / Kai-whakaahua: Des Helmore.

In isolation and in the absence of many of their natural enemies members of this beetle family have multiplied and diversified. The weevils are a group of beetles that have more known species worldwide - some 50 000 so far in the family Curculionidae - than any other family of organisms. In terms of weevil abundance and diversity, New Zealand is one of the richest countries in the world. In the absence of many of their natural enemies and competitors, members of the family have multiplied and diversified to an extraordinary degree. One of the largest subfamilies of weevils are the Cryptorhynchinae, of which in New Zealand some 250 species are known and many more await discovery.

Although there are so many cryptorhynchine weevils in New Zealand, they are mostly inconspicuous insects, and one might be forgiven for not being aware of them at all. However, even brief examination of native plants, or of the leaf-litter layer in native bush, will reveal large numbers of them.

Almost all weevils feed on living or dead plants as both adults and larvae. However, within a single species these two life stages do not necessarily feed on the same part of the plant, or even the same plants. Most of the New Zealand cryptorhynchine larvae feed on (or at least in) dead wood; whether they are digesting the wood itself, or fungi growing on it, is not known. While larger species will tunnel in quite thick branches and tree trunks, some of the smaller species will develop happily in leaf stalks. A few species

(continued overleaf)



I runga i te noho tawhiti atu i teetahi atu whenua, i te kore hoari hoki, kua maha haere teenei tuumomo piitara ('beetle'), kua rere koe hoki nga aahua o teetahi, o teetahi. I te ao katoa, e rima tekau mano nga tuumomo wiiwira ('weevils') o te whaamere Curculionidae; he nui ake teenei i teetahi atu ngaarara, kararehe katoa. He maha hoki no raatou kei Niu Tiireni nei e noho ana. Na te kore o oo raatou hoariri i konei, kua tini haere raatou, aa, he mea whakamiiharo te maha o oo raatou aahua. Ko Cryptorhynchinae he hapuu nui no raatou. E rua rau rima tekau oona whaanau kei Niu Tiireni, aa, teeraa pea eetahi kaaore anoo kia kitea.

Ahako te nui o raatou he pakaupaku, he noho huna. No reira, kaaore pea e kitea e raatou. Engari, mehemea ka aata maatakitaki i nga raakau, i nga rau raanici e takoto ana iraro o nga raakau, ka kitea nuitia.

Ahako kuuao, ahako pakeke, he raakau te kai; raakau ora, poporaanici. Engari pea, he raakau koe taa te kuuao kai, he raakau koe taa te pakeke. E noho ana i roto i nga raakau pirau te nuinga o nga kuuao o nga tuumomo Cryptorhynchinae o Niu Tiireni; kaaore e moohiotia ana mehemea e kainga ana te raakau raanici, ko te hekaheka e tupu ana i runga i te raakau raanici. Ko nga mea rarahi ka korua oo raatou rua i roto i nga manga raakau; ko eetahi o nga mea nohinohi ka noho i roto i nga taataa rau. He keru rua i roto i nga rau raakau te mahi a nga toke o eetahi.

He mea whakamiiharo teenei: ko te kai a nga toke e kitea

(ara haere tonu)

are leaf-miners of growing plants as larvae.

Remarkably, while the larval food has been determined for many species, the food used by the adults has yet to be ascertained, although it is probably living leaves for a majority of species. Sadly, from the point of view of biological understanding, although an adult beetle may be found on a given plant species, this does not necessarily signify that the insect is feeding on that plant.

Perhaps best known of the New Zealand cryptorhynchines is the so-called 'elephant weevil', *Rhynchodes ursus*. This large insect is found all over the country, the larvae making tunnels in dead branches and trunks of such trees as kauri and southern beech. Many other Cryptorhynchinae tunnel in wood as larvae, and sometimes as adults. Perhaps the most significant of them economically are members of the tribe Psepholacini, 'pit weevils', particularly those in the genus *Psepholax*. Both adults and larvae of these insects make tunnels in the dead and dying wood of both native trees and exotics, including species of pine. Among the easiest to observe of the Psepholacini are members of the genus *Strongylopterus*, beetles up to 13 mm long which make round holes in pohutukawa branches and trunks. During the night the adult beetles will emerge from their burrows and move around over the bark.

Whilst these relatively large-bodied species can be collected from their host trees at any time, most New Zealand cryptorhynchines are small and inconspicuous insects, spending the daylight hours hidden in leaf litter or similar cryptic habitats, and becoming active at night.

Despite knowing more about the feeding habits of larvae than of adults, we know more about adult structure than that of the larvae, and our classification of cryptorhynchines is based on the adult form. Indeed, for many species the larvae and pupae have not been found or described. Thus identification guides may treat only the adults, as here. Some cryptorhynchine larvae are described in *Fauna of New Zealand* no. 28, 'Larvae of Curculionidea', by Brenda May.

Contributor Chris Lyal studies weevils at The Natural History Museum in London, England. His past studies have included work on Curculionidae of South-east Asia and Africa, and also research into the parasitic lice of mammals and their co-evolution. His present work is on seed-feeding weevils in tropical forests, with a sideline in the structural adaptations that enable them to communicate with each other by means of squeaking noises. Chris was educated at London University, and holds a PhD from Imperial College. He and his wife Juliet spent some months in New Zealand collecting and studying cryptorhynchine weevils for this contribution.

ana, engari kaaore anoo kia moohiotia he aha te kai a nga piitara pakeke. Tecraa pea he rau raakau ora. Engari, ahakoa te nohonoho o te piitara i runga i tectahi raakau kaaore e tino moohiotia ana mehema ka kainga taua raakau e ia.

Ko te tuumomo Cryptorhynchinae e tino moohiotia ana ko te wiiwara arewhana (*Rhynchodes ursus*). Kei nga pito-pito katoa o te whenua teenei ngaarara e kitea ana. Kei te keru rua nga toke i roto i te kauri me te tawai.

Ko eetahi tunga Cryptorhynchinae, me nga pakeke hoki, ka keru rua ki roo raakau. Ko nga mea e paa ana ki te orange o te tangata ko te iwi e kiia nei ko Psepholacinae ('pit weevils'), ko nga mea tonu no te hapuu e kia nei ko *Psepholax*. Ka keru rua raatou i roto i nga raakau Maaori me nga raakau no tawhiti, tae atu ki nga paaina. Ko te hapuu *Strongylopterus* nga mea e taaca te maatakitaki. Ka tae ki te tekau ma toru mirimita te roa. Na raatou nga putaputa i nga manga me nga kaatua o te poohutukawa. I te poouri ka puta mai i roto i oo raatou rua, ka nekeneke haere i runga i te kiri raakau.

Ka taaca cenci mea rarahi te kohikohi i runga i nga raakau i nga waa katoa. Teena ko teenei, he mea nohinohi te nuinga o nga Cryptorhynchinae, aa, he uua te maatakitaki. I te ao kua huna i roto i nga rau mate, aa, ka puta mai i te poo.

Ahakoa kua maatauria atu nga kai o nga toke i aa nga pakeke kai, ko te hanganga o nga pakeke kei te maatauria atu i oo nga toke hanganga. Na te hanganga o nga pakeke ka whakaingoatia ai ko teewhea, ko teewhea o raatou. Engari, ko nga tokeme nga tuungoungou o etahi whaanau kaaore anoo kia kitea, kia aata koorerotia raanei. No reira, ka kooreirotia nga pakeke anake i roto i nga pukapuka. Kei roto i te *Fauna of New Zealand* no. 28, 'Larvae of Curculionidea', ka koorerotia etahi toke Cryptorhynchinae, na Brenda May i tuhituhi.

Ko Chris Lyal te kaituhi: e aata-maatakitaki ana ia i nga wiiwara i te Natural History Museum i Raanana, i Ingarangi. I mua ra ko tana mahi he aata-maatakitaki i Curculionidae i Aahia ki te tonga ma raawhiti, i Awherika hoki; ka aapiti atu ki aua mahi he aata-maatakitaki ki nga kutu kararehe me te whakatupu tahi o nga kutu me oo raatou kararehe. Ko tana mahi inaaianei he aata-maatakitaki i nga wiiwara e kai ana i nga kaakano raakau i roto i nga ngaaherehere o nga takiwaa wera o te ao, me te whakare-rekeetanga o oo raatou tinana e taaea ai e raatou te piipii hei koorero teetahi ki teetahi. I kuraina a Chris i te Whare Waananga o Raanana, aa, kua whiwhi ia ki te tohu PhD o Imperial College. I noho ia, raaua ko tana wahine, a Huuria, i Niu Tiireni nei, e kohikohi ana, maatakitaki ana i nga wiiwara Cryptorhynchinae mo teenei pukapuka.

ABSTRACT

The 42 cryptorhynchine genera of New Zealand are described, figured and keyed. All 316 described species are placed in systematic context, including all junior synonyms. The morphology, distribution and systematics of the genera are discussed, and all available biological data for species are correlated. For all described species the following information is given: taxonomic history, bibliography, type repositories, type label data, distribution (in regions of New Zealand), and biological information, including any rearing records. The numbers allocated by Broun to all his cryptorhynchine species are provided, to facilitate information retrieval from some early publications. Ten new genera and 2 new species are described, 10 genera are sunk in synonymy, 112 species are placed in new combinations, 2 species thus made junior homonyms are given new names, and 34 species are placed in synonymy. Lectotypes are designated for 91 species. Two hundred and fifty-eight species are now recognised in the New Zealand fauna.

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ACKNOWLEDGMENTS

I would like to thank the Director, Mr J.F. Longworth, and staff of DSIR Entomology Division, Auckland (now part of the Native Plants and Animals Division of Manaaki Whenua - Landcare Research N.Z. Ltd) for their hospitality and support during a period of 11 months I spent working there in 1985-86. Specimens were collected in a number of National Parks in New Zealand by kind permission of the Department of Lands and Survey.

Particular assistance was given in New Zealand by Dr G. Kuschel, Dr R.C. Craw, Mrs B.M. May, and the late Dr C.F. Morales of DSIR, Mr K.A.J. Wise of the Auckland War Memorial Museum, Dr R. Hornabrook of Wellington, and Mr P.M. Johns of the University of Canterbury, Christchurch; in Australia by Dr E.C. Zimmerman, Dr A. Calder, Dr J.F. Lawrence, Dr E. Schmidt-Nielsen, Dr M.D. Murray, and Dr D.S. Horning; and in the U.K. by Mr D. Hollis and Mr R.T. Thompson. Many of the taxonomic changes made in this publication were suggested by Dr Kuschel, although I take responsibility for all of them.

I am grateful for the loan of specimens from Dr A.T. Howden, the Canadian Museum of Nature (Dr R.S. Anderson), the Canadian National Insect Collection (Dr D. Bright), the New Zealand Arthropod Collection (Dr R.C. Craw), Dr R. Hornabrook, the National Museum of New Zealand, Wellington (Mr R.L. Palma, Mr R.G. Ordish), and the Bernice P. Bishop Museum, Honolulu, Hawaii (Dr G.A. Samuelson). Hospitality and assistance were given in the course of the study by Dr and Mrs A. Calder, Dr and Mrs R.C. Craw, Dr and Mrs D. Hornabrook, Dr A.T. and Dr H.F. Howden, Dr and Mrs M.D. Murray, Dr and Mrs R.L.C. Pilgrim, and Dr E.C. Zimmerman.

The splendid habitus drawings in this volume were prepared by Mr D.W. Helmore of DSIR.

Finally, I would like to thank my wife Juliet for all her help in field work and in preparation of this publication.

INTRODUCTION

The Cryptorhynchinae are one of the largest subfamilies of the beetle family Curculionidae (true weevils), in the superfamily Curculionoidea. Members of this superfamily may be distinguished from most other beetles by the elongate rostrum formed by the front of the head (Fig. 45), although this is sometimes secondarily reduced (Fig. 6). Curculionidae, in addition to the rostrum, may be recognised by the form of the antennae, in which the terminal three segments are fused into a club and the second segment arises subapically on the first (Fig. 48) ('geniculate' antennae), and the small palpi, which are often concealed.

The distinguishing features that enable identification of members of the Cryptorhynchinae are a prosternal canal and mesosternal receptacle (Fig. 46) into which the rostrum can fit (see 'Morphology and Terminology' section) and the presence of an uncus on the tibia (Fig. 168). Unfortunately the sternal canal is not an infallible indicator of Cryptorhynchinae since some Zygotinae and Baridinae, for example, also have a canal yet some tribes within the Cryptorhynchinae lack it. While the canal does not occur in any other New Zealand weevil group, some native Cryptorhynchinae have the prosternal canal reduced and the mesosternal receptacle absent (Fig. 115); these beetles belong to the tribe Psepholacini, which is discussed in detail below.

All Cryptorhynchinae, apart from some Australian species which feed on herbivore dung and a Central American species which will eat psyllid larvae (Hansen *et al.*, in prep.), feed on live or dead plant material. The majority of the New Zealand species for which rearing records are available (see Appendix 2) feed on, or at least in, dead wood; others feed in living wood or on other dead plant tissue, or mine green leaves. Feeding habits are discussed further in the section on biology, below.

The bulk of taxonomic work on New Zealand Cryptorhynchinae, as with other groups of beetles in this country, was done by Captain Thomas Broun at the end of the last century and the beginning of this. He is responsible for the vast majority of species descriptions and, through his correspondence with the European coleopterists Sharp and Pascoe, for the provision of specimens named by these authors. He also described 18 of the 42 genera accepted in this study (10 of which are new), and a further 12 genera which have been or must be sunk as synonyms of others. Unfortunately he did not provide keys to separate either species or genera, nor did he illustrate his species. It is clear from his descriptions that his generic concepts changed over time, and he did not always examine his collection when naming new 'distinctive' species. Further, nearly half the described species were placed in the large cosmopolitan genus *Acalles*; careful examination has revealed that in fact no New Zealand species belong to this genus. The final difficulty faced by anyone wishing to work on New Zealand Cryptorhynchinae follows the transfer of Broun's collection to the Natural History Museum - formerly British Museum (Natural History) - in London, thus removing the vast majority of the type specimens from New Zealand.

Broun gave each of his species a number, and sometimes used these rather than names to refer to taxa. A list of all numbers applied to Cryptorhynchinae is given in Appendix 3.

This study assesses the generic classification of New Zealand Cryptorhynchinae and provides a key to their identification to at least genus level. In addition to generic treatments the locations of all types are given and distributional and biological data for all species are summarised.

BIOLOGY

The larvae of New Zealand Cryptorhynchinae are almost certainly all endophytic, but adults are rarely so (an exception is the *Psepholacini* – adults of species in this tribe spend part of their time inside the galleries excavated by and for the larvae). Most species appear to be more active (as adults) at night than during the day, and thus in their inactive period they must conceal themselves from predators. A number of species can be collected readily during the day by beating woody plants on which there is a proportion of dead wood, or dead leaves. These plants cannot be assumed to be host plants in the sense of supporting larval (or adult) feeding, although the weevils clearly are exercising some choice, given that their distribution in a small area is often apparently governed by plant species rather than presence of dead plant tissue.

The most 'favoured' habitat for many New Zealand Cryptorhynchinae during the day is leaf litter, from which a high proportion of species have been collected. Again, it cannot be assumed that the adult or larval food is in the leaf litter, and records of adults from birds' burrows, seaweed, moss, lichen, underrocks, etc., when larval host records are none of these, indicate that it is the concealment afforded by the habitat that is important, not its food potential.

Many adult Cryptorhynchinae, if disturbed when on the aerial part of a plant, will fold their legs against their body and fold their head down so that the rostrum lies between the front legs. In this position they will drop to the ground and lie immobile. The lack of any long projection allows them to fall without getting caught on plants, and to slip into inaccessible crannies on the ground. Their cryptic patterns make them very difficult to see and, in their shape, they may resemble such natural objects as seeds (e.g., *Ampagia*) or broken twigs (e.g., *Ectopsis*).

All Cryptorhynchinae feed on plants or plant-associated material as larvae, as do the vast majority of other Curculionidae. A large proportion of New Zealand species have been collected or reared from dead wood. However, the larvae cannot necessarily be assumed to be feeding on the dead wood itself, since digestion of cellulose has not been demonstrated, and the wood will almost always contain fungi and bacteria which might be the true food. One observation on the galleries of *Psepholax macleayi* noted a black

staining of the wood, which may have been caused by fungi. Few insects can in fact digest cellulose directly, although many utilise symbiotic bacteria, fungi, or protozoans to gain nutrients from wood. Among Cryptorhynchinae, Grinbergs (1962) has identified bacterial mycetomes at the base of the malpighian tubules in *Psepholax* (as *Empleurodes*) larvae in South America.

Apart from dead wood, other larval feeding records are from live wood (although this is rare, and frequently the plant is dying or stressed in some fashion), other dead angiosperm or gymnosperm plant tissue (e.g., leaf petioles), fern rhizomes (*Agacalles* species only) and leaf-mining (some undescribed *Microcryptorhynchus*). May (1993) states that many cryptorhynchine larvae, perhaps the majority, are primary invaders working initially in live tissue which degenerates as feeding progresses and is decayed by the time the adult emerges.

Adult feeding habits of New Zealand Cryptorhynchinae are unknown. Some at least probably feed on green leaves, but without the support of observational data this is mere guesswork. That they do feed is suggested by the presence of gut contents in males (female gut contents could have been derived from pre-oviposition drilling). However, light microscopy of gut contents has not yet indicated what the food might be.

All known plant associations are listed for each species, and are summarised (by plant) in Appendix 2; occurrence of the species in leaf litter is also stated. Inferences as to host (i.e., feeding) associations from these data are to be drawn only cautiously, as many of the records for adults will be of chance relationships. Clearly, only rearing records, or adults or larvae being cut from the wood of a given plant, indicate a 'real' host association. Collection of adults from freshly cut wood (see collecting methods, below) suggests that the wood or associated biota is a larval food, but this is not conclusive.

Examination of the larval host records of New Zealand species (Appendix 2) reveals very few patterns, the association of *Agacalles* species with fern rhizomes being the clearest, though it is notable also that *Mirastethus baridoides* develops only in gymnosperms (see also May 1993). At the species level, assignment of host specificity is difficult, owing in part to the low number of observations for most species (see discussion following *Eutyrrhinus* in the main text). The dead wood of different species may be too uniform in terms of nutrient products to encourage much host specificity.

In the lists below the inclusion of a number in parentheses (e.g., 'W 71/85') refers to a wood sample collected by DSIR staff; a full record of rearing from the sample, and the specimens reared, are preserved in the NZAC.

METHODS AND CONVENTIONS

Collecting. To collect any insect effectively knowledge of its biology must be used to focus efforts in appropriate habitats. For cryptorhynchine weevils the most important factors are that they (1) are mostly apterous, (2) feed on plants (particularly in dead woody tissue), (3) are often active at night, and (4) are frequently found in leaf litter during the day. These factors largely dictate collecting methods.

Although at the most basic level one can collect beetles with fingers and a box, various items of collecting equipment are necessary for thorough work. These are an aspirator ('pooter'), a beating tray (a white sheet will do, but having one stretched over a light framework is much simpler for handling and collecting the insects), a sweep net (not as useful as a beating tray for Cryptorhynchinae, but still valuable on occasion), a cloth-covered sieve for sifting leaf litter, a method of extracting beetles from leaf litter (Winkler bag or Berlese funnel), a box for rearing from wood, etc., a saw, axe, knife, string, cloth bags, torch, fly spray, paper for labels, pencil, and glass tubes each containing some alcohol. Whilst this list resembles the contents of a small ironmonger's shop, it is all valuable, and I have gone into the field carrying much of it.

Leaf litter. This rich environment is best collected intact for extraction in the laboratory. One can either collect 'raw' litter, which is bulky, or sift it in the field, thus removing the large leaves and fragments of wood and concentrating quite large volumes down to several handfuls of humus and small plant pieces. Few of the insects will be removed during the sifting process. The sifted or unsifted litter should be placed in a cloth bag (not plastic, which can cook the fauna rapidly) and labelled with locality, date, and dominant plant(s). The richest part of the habitat is the deep, moist litter around the base of plants, although general samples should be taken.

The sample should be placed in the extraction equipment as soon as possible after collection, to minimise desiccation and death of the fauna. This extraction equipment may use heat to drive specimens down through a grid, as with a Berlese funnel or Tullgren funnel, or allow it to move through a mesh, as with a Winkler bag. In either case, the litter should be kept until it is quite dry and nothing is left alive in it. In the absence of such equipment, an alternative method is to spread the litter very thinly on a white sheet in the direct sun, and watch carefully for movement, collecting specimens with an aspirator; this is a long and painstaking method, and not as effective as use of a funnel or Winkler bag.

Beating. As mentioned above, cryptorhynchines can often be found on plants with at least a proportion of dead

wood or leaves. Plants should be beaten vigorously with a stout stick over a beating sheet and the sheet watched carefully for some time, since the small cryptic beetles will sometimes remain still and with the legs folded for several minutes before beginning to move.

Spraying. Some habitats, such as mossy banks or large logs, cannot be readily searched, beaten, or taken from the field. In these cases a white cloth sheet or large sheet of plastic should be spread as close as possible to the site, and preferably underneath if a log, and the whole sprayed with a fly spray. After allowing a drop time of 20 minutes or so, specimens can be collected from the sheet.

Night collecting. Many species are active at night, and searching dead and dying wood surfaces, beating plants, and spraying can all be very productive.

Rearing. Samples of wood, fern rachides, etc., can be collected and brought back to the laboratory to rear any larvae that might be inside. The sample is put into a metal or plastic box (if the latter it should be opaque, so that no light can pass through the walls or lid) with a glass jar attached to one end. When insects emerge from the wood they generally are attracted to the light coming through the glass jar and can be both seen and collected.

Cut wood. To attract beetles and gain some indication of host preference, branches can be cut from living trees and suspended beneath them. A range of diameters is most useful, to attract as full a range as possible. Over several weeks these branches can be visited and beaten over a beating tray, and any beetles resting on them can be collected. After whatever period is thought suitable the branches can be taken back to the lab for rearing.

Preservation. Specimens once collected can either be killed using ethyl acetate vapour and then stored dry in layers of tissue, or put directly into 70% or 80% ethyl alcohol (ethanol), which both kills and preserves them.

Preparation. Preparation and curation of insects have been fully described in Walker & Crosby (1988). Briefly, large beetles should be pinned to one side of the midline through the elytron, and small beetles should be glued using a water-soluble glue on to card points, so that the ventral surface is visible. All specimens should be labelled with the locality (including region), collection date, collector's name, and bionomic data (host plant, how collected, etc.).

Illustrations. The following comments refer to the illustrations in this publication. Structures which were not symmetrical when dissected from the insects were drawn asymmetrically, but where asymmetry had been caused by the dissection process (e.g., through removal from supports or the framework provided by other parts of the body) this has usually been corrected to symmetrical form for

illustration. This correction was not performed for the hemisternites of the ovipositor since the possibility of introducing error was too great. The aedeagal apodemes frequently cross and uncross during manipulation; the aedeagi were drawn as seen, but plan and side views may not coincide as regards the crossing over of the apodemes. The distinction between membranous and sclerotised parts was not always clear, and an attempt has been made to convey this in figures by the use of dotted lines. Dotted lines also indicate where the course of a structure or sclerite margin is unclear. The complex overlay of membranes in structures such as the aedeagus has been largely ignored, since any attempt to indicate this would lead to a confusing mass of dashed lines.

Figures of tergites and sternites generally exclude the setae and scales, and are given to illustrate outline shape only.

Endophallic sclerites are stippled, but external sclerites of the aedeagus and the ostiolar sclerites are distinguished by their thicker outline.

The ventral aspect of male tergum VIII is shown with the hemisternites of sternum VIII in place, and the posterior (membranous) margin between them. The torn membranes between sternites VIII and IX and sternites VIII and VII are not shown.

Material examined. Specimens examined were largely from the New Zealand Arthropod Collection (NZAC) at the Mount Albert Research Centre, Auckland, and from the Natural History Museum, London (BMNH). In the latter collection Thomas Broun's material is maintained separately, and all type material of his species in the BMNH is in this collection. Other material examined is in the Museum of New Zealand, Wellington (NMNZ), the Auckland War Memorial Museum (AMNZ), the Canterbury Museum, Christchurch (CMNZ), the University of Canterbury collection, Christchurch (UCNZ), the private collection of Dr R. Hornabrook, Wellington, the Macleay Museum, University of Sydney, the Australian National Insect Collection (ANIC) at CSIRO, Canberra, the private collection of Mrs A.T. Howden, Ottawa, the Canadian National Insect Collection, the Biosystematics Research Centre, Ottawa, and the Canadian Museum of Nature, Ottawa.

Type data. In the descriptive part of this work the status, repositories, and full label data of all primary type specimens (and a summary of label data for secondary type specimens) of New Zealand Cryptorhynchinae that have been examined are listed under the appropriate species. Lectotypes are designated where appropriate, but not where there is any doubt as to the correct course of action.

Such designations are better left until the relevant genera are revised.

In the lists of label data different labels are distinguished by a solidus (/) and different lines within a single label by a semicolon (;); all other punctuation is as it appears on the label. Where a male or female symbol appears on a label it is represented in the text by '[m.]' and '[f.]' respectively. Some labels are not listed, for the sake of brevity.

All specimens in the Broun Collection in the BMNH bear a printed label "New Zealand; Broun Coll.; Brit. Mus.; 1922-482" or, for Chatham Islands specimens, the same with "Chatham Islands" instead of "New Zealand"; these labels are not mentioned below. Most specimens have been given a determination label by me with the type status ("HOLOTYPE", "LECTOTYPE" etc), the original combination and spelling, the author of the species and date of publication, and the present authority (e.g. "LECTOTYPE; *Scelodolichus abruptus*; Marshall, 1937; Lyal det. 1987" handwritten (Lyal), red). These labels are not listed below.

Type specimens in the BMNH frequently bear discs giving the type status. These are listed in an abbreviated form, as follows: 'BMNH lectotype disc' - "LECTO-; TYPE" printed disc with violet border; 'BMNH holotype disc' - "Holo-; type" printed disc with red border; 'BMNH type disc' - "Type" printed disc with red border; 'BMNH type; H.T. disc' - "Type; H.T." printed disc with red border; 'BMNH syntype disc' - "SYN-; TYPE" printed disc with blue border; 'BMNH paralectotype disc' - "PARA-; LECTO-; TYPE" printed disc with blue border.

Text conventions. In the description of species distributions, the regions of New Zealand as defined by Crosby *et al.* (1976) are used.

MORPHOLOGY AND TERMINOLOGY

General shape. The habit of Cryptorhynchinae when disturbed (described in the 'Biology' section, above) of folding the rostrum between the fore coxae and the legs against the body and dropping, is associated with several morphological features including the general ovoid shape of the insects. The most apparent adaptation is the sternal canal, into which the rostrum fits (Fig. 46), with raised flanges ('postocular lobes') on the anterolateral margin of the pronotum to cover and protect the eyes (Fig. 46, 490). When the rostrum is in the sternal canal, the scape of the antennae is folded into a conspicuous rostral groove, the scrobe; the flagellum and club are folded forward to lie under the rostrum. As for the legs, the femora frequently

have a ventral groove to receive the tibia, sometimes with an anterior flange or tooth. The most derived form of this adaptation is found in *Ampagia*, where the femora are very broad in relation to their length and the hind femur fits closely against a carina on abdominal ventrite 1, the insect thus having no obvious projections when the legs are folded.

Head. Although the ventral surface of the rostrum provides valuable taxonomic features (Lyal, in press), structures mentioned in the descriptions and key are, unless otherwise stated, dorsal and lateral. This is partly because of the difficulty of observing the ventral surface in most preserved specimens, which have the ventral surface of the rostrum either against the card mount or folded into the thoracic canal.

The rostrum can vary between genera, between species within genera, and between the sexes. Variation affects length, width vs. depth, curvature, convexity of the upper surface, degree of squamosity of the upper surface, surface sculpturing, length and architecture of the scrobe, and position of antennal insertions. The sexual differences most frequently met with are that males generally have the rostrum more rugose or punctured, and the dorsal longitudinal curvature (especially basally) and the basal squamosity more extensive than in females. The dorsal transverse curvature may be greater or less in the male than in the female. In some genera the females have a subcylindrical rostrum, whilst in the males it is broader. The antennal insertions are frequently nearer the apex in males (females in at least some species use the rostrum to drill oviposition holes, and thus the antennae must be out of the way, a constraint that does not affect males). Characteristics of the rostrum provide the simplest means of sexing specimens.*

A very short rostrum is found in some *Psepholacini*, especially *Psepholax*, in New Zealand species of which it may be only 1.5x as long as broad (Fig. 6).

Several features are not mentioned in the descriptions unless there is an unusual state in a given genus. Generally the rostrum is convex dorsally, with punctation coarser proximally than towards the apex, and squamosity is much more abundant basally than towards the apex, although fine setae are frequently seen distad but not basally. The scrobe has a carinate margin dorsally, and generally this does not reach the eye. The scrobe is weakly curved or 'straight', but no generic significance has been found for this character state, which anyway is difficult to express clearly.

* Comparisons between the sexes are explicit as to gender, and so '... than [the opposite sex]' is omitted from descriptions.

The antennae generally have the first segment (scape) almost as long as the seven-segmented funicle, and when this is in the scrobe (see above) it nearly touches or does touch the eye. In *Mecistostylus* it extends beyond the scrobe and the anterior margin of the eye, but otherwise this character is not mentioned in the descriptions. The first two segments of the funicle are generally longer than the other funicle segments, which are round, oval, or barrel-shaped in profile, and generally become broader towards the club. In the descriptions, the funicle segments are referred to as F1, F2, etc.

The ratio of lengths of the first two funicle segments, the rest of the funicle, and the scape can be of use in distinguishing genera. The club is generally oval, with the apex more or less acuminate and the 'internal' face sometimes flattened or concave, although this is difficult to express and observe. The club is almost always the same colour as the rest of the antenna (which tends to be a paler brown than the integument generally). For the few genera in which it may be darker than the funicle and scape, this is specified.

The eyes are generally convex but not protuberant, and there may be a depression in the head along their dorsal border. They are generally round or triangular but acuminate anteroventrally, ventral to the base of the rostrum.

The head between the eyes is usually flat or weakly convex, but often there is a median pit (interocular pit) corresponding to an internal apodeme. Because the pit is often obscured by scales or by the anterior margin of the pronotum, and because there seems to be little generic significance in the character, it is not always mentioned in the descriptions.

Thorax. The anterior margin of the pronotum dorsally is in most instances rounded, weakly emarginate medially or truncate, and projects over the head. Only if the degree of projection is very great or minor is the character state mentioned in generic descriptions. On the side of the pronotum immediately behind the eye the margin is produced into a rounded 'postocular lobe', fringed with more or less elongate scales, which covers most of the eye when the head is in the defensive position (see above, p. 12). Anteriorly the pronotum is frequently depressed with respect to the posterior part, and is often much narrower, the change in width sometimes being abrupt.

The shape of the posterior margin of the pronotum is not always clear; it is recorded in the descriptions as 'straight' (which encompasses a weak sinuation or rounded margin), 'sinuate', or 'rounded', but precision is difficult, and little reliance should be placed on this character.

In many species the pronotum bears dorsal and lateral prominences and tufts of scales. For convenience, and

rather than describe repeatedly in cumbersome terms the precise position of these, the three general positions are given in Fig. 45. Prominences do not occur at position 1, and frequently the erect scales there are densely grouped rather than forming tufts. Prominences and tufts, if both are present, generally coincide in position, i.e., a tuft is on a prominence.

The thoracic canal comprises the prosternal canal and the mesosternal receptacle (Fig. 46). The prosternal canal is bounded laterally before the fore coxae by carinae (but not in some Psepholacini). These are either smoothly continuous with the postocular lobes or the lobes project weakly between the carinae, the canal then being partially closed anteriorly. Posteriorly the carinae generally project between the fore coxae for a short distance (not mentioned in descriptions unless there is no projection). The walls of the posterior part of the canal are formed by the convex or flat inner faces of the fore coxae. The prosternal canal is 'deep' (i.e., slightly cavernous) except in some Psepholacini. In most genera it is either glabrous or bears scattered fine setae, but since these setae are frequently very difficult to see no distinction is made in the descriptions, and only if scales are present is comment made.

The mesosternal receptacle is generally U-shaped, although in some genera the posterior wall is absent or there is no apparent receptacle at all (Fig. 115, 137). Where the posterior wall is present the receptacle is generally cavernous, i.e., with the posterior margin (when viewed ventrally) anterior to the posteriormost extent of the receptacle; in such instances the posterior extent of the receptacle is judged by the margin, not the interior wall. The lateral margins of the receptacle extend towards the fore coxae, which themselves frequently have posterior projections extending towards the receptacle. The receptacle margins also generally project ventrally below the level of the mesosternum and metasternum. Internally the receptacle is glabrous or bears very fine, scattered setae, unless otherwise stated. In some genera the receptacle margin projects ventrally and the posterior face of the posterior wall has a hollow on either side, separated by a median ridge or carina (Fig. 123, 136). In at least some instances the hollow receives the end of the fore tibia when the legs are folded against the body.

The metasternum is generally flat or convex medially, although in some genera it is more or less depressed. In the extreme the posteromedian area is deeply and abruptly depressed relative to the anterolateral regions between the hind coxae (Fig. 131), a state found particularly in *Crisius* and *Indecentia*, although in some species the depressed area is more pit-like. In many genera the posterior part of the metasternum between the middle and hind coxae is

deeply and abruptly depressed, giving the appearance of a notch in the hind margin of the sclerite (Fig. 128, 126). The sternite may be inclined so that the posterior margin projects ventrally between the coxae in side view, and the width of the metasternum between the middle and hind coxae relative to the length of the hind coxa is also a useful character.

The metasternum is separated laterally from the metepisternum by the anapleural suture, although this may be incomplete (Fig. 47). In Cryptorhynchinae, Baridinae, and Molytinae there is often a row of modified scales – 'sclerolepidia' – along the anapleural suture, the precise morphology of which has not been studied. In some New Zealand Cryptorhynchinae the sclerolepidia are generally not apparent (considered absent in the descriptions below), but in other genera the anapleural suture at least has a row of glossy cream appressed or embedded scales or plumose scales. These scales are termed sclerolepidia here, but use of the term is not intended to convey homology at any level above genus, unless so stated. The sclerolepidia may extend over the metepisternum and metasternum, and sometimes their individual outlines are unclear and they form agglutinated mounds (e.g., *Dermothrius*, Fig. 150). The presence and extent of these scales is used in the keys and descriptions below. The metepisternum itself may be large and clearly visible, or concealed by the elytron; the latter condition is associated with loss of flight.

Each femur may have a glabrous or squamous furrow ventrally, into which fits the tibia when the leg is folded. This furrow may extend the length of the femur or be quite short. The anterior margin of the furrow may be developed medially into a triangular tooth of varying size, generally largest on the foreleg and smallest on the hind leg.

The tibiae are generally nearly straight, although weakly curved in at least one aspect; this is not discussed in the descriptions. On the external margin there may be one or more teeth or a long flange (Fig. 168); absence of this is not mentioned in generic descriptions. Ventrally there may be a fine longitudinal carina, although this is very difficult to observe, and little emphasis should be placed upon it when interpreting descriptions. The ventral carina, if present, may end in a small tooth, the premucro, often obscured by scales or setae (Fig. 168). The more prominent and ever-present tooth on the end of the tibia is the uncus (Fig. 168), arising more from the dorsal side, although it may extend from dorsal to ventral margins. In some genera, particularly in the Psepholacini and the *Rhynchodes* group, there is an extra projection from the apex of the tibia (Fig. 168), the 'supra-uncal projection'. This is not strictly a tooth, but is the 'true' apex of the tibia extending dorsally to the uncus (see Thompson 1992).

The scutellum may be large and visible, but in flightless forms it is frequently small and concealed by the elytra, although there may be a depression at its position. Along the sutural margins of the elytra near the base there may be one or more pairs of glossy raised knobs, but there should be no possibility of confusing them with the scutellum.

The elytra are generally wider at their base than the adjacent base of the pronotum, with more or less prominent humeri (basal outer angles of the elytra); in wingless species the outline is more rounded and the bases of the elytra and pronotum tend towards the same width.

The elytra of Curculionidae are marked with striae – longitudinal lines of punctures – separated by raised flat or convex interstriae, numbered from the suture outwards (Fig. 45) and with the notation I1, I2, etc. in the descriptions below. The interstriae frequently bear prominences, often in similar positions in different genera although there is very little chance of homologising them. As on the pronotum, the prominences frequently bear tufts of scales.

Beneath the apex of each elytron there is usually a patch of fine, parallel, transverse grooves. These can be seen after removal of the abdomen by turning the elytra under incident light until there is a suitable reflection. These grooves are the *pars stridens* ('strigil') of an elytral-tergal stridulatory organ. The plectrum operating against the elytral *pars stridens* has been found by experiment elsewhere to be the anterior margins of the tubercles bearing the microsetae of tergum VII (see below). The elytral-tergal stridulatory organ is found in the Scolytidae and Platypodidae, as well as in members of 14 curculionid subfamilies. Although not present in all Cryptorhynchinae, the organ is common in the subfamily. The distribution of the organ, its function, and its mode of operation are discussed in detail by Lyal & King (submitted MS.). Because of the organ's wide distribution taxonomically, its absence is considered likely to be apomorphic.

Abdomen. Only ventral characters are discussed in the descriptions, the terga being ignored apart from VII and VIII, which are discussed with the terminalia.

The first two abdominal sterna of Curculionidae are infolded between the thorax and sternum 3, and cannot be seen from the outside. For simplification of numbering and to avoid confusion, sternites III–VII are referred to as ventrites 1–5 (Fig. 190). Thus immediately posterior to ventrite 5 (the last visible sternite) is sternum VIII (which can be seen only after dissection). In the descriptions of genera below the ventrites are referred to as V1, V2, etc.

Ventrite 1 extends anteriorly between the hind coxae, and the shape of this 'intercoxal process' is of taxonomic value. Ventrites 3 and 4 are almost always subequal in

length. Ventrite 5 is semicircular and variably convex or flat; frequently there are depressions on either side of the midline. There seems to be no clear generic pattern to the form of ventrite 5, and generally it is omitted from the descriptions.

Terminalia. Tergite VII, although discussed separately for males and females in the generic descriptions, is dealt with here to avoid repetition. Frequently the tergite bears on its dorsal surface very short, posteriorly directed 'microsetae', each on a small tubercle. The microsetae can be distinguished from the other tergal setae by their small size, by the presence of the tubercle (although its nature can be very difficult to discern), and in that they are often isolated from other setae in glabrous strips and surrounded by microgranulate cuticle. In most figures setae other than the microsetae are omitted. There may be up to 12 pairs of microsetae in longitudinal rows on either side of the midline (Fig. 199), although sometimes there is just a single pair, or the numbers in each row differ. The microsetae may appear to be in small pits if viewed by transmitted light, but this is an artifact. The number and arrangement of the microsetae is of taxonomic significance, and generally is similar in males and females, although the shape of the tergite differs between the sexes. Their function is as a component of the plectrum of the elytral strigil (discussed above).

Several structures bear prominent apodemes, and a discussion of three of them – that of female sternite VIII, the male spiculum gastrale, and that of the male tegmen – is appropriate. Because of the structure of apodemes, there can be some difficulty in illustrating them accurately and understandably. An apodeme is an invagination of the cuticle, and thus the external surface extends, at least potentially, right inside it. This is clear in each of the three structures mentioned, in the form of a pale line along the centre of the apodeme (Fig. 419). The extent of this invagination is not given in most figures, but merely a dotted pair of lines drawn, ceasing just anterior to the invagination. The (cut) membrane near the invagination is shown for the spiculum gastrale and female sternite VIII, but not the tegmen. With the tegmen, the ventral posterior extension is sometimes only weakly sclerotised (Fig. 512, cf. Fig. 458), and this is figured only where possible. The connections of tegmen, aedeagus, and genital pocket are complex, and are not discussed here.

The spiculum gastrale and aedeagus continue to develop and thicken during the life of the beetle. Consequently the spiculum gastrale in particular may be slender and poorly sclerotised in freshly emerged specimens but thick and heavily sclerotised in mature specimens.

Female. Tergite VIII is often scoop-shaped, with the apex directed ventrad. The apex may be smooth, but more frequently is crenulate (Fig. 205); these crenulations, because of the downcurved apex (Fig. 424) of the sclerite, are most apparent from the posterior aspect, and consequently do not always show up well in the outline figures in this study. In some instances the apex lacks crenulations but instead bears very stout setae (Fig. 265, 266). The function of both is likely to be in oviposition, the female using the tergite to scrape substrate material over the egg when it is placed in the hole drilled for it; a crenulate apex would seem to be well adapted for this. The use of the stout setae in some mechanical operation such as scraping substrate is indicated by the severe abrasion observed in some specimens (Fig. 272). The only contra-indication for a mechanical function is in *Didymus* (Fig. 302), where long, slender setae extend beyond the crenulations.

Sternite IX is similar in some respects to the spiculum gastrale of the male, in that its most conspicuous feature is generally a long apodeme. However, the apical plate, while most heavily sclerotised as a pair of arms, is 'external' (i.e., faces ventrally rather than, as in the male, dorsally), and can be considered homologous with the true sternite.

The vagina sometimes has a sclerotised region near its junction with the oviduct and spermathecal duct, and this is figured where it occurs. The spermathecal duct usually joins the vagina at the junction of the bursa and the oviduct (Fig. 229), but occasionally at a more anterior position on the bursa (Fig. 262). There is in most instances no absolute method of distinguishing bursa from vagina.

The hemisternites of the ovipositor vary between genera, especially in the position and shape of the styli, and whether or not the apex of the hemisternite is extended subcylindrically beyond the opening of the vagina (e.g., Fig. 231, 275).

Male. Sternum VIII always bears a pair of semilunar or triangular sclerites ('hemisternites') (e.g., Fig. 456h). The shape of these is often unclear, and no generic characters have been discovered in this study; mention of them is omitted from the descriptions, although they are figured for an example of each genus. In a few instances, between the sclerites is a very small pouch or apodeme ('spiculum relictum' of Thompson 1992) (Fig. 565). The presence of this is apparently of generic significance, but its absence is not mentioned in the descriptions.

Sternum IX is generally represented in male Curculionidae by a long apodeme with a posterior sclerotised plate or pair of arms ('apical arms' in descriptions), the structure being known as the 'spiculum gastrale'. It is open to doubt whether any of the spiculum gastrale is homo-

logous to the ancestral sternite IX. The apical arms are fused to the genital pocket and generally exhibit little curvature dorsad. In New Zealand Cryptorhynchinae the spiculum gastrale always has the apical arms symmetrical or virtually so (although there may be asymmetries in detail), and is itself virtually symmetrical (i.e., straight).

The tegmen surrounds the aedeagus ('median lobe' in many other works), with a ventral apodeme projecting anteriorly and a pair of parameres dorsally directed posteriorly. The homology of the parameres with those of other insects is not certain, leading some workers to term them 'parameroid lobes'. The parameres may be fused to varying degrees at the base, and are frequently very poorly sclerotised. Apically the parameres, although appearing smooth in many instances, may always be coated with microtrichia and minute socketed setae. Such setae have been seen in *Eutyrrhinus* and a number of other genera. The microtrichia and setae are generally excluded from illustrations unless very apparent in the specimen figured, and are not mentioned in the individual generic descriptions.

The body of the aedeagus is almost always sclerotised dorsally along the margins (the sclerotisation extending variably towards the midline) and apically beyond the ostium. There are frequently two ostiolar sclerites, although their sclerotisation may be very faint. Between the ostiolar sclerites there is sometimes a fine sclerotised band extending from the dorsal surface of the body into the endophallus; this is difficult to see, and hence not always figured or mentioned. The ventral surface is generally completely sclerotised, with the anterior margin broadly rounded between the apodemes. The variability of degree of sclerotisation, and consequent difficulty in determining its extent, make these character states inappropriate for use in the generic descriptions, although unusual patterns are mentioned.

The endophallus ('internal sac') generally contains two or more 'basal sclerites' ('transfer apparatus' of some authors), the shape of which is valuable at the species level and has some importance for distinguishing genera. In some species these have become modified into a long flagellum, the presence or absence of which can be of generic significance.

Flightlessness. In the discussion above a number of references have been made to character states associated with flightlessness. These are the concealment of the scutellum beneath the elytra, the reduction in size of the metepisternum and its concealment beneath the elytra, the loss of humeral angles and consequent reduction in width of the base of the elytra so as to be the same as that of the pronotum, and the shortening and 'rounding' of the elytra.

A very clear example of the dramatic effect that loss of flight has on the morphology of these insects is provided by flightless species of *Psepholax* on the Three Kings Islands and Poor Knights Islands, probably derived from *P. sulcatus*. The scutellum and metepisternum are still visible, but the abdomen and elytra are considerably shorter than those of *P. sulcatus*, giving the insect a very different appearance. Loss of wings is an apomorphic condition for Cryptorhynchinae, and has arisen numerous times within the subfamily. It is unclear whether the ancestors of any New Zealand Cryptorhynchinae were themselves flightless, since few sister-groups have as yet been found. The loss is often associated with adult life in the leaf litter, and the (probable) convergence of features makes it very difficult to identify phylogenetic relationships.

SYSTEMATICS

The classification of the Cryptorhynchinae is in some disarray, and there is little point in discussing the tribal or subtribal divisions with respect to the New Zealand fauna. In fact there are only two 'traditional' groups in the country: Psepholacini, which is probably monophyletic, and Cryptorhynchini (mostly 'Tylodina'), which is almost certainly not. At least some concepts of the Tylodina (as either a tribe or a subtribe) would lead to members of some New Zealand genera being split between suprageneric groups. To facilitate understanding of the New Zealand fauna it is more satisfactory to discuss groups of genera, where these are apparent. Sadly, even at this level it has not been possible to place all the genera in groups, and the relationships of a number have not been determined.

The relationships of the New Zealand cryptorhynchine genera outside the country, where known, are predominantly with Australia, New Caledonia, New Guinea, and the Oriental Region; there are very few faunal connections with South America. Some genera have a range extending outside New Zealand or belong to a group with such a range (Table 1, pp. 20–21). However, the majority of genera neither contain species known from outside New Zealand nor belong to any clear groupings of genera that have such a distribution.

One of the largest cryptorhynchine genera in New Zealand has hitherto been *Acalles*. This has turned out to be very much of a 'dumping ground' for the small weevils, none of which were actually congeneric with the European type species of *Acalles*. Species previously placed in *Acalles* are here transferred to a large number of other genera.

The relationships of three groups of genera – the Psepholacini, the *Rhynchodes* group, and the *Metacalles*

group – are dealt with below in some detail, since it is more informative to give the discussion here rather than 'hidden' following one of the genera concerned. Other details of relationships are given with each generic description.

Psepholacini. This tribe in New Zealand comprises six genera: *Psepholax*, *Oreda*, *Mesoreda*, *Homoreda*, *Strongylopterus*, and *Nothaldonus*. Of these the last is least obviously a member of the tribe, despite similarities to *Strongylopterus*. The biology of *Nothaldonus* is not known, but the others make tunnels in wood, in which both adults and larvae can be found.

The tunnelling habit of the adults may account for some of the morphological features which, in some instances, parallel those of Scolytidae. A characteristic of the members of the tribe, although not a unique apomorphy, is the extension of the apical margin of the tibia – which can be distinguished in all cryptorhynchines as a ridge on the anterior face bearing stout yellowish macrosetae – around the dorsal surface, so that it forms a tooth or semicircular cusp dorsal to the uncus (Fig. 168, 175, 176). The prosternal canal lacks clear lateral carinae in *Psepholax*, *Strongylopterus*, and *Homoreda*, but the carina is present in *Oreda*, *Mesoreda*, and *Nothaldonus*. The mesosternal receptacle is complete in *Nothaldonus*, and fairly well developed in *Mesoreda*, but has lost its clear U-shape in the other genera, becoming just a pad in *Psepholax* and most *Strongylopterus*. In *Psepholax*, *Oreda*, and *Homoreda* the rostrum is straight and notably short, presumably as an adaptation to boring into wood. In all New Zealand taxa except *Nothaldonus* the basal apodeme of the male tegmen is very short, and in all New Zealand genera except *Strongylopterus* and *Psepholax* there is a sclerite ventrally in the endophallus shaped as an inverted Y or inverted V. In some genera there is a tooth externally (dorsally) on at least the middle tibia.

Oreda, *Mesoreda*, and *Homoreda* probably form a monophyletic group, indicated by the apomorphic cut-back form of the anterior of the prosternal canal carinae (Fig. 52–56), the ventrally projecting subgenal arm flanges, and the inverted Y-shaped sclerite in the endophallus. The relationships within the clade are not certain, although the development of the strongly projecting tooth on the anterior of the prosternal canal margins suggests that *Oreda* and *Homoreda* are sister-groups.

Strongylopterus and *Nothaldonus* have an equivocal position. The two are very similar in habitus (Fig. 1, 2), and the female genitalia are very similar, particularly in the weak sclerite in the bursa/vagina complex (Fig. 202, 207), the shape of sternite VIII (Fig. 201, 206), and the shape of tergite VIII (Fig. 200, 205). In these characters they differ

Table 1 Distribution of New Zealand cryptorhynchine genera and genus-groups (between lines).

	Endemic	Generic distribution outside New Zealand	Genus-group distribution outside New Zealand
<i>Nothaldonus</i>	+		
<i>Homoreda</i>	+		
<i>Mesoreda</i>	+		
<i>Oreda</i>		New Caledonia, Guam	Chile, E. Australia, New Caledonia, New Guinea, Fiji, Japan, Philippines, Moluccas, China, India, Norfolk I.
<i>Strongylopterus</i>		Fiji, Art, New Caledonia, New Guinea, Juan Fernandez Is	
<i>Psepholax</i>		E. Australia, Norfolk I., New Caledonia, Chile	
<i>Sympedius</i>	+		
<i>Baeorhynchodes</i>	+		
<i>Eutyrrhinus</i>		Australia, New Guinea, Solomon Is, Moluccas, Malaysia	Australia, New Guinea, Solomon Is, Moluccas, Malaysia, New Caledonia, Lifu
<i>Rhynchodes</i>		New Caledonia, Lifu	
<i>Mitrastethus</i>		Australia, New Guinea, New Caledonia, Norfolk I.	
<i>Mecistostylus</i>		New Hebrides	New Hebrides, New Caledonia, Lifu, Australia, Fiji, New Guinea, Rennell I., Philippines, Moluccas
<i>Ectopsis</i>	+		
<i>Hadracalles</i>	+		
<i>Tychanopais</i>	+		
<i>Tychanus</i>	+		
<i>Clypeolus</i>	+		
<i>Didymus</i>		Kermadec Is, Norfolk I.	
<i>Hiracalles</i>	+		
<i>Indecentia</i>	+		
<i>Crisius</i>	+		
<i>Whitiacalles</i>	+		

from other Psepholacini, and may well be sister-groups. In the male genitalia the form of the basal sclerites of *Strongylopterus* is similar to that of the *Oreda* group, the inverted V-shaped sclerite in the endophallus of *Nothaldonus* is similar to the inverted Y-shape of the *Oreda* group, and only *Strongylopterus* has the short tegminal basal apodeme common to other Psepholacini. Finally, whilst *Strongylopterus* has no (or weak) marginal carinae to the prosternal canal, and no mesosternal receptacle (Fig. 111), *Nothaldonus* has complete carinae and a well formed mesosternal receptacle (Fig. 110). Within the Psepholacini loss of the prosternal canal carinae and the mesosternal receptacle has

occurred almost certainly more than once. Within the New Zealand fauna the loss in *Psepholax* is not homologous with the loss within the *Oreda* / *Homoreda* / *Mesoreda* clade, and neither is homologous with the loss in *Strongylopterus*, if *Nothaldonus* is its sister-group. Apomorphies to unite *Strongylopterus* and *Nothaldonus* with other Psepholacini are not clear, but more genera, outside New Zealand, need to be examined before fixing the position of these two genera.

Members of the tribe are found from South America (where they probably arrived by rafting rather than being there as relicts of a Gondwanan fauna), through eastern

Endemic	Generic distribution outside New Zealand	Genus-group distribution outside New Zealand
<i>Maneneacalles</i>	+	
<i>Dermothrius</i>	+	
<i>Paromalina</i>	+	
<i>Agacalles</i>	+	
<i>Synacalles</i>	Norfolk I.?	Norfolk I.?, Australia?
<i>Scelodolichus</i>	New Caledonia	New Caledonia
<i>Metacalles</i>	Australia?	
<i>Crooktacalles</i>	+	
<i>Omoecacalles</i>	+	
<i>Allanalcis</i>	+	
<i>Zeacalles</i>	+	
<i>Postacalles</i>	+	
<i>Trinodicalles</i>	+	
<i>Patellitergum</i>	+	
<i>Rainacalles</i>	+	
<i>Pachyderris</i>	+	
<i>Andracalles</i>	Lord Howe I., Norfolk I., Tahiti, Niue, Samoa	
<i>Adstantes</i>	+	Lord Howe I., Norfolk I., Pacific Is,
<i>Microcryptorhynchus</i>	Australia, New Guinea, Pacific Is, Marianas	Australia, New Guinea, Auckland Is
<i>M. (Notacalles)</i>	Auckland Is	
<i>Ampagia</i>	Australia, Lord Howe I., Fiji, Samoa, New Caledonia, Malaysia	

Australia, New Zealand, New Caledonia, New Guinea, and Fiji to Japan and India. There are approximately 40 genera. The sister-group of the tribe has not been determined, but it is notable that the *Rhynchodes* group of genera are characterised by the following character states also found in the Psepholacini: tibial apex extending dorsally to uncus (in most cases); male tegmen with very short apodeme; male endophallus with inverted Y-shaped sclerite; and rostrum straight. The two groups also share a similar biology. The presence of a clearly margined prosternal canal in some Psepholacini, and the phylogenetic relationships of the genera (C.H.C. Lyal, unpubl.), indicate that the loss of the prosternal canal and mesosternal receptacle is apomorphic

within the Psepholacini, and that their classification in the 'Ithyporini' is inappropriate.

The relationships of the New Zealand genera are particularly with Australia, and in *Psepholax* itself there are representatives in New Zealand of more than one group that is also found in Australia.

***Rhynchodes* group.** In New Zealand this group of genera includes *Rhynchodes*, *Baeorhynchodes*, *Eutyrrhinus*, and *Sympedius*. Elsewhere the group includes *Orochlesis* (Australia to Japan and Fiji), *Strattis* (Sri Lanka), *Syrotelus* (Java, Japan, India), *Lophocheirus* (New Guinea, Australia), *Odosyllis* (Philippines), *Nauphaeus* (Moluccas,

Philippines), *Cydostethus* (Moluccas), *Brachypithes* (Australia), and *Nedymorus* (Aru). The prime apomorphy of the group is a long membranous pouch extending between the posterior and anterior ends of the female sternite VIII (Fig. 251) rather than confined to the apical plate as in most Cryptorhynchinae (e.g. Fig. 261). Other characters that indicate a close relationship of the genera are the form of the mesosternal receptacle (Fig. 116–119), the presence of a small tooth or flange at the base of the middle tibia, generally with an adjacent pitted area (Fig. 180, 181) and the presence of a small supra-uncal projection on the hind tibia. Many of the species have an inverted Y-shaped sclerite in the male endophallus. As noted above, some of these characters are found also in the Psepholacini, and the *Rhynchodes* group should be considered a potential sister-group in any analysis of that tribe.

Of the New Zealand genera, *Rhynchodes*, *Baeorhynchodes*, and *Eutyrhinus* are more closely related to each other than any is to *Sympedius*. Of genera found outside New Zealand the closest morphologically to *Sympedius* are *Orochlesis* (Australia–Japan–Fiji) and *Strattis* (endemic to Sri Lanka), all three genera lacking apomorphies which link *Rhynchodes*, *Baeorhynchodes*, and *Eutyrhinus*. Discovering apomorphies common to two or more of *Sympedius*, *Orochlesis*, and *Strattis* is not simple. The two species of *Strattis* are united by the apomorphic virtually complete reduction of the male tegminal apodeme. The species in *Sympedius* group I (see description below) all have a small, roughly striate area on either side of ventrite 1 (Fig. 190) and a sculptured area on the hind femur, these possibly acting together as a stridulatory device. Some species of *Orochlesis* have a patch on either side of ventrite 1 which, although not sculptured in exactly the same way as that of *Sympedius* group I, may be homologous. Otherwise, most *Orochlesis* species are characterised by oval, decumbent, contiguous or separate scales and a smooth, 'rounded' body form which is here considered apomorphic.

The species of *Sympedius* group II, all of which are transferred from *Tychanus* in this study, have an apomorphic development of a prominence on interstriae 3–7 near the apex of the elytron (Fig. 101); a small swelling in this position is not uncommon, and the presence of such a development in some species of group I is not sufficient to indicate monophyly of the genus. Synapomorphies of species of group II with the species of group I, *Orochlesis*, or *Strattis* have not been identified. The two species of *Strattis* approach in appearance *Sympedius* more than *Orochlesis*. There is no good evidence for considering any groups other than *Strattis*, *Sympedius* group I, and *Sympedius* group II as monophyletic and, at present, the closest relatives to the latter two groups are unidentified. Assum-

ing, for the sake of parsimony, the introduction of one member of a plesiomorphic *Orochlesis*-like stock rather than two, three, four, or five, the two groups of species here treated as *Sympedius* are better united than separated.

Metacalles group. *Metacalles*, *Scelodolichus*, *Agacalles*, *Dermothrius*, *Paromalina*, and *Synacalles* probably form a monophyletic group; *Maneneacalles* and *Crooktacalles* possibly also fall within it. This group is distinguished by the apomorphic erect setiform scales on the pronotum, elytra, and, generally, legs (Fig. 29); these are absent only in some species of *Dermothrius* and are present but short and stout in some species of *Paromalina* (*P. vestita* and *P. nigricollis*) and *Synacalles* (*S. peelensis*, *S. mundus*, *S. hystriculus*, and *S. trinotatus*). A few species of *Zeacalles* have erect setiform scales on the pronotum and sometimes the elytra, but not on the legs; this is taken to be homoplastic. As the probable function of these scales is to detect the surrounding substrate material while in the leaf litter, it would not be surprising to discover a good deal of homoplasy. Some *Microcryptorhynchus* have similar scales towards the apex of the elytra, but there are no other apomorphies indicating a close relationship with the *Metacalles* group. Outside the Cryptorhynchinae the character also occurs in leaf litter forms, e.g., the molytine *Etheophanus*. The pronotum is generally conspicuously widest at the level of the front coxae, and the sides are strongly convex (Fig. 29); this, although a plesiomorphic character state, is in contrast to the *Zeacalles* group where the pronotum is widest at or near the posterior margin (although within the *Metacalles* group *Paromalina* is similar to *Zeacalles* in this respect). Wings, the elytral strigil, and the microsetae of tergum VII are all absent; outside the group all three are absent only in *Crooktacalles* and *Microcryptorhynchus* (although the former genus may itself belong in the *Metacalles* group, a matter which is discussed under the generic entry below). These character states are not strong indicators of monophyly, but there are no apomorphies linking members of the postulated group with other genera.

Outside New Zealand there are one described and two undescribed species of *Scelodolichus* in New Caledonia and one undescribed species of *Metacalles* in Australia. *Microcryptorhynchus setosus* Lea from Norfolk Island is probably part of a clade with *Synacalles hystriculus*, *S. trinotatus*, and *S. posticalis*, but pending further examination is not transferred here. The sister-group of these genera is not known.

Within the *Metacalles* group relationships are uncertain, and most apomorphic character states that have been determined do not indicate relationships unequivocally. *Dermothrius* and *Paromalina* form a monophyletic group, indi-

cated by the unique form of the agglutinated scales of the metepisternum and metasternum. The bases of interstriae 2 and 3 are strongly raised in *Metacalles* (Fig. 198) and *Agacalles*, although they are more weakly developed in at least some species of all other genera of the group except *Paromalina*, and in some genera outside the group, e.g., some *Zeacalles*, *Microcryptorhynchus*, and *Notacalles*. *Agacalles* and *Metacalles* may be sister-groups (*Agacalles* species share an apomorphic subapical broadening of the aedeagus), although two species of the former genus are more similar to *Metacalles* than their congeners in having 'untidy' tufts of long clytral scales and dark antennal clubs. Dark antennal clubs are apomorphic, and occur in non-tenacral specimens of the two species of *Agacalles* referred to above, all described *Metacalles* (but not in an undescribed species), most *Dermothrius*, and *Synacalles* group II. Again, the character state is found outside the group, for example in some *Zeacalles* species and in the diabathrariine leaf-litter genus *Geochus*. The pronotum may bear plesiomorphic oval scales (some *Metacalles*, including an undescribed species, and *Dermothrius brevipennis*), apomorphic elongate scales (most *Dermothrius*, *Paromalina*, *Scelodolichus*, *Agacalles*, and some *Metacalles*), or round scales (*Synacalles*), these sometimes with the stalk central (*Synacalles* groups I and III, the state also being found in *Omoecalles* and *Maneneacalles concinnus* but not in other species of the latter genus).

The presence in a species of *Dermothrius* and some *Metacalles* of oval pronotal scales, and the variation in scale elongation in *Agacalles*, might indicate one of two things: either long scales are apomorphic for *Dermothrius* + *Paromalina* + *Agacalles* + *Metacalles* + *Scelodolichus*, the apomorphy reversed in *Dermothrius*, *Metacalles*, and *Agacalles* species; or they are independently gained in *Dermothrius* + *Paromalina*, *Scelodolichus*, *Agacalles*, and *Metacalles*. These proposals are equally parsimonious and, at present, no choice can be made between them. There may be a flagellum (some *Synacalles*) or a tubular sclerite in the endophallus that may function as a flagellum (some *Synacalles*, some *Metacalles*). The hemisternites of sternum VIII may be linked anteriorly (some *Metacalles*, some *Synacalles*). The mesosternal receptacle in *Metacalles* females, and some males, extends nearly to or beyond the level of the posterior of the hind coxae, a character shared only with *Synacalles* group II. The aedeagus of an undescribed species appears intermediate between that of *Synacalles peetensis* and *Maneneacalles concinnus*, the flagellum being absent, although externally the species is similar to *Synacalles dorsalis*. The present arrangement is not fully satisfactory, but will suffice for identification purposes.

KEY TO GENERA OF CRYPTORHYNCHINAE KNOWN FROM NEW ZEALAND

(Note. Couplets 40 and 46 key out two undescribed genera, the first represented by two species and the second only one. The specimens are too few and in too poor a state to warrant description; all are lodged in the NZAC.)

- 1 Scutellum visible 2
—Scutellum not visible 28
- 2(1) Antennal club subcylindrical (Fig. 12); pronotum elevated anteriorly in profile (Fig. 63); length 3–7 mm (p. 55) .. *Mecistostylus*
—Antennal club ovoid (Fig. 9, 48); pronotum depressed anteriorly in profile (Fig. 60, 66) 3
- 3(2) Ventrite 1 with a glabrous ridged patch laterally (Fig. 190); scutellum conical, weakly projecting between clytra, and metasternum between middle and hind coxae more than three-fifths length of hind coxae; male genitalia with an inverted Y-shaped sclerite in endophallus (Fig. 506); female sternum VIII with intersegmental membrane free to apex of apodeme (cf. Fig. 251); length 2–5 mm (Fig. 7) (p. 45) .. *Sympedius* group I
—Ventrite 1 without a glabrous ridged patch laterally (e.g., Fig. 191); scutellum generally not projecting conically but, if so, then metasternum between middle and hind coxae less than half length of hind coxae, and male genitalia lacking an inverted Y-shaped sclerite in endophallus; female sternum VIII with intersegmental membrane not free to apex of apodeme (e.g., Fig. 261) 4
- 4(3) Hind tibia with apical carina extending dorsally to uncus, forming a tooth or semicircular cusp ('supra-uncal projection') (Fig. 168, 171); metasternum separating middle and hind coxae by at least three-quarters length of hind coxae (Fig. 118, 120); posterior margin of metasternum not emarginate in front of hind coxae, or only weakly so 5
—Hind tibia with apical carina not extending dorsally to uncus to form a tooth or cusp; metasternum separating middle and hind coxae by less than three-fifths length of hind coxae or, if more, then posterior margin of metasternum strongly emarginate in front of hind coxae, with a transverse groove between hind and middle coxae 16
- 5(4) Fore tibia carinate dorsally (Fig. 177, 179) 6

- Fore tibia rounded dorsally (Fig. 184) 9
- 6(5) Fore tibia with a more or less slender explanate carina dorsally, at least at base (Fig. 166, 177, 179); prosternal canal with scales in anterior half, and mesosternal receptacle closed posteriorly; basal margin of elytra strongly sinuate, projecting over base of pronotum (Fig. 8, 9) 7
- Fore tibia with a blunt carina not developed into a slender flange (Fig. 164); prosternal canal with a scattering of fine setae internally but no scales or, if scales present, then mesosternal receptacle not closed posteriorly; basal margin of elytra sinuate but not projecting markedly over base of pronotum (Fig. 1, 2) 8
- 7(6) Elytral apices produced into short ventral flanges, appearing as short spines in dorsal aspect (Fig. 9); scale pattern on elytra mottled; length 4–12 mm (p. 49) .. *Eutyrrhinus*
- Elytral apices not produced into short ventral flanges (Fig. 8); elytra dark, with a pale sutural streak on proximal third; length 3–5 mm (p. 48) .. *Baeorhynchodes*
- 8(6) Prosternal canal with clear lateral carinae extending between fore coxae (Fig. 110); mesosternal receptacle closed posteriorly (Fig. 110); pronotum with rounded prominences posteriorly on either side of midline (Fig. 1, 50); length 11–12 mm (p. 30) .. *Nothaldonus*
- Prosternal canal lacking clear lateral carinae or, if carinae present, these not extending between fore coxae (Fig. 111); mesosternal receptacle pad-like and, if concave, not closed posteriorly (Fig. 111); pronotum lacking prominences (Fig. 2, 51); length 5–13 mm (p. 31) .. *Strongylopterus*
- 9(5) Hind tibia with apical margin developed into a strong, tooth-like projection dorsal to uncus when viewed laterally (supra-uncal projection) (Fig. 167, 169, 171); middle tibia with an external tooth or teeth (Fig. 168, 170) or elongate flange (Fig. 172) (if the latter, rostrum less than 1.5X as long as broad in ventral aspect and mesosternal receptacle not developed; Fig. 115); metasternum between middle and hind coxae smoothly convex; elytra rounded apically (Fig. 4–6) 10
- Hind tibia with apical margin extending as a weak carina dorsally to uncus when viewed laterally (supra-uncal projection) (Fig. 182); middle tibia lacking an external tooth or, if with a small tooth at base (Fig. 180), then metasternum with posterior margin of elevated portion emarginate anterior to hind coxa (Fig. 118) and elytra with apex acuminate (Fig. 10); mesosternal receptacle developed (Fig. 118, 120); rostrum more than 3X as long as broad in ventral aspect .. 13
- 10(9) Mesosternum lacking anterior-facing glabrous wall against which apex of rostrum rests (Fig. 112, 115); prosternum without carinae bounding rostral canal (although a prominent tooth sometimes present anteriorly) or, if carinae present, then scrobe lacking a clearly carinate dorsal margin; rostrum less than 2.5X as long as broad ventrally 11
- Mesosternum with anterior-facing wall against which apex of rostrum rests (Fig. 113, 114); prosternum with carinae bounding rostral canal; scrobe always with dorsal margin clear; rostrum generally more than 2.5X as long as broad ventrally 12
- 11(10) Rostrum more than 1.5X as long as broad in ventral aspect; lateral margin of prosternal canal developed anteriorly into a tooth or projection and cut back before meeting postocular lobe (Fig. 52, 53, 112); male endophallus with an inverted Y-shaped sclerite (Fig. 475); length 8–11 mm (Fig. 3) (p. 34) .. *Homoreda*
- Rostrum less than 1.5X as long as broad in ventral aspect; anterior margin of prosternal canal not developed into a tooth (Fig. 57, 115), though sometimes cut back before meeting postocular lobe; prosternal canal generally lacking carinate margins; male endophallus lacking a ventral inverted Y-shaped sclerite (Fig. 498, 506); length 3–11 mm (Fig. 6) .. (p. 39) .. *Psepholax*
- 12(10) Pronotum with anterior margin projecting pronouncedly over head (Fig. 4, 54, 55); prosternal canal anteriorly with carina developed into a long tooth (Fig. 54, 55, 113), particularly in male; scales dorsally predominantly black, with small patches of yellow (Fig. 4); aedeagus lacking a reticulate region posterior to ostium (Fig. 483); length 6–11 mm .. (p. 35) .. *Oreda*
- Pronotum with anterior margin not projecting pronouncedly over head (Fig. 5, 56); prosternal canal anteriorly with carina not developed into a tooth (Fig. 56, 114); scales dorsally predominantly brown and tan (Fig. 5); aedeagus with a clearly reticulate region dorsally immediately posterior to ostium (Fig. 483); length 4–8 mm (p. 37) .. *Mesoreda*
- 13(9) Elytra acuminate apically (Fig. 10); prosternal canal with scales anteriorly; length 11–25 mm (p. 51) .. *Rhynchodes*
- Elytra not acuminate apically; prosternal canal with fine setae but lacking scales; length generally less than 9 mm 14

- 14(13) Pronotum with pronounced 'shoulders' (Fig. 101); pronotum and elytra with prominences; more ovate weevils, with elytra at least 0.9x as wide as long (Fig. 101); length 3–8 mm ... (p. 45) .. *Sympedius* group II
 —Pronotum with sides smoothly rounded (Fig. 2, 11); pronotum and elytra lacking prominences; elongate weevils, with elytra less than 0.65x as wide as long (Fig. 2, 11) 15
- 15(14) Pronotum coarsely punctate-reticulate; pronotal scales rarely rubbed off, predominantly oval to elongate, grey, tan, or black; derm dark brown; mesosternal receptacle pad-like and, if concave, not closed posteriorly (Fig. 111); metasternum lacking a small tooth before hind coxa (Fig. 111); length 5–13 mm (Fig. 2) (p. 31) .. *Strongylopterus*
 —Pronotum finely and sparsely punctate; pronotal scales frequently rubbed off, but if present predominantly round, grey, and appressed; derm red-brown; mesosternal receptacle closed posteriorly (Fig. 120); metasternum with a small tooth before hind coxa (Fig. 120); length 5–7 mm (Fig. 11) (p. 53) .. *Mitrastethus*
- 16(4) A row or patch of more or less glossy creamy scales along metasternum or metepisternum adjacent to elytra, extending virtually length of metasternum (Fig. 149, 160, 161) or, if smaller (Fig. 148), then with a large, heart-shaped patch of pale scales on elytra (Fig. 106); generally less than 3 mm long; scutellum never conical; mesosternal receptacle always with a posterior wall 17
 —Without a row or patch of glossy, creamy scales along metasternum or metepisternum adjacent to elytra, extending virtually length of metasternum (e.g. Fig. 47, 100); more or less than 3 mm long; scutellum sometimes conical; mesosternal receptacle with or without a posterior wall 21
- 17(16) Pronotum and elytra with erect setiform scales (Fig. 25); base of elytral interstria 3 generally with a patch of erect, round or oval scales; male – aedeagus with 'body' longer than its apodemes (Fig. 660) (p. 89) .. part *Synacalles*
 —Pronotum not bearing erect setiform scales (i.e., with prominent decumbent scales, or erect scales with sides diverging towards apex); base of elytral interstria 3 generally raised, but lacking a patch of erect, round or oval scales; male – aedeagus with body shorter than apodemes or subequal in length 18
- 18(17) Elytra with a large, heart-shaped patch of pale scales medially (Fig. 106); pale scales laterally on thorax confined to a small patch (Fig. 148); metasternum depressed posterior to mesosternal receptacle (cf. Fig. 127); length 2.5–4 mm. (p. 72) .. part *Hüracalles*
 —Elytra without such a heart-shaped scale patch; pale scales laterally on thorax in a long bar or broader patch (Fig. 149, 160, 161); metasternum not depressed posterior to mesosternal receptacle 19
- 19(18) Pronotum without prominent erect or decumbent scales; elytra lacking prominences or raised interstriae; metepisternum with a broad patch of appressed, tessellate scales (Fig. 94, 160); length 2.5–3.5 mm (Fig. 37). Chatham Is (p. 124) .. *Patellitergum*
 —Pronotum and elytra with prominent, erect or decumbent scales (Fig. 24, 40); elytra generally with prominences or raised interstriae; metepisternum (anapleural suture) with a narrow bar of pale, glossy, imbricate or separate scales (Fig. 149, 161). Chatham Is and mainland 20
- 20(19) Pronotum and elytra with prominent decumbent scales; antennal club darker than funicle; anapleural suture with specialised scales imbricate or, more rarely, contiguous or separate (Chatham Is species); elytra lacking prominences (Fig. 97), although interstria 3 sometimes raised on anterior half; dorsal round scales flanking midline of pronotum approximately same diameter as apex of funicle segment 1; male – aedeagus with apex convex (Fig. 801); length 1.25–2 mm (Fig. 40) (p. 129) .. *Adstantes*
 —Pronotum and elytra with prominent, erect and decumbent scales; antennal club concolorous with funicle; anapleural suture with separate, erect, yellow scales; elytra with prominences on interstriae 1 and 3 (Fig. 77); dorsal round or oval scales flanking pronotal midline clearly less in diameter than apex of funicle segment 1; male – aedeagus with apex bifurcate (Fig. 639); length 2.5–3 mm (Fig. 24) (p. 87) .. *Maneneacalles*
- 21(16) Anapleural suture with broader part anteriorly containing small patch of sclerolepidia (Fig. 47); metasternum separating middle and hind coxae by at least two-thirds length of hind coxa (Fig. 121), with an inverted V-shaped pit medially (Fig. 121); elytra and pronotum lacking scale tufts (Fig. 13); length 5–13 mm (p. 57) .. *Ectopsis*
 —Anapleural suture without a broad anterior part, and sclerolepidia absent; metasternum separating middle

- and hind coxae by less than two-thirds length of hind coxa; if metasternum with a pit medially, this not in the form of an inverted V (Fig. 129–131); clytra and pronotum with or without scale tufts 22
- 22(21)** Ventrite 1 with a semicircular elevated area delimited by a carina (Fig. 192); rostrum less than 2.5x as long as wide at level of antennal insertions (Fig. 44); hind leg with trochanter / femur joint at right angles to ventral margin of femur, and dorsal margin of femur very convex longitudinally (Fig. 189); mesosternal receptacle very short, projecting ventrally but without a pronounced posterior longitudinal ridge (Fig. 141); length 2–3 mm (p. 140) .. *Ampagia*
 —Ventrite 1 lacking an elevated area delimited by a carina; rostrum more than 3x as long as its width at level of antennal insertions (Fig. 197); hind leg with junction of trochanter and femur at an obtuse angle to ventral margin of femur or, if at right angles, dorsal and ventral margins subparallel (Fig. 186, 188); mesosternal receptacle as long as wide or longer, or lacking a posterior wall, and if projecting ventrally to any extent then with a pronounced posterior longitudinal ridge (Fig. 125) 23
- 23(22)** Pronotum wider than elytra (Fig. 20); elytra very convex and irregular in profile (Fig. 74, 75); metasternum with median pit and metepisternum concealed by elytron; length 4–8 mm (p. 74) .. *Indecentia*
 —Pronotum narrower than clytra (e.g., Fig. 21, 32); clytra generally not very convex in profile (e.g., Fig. 73, 88, 96); if metasternum with a median pit then metepisternum visible 24
- 24(23)** Mesosternal receptacle lacking a posterior wall (Fig. 137); prosternal canal with a dense covering of cream scales; pronotum and elytra lacking prominences; male endophallus with a flagellum (Fig. 721, 722) (p. 109) .. *Omoecalles*
 —Mesosternal receptacle complete, U-shaped (e.g., Fig. 124); prosternal canal with fine setae but no scales; pronotum and elytral prominences present or absent; male endophallus lacking a flagellum (Fig. 615, 794) 25
- 25(24)** Elytra with greatest width in anterior quarter, more or less evenly tapered to apex from widest point (Fig. 39, 108); elytra with a prominence on interstria 1 (sometimes extending to interstria 2) before posterior declivity and immediately posterior to a triangular or diamond-shaped patch of intensely black scales (Fig. 39); fore femur lacking a ventral tooth; length 2–5 mm (p. 126) .. *Pachyderis*
 —Elytra widest near humeri or in posterior three-quarters, in outline not as above (Fig. 16, 18, 21, 22), without prominences on interstria 1 immediately anterior to apical declivity and posterior to a patch of intensely black scales; fore femur with or without a ventral tooth 26
- 26(25)** Scutellum generally conical, frequently projecting above level of elytra (Fig. 18, 71); fore femur lacking a ventral tooth, or tooth very small; metasternum not depressed, or with a pit in midline; length 2.5–4.5 mm (p. 69) .. *Didymus*
 —Scutellum rounded, not conical or projecting; fore femur with or without a ventral tooth, but if tooth small or absent then metasternum depressed behind mesosternal receptacle or with a pit at that point 27
- 27(26)** Elytra diverging from base to widest point in posterior half (Fig. 16, 102, 103), or if not diverging then with basal margin sinuate; metasternum not, or only very weakly, depressed and without a pit medially; fore femur with a tooth ventrally; humeral angles of elytra generally not markedly developed (Fig. 16, 102, 103); length 4–10 mm (p. 62) .. *Tychanus*
 —Elytra widest in anterior half or, if in posterior half, then basal margin not very sinuate; metasternum depressed (Fig. 131) or with a pit (Fig. 129, 130) medially; fore femur with or without a ventral tooth; elytra often developed at humeral angles or immediately posteriorly (Fig. 21, 22); length 2–8 mm (p. 75) .. *Crisius*
- 28(1)** Anapleural suture with a row of distinct, specialised pale scales, generally glossy, appressed, and waxy, or very small and plumose, or such scales forming a larger patch on metasternum or metepisternum laterally (Fig. 148–163) 29
 —Anapleural suture, metepisternum, and metasternum without scales, or with scales similar to those elsewhere on thorax 42
- 29(28)** Specialised scales creamy-white, slightly glossy, forming a band on metasternum and metepisternum, extending onto mesepimeron (Fig. 163); male—elytral margin generally with a carina near ventrites 1 and 2 (Fig. 145); length 1.5–3 mm . (p. 138) .. *Andracalles*
 —Specialised scales confined to metasternum, metepisternum, or anapleural suture, not extending onto mesepimeron (e.g., Fig. 151, 162); male—elytral margin lacking a carina near ventrites 1 and 2 30

- 30(29) Specialised scales forming a small triangular patch (Fig. 148); elytra with a large, oval or heart-shaped patch of pale scales medially (Fig. 19, 106); length 2.5–4 mm (p. 72) .. *Hürcaltes*
 —Specialised scales forming a bar or patch of different shape; elytra without a large, oval or heart-shaped patch of scales medially 31
- 31(30) Specialised scales forming a patch of maximum length subequal to or slightly less than its maximum width, including extensions (Fig. 150, 151, 156, 159) 32
 —Specialised scales forming a narrow bar or row of maximum length more than about 3x its maximum width (e.g., Fig. 149, 152, 155, 161, 162) 35
- 32(31) Elytra with large prominences bearing tufts of elongate scales on interstria 3 near posterior elytral declivity (Fig. 36, 107); length 1.5–4 mm (p. 121) .. *Trinodicaltes*
 —Elytra without large prominences on interstria 3, at most with interstria 2 raised for some of its length near posterior elytral declivity 33
- 33(32) Specialised scales not forming a convex mass, not extending between middle and hind coxae (Fig. 156); elytral striae generally not well marked, and fore femur without a ventral tooth; length 1.5–2 mm (p. 114) .. part *Zeacalles*
 —Specialised scales forming a brownish to creamy-white, more or less convex mass laterally on metasternum and metepisternum, obscuring anapleural suture, and frequently extending between middle and hind coxae (Fig. 150, 151); elytral striae well marked or, if not, then fore femur with a ventral tooth 34
- 34(33) Femora without a ventral tooth; length less than 2 mm (Fig. 26) (p. 93) .. *Dermothrius*
 —Fore femur (at least) with a ventral tooth; length 1.6–3.0 mm (Fig. 27) (p. 95) .. *Paromalina*
- 35(31) Elytra lacking prominent erect, semi-erect, or decumbent scales, although general scale cover sometimes decumbent 36
 —Elytra with rows of erect, semi-erect, or prominent decumbent scales along interstriae, at least basally or posteriorly (best viewed tangentially to surface) . 38
- 36(35) Pronotum with scale tufts at sides (Fig. 33); pronotal scales oval, not more than 1.5x as long as wide; interstria 2 of elytra never raised into a prominence; specialised thoracic scales almost always confined to a short, raised row on anterior of anapleural suture (Fig. 152, 153); length 1.5–2.7 mm .. (p. 111) .. *Allanalcis*
 —Pronotum lacking scale tufts, its sides rounded (Fig. 34, 35); pronotal scales more elongate, generally more than twice as long as wide on disc or, if not, then interstria 2 raised into a prominence before posterior declivity of elytra; specialised thoracic scales forming a line or broader patch along anapleural suture or extending over metepisternum (Fig. 154–158) 37
- 37(36) Specialised thoracic scales forming a narrow line along anapleural suture (Fig. 154) or a broader, clearly defined patch separated from elytral margin, at least posteriorly (Fig. 157); length 1.5–2.5 mm (p. 114) .. part *Zeacalles*
 —Specialised thoracic scales forming a broad, somewhat irregular patch near elytra (Fig. 158); length 1.7–2.2 mm (p. 120) .. *Postacalles*
- 38(35) Metepisternum generally concealed by a more or less broad band of imbricate, pale whitish, indistinct scales touching elytral margin (Fig. 162); pronotum and elytra without prominences; pronotal scales oval or elongate; metasternum between middle and hind coxae raised relative to hind coxa or flat (weakly convex); pronotal and elytral scales greyish-white or greyish-yellow; length 1–2.5 mm (Fig. 41, 42) (p. 131) .. *Microcryptorhynchus* .. 56
 —Metepisternum with modified scales forming a band not touching elytra or, if touching elytra, then pronotum with round scales or with band not broad (Fig. 149, 152) and scales orange to tan; metasternum between middle and hind coxae always raised relative to hind coxa; length 1.0–5.4 mm 39
- 39(38) Decumbent scales on disc of pronotum more or less circular, or if weakly oval then not more than 1.5x as long as wide; elytral interstria 2 lacking a prominence near posterior declivity, although this sometimes present on interstria 3; elytra never abruptly raised and rounded as in Fig. 90 40
 —Decumbent scales on disc of pronotum elongate or elongate-oval, generally not less than twice as long as wide or, if more rounded, then elytral interstria 2 with a prominence near posterior declivity (Fig. 34, 90); elytra sometimes greatly rounded (Fig. 90) 41
- 40(39) Specialised scales on side of thorax small, yellow, extending along anapleural suture and sometimes over metepisternum posteriorly (Fig. 149), in which case a

- prominence present on interstria 3 near posterior elytral declivity; fore femur approx. twice as wide as fore tibia; male — aedeagus bifurcate apically (Fig. 639); length 2.5–4.5 mm (p. 87) .. *Maneneacalles*
- Specialised scales on metepisternum and metasternum small, creamy-white, forming a more or less extensive but generally ill defined patch; elytra lacking prominences; fore femur approximately twice thickness of fore tibia; male — aedeagus not bifurcate apically. [See Note, p. 23] undescribed genus and species
- 41(39)** Pronotum, elytra, and legs with long, erect, setiform scales (Fig. 28); specialised scales on anapleural suture somewhat irregular, generally in contact with elytra (Fig. 152); pronotum contracted at base (Fig. 28); elytra in profile sloping gradually to apex (Fig. 84); length 1.5–4 mm (p. 97) .. *Agacalles*
- Pronotum, elytra, and legs generally without long, erect, setiform scales (Fig. 34), but if such setiform scales present then elytra in profile abruptly sloping posteriorly, so slope of posterior declivity paralleling anterior margin (Fig. 90); specialised scales on anapleural suture 2 forming either a narrow row (Fig. 154) or a broader, well defined band (Fig. 155, 157), generally not in contact with elytra; pronotum generally not greatly contracted at base (Fig. 34); length 1–3 mm (p. 114) .. part *Zeacalles*
- 42(28)** Mesosternal receptacle with a hollow on either side of midline carina posteriorly (Fig. 135, 136); femora with broad, glabrous and granulate ventral furrows delimited both anteriorly and posteriorly with carinae (Fig. 187); hind femur broader at base than sub-basally, and junction with trochanter at right angles to dorsal and ventral margins of femur (Fig. 186); length 2.5–3 mm (p. 106) .. *Crooktacalles*
- Mesosternal receptacle with a convex posterior face and no median carina, or if as above then ventral femoral furrow without a posterior carina and not glabrous; femur ventrally without a furrow or, if glabrous granulate furrow present, then mesosternal receptacle lacking a posterior carina, hind femur narrower basally than sub-basally, and junction with trochanter not at right angles to dorsal and ventral femoral margins (cf. Fig. 184, 185, 188) 43
- 43(42)** Pronotum with a fairly uniform scattering of prominent, erect, setiform or club-shaped scales; elytra with prominent, erect or semi-erect scales along interstriae; fore femur without a ventral tooth or, if tooth present, then erect scales setiform and decumbent pronotal scales elongate (Fig. 28); pronotum lacking a median carina near posterior margin; scape with or without fine setae, but lacking oval scales 44
- Pronotum and elytra without prominent erect scales, except in tufts or a loose anterior grouping or, if erect scales present, then these generally not setiform on pronotum (Fig. 17) and fore femur with a ventral tooth and decumbent scales on pronotum round or oval, or a median short carina near posterior margin of pronotum, or scape with oval scales 51
- 44(43)** Pronotum widest near posterior margin, with curvature of side roughly continuous with that of elytra (Fig. 32, 39); erect scales on pronotum clearly elongate-oval or narrowly fan-shaped 45
- Pronotum widest near midlength, distinctly narrowing before base (Fig. 28, 29, 30) or, if widest near posterior margin, then erect pronotal scales long and setiform (erect pronotal scales otherwise setiform or broader) 46
- 45(44)** Mesosternal receptacle open posteriorly (Fig. 137); prosternal canal squamous; elytra without prominences; length 2–3 mm ... (p. 109) .. *Omoecalles*
- Mesosternal receptacle closed posteriorly (cf. Fig. 140); prosternal canal with a scattering of fine setae; elytra with a more or less developed prominence on interstria 1 near posterior declivity; length 4–5 mm (p. 126) .. part *Pachydermis*
- 46(44)** Pronotum with a median, very coarsely punctate carina or prominence; pronotal scales round to oval; antennal club concolorous with funicle; length 2 mm. [See Note, p. 23] undescribed genus and species
- Pronotum lacking a median prominence or, if present, then scales elongate and prominence either very faintly punctate or coarsely punctate with antennal club much darker than funicle 47
- 47(46)** Pronotal scales other than erect scales elongate or elongate-oval (Fig. 28, 29, 30) 48
- Pronotal scales other than erect scales round (Fig. 19, 25, 94) 50
- 48(47)** Elytra strongly convex, with posterior declivity nearly vertical (Fig. 86); scale tufts not developed; elytral striae generally very weakly marked; antennal club concolorous with funicle or slightly darker; length 1.5–4 mm (Fig. 30) (p. 103) .. *Scelodolichus*
- Elytra not strongly convex, with posterior declivity not nearly vertical (Fig. 84, 85) or, if so, then antennal club

- markedly darker than funicle and elytra with scale tufts; scale tufts otherwise present or absent; elytral striae or strial punctures generally well marked (Fig. 28, 29)..... 49
- 49(48) Elytra with ratio of greatest depth in profile to length (Fig. 49) more than 0.57; pronotum with or without tufts of scales, prominences, or a median carina; antennal club generally darker than funicle; elytra always with tufts of black or pale elongate scales; more oval weevils (Fig. 29) 1.3–2.0 mm in length..... (p. 99) .. *Metacalles*
 —Elytra with ratio of greatest depth in profile to length (Fig. 49) generally less than 0.55, although if more than elytra lacking tufts of scales; pronotum never with scale tufts, prominences, or a median carina; antennal club rarely darker than funicle; elytra either lacking scale tufts or with orange-yellow tufts; more elongate weevils (Fig. 28) 1.5–4.0 mm in length (p. 97) .. *Agacalles*
- 50(47) Elytra with a large, pale, oval or heart-shaped patch of scales across sutural margin medially (Fig. 19, 105, 106); erect scales short, broad (Fig. 193, 194); metasternum more or less depressed between clear lateral lobes (Fig. 127); length 2.5–4.0 mm..... (p. 72) .. *Hüiracalles*
 —Elytra lacking a large, oval or heart-shaped pale patch of scales; erect scales generally longer and setiform (Fig. 25); metasternum not depressed medially, with lateral lobes not as clear; length 1.25–3.5 mm (p. 89) .. *Synacalles*
- 51(43) Elytra in side view with total depth equal to or greater than length (Fig. 92, 93, 95); fore femur lacking a ventral tooth 52
 —Elytra in side view with total depth less than length (Fig. 65, 66, 70, 76), and fore femur with or without a ventral tooth; if elytra subequal (rarely), then fore femur with a ventral tooth..... 53
- 52(51) Elytra with large, conical prominences bearing tufts of scales (Fig. 93, 107); large prominences on elytral interstria 3 near posterior declivity; length 1.5–4 mm (p. 121) .. *Trinodicalles*
 —Elytra with small, inconspicuous tufts of scales; elytral interstriae 3 lacking large prominences (Fig. 38, 95); length 2.0–2.3 mm (p. 125) .. *Rainacalles*
- 53(51) Mesosternal receptacle with ‘internal margin’ of cup shallow and not extending between middle coxae, posterior margin with a prominent longitudinal carina (Fig. 123); pronotum generally with scales sparse and separate, at least in part; derm dull or, if shiny, then elytral scales not round and appressed but sparse and separate along either side of costal margin (Fig. 15); length 3–13 mm (p. 60) .. *Tychanopais*
 —Mesosternal receptacle with ‘internal margin’ of cup between middle coxae, often at about midline, and with posterior margin lacking a longitudinal carina (Fig. 122, 126, 132); pronotum generally with scales imbricate or contiguous and derm shiny or, if dull (microgranulate) then scales of pronotum and elytra appressed; scales of elytra contiguous or imbricate if not round and appressed 54
- 54(53) Scales of pronotum and elytra mostly small, round or oval, and appressed, never gathered into tufts (Fig. 14); derm matt; fore femur with a ventral tooth, from which carinae extend to both sides of femur/tibia joint (Fig. 183); length 7–10 mm (p. 58) .. *Hadracalles*
 —Scales of pronotum and elytra predominantly decumbent or semi-erect, frequently gathered into tufts; derm glossy; ventral tooth present or absent, if present then femur lacking carinae, as in Fig. 183 55
- 55(54) Scape generally with oval scales (Fig. 196); fore tibia with or without a ventral tooth; prosternal canal with scattered fine setae or, if scales present, elytra with prominences; pronotal and elytral scales not glossy; length 3.5–9 mm (Fig. 17) (p. 65) .. *Clypeolus*
 —Scape with fine setae but not scales; fore tibia without a ventral tooth; prosternal canal with a dense covering of scales; pronotum and elytra lacking prominences; pronotal and elytral scales glossy on disc; length 2.5–3 mm (Fig. 23) (p. 86) .. *Whitiacalles*
- 56(38) Metasternum raised before hind coxae, with either a vertical wall or a conical projection (Fig. 143), separating middle and hind coxae by less than length of a hind coxa (Fig. 143); very rarely densely covered with grey, appressed scales; pronotum often with 2 short longitudinal patches of pale scales extending forwards from posterior margin (Fig. 109) (p. 131) .. subgenus *Microcryptorhynchus*
 —Metasternum between middle and hind coxae flat before hind coxae (Fig. 144), generally separating middle and hind coxae by the length of a hind coxa (Fig. 144); most species with a dense covering of grey, appressed scales on pronotum and elytra; pronotum very rarely with posterolateral longitudinal stripes of pale scales (p. 131) .. subgenus *Notacalles*

DESCRIPTIONS

Genus *Nothaldonus* Broun

Broun, 1893a: 1235. Hutton, 1904: 211. Hudson, 1934: 221. Type species *Aldonus peacei* Broun, 1880, by monotypy.

Length 11–12 mm. Habitus, Fig. 1. Derm black, shiny, densely squamose. Scales small, oval, elongate, decumbent with erect patches, separate, contiguous and imbricate; coloration tan and dark brown; erect setiform scales absent. Pronotum in profile (Fig. 50) convex but smoothly depressed anteriorly, depressed abruptly at base; elytra weakly convex, abruptly declivous posteriorly. Apterous.

Head. Rostrum shorter than pronotum, squamose dorsally at base, the squamosity extending to between antennal insertions in male, much less far in female; punctation much coarser and more extensive in male.

Antennae inserted approx. halfway along rostrum. Funicle longer than scape, with dark decumbent setae; F1 and F2 elongate, subequal, together just over half length of funicle but not as long as scape. Scape with or without a few small scales apically.

Thorax. Pronotum (Fig. 1) subequal in length and width, widest at middle, narrowed anteriorly with sides convex; anterior margin weakly convex, sometimes weakly emarginate medially; posterior margin bisinuate, with a small, depressed median lobe projecting posteriorly; an irregular, longitudinal median carina on anterior part, more marked in male; a large, elongate swelling on either side of midline in posterior half (Fig. 1); punctation dense, coarse, with interstices thus forming a reticulum; sparse tufts of dark scales in positions 2 and 3, the latter very weak. Scutellum small, round, with small scales.

Elytra (Fig. 1) with basal margin sinuate, wider than pronotum basally; humeri convex, with sides smoothly convex to truncate apex; interstriae encroached upon by stria punctures, with small tubercles on I3 and I5 near anterior margin and near middle, and an acute tubercle on I5 near declivity; interstriae 3 and 5 raised over part of their length; stria punctures large, deep, regular; tubercles each with a tuft of scales. Elytral strigil very fine.

Postocular lobes weakly rounded, extending between marginal carinae of prosternal canal. Prosternal canal cavernous; marginal carina projecting strongly between fore coxae (Fig. 110). Mesosternal receptacle U-shaped, subequal in length and width, extending posteriorly to anterior of middle coxae; margins broad, not greatly produced ventrally (Fig. 110). Metasternum concave anteriorly and

posteriorly, separating middle and hind coxae by the length of a hind coxa. Metepisternum narrow; anapleural suture complete (Fig. 50); sclerolepidia absent.

Fore coxa with an obtuse posterior projection. Femora with a small, distally inclined tooth ventrally, lacking a ventral groove, squamose ventrally. Tibiae without a ventral carina; premucro sometimes small; supra-uncal projection small (Fig. 164, 165).

Abdomen. Ventrite 1 concave medially, with intercoxal process wider than long; posterior margin sinuate, medially emarginate, sometimes obscure medially. Ventrite 2 longer than V1 (excluding intercoxal process), concave in male, convex in female, sloping posteriorly towards V3. Ventrites 3 and 4 flat, each half length of V2. Punctuation sparse. Squamosity sparse, but with denser patches laterally on V3 and V4.

Female terminalia. Tergite VII (Fig. 199) longer than wide; 10 microsetae present in each of a pair of weakly defined longitudinal glabrous strips; anterior and posterior margins convex (Fig. 199). Tergite VIII longer than wide, subtriangular, convex apically, with slender crenulations (Fig. 200). Sternite VIII with elongate, narrow apical plate more than half as long as its apodeme (Fig. 201). Hemisternites of ovipositor slender, subcylindrical apically; styli large, terminal, compressed (Fig. 202, 203); vagina/bursa complex with a very weak sclerite at junction with oviduct; spermathecal duct inserted at or near junction of bursa and oviduct (Fig. 202).

Male terminalia. Tergite VII (Fig. 455) wider than long, with 7 pairs of obscure microsetae; anterior margin convex; posterior margin truncate, weakly emarginate medially. Spiculum gastrale longer than aedeagal apodemes; apical arms broad (Fig. 457). Tegmen with parameres broad, shorter than width of ring; apodeme longer than width of ring (Fig. 458, 459). Aedeagal body one-third as long as its apodemes, strongly curved, with sides rounded, apex lanceolate; apodemes and body united (Fig. 460, 461). Endophallus with a large, inverted V-shaped sclerite and large basal sclerites; flagellum absent (Fig. 460).

Range. New Zealand.

Remarks. *Nothaldonus* is close to *Strongylopterus* in many respects (see 'Systematics' section), and certainly resembles members of that genus in habitus and details of the female genitalia; the two are probably sister-groups. *Strongylopterus* lacks full carinae on the prosternal canal, has a mesosternal receptacle with a posterior wall, and has a longitudinal median carina on the pronotum.

The biology of *Nothaldonus peacei* is unknown, al-

though the larva almost certainly burrows in wood. *N. peacei* is the only New Zealand cryptorhynchine protected under the Wildlife Amendment Act (1980).

Nothaldonus peacei (Broun)

Fig. 1, 50, 110, 164, 165, 199–203, 455–461

Broun, 1880: 484 (*Aldonus*); —1893a: 1235 (*Nothaldonus*). Hutton, 1904: 211. Hudson, 1934: 221.

Type data. Lectotype male here designated, BMNH, pinned, with labels "859" printed, green / "Parua" printed. Paralectotype female, BMNH, pinned, same locality. All syntypes located.

Range. ND / —.

Genus *Strongylopterus* Schoenherr

Schoenherr, 1837: 473 (attributed to Chevrolat); —1845: 62 (attributed to Chevrolat). Lacordaire, 1866: 74 (attributed to Schoenherr). Kuschel, 1982: 274. Type species *Strongylopterus ovatus* Boheman in Schoenherr, 1837, by original designation.

Aldonus White, 1846: 16. Lacordaire, 1863: 130. Broun, 1880: 482. Hutton, 1904: 211. Broun, 1910a: 297. Hudson, 1934: 221. Type species *Aldonus hylobioides* White, 1846, by monotypy. Synonymised with *Strongylopterus* by Kuschel (1982, p. 274).

Pseudomolius Fairmaire, 1881a: 421; —1881b: 305. Type species *Pseudomolius crassicornis* Fairmaire, 1881, by monotypy. Synonymised with *Strongylopterus* by Kuschel (1982, p. 274).

Length 5–13 mm. Habitus, Fig. 2. Derm brown or black, shiny, densely squamose, with a mixture of decumbent oval scales and semierect and erect fine setae, or sparsely squamose with many semierect and erect fine setae, but squamosity never completely concealing derm; erect setiform scales absent; scales dark brown, black, or pale tan. In profile (Fig. 51) pronotum very weakly convex, weakly depressed anteriorly; pronotum and elytra depressed abruptly at base; elytra smoothly convex, sometimes flat anteriorly. Brachypterous.

Head. Rostrum 0.7–1.0× length of pronotum, straight or evenly curved, smooth dorsally in female, wider in male; male with median longitudinal carina of variable length; punctation very fine in female, although sometimes coarse at base, * more or less fine apically in male but otherwise

coarse, and punctures sometimes running together as furrows; squamosity sparse and at base only in female, generally more dense and extending to at least level of antennal insertions in male, though sometimes sparse and with scales very small.

Antennae inserted in distal half of rostrum, generally nearer apex in male. Scrobe with dorsal marginal carina more strongly developed in male. Funicle and scape subequal in length, with fine, pale, decumbent setae; F1 and F2 subequal, or F1 shorter than F2; F2 more than twice length of F3, and F2+3 generally less than half length of funicle.

Thorax. Pronotum (Fig. 2) wider than long, widest at about middle or near base, * abruptly narrowed anteriorly, with sides smoothly convex posteriorly, nearly parallel anteriorly; anterior margin medially emarginate or truncate; posterior margin straight, concave, or bisinuate; a slender longitudinal median carina sometimes present; punctation dense and generally coarse. Scutellum round or triangular, with small, tan scales.

Elytra with basal margin sinuate, wider than pronotum basally; sides smoothly convex to convex or truncate apex; interstriae sometimes partly encroached upon by striae punctures, strongly or weakly rugose; striae punctures large, deep, regular, sometimes confluent. Elytral strigil very fine, obscure.

Postocular lobes rounded, extending between margins of prosternal canal. Prosternal canal deep or shallow, with scales or setae anteriorly, glabrous posteriorly; margin generally raised into series of small tubercles, sometimes carinate anteriorly but rarely so posteriorly, generally cut back posteriad of anterior margin of prosternum, and thus not meeting postocular lobe; margin not reaching fore coxae (Fig. 111). Mesosternum flat, convex or concave on disc, raised very slightly and projecting anteriorly to just in front of middle coxae (Fig. 111), generally sparsely squamose, glabrous on anterior margin; receptacle obsolete. Metasternum convex or concave, sometimes with a depression or pit medially near emarginate posterior margin separating middle and hind coxae by the length of a hind coxa or less. Metepisternum exposed; anapleural suture complete; sclerolepidia absent (Fig. 51).

Fore coxae on mesal face glabrous or with sparse squamosity, lacking a posterior projection (Fig. 111). Femora with a small, distally directed ventral tooth; ventral groove absent; ventral surface squamose. Tibiae lacking external teeth but with external carina or laminar projection present on at least proximal half of middle tibia (Fig. 166); ventral carina present, terminating in a small to moderate premucro; uncus large, stout; a small or large * supra-uncal projection present.

Abdomen. Ventrite 1 concave or convex on disc, with a median longitudinal furrow; intercoxal process wider than long; posterior margin medially emarginate. Ventrite 2 as long as V1 (excluding intercoxal process) or longer, convex but sometimes concave medially. Ventrites 3 and 4 flat or convex, together subequal in length to V2. Punctuation shallow, dense or sparse. Squamosity more dense laterally than medially.

Female terminalia. Tergite VII with length and width subequal; 5–9 microsetae present on each of a pair of obscure, glabrous longitudinal strips along anterior two-thirds of sclerite; anterior margin weakly convex; posterior margin strongly convex (Fig. 204). Tergite VIII as long as wide or longer, subtriangular; posterior margin convex, with slender crenulations (Fig. 205). Sternite VIII with elongate narrow apical plate more than half as long as its apodeme (Fig. 206). Hemiscerites of ovipositor slender, subcylindrical apically; styli large, terminal, subcylindrical, sometimes wider apically than basally (Fig. 207, 208); vagina/bursa complex with a very weak sclerite at junction with oviduct; spermathecal duct inserted at or near junction of bursa and oviduct (Fig. 208).

Male terminalia. Tergite VII wider than long, with up to 11 pairs of microsetae arranged in 2 otherwise glabrous longitudinal strips; anterior margin weakly convex; posterior margin concave (Fig. 462). Sternum VIII with a median membranous pocket (Fig. 463). Spiculum gastrale with apodeme as long as aedeagal apodemes; apical arms narrow (Fig. 464). Tegmen with parameres very short; apodeme shorter than width of tegminal ring (Fig. 465, 466). Aedeagal body more than half as long as its apodemes, weakly curved, with sides weakly rounded and apex rounded; ventral surface 'ridged' (Fig. 468); aedeagal body and apodemes united (Fig. 467, 468). Endophallus with large sclerites; flagellum absent (Fig. 467).

Range. New Zealand incl. Chatham Is, Fiji, Art I., Juan Fernandez Is, Chile, New Guinea(?), New Caledonia(?).

Remarks. While lacking a mesosternal receptacle and (generally) lateral carinae to the prosternal canal, *Strongylopterus* has a relatively longer and narrower rostrum than other New Zealand Psepholacini with these character states. The female tergite VIII, while similar to those of *Psepholax*, *Oreda*, *Mesoreda*, and *Homoreda*, is narrower and the sides are concave towards the posterior margin, unlike the others, which are convex. The female sternum VIII is narrower than in the other genera. The ridged ventral surface of the aedeagus is autapomorphic for the genus. *Strongylopterus* species lack an external tooth on the middle tibia, as is found in other New Zealand Psepholacini

except *Nothaldonus*.

Strongylopterus is most similar to *Nothaldonus* and is probably its sister-group, although the latter genus has a complete mesosternal receptacle, lateral carinae to the prosternal canal, and a longitudinal median carina on the pronotum, all lacking in *Strongylopterus*. Relationships of these two genera to each other and to the rest of the Psepholacini are discussed in the 'Systematics' section.

Osseteris Pascoe (1872, p. 479), based on *Osseteris scutellaris* Pascoe, 1872 and synonymised with *Strongylopterus* by Kuschel (1982, p. 274) is here removed from synonymy. Study of the types of species originally included in *Osseteris* has revealed that the type species (described from Irian Jaya) and those described by Marshall from India are not congeneric with other *Strongylopterus*. The two species from Fiji described by Zimmerman in *Osseteris* are, however, properly placed in *Strongylopterus*.

Strongylopterus chathamensis (Sharp)

Fig. 111

Sharp, 1903: 110 (*Aldonus*). Broun, 1909c: 146. Brookes, 1925: 292. Hudson, 1934: 221.

misturatus Broun, 1910b: 309 (*Aldonus*). Brookes, 1925: 292. Hudson, 1934: 221. New synonymy.

lineifer Broun, 1910b: 310 (*Aldonus*). Brookes, 1925: 292. Hudson, 1934: 221. New synonymy.

Type data. *chathamensis*: lectotype male here designated, BMNH, pinned, with labels BMNH type disc / "Chatham; Islds" handwritten / "Sharp Coll.; 1905-313" printed / "Aldonus; chathamensis; Type D.S." handwritten / "Aldonus" handwritten. Paralectotype female, BMNH, on card, same data as lectotype.

lineifer: holotype male, BMNH, on card, with labels "45.[m.]." handwritten / BMNH holotype disc / "Whakuru; - S.D. Shand." handwritten (Broun) / "Aldonus; lineifer. [m.]." handwritten (Broun).

misturatus: lectotype male here designated, BMNH, on card, with labels "44.[m.]" handwritten / "Whakuru; - Shand." handwritten (Broun) / "Aldonus [m.]; misturatus" handwritten (Broun) / BMNH lectotype disc. Paralectotypes: 2 males, 3 females, BMNH; 1 male, 1 female, CMNZ; 2 males, 3 females, NZAC, same locality as lectotype.

Range. Chatham Is.

Biology. *Strongylopterus chathamensis* has been collected from a variety of woody plants, including *Coprosma*

chathamica, dead *Corynocarpus laevigatus*, *Dracophyllum* sp., dead *Myrsine chathamica*, dead *Olearia traversii*, under the bark of *Plagianthus betulinus*, *Pseudopanax* sp. and *Senecio huntii*. These records are predominantly from the wood of the plants, rather than from leaves, and many records are from night collecting. Specimens have also been taken from litter.

The species has been reared from *Dracophyllum arboreum* stems (W67/24), *Hymenanthera chathamica* dead branches, stumps, and stems (W70/9, W67/44, W67/6), *Corynocarpus laevigatus* (W67/47), *Myrsine chathamica* (W67/40), *Olearia traversii* (cut from stem, and reared from a dead branch – W67/5), *Pseudopanax chathamicus* bole (W67/39), *Senecio huntii* branches (W67/43), and an unidentified stump (W67/26).

***Strongylopterus hylobioides* (White)**

Fig. 2, 51, 166, 204–208, 462–469

White, 1846: 16 (*Aldonus*). Broun, 1880: 483. Hutton, 1898: 157; —1904: 211. Broun, 1909c: 146; —1910a: 298. Hudson, 1934: 221. Styles, 1973: 354. Kuschel, 1982: 274 (*Strongylopterus 'hylobioides'* [sic]; = *celator* Pascoe, *rostratus* Broun, *insularis* Brookes). May, 1987: 49. Kuschel, 1990: 74.

celator Pascoe, 1876b: 60 (*Aldonus*). Broun, 1880: 483. Hutton, 1904: 211. Hudson, 1934: 150, 221 (description of pupation).

rostratus Broun, 1880: 483 (*Aldonus*). Hutton, 1904: 211. Hudson, 1934: 221.

insularis Brookes, 1932: 32 (*Aldonus*). Hudson, 1934: 221.

Type data. *hylobioides*: lectotype male here designated, pinned, BMNH, with labels BMNH lectotype disc / "Port.; Nicholson; N. Zealand" handwritten, black border / "Aldonus.; hylobioides; White. N. Zeal" handwritten, green / "Aldonus Hylobioides; White. Zool. Ereb & Terror" handwritten (White) / "This is probably; the type of; Aldonus hylobioi-; White." handwritten.

celator: lectotype male here designated, BMNH, pinned on card, with labels BMNH type disc / "N.Z.; Tairua" handwritten (Pascoe), yellow oval / "Aldonus; celator; type Pasc." handwritten (Pascoe).

insularis: holotype male, NZAC, on card, with labels "[m.]" handwritten, on card bearing insect / "Coll.; E. Fairburn; 9-12-1-1931." handwritten (Brookes) / "Stephen Isld; Cook Strait." handwritten (Brookes) / "HOLOTYPE." handwritten (Brookes, red) / "Aldonus; insularis; Brookes" handwritten (Brookes). Allotype female, NZAC, on card, same data as holotype.

rostratus: lectotype female here designated, BMNH, pinned, with labels "858" printed, green / "Manaia" printed / "Aldonus; rostralis" handwritten (Broun) / BMNH lectotype disc. A specimen with a green printed label "858" and no other data is in the Canterbury Museum, and may be a paralectotype. Two specimens only in original series.

Range. Kermadec Is / ND, AK, CL, WO, BP, GB, WI, WN / SD, NN, MB / SI / Chatham Is. Coastal.

Biology. *Strongylopterus hylobioides* lives in dead wood of most dicotyledonous trees and shrubs of the coastal belt (Kuschel 1990), with a particular preference for *Metrosideros excelsa* (Kuschel 1982), *Melicytus ramiflorus*, and *Olearia furfuracea* (Kuschel 1990). Specimens have been collected otherwise from *Alocasia macrorrhiza* petiole bases (in the Kermadec Is), under bark of a dead *Ascarina lucida* var. *lanceolata* tree (Kermadecs), *Asclepias* sp. inflorescence (Kermadecs), *Beilschmiedia tarairi* (under dead bark and from a dead standing tree), *Dracophyllum longifolium*, *Dracophyllum* sp., *Eucalyptus* sp. under bark (Kermadecs), *Eucalyptus fastigata* (Styles 1973), *Hoheria populnea* under dead bark, *Macropiper excelsum* (Kermadecs), *Melicytus ramiflorus*, dead *Metrosideros* sp., *Myrsine kermadecensis* (under bark of dead tree), *Olearia traversii* (Chatham), *Pseudopanax lessonii*, on dead *Rhopalostylis sapida* leaf, and *Weinmannia racemosa* under dead bark. Adults have also been found several times in litter samples.

Specimens have been reared from *Corynocarpus laevigatus* rotten wood, *Dysoxylum spectabile* (W72/2), *Hoheria* sp. (Styles 1973), *Melicytus* sp. (W72/15), dead and live wood of *Metrosideros excelsa* (Kuschel 1982, May 1987), *Olearia furfuracea*, dead *Olearia rani* wood (May 1987), dead *Pseudopanax simplex*, *Pomaderris phycifolia* (W67/105), dead *Planchonella novozelandica* (Kuschel 1982, p. 274), *Senecio reinoldii* (W66/10) and unknown hosts (W67/106, W80/6). Adults have been cut from the dead wood of *Crataegus monogyna*, wood of *Elaeocarpus dentatus* (Styles 1973), dead *Coprosma australis*, *Ixerba brexioides* wood, *Kunzea ericoides* wood (Styles 1973), dead *Myrsine australis*, a dead *Myrsine divaricata* branch, a *Pinus radiata* log (Styles 1973) and a *Podocarpus totara* log (Styles 1973).

Larvae, pupae, and adults have been cut out of solid wood of *Hedycarya arborea* (Hudson 1934), *Lophomyrtus bullata* (Hudson 1934) (as *Myrtus bullata*) and *Dysoxylum spectabile* wood (Hudson 1934, Styles 1973), and adults and larvae have been found in a dead standing *Paratrophis banksii* tree; these records all indicate that the species can develop in these hosts.

Genus *Homoreda* Broun

Broun, 1893a: 1383. Hutton, 1904: 211. Hudson, 1934: 221. Type species *Oreda murina* Broun, 1880 (= *Homoreda punctata* Broun, 1893), by monotypy.
Kentraulax Broun, 1909a: 156. Hudson, 1934: 221. Type species *Oreda murina* Broun, by monotypy. New synonymy.

Length 8–11 mm. Habitus, Fig. 3. Derm black or brown, shiny, densely or sparsely squamose. Scales small, oval, elongate or hair-like, decumbent or semi-erect, separate; erect setiform scales absent. Pronotum in profile (Fig. 52, 53) depressed anteriorly, convex posteriorly, depressed abruptly at base; elytra convex. Macropterous, brachypterous, or apterous.

Head. Rostrum less than three-quarters length of pronotum, straight or weakly curved, raised dorsally at base in male (Fig. 52), broader in distal half (at least) than at base, more so in male; dorsal carinae absent, but male sometimes with a pair of longitudinal linear protuberances proximally or a longitudinal furrow distally; dorsal punctation coarser in male; squamae or small setae extending to apex, but more dense and coarse at base, or present at base only, generally more extensive in male; subgenal arms with 'keel' or apical projection ventrally larger in male (Fig. 52, 53).

Antennae inserted approx. halfway along rostrum; scrobe with dorsal marginal carina more developed in male, its ventral margin cut back abruptly before base of rostrum and in male produced ventrally (Fig. 52). Funicle longer than scape; F1 and sometimes F2 longer than F3 but together not as long as scape or rest of funicle. Scape and funicle segments with fine, decumbent setae or occasionally narrow scales on scape.

Thorax. Pronotum (Fig. 3) wider than long, widest in posterior half, abruptly narrowed anteriorly; sides smoothly and strongly convex in posterior part; anterior margin medially weakly emarginate; posterior margin bisinuate; median longitudinal carina complete and short, or represented by an impunctate strip only, or absent; punctation dense, fine. Scutellum round, oval, or triangular, glabrous or with elongate scales.

Elytra (Fig. 3) with basal margin sinuate, wider than pronotum basally; sides smoothly convex to apex; junction of interstriae 4, 5, and 6 projecting weakly at sides of posterior declivity; interstriae rugose, sometimes coarsely so at base; posterior declivity abrupt; striae punctures elongate. Elytral strigil fine.

Postocular lobe abruptly cut back medially, not meeting

margin of prosternal canal (Fig. 52, 53, 112). Prosternal canal bounded laterally by a raised, rounded ridge extending anteriorly from coxae, this bearing a short carina anteriorly which is raised into a projecting tooth, more prominent in male and not meeting postocular lobe (Fig. 52, 112). Mesosternum with a rounded, setose or squamose median protuberance, sometimes with short lateral raised arms (Fig. 112). Metasternum concave medially, especially posteriorly, separating middle and hind coxae by less or more than length of a hind coxa; anterior margin between coxae straight; posterior margin deeply emarginate medially. Metepisternum clear; anapleural suture complete; sclerolepidia absent.

Fore coxa on mesal face setose or squamose, lacking a posterior projection. Femora squamose or setose ventrally, with ventral tooth minute or absent, and ventral groove absent. Tibiae with a large external tooth on middle and hind legs (Fig. 167); ventral carina absent; premucro sometimes small; uncus large, arising medially or basally; supra-uncal projection large (Fig. 167).

Abdomen. Ventrite 1 convex on disc; intercoxal process convex or flat, but concave near margin and wider than long; posterior margin sinuate. Ventrites 1 and 2 subequal in length (excluding intercoxal process). Ventrite 2 convex, weakly sloping towards V3 posteriorly or abruptly sloping from V1 anteriorly to V3 posteriorly. Ventrites 3 and 4 transversely convex, each about half length of V2. Punctuation denser on V1, V2, and V5 than on V3 and V4.

Female terminalia. Tergite VII wider than long, with 8 or more pairs of microsetae arranged in parallel longitudinal glabrous strips; anterior margin weakly convex; posterior margin convex (Fig. 210). Tergite VIII posterior margin continuously convex with lateral margins, weakly and irregularly crenulate, as wide as long or wider (Fig. 211). Sternite VIII with apical plate wider than long, at least half length of apodeme (Fig. 212); apodeme broad or narrow (Fig. 209, 210). Hemisternites of ovipositor broad, short, parallel-sided or tapering towards styli; styli narrow or broad, oval in cross-section, half length of hemisternites (Fig. 213, 214); vagina/bursa complex with a large sclerite at junction with oviduct (Fig. 213, 214); spermathecal duct inserted near junction of oviduct and bursa on vagina/oviduct branch (Fig. 213).

Male terminalia. Tergite VII with length and width subequal; 8 or more pairs of microsetae arranged in parallel longitudinal glabrous strips, at least the posteriormost pair marginal or submarginal; anterior margin weakly convex; posterior margin convex or medially emarginate (Fig. 470). Sternum VIII with a weak membranous pocket between hemisternites (Fig. 471). Spiculum gastrale as

long as aedeagal apodemes; apical arms narrow (Fig. 472). Tegmen with parameres separate, short, subequal in length to tegminal apodeme; tegminal apodeme shorter than width of ring (Fig. 473, 474). Aedeagal body less than one-third as long as its apodemes, straight in lateral view, with sides straight and apex rounded or broadly acuminate; body dorsally smooth or rugose posterior to ostium (Fig. 475, 477); apodemes and body united (Fig. 475, 476). Endophallus with an inverted Y-shaped sclerite, a median dorsal sclerite, and large basal sclerites; flagellum absent (Fig. 475, 476).

Range. New Zealand, incl. Chatham Is.

Remarks. *Homoreda* is a psepholacine related to *Oreda* and *Mesoreda*. These three genera are distinguished from others in the tribe by the broad, inverted Y-shaped sclerite in the endophallus (Fig. 475, 483, 490) and the cut-back anterior margin to the prosternal canal (Fig. 52–56). *Homoreda* may be distinguished from the other two genera by the absence of a posterior face to the mesosternal receptacle, which is completely lost in *H. flavisetosus* and represented by lateral raised arms in *H. murina*, and the large tooth at the anterior end of the prosternal canal margin in males (Fig. 52). The latter character serves to distinguish the genus from all other New Zealand Cryptorhynchinae.

In *H. flavisetosus* females sternite VIII has a very broad apodeme and the membrane joining it to sternite VII is free for much of the apodeme's length (Fig. 214), in a manner reminiscent of the *Rhynchodes* group of genera.

Homoreda flavisetosa (Broun) new combination

Fig. 209

Broun, 1911: 106 (*Kentraulax*). Hudson, 1934: 221.

Type data. Lectotype male here designated, BMNH, on card, with labels "83.[m.]" handwritten / "Pitt Island.; - T.Hall-" handwritten / "Kentraulax; flavisetosus. [m.]" handwritten (Broun) / BMNH lectotype disc. Paralectotypes: 2 males, 1 female, BMNH, on card; 1 female, NZAC, pinned. Possible paralectotypes: 1 male, 1 female, BMNH, pinned. All paralectotypes with similar data to lectotype. Original series comprised "several" specimens according to Broun.

Range. Chatham Is.

Biology. Adults have been collected from the trunk of a *Coprosma* sp. at night, and specimens have been taken from a decayed log of *Myrsine chathamica*.

Homoreda murina (Broun) new combination

Fig. 3, 52, 53, 112, 167, 210–214, 470–477

Broun, 1880: 487 (*Oreda*). Hutton, 1904: 211. Broun, 1909a: 157 (*Kentraulax*). Hudson, 1934: 221.

punctata Broun, 1893a: 1383 (*Homoreda*). Hutton, 1904: 211. Hudson, 1934: 221. New synonymy.

Type data. *murina*: lectotype male here designated, BMNH, pinned, with labels "864" printed, green / "Manaiia" printed / "Kentraulax; murina" handwritten (Broun) / BMNH lectotype disc. Paralectotype male, BMNH, on card, mounted on dorsum, same locality as lectotype. All syntypes located.

punctata: holotype female, BMNH, on card, with labels "2414" handwritten / "Otago" printed / "Homoreda; punctata." handwritten (Broun) / BMNH type disc.

Range. ND, BP, TK, WN, WA / SD, NN, BR, DN / Chatham Is.

Biology. Specimens of *Homoreda murina* have been taken from *Pittosporum tenuifolium*, "cut from log" (Broun 1880), and cut from roots of *Myoporum* sp. (Styles 1973). The species has been reared from a dead root of *Pseudopanax arboreus* (May 1987), a buttress of *Pseudopanax chathamicus* (W67/29) (with a note that the tunnels were "characteristic"), and *Pittosporum eugenioides*.

Genus *Oreda* White

White, 1846: 16. Lacordaire, 1866: 113. Broun, 1880: 486.

Lea, 1900: 539. Hutton, 1904: 211. Hudson, 1934: 221.

Zimmerman, 1942: 103. Morimoto, 1978: 129. Type species *Oreda notata* White, 1846, by monotypy.

Length 6–11 mm. Habitus, Fig. 4. Derm black, shiny, granulate on elytra, densely squamose but scales not obscuring derm. Scales elongate, erect, mostly black, but yellow scales in small patches on pronotum and elytra. Pronotum in profile (Fig. 54, 55) convex, depressed weakly anteriorly; pronotum and elytra depressed abruptly at base; elytra convex. Macropterous.

Head. Rostrum at most half length of pronotum, straight or weakly curved at base, wider in male; male with a basal dorsal 'hump' (Fig. 54, 55); punctation fine, denser basally than apically; sparse small scales and setae at base and laterally, more so in male.

Antennae inserted in anterior half of rostrum. Scrobes with dorsal marginal carina much more developed in male. Funicle and scape subequal in length, with fine, dark,

decumbent setae; F1 and F2 subequal, each about twice length of F3, together less than half total length of funicle.

Thorax. Pronotum (Fig. 4) wider than long, widest in posterior half, abruptly narrowed anteriorly, with sides smoothly convex posteriorly; anterior margin strongly convex, projecting strongly over head (Fig. 4, 54, 55); posterior margin bisinuate; a very weak median longitudinal carina sometimes apparent anteriorly, and a weak shallow longitudinal depression sometimes apparent posteriorly; punctation dense, the interstices forming a reticulum. Scutellum round or triangular, with small pale scales.

Elytra with basal margin sinuate, wider than pronotum basally; sides smoothly convex to truncate apex; interstriae rugose, weakly produced posteriorly at junction of interstriae 4, 5, and 6; stria punctures elongate, deep, regular. Elytral strigil fine, obscure.

Postocular lobe very weak, abruptly cut back ventrally, not meeting margin of prosternal canal. Prosternal canal bounded by a marginal carina raised into a projecting tooth anteriorly, more prominent in male and not meeting postocular lobe (Fig. 54, 55, 113); canal projecting posteriorly between fore coxae (Fig. 113). Mesosternal receptacle shallowly concave, much wider than long, extending posteriorly just to level of anterior of middle coxae or failing to reach them; margins produced ventrally (Fig. 113). Metasternum with a longitudinal median furrow, otherwise flat or convex, separating middle and hind coxae by more than length of a hind coxa. Metepisternum broad; anapleural suture complete (Fig. 54); sclerolepidia absent.

Fore coxae with an obtuse posterior projection (Fig. 113). Femora squamose ventrally, with a small ventral tooth distally; ventral groove absent. Tibiae with a broad external tooth or flange proximally on middle leg (Fig. 168); ventral carina, uncus, pre-mucro, and suprauncal projection present (Fig. 168).

Abdomen. Ventrite 1 flat or convex on disc; intercoxal process wider than long; posterior margin straight, medially emarginate. Ventrite 2 longer than V1 (excluding intercoxal process), convex in female; male with a slope between anterior and posterior parts. Ventrites 3 and 4 weakly raised posteriorly, each slightly more than half length of V2. Ventrite 5 flat or with weak lateral depressions (female). Punctation more sparse on V3 and V4 than on other ventrites. Squamosity sparse, with dense patches laterally on at least ventrites 3 and 4.

Female terminalia. Tergite VII wider than long, with 5 pairs of microsetae arranged in longitudinal glabrous strips; anterior margin weakly convex; posterior margin weakly convex (Fig. 215). Tergite VIII with width and

length subequal; posterior margin irregularly crenulate (Fig. 216). Sternite VIII with plate as wide as long, more than two-thirds length of apodeme (Fig. 217). Hemisternites of ovipositor broad, tapering to apical styli; styli broad, weakly compressed dorsoventrally, more than one-third as long as hemisternites (Fig. 218, 219); vagina with a weak sclerite at junction with oviduct; spermathecal duct inserted near junction of oviduct and bursa (Fig. 218).

Male terminalia. Tergite VII (Fig. 478) wider than long, with 7–10 pairs of microsetae arranged in longitudinal glabrous strips not attaining posterior margin; anterior margin with a weak truncate projection; posterior margin concave. Sternum VIII with a weak, median, membranous pocket between hemisternites (Fig. 479). Spiculum gastrale not as long as aedeagal apodemes; apical arms broad (Fig. 480). Tegmen with parameres narrow, separate, shorter than width of its ring; tegminal apodeme shorter than width of ring (Fig. 481, 482). Aedeagal body slightly more than half as long as its apodemes, weakly curved in lateral view, with sides straight and apex rounded; body dorsally smooth posterior to ostium; apodemes and body united (Fig. 483, 484). Endophallus with a broad, inverted Y-shaped sclerite, a median dorsal sclerite, and large basal sclerites; flagellum absent (Fig. 483).

Range. New Zealand, New Caledonia, Guam.

Remarks. *Oreda* is a psepholacine closely related to *Homoreda* and *Mesoreda* (see 'Systematics' section). It may be distinguished by the presence of a projecting tooth anteriorly on a developed prosternal canal carina (Fig. 113), the anterior-facing wall on the mesosternum (Fig. 113), and the greatly projecting anterior margin of the pronotum (Fig. 4, 54, 55). *Homoreda* species have a tooth on the prosternal canal sides (Fig. 112) but no long, clear carina and no anterior-facing wall to the mesosternum (Fig. 112). *Mesoreda* species do not have a tooth on the prosternal canal carina, and in neither *Mesoreda* nor *Homoreda* does the anterior margin of the pronotum project above the head to the extent that it does in *Oreda* (Fig. 52–56). *Oreda notata* is predominantly black, with small patches of yellow scales on the pronotum and elytra – a colour pattern unique among New Zealand Cryptorhynchinae.

Oreda dubia, here synonymised with *O. notata*, was described from a specimen collected in New South Wales; two other specimens have been seen that are labelled as collected in Australia. It is likely that all three were accidentally transported from New Zealand, and that the species does not occur naturally in Australia. Neither *O. hylastes* Heller, described from New Caledonia, nor *O. maculata* Zimmerman from Guam has been seen in this study.

Oreda notata White

Fig. 4, 54, 55, 113, 168, 215–219, 478–484

White, 1846: 16 (*Oreda*). Broun, 1880: 486. Hutton, 1904: 211. Hudson, 1934: 150, 221.

dubia Lea, 1900: 540 (*Oreda*). New synonymy.

Type data. *notata*: holotype male, BMNH, pinned, forelegs missing, with labels BMNH type disc / "New Zeal" and "[18]58; 29" on reverse, handwritten, blue disc / "Oreda; notata. White; Erebus. Terror; N.Z. type" handwritten, green / "Oreda notata; White Zool. Erebus & Terror." handwritten.

dubia: holotype female, ANIC, with labels "dubia Lea; TYPE; N.S.W." handwritten (Lea) / "HOLOTYPE" printed, red / "On permanent loan from; MACLEAY MUSEUM; University of Sydney" printed / "Oreda (TYPE); dubia lea; N. S. Wales" handwritten (Lea) / "Oreda; notata White [f.]; Lyal det 1986" handwritten (Lyal).

Range. ND, AK, WO, BP, WI, WN / SD.

Biology. Specimens of *Oreda notata* have been collected in colonies on dead *Corynocarpus laevigatus*, on *Sophora* sp., on *Cyathea smithii*, in a rotting tree stump, under bark of decaying small trees, and under the bark of a standing dead *Beilschmiedia tawa*. Larvae have been collected from *Knighia excelsa*, and the species has been reared from dead wood of *Corynocarpus laevigatus* and *Melicytus* sp. (May 1987) and from *Alnus rubra* wood (Styles 1973). Hudson (1934) records that specimens have been cut from dead wood of *tawa* (*Beilschmiedia tawa*), *karaka* (*Corynocarpus laevigatus*), *hinau* (*Elaeocarpus dentatus*) and *Myrsine* sp. (as *Suttonia*). Hudson (1934) also maintains that the adult strongly resembles a bird's dropping containing the seeds of the common fuchsia (*Fuchsia excorticata*).

Genus *Mesoreda* Broun

Broun, 1893a: 1235. Hutton, 1904: 211. Hudson, 1934: 221. Type species *Oreda brevis* Pascoe, 1876b (= *Oreda setigera* Broun, 1880), here designated.

Length 4–8 mm. Habitus, Fig. 5. Derm dark brown or black, shiny, densely squamose. Scales elongate, oval and triangular, imbricate, contiguous, and separate, decumbent and semi-erect; erect setiform scales absent, but elytra with erect elongate scales on interstriae. Pronotum in profile (Fig. 56) weakly depressed anteriorly, weakly convex posteriorly, abruptly and weakly depressed at base; elytra weakly convex. Macropterous.

Head. Rostrum shorter than pronotum, straight or weakly curved, dorsally weakly convex towards apex, generally flat at base, broader in distal half (at least) than at base, more so in male, densely squamose at base, with squamosity more extensive in male; punctation dense, coarser in male; subgenal arm sometimes with a weak ventral projection.

Antennae inserted in distal half (female) or third (male) of rostrum. Scrobe with ventral margin carinate near antennal insertion, abruptly cut back before base of rostrum. Funicle and scape subequal in length, with coarse, decumbent and semi-erect setae or occasionally with narrow scales on scape; F1 and F2 subequal in length, each longer than F3 but together not as long as rest of funicle. Club elongate, oval, at least three-quarters length of funicle.

Thorax. Pronotum wider than long, widest in posterior half, abruptly narrowed anteriorly; sides smoothly and strongly convex posteriorly; anterior margin weakly emarginate medially; posterior margin bisinuate; carinae and protuberances absent; punctation dense (Fig. 5). Scutellum round, triangular or oval, flat, with small scales.

Elytra with basal margin sinuate, wider than pronotum basally; sides smoothly convex to apex; interstriae rugose, with I3 sometimes wide basally, and junction of I4–6 projecting weakly at sides of posterior declivity; striae punctures deep. Elytral strigil present or absent.

Postocular lobe rounded, sometimes weakly so, not meeting margin of prosternal canal (Fig. 114). Prosternal canal with elongate, plumose scales; marginal carina cut back abruptly anteriorly (Fig. 56, 114). Mesosternal receptacle shallowly cup-shaped, at most half as long as wide, extending posteriorly to just between middle coxae or failing to reach them (Fig. 114); margins produced ventrally. Metasternum convex on disc, with a median depression near posterior margin, separating middle and hind coxae by more than length of a hind coxa. Metepisternum broad; anapleural suture complete; sclerolepidia absent.

Fore coxae with a more or less obscure posterior projection. Femora squamose ventrally, with a small, ventral, distally inclined tooth distally, smallest on front leg; ventral groove absent. Middle tibia and sometimes hind tibia with an external tooth (Fig. 169); ventral carina absent; premucro small; uncus large; supra-uncal projection large on middle and hind tibiae (Fig. 169).

Abdomen. Ventrite 1 flat or convex on disc; intercoxal process wider than long; posterior margin weakly, smoothly emarginate. Ventrite 2 as long as V1 or slightly longer (excluding intercoxal process), convex. Ventrites 3 and 4 together subequal in length to V2, flat. Ventrite 5

convex or with weak lateral depressions. Punctuation weak, shallow. Squamosity sparse medially, denser laterally; setiform scales present medially, more apparent on V1 and V2 than on other ventrites.

Female terminalia. Tergite VII wider than long, with 9 pairs of microsetae arranged in obscure longitudinal glabrous strips; anterior margin straight; posterior margin convex or medially emarginate (Fig. 220). Tergite VIII with posterior margin continuously convex with sides; posterior margin entire; tergite wider than long (Fig. 221). Sternite VIII with apical plate wider than long, shorter than apodeme (Fig. 222). Hemisternites of ovipositor broad, short, tapering towards styli; styli short, greatly compressed or oval in cross-section (Fig. 223, 225); vagina / bursa complex with a large sclerite or sclerites at junction of bursa, vagina, and oviduct (Fig. 223); spermathecal duct inserted at junction of oviduct and bursa (Fig. 223).

Male terminalia. Tergite VII wider than long, with 6 or 7 pairs of microsetae arranged in longitudinal glabrous strips, these sometimes attaining posterior margin; anterior margin weakly convex; posterior margin weakly and smoothly concave (Fig. 485). Spiculum gastrale with apodeme subequal in length to aedeagal apodemes; apical arms broad (Fig. 487). Tegmen with parameres broad, separate, shorter than width of tegminal ring; tegminal apodeme shorter than width of ring (Fig. 488, 489). Aedeagus with body half as long as its apodemes, weakly curved, with sides rounded smoothly to rounded apex; body with a corrugated or reticulate patch dorsally, posterior to ostium (Fig. 490, 492); apodemes and body united; endophallus with an X- or inverted Y- or V-shaped sclerite and large basal sclerites; flagellum absent (Fig. 490, 491).

Range. New Zealand, incl. Chatham Is.

Remarks. *Mesoreda* is a psepholacine genus closely related to *Homoreda* and *Oreda* (see 'Systematics'). It may be distinguished by its dense tan and brown squamosity from *Oreda*, which is black with or without small yellow patches (Fig. 4). *Homoreda* species generally have at least some greyish-tan scales, although these may be easily rubbed off. *Mesoreda* and *Oreda* have an anterior concave wall on the raised central part of the mesosternum and marginal carinae to the prosternal canal (Fig. 113, 114), both lacking in *Homoreda* (Fig. 112), while in *Oreda* the pronotum extends much further over the head than in *Mesoreda* (Fig. 55, 56). The reticulate patch on the postero-dorsal surface of the aedeagus of *Mesoreda* (Fig. 492) is virtually unique among Psepholacini and New Zealand Cryptorhynchinae. *Homoreda* has a more corrugated region immediately posterior to the ostium (Fig. 477).

Mesoreda brevis (Pascoe) new combination

Fig. 5, 485–492

Pascoe, 1876b: 60 (*Oreda*). Broun, 1880: 487. Hutton, 1904: 211. Hudson, 1934: 221. Styles, 1973: 354. May, 1987: 48.

setigera Broun, 1880: 488 (*Oreda*); —1893a: 1235 (*Mesoreda*). Hutton, 1904: 211. Broun, 1913: 133. Hudson, 1934: 150, 221. New synonymy.

laminata Broun, 1921: 646 (*Mesoreda*). Hudson, 1934: 150, 221. New synonymy.

Type data. *brevis*: lectotype male here designated, BMNH, pinned on card, with labels BMNH lectotype disc / "NZ; Auckland" handwritten (Pascoe), oval / "Pascoe Coll.; B.M.1893-60." printed / "Oreda; brevis Pasc." handwritten (Pascoe). Paralectotype male, BMNH, pinned on card, no data.

setigera: lectotype male here designated, BMNH, on card, with labels "865" printed, green / "[m.]" handwritten / "TAIRUA" printed / "Mesoreda; setigera" handwritten (Broun) / BMNH lectotype disc. Other specimens: 1, CMNZ, with green "865" only; 1, relabelled by Masters, MacLay Museum; both possibly syntypes. Original series comprised "several" specimens according to Broun.

laminata: holotype male, BMNH, on card, with labels "4227-" handwritten / "Wellington; 21-8-1916" handwritten (Broun) / "Mesoreda; laminata" handwritten (Broun) / BMNH type disc.

Range. ND, AK, CL, WN / SD, NN.

Biology. *Mesoreda brevis* has been beaten from vegetation, and reared from a variety of plants: a 'standing' dead branch of an almost-dead *Myoporum laetum* (W67/86), and Styles (1973) cites a further two records of rearings from this host; roots of *Myoporum* sp. (Styles 1973); dead wood of *Hebe macrocarpa* (May 1987); a dead branch of *Sophora microphylla* (May 1987); and dead branches of *Cassinia retorta* (W67/92). Hudson (1934) reports that this species is occasionally cut out of dead *Beilschmiedia tawa*.

Mesoreda orthorhina (Broun)

Fig. 220–225

Broun, 1886: 909 (*Oreda*); —1893a: 1235 (*Mesoreda*). Hutton, 1904: 211. Broun, 1913: 133. Hudson, 1934: 221. Styles, 1973: 354.

longula Broun, 1913: 133 (*Mesoreda*). Hudson, 1934: 221 (synonymy with *M. orthorhina*).

Type data. *orthorhina*: lectotype male here designated,

BMNH, on card point with genitalia separate in vial, with labels BMNH type disc / "1625" handwritten (Broun) / "Otago" printed / [illegible, due to staining by glycerine from vial - originally Broun's handwritten label with "Oreda" or "Mesoreda" "orthorhina"] / blank card. Original number of specimens in series not stated by Broun.

longula: lectotype male here designated, NZAC, on card point, with genitalia separate in vial, with labels "[m.]" typed / "Wairiri; Kaikoura" handwritten / "Mesoreda; longula." handwritten (Broun) / "A.E. Brookes; Collection" printed / "orthorhina; Broun; Kuschel det. 1963" handwritten (Kuschel) / "orthorhina; Broun; comp. on card. type; Kuschel, 1964" handwritten (Kuschel), yellow. Paralectotype female on card, BMNH, same locality.

Range. WN / KA, SC, OL, DN.

Biology. Larvae and adults of *Mesoreda orthorhina* have been cut from the wood of *Myrsine australis* (Styles 1973), and specimens have been found in *Corynocarpus laevigatus*, both in dead wood and under bark.

Mesoreda sulcifrons Broun

Fig. 56, 114, 169

Broun, 1909a: 155; —1913: 133. Hudson, 1934: 221. Styles, 1973: 354. May, 1987: 48. Kuschel, 1990: 74.

Type data. Lectotype male here designated, BMNH, on card, with labels "2934. [f.]" handwritten / "Timaru; - Wallace." handwritten (Broun) / "Mesoreda; sulcifrons" handwritten (Broun) / BMNH lectotype disc. One syntype not located.

Range. ND, AK, CL, GB, TO, RI, WN/NN, MB, BR, NC, MC, SC, DN, FD, SL / SI / Chatham Is.

Biology. Adults of *Mesoreda sulcifrons* have been collected from a number of woody plants, including *Pseudopanax colensoi*, *P. chathamicus*, *P. lessonii*, dead *P. crassifolius*, and *Dysoxylum spectabile* (under bark). Styles (1973) records adults cut from the wood of *Pseudopanax* sp. (as *Neopanax*) and *Pittosporum tenuifolium*. In addition specimens have been taken from a polypore fungus and in leaf litter.

Specimens have been reared from the wood of a number of plants, mostly *Pseudopanax* species: a dead branch of *Coprosma australis* (W67/89); *C. robusta* (W70/6); trunk and branches of an already dead *Pseudopanax crassifolius* tree cut down 2 years before sampling (W77/1a, W77/1b); felled *P. arboreus*; dead *P. simplex*; dead *P. chathamicus*,

with one sample taken from sound wood lacking bark (W67/38) and another from a recently dead tree bole with bark (W67/39); dead wood of *Pittosporum tenuifolium* (May 1987); dead wood of *Olearia rani* (May 1987); *Schefflera digitata* (W69/15); and a dead, undecayed branch of *Weinmannia sylvicola* collected on the ground (W77/16).

Genus *Psepholax* White

White, 1843: 275; —1846: 15. Lacordaire, 1866: 72. Pascoe, 1872: 481. Broun, 1880: 478. Lea, 1900: 523. Hutton, 1904: 211. Lea, 1913: 436. Hudson, 1934: 149, 220. Kuschel in Wibmer & O'Brien, 1986: 215. Type species *Psepholax sulcatus* White, 1843, by monotypy.

Pteroplectus Schoenherr, 1847: 50. Type species *Pteroplectus macleayi* Schoenherr, by original designation. Synonymised with *Psepholax* by Lacordaire (1866, p. 72).

Empleurus Lacordaire, 1866: 74. Type species *Strongylopterus dentipes* 'Schoenherr' (Boheman), 1845, by original designation.

Pseudoreda Broun, 1893a: 1383. Hutton, 1904: 211. Hudson, 1934: 221. Type species *Psepholax tibialis* Broun, 1883, by original designation. Synonymised with *Psepholax* by Kuschel in Wibmer & O'Brien (1986, p. 215).

Aphocoelis Broun, 1909a: 137. Hudson, 1934: 221. Type species *Aphocoelis versicolor* Broun, 1909, by monotypy. Synonymised with *Psepholax* by Kuschel in Wibmer & O'Brien (1986, p. 215).

Empleurodes Marshall, 1946: 96 (new name for *Empleurus* Lacordaire, 1866, not Hope, 1838 (Coleoptera)). Synonymised with *Psepholax* by Kuschel in Wibmer & O'Brien (1986, p. 215).

Length 3–11 mm. Habitus, Fig. 6. Derm dark brown or black, shiny, densely or sparsely squamose. Scales round, oval, and elongate, imbricate, contiguous, and separate, decumbent and semi-erect, coloured tan, brown, and black; erect setiform scales absent, but elytra sometimes with erect elongate scales. Pronotum and elytra in profile (Fig. 57) smoothly convex; anterior of pronotum sometimes weakly depressed; both pronotum and elytra abruptly but very weakly depressed basally. Macropterous or brachypterous.

Head. Rostrum straight, shorter than pronotum, its length less than width of head across eyes or subequal; male sometimes with rostrum much thicker, and raised dorsally;

rostral punctation sparse or dense, in male sometimes rugose or with longitudinal irregular striations; rostral squamosity variable, in female sometimes with a dense tuft of long, pale, erect setae.

Antennae inserted approximately halfway along rostrum or nearer apex than base. Scrobe with ventral margin abruptly cut back before base of rostrum. Scape and funicle with fine, pale, decumbent and semi-erect setae; funicle shorter or longer than scape, with F1 and F2 each longer than F3, and together half or less length of scape.

Thorax. Pronotum (Fig. 6) wider than long, widest in posterior half and more or less abruptly narrowed anteriorly, with sides smoothly and strongly convex posteriorly, or trapezoidal; anterior margin generally emarginate medially, sometimes strongly so; posterior margin bisinuate; a weak median longitudinal carina sometimes present, otherwise smooth; punctation dense, fine, with an impunctate longitudinal median strip or patch sometimes present; squamosity frequently removed by rubbing. Scutellum oval, round, or triangular, flat, sparsely squamose.

Elytra with basal margin variably sinuate, wider than pronotum basally (Fig. 6); sides weakly convex to apex (Fig. 6); interstriae weakly or strongly rugose, sometimes strongly carinate or with large, curved teeth in posterior half in males; interstriae 1 and 3 sometimes narrowed or absent medially or posteriorly, and I3 generally broadened at base; striae punctures deep, small; striae deep; males sometimes with a long patch of dorsally directed elongate scales along lateral margin near humerus. Elytral strigil present.

Postocular lobe weak or absent, not meeting margin of prosternal canal. Prosternal canal broad, setose or squamose internally, with setae fine or coarse and scales very elongate, slender; marginal carina absent, or present only in anterior third and cut back before meeting anterior margin; margin of canal otherwise formed by a raised, rounded ridge extending anteriorly from fore coxae (Fig. 115). Mesosternum lacking a receptacle; anterior margin straight or emarginate; posterior margin straight or rounded (Fig. 115). Metasternum convex on disc, with a depression or shallow pit on midline near emarginate posterior margin, separating middle and hind coxae by less than length of a hind coxa. Metepisternum broad; anapleural suture complete; sclerolepidia absent.

Fore coxae on mesal face partially squamose, with a more or less obscure posterior projection. Femora sometimes with a small, ventral, distally inclined tooth; ventral groove obscure or absent, squamose ventrally; hind femur sometimes with dorsal and ventral margins subparallel.

Tibiae with an external tooth on middle and sometimes hind leg (Fig. 170, 174), rarely a flange (Fig. 172); ventral carina absent, weak, or strong; premucro small; uncus large; supra-uncal projection large on middle and hind tibiae (Fig. 170–176).

Abdomen. Ventrite 1 flat or convex on disc, sometimes sloping towards V2 posteriorly; intercoxal process quadrate or wider than long; posterior margin smoothly emarginate. Ventrite 2 longer or shorter than V1 (excluding intercoxal process), convex or concave on disc. Ventrites 3 and 4 together as long as V2 or longer, transversely convex. Punctation variable, generally most extensive and strong on V1, V2, and V5. Squamosity absent or variable; fine or coarse setae generally present, most dense on V1 and V2.

Female terminalia. Tergite VII (Fig. 226) as wide as long or wider, with 7–11 pairs of microsetae arranged in regular or irregular, obscure, longitudinal glabrous strips; anterior margin weakly convex; posterior margin convex or medially emarginate. Tergite VIII posterior margin convex or with a median projection, irregularly crenulate or smooth, as wide as long or wider (Fig. 227, 234). Sternite VIII with apical plate wider than long, subequal in length to its apodeme or shorter; apodeme occasionally forked (Fig. 228, 232, 235). Hemisternites of ovipositor broad, short; styli long, conical, terminal on hemisternites (Fig. 229–231, 233, 237); vagina lacking sclerites or with a pair of oval or long sclerites or a large transverse sclerite; spermathecal duct inserted at junction of bursa and oviduct, or anteriorly of this junction on vagina (Fig. 229, 236).

Male terminalia. Tergite VII (Fig. 493) wider than long, with 6–11 pairs of microsetae regularly or irregularly arranged in weak, longitudinal glabrous strips, sometimes attaining posterior margin, or microsetae absent; anterior margin convex or sinuate; posterior margin straight or variably concave or emarginate. Spiculum gastrale with apodeme subequal in length to aedeagal apodemes or longer; apical arms narrow (Fig. 495). Tegmen with parameres broad, separate, slightly or much shorter than width of tegminal ring; tegminal apodeme shorter than width of ring (Fig. 496, 497). Aedeagal body half as long as its apodemes or slightly more, weakly curved, with sides weakly and smoothly rounded to rounded apex, broadly or weakly acuminate; apodemes and body united; endophallus with 2 long basal sclerites sometimes of complex form, and sometimes 2 anterior sclerites; flagellum absent (Fig. 498, 499, 500).

Range. New Zealand incl. Chatham Is, eastern Australia, Norfolk I., New Caledonia, Chile.

Remarks. *Psepholax* species have the shortest rostrum in proportion to its breadth of any New Zealand Cryptorhynchinae, this being at most 1.5X as long as broad. The mesosternum between the mesocoxae is reduced to a convex pad which, as in *Homoreda*, lacks a convex anterior wall against which the rostrum rests (cf. *Oreda*). The middle tibia has an external tooth or flange, a character shared among the Psepholacini with *Homoreda*, *Oreda*, and *Mesoreda*. The prosternal canal lacks a lateral carina in almost all species, the exception being *P. simplex*, which has the shortest rostrum of any New Zealand cryptorhynchine. The apex of the hind tibia is developed into a pronounced cusp or tooth (Fig. 175, 176), similar to that of other Psepholacini but here more developed.

Psepholax is a widespread genus. *P. tibialis*, *P. sulcatus*, and *P. macleayi* form a monophyletic group with other species on Norfolk Island, in eastern Australia, and possibly in New Caledonia (see 'Systematics' section).

Sexual dimorphism can be pronounced in some species. The more extreme examples are *P. acanthomerus*, *P. coronatus*, and *P. macleayi*, the males of which are armed with large elytral teeth; and *P. sulcatus*, in which the female has a dense patch of long, stramineous setae on the concave dorsal surface of the rostrum and head, totally lacking in the male, in which the rostrum is convex dorsally. *P. mystacinus* is known only from the female, but is closely related to *P. coronatus* and *P. acanthomerus*, so the male is likely to be similarly armed. The sexual dimorphism is so great that the sexes of *P. macleayi* and *P. sulcatus* were originally described as separate species, a situation complicated in *P. macleayi* by its great variability, which led to a number of synonyms being created. In *P. tibialis* the middle and hind tibiae of the female are produced dorsally (externally) into large flanges, absent in the male (Fig. 172, 173; cf. Fig. 170, 171). Females of *P. coronatus* and *P. mystacinus* have the apodeme of sternum VIII forked (Fig. 235), a feature not seen elsewhere in New Zealand Cryptorhynchinae.

The sclerites generally present in the vagina of female *Psepholax* may be oval or elongate, or extend as a broad plate across the width of the vagina near its junction with the bursa and oviduct (Fig. 229, 230, 233, 236, 237). In *P. coronatus* the sclerites are elongate rods that extend considerably beyond the junction with the bursa, but the spermathecal duct joins the vagina at the anterior end of these rods; at this point the membrane assumes the brown colour characteristic of the oviduct (Fig. 236, 237). The function of these sclerites is not known, but presumably is related to copulation. In *P. coronatus* the sclerites are similar in the shape and size of the area they enclose to that occupied by the large sclerites of the male endophallus

(given that there is greater separation possible to the posterior ends of the female rods than there is at the anterior end, owing to greater folding of the membrane) (Fig. 236, 237, 500). The two may fit together in copulation, ensuring that the male gonopore is appropriately placed adjacent to the opening of the spermathecal duct. If this is so the development is similar to that in *Andracallespani* from the Three Kings Islands, in which the vagina is thickened and in the form of the body of the aedeagus, again to ensure that the gonopore lies close to the opening of the spermathecal duct during copulation (Lyal 1993). *Psepholax tibialis*, although having long rods in the endophallus, has a quite different arrangement of sclerites in the vagina.

There are undescribed species or subspecies related closely to *P. sulcatus* on the Three Kings Islands and Poor Knights Islands, differing chiefly in their brachyptery and associated modifications. An undescribed species closely related to *P. tibialis* (sister-species) has been collected on Mt Hikurangi (BP) from *Nothofagus menziesii*.

Biology. Adults and larvae share tunnels in live, dying, and sound dead wood; presumably healthy live wood is used apparently only by *P. tibialis*, although one record of *P. macleayi* notes callus formation on the outside of the tree where burrows had been dug by the insect. The larva of *P. tibialis* has been described by May (1993), who also gives information on the biology of members of the genus.

Psepholax acanthomerus Broun

Broun, 1913: 132. Hudson, 1934: 221.

Type data. Lectotype male here designated, BMNH, on card, with labels "3311.[m.]" handwritten / "Mt. Greenland.; 2500 feet." handwritten (Broun) / "Psepholax [m.]; acanthomerus" handwritten (Broun). Paracotype female, BMNH, same data as lectotype. All syntypes located.

Range. — / WD, OL.

Psepholax coronatus White

Fig. 234–237, 500

White, 1846: 15. Broun, 1880: 481. Hutton, 1904: 211. Hudson, 1934: 150, 220. Styles, 1973: 354.

Type data. Lectotype male here designated, BMNH, pinned, with labels "N. Zeal" and "[18]45; 30" handwritten, disc / BMNH type disc / "Psepholax coronatus White; Zool. Ereb & Terror.: Waikowaiti" handwritten (White) / BMNH lectotype disc.

Range. ND, WO, TK, TO, GB, RI, WI, WN/SD, NN, BR, MC, DN, SL / SI / Chatham Is.

Biology. *Psepholax coronatus* has been collected from *Coprosma lucida* and *Meliclytus ramiflorus*; a record from moss presumably represents the insect using a concealing habitat. Spiller & Wise (1982) cite the following 'hosts', taken from Miller (1925) (not seen in this study): *Dacrydium cupressinum*, *Nothofagus fusca*, *N. cliffortioides*, *Weinmannia sylvicola*. Specimens have been cut from the wood of *Corynocarpus laevigatus* (Hudson 1934), *Weinmannia racemosa* (Styles 1973) and *Hoheria* sp. (Hudson 1934), and reared from dead *Hoheria* sp. without bark (W67/103) and *Pomaderris phyllicifolia* (W67/105). Miller (1984) notes that "the shotgun weevil ... attacks living rimu, beech, etc. wherever the bark has been injured and limbs broken, as well as freshly sawn, but not drying, timber." On oviposition he states: "The female bores a circular hole, about 4 mm in diameter, into the wood, and at the bottom makes small pits in each of which an egg is laid; sometimes the egg pits are made in the walls of the burrows. The larval tunnels radiate from the oviposition sites." (Miller 1984, p. 86). The larval tunnels are figured.

Psepholax crassicornis Broun

Fig. 175, 176

Broun, 1895: 408 (*Psepholax*); —1911: 94 (*Aphocoelis*).
Hutton, 1904: 211 (*Psepholax*). Hudson, 1934: 221.
Styles, 1973: 353. May, 1987: 49.
versicolor Broun, 1909a: 138 (*Aphocoelis*). Hudson, 1934: 221. New synonymy.

Type data. *crassicornis*: holotype female, BMNH, pinned, with labels "2931" handwritten (Broun) / "Wellington" printed / "Psepholax; crassicornis" handwritten (Broun) / BMNH type disc.

versicolor: holotype female, BMNH, on card, with labels "2933." handwritten / "Otira Gorge" printed / "Aphocoelis; versicolor." handwritten (Broun) / BMNH type disc / "Psepholax; crassicornis Broun; Lyal det 1986" handwritten (Lyal).

Range. ND, AK, CL, TK, TO, RI, WN, WA / NN, BR, WD, NC, MC, DN, SL / SI / Chatham Is.

Biology. Adults of *Psepholax crassicornis* have been collected from woody plants, including *Pseudopanax arboreus*, *P. colensoi*, *P. edgerleyi*, and *Nestegis cunninghamii*; in addition, adults have been cut from the wood of *Pittosporum tenuifolium* (Styles 1973).

The species has been reared from a number of hosts, particularly *Pseudopanax* spp., the larvae burrowing in the dead or dying woody tissue. The rearing records available are from dead flower stems of *Aciphylla colensoi* (W68/25), a decaying *Beilschmiedia tarairi* stump (W67/118), a dead trunk, medium-sized branches, semi-live stumps, and live/dead wood of *Pseudopanax arboreus* (May 1987 and unpubl.), 4–6 cm dead undecayed trunk (W77/12), dead branches on ground (W77/1a) and 'branches' (W68/14) of *P. crassifolius*, dead wood of *P. edgerleyi* (May 1987), 'loose bits of wood' of *P. simplex* or *P. colensoi* (W68/48), small recently dead branches of *P. simplex* (W67/78), branches of *Pseudopanax* sp. (W68/8, W68/9; Styles 1973) and branches of *Weinmannia sylvicola* (W67/104).

Psepholax femoratus Broun

Fig. 233

Broun, 1880: 481. Hutton, 1898: 157; —1904: 211.
Hudson, 1934: 220. Styles, 1973: 353. May, 1987: 49.
Kuschel, 1982: 275.

Type data. Lectotype male here designated, BMNH, on card, with labels "853" printed, green / "Parua" printed / "Psepholax; femoratus" handwritten (Broun) / BMNH lectotype disc. One syntype not located.

Range. ND, AK, CL, WN / —.

Biology. Adult *P. femoratus* have been collected from a number of live and dead woody and other plants, including *Carmichaelia* sp. *Coprosma* sp., *C. macrocarpa*, *Geniostoma ligustrifolium*, *Meliclytus* sp., *M. ramiflorus*, *Pittosporum* sp., *P. crassifolius* and 'pigwood' (Kuschel 1982 and unpubl.). Specimens have been reared from live and dead wood of *Pittosporum tenuifolium* (May 1987) and wood of *Pittosporum* sp. (adults and larvae observed in the sample: Styles 1973) and dead wood of *Sophora microphylla* (May 1987). Kuschel (1982) states that the species is known to attack *Pittosporum* and *Coprosma*.

Psepholax macleayi (Schoenherr)

Fig. 57, 115, 174

Schoenherr, 1847: 52 (*Pteroplectus*). Gemminger & Harold, 1871: 2549 (*Psepholax*).
cornutus Broun, 1880: 479 (*Psepholax*). Hutton, 1904: 211. Hudson, 1934: 220. New synonymy.
granulatus Broun, 1880: 479 (*Psepholax*). Hutton, 1904: 211. Hudson, 1934: 220. Styles, 1973: 353. May, 1987: 49. New synonymy.

punctulatus Broun, 1880: 480 (*Psepholax*). Hutton, 1904: 211. Hudson, 1934: 220. New synonymy.
rostralis Broun, 1880: 480 (*Psepholax*). Hutton, 1904: 211. Hudson, 1934: 220. New synonymy.
denticostatus Broun, 1909a: 139 (*Psepholax*). Hudson, 1934: 221. New synonymy.

Type data. *cornutus*: holotype male, BMNH, pinned, with labels "848" printed, green / "Psepholax; cornutus" handwritten (Broun) / "Psepholax macleayi; Schonh., 1847; Lyal det 1986" handwritten (Lyal).

denticostatus: holotype male, BMNH, on card, with labels "2932. [m.]" handwritten (Broun) / "Karori.; Wellington" handwritten (Broun) / "Psepholax; denticostatus." handwritten (Broun) / "Psepholax; macleayi [m.]; Schonh., 1847; Lyal det 1986" handwritten (Lyal).

granulatus: lectotype male here designated, BMNH, on card, with labels "847" printed, green / "Tairua" printed / "Psepholax; granulatus" handwritten (Broun) / BMNH type disc / "Psepholax; macleayi Schonh.; 1847; Lyal det 1986" handwritten (Lyal) / BMNH lectotype disc. The original series comprised "several" specimens according to Broun.

macleayi: lectotype male here designated, Riksmuseum, Stockholm, pinned, with labels "Pteroplectus; Mac-Leay S." handwritten / "265; 85" printed (first line) and handwritten (second line), red card / "Riksmuseum; Stockholm" printed, green card.

punctulatus: lectotype female, BMNH, on card, with labels "850" printed, green / "Tairua" printed / "Psepholax; punctulatus" handwritten (Broun) / BMNH type disc / "Psepholax; macleayi [f.]; Schonh., Lyal det 1986" handwritten (Lyal). Original number of specimens in series not stated by Broun.

rostralis: lectotype female here designated, BMNH, pinned, with labels "851" printed, green / "Tairua" printed / "Psepholax; rostralis" handwritten (Broun) / BMNH type disc / "Psepholax; macleayi [f.]; Schonh., 1847; Lyal det 1986" handwritten (Lyal).

Range. North I. except WA / SD, NN, MB, BR, WD, DN, OL, FD, SL / SI.

Biology. Adults of *P. macleayi* have been collected from a large number of woody plants, both dead and live, including *Beilschmiedia tawa*, *Coprosma* sp., *C. lucida*, *Dacrydium cupressinum*, *Dracophyllum longifolium*, *Hebe* sp., *Knightia excelsa*, *Kunzea ericoides*, *Leptospermum* sp., *Ixerba brexioides* (log), *Metrosideros robusta* (log), *Nothofagus fusca*, *Olearia colensoi*, *O. colensoi grandis*, *Phormium* sp., *Pseudopanax colensoi*, *P. edgerleyi*, *Senecio* sp. and *Weinmannia racemosa* (freshly fallen tree). In

addition, specimens have been taken under the bark of *Olearia* sp., dead *Nothofagus* spp. and dead *Weinmannia racemosa*, and cut from the wood of *Knightia excelsa*, *Nothofagus* sp. (Broun 1880), *Pinus ponderosa*, dead and dying *Weinmannia* sp. and willow (*Salix* sp.), each of which is probably a host for larvae. Other collecting data, from *Blechnum discolor*, litter, and under *Stilbocarpa* and *Poa*, conveys that adults sometimes shelter in concealing habitats.

Specimens have been reared from *Aristotelia serrata* (three records), in both dead and dying wood (May 1987; W67/60), *Fuchsia excorticata*, *Hebe elliptica* (W68/40), *Knightia excelsa* (not reared, but larvae found boring in the wood), a branch of *Metrosideros robusta* (W68/20), dying *M. unbellata* (W68/45, W69/45), *Nothofagus fusca* (not reared, but larvae and adults found in wood), *Pomaderris phyllicifolia* (W67/105), the trunk of *Pinus nigra* (Styles 1973), the trunk of *Pseudopanax simplex*, and an unknown host (W73/1). J.C. Watt & J.S. Dugdale made collection notes that in *Aristotelia serrata* (W67/60) the galleries were stained black and the surrounding wood stained brown, and some of the entrance galleries were calloused over, indicating that the insects had been in the tree when it was healthy enough to respond to their presence.

Psepholax mediocris Broun

Broun, 1886: 909. Hutton, 1904: 211. Hudson, 1934: 220. Kuschel, 1982: 275.

Type data. Lectotype male here designated, BMNH, on card, with labels "1624." handwritten (Broun) / "Mau-ngatua" printed / "Psepholax; mediocris" handwritten (Broun) / BMNH type disc. Original number of specimens in series not stated by Broun.

Range. ND, TK / SD, NN, DN, FD, SL / SI.

Biology. Adults of *P. mediocris* have been collected by sweeping low plants, but mostly they have been taken from live and dead woody plants, including *Coprosma* sp., *C. foetidissima*, *Dysoxylum spectabile*, *Hebe* sp., *H. odora*, *H. salicifolia*, *Melicytus ramiflorus*, *Paratrophis banksii* and *Planchonella novozelandica* (Broun 1886, Kuschel 1982 and unpubl.). Adults have been cut from the wood of *Carpodetus serratus* (Styles 1973) and *Coprosma* sp. (Styles 1973).

Specimens have been reared from *Hebe elliptica* (W68/40), *H. stricta* dead trunk and 'semi-live' stump and branches (W66/3), a dead branch of *Carpodetus serratus* (W67/72; *Psepholax simplex* were also reared from this

sample), dead wood of *Coprosma foetidissima* on a standing tree (W68/1), sound wood of *C. macrocarpa* (with predators *Leperina browni* and *Phymatophaea* sp.; Kuschel 1982), medium-sized branches of *Pseudopanax crassifolius*, a recently dead trunk of *P. simplex* (W67/77), and an unidentified log (May 1987).

Remarks. Kuschel (1982, p. 275) notes that specimens from the Poor Knights Islands differ from others in having stronger spinules on the elytra.

Psepholax mystacinus Broun

Broun, 1886: 866. Hutton, 1904: 211. Hudson, 1934: 220.

Type data. Lectotype female here designated, BMNH, on card, with labels "1544" handwritten (Broun) / "Tairi" printed / "Psepholax; mystacinus" handwritten (Broun) / BMNH lectotype disc. Paralectotype female, BMNH, pinned on card with genitalia in vial, slightly damaged, same locality as lectotype.

Range. ND / DN.

Psepholax simplex Pascoe

Fig. 232

Pascoe, 1876b: 62. Broun, 1880: 481. Hutton, 1904: 211. Hudson, 1934: 150, 220. Styles, 1973: 354. May, 1987: 49.

brevicornis Broun, 1893a: 1382 (*Psepholax*). Hutton, 1904: 211. Hudson, 1934: 221. New synonymy.

Type data. *simplex*: lectotype female here designated, BMNH, pinned on card, with labels BMNH holotype disc / BMNH type disc / "NZ; Tairua" handwritten (Pascoe) / "Pascoe Coll.; B.M. 1893-60." printed / "Psepholax; simplex Pasc." handwritten (Pascoe) / BMNH lectotype disc.

brevicornis: holotype male, BMNH, on card, with labels "2413" handwritten (Broun) / "Maungatua" printed / "Psepholax; brevicornis" handwritten (Broun) / BMNH type disc / "Psepholax; simplex Pascoe; Lyal det 1986" handwritten (Lyal).

Range. North I. except WI, WA / SD, NN, MB, BR, MC, DN, SL / SI.

Biology. Adults of *P. simplex* have been collected from a number of woody plants, including *Coprosma* sp., *Dacrydium colensoi*, *Hebe odora*, *Lygodium articulatum*, *Pit-*

sporum eugenioides, *Pseudopanax colensoi*, *P. edgerleyi*, *P. arboreus* and *Weinmannia* sp., as well as under logs (Broun 1893a and unpubl.); most of the records are from *Pseudopanax* species. Specimens have been reared from a number of woody plants, again particularly *Pseudopanax* species.

Rearing records are available from dead branches of *Carpodetus serratus* (W67/72; *Psepholax mediocris* was also reared from this sample), solid dead wood and live and dead wood of *Pseudopanax arboreus* (Styles 1973, May 1987 and unpubl.), *P. colensoi* (W68/41), a recently dead trunk of *P. simplex* (W67/77), dead branches (W77/1a) and dead undecayed trunk (W77/12) of *P. crassifolius*, *Schefflera digitata* (W69/15) and dead standing branches of *Senecio kirki* (W67/94). Adults and larvae have been cut from branches of *Pseudopanax arboreus* (Gourlay 1960).

Psepholax sulcatus White

Fig. 6

White, 1843: 275; —1846: 15. Broun, 1880: 479. Hutton, 1898: 157; —1904: 211. Broun, 1909c: 146. Brookes, 1925: 292. Hudson, 1934: 150, 220. Styles, 1973: 353. Kuschel, 1982: 275 (= *Psepholax barbifrons* White). May, 1987: 49. Kuschel, 1990: 74.

barbifrons White, 1846: 15 (*Psepholax*). Broun, 1880: 479. Hutton, 1904: 211. Broun, 1911c: 94. Hudson, 1934: 149, 220.

Type data. *sulcatus*: lectotype male here designated, BMNH, on card point, with labels BMNH type disc / BMNH lectotype disc / "New Zealand" and "5654; a" handwritten, disc / "Psepholax sulcatus White; New Zealand. 5654. Dr Sinclair" handwritten (White).

barbifrons: lectotype female here designated, BMNH, pinned on card, with labels BMNH lectotype disc / BMNH type disc / "N. Zeal" and "45; 30" handwritten, disc / "Psepholax barbifrons White; Zool. Ercebus & Terror." handwritten. Original number of specimens in series not stated by White. Two specimens in the MacLeay Museum, relabelled by Masters, may be paralectotypes.

Range. ND, AK, CL, TO, TK, RI, WN, WA / SD, NN, MB, KA, BR, MC, SC, DN, SL / Chatham Is.

Biology. *Psepholax sulcatus* attacks various dead and dying trees. Kuschel (1990) cites the following as 'hosts' at Lynfield, a suburb of Auckland: *Albizia lophantha*, *Coprosma robusta*, *Cordyline australis*, *Elaeocarpus dentatus*, *Melicope ternata*, *Melicytus ramiflorus*, *Myrsine australis* and *Pittosporum tenuifolium*. Adults have been

collected, elsewhere, from *Beilschmiedia tarairi* (under bark), *Coprosma* sp., "*Cordyline laevigatus*", *Corynocarpus laevigatus*, *Dracophyllum* sp., *Entelea arborescens*, *Fraxinus excelsior*, *Geniostoma ligustrifolium*, *Nothofagus* sp., *Nestegis apetala*, *Myrsine divaricata*, *Weinmannia racemosa* (under bark of a dead tree), and from leaf litter (Kuschel 1982 and unpubl.).

Specimens have been reared from, or found in tunnels in *Coprosma robusta*, *Dysoxylum spectabile* (larvae feed in solid, sound, dead wood: Hudson 1934), *Knightia excelsa*, *Leptospermum* ("in" the plant: Broun 1880), *Meryta sinclairii* (collected in holes in dying base), *Metrosideros excelsa* (reared from dead sound wood and a dead branch - W80/6), *Myoporum laetum* (reared from a standing dead branch - W67/86); larvae noted by Hudson (1934) to feed in solid sound dead wood), *Myrsine australis* dead branch (W74/4) (larvae feeding in solid sound dead wood: Hudson 1934, under the host name *Suttonia*), dead standing *Myrsine divaricata* (W80/8, W80/9), *M. 'durrilei'* (cut from wood), *M. salicina* (semi-dead trunk), *Olearia rani* (live/dead wood: May 1987), dead standing *Paratrophis banksii*, dead *Persoonia toru* (W74/15), *Pinus ponderosa*, *P. radiata* stumps, *Podocarpus dacrydioides* (in tunnels) and *Weinmannia racemosa* (reared specimens found in "brood chambers cut from wood": Styles 1973).

Psepholax tibialis (Broun)

Fig. 170-173, 493-499

Broun, 1880: 482 (*Pseudoreda tibiale*). Hutton, 1904: 211 (*Pseudoreda tibialis*). Broun, 1909c: 146. Hudson, 1934: 221. May, 1987: 49 (*Psepholax*).

Type data. Holotype female, BMNH, on card point, with labels "855" printed, green / "Auckland" printed / "Pseudoreda; tibialis" handwritten (Broun) / BMNH type disc / "Psepholax; tibialis Broun; Lyl det 1986" handwritten (Lyl).

Range. ND, AK, CL / NN.

Biology. Adults of *P. tibialis* have been collected from *Kunzea ericoides*, *Nothofagus truncata*, and *Weinmannia* sp. The species has been reared from live wood of *Leptospermum scoparium* (two records - May 1987, 1993, and unpubl.), where the visible sign on the trunk is a circular hole 4 mm in diameter (B.M. May, pers. comm.), *Myrsine australis* (May 1993), *Nothofagus menziesii* (May 1993) and *Weinmannia silvicola* (two records, one from a live tree 15 cm in diameter - W67/90 and May 1993).

Genus *Sympedius* Pascoe

Pascoe, 1876b: 65. Broun, 1880: 499. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 128. Type species *Sympedius testudo* Pascoe, 1876, here designated.

Length 2-8 mm. Habitus, Fig. 7, 101. Derm black or brown, densely squamose. Scales small or moderate-sized, oval or more or less elongate, separate, contiguous, or imbricate, appressed, erect, or decumbent; erect setiform scales absent. Pronotum in profile (Fig. 58) convex or nearly flat, with an anterior depression; elytra abruptly raised at base, convex. Macropterous, brachypterous, or apterous.

Head. Rostrum shorter than pronotum, squamose dorsally at base, more extensively in male; males sometimes with a median longitudinal carina in proximal half, and both sexes frequently rugose towards base, most markedly in male.

Antennae inserted in distal half of rostrum, nearer apex in male. Scrobe with dorsal marginal carina sometimes greatly developed. Scape and funicle with fine or coarse, pale, decumbent and semi-erect setae, and scape sometimes with a few elongate scales; funicle shorter or longer than scape, with F1 and F2 elongate, subequal in length, together more or less than half length of funicle.

Thorax. Pronotum (Fig. 7, 101) wider than long, abruptly narrowed anteriorly, widest in posterior half; sides emarginate anteriorly, convex posteriorly; anterior margin convex; posterior margin sinuate; weak prominences sometimes present at positions 1, 2, and 3; a median longitudinal carina sometimes apparent, otherwise smooth; punctation dense or sparse, shallow, uniform; scales forming more or less pronounced tufts at positions 1, 2, and 3; squamosity generally dense and obscuring derm. Scutellum small or large, round or transversely oval, largely glabrous (Group II) or with a dense covering of small scales (Group I).

Elytra (Fig. 7, 101) with basal margin sinuate, as wide as pronotum basally or wider; sides convex, with widest point in posterior half, convex between widest point and apex in Group I (Fig. 7), concave in Group II (Fig. 101); small or large tubercles present on interstriae 3, 5, and basally on 7; small, glossy tubercles sometimes apparent along median suture just posterior to scutellum; lateral margin in dorsal aspect formed by interstria 9 (Group I) or 19 basally and 18 for most of margin (Group II); a prominent swelling on interstriae 3-7 near apex in Group II; stria punctures moderate or large, shallow or deep, more or less regular; squamosity generally dense, with scales decumbent, sometimes erect or semi-erect and forming tufts on protuberances, or crests along interstriae, or erect and widely spaced

along interstriae. Elytral strigil absent.

Postocular lobes weakly rounded or more abruptly cut back ventrally, extending slightly between marginal carinae of prosternal canal. Mesosternal receptacle U-shaped, wider than long, deeply cavernous, extending posteriorly nearly to level of midline of middle coxae; margins produced ventrally. Metasternum concave or convex, separating middle and hind coxae by less than length of a hind coxa; a small median pit sometimes present near anterior or posterior margin. Metepisternum broad; anapleural suture complete; sclerolepidia absent.

Fore coxa on mesal face glabrous or squamous, with a posterior projection. Femora squamose ventrally, with or without a distally inclined tooth or elevation ventrally; ventral groove absent or obscure. Tibiae with a small external tooth basally on middle leg; ventral carina terminating in a small premucro; uncus broad.

Abdomen (Fig. 190). Ventrite 1 convex on disc, with a glabrous sculptured patch resembling a stridulatory file (Fig. 190); intercoxal process wider than long, sometimes concave anteriorly. Ventrite 2 as long as V1 (excluding intercoxal process), convex on disc. Ventrites 3 and 4 each half as long as V2, transversely convex. Punctuation sparse or dense, most dense on V1, V2, and V5, with impunctate patches especially on V3 and V4. Squamosity dense or sparse, with scales oval, generally elongate on V1 and V5.

Female terminalia. Tergite VII (Fig. 238) with length and width subequal; microsetae absent; anterior margin weakly convex; posterior margin convex. Tergite VIII (Fig. 239, 243) longer than wide, with posterior margin truncate and crenulate (Group I) (Fig. 239) or truncate and emarginate, lacking crenulations but with more or less projecting submarginal stout setae (Group II) (Fig. 243). Sternite VIII (Fig. 240) elongate, narrowly Y-shaped, with apical arms separate and parallel for over half its length; membrane ventrally free to apex of apodeme, forming a large, elongate pocket. Hemisternites of ovipositor slender, tapering smoothly to conical, subterminal (Group I; Fig. 241, 242) or slender, terminal (Group II) styli. Bursa lacking a sclerite (Group I; Fig. 241) or with sclerite at junction of bursa/vagina complex and oviduct (Group II); spermathecal duct arising at junction of oviduct and bursa (Fig. 241).

Male terminalia. Tergite VII (Fig. 501) lacking microsetae; anterior margin sinuate or convex; posterior margin weakly concave, sometimes obtusely or broadly produced posteriorly at posterolateral angles. Sternum VIII with a small pouch between hemisternites (Fig. 502). Spiculum gastrale (Fig. 503) shorter than aedeagus with apodemes; apical arms narrow, sometimes with a lightly sclerotised

anterior flange, the anterior margin of which may be sclerotised more heavily. Tegmen (Fig. 504, 505) with parameres broad and as long as width of tegminal ring, or shorter; apodeme length subequal to width of ring. Aedeagal body less than half as long as its apodemes, curved medially or apically, with sides rounded or straight; apex rounded, generally with a small, rounded median projection; body and apodemes united or narrowly separate (Fig. 506, 507). Endophallus with a complex basal sclerite sometimes incorporating a short tube; a prominent, inverted Y-shaped sclerite usually present ventrally (Fig. 506).

Range. New Zealand, possibly including Chatham Is.

Remarks. *Sympedius* is a member of the *Rhynchodes* group of genera which, in New Zealand, comprises also *Baeorhynchodes*, *Rhynchodes*, and *Eutyrrhinus*. This group is discussed in the 'Systematics' section, as are problems with the holophyly of *Sympedius* as here accepted. *Sympedius*, while sharing with the other New Zealand members of the group the apomorphic basal dorsal tooth or flange on the middle tibia and the 'pouched' female sternite VIII (Fig. 240), differs in not having the elytra acuminate apically nor the base of the elytra greatly sinuate.

As is apparent from the description above, and as discussed in the 'Systematics' section, there are two holophyletic groups of species included in the genus. Group I can be distinguished by the presence of a small striate area on either side of ventrite 1 (Fig. 190) and a sculptured area on the hind femora, together probably acting as a stridulatory device, although there are no published records of stridulation for the genus. Members of Group II have a characteristic elytral outline (Fig. 101) different from that of Group I (Fig. 7) and, indeed, any other New Zealand cryptorhynchine.

Broun (1911) reported *Sympedius costatus* (as *Tychanus*) from the Chatham Islands as a new species, but stated that the species would be described later. In the eventual description the species was recorded only from mainland New Zealand. No specimens from the Chatham Islands have been seen, and in Broun's Chatham Islands collection only a bare pin with a Chatham Islands label is present.

May (1993) provides a generic description based on larvae and discusses larval biology.

GROUP I

Sympedius lepidus Broun

Broun, 1885: 387; —1886: 935. Hutton, 1904: 212.
Hudson, 1934: 221. Hustache, 1936: 128. Styles, 1973:
355. Kuschel, 1990: 74.

Type data. Lectotype male here designated, BMNH, on card, with labels "1683" handwritten (Broun) / "Waitakerei" printed / "Sympedius; lepidus" handwritten (Broun). Two syntypes not located.

Range. ND, AK, CL, WO / NN, BR.

Biology. *Sympedius lepidus* adults have been taken on a variety of plants, and have been attracted by cut branches of *Pittosporum tenuifolium* (Kuschel 1990). Specimens have been reared from *Coprosma* sp. (Styles 1973).

***Sympedius minor* Broun**

Broun, 1921: 651. Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels "4234." handwritten (Broun) / "Rotoiti; 13-6-1916." handwritten (Broun) / "Sympedius; minor." handwritten (Broun).

Range. TO / BR.

***Sympedius rectirostris* Broun**

Broun, 1909a: 149. Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels "2953." handwritten (Broun) / "Southland" printed / "Sympedius; rectirostris" handwritten (Broun).

Range. CL, TO / BR, CO, SL.

***Sympedius testudo* Pascoe**

Fig. 7, 58, 190, 238–242, 501–507

Pascoe, 1876b: 65. Broun, 1880: 500. Hutton, 1904: 212. Hudson, 1934: 152, 221. Hustache, 1936: 128. Styles, 1973: 355. May, 1987: 49. Kuschel, 1990: 74.

Type data. Lectotype female, BMNH, pinned on plastazote strip, with labels "N. Z.; Tairua" handwritten (Pascoe) on yellow oval / "Sympedius; testudo; type Pasc." handwritten (Pascoe) / BMNH lectotype disc / "Pascoe Coll.; B.M. 1893-60." printed / "Sympedius; testudo Pasc." handwritten (Pascoe), label from Pascoe Collection drawer. Paralectotypes: 2 males, 2 females, BMNH, 1 male with label "N.Z.; Auckland" handwritten (Pascoe) on yellow oval, 1 female with label "N.Z.; Tairua" handwritten

(Pascoe) on yellow oval, all with labels BMNH paralectotype disc / "Pascoe Coll.; B.M. 1893-60." printed / "PARALECTOTYPE; Sympedius; testudo; Pascoe, 1876; Lyal det 1987." printed, pink.

Range. ND, AK, CL, WO, BP, TO, WN / NN.

Biology. Adults of *Sympedius testudo* have been taken from a variety of woody plants, including *Hoheria ?populnea*, *Nestegis apetala*, *Phebalium nudum*, *Pittosporum tenuifolium*, *Schefflera digitata*, *Myoporum laetum* (ngaio) and dying *Sophora* (Hudson 1934 and unpubl.). In addition, adults have been collected from cut branches of *Coprosma arborescens*, *Nestegis lanceolata* (adults have also been found in dead wood of this host) and *Sophora microphylla* (Kuschel 1990).

Specimens have been reared from *Coprosma* sp. (Styles 1973), *C. lucida* and *C. robusta* dead wood (May 1987, 1993), *Geniostoma ligustrifolium* (May 1993), *Myoporum laetum* dead wood (May 1987, 1993) and *Nothofagus menziesii* (Styles 1973).

GROUP II

***Sympedius bufo* (Sharp) new combination**

Fig. 243

Sharp, 1883: 68 (*Tychanus*). Broun, 1893a: 1239. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Lectotype male here designated, BMNH, on card, with labels "Tychanus bufo; Type D.S.; Greymouth.; Helms" handwritten (Sharp) on card bearing beetle / BMNH lectotype disc / BMNH "Type; H.T." disc / "Greymouth.; New Zealand; [red line]; (Helms)" printed / "Sharp Coll.; 1905-313." printed.

Paralectotype female, BMNH, on card, with labels "Tychanus bufo.; D.S.; Greymouth" handwritten (Sharp) on card bearing beetle / BMNH paralectotype disc / "Greymouth.; New Zealand; [red line]; (Helms)" printed / "Sharp Coll.; 1905-313." printed.

Range. WN / SD, NN, BR / SI.

Biology. An adult *Sympedius bufo* has been taken in leaf litter, and a specimen has been collected from *Meliccytus ramiflorus*.

***Sympedius costatus* (Broun) new combination**

Broun, 1911: 94 (*Tychanus*: nomen nudum); —1913: 137. Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels "3319" handwritten (Broun) / "Silverstream; Wellington." handwritten (Broun) / "Tychanus; costatus." handwritten (Broun).

Range. WI, WN / BR, SL / ?Chatham Is.

Sympedius densus (Broun) new combination

Broun, 1880: 499 (*Tychanus*). Hutton, 1904: 211. Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Lectotype female here designated, BMNH, on card, with labels "887" printed, green / "Manaia" printed / BMNH lectotype disc / "var. only.; 886 - [blue crayon line]" handwritten (Broun).

Paralectotype male, BMNH, on card, with labels as for lectotype, but with "Tychanus; densus" handwritten (Broun) in addition. All syntypes located.

Range. ND / —.

Sympedius ferrugatus (Pascoe) new combination

Fig. 101

Pascoe, 1876b: 64 (*Tychanus*). Broun, 1880: 498. Hutton, 1904: 211. Hudson, 1934: 221. Hustache, 1936: 128. Hudson, 1950: 51. Kuschel, 1990: 74.

Type data. Lectotype female here designated, BMNH, pinned, with labels BMNH lectotype disc / BMNH 'Type; H.T.' disc / "N.Z.; Tairua" handwritten (Pascoe), yellow oval / "Tychanus; ferrugatus; type Pasc" handwritten (Pascoe) / "Tychanus; ferrugatus, Pasc." handwritten (Pascoe) label from drawer in Pascoe Collection / "Pascoe Coll.; 93-60" printed.

Range. ND, AK, CL, BP, TK, WN / —.

Biology. Adults have been found in bush floor litter.

Genus *Baeorhynchodes* Broun

Broun, 1909a: 158. Hudson, 1934: 224 (*Baeorhynchodes*). Hustache, 1936: 237. Type species *Baeorhynchodes cristatus* Broun, 1909, by monotypy.

Length 3–5 mm. Habitus, Fig. 8. Derm reddish-brown or black, shiny. Scales elongate, mostly decumbent, separate, contiguous, and imbricate, coloured black, grey, grey-brown, or cream; erect setiform scales absent. Pronotum in

profile (Fig. 59) flat or weakly convex, not depressed at base; clytra very strongly convex. Macropterous.

Head. Rostrum slightly shorter than pronotum or as long, straight or weakly curved, punctate dorsally except at extreme apex, more coarsely in male, the punctures sometimes joined longitudinally in proximal half of rostrum; rostrum squamose dorsally at base, with squamosity extending nearer apex in male; median longitudinal carina in proximal three-quarters of length pronounced in male, sometimes present but less developed in female.

Antennae inserted nearer apex than base of rostrum. Scrobe with dorsal marginal carina more marked in male. Scape as long as funicle or longer; F1 longer than F2, both slightly elongate, together subequal to rest of funicle but shorter than club; funicle with coarse, dark, decumbent setae distally; scape and base of funicle with finer, shorter setae (female) or pale, narrow scales (male). Club cylindrical, tapering distally, slightly constricted at junction between C1 and C2, slightly darker than rest of antenna or concolorous.

Thorax. Pronotum (Fig. 8) wider than long, widest at or near posterior margin; sides weakly convex medially, sometimes sinuate; anterior margin convex or weakly truncate; posterior margin bisinuate, partially obscured by anterior margins of elytra; prominences absent, but a short longitudinal depression present just anterior to scutellum; punctation even; scales elongate triangular, separate, contiguous, or partially imbricate, decumbent, with a strong tuft at position 1 and weak tufts at positions 2 and 3. Scutellum large, round or oval, sometimes protuberant, densely covered with small, elongate scales.

Elytra with basal margin sinuate, convex, and raised anterior to interstriae 2, 3, and 4, wider than pronotum basally; sides convex, more markedly so in proximal half, tapering evenly to apex; interstriae 1 and 2 strongly and evenly produced in proximal third to form a single median prominence, weakly depressed midway down posterior declivity; interstria 7 carinate over proximal three-fifths to form margin of elytron; striae punctures deep, regular, with a very small seta or scale in each; interstria 1 with dense, imbricate, elongate-triangular, decumbent and semi-erect cream scales between scutellum and prominence forming a well marked pale band; prominence with a tuft of long, slender black scales; scales otherwise small, elongate-oval, decumbent (Fig. 8). Elytral strigil absent.

Postocular lobe weakly or very weakly rounded, broadly continuous with margin of prosternal canal. Prosternal canal squamous anteriorly to fore coxae. Mesosternal receptacle U-shaped, with lateral margins longer than

width (much less so in male), deep, extending posteriorly to level of midline (male) or near posterior of middle coxae (female) (Fig. 116, 117); margins produced ventrally. Metasternum concave medially, especially posteriorly, concave near to anterior margin, convex laterally on disc, especially in female, separating middle and hind coxae by about the length of a hind coxa or slightly less, weakly projecting ventrally between middle and hind coxae, more so in male. Metepisternum large; anapleural suture complete; sclerolepidia absent.

Fore coxa with a broad, laminar posterior projection. Femora squamose ventrally, with a small, distally inclined tooth ventrally, largest on fore femur and smallest on hind femur; ventral groove absent. Tibiae with a small external tooth near base of middle tibia, but teeth otherwise absent; external laminar development present at least basally on all tibiae, especially on middle leg (Fig. 177, 178); ventral carina sometimes obscure; premucro present; uncus large; supraanal projection present on hind tibia. Legs with scales narrow, decumbent on femora and tibiae, semi-erect and narrower on tarsus, fringing 3rd tarsomere.

Abdomen. Ventrite 1 slightly convex on disc, sloping towards V2 posteriorly; intercoxal process concave, wider than long; posterior margin straight. Ventrite 2 slightly longer than V1 (excluding intercoxal process), convex or flat on disc, sloping towards V3. Ventrites 3 and 4 each slightly more than half as long as V2, weakly transversely convex. Punctuation even. Scales elongate, decumbent; squamosity more dense laterally than medially on ventrites 3–5.

Female terminalia. Tergite VII (Fig. 244) wider than long; microsetae absent; anterior margin straight; posterior margin convex. Tergite VIII (Fig. 245) with length and width subequal, truncate posteriorly, lacking crenulations or projecting stout scales or teeth. Sternite VIII (Fig. 246) elongate, narrowly Y-shaped, with lateral sclerotisations of apical plate separate for over half length; membrane ventrally free to apex of apodeme, forming a large, elongate pocket. Hemisternites of ovipositor slender; styli conical (Fig. 247, 248). Bursa lacking sclerites, or with fine sclerites at junction of bursa and oviduct; spermathecal duct arising at junction of bursa and oviduct (Fig. 247).

Male terminalia. Tergite VII (Fig. 509) wider than long, lacking microsetae; anterior margin weakly convex; posterior margin weakly concave. Sternum VIII (Fig. 510) with a lightly sclerotised median apodeme more heavily sclerotised apically. Spiculum gastrale (Fig. 511) nearly as long as aedeagus with apodemes; apical arms narrow, with lightly sclerotised anterior flanges. Tegmen (Fig. 512, 513) with parameres very short, broad, weakly sclerotised;

apodeme longer than width of tegminal ring. Aedeagal body as long as its apodemes, weakly curved, with sides very weakly rounded from widest point near apex; apex truncate, with a median rounded extension; ventral surface very lightly sclerotised or unsclerotised; body and apodemes united (Fig. 514, 515). Endophallus lacking basal sclerites; an inverted Y-shaped sclerite present, as long as aedeagal body; flagellum absent (Fig. 514).

Range. New Zealand.

Remarks. *Baeorhynchodes* is a member of the *Rhynchodes* group of genera (see 'Systematics' section), comprising in New Zealand also *Rhynchodes*, *Eutyrrhinus*, and *Sympedius*. The first three have a greatly curved anterior margin to the elytra, an apomorphy found also in a number of other non-New Zealand genera. *Rhynchodes* and *Eutyrrhinus* species both have the elytral apex pointed, an apomorphy not present in *Baeorhynchodes*. *Baeorhynchodes* can be distinguished from all other New Zealand Cryptorhynchinae by the distinctive strip of cream scales between the scutellum and the sutural prominence on the elytra. It is notable that *Baeorhynchodes* resembles some *Orochlesis* species, *Brachyphytes* (a monobasic Australian genus), and particularly *Nedymorus* (a monobasic genus from Aru Island) in features of the elytral suture, although these genera lack the carinate interstria 7.

Baeorhynchodes cristatus Broun

Fig. 8, 59, 116, 117, 177, 178, 244–248, 508–514

Broun, 1909a: 159. Hudson, 1934: 224 (as *Baeorrhynchodes*). Hustache, 1936: 237.

Type data. Holotype female, BMNH, on card, with labels "2971." handwritten / "Canterbury" printed / "Baeorhynchodes; cristatus." handwritten (Broun).

Range. — / NN, BR, MC.

Genus *Eutyrrhinus* Dejean

Dejean, 1835: 292 (no description; genus attributed to Chevrolat). Schoenherr, 1837: 271 (as *Eutyrrhinus*; genus described, attributed to Chevrolat); —1844: 358. Lacordaire, 1866: 111 (attributed to Schoenherr). Broun, 1880: 503 (genus described, attributed to Schoenherr). Hutton, 1904: 214 (attributed to Schoenherr). Lea, 1910: 594 (keyed), 627 (described) (attributed to Schoenherr). Heller, 1916: 326 (attributed to Schoenherr). Hudson, 1934: 224 (as *Eutyrrhinus*;

attributed to Schoenherr). Hustache, 1936: 240 (as *Euthyrhinus*; attributed to Schoenherr). Type species *Curculio meditabundus* Fabricius, 1775, by monotypy.

Length 4–12 mm. Habitus, Fig. 9. Derm black or brown, shiny, densely squamose. Scales oval, appressed, decumbent, or semi-erect, separate, contiguous, or imbricate; erect setiform scales absent. Pronotum in profile (Fig. 60) convex, but depressed anteriorly and abruptly at base; elytra more or less flat anteriorly and convex posteriorly. Macropterous.

Head. Rostrum shorter than pronotum, straight or very weakly curved, wider and less convex dorsally in male; male with or without a short longitudinal median carina; punctation dorsally coarse, fine, or absent, generally much coarser in male; squamosity generally present basally and sometimes nearly reaching apex, generally more extensive in male.

Antennae inserted nearer base than apex of rostrum. Scrobe with a dorsal marginal carina, meeting head at or below level of ventral margin of eye. Funicle longer than scape; F1 and F2 elongate, subequal, together approximately half total length of funicle. Scape and F1–6 with small, narrow, elongate, decumbent or semi-erect scales or setae.

Thorax. Pronotum (Fig. 9) wider than long, widest at or near posterior margin, more or less abruptly narrowed in anterior half or sides weakly sinuate*; anterior margin rounded, generally truncate or medially emarginate; posterior margin bisinuate, partially obscured by anterior margin of elytra; a short median longitudinal carina sometimes present; a median longitudinal depression sometimes present just anterior to scutellum*; small, semicircular projections about the size of scales or slightly larger present medially and laterally, sometimes abundant and projecting through squamosity; punctation coarse, dense; scales sometimes erect and forming pairs of tufts at points 1 and 2. Scutellum large, circular, oval, heart-shaped, or trapezoidal, glabrous or with small scales anteriorly.

Elytra with basal margin strongly sinuate (Fig. 9), raised anterior to interstriae 2, 3, and 4, wider than pronotum basally; sides weakly convex or nearly straight and subparallel before more or less acuminate apex; interstriae variably broadened, raised, and depressed; interstriae with small tubercles more or less developed, generally most apparent on interstria 1; stria punctures deep, sometimes nearly confluent, generally obscured by squamosity; scales sometimes raised into a pair of tufts posteriorly. Elytral strigil absent.

Postocular lobe very weakly rounded, or larger, with margin cut back between lobe and junction with marginal carina of prosternal canal*, otherwise extending slightly between margins of prosternal canal. Prosternal canal with scales present anterior to fore coxae on sides and base, or on sides only*, or not present*. Mesosternal receptacle either: (1) open posteriorly, and extending nearly to level of midline of middle coxae, with floor sloping uniformly between anterior and posterior margins, and posterior margin only slightly raised relative to metasternum; length subequal to or less than width; margins produced ventrally; scales present internally; or (2)* U-shaped, with lateral margins subequal to posterior margin or longer; posterior margin of receptacle anterior to middle coxae or extending posteriorly to level of midline of middle coxae in female, less far in male; margins produced ventrally. Metasternum concave medially, especially posteriorly, with longitudinal median furrow generally present in at least posterior half, separating middle and hind coxae by approximately the length of a hind coxa. Metepisternum large; anapleural suture complete; sclerolepidia absent.

Fore coxa on mesal face glabrous or squamose, with a large, conical posterior projection. Femora with a small, distally inclined tooth ventrally, generally largest on fore femora, sometimes blunt or obtuse on others; ventral groove absent or obscure, if present then clearest on middle femur, squamose. Tibiae with a small external tooth sometimes present near base on middle leg, otherwise lacking teeth; an external laminar development present on fore tibia (Fig. 179), to a lesser extent on middle tibia, and in some species to a limited extent on hind tibia; ventral carina terminating in premucro, this sometimes large on fore tibia; uncus large; apex of hind tibia extending dorsally to uncus.

Abdomen. Ventrite 1 convex posteriorly, sloping towards V2; intercoxal process concave, at least just behind anterior margins, wider than long or dimensions subequal; posterior margin concave or medially emarginate. Ventrites 1 and 2 subequal in length (excluding intercoxal process); V2 flat, sloping towards V3. Ventrites 3 and 4 each about half as long as V2, transversely convex. Punctuation even, more or less dense, shallow. Scales oval or elongate, generally more elongate on anterior intercoxal process than elsewhere, imbricate, contiguous, or separate, decumbent or semi-erect.

Female terminalia. Tergite VII (Fig. 249) wider than long; microsetae absent; anterior margin weakly convex, posterior margin convex. Tergite VIII (Fig. 250) as long as wide or longer*; posterior margin convex or truncate, sometimes medially emarginate, lacking crenulations or

projecting stout scales or teeth, or such teeth submarginal and small*. Sternite VIII (Fig. 251) elongate, narrowly U-shaped with lateral sclerotisations separate from base, or narrowly Y-shaped with lateral sclerotisations separate for over half their length; membrane ventrally free to apex of apodeme, forming a large, elongate pocket. Hemisternites of ovipositor tapering to cylindrical styli (Fig. 252, 253). Bursa with a pair of large, oval sclerites at junction with oviduct; spermathecal duct arising at junction of bursa and oviduct (Fig. 252).

Male terminalia. Tergite VII (Fig. 516) lacking microsetae; anterior margin weakly convex; posterior margin straight. Sternum VIII (Fig. 517) with a lightly sclerotised or unsclerotised, sometimes bifurcate median pocket. Spiculum gastrale (Fig. 518) shorter than aedeagus with apodemes or as long; apical arms more or less narrow, sometimes with lightly sclerotised anterior flanges. Tegmen (Fig. 519, 520) with parameres longer, shorter, or much shorter than width of tegminal ring; apodeme shorter than width of tegminal ring. Aedeagal body not as long as its apodemes, slightly curved; sides virtually straight, or rounded with widest part at middle; apex rounded or broadly acuminate; body and apodemes united (Fig. 521, 522). Endophallus with dorsal and ventral lobes; basal sclerites well developed, sometimes forming a longitudinal rod*; otherwise sclerites absent, or with an inverted V- or Y-shaped sclerite dorsally or ventrally, or both distally*; flagellum absent (Fig. 521).

Range. New Zealand, Australia, New Guinea, Solomon Is, Moluccas, Malaysia.

Remarks. In the above description an asterisk (*) indicates character states not found in the New Zealand species.

Eutyrrhinus is a member of the *Rhynchodes* group of genera (see 'Systematics'). In New Zealand *Eutyrrhinus* can be distinguished by the elytra terminating in a point (as in *Rhynchodes*) and the mesosternal receptacle being open posteriorly. *Eutyrrhinus squamiger* is restricted to New Zealand, but is closely related to *E. mediatubundus* (Australia) and *E. tessellatus* (New Guinea, Solomons, Moluccas).

Eutyrrhinus squamiger White

Fig. 9, 60, 179, 249–253, 516–522

White, 1846: 16 (as *Eutyrrhinus*). Broun, 1880: 503. Hutton, 1904: 214. Hudson, 1934: 155, 224 (as *Eutyrrhinus*). Hustache, 1936: 241 (as *Eutyrrhinus*). Kuschel, 1990: 73.

Type data. Lectotype female here designated, BMNH,

pinned, with labels BMNH holotype disc / BMNH type disc (reversed) / "New; Zeal" and "53; 49" handwritten on either side of blue disc / "Eutyrrhinus; squamiger; N. Zeal. [illegible]; Erebus, Terror. type" handwritten / "Eutyrrhinus squamiger White; Zool. Erebus & Terror." handwritten / "I do not consider; this = to mediatubundus; scaling, e.g., is; different from type; 1950; Det. by E.C.Zimmerman" handwritten (Zimmerman) / "LECTOTYPE; Eutyrrhinus; squamiger; White, 1846; Lyal det. 1987" handwritten (Lyal), red.

Range. ND, AK, CL, TO–RI, HB, WI, WA/BR, MC, DN, SL.

Biology. Adults of *Eutyrrhinus squamiger* have been cut from *Knighthia excelsa* (Broun 1880, Kuschel 1990), and one specimen was found on a dead *Sophora* twig. Hudson (1934) reports finding one specimen under willow (*Salix*) bark, and 60 specimens found in an old willow tree. There are thus very few host records for *E. squamiger* and, of those, two are associations with exotic species. Hawkeswood (1991) reviews the biology of *Eutyrrhinus mediatubundus* in Australia, and reports that it is known to develop in mainly dead and dying wood of 29 plant species in 18 families (6 Gymnospermae and 23 Angiospermae, including both natives and exotics). Hawkeswood (1991, p. 65) further notes that most of the plants contain sugar- and nutrient-rich sap or latex, e.g., Anacardiaceae, Araucariaceae, Moraceae, Pinaceae, or are rich in nitrogenous compounds, e.g., Caesalpiniaceae, Fabaceae, Mimosaceae.

Genus *Rhynchodes* White

White, 1846: 16. Lacordaire, 1866: 108 (*Rhynchodes*). Broun, 1880: 502. Hutton, 1904: 215. Heller, 1916: 325. Hudson, 1934: 224 (*Rhynchodes*). Hustache, 1936: 237. Type species *Rhynchodes saundersi* White (= *Rhynchodes ursus* White), by subsequent designation (Heller 1916, p. 325).

Arachnobas Montrouzier, 1860: 896. Type species undesignated. Synonymised by Lacordaire (1866, p. 108).

Length 11–25 mm. Habitus, Fig. 10. Derm brown or black, shiny, densely squamose (although readily rubbed off, especially along interstriae). Scales small or large, elongate and sometimes hairlike, erect or decumbent, imbricate, contiguous, or separate; erect setiform scales absent. Pronotum in profile (Fig. 61) weakly convex, sometimes depressed anteriorly, depressed at base; elytra convex. Macropterous.

Head. Rostrum subequal in length to pronotum, straight or

weakly curved; dorsal carinae absent, or male with 3 longitudinal rows of denticles in proximal half*; punctuation very fine in female, coarser or very rugose* in male; basal squamosity extending to between antennal inscriptions in male, not so far in female.

Antennae inserted approximately halfway along rostrum in female, halfway* or in anterior half in male. Scrobe with dorsal margin not carinate in females, carinate basally in males. Funicle longer than scape, with F1 and F2 elongate, F1 longer or shorter* than F2, F1+2 less than half (males) or more than half (females and non-New Zealand males) total length of funicle. Scape and funicle segments with small elongate scales.

Thorax. Pronotum (Fig. 10) wider than long, widest at or near posterior margin; sides weakly but variably convex medially, with some specimens sinuate laterally and others more abruptly narrowed anteriorly; anterior margin convex; posterior margin bisinuate, partially obscured by anterior margins of elytra; median longitudinal carina absent, short, or nearly complete, otherwise smooth; punctuation fine, dense, sometimes absent from median longitudinal line. Scutellum large, round or oval, glabrous.

Elytra (Fig. 10) with basal margin very sinuate, wider than pronotum basally; sides with humeri forming widest part of elytra, virtually straight between humeri and abrupt convergence to acuminate apex (Fig. 10); interstriae variably raised and broadened, with I7 broadly carinate behind humerus and forming elytral margin in dorsal view (Fig. 10) (elytron obtusely angled about I7 in longitudinal view); stria punctures large, shallow* or deep, regular; distinct prominences or tubercles absent; scales elongate-oval* to hair-like (New Zealand males with longer and finer scales than females), decumbent, semi-erect, or erect, dense but easily rubbed off. Elytral strigil absent.

Postocular lobe sometimes weak, rounded, extending between lateral margins of prosternal canal. Prosternal canal with small scales or coarse setae generally present, at least anterior to fore coxae, and fine setae or scales between fore coxae; marginal carina not projecting between fore coxae. Mesosternal receptacle U-shaped, glabrous, lightly or densely squamose* internally, longer than wide (New Zealand females) or with length and width subequal (males), extending posteriorly to level of midline of middle coxa in female, less far in male (Fig. 118, 119); margins produced ventrally. Metasternum concave medially, especially posteriorly and near anterior margin, separating middle and hind coxae by less than length of a hind coxa; anterior margin between coxae straight; posterior margin medially emarginate (Fig. 118). Metepisternum clear; anapleural suture complete; sclerolepidia absent.

Forelegs of male notably longer than other legs* or of similar size. Fore coxa with a broad, laminar posterior projection directed towards mesosternal receptacle (exaggerated by a patch of scales). Femora with ventral tooth very small or absent; ventral groove present at least distally, obscure, squamose. Tibiae with a small external tooth sometimes present near base on middle leg (Fig. 180, 181), otherwise lacking tooth; ventral carina present or absent; premucro absent or small and obtuse; uncus large; apex of hind tibia sometimes extending dorsal to uncus to produce a small, obtuse supra-uncal projection (Fig. 182).

Abdomen. Ventrite 1 weakly convex on disc or concave along midline, sloping towards V2 posteriorly; intercoxal process concave, nearly triangular, with length and width subequal; posterior margin straight, medially emarginate, sometimes broadly so*. Ventrites 1 and 2 subequal in length (excluding intercoxal process). Ventrite 2 convex, sloping towards V3. Ventrites 3 and 4 together about as long as V2, transversely convex. Ventrites finely punctate or impunctate. Squamosity generally sparse or absent on either side of midline on V3 and V4, otherwise variable, frequently dense laterally on V2-4. Scales elongate, decumbent, sometimes hair-like on intercoxal process.

Female terminalia. Tergite VII (Fig. 254) longer than wide; microsetae absent; anterior margin straight or weakly convex; posterior margin convex. Tergite VIII (Fig. 255) much longer than wide, medially emarginate apically, lacking crenulations or projecting stout scales or teeth. Sternite VIII (Fig. 256) elongate, narrowly Y-shaped, with lateral sclerotisations of apical plate separate and parallel for over three-quarters of their length; membrane ventrally free to apex of apodeme, forming a large, elongate pocket. Hemisternites of ovipositor slender, tapering to cylindrical styli (Fig. 257, 258); vagina / bursa complex with a large sclerite at junction with oviduct; spermathecal duct inserted at junction of bursa and oviduct (Fig. 257).

Male terminalia. Tergite VII (Fig. 523) wider than long, lacking microsetae; anterior margin convex; posterior margin truncate and medially emarginate. Spiculum gastrale (Fig. 525) nearly as long as aedeagus with apodemes; apical arms narrow, with lightly sclerotised flanges extending anteriorly. Tegmen (Fig. 526, 527) with parameres large, broad, shorter or longer than width of tegminal ring; apodeme at most as long as width of tegminal ring. Aedeagal body shorter than its apodemes, curved, with sides more or less rounded from widest point near apex; apex rounded, sometimes medially emarginate*; ventral surface sclerotised only apically; body and apodemes united (Fig. 528, 529). Endophallus with basal sclerite

complex; a narrow, inverted Y-shaped sclerite present ventrally, and a broad one sometimes present dorsally, just extending on to dorsal surface of aedeagus; sclerites each nearly as long as aedeagal body; flagellum absent (Fig. 528).

Range. New Zealand, New Caledonia, Lifu.

Remarks. In the above description an asterisk (*) indicates character states not found in New Zealand species.

Rhynchodes ursus is one of the bulkiest weevils in New Zealand, although the size is very variable, and some specimens are of similar size to *Eutyrrhinus*, from which it may be distinguished by the posteriorly closed mesosternal receptacle (open in *Eutyrrhinus*). The genus is closely related to *Eutyrrhinus*, *Baeorhynchodes* and *Sympedius* (see discussion in 'Systematics' section). The larva is described by May (1993).

Rhynchodes ursus White

Fig. 10, 48, 61, 118, 119, 180–182, 254–258, 523–529

White, 1846: 16. Broun, 1880: 502 (*Rhynchodes*). Hutton, 1904: 215. Hudson, 1934: 224 (*Rhynchodes*). Hustache, 1936: 237.

saundersii White, 1846: 17 (*Rhynchodes*). Broun, 1880: 503 (*Rhynchodes*). Hutton, 1904: 215. Hudson, 1934: 224 (*Rhynchodes*). Hustache, 1936: 237. New synonymy.

squameus Broun, 1881: 730 (*Rhynchodes*). Hutton, 1904: 215. Hudson, 1934: 224 (*Rhynchodes*). Hustache, 1936: 237. New synonymy.

weberi Colenso, 1882: 281 (*Rhynchodes*). Hutton, 1904: 215. Hudson, 1934: 224 (*Rhynchodes*). Hustache, 1936: 237. New synonymy.

rubripunctatus Colenso, 1882: 282 (*Rhynchodes*). Hutton, 1904: 215. Hudson, 1934: 224 (*Rhynchodes*). Hustache, 1936: 237. New synonymy.

atrus Broun, 1883: 441 (*Rhynchodes*); —1886: 802. Hutton, 1904: 215. Hudson, 1934: 224 (*Rhynchodes*). Hustache, 1936: 237 (*Rhynchodes atrus*). New synonymy.

Type data. *ursus*: lectotype male here designated, BMNH, pinned, with labels "N. Zeal" and "[18]45; 30" handwritten, on either side of white disc / "Pt Nicholson" handwritten / BMNH type disc / "Rhynchodes ursus White; Zool Erebus & Terror" handwritten.

atrus: holotype female, BMNH, pinned, with labels "1430" printed, green / "Mount Arthur" printed / "Rhynchodes; atrus." handwritten (Broun).

rubripunctatus: type series not located.

saundersi: type in "Mus. Saunders", not seen.

squameus: holotype female, BMNH, pinned, with labels: "1296" printed, green / "Parua" printed / "Rhynchodes; squameus" handwritten (Broun).

weberi: type series not located.

Range. Kermadec Is / North I. except TK, WA / South I. except KA, NC, MK / SI / Chatham Is.

Biology. The larvae of *Rhynchodes ursus* tunnel through the solid trunk and branches of dead trees, including *Agathis australis* (unpubl.), *Beilschmiedia tarairi* (Styles 1973), *Dacrydium cupressinum* (Broun 1880, Hudson 1934, May 1993), *Dracophyllum traversii* (W71/15; May 1993), *Nothofagus* spp. (Hudson 1934) and *N. cliffortioides* (May 1993). Hudson (1934) states that they are feeding on the sound wood. Spiller & Wise (1982), citing Helson (1952; not seen in this study) also give *Dacrydium cupressinum* as a host. A specimen in NZAC is recorded as "from dead *Dracophyllum longifolium*", and this may refer to a rearing record. Adults are found on trees, and Hudson (1934) states that they gather to feed on exuded tree sap. The so-called 'giant ichneumonid wasp', *Certonotus fractinervis*, is a parasitoid on the larvae (Hudson 1934). The biology and behaviour of the larva are described by May (1993).

Remarks. The record of *Rhynchodes ursus* from the Kermadec Islands is based on a label in the Broun Collection (BMNH); no specimen or published record has been seen.

Genus *Mitrastethus* Redtenbacher

Redtenbacher, 1868: 167. Broun, 1880: 504–505. Faust, 1889: 72. Lca, 1910: 595, 625. Heller, 1916: 325. Hudson, 1934: 224. Hustache, 1936: 251. Type species *Mitrastethus baridioides* Redtenbacher, 1868, by monotypy.

Length 5–7 mm. Habitus, Fig. 11. DERM brown, shiny, densely squamose. Scales mostly small, appressed, round and oval, imbricate or tessellate; elongate erect scales sparse, erect setiform scales absent; rubbed specimens common. Pronotum in profile (Fig. 62) more or less depressed anteriorly, weakly convex posteriorly; pronotum and elytra abruptly and weakly depressed at base; elytra weakly convex. Macropterous.

Head. Rostrum two-thirds length of pronotum, very weakly curved in male, straight in female, more convex dorsally and broader in male; median longitudinal carina

present but obscure in male, absent in female; punctation coarse in male, fine and sparse in female; rostrum squamose dorsally at base, extending to near apex in male.

Antennae inserted approximately halfway along rostrum in male, one-quarter length from base in female, with fine, semi-erect setae. Scrobes broad. Funicle segments 1 and 2 elongate, subequal in length, together subequal in length to scape.

Thorax. Pronotum (Fig. 11) wider than long, widest in posterior half, narrowed anteriorly; sides emarginate, smoothly convex posteriorly; anterior margin convex, sometimes weakly emarginate medially; posterior margin bisinuate with a median posterior projection, weakly carinate; carinae and projections otherwise absent; punctation fine and uniform, except sometimes for a faint longitudinal impunctate region; scales round, appressed, imbricate, with elongate decumbent and erect scales scattered anteriorly and laterally. Scutellum circular or transverse, with small scales.

Elytra (Fig. 11) with basal margin sinuate, sometimes weakly raised, wider than pronotum basally; sides smoothly convex; apex truncate or smoothly convex; interstria 5 sometimes produced into a prominence near apex, and 17 produced at humerus, otherwise prominences and tubercles absent, but weakly depressed on either side of scutellum; stria punctures shallow, regular; a row of erect or decumbent elongate scales along each interstria; scales otherwise round or oval, appressed, imbricate or tessellate. Elytral strigil present.

Postocular lobe rounded, smoothly continuous with margin of cavernous prosternal canal. Mesosternal receptacle (Fig. 120) cavernous, wider than long, extending posteriorly to just before or between middle coxae; margins produced ventrally; median longitudinal carina sometimes extending posteriorly one-third length of middle coxae from rear of receptacle. Metasternum (Fig. 120) convex or concave medially, separating middle and hind coxae by more than length of a hind coxa, with small median pits near anterior margin and on posterior margin, a deep pit posteromedial to each middle coxa, and a small tooth anterior to each hind coxa. Metepisternum exposed; anapleural suture complete; sclerolepidia absent (Fig. 62).

Fore coxa with a posterior projection. Femora lacking a ventral tooth; ventral groove absent or very broad, obscure, glabrous distally or squamose. Tibiae with ventral carina obscure; premucro (if present) small; uncus large; supra-uncal projection small, sometimes obscure.

Abdomen. Ventrite 1 on disc shallowly concave anteriorly, flat or convex posteriorly, with a shallow pit on

intercoxal process; posterior margin smoothly emarginate; intercoxal process at least twice as wide as long. Ventrite 2 longer than V1 (excluding intercoxal process), flat. Ventrites 3 and 4 each slightly more than half length of V2, weakly transversely convex. Punctation fine, but ventrites sometimes impunctate medially. Squamosity dense laterally, sparse or absent medially on V1–4, dense on V5; scales round and appressed, elongate and erect; fine setae posteriorly on V5.

Female terminalia. Tergite VII (Fig. 259) wider than long; 7 or 8 pairs of microsetae present on a pair of longitudinal glabrous strips medially, these not attaining posterior margin; anterior margin with a small, convex anterior projection medially; posterior margin convex. Tergite VIII (Fig. 260) as wide as long, truncate and crenulate apically. Sternite VIII (Fig. 261) with a broad, oval apical plate subequal in length to its apodeme. Hemisternites of ovipositor slender, finely sclerotised, tapering to large, oval styli (Fig. 262, 263); bursa with a sclerite at junction with oviduct and vagina; spermathecal duct arising at junction of bursa and oviduct.

Male terminalia. Tergite VII (Fig. 530) wider than long, with 6–8 pairs of microsetae arranged on a median longitudinal pair of glabrous strips terminating at posterior margin; anterior margin with a small, convex anterior projection medially; posterior margin straight. Spiculum gastrale (Fig. 532) subequal in length to aedeagal apodemes; apical arms broad, triangular; apodeme more than twice as long as apical arms. Tegmen (Fig. 533, 534) with parameres separate only apically, shorter than its apodeme; apodeme longer than width of tegmental ring. Aedeagal body (Fig. 535, 536) less than half as long as its apodemes, strongly curved (Fig. 536), lanceolate, its apex narrowed, with a truncate or rounded projection (Fig. 535); body and apodemes united. Endophallus (Fig. 535) with small, rod-like basal sclerites; flagellum absent.

Range. New Zealand, Australia, New Guinea, New Caledonia, Norfolk I.

Remarks. *Mitrastethus* is recognisable by its red-brown colour (sometimes obscured by small greyish scales), distinctive shape (Fig. 11), long metasternum with posterior tooth and anterior pits (Fig. 120), and complete mesosternal receptacle (Fig. 120). There appear to be no close relatives in New Zealand, but the New Zealand species is very close to the Australian *M. australiae*. *M. baridioides* was confused with *Curculio bituberculatus* Fabricius for many years; the problem is fully discussed by Kuschel (1970). The larva of *M. baridioides* is described by May (1993), who also gives details of the biology of the species.

Mitrastethus baridioides Redtenbacher

Fig. 11, 62, 120, 259–263, 530–536

Redtenbacher, 1868: 168. Broun, 1877: 369 (as *Dryophthorus bituberculatus*); —1880: 504 (*Mitrastethus biuberculatus*). Hutton, 1904: 215. Hudson, 1934: 155, 224. Hustache 1936: 251 (*Mitrastethus baridioides*). Kuschel, 1970: 198.

brouni Faust, 1889: 72 (*Mitrastethus*). Hustache, 1936: 251. Kuschel, 1970: 199 (as junior synonym of *M. baridioides*).

Type data. *baridioides*: type series not seen.
brouni: type series not seen.

Range. ND, AK, CL, BP, TK, TO, WA / NN, WD.

Biology. Adults of *Mitrastethus baridioides* have been collected many times on dead *Agathis australis*, and more particularly under the bark, where the adults can be found in very resinous conditions in recently cut logs. Broun (1880) records the species 'in wood of kauri' (*A. australis*). May (1993) records larvae reared from dead *Agathis australis*, *Prumnopitys taxifolia* and 'untreated pine boxing'. Specimens have also been taken under the bark of dead *Pinus* sp., in Norfolk pine logs, and beaten from *Pseudopanax* sp. (Hudson 1934, as *Nothopanax*).

Genus *Mecistostylus* Lacordaire

Lacordaire, 1866: 136. Hutton, 1904: 215. Hudson, 1934: 224. Hustache, 1936: 258. Type species *Mecistostylus douei* Lacordaire, 1866, by original designation.

Paranomocerus Redtenbacher, 1868: 168. Hutton, 1904: 215. Hudson, 1934: 224. Hustache, 1936: 259. Type species *Paranomocerus spiculus* Redtenbacher, 1868, by monotypy. New synonymy.

Length 3–7 mm. Habitus, Fig. 12. Derm brown, shiny, densely squamose. Scales small, erect, decumbent, and appressed, imbricate; erect setiform scales absent. Pronotum in profile (Fig. 63) weakly convex or flat, with highest point at anterior and an abrupt but weak depression at base; elytra more or less evenly convex posteriorly. Macropterous.

Head. Rostrum longer than pronotum; median longitudinal carina dorsally in at least proximal half of rostrum, though sometimes obscure; male with longitudinal ridges more or less apparent anteriorly; punctation fine or absent between level of antennal insertions and apex, coarse at base; rostrum squamous at base, more extensively in male.

Antennae inserted just in distal half of rostrum in female, near apex in male, with elongate scales present distally on scape, more apparent in male. Scape meeting eye (female) or surpassing it (male). Funicle shorter than scape, with F1 and F2 elongate; F1 longer than F2, together about half length of scape. Club cylindrical, as long as F2 or longer (Fig. 12).

Thorax. Pronotum (Fig. 12) wider than long, widest at base or in posterior third; sides subparallel posteriorly, converging anteriorly; anterior margin emarginate medially; posterior margin bisinuate; weak protuberances sometimes present at point 3 and laterally midway between this and anterior margin; punctation coarse; scales oval, imbricate, appressed, with erect elongate scales forming tufts at points 1, 2, and 3 and a pair between 1 and 3. Scutellum large, circular, with elongate-oval scales.

Elytra with basal margin sinuate, wider than pronotum basally; sides virtually straight from humeri to widest point at two-thirds distad, converging posteriorly to truncate apex; prominences scattered on interstriae 2, 3, and 5; striae punctures deep, regular; a single oval scale in each striae puncture, separate from other elytral scales, otherwise scales oval, imbricate, appressed, sometimes with a scattering of pale, elongate, erect scales. Elytral strigil present.

Postocular lobe rising abruptly from margin anteriorly, smoothly continuous with margin of prosternal canal. Mesosternal receptacle cup-shaped, longer than wide, extending posteriorly to level of midline of middle coxae; margins produced ventrally beyond coxae. Metasternum convex medially, separating middle and hind coxae by more than length of a hind coxa. Metepisternum exposed; anapleural suture complete; sclerolepidia absent (Fig. 63).

Fore coxa on mesal face sparsely squamous or glabrous, with a laminar posterior projection. Fore and middle femora with a small ventral tooth, hind femora with or without a very small tooth; ventral groove present only distally, obscure, squamose. Tibiae with a very small external tooth on middle leg, generally obscured by scales; ventral carina absent; premucro absent or small; uncus large.

Abdomen. Ventrite 1 convex on disc; intercoxal process concave with raised margins in male, concave in female, wider than long; posterior margin weakly and smoothly emarginate. Ventrite 2 longer than V1 (excluding intercoxal process), convex on disc. Ventrites 3 and 4 each about half as long as V2, weakly transversely convex. Ventrites punctate. Scales round, appressed and separate laterally on V1–4 and medially on V1 and V2, elongate and erect medially on V1–4; V5 with a scattering of fine scales and setae.

Female terminalia. Tergite VII (Fig. 264) with length and width subequal; 8 or 9 pairs of microsetae, the posterior 6 or 7 pairs on small tubercles on each of a pair of longitudinal glabrous strips, the anterior one marginal or submarginal; anterior margin weakly convex; posterior margin strongly convex. Tergite VIII (Fig. 265) longer than wide, convex apically, with crenulations weak and irregular but with stout subapical dorsal and ventral setae (Fig. 266). Sternite VIII (Fig. 267) with an elongate, narrow apical plate more than half as long as its apodeme. Hemisternites of ovipositor very slender, with an elongate, subcylindrical, apical free portion; styli slender (Fig. 268, 269). Vagina with sclerites at junction with bursa and oviduct; spermathecal duct arising near junction of bursa and oviduct (Fig. 268).

Male terminalia. Tergite VII (Fig. 537) wider than long, with 7 or 8 pairs of microsetae arranged on a pair of longitudinal glabrous strips terminating at posterior margin; anterior margin straight or weakly convex; posterior margin strongly emarginate between glabrous strips. Sternum VIII as in Fig. 538. Spiculum gastrale (Fig. 539) with apodeme as long as aedeagus, slender; apical arms narrow. Tegmen (Fig. 540, 541) with parameres longer than its apodeme; apodeme as long as width of tegminal ring. Aedeagal body less than half as long as its apodemes, curved, with sides weakly rounded; apex truncate, medially emarginate and bearing long setae; aedeagal body and apodemes united (Fig. 542, 543). Endophallus with basal sclerites complex and including a short, broad rod or tube (Fig. 542).

Range. New Zealand incl. Chatham Is, New Hebrides.

Remarks. Two specimens of an undescribed species of *Mecistostylus* from the New Hebrides are in the collections of the BMNH. *Mecistostylus* belongs to the *Mecistostylina* ('*Mecistostylides*' of Lacordaire 1866), a group of genera including *Mecomastix* (New Hebrides, New Caledonia), *Anomocerus* (Lifu), *Hemideres* (New Caledonia), *Blepiarda* (Australia, Fiji, New Guinea, Rennell I.), *Protopalus* (Australia), *Endymia* (Philippines, New Guinea, Batschian), *Eurhopala* (New Guinea), and possibly *Amalthus* (Morty), *Idastes* (New Hebrides), and *Doetes* (Moluccas). *Aesychora*, *Sclerolips*, *Panopides*, and *Paronymia*, included in the subtribe by Hustache (1936), do not belong; *Griffithia* has not been seen. Members of these genera generally show sexual dimorphism in the origin and length of the antennae, the male's antenna inserting much nearer the apex of the rostrum than that of the female and having a very elongate scape. In addition, they have an elongate cylindrical antennal club and a more or less narrowly trapezoidal pronotum, raised anteriorly. There are no

closely related genera in New Zealand. *Mecistostylus* can be distinguished from other New Zealand Cryptorhynchinae by the length of the rostrum, the shape of the antennae, and the distinctive profile (Fig. 63).

The apex of female tergite VIII is unusual in having, rather than crenulations, rows of stout spines (Fig. 265, 266). The rounded or jagged apices of the spines are probably a result of abrasion, as some are pointed. Although not apparent from Fig. 266, the submarginal ventral spines are socketed at the base. Similar spines are found in *Ectopsis* (Fig. 271, 272), *Hadracalles* (Fig. 277), and *Pachyderis* (Fig. 429).

Mecistostylus douei Lacordaire

Fig. 12, 63, 264–269, 537–543

Lacordaire, 1866: 137. Hutton, 1904: 215. Hudson, 1934: 224. Hustache, 1936: 258. May, 1987: 48. Kuschel, 1990: 74.

maurus Broun, 1880: 505 (*Paranomocerus*). Hutton, 1904: 215. Hudson, 1934: 224. Hustache, 1936: 259. New synonymy.

spiculus Redtenbacher, 1868: 169 (*Paranomocerus*). Broun, 1880: 505. Hutton, 1904: 215. Hudson, 1934: 224. Hustache, 1936: 259. New synonymy.

Type data. *douei*: type series not seen.

maurus: holotype female, BMNH, on card, with labels "899" printed, green / "Parua" printed / "Paranom.; maurus." handwritten (Broun).

spiculus: type series not seen.

Range. ND, AK, CL, BP, TO, RI, WN / SD, NN, NC, MC, OL, SL / SI / Chatham Is.

Biology. Adults of *Mecistostylus douei* have been collected from a number of plants, including *Acacia dealbata*, *Gahnia* sp. (on leaves at night), *Nothofagus* (Broun 1880), *Pseudopanax arboreus*, *P. colensoi*, *P. edgerleyi*, *Schefflera digitata* and *Styphelia* sp.

The species has been reared a number of times from *P. arboreus*, both in live phloem (May 1987), where it was also recorded as 'pupating into wood' (W78/1), and solid dead trunk, medium-sized branches, and twigs. It has also been reared from a recently dead bole of *P. chathamicus* with bark still attached (W67/39), branches of *P. crassifolius* (W68/14) and trunk and dead sound wood of *P. simplex*. Kuschel (1990) states that it is restricted to *Pseudopanax* species, but while this might be so at Lynfield, and certainly the preponderance of records are from this genus, elsewhere it has been reared from a partly dead

branch of *Hymenanchera chathamica* (W70/9a) and the trunk and branches of *Weinmannia racemosa* (W68/16).

Genus *Ectopsis* Broun

Broun, 1881: 719. Hutton, 1904: 211. Hudson, 1934: 221. Hustache, 1936: 130. Type species *Ectopsis ferrugalis* Broun, 1881, by monotypy.

Length 5–13 mm. Habitus, Fig. 13. Derm black, minutely rugose and apparently matt, with occasional shiny patches. Squamosity not fully covering derm on head, thorax, elytra, or abdomen. Scales small, separate, contiguous, and imbricate, decumbent; erect setiform scales absent. Pronotum in profile (Fig. 64) and elytra virtually flat or weakly convex, usually with an abrupt depression at their junction; elytra depressed abruptly posteriorly, with posterior face concave or convex. Brachypterous or apterous.

Head. Rostrum shorter than pronotum, straight or weakly curved, broader and more robust in male; median and lateral carinae sometimes present, particularly in male; dorsal punctation fine, but coarser and more extensive in male; scales small, absent distal to antennal insertions, in females sometimes present only in proximal third.

Antennae inserted near apex of rostrum in male, about two-thirds from base in female; all segments with coarse or fine semi-erect and decumbent setae. Funicle and scape subequal in length, with F2 longer than F1 or subequal, each longer than other segments, sometimes greatly so.

Thorax. Pronotum (Fig. 13) as wide as long or wider, widest in anterior half, abruptly and deeply emarginate anteriorly, gradually narrowed posteriorly; anterior margin truncate or very weakly emarginate medially; posterior margin weakly sinuate; a weak median longitudinal carina sometimes in anterior half, otherwise smooth; punctation coarse, irregular, sparse; scales small, decumbent, sometimes weakly raised in centre to form a complex pattern of crests. Scutellum bearing a thick tuft of elongate scales.

Elytra (Fig. 13) with basal margin weakly sinuate or smoothly concave, wider than pronotum basally; humeral angles not produced but lying anterior to scutellum; sides more or less straight and parallel before rounded or broadly acuminate apex; interstriae 3 and 5 sometimes weakly raised basally, and I4 depressed basally; posterior declivity fairly abrupt, sometimes concave medially; prominences more or less irregular or absent; interstriae not clearly delimited, with large foveae more or less apparent. Elytral strigil large.

Postocular lobe smoothly continuous with marginal

carina of prosternal canal. Prosternal canal sometimes squamous posteriorly. Mesosternal receptacle (Fig. 121) semicircular, cavernous, extending posteriorly to level of midline of middle coxae; margins produced ventrally. Metasternum (Fig. 121) separating middle and hind coxae by less than length of a hind coxa, with deep pits medially and between middle and hind coxae; pits laterally more or less marked or obscured by scales; posterior margin deeply emarginate medially and depressed to form a deep pit between metasternum and ventrite 1. Metepisternum exposed, narrow; anapleural suture complete and with a broad anterior patch containing small, indistinct sclerolepidia (Fig. 47).

Fore coxa with a posterior projection. Femora unarmed or with a ventral tooth, this most developed on fore femur; ventral groove with an anterior carina, glabrous. Tibiae sometimes with an obscure ventral carina terminating in a very small premucro.

Abdomen. Ventrite 1 convex medially, less so in male, where it may be flat; intercoxal process wider than long, with paired depressions; posterior margin emarginate medially. Ventrites 1 and 2 subequal in length (excluding intercoxal process); V2 convex on disc, sloping weakly towards V3 posteriorly. Ventrites 3 and 4 each less than one-quarter the length of V2, flat. Ventrites virtually impunctate. Scales small, scattered, with 4 very sparse tufts sometimes apparent on each of V2–4.

Female terminalia. Tergite VII (Fig. 270) longer than wide; microsetae numbering 5 or 6, mostly in a pair of median longitudinal glabrous bands; anterior margin weakly convex; posterior margin convex. Tergite VIII (Fig. 271) longer than wide, truncate posteriorly, with stout setae arising submarginally ventrally and dorsally (Fig. 272). Sternite VIII (Fig. 273) with an elongate oval apical plate less than half as long as its apodeme. Hemisternites of ovipositor with long, cylindrical apical projections bearing long, slender styli (Fig. 275). Junction of bursa and oviduct with a very strong sclerite; spermathecal duct arising at junction of bursa and oviduct (Fig. 274).

Male terminalia. Tergite VII (Fig. 544) with 5 or 6 pairs of microsetae on longitudinal glabrous strips; anterior margin weakly convex; posterior margin medially emarginate between glabrous strips. Sternum VIII (Fig. 545) with a small membranous pouch between the 2 narrow semilunar sclerites. Spiculum gastrale (Fig. 546) with apodeme as long as aedeagal apodeme or longer; apical arms rectangular. Tegmen (Fig. 547, 548) with parameres broad or pointed, subequal in length to its apodeme; apodeme longer than width of tegmental ring. Aedeagal body shorter than its apodemes, curved, with sides rounded, widest near

apex; apex smoothly rounded or bearing a small projection; ostium halfway along aedeagal body; body and apodemes united (Fig. 549, 550). Endophallus with basal sclerites comprising 2 strongly sclerotised rods produced basally into apically free membranous lobes; flagellum absent (Fig. 549).

Range. New Zealand, incl. Chatham Is.

Remarks. *Ectopsis* is probably related to *Hadracalles*, as indicated by the form of the female genitalia—particularly the spines of tergite VIII and the shape of sternite VIII and the hemisternites—and the presence of pits on the metasternum laterally, although this character is open to question, since pits are found in some form or another quite widely. The relationships of these two genera outside New Zealand have not been established. *Ectopsis* can be distinguished from other New Zealand cryptorhynchine genera by the small patch of sclerolepidia anteriorly on the anapical suture (Fig. 47), the complex form of the metasternum (Fig. 121), and the shape of the pronotum (Fig. 13). Female tergite VIII is unusual in having rows of stout subapical spines posteriorly, rather than marginal crenulations (Fig. 272). The rounded or jagged apices of the dorsal spines are probably a result of abrasion, as a few of them in the specimen figured are pointed. The ventral spines do not appear to be so abraded, but are originally conical. Though not apparent from Fig. 272, the submarginal ventral spines are socketed at the base. Similar spines are found in *Pachyderis*, *Mecistostylus* (Fig. 266), and *Hadracalles*, as noted above.

Ectopsis ferrugalis Broun

Fig. 13, 47, 64, 121, 270–275, 544–550

Broun, 1881: 719. Hutton, 1904: 211. Hudson, 1934: 151, 221. Hustache, 1936: 130.

Type data. Holotype female, BMNH, pinned, with label "1272" printed, green.

Range. ND, AK, WO, TO, GB, TK, WI, WN / SD / Chatham Is.

Biology. Adults of *Ectopsis ferrugalis* have been beaten from dead *Pseudopanax arboreum* (Hudson 1934; note that the reference in Spiller & Wise (1982) to Hudson (1928) is in error, since *Ectopsis* is not mentioned in this work), found on *Pseudopanax* sp. (whether live or dead cannot be ascertained), and found in leaf litter. All rearing records are from dead boles and trunks of *Pseudopanax*

chathamicus on the Chatham Islands (W67/22, W67/39, W67/42, W67/48); in one instance it was noted "larvac subcortically, pupal chambers in wood, entrance lined with wood shreds".

Ectopsis foveigerus Broun

Broun, 1917: 448. Hudson, 1934: 221. Hustache, 1936: 130.

Type data. Holotype male, BMNH, on card, with labels "3935." handwritten (Broun) / "Wangaroa; 3.4.1914." handwritten (Broun) / "Ectopsis; foveigerus." handwritten (Broun).

Range. ND, incl. Poor Knights Is / —.

Biology. Adults of *Ectopsis foveigerus* have been found in leaf litter.

Ectopsis simplex Broun

Broun, 1893b: 383. Hutton, 1904: 211. Hudson, 1934: 221. Hustache, 1936: 130.

Type data. Holotype female, BMNH, on card, with labels "2969." handwritten (Broun) / "Pirongia" printed / "Ectopsis; simplex" handwritten (Broun).

Range. ND, AK, CL, WO, BP / —.

Biology. Adults of *Ectopsis simplex* have been found in leaf litter, on dead *Agathis australis* at night, and under bark of *Pseudopanax colensoi*.

Genus *Hadracalles* Broun

Broun, 1893a: 1384. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 126. Type species *Hadracalles fuliginosus* Broun, 1893, by monotypy.

Length 7–10 mm. Habitus, Fig. 14. Derm black, matt or weakly reflective. Scales numerous, small to minute, appressed or decumbent, oval, round, or slightly elongate; erect setiform scales absent. Pronotum in profile (Fig. 65) very weakly depressed anteriorly; pronotum and clytra smoothly convex, both weakly depressed at their junction. Apterous.

Head. Rostrum subequal in length to pronotum; median dorsal longitudinal carina in proximal half obscure in

female, distinct in male; a lateral carina also present in male; punctation fine apically, coarser at base; rostrum squamose at base, more so in male.

Antennae inserted in distal half of rostrum. Funicle and scape subequal in length; F2 longer than F1, together slightly longer than rest of funicle. Scape, funicle, and club with fine, decumbent or semi-erect setae, most prominent on funicle.

Thorax. Pronotum (Fig. 14) wider than long, widest in posterior half, abruptly narrowed anteriorly; sides convex posteriorly; anterior margin convex, weakly emarginate medially; posterior margin straight; a longitudinal carina or an impunctate strip medially, rarely extending complete length of pronotum; punctation fairly coarse, each puncture filled by an appressed roundish scale; scales dorsally confined to punctures. Scutellum concealed or small, triangular, depressed, glabrous.

Elytra with basal margin slightly and irregularly sinuate, wider than pronotum basally; sides smoothly convex from base to truncate apex; interstriae sometimes partially obscured by stria punctures; interstria 3 sometimes projecting anteriorly; tubercles and prominences absent except for a row of 5 or 6 small, shiny nodules on either side of suture basally; stria punctures large, shallow, regular; a single scale in each stria puncture approximately equal in size to pronotal scales, otherwise scales smaller, contiguous or separate, appressed except for an obscure, irregular row of decumbent scales on each interstria. Elytral strigil large.

Postocular lobes rounded, extending slightly between marginal carinae of prosternal canal. Mesosternal receptacle (Fig. 122) cup-shaped, slightly longer than broad, extending posteriorly slightly beyond level of midline of middle coxae; margins weakly produced ventrally. Metasternum (Fig. 122, 147) weakly depressed posterior to mesosternal receptacle, separating middle and hind coxae by less than length of a hind coxa; metasternum 'notched' just anterior to hind coxae, not projecting ventrally, laterally with 1 or more large foveae each with an isolated elongate scale, sometimes obscured by elongate scales or gummy matter. Metepisternum narrow, not completely covered by elytron; anapleural suture lost posteriorly, although marked by a glabrous line; sclerolepidia absent (Fig. 147).

Fore coxa with a weak posterior projection. Femora with a ventral tooth; middle and hind femora with a smaller tooth than fore femur, or with a rounded prominence; ventral groove partially or completely squamose; ventral carina dividing before apex to enclose a small depressed area (Fig. 183). Tibiae with ventral carina present; pre-micro absent; uncus broad.

Abdomen. Ventrite 1 concave medially, in female with a transverse ridge on disc parallel to medially emarginate posterior margin; intercoxal process wider than long. Ventrites 1 and 2 subequal in length (excluding intercoxal process); V3 and V4 each slightly more than half length of V2, flat. Ventrites impunctate, with squamosity more dense on V1, V2, and V5 than on V3 and V4.

Female terminalia. Tergite VII (Fig. 276) longer than wide; 1 pair of microsetae, each seta in a narrow, transverse pit with anterior margin weakly raised and with an associated anterior glabrous region; anterior margin of tergite with a convex median projection; posterior margin convex. Tergite VIII (Fig. 277) longer than wide; posterior margin truncate, with 3 coarse crenulations and dense submarginal rows of stout setae dorsally and ventrally. Sternite VIII (Fig. 278) as long as apodeme, with lateral sclerotisations of apical plate narrow. Hemisternites of ovipositor long, slender, with cylindrical apical projections bearing slender, terminal styli (Fig. 279, 281, 282); no sclerite in bursa; spermathecal duct arising at junction of bursa and oviduct (Fig. 279, 280).

Male terminalia. Tergite VII (Fig. 551) with 6 pairs of microsetae arranged in longitudinal glabrous strips, each microseta in a narrow, transverse pit with anterior margin weakly raised; anterior margin of tergite sinuate, with a median convex projection; posterior margin deeply concave. Spiculum gastrale (Fig. 553) with apodeme long, slender; apical plate with pre-apical spurs. Tegmen (Fig. 554, 555) with parameres joined for most of length, shorter than its apodeme; apodeme longer than width of tegminal ring. Aedeagal body about one-quarter as long as its apodemes, weakly curved; sides sinuate; apex smoothly rounded; body and apodemes united (Fig. 556, 557). Endophallus with basal sclerites very weakly sclerotised, complex in form, and a broad, lanceolate sclerite ventrally towards ostium; ductus ejaculatorius surrounded by 4 apically free lobes; flagellum absent (Fig. 556).

Range. New Zealand.

Remarks. *Hadracalles* can be distinguished from other New Zealand Cryptorhynchinae by the small carina on the underside of the femur distally (Fig. 183) and by the round, appressed scales on the pronotum and elytra, which are found in this form in no other genus. The stout submarginal setae on female tergite VIII were not abraded in the specimen dissected, and do not project posteriorly in the manner seen in *Ectopsis*, *Mecistostylus* and *Pachyderis*. However, their presence in this developed state may indicate relationship, at least with the first genus, since neither *Ectopsis* nor *Hadracalles* possesses the apomorphies of the

Mecisostylina. This relationship is also indicated by the similar form of the female sternite VIII, the hemisternites of the ovipositor, and the presence of pits on the metasternum of *Ectopsis*, although these are not so well marked as the foveae of *Hadracalles*. The last of these characters, the pits on the metasternum, is also found in some other genera, e.g., *Hiracalles* and *Didymus*, so may not truly indicate relationship of *Ectopsis* and *Hadracalles*. The clear, raised oval areas on tergite VII associated with the microsetae are similar to those of *Trinodicalles*, *Patellitergum* and *Omoecalles*.

May (1993) notes that *Hadracalles* larvae are distinctive in having thick Malpighian tubules and no gastric caeca.

Hadracalles fuliginosus Broun

Fig. 14, 65, 122, 147, 183, 276–282, 551–557

Broun, 1893a: 1384. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 126. Kuschel, 1982: 275.

Type data. Holotype male, BMNH, pinned, with labels "2415." handwritten (Broun) / "Hadracalles; fuliginosus" handwritten (Broun) / BMNH type disc.

Range. ND / DN.

Biology. Adults of *Hadracalles fuliginosus* have been collected from litter under *Phormium tenax* and other plants, and from *P. tenax*. Specimens have been reared from live and dead rhizomes of *P. tenax*.

Remarks. Kuschel (1982) notes that this species has never been found on mainland New Zealand apart from the reported capture of the type specimen at Moeraki (DN). All other specimens were collected from the Poor Knights, Three Kings, and Coppermine Island. It is interesting that the first two groups of islands are the most isolated of those close to the mainland, having been separate for perhaps 1 and 2 million years respectively (Hayward 1986). Coppermine Island is closer to the north-east coast of New Zealand, and has been connected to it more recently.

Genus *Tychanopais* Broun

Broun, 1893a: 1379. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 129. Type species *Tychanopais pictulus* Broun, 1893, by monotypy.

Dendrostygnus Broun, 1895: 409. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 128. Type species *Dendrostygnus calcaratus* Broun, by monotypy. New synonymy.

Hatasu Broun, 1909a: 141. Hudson, 1934: 223. Hustache, 1936: 125. Type species *Hatasu dorsale* Broun, by monotypy. New synonymy.

Length 2–13 mm. Habitus, Fig. 15. Derm black, matt. Squamosity sparse to dense, rarely providing complete cover. Scales small, round, oval, or elongate, appressed, decumbent, or semi-erect; erect setiform scales absent. Pronotum in profile (Fig. 66) convex, sometimes depressed anteriorly and abruptly depressed at base; clytra convex. Apterous.

Head. Rostrum shorter than pronotum, lacking longitudinal dorsal carinae, squamose dorsally, mostly at base, generally more extensively in male; scales erect, semi-erect, or decumbent; fine setae present anteriorly; punctation more or less dense, fine.

Antennae inserted in distal half of rostrum, generally nearer apex in male. Funicle as long as scape or slightly longer; F1 and F2 elongate, subequal or with one shorter than the other, together more or less than half length of funicle. Scape and funicle with fine setae variously apparent.

Thorax. Pronotum (Fig. 15) as wide as long or wider, widest in posterior half, more or less abruptly constricted in anterior half; sides emarginate anteriorly, convex posteriorly; anterior margin convex, sometimes medially emarginate, projecting strongly over head (Fig. 15, 66); posterior margin straight or sinuate; tubercles absent, or pairs 2 and 3 present; punctation variable, from dense with interstices forming a reticulum to sparse with large impunctate and finely granulate areas; scales dense or sparse, decumbent or appressed in part, with semi-erect or erect scales on anterior margin, scattered on disc, in longitudinal bands on either side of midline, or grouped into tufts at points 2 and 3. Scutellum concealed.

Elytra (Fig. 15) with basal margin sinuate, wider than pronotum basally; sides convex, sometimes made irregular by tubercles, more or less abruptly constricted to weakly rounded or truncate apex; interstriae usually encroached upon by stria punctures and tubercles; stria punctures large, deep, sometimes elongate, irregular; tubercles or elongate prominences at least on interstriae 3 and 5, sometimes generally distributed on clytra; squamosity dense or sparse; scales decumbent or appressed, with more elongate, erect or semi-erect scales sometimes present on tubercles. Elytral strigil absent.

Postocular lobe smoothly rounded, extending between margins of prosternal canal. Prosternal canal with marginal carina broad, cut back before junction with postocular lobe. Mesosternal receptacle (Fig. 123) cavernous, very shallowly cup-shaped and sometimes barely concave, not

extending posteriorly to middle coxae; margin produced ventrally; a median longitudinal carina on mesosternum posterior to receptacle. Metasternum concave medially, with a small median longitudinal carina or raised part, separating middle and hind coxa by less than length of a hind coxa, projecting ventrally in lateral aspect; posterior margin notched anterior to coxae (Fig. 123). Metepisternum obscure, concealed posteriorly by clytra; anapleural suture incomplete; sclerolepidia absent (Fig. 66).

Fore coxa with an obtuse posterior projection. Femora squamose ventrally, with a small, ventral, distally inclined tooth, sometimes very small and obtuse; ventral groove absent. Tibiae with ventral carina terminating distally in a small premucro; uncus small, broad.

Abdomen. Ventrite 1 convex on disc, with median longitudinal concavity more or less apparent posteriorly and sometimes very deep; intercoxal process concave, wider than long; posterior margin medially emarginate. Ventrite 2 as long as V1 (excluding intercoxal process), convex on disc; median longitudinal concavity sometimes very deep, at least anteriorly, sloping towards V3 posteriorly. Ventrites 3 and 4 each about half as long as V2, transversely convex. Ventrites impunctate or punctate, depending on squamosity. Squamosity dense or sparse; scales oval or narrow.

Female terminalia. Tergite VII (Fig. 283) longer than wide; microsetae absent; anterior margin strongly convex, with a median projection anteriorly; posterior margin convex. Tergite VIII (Fig. 284) as long as wide or longer; posterior margin truncate, entire. Sternite VIII (Fig. 285) with plate as long as wide, rounded or rectangular, less than half length of apodeme. Hemisternites of ovipositor slender, tapering to slender terminal styli (Fig. 286, 287). Vagina and bursa with or without an ill defined sclerite; spermathecal duct arising at junction of bursa and oviduct (Fig. 286).

Male terminalia. Tergite VII (Fig. 558) wider than long, lacking microsetae or with 2 or 3 obscure microsetae near posterior margin; anterior margin strongly convex, with a median anterior projection; posterior margin concave. Sternum VIII (Fig. 559, 565) with a simple or Y-shaped median pouch with or without a small sclerite included. Spiculum gastrale (Fig. 560) shorter than aedeagus; apical arms rectangular or slender and pointed. Tegmen (Fig. 561, 562) with parameres subequal in length to width of tegminal ring; apodemes longer than width of ring. Aedeagal body over half as long as its apodemes, curved either throughout length or basally and apically only, with sides rounded or parallel and apex acuminate or rounded; body and apodemes united (Fig. 563, 564). Endophallus with a

pair of elongate sclerites near gonopore and another pair medially; flagellum absent (Fig. 563).

Range. New Zealand, incl. Chatham Is.

Remarks. The relationships of *Tychanopais* both within and outside New Zealand are far from clear, and a sister-group has not been identified. Members of the genus are distinct in being largely matt with the derm microgranulate, having a longitudinal depression on ventrite 2, a very short mesosternal receptacle with a posterior longitudinal carina, and very large strial punctures on the clytra. The clytra are often very sparsely squamose along the sutural margin. While this combination of characters distinguishes members of the genus, most of the characters are found individually in species of other genera.

Tychanopais dealbatus Broun

Fig. 123

Broun, 1921: 654. Hudson, 1934: 222. Hustache, 1936: 129.

Type data. Holotype male, BMNH, on card, with labels "4238" handwritten (Broun) / "Martinboro.; 21 - 8 - 1916 -" handwritten (Broun) / "Tychanopais; dealbatus." handwritten (Broun).

Range. RI, WN, WA / MC.

Biology. Adults of *Tychanopais dealbatus* have been collected in litter.

Tychanopais flavisparsus Broun

Broun, 1913: 140. Hudson, 1934: 222. Hustache, 1936: 129.

Type data. Holotype female, BMNH, on card, with labels "3323" handwritten (Broun) / Titahi.; Wellington." handwritten (Broun) / "Tychanopais; flavosparsus." handwritten (Broun).

Range. TK, WN, WA / SD, NN.

Biology. Adults of *Tychanopais flavisparsus* have been collected from *Nothofagus* sp.

Tychanopais fougeri (Hutton) new combination

Hutton, 1898: 157 (*Acalles*); —1904: 214. Broun, 1909c: 146. Hudson, 1934: 222. Hustache, 1936: 122.

dorsale Broun, 1909a: 141 (*Hatasu*). Hudson, 1934: 223. Hustache, 1936: 125. New synonymy.

Type data. *fougeri*: lectotype female here designated, CMNZ, pinned, with labels "HOLOTYPE" printed, pink card / "Acaïles; fougeri; Type" handwritten. Paralectotype male, CMNZ, pinned, with label: "PARATYPE" printed, green-grey card.

dorsale: lectotype female here designated, BMNH, on card, with labels "2962." handwritten (Broun) / "Broken; river." handwritten (Broun) / "Hatasu; dorsale. [f.]" handwritten (Broun). Paralectotype male, BMNH, on card mounted on dorsum, with labels as for lectotype. All syntypes located.

Range. BP, TO, WN, WA / SD, NN, ?KA, MC / Chatham Is.

Biology. Adults of *Tychanopais fougeri* have been collected under *Corynocarpus laevigatus* logs (Hudson 1934), and on *Macropiper excelsum*.

Tychanopais hudsoni (Marshall) new combination

Marshall, 1926: 12 (*Hatasu*). Hudson, 1934: 223. Hustache, 1936: 125.

Type data. Holotype male, BMNH, pinned on card, with BMNH type disc and labels "NEW ZEALAND. Flora Camp.; Mt. Arthur.; 2800 ft.; 10.1.25.; G.V.Hudson.; 645. [along end of label]" printed and handwritten / "Hatasu; hudsoni, Mshl.; TYPE." handwritten (Marshall).

Range. — / NN, BR.

Biology. Adults of *Tychanopais hudsoni* have been beaten from dead branches (Hudson 1934) and collected from *Blechnum discolor* at night.

Tychanopais pictulus Broun

Fig. 15, 283–287, 558–564

Broun, 1893b: 1380. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 129.

calcaratus Broun, 1895: 410 (*Dendrostygnus*). Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 128. New synonymy.

Type data. *pictulus*: holotype (?sex), BMNH, on card, with labels "2409." handwritten (Broun) / "Otago" printed / "Tychanopais; pictulus." handwritten (Broun).

calcaratus: lectotype male here designated, BMNH, on card, with labels "2966." handwritten (Broun) / "Mount; Pirongia" handwritten (Broun) / "Dendrostygnus; calcaratus" handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. WO, WN / SD, NN, BR, MC, CO, DN, SL.

Biology. Adults of *Tychanopais pictulus* have been collected a number of times from leaf litter.

Tychanopais tuberosus (Broun) new combination

Fig. 66, 565

Broun, 1923: 704 (*Hatasu*). Hudson, 1934: 223. Hustache, 1936: 125 (*H. tuberosum*).

Type data. Lectotype male here designated, BMNH, on card, with labels "Mt. Arthur.; 10 - 1 - 1918." handwritten (Broun) / "Hatasu; tuberosa" handwritten (Broun). Paralectotype female, NZAC, on card, with labels "Mt. Arthur.; 13 - 1 - 1917" handwritten (Broun) / "Hatasu; tuberosa." handwritten (Broun) / "T. Broun; Dup. Coll." printed / "SYNTYPE; Hatasu; tuberosa; Broun, 1923; R.C.Craw det.; 1983" handwritten (Craw), green. All syntypes located.

Range. — / SD, NN, NC, MC.

Biology. Adults of *Tychanopais tuberosus* have been collected from *Nothofagus*, on *Macropiper excelsum*, and on dead wood.

Remarks. The date given on the lectotype disagrees with that given in the original description, which is 13.i.1917 (as on the female paralectotype). The description, however, fits the male perfectly but the female less so. The difference in data between the lectotype and the printed description is considered here to be a lapsus.

Genus *Tychanus* Pascoe

Pascoe, 1876b: 64. Broun, 1880: 498. Hutton, 1904: 211. Hudson, 1934: 221. Hustache, 1936: 128. Type species *Tychanus gibbus* Pascoe, 1876, here designated.

Length 4–10 mm. Habitus, Fig. 16; outline, Fig. 102, 103. Derm black, shiny or matt, densely squamose. Scales small, oval and elongate, erect and decumbent, separate, contiguous, and imbricate, coloured cream, brown, and

grey; erect setiform scales absent. Pronotum in profile (Fig. 67–69) convex, with sometimes a weak anterior depression; pronotum and elytra depressed basally; clytra convex. Apterous or macropterous.

Head. Rostrum as long as pronotum or slightly longer, with or without a short, dorsomedian longitudinal carina and weaker lateral carinae, punctate dorsally, more strongly at base and more extensively in male, squamose at least basally, more extensively in male.

Antennae inserted approx. halfway along rostrum. Funicle longer than scape; F1 and F2 elongate, subequal, together more than half total length of funicle. Scape and funicle with pale, decumbent, fine or coarse setae, and sometimes narrow scales on scape.

Thorax. Pronotum wider than long, widest in anterior half and abruptly narrowed in anterior quarter (Fig. 16, 102, 103), parallel-sided posteriorly or with margins weakly rounded in posterior three-quarters; anterior margin weakly rounded or truncate; posterior margin sinuate; a very short median longitudinal carina or narrow elevation just anterior to scutellum, otherwise smooth; punctation dense, more or less even except sometimes for a short longitudinal median area; scales elongate-oval and decumbent, imbricate or contiguous, or elongate, semi-erect and erect, forming 3 pairs of sometimes weak tufts at points 1, 2, and 3. Scutellum round or oval with a small patch or tuft of scales, or absent (holotype of *T. scabiosus* only).

Elytra (Fig. 16, 102, 103) with basal margin weakly sinuate, slightly wider than pronotum basally; humeral angles sometimes produced; sides straight, weakly convex or weakly sinuate, diverging from base to widest point three-quarters along elytra, then more or less abruptly deflected mesad to rounded or truncate apex. Interstriae with prominences absent, scattered, or very large on interstriae 2 and 3; interstria 8 sometimes marked as lateral margin of elytra (in dorsal aspect) and sometimes carinate in posterior half, with small, glossy tubercles sometimes apparent along suture just posterior to scutellum; stria punctures large, deep or shallow, regular; squamosity generally dense; scales elongate-oval, imbricate, decumbent, on protuberances sometimes very elongate, erect, forming tufts, these more developed in male. Elytral strigil absent or present.

Postocular lobes weakly rounded, extending very slightly between marginal carinae of prosternal canal. Mesosternal receptacle U-shaped, either extending posteriorly to level of midline of middle coxae with width and length subequal (Fig. 124), or wider than long and not extending so far (Fig. 125); margins produced ventrally.

Metasternum (Fig. 124, 125) weakly concave posterior to mesosternal receptacle, separating middle and hind coxae by much less than length of a hind coxa, projecting ventrally between middle and hind coxae. Metepisternum narrow, partially concealed by elytra; anapleural suture complete; sclerolepidia absent.

Fore coxae with a posterior projection. Femora with a small, distally inclined tooth ventrally, largest on fore femur and smallest on hind, and sometimes raised on a flange; ventral groove absent or obscure, squamose. Tibiae with ventral carina obscure; uncus small, broad; premucro rounded or acuminate. Legs densely squamous; scales dense, small, narrow, semi-erect or erect, forming a small tuft externally at base of tibiae.

Abdomen. Ventrite 1 convex on disc; intercoxal process wider than long, concave at least near margin; posterior margin straight or emarginate. Ventrite 2 as long as V1 or slightly longer (excluding intercoxal process), convex on disc. Ventrites 3 and 4 each slightly less than half length of V2, transversely convex. Ventrites sparsely and shallowly punctate, with impunctate patches. Squamosity dense laterally and sometimes on disc, otherwise sparse; scales oval or narrow.

Female terminalia. Tergite VII (Fig. 288, 293) with length and width subequal; microsetae absent, or present in 2 parallel rows; anterior margin weakly convex; posterior margin convex, or truncate and weakly convex. Tergite VIII (Fig. 289, 294) as long as wide or longer; apex truncate or rounded, finely and sometimes weakly crenulate. Sternite VIII (Fig. 290, 295) with lateral sclerotisations of apical plate broad or narrow; plate shorter than its apodeme. Hemisternites of ovipositor slender, tapering smoothly to slender terminal styli (Fig. 291, 292). Bursa with or without a weak sclerite near junction with oviduct; spermathecal duct inserted at junction of bursa and oviduct (Fig. 291).

Male terminalia. Tergite VII (Fig. 566, 573, 575) lacking microsetae or with up to 8 pairs in 2 longitudinal rows anterior from posterior margin; anterior margin straight or weakly convex; posterior margin weakly or strongly concave. Sternum VIII (Fig. 567, 576) sometimes with a shallow, lightly sclerotised median pocket between hemisternites. Spiculum gastrale (Fig. 568, 574, 577) shorter than aedeagus with apodemes; apical plate as long as wide or longer, of complex form, with sclerotised plate extending anteriorly and posteriorly from 'arms', and anterior margin sometimes as heavily sclerotised as 'arms'. Tegmen (Fig. 569, 570, 578) with parameres short or long, narrow, acuminate or nearly so, fused for much of length; apodeme longer than width of tegminal ring. Aedeagal

body shorter than its apodemes, curved (Fig. 571, 572), with sides very weakly rounded and apex broadly acuminate; body and apodemes united or narrowly separate. Endophallus with or without a pair of rod-like basal sclerites or posterior elongate sclerites; flagellum absent (Fig. 571).

Range. New Zealand.

Remarks. *Tychanus* is not clearly monophyletic, although the unusual form of the parameres, the development of the apical plate of the spiculum gastrale (most similar in *T. vexatus* and *T. verrucosus*), and the shape of the elytra may indicate a close relationship between the three species. Relationships with other genera are difficult to determine, although it somewhat resembles *Clypeolus* and *Crisius*.

The genus may be distinguished from others by the combination of strong posterolateral development of the elytra (Fig. 16, 102, 103), lack of an abrupt depression or pit medially on the metasternum, presence of a scutellum that is not conical, and femora bearing ventral teeth. In most Cryptorhynchinae the microsetae of tergum VII, if present, are there in both sexes; the absence of microsetae in *T. vexatus* females while they are present in males is therefore unusual. The larva is described by May (1993).

Tychanus gibbus Pascoe

Fig. 16, 67, 124, 288–292, 566–572

Pascoe, 1876b: 64. Broun, 1880: 498. Hutton, 1904: 211. Hudson, 1934: 221. Hustache, 1936: 128. Styles, 1973: 355. May, 1987: 49. Kuschel, 1990: 74.

Type data. Lectotype female here designated, BMNH, pinned, with labels BMNH lectotype disc / BMNH 'Type; H.T.' disc, inverted / "N.Z.; Tairua" handwritten (Pascoe), yellow oval / "Tychanus; gibbus; type Pasc." handwritten (Pascoe) / "Tychanus; gibbus Pasc." handwritten (Pascoe), label from collection drawer / "Pascoe Coll.; 93-60" printed.

Range. ND, AK, CL, BP, TO /—.

Biology. Adults of *T. gibbus* have been collected from a number of plants, including *Carmichaelia* sp., *Coprosma* sp., cut *C. arborea*, almost-dead *C. lucida*, *Fuchsia excorticata*, *Hebe salicifolia*, *Olearia furfuracea*, *Phebalium nudum* and *Pittosporum tenuifolium* (Kuschel 1990).

Specimens have been reared from dead sound wood of *Coprosma australis* and live wood of *C. arborea* (May

1987), dead sound wood of *Fuchsia excorticata* (May 1987, 1993), live wood of *Olearia furfuracea* (May 1987, 1993) and 'main stem' of the same plant, and from *O. albida* var. *angulata* (Styles 1973). May (1993) describes aspects of larval biology.

Tychanus verrucosus Pascoe

Fig. 68, 102, 293–295, 573, 574

Pascoe, 1876b: 65. Broun, 1880: 499. Hutton, 1904: 211. Hudson, 1934: 221. Hustache, 1936: 128. Styles, 1973: 355. May, 1987: 49. Kuschel, 1990: 74. *scabiosus* Broun, 1883: 440 (*Tychanus*); —1886: 801 (repetition of Broun 1883). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 128. New synonymy.

Type data. *verrucosus*: lectotype female here designated, BMNH, pinned on plastazote with first two labels, with labels "NZ; Tairua" handwritten (Pascoe), yellow oval / "Tychanus; verrucosus; type Pasc." handwritten (Pascoe) / BMNH lectotype disc / BMNH type disc / "Tychanus; verrucosus, Pasc." handwritten (Pascoe) (Pascoe Collection series label) / "Pascoe Coll.; 93-60." printed. Possible paralectotype male, BMNH, same locality.

scabiosus: holotype male, BMNH, on card, with labels "1429." printed, green / "Wellington" printed / "Tychanus; scabiosus." handwritten (Broun).

Range. AK, CL, WO, BP, TK, TO, GB, RI, WN / SD, NN, MB, BR, WD, NC, MC, FD, SL / SI.

Biology. Kuschel (1990) reports *T. verrucosus* to be "common to the south of Auckland, but extremely rare at Lynfield, and replaced there by *Sympedius vexatus* Pascoe [*Tychanus* in this study] on the host plant [native *Rubus* species]." Records are also available from "ferns", *Lophomyrtus bullata*, *Schefflera digitata* and dead *Senecio*, although the species has been reared only from *Rubus australis* (two records: W72/96, and a second specifying dead wood), dead wood of *R. cissoides* (two records, one given in May 1987) and wood of *Rubus* sp. (Styles 1973).

Tychanus vexatus (Pascoe) new combination

Fig. 69, 103, 125, 575–578

Pascoe, 1876b: 65 (*Sympedius*). Broun, 1880: 501. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 128. Styles, 1973: 355. May, 1987: 49. Kuschel, 1990: 74.

Type data. Four probable syntypes of undetermined sex, BMNH, 2 on card, 2 pinned, with labels "Sympedius;

vexatus; 3 Tairua" handwritten (Pascoc) (1 pinned specimen only) / "Sympedius; vexatus" handwritten (Pascoc) (specimens on card only) / "No. 3; Tairua" handwritten (1 specimen on card only) / "New Zealand" handwritten (1 specimen on card only) / "Pascoc Coll.; B.M.1893-60." printed (pinned specimens only) / "Pascoc; Coll.; 93-60." printed (specimens on card only) / BMNH syntype disc. Original number of specimens in series not stated by Pascoc.

Range. ND, AK, CL, WO, BP, TK, TO, TO-RI, WN/BR.

Biology. Adults of *T. vexatus* have been taken from decayed wood and on dead *Rubus* at night. Kuschel (1990) reports that at Lynfield they are easily baited with cut branches of *Parsonsia heterophylla* and *Rubus cissoides* (see entry for *Tychanus verrucosus*).

Specimens have been reared from *Rubus* sp. and *Clematis* sp. (Styles 1973), and from dead branchlets of *Nestegis lanceolata* (May 1987).

Remarks. All the syntype specimens came from the Pascoc Collection, but none bears the oldest form of BMNH registration label applied to this collection. Pascoc usually if not always labelled one specimen of his species as type (Thompson 1968), but none of those found bears such a label. It is likely that other specimens of the syntypic series have still to be located.

Genus *Clypeolus* Broun

Broun, 1909a: 142. Hudson, 1934: 221. Hustache, 1936: 129. Type species *Clypeolus cineraceus* Broun, 1909, by monotypy.

Length 3.5–9 mm. Habitus, Fig. 17. Derm dark brown or black, densely squamose. Scales round, oval, and elongate, tessellate and imbricate, appressed, decumbent, and erect, with elongate erect scales scattered and in tufts; erect, short setiform scales occasionally present; scales grey and dull brown to black, frequently with a characteristic pale patch medially on each elytron, most obvious at its posterior angle, where it meets a tubercle (Fig. 17, 104). Pronotum in profile (Fig. 70) weakly convex, more or less depressed in anterior half; depression at base of pronotum and of elytron more or less clear; elytra convex. Apterous.

Head. Rostrum shorter than, equal to, or longer than pronotum, weakly convex or flat dorsally, sometimes strongly convex between scrobes in male; punctation stronger dorsally in male; squamosity dense, more exten-

sive in male.

Antennae inserted at or just anterior to mid rostrum. Funicle longer than scape; F1 and F2 slender, together subequal in length to scape; F2 sometimes notably shorter than F1. Scape more or less squamose (Fig. 196).

Thorax. Pronotum wider than long, widest at base or middle (Fig. 17), flat and depressed anteriorly, flat or weakly convex posteriorly; sides diverging, or roughly parallel and straight, or convex from posterior margin to widest point then abruptly narrowed to anterior third; anterior margin convex, medially emarginate; posterior margin straight or weakly bisinuate; median longitudinal carina, if present, most pronounced in posterior third of pronotum; punctation fairly even, sometimes with a median longitudinal impunctate strip; scales decumbent and circular, with more erect, elongate scales sometimes present in a lateral fringe or a short posteromedian longitudinal ridge, or scattered. Scutellum concealed.

Elytra with basal margin straight or weakly sinuate, sometimes with more or less abrupt small anterior projections on interstriae 3 and 5, wider than pronotum basally; humeri more or less produced, rounded or rectangular; sides convex or weakly concave between humeri and widest point (at middle or in proximal or distal half), frequently with irregularities or prominences, and straight, weakly concave, or convex between widest point and convex apex; interstriae 3, 5, and 7 frequently carinate basally; 14 generally with a large or small tubercle before posterior declivity and at apex of diamond-shaped scale patch (Fig. 17, 104); basal third of suture flanked by a row of small, glossy tubercles; elytra otherwise more or less tuberculate, with striae consequently distorted, although otherwise distinct; striae punctures small or large, deep, and sometimes encroaching upon interstriae. Squamosity dense; scales round or oval and decumbent, except on protuberances, where usually elongate, erect, and grouped into tufts or crests, and along interstriae, where erect, elongate scales occasionally form a sparse line. Elytral strigil large.

Postocular lobe sometimes very prominent, usually smoothly continuous with marginal carina of prosternal canal. Prosternal canal (Fig. 126) short, with margin sometimes abruptly cut back between lobe and carina, and with dense cream squamosity sometimes present (*C. binodes*). Mesosternal receptacle (Fig. 126) U-shaped, sometimes cavernous, in length 0.5–1x its width, extending posteriorly one-third to two-thirds down middle coxae; margins produced ventrally, with posterior margin at same height as lateral margins or lower; receptacle glabrous or with scales as for prosternal canal. Metasternum (Fig. 126) more or

less concave medially, separating middle and hind coxae by at most half length of a hind coxa, sometimes weakly projecting ventrally between coxae; posterior margin with a notch anterior to hind coxae, sometimes nearly touching anterior margin medially. Metepisternum narrow, partially or completely covered by elytra; anapleural suture obscure; sclerolepidia absent.

Fore coxae with or without a weak posterior projection. Femora unarmed or bearing a small to moderate-sized tooth ventrally, sometimes with a ventral groove, rarely glabrous or with an anterior carina. Tibiae with a ventral carina; uncus small; premucro present.

Abdomen. Ventrite 1 convex, concave, or flat on disc, generally with a small median pit or groove anteriorly; intercoxal process generally wider than long, occasionally with length and width subequal; posterior margin emarginate medially, with suture between ventrites 1 and 2 sometimes obscure. Ventrite 2 as long as V1 (excluding intercoxal process) or longer; slope towards V3 most marked in posterior half or not marked. Ventrites 3 and 4 each one-quarter to one-half as long as V2, flat or transversely convex. Punctuation weak or absent on ventrites 1–4, dense on V5. Squamosity dense or sparse.

Female terminalia. Tergite VII (Fig. 296) as wide as long or wider; microsctae numbering 2–7, apical or in a pair of median longitudinal glabrous bands; anterior margin weakly convex; posterior margin weakly convex or medially emarginate. Tergite VIII (Fig. 297) as wide as long; posterior margin truncate, crenulate. Sternite VIII (Fig. 298) with apical plate longer than wide, less than two-thirds length of apodeme, sometimes very short. Hemisternites of ovipositor long, tapering evenly to slender, subcylindrical, or conical styli (Fig. 299, 300). Spermathecal duct arising at junction of bursa and oviduct; bursa and vagina lacking sclerotisation (Fig. 299).

Male terminalia. Tergite VII (Fig. 579) wider than long, with 2–11 microsctae on posterior margin or on a pair of longitudinal glabrous strips, these microsctae rarely numerically symmetrical; anterior margin more or less weakly convex; posterior margin broadly or narrowly concave medially between apical microsctae, and these sometimes arising from angulate projections. Sternum VIII (Fig. 580) sometimes with a weakly sclerotised connection between hemisternites; a small median apodeme sometimes present. Spiculum gastrale (Fig. 581) with apodeme subequal in length to aedeagal apodemes; apical arms with anterior sclerotised flanges generally forming a rectangular plate. Tegmen (Fig. 582, 583) with parameres and apodeme subequal in length and longer than width of tegminal ring. Aedeagal body shorter than apodemes, curved (Fig. 584,

585), with sides parallel or diverging apicad; apex truncate, rounded, or broadly acuminate, sometimes with a small convex projection medially; a pair of large sclerites sometimes present dorsally towards base, free or fused together or to sides; body and apodemes usually united, though sometimes weakly so (Fig. 584, 585). Endophallus with basal sclerites comprising 2 strongly sclerotised rods generally (but not always) downturned apically, at least sometimes apparently operating as a flagellum (Fig. 584).

Range. New Zealand.

Remarks. *Clypeolus* is a moderately distinct genus. Diagnostic features are the presence of scales on the antennal scape (found in almost all species), the characteristic patch of pale scales on the elytra (Fig. 17, 104), the form of the basal sclerites of the male endophallus in most species (Fig. 584, 585), and where present, the dorsal sclerites on the aedeagal body. *Didymus* species too are sometimes sclerotised on the dorsal surface of the aedeagus, and this might indicate a relationship. The elytral markings (Fig. 17, 104) are clear in only some of the species, although they can be discerned in most species once the pattern is comprehended fully. At the posterior angle of the patch, where it is frequently most clear, there is generally a prominence or tubercle. *Clypeolus* is most similar to *Crisius* and *Sympedius* in shape and body size but, unlike members of these two genera, *Clypeolus* species lack a visible scutellum and, unlike *Crisius* species, lack a metasternal pit.

The relationships of *Clypeolus* are obscure, although the shape of the metasternum is similar to that of *Hirracalles*, and thus might indicate a relationship to the *Crisius* group.

Although the profile given in Fig. 70 is fairly typical of species in the genus, there is one undescribed species in which elytral height and depth (see Fig. 49) are subequal rather than length being greater than height.

Clypeolus binodes (Broun) new combination

Broun, 1921: 657 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121.

Type data. Holotype male, BMNH, on card, with labels "4242." handwritten (Broun) / BMNH holotype disc / "Martinboro.; 21.8.1916." handwritten (Broun) / "Acalles [m.]; binodes" handwritten (Broun) / "Sect. 11." handwritten (Broun).

Range. WA / ?NC, OL, SL.

Biology. *Clypeolus binodes* has been reared from *Crataegus oxyacantha*.

***Clypeolus brookesi* (Broun)**

Broun, 1923: 703 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121. Kuschel, 1990: 73, 79 (*Clypeolus*).

Type data. Holotype female, BMNH, on card, with labels "Pakaroa 24.3.18." handwritten (Broun) / "Crisiodes; brookesi." handwritten (Broun) / BMNH holotype disc.

Range. ND, AK / —.

Biology. Adults of *Clypeolus brookesi* have been collected from leaf litter. Specimens have been reared from a dead branch of *Coprosma macrocarpa* (Kuschel 1990).

***Clypeolus cilicollis* (Broun) new combination**

Broun, 1921: 572 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121.

Type data. Holotype male, BMNH, on card, with labels BMNH holotype disc / "4120." handwritten (Broun) / "Green Bay; 2.1.15." handwritten (Broun) / "Crisius; cilicollis" handwritten (Broun).

Range. AK / —.

***Clypeolus cineraceus* Broun**

Fig. 17

Broun, 1909a: 143. Hudson, 1934: 221. Hustache, 1936: 129.

Type data. Holotype female, BMNH, on card, with labels "2970" handwritten / "Broken; River." handwritten (Broun) / BMNH holotype disc / "Clypeolus; cineraceus" handwritten (Broun).

Range. BP, WA, WN / NN, BR, MC, FD, SL / SI.

Biology. Adults of *Clypeolus cineraceus* have been collected in leaf litter and on tree trunks at night.

***Clypeolus complexus* (Broun) new combination**

Broun, 1921: 648 (*Tychanus*). Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype female, BMNH, on card, with labels "4229" handwritten (Broun) / BMNH holotype disc / "Wadestown; 10.8.1916." handwritten (Broun) / "Tychanus; complexus." handwritten (Broun).

Range. WN / —.

***Clypeolus dux* (Broun) new combination**

Fig. 104, 126, 196, 296–300

Broun, 1893a: 1240 (*Tychanus*). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype female, BMNH, on card, with labels "2183." handwritten (Broun) / "Clevedon.; South Wairoa" handwritten (Broun) / "Tychanus; dux -" handwritten (Broun).

Range. AK, BP / —.

***Clypeolus fuscidorsis* (Broun) new combination**

Broun, 1909a: 143 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 122.

Type data. Holotype (?sex), BMNH, on card, with labels "2944" handwritten (Broun) / "Invercargill; -A-Philpott-" handwritten / "Acalles; fuscidorsis. Bn." handwritten.

Range. — / SL.

***Clypeolus lachrymosus* (Broun)**

579–585

Broun, 1881: 729 (*Tychanus*). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 128. May, 1987: 49. Kuschel, 1990: 73, 79 (*Clypeolus*).

Type data. Lectotype female here designated, BMNH, on card, with labels "1294" printed, green / "Manaiā" printed / "Tychanus; lachrymosus." handwritten (Broun). Paralectotype female, NZAC, with genitalia separate in vial, data as for lectotype except locality is "Whangarei". All syntypes located.

Range. ND, AK, CL, WO, BP / NN.

Biology. Adults of *C. lachrymosus* are mainly associated with *Solanum mauritianum* in native bush (Kuschel 1990, referring to Wattle Bay, Auckland), and have been collected in leaf litter. Specimens have been reared from dead wood of *Olearia rani* (May 1987) and dead sound wood of *Coprosma australis*, *Hedycarya arborea* and *Leptospermum scoparium*.

Clypeolus maritimus (Broun) new combination

Broun, 1893a: 1236 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 123.

cryptobius Broun, 1893a: 1236 (*Acalles*). Lewis, 1902: 204 (junior synonym of *A. maritimus*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 123 (junior synonym of *A. maritimus*).

Type data. *maritimus*: lectotype male here designated, BMNH, on card, with labels "2174." handwritten (Broun) / "Mokohinau" printed / "Acalles; maritimus" handwritten (Broun). Paralectotype female, BMNH, mounted on dorsum on card, legs missing, no locality. All syntypes located.

cryptobius: lectotype female here designated, BMNH, on card, with labels "2175." handwritten (Broun) / "Mokohinau" printed / "Acalles; cryptobius" handwritten (Broun) / BMNH lectotype disc. Paralectotype female, BMNH, pinned on card, no data. All syntypes located.

Range. ND, AK / —.

Biology. Adults of *C. maritimus* have been found among roots of *Mesembryanthemum* sp. (Broun 1893a).

Clypeolus notoporphinus (Broun) new combination

Broun, 1914: 132 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 123.

Type data. Holotype male, BMNH, on card, with labels "3454" handwritten (Broun) / "Te Aroha; Novr 1910" handwritten (Broun) / "Acalles; notoporphinus" handwritten (Broun).

Range. WO-BP / —.

Clypeolus pascoei (Broun)

Fig. 70

Broun, 1880: 491 (*Acalles*). Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 123. Kuschel, 1982: 275 (*Clypeolus*; = *Acalles dentigerus* Broun, *A. ingens* Broun). May, 1987: 48. Kuschel, 1990: 73.

ingens Broun, 1893a: 1236 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 122. Kuschel, 1982: 275 (junior synonym of *C. pascoei* Broun).

dentigerus Broun, 1917: 455 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121. Kuschel, 1982: 275 (spelling emended to *dentiger*; junior synonym of *C. pascoei* Broun).

Type data. *pascoei*: holotype (?sex), BMNH, on card, with labels "872" printed, green / "Auckland" printed / "Acalles; pascoei." handwritten (Broun).

dentigerus: holotype male, BMNH, on card, with labels "3944" handwritten (Broun) / "Muriwai; 13.4.1914." handwritten (Broun) / "Acalles [m.]; dentigerus" handwritten (Broun) / BMNH holotype disc.

ingens: holotype male, BMNH, pinned on card, with labels "2176" handwritten (Broun) / "TIRITIRI" printed / "Acalles; ingens" handwritten (Broun).

Range. ND, AK / —.

Biology. *Clypeolus pascoei* is common in coastal vegetation of the North Island and the Hauraki Gulf islands (Kuschel 1982). Adults may be beaten from plants (e.g., *Meliclytus ramiflorus*), but are more often found in litter. Kuschel (1990) reported that litter under *Gahnia* sedge and *Cortaderia* grass was favoured at Lynfield (Auckland), and also decayed wood, and even litter in seabird burrows. Specimens have been reared from larvae found in dead and damaged stems of *Freycinetia baueriana* and *F. baueriana banksii* (May 1987, Kuschel 1990), from dead stems of *Olearia furfuracea* (Kuschel 1982) and dead decaying wood of *Pseudopanax crassifolius* (May 1987), and extracted from *Meliclytus ramiflorus* (Kuschel 1982).

Clypeolus robustus (Broun) new combination

Broun, 1909a: 148 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Two syntypes (?sex), BMNH, 1 on card, 1 on card mounted on dorsum, both with labels "2950" handwritten (Broun) / "Mount; Te Aroha." handwritten (Broun) / "Acalles; robustus." handwritten (Broun) / BMNH syntype disc. The one mounted on its dorsum also has "Sect. 11." handwritten (Broun). All syntypes located.

Range. AK, WO-BP / —.

Biology. Adults of *Clypeolus robustus* have been collected in leaf litter.

Clypeolus signatus (Broun)

Broun, 1880: 491 (*Acalles*) (not *A. signatus* Blanchard, 1851: 411). Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 124. Kuschel, 1982: 276 (*Clypeolus*; = *Acalles flynni* Broun, *A. xanthostictus* Broun); — 1990: 73.

xanthostictus Broun, 1893a: 1237 (*Acalles*). Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 124. Kuschel, 1982: 276 (junior synonym of *C. signatus* Broun).

flynni Broun, 1914: 131 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 122 (as *A. flynsi*). Kuschel, 1982: 276 (junior synonym of *C. signatus* Broun).

Type data. *signatus*: holotype (?sex), BMNH, on card, with labels "873" printed, green / "Auckland" printed / "Acalles; signatus." handwritten (Broun).

flynni: holotype female, BMNH, on card, with labels "3453" handwritten (Broun) / "Gt. Barrier; March 1911." handwritten (Broun) / "Acalles; flynni." handwritten (Broun).

xanthostictus: lectotype male, here designated, BMNH, on card, with labels "2177." handwritten (Broun) / "Mokohinau" printed / "Acalles; xanthostictus" handwritten (Broun). Paralectotypes: 2 males, 1 female, same data as lectotype, of which 1 male, 1 female are labelled as "var; 2177" in Broun's handwriting, but these were not published as distinct variants, and therefore form part of the type series. All syntypes located.

Range. ND, AK, CL / ?NN.

Biology. Adults of *C. signatus* have been obtained frequently from litter and decayed wood, the litter in Lynfield (Auckland) being "usually of sedges (*Carex*, *Gahnia*, *Uncinia*, *Schoenus*, *Lepidosperma*)" (Kuschel 1990). Specimens have been reared from well decayed culms of *Gahnia lacera* (Kuschel 1982, 1990).

Clypeolus simulans (Broun) new combination

Broun, 1921: 648 (*Tychanus*). Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels "4230" handwritten (Broun) / "Titahi Bay; 10-8-1916-" handwritten (Broun) / "Tychanus; simulans" handwritten (Broun).

Range. WN / —.

Clypeolus squamosus (Broun) new combination

Broun, 1914: 239 (*Tychanus*). Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels "3638." handwritten (Broun) / "Padding Hill.; 4-5-1912-"

handwritten (Broun) / "Tychanus; squamosus." handwritten (Broun).

Range. — / NN, MC.

Clypeolus sympedioides (Broun) new combination

Broun, 1893b: 1386 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Holotype female, BMNH, on card, with labels "2418." handwritten (Broun) / "Otago" printed / "Acalles; sympedioides" handwritten (Broun).

Range. — / DN.

Clypeolus terricola (Broun) new combination

Broun, 1921: 649 (*Tychanus*). Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels "4231." handwritten (Broun) / "Featherston; 6-10-1916-" handwritten (Broun) / "Tychanus; terricola" handwritten (Broun).

Range. WN, WA / MC.

Clypeolus veratrus (Broun)

Broun, 1893a: 1235 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124. Kuschel, 1982: 276 (*Clypeolus*). May, 1987: 48.

Type data. Holotype (?sex), BMNH, on card, with labels "2173." handwritten (Broun) / "Mokohinau" printed / "Acalles; veratrus" handwritten (Broun).

Range. ND (incl. Three Kings Is), AK / —.

Biology. Adults of *C. veratrus* have been beaten from *Coprosma* sp. and *C. macrocarpa* (Kuschel 1982), and found in *Meryta* leafmould at night. The species has been reared from a live stem of *Coprosma repens* (May 1987).

Genus *Didymus* Kuschel

Kuschel, 1982: 276. Type species *Acalles intutus* Pascoe, 1876, by original designation.

Length 2.5–4.5 mm. Habitus, Fig. 18. Derm dark brown or black, densely squamose. Scales round, fan-shaped, oval.

and elongate, tessellate and imbricate, appressed and erect, with elongate erect scales in tufts and scattered; erect setiform scales absent. Pronotum in profile (Fig. 71) depressed anteriorly, convex posteriorly, distinctly depressed at base between pronotum and elytra; elytra convex. Brachypterous or apterous.

Head. Rostrum shorter than pronotum; punctation dorsally generally stronger in male; squamosity dense basally, more extensive in male.

Antennae inserted nearer base of rostrum than apex (Fig. 18, 197). Funicle longer than scape; F1 and F2 subequal in length, or F1 longer than F2, together more than half length of scape. Scape with decumbent or semi-erect setae, but no scales.

Thorax. Pronotum as wide as long or wider, widest in posterior half and rarely (island species: *metrosideri* and species from Three Kings Is – see below) at base; sides convex posteriorly, straight or weakly sinuate anteriorly, very weakly convex and converging in island species; anterior margin convex; posterior margin straight (Fig. 18); punctation coarse, and prominences absent; scales appressed, circular, with fan-shaped or elongate erect scales scattered and sometimes gathered into loose tufts at positions 1 and 2. Scutellum conical, frequently projecting above elytral level (Fig. 71), with small, generally cream scales.

Elytra with basal margin weakly convex or straight, wider than pronotum basally; humeral angles obtuse or not projecting; lateral margins convex, with widest point in posterior half (in anterior half in island species); apex more or less weakly convex; interstriae lacking prominences, or with prominences developed on I2 and I3, sometimes raised towards base; striae punctures large or moderate-sized, not confluent; scales (1) round and oval, appressed and decumbent, (2) elongate and erect, scattered and sometimes in tufts. Elytral strigil absent.

Postocular lobe weakly rounded, smoothly continuous with marginal carina of prosternal canal or weakly cut back before it. Mesosternal receptacle U-shaped, as long as, longer than, or shorter than wide, extending posteriorly between one-third to one-half down middle coxae; margins produced ventrally, but posterior margin sometimes barely produced below level of metasternum. Metasternum flat or weakly concave medially, separating middle and hind coxae by less than length of a hind coxa. Metepisternum narrow; anapleural suture complete or absent posteriorly (Fig. 71); sclerolepidia absent.

Fore coxae with a posterior projection. Femora unarmed, or with a very small tooth on fore femur; ventral

groove obscure or short and squamous. Tibiae with uncus broad; ventral carina absent or obscure; premucro small.

Abdomen. Ventrite 1 weakly convex or flat medially; intercoxal process wider than long, weakly concave; posterior margin unclear medially. Ventrite 2 subequal in length to V1 behind hind coxae or longer, sometimes sloping towards V3 posteriorly. Ventrites 3 and 4 together less than three-quarters length of V2. Punctation dense to light. Squamosity dense.

Female terminalia. Tergite VII (Fig. 301) with length and width subequal; microsetae absent; anterior margin weakly convex; posterior margin weakly convex or truncate. Tergite VIII (Fig. 302) with length and width subequal; posterior margin truncate, crenulate. Sternite VIII (Fig. 303) with apical plate broad, less than two-thirds length of apodeme. Hemisternites of ovipositor tapering variably to apical styli (Fig. 304, 305). Spermathecal duct arising at junction of bursa and oviduct; bursa and vagina lacking sclerites (Fig. 304).

Male terminalia. Tergite VII (Fig. 586) wider than long, lacking microsetae; anterior margin strongly or weakly convex; posterior margin weakly convex, sometimes medially emarginate. Spiculum gastrale (Fig. 588) as long as aedeagal apodemes or shorter. Tegmen (Fig. 589, 590) with parameres united basally; apodeme longer than width of ring. Aedeagal body less than half as long as its apodemes, curved evenly or more or less abruptly apically, sometimes with weak dorsal sclerites anteriorly; sides convergent apically or weakly sinuate and subparallel; apex broadly acuminate; apodemes and body united (Fig. 591, 592). Endophallus with a pair of basal sclerites of complex or simple form; flagellum absent (Fig. 591).

Range. New Zealand incl. Kermadec Is, Norfolk I.

Remarks. There are two undescribed species of *Didymus* from the Three Kings Islands, in which the scutellum projects far less than in the other species, and can be obscure. These two species are similar to *D. metrosideri* from the Kermadec Islands in their general ovoid outline, as indicated in the generic descriptions above. This body form is probably correlated with the loss of wings, and does not necessarily indicate monophyly.

Didymus can be distinguished from other New Zealand genera except *Indecentia* and some species of *Crisius* by its conical scutellum. *Indecentia* differs in its very characteristic outline and profile (Fig. 18, 71), and both *Indecentia* and *Crisius* species have a pit or broad depression medially on the metasternum, a structure absent in *Didymus*. The dorsal sclerites of the aedeagus are very unusual in New

Zeland Cryptorhynchinae, and are found elsewhere in *Clypeolus*, which otherwise differs from *Didymus* in the concealment of the scutellum by the clytra. The relationships of *Didymus* are not clear, but may lie with *Clypeolus*.

Didymus bicostatus (Broun)

Broun, 1921: 656 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121. Kuschel, 1982: 276 (*Didymus*).

Type data. Holotype female, BMNH, on card, with labels "4241." handwritten (Broun) / "Karekare; 23.2.1916." handwritten (Broun) / "Acalles; bicostatus." handwritten (Broun) / BMNH holotype disc / "Didymus; bicostatus; (Broun); det G. Kuschel; 1982" handwritten (Kuschel).

Range. AK / —.

Biology. *Didymus bicostatus* has been taken and reared from sound dead wood of *Olearia rani*.

Didymus erroneus (Pascoe)

Pascoe, 1876b: 63 (*Acalles*). Broun, 1880: 489. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 121. Styles, 1973: 356. Kuschel, 1982: 276 (*Didymus*). May, 1987: 48. Kuschel, 1990: 73.

Type data. Lectotype male here designated, BMNH, on card pinned on card, with BMNH lectotype disc / BMNH type disc (inverted) / and labels "Acalles; erroneus; type Pasc." handwritten (Pascoe) / "Tairua" handwritten (Pascoe), yellow oval / "Pascoe Coll; 93-60." printed / "Acalles; erroneus Pasc." handwritten (Pascoe) label from drawer in Pascoe Collection. Six paralectotypes (?sex), BMNH, all from Pascoe Collection but not clearly of original series, same locality. Original number of specimens in series not stated by Pascoe. A specimen from Auckland also bearing a Pascoe type label, "Acalles; erroneus; type Pasc." handwritten (Pascoe), is excluded from the type series because the locality given is incorrect. It is very unusual for Pascoe to duplicate his type labels.

Range. ND, AK, CL, WO-BP, BP, GB / SD.

Biology. Adults of *D. erroneus* have been collected in litter, and can be found on a variety of woody plants, including *Acacia mearnsii*, *Agathis australis*, *Carmichaelia aligera*, *Eucalyptus* sp., *Fuchsia excorticata*, *Hoheria populnea*, *Leptospermum scoparium*, *Nestegis lanceolata*, *Olearia furfuracea*, *Parsonsia heterophylla*,

Pittosporum tenuifolium, *Pseudopanax arboreus*, *Rubus cissoides* (Kuschel 1990), *Metrosideros robusta*, *Phyllocladus trichomanoides* and cut branches of *Hoheria*.

Specimens have been reared from small dead branches of *Sophora* sp. and *Beilschmiedia tawa* (Styles 1973), dead stems of *Phebalium nudum* (W66/4) and dead branchlets of *Vitex lucens* (May 1987).

Didymus impexus (Pascoe)

Fig. 301–305

Pascoe, 1877: 146 (*Acalles*). Broun, 1880: 490. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 122. Styles, 1973: 356. Kuschel, 1982: 276 (*Didymus*). May, 1987: 48.

australis Broun, 1893a: 1239 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 223. Hustache, 1936: 121. Kuschel, 1982: 276 (junior synonym of *D. impexus* Pascoe).

Type data. *impexus*: lectotype male here designated, BMNH, on card pinned on card, with BMNH lectotype disc / BMNH type disc (inverted) / and labels "Canterbury" handwritten (Pascoe), yellow oval / "Acalles; impexus; type Pasc" handwritten (Pascoe) / "Acalles; impexus, Pasc" handwritten (Pascoe), drawer label from Pascoe Collection. Original number of specimens in series not stated by Pascoe.

australis: holotype, sex undetermined, BMNH, on card, with labels "2180." handwritten (Broun) / "Moeraki" handwritten (Broun) / "Acalles; australis" handwritten (Broun).

Range. AK, WA / SD, NN, MC, SC, DN.

Biology. Adults of *D. impexus* have been beaten from *Carmichaelia* sp., *Fuchsia arborescens* and *Podocarpus dacrydioides*, cut from wood of *Clematis* sp. (Styles 1973), and found in dead wood of *Myoporum laetum*.

Specimens have been reared from dead dry branches of *Acacia verticillata*, dead wood of *Olearia rani* and *Vitex lucens* (May 1987), and from *Fuchsia excorticata*, *Kunzea ericoides*, *Olearia* sp. and *Pseudopanax* sp. (Styles 1973).

Didymus intutus (Pascoe)

Fig. 18, 71, 197, 586–592

Pascoe, 1876b: 63 (*Acalles*). Broun, 1880: 489. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 122. Styles, 1973: 356. Kuschel, 1982: 276 (*Didymus*); — 1990: 73.

griseus Broun, 1883: 436 (*Acalles*); —1886: 797 (repetition of Broun, 1883). Hutton, 1904: 213 (attributed to Broun, 1886). Hudson, 1934: 222 (attributed to Broun, 1886). Hustache, 1936: 122. Kuschel, 1982: 276 (junior synonym of *D. intutus* Pascoe).

Type data. *intutus*: lectotype male here designated, BMNH, on card pinned on card with paralectotype female, with labels “[m.]” and “[f.]” and “T.” on mounting card adjacent to appropriate specimens, handwritten / “LT.” handwritten (Kuschel) on card to which mounting card is pinned, below male / “[m.]” printed / BMNH lectotype disc / “[f.]” printed / BMNH paralectotype disc / “Acalles; *intutus*; type Pasc.” handwritten (Pascoe) / “NZ; Tairua” handwritten (Pascoe), yellow oval / “Pascoe Coll.; 93-60” printed / “Acalles; *intutus* Pasc.” handwritten (Pascoe), drawer label from Pascoe Collection / “Didymus; *intutus*; (Pascoe); det. G. Kuschel; 1982” handwritten (Kuschel).

griseus: holotype female, BMNH, on card, with labels “1421.” printed, green / “Auckland” printed / “Acalles *griseus*.” handwritten (Broun) / BMNH type disc / “Tychanus; *griseus*; Broun; det. G. Kuschel; 1982” handwritten (Kuschel).

Range. ND, AK, CL, WI, WN / SD, NN, BR, KA.

Biology. *Didymus intutus* is particularly common on coastal vegetation (Kuschel 1982), and has been found on *Acacia mearnsii*, *Avicennia resinifera*, *Brachyglottis repanda* flowers, *Carmichaelia aligera*, *Cassinia leptophylla*, *Coprosma rhamnoides*, dead *Coprosma* sp., *Styphelia fasciculata*, *Lophomyrtus bullata*, *Melicytus* sp., *Metrosideros excelsa*, *Muehlenbeckia australis*, *Myoporum laetum*, dead *Olearia furfuracea*, *Phormium tenax*, *Pinus radiata*, *Pitiosporum tenuifolium* and *Sophora*. Adult insects have also been found in leaf litter and birds’ nests. Specimens have been taken from cut *Rubus cliffortoides*.

Kuschel (1982) cites it as having been reared from varied trees and shrubs belonging to different families of dicotyledons. Records are available of its rearing from dead stems of *Cassinia retorta* (W67/92), dead *Coprosma robusta* (W77/23a), dead wood of *Olearia furfuracea* (Kuschel 1990), and of larvae feeding in pith and heartwood of dead and dying branches of *Pennantia corymbosa* and in *Cassinia leptophylla* (Styles 1973).

Didymus metrosideri (Broun)

Broun, 1910a: 296 (*Acalles*). Hustache, 1936: 123 (as *A. metrosiderae*). Kuschel, 1982: 276 (*Didymus*).

Type data. Syntypes (?), male, female (mounted on

dorsum), BMNH, on card, with labels “25.” handwritten (Broun) / “Kermadec Is.; Broun Coll.; Broun.M.1922-482.” printed / “Kermadecs.; Sunday Isd.” handwritten (Broun) / “Acalles; *metrosideri*.” handwritten (Broun) / BMNH lectotype disc (male only) / “SYNTYPE ?; Acalles; *metrosiderae*; Broun, 1910; Lyal det 1989” handwritten (Lyal), green. Original number of specimens in series not stated by Broun, but greater than two. The locality given in the description is Raoul Island and on the specimens Sunday Island; these two names are alternatives for the same island.

Range. Kermadec Is.

Biology. Specimens of *D. metrosideri* have been found in leaf litter and taken from a variety of plants, including *Ascarina lucida lanceolata*, *Coprosma petiolata*, *Corynocarpus laevigatus*, *Homalanthus polyandrus*, *Melicytus ramiflorus*, *Metrosideros kermadecensis*, *Myoporum laetum* (some in dead twigs), dead *Myrsine kermadecensis*, and *Rhopaloslylis* sp.

Hiracalles new genus

Type species *Acalles scitus* Broun.

Length 2.5–4 mm. Habitus, Fig. 19. Derm dark brown to black, densely squamose. Scales round, appressed and semi-erect, much larger on pronotum than elytra; erect setiform scales absent, but club-shaped erect scales present (Fig. 193, 194). Pronotum in profile weakly depressed in anterior third and depressed at base; elytra convex (Fig. 72). Apterous.

Head. Rostrum shorter than pronotum, squamose basally, more densely so in male; punctuation dorsally stronger in male.

Antennae inserted in distal half of rostrum. Funicle and scape subequal in length; F1 and F2 elongate, subequal in length, together less than half length of funicle. Scape lacking scales; scape and funicle with fine, decumbent setae.

Thorax. Pronotum wider than long, widest at about middle; sides concave anteriorly, strongly convex posteriorly; anterior margin convex; posterior margin straight (Fig. 19); prominences absent; punctuation dense, even; scales (1) round, appressed, with edges sometimes curling up, tessellate, and (2) erect, slender, club-like or fan-shaped, scattered (Fig. 193, 194). Scutellum small or concealed.

Elytra with basal margin straight or weakly sinuate, as wide as pronotum basally; sides convex anteriorly, broadly and weakly concave posteriorly; apex weakly convex; prominences absent or very weak, scattered; striae punctures round or oval, large and sometimes encroaching upon interstriae; scales (1) round and oval, contiguous and imbricate, appressed and semi-erect, sometimes forming low ridges, and (2) erect as on pronotum, scattered and forming weak tufts and longitudinal ridges. A prominent, pale, squamose mark centrally in posterior part of elytra (Fig. 105, 106). Elytral strigil absent.

Postocular lobes rounded, extending between marginal carinae of prosternal canal (Fig. 127). Mesosternal receptacle (Fig. 127) U-shaped, wider than long, cavernous, extending posteriorly to level of midline of middle coxae; margins produced ventrally. Metasternum depressed – sometimes deeply so – behind mesosternal receptacle (Fig. 127), separating middle and hind coxae by less than length of a hind coxa. Metepisternum concealed except for anterior end, which is obscure; sclerolepidia absent, or glossy cream scales present on reduced metepisternum (Fig. 148). Fore coxae with a large, rounded posterior projection (Fig. 127). Femora lacking ventral teeth; ventral groove long, broad, glabrous or squamous. Tibiae lacking a ventral carina; premucro absent.

Abdomen. Ventrite 1 concave, flat, or convex medially, convex laterally; intercoxal process concave or flat, wider than long. Ventrite 2 subequal in length to V1 (excluding intercoxal process), sloping towards V3. Ventrites 3 and 4 each slightly less than half maximum length of V2, transversely convex. Punctuation dense to absent, greatest on ventrites 1, 2, and 5. Squamosity fairly even, though sometimes sparse on ventrites 3 and 4; scales elongate, semi-erect, curved.

Female terminalia. Tergite VII (Fig. 306) longer than wide; microsetae present in 2 very obscure longitudinal parallel rows of 2–4, in anterior half of sclerite; anterior and posterior margins convex. Tergite VIII (Fig. 307) longer than broad, weakly convex apically, lacking crenulations, with a row of stout submarginal setae. Sternite VIII (Fig. 308) with apical plate wider than long, approximately half length of apodeme. Hemisternites of ovipositor with styli slender, terminal (Fig. 309, 310); spermathecal duct arising near junction of oviduct and bursa; bursa with a weak sclerite at junction with oviduct (Fig. 309).

Male terminalia. Tergite VII (Fig. 593) as wide as long or wider, with 2 obscure, parallel longitudinal rows of 4 or 5 microsetae; anterior margin convex; posterior margin emarginate or truncate between lateral projections. Spiculum gastrale (Fig. 595) with apodeme subequal in length to

aedeagal apodemes; apical plate quadrate, weakly sclerotised apart from 'arms'. Tegmen (Fig. 596, 597) with parameres fused in at least proximal half, much shorter than apodeme; apodeme much longer than width of tegminal ring. Aedeagal body shorter than its apodemes, curved (Fig. 598), lanceolate, or with apex rounded in dorsal view (Fig. 597); body and apodemes united. Endophallus with basal sclerites small, fused, heavily sclerotised; a broad sclerite present distally; flagellum absent (Fig. 597).

Range. New Zealand.

Remarks. The most apparent distinguishing feature of the genus is the large cream patch of scales on the elytra, in which the species of *Hiiracalles* are similar to those of no other New Zealand genus. The deeply depressed metasternum, particularly in *H. scitus*, is similar to that of *Crisius* and, to some extent, *Clypeolus*, and there may be a relationship between the genera. This is discussed further under *Crisius*. However, no species of these genera have the large, circular scales on the pronotum that are characteristic of *Hiiracalles*. The posterior projection from the fore coxae is unusual in shape, having a clear semicircular rim ventrally (Fig. 127).

Hiiracalles dolosus (Broun) new combination

Fig. 106, 148, 193, 194

Broun, 1893a: 1484 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Lectotype male here designated, BMNH, on card, with labels "2564." handwritten (Broun) / "Hunua" printed / "Acalles; dolosus" handwritten (Broun). Paralectotype (?sex), BMNH, on card mounted on dorsum, with same data as lectotype. All syntypes located.

Range. ND, AK, CL, WO, BP, TO / NN, WD.

Biology. Adults of *Hiiracalles dolosus* have been collected from a number of leaf litter samples, as well as sifted moss, rotten wood, in epiphytes, and on the trunk of a dead *Agathis australis* at night. The species has been reared from dead bark of *Podocarpus ferrugineus*.

Hiiracalles scitus (Broun) new combination

Fig. 19, 72, 105, 127, 306–310, 593–599

Broun, 1880: 494 (*Acalles*); — 1893a: 1485. Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124. Styles, 1973: 356. Kuschel, 1990: 73 ('*Acalles*').

Type data. Lectotype male here designated, NZAC, on card, with labels "878" printed, green / "Parua" printed / "T. Broun; Coll." printed / "A.E. Brookes; Collection" printed. Paralectotype female, BMNH, on card mounted on dorsum, same data as lectotype. All syntypes located.

Range. ND, AK, CL, WO, BP, TK, TO, RI, WN, WA/NN.

Biology. Adults of *Hiiracalles scitus* have been collected repeatedly from leaf litter and decayed wood (e.g., Kuschel 1990), as well as from plants, including '*Collosperrum* and *Agathis australis*' and ferns at night. The species has been reared from a dead stump of *Metrosideros robusta* (W69/9), dead branches of *Weinmannia racemosa* 2.5–4 cm in diameter (W66/9) and from under bark of *Lüseca calicularis* (Styles 1973).

Genus *Indecentia* Broun

Broun, 1880: 484. Hudson, 1934: 221. Type species *Indecentia nubila* Broun, 1880, here designated.

Incentia Anon, 1882: 409. Hutton, 1904: 211 (attributed to Broun, 1880). Hustache, 1936: 255. Unnecessary replacement name for *Indecentia* Broun.

Length 4–8 mm. Habitus, Fig. 20. Derm brown, very densely squamose. Scales small, oval or more or less elongate, decumbent or erect, sometimes gathered into large crests or tufts on pronotum and elytra; erect setiform scales absent. Pronotum and elytra in profile (Fig. 74, 75) made irregular by large scale tufts; pronotum convex medially, deeply concave anteriorly and posteriorly; elytra also very concave anteriorly and convex medially, so bases of pronotum and elytra deeply depressed with respect to highest point of each. Apterous.

Head. Rostrum subequal in length to pronotum; sides concave, more so in male; male with a pair of short longitudinal ridges dorsally; punctation coarser in male; rostrum squamose dorsally over at least proximal third, more extensively in male.

Antennae inserted in distal half of rostrum, slightly nearer apex in male, with fine, semi-erect and decumbent setae. Funicle and scape subequal in length; F1 and F2 elongate, subequal in length, together about half length of funicle.

Thorax. Pronotum wider than long, widest in posterior half or three-quarters, abruptly narrowed in anterior quarter; anterior margin weakly convex, straight, or weakly emarginate medially; posterior margin straight (Fig. 20); a

large prominence on either side of midline in posterior half; punctation coarse; squamosity obscuring completely details of surface structure, with tufts of erect scales running from prominences to and along lateral margin, otherwise scales decumbent. Scutellum small, round, with appressed or decumbent scales.

Elytra with basal margin more or less sinuate, as wide as pronotum basally (Fig. 20); sides subparallel before truncate apex; large irregular prominences present medially on interstria 3 and extending to I2 and I4, surface otherwise with irregular projections and tubercles; stria punctures large, shallow, irregular, encroaching upon interstriae; surface thickly covered with semi-erect and decumbent oval scales, obscuring completely details of surface structure; a fringe of erect, more elongate scales around apical margin, and prominences with crests of erect, elongate scales, very long and narrow in male (Fig. 74). Elytral strigil present.

Postocular lobes rounded, extending between marginal carinae of prosternal canal (Fig. 128). Mesosternal receptacle (Fig. 128) deep, cavernous, cup-shaped, longer than wide, extending posteriorly to level of midline of middle coxae; margins produced ventrally. Metasternum with a large, depressed area posteromedially and smaller ones immediately anterior to hind coxae (Fig. 128), separating middle and hind coxae by less than length of a hind coxa. Metepisternum concealed; sclerolepidia absent.

Fore coxa with a conical posterior projection (Fig. 128). Femur with a very small ventral tooth, frequently obscured by scales; ventral groove indistinct, squamose. Tibiae lacking a ventral carina; premicro present; uncus stout.

Abdomen. Ventrite 1 convex on disc, more strongly so in female; intercoxal process wider than long, concave medially; posterior margin straight. Ventrite 2 shorter than V1 (excluding intercoxal process), convex. Ventrites 1 and 2 sloping posteriorly. Ventrites 3 and 4 together longer than V2, transversely convex. Ventrites lightly punctate, finely granulate, densely squamous, the scales erect and decumbent, imbricate.

Female terminalia. Tergite VII (Fig. 311) with length and width subequal; a pair of microsetae on small, projecting glabrous tubercles submarginally; anterior margin weakly convex; posterior margin convex. Tergite VIII (Fig. 312) longer than wide, with apical crenulations. Sternite VIII (Fig. 313) with a shield-shaped apical plate slightly shorter than apodeme. Hemisternites of ovipositor tapering to more or less broad styli (Fig. 314, 315). Spermathecal duct arising at junction of bursa and oviduct; bursa and vagina lacking sclerites (Fig. 314).

Male terminalia. Tergite VII (Fig. 600) with length and

width subequal; a pair of microsetae on small, projecting glabrous tubercles submarginally; anterior margin weakly convex; posterior margin deeply concave between tubercles. Spiculum gastrale (Fig. 602) with apodeme shorter than aedeagus; apical arms slender. Tegmen (Fig. 603, 604) with parameres undeveloped; apodeme subequal in length to width of tegminal ring. Aedeagal body just under half as long as its apodemes, curved (Fig. 606), with sides virtually weakly sinuate and apex broadly acuminate; body and apodemes united (Fig. 605). Endophallus with a ventral longitudinal sclerite and heavily sclerotised basal sclerites (Fig. 605); flagellum absent.

Range. New Zealand.

Remarks. The long, dense squamosity, large tufts on pronotum and elytra, deep depression of pronotum and elytra at their bases (Fig. 75), shape and width of the pronotum relative to the elytra in outline, and medially depressed metasternum together distinguish *Indecentia* from all other New Zealand Cryptorhynchinae. The very narrow, elongate scales on the elytral prominences in the male (Fig. 740) are paralleled only in *Crisius binotatus* and *Tychanus gibbus*, both of which show very similar patterns of tufted elytral prominences in the male; the significance of this sexual dimorphism is not known. The abruptly depressed median part of the metasternum immediately posterior to the mesosternal receptacle, the form of the male tergite VII, and the form of the endophallic sclerites all indicate that the genus is close to *Crisius*, and probably that its closest relatives lie within that genus. As discussed under *Crisius*, the very unusual body form of *Indecentia* makes it clearly recognisable, and difficulties in genus recognition would result if the two were synonymised.

Although Fig. 312 shows the female tergite VIII with three distinct, double-pointed crenulations on the posterior margin, this apparent symmetry is not characteristic, and there may be a mixture of single and double points.

Indecentia nubila Broun

Fig. 20, 74, 75, 128, 311–315, 600–606

Broun, 1880: 485 (*Indecentia*). Hutton, 1904: 211 (*Incentia*). Hudson, 1934: 151, 221 (*Indecentia*). Hustache, 1936: 256 (*Incentia*).

stramineum Broun, 1880: 486 (*Indecentia*). Hutton, 1904: 211 (*Incentia*). Hudson, 1934: 221 (*Indecentia*). Hustache, 1936: 256 (*Incentia*). May, 1987: 48 (*Indecentia*). Kuschel, 1990: 74. New synonymy.

Type data. *nubila*: holotype female, BMNH, on card, with labels "860" printed, green / "Auckland" printed / "Incentia; nubila" handwritten (Broun).

stramineum: lectotype male here designated, BMNH, on card, with labels "861" printed, green / "[m.]" handwritten / "Manaia" printed / "Incentia; straminea" handwritten (Broun). Paralectotype female, BMNH, on card, with labels "861" printed, green / "[f.]" handwritten / "Manaia" printed. All syntypes located.

Range. ND, AK, CL, BP, TK, TO, GB, WI, WN/BR, DN, FD, SL.

Biology. Adults of *Indecentia nubila* have been beaten from *Schefflera digitata* on several occasions (e.g., Kuschel 1990), and have been taken from *Blechnum fluviale*, 'makunaku' and rotten tree stumps. The species has been reared from live callus tissue of *S. digitata* (May 1987) and from live bark of *S. digitata*.

Genus *Crisius* Pascoe

Pascoe, 1876b: 66. Broun, 1880: 500. Hutton, 1904: 212.

Hudson, 1934: 221. Hustache, 1936: 127. Type species *Crisius binotatus* Pascoe, 1876, by monotypy.

Getacalles Broun, 1893a: 1380. Hutton, 1904: 212.

Hudson, 1934: 221. Hustache, 1936: 129. Type species *Tychanus ventralis* Broun, 1885, here designated. New synonymy.

Torilus Broun, 1909a: 151. Hudson, 1934: 223. Hustache, 1936: 125. Type species *Torilus griseicollis* Broun, 1909a, by monotypy. New synonymy.

Length 2–8 mm. Habitus, Fig. 21, 22. Derm brown or black, shiny or nearly matt, densely squamose, although scales sometimes sparse on pronotal disc and medially on elytra; surface sometimes obscured by gummy matter, concealing density and detail of squamosity. Scales (1) round and frequently small, appressed and semi-decumbent, contiguous, imbricate, and separate, and (2) elongate, appressed or erect, separate; erect setiform scales absent; velvety black scale patches sometimes present at base of elytra, on pronotum, or on venter. Pronotum in profile (Fig. 73) generally depressed in anterior third or half; pronotum and elytra more or less abruptly depressed at base; elytra flat or convex anteriorly, convex posteriorly. Macropterous, brachypterous, or apterous.

Head. Rostrum subequal in length to pronotum, lightly and finely punctate, at least at apex, but towards base generally

more densely punctate and sometimes grooved, especially in male, where sometimes unicarinate or tricarinate, though carinae partially or completely obscured by scales; rostrum thickly or sparsely squamose basally, with scales extending up to level of antennal insertions in some males.

Antennae arising nearer apex of rostrum than base. Scape nearly as long as flagellum or longer, with fine, semi-erect and decumbent setae but no scales. Funicle segment 1 and usually F2 sometimes slender, subequal or with F2 longer than F1, each longer than other segments, together not as long as rest of flagellum.

Thorax. Pronotum wider than long, widest at base or in posterior two-thirds (Fig. 21, 22); anterior third or less generally much narrower than posterior portion, widening sometimes abruptly; sides of broader part frequently convex; anterior margin convex or medially emarginate; posterior margin variable; punctation fine or coarse, frequently obscured by scales; a median longitudinal carina or an impunctate strip sometimes present; tubercles or prominences generally present at positions 1, 2, 3, and occasionally elsewhere, sometimes linked by ridges; erect scales sometimes gathered into tufts. Scutellum not concealed, generally squamose.

Elytra with basal margin straight or weakly sinuate, occasionally produced more or less abruptly at interstria 3, sometimes raised above level of pronotum at I2, exposing glabrous anterior face, wider than pronotum basally; humeral angle generally more or less produced into a rectangular or rounded prominence, this sometimes extending anterior to hind margin of pronotum; sides posterior to humeri convex, generally with irregularities or prominences, and more or less attenuate posteriorly. Interstriae – particularly I3, I5, and I7 – frequently with scattered tubercles, and small glossy tubercles sometimes present on suture near scutellum; I2 or I3 sometimes raised near base; stria punctures fine or coarse. Squamosity dense or sparse, sometimes absent on disc; scales as described above, occasionally forming scattered tufts. Elytral strigil present or absent.

Postocular lobes weak to large, semicircular or slightly angulate, smoothly continuous with marginal carinae of prosternal canal or extending between its margins, these rarely cut back before junction with lobes. Prosternal canal generally glabrous, occasionally with a few scales posteriorly. Mesosternal receptacle (Fig. 129–131) U-shaped, as long as wide or longer, extending posteriorly to level of midline of middle coxae or beyond coxae; margins equally produced ventrally. Metasternum concave, separating middle and hind coxae by less than half length of a hind coxa, abruptly depressed before hind coxae (Fig.

129–131), sometimes projecting ventrally between middle and hind coxae; a small to large pit or large, clear depression present medially (Fig. 129–131), sometimes obscured by scales. Metepisternum obscure or clear, narrow, not covered completely by elytron; anapleural suture complete or obscure; sclerolepidia absent.

Fore coxae glabrous or squamous internally, generally with a posteroventral projection. Femora unarmed, or each bearing a small to large tooth ventrally; ventral groove generally present, frequently with an anterior and a posterior carina in proximal third, glabrous or squamose. Tibiae sometimes with a ventral carina and a small premucro; uncus broad basally, sometimes apparently arising near ventral side.

Abdomen. Ventrite 1 concave or convex medially, generally depressed anteriorly; intercoxal process wider than long; posterior margin straight or broadly emarginate. Ventrite 2 shorter than V1 or subequal, sometimes with a median tubercle or median anterior pit. Ventrites 3 and 4 subequal in length, together as long as V2 to twice as long, flat or transversely convex. Punctation coarse or fine, generally coarsest on ventrites 1, 2, and 5. Squamosity scattered or dense; a median tuft sometimes present on ventrites 2–4, and velvety black scale patches frequently on V2–5.

Female terminalia. Tergite VII (Fig. 316, 323) as long as wide or longer, with a single pair of microsetae medially or up to 5 pairs arranged longitudinally in glabrous strips; anterior margin weakly or strongly convex, frequently with a median sclerotised lobe; posterior margin convex or concave. Tergite VIII as long as wide or longer; posterior margin truncate or convex, smooth or with 2 or 4 lobes (Fig. 317, 321, 322, 324). Sternite VIII (Fig. 318) with apical plate broad, shorter or longer than apodeme or subequal; anterior end of apodeme rarely with a long cross-bar. Hemisternites of ovipositor tapering more or less evenly to terminal styli (Fig. 319, 320). Vagina and bursa lacking sclerites, or with sclerotised areas anterior and sometimes posterior to junction with oviduct; spermathecal duct arising at junction of bursa and oviduct (Fig. 319).

Male terminalia. Tergite VII (Fig. 607, 608, 610, 623) as long as wide or longer, with 1–3 pairs of microsetae, the hindmost sometimes on a marked posterior extension of hind margin; anterior margin convex, frequently with a median lobe; posterior margin emarginate, concave, or biconcave and medially emarginate. Tergite VIII generally with a large anterior projection internally from posterior margin (Fig. 611). Spiculum gastrale (Fig. 612, 622, 624) variable, with apodeme longer or shorter than aedeagal apodemes or subequal in length. Tegmen (Fig. 613, 614,

617, 618, 625) with parameres separate or united in proximal half, shorter than apodeme; apodeme longer or shorter than width of ring or subequal. Aedeagal body as long as wide to much longer, very variable in shape and sclerotisation; apodemes and body united (Fig. 609, 615, 616, 619–621, 626). Endophallus with basal sclerites of various, sometimes complex, form or absent; a dorsal and sometimes a ventral longitudinal sclerite present; flagellum absent, or a flagellum-like sclerite present (Fig. 609, 615, 619, 621, 626).

Range. New Zealand, including Chatham Is.

Remarks. *Crisius* is a large and diverse genus. It may be distinguished from others (with four exceptions) by the pit or broad, abrupt depression in the metasternum immediately posterior to the mesosternal receptacle (Fig. 129–131). This pit may be narrow or broad and, in some species, obscured by dense squamosity, although detectable by probing with a pin. The other genera with such a pit or depressed area are: (i) *Indecentia*, distinguished by the elytra being narrower than the pronotum (Fig. 20) and much more convex in profile than those of *Crisius* (Fig. 74, 75); (ii) *Hiracalles*, distinguished by the large, circular pronotal scales (Fig. 194) and the distinctive pattern on the elytra (Fig. 105, 106); (iii) *Whitiacalles*, distinguished by the presence of plumose scales in the pronotal canal, concealed scutellum, and rather different body form (Fig. 23); and (iv) *Crooktacalles*, distinguishable by the very prominent, short mesosternal receptacle (Fig. 135, 136).

Many *Crisius* species have the humeral angles of the elytra produced laterally and anteriorly (Fig. 21, 22), a character found in only a few other New Zealand Cryptorhynchinae – *Sympedius* (Fig. 7), *Rhynchodes* (Fig. 10), *Trinodicalles* (Fig. 93), and *Tychanus verrucosus*. This character state is a distinctive identification aid for many species in the genus.

The forward internal projection of the posterior margin of male tergite VIII in many species of *Crisius* (Fig. 611) is similar, but almost certainly not homologous, to that in some *Agacalles* (Fig. 696).

The main indicator for relationships of the genus is the structure of the metasternum posterior to the mesosternal receptacle. Figures 129–131 illustrate the character state transformation series between a small metasternal pit and a large one with the more elevated area of the metasternum limited to a pair of lateral 'wings'. This last state is indistinguishable from that in *Hiracalles scitus* (Fig. 127), although rather dissimilar to that in *H. dolosus*. The state in the latter species can be derived from that of *H. scitus*, however. *Indecentia* fits well with the more primitive state.

Whitiacalles has more a gradual depression than an abrupt pit, although derivation from one of the states observed in *Crisius* is by no means impossible. The form of male tergite VII also provides information: apomorphies are the anterior projection of the anterior margin and the shape of the posterior margin. Both *Indecentia* and *Hiracalles* males have tergite VII in a form that falls within the range of that of *Crisius* species, and that of *Whitiacalles* is very similar, especially in its anterior margin. *Crisius*, *Indecentia*, *Whitiacalles*, and *Hiracalles* are considered here to form a monophyletic group, *Whitiacalles* perhaps being outside a group formed by the other three. *Crooktacalles* has a metasternum similar to the most derived form (Fig. 135, 136), but in no other respect approaches *Crisius*; at present these genera are not considered to be related closely.

The generic concept of *Crisius* employed here is not fully satisfactory, but it is not at present possible to subdivide the genus. Two criteria were used in arriving at the present generic limits: the need to have an identifiable unit, and the principle that taxa should be monophyletic. For *Crisius*, given that a full analysis of the genus was not possible, this produces an unresolved problem. The closest relative of *Indecentia nubila* almost certainly lies within *Crisius*, and perhaps that of *Hiracalles* spp. does also. However, inclusion of *Indecentia* and *Hiracalles* within *Crisius* would produce a genus that was very difficult to key out, and which looks much less homogeneous than the concept used here. Consequently *Indecentia* and *Hiracalles* are held to be good genera, and *Crisius* is almost certainly paraphyletic. Inclusion of *Getacalles* and *Torilus* in *Crisius*, however, was deemed necessary because their exclusion raised the danger of producing more paraphyletic groups without increasing ease of identification.

Within *Crisius* there are several fairly distinct species groups, although it would be rash to identify many of them at present as monophyletic. *Crisius variegatus* and *C. longulus* are clearly a species pair, and the form of their female tergite VII suggests a relationship to a group comprising *ornatus*, *picicollis*, *fasciculatus*, *semifuscus*, and *scutellaris*. The raised anterior margin of the elytra, and details of the elytral scale pattern, indicate *decorus*, *dorsalis*, and *humeralis* to be closely related, and the body form of *obesulus* and *postipuncta* identifies them as close to each other; further work may show them to be synonyms. The small species *confusus*, *bicristiceps*, *curtus*, and *lineirostris* share elements of elytral scale pattern, though no clear synapomorphies have yet been identified, and they share synapomorphies with other groups of the genus in conflicting patterns. A group comprising *bicinctus*, *zenomorphus*, *latirostris*, *sternalis*, *nodigerus*, *anceps*, *eucoelius*, and *browni* exhibits conflicting synapomorphies

with the *confusus* group and the species previously included in *Torillus* and those close to it—*griseicollis*, *lunalis*, *eximius*, and *contiguus*—which themselves have an autapomorphic development of the elytral tuft pattern. This last group of species show in the form of male tergite VII and some other factors a relationship to those species previously included in *Getacalles*, which themselves fall into two groups (with additions from *Acalles*): *cinereus*, *fasciatus*, *sparsus*, *flavisetosus*, *fuscatus*, and *subcarinatus*, as indicated by the form of ventrite 2; and *grisealis*, *minor*, *baccatellus*, *posticalis*, *fulvicornis*, *humeralis*, *oblongus*, *rostralis*, and *ventralis*. *C. hopensis*, while clearly related to both groups, is uncertainly placed with either. There are species not mentioned in the above list whose relationships are less clear, and other smaller groups within those discussed. The species listed below are in alphabetical order, with no attempt to indicate groups.

Some species previously in *Getacalles* (*variellus*, *ventralis*, *humeralis*, *baccatellus*, *foveiceps*, *oblongus*, and *rostralis*) have what may be eye-spots towards the front of the pronotum. They are most 'convincing' in some specimens of *variellus*, viewed from the front and looking slightly down on the insect. In this aspect they appear as pale 'eyes' with a black surround.

The new combinations here proposed lead to two homonyms: *humeralis* Broun, 1921 (itself also a homonym, in *Acalles*, of *humeralis* Perkins, 1900) and *humeralis* Broun, 1913; and *posticalis* Broun, 1917 and *posticalis* Broun, 1914. The junior homonyms have been renamed *brouni* and *postipuncta* respectively.

Crisius cinereus (Broun), although published in *Acalles* under this specific name, was alluded to in print by Hutton (1904) and Hudson (1934) as *Acalles huttoni* Broun, both authors referring to the species number and page reference of *A. cinereus*. Broun's type specimen bears a label handwritten by Broun "*Acalles huttoni*" but not one indicating it to be *cinereus*. It seems likely that Broun had changed his mind between labelling the specimen and sending the manuscript, but Hutton followed the labelling on the specimen (and probably in Broun's collection) rather than the name in the original publication. Hudson almost certainly used Hutton's work as a source, since several errors in the former work are perpetuated in the latter. The name *Acalles huttoni* must be seen as an unnecessary replacement name.

May (1993) describes the larva of *Crisius* and discusses the larval biology of members of the genus. May (1987, p. 48) gives rearing records for several unidentified *Crisius* species: sp. A—reared from live leaf bases of *Celmisia sessiflora*; sp. B—*Astelia nivicola* dead leaf bases; sp. D—*Celmisia viscosa* dead leaf bases; sp. E—*Oreobolus pectinatus* live crown.

Crisius anceps (Broun) new combination

Broun, 1921: 572 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 120.

Type data. Holotype male, BMNH, on card, with labels "4119." handwritten (Broun) / "Howard.; 10.5.1915" handwritten (Broun) / "Acalles; anceps" handwritten (Broun).

Range. — / BR.

Crisius baccatellus (Broun) new combination

Broun, 1917: 449 (*Getacalles*). Hudson, 1934: 222. Hustache, 1936: 129.

Type data. Lectotype female here designated, BMNH, on card, with labels: "[f.]" printed / "3936" handwritten (Broun) / BMNH lectotype disc / "Scarcliff.; 20.9.1913." handwritten (Broun) / "Getacalles; baccatellus" handwritten (Broun) / "= Getacalles; humeralis; Broun; det. G. Kuschel; 1982" handwritten (Kuschel). Paralectotypes: 1 female, BMNH, same data as lectotype; 1 male, NZAC, same data as lectotype with "var.; 3936" handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. — / BR, MC.

Crisius bicinctus (Broun) new combination

Broun, 1915: 339 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Holotype male, BMNH, on card, with labels "3772." handwritten (Broun) / "Mt Hutt; 10.1.1913." handwritten (Broun) / "Acalles; bicinctus" handwritten (Broun).

Range. — / MC.

Crisius bicristiceps (Broun) new combination

Broun, 1914: 238 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Syntypes: 3 males, 1 female, BMNH, on card, with labels "3636." handwritten (Broun) / "Bell Rock; 15.9.1912" handwritten (Broun) (2 males) or "Bell Rock; 5.9.12." handwritten (Broun) (female) or "Bell Rock; 19.10.12" (male) / "Acalles; bicristiceps" handwritten (Broun) (2 males). All specimens of original series located.

Range. AK / NN, MC, DN.

Biology. Specimens of *C. bicristiceps* have been reared from live bark of *Cordyline banksii*.

Crisius binotatus Pascoe

Fig. 21, 73, 316–320

Pascoe, 1876b: 66 (*Crisius*). Broun, 1880: 500, Hutton, 1904: 212. Hudson, 1934: 152, 221. Hustache, 1936: 127. Styles, 1973: 355. May, 1987: 48.

Type data. Lectotype female here designated, BMNH, pinned on plastazote strip with first 2 labels, with labels "NZ; Tairua" handwritten (Pascoe), yellow oval / "Crisius; binotatus; type Pasc." handwritten (Pascoe) / BMNH lectotype disc / "Pascoe Coll.; 93-60" printed. Paralectotype female, BMNH, pinned, same data as lectotype.

Range. ND, AK, CL, WO–BP, BP, WN / —.

Biology. Adult *C. binotatus* have been collected on dead *Agathis australis*, particularly at night, and have been beaten from *Meliccytus ramiflorus*. Specimens have been reared from dead bark of *Agathis australis* (May 1987) and from the exotic *Pinus radiata* (Styles 1973).

Remarks. Both type specimens are labelled "type" in Pascoe's handwriting, a very unusual occurrence. The least damaged of the two has been chosen as lectotype. The number of specimens before Pascoe when he described the species is not known, and it is worth noting that two specimens are in the MacLay Museum, relabelled by Masters.

Crisius brouni Lyal new name, new combination

humeralis Broun, 1921: 571 (*Acalles*) (not *Acalles humeralis* Perkins, 1900; not *Crisius humeralis* (Broun, 1913)). Hudson, 1934: 223. Hustache, 1936: 122.

Type data. Holotype female, BMNH, on card, with labels "4118." handwritten (Broun) / "Howard.; 10.5.1915." handwritten (Broun) / "Acalles; humeralis" handwritten (Broun).

Range. — / SD, NN, BR, NC.

Biology. Adult *C. brouni* have been collected from leaf litter, and specimens have been reared from "Weinmannia".

Crisius cinereus (Broun) new combination

Broun, 1883: 440 (*Acalles*); —1886: 801 (repetition of 1883 description). Hustache, 1936: 121. 'huttoni' Broun' Hutton, 1904: 213 (*Acalles*). Hudson, 1934: 222. Unnecessary replacement name.

Type data. Holotype male, BMNH, on card, with labels "1428." printed, green / "Whangarei" printed / "Acalles; huttoni" handwritten (Broun).

Range. ND, AK / —.

Biology. Adult *C. cinereus* have been taken from *Leptospermum* (Broun 1883, 1886).

Crisius confusus (Broun) new combination

Broun, 1914: 237 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Syntypes: 3 males, 1 female BMNH, 2 males NZAC, on card, all from Rakaia Gorge, 18.5.1912, all with labels "SYNTYPE; Acalles; confusus; Broun, 1914; Lyal det 1986" handwritten (Lyal), green. All syntypes located.

Range. AK, WO, RI, WA / SD, NN, BR, MC, DN, FD.

Biology. Adults of *C. confusus* have been collected from leaf litter.

Crisius contiguus Broun

Broun, 1921: 574. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Holotype male, BMNH, on card, with labels "4122." handwritten (Broun) / "Glen Hope; 3.3.1915" handwritten (Broun) / "Crisius; contiguus." handwritten (Broun).

Range. WN / NN, BR.

Crisius curtus (Broun) new combination

Broun, 1881: 728 (*Sympedius*). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels: "Parua" printed / "Sympedius; curtus." handwritten (Broun).

Range. — / ND.

***Crisius decorus* Broun**

Broun, 1913: 139. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Holotype male, BMNH, on card, with labels: "3322" handwritten (Broun) / "Makatote.; Feby. 1910." handwritten (Broun) / "Crisius; decorus." handwritten (Broun).

Range. TO / —.

***Crisius dives* Broun**

Fig. 607

Broun, 1921: 650. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Holotype male, BMNH, on card, with labels "4232" handwritten (Broun) / "Wadestown.; Augt. 1916." handwritten (Broun) / "Crisius; dives." handwritten (Broun).

Range. WN / —.

Biology. Adult *C. dives* have been obtained from leaf litter.

***Crisius dorsalis* Broun**

Broun, 1904: 123. Hudson, 1934: 221. Hustache, 1936: 127. May, 1987: 48.

Type data. Holotype (?sex), BMNH, on card, head detached, with labels "2952" handwritten (Broun) / "Suter. 376; 40-Mile Bush" handwritten / "Crisius; dorsalis." handwritten (Broun).

Range. TK-WO, TO, HB, WI, WA / —.

Biology. Adults of *C. dorsalis* have been found in litter. Specimens have been reared from dead leaf bases of *Astelia nervosa* (May 1987).

***Crisius eucoelius* (Broun) new combination**

Broun, 1921: 652 (*Getacalles*). Hudson, 1934: 222. Hustache, 1936: 129.

Type data. Lectotype male here designated, BMNH, on card, with labels "Mt Arnaud; 28.6.1916" handwritten (Broun) / "Getacalles; eucoelius." handwritten (Broun) /

BMNH lectotype disc. Paralectotype female, BMNH, same data as lectotype. All syntypes located.

Range. — / BR.

***Crisius eximius* Broun**

Broun, 1921: 574. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Holotype male, BMNH, on card, with labels "4123" handwritten (Broun) / "Glen Hope; 18.7.1915" handwritten (Broun) / "Crisius; eximius." handwritten (Broun).

Range. — / NN.

***Crisius fasciatus* (Broun) new combination**

Broun, 1914: 136 (*Getacalles*). Hudson, 1934: 221. Hustache, 1936: 129.

Type data. Holotype female, BMNH, on card, with labels "[f.]" printed / "3460." handwritten (Broun) / "Tisbury; 6/ 11/ 10" first line printed, second line handwritten / BMNH holotype disc / "Getacalles; fasciatus." handwritten (Broun) / "= Crisius; sparsus [f.]; (Broun); det. G. Kuschel; 1982" handwritten (Kuschel).

Range. — / SL.

***Crisius fasciculatus* Broun**

Broun, 1893a: 1492. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 127. May, 1987: 48. Kuschel, 1990: 73.

Type data. Lectotype male here designated, BMNH, on card, with labels "2574." handwritten (Broun) / "Hunua" printed / "Crisius; fasciculatus" handwritten (Broun). Paralectotype (?sex), NZAC, on card, head missing, no locality label. One syntype not located.

Range. ND, AK, WO, BP / —.

Biology. Adults of *C. fasciculatus* are found among bush floor sedges, in leaf litter and decayed wood, and on *Freyinetia* (Kuschel 1990). Specimens have been reared from live aerial roots and subcortically in the stems of *Freyinetia baueriana* ssp. *banksii* (May 1987).

***Crisius flavisetosus* (Broun) new combination**

Fig. 321

Broun, 1909a: 149 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 122.

Type data. Holotype female, BMNH, on card, with labels "2951." handwritten (Broun) / "Broken; river." handwritten (Broun) / "Acalles; flavisetosus" handwritten (Broun).

Range. — / MC, DN.

***Crisius fulvicornis* (Broun) new combination**

Broun, 1914: 242 (*Getacalles*). Hudson, 1934: 221. Hustache, 1936: 129.

parvulus Broun, 1914: 242 (*Getacalles*). Hudson, 1934: 222. Hustache, 1936: 129. New synonymy (G. Kuschel, pers. comm.).

Type data. *fulvicornis*: lectotype male here designated, BMNH, on card, with labels "[m.]" printed / "3641." handwritten (Broun) / "Curiosity.; 9.8.1912." handwritten (Broun) / BMNH lectotype disc / "Getacalles; fulvicornis" handwritten (Broun) / genitalia in balsam mount on plastic / "Getacalles; fulvicornis; Lectotype [m.] Broun; det. G. Kuschel; 1982" handwritten (Kuschel). Paralectotype male, NZAC, locality label "Rakaia; 29-9-1912" handwritten (Broun). Third specimen of type series not certainly located, but a female in BMNH labelled "Rakaia; 1.11.12" may be it.

parvulus: lectotype male here designated, BMNH, on card, with labels "[m.]" printed / "3642" handwritten (Broun) / BMNH lectotype disc / "Rakaia; 27.9.1912." handwritten (Broun) / "Getacalles; parvulus" handwritten (Broun) / genitalia in balsam on plastic rectangle / "Getacalles; fulvicornis; Broun; det. G. Kuschel; 1982" handwritten (Kuschel). Paralectotype female, BMNH, on card mounted on dorsum, same data as lectotype. All syntypes located.

Range. — / MC, MK / SI.

***Crisius fuscatus* (Broun) new combination**

Broun, 1907: 60 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 122.

Type data. Lectotype male here designated, BMNH, on card, with labels "2942" handwritten (Broun) / "B. Hill; 1901." handwritten (Broun) / "Acalles; fuscatus." handwritten (Broun). Paralectotype male, BMNH, on card

mounted on dorsum, same data. All syntypes located.

Range. — / ?CO.

***Crisius grisealis* (Broun) new combination**

Broun, 1921: 653 (*Getacalles*). Hudson, 1934: 222. Hustache, 1936: 129.

Type data. Holotype male, BMNH, on card, with labels "4237." handwritten (Broun) / "Titahi Bay.; 10.8.1916." handwritten (Broun) / "Getacalles; grisealis." handwritten (Broun) / BMNH holotype disc.

Range. RI, WN / SD, KA.

Biology. Adult *C. grisealis* have been collected several times in leaf litter.

***Crisius griseicollis* (Broun) new combination**

Broun, 1909a: 152 (*Torilus*). Hudson, 1934: 223. Hustache, 1936: 125.

Type data. Holotype female, BMNH, on card, with labels "2964" handwritten (Broun) / "Broken; River." handwritten (Broun) / "Torilus; griseicollis" handwritten (Broun).

Range. TK, WN, WA / SD, NN, BR, MB, NC, WD, MC.

Biology. Adult *C. griseicollis* have been obtained frequently in leaf litter (often in *Nothofagus* forests), on moss, and in fungus on *Nothofagus*.

***Crisius hopensis* (Broun) new combination**

Fig. 608, 609

Broun, 1921: 655 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 122.

Type data. Holotype male, BMNH, on card with genitalia separate in vial, with labels "4240." handwritten (Broun) / "Glen Hope; 3.3.1915" handwritten (Broun) / "Acalles; hopensis." handwritten (Broun) / BMNH holotype disc.

Range. — / NN, MB, BR.

***Crisius humeralis* Broun**

Broun, 1913: 138. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Holotype (?sex), BMNH, on card, with labels "3320" handwritten / "Mt. Quoin.; Wellington" handwritten (Broun) / "Crisius; humeralis" handwritten (Broun).

Range. WN / —.

Biology. Adults of *C. humeralis* have been found frequently in leaf litter, as well as amongst moss and on mossy logs at night.

***Crisius humeratus* (Broun) new combination**

Broun, 1893a: 1381 (*Getacalles*). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 129.

Type data. Lectotype male here designated, BMNH, on card, with labels "2412." handwritten (Broun) / "Moeraki" handwritten (Broun) / "Getacalles; humeratus" handwritten (Broun) / "Getacalles; humeratus; [f.] Broun; det. G. Kuschel; 1982" handwritten (Kuschel). Paralectotype female, BMNH, mounted on card on dorsum, no locality label. All syntypes located.

Range. — / WD, MC, SC, MK, OL, DN, SL.

Biology. Adult *C. humeratus* have been collected in leaf litter and from *Fuchsia* and *Kunzea ericoides*.

***Crisius latirostris* Broun**

Fig. 129, 622

Broun, 1914: 240. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Syntypes: 2 males, 1 female, BMNH, on card, with labels "3639." handwritten (Broun) / "McClellans.; 23.4.1912." handwritten (Broun) / "Crisius; latirostris" handwritten (Broun) (1 male, female only). One syntype not located.

Range. — / MC, SC, DN, FD, SL / SI.

Biology. Adult *C. latirostris* have been collected frequently from leaf litter, as well as from moss and rotten wood.

***Crisius lineirostris* (Broun) new combination**

Broun, 1911: 107 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 123.

Type data. Holotype male, BMNH, on card, with labels "87." handwritten / "Pitt Island.; - T. Hall." handwritten (Broun) / "Acalles; lineirostris" handwritten (Broun).

Range. — / Chatham Is.

Biology. Adult *C. lineirostris* have been obtained from litter, moss and *Muehlenbeckia australis*.

***Crisius longulus* Broun**

Fig. 610–616

Broun, 1921: 650. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Holotype male, BMNH, on card, with labels "4233" handwritten / "Stephens Isd.; 17.9.1916." handwritten (Broun) / "Crisius; longulus" handwritten (Broun).

Range. — / SD (Stephens I., Maud I.).

Biology. *Crisius longulus* has been collected from *Macropiper* sp. (presumably *M. excelsum*).

***Crisius lunalis* (Broun) new combination**

Broun, 1917: 448 (*Tychanus*). Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype male, BMNH, on card, with labels "3934." handwritten (Broun) / "Mt Algidus; 3.12.1913" handwritten (Broun) / "Tychanus; lunalis" handwritten (Broun).

Range. — / NN, MC.

***Crisius minor* (Broun) new combination**

Broun, 1893a: 1381 (*Getacalles*). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 129.

Type data. Holotype male, BMNH, on card, with labels "[m.]" printed / BMNH holotype disc / "Moeraki" handwritten (Broun) / "Getacalles; minor" handwritten (Broun) / abdomen in balsam on plastic rectangle / "Getacalles; minor; Broun; det. G. Kuschel; 1982" handwritten (Kuschel) / "There was no aedeae; gus inside!; Kuschel 26.8.82." handwritten (Kuschel).

Range. — / DN.

***Crisius nodigerus* (Broun) new combination**

Broun, 1917: 453 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 123.

Type data. Syntypes: 3 males, 1 female, BMNH, on card, with labels "3942." handwritten (Broun) / "Routeburn.; 13.2.1914" handwritten (Broun) (female) or "Hollyford.; 19.2.1914." handwritten (Broun) (males) / "Acalles; nodigerus" handwritten (Broun) (female). All syntypes located.

Range. — / WD, OL, FD, CO, DN, SL.

Biology. Adult *C. nodigerus* have been collected often from leaf litter, as well as from moss and rotten wood.

***Crisius obesulus* Sharp**

Sharp, 1886: 430. Broun, 1893a: 1241. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Lectotype female, here designated, BMNH, on card, with labels "Crisius obes-; ulus Type D.S.; Greymouth; Helms" handwritten (Sharp) on mounting card / "II; 16" handwritten / BMNH lectotype disc / BMNH "Type; H.T." disc / "Greymouth.; New Zealand; (Helms)" printed / "Sharp Coll.; 1905-313." printed. Paralectotype (?) female, BMNH, same data as lectotype.

Range. — / MB, BR, WD, OL-FD.

***Crisius oblongus* (Broun) new combination**

Broun, 1914: 243 (*Getacalles*). Hudson, 1934: 222. Hustache, 1936: 129.

Type data. Holotype female, BMNH, on card, with labels "[f.]" printed / "3644" handwritten (Broun) / "McClenans; 23.4.1912." handwritten (Broun) / "Tychanus; oblongus." handwritten (Broun) / "Getacalles; humeratus; Broun; det. G. Kuschel; 1982" handwritten (Kuschel).

Range. — / BR, MC.

***Crisius obscurus* (Broun) new combination**

Broun, 1921: 573 (*Tychanus*). Hudson, 1934: 221. Hustache, 1936: 128.

Type data. Holotype female, BMNH, on card, with labels "4121." handwritten (Broun) / "Rakaia; 27.9.1912" hand-

written (Broun) / "Tychanus; obscurus." handwritten (Broun).

Range. — / MC.

***Crisius ornatus* Broun**

Broun, 1893a: 1242. Hutton, 1904: 212. Hudson, 1934: 152, 221. Hustache, 1936: 127.

Type data. Holotype female, BMNH, on card, with labels "2187." handwritten / "Karori.; Wellington" handwritten (Broun) / "Crisius; ornatus" handwritten (Broun).

Range. WN / KA, MC, DN.

Biology. Adult *C. ornatus* have been found in leaf litter, under *Laurelia novaezelandiae* bark (Broun 1893a), and under logs of a recently felled *Podocarpus ferrugineus* tree (Hudson 1934).

***Crisius picicollis* Broun**

Broun, 1893a: 1241. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Lectotype female here designated, BMNH, on card, with labels "2185." handwritten / "Mokohinau" printed / "Crisius; picicollis." handwritten (Broun). Paralectotype male, BMNH, mounted on dorsum on card, legs missing, no data label. All syntypes located.

Range. ND / —.

***Crisius posticalis* (Broun) new combination**

Broun, 1914: 241 (*Getacalles*). Hudson, 1934: 221. Hustache, 1936: 129.

Type data. Lectotype male, BMNH, on card, with labels "[m.]" printed / "3640." handwritten (Broun) / "McClenans; 23.4.1912." handwritten (Broun) / "Getacalles; posticalis" handwritten (Broun) / genitalia in balsam on plastic rectangle / BMNH lectotype disc / "Getacalles; posticalis; Lectotype [m.] Broun; det. G. Kuschel; 1982" handwritten (Kuschel). One syntype not located.

Range. — / NC, MC, SC.

Biology. Adult *C. posticalis* have been collected several times from leaf litter.

Crisius postipuncta Lyal new name

Fig. 322, 617–620

posticalis Broun, 1917: 450 (*Crisius*; not *Crisius posticalis* Broun, 1914). Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Syntypes: 1 male, 2 females, BMNH, on card, all with labels "3938." handwritten / "Hollyford.; 19.2.1914." handwritten (Broun) / "Crisius; posticalis" handwritten (Broun) (2 only). All syntypes located.

Range. — / NN, OL–FD.

Crisius rostralis (Broun) new combination

Broun, 1893a: 1380 (*Getacalles*). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 129.

foveiceps Broun, 1917: 450 (*Getacalles*).—Hudson, 1934: 222. Hustache, 1936: 129. New synonymy (G. Kuschel, pers. comm.).

Type data. *rostralis*: lectotype male here designated, BMNH, on card, with labels "[m.]" printed / "2410" handwritten (Broun) / "Moeraki" handwritten (Broun) / BMNH lectotype disc / "Getacalles; rostralis" handwritten (Broun) / genitalia in balsam on plastic rectangle / "Getacalles; rostralis; Broun; Kuschel det. 1981" handwritten (Kuschel). Paralectotype female, BMNH, same data as lectotype. One syntype not located.

foveiceps: lectotype male here designated, BMNH, on card, with labels "3937." handwritten (Broun) / "Clippings; 29.1.1912." handwritten (Broun) / BMNH lectotype disc / "Getacalles; foveiceps" handwritten (Broun) / "Getacalles; rostralis; Broun, 1893; det. G. Kuschel; 1982" handwritten (Kuschel). Paralectotype male, BMNH, same data as lectotype, genitalia mounted on plastic rectangle on pin. All syntypes located.

Range. — / OL, CO, DN, SL.

Biology. Adults of *C. rostralis* have been collected several times from leaf litter.

Crisius scutellaris Broun

Broun, 1880: 501. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Syntypes: 1 male, 1 female, BMNH, on card, with labels "893" printed, green / "Parua" printed / "Crisius; scutellaris" handwritten (Broun) (female only).

All syntypes located.

Range. ND, AK, CL, WO, BP, TK / —.

Biology. Adult *C. scutellaris* have been collected in leaf litter and from rotten tree stumps and logs.

Crisius semifuscus Broun

Broun, 1913: 139. Hudson, 1934: 221. Hustache, 1936: 127.

Type data. Holotype (?sex), BMNH, on card, with labels "3321" handwritten / "Titahi; Wellington" handwritten (Broun) / "Crisius; semifuscus" handwritten (Broun).

Range. TO–RI, WN / SD, NN.

Biology. Adult *C. semifuscus* have been collected in leaf litter and from *Pseudopanax*. Specimens have been reared from *Fomes* on *Nothofagus menziesii*, a dead branch of a large *Laurelia novaezealandiae* (W69/11), the main trunk of *Hedycarya arborea*, *Rubus australis* (W72/96) and a solid dead trunk of *Pseudopanax crassifolius*.

Crisius signatus Broun

Broun, 1893a: 1242. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 127. May, 1987: 48.

Type data. Lectotype male here designated, BMNH, on card, with labels "2186." handwritten / "Mount Arthur" printed / "Crisius; signatus" handwritten (Broun). Paralectotype male, NZAC, same data as lectotype. All syntypes located.

Range. — / NN, MB, BR, NC, WD, SC, OL, FD.

Biology. Adult *C. signatus* have been collected from leaf litter and *Nothofagus* logs. Specimens have been reared from dead bark of *Nothofagus menziesii* (May 1987).

Crisius sparsus (Broun) new combination

Broun, 1914: 135 (*Getacalles*). Hudson, 1934: 221. Hustache, 1936: 129.

Type data. Holotype male, BMNH, on card, with labels "[m.]" printed / "3459." handwritten (Broun) / "Tisbury; 6/11/10" first line printed, second line handwritten / BMNH holotype disc / "Getacalles; sparsus." handwritten (Broun)

/genitalia in balsam on plastic rectangle/"*Crisius*; *sparsus*; Holotype [m.] Broun; det G. Kuschel; 1982" handwritten (Kuschel).

Range. — / SL.

Biology. An adult of *C. sparsus* has been collected from leaf litter.

***Crisius sternalis* (Broun) new combination**

Broun, 1917: 452 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Syntypes: 2 males, 3 females, BMNH, on card, with labels "3941." handwritten (Broun) / "Mt Alfred.; 3.2.1914." handwritten (Broun) (1 male, 1 female) or "Earnslaw; 6.2.1914." handwritten (Broun) (1 male, 1 female) or "Lomond; 6.3.1914" handwritten (Broun) (1 female) / "Acalles; sternalis" handwritten (Broun) (2 male, 2 female). Original number of specimens in series not stated by Broun.

Range. — / MK, OL, DN, SL.

Biology. Adult *C. sternalis* have been collected frequently from leaf litter, as well as from moss and rotten wood.

***Crisius subcarinatus* (Broun) new combination**

Broun, 1911: 107 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 124.

Type data. Lectotype male here designated, BMNH, on card, with labels "88." handwritten / "Pitt Island.; - J - Hall." handwritten (Broun) / "Acalles [m.]; subcarinatus." handwritten (Broun).

Range. — / MC / Chatham Is.

Biology. Adults of *C. subcarinatus* have been collected from leaf litter.

Remarks. Broun had a single male in his possession, and had seen a female, which has not been located. A male in NZAC agrees less well with the description than does the male in BMNH. The two specimens from MC are both from Lyttelton, and may have been imported accidentally from the Chatham Islands.

***Crisius variegatus* Broun**

Fig. 130, 323, 324

Broun, 1880: 501. Waterhouse, 1884: pt. 21, pl. 145, fig. 6. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 127. Styles, 1973: 355. May, 1987: 48. Kuschel, 1982: 275.

Type data. Holotype female, BMNH, on card, with labels "892" printed, green / "Tairua" printed.

Range. ND, AK, CL, WO / —.

Biology. Adults of *C. variegatus* have been obtained from leaf litter.

Specimens have been reared from a dead *Clematis* vine (May 1993), live wood of *Lupinus arboreus* (May 1987, 1993), live and dead wood of *L. luteus* (R.M. May, pers. comm.), cut *Parsonsia heterophylla* (Poor Knights W81/16 and Lynfield), and a live vine of *Tetrapathaea tetrandra* (May 1987, 1993). Kuschel (1990), referring to Lynfield, states that the species is found "on *Sophora microphylla* and *Parsonsia heterophylla*, the larvae in live plants, heavily attacking the exposed (live) roots of an uprooted *S. microphylla* tree [W76/8]". Styles (1973) reports larvae, pupae, and adults in *Beilschmiedia tarairi*. May (1993) describes the larva.

***Crisius variellus* (Broun) new combination**

Broun, 1914: 243 (*Getacalles*). Hudson, 1934: 222. Hustache, 1936: 129.

Type data. Holotype male, BMNH, on card, with labels "[m.]" printed / "3643" handwritten (Broun) / BMNH holotype disc / "Rakaia; 9.10.1912" handwritten (Broun) / "Getacalles; variellus" handwritten (Broun) / "Getacalles; humeratus; Broun; det G. Kuschel; 1982" handwritten (Kuschel).

Range. — / MC.

***Crisius ventralis* (Broun) new combination**

Fig. 22, 621

Broun, 1885: 387 (*Tychanus*); —1886: 935; —1893a: 1381 (*Getacalles*). Hutton, 1904: 212 (*Tychanus*). Hudson, 1934: 221. Hustache, 1936: 129 (*Getacalles*). Kuschel, 1982: 275; —1990: 73.

inaequalis Broun, 1893a: 1493 (*Getacalles*). Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 129.

Kuschel, 1982: 275 (junior synonym of *G. ventralis*).
favosus Broun, 1909a: 157 (*Getacalles*). Hudson, 1934:
221. Hustache, 1936: 129. Kuschel, 1982: 275 (junior
synonym of *G. ventralis*).
substriatus Broun, 1913: 147 (*Getacalles*). Hudson, 1934:
222. Hustache, 1936: 129. Kuschel, 1982: 275 (junior
synonym of *G. ventralis*).
fulvisparsus Broun, 1921: 653 (*Getacalles*). Hudson,
1934: 222. Hustache, 1936: 129. Kuschel, 1982: 275
(junior synonym of *G. ventralis*).

Type data. *ventralis*: lectotype male here designated, BMNH, on card, with labels "1682." handwritten (Broun) / "Mokohinau I" printed / "Getacalles; ventralis" handwritten (Broun) / BMNH lectotype disc / "Getacalles; ventralis [m.]; (Broun); Kuschel det 1981" handwritten (Kuschel). Paralectotype male, BMNH, on card, no locality data. Original number of specimens in series not stated by Broun.

favosus: lectotype male here designated, BMNH, on card, with labels "2965." handwritten (Broun) / "Ligars; Bush." handwritten (Broun) / "Getacalles; favosus." handwritten (Broun) / BMNH lectotype disc / "= Getacalles; ventralis [m.]; (Broun); Kuschel det 1981" handwritten (Kuschel). Paralectotype male, BMNH, mounted on card on dorsum, same locality. All syntypes located.

fulvisparsus: holotype male, BMNH, on card, with labels "4236" handwritten (Broun) / "Wadestown.; 21.8.1916." handwritten (Broun) / "Getacalles; fulvisparsus" handwritten (Broun) / "= Getacalles; ventralis; (Broun); Kuschel det 1981" handwritten (Kuschel) / BMNH holotype disc.

inaequalis: holotype female, BMNH, on card, with labels "2575." handwritten (Broun) / "Hunua; Maketu." handwritten (Broun) / "Getacalles; inaequalis" handwritten (Broun) / BMNH holotype disc / "= Getacalles; ventralis [f.]; (Broun 1885); det. G. Kuschel; 1982" handwritten (Kuschel).

substriatus: lectotype male here designated, BMNH, on card, with labels "3332." handwritten (Broun) / "Martin-boro.; Wellington" handwritten (Broun) / "Getacalles; substriatus" handwritten (Broun) / BMNH lectotype disc / "= Getacalles; ventralis [m.]; (Broun); Kuschel det. 1981" handwritten (Kuschel). Paralectotype male, BMNH, mounted on card on dorsum, same locality. All syntypes located.

Range. North I. except WO / SD, NN, WD.

Biology. Adults of *C. ventralis* have been taken repeatedly from leaf litter, mostly coastal (Kuschel 1982, 1990), and from birds' nest material and litter in petrel burrows.

Crisius zenomorphus (Broun) new combination

Fig. 131, 623–626

Broun, 1917: 454 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 124.

Type data. Syntypes: 1 male, 1 (?sex), BMNH, on card, male venter uppermost, with labels "3943." handwritten (Broun) / "Lomond.; 7.3.1914." handwritten (Broun) / "Acalles; zenomorphus" handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. — / WD, OL, CO, SL / SI.

Biology. Adult *C. zenomorphus* have been collected from leaf litter, ground plants and decaying wood.

Whitiacalles new genus

Type species *Acalles ignotus* Broun.

Length 2.5–3 mm. Habitus, Fig. 23. Derm brown, shiny, densely squamose, giving insect a smooth, glossy appearance. Scales oval, imbricate, tessellate, and contiguous, appressed, with a few on pronotum and elytra semi-erect or erect; tufts weak or absent; erect setiform scales absent. Pronotum in profile (Fig. 76) weakly convex, weakly depressed anteriorly and at base; elytra smoothly convex. Apterous.

Head. Rostrum shorter than pronotum; punctation dorsally slightly stronger in male; squamosity dense basally, extending to level of antennal insertions in male, less far in female.

Antennae inserted approximately halfway along rostrum. Funicle just less than twice length of scape; F1 and F2 elongate, with F1 longer than F2, together less than length of scape. Scape lacking scales, but scape and funicle with fine, pale, semi-erect and decumbent setae.

Thorax. Pronotum wider than long, widest in posterior half; sides weakly convex, sometimes weakly concave anteriorly; anterior margin very weakly rounded or weakly emarginate medially; posterior margin sinuate (Fig. 23); prominences absent; punctation dense, largely obscured by squamosity; weak, open tufts of scales sometimes present at positions 1, 2, and 3. Scutellum concealed.

Elytra with basal margin incised at either side of interstria 4, raised and projecting anteriorly at I1–3, not wider than pronotum basally; sides convex, more strongly so in anterior half than posteriorly; apex abruptly rounded; prominences absent; stria punctures round, separate; weak

scale tufts generally present at humeri and scattered elsewhere. Elytral strigil present.

Postocular lobe rounded, continuous with marginal carina of prosternal canal. Prosternal canal with a scattering of feathery scales. Mesosternal receptacle (Fig. 132) U-shaped, wider than long, not extending posteriorly to level of midline of middle coxae, with feathery scales internally; margins thin, produced ventrally, especially lateral margins. Metasternum (Fig. 132) deeply concave medially immediately posterior to mesosternal receptacle, separating middle and hind coxae by much less than length of a hind coxa, projecting ventrally between middle and hind coxae. Metepisternum concealed; anapleural suture concealed; sclerolepidia absent.

Fore coxae lacking a posterior projection. Femora lacking a ventral tooth; ventral groove marked by an anterior carina, broad, squamose. Tibiae lacking ventral carina; premucro present. Femora and tibiae with a dense covering of semi-erect and erect scales; tibiae with an anterior patch of scitiform scales distally; tarsi with pale setae dorsally.

Abdomen. Ventrite 1 concave medially, convex laterally; intercoxal process concave, wider than long. Ventrite 2 shorter than V1 (excluding intercoxal process), depressed medially, sloping abruptly towards V3. Ventrites 3 and 4 each slightly more than half length of V2, transversely convex. Punctuation and squamosity dense.

Female terminalia. Tergite VII (Fig. 325) with length and width subequal; 2 pairs of microsetae present, the posterior pair submarginal; anterior margin convex and produced forwards medially; posterior margin weakly convex or truncate. Tergite VIII (Fig. 326) longer than broad; posterior margin convex, with strong crenulations. Sternite VIII (Fig. 327) with apical plate quadrate, not as long as apodeme. Hemisternites of ovipositor with styli terminal; bursa and vagina lacking sclerites; spermathecal duct inserted at junction of bursa and oviduct (Fig. 328, 329).

Male terminalia. Tergite VII (Fig. 627) wider than long, with 2 pairs of microsetae, the posterior pair submarginal; anterior margin convex, produced forwards medially; posterior margin convex. Spiculum gastrale (Fig. 629) longer than aedeagal apodemes; apical arms broad. Tegmen (Fig. 630, 631) with parameres narrow, not as long as tegminal apodeme; apodeme longer than width of tegminal ring. Aedeagal body shorter than its apodemes, strongly curved, much longer than wide; apex truncate, extended as a flat plate (Fig. 632, 633). Endophallus with basal sclerites as a pair of curved rods; flagellum absent (Fig. 632).

Range. New Zealand.

Remarks. The presence of scales in the prosternal canal distinguishes *Whitiacalles* from all but *Rhynchodes*, *Baeorhynchodes*, *Eutyrrhinus*, *Omoecalles*, and *Chypeolus binodes*. The first three (and sometimes specimens of *Omoecalles*) have the scutellum visible, unlike *Whitiacalles*. *Omoecalles* species have the posterior wall of the mesosternal receptacle flush with the metasternum, and none of the genera have a deep pit in the metasternum posterior to the mesosternal receptacle. All, other than *Omoecalles* species, are larger than *Whitiacalles*. A distinctive feature of *Whitiacalles ignotus* is the covering of glossy scales on at least the disc of the pronotum and the elytra, although this character is difficult to describe adequately. The medial depression of the metasternum (Fig. 132) and the anteriorly produced anterior margin of both male and female tergite VIII (Fig. 325, 326) indicate a relationship with *Crisius*, *Hiracalles*, and *Indecentia* (discussed under *Crisius*).

Whitiacalles ignotus (Broun) new combination

Fig. 23, 76, 132, 325–329, 627–633

Broun, 1914: 239 (*Acalles*; not *Acalles ignotus* Blackburn in Blackburn & Sharp, 1885: 180 (Hawaii)). Hudson, 1934: 222. Hustache, 1936: 122.

Type data. Lectotype male here designated, BMNH, on card, with labels "3637" handwritten (Broun) / "Rakaia Gorge.; 5.6.1912." handwritten (Broun) / "Acalles; ignotus." handwritten (Broun). Paralectotype female, BMNH, on card mounted on dorsum, same data as lectotype. Third syntype not located.

Range. — / SD, MC, SC.

Biology. Adults of *W. ignotus* have been collected by beating and sweeping tussock (Stephens Island specimens) and in leaf litter; the larvae are unknown.

Maneneacalles new genus

Type species *Acalles concinnus* Broun.

Length 2.5–4.5 mm. Habitus, Fig. 24. Derm brown, densely squamose. Scales (1) round or oval, appressed or decumbent, sometimes covered by a waxy substance, and (2) elongate, slender, erect, and scattered, with some tufts; scitiform scales absent, although elongate scales approach that condition (Fig. 77). Pronotum in profile (Fig. 77) weakly convex, depressed in anterior third and at base; elytra convex. Apterous.

Head. Rostrum shorter than pronotum, squamose posterior to antennal insertions only; punctuation weak; a weak median longitudinal ridge sometimes present posterior to antennal insertions.

Antennae inserted in proximal half of rostrum. Scape more than half as long as funicle, lacking scales, but scape and funicle with fine, decumbent setae; F1 longer than F2, or F1 and F2 subequal, together about half length of funicle; F2 longer than other segments.

Thorax. Pronotum as long as wide, widest at about middle; sides and anterior margin convex; posterior margin weakly sinuate (Fig. 24); anterior third convex, posterior two-thirds with a longitudinal median depression sometimes terminated near posterior margin by a small, abrupt depression and flanked by broad ridges which themselves sometimes terminate anteriorly in prominences at position 2; punctuation dense; scales (1) oval or round, the latter sometimes with a central depression indicating a 'stalk' (this sometimes obscured when scales covered in waxy substance), separate or contiguous, appressed or erect, and (2) slender and erect, scattered, sometimes with weak tufts at position 1 and stronger tufts at position 2. Scutellum concealed.

Elytra with basal margin straight, not wider than pronotum basally; sides convex anteriorly, convex or weakly concave posteriorly; prominences absent, or 2 prominences present on interstria 3, the hindmost larger; stria punctures large anteriorly and centrally, becoming smaller laterally and posteriorly, round and oval, separate and confluent; scales (1) round and irregular, attached by edge, decumbent, imbricate and separate, and (2) elongate, erect, scattered, with tufts on prominences (if present) and sometimes between prominences. Elytral strigil absent.

Postocular lobe weak, continuous with marginal carina of prosternal canal. Mesosternal receptacle U-shaped, wider than long, cavernous, not extending posteriorly to level of midline of middle coxae; margins produced ventrally. Metasternum concave or flat medially, separating middle and hind coxae by less than length of a hind coxa, not projecting ventrally between middle and hind coxae. Metepisternum partially concealed; anapleural suture obscure, its region with a posteriorly broadening row of irregularly separate or contiguous squamae (Fig. 77, 149).

Fore coxae with a conical posterior projection. Femora lacking a ventral tooth, squamose ventrally; ventral groove absent. Tibiae lacking a ventral carina; premucro present; uncus large.

Abdomen. Ventrite 1 flat or convex medially; intercoxal process concave anterolaterally, wider than long; suture

between ventrites 1 and 2 incomplete medially. Ventrite 2 subequal in length to V1 (excluding intercoxal process), sloping towards V3. Ventrites 3 and 4 each about half length of V2, transversely convex. Punctuation coarse and sparse on V1, otherwise obscure. Scales (1) round and appressed and (2) elongate and semi-erect; fine setae sometimes present on V1 and on V5 posteriorly.

Female terminalia. Tergite VII (Fig. 330) wider than long; microsetae absent; anterior margin very weakly convex; posterior margin weakly convex, sometimes truncate. Tergite VIII (Fig. 331) wider than long; posterior margin weakly convex and crenulate. Sternite VIII (Fig. 332) with apical plate wider than long, faintly sclerotised apart from short 'arms' diverging from apodeme, sometimes with a long cross-bar terminating apodeme anteriorly. Hemisternites of ovipositor with styli terminal, large, compressed dorsoventrally (Fig. 333, 334). Bursa and vagina lacking sclerotisation; spermathecal duct arising on bursa away from junction with oviduct (Fig. 333).

Male terminalia. Tergite VII (Fig. 634) wider than long; microsetae absent, or a single pair present on posterior margin; anterior margin weakly convex; posterior margin biconcave. Spiculum gastrale (Fig. 636) with apodeme subequal in length to aedeagal apodemes; apical arms broad, large. Tegmen (Fig. 637, 638) with parameres undeveloped; apodeme as long as width of tegminal ring, or longer. Aedeagal body sometimes wider than long, shorter than its apodemes, although posterior limit sometimes difficult to determine, curved dorsally but not ventrally (Fig. 640); sides rounded; apex deeply bifid beyond ostium, which apparently opens posteriorly (Fig. 639); ventral surface sclerotised posteriorly, unsclerotised and wrinkled anteriorly; body and apodemes united (Fig. 639, 640). Endophallus with broad, complex basal sclerites; flagellum absent (Fig. 639).

Remarks. *Maneneacalles* can be distinguished from other New Zealand genera by the distinctive separate or contiguous creamy yellow specialised scales along the anapleural suture (Fig. 149) and, for the mainland species, the pronotal appressed scales, which are attached to the derm by a central or near-central stalk. The latter character state is found also in *Omoecacalles* and *Synacalles*, and is approached in some other genera, particularly *Andracalles*. *Omoecacalles* differs from *Maneneacalles* in lacking a posterior wall to the mesosternal receptacle, while *Synacalles* species possess elongate, erect, setiform scales on the pronotum and elytra. The scales are sometimes obscured by wax. The aedeagus is remarkable and unique in New Zealand Cryptorhynchinae in being bifid apically. In situ, the apex lies immediately over the base of the apical

plate of the spiculum gastrale, the apodeme of the spiculum lying almost within the 'notch' in the aedeagus. This is possibly a method of 'packing' the terminalia within the abdomen. No obvious correlation could be found in the female genitalia.

The relationships of *Maneneacalles* are unclear; the elytral markings are similar to those of *Metacalles*, but there are no apomorphies linking the two.

In addition to the mainland species of *Maneneacalles* there are two larger undescribed species found on the Three Kings Islands (Great Island; one collected from *Myoporum laetum*, the other from *Brachyglottis repanda*).

Range. New Zealand.

Maneneacalles concinnus (Broun) new combination

Fig. 24, 77, 149, 184, 195, 330–334, 634–640

Broun, 1893a: 1238 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Lectotype male here designated, BMNH, on card, with labels "2179." handwritten (Broun) / "Waitakerei" printed / "Acalles; concinnus" handwritten (Broun). Original number of syntypes not stated by Broun.

Range. ND, AK, BP, WN / —.

Biology. Adults of *M. concinnus* have been found in leaf litter. Specimens have been reared from dead branchlets of *Fuchsia excorticata*.

Synacalles new genus

Type species *Acalles hystriculus* Pascoe, 1876.

Length 1.25–3.5 mm. Habitus, Fig. 25. Derm dark brown, densely squamose, sometimes covered by waxy substance. Pronotum in profile (Fig. 78–81) convex, depressed anteriorly; pronotum and elytra clearly depressed at base; elytra convex. Pronotum with scales separate, contiguous, or tessellate, round, appressed or decumbent; elytra with scales contiguous, tessellate, or imbricate, round or oval, appressed, decumbent, or erect, sometimes gathered into tufts; round scales smaller on elytra than on pronotum; setiform scales or erect, clongate, broader scales present. Apterous.

Head. Rostrum shorter than pronotum; punctation coarse or weak, weaker towards apex than basally, where punc-

tures sometimes confluent, particularly in male; basal carina sometimes present, more apparent in male; squamosity more extensive in male, variable between groups.

Antennae inserted in proximal half of rostrum. Funicle longer than scape; F1 sometimes more swollen than F2; F1 and F2 subequal, or F1 longer than F2, together about half as long as funicle and more than half as long as scape. Scape lacking scales, but scape and funicle with fine, semi-erect or decumbent setae. Club darker than rest of antenna, or concolorous.

Thorax. Pronotum with length and width subequal, widest at middle or in posterior half; sides strongly convex; anterior margin convex, projecting strongly over head; posterior margin straight (Fig. 25); prominences absent; punctation dense, coarse or fine; a median longitudinal band of pale scales frequently present. Scutellum small or concealed.

Elytra with basal margin straight or weakly sinuate, as wide as pronotum basally; sides convex, widest in anterior or posterior half (Fig. 25); interstriae clear, with I2 and I3 more or less raised at base, although very weakly in some species; striae punctures large, sometimes encroaching on interstriae; prominences absent, or very weak prominences present along suture (group IV) or elsewhere; scale tufts absent or scattered, sometimes strongest along suture (group IV) or interstria 3 (some group II); 'ruffs' of erect, oval scales densely packed along base of interstria 3 and apically along suture sometimes present in group III; erect scales frequently pale when arising from a 'bed' of pale oval scales, otherwise brown or black. Elytral strigil absent.

Postocular lobe small or moderate-sized, smoothly continuous with marginal carina of prosternal canal. Mesosternal receptacle deep, cavernous, either (1) cup-shaped, with lateral margins shorter than posterior margin and not extending posteriorly to level of midline of middle coxae, or (2) U-shaped, with lateral and posterior margins subequal in length and extending at least to level of midline and sometimes to near posterior margin of middle coxae; margins produced ventrally. Metasternum flat posterior to mesosternal receptacle, separating middle and hind coxae by less than length of a hind coxa or by a distance subequal to length of a hind coxa (*S. peelensis*). Metepisternum concealed (groups II and IV) or narrow and largely concealed (groups I and III); sclerolepidia absent, or present as 1 or 2 rows of flat, glossy scales near elytral margin (some group III) (Fig. 80).

Fore coxae with a posterior projection. Femora squamose ventrally, lacking a ventral tooth or groove. Tibiae lacking a ventral carina; premucro sometimes obscure.

Abdomen. Ventrite 1 convex, flat or concave medially; intercoxal process wider than long, concave at least anteriorly; suture between ventrites 1 and 2 sometimes incomplete medially. Ventrite 2 shorter than VI or subequal in length (excluding intercoxal process), generally sloping abruptly to V3 posteriorly. Ventrites 3 and 4 together shorter than V2 or subequal, transversely convex. Punctuation sparse or moderate, more or less coarse. Scales oval or elongate, separate.

Female terminalia. Tergite VII (Fig. 335) as wide as long, lacking microsetae; anterior and posterior margins weakly convex. Tergite VIII (Fig. 336, 340) as long as wide or longer (group II); posterior margin convex or truncate, dentate or smooth (group IV). Sternite VIII (Fig. 337, 341) with apical plate as wide as long or wider, shorter than its apodeme. Hemisternites of ovipositor sometimes broad (groups II, III); styli terminal, long (group II) or short (groups I, IV), and sometimes compressed (group I) (Fig. 338, 339, 342, 343). Spermatheca slender (groups I, II) or broad (groups III, IV). Spermathecal duct sometimes wide (group I; Fig. 342), arising at (group II) or away from junction of oviduct and vagina (groups II, III, IV) (Fig. 338); vagina and bursa lacking sclerites (Fig. 338, 342).

Male terminalia. Tergite VII (Fig. 641, 648, 655, 662) wider than long, lacking microsetae; anterior margin convex; posterior margin truncate, weakly convex, sinuate, or weakly concave. Hemisternites of sternum VIII sometimes connected by a sclerotised bridge (Fig. 663). Spiculum gastrale (Fig. 643, 656, 657, 664) shorter or longer than aedeagal apodemes or subequal in length; posterior plate very variable. Tegmen (Fig. 644, 645, 651, 652, 658, 659, 665, 666) with parameres shorter than width of ring, sometimes very short (group I); apodeme longer than width of ring (group I), much longer than width of ring (group II and part of group I), or shorter than width of ring (groups III and IV). Aedeagal body less than half as long as its apodemes (groups I and II), shorter than apodemes but more than half their length (group IV), or longer than apodemes (group III); sides parallel and apex sinuate or acuminate (group I), or diverging from base to rounded, acuminate apex (group II), or diverging from base or emarginate and diverging to rounded apex (group III), or rounded to narrowly truncate apex (group IV); aedeagal body generally curved, sometimes strongly so, and sometimes sclerotised dorsally (group I); apodemes and body united (Fig. 646, 647, 653, 654, 660, 661, 667, 668). Endophallus without sclerites, or sclerites of various forms; flagellum absent (groups III, IV), short (group II), or long (group I) (Fig. 646, 653, 660, 667).

Range. New Zealand, (?) Norfolk I.

Remarks. *Synacalles* belongs to the *Metacalles* group of genera. In common with others in this group most species have long, erect setiform scales on the pronotum, elytra, and legs, although in the described species of *Synacalles* group I (see below) and *S. hystriculus* and *S. trinotatus* these scales are relatively short and broad. *Synacalles* may be distinguished from other genera in the group by the round dorsal pronotal scales (slightly oval in *S. dorsalis*, but this species is unique in New Zealand in having its two elytral setal tufts on the suture).

There is some discussion in the 'Systematics' section on the confused state of the *Metacalles* group. At present there is no clear autapomorphy for *Synacalles*, although the round dorsal pronotal scales may qualify. However, the constituent species-groups cannot be distinguished readily without dissection of the males, and I feel that, at present, the most useful treatment is as a single genus, even though it may be paraphyletic. Within the genus there are four clear monophyletic groups, as follows.

- Group I. These have the longest endophallic flagellum so far seen in New Zealand cryptorhynchines and a very short aedeagal body (Fig. 646, 647). The ventral surface of the aedeagal body is 'wrinkled' like that of *Strongylopterus*, although a relationship is not suggested. Although the described species have relatively short, erect scales on pronotum and elytra, an undescribed sister species to *S. peelensis+mundus* has erect setiform scales, indicating that the shorter form is probably apomorphic within the group. The dorsal pronotal scales are round and appressed, with a central 'stalk', similar to those of group III and *Maneneacalles concinnus*.

- Group II. There is only a single described species in group II, the two named species being synonymised here. A second, undescribed species from the Nelson area probably belongs to the group. The antennal club is darker than the funicle and scape, an apomorphic character state found elsewhere sometimes in *Synacalles posticalis* (group III), in all described species of *Metacalles*, two species of *Agacalles*, and most species of *Dermothrius*. This character is discussed also in the Systematics section. There is a small sclerite in the endophallus that seems to be a type of flagellum.

- Group III. There are three members of group III in New Zealand and, surprisingly, *Microcryptorhynchus setosus* Lea from Norfolk Island also probably belongs to this clade, although formal transfer has not been made since a male for dissection has not been available. The aedeagus is longer than its apodemes and sometimes strongly curved (Fig. 660, 661), a character state unique in New Zealand Cryptorhynchinae. The base of interstria 3 has a 'ruff' of erect, round scales, and a similar arrangement is present on

the suture towards the apex (Fig. 25); this character state is much less marked in *S. posticalis* than in the other two New Zealand species, though fairly distinct in *M. setosus*. The dorsal pronotal scales have a central 'stalk', as do those of group I species. Two of the species, *S. hystriculus* and *S. trinotatus*, have the scutellum visible and sclerolepidia apparent, both plesiomorphic character states within the *Metacalles* genus-group.

• Group IV. The two named species are synonymised here. The species is unique in New Zealand in the position of the elytral setal tufts (see above), although central tufts are found in other species in conjunction with tufts elsewhere on the elytra (e.g., *Synacalles* group I, *Metacalles*). The female tergite VIII lacks any crenulation or projecting stout setae, unlike other members of the genus or genus-group. The degree to which interstriae 2 and 3 are raised basally is least in this species-group among all members of the *Metacalles* group of genera, and may not be noted.

GROUP I

Synacalles mundus (Broun) new combination

Broun, 1881: 724 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 123.

Type data. Holotype male, BMNH, on card, with labels "1283." printed, green / "Whangarei" printed / "Acalles; mundus." handwritten (Broun).

Range. ND / —.

Synacalles peelensis (Broun) new combination

Fig. 78, 340–343, 641–647

Broun, 1913: 135 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 123. Styles, 1973: 356. May, 1987: 47.

consors Broun, 1913: 136 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121. New synonymy.

Type data. *peelensis*: lectotype male here designated, BMNH, on card, head detached, with labels "3315" handwritten / "Mount; Peel." handwritten (Broun) / "Acalles; peelensis" handwritten (Broun). Paralectotype male, BMNH, on card on dorsum, same data as lectotype. All syntypes located.

consors: 4 syntypes (?sex), BMNH, on card, with labels "3316." handwritten (Broun) / "M[♂] Greenland; Ross. 2500 feet." handwritten (Broun) or "M[♂] Greenland; Ross. 2500 ft." handwritten (Broun) or "M[♂] Greenland; Ross..." handwritten (Broun) / "Acalles; consors" handwritten (Broun).

Original number of specimens not stated by Broun.

Range. ND, AK, BP, TK, TO/SD, NN, BR, WD, NC, MC, SC, OL, FD.

Biology. Adults of *S. peelensis* have been collected a number of times in leaf litter, as well as in moss, on fungus, *Collosporum* on *Agathis australis*, and *A. australis* itself at night, dead branches, logs and stumps at night, dead *Nothofagus* at night, and by sweeping *Blechnum* and *Paeisia*. The species has been reared from a dead stump of *Nothofagus cliffortioides* (May 1987), *Fuchsia excorticata* (Styles 1973), *Coprosma foetidissima* and dead wood of elm (*Ulmus*).

GROUP II

Synacalles cingulatus (Broun) new combination

Fig. 79, 648–654

Broun, 1883: 437 (*Acalles*); —1886: 798 (repetition of Broun, 1883). Hutton, 1904: 213 (attributed to Broun, 1886). Hudson, 1934: 222 (attributed to Broun, 1886). Hustache, 1936: 121. Kuschel, 1990: 73 ('*Acalles*').

facilis Broun, 1893a: 1486 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121. Styles, 1973: 357. New synonymy.

Type data. *cingulatus*: 6 syntypes (?sex), BMNH (4) and NZAC (2), on clear plastic rectangle each with 1 mounted on venter, 1 on dorsum, with labels "1423" printed, green (1), handwritten (1) / "Wellington" printed (BMNH only) / "Acalles; cingulatus" handwritten (Broun) (1 BMNH and NZAC, which has two such labels). All syntypes located.

facilis: lectotype female here designated, BMNH, on card, with labels "2566." handwritten (Broun) / "Hunua; Maketu." handwritten (Broun) / "Metacalles; facilis.." handwritten (Broun). Paralectotype female, BMNH, on card on dorsum, same data as lectotype. All syntypes located.

Range. ND, AK, CL, BP, TK, TO, WN / —.

Biology. Adults of *S. cingulatus* have been collected from leaf litter. Kuschel (1990, p. 73) reports for Lynfield, Auckland: "Some in *Parsonsia heterophylla*, most from litter of sedges, especially coastal *Gahnia lacera* and *Blechnum 'capense'*." Adults have also been collected from *Aristotelia serrata* at night and by beating dead wood. Specimens have been reared from the bark of *Brachyglottis repanda* and from *Fuchsia excorticata* (Styles 1973, both as *Acalles facilis*).

GROUP III

Synacalles hystriculus (Pascoe) new combination

Fig. 25, 80

Pascoe, 1876b: 63 (*Acalles*). Broun, 1880: 489. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 122. Styles, 1973: 356. Kuschel, 1990: 73 ('*Acalles*').

Type data. Syntypes: 2 (?sex), BMNH, on single card, 1 on dorsum, with BMNH type disc/and labels "Acalles; hystriculus; type Pasc." handwritten (Pascoe) / "N.Z.; Tairua" handwritten (Pascoe), yellow oval / "Pascoe Coll.; 93-60." printed / BMNH syntype disc / "Acalles; hystriculus Pasc" handwritten (Pascoe), Pascoe Coll. series label. Possible syntypes: 3 (?sex), on card, with labels "Tairua; New Zealand." printed / "Pascoe Coll.; 93-60." printed / BMNH syntype disc / "SYNTYPE?; Acalles; hystriculus; Pascoe, 1876; Lya! det 1988" printed.

Range. ND, AK, CL, BP, TO, RI, WN / SD, NN, BR, SC, DN.

Biology. Adults of *S. hystriculus* have been collected in leaf litter, and Kuschel (1990) reports that they are attracted in numbers to cut *Rubus cissoides* and *Parsonia heterophylla* and are also on adventive *Rubus fruticosus* at bush margins. Specimens have been collected subcortically in *Rubus* sp., and reared (Styles 1973) from dead *Ripogonum scandens*, *Clematis* spp. (2 records) and *Kunzea ericoides*.

Synacalles posticalis (Broun) new combination

Fig. 655–661

Broun, 1886: 868 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124. *albicrista* Broun, 1914: 244 (*Onias*). Hudson, 1934: 223. Hustache, 1936: 125. New synonymy.

Type data. *posticalis*: lectotype female here designated, NZAC, on card, with labels "F" handwritten / "Acalles; posticalis" handwritten / "T. Broun; Dup. Coll." printed. One syntype not located.

albicristus: 2 syntypes (?sex), BMNH, on card, with labels "3645" handwritten (Broun) / "Bell Rock; 3.9.1912." handwritten (Broun) / "Onias; albicristus" handwritten (Broun) (1 only). One syntype not located.

Range. — / NN, MB, MC, SC, OL, DN.

Biology. Adults of *S. posticalis* have been collected from leaf litter, moss in *Nothofagus* forest, dead branches of

Beilschmiedia tawa, and *Melicytus ramiflorus*. There are rearing records from the bark of dead *Aristotelia serrata* branches about 5 cm in diameter (W67/82) and from *Rubus australis* (W72/9).

Synacalles trinotatus (Broun) new combination

Broun, 1880: 490 (*Acalles*). Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Holotype (?sex), BMNH, on card, with labels: "871." printed, green / "Manaia" printed.

Range. ND, AK, (?)TK / —.

GROUP IV

Synacalles dorsalis (Broun) new combination

Fig. 81, 335–339, 662–668

Broun, 1881: 722 (*Aca species* have relatively shornton, 1934: 222. Hustache, 1936: 121. Kuschel, 1990: 73 ('*Acalles*').

rubricus Broun, 1881: 723 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124. New synonymy.

Type data. *dorsalis*: holotype male, BMNH, on card, with labels "1278." printed, green / "Whangarei" printed / "Acalles; dorsalis." handwritten (Broun).

rubricus: lectotype male, BMNH, on card, with labels "1281." printed, green / "Parua" printed / "Acalles; rubricus." handwritten (Broun). Paralectotype male, NZAC, on card, same data as lectotype but with "T. Broun; Dup. Coll." printed. All syntypes located.

Range. ND, AK, CL, TK, TO / —.

Biology. Adults of *S. dorsalis* have been collected by beating from a number of plants, including *Beilschmiedia tawa* + *Lygodium articulatum*, *Brachyglottis repanda*, *Macropiper excelsum*, *Metrosideros albiflora*, *M. robusta*, *Vitex lucens* (dead wood), *Weinmannia silvicola* and, at night, *Blechnum 'capense'*, *B. lanceolatum* and *Gahnia* (leaves). Specimens have also been obtained from dead wood and leaf litter, and Kuschel (1990) reports that at Lynfield the species can be found "In litter under *Alseuosmia macrophylla* and among bush floor *Carex* and *Uncinia*."

The species has been reared from dead branches of *Alseuosmia macrophylla* (W67/91).

Genus *Dermothrius* Broun

Broun, 1882: 128 (new name for *Pachypeza* Broun, 1881, not *Pachypeza* Serville in Dejean, 1835 (Coleoptera: Cerambycidae)). Anon, 1882: 409. Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 130. Type species *Pachypeza sanguinea* Broun, 1881, by monotypy.

Pachypeza Broun, 1881: 729.

Atylodes Broun, 1914: 137. Hudson, 1934: 222. Hustache, 1936: 125. Type species *Atylodes foveiger* Broun, 1914, by original designation. New synonymy.

Length less than 2 mm. Habitus, Fig. 260. Derm black or brown, shiny, sparsely or densely squamose, frequently covered with gummy substance. Scales generally elongate, slender, separate, erect, semi-erect, or decumbent (*D. brevipennis* with dense, imbricate, round, appressed scales); erect setiform setae present or absent. Pronotum in profile (Fig. 82) convex, more or less depressed in anterior third; pronotum and elytra depressed at base; elytra fairly strongly convex. Apterous.

Head. Rostrum shorter than pronotum; punctation dorsally sometimes coarser in male, sometimes confluent basally to form irregular longitudinal striae; a raised, impunctate, median longitudinal strip sometimes apparent, especially towards base; basal squamosity sometimes more extensive in male.

Antennae inserted approximately halfway along rostrum. Funicle longer than scape; F1 and F2 elongate, subequal or with F2 shorter than F1, together half (rarely less) length of funicle. Scape lacking scales, but scape and funicle with fine, semi-erect and decumbent setae. Club generally darker than rest of antenna.

Thorax. Pronotum as wide as long or wider, widest in posterior half; sides convex posteriorly, shallowly or deeply concave anteriorly; anterior margin strongly convex; posterior margin straight or weakly convex (Fig. 26); prominences absent; punctation generally dense, rarely with broad reticulations between punctures; scales generally very sparse, semi-erect or erect, rarely imbricate and decumbent. Scutellum concealed.

Elytra with basal margin straight, sometimes produced anteriorly at interstria 2, sometimes wider than pronotum basally; sides convex; interstriae convex, strongly marked; prominences absent; striae punctures generally confluent longitudinally, otherwise deep; scales generally very sparse, (1) elongate and semi-erect, rarely contiguous or imbricate, (2) rounder and decumbent or semi-erect. Elytral strigil absent.

Postocular lobe rounded, continuous with marginal carina of prosternal canal, sometimes very weak. Mesosternal receptacle U-shaped, as wide as long or wider, cavernous, not extending posteriorly to level of midline of middle coxae; margins produced ventrally. Metasternum concave medially, sometimes deeply so, separating middle and hind coxae by less than length of a hind coxa, not projecting ventrally between middle and hind coxae, or weakly projecting, covered laterally by agglutinated scales, these extending in a thin line between middle and hind coxae (Fig. 150). Metepisternum at least partly concealed by elytron; anapleural suture concealed by agglutinated scales.

Fore coxae with a posterior projection. Femora lacking a ventral tooth; ventral groove generally clear, glabrous, or squamose. Tibiae with ventral carina present or absent, premucro absent.

Abdomen. Ventrite 1 flat or concave medially, sometimes very deeply so; intercoxal process flat or concave, wider than long; suture between V1 and V2 sometimes incomplete medially. Ventrite 2 subequal in length to V1 (excluding intercoxal process) or shorter, sloping towards V3, especially posteriorly. Ventrites 3 and 4 together shorter than V2, transversely convex. Ventrite 5 sometimes with a deep posteromedian indentation in female. Punctation dense or sparse. Squamosity sparse.

Female terminalia. Tergite VII (Fig. 344) wider than long; microsetae absent; anterior and posterior margins weakly convex. Tergite VIII (Fig. 345) as long as wide, or longer; posterior margin convex, crenulate. Sternite VIII (Fig. 346) with apical plate as long as wide, shorter than apodeme; apex of apodeme generally broadly T-shaped. Hemisternites of ovipositor with styli terminal (Fig. 347, 348); spermathecal duct arising on bursa away from junction of bursa and oviduct; bursa and vagina lacking sclerites (Fig. 347).

Male terminalia. Tergite VII (Fig. 669) wider than long; microsetae absent; anterior margin convex; posterior margin truncate or concave. Spiculum gastrale (Fig. 671) with apodeme longer or shorter than aedeagal apodemes but not as long as entire aedeagus; apex of apodeme sometimes bifurcate; apical arms small or elongate. Tegmen (Fig. 672, 673) lacking parameres; apodeme longer than width of tegminal ring. Aedeagus with body longer or shorter than apodemes, longer than wide; sides weakly rounded or subparallel, with apex more strongly rounded and downturned, acuminate or truncate; dorsum sometimes sclerotised anteriorly; body and apodemes united (Fig. 674, 675, 676, 677). Endophallus with basal sclerites weak or absent; flagellum absent (Fig. 674, 676, 677).

Range. New Zealand.

Remarks. *Dermothrius* can be distinguished from all other genera except *Paromalina* and some *Trinodicalles* species by the presence of a broadly triangular patch of agglutinated scales on the metasternum, extending from the lateral margin to generally between the middle and hind coxae. Species differ from those of *Paromalina* in not having a ventral tooth on the femur, and *Trinodicalles* species can be distinguished from both *Dermothrius* and *Paromalina* by the presence of prominences on clytral interstriae 1 and 3.

D. brevipennis differs from other species in the genus in being densely squamose dorsally, having the apex of the apodeme of female sternite VIII not broadly T-shaped, and having the styli of the ovipositor more elongate. All but the last of these character states are plesiomorphic within the New Zealand Cryptorhynchinae, and species of *Paromalina*, the probable sister-group of *Dermothrius*, do not have the apomorphic states as exhibited in *Dermothrius* species other than *D. brevipennis*. There are no clear autapomorphies for *Paromalina*, although the femoral teeth may be apomorphically regained rather than plesiomorphically present. Thus, the arrangement of species between *Dermothrius* and *Paromalina* does not reflect an unequivocal cladistic judgment, but rather a compromise reached for ease of identification.

Within *Dermothrius* there are two clear species pairs, *asaphus* + *farinosus* and *sanguineus* + *puncticollis*, though each pair may represent only one species. The apomorphic flattened and truncate form of the aedeagal apex links *sanguineus* + *puncticollis* with *D. ruficollis*, while the bifurcate apodeme of the spiculum gastrale is found in *puncticollis* + *sanguineus* alone.

The anterior sclerotisation of the dorsum of the aedeagus is most marked in the species with a truncate aedeagal apex, but is also probably present in other species apart from *D. brevipennis*. The sclerotisation is based on the membranous connection between the two apodemes, present in all species, including *D. brevipennis* (Fig. 677), although generally not figured elsewhere in this study.

***Dermothrius asaphus* (Broun) new combination**

Broun, 1921: 577 (*Atylodes*). Hudson, 1934: 222. Hustache, 1936: 125.

Type data. Syntypes (?sex): 2 NZAC (mounted on a single card, 1 on dorsum, 1 on side), 4 BMNH (on 3 cards, the pair mounted 1 on venter, 1 on side), with labels "4129." handwritten (Broun) (BMNH specimens only) / "Pakuratahi.; 2.1.1915." handwritten (Broun) / "Atylodes; asaphus."

handwritten (Broun) / "T. Broun; Dup. Coll." printed (NZAC specimens only). Original number of syntypes not stated by Broun.

Range. WN / —.

Biology. Adults of *D. asaphus* have been found in leaf litter.

***Dermothrius brevipennis* (Broun) new combination**

Fig. 677

Broun, 1921: 655 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121.

Type data. Syntypes: 5 (?sex), BMNH, on cards (1 on dorsum), with labels "4239" handwritten (Broun) (2 only) / "4239. [f.]" handwritten (Broun) (1 only) / "Rotorua; 28.12.15." handwritten (Broun) / "A. brevip." handwritten (Broun) (1 only) / "Acalles [f.]; brevipennis" handwritten (Broun) (1 only) / "Acalles; brevipennis" handwritten (Broun) (1 only). All syntypes located; further specimens with same data in NZAC.

Range. — / SD, NN, BR.

Biology. Adults of *D. brevipennis* have been taken from leaf litter and moss under *Nothofagus* trees.

***Dermothrius farinosus* (Broun)**

Broun, 1893b: 378 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 122. Kuschel, 1990: 73 (*Dermothrius*).

Type data. Syntypes (?sex): 2 BMNH (1 mounted on dorsum), 1 NZAC, on card, with labels "2941" handwritten (Broun) / "Waikato" printed (BMNH specimens only) / "Mt. Pirongia.; Dec. 1892; T. Broun" handwritten (Gourlay?) (NZAC only) / "Acalles; farinosus." handwritten (Broun) (BMNH specimens only) / "Acalles farinosus; Paratype" handwritten (Gourlay?) (NZAC only) / "E.S. Gourlay; Acc. 1970; Ent. Div." printed (NZAC only) / "ATYLODES; farinosus Broun" handwritten (NZAC only). Original number of syntypes not stated by Broun.

Range. AK, CL, WO, TO / —.

Biology. Adults of *D. farinosus* have been found in leaf litter (Kuschel 1990).

***Dermothrius porcatus* (Broun) new combination**

Fig. 676

Broun, 1893b: 377 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 124.

porcatus var. *xenorhinus* Broun, 1893b: 378 (*Acalles*). Hustache, 1936: 124. New synonymy.

Type data. *porcatus*: 2 syntypes (?sex), BMNH, on card (1 mounted on dorsum), with labels "2938" handwritten (Broun) / "Waikato" printed (one on venter only) / "Atylodes; porcatus." handwritten (Broun) (one on venter only) / "Acalles; porcatus" handwritten (Broun) (one on dorsum only). Two syntypes not located.

xenorhinus: lectotype (?sex), BMNH, on card, with labels "2939" handwritten (Broun) / "Waikato" printed / "var. A.; xenorhinus" handwritten (Broun). Original number of syntypes not stated by Broun, but probably only one.

Range. WO / —.

Biology. Adults of *D. porcatus* have been found in leaf litter.

***Dermothrius puncticollis* (Broun) new combination**

Broun, 1893b: 378 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Syntypes: 2 (?sex), BMNH, on card, with labels "2940" handwritten (Broun) / "Waikato" printed / "Atylodes; puncticollis." handwritten (Broun) (1 only). One syntype not located.

Range. WO, BP / —.

Remarks. There is material from the South Island of *puncticollis* / *sanguineus* in BMNH.

***Dermothrius ruficollis* (Broun)**

Fig. 26, 82, 150, 344–348, 669–675

Broun, 1893b: 376 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 124. Kuschel, 1990: 73 (*Dermothrius*).

foveiger Broun, 1914: 137 (*Atylodes*). Hudson, 1934: 222. Hustache, 1936: 125. New synonymy.

Type data. *ruficollis*: 3 syntypes (?sex), BMNH, on card (1 on dorsum), with labels "2937" handwritten (Broun) (2 on venter only) / "2937 [m.]" handwritten (Broun) (1 on dorsum only) / "[m.]" handwritten (1 on dorsum only) /

"Waikato" printed (2 only) / "Pirongia" printed (1 only) / "Acalles; ruficollis" handwritten (Broun) (1 only) / "Atylodes; ruficollis" handwritten (Broun) (1 only). Three syntypes not located.

foveiger: 2 syntypes (?sex), BMNH, on card (1 on dorsum), with labels "3461." handwritten (Broun) / "Mount; Te Aroha" handwritten / "Atylodes; foveiger. [m.]" handwritten (Broun). One syntype not located.

Range. AK, CL, WO, BP, TO / —.

Biology. Adults of *D. ruficollis* have been found in leaf litter. Specimens have been reared from petioles of fallen leaves of *Knightia excelsa*.

***Dermothrius sanguineus* (Broun)**

Broun, 1881: 730 (*Pachypeza*); —1882: 128 (*Dermothrius*). Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 130. Kuschel, 1990: 73.

Type data. Holotype (?sex), BMNH, on clear plastic rectangle with green base, with labels "1295." printed / "Parua" printed / "Dermothrius; sanguineus" handwritten (Broun).

Range. ND, AK / —.

Biology. Adults of *D. sanguineus* have been found under *Blechnum 'capense'* at Lynfield (Kuschel 1990).

Genus *Paromalía* Broun

Broun, 1880: 496; —1881: 730. Hustache, 1936: 130.

Type species *Paromalía setiger* Broun, 1880, by subsequent designation (Broun 1895, p. 411).

Cyclacalles Broun, 1895: 411. Hutton, 1904: 214. Hudson, 1934: 223. Unnecessary replacement name.

Schylus Broun, 1895: 411. Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 131. Type species *Schylus nigricollis* Broun, 1895, by monotypy. New synonymy.

Length 1.6–3 mm. Habitus, Fig. 27. Derm brown to black, sometimes covered in waxy material. Head and pronotum weakly squamose, sometimes mostly glabrous except for patches of appressed, tessellate or imbricate, round, cream scales on pronotum near posterior margin or along sides; elytra generally more densely squamose. Scales elongate, decumbent, separate; erect setiform scales present or, if absent, then derm with short, erect, elongate scales.

Pronotum and elytra in profile (Fig. 83) smoothly convex, not or only weakly depressed basally. Apterous.

Head. Rostrum shorter than pronotum; punctation coarse, sometimes confluent and delimiting 3 longitudinal carinae along at least part of rostrum; squamosity weak, sometimes slightly coarser in male.

Antennae inserted in anterior half of rostrum, generally nearer apex in male. Scape subequal in length to funicle or longer, lacking scales, but scape and funicle with fine, semi-erect and decumbent setae; F1 and F2 subequal in length, together as long as rest of flagellum.

Thorax. Pronotum wider than long, widest towards base; sides convex posteriorly, weakly concave anteriorly; posterior margin weakly convex; anterior margin convex, strongly projecting over head (Fig. 27); prominences absent; punctation coarse, dense, or less dense and with a median longitudinal impunctate strip; scales not gathered into tufts. Scutellum concealed.

Elytra with basal margin straight, as wide as base of pronotum; sides strongly convex, with apical curvature not distinct (Fig. 27); prominences absent; striae punctures weak or strong, oval, not confluent; scales not gathered into tufts. Elytral strigil absent.

Postocular lobes rounded, continuous with marginal carinae of prosternal canal or projecting in between. Mesosternal receptacle U-shaped, wider than long, not extending posteriorly to midline of middle coxae; margins projecting weakly ventrad. Metasternum flat or concave, separating middle and hind coxae by less than length of a hind coxa, projecting ventrad between middle and hind coxae. Agglutinated scale patch concealing sometimes swollen metepisternum, at least anterior part of anapleural suture, and metasternum laterally, sometimes extending between external margins of middle and hind coxae (Fig. 151).

Fore coxae with a posterior projection. Femora with a ventral tooth, largest on anterior femur, sometimes very small on hind femur; ventral groove broad, inclined posteriorly, glabrous (sometimes covered in waxy material). Tibiae without a ventral carina; uncus broad or slender, arising near ventral side on fore tibia; premucro absent.

Abdomen. Suture between ventrites 1 and 2 lost; ventrites flat or weakly convex medially, sloping towards V3 posteriorly; intercoxal process flat or weakly convex, wider than long. Ventrites 3 and 4 subequal in length, together subequal in length to V1+2 (excluding intercoxal process) or longer, transversely convex. Punctation deep, more or less coarse and dense, absent on V3 and V4. Scales fine, elongate, sparse.

Female terminalia. Tergite VII (Fig. 349) as long as wide; microsetae absent; anterior and posterior margins convex. Tergite VIII (Fig. 350) longer than wide; posterior margin convex, crenulate. Sternite VIII (Fig. 351) with apical plate as long as wide, shorter than apodeme. Hemisternites of ovipositor with styli terminal (Fig. 352, 353) or subterminal; spermathecal duct arising at junction of bursa and oviduct (Fig. 352) or on bursa away from junction; bursa and vagina lacking sclerites.

Male terminalia. Tergite VII (Fig. 678) wider than long; microsetae absent; anterior margin convex; posterior margin truncate or concave. Spiculum gastrale (Fig. 680) with apodemes shorter or longer than aedeagal apodemes, shorter than entire aedeagus; apical arms short. Tegmen (Fig. 681, 682, 685, 686) with parameres not longer than apodeme, sometimes fused together (Fig. 681); apodeme shorter or longer than width of tegminal ring. Aedeagal body one-third as long as its apodemes or subequal (Fig. 683, 687), longer than wide, with sides sinuate or rounded; apex strongly or weakly acuminate, sometimes deflexed ventrad (Fig. 684); dorsum sclerotised or largely membranous; body and apodemes united; setae present apically and sometimes ventrally on body (Fig. 684, 688). Endophallus with basal sclerites weak or absent; flagellum absent (Fig. 683, 687).

Range. New Zealand (North I. only).

Remarks. *Paromalina* differs from all other New Zealand Cryptorhynchinae by the presence both of the large patch of glossy, agglutinated scales on the sides of the metasternum and the ventral femoral teeth. It seems to be the only small, apterous, litter-dwelling genus that possesses the femoral tooth, other than some *Scelodolichus* and *Agacalles*. In other respects the short, round body form approximates to that of a number of genera, particularly *Dermothrius*, which shares with *Paromalina* the apomorphic form of the thoracic agglutinated scales and is clearly a closely related genus. This is discussed further under *Dermothrius* and in the 'Systematics' section.

Within *Paromalina* there is great variation in the form of the male genitalia. Two species are figured here, *P. setiger* (Fig. 678–684) and *P. vestita* (Fig. 685–688); the third, *P. nigricollis*, has parameres separate only at the apex and an aedeagal body approximately one-third the length of the apodemes but deflexed apically rather than basally, as in *P. vestita*. Despite the aedeagal variation there seems little evidence that any of these species is more closely related to *Dermothrius* or any other genus than it is to other species within *Paromalina*. The only character state that indicates a different interpretation is the position of the spermathecal

duct on the bursa, plesiomorphically at the junction of the bursa and oviduct in *P. nigricollis*. This may be a reversal from the apomorphic position on the bursa away from the junction, and the synapomorphic form of the agglutinated scales and the femoral teeth indicate that this is the case.

The thorax of *P. setiger* bears laterally a patch of appressed, circular, concave white scales each with a central 'stalk' (Fig. 27). Such scales are not found in any other member of *Paromalina*, although *P. nigricollis* has small patches of circular, hemispherical yellow scales on the pronotum.

Paromalina nigricollis (Broun) new combination

Fig. 350–353

Broun, 1895: 412 (*Schylus*). Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 131.

Type data. Syntypes: 2 (?sex), BMNH, on card (1 on dorsum), with labels "2961" handwritten (Broun) / "Ligar's; Bush." handwritten (Broun) (1 on dorsum only) / "Mount; Te Aroha" handwritten (Broun) (1 on venter only) / "Schylus; nigricollis" handwritten (Broun) (1 on venter only). One syntype not located.

Range. ND, AK, WO–BP / —.

Biology. Adults of *Paromalina nigricollis* have been found in leaf litter.

Paromalina setiger Broun

Fig. 27, 83, 349, 678–684

Broun, 1880: 497 (*Paromalina*). Hutton, 1904: 214 (*Cyclacalles*). Hudson, 1934: 223. Hustache, 1936: 130 (*Paromalina setigera*). Kuschel, 1990: 74.

Type data. Syntypes: 2 (?sex), BMNH, NZAC, on card, with labels "883" printed, green / "Manaia" printed (BMNH specimen only) / "Cyclacalles; setiger." handwritten (Broun) / "setiger; Broun" typed (NZAC specimen only). Three syntypes not located.

Range. ND, AK, CL, WO, BP, RI, WA / —.

Biology. Adults of *Paromalina setiger* have been found in leaf litter, and Kuschel (1990) reports, in addition, taking specimens from inside a large, hollow *Metrosideros excelsa*; they have also been taken from *Knightia excelsa*, *Elaeocarpus* and dead *Rhopalostylis sapida* fronds.

Paromalina vestita Broun

Fig. 151, 685–688

Broun, 1880: 497 (*Paromalina*). Waterhouse, 1887: pt. 28, pl. 174, fig. 7. Hutton, 1904: 214 (*Cyclacalles*). Hudson, 1934: 223. Hustache, 1936: 130 (*Paromalina*). Kuschel, 1990: 74.

Type data. Holotype male, BMNH, on card, with labels "884" printed, green / "Whangarei" printed / "NEW ZEALAND (ND); Patuaa, near; Whangarei Harbour; T. Broun" handwritten (Lyal).

Range. ND, AK, WO, BP, GB, TO, TK, RI, WN / —.

Biology. Adults of *Paromalina vestita* have been taken repeatedly from leaf litter, this at Lynfield mostly among bush-floor sedges (*Gahnia*, *Carex*, *Uncinia*) (Kuschel 1990), although at other localities sedges are not recorded. Specimens have also been obtained from moss, sweeping *Blechnum* and *Paesia*, under bark on dead *Agathis australis* at night, and on *Collosporum* on *A. australis*. The species has been reared from an unidentified rotten log (W74/1).

Genus *Agacalles* Broun

Broun, 1886: 967. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 125. Type species *Agacalles formosus* Broun, 1886, by monotypy.

Length 1.5–4 mm. Habitus, Fig. 28. Derm dark brown or black, on pronotum, femora, tibiae, and elytra with a scattering of long, erect, more or less setiform scales, otherwise covered with shorter and broader elongate scales, decumbent or gathered into more or less erect tufts on elytra. Pronotum in profile (Fig. 840) convex, depressed weakly anteriorly and abruptly posteriorly. Elytra flat anteriorly, smoothly convex posteriorly. Apterous.

Head. Rostrum 0.5–0.7x as long as pronotum; punctuation fine or absent distally, coarse basally, with longitudinal ridges developed, particularly in male; squamosity sparse basally, particularly in male.

Antennae inserted approximately halfway along rostrum. Funicle longer than scape; F1 and F2 elongate, subequal, together nearly as long as scape. Scape and flagellum with pale, semi-erect or decumbent setae; scales absent. Club darker than rest of antenna, or concolorous.

Thorax. Pronotum (Fig. 28) longer than wide, widest in posterior half; sides convex, lacking any projections; ant-

erior margin convex; posterior margin straight, sometimes very weakly raised; punctation deep, dense; erect scales dark or pale, decumbent scales yellow or bronze, generally directed mesad and forward. Scutellum concealed.

Elytra (Fig. 28) with basal margin straight or weakly sinuate, generally weakly raised, slightly wider than pronotum basally, widest in proximal half; sides smoothly convex, more or less strongly attenuate posteriorly to weakly convex apex. Interstriae more or less distinct, with I2 and I3 raised at base; striae punctures large, deep, sometimes confluent; striae and interstriae sometimes obscured by matted scales. Scales elongate, generally not as long as those on pronotum, decumbent or grouped in erect, rather 'untidy' tufts, coloured cream, yellow, bronze, or black; setiform scales black or cream, related to colour of nearby decumbent scales. Elytral strigil absent.

Postocular lobe rounded, smoothly continuous with marginal carina of prosternal canal. Mesosternal receptacle cup-shaped, slightly wider than long, cavernous or with posterior wall vertical, extending posteriad approximately to level of midline of middle coxae; margins weakly produced ventrally, especially lateral margins. Metasternum flat or depressed posterior to mesosternal receptacle, separating middle and hind coxae by less than length of a hind coxa, sometimes projecting ventrally between middle and hind coxae. Metepisternum almost obscured by elytron; sclerolepidia appressed, generally obscure and concealed by waxy substance (Fig. 152).

Fore coxa with an obtuse posterior projection. Femora generally unarmed, although a small median ventral tooth present on all femora in *A. formosus*; a more or less glabrous ventral groove sometimes present distally. Tibiae lacking a ventral carina; premucro absent or present. Tarsus with 5th tarsomere long, slender; claws small, slender.

Abdomen. Ventrite 1 flat or concave medially; intercoxal process as wide as long or wider; posterior suture incomplete medially. Ventrite 2 subequal in length to VI (excluding intercoxal process), very weakly convex. Ventrites 3+4 subequal in length to V2, flat or weakly transversely convex. Punctation even; punctures large, each with a single more or less elongate scale.

Female terminalia. Tergite VII (Fig. 354) wider than long to longer than wide; microsetae absent; anterior and posterior margins weakly convex. Tergite VIII (Fig. 355) longer than wide; posterior margin convex, crenulate. Sternite VIII (Fig. 356) with lateral sclerotisations delimiting a weakly sclerotised plate of subequal length and width, about half as long as apodeme. Hemisternites of ovipositor slightly shorter than wide part of sternite VIII; styli slender, long, sometimes more than three-quarters

length of hemisternites (Fig. 357, 358). Bursa and vagina unsclerotised; spermathecal duct arising on bursa away from junction with oviduct (Fig. 357).

Male terminalia. Tergite VII (Fig. 689) wider than long, lacking microsetae; anterior margin convex; posterior margin very weakly convex. Tergite VIII (Fig. 690, 696) sometimes with a median anterior projection internally from posterior margin. Spiculum gastrale (Fig. 691) as long as aedeagal apodemes or shorter; posterior plate very small, with sclerotised 'arms' short. Tegmen (Fig. 692, 693) with parameres slender; apodeme longer than parameres or width of ring. Aedeagal body shorter than its apodemes, variably curved, sclerotised dorsally; sides evenly concave between base and widened subapical part; apex truncate or acuminate (note that Fig. 694 suggests a truncate apex with a median rounded projection; this is an acuminate apex, but the apical ventrad curvature makes it look otherwise); junction of apodemes to body very slender or entirely membranous (Fig. 694, 695). Endophallus lacking sclerites or with a small internal hook or tube (Fig. 694).

Range. New Zealand.

Remarks. *Agacalles* is a member of the *Metacalles* group of genera (see 'Systematics' section), and probably is the sister-group of *Metacalles* itself. It can be distinguished from *Metacalles* in having sclerolepidia (Fig. 152) and the aedeagus widened subapically (Fig. 694); the body form is generally more elongate than that of the rather round-bodied *Metacalles* (Fig. 28, 29), although no ratio of length and width has been found that separates the two genera satisfactorily.

The forward projection internally from the posterior margin of male tergite VIII (Fig. 696) is similar in some respects to that of many *Crisius* species (Fig. 611), though much smaller. The two structures are almost certainly homoplastic, and do not indicate a relationship.

Larval records are available for two species, both of which develop in dead fern tissue, and an association with ferns is known for adults of two other species. No other New Zealand Cryptorhynchinae are known to feed on ferns as larvae, although a number of species have been collected from ferns as adults (see Appendix 2). All *Agacalles* adults probably are leaf litter inhabitants during the day.

Agacalles comptus (Broun) new combination

Fig. 696

Broun, 1893a: 1486 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Holotype male, NZAC, on card, with labels "Hunua; Maketu" handwritten (Broun) / "2565." handwritten (Broun) / "T. Broun; Collection" printed / "A. E. Brookes; Collection" printed.

Range. AK, CL, WO, BP, TK, TO, WN/SD, NN, MB, BR, WD, MK, OL, FD / SI.

Biology. Adults of *A. comptus* have been collected from leaf litter and bryophytes. Larvae have been reared from dead rhizomes of the fern *Blechnum capense* (W76/12) and a dead caudex of the fern *Todea hymenophylloides*.

***Agacalles formosus* Broun**

Fig. 28, 84, 152, 354–358, 689–695

Broun, 1886: 967. Hutton, 1904: 212. Hudson, 1934: 221. Hustache, 1936: 125. Kuschel, 1990: 73.

Type data. Lectotype male here designated, BMNH, on card, with labels "1746." handwritten (Broun) / "Howick" printed / "Agacalles; formosus" handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. ND, AK, CL, WO, BP, WN / SD.

Biology. Adults of *A. formosus* have been collected from leaf litter, rotten wood, and bush-floor liverworts; Kuschel (1990) reports that they can be obtained readily by scraping and chopping tree fern trunks (*Cyathea*, *Dicksonia*). Larval biology is unknown, but the association with tree ferns may indicate that the larvae develop in the dead tissue.

***Agacalles gracilis* (Broun) new combination**

Broun, 1913: 136 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 122.

Type data. Holotype female, BMNH, on card, with labels: "var.; 2565." handwritten (Broun) / "Erua.; Jany - 1910" handwritten (Broun) / "Acalles; stenus" handwritten (Broun) (apparently never published).

Range. TO / —.

***Agacalles integer* (Broun)**

Broun, 1893b: 374 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 122. Kuschel, 1990: 73, 79 (*Agacalles*).

Type data. Lectotype male here designated, BMNH, on card, with labels "2935" handwritten / "Hunua.; Maketu" handwritten (Broun) / "Acalles; integer." handwritten (Broun). One syntype not located.

Range. AK, TO / —.

Biology. Adults of *A. integer* have been collected from leaf litter; Kuschel (1990) reports specimens on the rhizomes of *Blechnum 'capense'*.

***Agacalles tortipes* (Broun) new combination**

Broun, 1880: 492 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Holotype male, BMNH, on card, with labels "874" printed, green / "Tairua" printed / "Acalles; tortipes" handwritten (Broun).

Range. ND, AK, CL / —.

Biology. Adults of *A. tortipes* have been collected from leaf litter and moss. Specimens very similar to the type, but possibly representing a new species, have been reared from dead rhizomes of *Blechnum capense* (W76/12).

Genus *Metacalles* Broun

Broun, 1893b: 381. Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 129. Type species *Metacalles aspersus* Broun, 1893, by original designation. *Onias* Broun, 1909a: 153. Hudson, 1934: 223. Hustache, 1936: 125. Type species *Onias latisulcatus* Broun, 1909a, here designated. New synonymy.

Length 1.25–2mm. Habitus, Fig. 29. Dorsum brown or black, sparsely or densely squamose. Scales oval or elongate (sometimes very elongate), decumbent, semi-erect and erect, gathered into untidy tufts and scattered; decumbent scales sometimes covered by a waxy substance; setiform scales or erect, elongate, broader scales present. Pronotum in profile (Fig. 85) convex, depressed in anterior third and at base; elytra convex. Apterous.

Head. Rostrum shorter than pronotum; punctation weak to very weak, stronger basally than towards apex, sometimes stronger basally in male; squamosity limited to extreme base, sometimes very slightly more extensive in male.

Antennae inserted in proximal half of rostrum (rarely at middle), sometimes slightly nearer apex in male. Funicle

longer than scape; F1 more swollen and longer than F2; F2 longer than all others; F1+2 more than half length of scape, as long as rest of funicle or shorter. Scape and funicle with fine, semi-erect and decumbent setae; scales absent. Club and sometimes F6 and F7 darker than (rest of) funicle, rarely concolorous.

Thorax. Pronotum of variable proportions, widest in posterior half, with sides strongly convex; anterior margin convex or with weak median emargination, projecting strongly over head; posterior margin straight or sinuate (Fig. 29); a longitudinal swelling on either side of midline sometimes present posteriorly; a short median longitudinal carina sometimes present; punctation dense, coarse; scales separate or matted, more or less sparse, decumbent, semi-erect, and erect, elongate, sometimes very long, slender, and curved (Fig. 29). Scutellum concealed.

Elytra with basal margin straight, at least as wide as pronotum basally; sides convex, widest in proximal half; interstriae sometimes encroached upon by stria punctures; I2 and/or I3 raised at base (Fig. 198); stria punctures large, sometimes confluent; scattered, weak prominences sometimes present; scales oval or elongate, sparse or dense, frequently gathered into large, untidy, scattered tufts. Elytral strigil absent.

Postocular lobes small, rounded, smoothly continuous with marginal carinae of prosternal canal or weakly extending between them. Mesosternal receptacle U-shaped, longer than wide, deep, cavernous, extending posteriorly between level of midline and beyond posterior margin of middle coxae, extending in female at least to rear part of middle coxae; margins produced ventrally. Metasternum flat or weakly depressed posterior to mesosternal receptacle, sometimes almost divided by it, separating middle and hind coxae by less than length of a hind coxa. Metepisternum concealed; sclerolepidia absent.

Fore coxae with an obtuse posterior projection. Femora squamose ventrally, lacking a ventral tooth and groove. Tibiae lacking a ventral carina; premucro present or absent.

Abdomen. Ventrite 1 concave or convex medially; intercoxal process wider than long, concave; suture between V1 and V2 incomplete medially. Ventrite 2 shorter than V1 (excluding intercoxal process), sloping abruptly towards V3 posteriorly. Ventrites 3 and 4 together subequal in length to V2, transversely convex. Punctation sparse or dense, coarse. Scales elongate, separate.

Female terminalia. Tergite VII (Fig. 359) as wide as long or wider, lacking microsetae; anterior margin weakly convex; posterior margin convex. Tergite VIII (Fig. 360) longer than wide; posterior margin convex, dentate. Ster-

nite VIII (Fig. 361) with apical plate as wide as long or wider, more or less than half as long as apodeme; apex of apodeme sometimes broadly T-shaped. Hemisternites of ovipositor broad; styli terminal, broad (Fig. 362, 363). Spermathecal duct arising on bursa away from junction with oviduct; bursa and vagina lacking sclerites (Fig. 362).

Male terminalia. Tergite VII (Fig. 697) wider than long, lacking microsetae; anterior margin convex; posterior margin weakly concave, biconcave, or truncate. Hemisternites of sternum VIII sometimes with a weak anterior sclerotised connection (Fig. 698). Spiculum gastrale (Fig. 699) as long as aedeagal apodemes or shorter. Tegmen (Fig. 700, 701) with apodeme longer than parameres, longer than width of ring; parameres at least sometimes fused. Aedeagal body shorter than its apodemes (sometimes one-third as long), curved (Fig. 703); sides subparallel, weakly concave or weakly rounded; apex rounded (Fig. 702), sometimes sclerotised anterodorsally; apodemes and body united. Endophallus sometimes with paired, simple or more complex basal sclerites; flagellum with 2 side pieces sometimes present, variable (Fig. 702).

Range. New Zealand. One possible undescribed species has been seen from Australia.

Remarks. Broun (1893b) makes the point that "The type of this genus [*Metacalles*] can be recognised by the long rostral canal, which extends into the metasternum." He explicitly states that he had not been able to examine the sterna of species 1274 and 1290-92, which leaves only *M. aspersus* and *M. rugicollis*. The single specimen of *rugicollis* in the Broun Collection is mounted so that the venter is not visible. One specimen of *aspersus* in the Broun Collection is mounted on its dorsum, and agrees with the description. From this evidence it is taken that Broun's reference to the type species alludes to *M. aspersus*. It is worth noting that this character state applies to all females and some males of Broun's '*Metacalles*' but not to all the species now included in the genus.

There are two groups of *Metacalles*, but the relationship between them is not clear. One group, comprising *aterri-mus*, *irregularis*, *latisulcatus*, *setosus*, *sentus*, and *ornatus*, corresponds more to Broun's concept of *Onias*. It has the pronotal scales decumbent, but is more plesiomorphic in being relatively broader and less elongate, with two longitudinal prominences on the pronotum and with a ratio of elytral length to width of 0.90 or less. The other, including all the other species and corresponding approximately to Broun's concept of *Metacalles*, generally has very elongate and slender decumbent scales on the pronotum, 'untidy' elytral setal tufts of very long, slender scales, the

pronotum generally without lateral prominences, and the elytra nearly as wide as long (ratio more than 0.94). No single apomorphy for the genus that is not a 'loss' character state has yet been identified, but at present it seems more sensible to put all the species together than to attempt to distinguish more than one genus. There are a number of species awaiting description. The relationships of *Metacalles* are discussed in the 'Systematics' section.

Metacalles can be distinguished from other genera by the following combination of characters: antennal club usually darker than funicle; base of interstria 3 (at least) raised (Fig. 198); pronotum with erect, elongate or setiform scales and decumbent, oval or elongate scales (but not round scales); metasternum lacking sclerolepidia. Many of the species have rather untidy elytral tufts of very elongate scales, similar only to those of some *Agacalles* species.

Metacalles aspersus Broun

Fig. 29, 85, 198; cf. Fig. 359–363

Broun, 1893b: 382. Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 129. Kuschel, 1990: 74.

Type data. Lectotype female here designated, BMNH, on card, with labels "2959." handwritten (Broun) / "Pirongia.; Dec^r 1892." handwritten (Broun) / "Metacal.; aspersus" handwritten (Broun). Paralectotype female, BMNH, on card, mounted on dorsum, with label "Waikato" (printed) as locality. All syntypes located.

Range. ND, AK, WO, BP, TO / —.

Biology. Specimens of *M. aspersus* have been collected in leaf litter, in rotten tree stumps, and on bryophytes.

Metacalles aterrimus (Broun) new combination

Broun, 1909a: 146 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Syntypes: 1 male, 1 (?sex) mounted on dorsum, BMNH, on card, with labels "2948." handwritten (Broun) / "Broken; river." handwritten (Broun) / "Acalles; aterrimus" handwritten (Broun). All syntypes located.

Range. WO–BP, RI / BR, WD, MC, OL, FD.

Biology. Adults of *M. aterrimus* have been collected in leaf litter.

Metacalles cordipennis (Broun)

cf. Fig. 697–703

Broun, 1881: 720 (*Acalles*); —1893b: 382 (*Metacalles*). Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 129.

Type data. Holotype female, BMNH, on card, with labels "1274" printed, green / "Whangarei" printed / "Metacalles; cordipennis." handwritten (Broun).

Range. ND / —.

Metacalles crinitulus Hustache

Hustache, 1936: 129 (new name for *Metacalles crinitus* Broun, 1913, not Broun, 1881). *crinitus* Broun, 1913: 143 (*Metacalles*). Hudson, 1934: 224. Hustache, 1936: 129 (identified as homonym).

Type data. Holotype female, BMNH, on card, with labels "3327." handwritten (Broun) / "Erua.; Jany. 1910." handwritten (Broun) / "Metacalles; crinitus." handwritten (Broun) / "HOLOTYPE; Metacalles; crinitus; Broun, 1913; Lyal det 1986" handwritten (Lyal) / "HOLOTYPE; Metacalles crinitulus; Hustache, 1936; (n.n. for crinitus; Broun 1913 nec 1881); Lyal det 1986" handwritten (Lyal), red.

Range. TO / —.

Metacalles crinitus (Broun)

Broun, 1881: 727 (*Dolichoscelis*); —1893b: 382 (*Metacalles*). Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 129.

Type data. Syntypes: 2 (?sex), BMNH, on card, with labels "1291." printed, green / "Parua" printed (1 specimen only) / "Whangarei" printed (other specimen) / "Metacalles; crinitus" handwritten (Broun) (Parua specimen only). All syntypes located.

Range. ND / —.

Metacalles exiguus (Broun)

Broun, 1881: 728 (*Dolichoscelis*); —1893b: 382 (*Metacalles*). Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 130 (*Metacalles* and *Scelodolichus*).

Type data. Holotype male, BMNH, on card, with labels "1292." printed, green / "Whangarei" printed.

Range. ND /—.

***Metacalles irregularis* (Broun) new combination**

Broun, 1913: 145 (*Onias*). Hudson, 1934: 223. Hustache, 1936: 125.

Type data. Syntypes: 2 (?sex), BMNH, on card, with labels "3331." handwritten (Broun) / "Erua.; April 1910" handwritten (Broun) (1 only) / "Erua.; Jany. 1910" handwritten (Broun) (other specimen) / "Onias; irregularis" handwritten (Broun). All syntypes located.

Range. TO /—.

***Metacalles lanosus* Broun**

Broun, 1913: 144. Hudson, 1934: 224. Hustache, 1936: 129.

Type data. Holotype male, BMNH, on card, with labels "3328." handwritten (Broun) / "Makatote; Feby. 1910." handwritten (Broun) / "Metacalles; lanosus -" handwritten (Broun).

Range. BP, TO /—.

Biology. Adults of *M. lanosus* have been collected in leaf litter.

***Metacalles latisulcatus* (Broun) new combination**

Broun, 1909a: 153 (*Onias*). Hudson, 1934: 223. Hustache, 1936: 125.

Type data. Syntypes: 3 (?sex), BMNH, on card (1 mounted on dorsum), with labels "2967." handwritten (Broun) / "Broken; River." handwritten (Broun) / "Onias; latisulcatus" handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. TO–RI /MC.

***Metacalles latus* (Broun)**

Broun, 1881: 727 (*Dolichoscelis*); —1893b: 382 (*Metacalles*). Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 130.

Type data. Syntypes: 2 (?sex), BMNH, on card, with labels "1290." printed, green / "Parua" printed [1 specimen only] / "Whangarei" printed [other specimen] / "Metacal-

les; latus" handwritten (Broun) [Whangarei specimen only]. All syntypes located.

Range. ND /—.

***Metacalles ornatus* (Broun) new combination**

Broun, 1909a: 154 (*Onias*). Hudson, 1934: 223. Hustache, 1936: 125.

Type data. Syntypes: 1 male (mounted on dorsum), 1 female, BMNH, on card, with labels "2968." handwritten (Broun) / "Broken; River." handwritten (Broun) / "Onias; ornatus" handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. — /NN, MC, FD.

***Metacalles picatus* Broun**

Broun, 1914: 135. Hudson, 1934: 224. Hustache, 1936: 130.

Type data. Holotype male, BMNH, on card, with labels "3458." handwritten (Broun) / "Te Aroha; Nov^r 1910." handwritten (Broun) / "Metacalles; picatus." handwritten (Broun).

Range. AK, WO, BP, TK, TO /—.

Biology. Adults of *M. picatus* have been collected repeatedly in leaf litter.

***Metacalles rugicollis* Broun**

Broun, 1893b: 383. Hutton, 1904: 214. Hudson, 1934: 224. Hustache, 1936: 130.

Type data. Holotype, (?sex), BMNH, on card, with labels "2960" handwritten (Broun) / "Pirongia" printed / "Metacalles; rugicollis" handwritten (Broun).

Range. WO /—.

***Metacalles sentus* (Broun) new combination**

Broun, 1883: 438 (*Acalles*); —1886: 799 (repetition of Broun, 1883). Hutton, 1904: 213 (attributed to Broun, 1886). Broun, 1909a: 154 (*Onias*). Hudson, 1934: 223 (attributed to Broun, 1886). Hustache, 1936: 125.

Type data. Lectotype male and paralectotype female (mounted on dorsum), BMNH, mounted together on clear plastic rectangle with green basal strip, with labels "1424." printed, green / "Wellington" printed / "Onias; sentus." handwritten (Broun) / "LECTOTYPE [m.]; Acalles sentus; Broun, 1883; Lyal det 1986" handwritten (Lyal), red / "PARALECTOTYPE ?[f.]; Acalles sentus; Broun, 1883; Lyal det 1986" handwritten (Lyal), blue. All syntypes located.

Range. WN / NN.

***Metacalles sticticus* (Broun) new combination**

Broun, 1921: 658 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 124.

Type data. Holotype (?sex), BMNH, on card, with labels "4243." handwritten (Broun) / "S.IV" handwritten / "M. Arnaud; 15.6.1916." handwritten (Broun) / "Acalles; sticticus" handwritten (Broun).

Range. — / BR.

Genus *Scelodolichus* Broun

Broun, 1886: 968 (new name for *Dolichoscelis* Broun, 1880, not Hope, 1836). Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 130. Kuschel, 1982: 277. Type species *Dolichoscelis celsus* Broun, 1880, here designated.

Dolichoscelis Broun, 1880: 495. Type species as above. *Lasiotyloides* Heller, 1916: 322, 326. Hustache, 1936: 177. Type species *Lasiotyloides erythropygus* Heller, 1916, by original designation. Synonymised by Kuschel (1982).

Length 1.5–4 mm. Habitus, Fig. 30. Derm black or dark brown. Scales small, elongate, separate or contiguous, decumbent; erect setiform scales present. Pronotum in profile (Fig. 86) convex, with anterior depression more marked laterally than medially; elytra raised at base, smoothly convex. Apterous.

Head. Rostrum shorter than pronotum, convex or nearly flat dorsally, squamose dorsally at base, generally more extensively in males; males sometimes with 1 or 3 longitudinal carinae in proximal half; punctation dorsally even and fine, coarser at base, especially in males.

Antennae inserted in proximal half of rostrum. Funicle about twice as long as scape; F1 and F2 elongate, subequal,

together half total length of funicle or less. Scape and funicle with fine, semi-erect and decumbent setae. Club slightly darker than rest of antenna, or concolorous.

Thorax. Pronotum as long as wide or longer, widest in posterior half, sometimes at base; sides smoothly convex or nearly straight; anterior margin convex, projecting strongly over head; posterior margin straight or weakly sinuate (Fig. 30); prominences absent; a median longitudinal carina or broader raised area generally present; punctation sparse to dense, coarse to fine, shallow to deep; squamosity not obscuring derm. Scutellum concealed.

Elytra with basal margin straight or weakly sinuate, as wide as pronotum basally or wider; sides smoothly convex, widest in anterior half or quarter; narrow-bodied forms with a lateral, concave 'face' adjacent to hind legs; apex rounded; interstriae broad or narrow, with I2 and I3 sometimes weakly raised at base; striae punctures generally very shallow, sometimes deep and sparse, occasionally absent or confluent to form narrow, deep striae; tubercles, prominences, and scale tufts absent; elytra sometimes glabrous laterally or dorsally. Elytral strigil absent.

Postocular lobes very weakly rounded, extending slightly between marginal carinae of prosternal canal. Mesosternal receptacle (Fig. 133) U-shaped, wider than long, cavernous, extending posteriorly nearly to level of midline of middle coxae; margins produced ventrally; centre of posterior margin less produced than lateral margins. Metasternum concave, separating middle and hind coxae by less than length of a hind coxa, generally deeply depressed between middle and hind coxae, with a short, transverse carina uniting ventrally projecting acute prominences on either side of coxae (Fig. 133, 134). Metepisternum concealed by elytra; sclerolepidia absent.

Fore coxae with a large, obtuse posterior projection. Femora with ventral tooth absent or very small, rarely large, most apparent on middle and hind leg; ventral groove absent, obscure, or distinct, squamose or glabrous ventrally. Tibiae with ventral carina absent, obscure, or distinct, sometimes terminating in a small premuero; uncus small.

Abdomen. Ventrite 1 with median longitudinal furrow generally present, variably pronounced and deep; intercoxal process wider than long; posterior margin sinuate, medially emarginate. Ventrite 2 not as long as V1, sometimes only half its length (excluding intercoxal process), sometimes with a median longitudinal furrow at base. Ventrites 3 and 4 each slightly more than half length of V1, transversely convex or with a pronounced transverse ridge. Ventrite 5 (sternite 7) frequently with posterior face con-

cave in female (Fig. 373). Ventrites finely rugose, sometimes with irregular rounded ridges. Scales sparse, elongate, decumbent; setae sparse, erect.

Female terminalia. Tergite VII (Fig. 364) as long as wide; microsetae absent; anterior margin very weakly to strongly convex; posterior margin weakly convex. Tergite VIII (Fig. 365, 370) longer than wide; posterior margin weakly convex and crenulate. Sternite VIII (Fig. 366, 370) with apical plate as wide as long, much shorter than apodeme, frequently bent upwards at an angle to apodeme (Fig. 367) but sometimes straight (Fig. 371), very finely sclerotised; ventral membranous pocket extending approximately halfway along apodeme, sometimes weakly sclerotised posteriorly (Fig. 366, 367, 370, 371). Hemisternites of ovipositor broad, tapering; styli terminal, more or less abruptly narrowed (Fig. 368, 369, 372); spermathecal duct arising at junction of oviduct and bursa; vagina and bursa lacking sclerites, or vagina with weak sclerites (Fig. 368, 372).

Male terminalia. Tergite VII (Fig. 704) wider than long, lacking microsetae, sometimes permanently exposed posteriorly; anterior margin weakly convex; posterior margin truncate or concave. Spiculum gastrale (Fig. 706) as long as aedeagal apodemes or shorter, with apical arms narrow or broad. Tegmen (Fig. 707, 709) with parameres very short; apodeme much longer than width of tegminal ring but not as long as aedeagal apodemes. Aedeagal body longer or shorter than its apodemes, curved abruptly basally, straight or recurved apically (Fig. 709), lanceolate or parallel-sided, with a broadly acuminate or truncate apex, generally much longer than wide (Fig. 708), sometimes weakly sclerotised anterior to ostium; body and apodeme separate or weakly united. Endophallus with 1 or 2 slender basal sclerites and larger, more posterior sclerites generally present; flagellum absent (Fig. 708).

Range. New Zealand, New Caledonia.

Remarks. Broun (1886, p. 968) does not state that *Scelodolichus* is a replacement name for *Dolichoscelis*, but merely indicates by including "(p. 495)" after the generic name that the reader should refer back to that page of his 'Manual of New Zealand Coleoptera'. There *Dolichoscelis* is the only genus described, and in Broun's own copy of the Manual he has written "= Scelodolichus".

The genus may be closely related to *Crooktacalles*, and the characters that indicate this are discussed under the later genus. Other possible relationships of *Scelodolichus* with members of the *Metacalles* group of genera are discussed under 'Systematics'.

In all species dissected, intersternal membrane VII/VIII

in the female extends to approximately halfway along the apodeme of sternite VIII. This is very unusual, the common situation being for the membrane to join the apodeme at the anterior end of the apical plate (e.g., Fig. 361). The only similar state in New Zealand Cryptorhynchinae is in the *Rhynchodes* group, where the membrane is free to the apex of the apodeme (Fig. 246). In most *Scelodolichus* the apodeme is relatively narrow, as is common (Fig. 366), although in *S. juncobius* it is broad, reminiscent of the state in the *Rhynchodes* group (Fig. 370). There is, however, no other indication of close relationship between *Scelodolichus* and the *Rhynchodes* group, and the character state must be considered homoplastic. The extent of the membrane can be considered an apomorphy of *Scelodolichus*.

In many *Scelodolichus* species the posterior end of female ventrite 5 (sternite VI) forms a posteriorly facing concave wall (Fig. 86, 373), sometimes not greatly developed and little more than a narrow slit. Associated with this the apical plate of sternum VIII is tilted at an angle to its apodeme (Fig. 367). This presumably is to allow the apodeme to lie along the ventral surface of the abdomen and the apex of the plate to lie against the posterior margin (opening). In *S. juncobius* the posterior end of ventrite 5 lacks the wall, and sternite VIII is straight in profile (Fig. 371).

The female sternite VIII of *S. juncobius* is very unusual (Fig. 370). The apical plate is very weakly sclerotised but the apodeme strongly so, in common with other *Scelodolichus* species. However, the apodeme is broad and, without careful inspection, the sternite appears to comprise only a broad rod with a triangular emargination posteriorly.

In addition to *S. erythropygus* Heller (New Caledonia), specimens of two undescribed species have been seen from that island (CNCI, A. Howden Collection).

Scelodolichus altulus Broun

Broun, 1886: 968. Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 130. Kuschel, 1990: 74.

Type data. Syntypes: 2 males, 1 female, BMNH, on card (1 mounted on side), with labels "1747" handwritten (Broun) / "Mokohinau Isi" printed / "Scelodolichus; altulus" handwritten (Broun) (female only). Original number of syntypes not stated by Broun.

Range. ND, AK, CL, BP, GB / NN.

Biology. Adults of *S. altulus* have been collected frequently from leaf litter, as well as from a rotten log and a hollow *Knightia excelsa*.

***Scelodolichus celsus* (Broun)**

Fig. 30

Broun, 1880: 496 (*Dolichoscelis*). Hutton, 1904: 214 (*Scelodolichus*). Hudson, 1934: 223. Hustache, 1936: 130. May, 1987: 49.

Type data. Holotype female, BMNH, mounted on clear plastic rectangle with green band at pin end, with labels "881" printed, green / "Manaia" printed / "Scelodolichus; celsus" handwritten (Broun).

Range. ND, AK, BP / —.

Biology. Adults of *S. celsus* have been collected from leaf litter. Specimens have been reared from dead bark of *Metrosideros robusta* (May 1987).

***Scelodolichus decorus* Broun**

Broun, 1923: 703. Hudson, 1934: 223.

Type data. Holotype female, BMNH, on card, with labels "Pakarau; 19-5-18-" handwritten (Broun) / "Scelodolichus; decorus." handwritten (Broun).

Range. ND / —.

***Scelodolichus denotans* (Broun)**

Broun, 1881: 726 (*Dolichoscelis*). Hutton, 1904: 214 (*Scelodolichus*). Hudson, 1934: 223. Hustache, 1936: 130.

Type data. Syntypes: 2 (?sex), BMNH, on card, with labels "1289" printed, green / "Parua" printed / "Scelodol.; denotans." handwritten (Broun) (1 only). Third syntype not located.

Range. ND / —.

Biology. Adults of *S. denotans* have been collected from leaf litter.

***Scelodolichus flectipes* Broun**

Fig. 133, 134

Broun, 1914: 134. Hudson, 1934: 223. Hustache, 1936: 130.

Type data. Syntypes: 2 (?sex), BMNH, on card, 1 mounted on dorsum, with labels "3457." handwritten (Broun) / "Gt.

Barrier.; March, 1911" handwritten (Broun) / "Scelodolichus; flectipes" handwritten (Broun) and "Scelodol.; flectipes" handwritten (Broun). Original number of syntypes not stated by Broun.

Range. CL / —.

***Scelodolichus hilaris* Broun**

Fig. 86, 704–709

Broun, 1893a: 1491. Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 130. Kuschel, 1990: 74.

Type data. Syntypes: 4 (?sex), BMNH, on card, 1 mounted on dorsum, 1 on side, with labels "2573." handwritten (Broun) / "Hunua" printed (except specimen mounted on side) / "Scelodolichus; hilaris" (2 handwritten: Broun, Marshall) and "Scelodol.; hilaris" handwritten (Broun) (specimen mounted on dorsum lacks a determination label). Original number of syntypes not stated by Broun.

Range. AK, CL, WO, BP / —.

Biology. Adults of *S. hilaris* have been collected frequently from leaf litter, and from dead fronds of *Rhopalostylis sapida*.

***Scelodolichus juncobius* Broun**

Fig. 370–372

Broun, 1893a: 1239. Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 130.

Type data. Syntypes: 2 females, BMNH, on card, 1 mounted on side, with labels "2181." handwritten (Broun) / "Mokohinau" printed / "Scelodolichus; juncobius" handwritten (Broun) (1 only). Third syntype not located.

Range. ND / —.

Biology. Broun (1893a) notes that the types of *S. juncobius* were "found amongst roots of rushes".

***Scelodolichus lineithorax* (Broun)**

Fig. 185, 364–368

Broun, 1880: 496 (*Dolichoscelis*); —1895: 413 (*Scelodolichus*). Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 130. May, 1987: 49. Kuschel, 1990: 74.

Type data. Syntypes: 2 (?sex), BMNH, on card, 1 mounted on dorsum, with labels "882" printed, green, handwritten (Broun) (1 on dorsum) / "Parua" printed, handwritten (Broun) (1 on dorsum) / "Scelodolichus; lincithorax" handwritten (Broun) (1 on venter). Full syntypic series located.

Range. ND, AK, CL, BP, WN / NN.

Biology. Adults of *S. lineithorax* have been collected repeatedly in leaf litter, and Kuschel (1990) reports it as being "associated with bush floor sedges (*Carex*, *Gahnia*, *Lepidospermum*, *Schoenus*, *Uncinia*) and *Freycinetia baueriana*." Specimens have been reared from dead rhizomes of *Gahnia lacera* (May 1987).

***Scelodolichus politus* Broun**

Fig. 373

Broun, 1895: 412. Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 130.

Type data. Holotype female, BMNH, on card, with labels "2954." handwritten (Broun) / "Mount; Pirongia" handwritten (Broun) / "Scelodolichus; politus" handwritten (Broun).

Range. ND, AK, WO, BP / —.

Biology. Adults of *S. politus* have been collected repeatedly in leaf litter, as well as on *Gahnia* leaves at night, on dead *Agathis australis* at night, on *Collosporum* on *A. australis*, and by sweeping *Blechnum* and *Paesia*.

***Scelodolichus pyriformis* Broun**

Broun, 1923: 704. Hudson, 1934: 223.

Type data. Holotype female, BMNH, on card, with labels "n-sp." handwritten (Broun), underlined in red / "Pakarau; 24.3.18." handwritten (Broun) / "Scelodolichus; pyriformis." handwritten (Broun).

Range. ND / —.

***Scelodolichus setosus* (Broun)**

Broun, 1881: 726 (*Dolichoscelis*). Hutton, 1904: 214 (*Scelodolichus*). Hudson, 1934: 223. Hustache, 1936: 130.

Type data. Holotype (?sex), BMNH, on card, with labels "1287" printed, green / "Whanagarei" printed / "Scelodol.; setosus." handwritten (Broun).

Range. ND / —.

***Scelodolichus squamosus* Broun**

Broun, 1895: 413. Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 130.

Type data. Holotype (?sex), BMNH, on card, with labels "2955." handwritten (Broun) / "Mount; Te Aroha" handwritten (Broun) / "Scelodolichus; squamosus." handwritten (Broun).

Range. ND, AK, CL, BP, TK, RI / —.

Biology. Adults of *S. squamosus* have been found in leaf litter.

***Scelodolichus villosus* (Broun)**

Broun, 1881: 726 (*Dolichoscelis*). Hutton, 1904: 214 (*Scelodolichus*). Hudson, 1934: 223. Hustache, 1936: 130.

Type data. Holotype female, BMNH, on card, with labels "1288" printed, green / "Parua" printed / "Scelodol.; villosus." handwritten (Broun).

Range. ND / —.

***Crooktcalles* new genus**

Type species *Acalles certus* Broun.

Length 2.5–3 mm. Habitus, Fig. 31. Derm black or dark brown, more weakly squamose on head and pronotum than on elytra, sometimes covered in gummy material. Scales small, elongate-oval and decumbent on elytra, with a scattering of larger, oval, decumbent and semi-erect scales sometimes in weak tufts or with rows of elongate erect scales; pronotum with larger, oval or elongate, decumbent and erect scales sometimes forming tufts; erect setiform scales absent. Pronotum in profile (Fig. 87) depressed in anterior third and weakly convex posteriorly, or uniformly weakly convex; elytra strongly convex, sometimes abruptly so at base. Apterous.

Head. Rostrum shorter than pronotum; punctation coarse, more so in male; a median longitudinal carina present from

between eyes, and a weaker, shorter, lateral carina sometimes present between base and at least level of insertion of antennae, more pronounced in males; squamosity weak, extending further towards apex in males.

Antennae inserted approximately halfway along rostrum. Funicle approximately 1.5x as long as scape; F1 and F2 elongate, subequal, together half length of funicle. Scape lacking scales; scape and funicle with fine, semi-erect or decumbent setae.

Thorax. Pronotum wider than long, widest in posterior half; sides deeply or shallowly concave in anterior third, weakly convex in posterior two-thirds; anterior margin weakly convex; posterior margin straight; weak or moderate prominences present at points 2 and 3 (Fig. 31, 87), or prominences absent; punctation coarse, dense; scales elongate-oval or elongate, separate, sometimes gathered into weak tufts at points 1, 2, and 3. Scutellum concealed.

Elytra with basal margin straight medially, projecting anteriorly to base of pronotum laterally, as wide as pronotum basally or wider; sides strongly convex, with apical curvature not distinct (Fig. 31); prominences absent or very weak, scattered; stria punctures round and separate, obscure, or absent; larger semi-erect scales sometimes gathered into a few weak tufts in anterior half. Elytral strigil absent.

Postocular lobes rounded, continuous with marginal carinae of pronotal canal or extending weakly between them (Fig. 135, 136). Mesosternal receptacle (Fig. 135, 136) much wider than long, extending posteriorly less than one-third along length of middle coxae; margins thick, projecting ventrally well beyond coxae. Metasternum depressed medially (Fig. 135, 136), separating middle and hind coxae by much less than length of a hind coxa, projecting ventrally just mesad of hind coxae. Metepisternum concealed by elytron; anapleural suture concealed; sclerolepidia absent.

Fore coxae with a large posterior projection. Femora lacking a ventral tooth; at least hind femur broader at base than sub-basally, and with femur/trochanter joint at right angles to dorsal and ventral margins of femur (Fig. 186); ventral groove broad, distinct, glabrous, microgranulate, extending length of femur and delimited by anterior and posterior carinae (Fig. 187). Tibia lacking a ventral carina but with weak ventrolateral carinae delimiting flattened ventral area; uncus slender; premucro absent.

Abdomen. Ventricle 1 either (1) flat medially, with intercoxal process flat (Fig. 135), or (2) flat immediately posterior to metasternum, then recurved, so that anterior part underhangs posterior part (Fig. 136); intercoxal process

wider than long. Ventricle 2 subequal in length to V1 (excluding intercoxal process), weakly convex. Ventricles 3 and 4 together longer than V2, transversely convex. Punctation deep, coarse, and sparse or absent on ventricle 1, absent or very sparse on other ventricles. Scales elongate, decumbent, separate, scattered.

Female terminalia. Tergite VII (Fig. 374, 380) longer than wide; microsetae absent; anterior margin weakly convex; posterior margin convex (notch in Fig. 374 an individual deformation). Tergite VIII (Fig. 375, 381) as long as wide or longer; posterior margin weakly convex, crenulate. Sternite VIII (Fig. 376, 382) with apical plate as long as wide, subequal in length to apodeme. Hemisternites of ovipositor with styli terminal (Fig. 377, 379, 383, 384); spermatheca sometimes with base of spermathecal gland duct sclerotised and entering expanded 'bulb' (Fig. 378); spermathecal duct arising at junction of bursa and oviduct (Fig. 377) or on bursa (Fig. 383); bursa and vagina lacking sclerotisation (Fig. 377, 383).

Male terminalia. Tergite VII (Fig. 710) wider than long; microsetae absent; anterior margin convex; posterior margin concave. Spiculum gastrale (Fig. 712) with apodeme subequal in length to aedeagal apodemes; apical arms broad, long. Tegmen (Fig. 713, 714) with parameres undeveloped; apodeme subequal in length to width of ring. Aedeagal body one-third as long as its apodemes, slightly longer than wide, with apex weakly rounded; body and apodemes united (Fig. 715, 716). Endophallus with a slender basal sclerite; flagellum absent.

Range. New Zealand (North I. only).

Remarks. *Crooktalles certus* has a similar overall body form to some other apterous leaf-litter species, particularly in *Scelodolichus*, *Zeacalles*, and *Rainacalles*. However, these lack the distinctive very short but prominently projecting mesosternal receptacle of *Crooktalles* (Fig. 135, 136), the glabrous, microgranulate furrow ventrally on the femur (Fig. 187), and the distinctive wide base of the hind femur with the trochanter/femur joint at right angles to the dorsal and ventral margins of the femur (Fig. 186).

The character states of *Crooktalles* mentioned above are paralleled in *Ampagia*, and are associated with the defensive folding of the legs against the body (see 'Biology' and 'Morphology and Terminology' sections). The short, projecting mesosternal receptacle is concave on either side of a median longitudinal carina or vertical carina (depending on the length of the mesosternum). This adaptation allows the tips of the fore tibiae to be 'tucked in' safely when the legs are folded tightly against the body, and can also be seen in *Tychanopais* and *Tychanus*, for ex-

ample. The depression of the metasternum probably has a similar function in relation to the middle and perhaps hind legs (although this has not been observed), with the lateral raised flanges 'locking' the legs in place. Similar structures are found in some *Crisius* species, *Hiracalles*, and some *Allanaleis* species, for example. When the legs are folded the tibiae have their flattened ventral face closely appressed to the flattened glabrous face of the ventral femoral groove, and any gap between them is shielded by the carinae on either side of this groove. The anterior carina on the hind femur is more developed than the posterior one, especially at the base, since this is the more exposed side, and this leads to the characteristic widening of the base of the femur and orientation of the femur/trochanter junction, again seen in *Ampagia*.

The degree of relationship between *Crooktocalles* and *Ampagia* is unclear, but probably not close. *Ampagia* species all have the same rather distinctive outline (Fig. 44), different from that of *Crooktocalles*, although this may not be significant. However, autapomorphics for *Ampagia* not found in *Crooktocalles* are the slanting nature of the femoral grooves and the great development of the associated anterior carinae, the raised and carina-bounded area of the first ventrite (Fig. 192), the squamous prosternal canal, and the short rostrum. Autapomorphics for *Crooktocalles* with respect to *Ampagia* – i.e., excluding the femoral groove and mesosternal form – are the granulate surface of the femoral groove (found also in *Hiracalles*), the two parallel carinae on the tibiae (*Ampagia* has only one), and the loss of the parameres (shared with *Scelodolichus*, among others).

The similarity between *C. abruptus* and some *Scelodolichus* species might suggest a relationship between the two genera. However, apart from the loss of the parameres, there is no clear synapomorphy for *Crooktocalles* and *Scelodolichus*, although the following similarities can be noted: the carinate dorsal surface of the rostrum; the great degree to which the anterior margin of the pronotum projects over the head; the form of the metasternum between the middle and hind coxae; and the pronotal and elytral decumbent scales (especially in *C. abruptus* and *Scelodolichus*). In addition, the basal sclerites of the endophallus are very similar in some *Scelodolichus* and *C. certus*. *C. abruptus* has erect, elongate scales on the pronotum and elytra that might have been derived from the erect, setiform scales of the *Metacalles* group. *Crooktocalles* species do not share the apomorphic extent of the intersegmental membrane along the apodeme of female sternite VIII in *Scelodolichus* (q.v.). The systematic position of *Crooktocalles* is therefore far from certain, although it is probably closer to *Scelodolichus* than *Ampagia*.

The two species of *Crooktocalles* differ quite considerably from each other, although they are held together by the apomorphic states of the mesosternal receptacle, femoral groove, and tibial ventral face. *C. certus* (i) has a coarsely punctate pronotum with prominences, while that of *C. abruptus* is virtually smooth, and (ii) has a very convex elytral profile (Fig. 87), much more like that of *Scelodolichus* species (cf. Fig. 86). *C. abruptus* has erect, elongate scales over much of the pronotum and elytra, while there are only sparse decumbent scales in *C. certus*. In the female genitalia, *C. certus* has a sclerotised chamber at the base of the spermathecal gland, absent in *C. abruptus*, but the latter species has the spermathecal duct arising on the bursa rather than at the junction of bursa and oviduct, as in *C. certus*. Most unusual is the extraordinary apomorphic development of abdominal ventrite 1 of *C. abruptus* (Fig. 136). As indicated in the generic description, the intercoxal process is folded over itself, so that in sagittal section it would have an 'S' shape medially. Immediately behind the hollow formed by the folding is a small median conical projection. Like other adaptations of these insects, this is likely to be for reception of the folded legs.

Crooktocalles abruptus (Marshall) new combination

Fig. 136, 380–385

Marshall, 1937: 338 (*Scelodolichus*).

Type data. Lectotype male here designated, BMNH, on card, with BMNH lectotype disc / BMNH type disc / and labels "E. Fairburn; 21-1-1929." handwritten (Brooks) / "Mair Park; Whangarei." handwritten (Brooks) / "Pres. by; Imp. Inst. Ent.; B.M. 1937-244." printed / "Scelodolichus; abruptus Mshl.; TYPE [m.]" handwritten (Marshall). Paralectotypes: 1 male, NZAC, same data as lectotype; 1 female BMNH, 1 male NZAC, same data as lectotype but collected 15.1.1929. The third male paralectotype has not been located.

Range. ND, BP / —.

Biology. Adults of *Crooktocalles abruptus* have been collected from leaf litter.

Crooktocalles certus (Broun) new combination

Fig. 31, 87, 135, 186, 187, 374–379, 710–716

Broun, 1880: 493 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121. Kuschel, 1990: 73 ('*Acalles*').

Type data. Holotype male, NZAC, on card, with labels "Whangarei" printed / "T. Broun.; Dup. Coll." printed.

Range. ND, AK, CL, WO, BP, TK, TO, WI, WN / —.

Biology. Adults of *Crookacalles certus* have been collected repeatedly from leaf litter. Kuschel (1990) reported that at Lynfield the species was found "in monocot and dicot litter on bush floor, especially from a *Gahnia lacera* / *G. setiflora* association under large *Metrosideros excelsa* trees." Adults have also been collected in moss and liverworts. Specimens have been reared from very decayed *Pinus pinaster* cones half buried in bush-floor litter (Kuschel 1990).

Genus *Omoecalles* Broun

Broun, 1909a: 150. Hudson, 1934: 222. Mustache, 1936: 125. Type species *Omoecalles perspicuus* Broun, 1909, by monotypy.

Length 2–3 mm. Habitus, Fig. 32. Dcrm brown, shiny, densely squamose. Scales circular and appressed, contiguous or tessellate; elongate erect scales present, but erect setiform scales absent. Pronotum and elytra in profile (Fig. 88) smoothly convex, more or less abruptly depressed at base; pronotum depressed anteriorly. Apterous.

Head. Rostrum (Fig. 32) not as long as pronotum or subequal, curved, more evenly in female, sometimes more convex dorsally in female; a median longitudinal carina sometimes present in proximal half; punctuation fine distally, sometimes coarser basally, at least in male; rostrum squamose dorsally at base, slightly more extensively in male.

Antennae inserted approximately halfway along rostrum, bearing fine, semi-erect and decumbent setae. Funicle slightly longer than scape; F1 and F2 slightly elongate, each about twice length of F3.

Thorax. Pronotum wider than long, widest at posterior margin or in posterior third, lacking carinae and projections; sides convex or sinuate; anterior margin convex; posterior margin bisinuate, with a weak convex projection anterior to scutellum (Fig. 32); punctuation coarse and dense. Scutellum concealed or small, round, with or without a few small scales. Elytra with basal margin straight or weakly sinuate, slightly wider than pronotum basally; sides smoothly convex to apex, widest around proximal fourth; prominences and tubercles absent except for a row

of glossy tubercles along suture basally; stria punctures deep, regular, contiguous; scales not covering striae but obscuring interstriae; tufts absent. Elytral strigil present.

Postocular lobe rounded, smoothly continuous with margin of prosternal canal. Prosternal canal cavernous, squamose at least anteriorly, with scales round or irregular, separate or tessellate, appressed or embedded. Mesosternal receptacle (Fig. 137) open posteriorly, wider than long or length and width subequal, extending posteriorly to level of midline of middle coxae; lateral margins produced ventrally, glabrous internally. Mctasternum concave medially, separating middle and hind coxae by less than length of a hind coxa, projecting ventrally between middle and hind coxae, glabrous or with decumbent and erect scales; posterior margin raised. Metepisternum exposed; anapleural suture incomplete posteriorly, concealed by scales; sclerolepidia absent.

Fore coxa with a stout rearward projection more or less developed. Femora lacking a ventral tooth or ventral groove, squamose ventrally. Tibiae lacking a ventral carina; premucro small, stout, blunt; uncus large, stout.

Abdomen. Ventricle 1 convex, flat, or concave on disc; intercoxal process more or less concave, wider than long; posterior margin straight, indistinct medially. Ventricle 2 as long as V1 or longer (excluding intercoxal process), sloping towards V3. Ventrites 3 and 4 each slightly more than half length of V2, transversely convex or flat. Ventricle 5 sometimes convex laterally. Punctuation coarse on ventrites 1 and 2, sparse or absent on V3 and V4, moderate on V5. Scales round, appressed and oval, decumbent, separate, sometimes sparse on ventrites 3 and 4.

Female terminalia. Tergite VII (Fig. 385) as wide as long; 5 or 6 pairs of microsetae each with a pale semicircular area immediately anterior to it and set in 2 irregular, subparallel, longitudinal glabrous strips which fall short of both margins; anterior margin bisinuate, with a median convex projection; posterior margin convex. Tergite VIII (Fig. 386) longer than wide; posterior margin convex, crenulate. Sternite VIII (Fig. 387) with broad apical portion more than half as long as apodeme; apical arms broad, weakly curved. Hemisternites of ovipositor tapering towards long, cylindrical styli (Fig. 389). Spermathecal duct convoluted, with a very broad portion (Fig. 388), arising anterior to junction of oviduct and vagina. Vagina and bursa lacking sclerites.

Male terminalia. Tergite VII (Fig. 717) with 5–7 pairs of microsetae set in irregular, subparallel, longitudinal glabrous bands, the posterior 2 in each band submarginal, and each microseta with a pale semicircular area immediately anterior to it; anterior margin produced forwards,

biconcave with apex convex; posterior margin weakly concave or emarginate between outer pair of microsetae. Tergite VIII with a posteriorly directed concave face (Fig. 718, 723). Spiculum gastrale (Fig. 719) not as long as aedeagus with apodemes; apical plate as wide as long, triangular, but with a thicker cross-piece posteriorly; apodeme at least 4x as long as apical plate. Tegmen (Fig. 720, 722, 724, 725) with parameres undeveloped; apodeme longer than width of ring; ring sometimes with lateral flanges (Fig. 724, 725). Aedeagal body slender, shorter than its apodemes, straight medially, curved at base and apex (Fig. 722), sclerotised anterodorsally; sides concave or straight, weakly converging towards rounded or acuminate apex; body and apodemes united (Fig. 721, 722). Endophallus lacking basal sclerites; flagellum present (Fig. 721).

Range. New Zealand.

Remarks. The open mesosternal receptacle and squamose prosternal canal, linked with small size, are sufficient to distinguish members of this genus from all other New Zealand Cryptorhynchinae. The clear areas anterior to each microseta on tergum VII are reminiscent of those in the same position in *Trinodicalles*, *Patellitergum*, and *Hadracalles*. However, there are no other apomorphic character states that support that relationship. In the form of the prosternal canal and mesosternal receptacle the genus is similar to the Fijian *Phaneroesthus* and the more widespread Austro-Oriental genus *Deretiosus* but, again, no other apomorphies support these possible relationships. The concave face posteriorly on male tergite VIII seems to be autapomorphic for the genus. The sister-group of *Omoecalles* has not been identified. In male *O. ovatellus* the aedeagus is relatively heavily sclerotised and obscures the flagellum, which is shorter than that of *O. crisioides*.

Omoecalles crisioides (Broun)

Fig. 88, 188, 385–389, 717–722

Broun, 1880: 492 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121. Styles, 1973: 356. May, 1987: 47. Kuschel, 1990: 74, 81 (*Omoecalles*).

Type data. Lectotype female here designated, BMNH, on card, with labels "875" printed, green / "Tairua" printed / "Acalles; crisioides" handwritten (Broun). Original series contained "several" specimens.

Range. ND, AK, CL, WO, BP, TO, GB, HB, RI, WN/SD, NN, KA, BR, MC, WD, MK, OL.

Biology. Adults of *O. crisioides* have been obtained repeatedly from leaf litter, as well as decayed wood, bark, and fungus. Adults have also been collected from live and dead plants on branches, trunks, and foliage, including *Acacia mearnsii*, *Corynocarpus laevigatus*, *Cupressus torulosa*, *Dysoxylum spectabile*, *Eucalyptus* sp., *Ficus* sp., *Freycinetia baueriana*, *Hedycarya arborea*, *Hoheria populnea*, *Knightia excelsa*, *Macropiper excelsum*, *Melicope ternata*, *Melicytus ramiflorus*, *Melicytus* sp., *Olearia colensoi*, *O. furfuracea*, *Parsonsia heterophylla*, *Phormium* sp., *Pseudopanax arboreus*, *Schefflera digitata*, *Solanum mauritianum*, *Sophoramicrophylla*, dead "whau [*Entelea arborescens*] wood" and "ferns" (Kuschel 1990 and unpubl. data). In addition, specimens have been collected from cut branches of *Melicytus ramiflorus* and *Brachyglottis repanda*.

Specimens have been reared from *Clematis* sp. (Styles 1973), dead bark of *Corynocarpus laevigatus*, subcortical dead wood of *Crataegus monogyna* (May 1987), dead bark of *Dysoxylum spectabile*, *Ficus* sp. (Styles 1973), a large dead branch (W69/11) and small to moderate-sized branches of *Laurelia novaezelandiae*, dead and rotting bark of *Nothofagus cliffortioides*, *Olearia furfuracea*, and a dead, partially rotten trunk of *Pittosporum eugenioides* (W66/6).

Omoecalles ovatellus (Broun)

Fig. 32, 723–725

Broun, 1881: 720 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 123. May, 1987: 47. Kuschel, 1990: 74, 81 (*Omoecalles*).

Type data. Holotype female, BMNH, on card, with labels "1273" printed, green / "Manaia" printed / "Acalles; ovatellus" handwritten (Broun).

Range. ND, AK, CL, HB, WN / SD.

Biology. Adults of *O. ovatellus* have been collected from trees and shrubs, including *Cordyline australis*, *Corynocarpus laevigatus*, *Dysoxylum spectabile*, *Hedycarya arborea*, *Vitex lucens*, and "whau [*Entelea arborescens*] wood" (Kuschel 1990 and unpubl. data); specimens have also been obtained under *Beilschmiedia tarairi* bark and from leaf litter.

The species has been reared from dead bark of *Corynocarpus laevigatus* (May 1987), a large dead branch of *Laurelia novaezelandiae* (W69/11), and *Fomes* on *Nothofagus menziesii*.

Omoecalles perspicuus Broun

Fig. 137

Broun, 1909a: 151. Hudson, 1934: 222. Hustache, 1936: 125.

Type data. Syntypes: 3 females, BMNH, on card (1 mounted on dorsum), with labels "2963" handwritten (Broun) / "Waitakerei" printed (1 only) / "Omoecalles; perspicuus" handwritten (Broun) (1 only). All syntypes located.

Range. ND, AK, CL / —.

Biology. Specimens of *O. perspicuus* have been collected from *Astelia banksii*, *Citrus* sp., *Collospermum* sp., *C. hastatum* and *Cupressus tombosa*.

Genus *Allanalcis* Broun

Broun, 1913: 140. Hudson, 1934: 223. Hustache, 1936: 178. Type species *Acalles allanalcis* Broun, 1893a, here designated.

Euacalles Broun, 1921: 647. Hudson, 1934: 221. Hustache, 1936: 124. Type species *Euacalles cristatus* Broun, 1913, by monotypy. New synonymy.

Length 1.5–2.5 mm. Habitus, Fig. 33. Derm pale to dark brown or black, densely squamose. Scales round or oval, sometimes more elongate if gathered into tufts, decumbent or erect, imbricate to separate; erect setiform scales absent. Pronotum in profile (Fig. 89) convex posteriorly, depressed anteriorly; pronotum and clytra distinctly depressed at base; clytra convex. Apterous.

Head. Rostrum shorter than pronotum, weakly curved, convex dorsally, more so in male, especially towards apex, densely punctate dorsally; squamosity dense basally, extending at least to antennal insertions in male but not in female.

Antennae inserted approximately halfway along rostrum, sometimes nearer apex in male. Funicle longer than scape; F1 and F2 elongate, subequal or F2 longer than F1, together more than half length of scape. Scape lacking scales; scape and funicle with fine, semi-erect and decumbent setae. Club oval, with inner face flat.

Thorax. Pronotum (Fig. 33) wider than long, widest in posterior half; sides sinuate anteriorly, convex posteriorly; anterior margin convex; posterior margin straight; weak prominences sometimes present at position 2; punctuation dense, coarse; tufts of scales sometimes present at posi-

tions 2 and 3. Scutellum concealed.

Elytra (Fig. 33) with basal margin straight, as wide as pronotum basally or wider; humeri sometimes produced; sides smoothly convex, widest in anterior half, convex or weakly concave from widest point to convex apex; interstriae broad; prominences absent or weakly developed on interstriae 1, 3, and 5; striae punctures round or elongate; scales sometimes gathered into elongate tufts along interstriae. Elytral strigil present.

Postocular lobe rounded, continuous with marginal carina of prosternal canal. Mesosternal receptacle shallowly U-shaped, wider than long, cavernous, not extending posteriorly to level of midline of middle coxae (Fig. 138); margins produced ventrally. Metasternum depressed or concave medially, separating middle and hind coxae by less than length of a hind coxa, more or less projecting ventrally between middle and hind coxae; anterolateral margins sometimes forming a vertical wall between depressed area and middle coxae (Fig. 138). Metepisternum obscure; anapleural suture (if present) obscure, incomplete, but region of suture raised anteriorly, glabrous, with a short row of separate or imbricate rounded sclerolepidia sometimes continuous posteriorly with a row of less differentiated scales (Fig. 153).

Fore coxae with a posterior projection. Femora lacking a ventral tooth; ventral groove broad, more or less tilted posteriorly in middle and hind legs, squamose. Tibiae lacking a ventral carina and premucro; uncus broad, arising close to ventral side. Tarsal claws slender.

Abdomen. Ventrite 1 concave medially; intercoxal process concave, wider than long; suture between V1 and V2 apparent or incomplete. Ventrites 1 and 2 subequal in length (excluding intercoxal process), or V2 shorter than V1, sloping towards V3. Ventrites 3+4 subequal in length to V2, flat or transversely convex. Punctuation dense, coarse, less on ventrites 3 and 4 than others. Intercoxal process, centre of ventrite 1, anterior part of V2, and centre or posterior part of V5 sometimes with a patch of fine setae in male, otherwise ventrites with a fairly even cover of separate, oval, semi-erect scales.

Female terminalia. Tergite VII (Fig. 390, 395) either: (1) as long as wide, lacking microsetae but with a single pair of projecting angles posteriorly, each bearing a very large seta, with posterior margin concave between projecting angles and anterior margin produced forwards medially; or (2) longer than wide, with about 7 pairs of microsetae in 2 subparallel longitudinal rows, with posterior margin broadly convex and anterior margin produced anteromedially. Tergite VIII (Fig. 391, 396) at least as long as wide; posterior margin weakly convex, crenulate. Sternite

VIII (Fig. 392, 397) with apical plate about as long as wide, shorter than apodeme. Hemisternites subequal in length to broad portion of sternite VIII, tapering to terminal styli (Fig. 394, 399); spermathecal duct either (1) arising on bursa away from junction with oviduct (Fig. 393) or (2) broad, arising at junction of oviduct and bursa (Fig. 398); vaginal sclerites absent (Fig. 393, 398).

Male terminalia. Tergite VII (Fig. 726, 733) with (1) microsetae absent but a single pair of projecting angles posteriorly, each bearing a very large seta, or (2) 3–6 pairs of microsetae arranged in parallel lines, the hindmost pair projecting from posterior margin; anterior margin convex, produced forwards medially; posterior margin concave or emarginate between posterior microsetae or projecting angles. Spiculum gastrale (Fig. 728, 735) shorter than aedeagus with apodemes; apical arms (1) narrow, long or (2) broad. Tegmen (Fig. 729, 730, 736, 737) with parameres fused together to near apex, shorter than apodeme; apodeme shorter than width of tegminal ring or subequal. Aedeagal body shorter than its apodemes, either (1) curved in proximal half, with length and width subequal, and sides weakly rounded to rounded apex, with a broadly acuminate projection (Fig. 738, 739), or (2) curved apically, longer than wide, with sides sinuate, tapering apically to an elongate projection (Fig. 731, 732); ventral surface weakly sclerotised or unsclerotised; body and apodemes separate or finely united. Endophallus either (1) with an X-shaped basal sclerite and no flagellum or (2) with flagellum and guides (Fig. 731, 738).

Range. New Zealand.

Remarks. All described species of *Allanalcis* have a short row of separate, contiguous, or imbricate, non-plumose sclerolepidia on a raised glabrous base, a character state not found elsewhere and here deemed apomorphic. In two undescribed species the sclerolepidia are continuous posteriorly with a row of slightly less modified scales, probably following the line of the anapleural suture. This indicates that the shortening of the row is apomorphic within the genus. In at least *A. aulacus* and *A. allostethus* the metasternum is extensively depressed posterior to the mesosternal receptacle and bounded anterolaterally by raised vertical 'walls' which separate it from the middle coxae. In *A. eruensis* the metasternum is less depressed and the 'walls' are less vertical. In the undescribed species already mentioned the metasternum is scarcely depressed, thus indicating again that the character state is apomorphic within the genus.

The species fall fairly clearly into two groups on the basis of their genitalia. Males of *A. eruensis* and an undescribed

species have a flagellum and a long, apically curved aedeagus (Fig. 731, 732); the female spermathecal duct is wide, presumably to accept the flagellum, and arises as normal from the bursa/oviduct junction (Fig. 398). The other species have a shorter, broader aedeagus without a flagellum (Fig. 738) and a narrow spermathecal duct arising from the bursa away from the oviduct (Fig. 393). In addition, the posterior margin of tergum VII is adorned with a pair of large setae (Fig. 390, 733), absent from the other species-group (Fig. 395, 726). However, most members of both species-groups possess a short, raised row of sclerolepidia, noted above as apomorphic for the genus; the exceptions to this are the two undescribed species. The large, oval scales of the pronotum and the distinctive colour pattern (Fig. 33), whilst not identifiable with certainty as apomorphic, also link the two types. A further undescribed species, which has perhaps the most undifferentiated sclerolepidia seen in the genus, has tergite VII as in the first group and an aedeagus approaching that of the first group, but lacking the flagellum; instead the large, broadly X-shaped sclerites which in other species are linked to the base of the flagellum are present, perhaps suggesting a link to the second group.

There are several character states that link members of the genus to the *Crisius* group of genera. The depressed metasternum found in *A. aulacus* and *A. allostethus* is similar to the state found in some members of the *Crisius* group. This character state, however, which probably represents an adaptation allowing the hind legs to be folded close to the body (see discussion under *Crooktallies*), almost certainly arose independently in *Allanalcis* (see above). The forward projection of the anterior margin of tergum VII in both sexes is characteristic of the *Crisius* group, but there is no evidence to suggest that it is homologous in the two.

Allanalcis may be close to *Zeacalles*, and a number of species previously considered as members of *Allanalcis* are transferred to *Zeacalles* in this study. The major similarity is that some species of *Zeacalles* have the anterior end of the anapleural suture raised on a glabrous base, approaching the condition found in *Allanalcis*, and it is possible that the state in the latter genus is an apomorphic derivative from the state found in some of the former. If so, *Zeacalles* is paraphyletic with respect to *Allanalcis*. However, in most species of *Zeacalles* the sclerolepidia of the anapleural suture are very fine and apparently plumose, a state not seen in *Allanalcis*, where the sclerolepidia are larger and glossy. There is one undescribed species, probably belonging to *Zeacalles*, where the sclerolepidia are similar to those of *Allanalcis*, but in that case they are spread over the entire side of the mesosternum. Further, in

what may be the most plesiomorphic form of the sclerolepidial patch in *Allanalcis*, the area of the anapleural suture is not raised. While in many species of *Zeacalles* interstria 2 is raised immediately anterior to the posterior slope of the elytra, in *Allanalcis* this is not so and any development in this area is confined to interstria 3, as in *Pachyderris* and *Trinodicalles*. The pronotal scales are generally elongate in *Zeacalles* species, while those of *Allanalcis* are broadly oval.

Finally, there are some similarities between *Allanalcis* and *Rainacalles*, in the shape of tergite VII (particularly that of the male) and the form of the scales. No unequivocal synapomorphies have been detected between members of the two genera.

The male of *A. aulacus* has a depressed setose region of the metasternum and first ventrite, and an undescribed species has a similar region on ventrite 5; in both instances the structure is very much like that of *Zeacalles igneus*.

Three species and a number of unidentified specimens have been extracted from litter. Larval biology is unknown.

Allanalcis allostethus (Broun)

Fig. 89

Broun, 1893a: 1490 (*Acalles*). Hutton, 1904: 213. Broun, 1913: 142 (*Allanalcis*). Hudson, 1934: 223. Hustache, 1936: 120 (*Acalles*). Kuschel, 1990: 73 (*Allanalcis*).

Type data. Holotype female, BMNH, on card, with labels "2571." handwritten (Broun) / "Hunua; Maketu" handwritten (Broun) / "Allanalcis; allostethus" handwritten (Broun).

Range. AK, BP / —.

Biology. Adults of *A. allostethus* have been collected in leaf litter and decayed wood.

Allanalcis aulacus (Broun)

Fig. 33, 138, 390–394

Broun, 1893a: 1489 (*Acalles*). Hutton, 1904: 213. Broun, 1913: 142 (*Allanalcis*). Hudson, 1934: 223. Hustache, 1936: 121 (*Acalles*).

Type data. Syntypes: 1 male (mounted on dorsum), 1 female, BMNH, on card, each with labels "2570." handwritten (Broun) / "Hunua; Maketu" handwritten (Broun) / "Acalles; aulacus" (male only) "Allanalcis; aulacus" (female only), both handwritten (Broun). All syntypes located.

Range. ND, AK / —.

Biology. Adults of *A. aulacus* have been collected frequently from leaf litter, with one record from *Ganoderma* on a dead standing tree.

Allanalcis eruensis (Broun) new combination

Fig. 153, 395–399, 726–732

Broun, 1913: 134 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121.

cristatus Broun, 1921: 647 (*Euacalles*). Hudson, 1934: 221. Hustache, 1936: 124. New synonymy.

Type data. *eruensis*: lectotype male here designated, BMNH, on card, with labels "3314" handwritten (Broun) / "Erua.; March 1910." handwritten (Broun) / "Acalles; eruensis." handwritten (Broun). Paralectotype male, BMNH, mounted on dorsum on card, with labels as for lectotype. All syntypes located.

cristatus: holotype male, BMNH, on card, with labels "4228." handwritten (Broun) / "Rotoiti; 3.6.1916." handwritten (Broun) / "Euacalles; cristatus." handwritten (Broun).

Range. BP, TO / SD, NN, MB, BR.

Biology. Specimens of *A. eruensis* have been collected from leaf litter.

Allanalcis laticollis Broun

Fig. 733–739

Broun, 1914: 245. Hudson, 1934: 223.

Type data. Syntype female, BMNH, on card, with labels "3646" handwritten (Broun) / "Rakaia; 18.5.1912." handwritten (Broun) / "Allanalcis; laticollis" handwritten (Broun). Two syntypes (same data) not located.

Range. AK / MC.

Allanalcis melastictus Broun

Broun, 1921: 576. Hudson, 1934: 223.

Type data. Holotype male, BMNH, on card, with labels "4127." handwritten (Broun) / "Titirangi; 18.9.1915." handwritten (Broun) / "Allanalcis; melastictus" handwritten (Broun).

Range. AK / —.

Genus *Zeacalles* Broun

Broun, 1893b: 379. Hutton, 1904: 214. Hudson, 1934: 223.

Hustache, 1936: 126. Type species *Zeacalles flavescens* Broun, 1893, here designated.

Length 1–3 mm. Habitus, Fig. 34. Derm brown to black, shiny, sparsely to densely squamose. Scales round, oval, or elongate, imbricate and separate, decumbent and erect, with elongate erect scales sometimes present in tufts or scattered; erect setiform scales present or absent. Pronotum in profile (Fig. 90) smoothly convex or with a weak depression in anterior half, not or only weakly depressed at base; elytra strongly convex or nearly flat anteriorly, smoothly convex posteriorly. Apterous.

Head. Rostrum as long as pronotum or shorter, sometimes more convex dorsally in male; dorsal punctation variable, generally coarser in male; squamosity present basally, more extensive and dense in male.

Antennae inserted about halfway along rostrum, sometimes nearer base in female. Funicle not as long as scape; F1 and F2 elongate, subequal or F1 longer than F2, together at least three-quarters length of scape; scape and funicle lacking scales but with fine, semi-erect and decumbent setae. Club darker than rest of antenna or concolorous.

Thorax. Pronotum wider than long, widest in posterior half, generally near base, only rarely at middle; sides smoothly convex or nearly straight; anterior margin convex; posterior margin straight or weakly convex (Fig. 34); prominences absent or very weak at position 2; punctation coarse, fine, or absent; scale tufts absent or weakly present at position 2, sometimes immediately posterior to tufts at position 2. Scutellum concealed.

Elytra with basal margin straight or weakly produced at interstriae 2 and 3, as wide as pronotum basally; sides smoothly convex, with greatest width variably situated; apex convex, not always distinguishable from general curvature of margin; interstriae broad, sometimes obscure; interstria 2 often widened just anterior to posterior declivity, frequently with prominences immediately before posterior declivity (Fig. 34, 90) and otherwise absent, rarely scattered prominences present; stria punctures absent or round, elongate and confluent; scales sometimes gathered into tufts on prominences. Elytral strigil present.

Postocular lobe small, continuous with marginal carina of prosternal canal. Mesosternal receptacle cavernous, generally U-shaped, with length and width subequal, more rarely shallowly V-shaped, generally extending posteriorly to level of midline of middle coxae or beyond, more rarely to just behind anterior of middle coxae; margins thin, pro-

jecting ventrad. Metasternum depressed or concave medially, separating middle and hind coxae by less than length of a hind coxa, more or less projecting ventrally between middle and hind coxae. Metepisternum obscure, largely covered by elytron; anapleural suture incomplete anteriorly, sometimes weakly raised; sclerolepidia or specialised appressed imbricate scales present in one or more rows along anapleural suture or, rarely, in a broad patch covering anapleural suture (Fig. 154–157).

Fore coxae with a posterior projection. Femora lacking a ventral tooth; ventral groove sometimes obscure, broad, more or less inclined posteriorly on middle and hind legs, glabrous or squamose. Tibiae without a ventral carina; premacro weak or absent. Tarsal claws small.

Abdomen. Ventrite 1 concave or convex medially; intercoxal process concave or flat, wider than long. Ventrites 1 and 2 completely fused or with suture apparent, rarely with an elevated concave area in male, fringed with long setae (Fig. 191), subequal in length (excluding intercoxal process) or V2 shorter than V1, sloping towards V3. Ventrites 3 and 4 together subequal in length to V2 or longer, transversely convex. Ventrites 1 and 2 with elongate, semi-erect scales, these rarely extending on to V3–5; V3 and V4 generally glabrous, V5 with fine setae.

Female terminalia. Tergite VII (Fig. 400) longer than wide, with 2 or 3 pairs of microsetae arranged longitudinally, the posterior pair submarginal, or lacking microsetae; anterior margin more or less convex, sometimes projecting anteromedially; posterior margin truncate or convex. Tergite VIII (Fig. 401) as long as wide, or longer; posterior margin convex, entire. Sternite VIII (Fig. 402) with apical plate weakly sclerotised, as long as wide, shorter than apodeme. Hemisternites of ovipositor not longer than broad portion of sternite VIII, more or less tapering to terminal styli (Fig. 406). Spermathecal duct arising at junction of bursa and oviduct (Fig. 403) or on bursa away from junction; bursa unsclerotised or, rarely, with faint but extensive sclerotisation ventrally (Fig. 404, 405).

Male terminalia. Tergite VII (Fig. 740, 747) about as long as wide, with 1 or 2 pairs of microsetae arranged longitudinally, the posterior pair marginal or submarginal; anterior margin strongly convex; posterior margin shallowly emarginate or convex between posterior microsetae. Spiculum gastrale (Fig. 742, 749) longer or shorter than aedeagal apodemes, or subequal; apical arms narrow and long, with weakly sclerotised lateral flanges, or broad and forming a weakly sclerotised plate. Tegmen (Fig. 743, 744, 750, 751) with parameres shorter than apodeme, sometimes very short; apodeme longer or shorter than width of tegmental ring. Aedeagal body slightly shorter than its

apodemes to less than one-third as long, evenly curved or curved more strongly distally or proximally than elsewhere, longer than wide, with sides straight and apex rounded or broadly acuminate; body and apodemes united (Fig. 745, 746, 752, 753). Endophallus with or without a large, posterior, inverted Y-shaped sclerite; basal sclerite complex or simple, varicid; flagellum absent (Fig. 745, 752).

Range. New Zealand.

Biology. In the limited data available, adults are recorded as having been collected from leaf litter, moss, or rotten wood. There are no rearing records, and the larvae are unknown.

Remarks. The combination of a short, round body form with the widest part of the pronotum near the posterior margin, the slender band of scales along the anapleural suture, and the broadening or elevation into a prominence of interstria 2 just before the posterior declivity of the elytra distinguishes most species of *Zeacalles* from all others. However, for each of these characters there are exceptions. *Zeacalles igneus*, while possessing a narrow band of sclerolepidia on a raised anapleural suture, very similar in pattern to other members of the genus, has the pronotum broadest at about mid length, giving an outline different from any other described species in the genus. It is retained in the genus – with at least one closely related undescribed species – because of the apomorphic form of the sclerolepidia and anapleural suture. The sclerolepidia or modified scales are present in a number of arrangements (Fig. 154–157), of which the single or double strip along the anapleural suture is most common. A broader patch, though still apparently retained in a widened ‘suture’, is found in some species, particularly those placed formerly in *Allanalcis*, and a very broad patch irregularly spread over the metasternite in one species, *Z. picatus*. Almost all species, however, have the same type of scale in this patch: very small, white, and indistinct in outline. One undescribed species, on the contrary, has a broad patch of large, glossy cream scales; it is tentatively included in *Zeacalles* because of the very similar pronotal and elytral form and the broadening of interstria 2 immediately before the posterior declivity of the elytra.

Zeacalles may not be monophyletic. As noted above, in some species the anapleural scales are on a raised prominence reminiscent of *Allanalcis* as recognised here, and it is possible that the sister-group of *Allanalcis* lies within *Zeacalles* (see discussion under *Allanalcis*). Finally, *Rainacalles volens* shares the body form but no other apomor-

phies, and is here treated as a separate genus, the relationships of which lie somewhere between *Zeacalles*, *Allanalcis*, *Trinodicalles*, and *Pachyderris*. Resolution of the relationships between these genera requires a detailed analysis.

One unusual feature is worthy of mention. In *Z. igneus* and at least one undescribed species the male ventrite 1 and the anterior part of ventrite 2 are elevated, concave, and fringed with long setae (Fig. 191); in *Z. igneus* itself a similar development is present on ventrite 5. This feature has not been seen on other species of the genus, although it is approached in *Allanalcis aulacus*.

The bursa of *Z. variatus* has a weak but extensive sclerotisation ventrally (Fig. 404, 405). This gives the ventral surface the appearance of a broad ‘M’ in cross-section (Fig. 405). The function of this structure is not known.

There are a large number of undescribed species in *Zeacalles*, although none has so far been found outside New Zealand.

Zeacalles aeratus Broun

Broun, 1921: 578. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Lectotype female here designated, BMNH, on card, with labels “4130.” handwritten (Broun) / “Woodhen.; 20.6.1915.” handwritten (Broun) / “*Zeacalles*; *aeratus*.” handwritten (Broun). Paralectotype female, BMNH, on card mounted on dorsum, same data as lectotype. All syntypes located.

Range. — / NN.

Zeacalles albipictus (Broun) new combination

Fig. 157

Broun, 1921: 576 (*Allanalcis*). Hudson, 1934: 223.

Type data. Holotype male, BMNH, on card, with labels “4126.” handwritten (Broun) / “Glen Hope.; 30.8.1915.” handwritten (Broun) / “*Allanalcis*; *albipictus*.” handwritten (Broun).

Range. — / NN.

Zeacalles alpestris (Broun)

Broun, 1893a: 1488 (*Acalles*); —1893b: 380 (*Zeacalles*). Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Syntypes: 2 (?sex), BMNH, on card, one mounted on dorsum, with labels "2568" handwritten (Broun) / "Pirongia" printed / "Zeacalles; alpestris" handwritten (Broun) (specimen mounted on venter only). All syntypes located.

Range. WO, BP, TK, TO / —.

Biology. Adults of *Zeacalles alpestris* have been recorded from leaf litter and moss on trees.

Zeacalles binodosus Broun

Broun, 1910c: 69. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Syntypes: 1 male, 1 female, BMNH, on card, with labels "3139." handwritten (Broun) (female only) / "var; 3139." handwritten (Broun) (male only) / "Waimarino; Jany. 1909." handwritten (Broun) / "Zeacalles; binodosus." handwritten (Broun) (female only). All syntypes located.

Range. ND, TK, TO, GB, WN-WA / SD, NN, MB, BR, MC, SC.

Biology. Adults of *Zeacalles binodosus* have been generally collected from leaf litter, but also moss.

Zeacalles bisulcatus Broun

Broun, 1921: 579. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype male, BMNH, on card, with labels "4133." handwritten (Broun) / "Howard.; 30.3.1915" handwritten (Broun) / "Zeacalles bisulcatus" handwritten (Broun).

Range. — / BR.

Zeacalles blanditus (Broun) new combination

Broun, 1921: 577 (*Allanalcis*). Hudson, 1934: 223.

Type data. Holotype female, BMNH, on card, with labels "4128." handwritten (Broun) / "Allanalcis; blanditus" handwritten (Broun).

Range. — / NN, BR.

Biology. Adults of *Zeacalles blanditus* have been collected from leaf litter.

Zeacalles brookesi Marshall

Marshall, 1937: 337.

Type data. Holotype female, BMNH, on card, with BMNH holotype disc / and labels "Erua.; Jany. 1910." handwritten (Broun) / "Zeacalles; floccosus, Mshl.; TYPE [f.]" handwritten (Marshall) / "HOLOTYPE; Zeacalles; brookesi; Marshall, 1937; Lyal det, 1987" handwritten (Lyal), red. Paratypes: 1 female, BMNH, on card mounted on dorsum, same data as holotype except year of collection given as 1911; 2 females, BMNH and NZAC, on card, from Okuaia, Matamata, Waikato, collected by Brookes 14.iii.1922., both labelled "Zeacalles; brookesi, Mshl.; COTYPE [f.]" handwritten (Marshall). Marshall's name *floccosus* was never published.

Range. WO, TO / —.

Zeacalles carinellus Broun

Fig. 747-753

Broun, 1914: 245. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Syntypes: 4 (?sex), BMNH, on card, 1 mounted on side, with labels "3647." handwritten (Broun) (3 only) / "var.; 3647" handwritten (Broun) (1 only) / "McClennans.; 23.4.1912" handwritten (Broun) / "Zeacalles; carinellus" handwritten (Broun) (2 only). Original number of type specimens not stated by Broun.

Range. — / NN, MB, MC.

Zeacalles coarctalis Broun

Broun, 1921: 578. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype (?sex), BMNH, on card, with labels "4131." handwritten (Broun) / "Retaruke.; March 1910." handwritten (Broun) / "Zeacalles; coarctalis." handwritten (Broun).

Range. TO / —.

Zeacalles cordipennis Broun

Fig. 155

Broun, 1921: 582. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype (?sex), BMNH, on card, with labels

"4138." handwritten (Broun) / "Howard.; 10.3.1915." handwritten (Broun) / "Zeacalles; cordipennis" handwritten (Broun).

Range. — / BR.

***Zeacalles dilatatus* (Broun) new combination**

Broun, 1913: 142 (*Allanalcis*). Hudson, 1934: 223. Hustache, 1936: 178.

Type data. Holotype male, BMNH, on card, with labels "3226." handwritten (Broun) (published as 3326) / "Erua.; Jany. 1910." handwritten (Broun) / "Allanalcis; dilatatus." handwritten (Broun).

Range. TO / —.

***Zeacalles estriatus* Broun**

Broun, 1914: 246. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype male, BMNH, on card, with labels "3648." handwritten (Broun) / Mc Clennans.; 23.4.1912." handwritten (Broun) / "Zeacalles; estriatus" handwritten (Broun).

Range. — / MC.

***Zeacalles femoralis* Broun**

Broun, 1913: 145. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype (?sex), BMNH, on card, with labels "3330" handwritten (Broun) / Mt Greenland.; Ross. 2500 ft." handwritten (Broun) / "Zeacalles; femoralis." handwritten (Broun).

Range. — / WD.

***Zeacalles finitimus* Broun**

Broun, 1921: 579. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype (?sex), BMNH, on card, with labels "4132." handwritten (Broun) / "Woodhen; 20.6.1915." handwritten (Broun) / "Zeacalles; finitimus." handwritten (Broun).

Range. — / NN.

***Zeacalles flavescens* Broun**

Fig. 34

Broun, 1893b: 380. Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Lectotype female here designated, BMNH, on card, with labels "2956." handwritten (Broun) / "Pirongia" printed / "Zeacalles; flavescens" handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. WO / —.

***Zeacalles formosus* (Broun) new combination**

Broun, 1893b: 375 (*Acalles*). Hutton, 1904: 214. Broun, 1913: 142 (*Allanalcis*). Hudson, 1934: 223. Hustache, 1936: 122 (*Acalles*).

Type data. Syntypes: 1 male, BMNH, on card, with labels "2936." handwritten (Broun) / "Pirongia" printed / "Allanaleis; formosus." handwritten (Broun); 1 male, BMNH, on card mounted on dorsum, with labels as above except locality label is "Waikato" printed and there is no Broun species name label. One syntype not located.

Range. WO, BP, TO, RI / NN, BR, MC.

Biology. Adults of *Zeacalles formosus* have been collected in leaf litter.

***Zeacalles ignealis* (Broun) new combination**

Broun, 1913: 142 (*Allanalcis*). Hudson, 1934: 223. Hustache, 1936: 178.

Type data. Holotype male, BMNH, on card, with labels "3324." handwritten (Broun) / "Erua.; Jany. 1910." handwritten (Broun) / "Allanalcis ; ignealis." handwritten (Broun).

Range. TO / MC.

***Zeacalles igneus* (Broun) new combination**

Fig. 191

Broun, 1909a: 144 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 122.

Type data. Holotype female, BMNH, on card, with labels "2945." handwritten (Broun) / "Broken; River." handwritten (Broun) / "Acalles; igneus" handwritten (Broun).

Range. — / MC.

Zeacalles incultus (Broun) new combination

Broun, 1893a: 1490 (*Acalles*). Hutton, 1904: 214. Broun, 1913: 142 (*Allanalcis*). Hudson, 1934: 223. Hustache, 1936: 122 (*Acalles*). Kuschel, 1990: 73 (*Allanalcis*).

Type data. Holotype not located.

Range. AK, WO, TO, RI, WN / NN, MB, MC.

Biology. Adults of *Zeacalles incultus* have been recorded from leaf litter (Broun 1893a, Kuschel 1990) and from a rotten log.

Zeacalles inornatus Broun

Broun, 1921: 581. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype male, BMNH, on card, with labels "4136." handwritten (Broun) / "Mount Hope.; 14.2.1915." handwritten (Broun) / "Zeacalles; inornatus" handwritten (Broun) / "NEW ZEALAND (NN); Nelson: Mt Hope; 14.iii.86.; T. Hall" handwritten (Lyal).

Range. — / NN.

Zeacalles latulus Broun

Broun, 1921: 581. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype female, BMNH, on card, with labels "4135." handwritten (Broun) / "Woodhen.; 20.6.1915." handwritten (Broun) / "Zeacalles; latulus." handwritten (Broun).

Range. — / NN.

Zeacalles lepidulus Broun

Fig. 154

Broun, 1909a: 140. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype (?sex), BMNH, on card, with labels "2958." handwritten (Broun) / "Totara.; Southland." handwritten (Broun) / "Zeacalles; lepidulus." handwritten (Broun).

Range. — / NC, WD, SL.

Biology. Adults of *Zeacalles lepidulus* have been recorded from leaf litter.

Zeacalles oculatus (Broun) new combination

Broun, 1913: 142 (*Allanalcis*). Hudson, 1934: 223. Hustache, 1936: 178.

Type data. Holotype male, BMNH, on card, with labels "3325." handwritten (Broun) / "Hunua; Maketu." handwritten (Broun) / "Allanalcis; oculatus." handwritten (Broun).

Range. AK, TO / —.

Zeacalles parvus Broun

Broun, 1921: 582. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype male, BMNH, on card, with labels "4137." handwritten (Broun) / "Huia.; 10.4.1915." handwritten (Broun) / "Zeacalles; parvus." handwritten (Broun).

Range. AK / —.

Zeacalles picatus (Broun)

Fig. 156

Broun, 1893a: 1488 (*Acalles*); —1893b: 380 (*Zeacalles*). Hutton, 1904: 214. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype male, BMNH, on card, with labels "2569." handwritten (Broun) / "Hunua; Maketu." handwritten (Broun) / "Zeacalles; picatus" handwritten (Broun).

Range. ND, AK, BP, TK / —.

Biology. Adults of *Zeacalles picatus* have been recorded from leaf litter.

***Zeacalles pictus* Broun**

Broun, 1913: 144. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype female, BMNH, on card, with labels "3329." handwritten (Broun) / "Retaruke.; March 1910." handwritten (Broun) / "*Zeacalles; pictus*" handwritten (Broun).

Range. TK, TO / —.

Biology. Adults of *Zeacalles pictus* have been recorded from leaf litter.

***Zeacalles scaber* Broun**

Broun, 1915: 340. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype female, BMNH, on card, with labels "3773." handwritten (Broun) / "Rose Hill.; 30.3.1913" handwritten (Broun) / "*Zeacalles; scaber.*" handwritten (Broun) / "NEW ZEALAND (MC); Methven: Rose Hill; 30.iii.1913. T. Hall; Decaying leaves; on ground" handwritten (Lyal).

Range. — / NN, WD, MC.

Biology. Adults of *Zeacalles scaber* have been recorded from leaf litter.

***Zeacalles scruposus* Broun**

Broun, 1921: 580. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype male, BMNH, on card, with labels "4134." handwritten (Broun) / "Gordons Knob.; 13.11.1914." handwritten (Broun) / "*Zeacalles; scruposus.*" handwritten (Broun).

Range. — / SD, NN, BR, WD, MC, MK, FD.

Biology. Adults of *Zeacalles scruposus* have been found frequently in litter, and also in forest-floor moss.

***Zeacalles seticollis* (Broun) new combination**

Broun, 1921: 575 (*Allanalcis*). Hudson, 1934: 223.

Type data. Holotype (?sex), BMNH, on card, with labels "4125." handwritten (Broun) / "Woodhen.; 20.6.1915."

handwritten (Broun) / "*Allanalcis; seticollis*" handwritten (Broun).

Range. — / NN.

***Zeacalles sparsus* Broun**

Broun, 1915: 341. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Holotype (?sex), BMNH, on card, with labels "3774" handwritten (Broun) / "Pudding; 13.4.1913." handwritten (Broun) / "*Zeacalles; sparsus.*" handwritten (Broun).

Range. — / MC.

***Zeacalles speciosus* Broun**

Broun, 1917: 452. Hudson, 1934: 223. Hustache, 1936: 126.

Type data. Lectotype male here designated, BMNH, on card, with labels "3940." handwritten (Broun) / "Moa Basin.; 20.10.1913." handwritten (Broun) / "*Zeacalles; speciosus*" handwritten (Broun). Paralectotype female, BMNH, on card mounted on dorsum, same data as lectotype. All syntypes located.

Range. — / NN, BR, MC.

Biology. Adults of *Zeacalles speciosus* have been found in leaf litter.

***Zeacalles variatus* (Broun) new combination**

Fig. 400–406, 740–746

Broun, 1921: 575 (*Allanalcis*). Hudson, 1934: 223.

Type data. Syntypes: 2 females (1 mounted on dorsum) and 1 male BMNH, 3 males NZAC, all on card, with labels "4124." handwritten (Broun) (BMNH specimens only) / "Glen Hope; 18.7.1915." handwritten (Broun) (2 NZAC and male BMNH specimens only); other NZAC specimen has "Glen Hope; 20.6.1915" handwritten (Broun), and 2 BMNH females have "Glen Hope; 10.12.15" handwritten (Broun) / "*Allanalcis; variatus.*" handwritten (Broun) / "T. Broun; Dup. Coll" printed (2 NZAC specimens only) / "A. E. Brookes; Collection" printed ('other' NZAC specimen only). Four syntypes not located, although there are 3 specimens in NZAC with the same data but distinguished as "var" which may be syntypes.

Range. TO—RI / NN.

Zeacalles varius Broun

Broun, 1893b: 381. Hutton, 1904: 214. Hudson, 1934: 223.
Hustache, 1936: 126.

Type data. Syntype (?sex), BMNH, mounted on card, with labels "2957." handwritten (Broun) / "Pirongia" printed / "Zeacalles; varius" handwritten (Broun). One syntype not located.

Range. WO, TO / —.

Postacalles new genus

Type species *Postacalles rangirua* n.sp.

Length 1.7–2.2 mm. Habitus, Fig. 35. Derm brown, densely squamose. Scales elongate-oval, decumbent, sometimes concealed by gummy matter; erect setiform scales absent. Pronotum in profile (Fig. 91) very weakly depressed in anterior third, convex; pronotum and elytra depressed at base; clytra smoothly convex. Apterous.

Head. Rostrum shorter than pronotum; punctation coarse near base, finer distally, in male coarser from base to antennal insertions; squamosity dense near base, extending nearly to level of antennal insertions in male, less far in female.

Antennae inserted approximately halfway along rostrum, nearer apex in male. Funicle longer than scape; F1 and F2 elongate, with F1 longer and broader than F2, together approximately half as long as scape. Scape lacking scales; scape and funicle with fine, pale, semi-erect and decumbent setae.

Thorax. Pronotum as long as wide, widest near middle, lacking prominences and scale tufts; sides convex; anterior margin weakly convex; posterior margin straight (Fig. 35); punctation dense; a dense patch of cream scales on either side of midline extending forward from posterior margin in some specimens. Scutellum concealed.

Elytra (Fig. 35) with basal margin straight, as wide as pronotum basally; sides weakly convex, widest in anterior half; apex weakly convex; prominences absent, or glossy tubercles present on suture; interstria 2 raised over most of length; striae deep, well marked, with striae punctures oval; scales not gathered into tufts. Elytral strigil absent.

Postocular lobe rounded, smoothly continuous with marginal carina of prosternal canal. Mesosternal canal U-

shaped, as wide as long, extending nearly to posterior margin of middle coxae; margins produced ventrally. Metasternum sloping towards ventrite 1 behind receptacle, separating middle and hind coxae by less than length of a hind coxa; a narrow, raised strip present between middle and hind coxae. Metepisternum partially obscured by elytron; anapleural suture concealed by dense rows of appressed, tessellate and contiguous, pale, somewhat glossy scales (Fig. 158).

Fore coxae with a posterior ridge-like projection. Femora lacking a ventral tooth; ventral groove glabrous, with a median carina at least distally. Tibiae lacking a ventral carina; premucro absent.

Abdomen. Ventrite 1 on disc concave anteriorly, convex posteriorly, with intercoxal process concave, wider than long; V1 longer than V2 (excluding intercoxal process); V2 sloping towards V3. Ventrites 3 and 4 together shorter than V2, transversely convex. Punctation coarse on V1 and V2. Scales elongate, decumbent, sparse.

Female terminalia. Tergite VII (Fig. 407) as wide as long; microsetae absent; anterior and posterior margins weakly convex. Tergite VIII (Fig. 408) longer than wide; posterior margin convex, weakly crenulate. Sternite VIII (Fig. 409) with posterior plate as long as wide, about one-third as long as apodeme. Hemisternites of ovipositor longer than apical plate of sternite VIII; styli terminal (Figs 410, 411); bursa lacking sclerotisation; spermathecal duct arising at junction of bursa and oviduct (Fig. 409).

Male terminalia. Tergite VII (Fig. 754) wider than long, lacking microsetae; anterior margin convex; posterior margin truncate. Spiculum gastrale (Fig. 756) shorter than aedeagal apodemes; posterior arms narrow. Tegmen (Fig. 757, 758) with parameres undeveloped; apodeme subequal in length to width of tegminal ring. Aedeagal body shorter than its apodemes, with sides rounded to acuminate apex (Fig. 759); body and apodemes united (Figs 759, 760). Endophallus lacking sclerites; flagellum absent (Fig. 759).

Range. New Zealand.

Remarks. The affinities of *Postacalles* are uncertain. The patch of sclerolepidia may be derived from the condition in *Zeacalles* (although the scales are glossy and cream instead of plumose and white), and interstria 2 on the elytra is raised in a manner similar to that found in *Zeacalles*. However, there is no unequivocal apomorphy which links the two genera, and the pronotal and elytral shape of *Postacalles* argues against its inclusion in *Zeacalles*. From the rear margin of the pronotum arise two short parallel bars of glossy cream scales, in a manner similar to that of

some *Microcryptorhynchus* species, and the form of the pronotum is otherwise similar, but there are no other indicators of relationship. The pronotal scales are much narrower than those of *Allanalcis*, and erect setiform scales are absent, there thus being no suggestion of a close relationship with the *Metacalles* group of genera.

Postacalles may be distinguished from other small New Zealand cryptorhynchines by the lack of erect setiform scales, the presence of a broad bar of glossy specialised scales on the metepisternum, the development of interstria 2 before the posterior elytral declivity, the broadest part of the pronotum being away from the posterior margin, and the abruptly declivous elytra.

Postacalles rangirua new species

Length: male 1.79–1.94 mm, female 1.73–2.16 mm (mean 1.96 mm). Maximum width across pronotum: male 0.65–0.7 mm, female 0.67–0.78 mm (mean 0.72). Pronotal length: male 0.64–0.70, female 0.68–0.86 (mean 0.75). For all measurements, male $n = 2$, female $n = 4$. Habitus, Fig. 35. Squamosity dense. Scales yellow-brown over most of pronotum and elytra, with small dark brown patches on pronotum at position 1 and on sides, a larger patch on middle of each elytron, and smaller patches elsewhere on elytron, all these scales elongate-oval, decumbent; a dense patch of cream scales on either side of midline on pronotum extending from rear margin no more than one-quarter as long as pronotum, sometimes indistinct.

Male terminalia, Fig. 754–760; female terminalia, Fig. 407–411.

Type data. Holotype male, BMNH, dissected, on card point, with labels "New Zealand; FD (CL 369); BM 1986-274" printed / "Te Anau; Hollyford; Valley; 10.iii.1986; C.H.C. & J. Lyal" printed / "leaf litter; (see notes); very wet" printed. Paratypes: 1 male, 2 females, same data as holotype (male NZAC, females BMNH); 1 female, FD, Hump Ridge, 12.3.1938, E. Fairburn (NZAC); 1 female, ND, Waimatenui, leaf litter, 10.iii.1962, R.A. Cumber (NZAC).

Range. ND / FD.

Biology. The specimens from the Hollyford Valley were sifted from very wet leaf litter along a path which also serves as a watercourse in heavy rain. The dominant plants were *Nothofagus fusca*, *Phyllocladus alpinus*, *Podocarpus totara*, *P. halli*, *Fuchsia excorticata* and *Blechnum* sp. No information on the larvae is available.

Remarks. If the single record from Waimatenui is correct, *P. rangirua* may be expected to be found throughout New Zealand.

Trinodicalles new genus

Type species *Acalles adamsi* Broun.

Length 1.5–4 mm. Habitus, Fig. 36; outline (*T. conicollis*), Fig. 107. Derm brown or black, shiny, densely squamose. Scales round, oval, and elongate, imbricate, tessellate, and separate, appressed, decumbent, and erect, with elongate erect scales scattered and in tufts; erect setiform scales absent. Pronotum in profile (Fig. 92, 93) weakly convex, more or less depressed in anterior half; depression at base of pronotum and elytron distinct or weak; elytra strongly convex. Apterous.

Head. Rostrum shorter or longer than pronotum, or equal, sometimes shorter in male; punctation dorsally sometimes slightly stronger in male, and sometimes coarser towards base, where punctures may be confluent; squamosity more or less dense basally, rarely extending beyond antennal insertions, more extensive in male.

Antennae inserted approximately halfway along rostrum. Funicle longer than scape; F1 longer than F2; F2 sometimes longer than other funicle segments; F1+2 less than half length of scape. Scape and funicle with fine, semi-erect and decumbent setae; scales absent.

Thorax. Pronotum (Fig. 36, 107) as wide as long or wider, widest in posterior half, sometimes near base; sides convex, sometimes only weakly so; anterior margin convex or weakly emarginate; posterior margin straight; prominences absent, or present at position 2 and weakly at position 3; punctation dense, even; scale tufts always present at positions 2 and 3, otherwise sometimes at position 1 and laterally, though if tufts not at position 1 then a more general scattering of erect, elongate scales present towards anterior margin. Scutellum concealed.

Elytra (Fig. 36, 107) with basal margin straight, not wider than pronotum basally, or only slightly so; sides convex anteriorly, widest in anterior half, convex or straight between widest point and convex or truncate apex; prominences more or less scattered, but always present on interstria 3 before posterior declivity, frequently on interstriae 2 and 3 at highest point of elytra, and sometimes weakly on I1 anterior to large prominences on I3; stria punctures round, sometimes very large; scales in sometimes large tufts on prominences and often at humeri. Elytral strigil present.

Postocular lobe moderately or weakly rounded, continuous with marginal carina of prosternal canal. Mesosternal receptacle U-shaped, cavernous, wider than long, extending posteriorly just to level of midline of middle coxae, or not; margins projecting ventrally. Metasternum concave medially, projecting ventrally between middle and hind coxae and separating them by less than length of a hind coxa. Metepisternum (if not concealed) and lateral face of metasternum generally covered with a dense patch of glossy scales (Fig. 92, 159), though these sometimes replaced by 'normal' scales; anapleural suture concealed.

Fore coxae with posterior projection more or less apparent. Femora lacking a ventral tooth, squamose or glabrous ventrally; ventral groove absent or, if present, broad. Tibiae with ventral carina absent or obscure; premucro absent or very small; uncus large, sometimes with ventral margin nearly continuous with that of tibia. Tarsal claws small.

Abdomen. Ventrite 1 concave or convex medially, convex laterally; intercoxal process concave, wider than long; suture between ventrites 1 and 2 generally incomplete. Ventrite 2 shorter than V1 (excluding intercoxal process) or subequal, depressed relative to V1, convex or sloping towards V3. Ventrites 3 and 4 each slightly more than half as long as V2, flat or weakly transversely convex. Punctuation moderate or coarse on ventrites 1, 2, and 5, absent on V3 and V4. Intercoxal process and centre of ventrite 1 with or without elongate scales, frequently with a patch of fine setae, otherwise ventrites with a fairly even cover of separate, elongate, semi-creet scales, or squamosity absent.

Female terminalia. Tergite VII (Fig. 412) longer than wide; 1 or 2 pairs of microsetae present on glabrous strips, submarginal; anterior margin strongly produced anteromedially; posterior margin very weakly convex. Tergite VIII (Fig. 413) with length and width subequal, truncate posteriorly, with rounded marginal crenulations. Sternite VIII (Fig. 414) with apical plate longer than wide, shorter than apodeme; anterior end of apodeme broadened, triangular. Hemisternites of ovipositor with slender terminal styli (Fig. 416). Bursa lacking sclerotisation; spermathecal duct arising at junction of oviduct and bursa, convoluted, at least near spermatheca (Fig. 415).

Male terminalia. Tergite VII (Fig. 761, 768) with a pair of marginal microsetae and in most instances a submarginal pair; anterior margin strongly produced anteromedially; posterior margin deeply and abruptly emarginate between microsetae, or convex. Spiculum gastrale (Fig. 763, 769) shorter or longer than aedeagus with apodemes; apical arms narrow. Tegmen (Fig. 764, 765, 770, 772) with parameres broad, as long as apodeme or much shorter;

apodeme longer or shorter than width of tegminal ring. Aedeagal body shorter than its apodemes, curved, lanceolate in dorsal view or with sides rounded; apex rounded or acuminate; dorsal surface sometimes sclerotised basally; body and apodemes united (Fig. 766, 767, 771, 772). Endophallus with basal sclerites plate-like or elongate and curved, sometimes forming a flagellum (Fig. 766, 771).

Range. New Zealand.

Remarks. *Trinodicalles* can be distinguished from other New Zealand Cryptorhynchinae by the characteristic body form coupled with the two large prominences and tufts of scales on interstria 3 near the posterior clytral declivity. These prominences are posterior to a prominence on interstria 1, the reverse of the condition in *Pachyderris*, which is otherwise similar. The body form is somewhat modified in the two broad-bodied species, *terricola* and *conicollis*, but the first of these can be recognised by the characteristic patch of glossy scales on the metasternum (Fig. 159) while the second can be distinguished from all other New Zealand Cryptorhynchinae by its coloration, comprising a cream stripe from the humeri transversely across the pronotum, against a black background. Most species of the genus have a distinctive patch of glossy scales laterally on the metasternum (Fig. 92, 159), and all of these also have the basal sclerites of the aedeagus modified into a flagellum. The only two species lacking the patch of glossy scales are *conicollis*, mentioned above, and an undescribed species that is otherwise very similar to the majority of species in the genus. *T. conicollis*, despite the absence of a flagellum and the patch of glossy scales, is otherwise so similar to *T. terricola* that to place it in a separate genus seems unjustified.

The relationships of *Trinodicalles* are unclear, but it probably lies close to *Zeacalles*, *Pachyderris*, *Patellitergum*, and *Rainacalles*. There are a number of undescribed species.

Trinodicalles adamsi (Broun) new combination

Fig. 36

Broun, 1893a: 1237 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 120.

Type data. Lectotype female here designated, BMNH, on card, with labels "2178." handwritten (Broun) / "Mount Arthur" printed / "Acalles; adamsi" handwritten (Broun). Number of specimens in series not stated by Broun.

Range. — / NN, BR, OL.

***Trinodicalles altus* (Broun) new combination**

Broun, 1909a: 145 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 120.

Type data. Lectotype male here designated, BMNH, on card, with labels "2946," handwritten (Broun) / "Broken; Rivcr." handwritten (Broun) / "Acalles; altus." handwritten (Broun). Paralectotype male, BMNH, on card mounted on dorsum, same data as lectotype. Original number of syntypes not stated by Broun.

Range. — / MC.

***Trinodicalles conicollis* (Broun) new combination**

Fig. 93, 107, 761–767

Broun, 1913: 134 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121. Kuschel, 1990: 73 (*'Acalles'*).

Type data. Holotype male, BMNH, on card, with labels "3313" handwritten (Broun) / "Makatote.; March 1910" handwritten (Broun) / "Acalles; conicollis." handwritten (Broun).

Range. AK, WO, BP, TK, TO, RI / —.

Biology. Adults of *T. conicollis* have been collected from forest and from *Leptospermum* / *Coprosma* / *Melicytus* litter; the larval host is unknown.

***Trinodicalles cristatus* (Broun) new combination**

Broun, 1881: 721 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Lectotype male, BMNH, on plastic rectangle, with labels "1276" printed, green / "Wellington" printed / "Acalles; cristatus." handwritten (Broun). Paralectotype male, BMNH, on card, data as for lectotype but lacking Broun's identification label. All syntypes located.

Range. AK, WN / SD, MC.

Biology. Adults of *T. cristatus* have been found in leaf litter under dense, low shrubs and in lichens on forest trees.

***Trinodicalles decemcristatus* (Broun)
new combination**

Broun, 1883: 439 (*Acalles*); —1886: 800 (repetition of Broun, 1883). Hutton, 1904: 213 (attributed to Broun,

1886). Hudson, 1934: 222 (attributed to Broun, 1886). Hustache, 1936: 121. Styles, 1973: 355.

Type data. Holotype female, BMNH, on plastic rectangle, with labels "1426" printed, green / "Wellington" printed / "Acalles; decemcristatus." handwritten (Broun).

Range. ND, AK, WO, TO, WN / NN, BR, DN.

Biology. Adult *Trinodicalles decemcristatus* have been collected in leaf litter, and specimens have been reared from *Weinmannia silvicola* (Styles 1973).

***Trinodicalles latirostris* (Broun) new combination**

Fig. 768–772

Broun, 1883: 438 (*Acalles*); —1886: 799 (repetition of Broun, 1883). Hutton, 1904: 213 (attributed to Broun, 1886). Hudson, 1934: 222 (attributed to Broun, 1886). Hustache, 1936: 123. Kuschel, 1990: 73 (*'Acalles'*).

Type data. Holotype (?sex), BMNH, on card, with labels "1425." printed, green / "Parua" printed / "Acalles; latirostris" handwritten (Broun).

Range. ND, AK / MC, DN.

Biology. Specimens of *T. latirostris* have been found amongst *Astelia banksii* clusters (Kuschel 1990).

***Trinodicalles leporhinus* (Broun) new combination**

Broun, 1893a: 1385 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 123.

Type data. Holotype male, BMNH, on card, with labels "2417." handwritten (Broun) / "Moeraki" handwritten (Broun) / "Acalles; leporhinus" handwritten (Broun).

Range. — / WD, DN.

***Trinodicalles mimus* (Broun) new combination**

Fig. 412–416

Broun, 1893a: 1385 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 123 (as *A. minus*).

Type data. Syntypes: 1 male, 2 females, BMNH, on card, with labels "2416." handwritten (Broun) / "Moeraki" handwritten (Broun) (male, 1 female) or "Otago" printed (female) / "Acalles; mimus" handwritten (Broun) (females only); 1 (?sex), BMNH, on card, with labels "var." hand-

written (Broun) / "2416." handwritten (Broun) / "Otago" printed / "Acalles minus; VAR. (Spec. descr. by; Broun, 1893); Lyal det 1986" handwritten (Lyal). All syntypes located.

Range. — / NN, MC, DN.

Trinodicalles terricola (Broun) new combination

Broun, 1885: 387 (*Acalles*); —1886: 934. Hutton, 1904: 213 (attributed to Broun, 1886). Hudson, 1934: 222 (attributed to Broun, 1886). Hustache, 1936: 124. May, 1987: 47. Kuschel, 1990: 73 (*'Acalles'*).

Type data. Lectotype male here designated, BMNH, on card, with labels "1681." handwritten (Broun) / "Howick" printed / "Acalles; terricola" handwritten (Broun). Original number of syntypes not stated by Broun.

Range. ND, AK, BP / —.

Biology. Adults of *T. terricola* can be found in leaf litter, decayed wood, and moss (sample 67/272). Kuschel (1990) reports finding specimens in litter and wood mould taken from an old, hollow *Metrosideros excelsa* trunk. The species has been reared from dead wood of *Corynocarpus laevigatus* (May 1987).

Patellitergum new genus

Type species *Patellitergum rectirostre* n.sp.

Length 2.5–3.5 mm. Habitus, Fig. 37. Derm pale to dark brown, shiny, densely squamose. Scales contiguous to imbricate and (1) round, appressed to decumbent and (2) elongate-oval, decumbent; elytral scales smaller than pronotal scales; tufts absent; erect setiform scales absent. Pronotum in profile (Fig. 94) very weakly depressed anteriorly, smoothly convex and weakly depressed posteriorly. Elytra convex. Brachypterous.

Head. Rostrum shorter than pronotum, virtually straight in female, weakly curved in male; punctation weak, especially in female; male with median and lateral longitudinal carinae dorsally towards base; squamosity present basally, much more extensive in male.

Antennae inserted approximately halfway along rostrum in female, nearer apex in male. Scape shorter than funicle; F1 and F2 elongate, subequal, together approximately half length of funicle. Scape and funicle with fine, semi-erect and decumbent setae but no scales.

Thorax. Pronotum (Fig. 37) with length and width subequal, widest at middle; sides convex medially, concave anteriorly and posteriorly; anterior margin convex; posterior margin straight; punctation dense. Scutellum small, obscure.

Elytra with basal margin straight, very slightly wider than pronotum basally; sides smoothly convex, widest in proximal half; apex weakly convex; prominences absent, but a row of small, shiny nodules more or less apparent on interstria 1 in proximal half; interstriae 2 and 3 sometimes weakly raised basally; stria punctures oval, large. Elytral strigil present.

Postocular lobe rounded, continuous with marginal carina of prosternal canal. Mesosternal receptacle U-shaped, longer than wide, cavernous, extending to level of posterior margin of middle coxae; margins projecting ventrally. Metasternum depressed posteromedially, projecting ventrally between middle and hind coxae just external to narrowest part, and separating them by less than length of a hind coxa. Metepisternum narrow, covered with yellowish or creamy, appressed, specialised scales; ana-pleural suture incomplete posteriorly (Fig. 160).

Fore coxae with a posterior projection. Femora lacking a ventral tooth, squamose ventrally; ventral groove absent. Tibiae with ventral carina obscure or absent; premucro present.

Abdomen. Ventrite 1 convex medially; intercoxal process concave, wider than long. Ventrite 2 shorter than V1 (excluding intercoxal process), with suture between them obsolete medially. Ventrite 2 sloping towards V3 posteriorly. Ventrites 3+4 subequal in length to V2, convex. Punctation coarse. Scales elongate-oval, smaller and more slender on V3–5 than on V1 and V2.

Female terminalia. Tergite VII (Fig. 417) with length and width subequal; 2 or 3 pairs of microsetae present on transverse projections on anterior raised glabrous area; median depressed setose area clearly delimited anteriorly and laterally from glabrous region; anterior margin weakly convex; posterior margin convex. Tergite VIII (Fig. 418) with length and width subequal; posterior margin very weakly convex, crenulate. Sternite VIII (Fig. 419) with apical plate wider than long, shorter than apodeme; anterior end of apodeme broadly expanded. Hemisternites of ovipositor longer than apical plate of sternite VIII; styli terminal (Fig. 420, 421). Spermathecal duct arising at junction of bursa and oviduct; vagina and bursa lacking sclerotisation (Fig. 420).

Male terminalia. Tergite VII (Fig. 773, 774) wider than long, with 2 pairs of microsetae on transverse projections; median depressed setose area clearly delimited from raised

glabrous area bearing microsetae (Fig. 774); anterior margin very weakly convex; posterior margin concave. Spiculum gastrale (Fig. 776) longer than aedeagal apodemes; apical arms broad, widely divergent. Tegmen (Fig. 777, 778) with parameres shorter than apodeme; apodeme shorter than width of tegmental ring. Aedeagal body shorter than its apodemes, curved, longer than wide; sides weakly rounded anteriorly, more strongly rounded posteriorly; apex acuminate; body and apodemes united; ostiolar sclerites replaced by patches of broad spines (Fig. 779, 780, 781). Endophallus with an inverted U-shaped basal sclerite; flagellum absent (Fig. 779).

Range. Chatham Is.

Remarks. *Patellitergum* has no obvious close relatives. The oval, raised, clear areas anterior to each of the microsetae on tergum VII are similar to those found in *Hadracalles*, *Trinodicalles*, and *Omoecalles*. Of these, only *Trinodicalles* possesses sclerolepidia, of a type very similar to those of *Patellitergum*. No other indications of relationship have so far been identified, but it is possible that *Patellitergum* and *Trinodicalles* are closer to each other than to any other genus.

Patellitergum can be distinguished from other genera by the combination of a small scutellum, slightly glossy, creamy-yellow sclerolepidia on the metepisternum, no elytral or pronotal prominences or scale tufts, and no erect scales. The structure of tergum VII (Fig. 417, 773, 774), with the microsetae on a raised, horseshoe-shaped area delimiting a posterior, depressed, dish-like region of long, forked setae or scales, has not been seen elsewhere in New Zealand Cryptorhynchinae. The male of *P. rectirostre* has another unique feature, in that the ostiolar sclerites of the aedeagus are each replaced by a patch of stout straight and curved spines (Fig. 779, 780). The function of the tergal structures and the male ostiolar spines are not known. *Patellitergum rectirostre* is the only known species, and has a distinctive, virtually straight rostrum most apparent in the female.

Patellitergum rectirostre new species

Fig. 37, 94, 160, 417–421, 773–781

Length: male 2.34–2.81 mm (mean 2.59 mm), female 2.47–3.13 mm (2.89 mm). Maximum width across pronotum: male 0.81–1.09 mm (0.94 mm), female 0.91–1.06 mm (1.02 mm). Pronotal length: male 0.84–1.06 mm (0.98 mm), female 0.94–1.19 mm (1.11 mm). For all measurements, male $n = 10$, female $n = 5$. Habitus, Fig. 37.

Squamosity dense. Scales yellow-brown to black, variable in pattern but consistently with a dark patch on either side of midline at base of pronotum, at posterior end of weaker dark longitudinal bands. Elytra varying from completely yellow-brown to predominantly black with yellow-brown patches, a frequent form being yellow-brown with a small brown patch halfway along interstria 3.

Terminalia: male Fig. 773–781; female, Fig. 417–421.

Type data. Holotype male, NZAC, on card point, dissected, with labels “[m.]” written / “Awatotara; River mouth” printed / “litter around; Coxella” printed / “23.ii.67; A.K. Walker” printed / “Chatham I.; Exp. Feb. 1967” printed / “HOLOTYPE [m.]” printed; *Patellitergum*; *rectirostre*; Lyal 1992 det. printed and written, red card. Paratypes: 5 males, 4 females, same data as holotype; 2 males, Chatham I., Waitangi, 24.ii.67, “At night on beach”, G. Kuschel; 1 male, Chatham Is, South East I., 180 m, litter 70/164, 4.xi.1970, J.I. Townsend; 1 male, 1 female, Chatham Is, South East I., plant 70/169, 9.xi.1970, J.I.T.

Range. Chatham Is.

Biology. As indicated by the data labels cited above, specimens of this species have been collected from leaf litter and plants. Larvae are unknown.

Rainacalles new genus

Type species *Acalles volens* Broun, 1881.

Length 2–2.3 mm. Habitus, Fig. 38. Derm brown or black, shiny, densely squamose. Scales round, oval, and elongate, imbricate, semi-erect, and erect; erect setiform scales absent. Pronotum in profile (Fig. 95) depressed in anterior half, with prominent projections between depressed and raised parts. Pronotum and clytra strongly depressed at base. Elytra strongly convex. Apterous.

Head. Rostrum subequal in length to pronotum; punctation coarse, slightly more so in male, with punctures elongate and sometimes longitudinally confluent towards base of rostrum; squamosity present basally, somewhat more extensive in male.

Antennae inserted approximately halfway along rostrum. Scape shorter than funicle; F1 and F2 elongate, with F1 slightly the longer; F1+2 less than half length of funicle. Scape and funicle with fine, decumbent setae but lacking scales.

Thorax. Pronotum (Fig. 38) wider than long, widest at

posterior margin; sides almost straight; anterior margin convex; posterior margin straight; posterior half convex, with prominences at position 2; punctation moderate; tufts of scales present at positions 1, 2, and, more weakly, 3. Scutellum concealed.

Elytra with basal margin straight, very slightly wider than pronotum basally; sides smoothly convex, widest in proximal half, with posterior attenuation not distinguishable from general curvature; prominences absent; striae punctures elongate, sometimes confluent; scales gathered into scattered weak tufts. Elytral strigil present.

Postocular lobe rounded, smoothly continuous with marginal carina of prosternal canal. Mesosternal receptacle (Fig. 139) U-shaped, cavernous, with length and width subequal, extending to level of posterior margin of middle coxae; margins projecting ventrally. Metasternum (Fig. 139) depressed, flat medially, raised abruptly and projecting ventrally between middle and hind coxae and separating them by less than length of a hind coxa. Metepisternum and anapleural suture concealed; sclerolepidia absent.

Fore coxae with a posterior projection. Femora lacking a ventral tooth; ventral groove broad, squamose. Tibiae with ventral carina obscure; premucro absent.

Abdomen. Ventrite 1 concave medially, convex laterally; intercoxal process concave, wider than long. Ventrites 1 and 2 (excluding intercoxal process) subequal in length, with V2 sloping towards V3. Ventrites 3+4 subequal in length to V2, transversely convex. Punctation on ventrites 1, 2, and 5 coarse, on V3 and V4 weaker. Scales round or oval, smaller and slenderer on V5 than on other ventrites.

Female terminalia. Tergite VII (Fig. 422) as wide as long, with a pair of submarginal microsetae; anterior margin acuminate; posterior margin convex. Tergite VIII (Fig. 423) longer than broad; posterior margin convex, abruptly curved ventrad, with a ventrally directed median flange and a few lateral crenulations, visible only in lateral view. Sternite VIII (Fig. 424) with apical plate as long as wide, shorter than apodeme. Hemisternites of ovipositor subequal in length to apical plate of sternite VIII; styli terminal (Fig. 425, 426). Spermathecal duct arising at junction of bursa and oviduct; vagina and bursa lacking sclerotisation (Fig. 425).

Male terminalia. Tergite VII (Fig. 782) longer than wide, with a pair of marginal microsetae; anterior margin strongly convex; posterior margin strongly drawn out towards tubercles, bearing microsetae, and emarginate between them. Spiculum gastrale (Fig. 784) longer than aedeagal apodemes; apical arms broad. Tegmen (Fig. 785, 786) with parameres shorter than apodeme; apodeme

subequal in length to width of tegminal ring. Aedeagal body shorter than its apodemes, curved distally and basally, longer than wide; sides rounded to distally rounded apical projection; body and apodemes united (Fig. 787, 788). Endophallus with a U-shaped basal sclerite and a pair of weakly sclerotised bars posteriorly; flagellum absent (Fig. 787).

Range. New Zealand.

Remarks. *Rainacalles* can be distinguished from other New Zealand Cryptorhynchinae by its characteristic profile, with elytral depth greater than length (Fig. 49, 95), coupled with the lack of sclerolepidia, lack of setiform scales on the pronotum, lack of large prominences on the elytra, and oval shape of the pronotal and elytral scales. The body form suggests a close relationship to *Zeacalles*, but the genus lacks any specialised scales along the anapleural suture or on the metasternum. Further, the form of the apex of the female tergum VIII is unlike that found in any *Zeacalles* species. The body form almost certainly has been developed more than once, but so far no apomorphies have been identified that help to place *Rainacalles*. Only one species is known.

Rainacalles volens (Broun) new combination

Fig. 38, 95, 139, 422-427, 782-788

Broun, 1881: 722 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Holotype (?sex), BMNH, on card, with labels "1279" printed, green/"Parua" printed/"*Acalles*; *volens*." handwritten (Broun).

Range. ND, CL, WO, BP, TO, RI, WA / —.

Biology. Adults of *Rainacalles volens* have been found in leaf litter and on fungi on logs. Larvae have been cut from the wood of *Litsea calicaris* and reared (Styles 1973).

Genus *Pachyderis* Broun

Broun, 1909b: 121. Hudson, 1934: 222. Hustache, 1936: 125 (as *Pachyderis*). Kuschel, 1964: 431. Type species *Pachyderis punctiventris* Broun, 1909, by monotypy. *Xenacalles* Broun, 1911: 108 (no generic description, but with description of single included species, *X. squamiventris*). Broun, 1913: 146. Hudson, 1934: 223. Hustache, 1936: 125. Type species *Xenacalles*

squamiventris Broun, 1911, by monotypy (Broun (1913) needlessly and incorrectly designated *Acalles triangulatus* Broun, 1883 as type species). Synonymised by Kuschel (1964, p. 431).

Length 2–5 mm. Habitus, Fig. 39; outline, Fig. 108. Derm brown or black, shiny, more or less densely squamose. Scales round and oval, separate*, contiguous*, tessellate and imbricate, semi-erect, decumbent, and appressed, with elongate, oval, or club-shaped erect scales scattered and forming tufts and clumps; erect setiform scales absent. Pronotum in profile (Fig. 96) convex, depressed in anterior third; depression at junction of base of pronotum abrupt or not marked*. Elytra convex. Brachypterous or apterous.

Head. Rostrum as long as pronotum or shorter; median longitudinal carina frequently present in at least proximal third, sometimes obscure, more often present in male; punctation deeper in male, and male sometimes with punctures confluent longitudinally; rostrum squamous dorsally at base, sometimes more extensively in male, with scales erect and decumbent.

Antennae inserted approximately halfway along rostrum or slightly distal to this, rarely in distal third*, with fine, semi-erect or decumbent setae but no scales. Funicle longer than scape; F1 and F2 elongate, subequal, together less than half as long as scape, with F1 broader distally than F2.

Thorax. Pronotum as wide as long, or slightly wider, widest at posterior margin or in posterior third; sides straight or weakly convex; anterior margin rounded; posterior margin straight (Fig. 39, 108); prominences absent, but a small longitudinal carina or depression sometimes present on midline anterior to scutellum; punctation dense, coarse; erect scales generally forming sometimes weak tufts at positions 1 and 2. Scutellum large, circular, hemispherical or conical, with round or oval, appressed or semi-erect scales, or concealed*.

Elytra with basal margin straight or very weakly sinuate, wider than pronotum basally; sides convex in anterior half, widest in anterior fifth or quarter, straight or weakly concave in posterior half to truncate apex; prominences more or less developed on interstria 1 before posterior elytral declivity and on I3 anterior to prominences on I1, otherwise variably present on I3 and I5; a short row of small, glossy tubercles sometimes present on suture close to scutellum; stria punctures round or narrow, almost confluent; scales in sometimes weak tufts on prominences, those on prominence on interstria 1 generally pale and immediately posterior to an intensely dark triangular, diamond-shaped, or irregular* patch of oval, semi-erect scales

(sometimes absent in Three Kings species). Elytral strigil present.

Postocular lobes strongly or weakly rounded, extending between marginal carinae of prosternal canal. Mesosternal receptacle cup-shaped or V-shaped, cavernous, wider than long, extending posteriorly to at least level of midline of middle coxae and sometimes to posterior margin (Fig. 140); margins thin, produced ventrally. Metasternum concave medially, generally with a small, central pit or depression posteriorly at junction with abdominal ventrite 1 (Fig. 140), not or only weakly projecting ventrally between middle and hind coxae, and separating them by less than length of a hind coxa; anterior margin raised behind middle coxae; posterior margin emarginate before hind coxae. Metepisternum partially or completely* obscured by elytra, narrower posteriorly than anteriorly; anapleural suture obscure, complete or concealed*; sclerolepidia absent.

Fore coxa with a stout posterior projection. Femora lacking a ventral tooth and ventral groove, squamose ventrally. Tibiae with ventral carina absent or obscure; premucro small; uncus large.

Abdomen. Ventrite 1 convex or concave medially; intercoxal process concave, at least apically and generally near to anterior margin, wider than long; suture between ventrites 1 and 2 incomplete medially. Ventrite 2 as long as V1 (excluding intercoxal process), convex or with a weak medial concavity anteriorly, generally sloping towards V3 posteriorly. Ventrites 3 and 4 each slightly more than half length of V2, flat, transversely convex* or raised posteriorly. Punctation shallow or deep. Intercostal process with elongate, slender, decumbent scales submarginally. Ventrites with a scattering of elongate, decumbent, semi-erect or erect scales and a dense covering of round, appressed scales, these sometimes separate or contiguous medially on ventrites 1 and 2, otherwise imbricate. Three Kings Is species not as above, but with a scattering of oval semi-erect scales.

Female terminalia. Tergite VII (Fig. 428) as long as wide, with 5–7 microsetae present on each of a pair of longitudinal glabrous strips medially; anterior margin convex, more or less produced medially, or sclerotised portion with an anterior projection; posterior margin weakly convex. Tergite VIII (Fig. 429) weakly convex posteriorly; posterior margin bearing flattened, very stout setae arising submarginally on ventral side and with a few submarginal stout spines dorsally. Sternite VIII (Fig. 430) with broad apical plate wider than long, less than half length of apodeme. Hemisternites of ovipositor tapering towards long, slender styli (Fig. 431, 432). Spermathecal duct arising at

junction of oviduct and bursa; bursa and vagina lacking sclerites (Fig. 431).

Male terminalia. Tergite VII (Fig. 789) with 4*–6 pairs of microsetae arranged on a pair of longitudinal glabrous strips, these sometimes extending from anterior margin; anterior margin convex, more or less produced medially, or sclerotised portion with an anterior projection; posterior margin truncate, with 2 more or less angulate projections, or convex*. Sternum VIII (Fig. 790) with a weakly sclerotised median transverse structure or apodemal vestige sometimes present. Spiculum gastrale (Fig. 791) shorter than aedeagus with apodemes; apical arms broad. Tegmen (Fig. 792, 793) with parameres almost entirely fused together, broad or narrow*, shorter than its apodeme; apodeme at least as long as width of tegminal ring. Aedeagal body shorter than its apodemes, evenly curved (Fig. 795); sides rounded distally, straight, sinuate or rounded basally; apex rounded to acuminate, sometimes with a thin projecting flange (Fig. 794); body and apodeme united. Endophallus with basal sclerites complex, heavily or lightly* sclerotised; a small, inverted V-shaped sclerite sometimes present posteriorly; flagellum absent (Fig. 794).

Range. New Zealand, including Chatham Is, Auckland Is, and Campbell I.

Remarks. In the above description an asterisk (*) is used to indicate character states known only from the very unusual undescribed species from the Three Kings Islands.

Pachyderris can be distinguished from all other New Zealand genera by the characteristic prominence, bearing a tuft of pale scales, on interstria 1 at the forward end of the posterior declivity. In some species there is also a prominence on interstria 3 but, unlike *Trinodicalles*, this is anterior to that on interstria 1. In all but the Three Kings Islands species there is a prominent diamond-shaped or triangular intensely dark patch of scales extending between the prominences on interstria 1 and those on I3 (Fig. 39); this character will readily distinguish this genus from others.

The undescribed species from the Three Kings Islands (Great Island) is apterous, and has the scutellum and metepisternum concealed. The overall shape is more oval than in other species of the genus (Fig. 108) and the elytral prominence on interstria 1 is marked only in the male. Instead of the mixture of dark and pale scales found on other species, the colour is basically black, sometimes with a noticeably darker, more intense patch on the elytra in the same position as the dark triangle of other species, and generally with a paler patch or tuft of scales at the position

of the prominence on interstria 1. The sister-group of this species has not been identified.

The relationships of *Pachyderris* are unclear, but the overall appearance of the insects suggests that they probably lie with *Zeacalles*, *Allanalcis*, *Rainacalles*, and *Trinodicalles*. The unusual spines on the posterior margin of female tergite VIII are similar to those of *Ectopsis*, *Hadracalles*, and *Mecistostylus*, although less dense. No other characters support a relationship between *Pachyderris* and any of these genera.

Almost all of the records from mainland New Zealand are from the South Island, only *P. triangulatus* apparently having been collected in the North Island (WN). The other exception is the undescribed species from the Three Kings, mentioned above.

May (1971) describes the larva and pupa of *P. punctiventris*.

Pachyderris nigricans (Broun)

Broun, 1917: 451 (*Xenacalles*). Hudson, 1934: 223. Hustache, 1936: 125. Kuschel, 1964: 433 (*Pachyderris*).

Type data. Lectotype male, BMNH, on card, with labels "3939" handwritten (Broun) / "Clippings; 29 - 1 - 1914." handwritten (Broun) / "Xenacalles; nigricans" handwritten (Broun). One syntype not located.

Range. — / MC, OL, CO, DN, SL.

Biology. Specimens of *Pachyderris nigricans* have been reared from *Fraxinus* sp. (Oleaceae) (Styles 1973).

Pachyderris nodifer (Broun)

Broun, 1914: 134 (*Xenacalles*). Hudson, 1934: 223. Hustache, 1936: 125. Kuschel, 1964: 433 (*Pachyderris*).

Type data. Lectotype male, BMNH, on card mounted on card, with labels "3456" handwritten (Broun) / "Mount; Greenland." handwritten (Broun) / "Xenacalles; nodifer" handwritten (Broun).

Range. — / NN, BR, WD.

Biology. Adults of *Pachyderris nodifer* have been collected from *Podocarpus* sp., and reared from *Weinmannia* sp. and *Aristotelia serrata*.

Pachyderris punctiventris Broun

Fig. 39, 428–432, 789–795

Broun, 1909b: 121 (*Pachyderris*). Hudson, 1934: 222. Hustache, 1936: 125 (*Pachyderis* [sic]). Gourlay, 1950: 198. Brookes, 1951: 66 (*Pachyderris*). Kuschel, 1964: 433; —1971: 235 (= *P. simplex* Broun). May, 1971: 287.

simplex Broun, 1914: 133 (*Xenacalles*). Hudson, 1934: 223. Hustache, 1936: 125. Kuschel, 1964: 433; —1971: 235 (junior synonym of *P. punctiventris* Broun).

Type data. *punctiventris*: holotype female, Dominion Museum, Wellington [NMNZ; now Museum of New Zealand] (see Kuschel 1964, p. 433).

simplex: lectotype female, BMNH, on card, with labels "3455." handwritten (Broun) / "Hakapoua; 1/3/11" handwritten / "Xenacalles; simplex." handwritten (Broun). Paralectotype male, BMNH, mounted on dorsum on card, with labels as for lectotype except locality data / "Wallacetown; 25.3.10" handwritten. These data are not as recorded by Broun, but the handwriting on the two locality labels is the same and Broun had two specimens from the same collector (A. Philpott).

Range. — /BR, WD, OL, DN, SL /SI / Auckland Is (incl. Adams I.) / Campbell I.

Biology. Kuschel (1971) states that *Pachyderris punctiventris* occurs in forest and dense scrub, at least on the subantarctic islands. Specimens have been taken from *Carpodetus serratus*, *Coprosma foetidissima*, *Dracophyllum* sp., *Metrosideros umbellata*, *Myrsine divaricata*, *Polystichum vestitum* and *Pseudopanax simplex*, most of them beaten off dead branches of *M. umbellata* and *P. simplex* (Kuschel 1964, 1971). Specimens have also been taken from concealing habitats, e.g., a petrel burrow and, perhaps more significantly, under the bark of a *Dracophyllum*. Kuschel (1971) states that the larvae are to be found in sound to moderately rotten wood, and May (1981) cites this species as a "less selective dead wood feeder".

Specimens have been reared from *Cytisus* sp. (Styles 1973), dead branchlets of *Olearia arborescens* (May 1987) and *Pseudopanax simplex*. Larvae have been taken from the pith of *Coprosma foetidissima*, dead branches of *Metrosideros* sp., *M. umbellata*, and the wood of twigs of *Myrsine divaricata* (May 1971).

Pachyderris squamiventris (Broun)

Broun, 1911: 108 (*Xenacalles*); —1913: 147. Hudson, 1934: 223. Hustache, 1936: 126. Kuschel, 1964: 431

(*Pachyderris*).

Type data. Syntypes: 3 females, BMNH, on card, with labels "89." handwritten (Broun) / "Chatham Is.; Broun. Coll.; B.M. 1922-482", printed / "Pit Island; - T. Hall." handwritten (Broun) / "Xenacalles; squamiventris" handwritten (Broun) (2 only) / BMNH syntype disc; 2 females, NZAC, on card, with labels as above except BMNH labels and additionally with "T. Broun; collection" printed / "A. E. Brookes; Collection" printed. One syntype not found.

Range. Chatham Is.

Biology. Specimens of *Pachyderris squamiventris* have been collected from *Corynocarpus laevigatus*, *Myrsine* sp., *Olearia traversii* at night, *Pseudopanax chathamicus*, *Senecio huntii*, and under *Pimelia* on sand dunes.

There are rearing records from old branches and stems of *Myrsine chathamica* found on the forest floor (W67/32), dead standing boles of *Myrsine coxii* (W67/46), and dead stems (with bark attached; W67/24) and branches of *Dracophyllum arboreum* (W67/35).

Pachyderris triangulatus (Broun)

Fig. 96, 140

Broun, 1883: 439 (*Acalles*); —1886: 800 (repetition of Broun, 1883); —1893a: 1385. Hutton, 1904: 213 (attributed to Broun, 1886). Broun, 1913: 147 (*Xenacalles*). Hudson, 1934: 223. Hustache, 1936: 126. Kuschel, 1964: 433 (*Pachyderris*).

Type data. Lectotype male, BMNH, on clear mica rectangle with green basal strip, with labels "1427" printed, green / "Wellington" printed / "Xenacalles; triangulatus" handwritten (Broun). One syntype not located.

Range. WN / SD, NN, BR, MC, SC, OL, DN, SL.

Biology. Adults of *Pachyderris triangulatus* have been collected from leaf litter, and reared from *Carpodetus serratus*, *Crataegus oxycantha* and *Pseudopanax* sp. (Styles 1973).

Adstantes new genus

Type species *Acalles rudis* Broun, 1881.

Length 1.25–2 mm. Habitus, Fig. 40. Derm brown, densely squamose; surface sometimes obscured by gummy matter. Scales (1) round, appressed and semi-erect, imbricate, and (2) elongate-oval, erect and decumbent; erect setiform

scales absent. Pronotum in profile (Fig. 97) depressed in anterior third, convex. Pronotum and elytra depressed basally. Elytra smoothly convex. Apterous.

Head. Rostrum shorter than pronotum; punctation coarse near base, finer distally, coarser in male; squamosity dense near base, extending to, or nearly to level of antennal insertions in male, less far in female.

Antennae inserted approximately halfway along rostrum. Funicle longer than scape; F1 and F2 elongate, with F1 longer and broader than F2, together less than half length of funicle. Scape and funicle with fine, semi-erect and decumbent setae but no scales. Club darker than rest of antenna or concolorous.

Thorax. Pronotum (Fig. 40) as long as wide, widest near middle; sides convex, sometimes weakly concave anterior to widest point; anterior and posterior margins weakly convex; prominences absent; punctation coarse, dense; round scales larger than those on elytra; erect and decumbent scales scattered, but more clumped at positions 1 and 2. Scutellum not concealed.

Elytra with basal margin straight, as wide as pronotum basally or slightly wider; sides weakly convex, widest in anterior half; apex weakly convex (Fig. 40); prominences absent; suture lacking glossy tubercles; interstriae 2 and 3 raised at base, and I3 raised relative to I2 and I4 in anterior half (not in Chatham Is species); stria punctures elongate, confluent dorsally; striae deep, well marked; scales not gathered into tufts. Elytral strigil absent.

Postocular lobe weakly rounded, small, smoothly continuous with marginal carina of prosternal canal. Mesosternal canal U-shaped, wider than long, extending to level of midline of middle coxae; margins weakly produced ventrally. Metasternum flat medially, weakly sloping to ventrite 1 posteriorly, forming a narrow, raised strip between middle and hind coxae (Fig. 142, 161) and separating them by less than length of hind coxa. Metepisternum partially obscured by elytron; anapleural suture concealed by a dense row or rows of appressed, imbricate, pale, oval, glossy scales (Fig. 97, 161).

Fore coxae with a posterior projection. Femora lacking a ventral tooth or groove; ventral surface squamous. Tibiae lacking a ventral carina; premucro absent.

Abdomen. Ventrite 1 concave or convex medially; intercoxal process concave, wider than long. Ventrites 1 and 2 subequal in length (excluding intercoxal process), with V2 sloping towards V3. Ventrites 3+4 subequal in length to V2, transversely convex. Punctation coarse on V1 and V2. Scales (1) round and appressed, separate and tessellate, and

(2) oval and decumbent, sparse.

Female terminalia. Tergite VII (Fig. 433) as wide as long, lacking microsetae; anterior and posterior margins weakly convex. Tergite VIII (Fig. 434) wider than long; posterior margin weakly convex, finely crenulate. Sternite VIII (Fig. 435) with posterior plate broader than long, more than half length of apodeme. Hemisternites of ovipositor slightly longer than apical plate of sternite VIII; styli terminal. Vagina and bursa lacking sclerotisation; spermathecal duct arising at junction of bursa and oviduct (Fig. 436, 437).

Male terminalia. Tergite VII (Fig. 796) wider than long; 3 pairs of microsetae possibly present, though all setae sparse and small, and supposed microsetae very difficult to see; anterior margin weakly convex; posterior margin weakly concave. Spiculum gastrale (Fig. 798) subequal in length to aedeagal apodemes, with posterior arms broad. Tegmen (Fig. 799, 800) with parameres very short; apodeme subequal in length to width of tegminal ring. Aedeagal body not as long as its apodemes, with sides and apex rounded; body and apodemes separate (Fig. 801, 802). Endophallus with a more or less complete circular sclerite posteriorly, sometimes with longitudinal sclerites; flagellum absent (Fig. 801).

Range. New Zealand, including Chatham Is.

Remarks. Members of the genus *Adstantes* are distinctive, neat little weevils. The distinct scutellum, lack of erect setiform scales, raised bases of interstriae 2 and 3, raised interstria 3 (not in Chatham Islands species), round pronotal clothing scales of diameter similar to that of the apex of the first funicle segment, each with the 'stalk' near its centre, band of glossy yellowish specialised scales on the metepisternum, and clear patterning of black, tan, and white scales distinguish them from other small *Cryptorhynchinae*.

The genus is close to *Microcryptorhynchus*, differing in the clearly visible scutellum (although the scutellum is visible in some species of *Microcryptorhynchus*), absence of glossy tubercles on the elytral costal margin near the base, presence of appressed brown scales, the raised base of interstriae 2 and 3, the raised interstria 3 (present in a few *Microcryptorhynchus*), and the metasternum between the middle and hind coxae being in the form of a ridge rather than a tooth or simply weakly convex (Fig. 142, 161, cf. 143, 144). The sister-group of *Adstantes* has not been identified, but lies within the *Microcryptorhynchus* complex.

The specialised scales of the *Adstantes* metepisternum are sometimes difficult to distinguish from the unspecialised round, pale scales that generally cloak the metasternum.

num laterally and the mesepimeron, at least in *A. rudis*. Close examination reveals that they are glossy rather than having an irregular surface, are oval rather than round, and are generally rather yellow than the other scales. Because the unspecialised scales on the sides of the thorax are generally slightly waxy and indistinct, no attempt has been made in Fig. 161 to outline each scale separately.

There is an undescribed species of *Adstantes* on the Chatham Islands, but the two described species are restricted to mainland New Zealand. *Adstantes arctus* is known only from the type specimen, which is very rubbed and has virtually no scales left on the pronotum and elytra.

Adstantes arctus (Broun) new combination

Broun, 1881: 725 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Holotype (?sex), BMNH, on card, with labels "1285." printed, green / "Whangarei" printed / "Acalles; arctus." handwritten (Broun).

Range. ND / —.

Adstantes rudis (Broun) new combination

Fig. 40, 97, 142, 161, 433–437, 796–802

Broun, 1881: 721 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Lectotype male here designated, BMNH, on clear plastic rectangle with green strip at base, head detached, with labels "1277" printed, green / "Wellington" printed / "Acalles; rudis." handwritten (Broun). Original number in series not stated by Broun.

Range. AK, CL, WN / NN, BR, MC, SC, CO–DN, SL.

Biology. Adults of *A. rudis* have been found in leaf litter.

Genus *Microcryptorhynchus* Lea

Lea, 1908: 194; —1913b: 455, 489. Hustache, 1936: 233. Zimmerman, 1936b: 9; —1936c: 16; —1957: 80. Morimoto, 1978: 123. Kuschel, 1982: 277. Type species *Microcryptorhynchus pygmaeus* Lea, 1908, by monotypy.

Notacalles Kuschel, 1964: 435; —1982: 277. Type species *Acalles planidorsis* Kirsch, by original designation. New synonymy.

Length 1–2.5 mm. Habitus, Fig. 41, 42. Derm brown or black, sparsely or densely squamose. Scales (1) slender or oval, separate, decumbent, semi-erect and erect, and (2) round, tessellate or contiguous, appressed (mostly in subg. *Notacalles*); erect setiform scales sometimes present, usually towards apex of elytra; derm and scales frequently obscured by gummy matter. Pronotum in profile (Fig. 98) weakly convex, more or less depressed in anterior half, not greatly depressed at base. Elytra flat or weakly convex anteriorly, smoothly convex posteriorly. Apterous.

Head. Rostrum shorter than pronotum; dorsal punctation sometimes confluent longitudinally towards base, sometimes stronger in male; a short median carina sometimes present at base; squamosity dense or sparse at base, extending towards antennal insertions and sometimes surpassing them, more extensive in male.

Antennae inserted approximately halfway along rostrum. Funicle longer than scape; F1 and F2 elongate, with F2 shorter than F1, together subequal to rest of funicle, or longer. Scape and flagellum with fine or coarse, semi-erect and decumbent setae; scales absent. Club darker than rest of antenna, or concolorous.

Thorax. Pronotum as wide as long, widest at about middle or in posterior half; sides convex medially, frequently weakly concave anterior to widest point, sometimes weakly concave posterior to it; anterior margin weakly convex; posterior margin straight (Fig. 41, 42, 109); prominences absent; punctation coarse, dense; tufts of scales absent, but short, broad, longitudinal bands of cream, erect or decumbent oval scales arising from posterior margin in some species (mainly of nominate subgenus). Scutellum concealed or, more rarely, exposed.

Elytra with basal margin straight, as wide as pronotum basally or wider; sides convex, sometimes more weakly so before greatest width, which is generally in posterior half; apex rounded; prominences absent, but at least 1 pair of glossy tubercles present at base of suture; interstria 3 sometimes raised relative to I2 and I4; stria punctures generally large, oval, sometimes confluent; striae generally deep and well marked; scales not gathered into tufts. Elytral strigil absent.

Postocular lobe rounded, weak, smoothly continuous with marginal carina of prosternal canal. Mesosternal receptacle U-shaped, wider than long, cavernous, not extending posteriad to level of midline of middle coxae or beyond; margins more or less produced ventrally. Metasternum convex medially, separating middle and hind coxae by a distance less than (subg. *M.*) or equal to (subg. *N.*) length of a hind coxa, raised or with a projecting tooth

anterior to hind coxa (subg. *M.*: Fig. 143, 162) or not raised (subg. *N.*: Fig. 144) before hind coxa. Metepisternum narrow; anapleural suture concealed by more or less dense rows of pale, tessellate or imbricate scales (Fig. 162).

Fore coxae with a posterior projection. Femora lacking a ventral tooth or groove; ventral surface squamose. Tibiae lacking a ventral carina; premuero absent.

Abdomen. Ventricle 1 weakly concave or flat medially; intercoxal process concave, wider than long. Ventricle 1 and 2 subequal in length (excluding intercoxal process), with suture between them sometimes incomplete medially, and V2 sloping towards V3. Ventricle 3 and 4 together shorter than V2, transversely convex. Punctuation coarse on ventricle 1 and 2, absent on V3 and V4, weak on V5. Scales oval or setiform, decumbent, sparse.

Fecale terminalia. Tergite VII (Fig. 438) as wide as long or wider; microsetae absent; anterior margin weakly convex; posterior margin more or less weakly convex or truncate. Tergite VIII (Fig. 439) wider than long or longer than wide; posterior margin weakly convex or truncate, entire and with or without projecting stout setae, or crenulate. Sternite VIII (Fig. 440) with posterior plate wider than long, more than half length of apodeme. Hemisternites of ovipositor as long as apical plate of sternite VIII or longer; styli short, terminal; bursa lacking sclerotisation; spermathecal duct arising on bursa just distal to junction with oviduct (Fig. 441, 442).

Male terminalia. Tergite VII (Fig. 803) as wide as long or wider, lacking microsetae; anterior margin weakly convex; posterior margin truncate or very weakly convex. Spiculum gastrale (Fig. 805) longer than aedeagal apodemes; posterior arms slender. Tegmen (Fig. 806, 807, 811) with parameres very short, long, or absent; apodeme longer than width of tegmental ring. Aedeagal body generally shorter than its apodemes, as long as wide or longer; sides rounded or virtually straight, diverging, converging, or parallel; apex rounded, sometimes with a median, posteriorly directed, rounded projection, broadly or narrowly acuminate or truncate and downturned; dorsal surface sclerotised or unsclerotised (Fig. 808, 812); ostiolar sclerites present; body and apodemes separate or (rarely) united (Fig. 808, 809, 812). Endophallus sometimes with a longitudinal sclerite, frequently with short or long spines (Fig. 810) (nominate subgenus only, although short spines sometimes visible only by compound microscope); flagellum absent (Fig. 808, 812).

Remarks. The above description of *Microcryptorhynchus* sensu lato refers to species from New Zealand and associated islands only. The reasons for this are indicated below.

There has been some discussion over the correct name to use for this genus (Zimmerman 1957, Kuschel 1964, 1982, Morimoto 1978, Paulay 1985). I concur with Morimoto (1978) and Kuschel (1982) in not accepting *Miocalles notatus* Pascoe and *Microcryptorhynchus pygmaeus* Lea as congeneric, and consequently reject Zimmerman's (1957) synonymy of the two genera under *Miocalles*.

Microcryptorhynchus s.l. (*Miocalles* of Zimmerman 1957 and Paulay 1985) extends from Australia and New Guinea in the west over much of the Pacific to the Pitcairn Islands in the east, the Auckland Islands in the south, and the Marianas in the north (Zimmerman 1957). Over this range there is considerable variation between the species, and on any given island species may belong to one or more monophyletic units restricted to that island or island group (Zimmerman 1938, 1942). On Rapa there has been a considerable radiation, resulting in a large number of very diverse species (Zimmerman 1938, Paulay 1985), although this may have resulted from several introductions (Zimmerman 1938).

There has been considerable discussion in the literature over the number of genera that might be included at present in *Microcryptorhynchus* s.l., and how they should be distinguished if there is more than one (Zimmerman 1938, 1957, Kuschel 1964, 1982, Morimoto 1978, Paulay 1985). There is no doubt that individual monophyletic groups can be detected within the genus. However, morphological distinctions have so far not been drawn successfully across the whole geographic range, and many 'intermediates' exist (Zimmerman 1938, Paulay 1985). For the New Zealand and geographically related fauna Kuschel (1964, 1971, 1982) has attempted to define genera of the complex, but this process has not been carried out elsewhere. The central question must be whether '*Microcryptorhynchus*' s.l. is a monophyletic unit or not. If it is not – and so far no-one has presented any evidence to suggest that it is – then sister-groups for the different monophyletic units on each island or island group may be sought both within the genus as it stands and with other, probably leaf litter-dwelling, Cryptorhynchinae on the islands. The 'intermediate forms' still pose a problem, and it is a problem not only of homology but also of homoplasy, perhaps on a very large scale. That homoplasy exists in Cryptorhynchinae, perhaps particularly among small, apterous, litter-dwelling species, is undeniable.

To revise all species presently placed in *Microcryptorhynchus* (= *Miocalles* of authors) is clearly beyond the scope of this work. In addition to the time it would take, there are problems in that almost certainly a large number of *Microcryptorhynchus* species and species of possible sister groups, from potentially critical areas, have simply

not been collected because appropriate techniques have not been used. For the New Zealand fauna the problem arises with *Notacalles* and *Microcryptorhynchus*. Species of *Microcryptorhynchus* (in the sense of Kuschel 1972) are, as he points out, almost certainly congeneric with the Tasmanian type species of the genus, *M. pygmaeus* Lea. *Notacalles* species differ from other New Zealand *Microcryptorhynchus* chiefly in having the metasternum anterior to the hind coxae flat, rather than with a vertical face or a tubercle (umbo). No character state has yet been found that indicates that even other New Zealand *Microcryptorhynchus* form a monophyletic unit with the exclusion of *Notacalles*. Therefore, in this work I treat *Notacalles* as a monophyletic subgenus of *Microcryptorhynchus*.

The two subgenera of *Microcryptorhynchus* differ in only very few particulars, and are separated in the key (couplet 56, p. 29) rather than here by largely redundant descriptions.

The apomorphic ground-plan characters of *Microcryptorhynchus* include: small size, less than 3 mm in length; wings lost; anapleural suture with a band of large, white or cream scales; aedeagal body and apodemes articulated.

Subgenus *Notacalles* includes from New Zealand *floricola* (Broun), *leviculus* (Broun), *piciventris* (Broun), and *planidorsis* (Kirsch); from the Austral Islands *raivavaensis* Zimmerman, *parvus* Zimmerman, *tubuaiensis* Zimmerman, *rurutuensis* Zimmerman, *cookei* Zimmerman, and *minutus* Zimmerman; from Norfolk Island *rufimanus* Lea; and from Lord Howe Island *howensis* Lea. *M. (N.) piciventris* differs from other members of the subgenus in having a shorter metasternum (failing to separate the middle and hind coxae by a distance equal to the length of a hind coxa), having very short longitudinal patches of pale scales posteriorly on the pronotum, and lacking the dense covering of grey, appressed scales common to all other species. One undescribed species of *Microcryptorhynchus* s.s. from New Zealand has grey scales very similar to those of subgenus *Notacalles*.

May (1971, 1981) gives generic descriptions for larvae of 'Notacalles' and describes (1971) the larvae of *M. planidorsis*, *M. piciventris*, *M. ? kronei*, and *M. multisetosus* (all as *Notacalles*). The larva and pupa of *Microcryptorhynchus planidorsis* were described (as *Notacalles*) by May (1981).

Acalles praesetosus is included here in *Microcryptorhynchus* s.s. on the basis of its description and Broun's comments comparing it with *M. albistrigalis*; the holotype has not been located, and no specimens identified as this species have been seen.

Microcryptorhynchus (N.) floricola and *M. (N.) leviculus* both have very long, slender aedeagal bodies, quite

different both from each other and from those of other members of the genus.

Concerning the ecology of *Notacalles*, Kuschel (1964) states: "of nocturnal habits and occur in the daytime under logs, stones, under plants, in litter, amongst mosses and lichens, under loose bark and on dead branches of shrubs and trees. The larvae live in dead twigs and in petioles and main veins of larger leaves. Adults are found on many different Dicotyledons without specific host. They are probably polyphagous. They are often found on ferns, but it seems doubtful that the larvae would feed in dead fronds." (N.B. Kuschel included under *Notacalles* a number of species now placed in *Microcryptorhynchus* s.s., and his comments on ecology clearly apply to the whole genus.)

May (1987, p. 48) lists rearing records for a number of unidentified *Microcryptorhynchus* and *Notacalles*:

Microcryptorhynchus sp. A – from *Astelia trinerva* and *A. banksii* leaf mines; at Lynfield on adjacent *Astelia banksii* and *Phormium cookianum* (Kuschel 1990, as *Microcryptorhynchus* sp. 1);

sp. B – from *Collospermum hastatum* leaf mines;

sp. C – from *Freycinetia baueriana* ssp. *banksii* leaf mines;

sp. E – from *Libertia ixoides* leaf mines;

sp. F – from *Carmichaelia aligera* stem mines.

Notacalles sp. A – from *Cassinia vauvilliersii* dead subcortical;

sp. B – from *Celmisia sessiflora* and *C. laricifolia* dead subcortical;

sp. C – from *Paratrophis microphylla* dead subcortical;

sp. D – from *Rhopalostylis sapida* dead leaf bases.

Subgenus *Microcryptorhynchus*

Microcryptorhynchus albistrigalis (Broun) new combination

Broun, 1909a: 146 (*Acalles*). Hudson, 1934: 222. Hus-tache, 1936: 120.

Type data. Lectotype male here designated, BMNH, on card, with labels "2947." handwritten (Broun) / "Broken; River" handwritten (Broun) / "Acalles; albistrigalis" handwritten (Broun) / BMNH lectotype disc. Paralectotype (?sex), BMNH, on card, same data as lectotype. All syntypes located.

Range. — / MC.

Biology. Adults of *M. albistrigalis* have been collected in forest litter.

***Microcryptorhynchus contractus* (Broun)
new combination**

Broun, 1913: 137 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 121.

Type data. Holotype (?sex), BMNH, on card, with labels "3318." handwritten (Broun) / "Erua; Jany. 1910." handwritten (Broun) / "Acalles; contractus" handwritten (Broun).

Range. TO / —.

***Microcryptorhynchus ferrugo* (Kuschel)**

Kuschel, 1971: 237 (*Notacalles*); —1982: 277 (*Microcryptorhynchus*).

Type data. Holotype male, NZAC, on card point, with labels "[m.]" printed, red / "Adams I.; Magn. Stn.; Cove, 26.1.66; G. Kuschel" handwritten (Kuschel) / "ferrugo; Kuschel; Holotype" handwritten (Kuschel), red.

Range. — / Auckland Is, Adams I.

Biology. Adults of *M. ferrugo* have been collected in a number of litter samples, including some of tussock litter.

***Microcryptorhynchus kronei* (Kirsch)**

Kirsch in Kiesenwetter & Kirsch, 1877: 172 (*Acalles*; as *Kronii*). Krone in Kiesenwetter & Kirsch, 1877: 156. Hustache, 1936: 122 (as *A. Kroni*). Gourlay, 1950: 199. Brookes, 1951: 64 (as *A. kroneii*). Kuschel, 1964: 436, 440 (*Notacalles*); —1971: 236; —1982: 277 (*Microcryptorhynchus*); —1990: 74.

Type data. Type series not seen.

Range. AK / SL / SI / Auckland Is / Campbell I.

Biology. *Microcryptorhynchus kronei* has been collected in bush floor litter and on vegetation, principally on dead trunks, branches, and twigs (Kuschel 1990). Kuschel (1964) notes, for subantarctic islands (by comparison with other '*Microcryptorhynchus*'), that it is also found under stones and kelp. Plants from which specimens have been taken include *Acaena* sp., *Bulbinella* sp., *Carmichaelia aligera*, *Cassinia vauvilliersii*, *Chionochloa* sp., *Coprosma* sp., *C. macrocarpa*, *C. robusta*, *Danthonia* sp., *Dracophyllum* sp., *D. longifolium*, *Eucalyptus* sp., *Hebe* sp., *Leptospermum scoparium*, dead *Metrosideros rob-*

usta, *M. umbellata* (dead branches), *Myrsine* sp., *M. divaricata*, *Pinus radiata*, *Polystichum* sp., *P. vestitum*, *Pseudopanax simplex*, *Solanum mauritianum*, *Silbocarpa polaris*, *Weinmannia* sp. (flowers), *W. racemosa*, and *Urtica* sp. (Kuschel 1964, 1971, 1990, and unpubl. data). Kuschel (1964) notes that on the Auckland Islands and Campbell Island most specimens were obtained on *Cassinia vauvilliersii* and *Myrsine divaricata*. Kuschel (1971) further reports that on the subantarctic islands the species occurs in the tree and scrub zone up to about 300 m, and that the larvae are in thin, dead twigs of most woody plants.

Kuschel (1971) records the following 'safe' host data: *Cassinia vauvilliersii*, *Dracophyllum longifolium*, *D. scoparium*, *Hebe elliptica*, *Metrosideros umbellata*, and *Myrsine divaricata* (all on subantarctic islands), and for Stewart Island also *Leptospermum scoparium* and *Weinmannia racemosa*.

***Microcryptorhynchus latitarsis* (Kuschel)**

Fig. 98, 143, 162, 803–810

Kuschel, 1964: 436, 441 (*Notacalles*); —1971: 236; —1982: 277 (*Microcryptorhynchus*).

Type data. Holotype male, NZAC, on card, with labels "Rantui Cove, 60*; 10-11-54; E.S. Gourlay." printed / "Ex. leafmould, The Lookout" printed / "AUCKLAND; ISLANDS" printed / "Holotype [m.]; Notacalles; latitarsis; Kuschel" handwritten (Kuschel), red / "Notacalles; latitarsis; Kuschel; Kuschel, 1963" printed / "Notacalles; latitarsis; [m.]; Kuschel det., 1963" handwritten (Kuschel).

Range. — / SL / SI / Auckland Is, incl. Adams I.

Biology. *Microcryptorhynchus latitarsis* has repeatedly been taken from litter, as well as in mat plants, moss, and seabird nests (Kuschel 1964, 1971, and unpubl. data). Adults have also been collected from plants, including *Carex trifida*, *Coprosma* sp., *Griselinia littoralis*, *Metrosideros umbellata*, *Myrsine* sp., *M. divaricata*, *Poa foliosa* and *Polystichum* sp. (foliage).

***Microcryptorhynchus multisetosus* (Broun)**

Fig. 109

Broun, 1907: 61 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 123. Kuschel, 1964: 437, 444; —1971: 239 (*Notacalles*). May, 1971: 291. Kuschel, 1982: 277 (*Microcryptorhynchus*). May, 1987: 48.

Type data. Lectotype female here designated, NZAC, on card point with genitalia separate in vial, with labels “[f.]” typed / “Invercargill” handwritten / “2943” handwritten (Brookes) / “T. Broun; Dup. Coll.” printed / “Lectotype” handwritten (Kuschel), red / “multisetosus; Broun” handwritten (Kuschel) / “ACALLES; multisetosus Broun” handwritten. Paralectotype female, BMNH, same locality. All syntypes located.

Range. — / WD, OL, FD, SL / SI / Auckland Is / Campbell I.

Biology. Adults of *M. multisetosus* have been found in forest floor litter, moss and lichen, under logs, under stones and in dried kelp on beaches, on encrusting lichen on plants, and on dead and living plants, including “*A. lucidum*”, *Cassinia vauvilliersii*, *Coprosma* sp., *C. ciliata*, *C. cuneata*, *C. foetidissima*, *Dacrydium colensoi*, *Dracophyllum* sp., *D. longifolium*, *D. scoparium*, *Histiopteris incisa*, *Histiopteris* sp., *Metrosideros umbellata*, *M. robusta*, *Myrsine* sp., *M. divaricata*, *Olearia* sp., *Poa* sp., *Polystichum* sp., *P. vestitum*, *Pseudopanax simplex*, *Stilbocarpa*, ferns and sedges (Kuschel 1964, 1971, and unpubl. data). The species has been reared from dead sub-cortex of *Dracophyllum pyramidale* (May 1987) and from a larva collected in a litter sample (66/81, Adams I.; May 1971). Kuschel (1971) states that its bionomics and ecology are similar to those of *M. suillus*.

***Microcryptorhynchus perpusillus* (Pascoe)**

Fig. 438–442

Pascoe, 1877: 147 (*Acalles*). Broun, 1880: 490. Hutton, 1904: 212. Hudson, 1934: 222. Hustache, 1936: 123. Zimmerman, 1957: 86, 91 (*Miocalles*). Kuschel, 1990: 74, 80 (*Microcryptorhynchus*).

Type data. Lectotype (?sex) here designated, BMNH, on card with paralectotype (paralectotype mounted on dorsum, ?sex), with labels “T.” handwritten, on card mount underneath specimen / BMNH type disc / “Acalles; perpusillus; type Pasc.” handwritten (Pascoe) / “Tairua” handwritten (Pascoe), yellow oval / “Pascoe Coll.; 93-60.” printed / “Acalles; perpusillus Pasc.” handwritten (Pascoe), label from drawer in Pascoe Collection / “LECTOTYPE; Acalles; perpusillus; Pascoe, 1877; Lyal det, 1989” and “Left spec.” on reverse handwritten (Lyal), red / “PARALECTOTYPE; Acalles; perpusillus; Pascoe, 1877; Lyal det, 1989” and “Right spec.” on reverse, handwritten (Lyal), blue. Original number of syntypes not stated by Pascoe.

Range. ND, AK, CL, BP, TK / SD.

Biology. Adults of *M. perpusillus* are found in a range of concealing habitats, including leaf litter, on dead trunks, branches, and twigs of a number of tree and shrub species, in decayed tree fern fronds, and in bird nests. Plants that the species has been taken from include *Acacia decurrens*, *Astelia banksii*, *Citrus* spp., *Collosporum hastatum* on *Metrosideros excelsa*, *Cortaderia splendens*, *Cupressus torulosa*, *Dacrydium colensoi*, *Eucalyptus* spp., *Leptocarpus similis*, *Leptospermum* sp., *Libocedrus bidwillii*, *Phormium cookianum*, *P. hookerianum*, cutty grass, “tide-water monocots” and a live cherry stump (Kuschel 1990 and unpubl. data). The species has not been reared, but has been recorded “boring into bark and wood.”

***Microcryptorhynchus praesetosus* (Broun) new combination**

Broun, 1909a: 147 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Holotype not located.

Range. — / SL.

***Microcryptorhynchus quietus* (Broun) new combination**

Broun, 1893a: 1487 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124.

Type data. Syntypes: 2 females, BMNH, on card (1 mounted on dorsum), with labels “2567.” handwritten (Broun) / “Hunua; Maketu” handwritten (Broun). One syntype not located.

Range. AK / —.

Biology. Adult *M. quietus* specimens have been found in leaf litter (Broun 1893a).

***Microcryptorhynchus setifer* (Broun)**

Fig. 41

Broun, 1886: 867 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 124. Zimmerman, 1957: 87, 91 (*Miocalles*). Kuschel, 1964: 363 (*Notacalles*); —1982: 277 (*Microcryptorhynchus*). May, 1987: 48 (*Notacalles*).

Type data. Holotype female, NZAC, on card, with labels “[f.]” printed, blue / “1546” handwritten (Broun) / “Wai-takerei” printed / “T. Broun; Dup. Coll.” printed / “Acalles;

setifer; Broun; Holotype" handwritten, pink.

Range. ND, AK, CL / —.

Biology. Adults of *M. setifer* have been taken by sweeping *Blechnum* and *Paesia*, from *Collosporum*, and from decayed wood. The species has been reared from dead branchlets of *Beilschmiedia tarairi* (May 1987).

Microcryptorhynchus suillus (Kuschel)

Kuschel, 1964: 437, 443 (*Notacalles*); —1971: 239; —1982: 277 (*Microcryptorhynchus*). May, 1987: 87 (*Notacalles*).

Type data. Holotype male, NZAC, on card, with labels "Ranui Cove; 7-12-11-54; E.S. Gourlay." printed / "AUCKLAND; ISLANDS" printed / "Holotype [m.]; Notacalles; suillus; [m.]; Kuschel det. 1963" handwritten (Kuschel).

Range. ND / — / SI (Codfish I.) / Chatham Is / Auckland Is / Campbell I.

Biology. Specimens of *M. suillus* are found frequently in forest litter, as well as under logs, under encrusting lichens on trees, in dry kelp on beaches (Auckland Island), and on live and dead plants, including *Chionochloa* sp., *Coprosma* sp., *C. ciliata*, *C. cuneata*, *C. foetidissima*, *C. lucida*, *Cyathea smithii*, *Dracophyllum* sp., *D. longifolium*, *D. scoparium*, *Hebe elliptica*, *Histiopteris incisa*, *Leptospermum scoparium*, *Metrosideros* sp., *M. umbellata* (dead branches), *Myrsine divaricata*, *Olearia* sp., *O. angustifolia*, *O. lyallii*, *Polystichum* sp., *P. vestitum*, *Pseudopanax* sp., *P. simplex*, *Senecio huntii* and *Styphelia parviflora* (Kuschel 1964, 1971, and unpubl. data). The species has been reared from *Coprosma foetidissima* (Kuschel 1971) and from dead subcortical wood of *Myrsine divaricata* (May 1980, 1987); the former author states that the larvae live in dead twigs of a wide variety of trees and shrubs.

Microcryptorhynchus vafer (Broun)

Broun, 1881: 725 (*Acalles*; as *vafrum*). Hutton, 1904: 213 (as *vafrus*). Hudson, 1934: 222. Hustache, 1936: 124 (as *vafrum*). Kuschel, 1964: 436, 441 (*Notacalles*); —1982: 277 (*Microcryptorhynchus*); —1990: 74.

Type data. Lectotype female here designated, BMNH, on card, with labels "1286." printed, green / "Parua" printed / "Acalles; vafrus." handwritten (Broun) / BMNH lectotype disc. Paralectotype male, BMNH, dissected in vial, same data as lectotype. All syntypes located.

Range. ND, AK, WN / SD, SL / SI.

Biology. Specimens of *M. vafer* are found on the dead branches of trees and shrubs, including *Beilschmiedia tawa*, *Dysoxylum spectabile*, *Knighitia excelsa*, *Leptospermum scoparium*, *Metrosideros excelsa*, *M. perforata*, *Muehlenbeckia complexa*, *Nestegis lanceolata*, *Olearia furfuracea*, *Phormium tenax*, *Pinus radiata* and *Sophora microphylla* (Kuschel 1990 and unpubl. data).

Subgenus *Notacalles*

Microcryptorhynchus (*Notacalles*) *floricola* (Broun) new combination

Fig. 811, 812

Broun, 1886: 966 (*Acalles*). Hutton, 1904: 213. Hudson, 1934: 222. Hustache, 1936: 122. Kuschel, 1982: 277 (*Notacalles*).

Type data. Lectotype (?sex), BMNH, on card, with labels "1745." handwritten (Broun) / "Mokohinau" printed / "Acalles; floricola" handwritten (Broun). Original number in series not stated by Broun.

Range. ND / —.

Biology. Adults of *M. floricola* have been obtained from leaf litter and by beating vegetation. Broun (1886) reports the types to have been "taken from a *Mesembryanthemum*."

Microcryptorhynchus (*Notacalles*) *leviculus* (Broun) new combination

Broun, 1881: 721 (*Acalles*). Hutton, 1904: 213 (as *laeviculus*). Hudson, 1934: 222. Hustache, 1936: 123. Zimmerman, 1957: 85, 91 (*Miocalles*). May, 1987: 48 (*Notacalles*). Kuschel, 1990: 74.

Type data. Syntypes: 2 (?sex), BMNH, on card, with labels "1275." printed, green / "Whangarei" printed (1 only) or "Wellington" printed (other specimen) / "Acalles; leviculus" handwritten (Broun) (specimen from Whangarei). Original number of specimens in series not stated by Broun.

Range. ND, AK, WN / BR.

Biology. Adults of *M. leviculus* have been collected on old trunks of *Elaeocarpus denatus*, *Hoheria populnea*, *Pseudopanax arboreus*, *Sophora microphylla* and cut branches of *Parsonsia heterophylla* (Kuschel 1990).

Specimens have been reared from *Senecio kirkii* (Kuschel 1982) and dead subcortical tissue of *Brachyglottis* (as *Urostemon*) *kirkii*, *Coprosma lucida* and *C. robusta* (May 1987).

***Microcryptorhynchus* (*Notacalles*) *piciventris* (Broun)
new combination**

Fig. 144

Broun, 1909b: 120 (*Acalles*). Hudson, 1934: 223. Hustache, 1936: 123. Gourlay, 1950: 199 (as junior synonym of *A. kronei* Kirsch). Brookes, 1951: 64 (as junior synonym of *A. kronei*). Zimmerman, 1957: 86, 91 (*Miocalles*). Kuschel, 1964: 420, 436, 438 (*Notacalles*); —1971: 235. May, 1971: 290; —1987: 48.

furvus Broun, 1915: 339 (*Acalles*). Hudson, 1934: 222. Hustache, 1936: 122. Kuschel, 1964: 438 (junior synonym of *Notacalles piciventris*).

campbellicus Brookes, 1951: 64 (*Acalles*). Kuschel, 1964: 438 (junior synonym of *Notacalles piciventris*).

Type data. *piciventris*: lectotype male here designated, BMNH, on card with paralectotype (female, mounted on dorsum), with labels "[m.]" and "[f.]" and "LT." handwritten, on card bearing specimens / "45." handwritten (Broun) / "Auckland; Island." handwritten (Broun) / "Acalles; piciventris" handwritten (Broun) / BMNH lectotype disc / "LECTOTYPE; Acalles [m.]; piciventris; Broun, 1909; Lyal det 1989" handwritten (Lyal), red / "PARALECTOTYPE; Acalles [f.]; piciventris; Broun, 1909; Lyal det 1989" handwritten (Lyal), blue. All syntypes located.

campbellicus: holotype male, Dominion Museum (NMNZ; now Museum of New Zealand), not seen.

furvus: lectotype female and 2 paralectotypes, NZAC, designated by Kuschel (1964, p. 439). All syntypes located.

Range. — / NC, MC, SL / SI / Auckland Is / Campbell I.

Biology. Adults of *M. piciventris* occur on a great variety of plants, in forest litter, and under stones (Kuschel 1964). Plants from which specimens have been taken include *Acaena* sp., "*A. campbellicus*" (?genus), *Bulbinella* sp., *Carex* sp., *Cassinia* sp., *C. vauvilliersii*, *Chionochloa* sp., *Coprosma* sp., *C. foetidissima* (dead twigs), *Danthonia* sp., *Dracophyllum longifolium* (dead branches), *D. scoparium* (dead twigs), *Hebe* sp., *H. elliptica*, *Metrosideros umbellata* (trunks and dead branches), *Myrsine divaricata*, *Polystichum* sp., *P. vestitum*, *Pseudopanax* sp., and *P. simplex* (Kuschel 1964, 1971, and unpubl. data). May (1971) states that the larvae "feed subcortically in dead and dying branchlets, usually entering at a node and developing in the

area of one internode. Pupation takes place in a shallow excavation in the wood." Kuschel (1971) notes that the "larvae feed first on the bark, then work under the bark, and finally penetrate the wood of thin twigs."

Larvae have been reared from under the bark of *Hebe elliptica* (May 1971), under the bark (May 1971) and twigs (Kuschel 1971) of *Metrosideros umbellata*, "beginning in bark but continuing in pith of small twigs" of *M. umbellata* (specimens in NZAC), dead branchlets of *Coprosma ciliata* and *C. cuneata* (May 1987), as well as dead twigs of *C. foetidissima* (Kuschel 1971) and *Coprosma* sp., and dead branchlets and twigs of *Dracophyllum longifolium* and *D. scoparium* (Kuschel 1971, May 1987). Teneral adults have been extracted from the centre of thin, dead twigs of *Metrosideros umbellata* (Kuschel 1971). A larva has also been taken from leaf litter (May 1971). On the Auckland Islands pyemotid mites were found feeding on larvae (May 1971).

***Microcryptorhynchus* (*Notacalles*) *planidorsis* (Kirsch)
new combination**

Fig. 42

Kirsch in Kiesenwetter & Kirsch, 1877: 172 (*Acalles*). Krone in Kiesenwetter & Kirsch, 1877: 156. Hustache, 1936: 123. Gourlay, 1950: 199 (as *planidorsus*). Brookes, 1951: 65. Kuschel, 1964: 420, 436 (*Notacalles*); —1971: 235. May, 1971: 290; —1981: 257, 265 (larva and pupa described and keyed); —1987: 48.

Type data. Holotype female, Staatliches Museum für Tierkunde, Dresden, with labels listed by Kuschel (1964, p. 438).

Range. — / South I. / SI / The Snares / Auckland Is (incl. Adams I.) / Campbell I. (May 1981, p. 258).

Biology. Kuschel (1964) states that "adults occur on the ground under logs, stones and even under dry kelp, but are particularly abundant in forest litter and on perennial mostly woody plants." Other concealing sites where the weevils have been collected are in lichens and from Coelopidae pupae in dried *Durvillea* roots (Kuschel 1964). Plants from which adults have been obtained are *Carex* sp., *Cassinia vauvilliersii*, *Coprosma* sp., *Dracophyllum longifolium*, *Hebe* sp., *H. elliptica*, *Olearia* sp., *O. lyallii*, *Poa* sp., *P. litorosa*, *Polystichum vestitum*, *Pseudopanax simplex*, *Senecio stewartiae* and *Stilbocarpa polaris* (Kuschel 1964, 1971, and unpubl. data). Kuschel (1964) notes that for the subantarctic islands most specimens were beaten off *Hebe elliptica* and *Olearia lyallii*.

May (1971) believed the species to be probably host-specific in *Hebe elliptica*, and on Adams Island found

larvae feeding in the pith of dead twigs in association with *Pactolotypus depressirostris* (Kirsch), with pupal exuviae also present. Kuschel (1971) states the insect to be specific to *Hebe elliptica*, and reported collecting larvae in the pith of dead twigs of that plant "usually a little lower in the twig than [larvae] of *Pactolotypus depressirostris*." Kuschel (1971) notes further that the occurrence of the species is "confined to maritime vegetation just above the supralittoral zone, usually 1 to 5 m above sea-level on the subantarctic islands, but the plant extends up to 130 m on the exposed west coast of Big South Cape Island (Stewart Island) and with it also the weevil." May (1981, 1987) also reports larva and pupae subcortical and in pith of *Hebe elliptica* twigs on Campbell Island.

Genus *Andracalles* Kuschel

Kuschel, 1982: 277–278. Type species *Acalles spurcus* Broun, 1881, by original designation.

Length 1.5–3 mm. Habitus, Fig. 43. Derm black or dark brown, shiny, densely or sparsely squamose; surface frequently covered by gummy matter, obscuring density and detail of squamosity. Scales round, oval, and elongate, separate, contiguous, and imbricate; erect scales sometimes extremely large; erect setiform scales absent. Pronotum in profile (Fig. 99) depressed in anterior half and near posterior margin. Elytra flat or weakly convex anteriorly, sometimes raised abruptly at base, smoothly convex. Apticous.

Head. Rostrum shorter than pronotum; punctation coarse at base; 3 longitudinal carinae frequently present, extending from base to level of antennal insertions, or nearly so, generally more marked in female; squamosity present at least basally, generally extending to level of antennal insertions, at least in male.

Antennae inserted in distal half of rostrum, generally nearer apex in male. Scape and funicle subequal in length, with fine, semi-erect and decumbent setae but no scales; F1 expanded, broader and sometimes longer than F2; F1+2 less than half length of funicle, or subequal.

Thorax. Pronotum (Fig. 43) as wide as long or wider, widest in posterior half; sides convex posteriorly, concave anteriorly; anterior margin weakly convex; posterior margin straight; prominences absent; punctation coarse, dense; tufts of scales absent, or erect scales loosely aggregated at position 1, 2, or 3. Scutellum concealed.

Elytra with basal margin straight, as wide as pronotum basally or wider; sides convex, with greatest width variably

positioned; apex not distinguishable from general curvature, broadly convex; prominences absent; male generally with a carina on lateral margin near ventrites 1 and 2 (Fig. 145, cf. Fig. 146); interstriae 1–5 sometimes raised at base; stria punctures round, large, deep, sometimes confluent; large, erect scales distributed along interstriae, frequently forming prominent longitudinal lines but not gathered into tufts. Elytral strigil weak or absent.

Postocular lobe strongly rounded, smoothly continuous with marginal carina of prosternal canal or cut back before junction. Marginal carina of prosternal canal with very short, obtuse projections between fore coxae. Mesosternal receptacle U-shaped, cavernous, as wide as long or wider, extending posteriorly to level of midline of middle coxae; margins broad, only weakly produced ventrally. Metasternum flat or depressed medially, separating middle and hind coxae by less than length of a hind coxa; a narrow, projecting ridge between middle and hind coxae. Metepisternum narrow or concealed by elytron; anapleural suture incomplete, concealed by appressed, imbricate and tessellate, pale, glossy scales covering side of metasternum and metepisternum (if not concealed) and along mesepimeron near elytron (Fig. 163).

Fore coxa with an obtuse posterior projection. Femora lacking a ventral tooth and groove; surface squamose. Tibiae lacking a ventral carina; premacro sometimes pronounced; uncus small.

Abdomen. Ventrite 1 flat or weakly convex medially, convex laterally; intercoxal process concave or convex, wider than long. Ventrites 1 and 2 subequal in length, or V1 longer than V2 (excluding intercoxal process), the suture between them sometimes incomplete medially; V2 sloping towards V3. Ventrites 3+4 slightly shorter than V2, transversely convex. Punctuation sparse, coarse on ventrites 1 and 2, absent on V3–5. Scales oval or elongate and setiform, small, decumbent, sparse.

Female terminalia. Tergite VII (Fig. 443) as wide as long or wider, lacking microsetae; anterior margin weakly convex; posterior margin weakly convex or concave. Tergite VIII (Fig. 444, 449) wider than long; posterior margin weakly convex, crenulate. Sternite VIII (Fig. 445) with posterior plate wider than long and approx. half as long as apodeme, very weakly sclerotised except for 'arms'; apodeme broadened anteriorly, sometimes with a long, transverse bar at anterior end. Hemisternites of ovipositor longer than apical plate of sternite VIII or subequal, broad; styli short, subterminal, directed ventrad (Fig. 446, 447, 448). Spermathecal duct arising at junction of bursa and oviduct; bursa lacking sclerotisation (Fig. 446), but vagina sometimes with a very thick elastic membrane (see Lyal 1993, fig. 16).

Male terminalia. Tergite VII (Fig. 815) wider than long, lacking microsetae; anterior margin weakly convex; posterior margin truncate or weakly concave. Spiculum gastrale (Fig. 817) longer than aedeagal apodemes; posterior arms narrow. Tegmen (Fig. 813, 818, 819) with parameres very short and unsclerotised, or absent; apodeme longer or shorter than width of tegminal ring. Aedeagal body longer or shorter than its apodemes, longer than wide; sides weakly rounded, sometimes divergent from base; apex very weakly rounded, sometimes with an acuminate median projection; body and apodemes united (Fig. 814, 820, 821). Endophallus with or without a large, variously shaped sclerite; flagellum absent (Fig. 814, 821).

Range. New Zealand, Lord Howe I., Norfolk I., Tahiti, Niue, Samoa.

Remarks. *Andracalles* is one of a number of New Zealand genera with specialised scales on the metepisternum. More unusually, the scales extend along the mesepimeron near the elytra (Fig. 163). This pattern is found in no other New Zealand genus, although it is approached in some *Notacalles*. The males of many species have a carina near the lateral margin of the elytron, near ventrites 1 and 2 (Fig. 145c); in females the margin is simply rounded, and no carina is developed (Fig. 146).

Andracalles horridus, with its extraordinary large elytral scales, is perhaps the most unusual of the mainland species, although some specimens of *spurcus* approach the same condition. The other three nominal mainland species are very similar to each other, and may be synonymous. There are at least two undescribed species.

Although there are considerable differences in the male genitalia of *A. horridus* and *A. spurcus* on the one hand, and *A. canescens* on the other, I see no good reason to place them in separate genera. *A. pani*, a most unusual species found on the Three Kings Islands, has the male endophallus furnished with an extraordinarily large dorsal sclerite, and possibly permanently everted (Lyal 1993). The thick-walled vagina appears to be shaped so as to closely receive the body of the aedeagus, an adaptation not seen in other members of the genus.

Andracalles canescens (Broun)

Fig. 99, 145, 146, 443–447, 813, 814

Broun, 1881: 725 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 121. Kuschel, 1982: 278 (*Andracalles*).

Type data. Lectotype female here designated, BMNH, on card, with labels “1284” printed, green / “Parua” printed /

“*Acalles; canescens*” handwritten (Broun). Second syntype not located.

Range. ND, AK, CL, WO, BP / —.

Biology. Adults of *A. canescens* have been obtained by beating *Metrosideros robusta* and *Hoheria populnea*; specimens have also been found on dead *Agathis australis* at night.

Andracalles diversus (Broun) new combination

Broun, 1883: 436 (*Acalles*); —1886: 798 (repetition of Broun, 1883). Hutton, 1904: 214 (attributed to Broun, 1886). Hudson, 1934: 222. Hustache, 1936: 121.

Type data. Holotype male, BMNH, on card, with labels “1422” printed, green / “Parua” printed / “*Acalles; diversus*” handwritten (Broun).

Range. ND / —.

Biology. Adults of *A. diversus* have been beaten from *Metrosideros albiflora*.

Andracalles horridus (Broun)

Fig. 815–821

Broun, 1881: 723 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 122. Kuschel, 1982: 278 (*Andracalles*). May, 1987: 48. Kuschel, 1990: 73.

Type data. Lectotype male here designated, BMNH, on card with genitalia separate in vial, with labels “1280” printed, green / BMNH lectotype disc / “Auckland” printed / “*Acalles; horridus*” handwritten (Broun). Original number of specimens in series not stated by Broun.

Range. ND, AK, CL, BP, WI–WN / SD.

Biology. Adults of *A. horridus* have been taken from various trees and shrubs, including *Agathis australis*, *Beilschmiedia tawa*, *Carmichaelia aligera*, *Corynocarpus laevigatus*, *Dysoxylum spectabile*, *Hoheria populnea*, *Kunzea ericoides*, *Leptospermum scoparium*, *Metrosideros carminea*, *M. robusta*, *Muehlenbeckia australis*, *Nestegis lanceolata*, *Phyllocladus trichomanoides*, *Pittosporum tenuifolium*, *Rubus cissoides* and *Scoparium microphylla* (Kuschel 1990 and unpubl. data). Adults have also been found in dead rachides of *Dicksonia* sp. and in thin fumagine fungus on *Nothofagus solandri*. Specimens have been reared from the dead bark of *Vitex lucens* (May 1987).

Andracalles pani Lyal

Fig. 163, 448

Lyal, 1993: 4.

Type data. Holotype male, NZAC, on point, with labels [m.] handwritten (Lyal)/BMNH holotype disc/"Great Is.; Three Kings.; 1-3 Jan 63; E.S.Gourlay" handwritten / 2E.S.Gourlay; Acc. 1970; Ent. Div." printed/vial containing genitalia / "HOLOTYPE"; *Andracalles*; *pani* Lyal; Lyal det." handwritten (Lyal), red. Paratypes: 2 females NZAC, 1 female 1 male BMNH, same data as holotype.

Range. Three Kings Is.

Andracalles spurcus (Broun)

Fig. 43, 449

Broun, 1881: 724 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 124 (as *spureus*). Kuschel, 1982: 278 (*Andracalles*).

Type data. Syntypes: 2 (?sex), BMNH, on card, with labels "1282." printed, green / "Auckland" printed (1 only) / "Acalles; spurcus" handwritten (Broun) (specimen with "Auckland" label only) / BMNH lectotype disc (specimen with "Auckland" label only). Original number of specimens in series not stated by Broun.

Range. ND, AK, BP / —.

Biology. Adults of *A. spurcus* have been obtained by beating *Astelia* sp. at dusk, and have been found on *Metrodideros excelsa* and in bryophytes in dense forest.

Andracalles vividus (Broun)

Broun, 1880: 493 (*Acalles*). Hutton, 1904: 214. Hudson, 1934: 222. Hustache, 1936: 124. Kuschel, 1982: 278 (*Andracalles*); —1990: 73.

Type data. Holotype (?sex), BMNH, on card, with labels "876" printed, green / "Manaia" printed / "Acalles; vividus" handwritten (Broun).

Range. ND, AK, CL, BP, TO / BR.

Biology. Adults of *A. vividus* have been collected frequently in litter, as well as in rotten wood, moss, and epiphytes. Adults have also been taken from *Astelia banksii*, *Coprosma* sp., *Dysoxylum spectabile*, *Gahnia lacera*, *Metrodideros excelsa*, *Pseudopanax simplex*, *Styphelia* sp., *Vitex lucens*, and from *Collospermum* sp. and *Agathis australis* (Kuschel 1990 and unpubl. data).

Genus *Ampagia* Pascoe

Pascoe, 1870: 208. Lea, 1913a: 602; —1929: 185–194, pl.16. Hustache, 1936: 262. Zimmerman, 1936a: 4. Type species *Ampagia erinacea* Pascoe, 1870, by monotypy.

Amygdala Pascoe, 1871: 213. Lea, 1913c: 442. Hustache, 1936: 262 (as *Amygdala*). Type species *Amygdala abdominalis* Pascoe, 1871, by monotypy. Synonymised by Lea (1929, p. 186).

Acallopais Pascoe, 1877: 147. Broun, 1880: 496. Hutton, 1904: 214. Hudson, 1934: 223. Type species *Acallopais rudis* Pascoe, 1877, by monotypy. Synonymised by Lea (1929, p. 186).

Coptomerus Chevrolat, 1881: 69. Hustache, 1936: 262 (in synonymy with *Ampagia*, as *Contomerus*). Type species *Coptomerus nigricinus* Chevrolat, by monotypy. Synonymised with *Amygdala* by Lea (1913a, p. 442), with *Ampagia* by Lea (1929, p. 186).

Length 1.5–15 mm (New Zealand species 2–3 mm long, oval). Habitus, Fig. 44. Derm dark brown or black. Squamosity variable, from virtually glabrous with patches of small or elongate depressed scales, to a thick covering of round, decumbent and more elongate, upright scales (New Zealand species densely squamose); erect setiform scales absent. Pronotum and elytra in profile (Fig. 100) smoothly convex, forming a single continuous curve. Macropterous, brachypterous, or apterous.

Head. Rostrum shorter than pronotum, straight; sides straight or concave, diverging to broad apex (Fig. 44); a median dorsal longitudinal carina sometimes present in male; rostrum punctate dorsally, more so in male; scales small and decumbent or absent distally, larger and sometimes erect basally, more extensive in male.

Antennae inserted nearer base of rostrum than apex, with fine or coarse decumbent setae; scales absent. Scrobe short. Scape slightly longer than either F1 or F1+2; F2 shorter than F1.

Thorax. Pronotum (Fig. 44) trapezoidal, with length and width subequal; sides very weakly convex, widest near base; anterior margin convex; posterior margin straight or weakly convex; punctation fine or coarse. Scutellum very small, sometimes bearing a conical tuft of scales.

Elytra with basal margin straight or weakly sinuate, very slightly wider than pronotum basally; humeri not produced; sides smoothly convex, widest just posterior to base; apex convex; interstriae broad, flat; striae very narrow and shallow; projections, protuberances, and setal tufts absent, or restricted to a small humeral bulge and a suture immediately posterior to scutellum; punctation absent

or, if present, fine and shallow. Elytral strigil absent.

Postocular lobe smoothly continuous with marginal carina of prosternal canal. Prosternal canal short, generally with elongate scales anteriorly, these plumose in New Zealand species. Mesosternal receptacle (Fig. 141) very short, without lateral margins; posterior margin lying between fore coxae, completely projecting from venter as a vertical wall, in length about half coxal width. Metasternum weakly concave, separating middle and hind coxae by less than length of a hind coxa, exceptionally (*A. abdominalis*) by more than length of a hind coxa, usually projecting ventrally, rarely flat* between middle and hind coxae. Metepisternum partially or completely concealed; sclerolepidia absent.

Fore coxae sometimes with a small posterior extension. Femora unarmed ventrally; a glabrous ventral furrow present, with a very prominent anterior carinate margin; fore and middle femora with a more or less pronounced dorsal carina and posterolateral concavity, so that legs can fold to fit closely together; hind femur with dorsal margin more or less convexly produced, the margin so formed meeting closely the carina of ventrite 1 (see below) when in defensive position (Fig. 189, 192). Tibiae lacking a ventral carina; uncus broad; premucro obscure.

Abdomen. Ventrite 1 with a semicircular carina present between external margins of hind coxae, sometimes extending ventrally to anterior margin of ventrite 2 and demarcating a central flat or slightly convex region (Fig. 192) or extending along posterior margin of ventrite* (*A. nigrinasus*); intercoxal process much wider than long. Ventrite 2 subequal in length to V1 (excluding intercoxal process) or shorter, sloping abruptly to V3 medially, less so laterally. Ventrites 3+4 shorter than V2, very short, lacking any flat area medially. Ventrites shallowly punctate or smooth. Squamosity densest on V5; setae otherwise scattered or absent.

Female terminalia. Tergite VII (Fig. 450) wider than long; microsetae absent; anterior margin weakly sinuate; posterior margin weakly convex. Tergite VIII (Fig. 451) as long as wide; posterior margin truncate, weakly convex, entire, with a row of submarginal setae. Sternite VIII (Fig. 452) with apical plate wider than long, about one-quarter as long as apodeme. Hemisternites of ovipositor slightly longer than wide part of sternite VIII, curved, with short, semi-tubular projections to cylindrical styli (Fig. 453, 454). Bursa with a long median sclerite, sometimes faint, extending on ventral surface anteriorly from junction with oviduct (in New Zealand species incorporating a vertical longitudinal plate); spermathecal duct arising at junction of oviduct and bursa (Fig. 453).

Male terminalia. Tergite VII (Fig. 822) wider than long,

lacking microsetae; anterior margin convex; posterior margin concave. Sternum VIII sometimes with a small, sclerotised pocket between hemisternites*. Spiculum gastrale (Fig. 824) with apodeme shorter than aedeagus. Tegmen (Fig. 825, 826) with parameres shorter than width of tegmental ring and apodeme longer or shorter* than width of ring. Aedeagal body shorter than its apodemes, curved, with sides rounded and apex subacuminate; apodemes and body narrowly united (Fig. 827, 828). Endophallus with basal sclerites very variable, in New Zealand species obscure, forming a ring-shaped structure, with large longitudinal sclerites present posteriorly; flagellum absent (Fig. 827) or present*.

Range. New Zealand, Australia, Lord Howe I., Fiji, Samoa, New Caledonia, Malaysia.

Remarks. In the description above an asterisk (*) indicates character states not found in the New Zealand species.

Ampagia can be distinguished from all other New Zealand Cryptorhynchinae by the form of the mesosternal receptacle, which is very weakly concave, projects strongly, and bears only a very weak carina on its posterior face (cf. the stronger carina of *Crooktocalles*), a carina delimiting a weakly convex area on the first ventrite, the development of the dorsal margins of the middle and hind femora, the short rostrum, and the scales in the prosternal canal.

Ampagia has no obvious close relationships with any other member of the New Zealand fauna; the similarities with *Crooktocalles* are discussed under that genus. *Ampagia* is probably related closely to *Trigonopterus*, a widespread genus in Australasia and the Pacific.

The structure of the first ventrite, mesosternal receptacle, and legs is an adaptation to defence. Together they allow the legs to be folded very tightly against the body, and the flanges on the ventrite and legs permit the legs to be 'locked' against one another and the abdomen. The dorsal extensions of the femora act to cover 'gaps' that would otherwise allow leverage to predators (indicating that the adaptation is against invertebrate predators rather than birds or mammals, since the spaces covered would allow access by the first but be irrelevant to vertebrates, which would swallow the insects whole). The morphology of the legs and abdomen has been discussed by Lea (1929), and an analogous adaptation for defence in *Crooktocalles* has been discussed above (p. 107).

The structural correspondence between male and female genitalia has been discussed briefly above (see *Psepholax*, p. 41). In *Ampagia rudis* the floor of the bursa has a vertical median plate arising at the junction with the oviduct and extending anteriorly (Fig. 453). The two longitudinal sclerites of the endophallus visible indistinctly lying in the body

of the aedeagus (Fig. 827) would fit neatly on either side of this median vertical plate, although whether they actually do so during copulation remains to be investigated.

Ampagia rudis (Pascoe)

Fig. 44, 100, 141, 189, 192, 450–454, 822–828

Pascoe, 1877: 147 (*Acallopais*). Broun, 1880: 495. Hutton, 1904: 214. Lea, 1929: 186 (*Ampagia*). Hudson, 1934: 223 (*Acallopais*). Hustache, 1936: 263 (*Ampagia*).
sculpturatus Broun, 1880: 495 (*Acallopais*). Hutton, 1904: 214. Lea, 1929: 186 (*Ampagia*). Hudson, 1934: 223 (*Acallopais*). Hustache, 1936: 263 (*Ampagia*). New synonymy.

Type data. *rudis*: lectotype female here designated, BMNH, on card, with labels BMNH lectotype disc / BMNH type disc / "N.Z.; Tairua" handwritten (Pascoe), yellow oval / "Acallopais; rudis Pasc.; Type " handwritten (Pascoe) / "Acallopais; rudis, Pasc." handwritten (Pascoe).

sculpturatus: holotype male, BMNH, on card, with labels "880" printed, green / BMNH type disc / "Whangarei" printed / "Acallopais; sculpturatus" handwritten (Broun) / "Ampagia; rudis (Pascoe, 1877); Lyal det 1986" handwritten (Lyal).

Range. ND, AK (incl. Noises Is), CL / —.

Biology. Adults of *A. rudis* have been obtained by beating *Meliclytus*. Adults and larvae have been cut from wood of the introduced *Quercus ilex* (Styles 1973).

Other genera recorded from New Zealand

Three other genera have been reported from New Zealand, but should not be on the list of the fauna.

'*Anilaus*' *amplicollis* Fairmaire

Fairmaire, 1849a: 36 (*Acalles*); —1849b: 514. Lacordaire, 1866: 93 (*Anaballus*). Kuschel, 1972: 279 (*Anilaus*). Thompson, 1982: 107 (*Anaballus*). Zimmerman, 1992: 366 (new genus).
quadratus Broun, 1886: 867 (*Tychanus*). Hutton, 1904: 212.

Kuschel (1972) synonymised *Tychanus quadratus* Broun with Fairmaire's species and placed it in *Anilaus*. Thomp-

son (1982), while agreeing that the species was not correctly placed in *Anaballus*, did not accept that *Anilaus* was the correct placement. Most recently, Zimmerman (1992) has placed the species in a new genus, although, because names in this volume of his 'Australian Weevils' are not available, formal use of the name must await publication of a text volume. Only one specimen of the species has been recorded from New Zealand, and although Kuschel implicitly suggested (by the title of his paper) that it might be established in this country, there is no confirmation at present that it is.

Sympiezoscelus spencei Waterhouse

Waterhouse, 1853a: 204; —1853b: 104. Lacordaire, 1866: 139. Lea, 1910: 624. Hustache, 1936: 261.

The type specimen has on its label "New Holland or New Zealand", and Waterhouse (1853a) professed himself uncertain which country the specimen had come from, although (1853b) he noted only an Australian locality, and all other specimens seen originate in Australia. Lea (1910) indicated that the species is Australian, and cited Pascoe as stating this as well. There is no evidence that the genus occurs in New Zealand.

Trigonopterus egena Pascoe

Pascoe, 1876a: 58 (*Idotasia*). Broun, 1881: 506. Hutton, 1904: 215. Hudson, 1934: 224.

Members of this genus are widespread through the Pacific and the Australasian Region. Only one specimen of *T. egena* has been collected, with the locality 'Waikato', apparently by Captain Hutton (Broun 1881, and inferred from Pascoe 1875). The type specimen is in Pascoe's collection in the BMNH. Its locality appears twice on labels attached to it: on the underside of the card rectangle on which it is mounted, in Pascoe's handwriting but with the card cut very close to the end of the word; and on a separate oval label as "N.Z.; Waikato?" Pascoe notes in his description that the species resembles a species from Batachian to a greater extent than ones from Australia. It seems very likely that the specimen was originally mislabelled, and does not occur in New Zealand. *Trigonopterus* has been recognised for many years as the correct name for *Idotasia*, although there appears to be no published record of the combination *T. egena*.

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APPENDIX 1: GLOSSARY OF TERMS

- aedeagus** – the main part of the male genitalia, comprising the unpaired intromittent organ with its apodemes (Fig. 460, 461); 'median lobe' of some authors.
- anapleural suture** – suture between metasternum and mesepisternum (Fig. 47).
- apomorphic, apomorphy** – the derived state of a character, indicating relationship among the group of taxa in which it occurs.
- appressed** (of scales) – closely applied to the body surface.
- apterous** – lacking wings.
- basal sclerites** (of endophallus) – paired (usually) sclerites lying near the junction of the endophallus with the ductus ejaculatorius, of variable form.
- body** (of aedeagus) – the main part of the aedeagus, excluding apodemes.
- brachypterous** – with short or abbreviated wings.
- bursa** (= bursa copulatrix) – large, membranous lobe of female genitalia, branching from vagina generally at same point as oviduct and spermathecal duct (Fig. 229).
- carina(e)** – ridge-like feature(s) of derm.
- cavernous** – descriptive of mesosternal receptacle when posterior margin ventrally is forward of posteriormost part of receptacle, i.e., the posterior (interior) wall is concave.
- club** (of antenna) – segments 9–11, fused together (Fig. 48).
- contiguous** (of scales) – touching others, but with only part of perimeter, and thus not concealing derm.
- decumbent** (of scales) – bending downward towards tip from an upright base.
- elytral strigil** – patch of fine, parallel lines on inside of elytral apex, functioning as part of a sound-producing organ.
- embedded** (of scales) – apparently sunken into derm.
- endophallus** – membranous sac lying within aedeagus, continuous with ductus ejaculatorius and aedeagus, that everts during copulation; 'internal sac' of some authors.
- erect** (of scales) – upright.
- flagellum** – long sclerite sometimes present in endophallus through which ductus ejaculatorius opens (Fig. 721).
- funicle** (of antenna) – segments 2–8 (Fig. 48).
- genital pocket** (male) – membranous tube posterior to sternum VIII in which genitalia lie, and to which spiculum gastrale is attached.

hemisternites – (male) pair of sclerites on sternum VIII (Fig. 456); (female) pair of conical sclerites apically on ovipositor, surrounding vulva (Fig. 229).

humeri – anterolateral angles of folded elytra, sometimes produced (Fig. 45).

imbricate (of scales) – partially overlapping, appearing like tiles on a roof or scales on a fish.

intercoxal process – portion of ventrite I extending between hind coxae (Fig. 46).

interocular pit – pit on dorsum of head, between eyes.

internal sac – *see* endophallus.

interstria – raised strip on elytra between striae (Fig. 45).

macropterous – with full-sized wings.

manubrium – *see* tegmen.

median lobe – *see* aedeagus.

mesepimeron – sclerite on side of mesothorax; *see* Fig. 47.

mesepisternum(ite) – sclerite on side of mesothorax; *see* Fig. 47.

mesosternal receptacle – posterior extension of thoracic canal into which rostrum fits; generally cup-shaped (Fig. 46).

mesosternum(ite) – sclerite on ventral surface, extending on to side of mesothorax; *see* Fig. 47.

metasternum(ite) – sclerite on ventral surface, extending on to side of metathorax; *see* Fig. 47.

metepisternum(ite) – sclerite on side of metathorax; *see* Fig. 47.

microsetae – very small setae on tergite VII, usually borne on tubercles and generally with relatively large sockets (Fig. 455).

monophyletic – comprising species descended from a single common ancestor (and including that ancestor).

ostiole sclerites – pair of sclerites on dorsal wall of aedeagus adjacent to ostium.

ostium – opening of male aedeagus through which endophallus everts.

oviduct – channel through which egg passes into female genitalia (Fig. 229).

parameres – lobes attached to posterodorsal part of tegminal ring ('parameroid lobes' of some authors).

parameroid lobes – *see* parameres.

plesiomorphic, plesiomorphy – primitive state of a character, the common possession of which does not indicate close relationship among those species sharing it.

posterior declivity (of elytra) – distal part where, at rest, sutural margin curves ventrad towards lateral margin.

postocular lobe – rounded projection on anterior margin of pronotum immediately behind eye (Fig. 46).

premucro – small apical tooth arising from ventral margin of tibia (Fig. 168).

prosternal canal – channel along midline of prosternum, frequently with lateral carinae, in which rostrum fits when folded beneath thorax (Fig. 46).

rostrum – prolongation of head in weevils, with mouth at end (Fig. 45).

scape (of antenna) – 1st segment (Fig. 48).

sclerolepidia – specialised scales on anapleural suture in a number of subfamilies; in this study, plumose or glossy cream or yellow scales on anapleural suture or metasternum and metepisternum (Fig. 47).

scrobe – groove along rostrum into which scape fits when folded against rostrum.

semi-erect (of scales) – straight or weakly curved, not erect.

separate (of scales) – not touching one another.

setiferous tubercle – tubercle bearing a microseta (q.v.).

spermatheca – sclerotised body of female genitalia in which sperm are believed to be stored (Fig. 229).

spermathecal duct – duct leading from bursa or junction of bursa and oviduct to spermatheca (Fig. 229).

spermathecal gland – gland attached to spermatheca; following maceration of specimens only lumen of gland remains, as in Fig. 229.

spiculum gastrale – apodeme of male sternite IX, with a pair of sclerotised 'apical arms' (Fig. 457).

spiculum relictum – small pouch, sometimes sclerotised, sometimes found lying between hemisternites of sternum 8 in male (Fig. 565).

sternum – ventral division of any body segment.

sternite – sclerotised plate or plates of abdominal sterna (for the thorax, 'sternum' is used in this study).

stria(e) – line(s) on elytra formed by row(s) of punctures (Fig. 45).

styli – terminal segments of female hemisternites (Fig. 229).

supra-uncal projection – semicircular projection or tooth on dorsal surface of tibia near uncalus, formed by extension of 'true' tibial apex dorsal to uncalus (Fig. 168).

sutural margin (of elytra) – median longitudinal line where elytra meet along dorsum of insect (Fig. 45).

tegmen (pl. tegmina) – sclerotised ring surrounding aedeagus, with an anteroventral apodeme ('manubrium' of authors) and a pair of posterodorsal lobes (*see* 'parameres') (Fig. 459, 459).

tegminal ring – part of tegmen (q.v.) surrounding aedeagus.

tergum(-a) – dorsal division(s) of any body segment.

tergite(s) – sclerotised plate(s) of terga.

tessellate (of scales) – in contact with others around entire perimeter, obscuring derm.

uncus (of tibia) – apical tooth, generally arising from dorsal surface (Fig. 168).

vagina – posterior membranous part of female genitalia, between hemisternites and bursa (Fig. 229).

ventral groove (of femur) – groove into which tibia fits when bent against femur (Fig. 187).

ventrites – abdominal sternites III–VII (ventrites 1–5) (Fig. 190).

vulva – opening of female genitalia, between hemisternites.

APPENDIX 2. HOST PLANTS OF NEW ZEALAND CRYPTORHYNCHINAE

Cryptorhynchines recorded from the following plants are listed either as having been collected as adults (in which case the plant may not be a true 'host') or reared (under which heading is included instances where adult insects were cut from wood). In both categories the plant may have been dead ('d') or live ('l'); if no letter is appended, the condition is not known. "*" indicates that the plant is an exotic, i.e., not native to New Zealand. The list is arranged under the major subdivisions Pteridophyta and Spermatophyta, the latter subdivided into Gymnospermae and Angiospermae. Within each group, plant families are listed in alphabetical order. Following this list is an alphabetical checklist of plant genera with their families; nomenclature follows Mabberley (1990).

Plant	Larval host	Adults collected
PTERIDOPHYTA		
ASPLENIACEAE		
<i>Polystichum vestitum</i>		<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus (N.) piciventris</i> <i>Microcryptorhynchus (N.) planidorsis</i> <i>Pachyderris punctiventris</i>
<i>Polystichum</i> spp.		<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus latitarsis</i> <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus (N.) piciventris</i>
BLECHNACEAE		
<i>Blechnum capense</i>	<i>Agacalles comptus</i> (d) <i>Agacalles tortipes</i>	<i>Agacalles integer</i> <i>Synacalles dorsalis</i>
<i>Blechnum discolor</i>		<i>Tychanopais hudsoni</i>
<i>Blechnum fluviatile</i>		<i>Indecentia nubila</i>
<i>Blechnum lanceolata</i>		<i>Synacalles dorsalis</i>
<i>Blechnum</i> spp.		<i>Paromalina vestita</i> <i>Scelodolichus politus</i> <i>Synacalles peelensis</i>
CYATHAEACEAE		
<i>Cyathea smithii</i>		<i>Microcryptorhynchus suillus</i> <i>Oreda notata</i>
<i>Cyathea</i> sp.		<i>Agacalles formosus</i>
DENNSTAEDTIACEAE		
<i>Histiopteris incisa</i>		<i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i>
<i>Paesia</i> sp.		<i>Microcryptorhynchus setifer</i> <i>Paromalina vestita</i> <i>Scelodolichus politus</i> <i>Synacalles peelensis</i>
DICKSONIACEAE		
<i>Dicksonia</i> spp.		<i>Agacalles formosus</i> <i>Andracalles horridus</i>

OSMUNDACEAE

Todea hymenophylloides ----- *Agacalles comptus* (d)

SCHIZAEACEAE

Lygodium articulatum ----- *Psepholax simplex*
Synacalles dorsalis

SPERMATOPHYTA

GYMNOSPERMAE

ARAUCARIACEAE

Agathis australis ----- *Crisius binotatus* (d) ----- *Andracalles canescens* (d)
Mitrastethus baridioides ----- *Andracalles horridus*
Rhynchodes ursus (d) ----- *Andracalles vividus*
----- *Crisius binotatus* (d)
----- *Ectopsis simplex* (d)
----- *Didymus erroneus*
----- *Hiiracalles dolosus* (d)
----- *Hiiracalles scitus*
----- *Mitrastethus baridioides* (d)
----- *Paromalia vestita* (d)
----- *Scelodolichus politus* (d)
----- *Synacalles peelensis* (d)

CUPRESSACEAE

Libocedrus bidwillii ----- *Microcryptorhynchus perpusillus*
**Cupressus tombosa* ----- *Omoecalles perspicuus*
**Cupressus torulosa* ----- *Microcryptorhynchus perpusillus*
----- *Omoecalles crisioides*

PHYLLOCLADACEAE

Phyllocladus trichomanoides ----- *Andracalles horridus*
----- *Didymus erroneus*
----- *Didymus impexus*

PINACEAE

**Pinus nigra* ----- *Psepholax macleayi*
**Pinus pinaster* ----- *Crooktcalles certus* (d cones)
**Pinus ponderosa* ----- *Psepholax macleayi*
----- *Psepholax sulcatus*
**Pinus radiata* ----- *Crisius binotatus* ----- *Didymus intutus*
----- *Psepholax sulcatus* (d) ----- *Microcryptorhynchus kronei*
----- *Strongylopterus hylobioides* (d) ----- *Microcryptorhynchus vafer* (d)
**Pinus* sp. ----- *Mitrastethus baridioides* (d)
*'pine' ----- *Mitrastethus baridioides* (d)

PODOCARPACEAE

Dacrydium colensoi ----- *Psepholax simplex*
----- *Microcryptorhynchus multisetosus*
----- *Microcryptorhynchus perpusillus*
Dacrydium cupressinum ----- *Rhynchodes ursus* (d) ----- *Rhynchodes ursus*
----- *Psepholax coronatus*
----- *Psepholax macleayi*
Podocarpus dacrydioides ----- *Psepholax sulcatus*
Podocarpus ferrugineus ----- *Hiiracalles dolosus* (d)

Plant	Larval host	Adults collected
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Podocarpus totara ----- *Strongylopterus hylobioides*
Podocarpus sp. ----- *Pachyderris nodifer*
Prumnopitys taxifolia ----- *Mitrastethus baridioides* (d)

ANGIOSPERMAE

AGAVACEAE

Cordyline australis ----- *Omoeacalles ovatellus*
Psepholax sulcatus
Cordyline banksii ----- *Crisius bicristaticeps* (l)
Cordyline laevigatus ----- *Psepholax sulcatus*
Phormium cookianum ----- *Microcryptorhynchus sp. A*
Microcryptorhynchus perpusillus
Phormium tenax ----- *Hadracalles fuliginosus* ----- *Didymus intutus*
Microcryptorhynchus vafer
Phormium spp. ----- *Omoeacalles crisioides*
Psepholax macleayi

AIZOACEAE

Mesembryanthemum sp. ----- *Clypeolus maritimus*
Microcryptorhynchus (N.) floricola

ALSEUOSMIACEAE

Alseuosmia macrophylla ----- *Synacalles dorsalis* (d)

APOCYNACEAE

Parsonsia heterophylla ----- *Crisius variegatus* ----- *Didymus erroneus*
Microcryptorhynchus (N.) leviculus
Omoeacalles crisioides
Synacalles cingulatus
Synacalles hystericulus
Tychanus vexatus

ARACEAE

**Alocasia macrorrhiza* ----- *Strongylopterus hylobioides*

ARALIACEAE

Meryta sinclairii ----- *Psepholax sulcatus* (d/l)
Pseudopanax arboreus ----- *Homoreda murina* (d) ----- *Didymus erroneus*
Mecistostylus douei (l+d) *Ectopsis ferrugalis* (d)
Mesoreda sulcifrons (d) *Mecistostylus douei*
Psepholax crassicornis (l+d) *Microcryptorhynchus (N.) leviculus*
Psepholax simplex (d+d/l) *Omoeacalles crisioides*
Psepholax crassicornis
Psepholax simplex
Pseudopanax chathamica ----- *Ectopsis ferrugalis* (d) ----- *Mesoreda sulcifrons*
Homoreda murina *Pachyderris squamiventris*
Mecistostylus douei
Mesoreda sulcifrons (d)
Strongylopterus chathamensis (d)
Pseudopanax colensoi ----- *Psepholax simplex* ----- *Ectopsis simplex* (d)
Mecistostylus douei
Mesoreda sulcifrons
Psepholax crassicornis
Psepholax macleayi
Psepholax simplex

Plant	Larval host	Adults collected
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<i>Pseudopanax crassifolius</i>	----- <i>Clypeolus pascoei</i> (d) ----- <i>Mesoreda sulcifrons</i> (d) <i>Crisius semifuscus</i> (d) <i>Mecistostylus douei</i> <i>Mesoreda sulcifrons</i> (d) <i>Psepholax crassicornis</i> (d) <i>Psepholax mediocris</i> <i>Psepholax simplex</i>	
<i>Pseudopanax edgerleyi</i>	----- <i>Psepholax crassicornis</i> (d) -----	<i>Mecistostylus douei</i> <i>Psepholax crassicornis</i> <i>Psepholax macleayi</i> <i>Psepholax simplex</i>
<i>Pseudopanax lessonii</i>	-----	<i>Mesoreda sulcifrons</i> <i>Strongylopterus hylobioides</i>
<i>Pseudopanax simplex</i>	----- <i>Mecistostylus douei</i> (d) ----- <i>Mesoreda sulcifrons</i> (d) <i>Pachyderris punctiventris</i> <i>Psepholax crassicornis</i> (d) <i>Psepholax macleayi</i> <i>Psepholax mediocris</i> (d) <i>Psepholax simplex</i> <i>Strongylopterus hylobioides</i> (d)	<i>Andracalles vividus</i> <i>Mecistostylus douei</i> (l) <i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i> <i>Microcryptorhynchus</i> (N.) <i>planidorsis</i> <i>Pachyderris punctiventris</i>
<i>Pseudopanax</i> spp.	----- <i>Didymus impexus</i> ----- <i>Pachyderris triangulatus</i> <i>Psepholax crassicornis</i> (d)	<i>Crisius semifuscus</i> <i>Ectopsis ferrugalis</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i> <i>Mitrastethus baridioides</i> <i>Strongylopterus chathamensis</i>
<i>Schefflera digitata</i>	----- <i>Indecentia nubila</i> (l) ----- <i>Mesoreda sulcifrons</i> (d) <i>Psepholax simplex</i>	<i>Indecentia nubila</i> <i>Mecistostylus douei</i> <i>Omoeacalles crisioides</i> <i>Sympedius testudo</i> <i>Tychanus verrucosus</i>
<i>Stilbocarpa polaris</i>	-----	<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>
ASCLEPIADACEAE		
* <i>Asclepias</i> sp.	-----	<i>Strongylopterus hylobioides</i>
BETULACEAE		
* <i>Ainus rubra</i>	----- <i>Oreda notata</i>	
CHLORANTHACEAE		
<i>Ascarina lucida</i> var. <i>lanceolata</i>	-----	<i>Didymus metrosideri</i> <i>Strongylopterus hylobioides</i> (d)
COMPOSITAE		
<i>Brachyglottis kirkii</i>	----- <i>Microcryptorhynchus</i> (N.) <i>leviculus</i>	
<i>Brachyglottis repanda</i>	----- <i>Synacalles cingulatus</i> -----	<i>Didymus intutus</i> <i>Maneneacalles</i> sp. <i>Omoeacalles crisioides</i> (cut branches) <i>Synacalles dorsalis</i>
<i>Cassinia leptophylla</i>	----- <i>Didymus intutus</i> -----	<i>Didymus intutus</i>
<i>Cassinia retorta</i>	----- <i>Didymus intutus</i> (d) <i>Mesoreda brevis</i> (d)	

Plant	Larval host	Adults collected
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<i>Cassinia vauvilliersii</i>	----- <i>Microcryptorhynchus kronei</i> (d) ----- <i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus</i> (N.) sp. A (d) <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i> <i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>	
<i>Cassinia</i> sp.	----- <i>Microcryptorhynchus</i> (N.) <i>piciventris</i>	
<i>Celmisia laricifolia</i>	----- <i>Microcryptorhynchus</i> (N.) sp. B (d)	
<i>Celmisia sessiflora</i>	----- <i>Crisius</i> sp. (l) <i>Microcryptorhynchus</i> (N.) sp. B (d)	
<i>Celmisia viscosa</i>	----- <i>Crisius</i> sp. (d)	
<i>Olearia albida</i> var. <i>angulata</i>	----- <i>Tychanus gibbus</i>	
<i>Olearia angustifolia</i>	----- <i>Microcryptorhynchus suillus</i>	
<i>Olearia arborescens</i>	----- <i>Pachyderris punctiventris</i> (d)	
<i>Olearia colensoi</i>	----- <i>Omoeacalles crisioides</i> <i>Psepholax macleayi</i>	
<i>Olearia furfuracea</i>	----- <i>Clypeolus pascoei</i> (d) ----- <i>Didymus erroneus</i> <i>Didymus intutus</i> (d) <i>Didymus intutus</i> (d) <i>Omoeacalles crisioides</i> <i>Microcryptorhynchus vafer</i> (d) <i>Strongylopterus hylobioides</i> (d) <i>Omoeacalles crisioides</i> <i>Tychanus gibbus</i> (l) <i>Tychanus gibbus</i>	
<i>Olearia lyallii</i>	----- <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>	
<i>Olearia rani</i>	----- <i>Clypeolus lachrymosus</i> (d) <i>Didymus bicostatus</i> (d) <i>Didymus impexus</i> (d) <i>Mesoreda sulcifrons</i> (d) <i>Psepholax sulcatus</i> (d/l) <i>Strongylopterus hylobioides</i> (d)	
<i>Olearia traversii</i>	----- <i>Strongylopterus chathamensis</i> (d) - <i>Pachyderris squamiventris</i> <i>Strongylopterus chathamensis</i> (d) <i>Strongylopterus hylobioides</i>	
<i>Olearia</i> spp.	----- <i>Didymus impexus</i> ----- <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>planidorsis</i> <i>Psepholax macleayi</i>	
<i>Senecio huntii</i>	----- <i>Strongylopterus chathamensis</i> ----- <i>Microcryptorhynchus suillus</i> <i>Pachyderris squamiventris</i> <i>Strongylopterus chathamensis</i>	
<i>Senecio kirkii</i>	----- <i>Microcryptorhynchus</i> (N.) <i>leviculatus</i> <i>Psepholax simplex</i> (d)	
<i>Senecio reinoldii</i>	----- <i>Strongylopterus hylobioides</i>	
<i>Senecio stewartiae</i>	----- <i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>	
<i>Senecio</i> sp.	----- <i>Psepholax macleayi</i> <i>Tychanus verrucosus</i> (d)	
CORNACEAE		
<i>Griselinia littoralis</i>	----- <i>Microcryptorhynchus latitarsis</i>	
CORYNOCARPACEAE		
<i>Corynocarpus laevigatus</i>	----- <i>Mesoreda orthorhina</i> ----- <i>Andracalles horridus</i> <i>Omoeacalles crisioides</i> (d) <i>Didymus metrosideri</i> <i>Omoeacalles ovatellus</i> <i>Omoeacalles crisioides</i>	

Plant	Larval host	Adults collected
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<i>Oreda notata</i> (d)	<i>Omoeacalles ovatellus</i> (d)
<i>Psepholax coronatus</i>	<i>Oreda notata</i> (d)
<i>Strongylopterus chathamensis</i> (d)	<i>Pachyderris squamiventris</i>
<i>Strongylopterus hylobioides</i> (d)	<i>Psepholax sulcatus</i>
<i>Trinodicalles terricola</i> (d)	<i>Strongylopterus chathamensis</i>

CUNONIACEAE

<i>Weinmannia racemosa</i> -----	<i>Hiracalles scitus</i> (d) -----	<i>Psepholax macleayi</i> (d)
	<i>Mecistostylus douei</i>	<i>Psepholax sulcatus</i> (d)
	<i>Psepholax coronatus</i>	<i>Strongylopterus hylobioides</i> (d)
	<i>Psepholax macleayi</i> (d)	
	<i>Psepholax sulcatus</i> (d)	
<i>Weinmannia silvicola</i> -----	<i>Microcryptorhynchus kronei</i> (d) -----	<i>Psepholax coronatus</i>
	<i>Psepholax tibialis</i> (l)	<i>Synacalles dorsalis</i>
	<i>Trinodicalles decemcristatus</i>	
<i>Weinmannia</i> spp. -----	<i>Crisius humeralis</i> -----	<i>Microcryptorhynchus kronei</i>
	<i>Mesoreda sulcifrons</i> (d)	<i>Psepholax simplex</i>
	<i>Pachyderris nodifer</i>	<i>Psepholax tibialis</i>
	<i>Psepholax crassicornis</i> (d)	

CYPERACEAE

<i>Carex trifida</i> -----		<i>Microcryptorhynchus latitarsis</i>
<i>Carex</i> spp. -----		<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
		<i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>
<i>Gahnia lacera</i> -----	<i>Clypeolus signatus</i> (d) -----	<i>Andracalles vividus</i>
	<i>Scelodolichus lineithorax</i> (d)	
<i>Gahnia</i> sp. -----		<i>Mecistostylus douei</i>
		<i>Scelodolichus politus</i>
		<i>Synacalles dorsalis</i>
<i>Oreobolus pectinatus</i> -----	<i>Crisius</i> sp. (l)	

ELAEOCARPACEAE

<i>Aristotelia serrata</i> -----	<i>Pachyderris nodifer</i> -----	<i>Synacalles cingulatus</i>
	<i>Psepholax macleayi</i> (d+l)	
	<i>Synacalles posticalis</i> (d)	
<i>Elaeocarpus dentatus</i> -----	<i>Oreda notata</i> -----	<i>Microcryptorhynchus</i> (N.) <i>leviculus</i>
	<i>Strongylopterus hylobioides</i>	<i>Psepholax sulcatus</i>
<i>Elaeocarpus</i> sp. -----		<i>Paromalisa setiger</i>

EPACRIDACEAE

<i>Styphelia fasciculata</i> -----		<i>Didymus intutus</i>
<i>Styphelia parviflora</i> -----		<i>Microcryptorhynchus suillus</i>
<i>Styphelia</i> sp. -----		<i>Andracalles vividus</i>
		<i>Mecistostylus douei</i>
<i>Dracophyllum arboreum</i> -----	<i>Pachyderris squamiventris</i> (d)	
	<i>Strongylopterus chathamensis</i>	
<i>Dracophyllum longifolium</i> -----	<i>Microcryptorhynchus kronei</i> (d) -----	<i>Microcryptorhynchus kronei</i>
	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i> (d)	<i>Microcryptorhynchus multisetosus</i>
	<i>Rhynchodes ursus</i> (d)	<i>Microcryptorhynchus suillus</i>
		<i>Microcryptorhynchus</i> (N.) <i>piciventris</i> (d)
		<i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>
		<i>Psepholax macleayi</i>
		<i>Rhynchodes ursus</i>
		<i>Strongylopterus hylobioides</i>

Plant	Larval host	Adults collected
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<i>Dracophyllum pyramidale</i>	-----	<i>Microcryptorhynchus multisetosus</i> (d)
<i>Dracophyllum scoparium</i>	-----	<i>Microcryptorhynchus kronei</i> ----- <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
<i>Dracophyllum traversii</i>	-----	<i>Rhynchodes ursus</i> ----- <i>Rhynchodes ursus</i>
<i>Dracophyllum</i> spp.	-----	<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i> <i>Pachyderris punctiventris</i> <i>Psepholax sulcatus</i> <i>Strongylopterus chathamensis</i> <i>Strongylopterus hylobioides</i>

EUPHORBIACEAE

Homalanthus polyandrus ----- *Didymus metrosideri*

FAGACEAE

<i>Nothofagus cliffortioides</i>	-----	<i>Omoecalles crisioides</i> (d) ----- <i>Psepholax coronatus</i> <i>Rhynchodes ursus</i> (d) <i>Synacalles peelensis</i> (d)
<i>Nothofagus fusca</i>	-----	<i>Psepholax macleayi</i> ----- <i>Psepholax coronatus</i> <i>Psepholax macleayi</i>
<i>Nothofagus menziesii</i>	-----	<i>Crisius semifuscus</i> (on <i>Fomes</i>) ----- <i>Psepholax</i> sp. nr <i>tibialis</i> <i>Crisius signatus</i> (d) <i>Omoecalles ovatellus</i> (on <i>Fomes</i>) <i>Sympedius testudo</i> <i>Psepholax tibialis</i> (l)
<i>Nothofagus truncata</i>	-----	<i>Psepholax tibialis</i>
<i>Nothofagus</i> spp.	-----	<i>Psepholax macleayi</i> ----- <i>Mecistostylus douei</i> <i>Rhynchodes ursus</i> (d) <i>Psepholax macleayi</i> (d) <i>Psepholax sulcatus</i> <i>Synacalles peelensis</i> <i>Tychanopais flavisparsus</i> <i>Tychanopais tuberosa</i>

**Quercus ilex* ----- *Ampagia rudis*

GRAMINEAE

<i>Chionochloa</i> spp.	-----	<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
<i>Cortaderia splendens</i>	-----	<i>Microcryptorhynchus perpusillus</i>
* <i>Danthonia</i> sp.	-----	<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
<i>Poa foliosa</i>	-----	<i>Microcryptorhynchus latitarsis</i>
<i>Poa litorosa</i>	-----	<i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>
<i>Poa</i> sp.	-----	<i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>

GROSSULARIACEAE

<i>Carpodetus serratus</i>	-----	<i>Pachyderris triangulatus</i> ----- <i>Pachyderris punctiventris</i> <i>Psepholax mediocris</i> (d) <i>Psepholax simplex</i>
<i>Ixerba brexioides</i>	-----	<i>Strongylopterus hylobioides</i> ----- <i>Psepholax macleayi</i>

Plant	Larval host	Adults collected
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ICACINACEAE

Pennantia corymbosa ----- *Didymus intutus* (d)

IRIDACEAE

Libertia ixioides ----- *Microcryptorhynchus* sp. E (l)

LAURACEAE

Beilschmiedia tawa ----- *Didymus erroneus* (d) ----- *Andracalles horridus*
Mesoreda brevis ----- *Microcryptorhynchus vafer* (d)
Oreda notata ----- *Oreda notata* (d)
----- *Psepholax macleayi*
----- *Synacalles dorsalis*
----- *Synacalles posticalis* (d)

Beilschmiedia tarairi ----- *Crisius variegatus* ----- *Omoecalles ovatellus* (under bark)
----- *Psepholax crassicornis* (d) ----- *Psepholax sulcatus* (under bark)
----- *Rhynchodes ursus* (d) ----- *Strongylopterus hylobioides*
(d: under bark)

Litsea calicaris ----- *Hiracalles scitus*
----- *Rainacalles volens*

LEGUMINOSAE

**Acacia dealbata* ----- *Mecistostylus douei*
**Acacia decurrens* ----- *Microcryptorhynchus perpusillus*
**Acacia mearnsii* ----- *Didymus erroneus*
----- *Didymus intutus*
----- *Omoecalles crisioides*

**Acacia verticillata* ----- *Didymus impexus* (d)
**Albizia lophantha* ----- *Psepholax sulcatus*

Carmichaelia aligera ----- *Microcryptorhynchus* sp. F (l) ----- *Andracalles horridus*
----- *Didymus erroneus*
----- *Didymus impexus*
----- *Didymus intutus*
----- *Microcryptorhynchus kronei*
----- *Tychanus gibbus*

Carmichaelia sp. ----- *Psepholax femorata*

**Cytisus* sp. ----- *Pachyderris punctiventris* (d)
**Lupinus arboreus* ----- *Crisius variegatus* (l)
**Lupinus luteus* ----- *Crisius variegatus* (l+d)

Sophora microphylla ----- *Crisius variegatus* (l) ----- *Microcryptorhynchus vafer* (d)
----- *Mesoreda brevis* (d) ----- *Microcryptorhynchus* (N.) *leviculatus*
----- *Psepholax femorata* (d) ----- *Omoecalles crisioides*
----- *Sympedius testudo* (cut wood)

Sophora spp. ----- *Didymus erroneus* (d) ----- *Didymus intutus*
----- *Eutyrrhinus squamiger* (d)
----- *Oreda notata*
----- *Sympedius testudo*

LILIACEAE

Astelia banksii ----- *Microcryptorhynchus* sp. A (l) ----- *Andracalles vividus*
----- *Microcryptorhynchus perpusillus*
----- *Microcryptorhynchus* sp. A
----- *Omoecalles perspicuus*
----- *Trinodacalles latirostris*

Plant	Larval host	Adults collected
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<i>Astelia nervosa</i> -----	<i>Crisius dorsalis</i> (d) <i>Microcryptorhynchus</i> sp. A (l)	
<i>Astelia nivicola</i> -----	<i>Crisius</i> sp. (d)	
<i>Astelia</i> sp. -----		<i>Andracalles spurcus</i>
<i>Bulbinella</i> sp. -----		<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
<i>Collopermum hastatum</i> -----	<i>Microcryptorhynchus</i> sp. B (l)	<i>Microcryptorhynchus perpusillus</i> <i>Omoeacalles perspicuus</i>
<i>Collopermum</i> spp. -----		<i>Andracalles vividus</i> <i>Hiracalles scitus</i> <i>Microcryptorhynchus setifer</i> <i>Omoeacalles perspicuus</i> <i>Scelodolichus politus</i> <i>Synacalles pœlensis</i>
<i>Dianella nigra</i> -----	<i>Microcryptorhynchus</i> sp. D (l)	
<i>Ripogonum scandens</i> -----	<i>Synacalles hystriculus</i> (d)	
LOGANIACEAE		
<i>Geniostoma ligustrifolium</i> -----	<i>Sympedius testudo</i>	<i>Psepholax femorata</i> <i>Psepholax sulcatus</i>
MALVACEAE		
<i>Hoheria populnea</i> -----		<i>Andracalles canescens</i> <i>Andracalles horridus</i> <i>Didymus erroneus</i> <i>Microcryptorhynchus</i> (N.) <i>leviculus</i> <i>Omoeacalles crisioides</i> <i>Strongylopterus hylobioides</i> (d: under bark) <i>Sympedius testudo</i>
<i>Hoheria</i> spp. -----	<i>Psepholax coronatus</i> (d) <i>Strongylopterus hylobioides</i>	<i>Didymus erroneus</i> (cut branches)
<i>Plagianthus betulinus</i> -----		<i>Strongylopterus chathamensis</i> (under bark)
MELIACEAE		
<i>Dysoxylum spectabile</i> -----	<i>Omoeacalles crisioides</i> (d) <i>Psepholax sulcatus</i> (d) <i>Strongylopterus hylobioides</i>	<i>Andracalles horridus</i> <i>Andracalles vividus</i> <i>Mesoreda sulcifrons</i> <i>Microcryptorhynchus vafer</i> (d) <i>Omoeacalles crisioides</i> <i>Omoeacalles ovatellus</i> <i>Psepholax mediocris</i>
MONIMIACEAE		
<i>Hedycarya arborea</i> -----	<i>Clypeolus lachrymosus</i> (d) <i>Crisius semifuscus</i> (d) <i>Strongylopterus hylobioides</i>	<i>Omoeacalles crisioides</i> <i>Omoeacalles ovatellus</i>
<i>Laurelia novaezelandiae</i> -----	<i>Crisius semifuscus</i> (d) <i>Omoeacalles crisioides</i> <i>Omoeacalles ovatellus</i> (d)	<i>Crisius ornatus</i>
MORACEAE		
* <i>Ficus</i> sp. -----		<i>Omoeacalles crisioides</i>

Plant	Larval host	Adults collected
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<i>Paratrophis banksii</i>	<i>Psepholax sulcatus</i> (d) <i>Strongylopterus hylobioides</i>	<i>Psepholax mediocris</i>
<i>Paratrophis microphylla</i>	<i>Microcryptorhynchus</i> (N.) sp. C (d)	
MYOPORACEAE		
<i>Myoporum laetum</i>	<i>Mesoreda brevis</i> (d) <i>Psepholax sulcatus</i> (d) <i>Sympedius testudo</i> (d)	<i>Didymus impexus</i> (d) <i>Didymus intutus</i> <i>Didymus metrosideri</i> (d) <i>Maneneacalles</i> sp. <i>Sympedius testudo</i>
<i>Myoporum</i> spp.	<i>Mesoreda brevis</i>	<i>Homoreda murina</i>
MYRSINACEAE		
<i>Myrsine australis</i>	<i>Mesoreda orthorhina</i> <i>Psepholax sulcatus</i> (d) <i>Psepholax tibialis</i> (l) <i>Strongylopterus hylobioides</i>	<i>Psepholax sulcatus</i>
<i>Myrsine chathamica</i>	<i>Pachyderris squamiventris</i> (d) <i>Strongylopterus chathamensis</i>	<i>Homoreda flavisetosa</i> (d) <i>Strongylopterus chathamensis</i> (d)
<i>Myrsine coxii</i>	<i>Pachyderris squamiventris</i> (d)	
<i>Myrsine divaricata</i>	<i>Microcryptorhynchus kronei</i> (d) <i>Microcryptorhynchus suillus</i> (d) <i>Pachyderris punctiventris</i> (d) <i>Psepholax sulcatus</i> (d) <i>Strongylopterus hylobioides</i>	<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus latitarsis</i> <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i> <i>Pachyderris punctiventris</i> <i>Psepholax sulcatus</i>
<i>Myrsine durrileyi</i>	<i>Psepholax sulcatus</i> (d)	
<i>Myrsine kermadecensis</i>		<i>Didymus metrosideri</i> (d) <i>Strongylopterus hylobioides</i> (d)
<i>Myrsine salicina</i>	<i>Psepholax sulcatus</i> (d/l)	
<i>Myrsine</i> spp.	<i>Oreda notata</i>	<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus latitarsis</i> <i>Microcryptorhynchus multisetosus</i> <i>Pachyderris squamiventris</i>
MYRTACEAE		
* <i>Eucalyptus fastigata</i>		<i>Strongylopterus hylobioides</i>
* <i>Eucalyptus</i> spp.		<i>Didymus erroneus</i> <i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus perpusillus</i> <i>Omoeacalles crisioides</i> <i>Strongylopterus hylobioides</i> (under bark)
* <i>Kunzea ericoides</i>	<i>Didymus impexus</i> <i>Strongylopterus hylobioides</i> <i>Synacalles hystriculus</i>	<i>Andracalles horridus</i> <i>Crisius humeratus</i> <i>Psepholax macleayi</i> <i>Psepholax tibialis</i>
<i>Leptospermum scoparium</i>	<i>Clypeolus lachrymosus</i> (d) <i>Microcryptorhynchus kronei</i> <i>Psepholax tibialis</i> (l)	<i>Andracalles horridus</i> <i>Didymus erroneus</i> <i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus vafer</i> (d)
Plant	Larval host	Adults collected

<i>Leptospermum</i> spp.	<i>Psepholax sulcatus</i>	<i>Crisius cinereus</i> <i>Microcryptorhynchus perpusillus</i> <i>Psepholax macleayi</i>
<i>Lophomyrtus bullata</i>	<i>Strongylopterus hylobioides</i>	<i>Didymus intutus</i> <i>Tychanus verrucosus</i>
<i>Metrosideros albiflora</i>		<i>Andracalles diversus</i> <i>Synacalles dorsalis</i>
<i>Metrosideros carminea</i>		<i>Andracalles horridus</i>
<i>Metrosideros excelsa</i>	<i>Psepholax sulcatus</i> (d) <i>Strongylopterus hylobioides</i> (d+l)	<i>Andracalles spurcus</i> <i>Andracalles vividus</i> <i>Didymus intutus</i> <i>Microcryptorhynchus vafer</i> (d) <i>Paromalina setiger</i> <i>Strongylopterus hylobioides</i> <i>Trinodicalles terricola</i> (d)
<i>Metrosideros kermadecensis</i>		<i>Didymus metrosideri</i>
<i>Metrosideros perforata</i>		<i>Microcryptorhynchus vafer</i> (d)
<i>Metrosideros robusta</i>	<i>Hiracalles scitus</i> (d) <i>Psepholax macleayi</i> <i>Scelodolichus celsus</i> (d)	<i>Andracalles canescens</i> <i>Andracalles horridus</i> <i>Didymus erroneus</i> <i>Microcryptorhynchus kronei</i> (d) <i>Microcryptorhynchus multisetosus</i> <i>Psepholax macleayi</i> (d) <i>Synacalles dorsalis</i>
<i>Metrosideros umbellata</i>	<i>Microcryptorhynchus kronei</i> (d) <i>Microcryptorhynchus</i> (N.) <i>piciventris</i> (d) <i>Pachyderris punctiventris</i> (d) <i>Psepholax macleayi</i>	<i>Microcryptorhynchus kronei</i> <i>Microcryptorhynchus latitarsis</i> <i>Microcryptorhynchus multisetosus</i> <i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>piciventris</i> <i>Pachyderris punctiventris</i> <i>Mecistostylus douei</i>
<i>Metrosideros</i> spp.	<i>Pachyderris punctiventris</i> (d)	<i>Microcryptorhynchus suillus</i> <i>Strongylopterus hylobioides</i> (c, d)
OLEACEAE		
* <i>Fraxinus excelsior</i>		<i>Psepholax sulcatus</i>
* <i>Fraxinus</i> sp.	<i>Pachyderris nigricans</i>	
<i>Nestegis apetala</i>		<i>Sympedius testudo</i> <i>Psepholax sulcatus</i>
<i>Nestegis cunninghamii</i>		<i>Psepholax crassicornis</i>
<i>Nestegis lanceolata</i>	<i>Sympedius testudo</i> <i>Tychanus vexatus</i>	<i>Andracalles horridus</i> <i>Didymus erroneus</i> <i>Microcryptorhynchus vafer</i> (d) <i>Sympedius testudo</i>
ONAGRACEAE		
<i>Fuchsia arborescens</i>		<i>Didymus impexus</i>
<i>Fuchsia excorticata</i>	<i>Didymus impexus</i> <i>Maneneacalles concinnus</i> (d) <i>Psepholax macleayi</i> <i>Synacalles cingulatus</i>	<i>Didymus erroneus</i> <i>Tychanus gibbus</i>

Plant	Larval host	Adults collected
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Synacalles peelensis
Tychanus gibbus (d)

<i>Fuchsia</i> sp. -----		<i>Crisius humeratus</i>
PALMAE		
<i>Rhopalostylis sapida</i> -----	<i>Microcryptorhynchus</i> (N.) sp. D (d)	<i>Paromalina setiger</i> (d) <i>Scelodolichus hilaris</i> (d) <i>Strongylopterus hylobioides</i> (d)
<i>Rhopalostylis</i> sp. (Kermadecs) -----		<i>Didymus metrosideri</i>
PANDANACEAE		
<i>Freycinetia baueriana</i> -----		<i>Omoeacalles crisioides</i> <i>Scelodolichus lineithorax</i>
<i>Freycinetia baueriana banksii</i> --	<i>Clypeolus pascoei</i> (d) ----- <i>Crisius fasciculatus</i> (l) <i>Microcryptorhynchus</i> sp. C (l)	<i>Crisius fasciculatus</i>
PASSIFLORACEAE		
<i>Tetrapathaea tetrandra</i> -----		<i>Crisius variegatus</i> (l)
PIPERACEAE		
<i>Macropiper excelsum</i> -----		<i>Crisius longulus</i> <i>Omoeacalles crisioides</i> <i>Strongylopterus hylobioides</i> <i>Synacalles dorsalis</i> <i>Tychanopais fougeri</i> <i>Tychanopais tuberosum</i>
PITTIOSPORACEAE		
<i>Pittosporum crassifolium</i> -----		<i>Psepholax femorata</i>
<i>Pittosporum eugenioides</i> -----	<i>Homoreda murina</i> -----	<i>Psepholax simplex</i>
	<i>Omoeacalles crisioides</i> (d)	
<i>Pittosporum tenuifolium</i> -----	<i>Mesoreda sulcifrons</i> (d) -----	<i>Andracalles horridus</i> <i>Didymus erroneus</i> <i>Didymus intutus</i> <i>Homoreda murina</i> <i>Mesoreda sulcifrons</i> <i>Psepholax sulcatus</i> <i>Sympedius lepidus</i> (cut branches) <i>Sympedius testudo</i> <i>Tychanus gibbus</i>
	<i>Psepholax crassicornis</i> <i>Psepholax femorata</i> (l/d)	
<i>Pittosporum</i> sp. -----		<i>Psepholax femorata</i>
POLYGONACEAE		
<i>Muehlenbeckia australis</i> -----		<i>Andracalles horridus</i> <i>Crisius lineirostris</i> <i>Didymus intutus</i>
<i>Muehlenbeckia complexa</i> -----		<i>Microcryptorhynchus vafer</i> (d)
PROTEACEAE		
<i>Knightia excelsa</i> -----	<i>Dermothrius ruficollis</i> (d) ----- <i>Oreda notata</i> <i>Psepholax macleayi</i> <i>Psepholax sulcatus</i>	<i>Eutyrrhinus squamiger</i> <i>Microcryptorhynchus vafer</i> (d) <i>Omoeacalles crisioides</i> <i>Paromalina setiger</i> <i>Psepholax macleayi</i> <i>Scelodolichus altulus</i> (d)

Plant

Larval host

Adults collected

<i>Persoonia toru</i> -----	<i>Psepholax sulcatus</i> (d)	
RANUNCULACEAE		
<i>Clematis</i> spp. -----	<i>Crisius variegatus</i> (d) -----	<i>Didymus impexus</i>
	<i>Omoecalles crisioides</i>	<i>Synacalles hystriculus</i> (d)
	<i>Tychanus vexatus</i>	
RESTIONACEAE		
<i>Leptocarpus similis</i> -----		<i>Microcryptorhynchus perpusillus</i>
RHAMNACEAE		
<i>Pomaderris phyllifolia</i> -----	<i>Psepholax coronatus</i>	
	<i>Psepholax macleayi</i>	
	<i>Strongylopterus hylobioides</i>	
ROSACEAE		
<i>Acaena</i> spp. -----		<i>Microcryptorhynchus kronei</i>
		<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
* <i>Crataegus monogyna</i> -----	<i>Omoecalles crisioides</i> (d)	
	<i>Strongylopterus hylobioides</i>	
* <i>Crataegus oxycantha</i> -----	<i>Clypeolus binodes</i>	
	<i>Pachyderris triangulatus</i>	
* <i>Prunus</i> sp. -----		<i>Microcryptorhynchus perpusillus</i> (l)
<i>Rubus australis</i> -----	<i>Crisius semifuscus</i>	
	<i>Synacalles posticalis</i>	
	<i>Tychanus verrucosus</i> (d)	
<i>Rubus cliffortoides</i> -----		<i>Didymus intutus</i>
<i>Rubus cissoides</i> -----	<i>Tychanus verrucosus</i> (d) -----	<i>Andracalles horridus</i>
		<i>Didymus erroneus</i>
		<i>Synacalles hystriculus</i>
		<i>Tychanus vexatus</i>
* <i>Rubus fruticosus</i> -----		<i>Synacalles hystriculus</i>
<i>Rubus</i> spp. -----	<i>Synacalles hystriculus</i> -----	<i>Tychanus verrucosus</i>
	<i>Tychanus verrucosus</i>	<i>Tychanus vexatus</i>
	<i>Tychanus vexatus</i>	
RUBIACEAE		
<i>Coprosma arborea</i> -----	<i>Tychanus gibbus</i> (l)	
<i>Coprosma arborescens</i> -----		<i>Sympedius testudo</i>
<i>Coprosma australis</i> -----	<i>Clypeolus lachrymosus</i> (d)	
	<i>Mesoreda sulcifrons</i> (d)	
	<i>Strongylopterus hylobioides</i>	
	<i>Tychanus gibbus</i> (d)	
<i>Coprosma chathamica</i> -----		<i>Microcryptorhynchus multisetosus</i>
		<i>Microcryptorhynchus suillus</i>
		<i>Strongylopterus chathamensis</i>
<i>Coprosma ciliata</i> -----	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i> (d)	
<i>Coprosma cuneata</i> -----	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i> (d)	<i>Microcryptorhynchus multisetosus</i>
		<i>Microcryptorhynchus suillus</i>
<i>Coprosma foetidissima</i> -----	<i>Microcryptorhynchus suillus</i> -----	<i>Microcryptorhynchus multisetosus</i>
	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>	<i>Microcryptorhynchus suillus</i>
	<i>Pachyderris punctiventris</i> (d)	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
	<i>Psepholax mediocris</i> (d)	<i>Pachyderris punctiventris</i>
	<i>Synacalles peelensis</i>	<i>Psepholax mediocris</i>
		<i>Synacalles peelensis</i>

Plant	Larval host	Adults collected
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<i>Coprosma lucida</i> -----	<i>Sympedius testudo</i> (d) -----	<i>Microcryptorhynchus suillus</i> <i>Microcryptorhynchus</i> (N.) <i>leviculus</i> (d) -----	<i>Psepholax coronatus</i> <i>Psepholax macleayi</i> <i>Tychanus gibbus</i>
<i>Coprosma macrocarpa</i> -----	<i>Clypeolus brookesi</i> (d) -----	<i>Psepholax mediocris</i>	<i>Clypeolus veratrus</i> <i>Microcryptorhynchus kronei</i> <i>Psepholax femorata</i>
<i>Coprosma petiolata</i> -----			<i>Didymus metrosideri</i>
<i>Coprosma repens</i> -----	<i>Clypeolus veratrus</i> (l) -----		<i>Didymus intutus</i>
<i>Coprosma robusta</i> -----	<i>Didymus intutus</i> (d) -----		<i>Microcryptorhynchus kronei</i>
	<i>Mesoreda sulcifrons</i>		<i>Psepholax sulcatus</i>
	<i>Microcryptorhynchus</i> (N.) <i>leviculus</i> (d)		
	<i>Psepholax sulcatus</i>		
	<i>Sympedius testudo</i> (d)		
<i>Coprosma</i> spp. -----	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>	<i>Andracalles vividus</i>	
	<i>Psepholax femorata</i>	<i>Clypeolus veratrus</i>	
	<i>Psepholax mediocris</i>	<i>Didymus intutus</i> (d)	
	<i>Sympedius lepidus</i>	<i>Homoreda flavisetosa</i>	
	<i>Sympedius testudo</i>	<i>Microcryptorhynchus kronei</i>	
		<i>Microcryptorhynchus latitarsis</i>	
		<i>Microcryptorhynchus multisetosus</i>	
		<i>Microcryptorhynchus suillus</i>	
		<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>	
		<i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>	
		<i>Psepholax femorata</i>	
		<i>Psepholax macleayi</i>	
		<i>Psepholax simplex</i>	
		<i>Psepholax sulcatus</i>	
		<i>Tychanus gibbus</i>	

RUTACEAE

* <i>Citrus</i> spp. -----		<i>Omoecalles perspicuus</i> <i>Microcryptorhynchus perpusillus</i>
<i>Melicope ternata</i> -----		<i>Omoecalles crisioides</i> <i>Psepholax sulcatus</i>
<i>Phebalium nudum</i> -----	<i>Didymus erroneus</i> (d) -----	<i>Sympedius testudo</i> <i>Tychanus gibbus</i>

SALICACEAE

* <i>Salix</i> spp. -----	<i>Psepholax macleayi</i> -----	<i>Eutyrrhinus squamiger</i>
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SAPOTACEAE

<i>Planchonella novozelandica</i> ----	<i>Strongylopterus hylobioides</i> (d) ----	<i>Psepholax mediocris</i>
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SCROPHULARIACEAE

<i>Hebe elliptica</i> -----	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>	<i>Microcryptorhynchus suillus</i>
	<i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>	<i>Microcryptorhynchus</i> (N.) <i>piciventris</i>
	<i>Psepholax macleayi</i>	<i>Microcryptorhynchus</i> (N.) <i>planidorsis</i>
	<i>Psepholax mediocris</i>	
<i>Hebe macrocarpa</i> -----	<i>Microcryptorhynchus kronei</i> (d)	
	<i>Mesoreda brevis</i> (d)	
<i>Hebe odora</i> -----		<i>Psepholax mediocris</i> <i>Psepholax simplex</i>

Plant	Larval host	Adults collected
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Hebe salicifolia ----- *Psepholax mediocris*
Tychanus gibbus
Hebe stricta ----- *Psepholax mediocris* (d+l)
Hebe spp. ----- *Microcryptorhynchus kronei*
Microcryptorhynchus (N.) *pivicentris*
Microcryptorhynchus (N.) *planidorsis*
Psepholax macleayi
Psepholax mediocris

SOLANACEAE

**Solanum mauritanium* ----- *Clypeolus lachrymosus*
Microcryptorhynchus kronei
Omoeacalles crisioides

TILIACEAE

Entelea arborescens ----- *Psepholax sulcatus*

ULMACEAE

**Ulmus* sp. ----- *Synacalles peelensis* (d)

UMBELLIFERAE

Aciphylla colensoi ----- *Psepholax crassicornis* (d)

URTICACEAE

Urtica sp. ----- *Microcryptorhynchus kronei*

VERBENACEAE

Avicennia resinifera ----- *Didymus intutus*
Vitex lucens ----- *Andracalles horridus* (d) ----- *Andracalles vividus*
Didymus erroneus (d) ----- *Omoeacalles ovatellus*
Didymus impexus (d) ----- *Synacalles dorsalis* (d)

VIOLACEAE

Hymenanchera chathamica ----- *Mecistostylus douei*
Strongylopterus chathamensis (d)
Melicytus ramiflorus ----- *Clypeolus pascoei* ----- *Clypeolus pascoei*
Crisius binotatus
Didymus metrosideri
Omoeacalles crisioides
Psepholax coronatus
Psepholax femorata
Psepholax mediocris
Psepholax sulcatus
Strongylopterus hylobioides
Sympedius bufo
Synacalles posticalis
Melicytus spp. ----- *Oreda notata* (d) ----- *Ampagia rudis*
Strongylopterus hylobioides ----- *Didymus intutus*
Omoeacalles crisioides
Psepholax femorata

Plant	Larval host	Adults collected
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Alphabetical list of host-plant genera

('p', pteridophyte; 'g', gymnosperm)

Acacia LEGUMINOSAE
Acaena ROSACEAE
Aciphylia UMBELLIFERAE
Agathis ARAUCARIACEAE (g)
Albizia LEGUMINOSAE
Alnus BETULACEAE
Alocasia ARACEAE
Alseuosmia ALSEUOSMIACEAE
Aristolelia ELAEOCARPACEAE
Ascarina CHLORANTHACEAE
Asclepias ASCLEPIADACEAE
Astelia LILIACEAE
Avicennia VERBENACEAE
Beilschmiedia LAURACEAE
Blechnum BLECHNACEAE (p)
Brachyglottis COMPOSITAE
Bulbinella LILIACEAE
Carex CYPERACEAE
Carmichaelia LEGUMINOSAE
Carpodetus GROSSULARIACEAE
Cassinia COMPOSITAE
Celmisia COMPOSITAE
Chionochloa GRAMINEAE
Citrus RUTACEAE
Clematis RANUNCULACEAE
Collosperrum LILIACEAE
Coprosma RUBIACEAE
Cordyline AGAVACEAE
Cortaderia GRAMINEAE
Corynocarpus CORYNOCARPACEAE
Crataegus ROSACEAE
Cupressus CUPRESSACEAE (g)
Cyathea CYATHAEACEAE (p)
Cytisus LEGUMINOSAE
Dacrydium PODOCARPACEAE (g)
Danthonia GRAMINEAE
Dianella LILIACEAE
Dicksonia DICKSONIACEAE (p)
Dracophyllum EPACRIDACEAE
Dysoxylum MELIACEAE
Elaeocarpus ELAEOCARPACEAE
Entelea TILIACEAE
Eucalyptus MYRTACEAE
Ficus MORACEAE
Fraxinus OLEACEAE
Freycinetia PANDANACEAE
Fuchsia ONAGRACEAE
Gahnia CYPERACEAE
Geniostoma LOGANIACEAE
Griselinia CORNACEAE
Hebe SCROPHULARIACEAE
Hedycarya MONIMIACEAE
Histiopteris DENNSTAEDTIACEAE (p)
Hoheria MALVACEAE
Homalanthus EUPHORBIACEAE
Hymenanthera VIOLACEAE
Ixerba GROSSULARIACEAE

Knightia PROTEACEAE
Kunzea MYRTACEAE
Laurelia MONIMIACEAE
Leptocarpus RESTIACEAE
Leptospermum MYRTACEAE
Libertia IRIDACEAE
Libocedrus CUPRESSACEAE (g)
Litsea LAURACEAE
Lophomyrtus MYRTACEAE
Lupinus LEGUMINOSAE
Lygodium SCHIZAEACEAE (p)
Macropiper PIPERACEAE
Melicope RUTACEAE
Melicytus VIOLACEAE
Meryta ARALIACEAE
Mesembryanthemum AIZOACEAE
Metrosideros MYRTACEAE
Muehlenbeckia POLYGONACEAE
Myoporum MYOPORACEAE
Myrsine MYRSINACEAE
Nestegis OLEACEAE
Nothofagus FAGACEAE
Olearia COMPOSITAE
Oreobolus CYPERACEAE
Paesia DENNSTAEDTIACEAE (p)
Paratrophis MORACEAE
Parsonsia APOCYNACEAE
Pennantia ICACINACEAE
Persoonia PROTEACEAE
Phebalium RUTACEAE
Phormium AGAVACEAE
Phyllocladus PHYLLOCLADACEAE (g)
Pinus PINACEAE (g)
Pittosporum PITTOSPORACEAE
Plagianthus MALVACEAE
Planchonella SAPOTACEAE
Poa GRAMINEAE
Podocarpus PODOCARPACEAE (g)
Polystichum ASPLENIACEAE (p)
Pomaderris RHAMNACEAE
Prumnopitys PODOCARPACEAE
Prunus ROSACEAE
Pseudopanax ARALIACEAE
Quercus FAGACEAE
Rhopalostylis PALMAE
Ripogonum LILIACEAE
Rubus ROSACEAE
Salix SALICACEAE
Schefflera ARALIACEAE
Senecio COMPOSITAE
Solanum SOLANACEAE
Sophora LEGUMINOSAE
Stilbocarpa ARALIACEAE
Styphelia EPACRIDACEAE
Tetrapathaea PASSIFLORACEAE
Todea OSMUNDACEAE (p)
Ulmus ULMACEAE
Urtica URTICACEAE
Vitex VERBENACEAE
Weinmannia CUNONIACEAE

APPENDIX 3: BROUN SPECIES NUMBERS

Broun numbered all the New Zealand beetle species he knew, whether he had described them or not, and used the numbers in his written works to refer to species. Further, some specimens in collections bear only these numbers as identification. Below are listed all the New Zealand Cryptorhynchinae known to Broun; the numbers were taken from the type specimens and checked against Broun's published works. In some publications Broun did not give the numbers – these have been listed by May (1967).

Species from the Kermadec Islands, Subantarctic Islands, and Chatham Islands have separate series of numbers, also given below. The present systematic placement of the species listed below can be discovered using the index to this work.

Kermadec Islands

- 25 *metrosiderae* Broun, 1910 (*Acalles*)
- 26 *hylobioides* White, 1846 (*Aldonus*)
- 27 *saundersi* White, 1846 (*Rhynchodes*)

Subantarctic Islands

- 45 *piciventris* Broun, 1909 (*Acalles*)
- 46 *punctiventris* Broun, 1909 (*Pachyderris*)

Chatham Islands

- 26 *sulcatus* White, 1843 (*Psepholax*)
- 27 *hylobioides* White, 1846 (*Aldonus*)
- 28 *chathamensis* Sharp, 1903 (*Aldonus*)
- 29 *tibialis* Broun, 1880 (*Pseudoreda*)
- 30 *fougeri* Hutton, 1898 (*Acalles*)
- 44 *misturatus* Broun, 1910 (*Aldonus*)
- 45 *lineifer* Broun, 1910 (*Aldonus*)
- 81 *versicolor* Broun, 1909 (*Aphocoelis*)
- 82 *barbifrons* White, 1846 (*Psepholax*)
- 83 *flavisetosus* Broun, 1911 (*Kentraulax*)
- 84 *setigera* Broun, 1880 (*Mesoreda*)
- 85 *ferrugalis* Broun, 1881 (*Ectopsis*)
- 86 *costatus* Broun, 1913 (*Tychanus*)
- 87 *lineirostris* Broun, 1911 (*Acalles*)
- 88 *subcarinatus* Broun, 1911 (*Acalles*)
- 89 *squamiventris* Broun, 1911 (*Xenacalles*)
- 90 *spiculus* Redtenbacher, 1868 (*Paranomocerus*)
- 91 *ursus* White, 1846 (*Rhynchodes*)

Mainland (North I., South I.)

- 846 *sulcatus* White, 1843 (*Psepholax*)
- 847 *granulatus* Broun, 1880 (*Psepholax*)
- 848 *cornutus* Broun, 1880 (*Psepholax*)
- 849 *barbifrons* White, 1846 (*Psepholax*)
- 850 *punctulatus* Broun, 1880 (*Psepholax*)
- 851 *rostralis* Broun, 1880 (*Psepholax*)
- 852 *coronatus* White, 1846 (*Psepholax*)
- 853 *femoratus* Broun, 1880 (*Psepholax*)
- 854 *simplex* Pascoe, 1876 (*Psepholax*)
- 855 *tibialis* Broun, 1880 (*Psepholax*)
- 856 *hylobioides* White, 1846 (*Aldonus*)
- 857 *celator* Pascoe, 1876 (*Aldonus*)
- 858 *rostratus* Broun, 1880 (*Aldonus*)
- 859 *peacei* Broun, 1880 (*Aldonus*)
- 860 *nubila* Broun, 1880 (*Indecentia*)

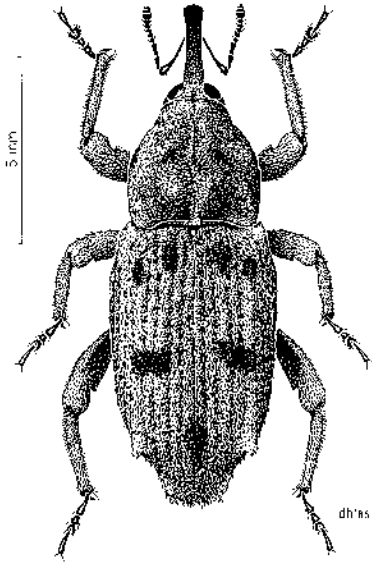
- 861 *stramineum* Broun, 1880 (*Indecentia*)
- 862 *notata* White, 1846 (*Oreda*)
- 863 *brevis* Pascoe, 1876 (*Oreda*)
- 864 *murina* Broun, 1880 (*Oreda*)
- 865 *setigera* Broun, 1880 (*Oreda*)
- 866 *intutus* Pascoe, 1876 (*Acalles*)
- 867 *erroneus* Pascoe, 1876 (*Acalles*)
- 868 *hystriculus* Pascoe, 1876 (*Acalles*)
- 869 *impexus* Pascoe, 1877 (*Acalles*)
- 870 *perpusillus* Pascoe, 1877 (*Acalles*)
- 871 *trinotatus* Broun, 1880 (*Acalles*)
- 872 *pascoei* Broun, 1880 (*Acalles*)
- 873 *signatus* Broun, 1880 (*Acalles*)
- 874 *tortipes* Broun, 1880 (*Acalles*)
- 875 *crisioides* Broun, 1880 (*Acalles*)
- 876 *vividus* Broun, 1880 (*Acalles*)
- 877 *certus* Broun, 1880 (*Acalles*)
- 878 *scitus* Broun, 1880 (*Acalles*)
- 879 *rudis* Pascoe, 1877 (*Acallopaia*)
- 880 *sculpturatus* Broun, 1880 (*Acallopaia*)
- 881 *celsus* Broun, 1880 (*Dolichoscelis*)
- 882 *lineithorax* Broun, 1880 (*Dolichoscelis*)
- 883 *setiger* Broun, 1880 (*Paromalina*)
- 884 *vestita* Broun, 1880 (*Paromalina*)
- 885 *gibbus* Pascoe, 1876 (*Tychanus*)
- 886 *ferrugatus* Pascoe, 1876 (*Tychanus*)
- 887 *densus* Broun, 1880 (*Tychanus*)
- 888 *verrucosus* Pascoe, 1876 (*Tychanus*)
- 889 *testudo* Pascoe, 1876 (*Sympedius*)
- 890 *vexatus* Pascoe, 1876 (*Sympedius*)
- 891 *binotatus* Pascoe, 1876 (*Crisius*)
- 892 *variegatus* Broun, 1880 (*Crisius*)
- 893 *scutellaris* Broun, 1880 (*Crisius*)
- 894 *ursus* White, 1846 (*Rhynchodes*)
- 895 *saundersi* White, 1846 (*Rhynchodes*)
- 896 *squamiger* White, 1846 (*Euthyrhinus*)
- 897 *bituberculatus* Fabricius s. Broun (*Mitrastethus*)
- 898 *spiculus* Redtenbacher, 1868 (*Paranomocerus*)
- 899 *maurus* Broun, 1880 (*Paranomocerus*)
- 900 *egena* Pascoe, 1876 (*Idotasia*)
- 1272 *ferrugalis* Broun, 1881 (*Ectopsis*)
- 1273 *ovatellus* Broun, 1881 (*Acalles*)
- 1274 *cordipennis* Broun, 1881 (*Acalles*)
- 1275 *leviculus* Broun, 1881 (*Acalles*)

- 1276 *cristatus* Broun, 1881 (*Acalles*)
 1277 *rudis* Broun, 1881 (*Acalles*)
 1278 *dorsalis* Broun, 1881 (*Acalles*)
 1279 *volens* Broun, 1881 (*Acalles*)
 1280 *horridus* Broun, 1881 (*Acalles*)
 1281 *rubricus* Broun, 1881 (*Acalles*)
 1282 *spurcus* Broun, 1881 (*Acalles*)
 1283 *mundus* Broun, 1881 (*Acalles*)
 1284 *canescens* Broun, 1881 (*Acalles*)
 1285 *arctus* Broun, 1881 (*Acalles*)
 1286 *vafer* Broun, 1881 (*Acalles*)
 1287 *setosus* Broun, 1881 (*Dolichoscelis*)
 1288 *villosus* Broun, 1881 (*Dolichoscelis*)
 1289 *denotans* Broun, 1881 (*Dolichoscelis*)
 1290 *latus* Broun, 1881 (*Dolichoscelis*)
 1291 *crinitus* Broun, 1881 (*Dolichoscelis*)
 1292 *exiguus* Broun, 1881 (*Dolichoscelis*)
 1293 *curtus* Broun, 1881 (*Sympedius*)
 1294 *lachrymosus* Broun, 1881 (*Tychanus*)
 1295 *sanguineus* Broun, 1881 (*Pachypeza*)
 1296 *squameus* Broun 1881 (*Rhyncodes*)
 1421 *griseus* Broun, 1883 (*Acalles*)
 1422 *diversus* Broun, 1883 (*Acalles*)
 1423 *cingulatus* Broun, 1883 (*Acalles*)
 1424 *sentus* Broun, 1883 (*Acalles*)
 1425 *latirostris* Broun, 1883 (*Acalles*)
 1426 *decemcristatus* Broun, 1883 (*Acalles*)
 1427 *triangulatus* Broun, 1883 (*Acalles*)
 1428 *cinereus* Broun, 1883 (*Acalles*)
 1429 *scabiosus* Broun 1883 (*Tychanus*)
 1430 *atrus* Broun, 1883 (*Rhyncodes*)
 1544 *mystacinus* Broun, 1886 (*Psepholax*)
 1545 *quadratus* Broun, 1886 (*Tychanus*)
 1546 *setifer* Broun, 1886 (*Acalles*)
 1547 *posticalis* Broun, 1886 (*Acalles*)
 1624 *mediocris* Broun, 1886 (*Psepholax*)
 1625 *orthorhina* Broun, 1886 (*Oreda*)
 1681 *terricola* Broun, 1885 (*Acalles*)
 1682 *ventralis* Broun, 1885 (*Tychanus*)
 1683 *lepidus* Broun, 1885 (*Sympedius*)
 1745 *floricola* Broun, 1886 (*Acalles*)
 1746 *formosus* Broun, 1886 (*Agacalles*)
 1747 *altulus* Broun, 1886 (*Scelodolichus*)
 2173 *veratrus* Broun, 1893 (*Acalles*)
 2174 *maritimus* Broun, 1893 (*Acalles*)
 2175 *cryptobius* Broun, 1893 (*Acalles*)
 2176 *ingens* Broun, 1893 (*Acalles*)
 2177 *xanthostictus* Broun, 1893 (*Acalles*)
 2178 *adamsi* Broun, 1893 (*Acalles*)
 2179 *concinus* Broun, 1893 (*Acalles*)
 2180 *australis* Broun, 1893 (*Acalles*)
 2181 *juncobius* Broun, 1893 (*Scelodolichus*)
 2182 *bufo* Sharp, 1883 (*Tychanus*)
 2183 *dux* Broun, 1893 (*Tychanus*)
 2184 *obesulus* Sharp, 1886 (*Crisius*)
 2185 *picicollis* Broun, 1893 (*Crisius*)
 2186 *signatus* Broun, 1893 (*Crisius*)
 2187 *ornatus* Broun, 1893 (*Crisius*)
 2409 *pictulus* Broun, 1893 (*Tychanopais*)
 2410 *rostralis* Broun, 1893 (*Getacalles*)
 2411 *minor* Broun, 1893 (*Getacalles*)
 2412 *humeratus* Broun, 1893 (*Getacalles*)
 2413 *brevicornis* Broun, 1893 (*Psepholax*)
 2414 *punctata* Broun, 1893 (*Homoreda*)
 2415 *fuliginosus* Broun, 1893 (*Hadracalles*)
 2416 *mimus* Broun, 1893 (*Acalles*)
 2417 *lepirhinus* Broun, 1893 (*Acalles*)
 2418 *sympedioides* Broun, 1893 (*Acalles*)
 2564 *dolosus* Broun, 1893 (*Acalles*)
 2565 *comptus* Broun, 1893 (*Acalles*)
 2566 *facilis* Broun, 1893 (*Acalles*)
 2567 *quietus* Broun, 1893 (*Acalles*)
 2568 *alpestris* Broun, 1893 (*Acalles*)
 2569 *picatus* Broun, 1893 (*Acalles*)
 2570 *aulacus* Broun, 1893 (*Acalles*)
 2571 *allostethus* Broun, 1893 (*Acalles*)
 2572 *incultus* Broun, 1893 (*Acalles*)
 2573 *hilaris* Broun, 1893 (*Scelodolichus*)
 2574 *fasciculatus* Broun, 1893 (*Crisius*)
 2575 *inaequalis* Broun, 1893 (*Getacalles*)
 2931 *crassicornis* Broun, 1895 (*Psepholax*)
 2932 *denticostatus* Broun, 1909 (*Psepholax*)
 2933 *versicolor* Broun, 1909 (*Aphocoeilis*)
 2934 *sulcifrons* Broun, 1909 (*Mesoreda*)
 2935 *integer* Broun, 1893 (*Acalles*)
 2936 *formosus* Broun, 1893 (*Acalles*)
 2937 *ruficollis* Broun, 1893 (*Acalles*)
 2938 *porcatus* Broun, 1893 (*Acalles*)
 2939 *xenorhinus* Broun, 1893 (*Acalles*)
 2940 *puncticollis* Broun, 1893 (*Acalles*)
 2941 *farinosus* Broun, 1893 (*Acalles*)
 2942 *fuscatus* Broun, 1907 (*Acalles*)
 2943 *multisetosus* Broun, 1907 (*Acalles*)
 2944 *fuscidorsis* Broun, 1909 (*Acalles*)
 2945 *igneus* Broun, 1909 (*Acalles*)
 2946 *altus* Broun, 1909 (*Acalles*)
 2947 *albistrigalis* Broun, 1909 (*Acalles*)
 2948 *aterrimus* Broun, 1909 (*Acalles*)
 2949 *praesetosus* Broun, (*Acalles*)
 2950 *robustus* Broun, 1909 (*Acalles*)
 2951 *flavisetosus* Broun, 1909 (*Acalles*)
 2952 *dorsalis* Broun, 1904 (*Crisius*)
 2953 *rectirostris* Broun, 1909 (*Sympedius*)
 2954 *politus* Broun, 1895 (*Scelodolichus*)
 2955 *squamosus* Broun, 1895 (*Scelodolichus*)
 2956 *flavescens* Broun, 1893 (*Zeacalles*)
 2957 *varius* Broun, 1893 (*Zeacalles*)
 2958 *lepidulus* Broun, 1909 (*Zeacalles*)
 2959 *aspersus* Broun, 1893 (*Metacalles*)
 2960 *rugicollis* Broun, 1893 (*Metacalles*)
 2961 *nigricollis* Broun, 1895 (*Schylus*)
 2962 *dorsale* Broun, 1909 (*Hatasu*)
 2963 *perspicuus* Broun, 1909 (*Omoeacalles*)
 2964 *griseicollis* Broun, 1909 (*Torilus*)

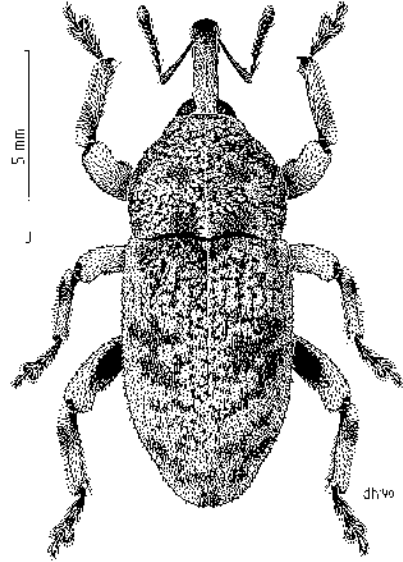
2965 *favosus* Broun, 1909 (*Getacalles*)
 2966 *calcaratus* Broun, 1895 (*Dendrostygnus*)
 2967 *latisulcatus* Broun, 1909 (*Onias*)
 2968 *ornatus* Broun, 1909 (*Onias*)
 2969 *simplex* Broun, 1893 (*Ectopsis*)
 2970 *cineraceus* Broun, 1909 (*Clypeolus*)
 2971 *cristatus* Broun, 1909 (*Baeorhynchodes*)
 3139 *binodosus* Broun, 1910 (*Acalles*)
 3311 *acanthomerus* Broun, 1913 (*Psepholax*)
 3312 *longula* Broun, 1913 (*Mesoreda*) [1312 in publication - lapsus calami]
 3313 *conicollis* Broun, 1913 (*Acalles*)
 3314 *eruenis* Broun, 1913 (*Acalles*)
 3315 *peelensis* Broun, 1913 (*Acalles*)
 3316 *consors* Broun, 1913 (*Acalles*)
 3317 *gracilis* Broun, 1913 (*Acalles*)
 3318 *contractus* Broun, 1913 (*Acalles*)
 3319 *costatus* Broun, 1913 (*Tychanus*)
 3320 *humeralis* Broun, 1913 (*Crisius*)
 3321 *semifuscus* Broun, 1913 (*Crisius*)
 3322 *decorus* Broun, 1913 (*Crisius*)
 3323 *flavisparsus* Broun, 1913 (*Tychanopais*)
 3324 *ignealis* Broun, 1913 (*Allanalcis*)
 3325 *oculatus* Broun, 1913 (*Allanalcis*)
 3326 *dilatatus* Broun, 1913 (*Allanalcis*)
 3327 *crinitus* Broun, 1913 (*Metacalles*)
 3328 *lanosus* Broun, 1913 (*Metacalles*)
 3329 *pictus* Broun, 1913 (*Zeacalles*)
 3330 *femoralis* Broun, 1913 (*Zeacalles*)
 3331 *irregularis* Broun, 1913 (*Onias*)
 3332 *substriatus* Broun, 1913 (*Getacalles*)
 3453 *flynni* Broun, 1914 (*Acalles*)
 3454 *notoporphinus* Broun, 1914 (*Acalles*)
 3455 *simplex* Broun, 1914 (*Xenacalles*)
 3456 *nodifer* Broun, 1914 (*Xenacalles*)
 3457 *flectipes* Broun, 1914 (*Scelodolichus*)
 3458 *picatus* Broun, 1914 (*Metacalles*)
 3459 *sparsus* Broun, 1914 (*Getacalles*)
 3460 *fasciatus* Broun, 1914 (*Getacalles*)
 3461 *foveiger* Broun, 1914 (*Atylodes*)
 3635 *confusus* Broun, 1914 (*Acalles*)
 3636 *bicristiceps* Broun, 1914 (*Acalles*)
 3637 *ignotus* Broun, 1914 (*Acalles*)
 3638 *squamosus* Broun, 1914 (*Tychanus*)
 3639 *latirostris* Broun, 1914 (*Crisius*)
 3640 *posticalis* Broun, 1914 (*Getacalles*)
 3641 *fulvicornis* Broun, 1914 (*Getacalles*)
 3642 *parvulus* Broun, 1914 (*Getacalles*)
 3643 *variellus* Broun, 1914 (*Getacalles*)
 3644 *oblongus* Broun, 1914 (*Getacalles*)
 3645 *albicristus* Broun, 1914 (*Onias*)
 3646 *laticollis* Broun, 1914 (*Allanalcis*)
 3647 *carinellus* Broun, 1914 (*Zeacalles*)
 3648 *estriatus* Broun, 1914 (*Zeacalles*)
 3771 *furvus* Broun, 1915 (*Acalles*)
 3772 *bicinctus* Broun, 1915 (*Acalles*)

3773 *scaber* Broun, 1915 (*Zeacalles*)
 3774 *sparsus* Broun, 1915 (*Zeacalles*)
 3934 *lunalis* Broun, 1917 (*Tychanus*)
 3935 *foveigerus* Broun, 1917 (*Ectopsis*)
 3936 *baccatellus* Broun, 1917 (*Getacalles*)
 3937 *foveiceps* Broun, 1917 (*Getacalles*)
 3938 *posticalis* Broun, 1917 (*Crisius*)
 3939 *nigricans* Broun, 1917 (*Xenacalles*)
 3940 *speciosus* Broun, 1917 (*Zeacalles*)
 3941 *sternalis* Broun, 1917 (*Acalles*)
 3942 *nodigerus* Broun, 1917 (*Acalles*)
 3943 *zenomorphus* Broun, 1917 (*Acalles*)
 3944 *dentigerus* Broun, 1917 (*Acalles*)
 4118 *humeralis* Broun, 1921 (*Acalles*)
 4119 *anceps* Broun, 1921 (*Acalles*)
 4120 *cilicollis* Broun, 1921 (*Acalles*)
 4121 *obscurus* Broun, 1921 (*Tychanus*)
 4122 *contiguus* Broun, 1921 (*Crisius*)
 4123 *eximius* Broun, 1921 (*Crisius*)
 4124 *variatus* Broun, 1921 (*Allanalcis*)
 4125 *seticollis* Broun, 1921 (*Allanalcis*)
 4126 *albipictus* Broun, 1921 (*Allanalcis*)
 4127 *melastictus* Broun, 1921 (*Allanalcis*)
 4128 *blanditus* Broun, 1921 (*Allanalcis*)
 4129 *asaphus* Broun, 1921 (*Atylodes*)
 4130 *aeratus* Broun, 1921 (*Zeacalles*)
 4131 *coarctalis* Broun, 1921 (*Zeacalles*)
 4132 *finitimus* Broun, 1921 (*Zeacalles*)
 4133 *bisulcatus* Broun, 1921 (*Zeacalles*)
 4134 *scruposus* Broun, 1921 (*Zeacalles*)
 4135 *latulus* Broun, 1921 (*Zeacalles*)
 4136 *inornatus* Broun, 1921 (*Zeacalles*)
 4137 *parvus* Broun, 1921 (*Zeacalles*)
 4138 *cordipennis* Broun, 1921 (*Zeacalles*)
 4227 *laminata* Broun, 1921 (*Mesoreda*)
 4228 *cristatus* Broun, 1921 (*Euacalles*)
 4229 *complexus* Broun, 1921 (*Tychanus*)
 4230 *simulans* Broun, 1921 (*Tychanus*)
 4231 *terricola* Broun, 1921 (*Tychanus*)
 4232 *dives* Broun, 1921 (*Crisius*)
 4233 *longulus* Broun, 1921 (*Crisius*)
 4234 *minor* Broun, 1921 (*Sympedius*)
 4235 *eucoelius* Broun, 1921 (*Getacalles*)
 4236 *fulvisparsus* Broun, 1921 (*Getacalles*)
 4237 *grisealis* Broun, 1921 (*Getacalles*)
 4238 *dealbatus* Broun, 1921 (*Tychanopais*)
 4239 *brevipennis* Broun, 1921 (*Acalles*)
 4240 *hopensis* Broun, 1921 (*Acalles*)
 4241 *bicostatus* Broun, 1921 (*Acalles*)
 4242 *binodes* Broun, 1921 (*Acalles*)
 4243 *sticticus* Broun, 1921 (*Acalles*)
 4313 *brookesi* Broun, 1923 (*Acalles*)
 4314 *decorus* Broun, 1923 (*Scelodolichus*)
 4315 *pyriformis* Broun, 1923 (*Scelodolichus*)
 4316 *tuberosa* Broun, 1923 (*Hatasu*)
 4340 *insularis* Brookes, 1932 (*Aldonus*)

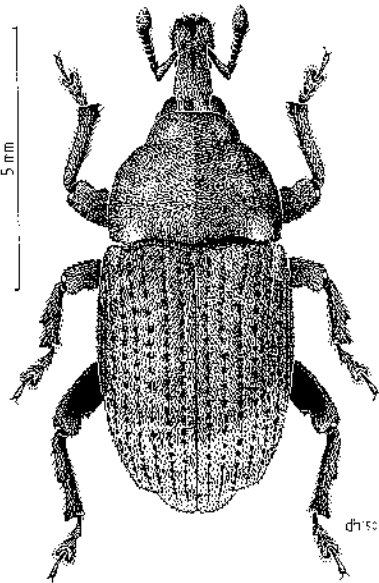
ILLUSTRATIONS



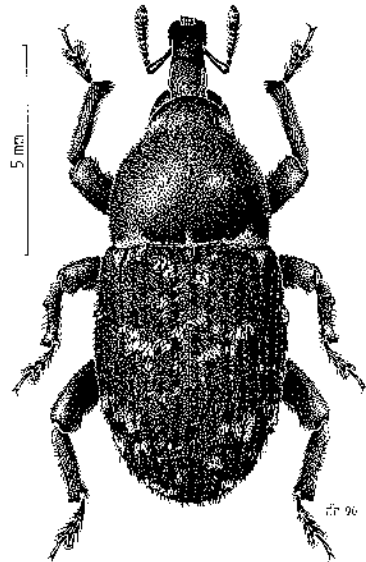
1. *Nothaldonus peacei*, female.



2. *Strongylopterus hylobioides*, male.

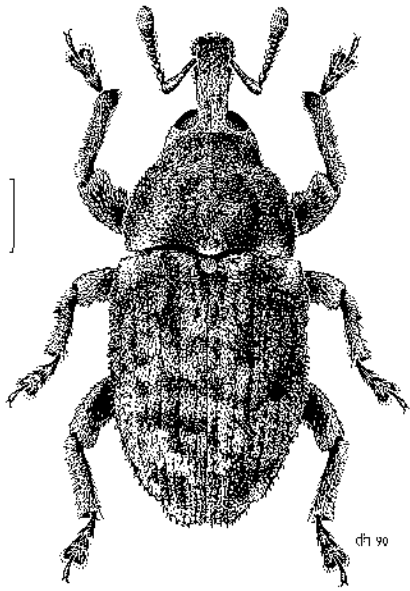


3. *Homoreda murina*, male.

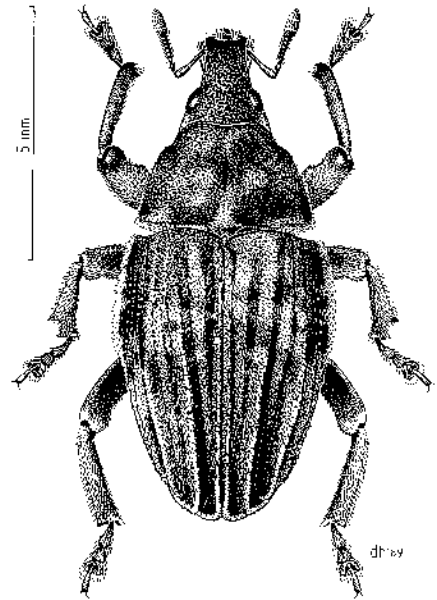


4. *Oreda notata*, male.

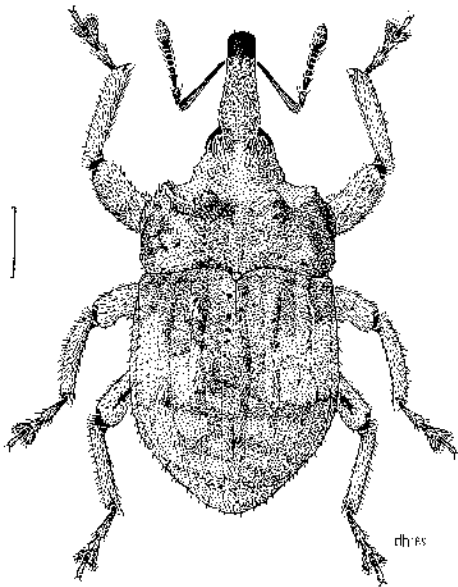
Fig. 1-44 Habitus drawings representing genera of New Zealand Cryptorhynchinae. Scale lines are 1.0 mm unless otherwise indicated. Artist: Des Helmore.



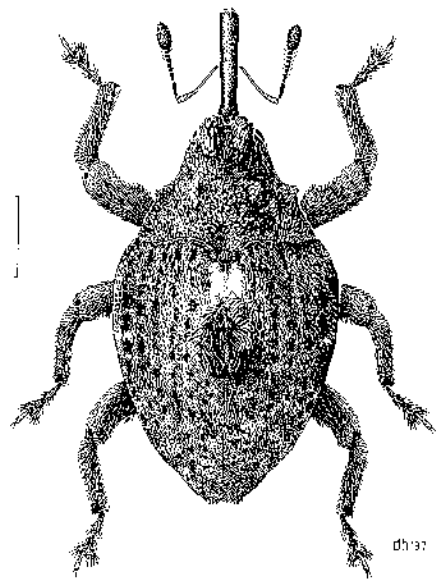
5. *Mesoreda brevis*, male.



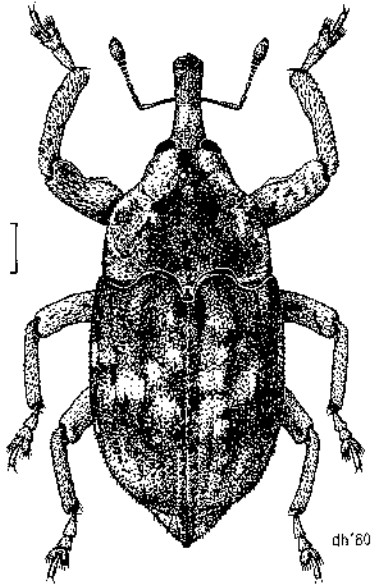
6. *Psepholax sulcatus*, male.



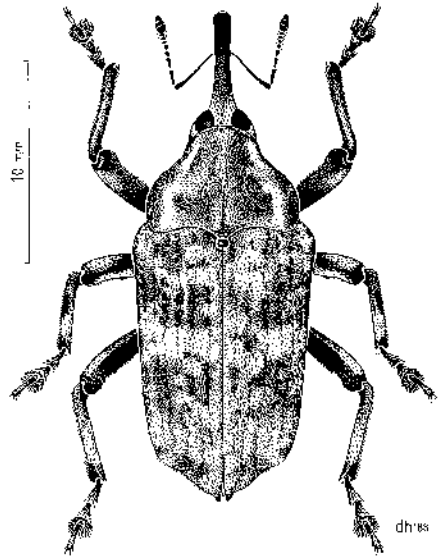
7. *Sympedius testudo*, male.



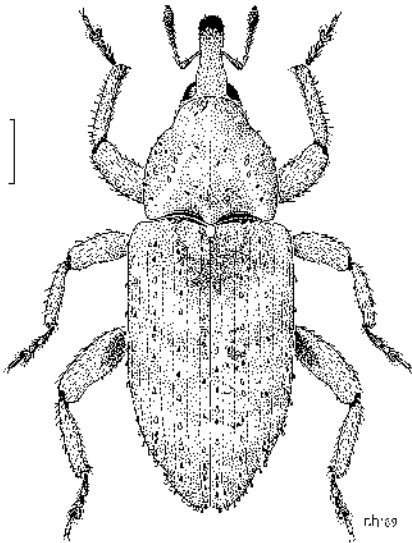
8. *Baeorhynchodes cristatus*, female.



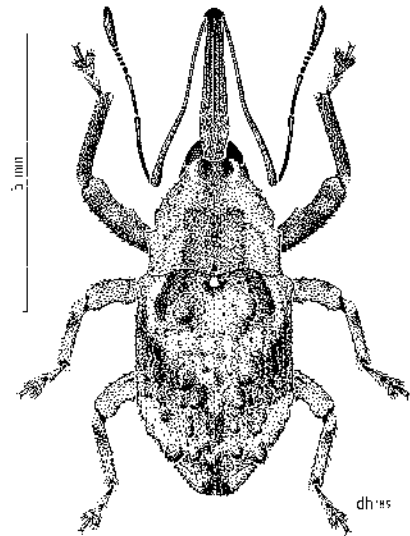
9. *Eutyrrhinus squamiger*, male.



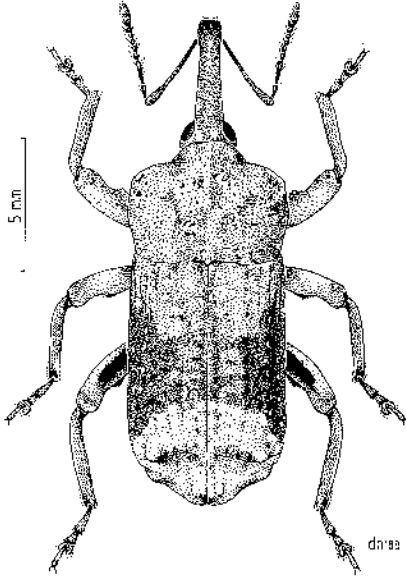
10. *Rhynchodes ursus*, female.



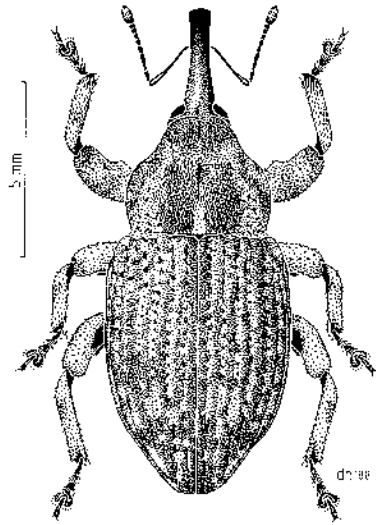
11. *Mitrastethus baridioides*, male.



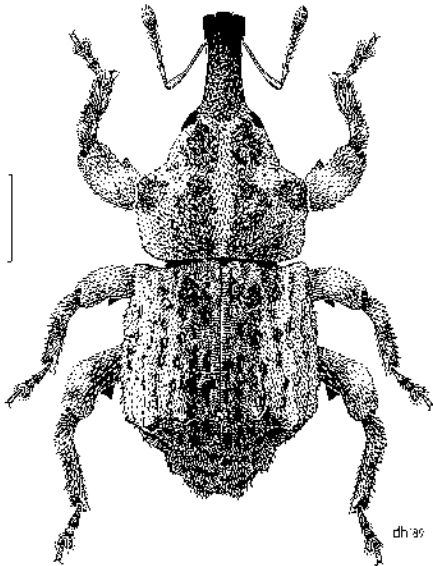
12. *Mecistostylus douei*, male.



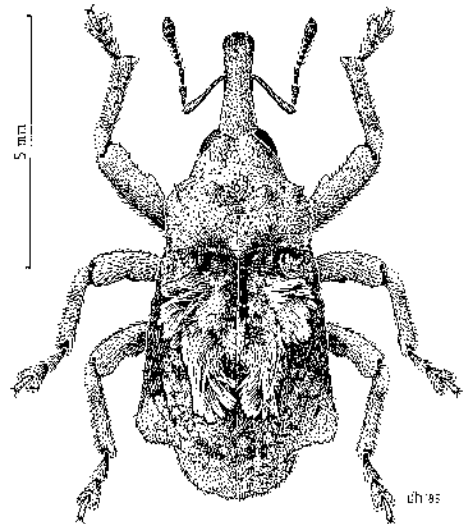
13. *Ectopsis ferrugalis*, male.



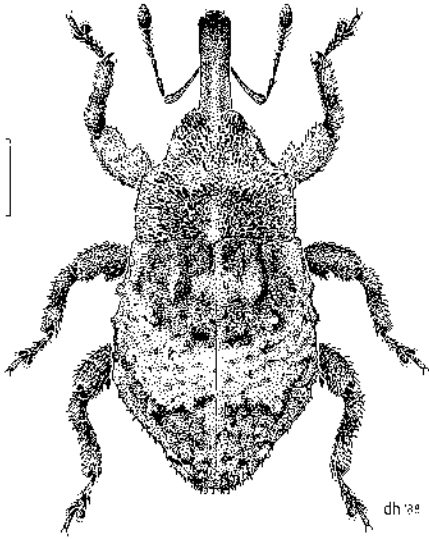
14. *Hadracalles fuliginosus*, female.



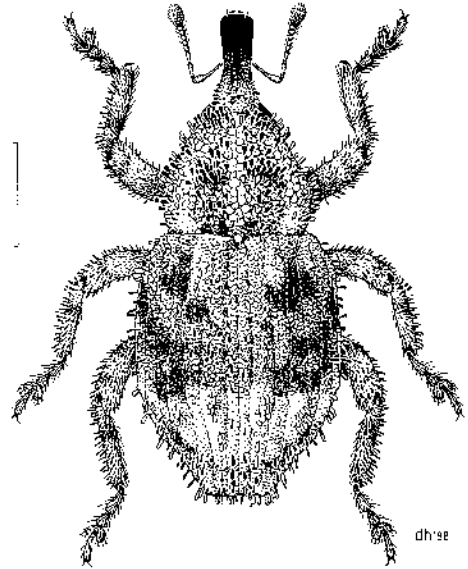
15. *Tychanopsis pictulus*, male.



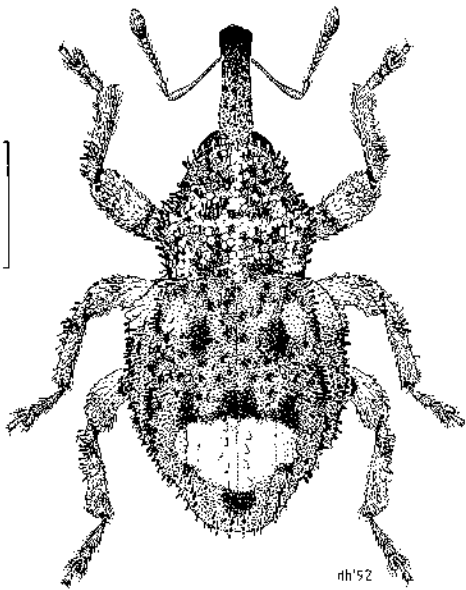
16. *Tychanus gibbus*, male.



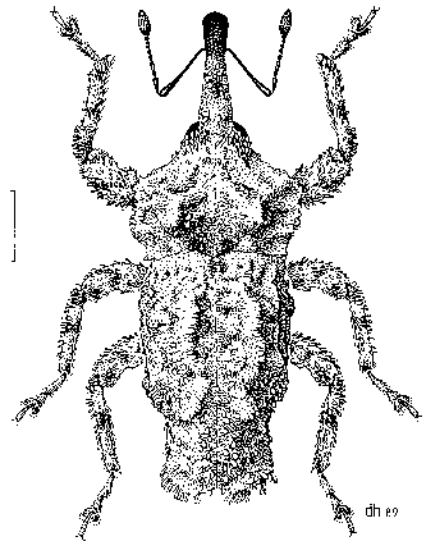
17. *Clypeolus cineraceus*, male.



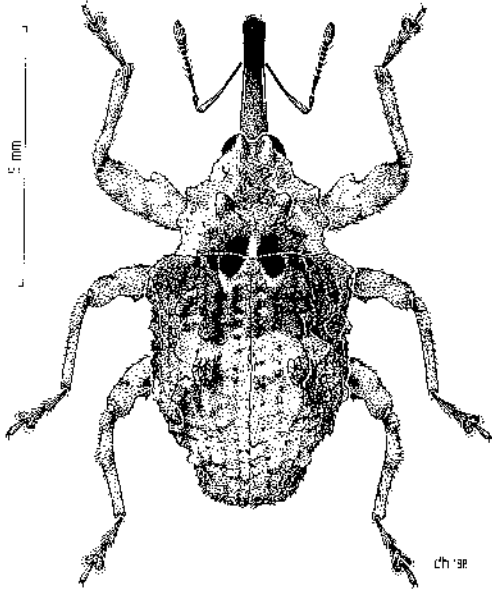
18. *Didymus intutus*, male.



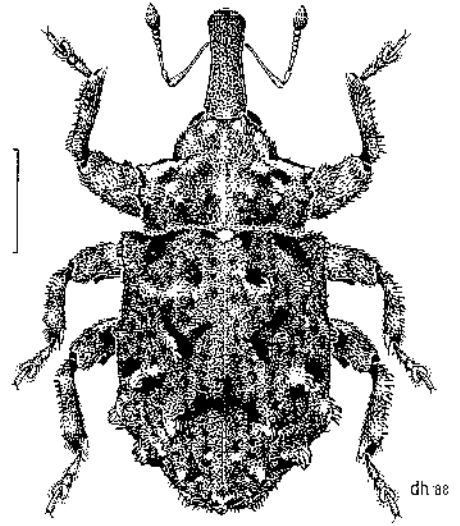
19. *Hircalles scitus*.



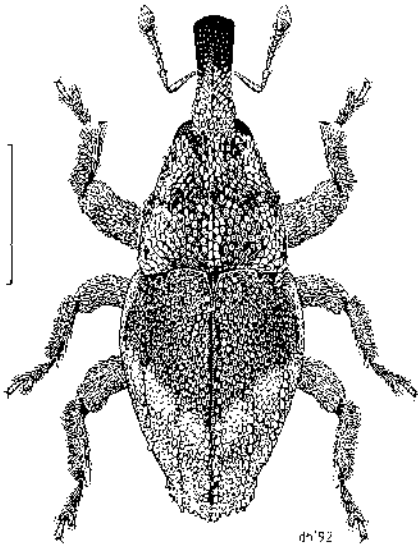
20. *Indecentia nubila*, female.



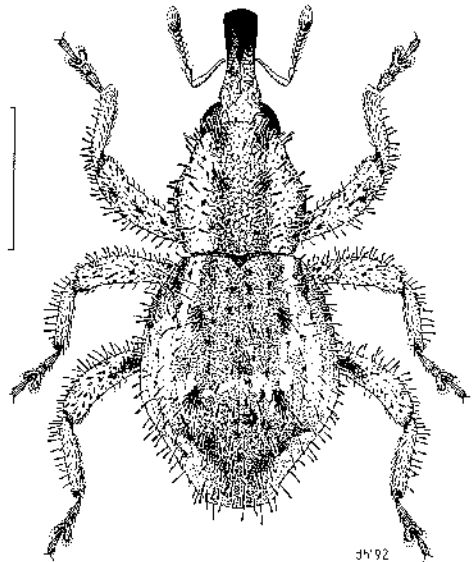
21. *Crisius binotatus*, female.



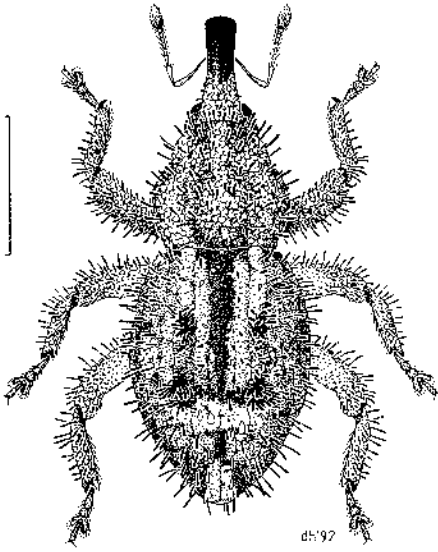
22. *Crisius ventralis*, male.



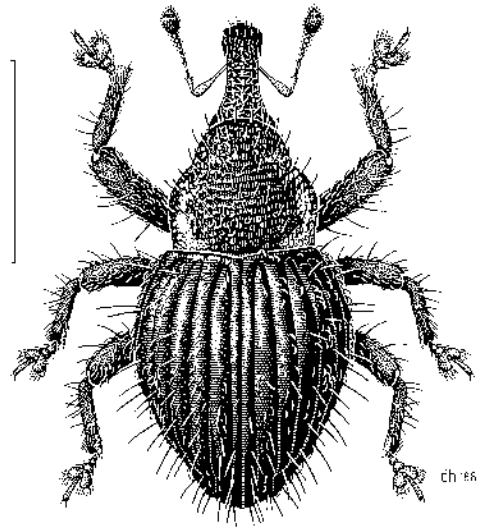
23. *Whitiacalles ignotus*.



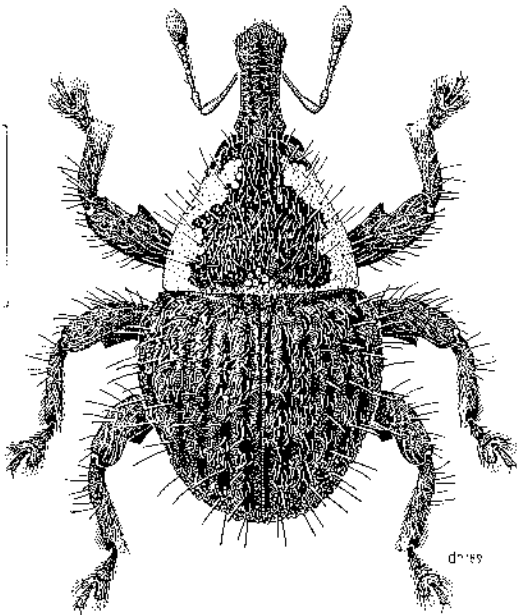
24. *Maneneacalles concinnus*, male.



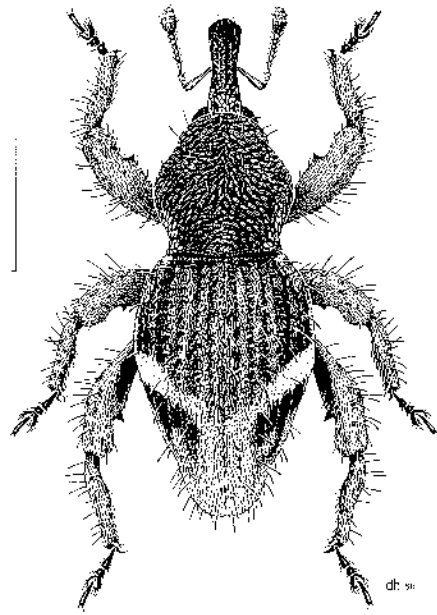
25. *Synacalles hystriculus*.



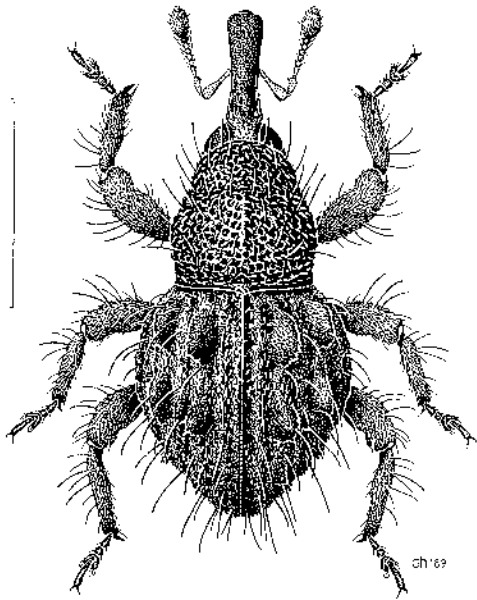
26. *Dermothrius ruficollis*, male.



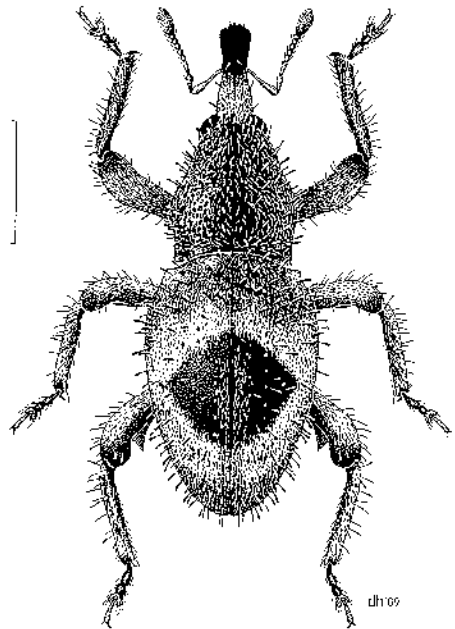
27. *Paromalina setigera*, male.



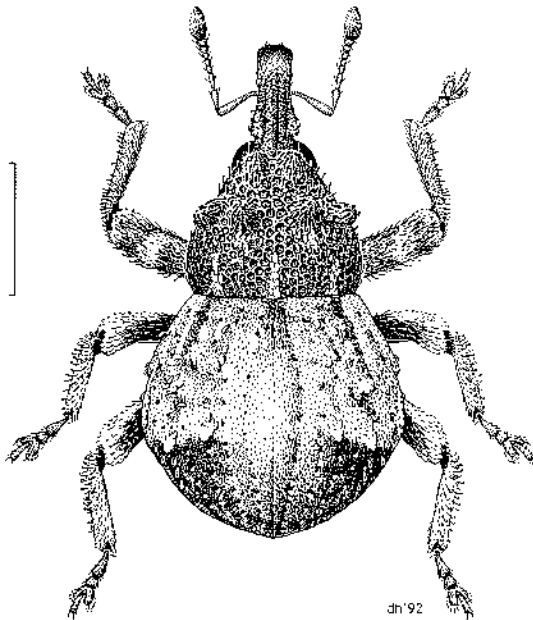
28. *Agacalles formosus*, male.



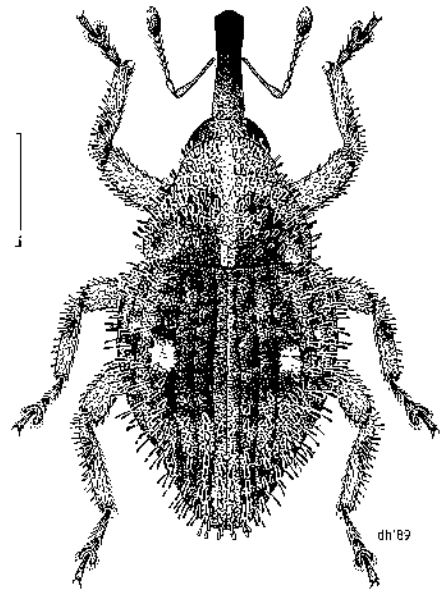
29. *Metacalles aspersus*, female.



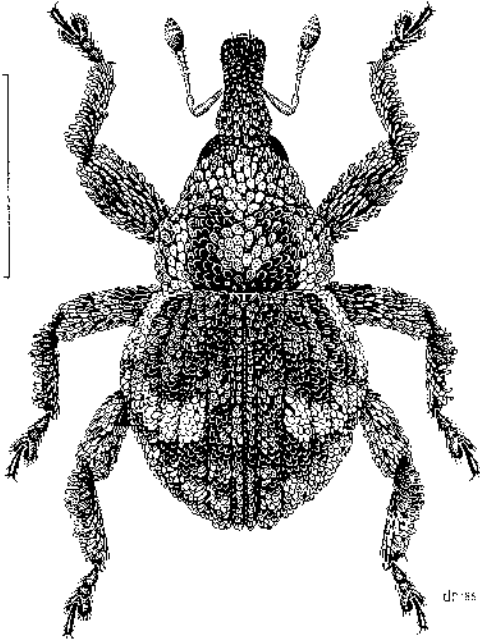
30. *Scelodolichus celsus*, male.



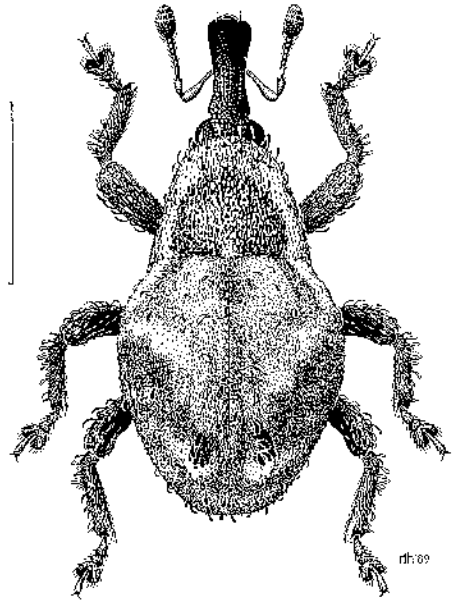
31. *Crooktallies certus*.



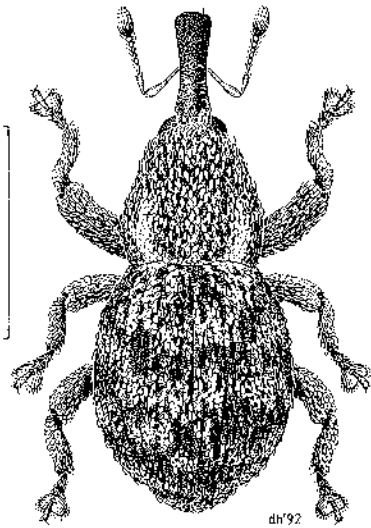
32. *Omoecalles ovatellus*, male.



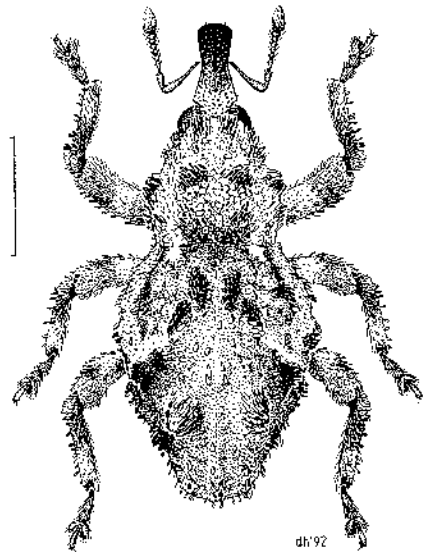
33. *Allanalcis aulacus*, male.



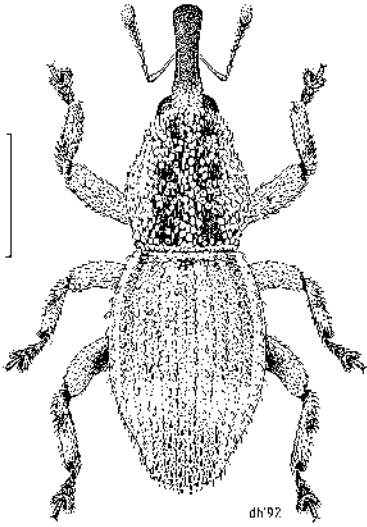
34. *Zeacalles flavescens*, male.



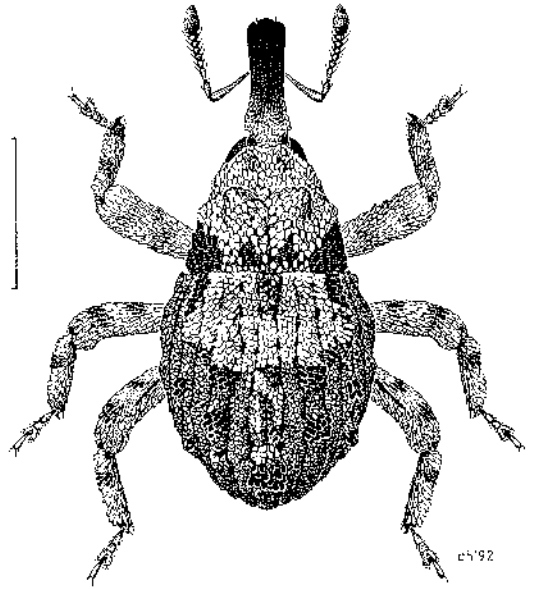
35. *Postacalles rangirua*.



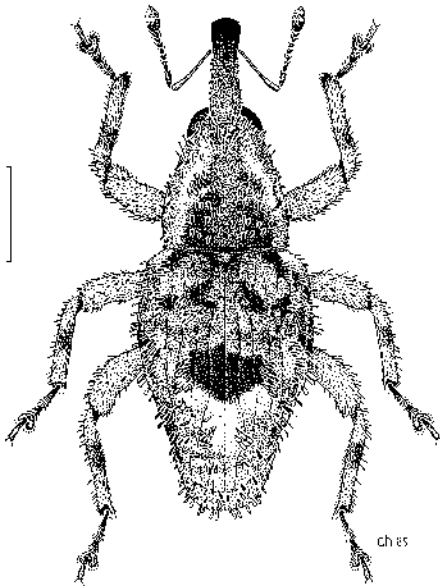
36. *Trinodicalles adamsi*.



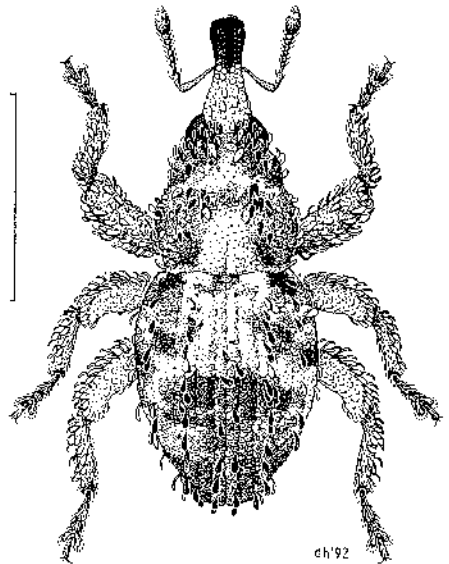
37. *Patellitergum rectirostre*, female.



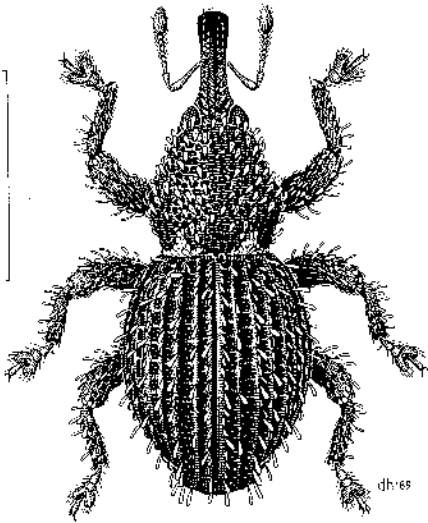
38. *Rainacalles volens*.



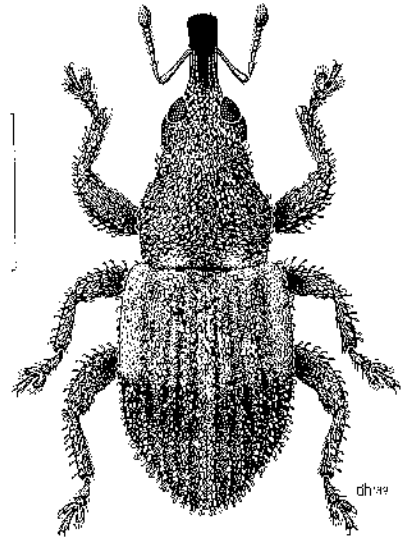
39. *Pachyderris punctiventris*, male.



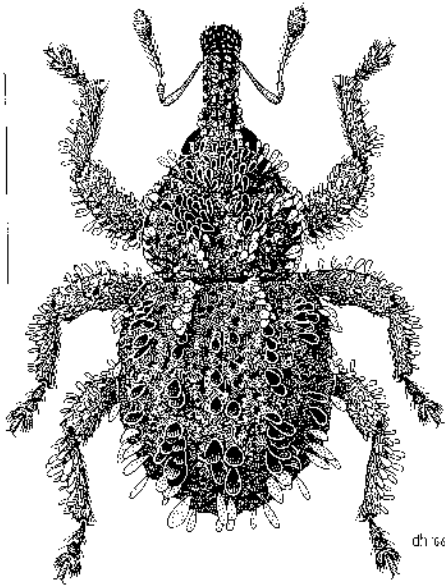
40. *Adstantes rudis*.



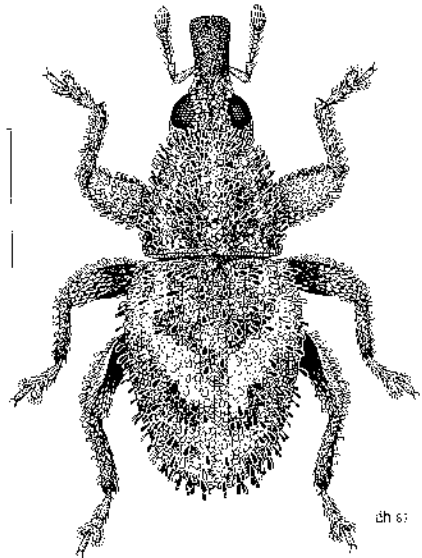
41. *Microcryptorhynchus (M.) setifer*, male.



42. *Microcryptorhynchus (N.) planidorsis*, male.



43. *Andracalles spurcus*, male.



44. *Ampagia rudis*, male.

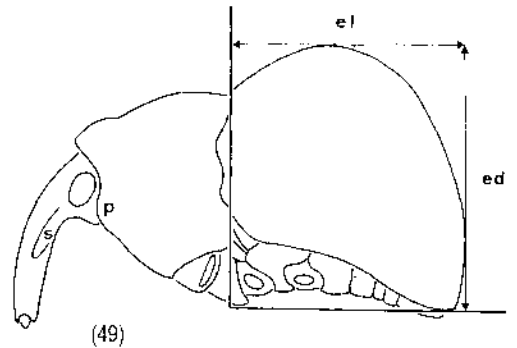
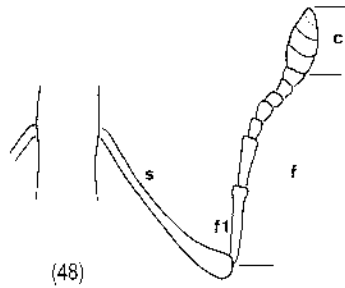
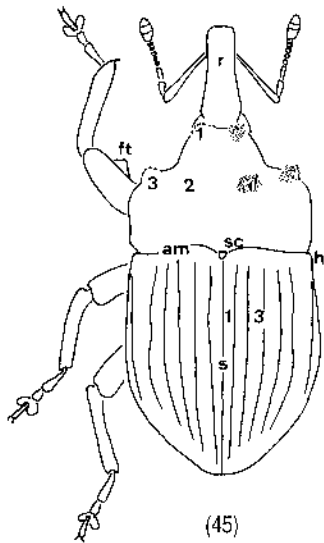
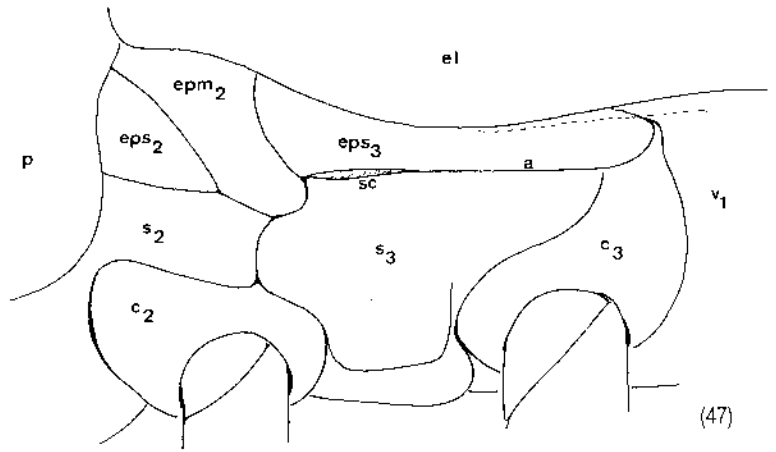
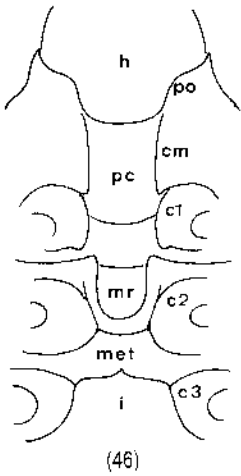


Fig. 45 Generalised cryptorhynchine, dorsal, indicating terminology used in this study. Key: numbers 1–3 on pronotum indicate positions of prominences and scale tufts; numbers on elytron are interstriae 1 and 3; am - anterior margin of elytron; ft - femoral tooth; h - elytral humerus; r - rostrum; s - sutural margin of elytra; sc - scutellum. **Fig. 46** Generalised cryptorhynchine thorax, ventral, indicating terminology used in this study. Key: cm - marginal carina of prosternal canal; c1–3 - fore, middle, and hind coxae; h - head; i - intercoxal process of ventrite 1; met - metasternum; mr - mesosternal receptacle; pc - prosternal canal; po - postocular lobe. **Fig. 47** *Ectopsis ferrugalis* male, mesothorax and metathorax, anterolateral. Key: a - anapleural suture; c2 - middle coxa; c3 - hind coxa; el - elytra; epm2 - mesepimeron; eps2 - mesepisternum; eps3 - metepisternite; p - pronotum; s2 - mesosternum; s3 - metasternum; sc - sclerolepidia; v1 - ventrite 1. **Fig. 48** Antenna, *Rhynchodes ursus*. Key: c - club; f - funicle; f1 - funicle segment 1; s - scape. **Fig. 49** Profile, showing measurement of elytral length ('el') and elytral depth ('ed') used in key. Other features indicated: p - postocular lobe; s - srobe.

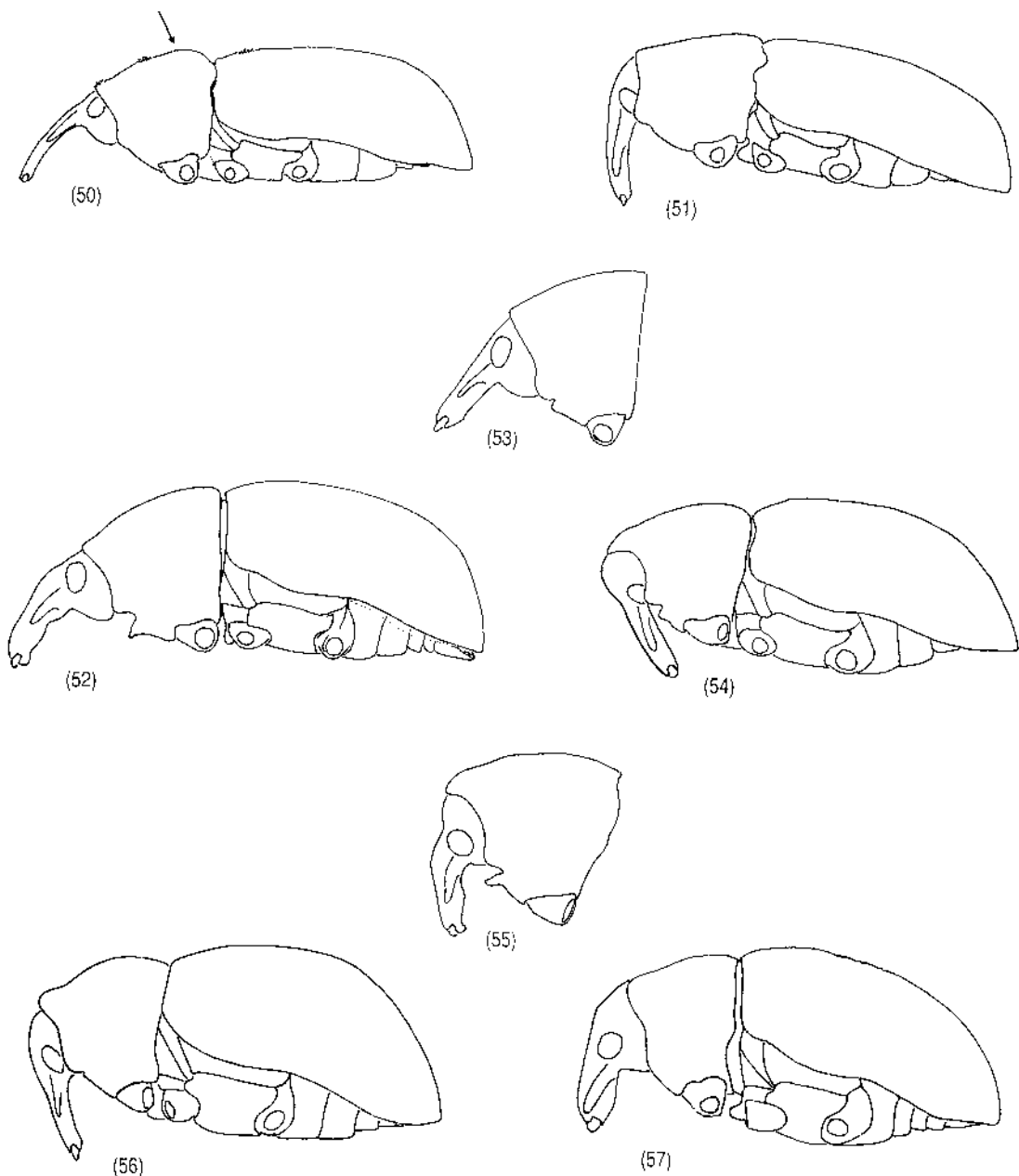


Fig. 50–57 Left lateral profile of: 50, *Nothaidonus peacei*, female, x4.8 (arrow indicates position of pronotal prominences); 51, *Strongylopterus hylobioides*, male, x4.8; 52, *Homoreda murina*, male, x5.0; 53, *Homoreda murina*, female, head and pronotum, x5.0; 54, *Oreda notata*, female, x6.4; 55, *Oreda notata*, male, head and pronotum, x7.0; 56, *Mesoreda sulcifrons*, female, x9.4 (note slender rostrum); 57, *Psepholax macleayi*, female, x7.8.

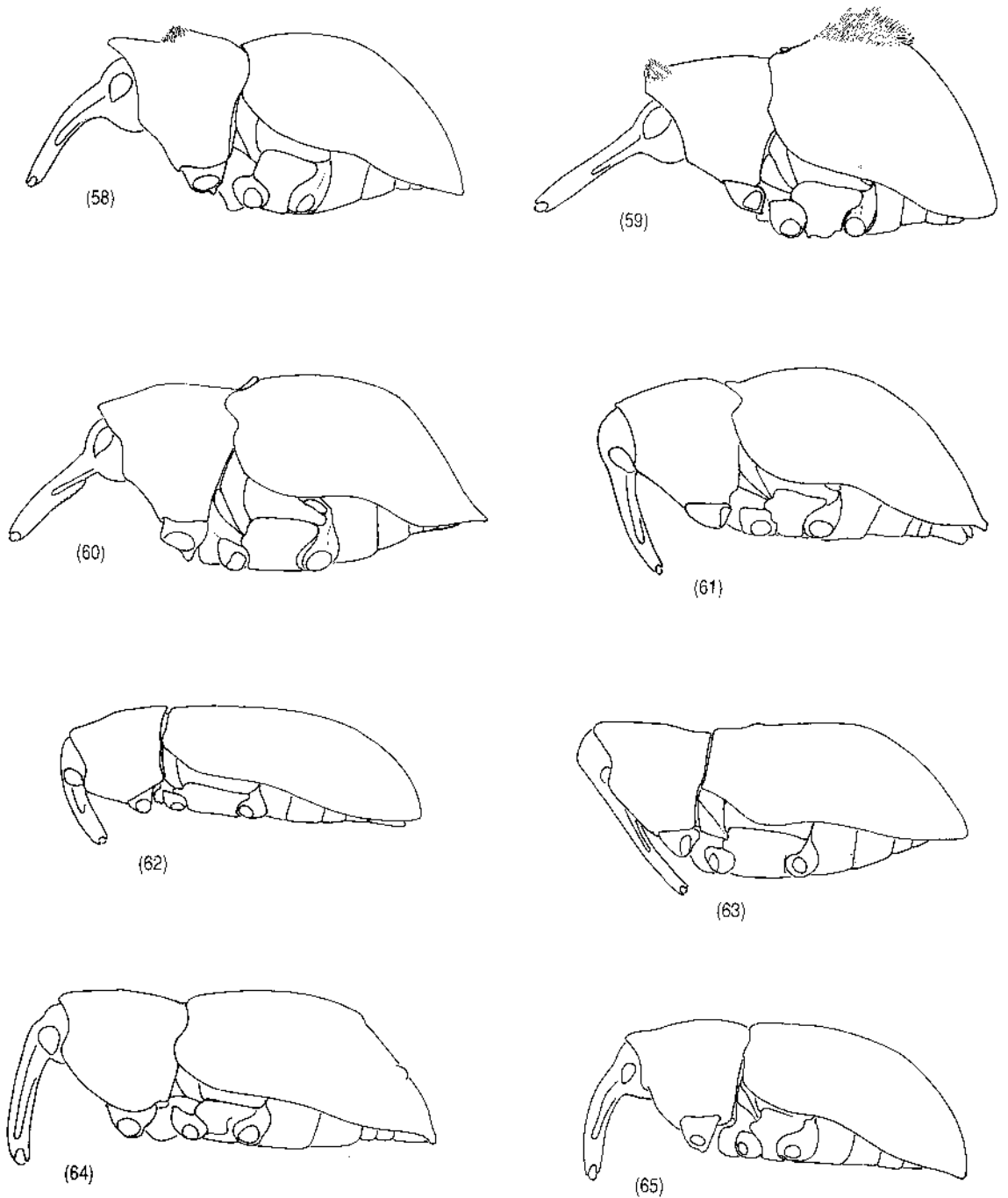


Fig. 58–65 Left lateral profile of: 58, *Sympedius testudo*, male, x9.6; 59, *Baeorhynchodes cristatus*, female, x11.4; 60, *Eutyrrhinus squamiger*, male, x4.8; 61, *Rhynchodes ursus*, male, x2.4; 62, *Mitrastethus baridioides*, male, x9.2; 63, *Mecistostylus douei*, female, x7.4; 64, *Ectopsis ferrugalis*, male, 4.4; 65, *Hadracalles fuliginosus*, male, x5.4.

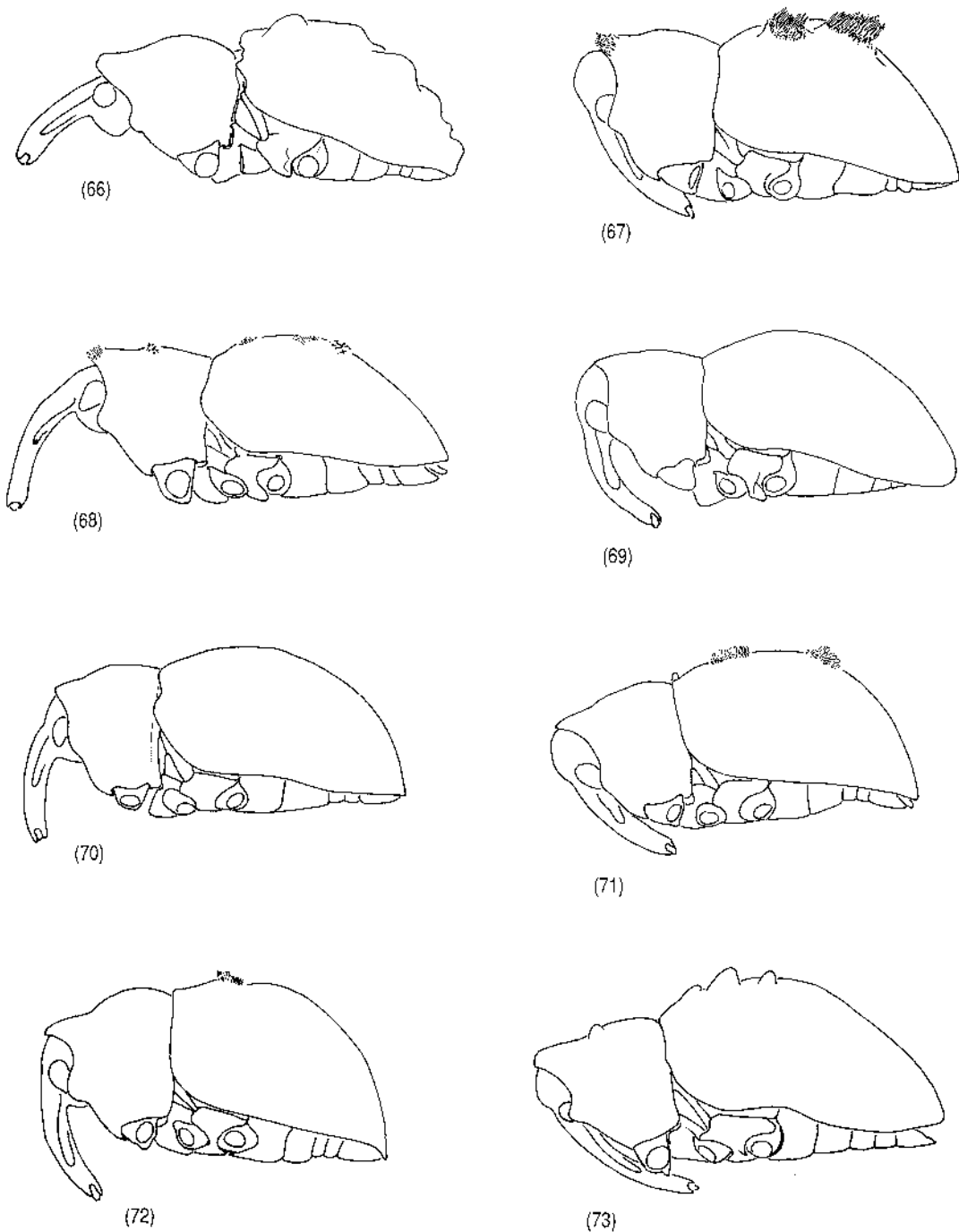
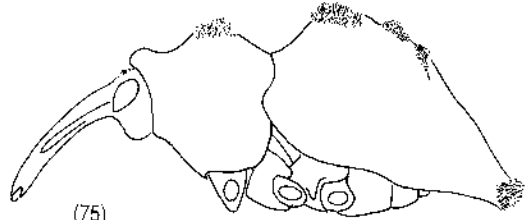


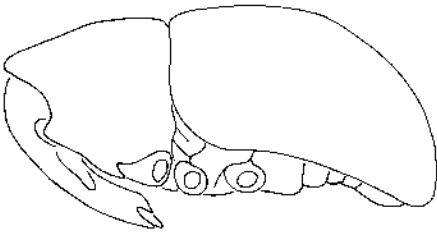
Fig. 66–73 Left lateral profile of: 66, *Tychanopais tuberosus*, male, x4.6; 67, *Tychanus gibbus*, male, x9.0; 68, *Tychanus verrucosus*, female, x10.4; 69, *Tychanus vexatus*, male, x9.4; 70, *Clypeolus pascoei*, male, x7.2; 71, *Didymus intutus*, female, x14.2; 72, *Hilarcalles scitus*, male, x14.4; 73, *Crisius binotatus*, female, x7.6.



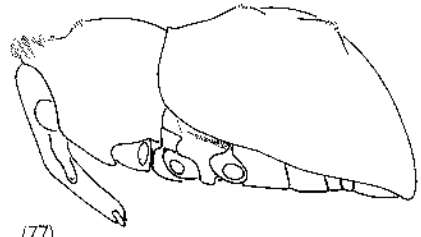
(74)



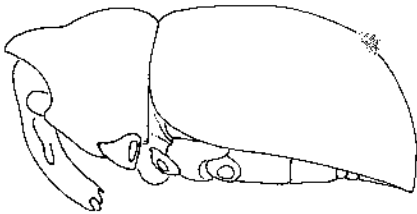
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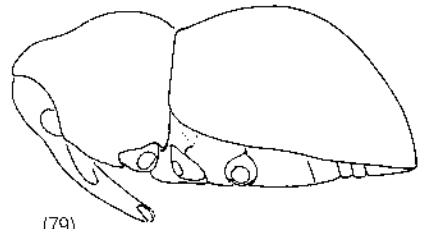
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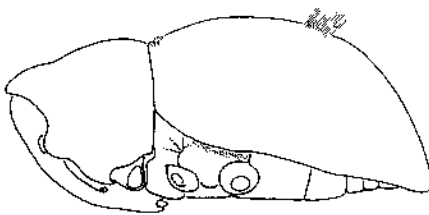
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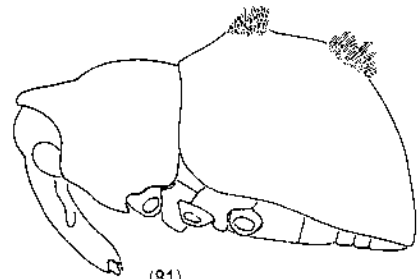
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(79)

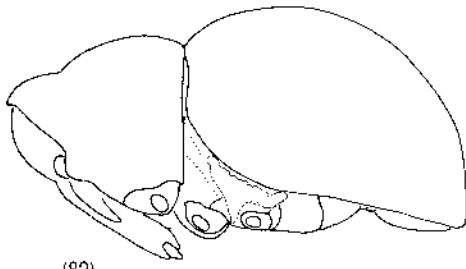


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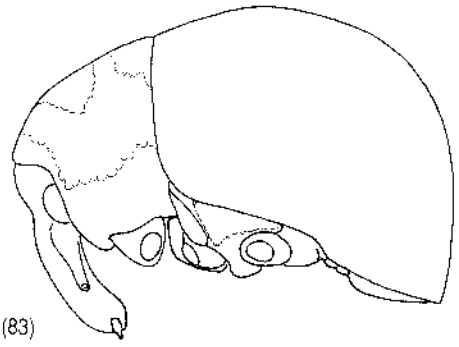


(81)

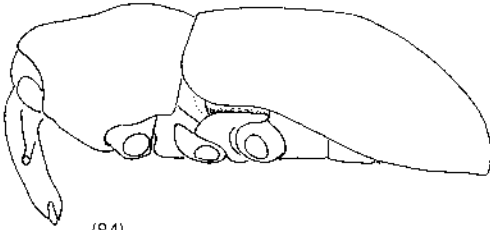
Fig. 74–81 Left lateral profile of: 74, *Indecentia nubila*, male, elytra, x9.0; 75, *Indecentia nubila*, female, x9.0; 76, *Whitiacalles ignotus*, male, x18.8; 77, *Maneneacalles concinnus*, male, x15.6; 78, *Synacalles peelensis*, male, x16.4; 79, *Synacalles cingulatus*, male, x28.4; 80, *Synacalles hystriculus*, male, x22.4; 81, *Synacalles dorsalis*, male, x21.2.



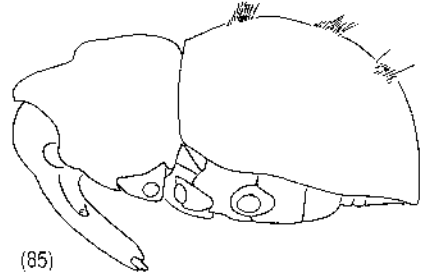
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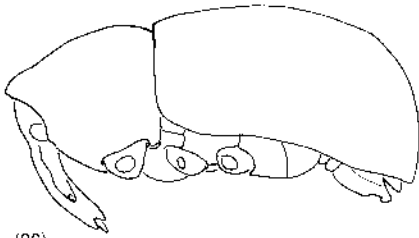
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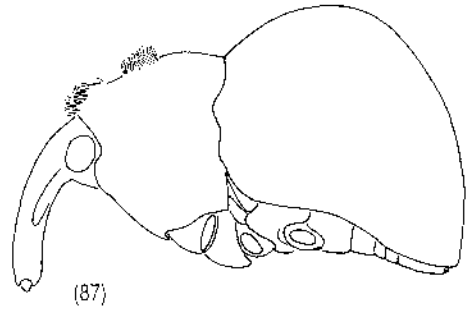
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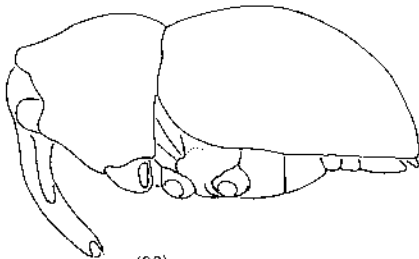
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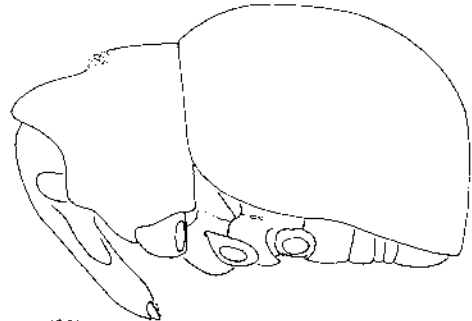
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(87)

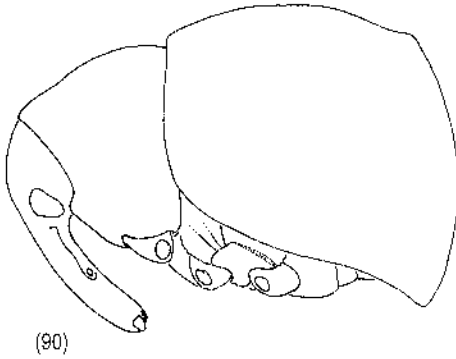


(88)

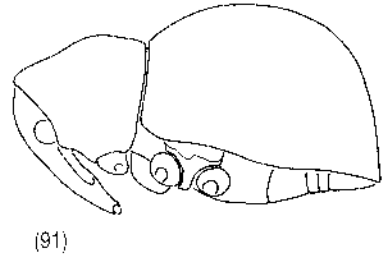


(89)

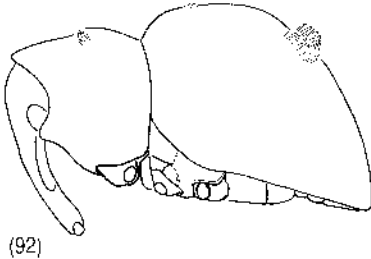
Fig. 82–89 Left lateral profile of: 82, *Dermothrius ruficollis*, male, x32.4; 83, *Paromalina setiger*, male, x22.4; 84, *Agacalles formosus*, male, x19.2; 85, *Metacalles aspersus*, female, x11.8; 86, *Scelodolichus hilaris*, female, x14.2 (abdominal segment 7 flexed ventrally, so that tergite and part of sternite normally covered by elytron are exposed); 87, *Crooktallus certus*, female, x16.4; 88, *Omoeacalles crisioides*, female, x18.0; 89, *Allanacis allostethus*, female, x30.4.



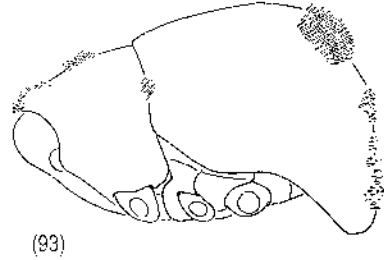
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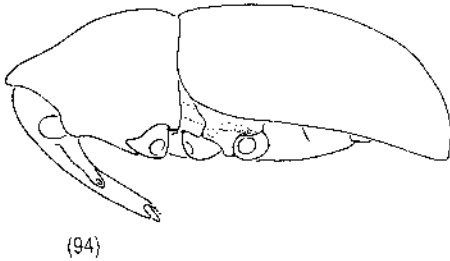
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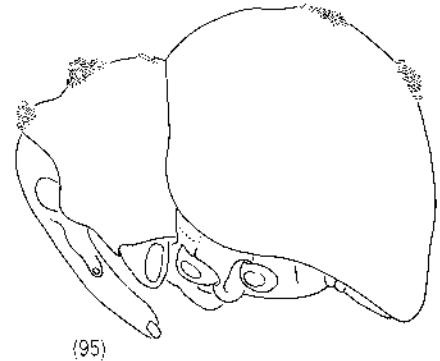
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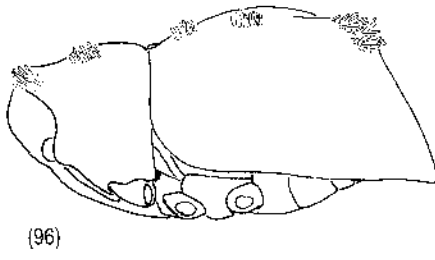
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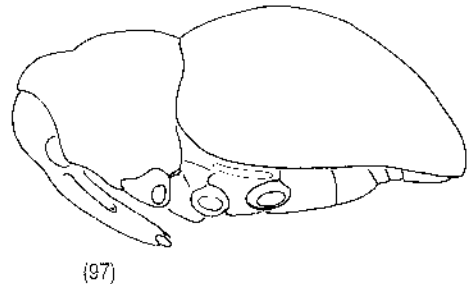
(94)



(95)



(96)



(97)

Fig. 90–97 Left lateral profile of: 90, *Zeacalles* sp., male, x25.6; 91, *Postacalles rangirua*, female, x20.4; 92, *Trinodicalles* sp., x12.8; 93, *Trinodicalles conicollis*, male, x12.8 (abraded specimen); 94, *Patellitergum rectirostre*, male, x19.2; 95, *Rainacalles volens*, female, x17.4; 96, *Pachyderris triangulatus*, female, x13.6; 97, *Astantes rudis*, male, x35.2.

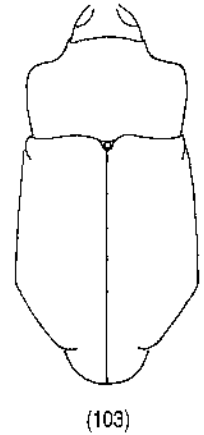
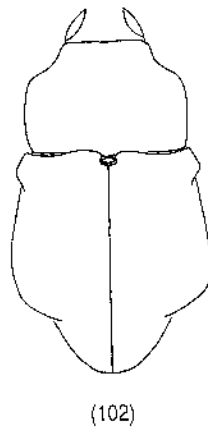
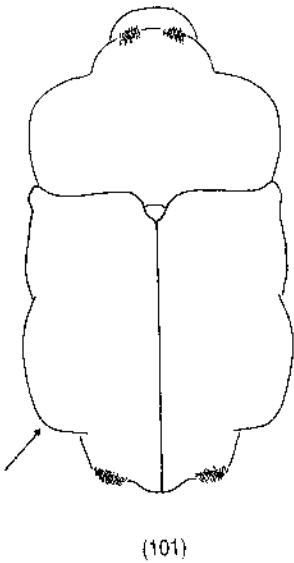
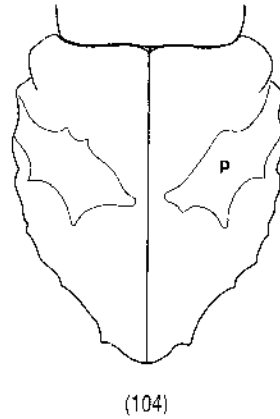
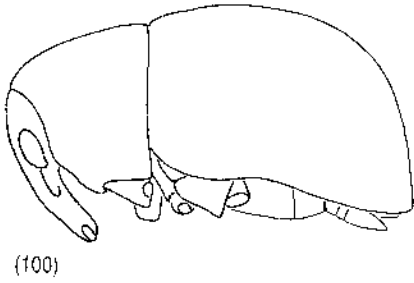
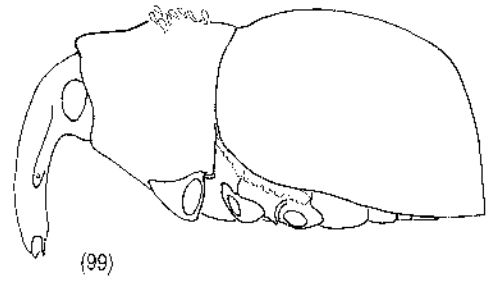
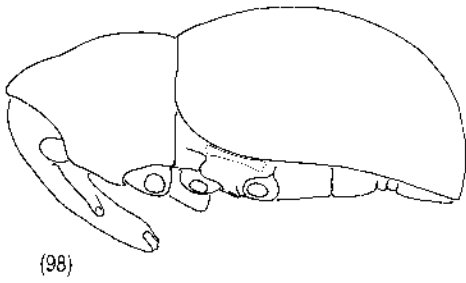
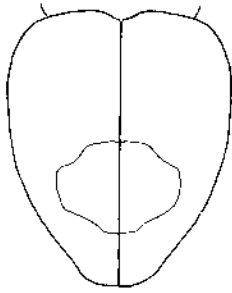
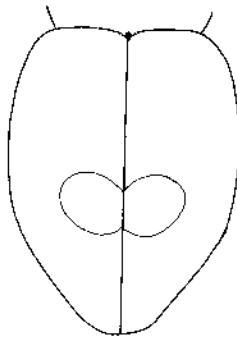


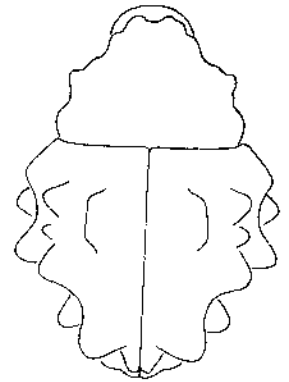
Fig. 98–100 Left lateral profile of: 98, *Microcryptorhynchus latitarsis*, male, x32.8; 99, *Andracalles canescens*, male, x28.0; 100, *Ampagia rudis*, male, x18.4. **Fig. 101–104** Dorsal outline of: 101, *Sympedius ferrugatus*, x8.8 (arrow indicates elytral prominence); 102, *Tychanus verrucosus*, female, x8.8 (excluding rostrum); 103, *Tychanus vexatus*, male, x5.8 (excluding rostrum); 104, *Clypeolus dux*, male, x9.6, elytra showing pale patch of scales 'p' (cf. Fig. 18).



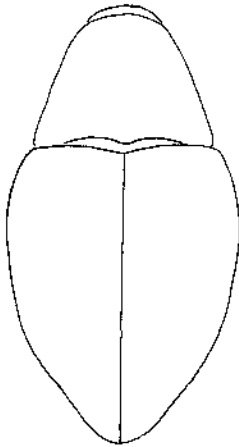
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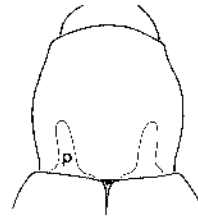
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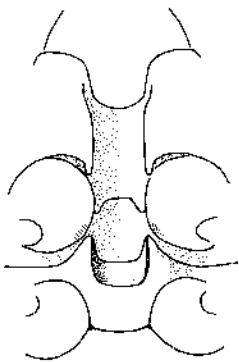
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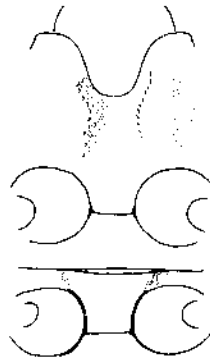
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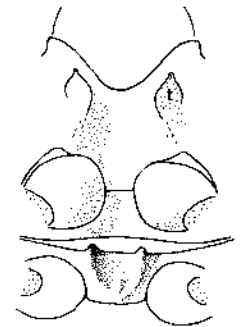
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(112)

Fig. 105–109 Dorsal outline of: 105, *Hiralcalles scitius*, female, x14.0, elytra showing pale patch of scales; 106, *Hiralcalles dolosus*, x15.2, elytra showing pale patch of scales; 107, *Trinodicalles conicollis*, male, x12.8 (scale tufts or ridges present on all prominences; detail omitted); 108, *Pachyderris* sp. (Three Kings Is), x13.6; 109, *Microcryptorhynchus* (*M.*) *multisetosus*, male, pronotum, x32, showing patches of pale scales 'p'. Fig. 110–112 Prothorax and mesothorax, ventral, of: 110, *Nothaldonus peacei*, male, x9.2; 111, *Strongylopterus chathamensis*, x16.0; 112, *Homoreda murina*, male, x12.0 (showing prominent tooth, 't', on either side of prosternal canal).

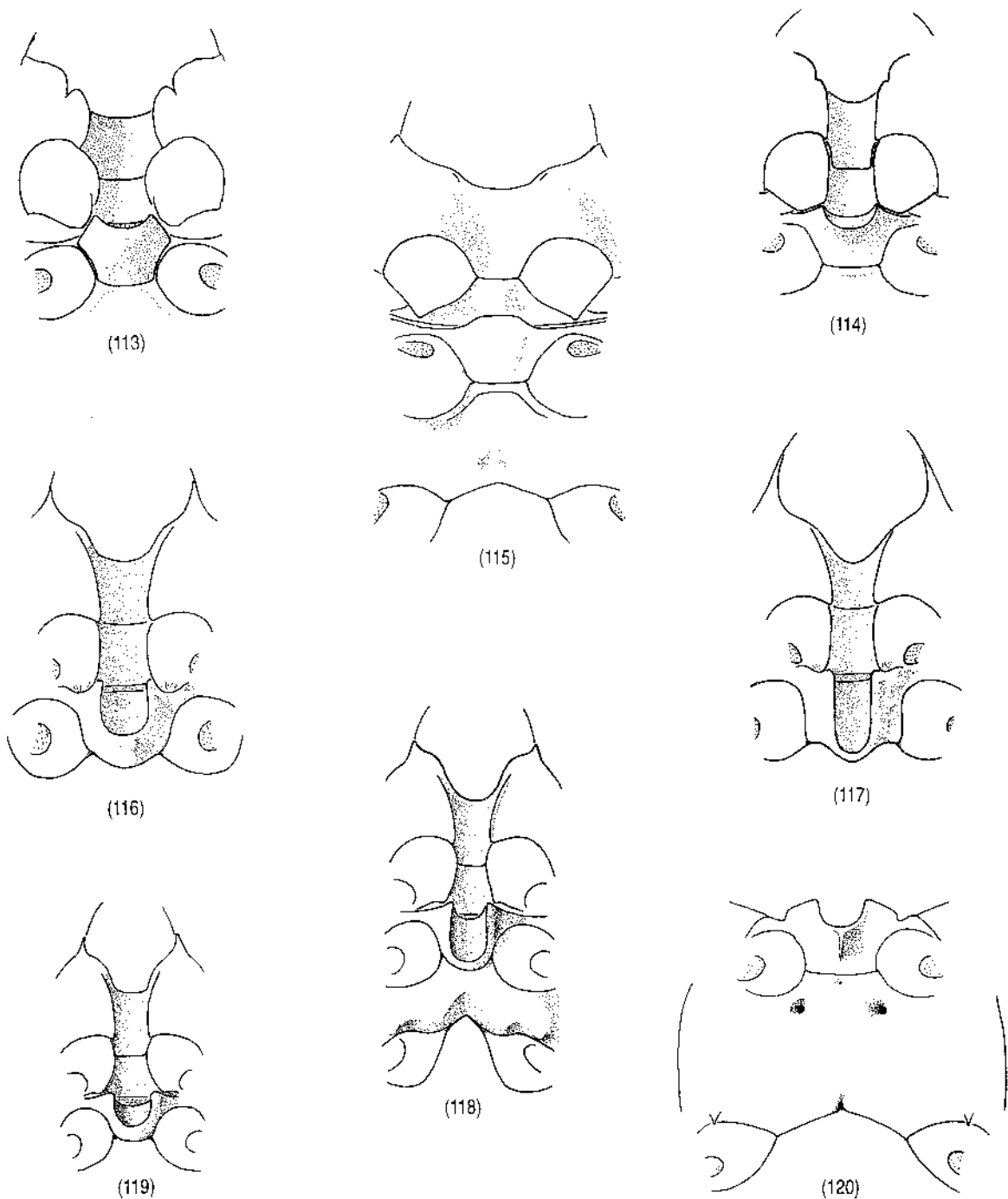


Fig. 113–119 Prothorax and mesothorax, ventral, of: 113, *Oreda notata*, female, x13.6; 114, *Mesoreda sulcifrons*, female, x18.4; 115, *Psepholax macleayi*, including metathorax, x14.4; 116, 117, *Baeorhynchodes cristatus*, male, x22.4, and female, x11.2; 118, *Rhynchodes ursus*, female, including metathorax, x6.4; 119, *R. ursus*, male, x4.0. **Fig. 120**, *Mitrastethus baridioides*, female, meso- and metathorax, x20.8.

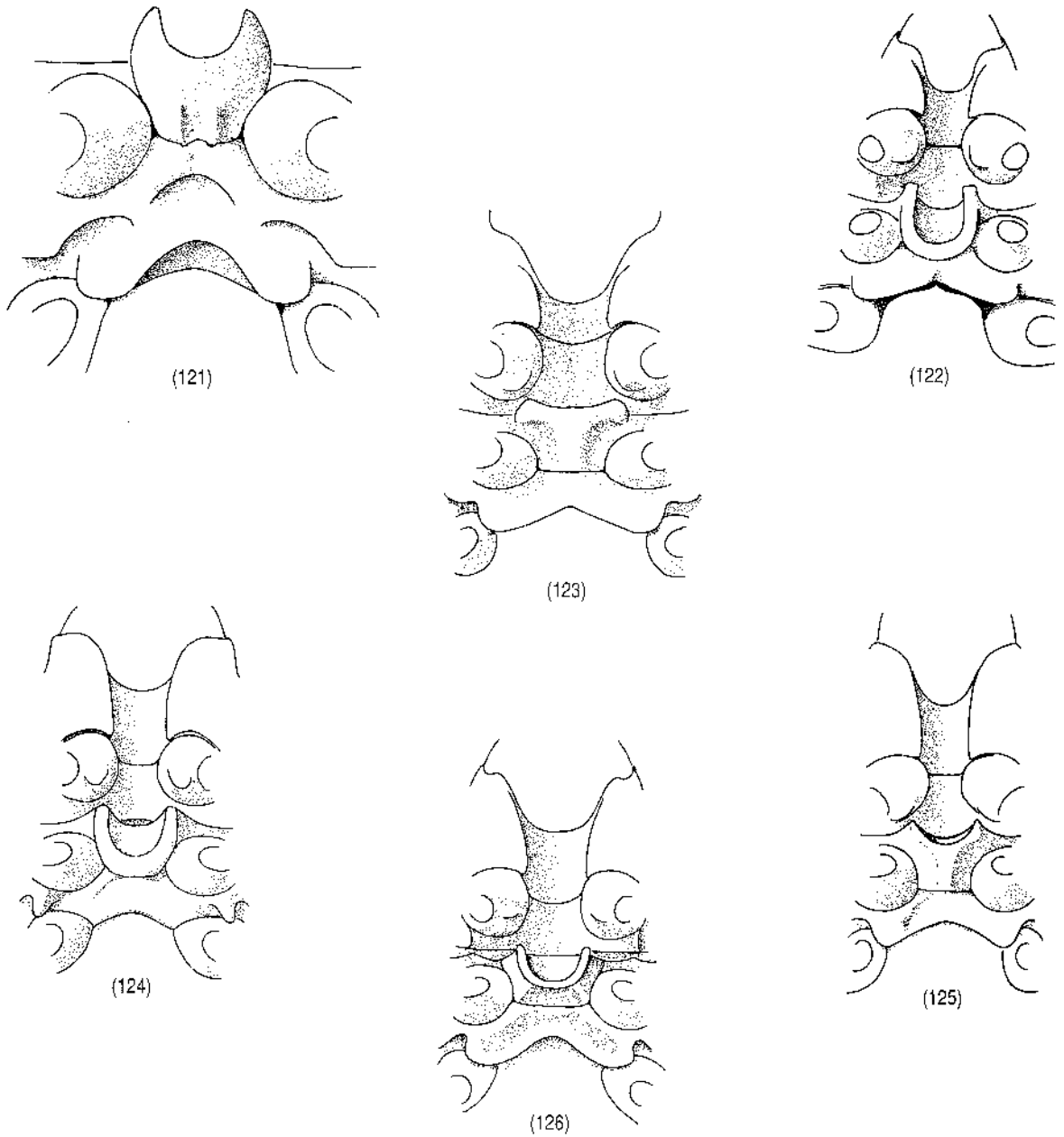


Fig. 121–126 Thorax, ventral, of: 121, *Ectopsis ferrugalis*, female, mesosternal receptacle and metasternum, x16.4; 122, *Hadracalles fuliginosus*, male, x10.0; 123, *Tychanopais dealbatus*, male, x20.4; 124, *Tychanus gibbus*, male, x14.0; 125, *Tychanus vexatus*, female, x17.6; 126, *Clypeolus dux*, male, x14.0.

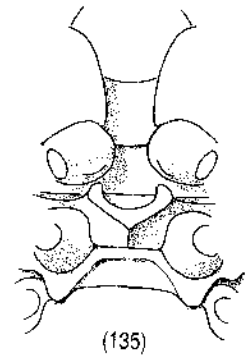
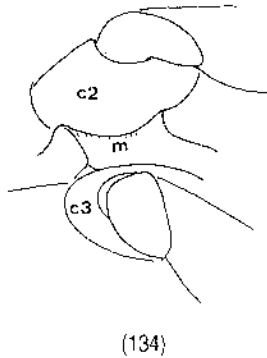
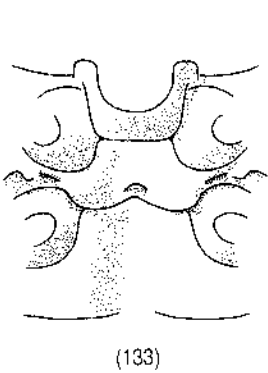
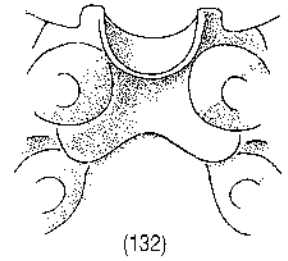
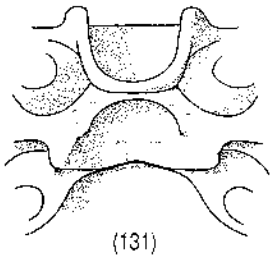
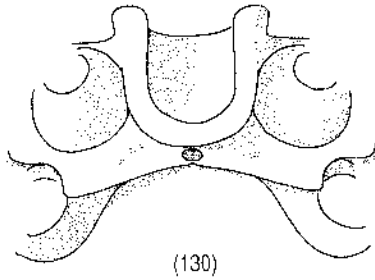
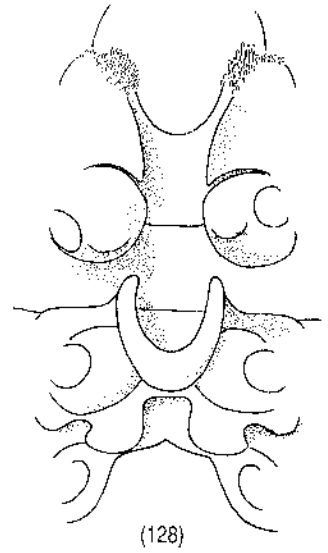
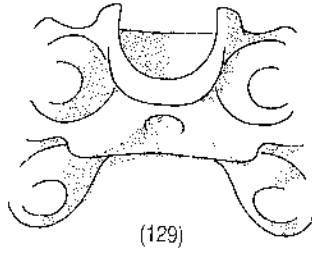
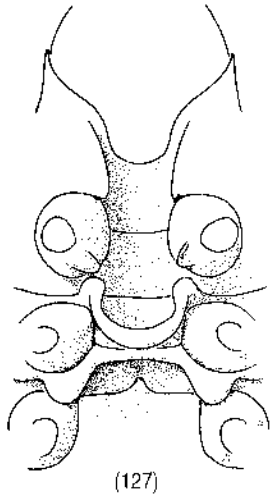


Fig. 127–135 Thorax, ventral, of: 127, *Hliracalles scitus*, female, x29.2; 128, *Indecentia nubila*, female, x21.8; 129, *Crisius latirostris*, male, meso- and metathorax, x31.2; 130, *Crisius variegatus*, female, meso- and metathorax, x20.4; 131, *Crisius zenomorphus*, male, meso- and metathorax, x31.2; 132, *Whitiacalles ignotus*, male, meso- and metathorax, x36.0; 133, 134, *Scelodolichus flectipes*, female, meso- and metathorax, x28.8, and metasternum between middle and hind coxae, postero-ventral (key: c2, c3 - middle and hind coxae; m - metasternum, showing carinate 'saddle' between raised parts); 135, *Crooktocalles certus*, female, x22.4.

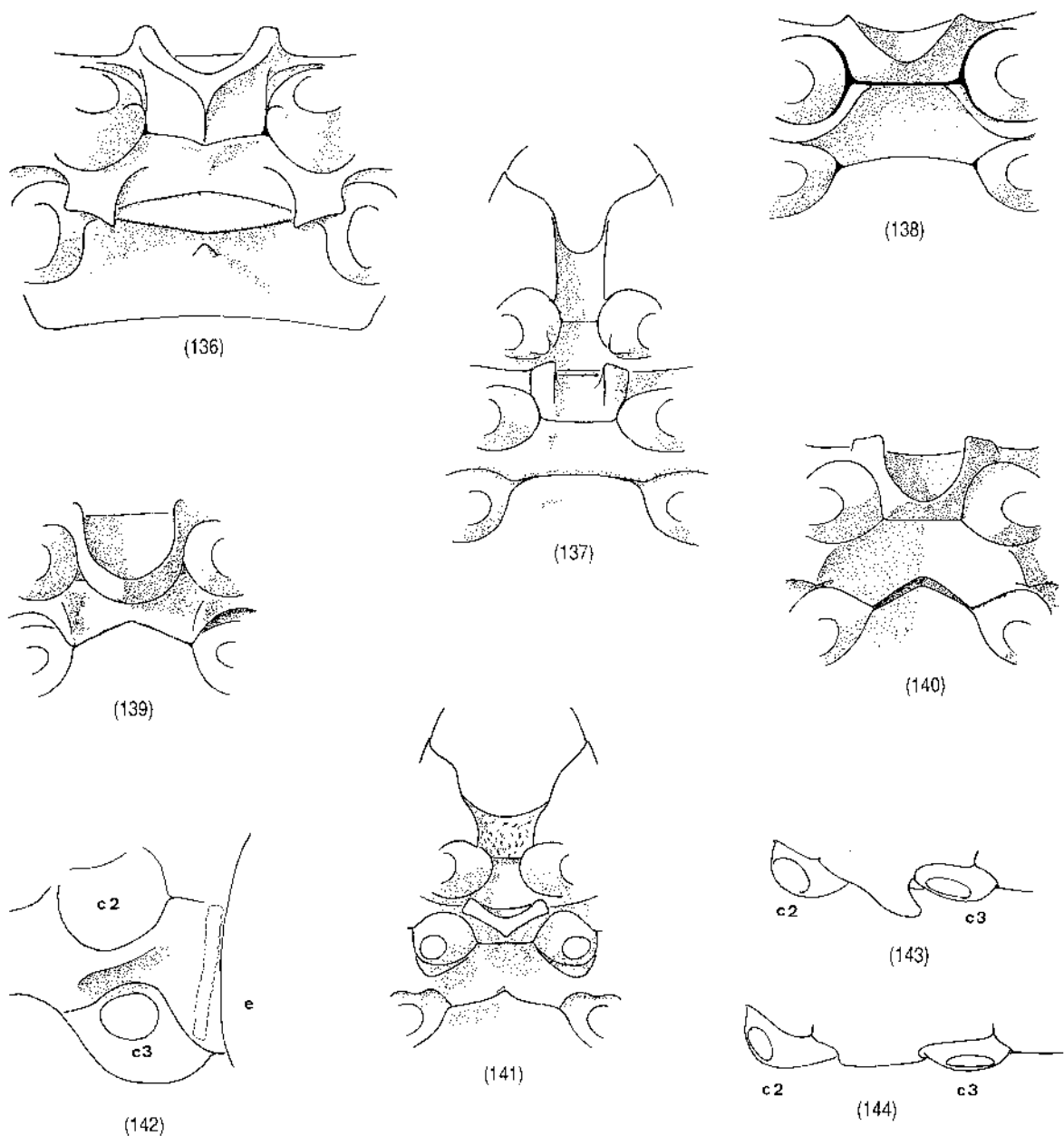


Fig. 136–141 Thorax, ventral, of: 136, *Crooktocalles abruptus*, male, meso- and metathorax, x41.6; 137, *Omoecalles perspicuus*, female, x25.6; 138, *Allanalcis aulacus*, female, meso- and metathorax, x48.0; 139, *Rainacalles volens*, meso- and metathorax, x40.0; 140, *Pachyderris triangulatus*, female, meso- and metathorax, x32.0; 141, *Ampagia rudis*, male, x32.0. **Fig. 142** *Adstantes rudis*, male, metasternum between middle and hind coxae, oblique view from posterior, x80.0. **Fig. 143, 144** Mesothorax, lateral oblique, showing outline of sternum between coxae: (143) *Microcryptorhynchus (M.) latitarsis*, male; (144) *Microcryptorhynchus (Notacalles) piciventris*, male. **Key:** c2, c3 - middle and hind coxae; e - elytron.

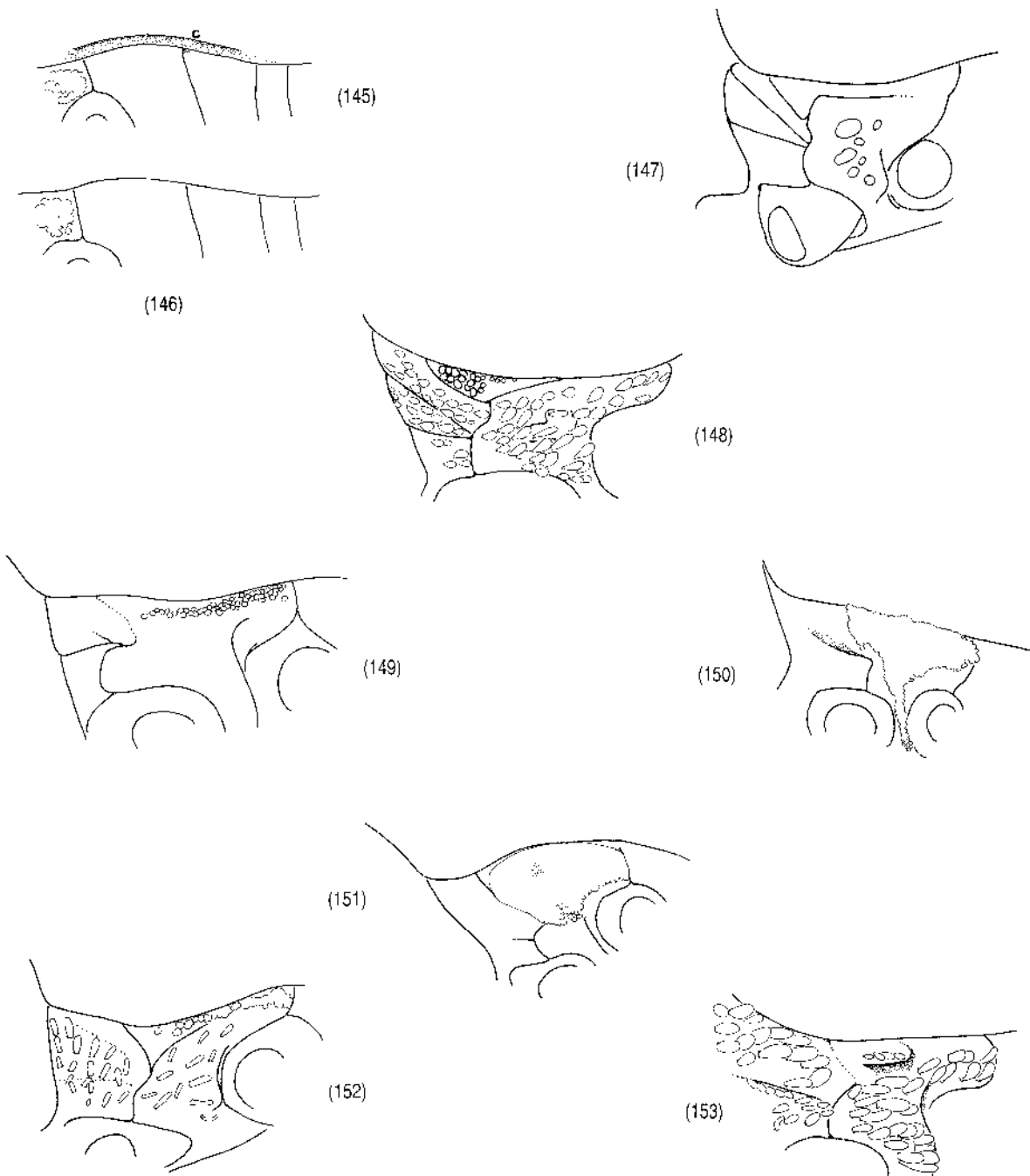


Fig. 145, 146 *Andracalles canescens*, elytral margin, ventrolateral, x5.6, showing carina ('c') present in male (145) and absent in female (146). **Fig. 147** *Andracalles fuliginosus*, female, meso- and metathorax, lateral, x15.2, showing metathoracic fovea. **Fig. 148–153** Mesosternum and metasternum, lateral, showing distribution of specialised scales: 148, *Hiracalles dolosus*; x48; 149, *Maneneacalles concinnus*, male, x51; 150, *Dermothrius ruficollis*, male, x66; 151, *Paromalia vestita*, male, x31; 152, *Agacalles formosus*, male, x56; 153, *Allanaicis eruensis*, male, x65.

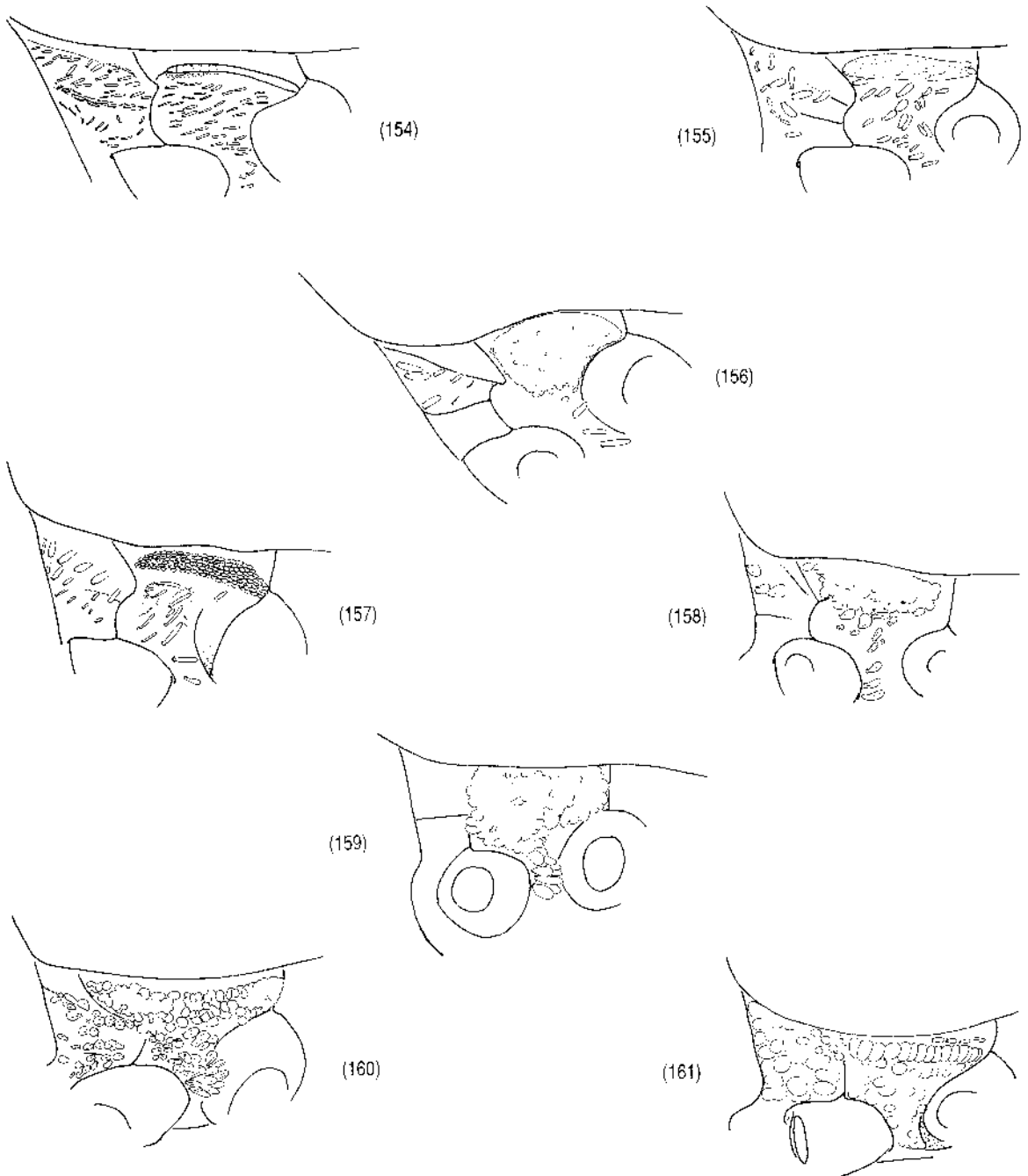


Fig. 154–163 Mesosternum and metasternum, lateral, showing distribution of specialised scales: 154, *Zeacalles lepidulus*, male, x56; 155, *Zeacalles* sp. cf. *cordipennis*, male, x62 (broadened anapleural suture indicated by lightly stippled area). 156, *Zeacalles picatus*, male, x64; 157, *Zeacalles* sp. cf. *albipictus*, male, x62; 158, *Postacalles rangirua*, male, x64; 159, *Trinodicalles* sp., x46; 160, *Patellitergum rectirostre*, male, x69; 161, *Adstantes rudis*, male, x80 (detail of non-specialised scales omitted); 162, *Microcryptorhynchus (M.) latitarsis*, male, x76; 163, *Andracalles pani*, x52 (detail of non-specialised scales largely omitted).

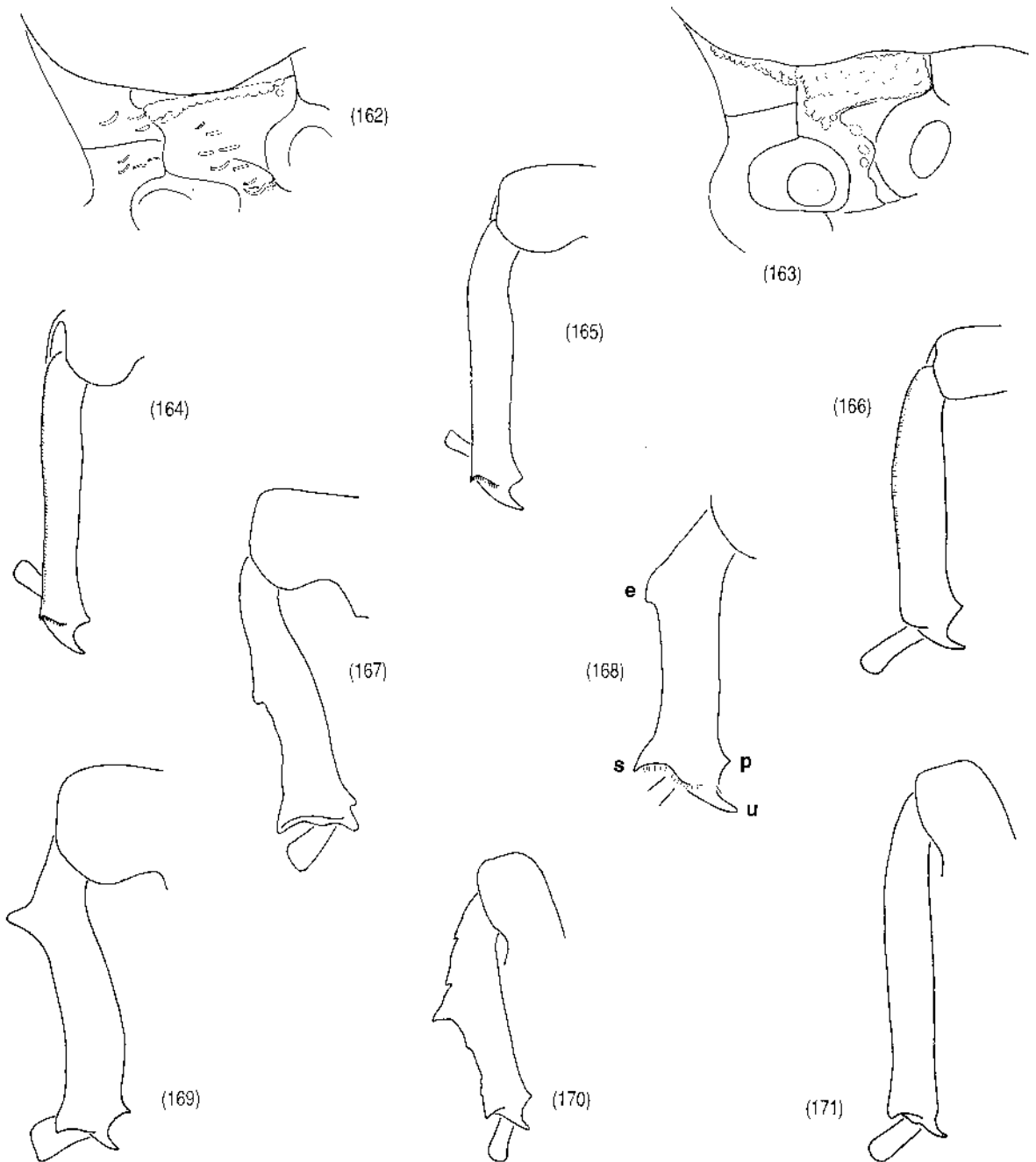


Fig. 164–171 Legs of: 164, 165, *Nothaldonus peacei*, female, fore tibia, anterodorsal, x13.6, and hind tibia, anterior (external), x13.6; 166, *Strongylopterus hylobioides*, male, middle tibia, anterior, x12.8; 167, *Homoreda murina*, male, hind tibia, anterior, x17.2; 168, *Oreda notata*, male, middle tibia, anterior, x6.0 (key: e - external tooth; p - premucro; s - supra-uncal projection; u - uncus); 169, *Mesoreda sulcifrons*, male, hind tibia, anterior, x24.0; 170, 171, *Psepholax tibialis*, male, middle and hind tibiae, anterior, x7.8.

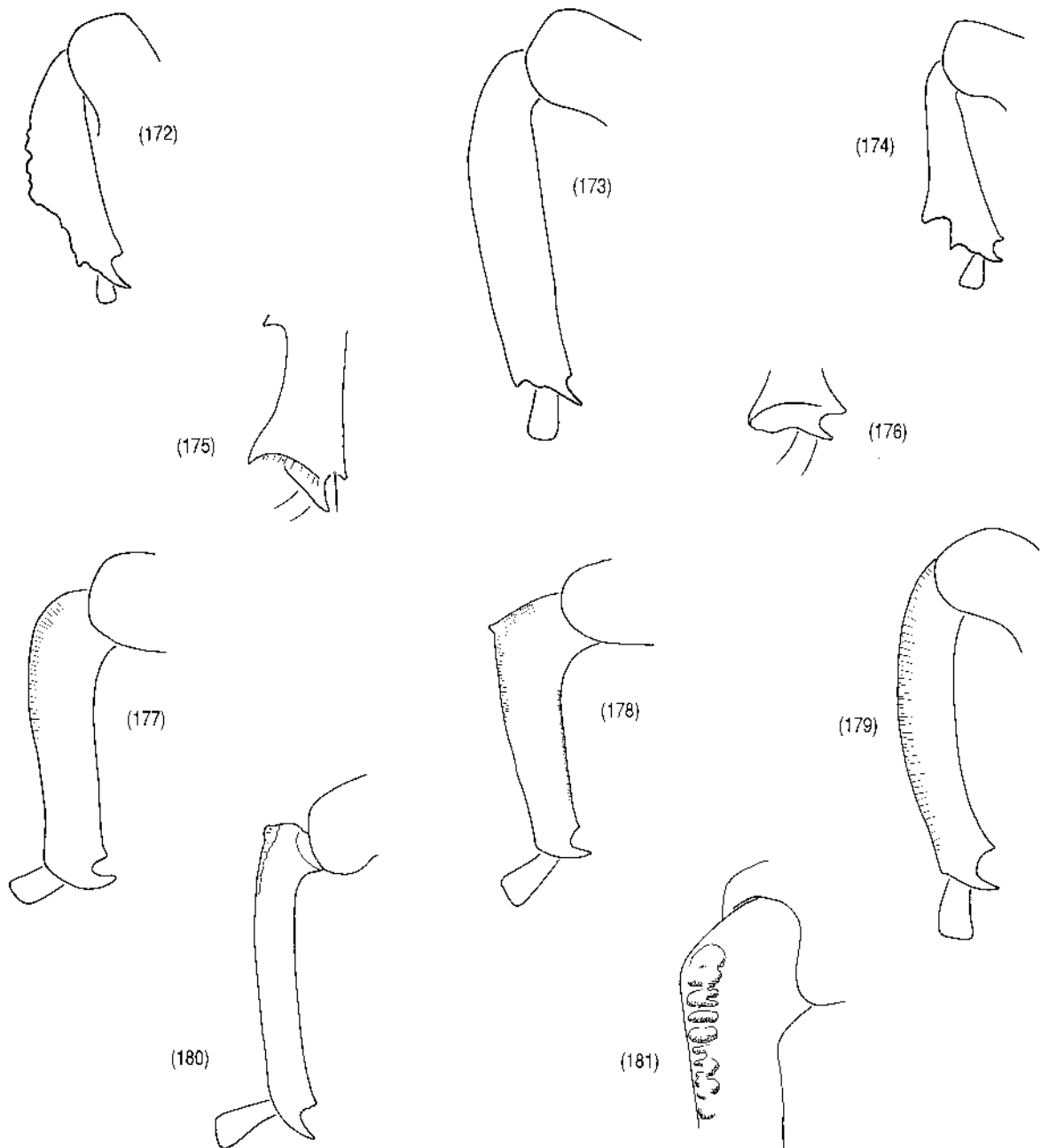


Fig. 172–181 Legs of: 172, 173, *Psepholax tibialis*, female, middle and hind tibiae, anterior, x7.8/x7.6; 174, *Psepholax macleayi*, male, middle tibia, anterior, x7.6; 175, 176, *Psepholax crassicornis*, hind tibial apex, anterior and anteroventral, x48; 177, 178, *Baeorhynchodes cristatus*, female, fore and middle tibiae, anterior, x34; 179, *Eutyrrhinus squamiger*, male, fore tibia, anterior, x12.8; 180, 181, *Rhynchodes ursus*, middle tibia, anterior, and detail of base, anterodorsal, x82.

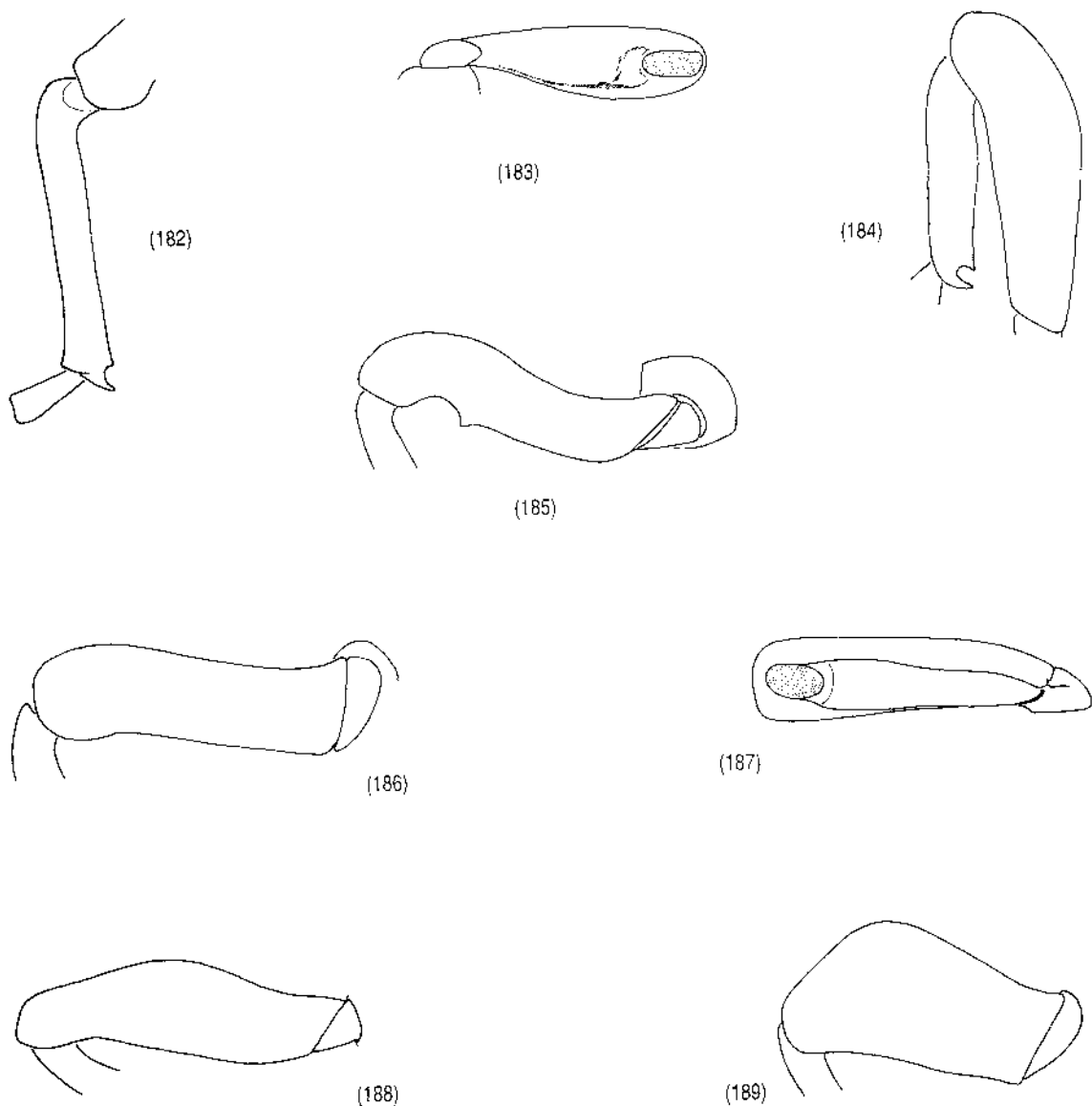


Fig. 182–189 Legs of: 182, *Rhynchodes ursus*, hind tibia, anterior, x82 (smaller specimen than figured for middle tibia); 183, *Hadracalles fuliginosus*, male, fore femur, ventral, x12.0 (anterior face to top of figure; stippling represents cavity left by removal of tibia); 184, *Maneneacalles concinnus*, male, fore femur and tibia, anterior, x51; 185, *Scelodolichus lineithorax*, female, hind femur, anterior, x37; 186, 187, *Crooktacalles certus*, male, hind femur, anterior and ventral, x43 (conventions as for Fig. 183); 188, *Omoecalles crisioides*, female, hind femur, anterior, x50; 189, *Ampagia rudis*, male, hind femur, x50.

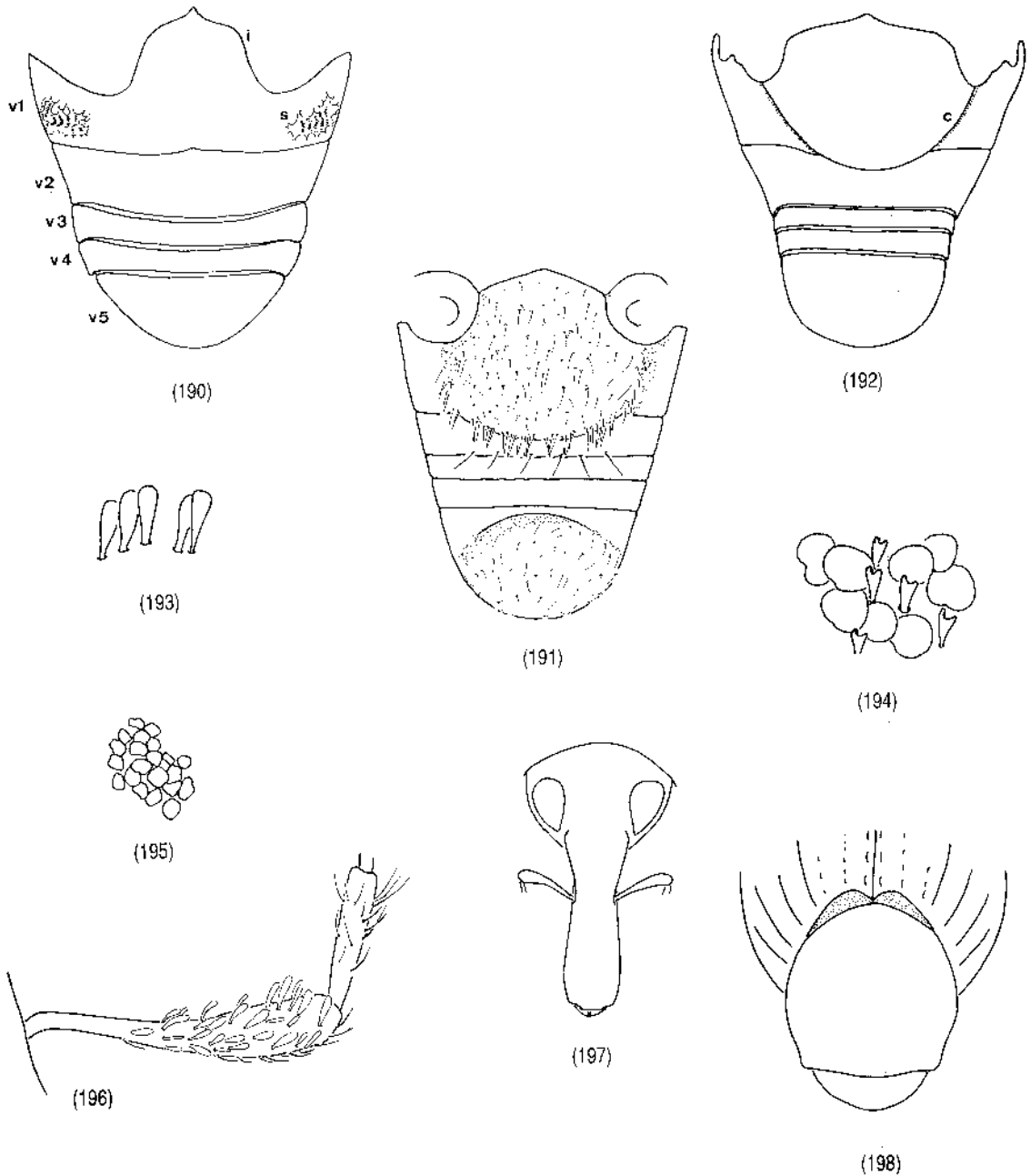


Fig. 190 *Sympedius testudo*, female, abdomen, ventral, x29, showing glabrous patches. Key: s - glabrous 'stridulatory' patch; V1 - ventrite 1 (= sternite III); V2-V5 - ventrites 2-5. **Fig. 191** *Zeacalles igneus*, male, abdomen, ventral, x49. **Fig. 192** *Ampagia rudis*, male, abdomen, ventral, x42. Key: c - carina on ventrite 1. **Fig. 193, 194** *Hiracalles dolosus*, pronotal erect scales, lateral, x60, and erect and appressed scales, dorsal, x62. **Fig. 195** *Maneneacalles concinnus*, male, circular scales on pronotal disc, x52. **Fig. 196** *Clypeolus dux*, male, antennal scape and 1st funicle segment, dorsal, x43. **Fig. 197** *Didymus intutus*, female, head, dorsal, x22. **Fig. 198** *Metacalles aspersus*, female, pronotum and base of elytra, anterodorsal, x29.6; vertical face of raised base of interstriae 2 and 3 stippled.

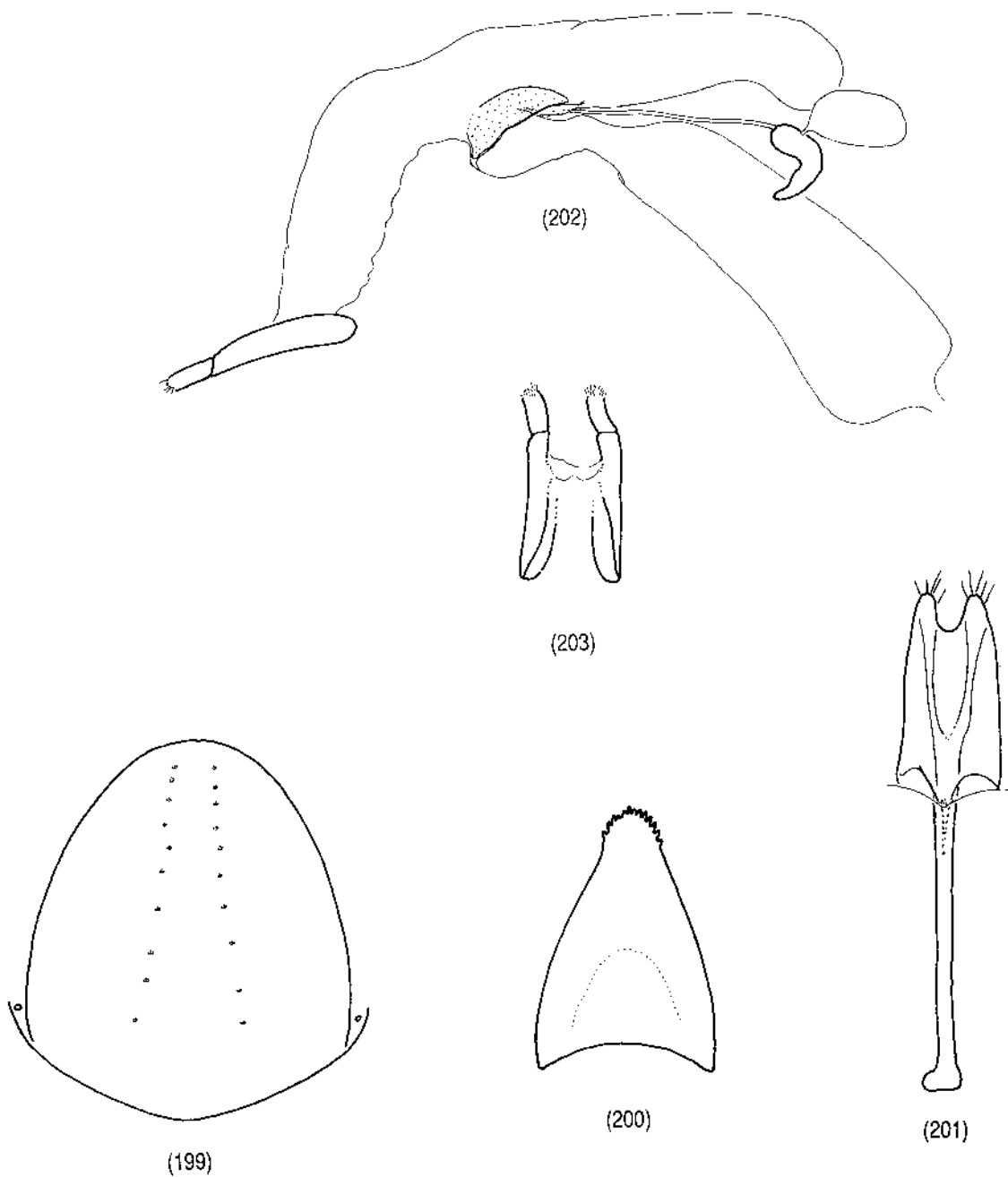
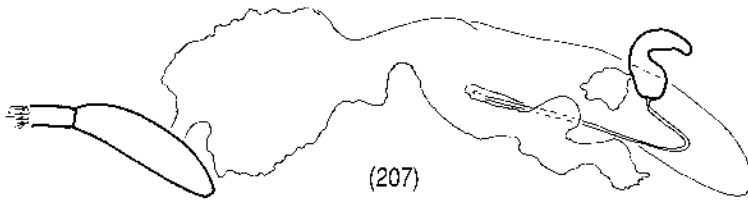
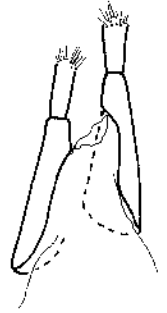


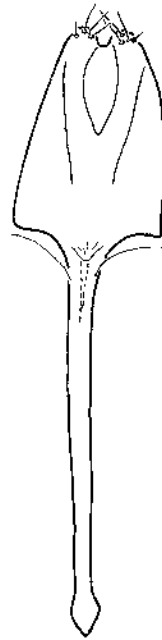
Fig. 199–203 *Nothaidonus peacei*, female terminalia, x32: 199, 200, tergites VII and VIII, dorsal; 201, sternite VIII, ventral; 202, genitalia, lateral; 203, hemisternites, dorsal.



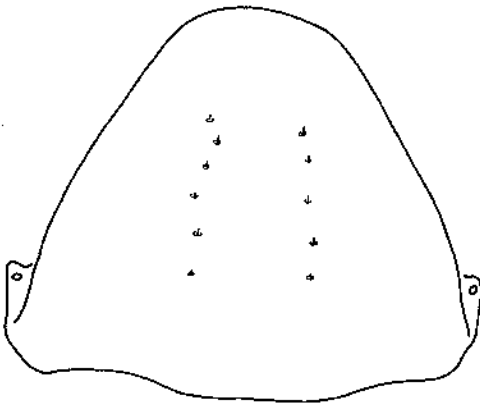
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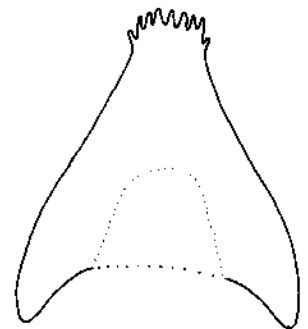
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Fig. 204–208 *Strongylopterus hylobioides*, female terminalia, x49: 204, 205, tergites VII and VIII, dorsal; 206, sternite VIII, ventral; 207, genitalia, lateral (not expanded); 208, hemisternites, dorsal.

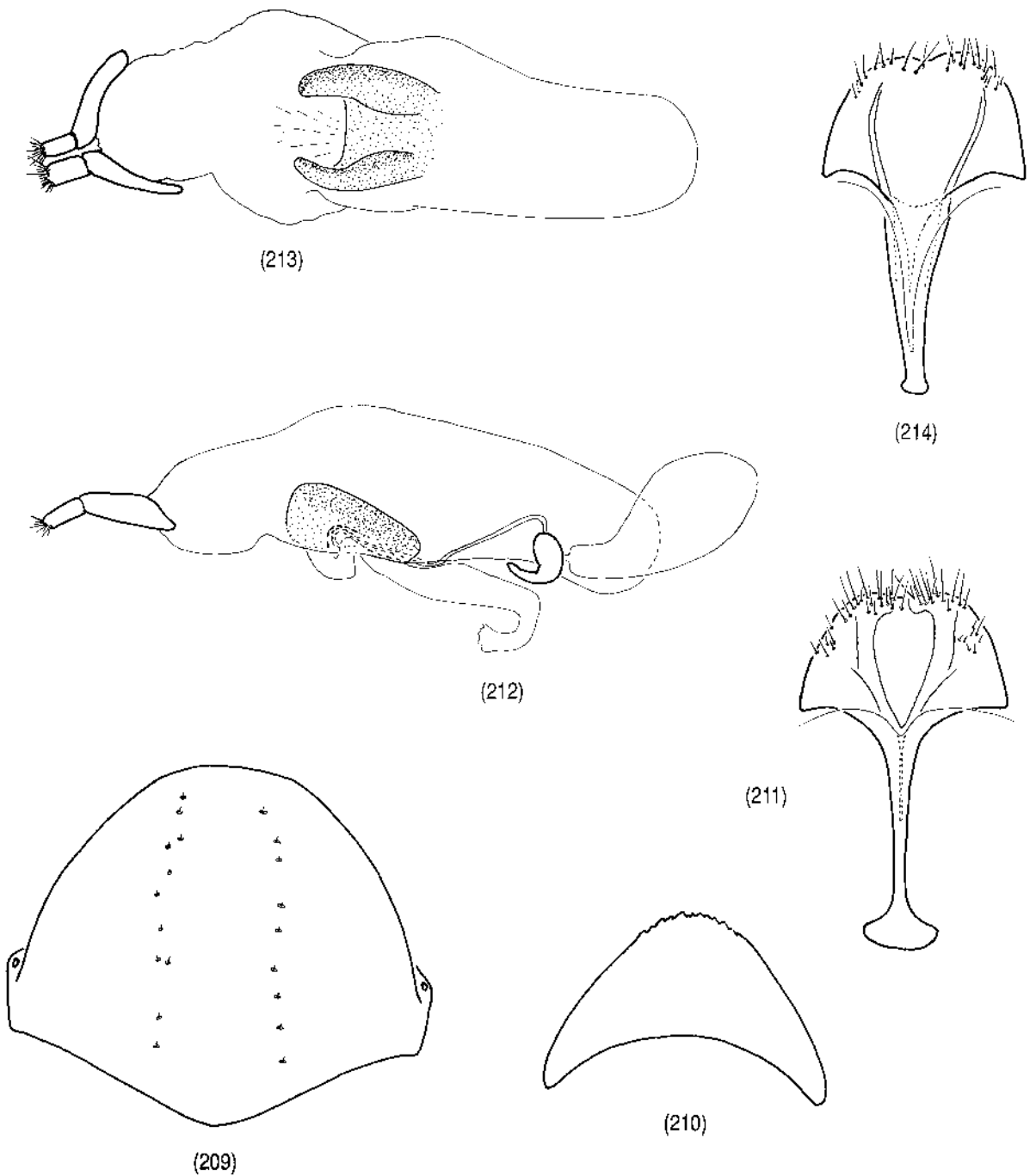


Fig. 209–213 *Homoreda murina*, female terminalia, x32: 209, 210, tergites VII and VIII, dorsal; 211, sternite VIII, ventral; 212, 213, genitalia, lateral and dorsal (one hemisternite slightly twisted, so narrower dorsolateral aspect of stylus figured). **Fig. 214** *H. flavisetosa*, sternite VIII, ventral, x34.

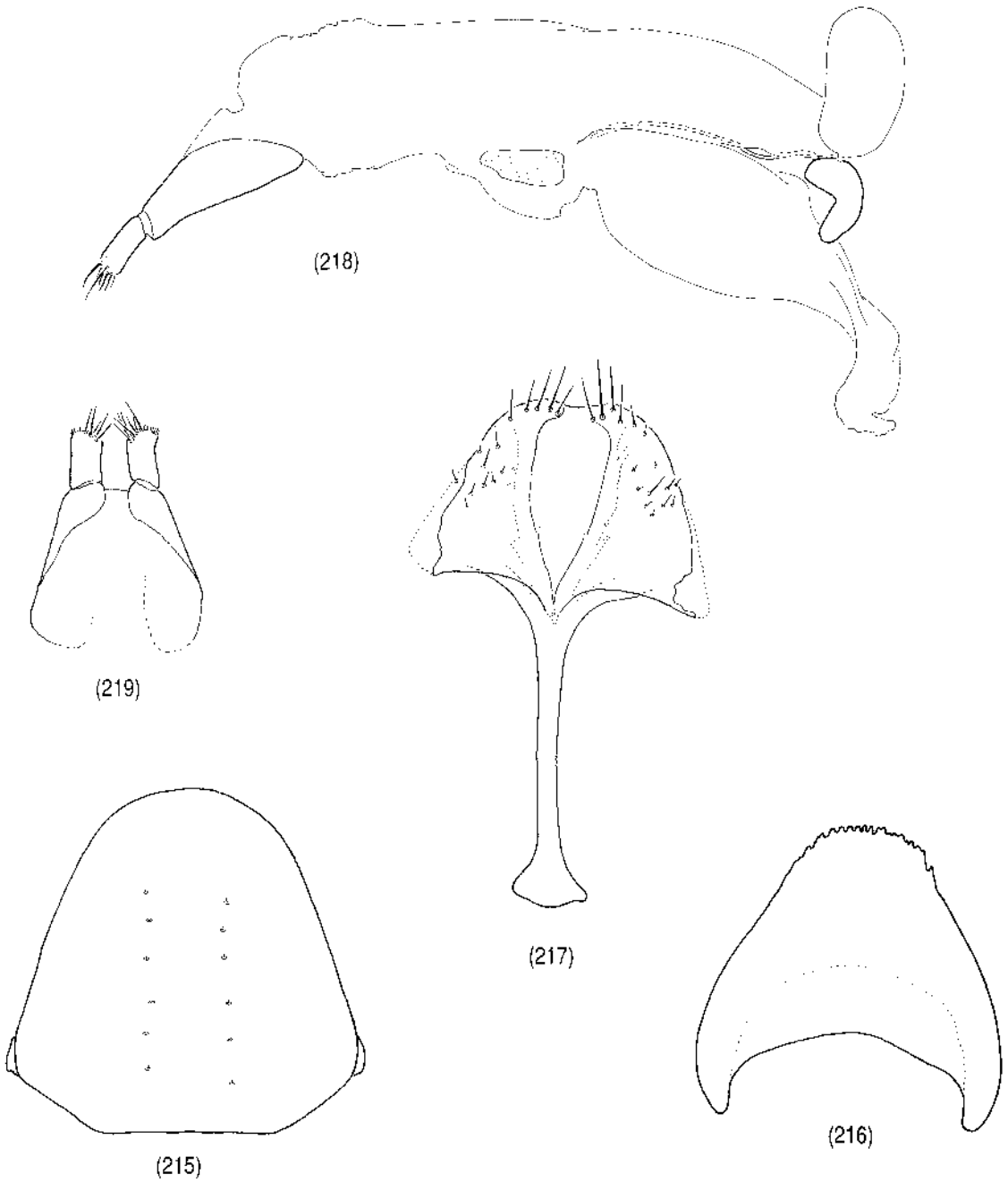


Fig. 215–219 *Oreda notata*, female terminalia: 215, 216, tergites VII (x36) and VIII (x55), dorsal; 217, sternite VIII, ventral (x55); 218, 219, genitalia, lateral and dorsal (x55).

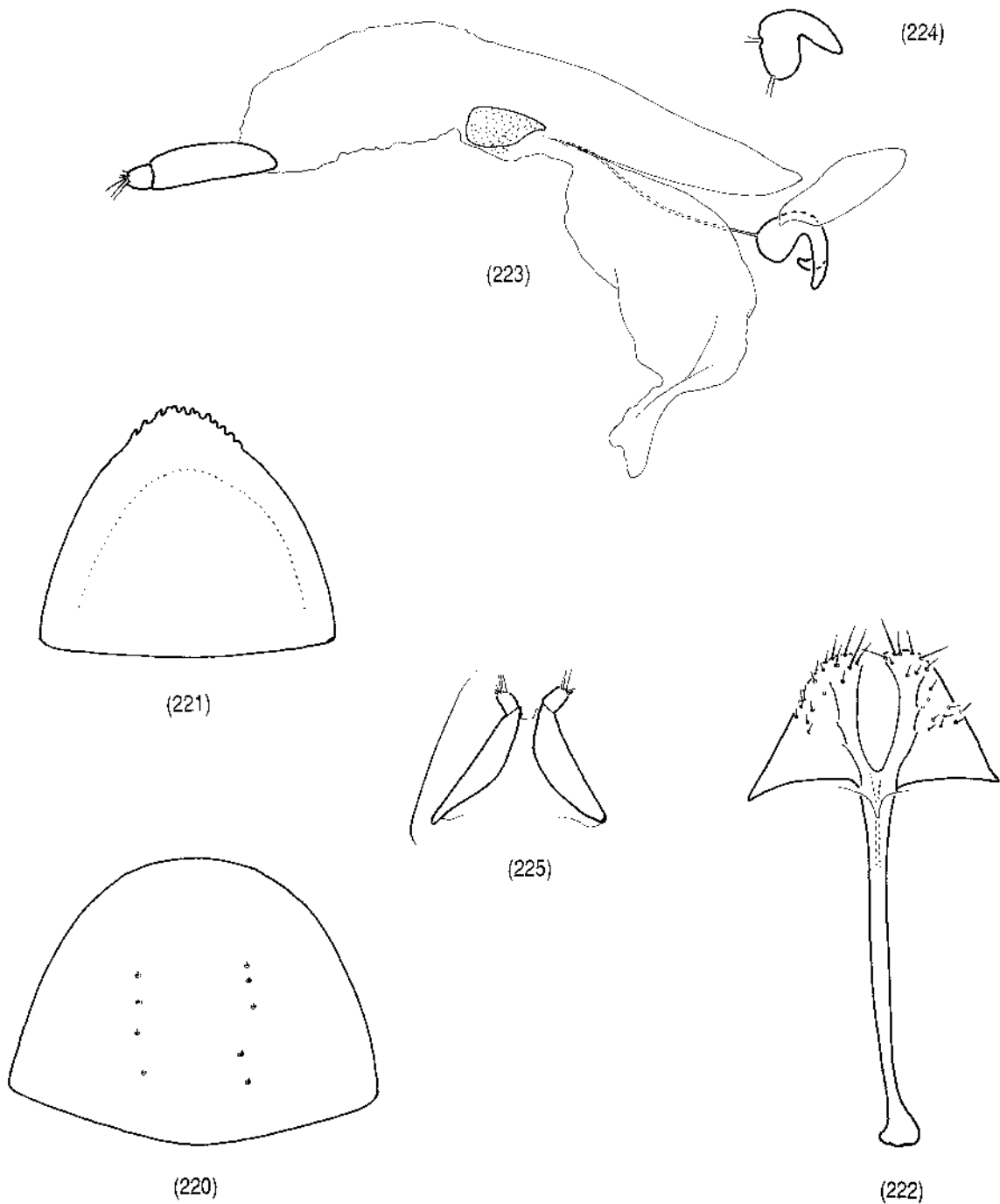


Fig. 220–225 *Mesoreda orthorhina*, female terminalia: 220, 221, tergites VII (x53) and VIII (x70), dorsal; 222, sternite VIII, ventral (x70); 223, genitalia, lateral, x55 (note aberrant bifurcate spermatheca); 224, 'normal' spermatheca, x55; 225, hemisternite, dorsal, x55.

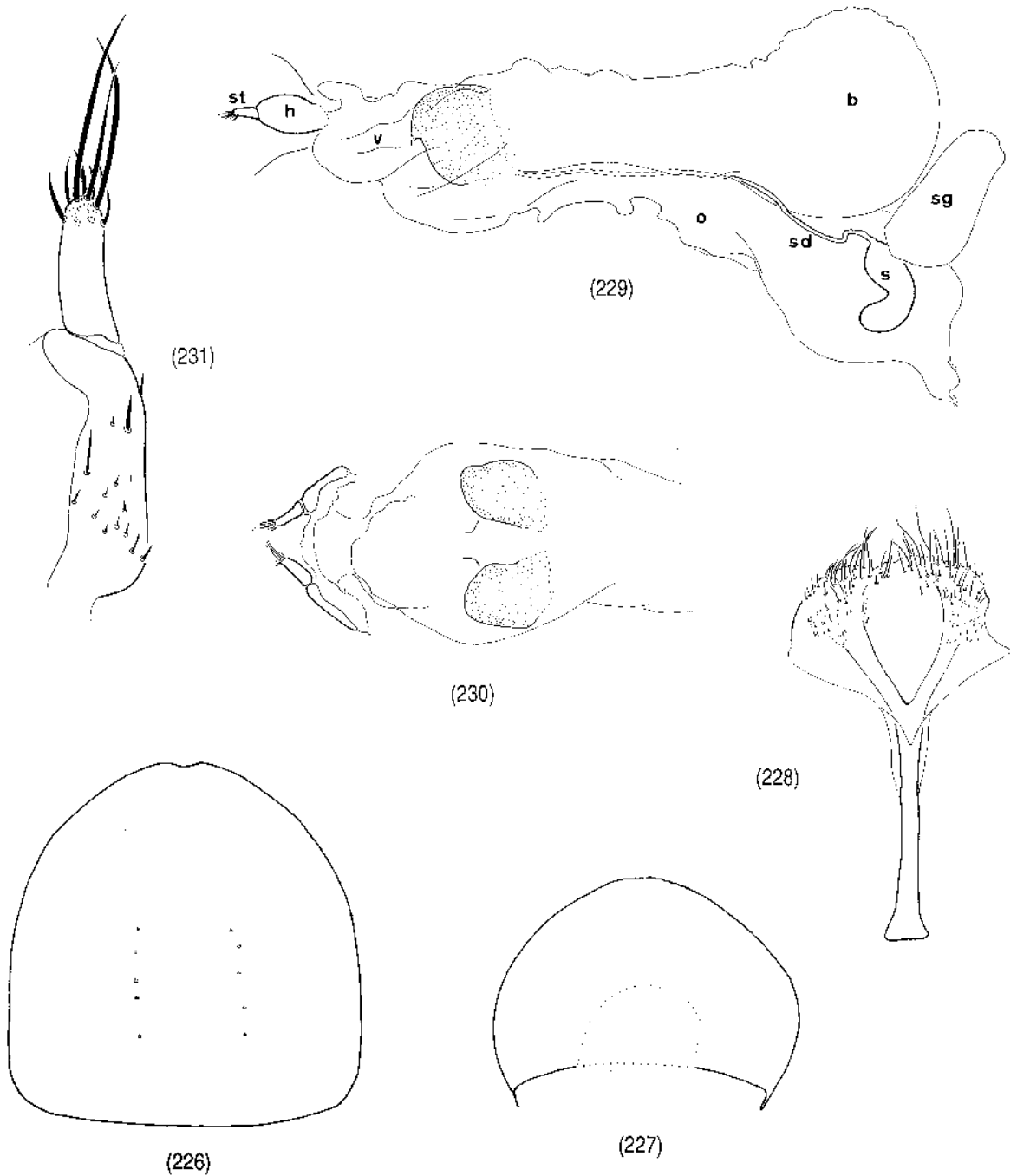
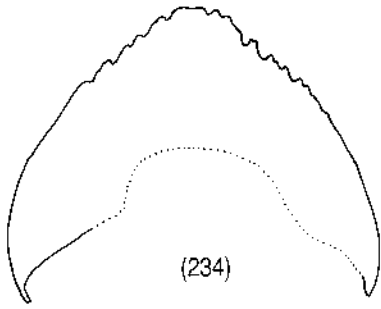
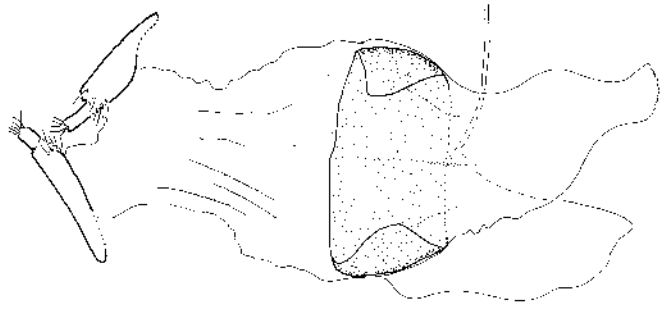


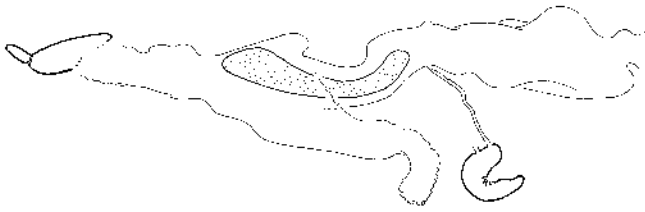
Fig. 226–231 *Psepholax* sp. nr *tibialis*, female terminalia: 226, 227, tergites VII (x30) and VIII (x39), dorsal; 228, sternite VIII, ventral, x30; 229, genitalia, lateral, x31 (key: b - bursa; h - hemisternite of ovipositor; o - oviduct; s - spermatheca; sd - spermathecal duct; sg - spermathecal gland; st - stylus; v - vagina); 230, posterior part of genitalia, dorsal, x30, showing hemisternites and sclerites; 231, hemisternite, dorsal, x131.



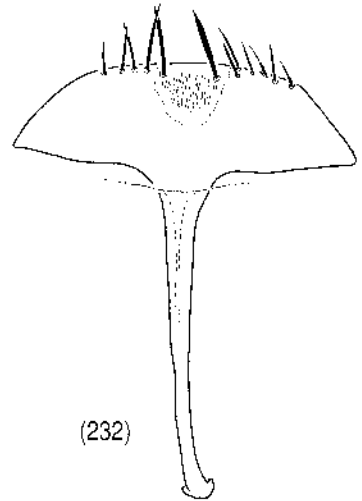
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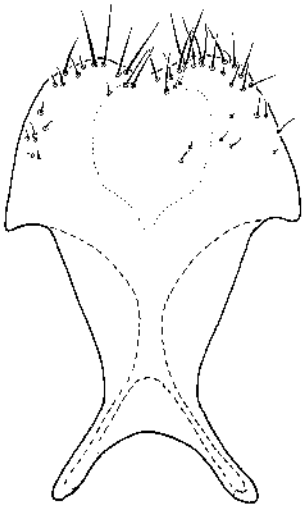
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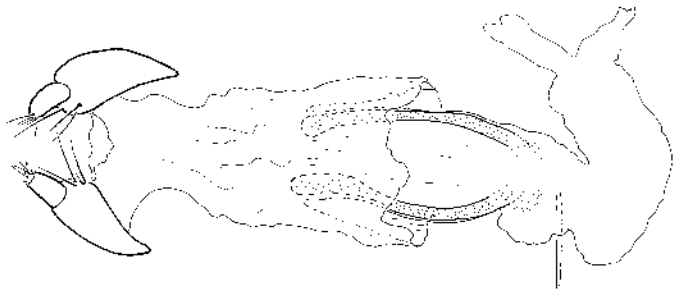
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Fig. 232 *Psepholax simplex*, sternite VIII, ventral, x83. **Fig. 233** *Psepholax femoratus*, genitalia, dorsal, x47. **Fig. 234–237** *Psepholax coronatus*, female terminalia: 234, tergite VIII, dorsal, x49; 235, sternite VIII, ventral, x49; 236, 237, genitalia, lateral (x35) and ventral (x47) (vagina and bursa collapsed, so full expansion not visible).

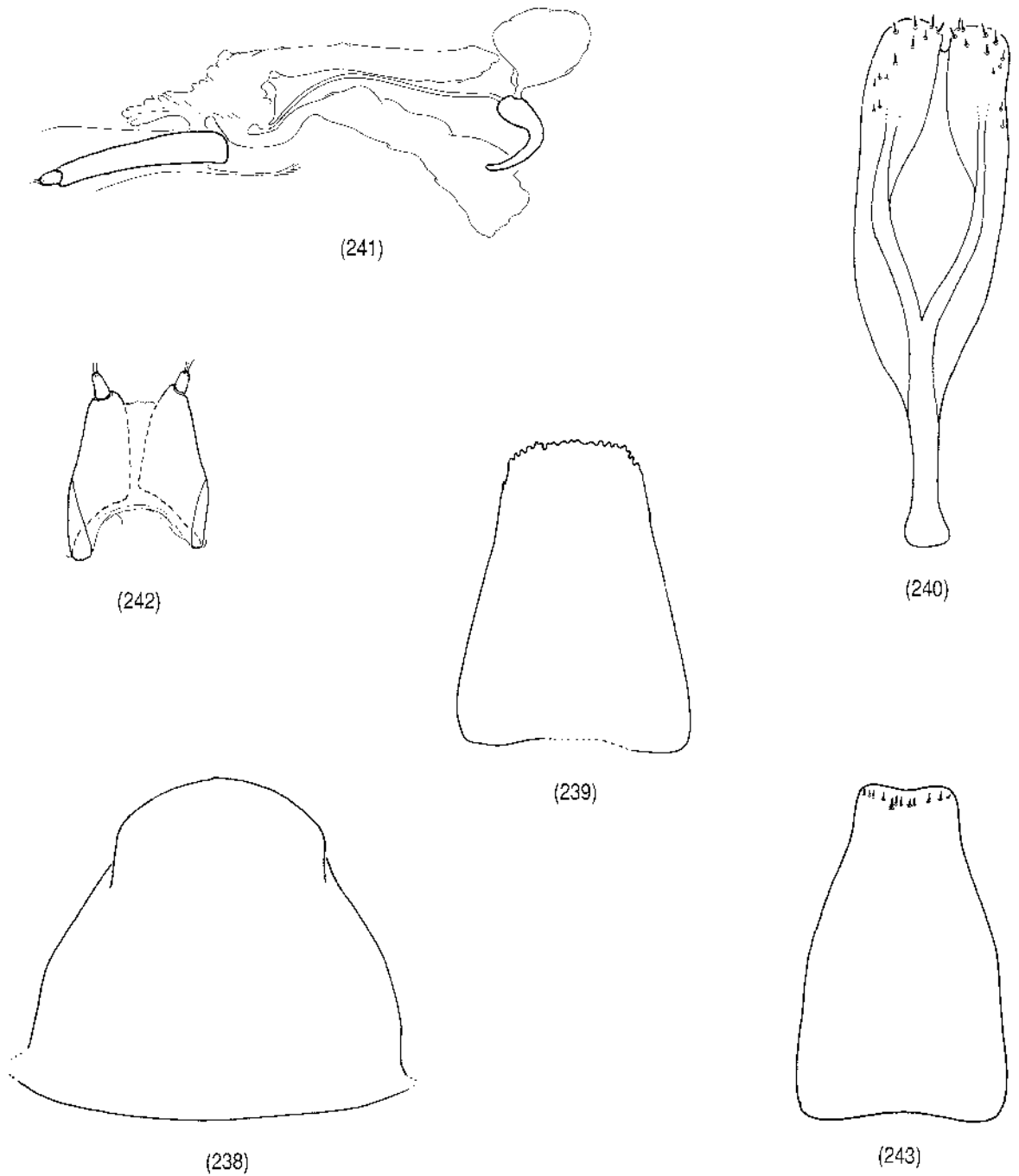


Fig. 238–242 *Sympedius testudo*, female terminalia, x67: 238, 239, tergites VII and VIII, dorsal; 240, sternite VIII, ventral; 241, genitalia, lateral (bursa and vagina not expanded); 242, hemisternites, dorsal. Fig. 243 *S. bufo*, tergite VIII, dorsal, x50.

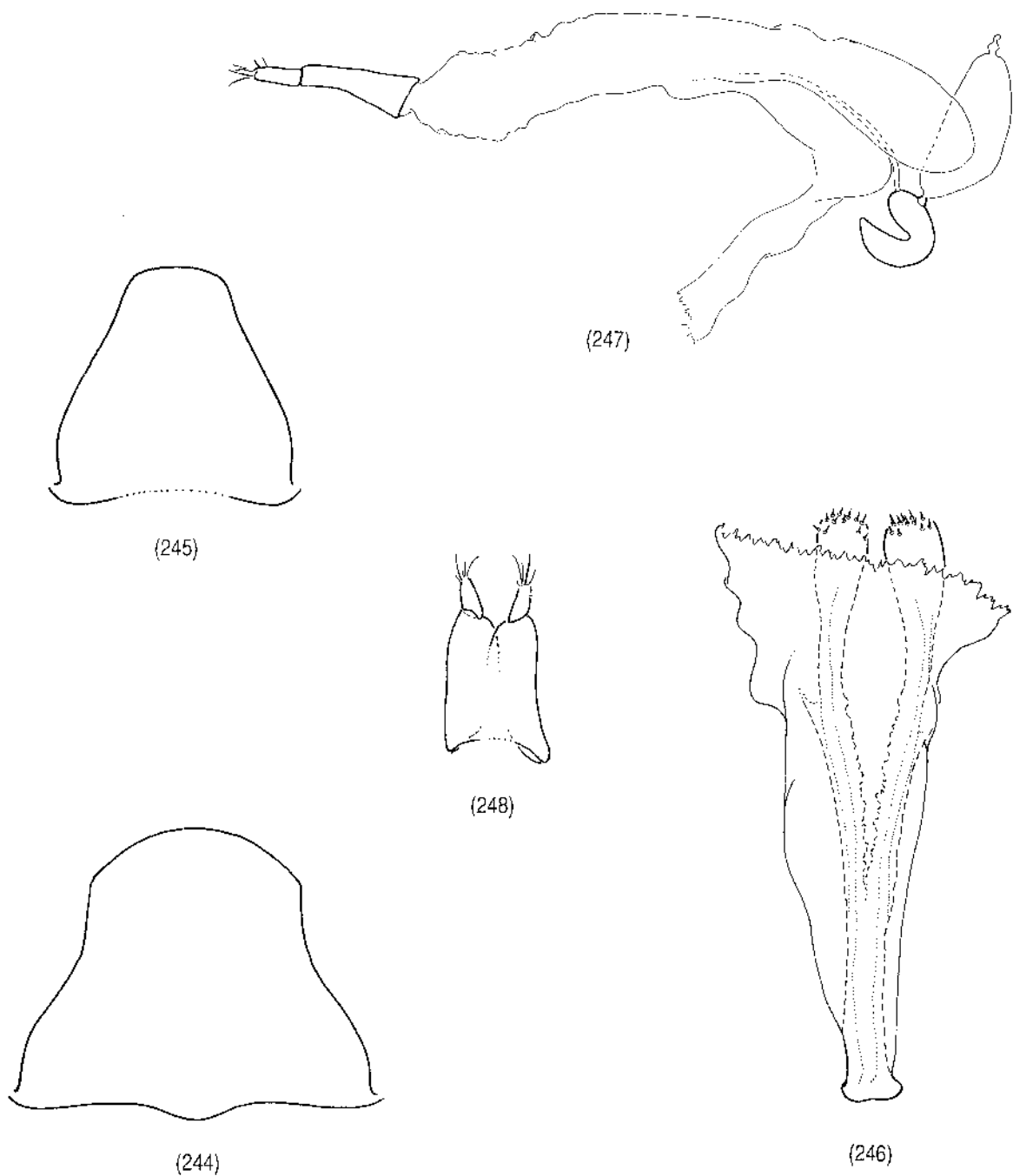


Fig. 244–248 *Baorhynchodes cristatus*, female terminalia: 244, 245, tergites VII and VIII, dorsal, x72; 246, sternite VIII, ventral, x72; 247, genitalia, lateral, x65; 248, hemisternites, ventral, x65.

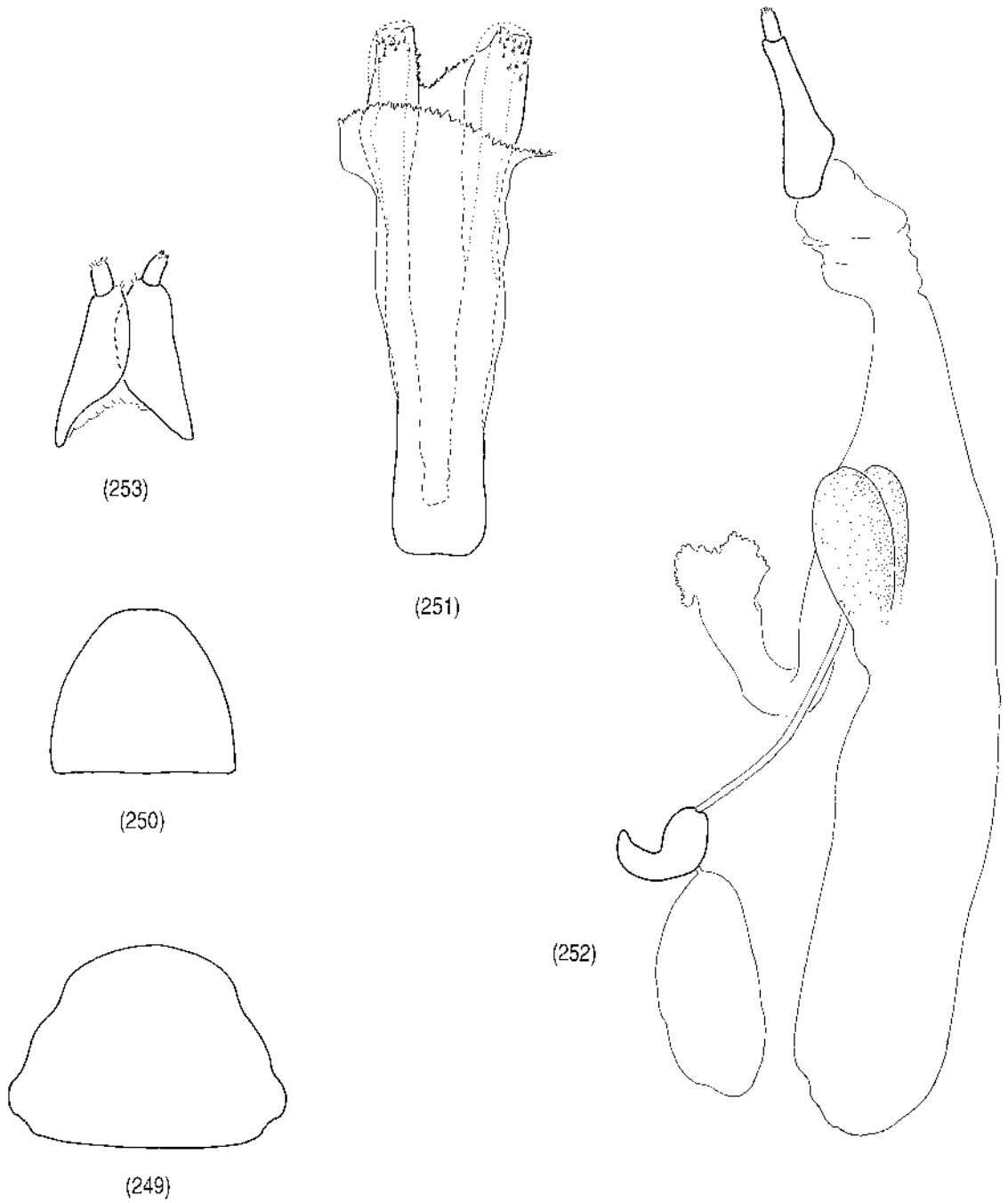


Fig. 249–253 *Eutyrrhinus squamiger*, female terminalia: 249, 250, tergites VII and VIII, dorsal, x38; 251, sternite VIII, ventral, x43; 252, genitalia, lateral, x53; 253, hemisternites, dorsal, x43.

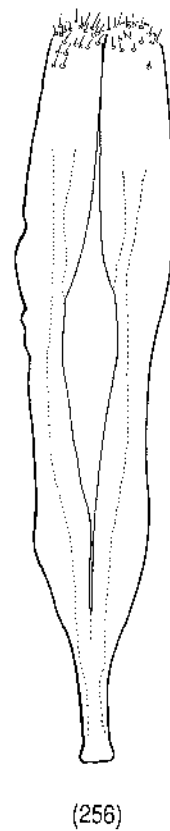
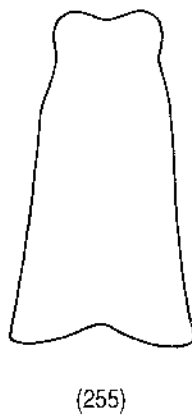
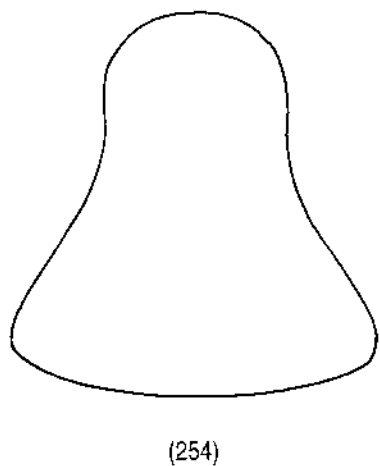
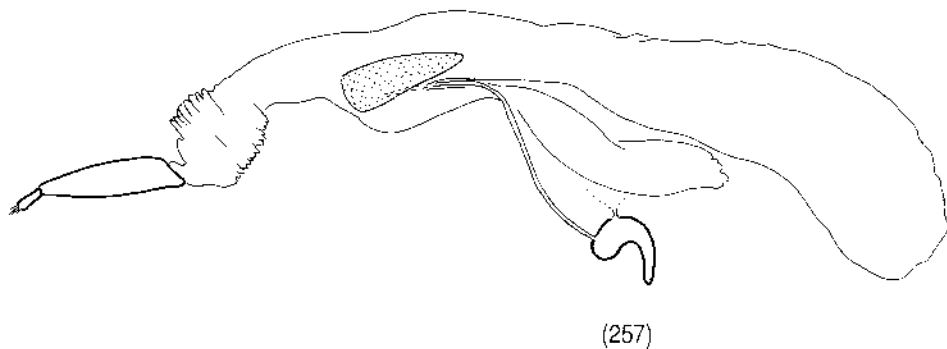


Fig. 254–258 *Rhynchodes ursus*, female terminalia: 254, 255, tergites VII and VIII, dorsal, x16.8; 256, sternite VIII, ventral, x24 (membrane removed; cf. Fig. 251, *Eutyrrhinus squamiger*); 257, genitalia, lateral, x12; 258, hemisternites, dorsal, x20.

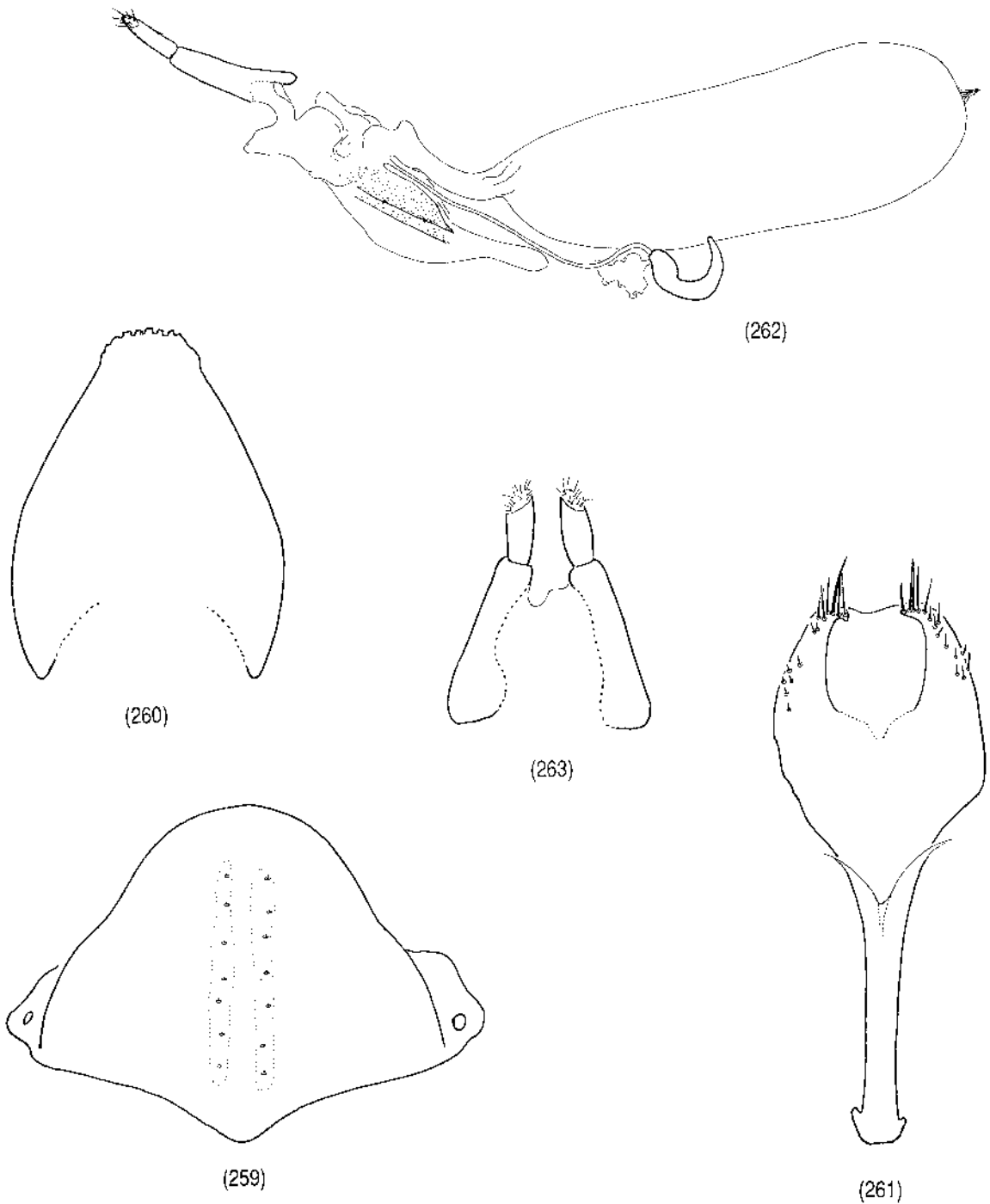


Fig. 259–263 *Mitrastethus baridioides*, female terminalia: 259, 260, tergites VII (x49) and VIII (x78), dorsal; 261, sternite VIII, ventral, x78; 262, genitalia, lateral, x66 (oviduct expanded by osmotic pressure and larger than bursa in figure); 263, hemisternites, dorsal, x78.

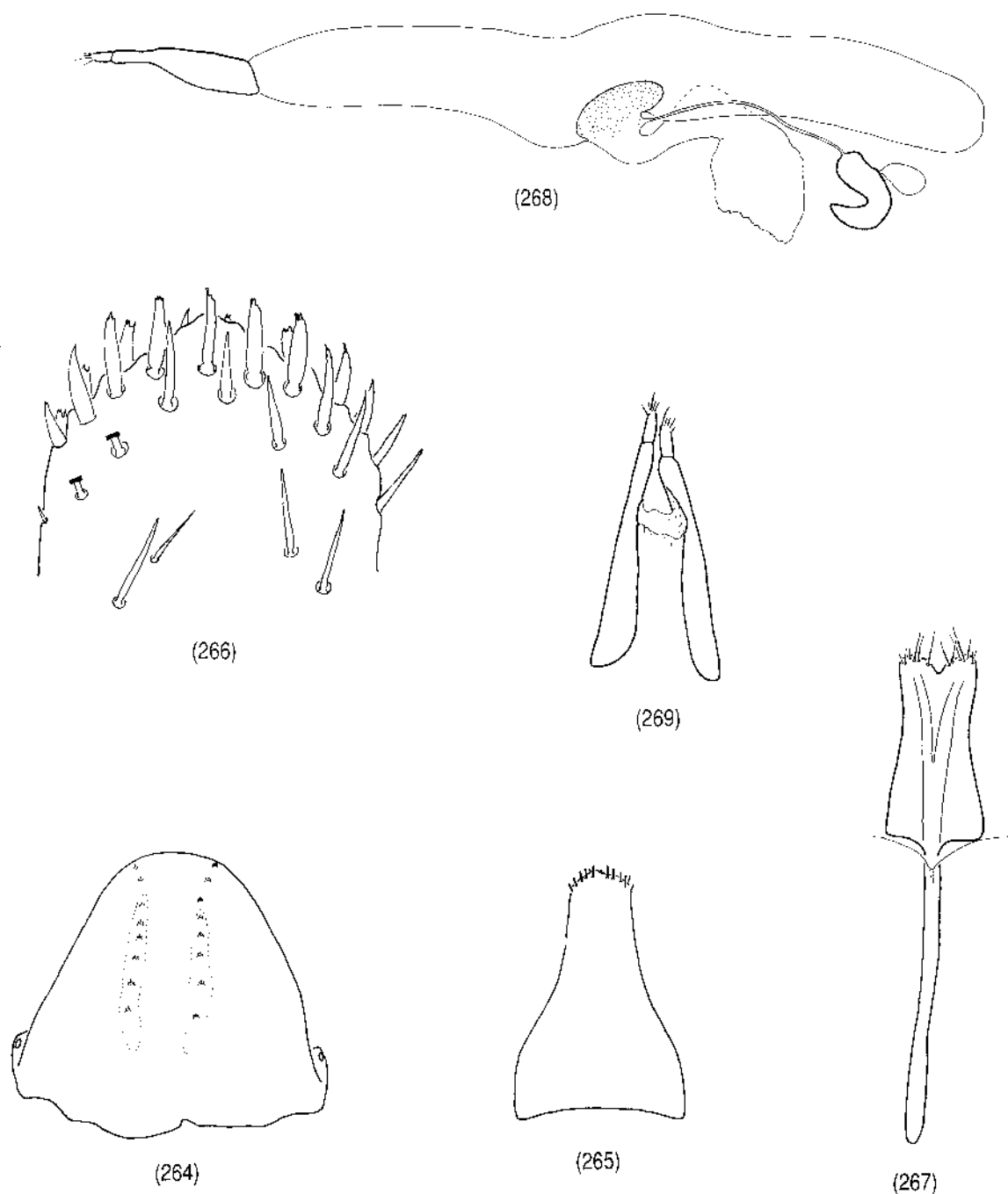


Fig. 264–269 *Mecistostylus douei*, female terminalia: 264, tergite VII, dorsal, x48 (dotted lines indicate rough extent of glabrous strips); 265, 266, tergite VIII, dorsal, x48, and detail of apex, x250; 267, sternite VIII, ventral, x48; 268, genitalia, lateral, x48; 269, hemisternites, dorsal, x74.

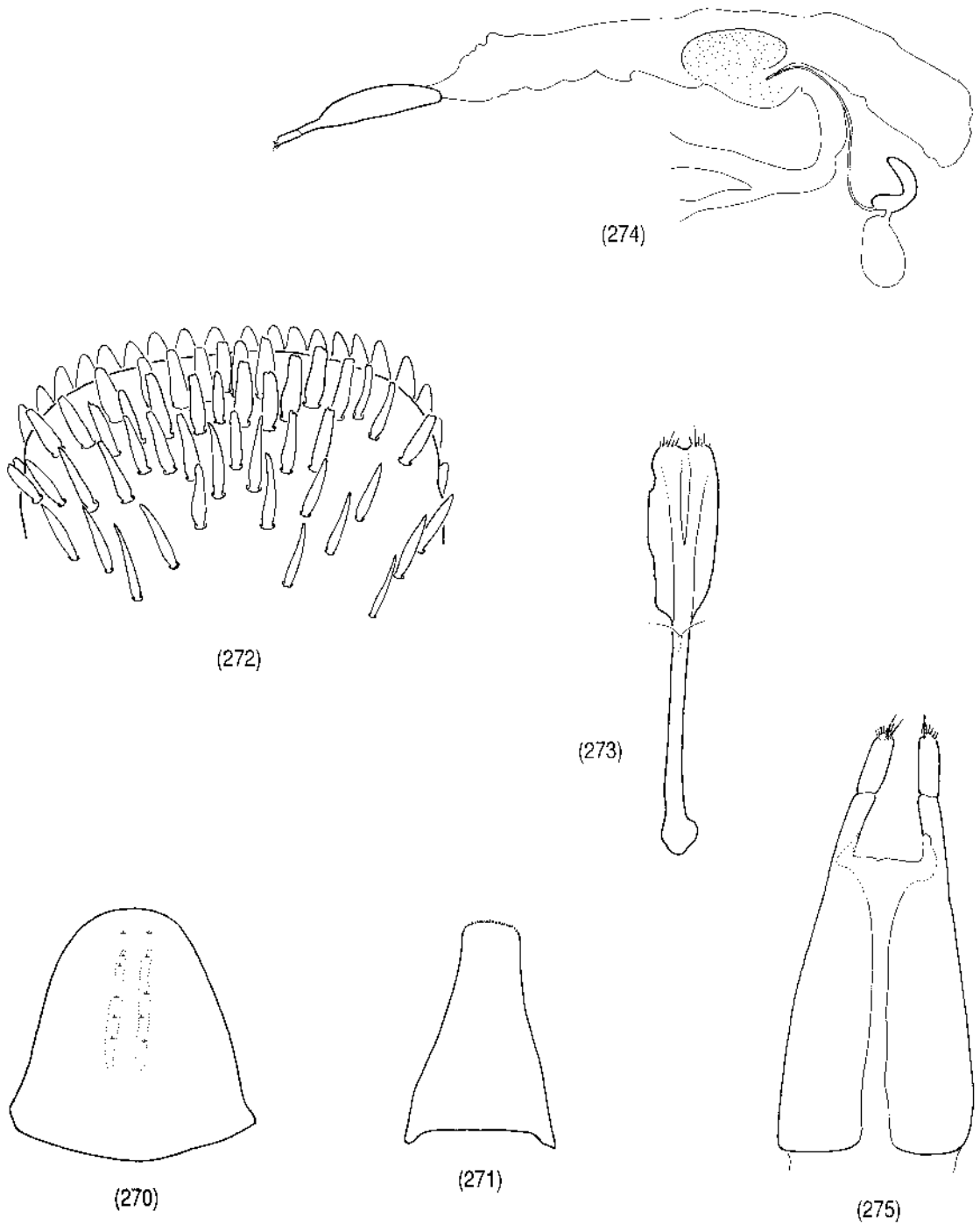


Fig. 270–275 *Ectopsis ferrugalis*, female terminalia: 270, 271, tergites VII and VIII, dorsal, x14 (apical setae of tergite VIII simplified or omitted); 272, tergite VIII, dorsal, detail of apex, x133; 273, sternite VIII, ventral, x18.5; 274, genitalia, lateral, x23; 275, hemisternites, dorsal, x59.

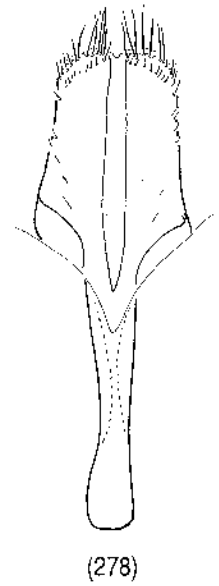
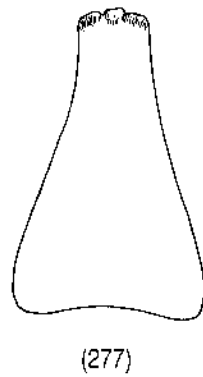
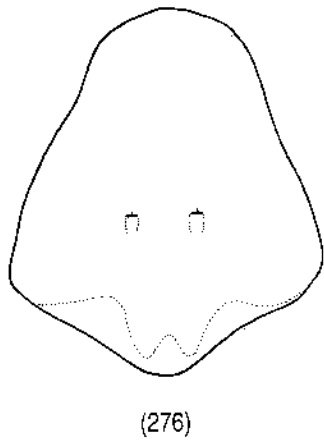
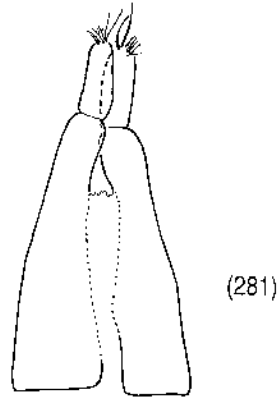
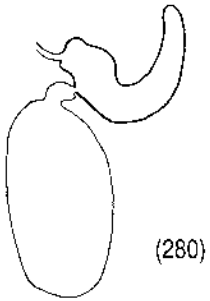
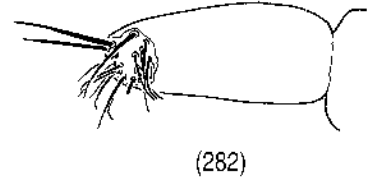
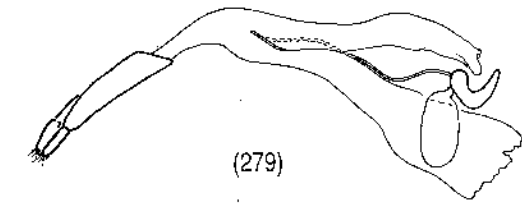


Fig. 276–282 *Hadracallies fuliginosus*, female terminalia: 276, 277, tergites VII and VIII, dorsal, x25; 278, sternite VIII, ventral, x30; 279, genitalia, lateral, x25; 280, spermatheca and gland, x58; 281, hemisternites, dorsal, x58; 282, stylus, lateral, x165.

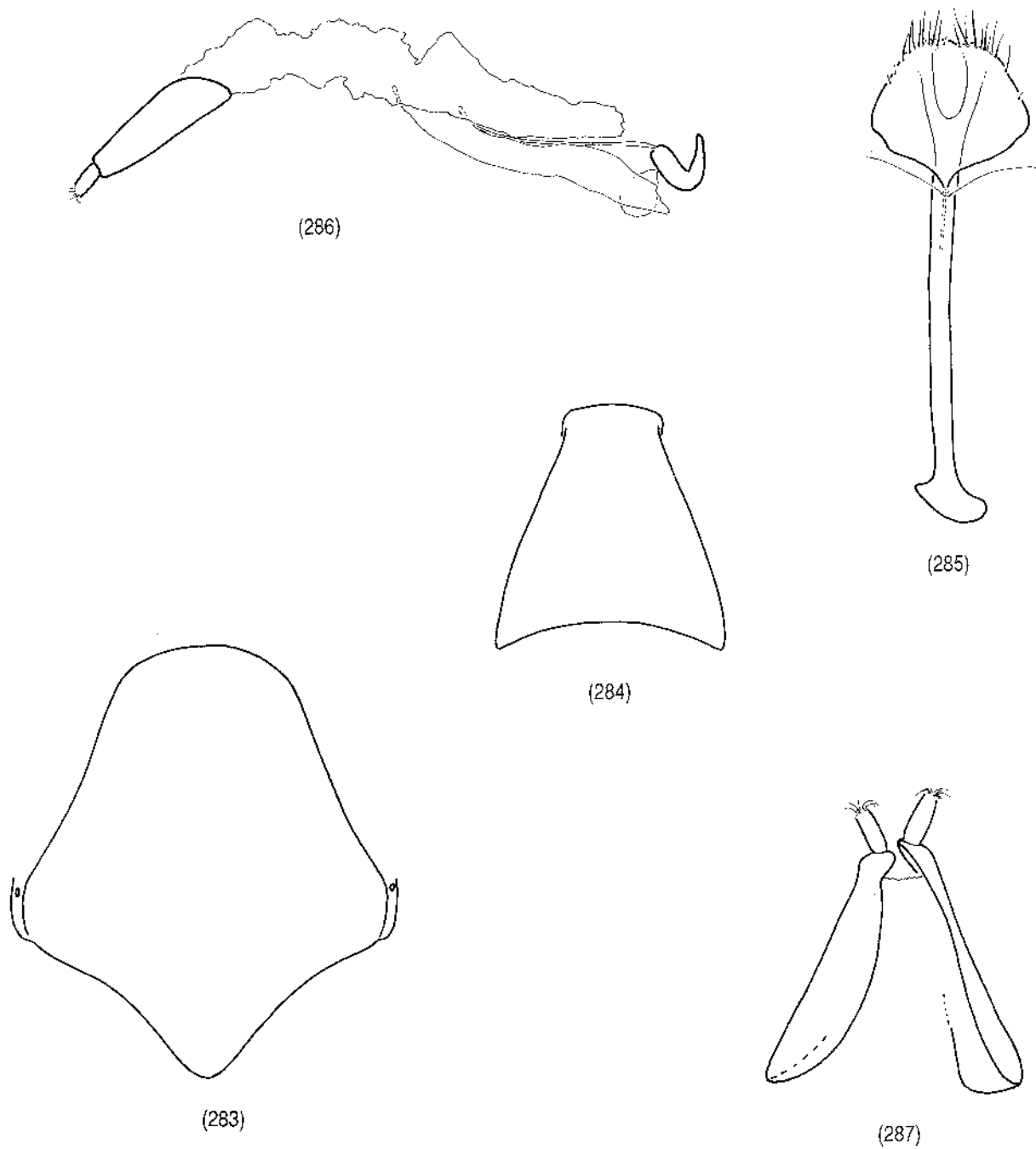


Fig. 283–287 *Tychanopais pictulus*, female terminalia: 283, 284, tergites VII and VIII, dorsal, x49; 285, sternite VIII, ventral, x49; 286, genitalia, lateral, x49; 287, hemisternites, dorsal, x77.

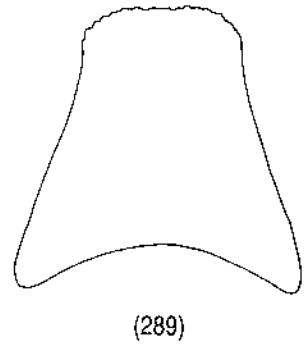
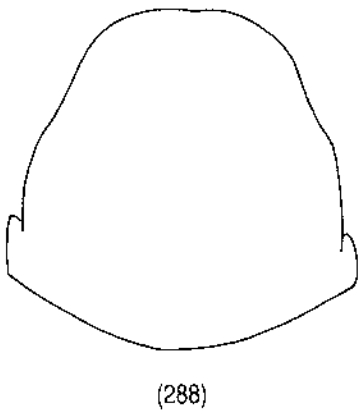
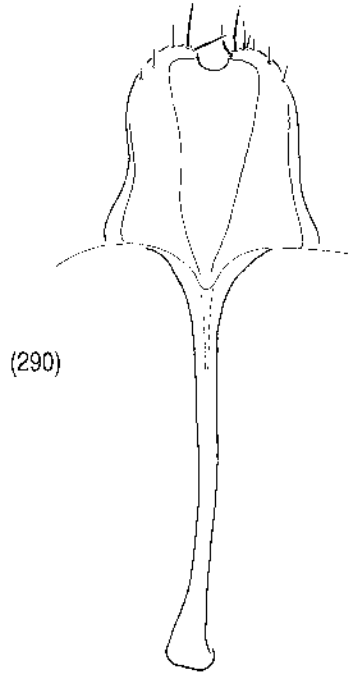
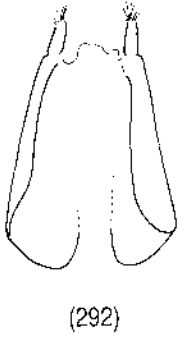
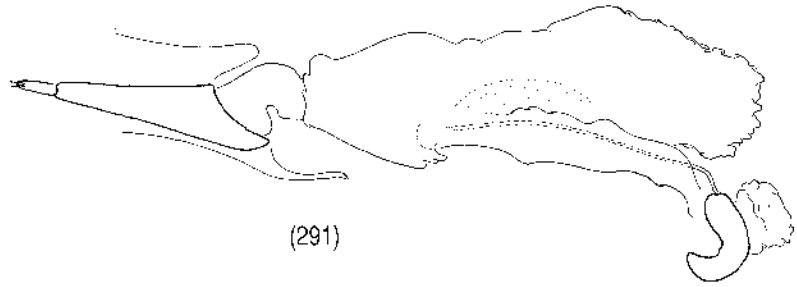


Fig. 288–292 *Tychanus gibbus*, female terminalia: 288, 289, tergites VII (x38) and VIII (x45), dorsal; 290, sternite VIII, ventral, x45; 291, genitalia, lateral, x45; 292, hemisternites, dorsal, x45.

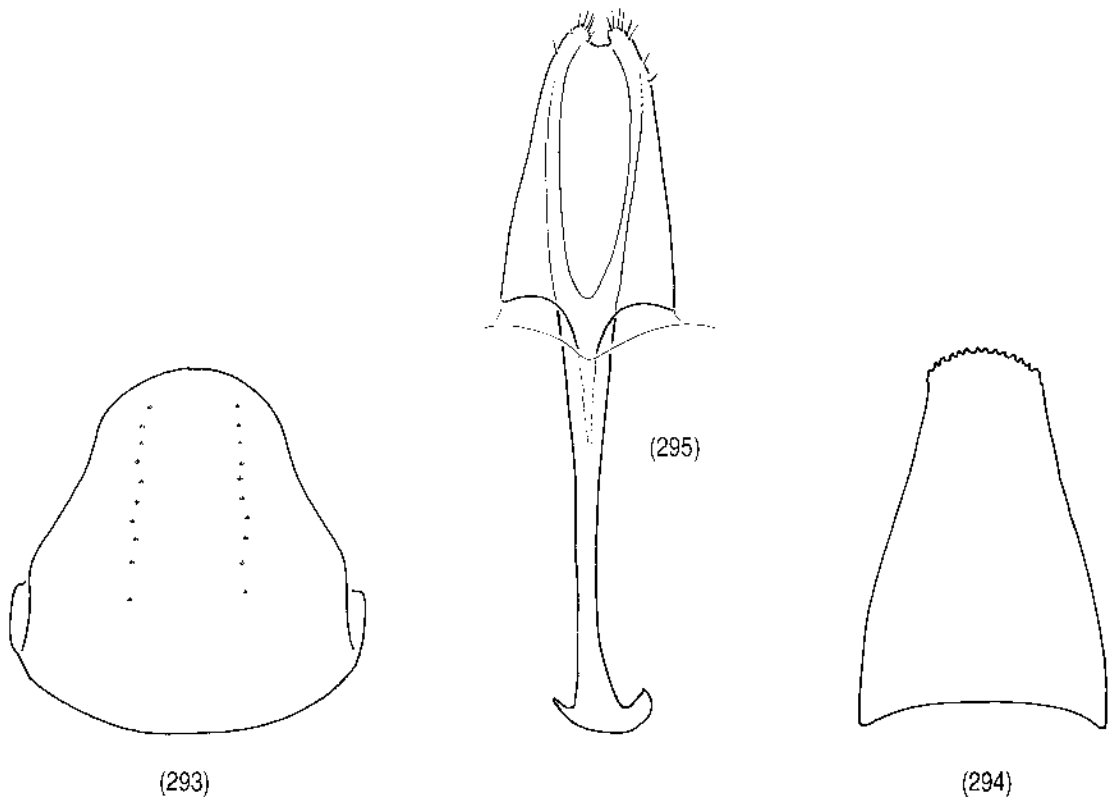


Fig. 293–295 *Tychanus verrucosus*, female terminalia: 293, tergite VII, dorsal, x41; 294, tergite VIII, dorsal, x52; 295, sternite VIII, ventral, x52.

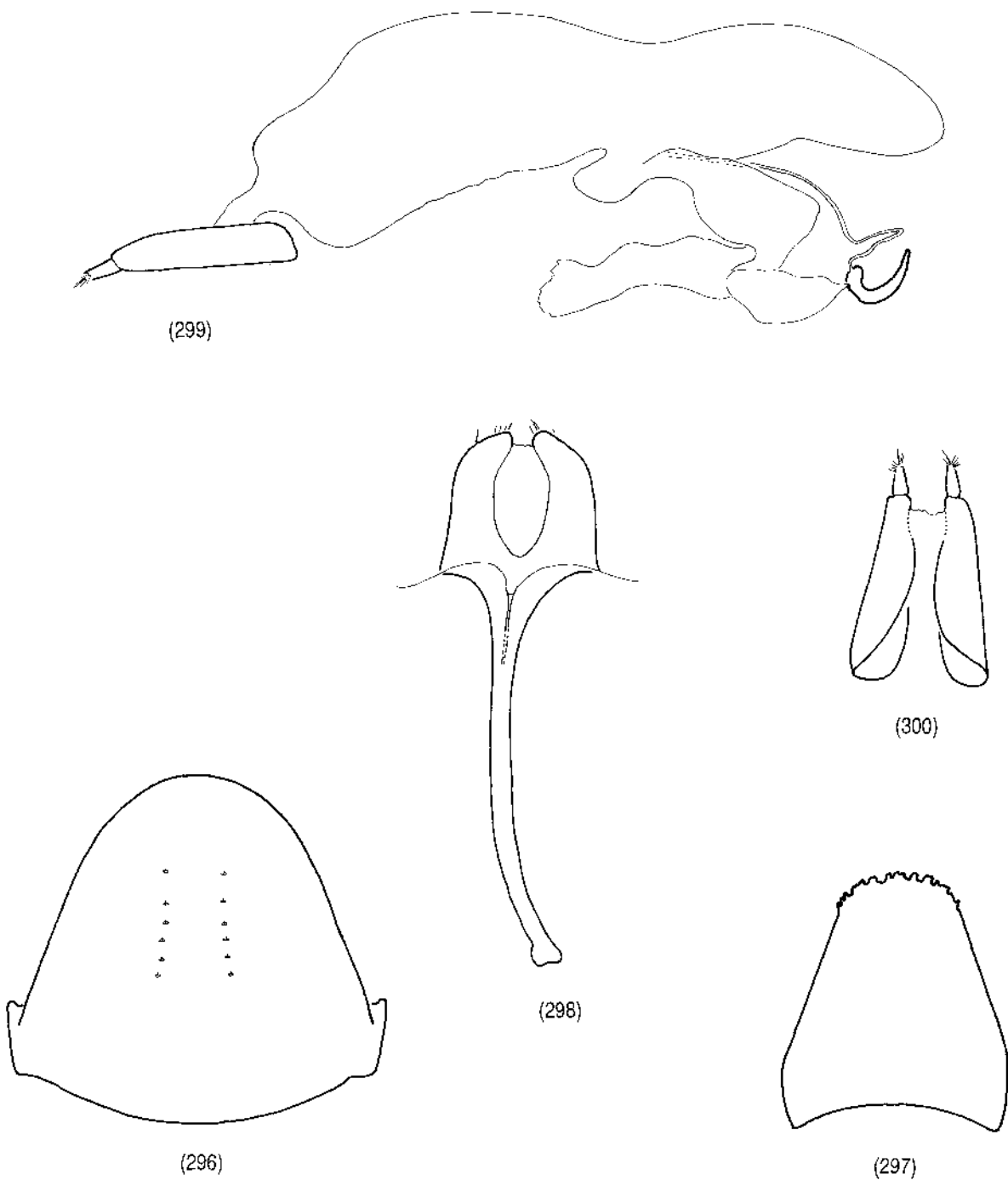
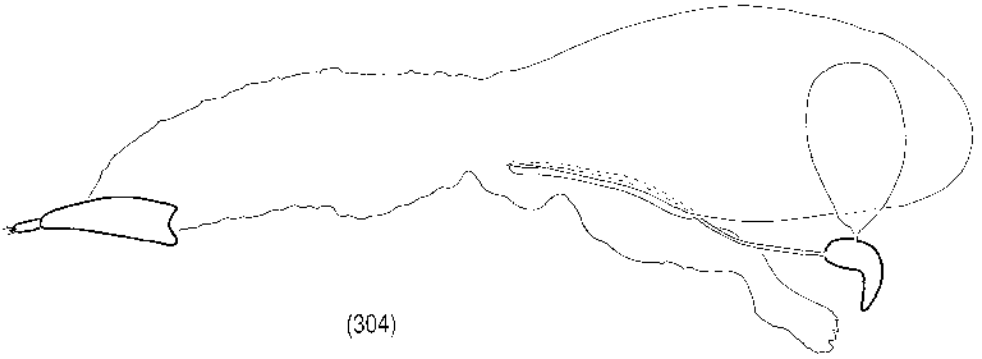
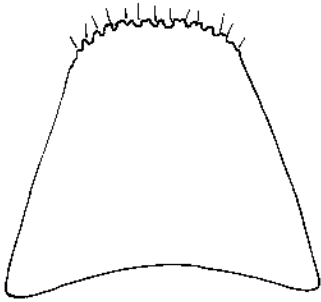


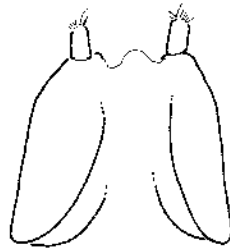
Fig. 296–300 *Clypeolus dux*, female terminalia, x43: 296, 297, tergites VII and VIII, dorsal; 298, sternite VIII, ventral; 299, genitalia, lateral; 300, hemisternites, dorsal.



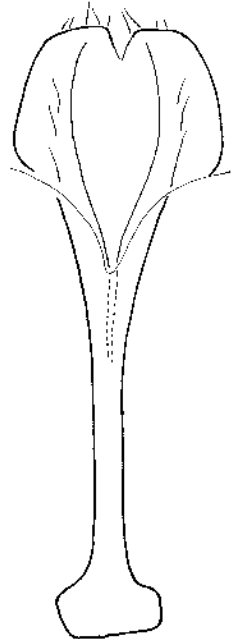
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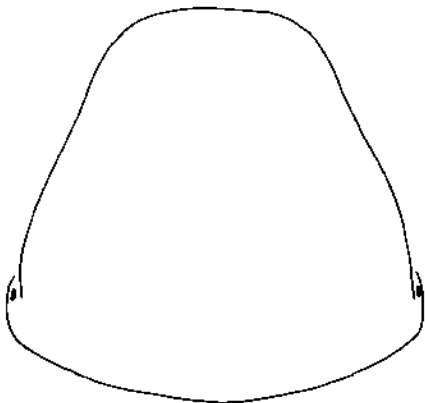
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(301)

Fig. 301–305 *Didymus impexus*, female terminalia: 301, 302, tergites VII and VIII, dorsal, x67; 303, sternite VIII, ventral, x67; 304, genitalia, lateral, x54; 305, hemisternites, dorsal, x67.

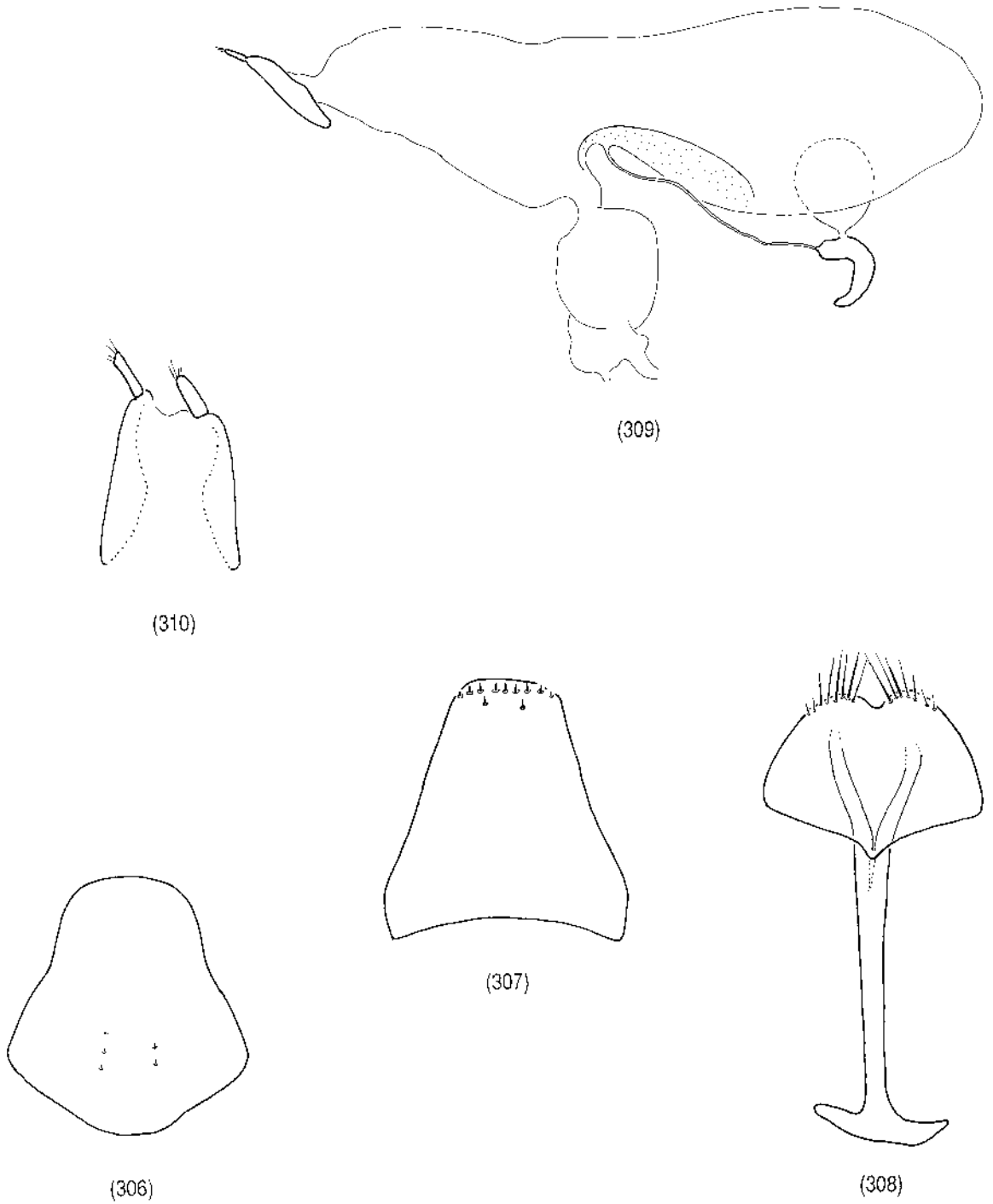
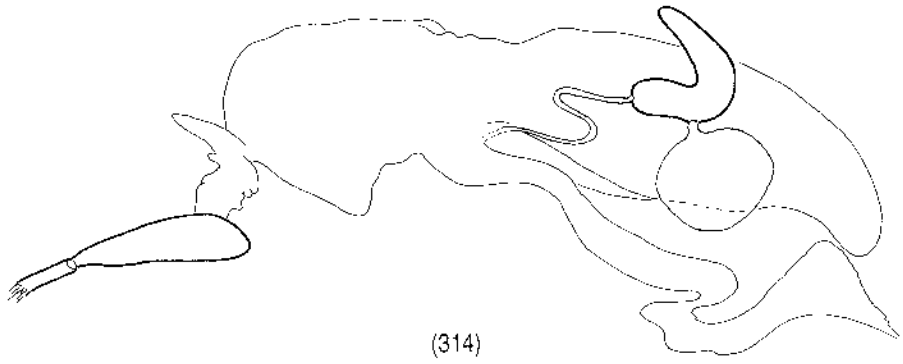
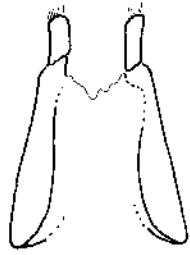


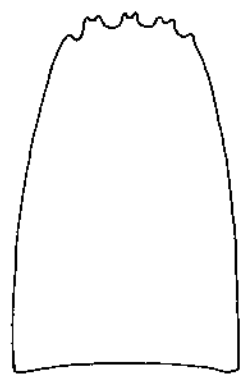
Fig. 306–310 *Hilarcalles scitus*, female terminalia: 306, 307, tergites VII (x56) and VIII (x89), dorsal; 308, sternite VIII, ventral, x89; 309, genitalia, lateral, x56; 310, hemisternites, dorsal, x89.



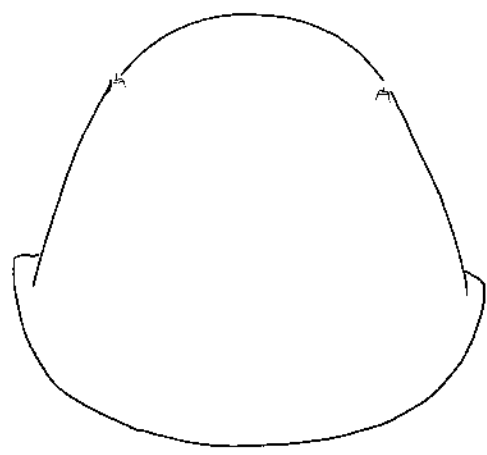
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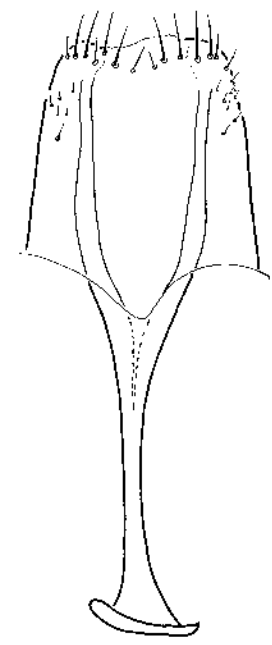
(315)



(312)



(311)



(313)

Fig. 311–315 *Indecentia nubila*, female terminalia, x74: 311, 312, tergites VII and VIII, dorsal; 313, sternite VIII, ventral; 314, genitalia, lateral; 315, hemisternites, dorsal.

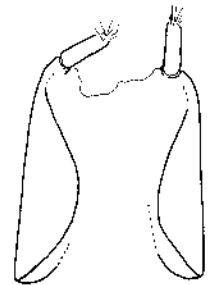
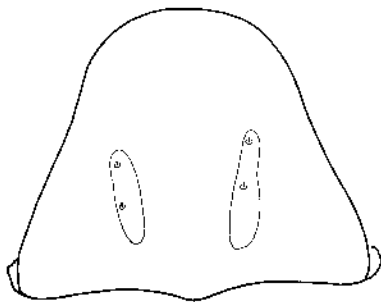
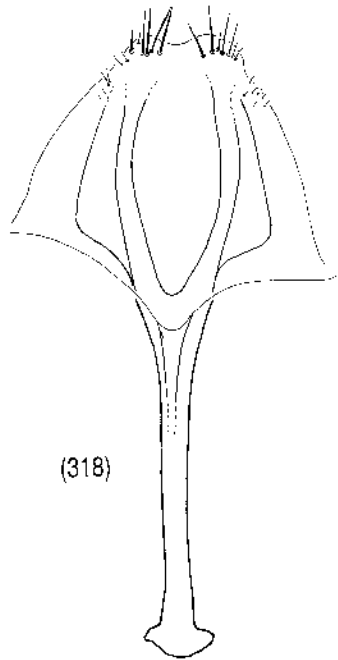
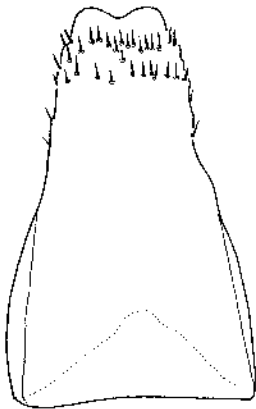


Fig. 316–320 *Crisius binotatus*, female terminalia: 316, 317, tergites VII (x39) and VIII (x55), dorsal; 318, sternite VIII, ventral, x55; 319, genitalia, lateral, x55; 320, hemisternites, dorsal, x29.

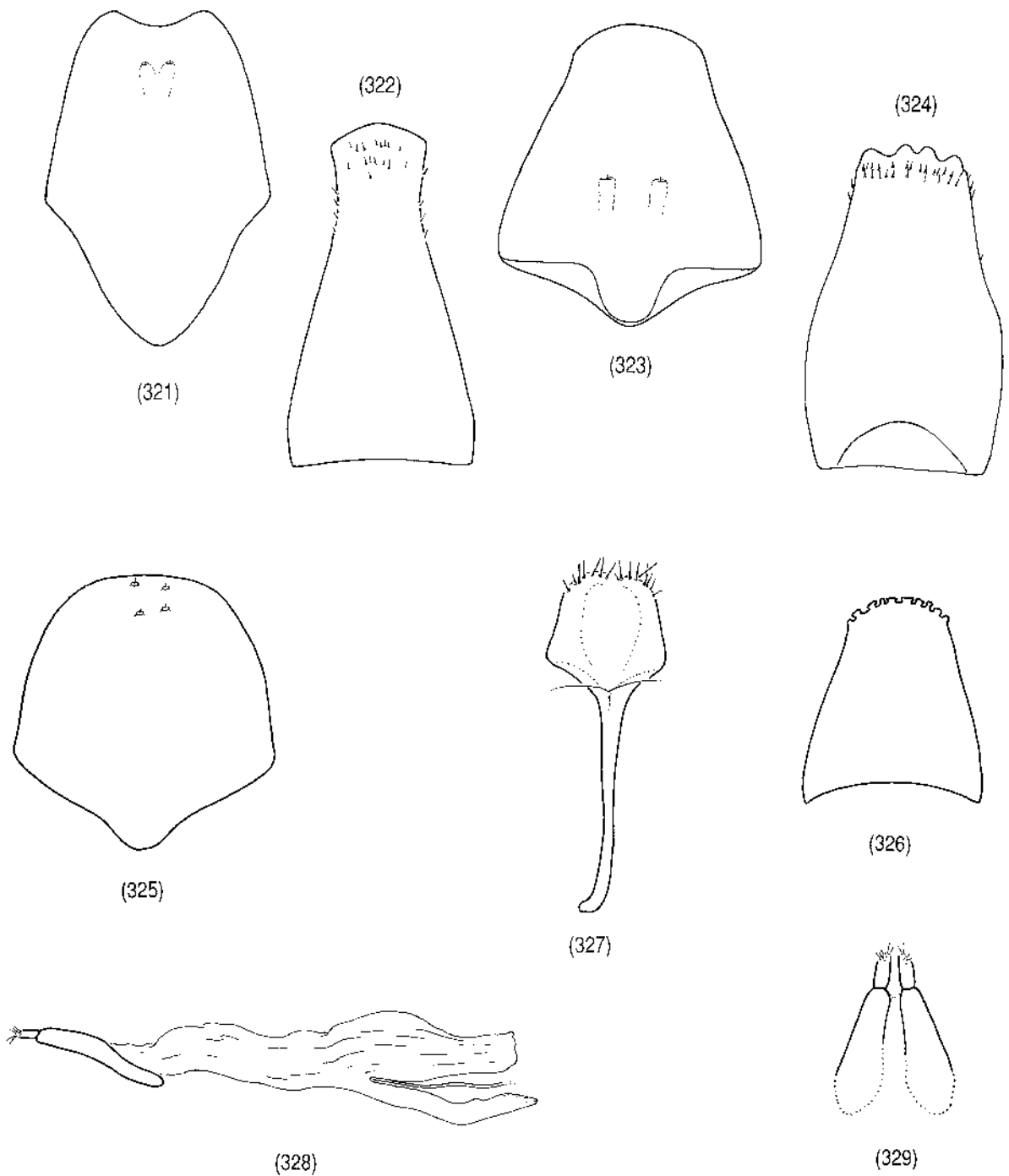


Fig. 321 *Crisius flavisetosus*, tergite VIII, dorsal, x60. **Fig. 322** *Crisius postipuncta*, tergite VIII, dorsal, x49. **Fig. 323, 324** *Crisius variegatus*, tergites VII (x38) and VIII (x49), dorsal. **Fig. 325–329** *Whitiacalles ignotus*, female terminalia, x90: 325, 326, tergites VII and VIII, dorsal; 327, sternite VIII, ventral; 328, genitalia, lateral; 329, hemisternites, dorsal.

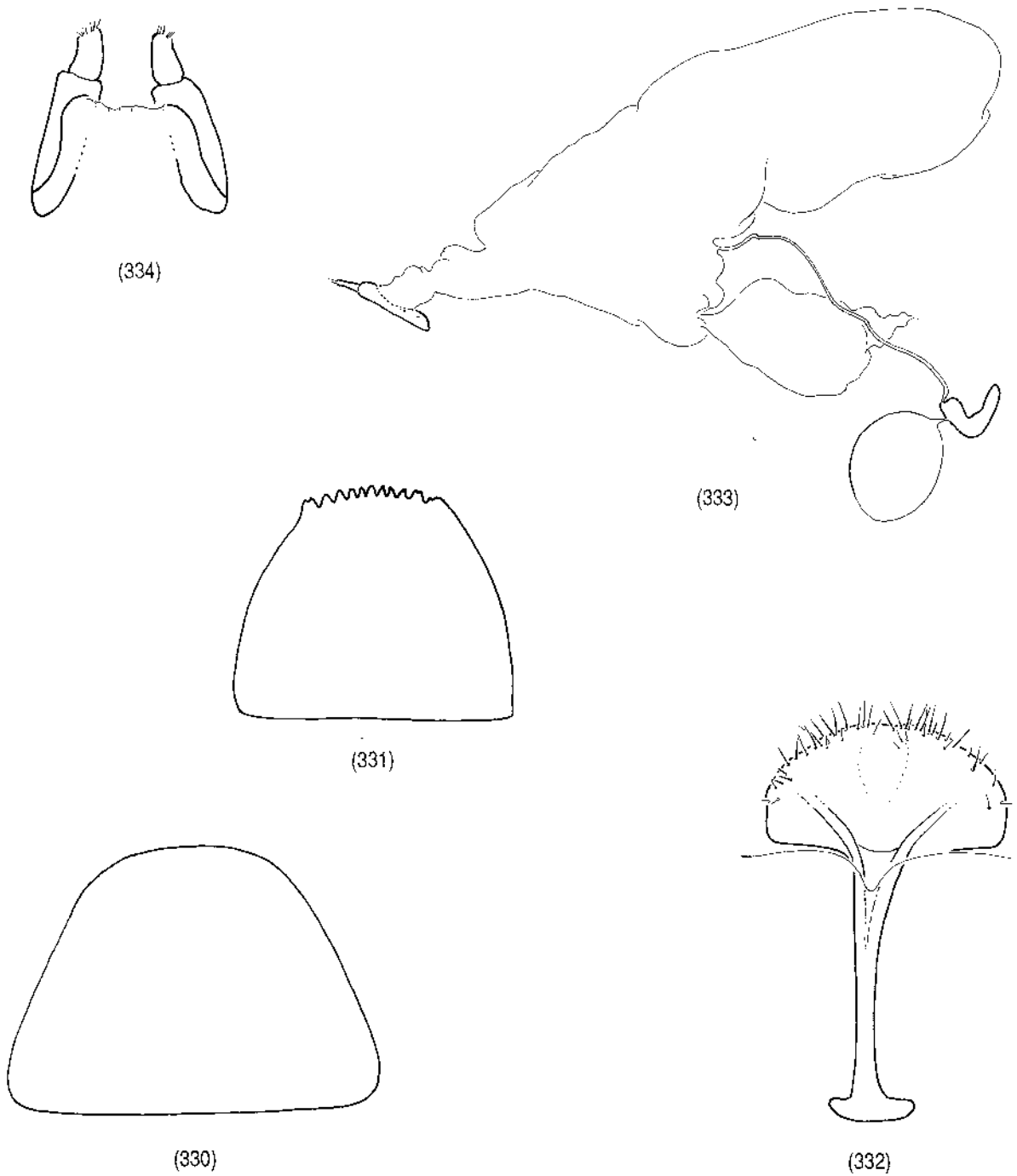


Fig. 330–334 *Maneneacalles concinnus*, female terminalia: 330, 331, tergites VII (x81) and VIII (x91), dorsal; 332, sternite VIII, ventral, x91; 333, genitalia, lateral, x56; 334, hemisternites, dorsal, x91.

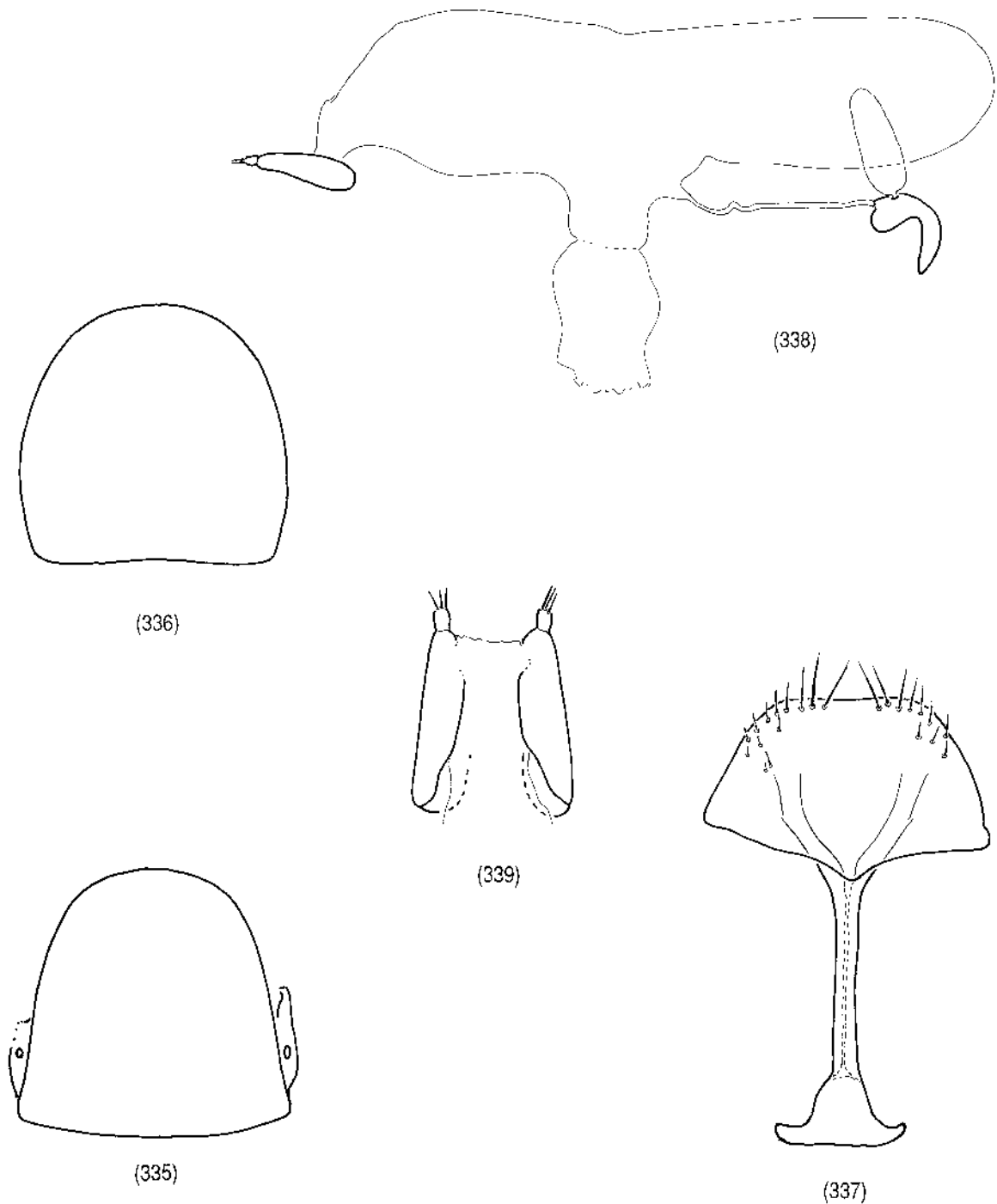


Fig. 335–339 *Synacalles dorsalis*, female terminalia: 335, 336, tergites VII (x105) and VIII (x156), dorsal; 337, sternite VIII, ventral, x156; 338, genitalia, lateral, x87 (dashed line - junction of vagina and oviduct); 339, hemisternites, dorsal, x156.

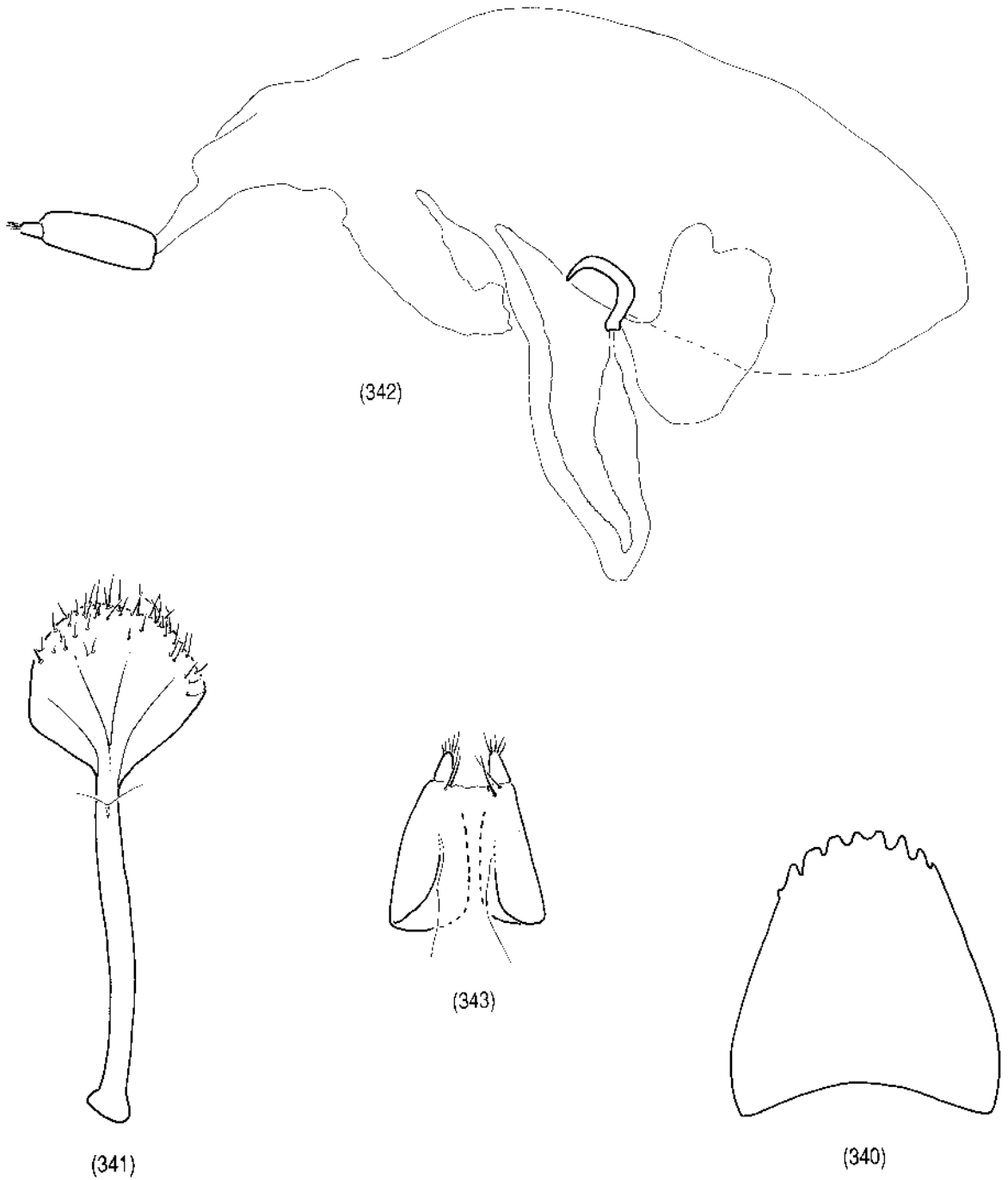
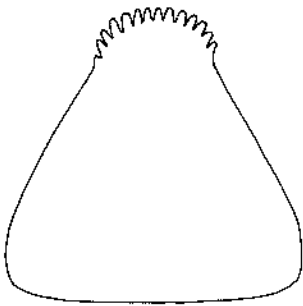


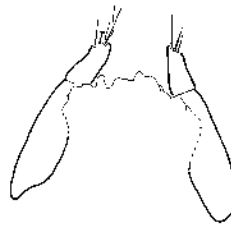
Fig. 340–343 *Synacalles peetensis*, female terminalia: 340, tergite VIII, dorsal, x114; 341, sternite VIII, ventral, x114; 342, genitalia, lateral, x90; 343, hemisternites, dorsal, x114.



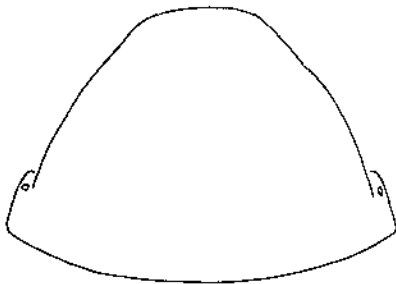
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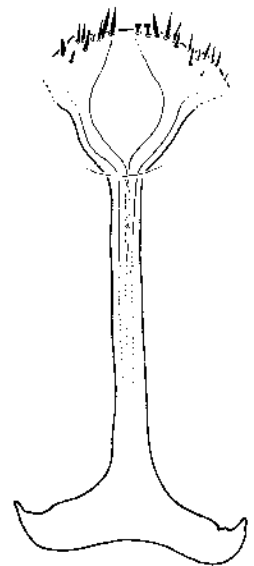
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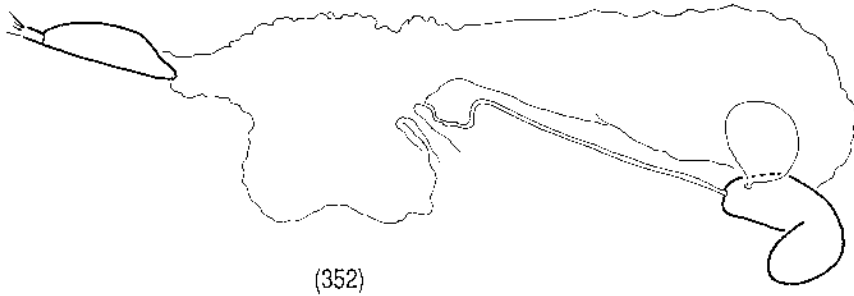


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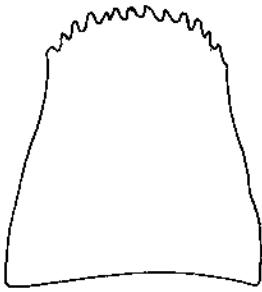


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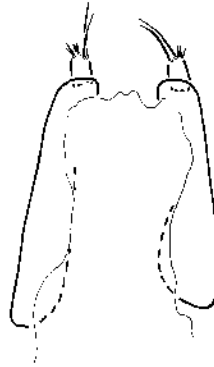
Fig. 344–348 *Dermothrius ruficollis*, female terminalia: 344, 345, tergites VII (x85) and VIII (x133), dorsal (TVIII distorted, so appearing slightly wider than in life); 346, sternite VIII, ventral, x133; 347, genitalia, lateral, x138; 348, hemisternites, dorsal, x138.



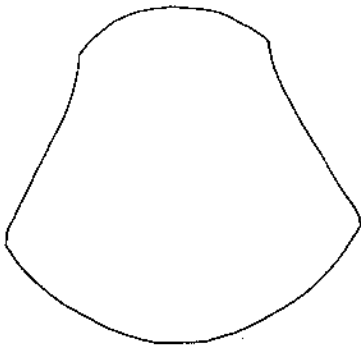
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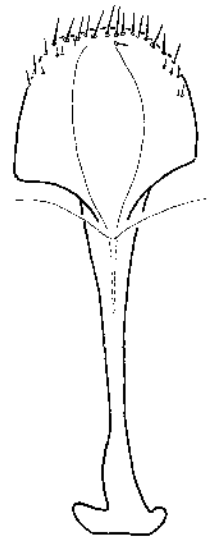
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Fig. 349 *Paromalia setiger*, tergite VII, dorsal, x90. **Fig. 350-353** *Paromalia nigricollis*, female terminalia: 350, tergite VIII, dorsal, x154; 351, sternite VIII, ventral, x154; 352, genitalia, lateral, x93; 353, hemisternites, dorsal, x156.

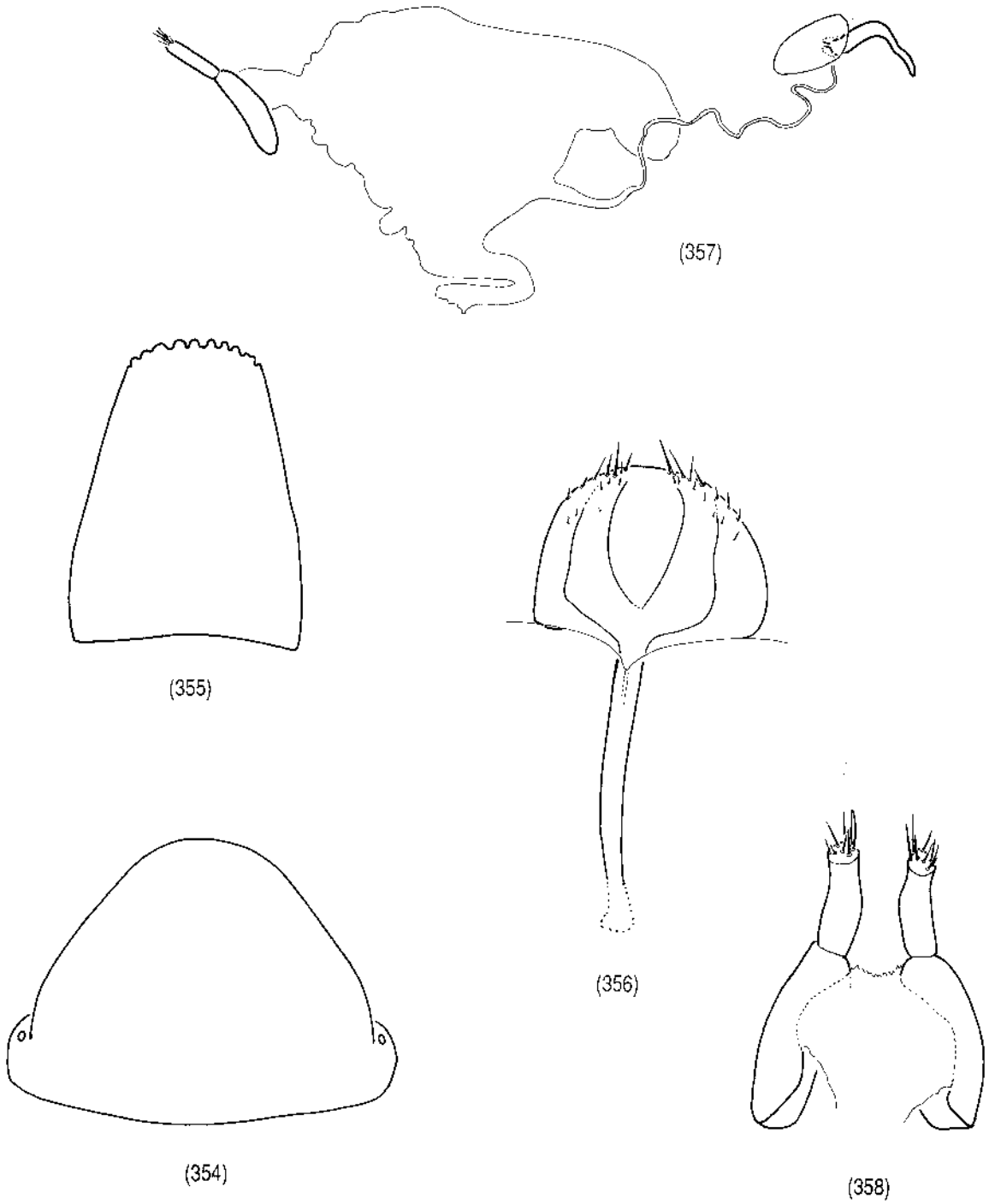
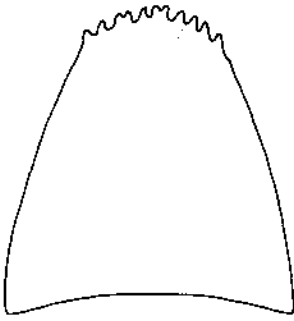
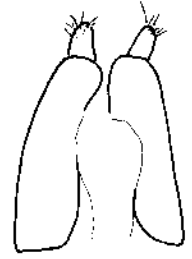


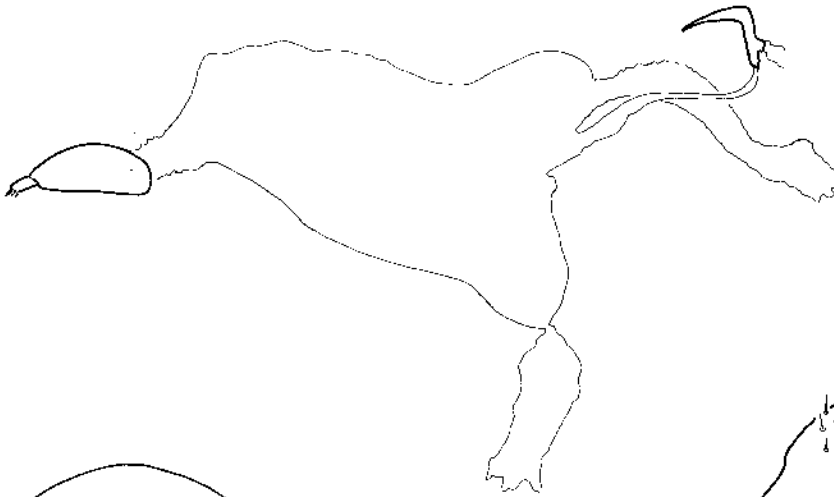
Fig. 354–358 *Agacalles formosus*, female terminalia: 354, 355, tergites VII (x95) and VIII (x114), dorsal; 356, sternite VIII, ventral, x114 (tip of apodeme lost); 357, genitalia, lateral, x95; 358, hemisternites, dorsal, x156.



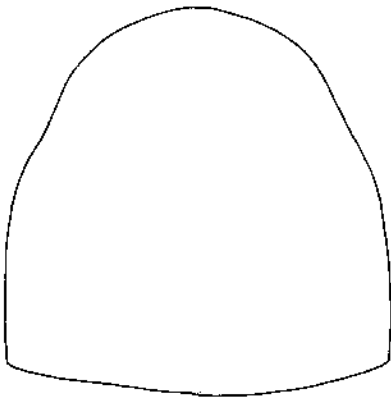
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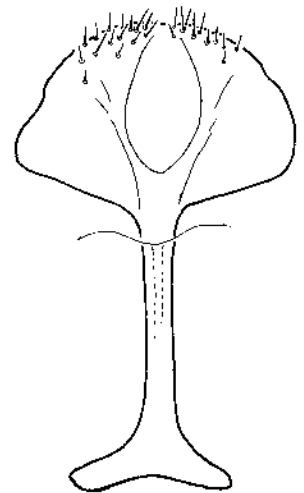
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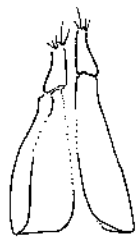


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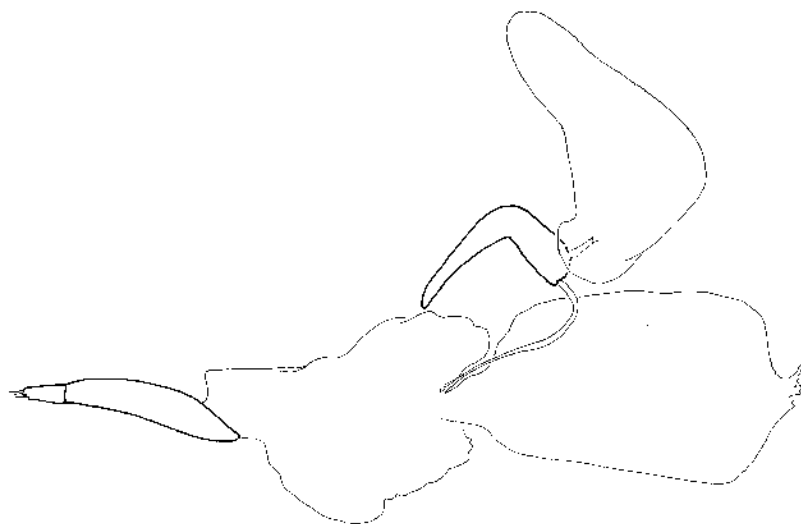


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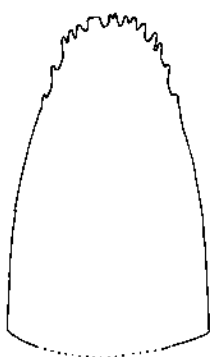
Fig. 359–363 *Metacalles* sp. cf. *aspersus*, female terminalia: 359, 360, tergites VII and VIII, dorsal, x159; 361, sternite VIII, ventral, x159; 362, genitalia, lateral, x94 (oviduct commences at constricted area on ventrally projecting lobe of vagina); 363, hemisternites, dorsal, x159.



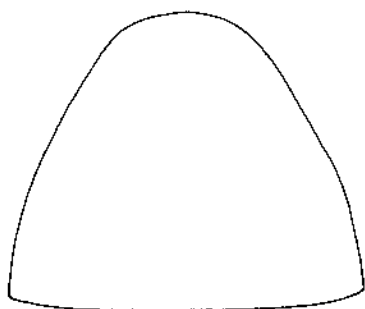
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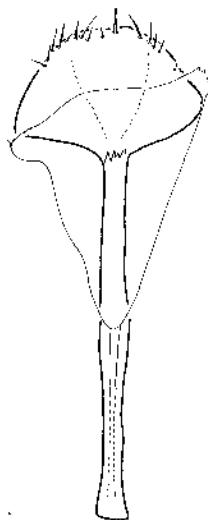
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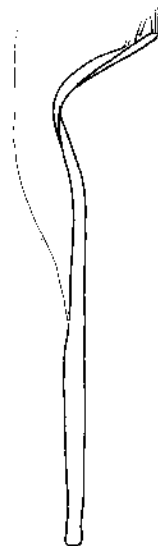
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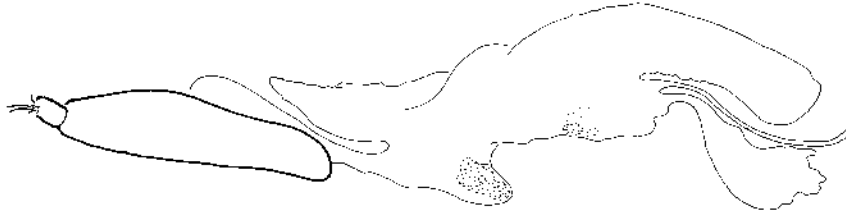


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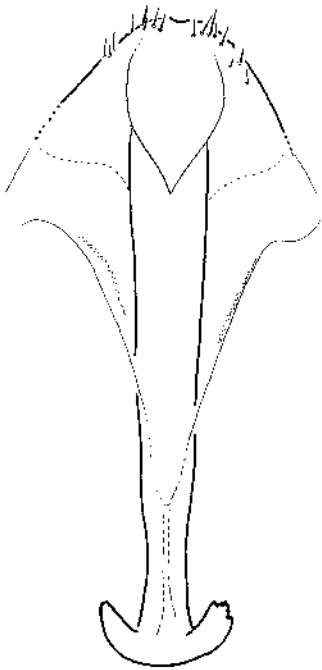


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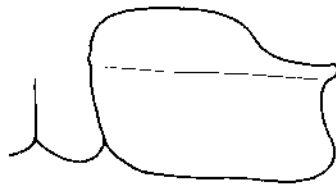
Fig. 364–368 *Scelodolichus lineithorax*, female terminalia: 364, 365, tergites VII (x70) and VIII (x78), dorsal; 366, 367, sternite VIII, ventral and lateral, x78; 368, genitalia, lateral, x78; 369, hemisternites, dorsal, x78.



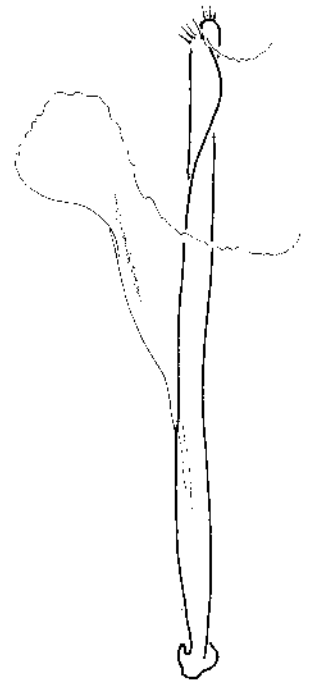
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Fig. 370–372 *Scelodolichus juncobius*, female terminalia, x82: 370, 371, sternite VIII, ventral and lateral; 372, genitalia, lateral (spermatheca missing). **Fig. 373** *Scelodolichus politus*, sternum 7, lateral, x90 (top part of sternum normally covered by elytron).

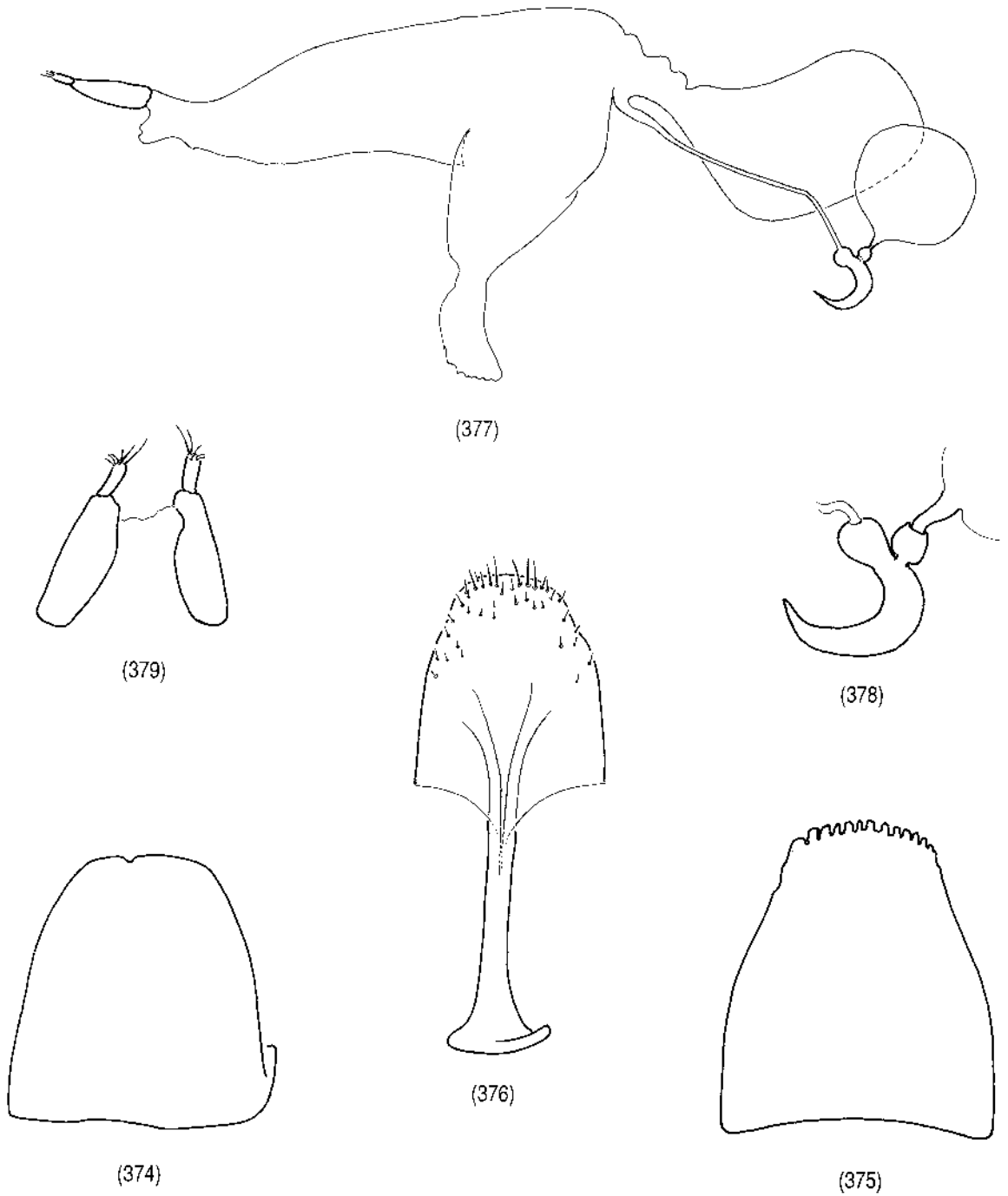


Fig. 374–379 *Crooktocalles certus*, female terminalia: 374, 375, tergites VII (x60; specimen deformed in preparation) and VIII (x104), dorsal; 376, sternite VII, ventral, x104; 377, genitalia, lateral, x61; 378, spermatheca, x156; 379, hemisternites, dorsal, x104.

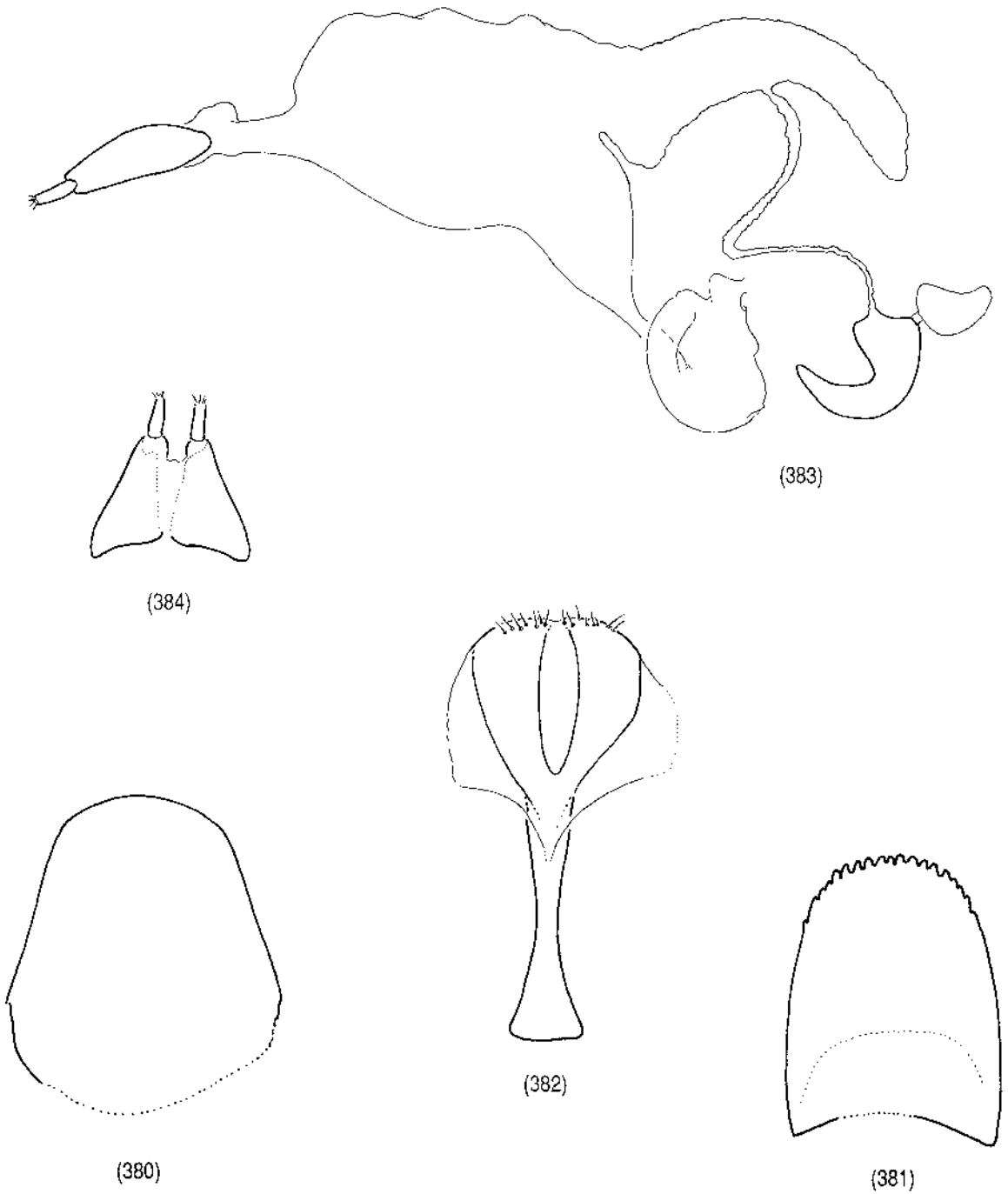


Fig. 380–385 *Crooktocalles abruptus*, female terminalia, x90: 380, 381, tergites VII and VIII, dorsal; 382, sternite VIII, ventral (drawn so that apodeme and plate equally angled away from plane of view); 383, genitalia, lateral (bursa collapsed); 384, hemisternites, dorsal.

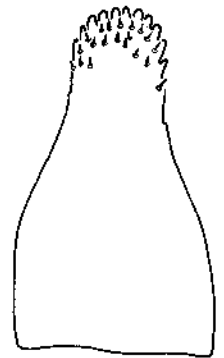
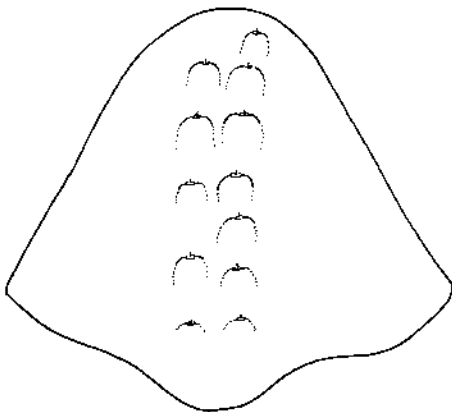
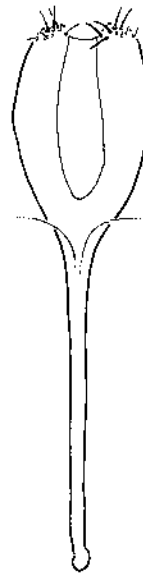
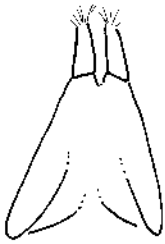
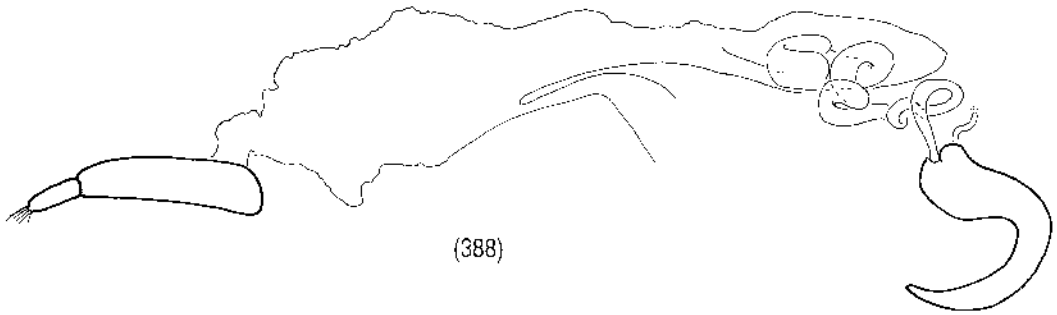
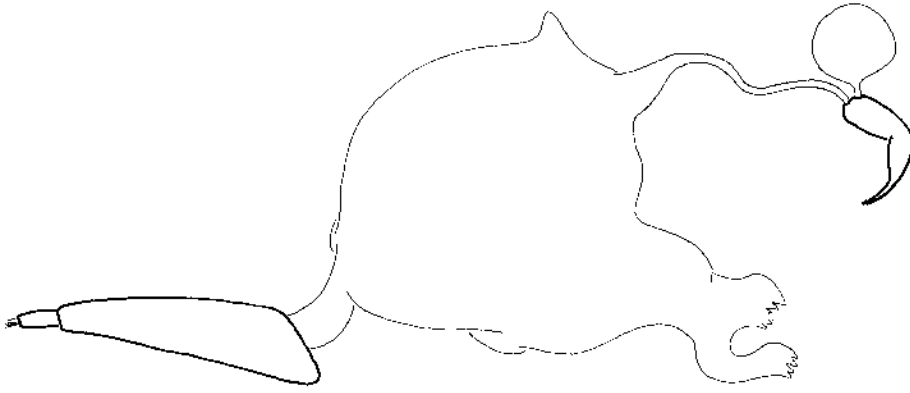
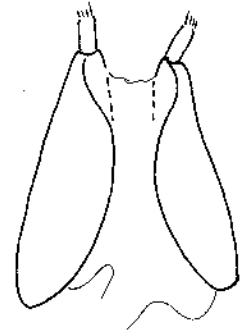


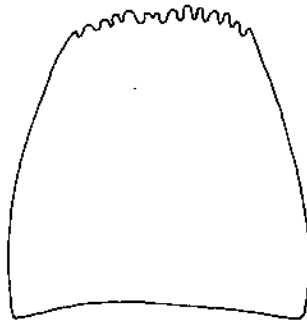
Fig. 385–389 *Omoeacalles crisioides*, female terminalia: 385, 386, tergites VII and VIII, dorsal, x87; 387, sternite VIII, ventral, x87; 388, genitalia, lateral, x69; 389, hemisternites, dorsal, x75.



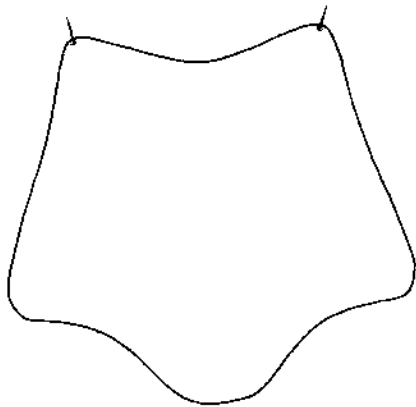
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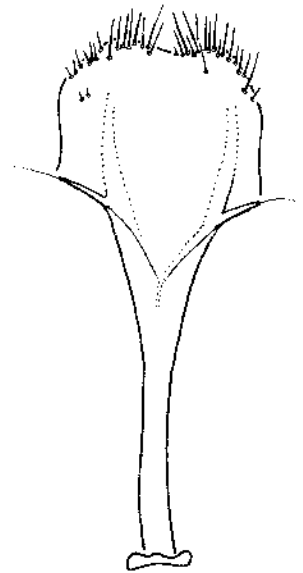
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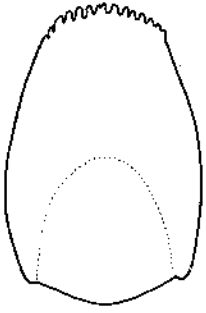


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(392)

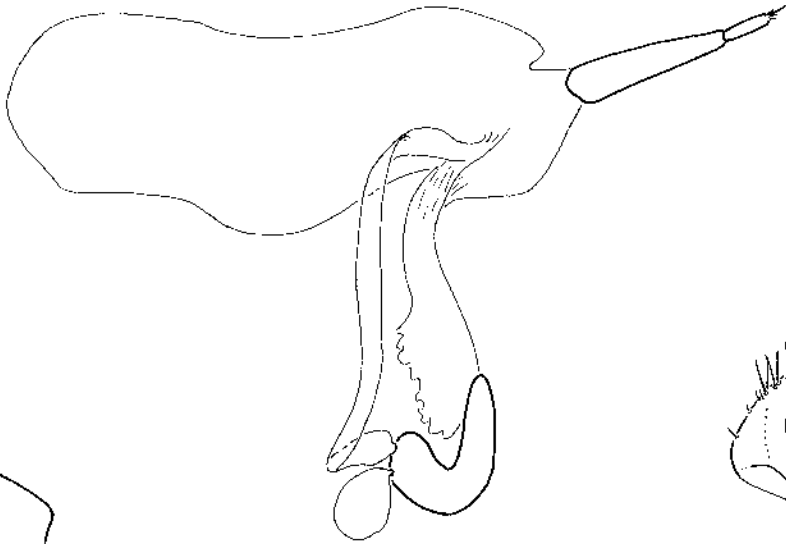
Fig. 390–394 *Allanaicis aulacus*, female terminalia, x142: 390, 391, tergites VII and VIII, dorsal; 392, sternite VIII, ventral; 393, genitalia, lateral; 394, hemisternites, dorsal.



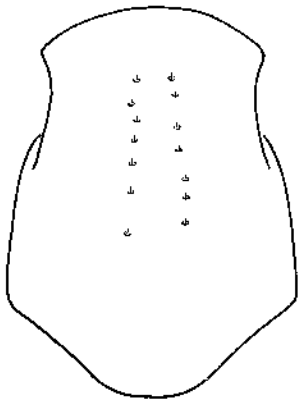
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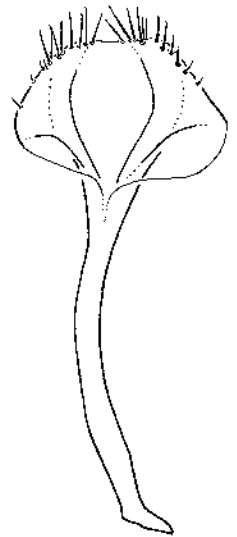
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Fig. 395–399 *Allanalcis eruensis*, female terminalia, x90: 395, 396, tergites VII and VIII, dorsal; 397, sternite VIII, ventral; 398, genitalia, lateral; 399, hemisternites, dorsal.

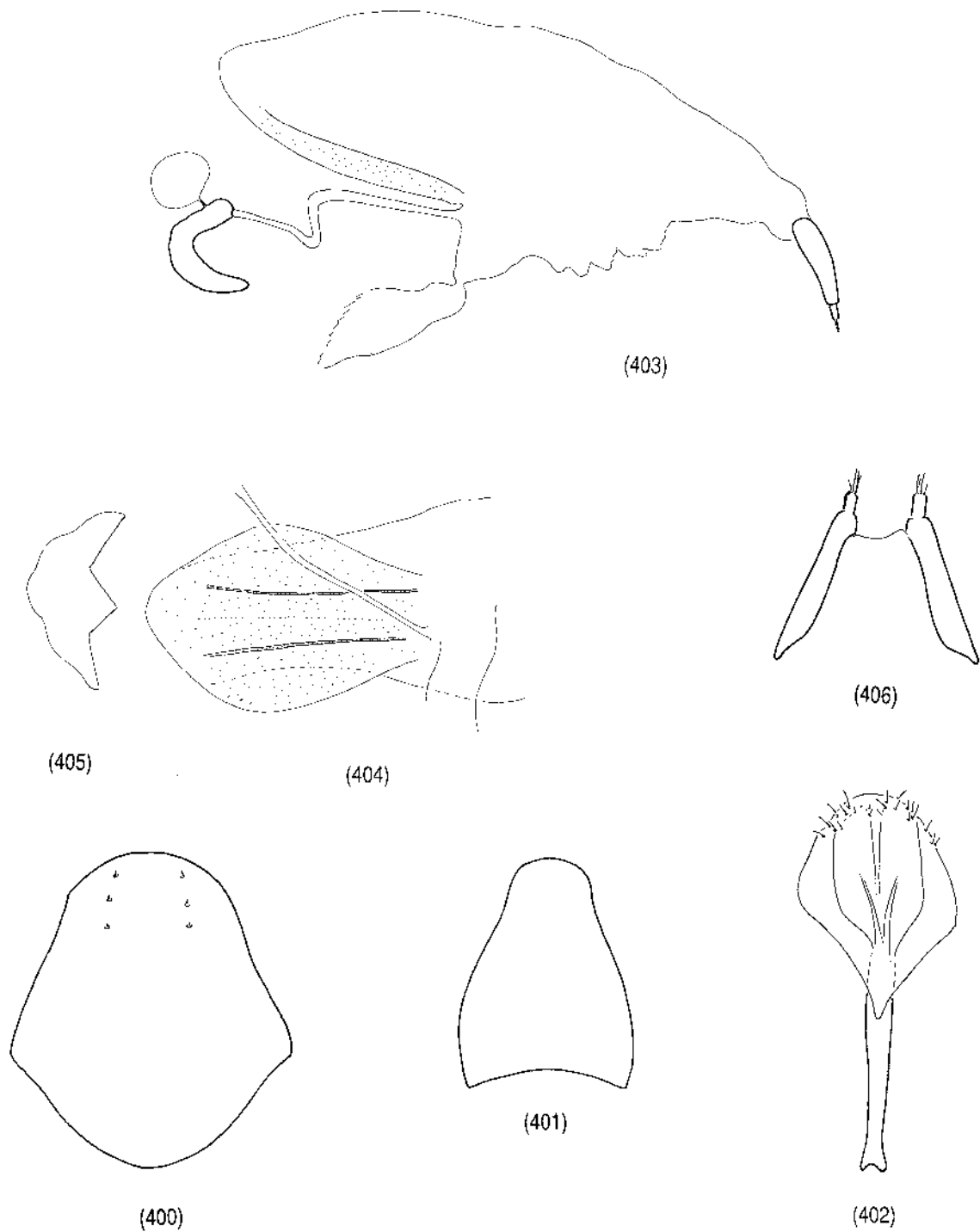
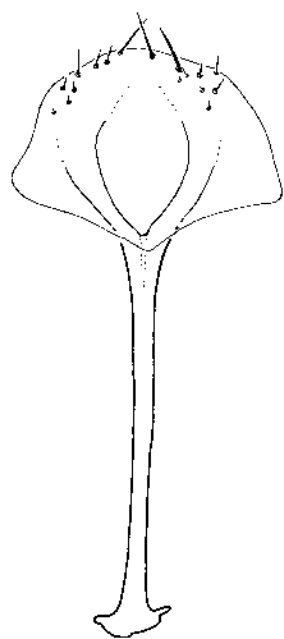
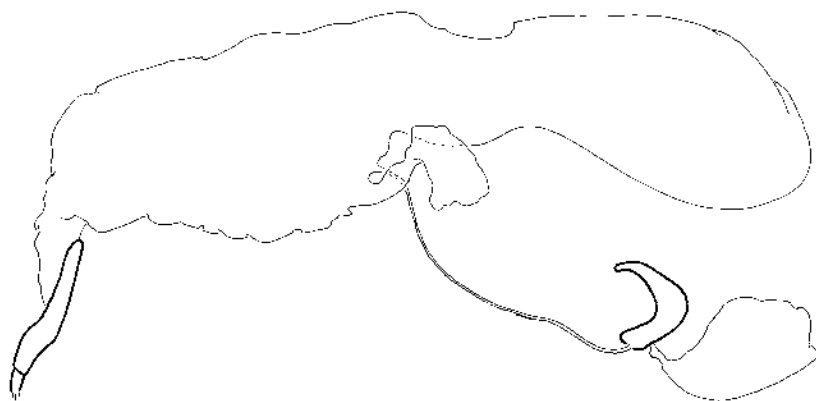


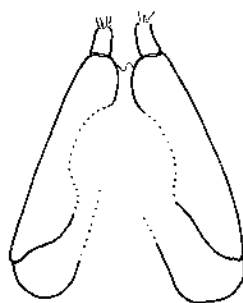
Fig. 400–406 *Zeacalles variatus*, female terminalia: 400, 401, tergites VII and VIII, dorsal, x111; 402, sternite VIII, ventral, x111; 403, genitalia, lateral, x60; 404, 405, bursa, ventral and in cross-section, x60; 406, hemisternites, dorsal, x111.



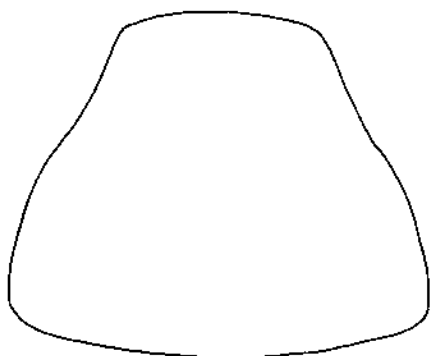
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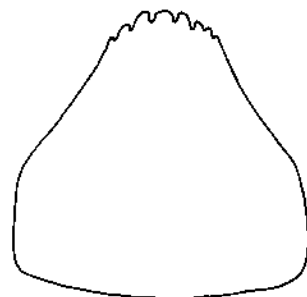
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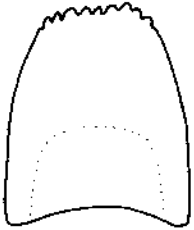


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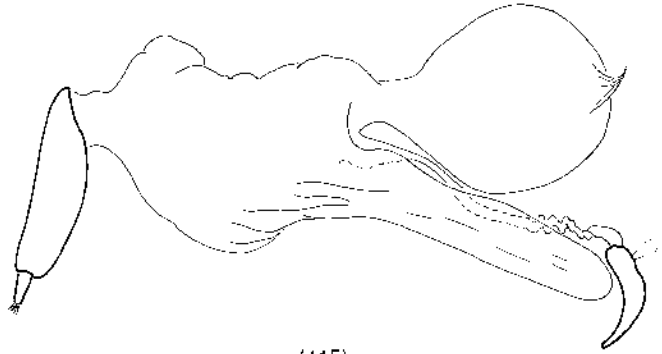


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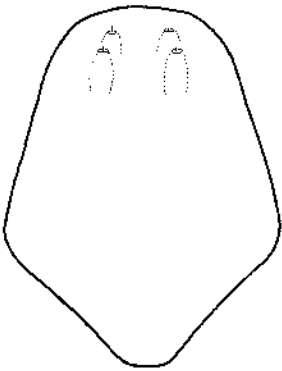
Fig. 407–411 *Postacalles rangirua*, female terminalia: 407, 408, tergites VII and VIII, dorsal, x165; 409, sternite VIII, ventral, x165; 410, genitalia, lateral, x88; 411, hemisternites, dorsal, x165.



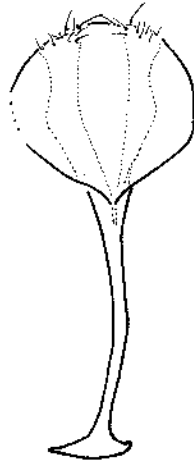
(413)



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Fig. 412–416 *Trinodicalles mimus*, female terminalia, x90: 412, 413, tergites VII and VIII, dorsal; 414, sternite VIII, ventral; 415, genitalia, lateral; 416, hemisternites, dorsal.

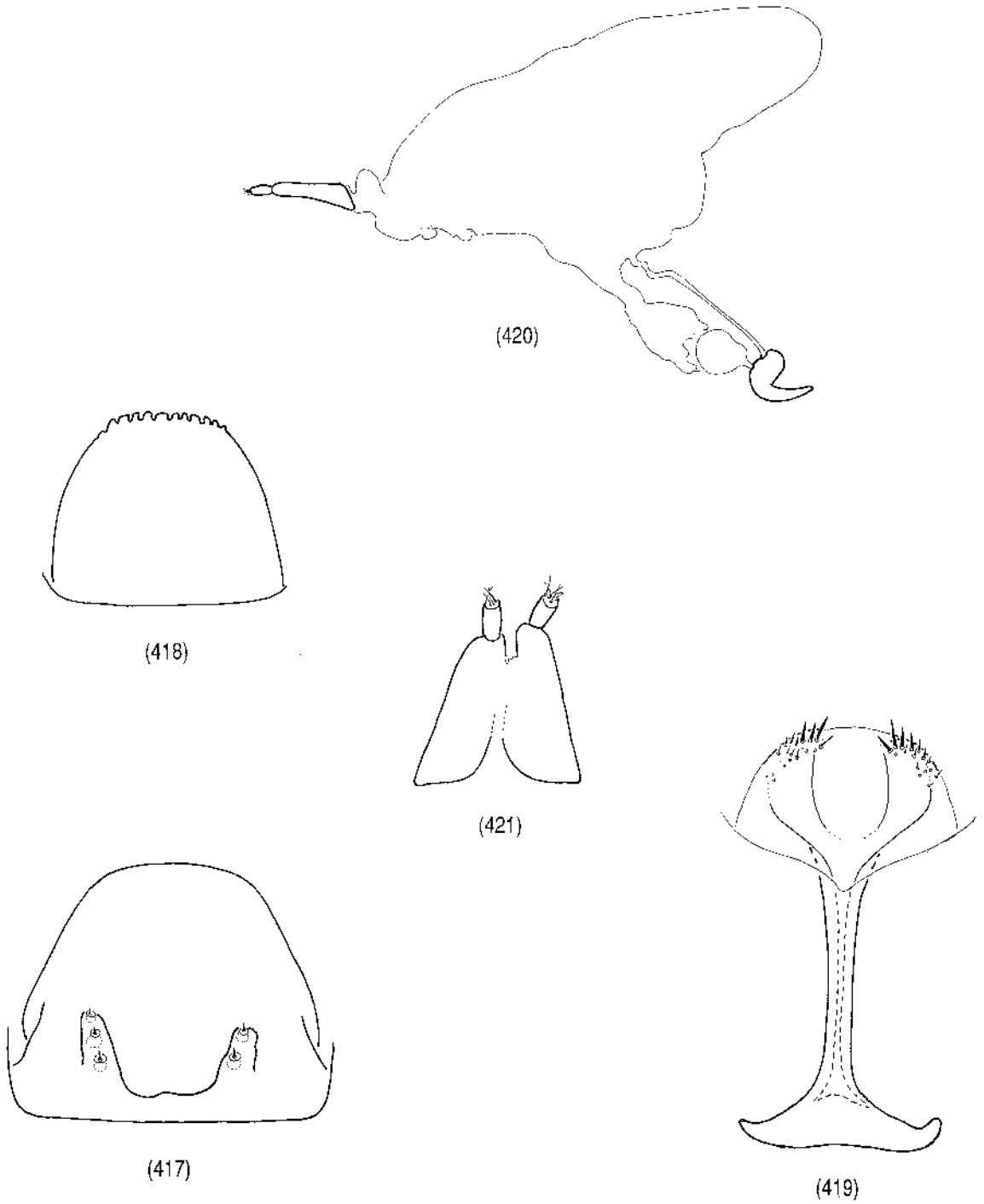


Fig. 417–421 *Patellitergum rectirostre*, female terminalia: 417, 418, tergites VII and VIII, dorsal, x95; 419, sternite VIII, ventral, x95; 420, genitalia, lateral, x69; 421, hemisternites, dorsal, x133.

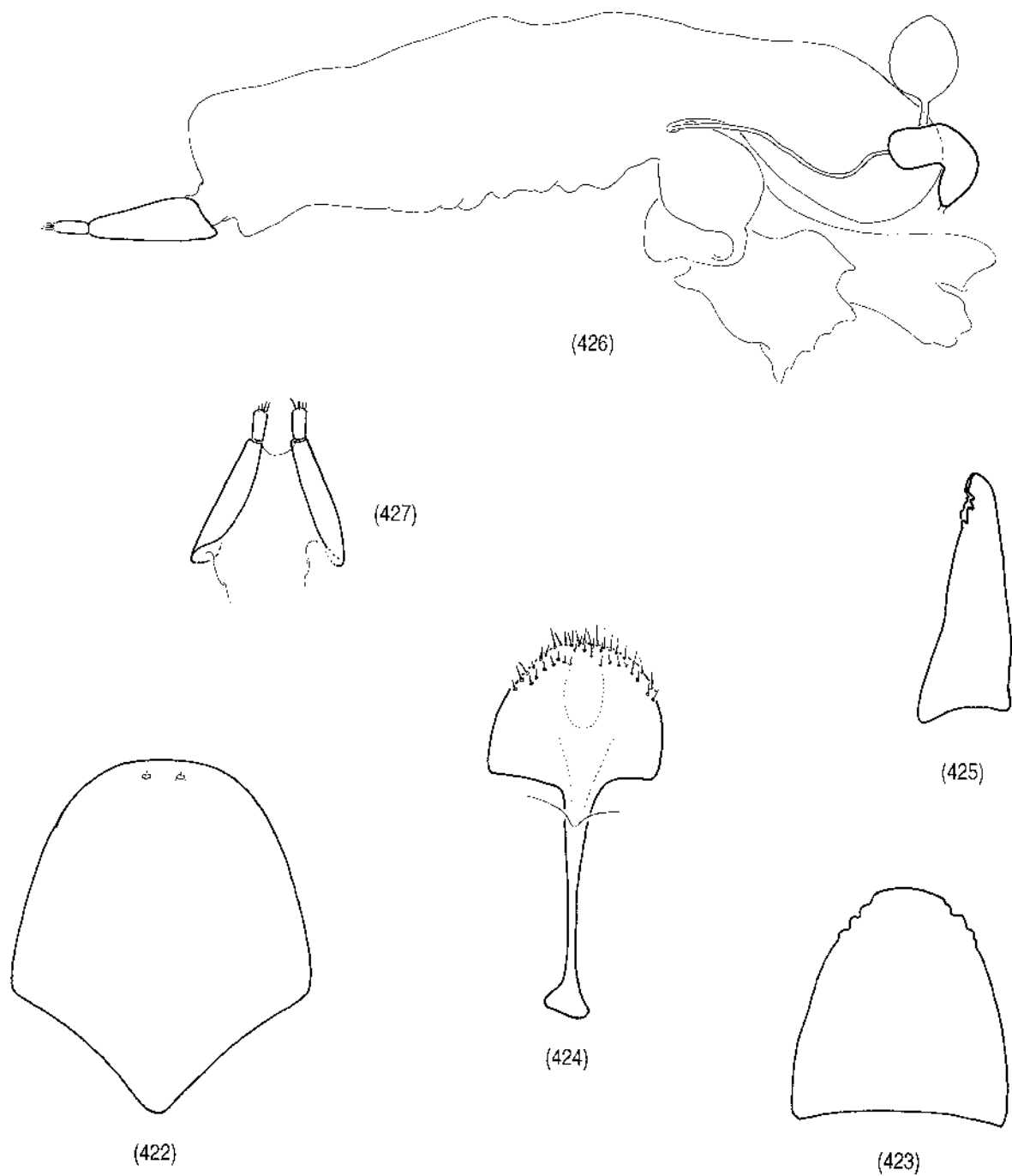


Fig. 422–427 *Rainacalles volens*, female terminalia, x90: 422, 423, tergites VII and VIII, dorsal; 424, 425, sternite VIII, ventral and lateral (ventral face towards left); 426, genitalia, lateral; 427, hemisternites, dorsal.

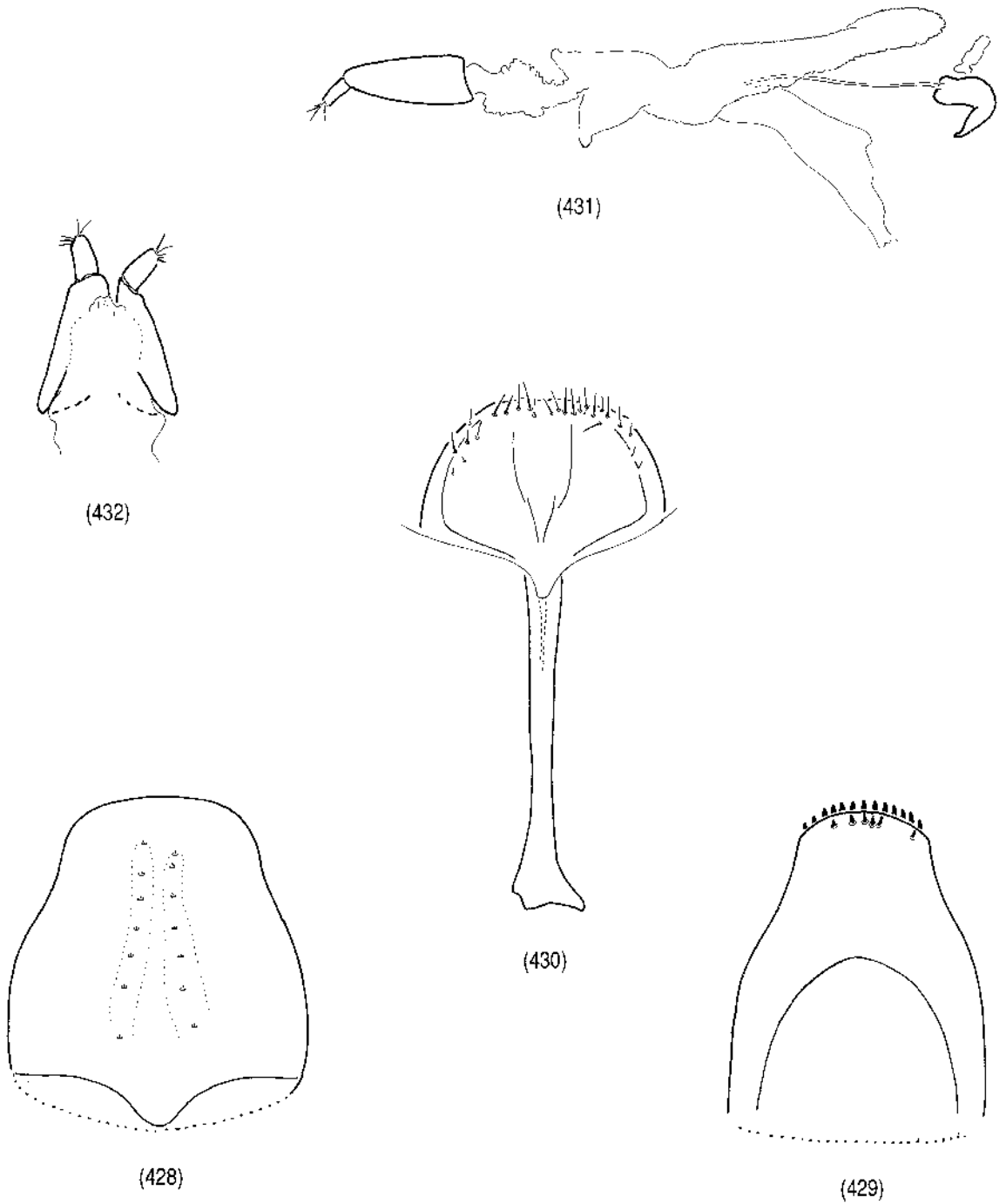


Fig. 428–432 *Pachyderris punctiventris*, female terminalia: 428, 429, tergites VII (x63) and VIII (x80), dorsal; 430, sternite VIII, ventral, x80; 431, genitalia, lateral, x63 (membranous parts not expanded); 432, hemisternites, dorsal, x63.

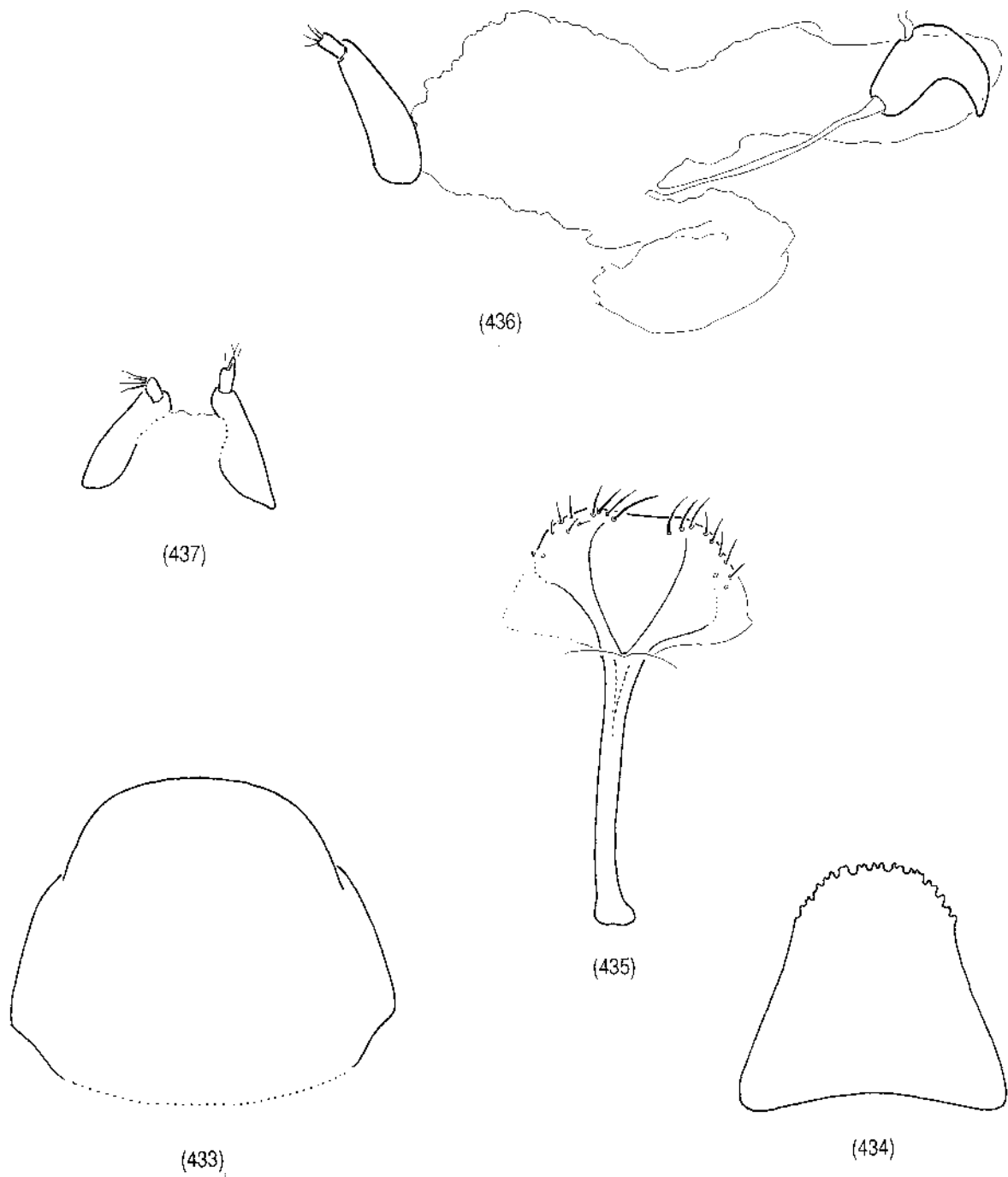


Fig. 433–437 *Adstantes rudis*, female terminalia: 433, 434, tergites VII (x126) and VIII (x159), dorsal; 435, sternite VIII, ventral, x159; 436, genitalia, lateral, x159; 437, hemisternites, dorsal, x159.

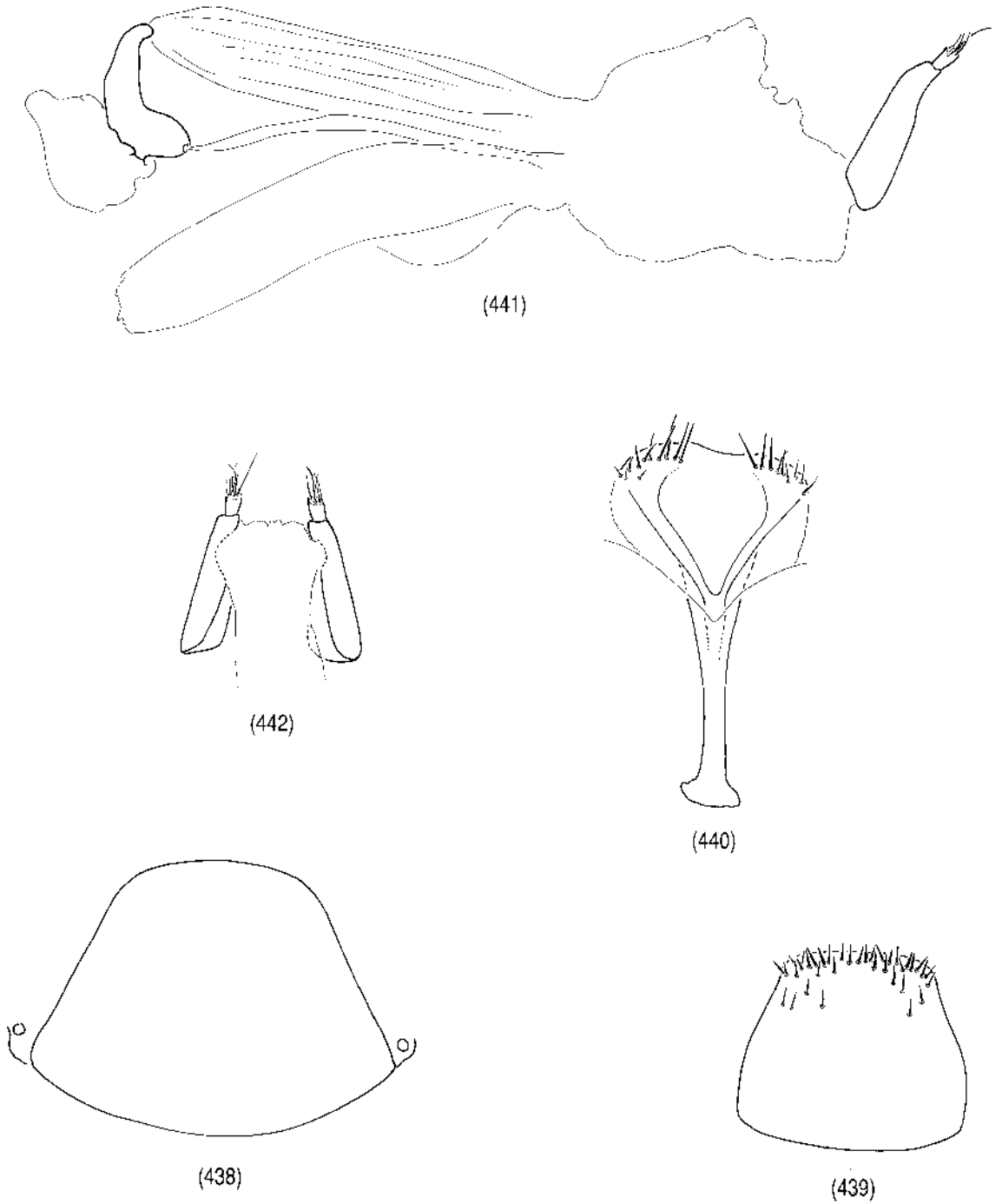


Fig. 438–442 *Microcryptorhynchus perpusillus*, female terminalia, x150: 438, 439, tergites VII and VIII, dorsal; 440, sternite VIII, ventral; 441, genitalia, lateral (membranous parts not fully expanded); 442, hemisternites, dorsal.

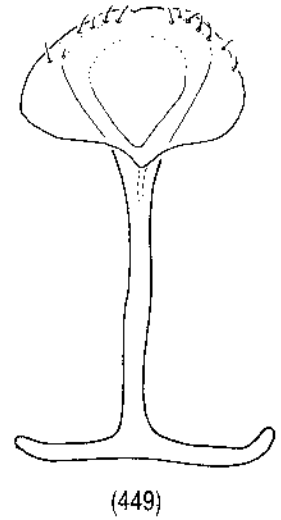
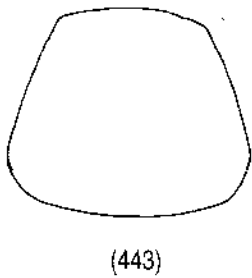
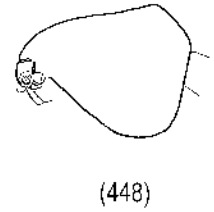
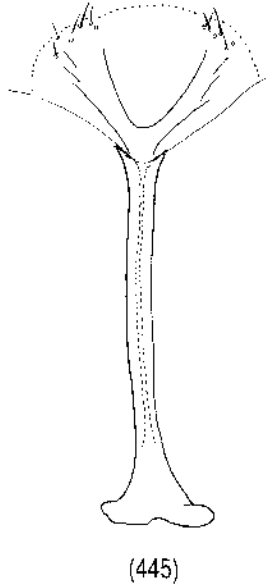
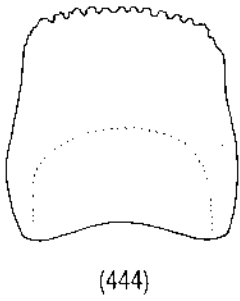
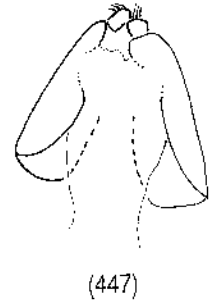
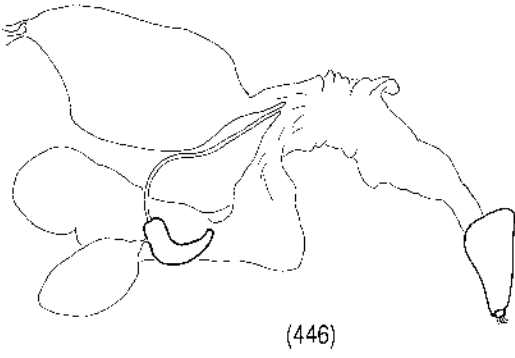


Fig. 443–447 *Andracalles canescens*, female terminalia: 443, 444, tergites VII (x93) and VIII (x135), dorsal; 445, sternite VIII, ventral, x135; 446, genitalia, lateral, x75; 447, hemisternites, dorsal, x68. **Fig. 448** *Andracalles pani*, hemisternite, lateral, x68. **Fig. 449** *Andracalles spurcus*, sternite VIII, x139.

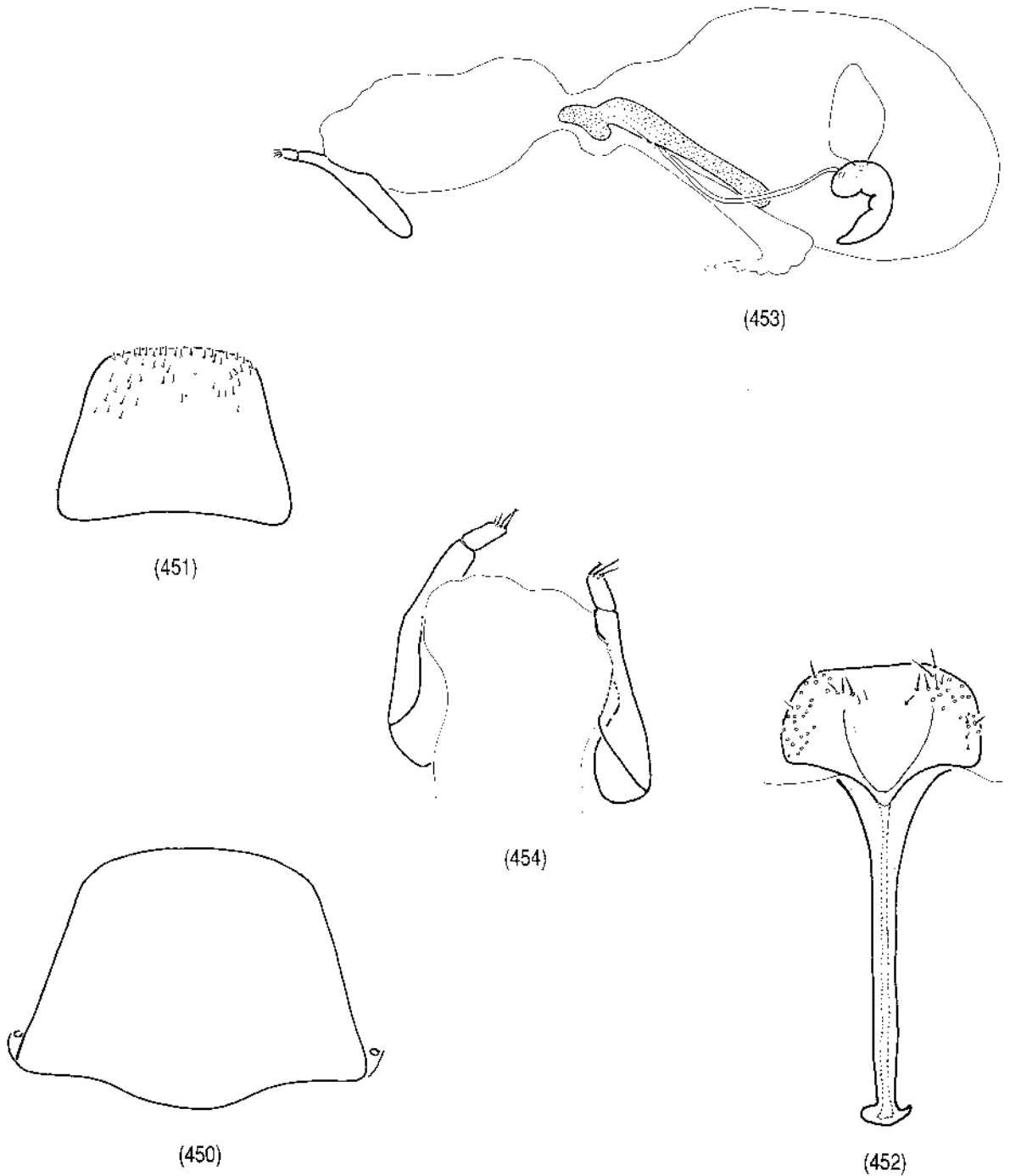


Fig. 450–454 *Ampagia rudis*, female terminalia: 450, 451, tergites VII and VIII, dorsal, x108; 452, sternite VIII, ventral, x108 (missing setae represented by open circles at positions of bases); 453, genitalia, lateral, x89; 454, hemisternites, dorsal, x156 (distorted and with setae missing).

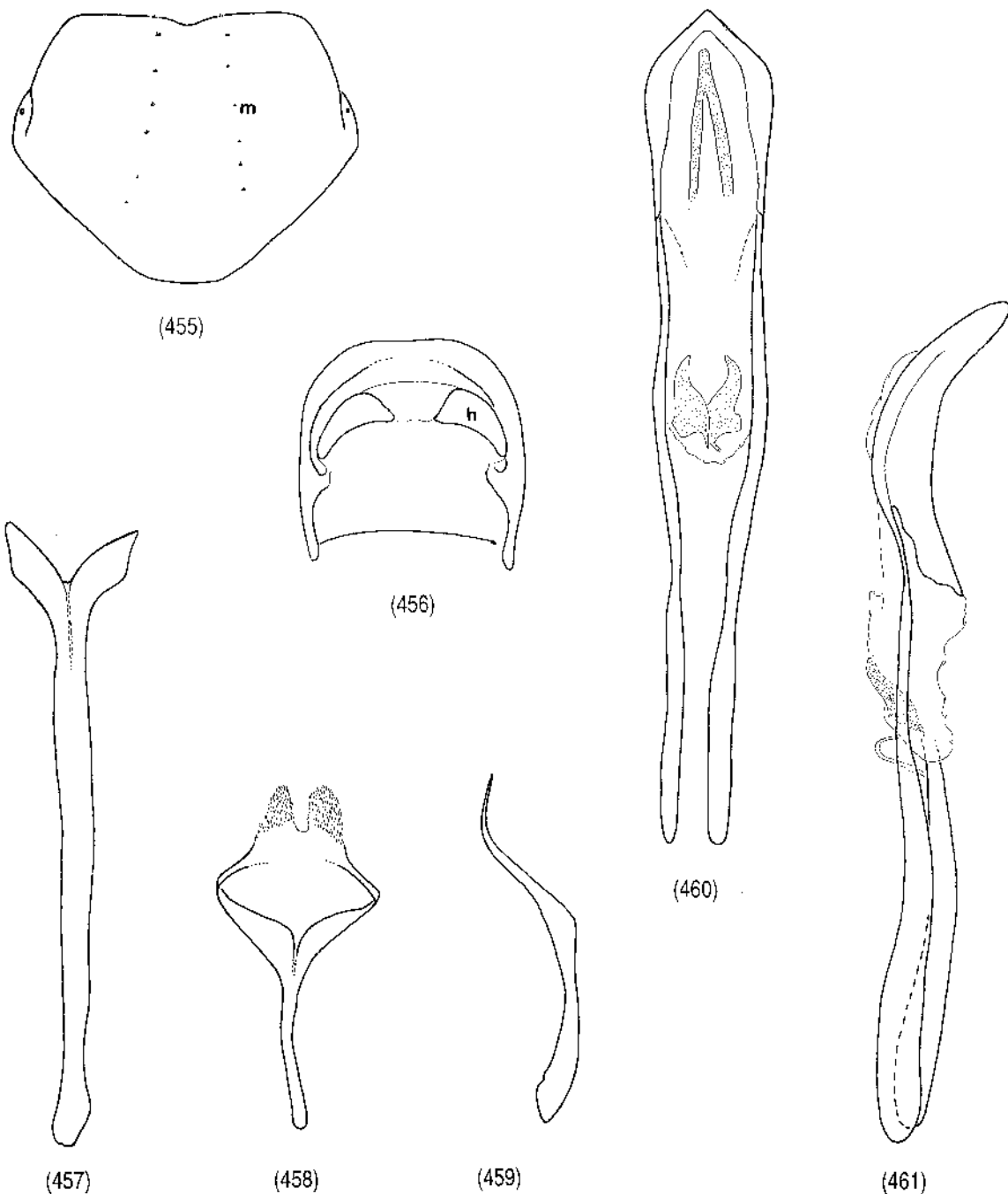
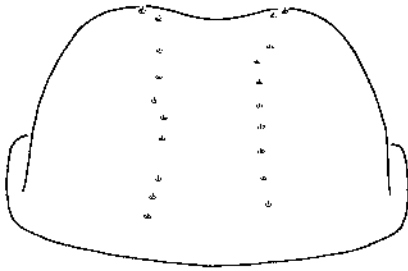
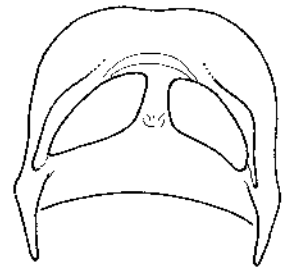


Fig. 455–461 *Nothaldonus peacei*, male terminalia: 455, tergite VII, dorsal, x27 (m - microseta); 456, tergite VIII and sternite VIII, ventral, x27 (h - hemisternite of sternum VIII); 457, spiculum gastrale, dorsal, x34; 458, 459, tegmen, dorsal and lateral, x34; 460, 461, aedeagus, dorsal and lateral, x34.



(462)



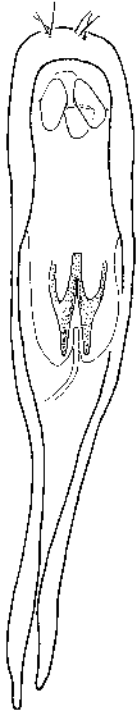
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(465)



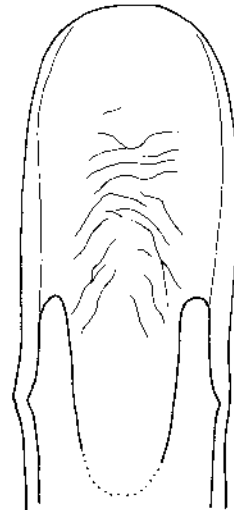
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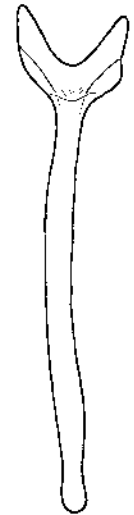
(467)



(468)



(469)



(464)

Fig. 462–469 *Strongylopterus hylobioides*, male terminalia: 462, tergite VII, dorsal, x37; 463, tergite VIII and sternite VIII, ventral, x37; 464, spiculum gastrale, dorsal, x37; 465, 466, tegmen, dorsal and lateral, x37; 467, 468, aedeagus, dorsal and lateral, x37; 469, aedeagus, ventral, x 52, showing ridges.

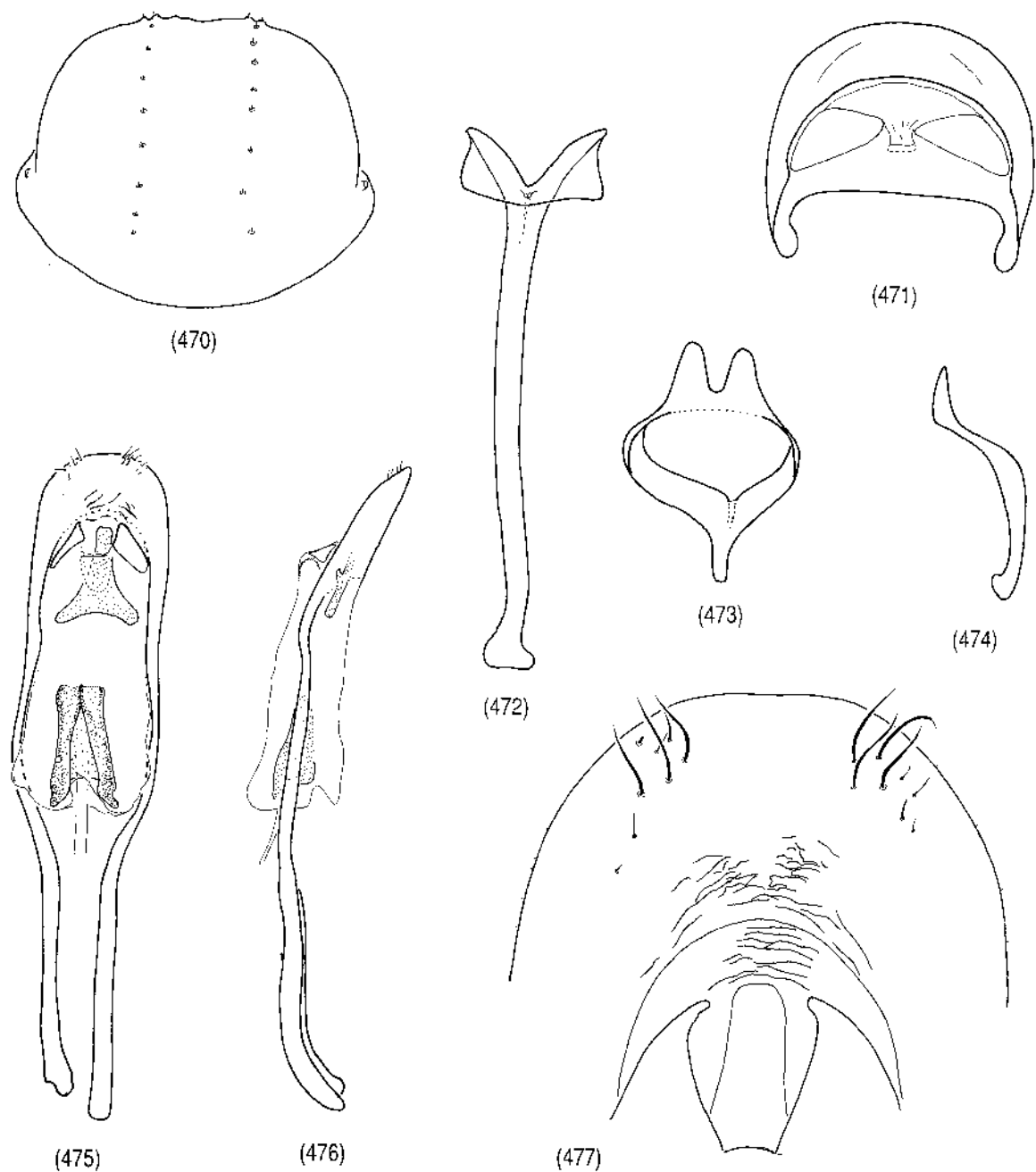
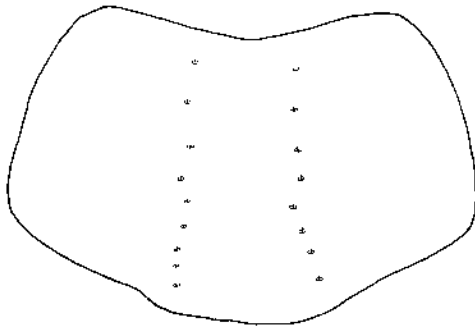
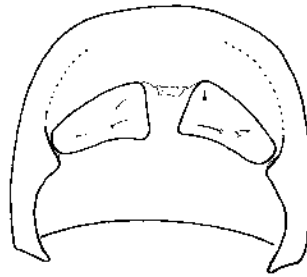


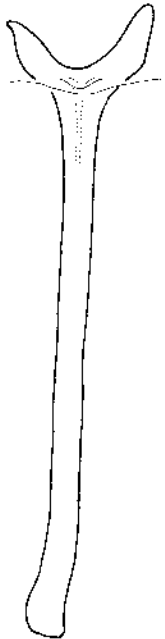
Fig. 470–477 *Homoreda murina*, male terminalia: 470, tergite VII, dorsal, x34; 471, tergite VIII and sternite VIII, ventral, x34; 472, spiculum gastrale, dorsal, x34; 473, 474, tegmen, dorsal and lateral, x34; 475, 476, aedeagus, dorsal and lateral, x34; 477, aedeagus, apex, dorsal, x135.



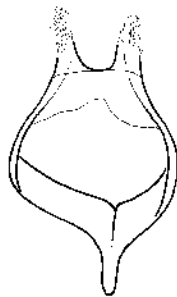
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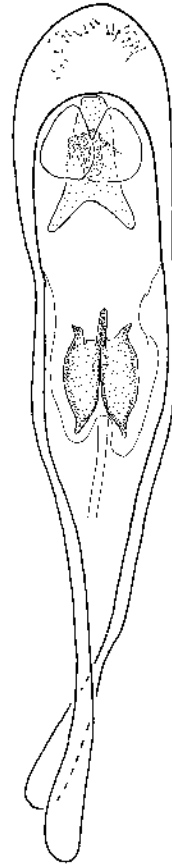
(480)



(481)



(482)



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Fig. 478–484 *Oreda notata*, male terminalia, x40: 478, tergite VII, dorsal; 479, tergite VIII and sternite VIII, ventral; 480, spiculum gastrale, dorsal; 481, 482, tegmen, dorsal and lateral; 483, 484, aedeagus, dorsal and lateral.

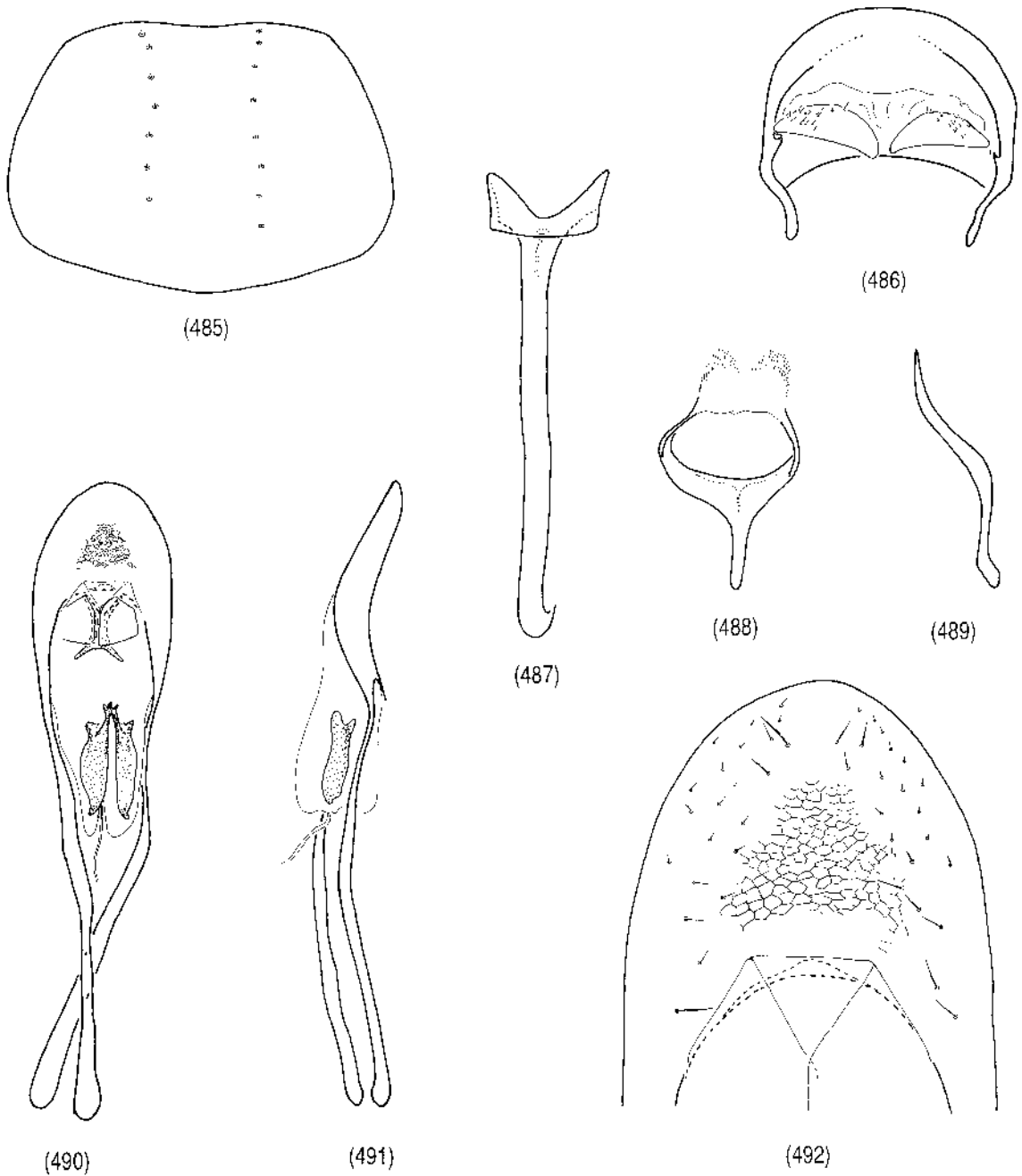


Fig. 485–492 *Mesoreda brevis*, male terminalia: 485, tergite VII, dorsal, x49; 486, tergite VIII and sternite VIII, ventral, x49; 487, spiculum gastrale, dorsal, x46; 488, 489, tegmen, dorsal and lateral, x46; 490, 491, aedeagus, dorsal and lateral, x46; 492, aedeagus, apex, dorsal, x130.

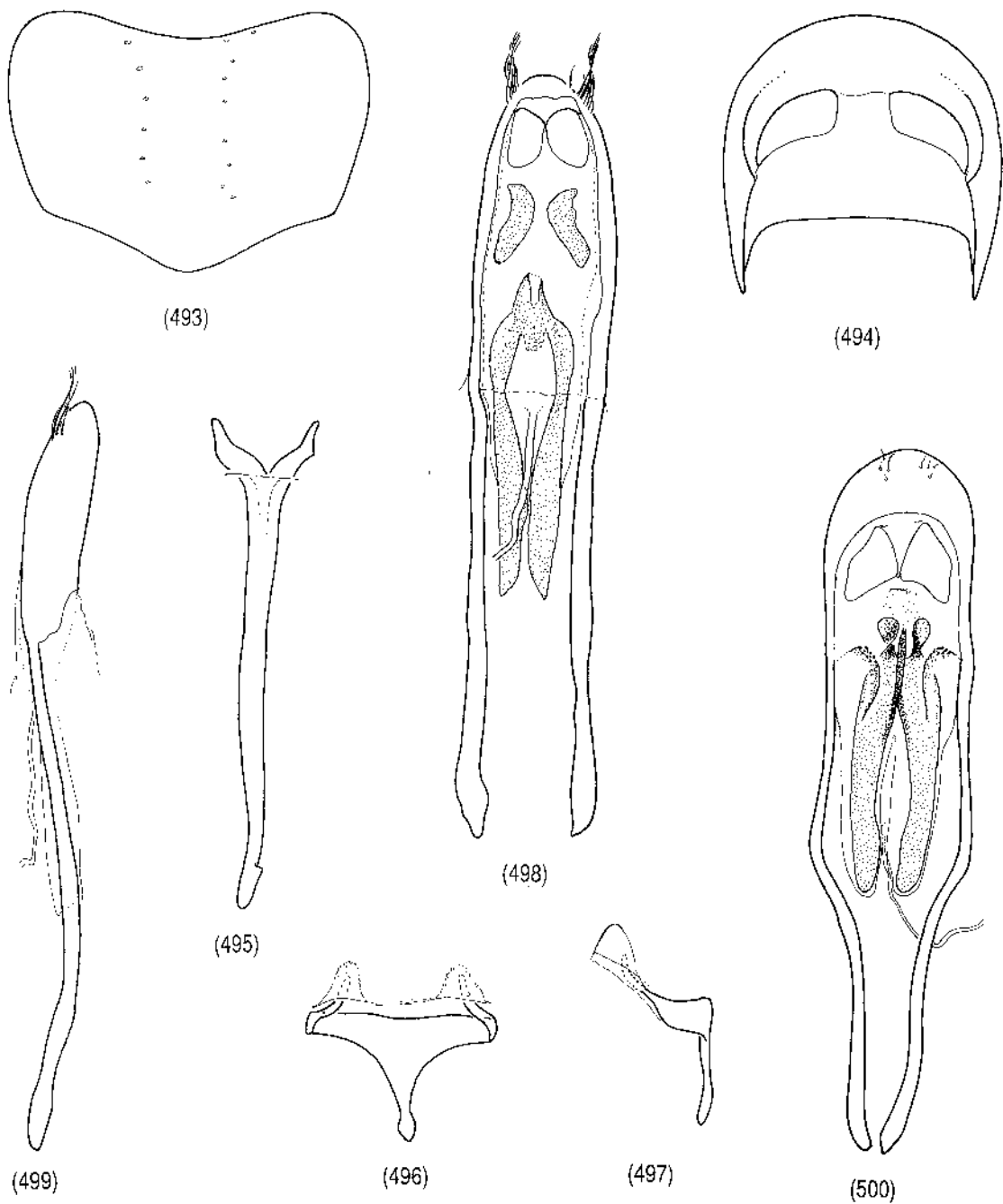
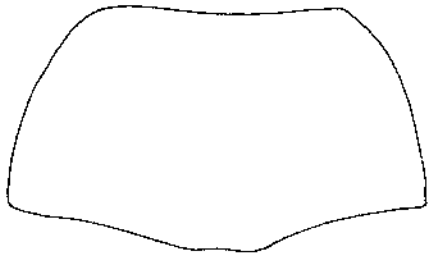
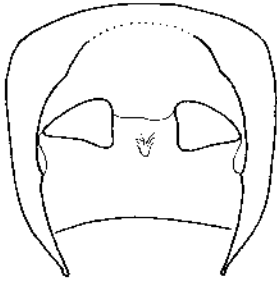


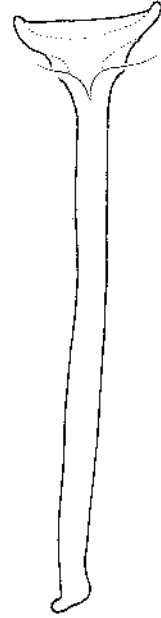
Fig. 493–499 *Psepholax tibialis*, male terminalia: 493, tergite VII, dorsal, x26; 494, tergite VIII and sternite VIII, ventral, x26; 495, spiculum gastrale, x22; 496, 497, tegmen, dorsal and lateral, x26; 498, 499, aedeagus, dorsal and lateral, x26. **Fig. 500** *Psepholax coronatus*, aedeagus, dorsal, x47.



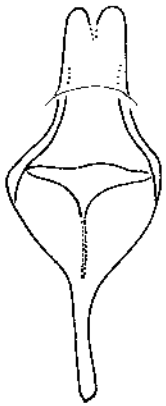
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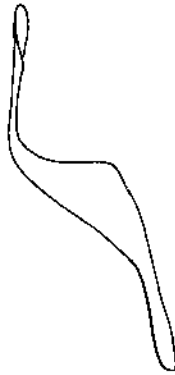
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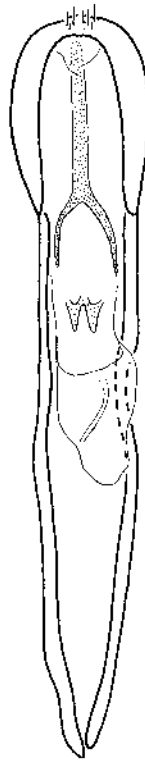
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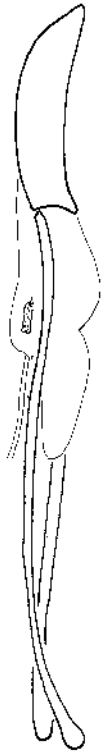
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(505)

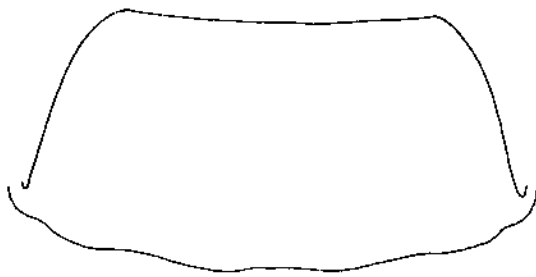


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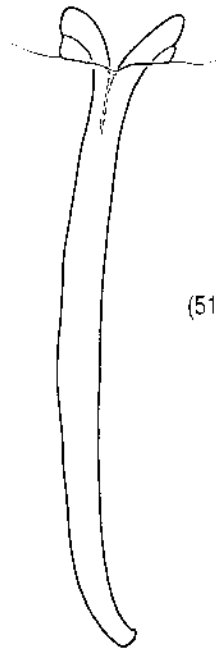


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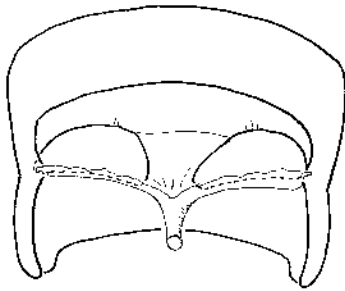
Fig. 501–507 *Sympedius testudo*, male terminalia, x66: 501, tergite VII, dorsal; 502, tergite VIII and sternite VIII, ventral; 503, spiculum gastrale, dorsal; 504, 505, tegmen, dorsal and lateral; 506, 507, aedeagus, dorsal and lateral.



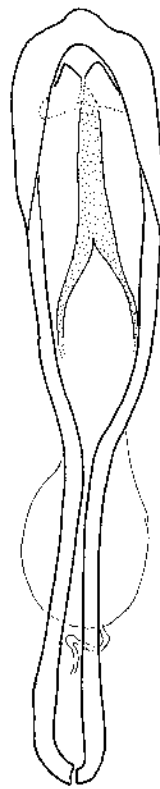
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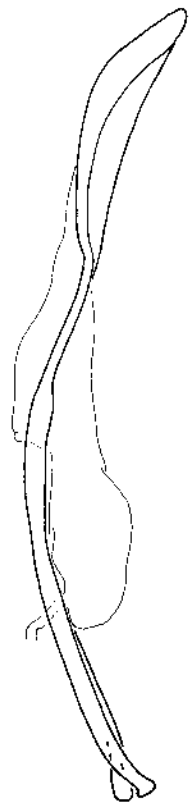
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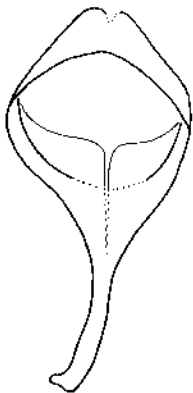
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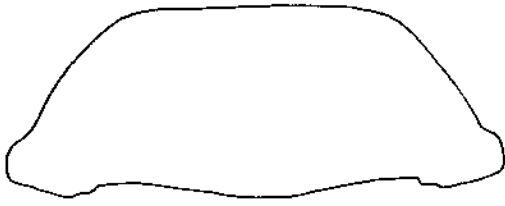


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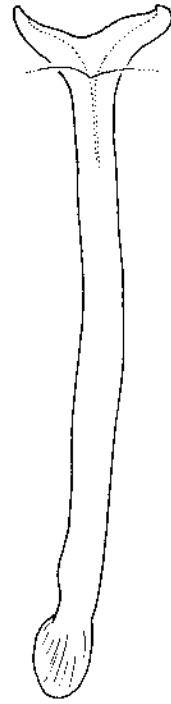


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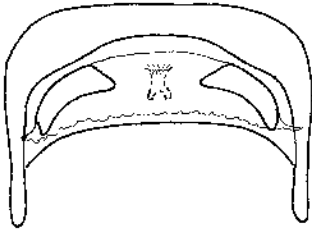
Fig. 509–515 *Baeorhynchodes cristatus*, male terminalia, x65: 509, tergite VII, dorsal; 510, tergite VIII and sternite VIII, ventral; 511, spiculum gastrale, dorsal; 512, 513, tegmen, dorsal and lateral; 514, 515, aedeagus, dorsal and lateral.



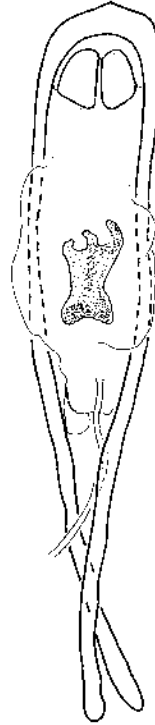
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(518)



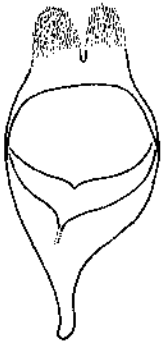
(517)



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Fig. 516–522 *Eutythinus squamiger*, male terminalia: 516, tergite VII, dorsal, x42; 517, tergite VIII and sternite VIII, ventral, x42; 518, spiculum gastrale, dorsal, x32; 519, 520, tegmen, dorsal and lateral, x32; 521, 522, aedeagus, dorsal and lateral, x32.

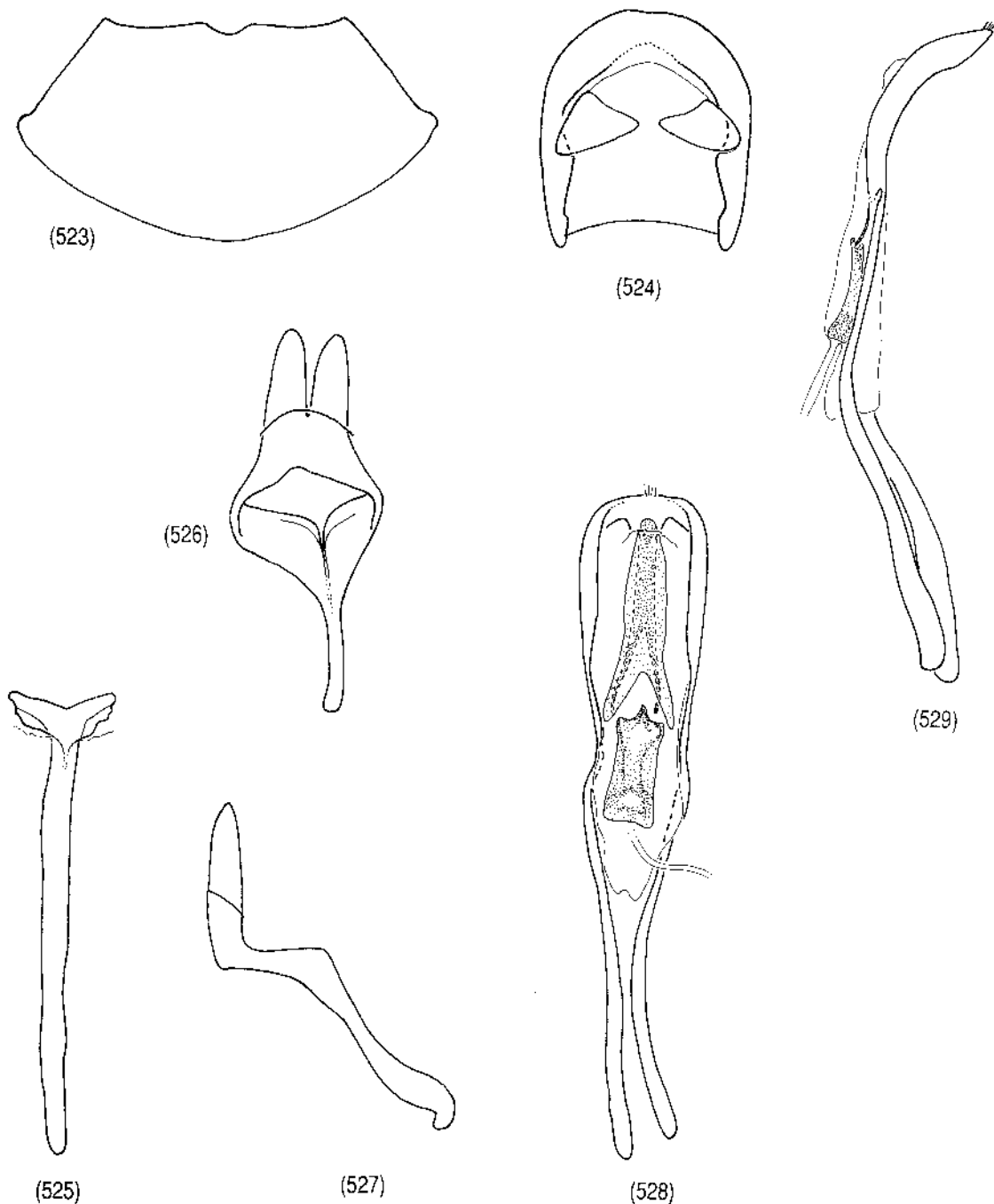


Fig. 523–529 *Rhynchodes ursus*, male terminalia: 523, tergite VII, dorsal, x14; 524, tergite VIII and sternite VIII, ventral, x14; 525, spiculum gastrale, dorsal, x20; 526, 527, tegmen, dorsal and lateral, x20; 528, 529, aedeagus, dorsal and lateral, x20 (ventral endophallic inverted Y-shaped sclerite narrower and more heavily sclerotised than dorsal sclerite).

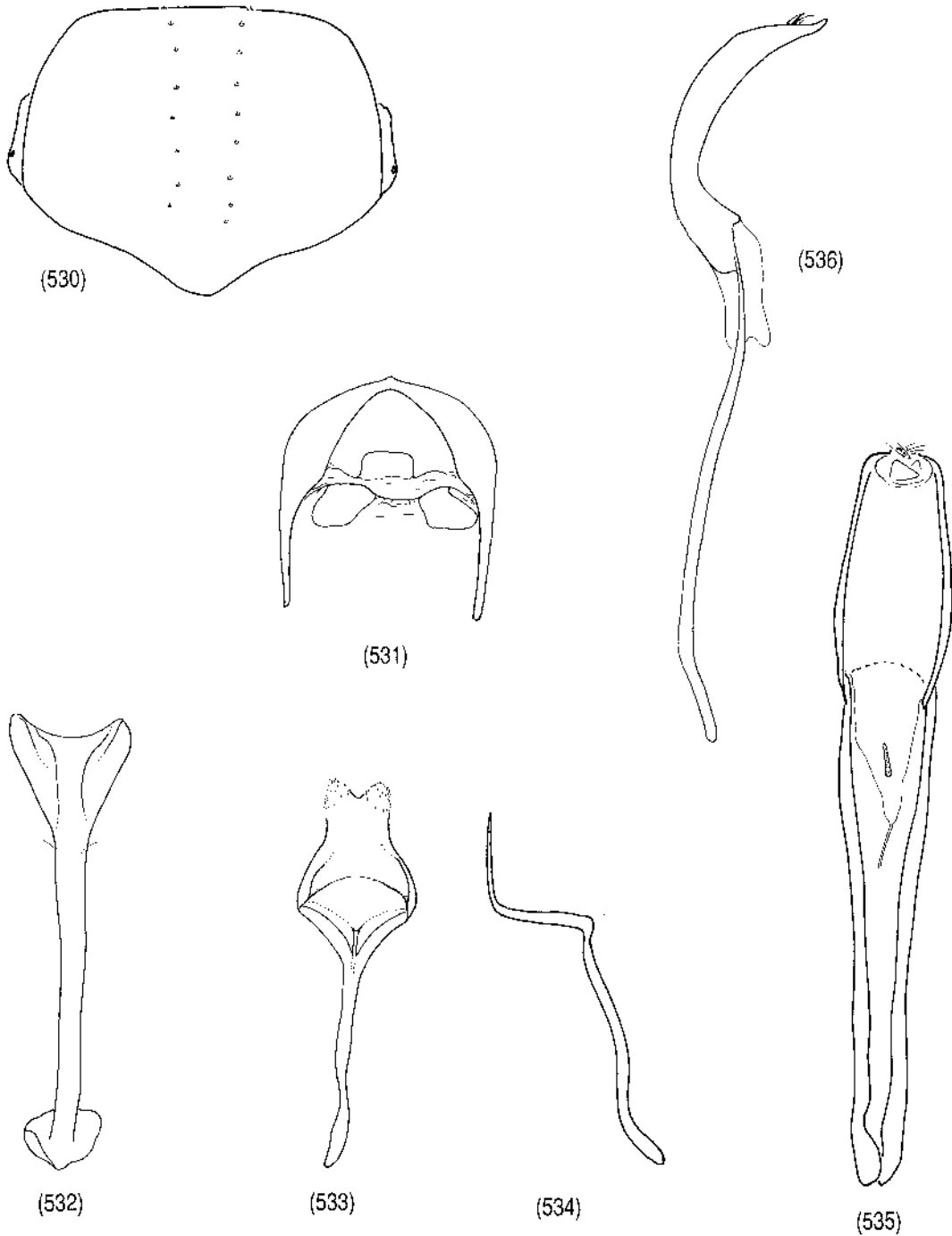


Fig. 530–536 *Mitrastethus baridoioides*, male terminalia: 530, tergite VII, dorsal, x46; 531, tergite VIII and sternite VIII, ventral, x46; 532, spiculum gastrale, dorsal, x46; 533, 534, tegmen, dorsal and lateral, x49; 535, 536, aedeagus, dorsal and lateral, x49.

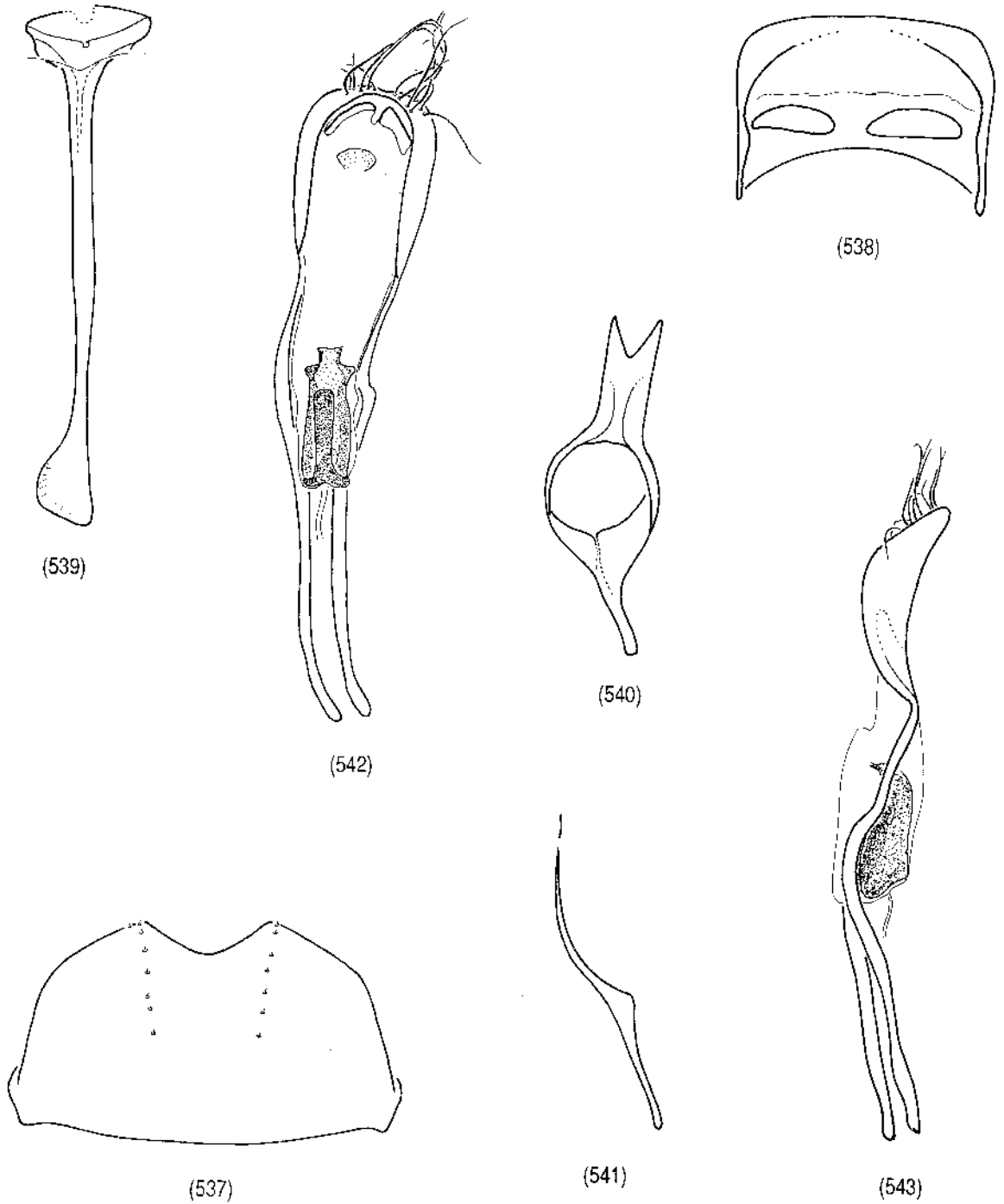


Fig. 537–543 *Mecistostylus douei*, male terminalia: 537, tergite VII, dorsal, x57; 538, tergite VIII and sternite VIII, ventral, x57; 539, spiculum gastrale, dorsal, x57; 540, 541, tegmen, dorsal and lateral, x62; 542, 543, aedeagus, dorsal and lateral, x62.

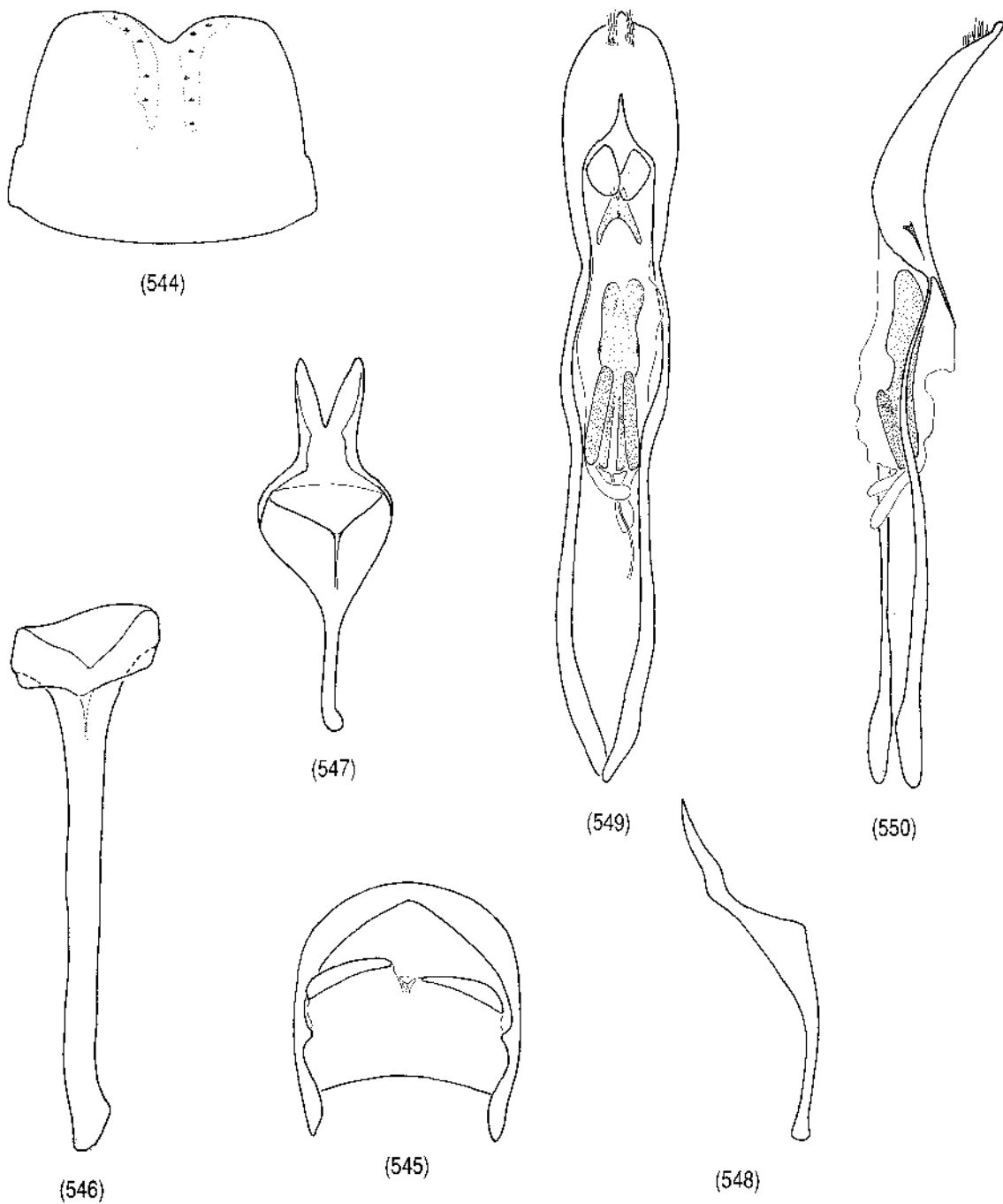


Fig. 544–550 *Ectopsis ferrugalis*, male terminalia, x23: 544, tergite VII, dorsal; 545, tergite VIII and sternite VIII, ventral; 546 spiculum gastrale, dorsal; 547, 548, tegmen, dorsal and lateral; 549, 550, aedeagus, dorsal and lateral.

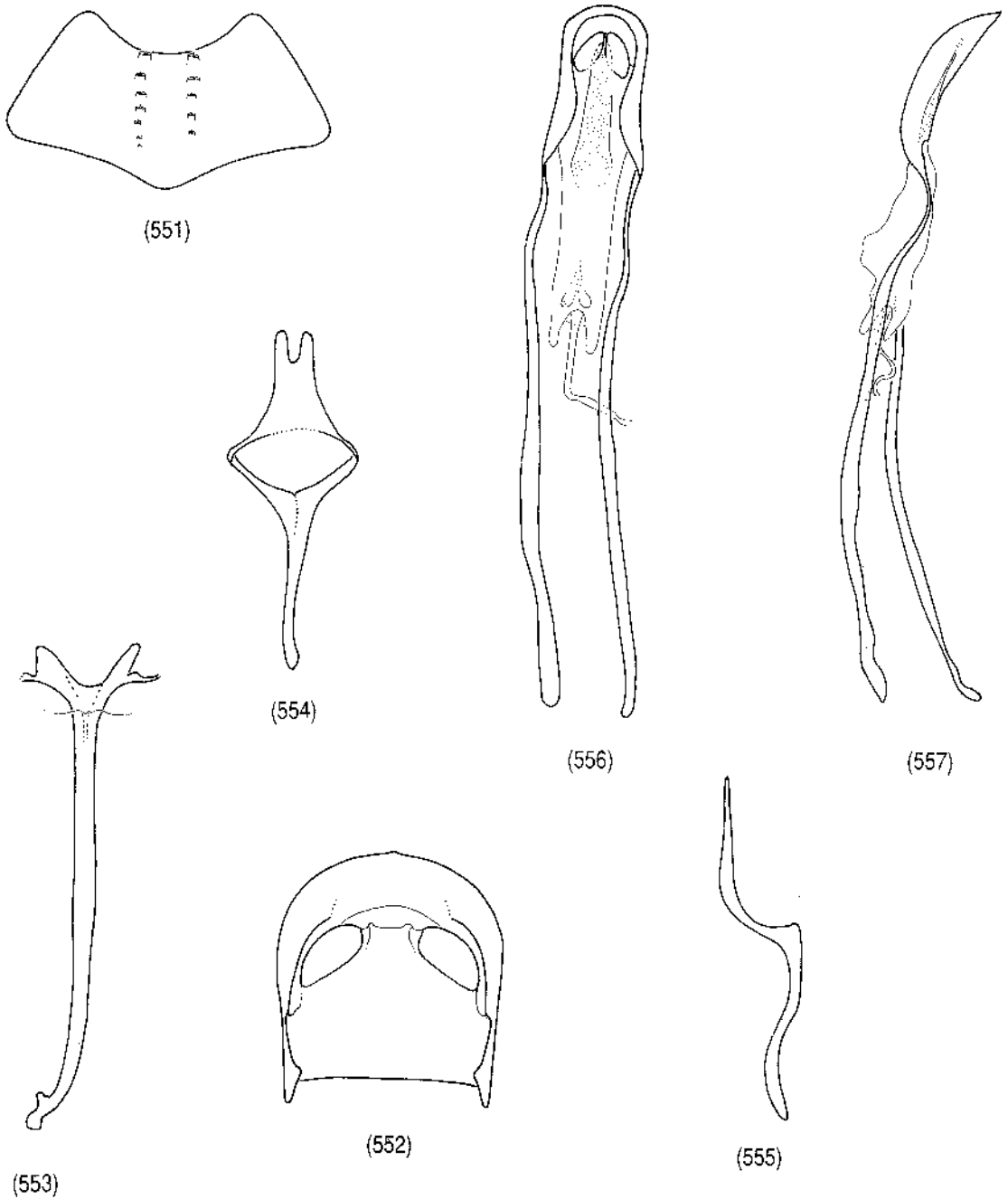


Fig. 551–557 *Hadracalles fuliginosus*, male terminalia: 551, tergite VII, dorsal, x23; 552, tergite VIII and sternite VIII, ventral, x30; 553, spiculum gastrale, dorsal, x30; 554, 555, tegmen, dorsal and lateral, x30; 556, 557, aedeagus, dorsal and lateral, x30.

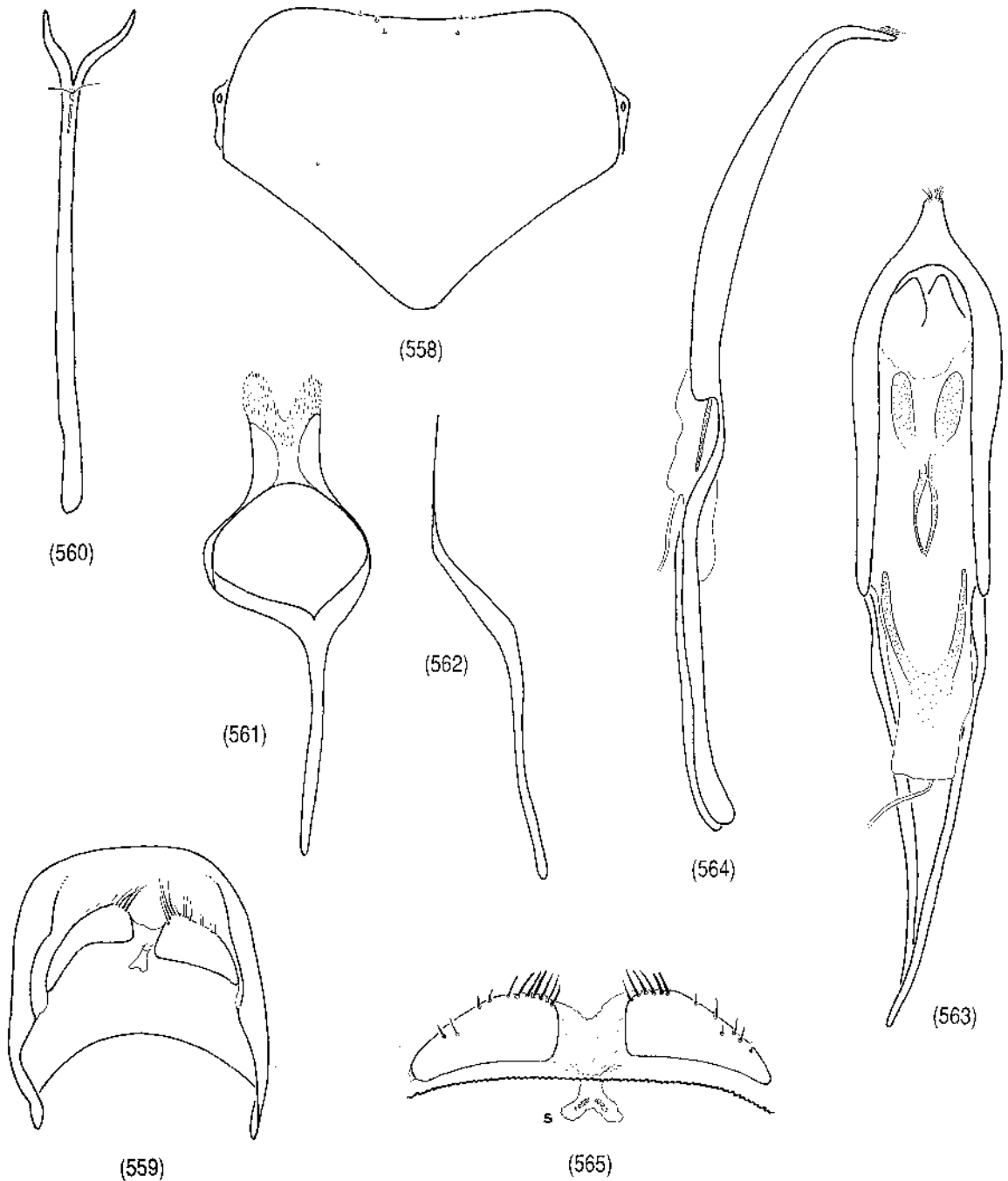


Fig. 558–564 *Tychanopais pictulus*, male terminalia, x52: 558, tergite VII, dorsal; 559, tergite VIII and sternite VIII, ventral; 560, spiculum gastrale, dorsal; 561, 562, tegmen, dorsal and lateral; 563, 564, aedeagus, dorsal and lateral. Fig. 565 *Tychanopais tuberosus*, sternum VIII, x54 (s - spiculum relictum).

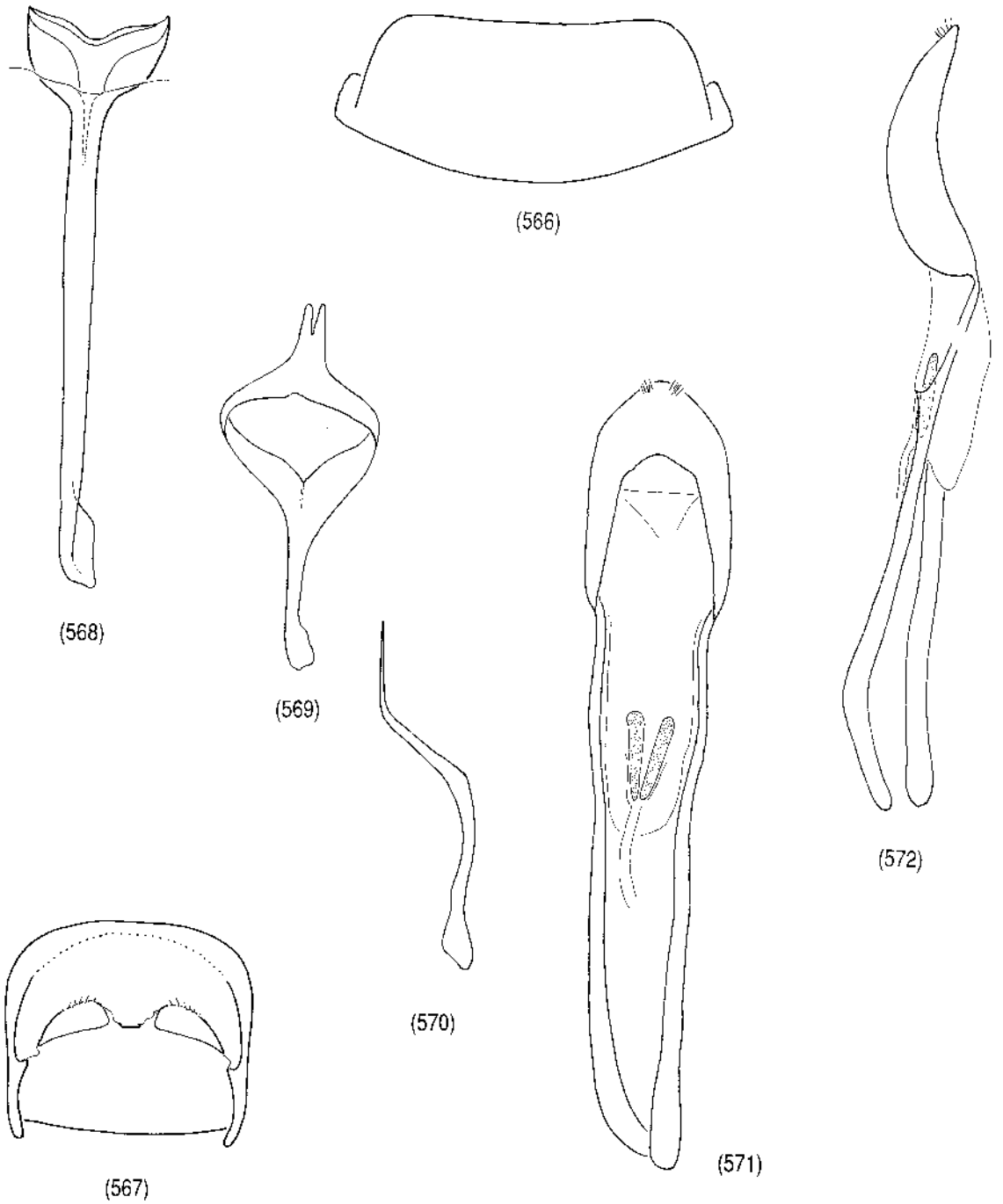


Fig. 566–572 *Tychanus gibbus*, male terminalia: 566, tergite VII, dorsal, x33; 567, tergite VIII and sternite VIII, ventral, x33; 568, spiculum gastrale, dorsal, x36; 569, tegmen, dorsal and lateral, x36; 506, 507, aedeagus, dorsal and lateral, x36.

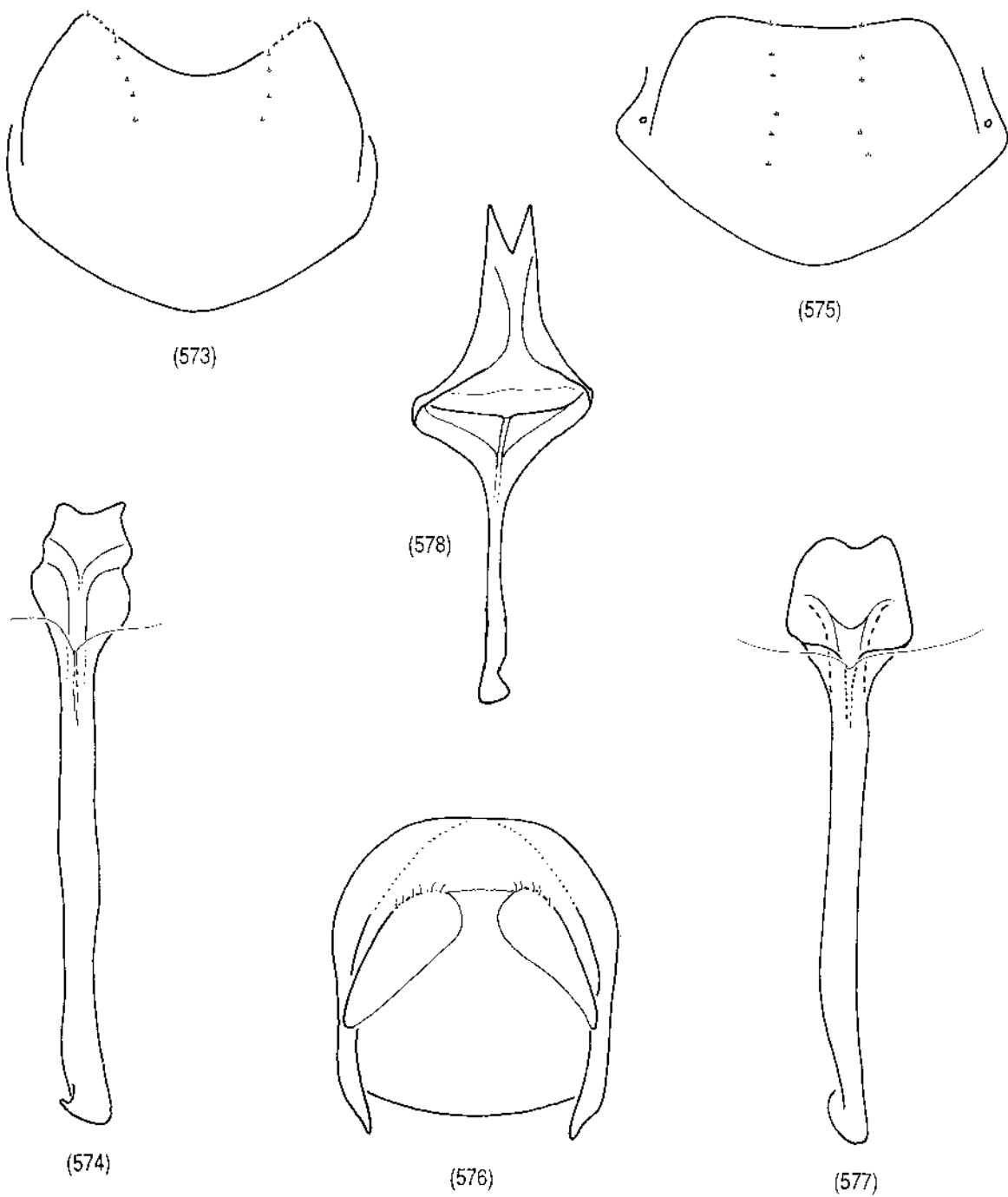


Fig. 573, 574 *Tychanus verrucosus*, male terminalia: 573, tergite VII, dorsal, x62; 574, spiculum gastrale, dorsal, x50. **Fig. 575–578** *Tychanus vexatus*, male terminalia: 575, tergite VII, dorsal, x50; 576, tergite VIII and sternite VIII, ventral, x62; 577, spiculum gastrale, dorsal, x62; 578, tegmen, dorsal, x62.

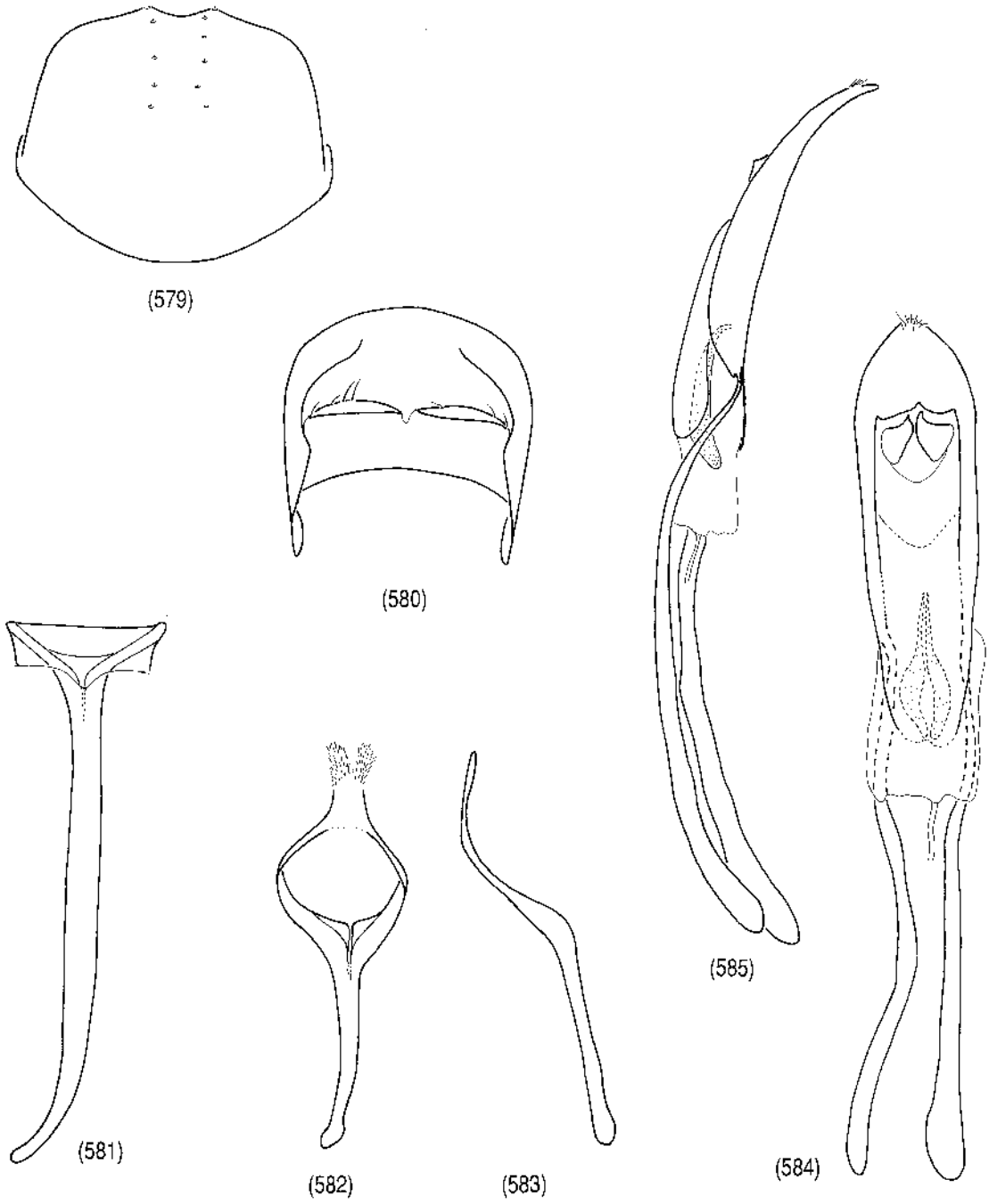
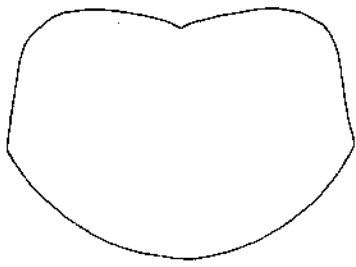
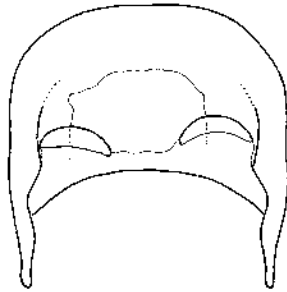


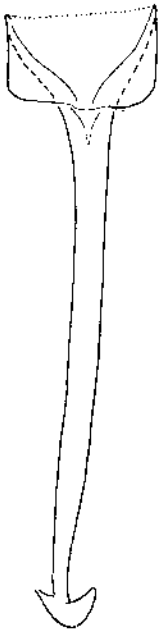
Fig. 579–585 *Clypeolus lachrymosus*, male terminalia, x32: 579, tergite VII, dorsal; 580, tergite VIII and sternite VIII, ventral; 581, spiculum gastrale, dorsal; 582, 583, tegmen, dorsal and lateral; 584, 585, aedeagus, dorsal and lateral.



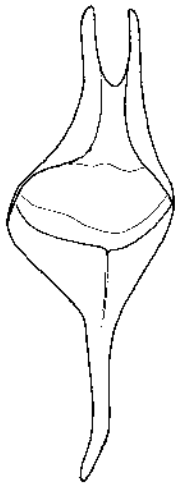
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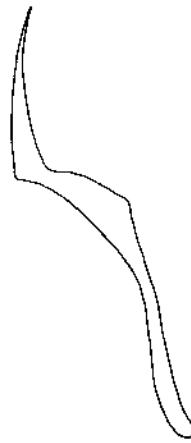
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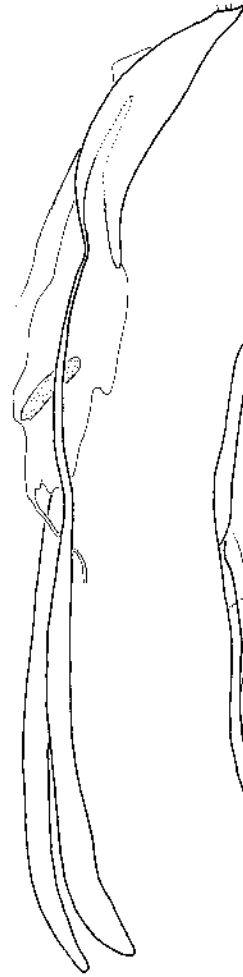
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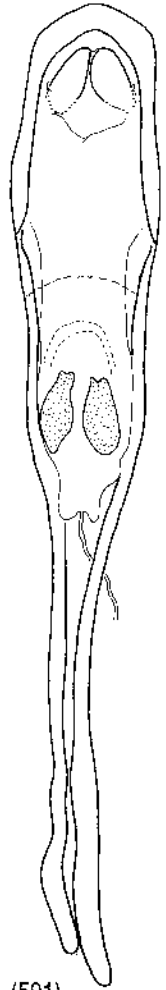
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(590)

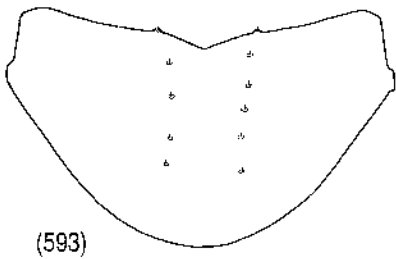


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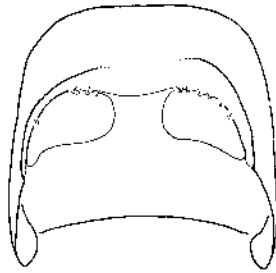


(591)

Fig. 586–592 *Didymus intufus*, male terminalia, x58: 586, tergite VII, dorsal; 587, tergite VIII and sternite VIII, ventral; 588 spiculum gastrale, dorsal; 589, 590, tegmen, dorsal and lateral; 591, 592, aedeagus, dorsal and lateral.



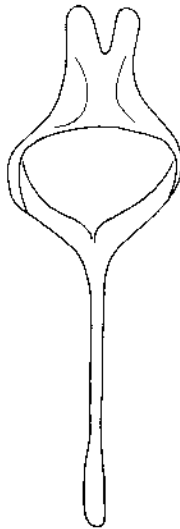
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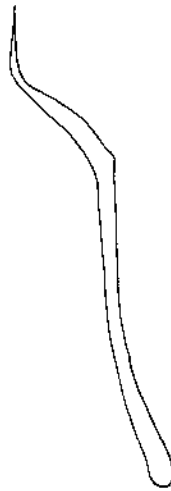
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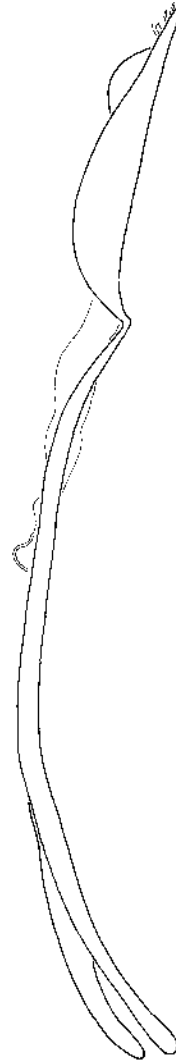
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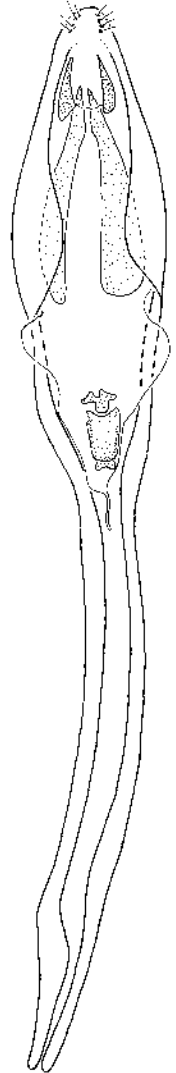
(596)



(597)



(599)



(598)

Fig. 593–599 *Hiracalles scitus*, male terminalia, x75: 593, tergite VII, dorsal; 594, tergite VIII and sternite VIII, ventral; 595, spiculum gastrale, dorsal; 596, 597, tegmen, dorsal and lateral; 598, 599, aedeagus, dorsal and lateral.

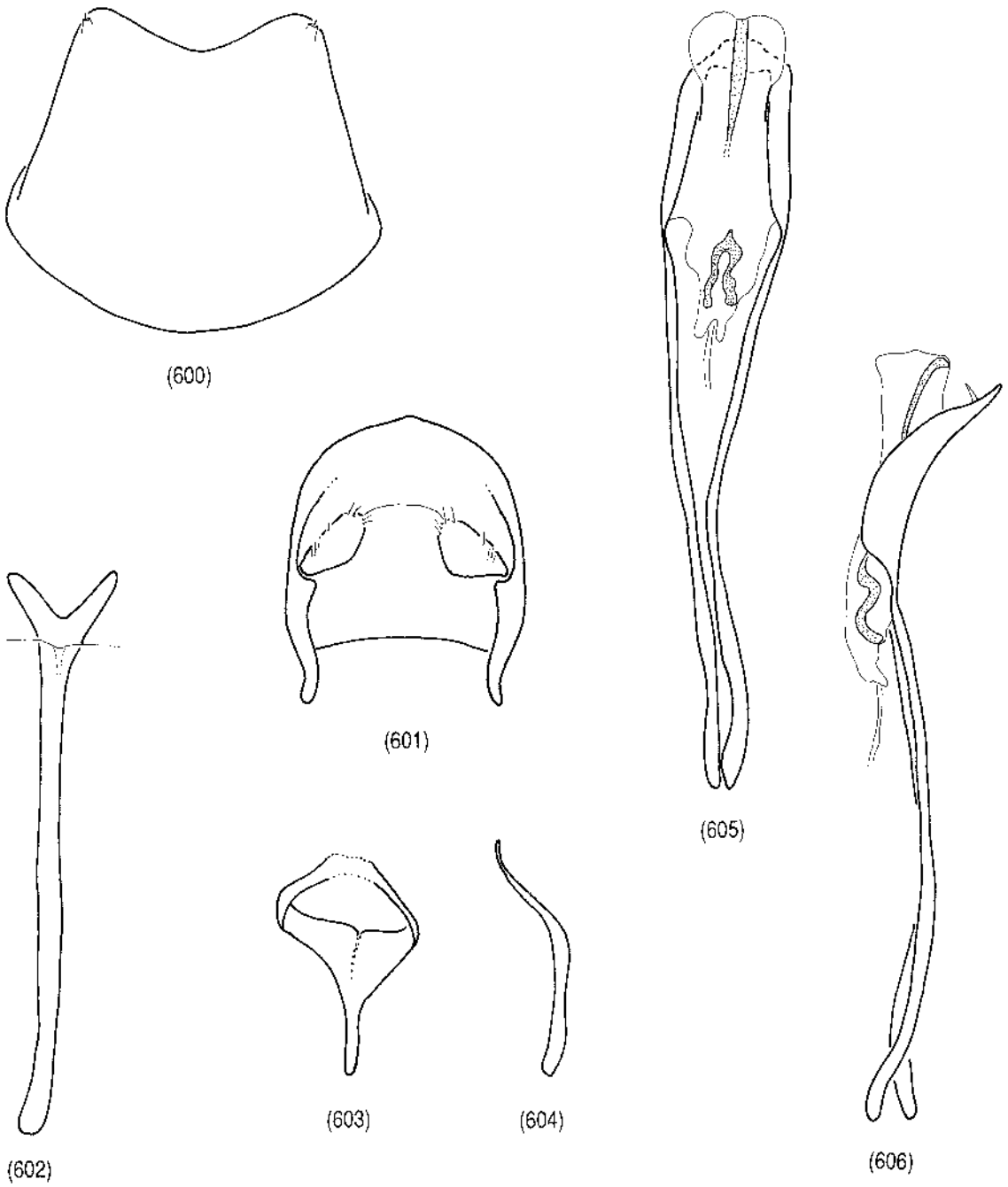


Fig. 600–606 *Indecentia nubila*, male terminalia, x71: 600, tergite VII, dorsal; 601, tergite VIII and sternite VIII, ventral; 602, spiculum gastrale, dorsal; 603, 604, tegmen, dorsal and lateral; 605, 606, aedeagus, dorsal and lateral (endophallus partially everted).

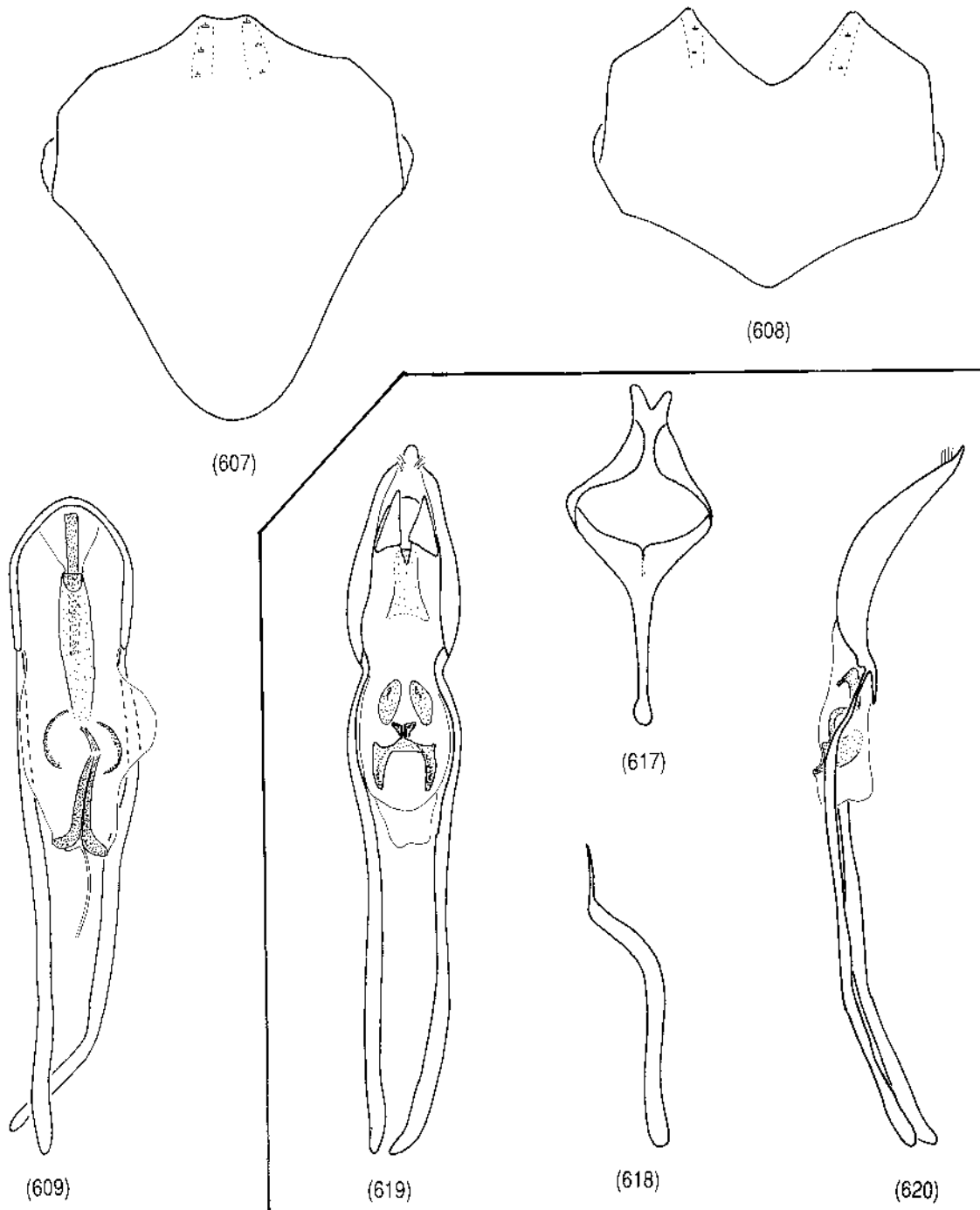
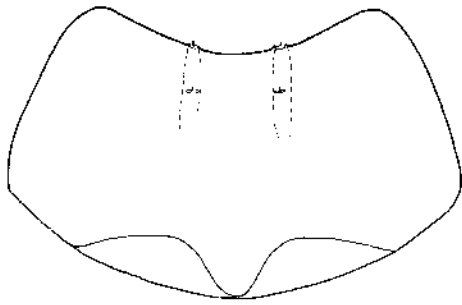
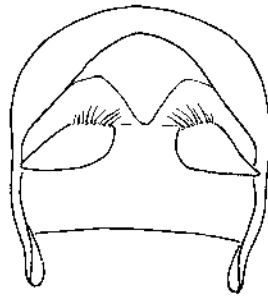


Fig. 607 *Crisius dives*, tergite VII, dorsal, x23. Fig. 608, 609 *Crisius hopensis*, male terminalia: 608, tergite VII, dorsal, x28; 609, aedeagus, dorsal, x22.

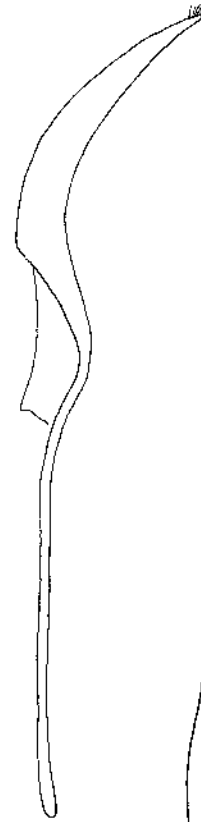
Fig. 617–620 *Crisius postipuncta*, male terminalia, x36: 617, 618, tegmen, dorsal and lateral; 619, 620, aedeagus, dorsal and lateral.



(610)



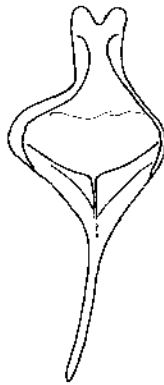
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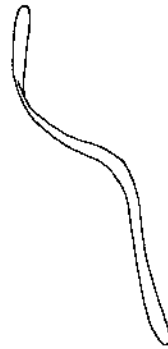
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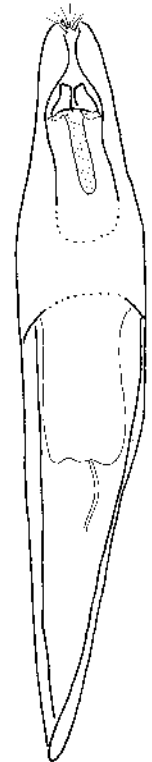
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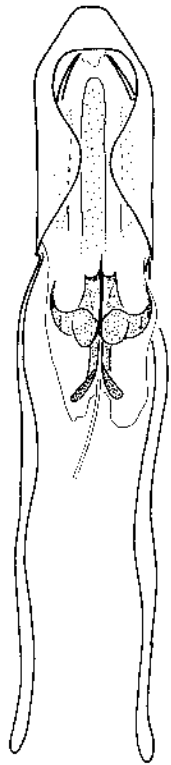


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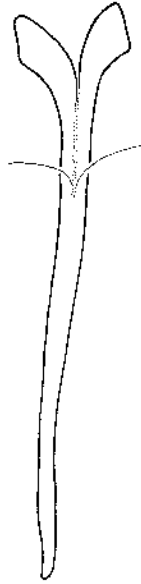


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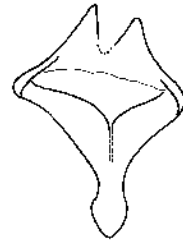
Fig. 610–616 *Crisius longulus*, male terminalia: 610, tergite VII, dorsal, x39; 611, tergite VIII and sternite VIII, ventral, x28; 612, spiculum gastrale, dorsal, x28; 613, 614, tegmen, dorsal and lateral, x28; 615, 616, aedeagus, dorsal and lateral, x28.



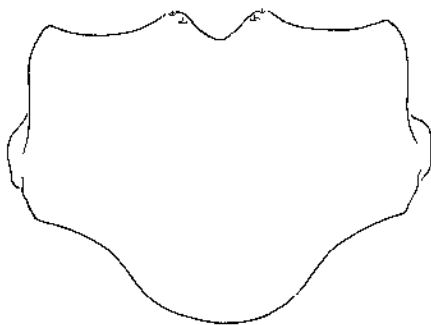
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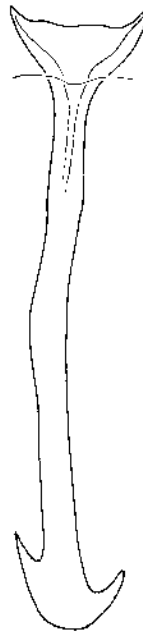
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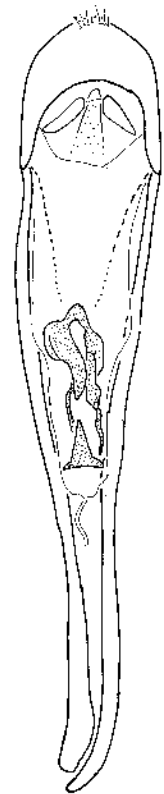
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(623)

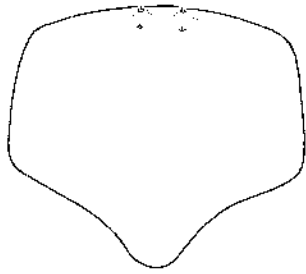


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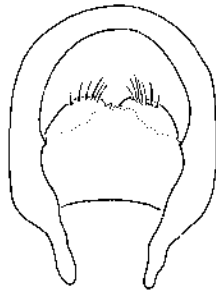


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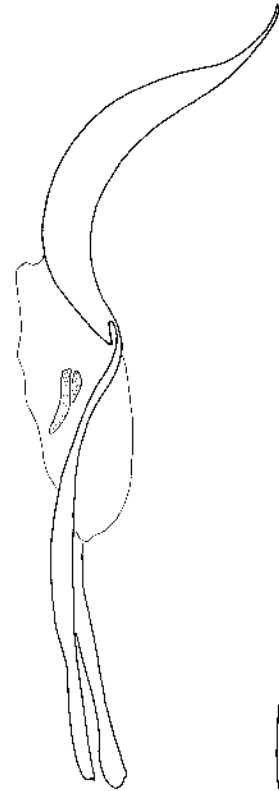
Fig. 621 *Crisius ventralis*, aedeagus, dorsal, x45. Fig. 622 *Crisius latirostris*, spiculum gastrale, dorsal, x75. Fig. 623–626 *Crisius zenomorphus*, male terminalia: 623, tergite VII, dorsal, x52; 624, spiculum gastrale, dorsal, x41; 625, tegmen, dorsal, x41; 626, aedeagus, dorsal, x41 (basal sclerites distorted). (Fig. 617–620 are on p. 266)



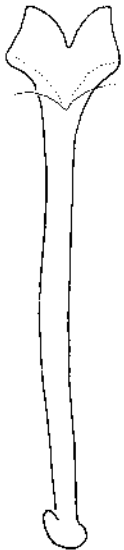
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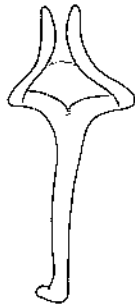
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(633)



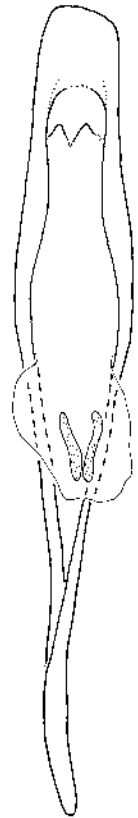
(629)



(630)



(631)



(632)

Fig. 627–633 *Whitiacalles ignotus*, male terminalia, x75: 627, tergite VII, dorsal; 628, tergite VIII and sternite VIII, ventral; 629, spiculum gastrale, dorsal; 630, 631, tegmen, dorsal and lateral; 632, 633, aedeagus, dorsal and lateral.

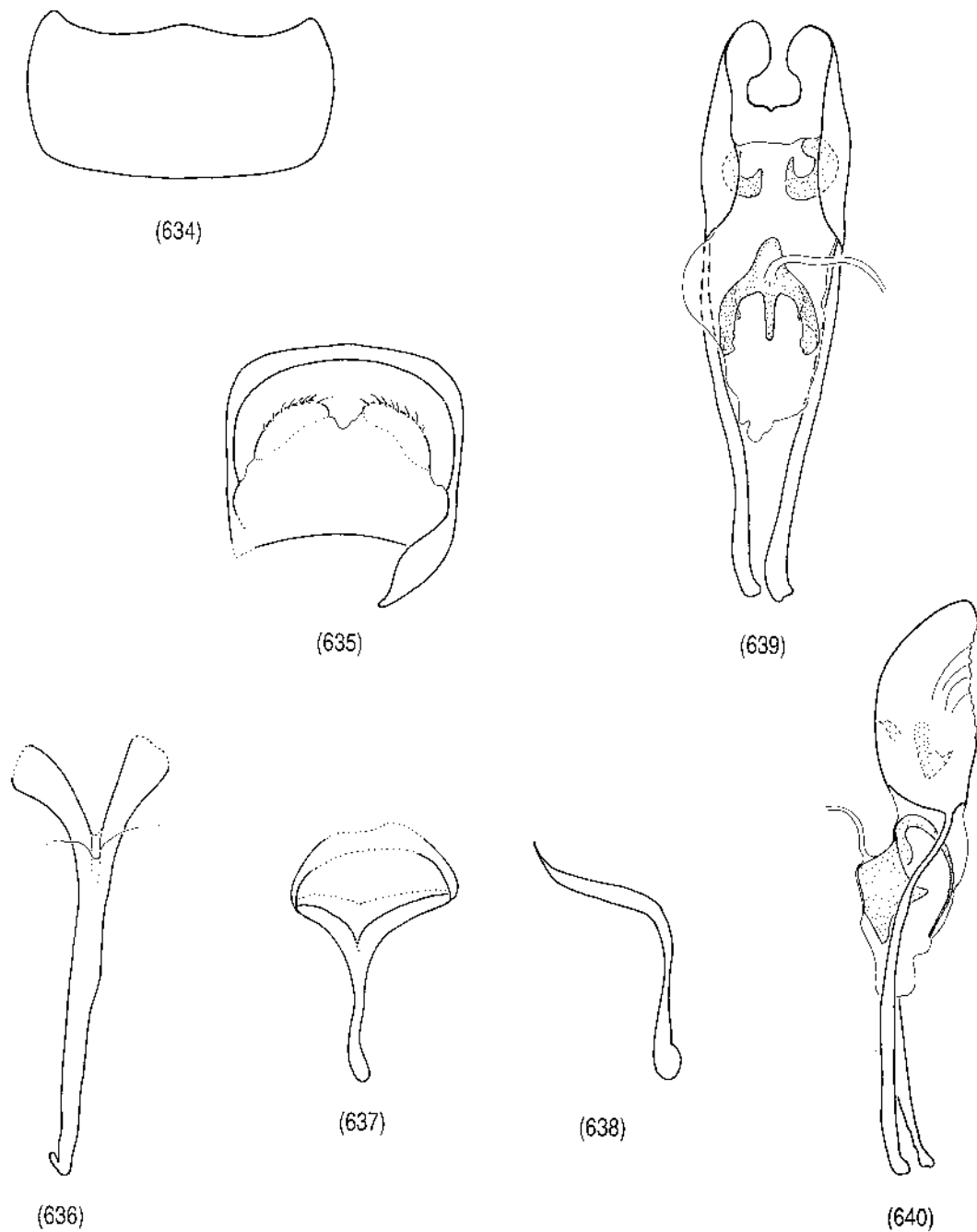


Fig. 634–640 *Maneneacalles concinnus*, male terminalia, x73: 634, tergite VII, dorsal; 635, tergite VIII and sternite VIII, ventral; 636, spiculum gastrale, dorsal; 637, 638, tegmen, dorsal and lateral; 639, 640, aedeagus, dorsal and lateral.

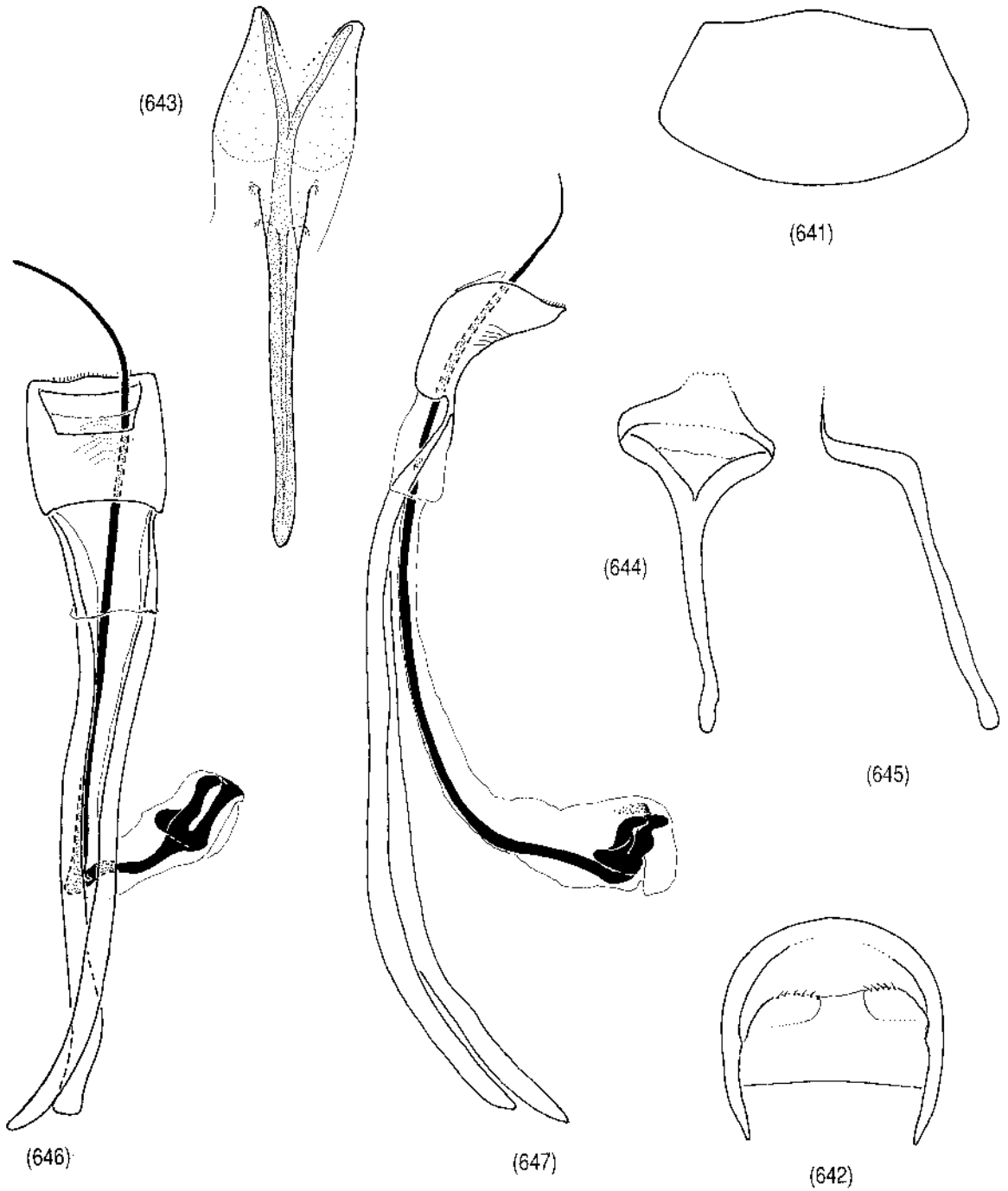
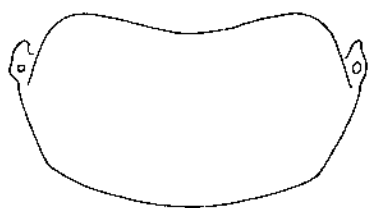
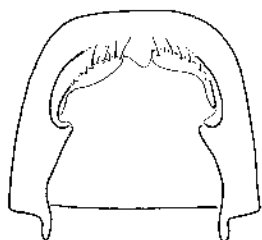


Fig. 641–647 *Synacalles peelensis*, male terminalia, x75: 641, tergite VII, dorsal; 642, tergite VIII and sternite VIII, ventral; 643, spiculum gastrale, ventral, still attached to genital pocket (stippling reflects degree of sclerotisation); 644, 645, tegmen, dorsal and lateral; 646, 647, aedeagus, dorsal and lateral (stippled lines on body of aedeagus are ventral folds).



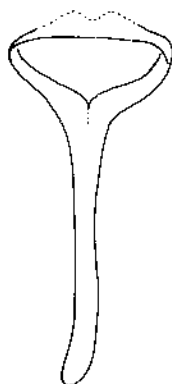
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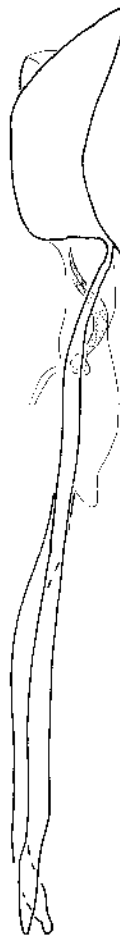
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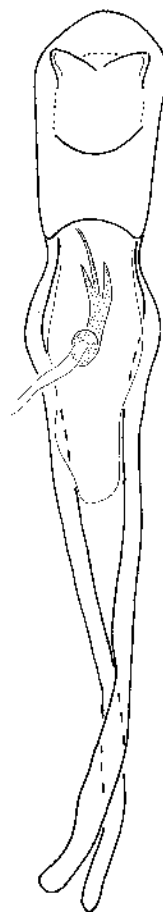
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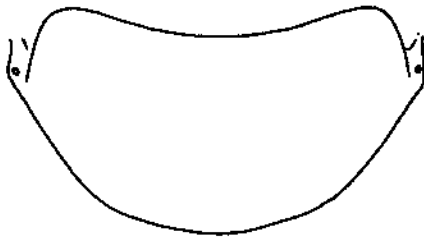


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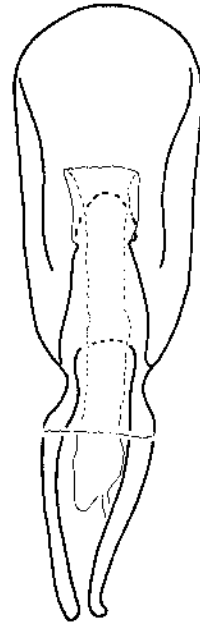


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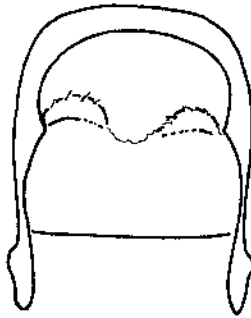
Fig. 648–654 *Synacalles cingulatus*, male terminalia: 648, tergite VII, dorsal, x130; 649, tergite VIII and sternite VIII, ventral, x130; 650, spiculum gastrale, dorsal, x130; 651, 652, tegmen, dorsal and lateral, x170; 653, 654, aedeagus, dorsal and lateral, x170.



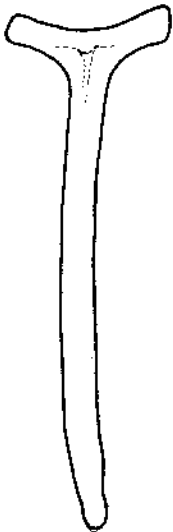
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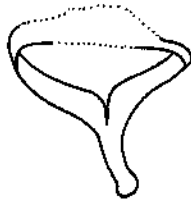
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(656)



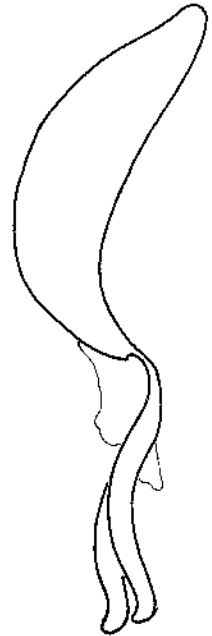
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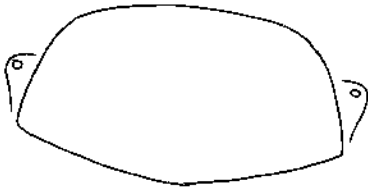


(659)



(661)

Fig. 655–661 *Synacalles posticalis*, male terminalia: 655, tergite VII, dorsal, x98; 656, tergite VIII and sternite VIII, ventral, x98; 657, spiculum gastrale, ventral, x130; 658, 659, tegmen, dorsal and lateral, x130; 660, 661, aedeagus, dorsal and lateral, x130.



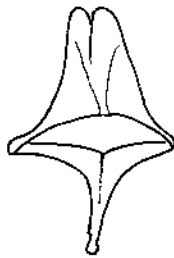
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(663)



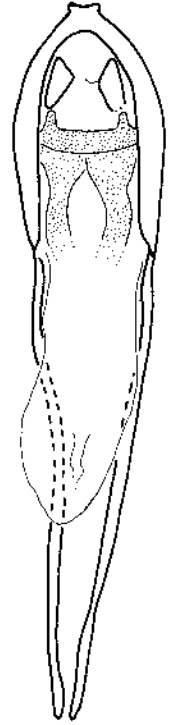
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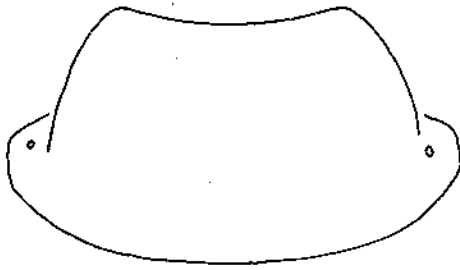


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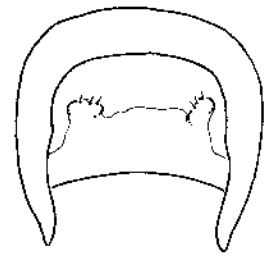
Fig. 662–668 *Synacalles dorsalis*, male terminalia: 662, tergite VII, dorsal, x78; 663, tergite VIII and sternite VIII, ventral, x85; 664, spiculum gastrale, dorsal, x85; 665, 666, tegmen, dorsal and lateral, x85; 667, 668, aedeagus, dorsal and lateral, x85.



(669)



(671)



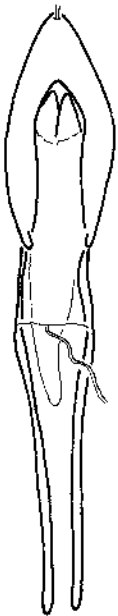
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(672)



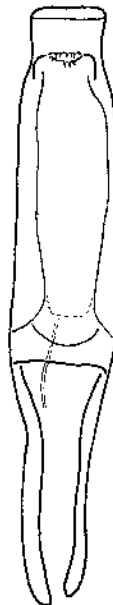
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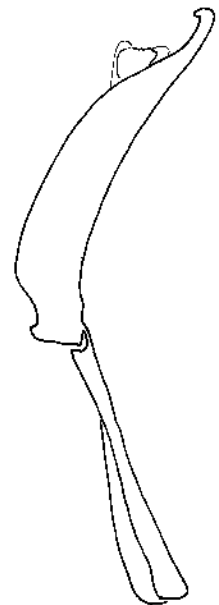
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(675)

Fig. 669–675 *Dermothrius ruficollis*, male terminalia: 669, tergite VII, dorsal, x95; 670, tergite VIII and sternite VIII, ventral, x95; 671, spiculum gastrale, dorsal, x95; 672, 673, tegmen, dorsal and lateral, x78; 674, 675, aedeagus, dorsal and lateral, x78. **Fig. 676** *Dermothrius porcatus*, aedeagus, dorsal, x133. **Fig. 677** *Dermothrius brevipennis*, aedeagus, dorsal, x88.

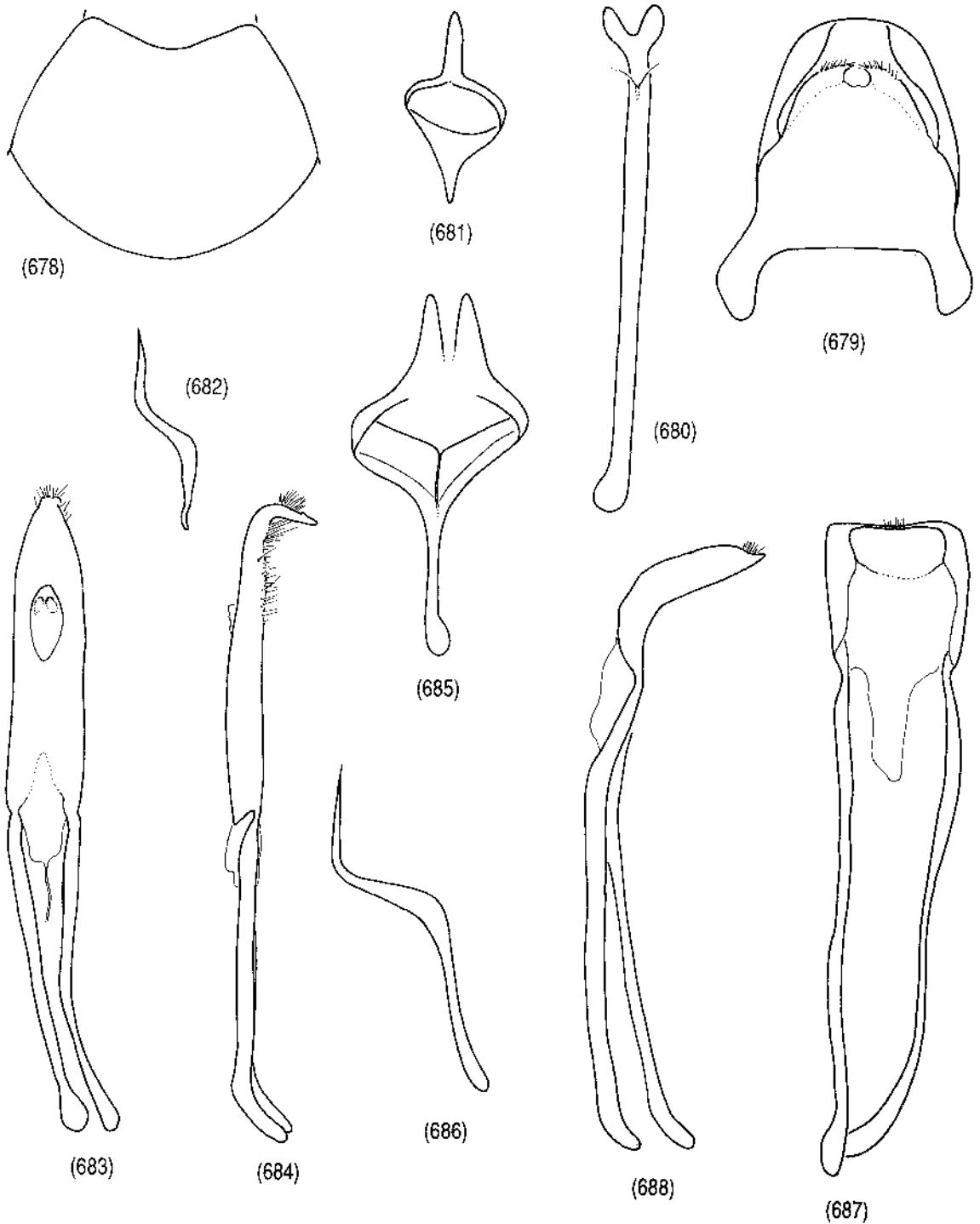


Fig. 678–684 *Paromalia setiger*, male terminalia, x75: 678, tergite VII, dorsal; 679, tergite VIII and sternite VIII, ventral; 680, spiculum gastrale, dorsal; 681, 682, tegmen, dorsal and lateral; 683, 684, aedeagus, dorsal and lateral. **Fig. 685–688** *Paromalia vestita*, male terminalia, x75: 685, 686, tegmen, dorsal and lateral; 687, 688, aedeagus, dorsal and lateral.

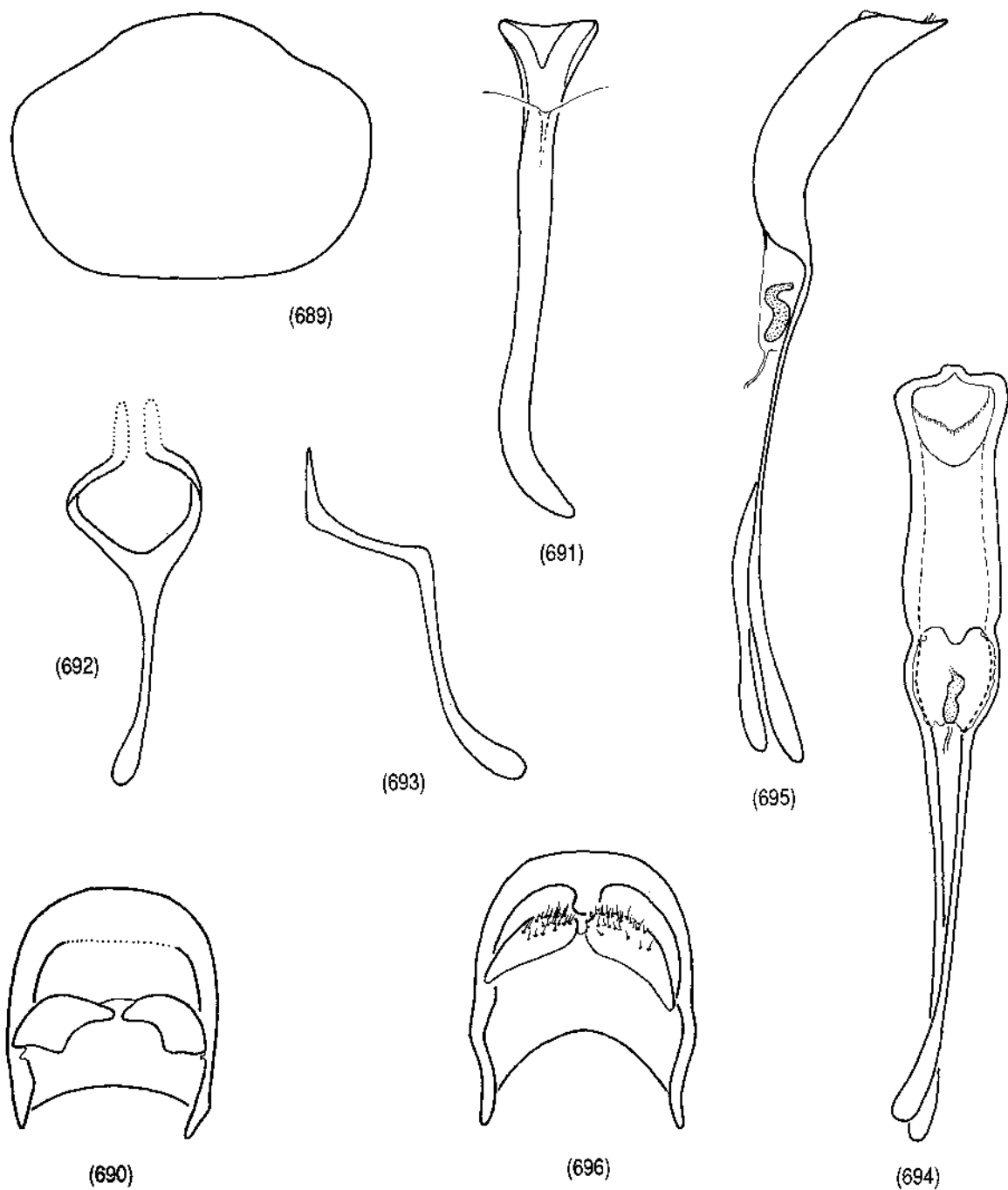
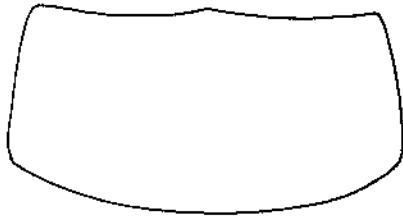
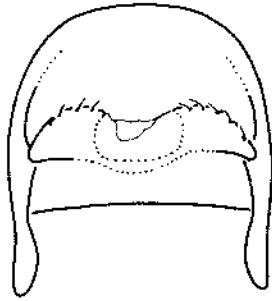


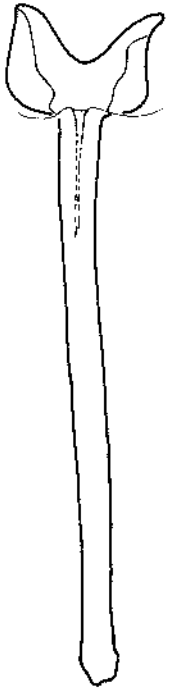
Fig. 689–695 *Agacalles formosus*, male terminalia, x88: 689, tergite VII, dorsal; 690, tergite VIII and sternite VIII, ventral; 691, spiculum gastrale, dorsal; 692, 693, tegmen, dorsal and lateral; 694, 695, aedeagus, dorsal and lateral. Fig. 696 *Agacalles comptus*, tergite VIII and sternite VIII, ventral, x114.



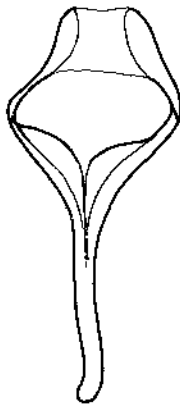
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(698)



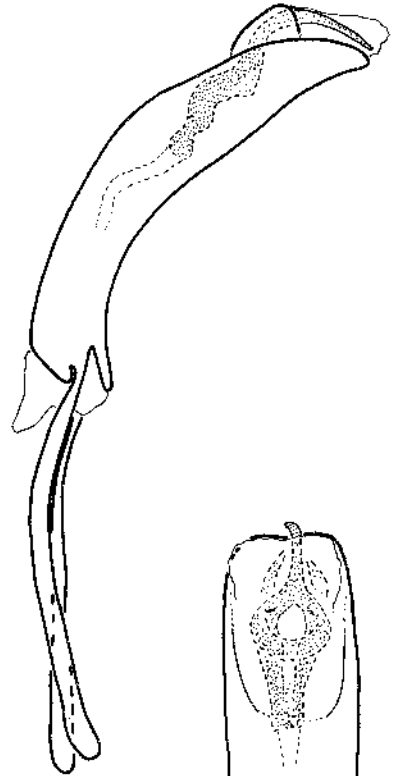
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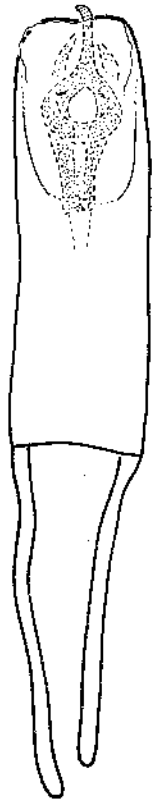
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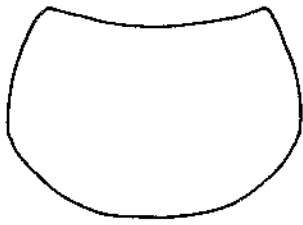


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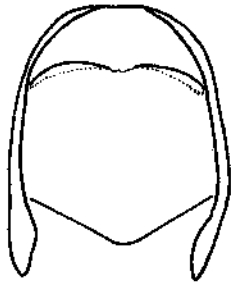


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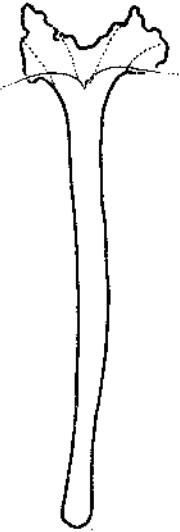
Fig. 697-703 *Metacalles* sp. cf. *cordipennis*, male terminalia, x52: 697, tergite VII, dorsal; 698, tergite VIII and sternite VIII, ventral; 699, spiculum gastrale, dorsal; 700, 701, tegmen, dorsal and lateral; 702, 703, aedeagus, dorsal and lateral.



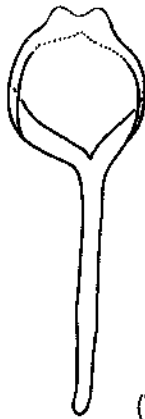
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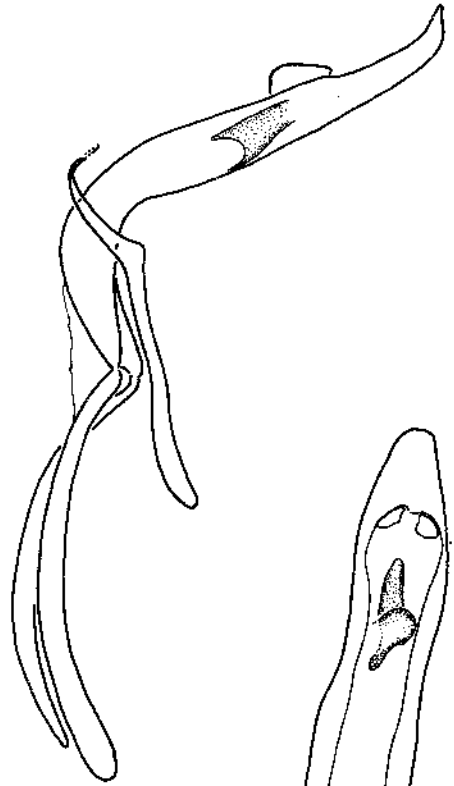
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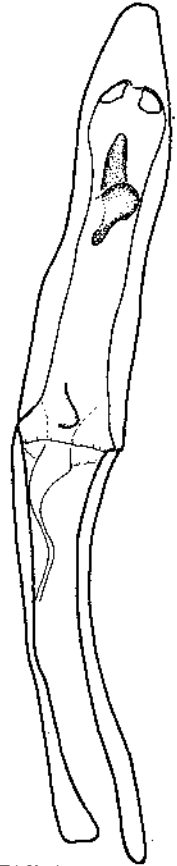
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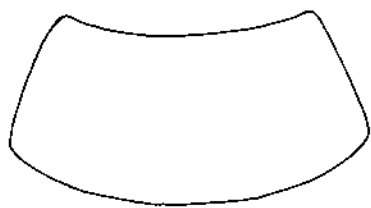


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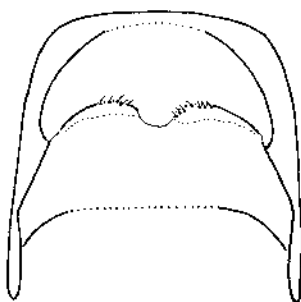
Fig. 704–709 *Scelodolichus hilaris*, male terminalia: 704, tergite VII, dorsal, x49; 705, tergite VIII and sternite VIII, ventral, x44; 706, spiculum gastrale, dorsal, x47 (asymmetry of apex due to bending in preparation); 707, tegmen, dorsal, x47; 708, aedeagus, dorsal, x47; 709, aedeagus and tegmen, lateral, x47.



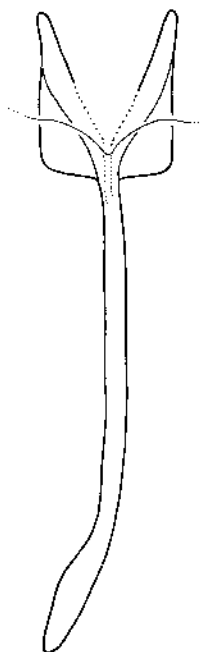
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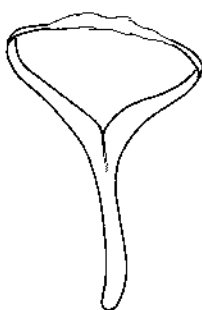
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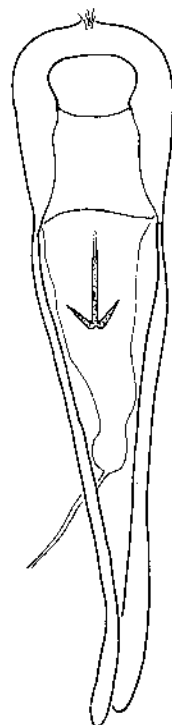
(712)



(713)



(714)



(715)

Fig. 710–716 *Crooktocalles certus*, male terminalia, x75: 710, tergite VII, dorsal; 711, tergite VIII and sternite VIII, ventral (slightly deformed in preparation so wider than when in situ); 712, spiculum gastrale, dorsal; 713, 714, tegmen, dorsal and lateral; 715, 716, aedeagus, dorsal and lateral.

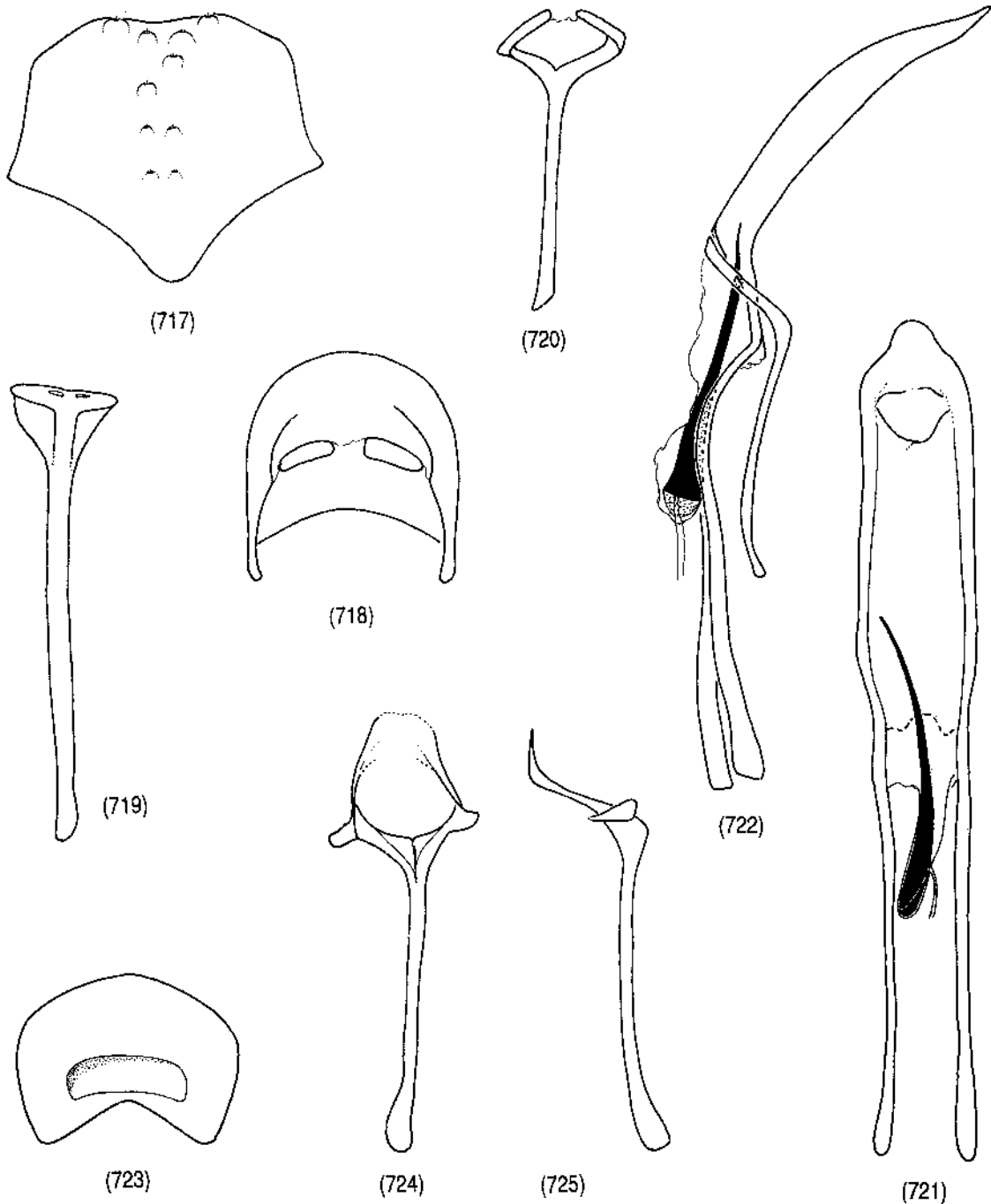
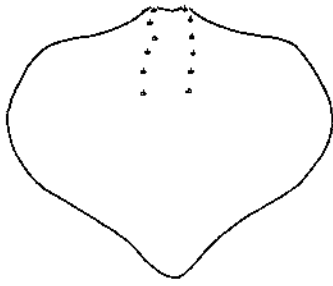
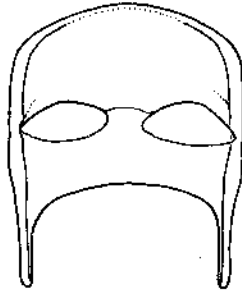


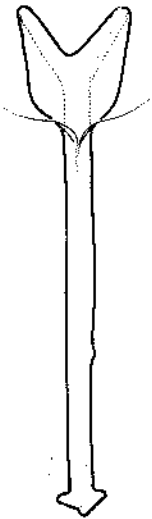
Fig. 717–722 *Omoeacalles crisioides*, male terminalia, x68: 717, tergite VII, dorsal; 718, tergite VIII and sternite VIII, ventral; 719, spiculum gastrale, dorsal; 720, tegmen, dorsal; 721, aedeagus, dorsal; 722, aedeagus and tegmen, lateral. **Fig. 723–725** *Omoeacalles ovatellus*, male terminalia, x58: 723, tergite VIII, posterior; 724, 725, tegmen, dorsal and lateral.



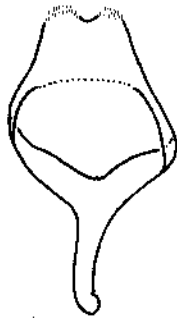
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(727)



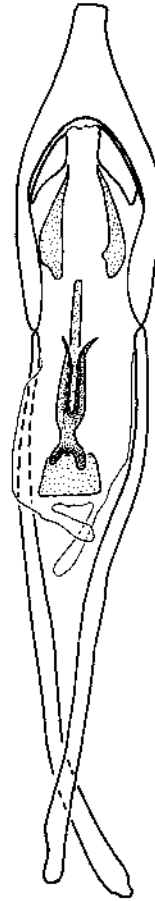
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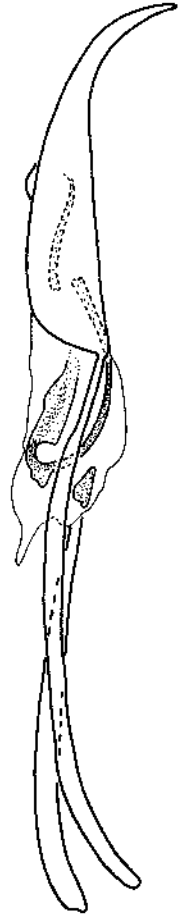
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(730)

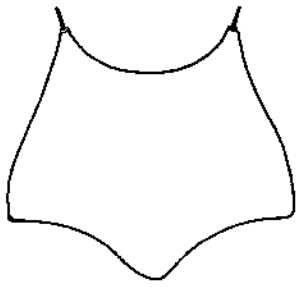


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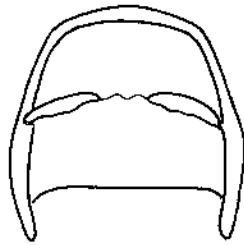


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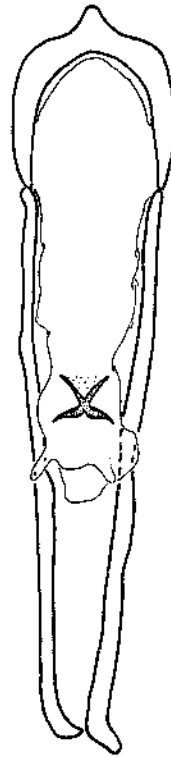
Fig. 726–732 *Allanacis eruensis*, male terminalia, x75: 726, tergite VII, dorsal; 727, tergite VIII and sternite VIII, ventral; 728, spiculum gastrale, dorsal; 729, 730, tegmen, dorsal and lateral; 731, 732, aedeagus, dorsal and lateral.



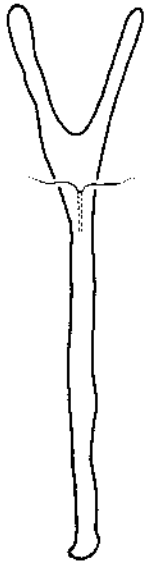
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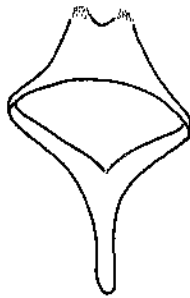
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(738)



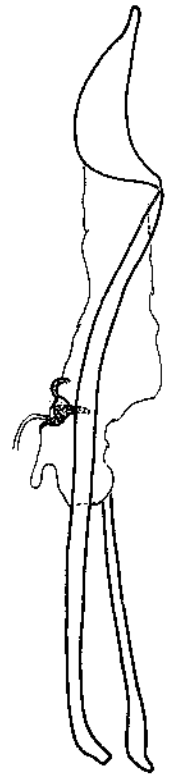
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(736)

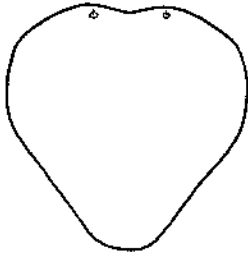


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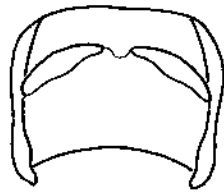


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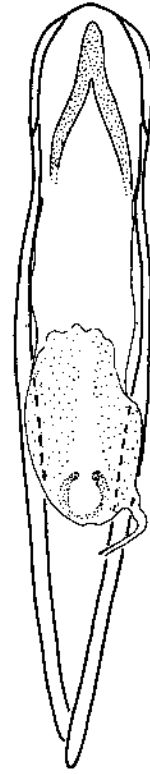
Fig. 733–739 *Allanaicis laticollis*, male terminalia, x140: 733, tergite VII, dorsal; 734, tergite VIII and sternite VIII, ventral; 735, spiculum gastrale, dorsal; 736, 737, tegmen, dorsal and lateral; 738, 739, aedeagus, dorsal and lateral.



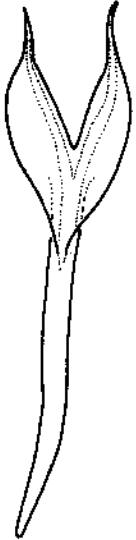
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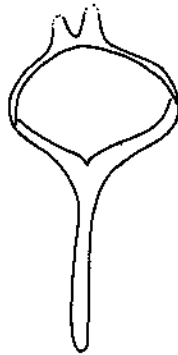
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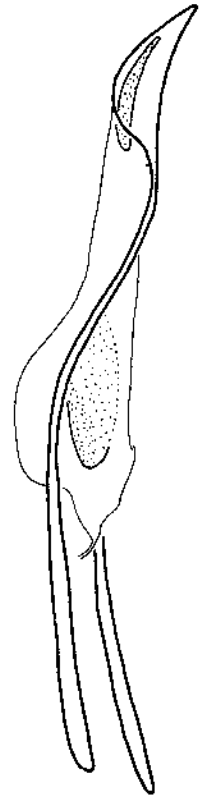
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(743)

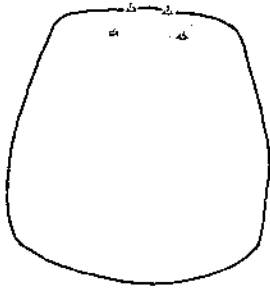


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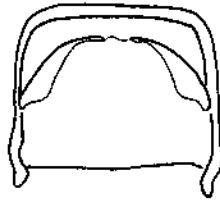


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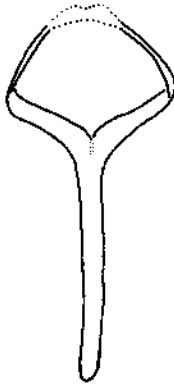
Fig. 740-746 *Zeacalles variatus*, male terminalia, x88: 740, tergite VII, dorsal; 741, tergite VIII and sternite VIII, ventral; 742, spiculum gastrale, dorsal; 743, 744, tegmen, dorsal and lateral; 745, 746, aedeagus, dorsal and lateral.



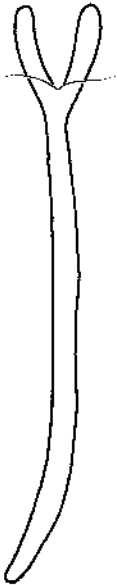
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(748)



(750)



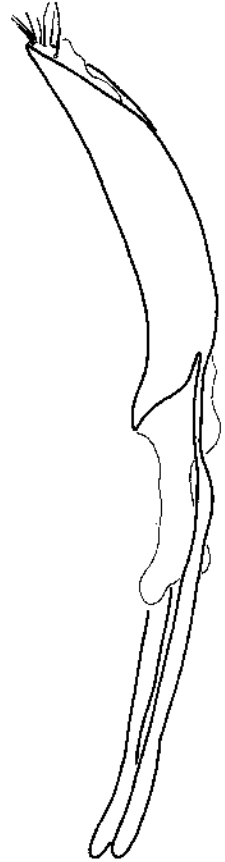
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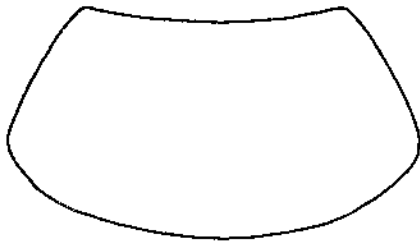


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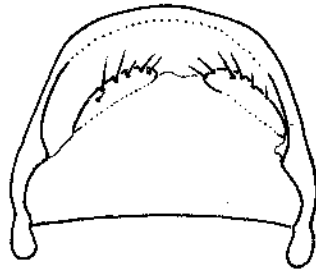


(753)

Fig. 747–753 *Zeacalles carinellus*, male terminalia, x108: 747, tergite VII, dorsal; 748, tergite VIII and sternite VIII, ventral; 749, spiculum gastrale, dorsal; 750, 751, tegmen, dorsal and lateral; 752, 753, aedeagus, dorsal and lateral.



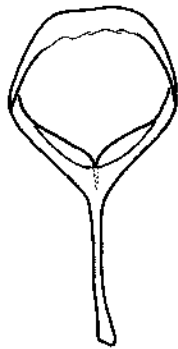
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(755)



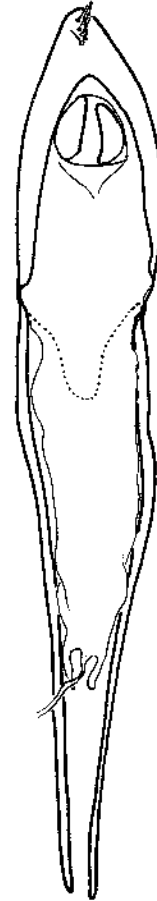
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(758)

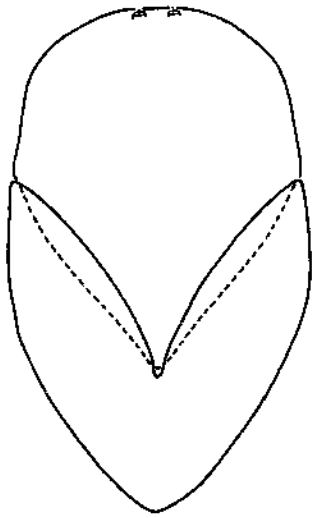


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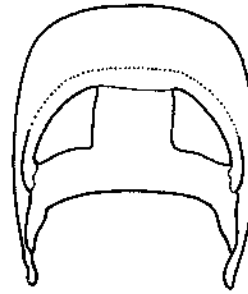


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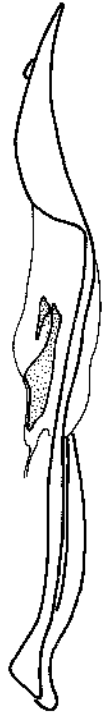
Fig. 754–760 *Postacalles rangirua*, male terminalia, x138: 754, tergite VII, dorsal; 755, tergite VIII and sternite VIII, ventral; 756, spiculum gastrale, dorsal; 757, 758, tegmen, dorsal and lateral; 759, 760, aedeagus, dorsal and lateral.



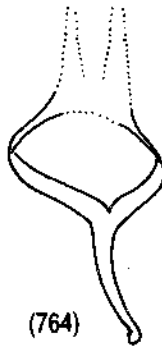
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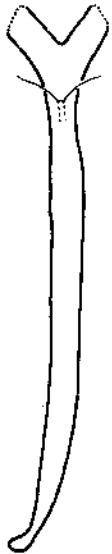
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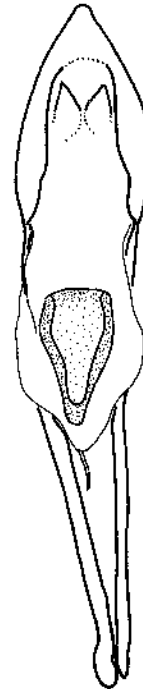
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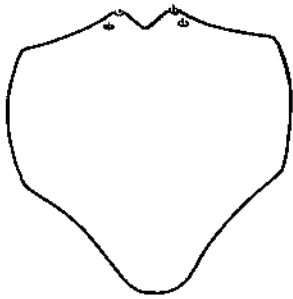


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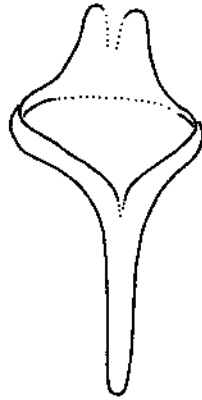


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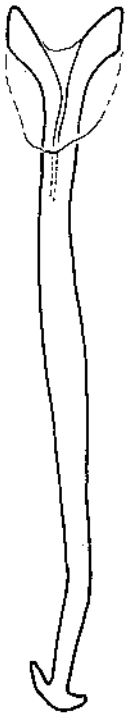
Fig. 761–767 *Trinodicalles conicollis*, male terminalia, x75: 761, tergites VI and VII, dorsal; 762, tergite VIII and sternite VIII, ventral; 763, spiculum gastrale, dorsal; 764, 765, tegmen, dorsal and lateral; 766, 767, aedeagus, dorsal and lateral.



(768)



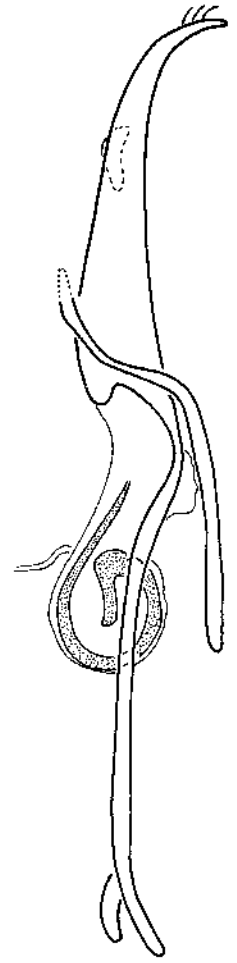
(770)



(769)



(771)



(772)

Fig. 768–772 *Trinodicalles latirostris*, male terminalia, x90: 768, tergite VII, dorsal; 769, spiculum gastrale, dorsal; 770, tegmen, dorsal; 771, aedeagus, dorsal; 772, aedeagus and tegmen, lateral.

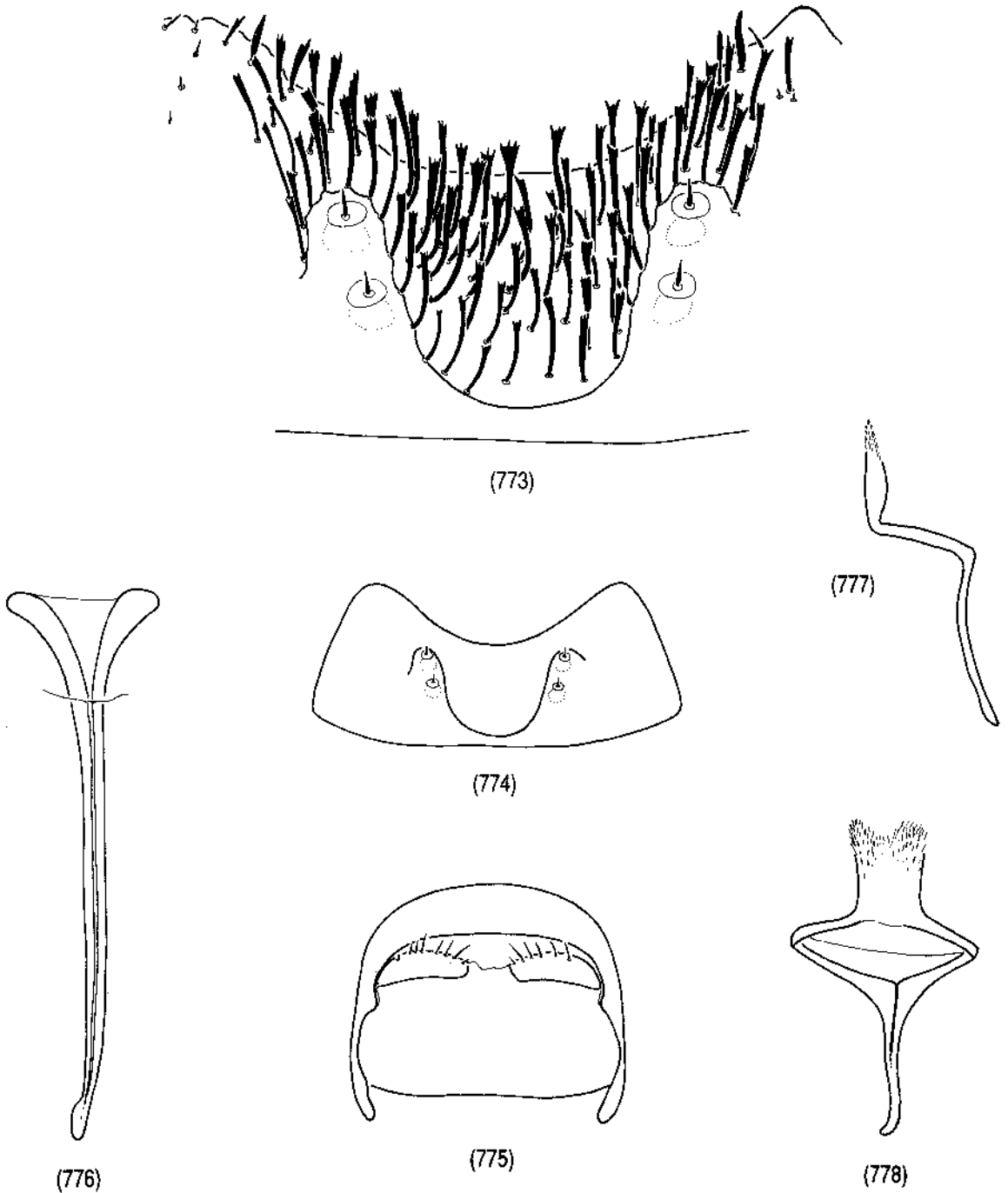
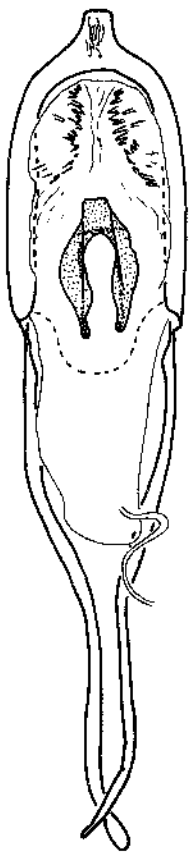
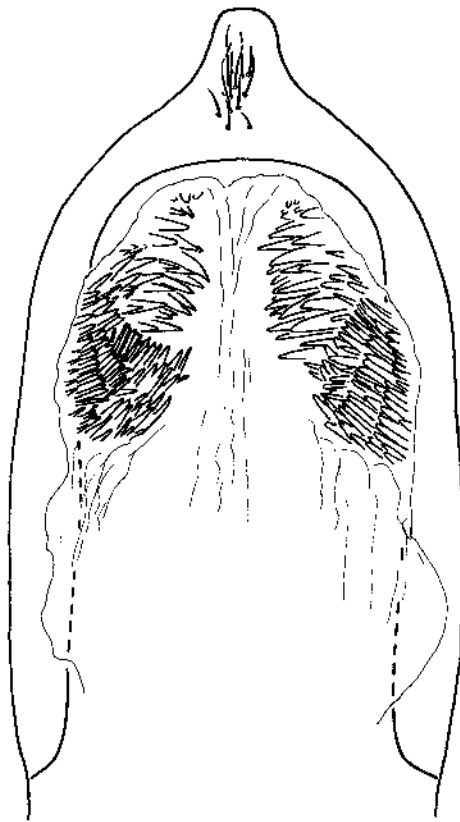


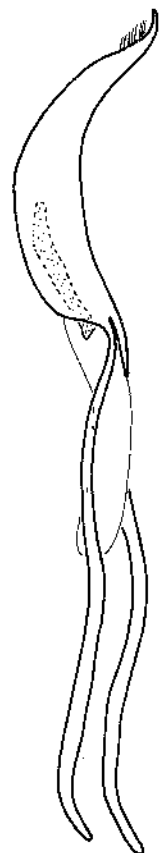
Fig. 773–778 *Patellitergum rectirostre*, male terminalia: 773, tergite VII, dorsal, showing detail of setae, x240; 774, tergite VII, dorsal, x93 (setae other than microsetae omitted); 775, tergite VIII and sternite VIII, ventral, x93; 776, spicium gastrale, dorsal, x93; 777, 778, tegmen, dorsal and lateral, x93.



(779)



(780)



(781)

Fig. 779–781 *Patellitergum rectirostre*, male terminalia: 779, aedeagus, dorsal, x93; 780, aedeagal apex, dorsal, x240 (detail of ostiolar region); 781, aedeagus, lateral, x93.

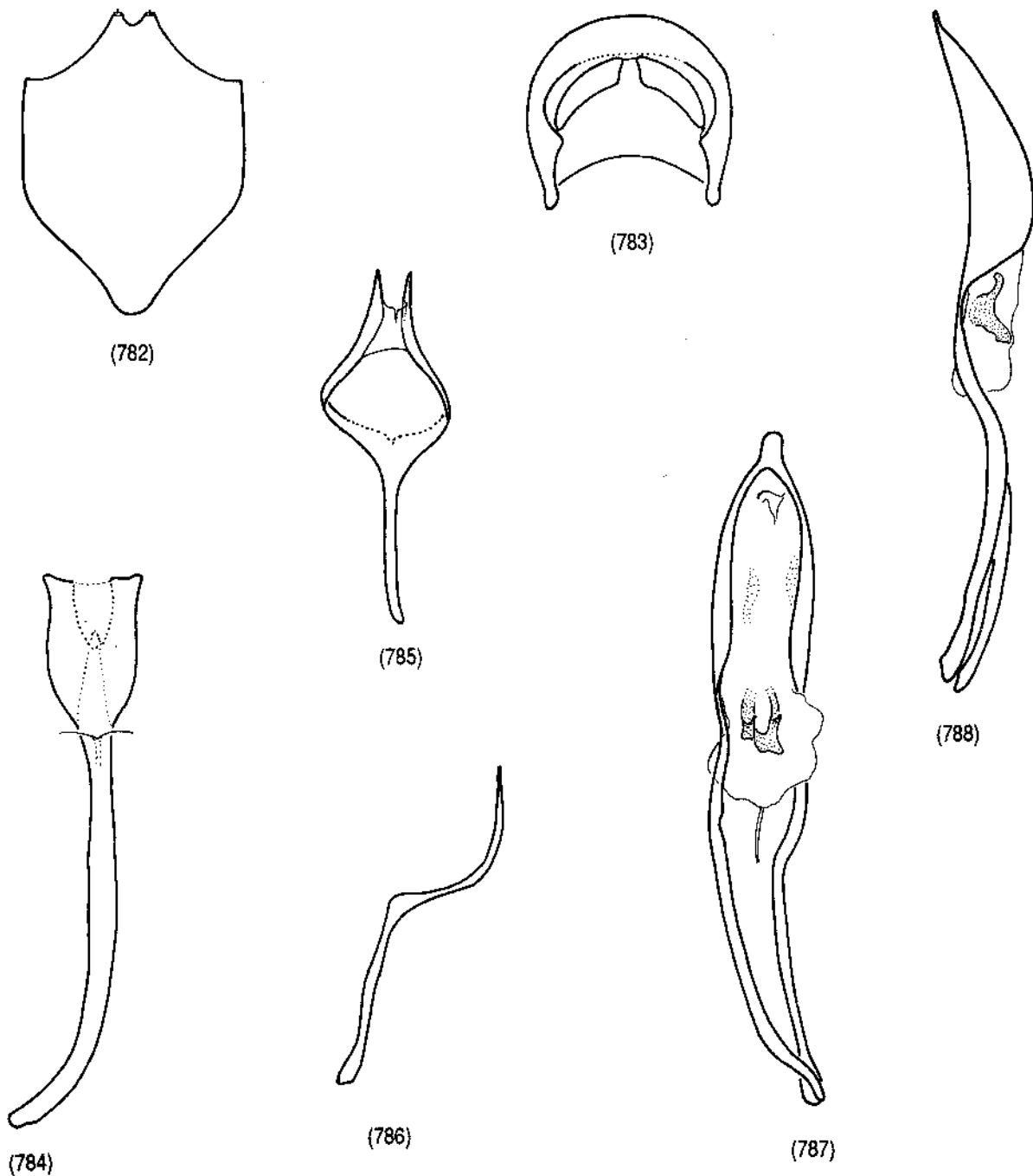
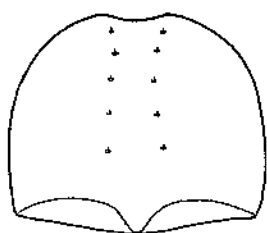
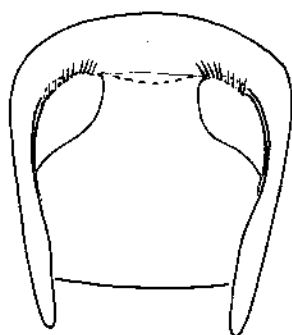


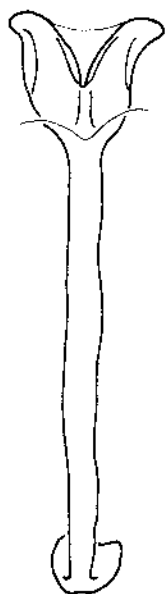
Fig. 782–788 *Rainacalles volens*, male terminalia, x90: 782, tergites VI and VII, dorsal; 783, tergite VIII and sternite VIII, ventral; 784, spiculum gastrale, dorsal; 785, 786, tegmen, dorsal and lateral; 787, 788, aedeagus, dorsal and lateral.



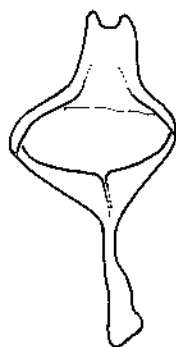
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(790)



(791)



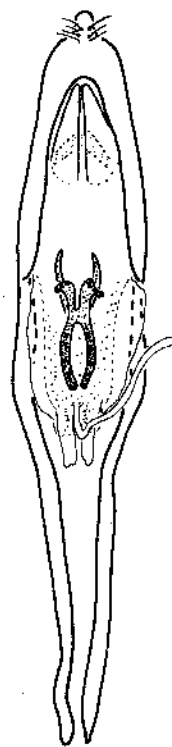
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(793)

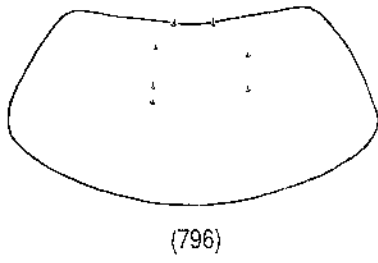


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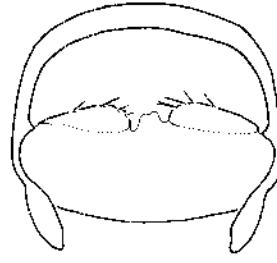


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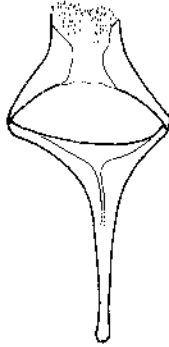
Fig. 789–795 *Pachyderris punctiventris*, male terminalia: 789, tergite VII, dorsal, x50; 790, tergite VIII and sternite VIII, ventral, x67; 791, spiculum gastrale, dorsal, x67; 792, 793, tegmen, dorsal and lateral, x67; 794, 795, aedeagus, dorsal and lateral, x67.



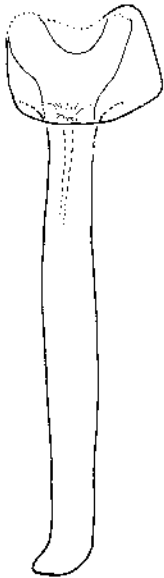
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(797)



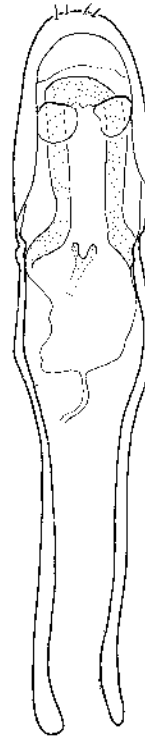
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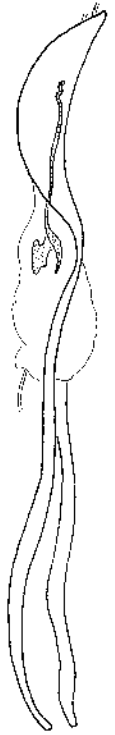
(798)



(800)



(801)



(802)

Fig. 796–802 *Adstantes rudis*, male terminalia, x135: 796, tergite VII, dorsal; 797, tergite VIII and sternite VIII, ventral; 798, spiculum gastrale, dorsal; 799, 800, tegmen, dorsal and lateral; 801, 802, aedeagus, dorsal and lateral.

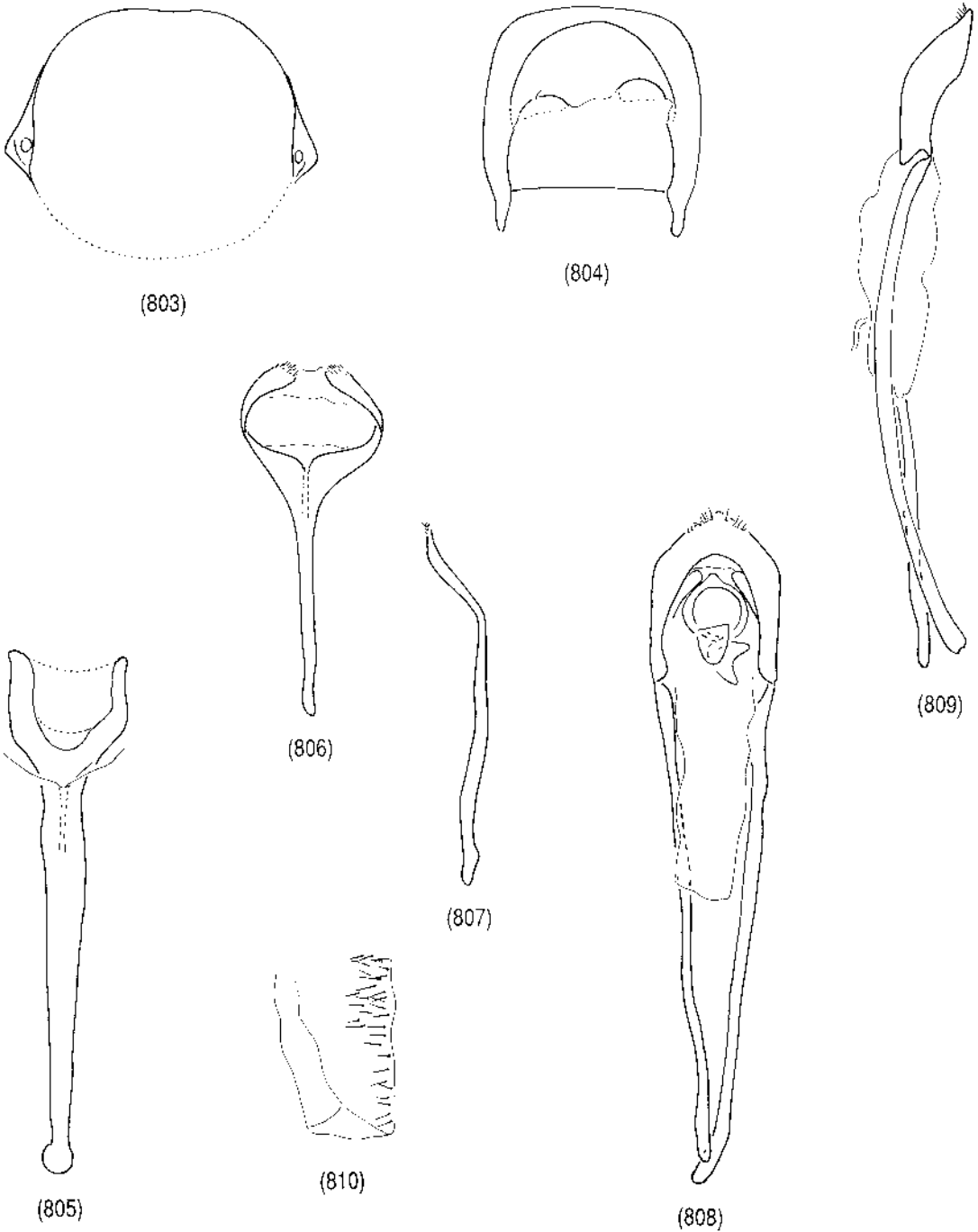


Fig. 803–810 *Microcryptorhynchus (M.) latitarsis*, male terminalia: 803, tergite VII, dorsal, x135; 804, tergite VIII and sternite VIII, ventral, x135; 805, spiculum gastrale, dorsal, x135; 806, 807, tegmen, dorsal and lateral, x135; 808, 809, aedeagus, dorsal and lateral, x135; 810, anterior part of endophallus, x215, showing internal spines.

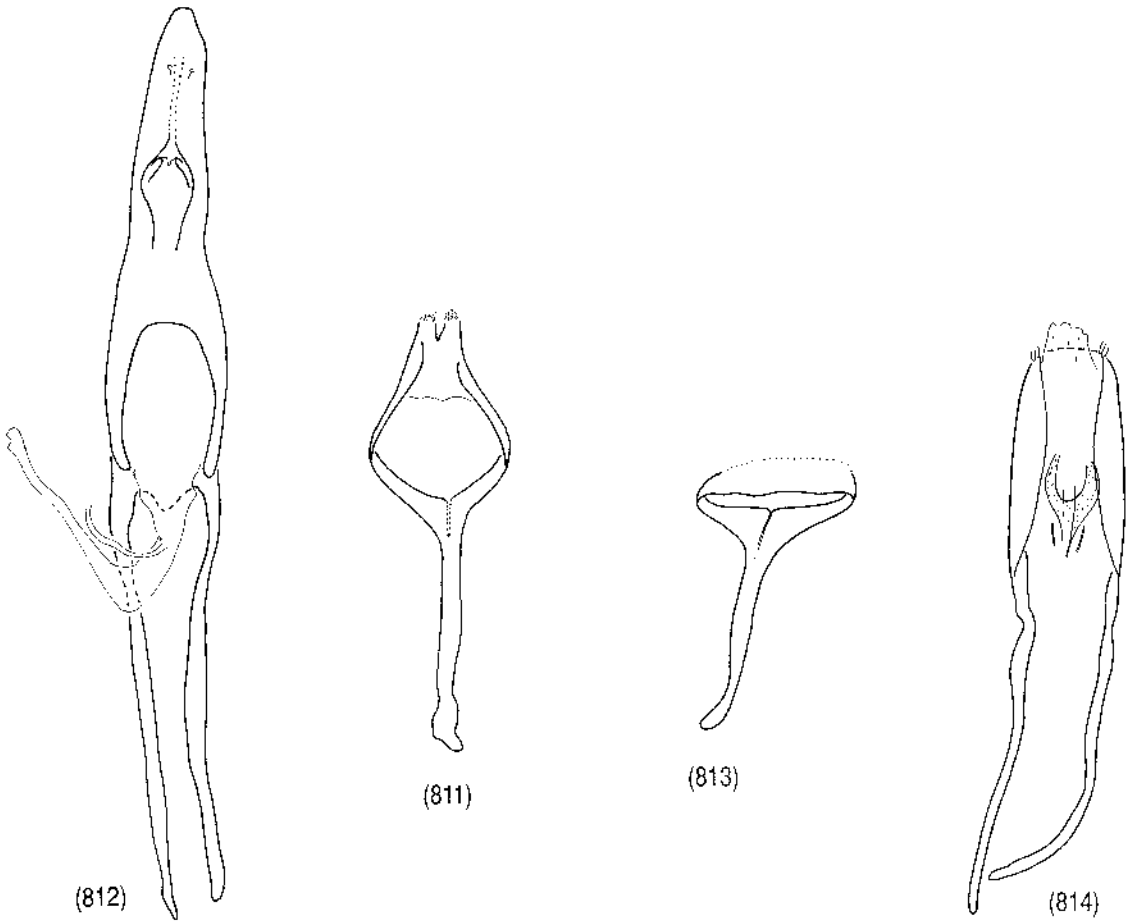
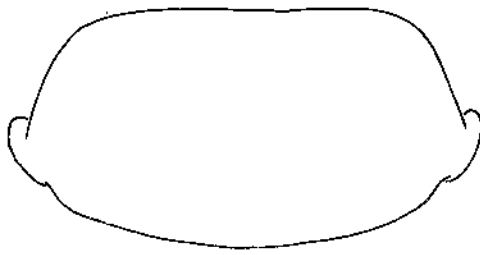
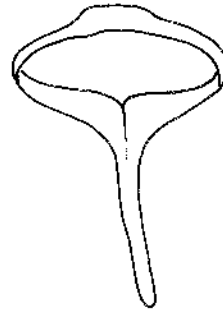


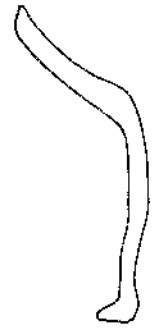
Fig. 811, 812 *Microcryptorhynchus (Notacalles) floricola*, male terminalia, x135: 811, tegmen, dorsal; 812, aedeagus, dorsal (asymmetry due to slightly oblique view). **Fig. 813, 814** *Andracalles canescens*, male terminalia, x130: 813, tegmen, dorsal; 814, aedeagus, dorsal.



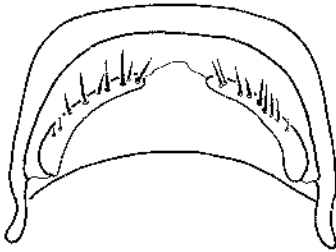
(815)



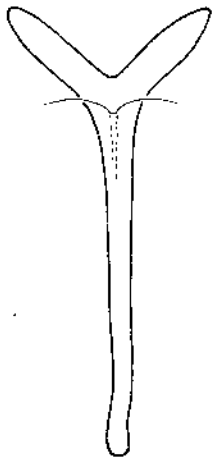
(818)



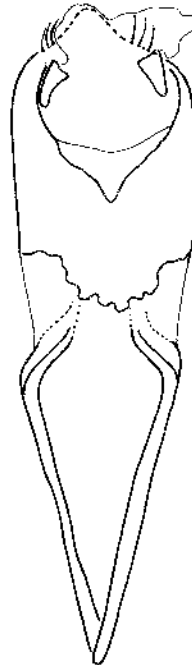
(819)



(816)



(817)

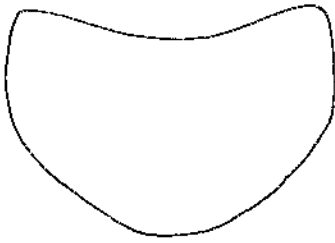


(820)



(821)

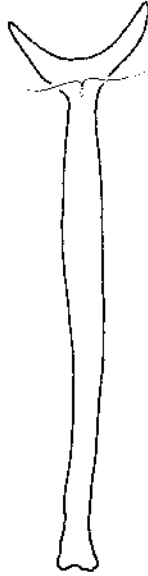
Fig. 815–821 *Andracalles horridus*, male terminalia, x156: 815, tergite VII, dorsal; 816, tergite VIII and sternite VIII, ventral; 817, spiculum gastrale, dorsal; 818, 819, tegmen, dorsal and lateral; 820, 821, aedeagus, dorsal and lateral.



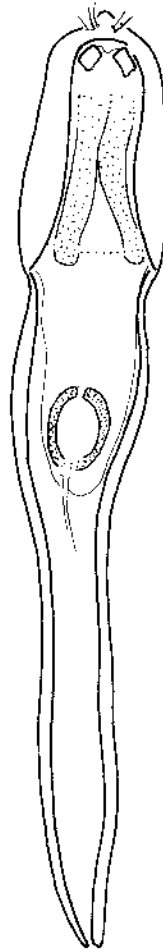
(822)



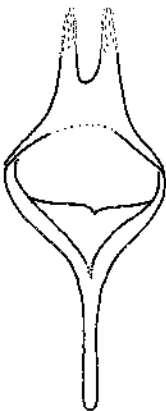
(823)



(824)



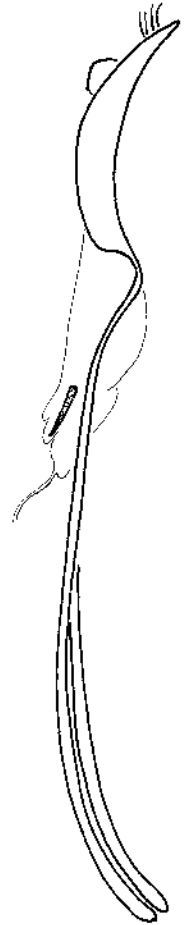
(827)



(825)



(826)



(828)

Fig. 822–828 *Ampagia rudis*, male terminalia, x90: 822, tergite VII, dorsal; 823, tergite VIII and sternite VIII, ventral; 824, spiculum gastrale, dorsal; 825, 826, tegmen, dorsal and lateral; 827, 828, aedeagus, dorsal and lateral.

TAXONOMIC INDEX

All nominal taxa are indexed, regardless of their status in taxonomy. Page numbers in bold type denote primary references to taxa, and in italic type denote illustrations. A suffixed letter 'k' indicates a terminal key couplet.

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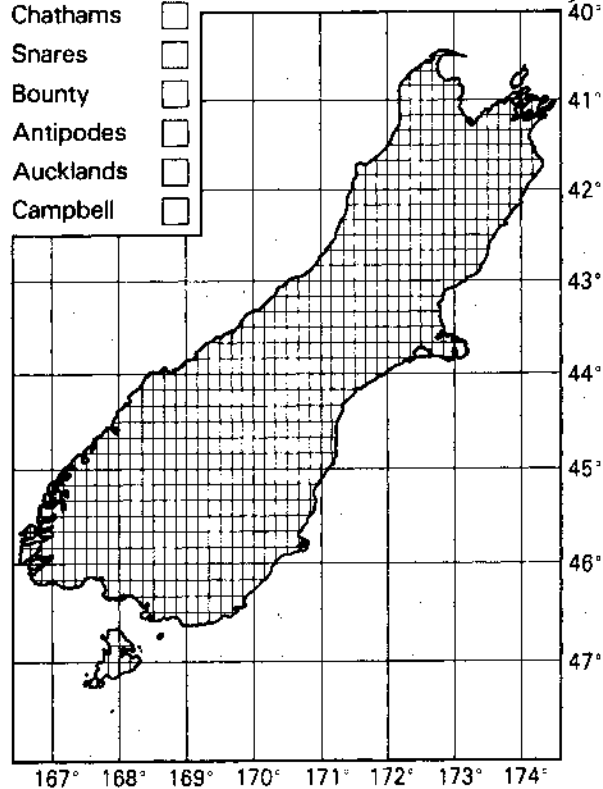
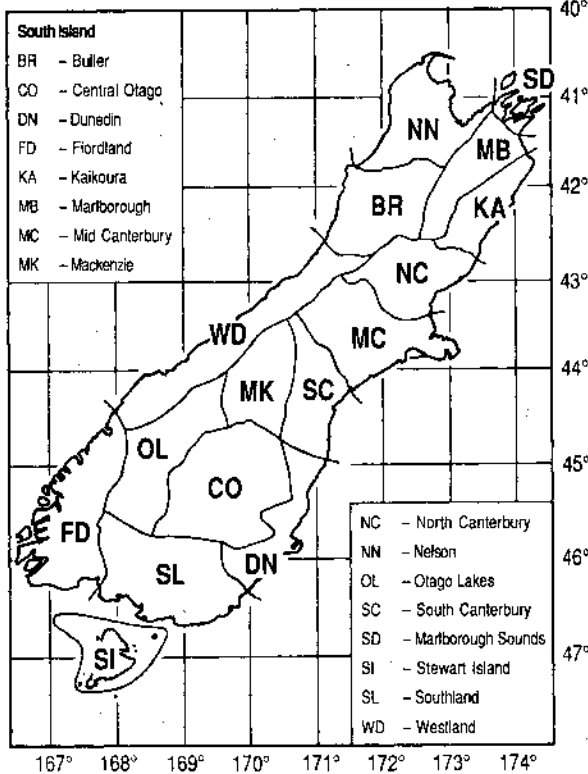
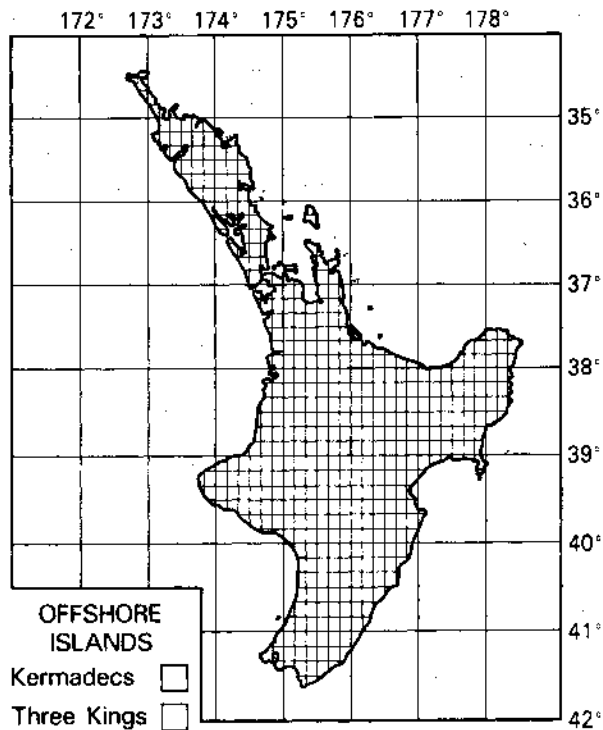
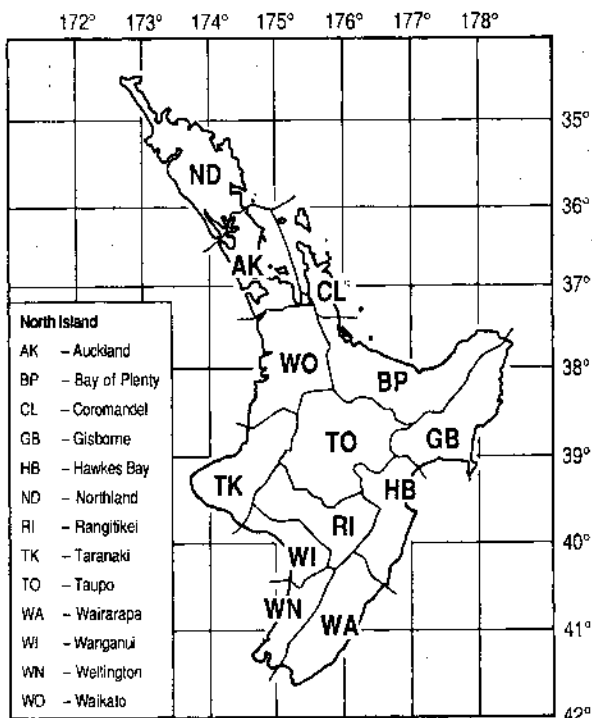
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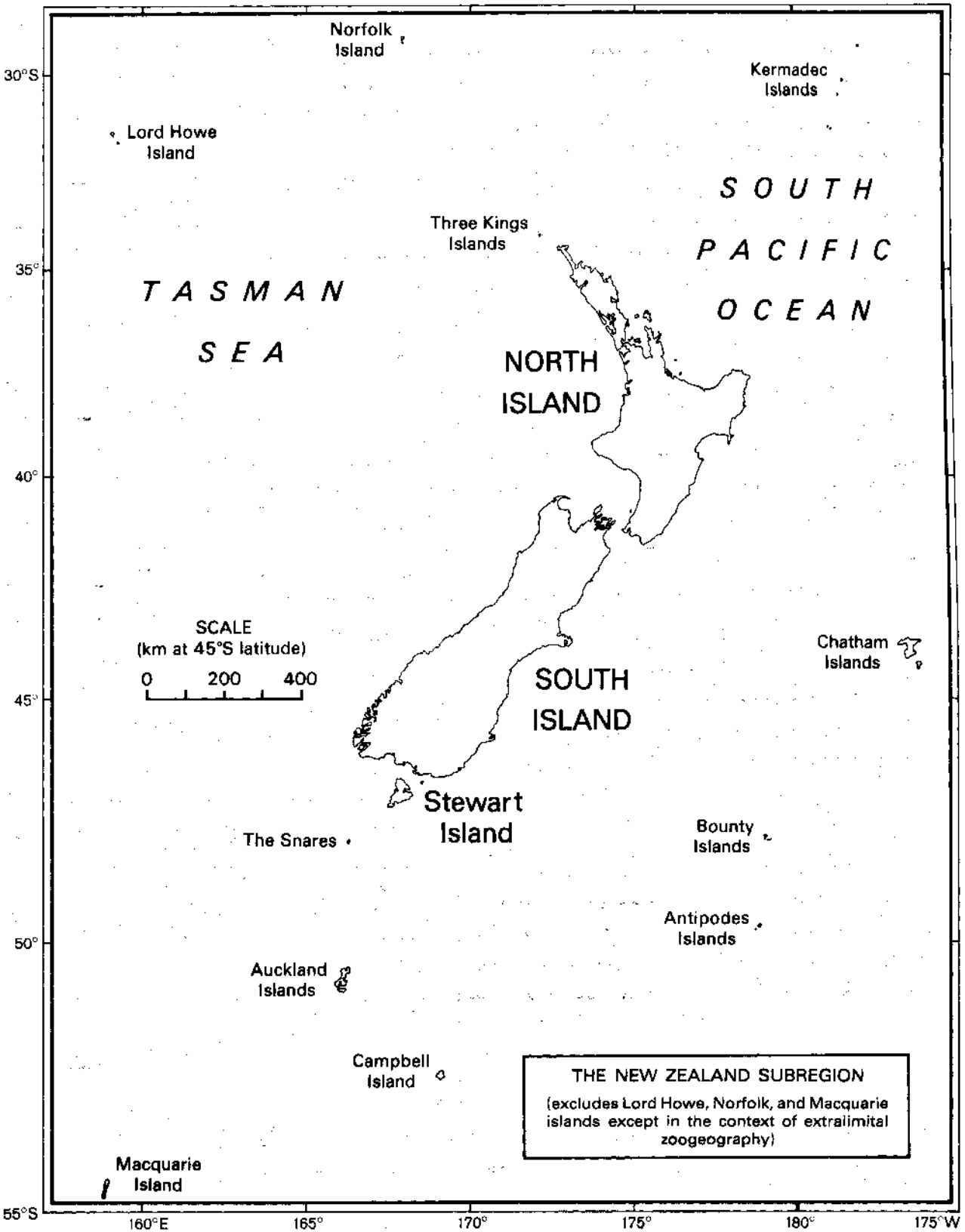
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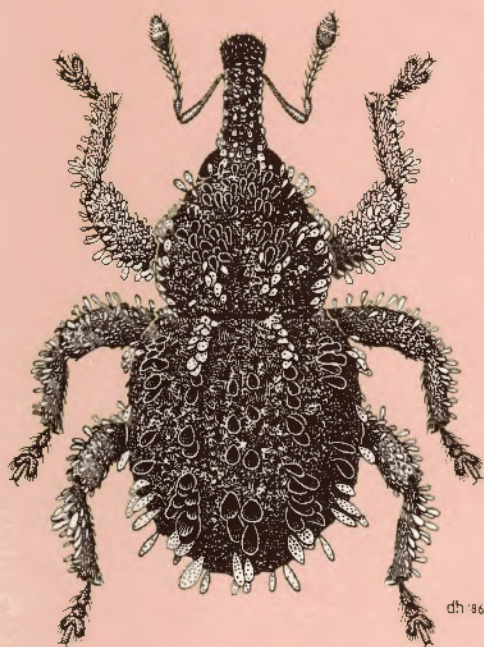
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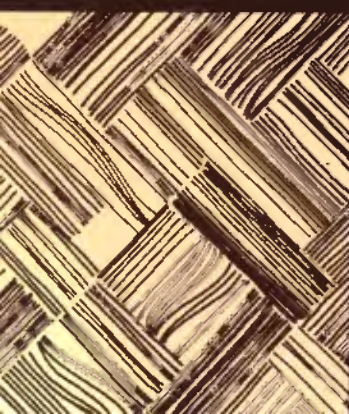
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Lyal, C. H. C. 1993. Cryptorhynchinae (Insecta: Coleoptera: Curculionidae) *Fauna of New Zealand* 29, 308 pp. [Page 308 blank]

Date of publication: 2 December 1993
Fauna of New Zealand, ISSN 0111-5383; 29
ISBN 0-478-04518-2

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