

**Fauna of
New Zealand**
Ko te Aitanga Pepeke
o Aotearoa

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Fauna of New Zealand
Ko te Aitanga Pepeke o Aotearoa

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Nemonychidae, Belidae,
Brentidae
(Insecta: Coleoptera: Curculionoidea)

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Manaaki
Whenua
P R E S S

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POPULAR SUMMARY

HEWHAKARĀPOPOTOTANGA

Class **Insecta**Order **Coleoptera**Families **Nemonychidae, Belidae,
Brentidae****Orthoceri Weevils**

This contribution deals with Orthoceri weevils of the families Nemonychidae, Belidae and Brentidae. Weevils are a major taxon of beetles characterised by a head extended into a proboscis or rostrum. They are plant-feeders as adult and larva. Depending on how important certain plants are to the economy of a country, weevils are perceived as beneficial, of no importance, or pests. They are usually of no importance in their native country, but can become pests in other countries. However, if noxious weeds have host-specific weevils in their original country, the weevils can be imported under strict quarantine conditions and may be released after ensuring that they are free of parasitoids and do not affect any native plants. New Zealand has already introduced and released weevils for the control of gorse and thistles, and is considering other introductions.

Weevils have existed for at least 140 million years, since the era of gymnosperms (cycads and conifers) and dinosaurs. Weevil fossils were already abundant well before flowering plants (angiosperms) appeared on earth. Gymnosperm species have since declined to very low numbers, and angiosperms, known only since Cretaceous times, have proliferated to some 200 000 species worldwide. Early weevils had a long rostrum, with long, slender mandibles and long labial and maxillary palps. These mouthpart features strongly suggest that ancestral weevils were pollen-feeders. Gymnosperms have large male and female cones (strobili), and the male cones produce copious amounts of highly nutritious pollen. Therefore it is assumed that Jurassic weevils would have been specialist pollen feeders, because all extant nemonychid species still have pollen as their sole or main diet.

(continued overleaf)

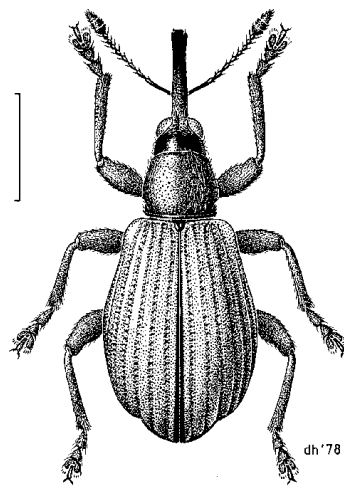


Illustration / Whakaahua: *Strobilobius lidocedri* Kuschel, a special apionine unique to Cupressaceae, and amongst apionines almost the only species unique to conifers worldwide (Illustrator / Kaiwhakaahua: D. W. Helmore).

Ko ngā wīwhara Orthoceri o ngā whānau Nemonychidae, Belidae, me Brentidae te aronga o tēnei tuhinga. He tino karangatanga ngā wīwhara nō te kāhui pītara nui tonu. Arā tōna tino tohu, ko te tipu whakamua o te upoko, ko te waha, ko te ngutu rānei kei te pito rawa. He kai tipu ngā pakeke me te kōhungahunga. Ko te whakaaro he hanga pai, he hanga kino rānei te wīwhara, kei te āhua tonu o te noho taonga o ngā tipu e whai hononga ana ki te wīwhara ki te ōhanga o tētahi whenua. I te nuinga o te wā, kāore te wīwhara e whakararu i te iwi i tōna whenua ake, engari tērā ka noho hei hanga kino i whenua kē. Heoi anō, mēnā he momo wīwhara e noho motuhake ana ki tētahi otaota kino i tōna whenua ake, tērā ka āta tīkina atu taua wīwhara, i runga anō i ngā here tū taratahi e tika ana, ā, ina kitea kāore ōna pirinoa, kāore rānei ōna pānga kino ki ngā rākau māori, hei reira pea tukuna ai kia rarau te noho ki tana whenua hou. Kua whakanohoia kētia mai ki Aotearoa nei ētahi wīwhara hei patu i te kōhe me te kotimana, ā, e whakaarohia ana kia tīkina atu anō ētahi.

Kua 140 miriona tau, neke atu ngā wīwhara e ora ana ki tēnei ao, arā, nō te wā o ngā tipu kano tahanga (ngā cycad me ngā rākau whai huainohi) me ngā moko tuauri. Arā te huhua o ngā wīwhara mātātoka kua kitea, nō mua noa atu i te orokohanga ake o ngā tipu whaipua. Kua tino heke haere te maha o ngā tipu kano tahanga, engari ko ngā tipu whaipua, i puta tuatahi i te takiwā Cretaceous, kua tipu kia mano, kia rea – e 200,000 pea ngā momo puta noa

(haere tonu)

Conventionally, weevils are divided into two convenient groups: Orthoceri, defined by having all antennal segments following a straight line, and Gonatoceri, characterised by 'broken' or elbowed antennae, the result of a deviation in an angle of the segments following the basal one (scape). All Jurassic and Lower Cretaceous weevils were Orthoceri with straight antennae associated with gymnosperms. The vast majority of extant Nemonychidae, and some Belidae, retain an association with gymnosperms and still live exclusively on Araucariaceae, Podocarpaceae, and Pinaceae.

This contribution is devoted to the 3 Orthoceri families Nemonychidae, Belidae, and Brentidae (the other Orthoceri family Anthribidae, with 58 species, has been revised by Holloway (1982), *Fauna of New Zealand* 3). Although these 3 families are poorly represented in New Zealand, with only 16 native and 1 introduced species, they are of considerable biological, phylogenetic, and biogeographical interest. All 4 species of Nemonychidae, and 5 out of 6 species of Belidae, are associated with Podocarpaceae (totara, rimu, matai, kahikatea and relatives) and Phyllocladaceae (tanekaha, toatoa). Whilst the Nemonychidae of New Zealand are closer to the Chilean species found on Podocarpaceae than to the Australian ones found on Araucariaceae, 5 species of Belidae show a definite close affinity to Australia. The sixth belid species belongs to a New Caledonian genus associated with Araliaceae.

The family Brentidae has 2 dissimilar subfamilies in New Zealand: Brentinae and Apioninae. Brentinae are represented by an endemic genus and species known as the giraffe weevil (pepeke nguturoa): The size difference and the sexual dimorphism of this species is spectacular. The giraffe weevil is unique in being the sole weevil species in the world with a visible scutellum. It is also unique in that some of its males can be over 8 cm long, thus easily surpassing the length of any other brentine. The subfamily Apioninae is represented by 5 native and 1 foreign species, the latter purposely introduced for a partial control of gorse (*Ulex europaeus*). Three genera, with a single species each, are endemic. They are not close to each other or to anything else outside New Zealand. One genus (*Zelapterus*) has a very small, smooth, and shiny species that is flightless and still has no known host. Another genus (*Cecydophyus*) is represented by a large, dull, and hairy species, whose host is silver beech (*Nothofagus menziesii*). The third genus (*Strobilobius*) has a species with hairless, deeply sculptured elytra, and is of considerable interest because of its association with the coniferous pahautea (*Libocedrus bidwillii*) of the cypress family. The fourth apionine genus (*Neocyba*) is also endemic, with 2 species associated with rata and pohutukawa (*Metrosideros* spp.). It is closely related to a genus from New Caledonia.

i te ao. He whai ngutu roa ngā wīwhara o neherā, he roa, he tōhihi te kauwae, he roa anō ngā hihipā i ngā ngutu me te kauwae. E tohu ana te waha koinei te hanga he kai hae pea ngā wīwhara o tua whakarere. He whai huainohi rahi - he tāne ētahi, he wāhine ētahi – (ka kīia he strobili) ngā tipu kano tahanga, ā, inā kē te nui o te hae mōmona ka hangaia e ngā huainohi tāne. Nō reira, e whakapaetia ana ko te hae anake pea te kai a ngā wīwhara o te takiwā Jurassic. Ka mutu, katoa ngā momo nemonychid e ora tonu ana, he kai hae anake, he tino kai rānei te hae nā rātou.

Kua wehea e te ao pūtaiao ngā wīwhara kia rua ngā karangatanga whānui: ko te Orthoceri tētahi, ko te tohu tautuhi i tēnei karangatanga, ko te noho rārangi tōtika mai o ngā wāhanga katoa o ngā pūhihi; ko ngā Gonatoceri anō tētahi, ānō nei kua whati, he whai 'tuke' rānei o rātou pūhihi (i pērā ai i te mea he kotiti te ahunga o te wāhanga tuarua o ngā pūhihi, arā, te wāhanga ka whai i muri mai i te wāhanga i te pūtake). Katoa ngā wīwhara o te takiwā Jurassic me te Cretaceous o Raro, nō te karangatanga Orthoceri, ā, he rere tōtika ngā pūhihi, e tohu ana i te hononga ki ngā tipu kano tahanga. Ko te tino nuinga o ngā Nemonychidae, tae atu ki ētahi o ngā Belidae, e honoa tonutia ana ki ngā tipu kano tahanga, ā, kei te noho motuhake ki ngā Araucariaceae, ngā Podocarpaceae, me ngā Pinaceae.

Kei te aro whāiti tēnei o ngā tānga kōrero ki ētahi whānau Orthoceri e 3, arā, ngā Nemonychidae, ngā Belidae, me ngā Brentidae (kua oti i a Holloway (1982) te āta tiro tiro tērā atu whānau Orthoceri, me ngā momo Anthribidae e 58, i *Te Aitanga Pepeke o Aotearoa* 3). Ahakoa kāore e kaha nohoia ana a Aotearoa e ēnei whānau e 3 (16 ngā momo nō konei taketake ake, 1 te momo rāwaho), he whānau e āta arohia nuitia ana e te hunga mātai pepeke mō te wāhi ki te koiora, te whakapapa, me te arowhenua-koiora. Katoa ngā momo Nemonychidae e 4, me ētahi momo Belidae e 5 o roto i te 6, e whai hononga ana ki ngā Podocarpaceae (te tōtara, te rimu, te matai, te kahikatea me ērā atu o tēnei kāhui rākau) me ngā Phyllocladaceae (te tānekaha me te toatoa). He tata ake ngā Nemonychidae o Aotearoa ki ngā Nemonychidae noho Podocarpaceae o Chile, tēnā i ērā o Ahitereira e noho ana ki ngā Araucariaceae, engari e 5 ngā momo Belidae e kaha rite ana ki o Ahitereira. Ko te belid tuaono, nō tētahi puninga o New Caledonia, ā, e honoa ana ki ngā Araliaceae.

E rua ngā whānau whāiti o nga Brentidae i Aotearoa, kāore e tino rite tētahi ki tētahi. Kotahi te puninga Brentinae nō Aotearoa taketake ake, kotahi anō te momo o roto i taua puninga. Koia tērā ko te pepeke nguturoa. Me kōrero te rerekē o te rahi me te hanga o te tinana o te toa me te uwaha o tēnei momo. He ahurei te pepeke

(haere tonu)

Contributor **Guillermo (Willy) Kuschel** was born in Frutillar, southern Chile. Brought up bilingual in Spanish and German, he also learned English, French, classical Greek, and Latin at college. He graduated at the Universidad de Chile, Santiago, with an MSc in 1950 and PhD in 1953. He was a research entomologist at the Instituto de Zoología, Universidad de Chile, and co-founder and editor of the *Revista Chilena de Entomología*. He was invited to New Zealand in 1962 to be in charge of the then newly created Systematics Section of Entomology Division, DSIR. His interest in plant/insect associations started early in his teens, and he later devoted most of his time to weevils, especially to those of conifers and other early plant groups. He traveled extensively in South America and New Zealand doing fieldwork. He was editor of a book on ecology and biogeography of New Zealand, and is author of over one hundred publications on taxonomy, biology, ecology, biogeography, paleontology, and higher classification of weevils. Married to Beverley A. Holloway (author of *Fauna of New Zealand 3* on the Orthoceri weevil family Anthribidae), they have two daughters and a son.

I whānau mai te kaituhi, a **Guillermo (Willy) Kuschel**, ki Frutillar, i te tonga o Chile. Ko te reo Pāniora me te reo Tiamana ngā reo o te kāinga i a ia e tamariki ana, ā, me tana ako anō i te reo Ingarīhi, te reo Wīwī, te reo Kariki onamata, tae atu ki te reo Rātini i te kura tuarua. Nō te tau 1950 i whakawhiwhia ai ia ki tana tohu MSc e te Universidad de Chile, Santiago, whai i muri mai ko tana tohu Ph D i te tau 1953. He kairangahau pepeke ia i te Instituto de Zoología o te Universidad de Chile, ā, ko ia tētahi o te tokorua nā rāua te pukapuka *Revista Chilena de Entomología* i whakatū. Ko ia anō te ētita o taua rauemi. He mea āta pōhiri ia kia haere mai ki Aotearoa i te tau 1962 hei rangatira mō te Kaupeka Whakapapa o te Wāhanga Pepeke o te DSIR kātahi anō ka whakatūria i tērā wā. Nōna e taiohi tonu ana, ka tipu ake tana minamina ki ngā hononga i waenga i ngā tipu me ngā pepeke. Nō muri mai, ka whāiti ake tana titiro ki ngā wīwhara, me te aronui ki ērā e noho tahi ana ki ngā rākau whai koroī me ērā atu kāhui tipu o tuauri whāioio. I kaha tonu tana toro haere i Amerika ki te Tonga me Aotearoa, he rangahau ā-nuku te mahi. Ko ia te ētita o tētahi pukapuka e pā ana ki te taupuhi kaiao me te arowhenua-koiora o Aotearoa, ā, he neke atu i te kotahi rau ngā tanga kōrero kua puta i a ia e pā ana ki te whakarōpūtanga, te koiora, te taupuhi kaiao, te arowhenua-koiora, te mātai mātātoka, me ngā whakarōpūtanga whakarunga o ngā wīwhara. Ko Beverley A. Holloway tana hoa rangatira (nāna ngā kōrero o *Te Aitanga Pepeke o Aotearoa 3*, e pā ana ki te whānau wīwhara Anthribidae, o te rōpū Orthoceri). E rua ā rāua tamāhine, kotahi te tama.

nguturoa, inā rā, koia anake te wīwhara huri i te ao e kitea atu ana tana papatua tapatoru. Ka mutu, he neke atu i te 8 cm te roa o ētahi o ngā toa. He roa noa ake tērā i ana whanaunga katoa o te whānau whāiti Brentinae. O te whānau whāiti Apioninae, e 5 ngā momo taketake ake o Aotearoa, kotahi te momo rāwaho. He mea āta tiki atu te rāwaho kotahi hei patu i te kōhe (*Ulex europaeus*). E toru ngā puninga taketake ake kotahi anō te momo o roto i ia puninga, ā, kāore ēnei e kitea i ētahi atu wāhi o te ao. Kāore ngā momo nei e tino rite, tētahi ki tētahi, kāore rānei e rite ki tētahi momo e kitea ana i wāhi kē o te ao. Ko te momo o tētahi o ngā puninga (te puninga *Zelapterus*) he tino pakupaku, he maheni, he mōhinuhinu anō te anga, he rerekore, ā, kāore e mōhiotia te momo rākau e noho ai ia. Ko te momo o tētahi atu puninga (a *Cecydophyus*), he rahi, he mōhinuhinu kore, he huruhuru anō te anga, ā, ko te tawai (*Nothofagus menziesii*) tana rākau noho. Ko te momo o te puninga tuatoru (a *Strobilobius*), he huruhuru kore ngā kahu parirau, otirā, he whai kōwakawaka. E arohia nuitia ana tēnei nā i te mea e whai hononga ana ki te pāhautea (*Libocedrus bidwillii*), he rākau huainohi nō te whānau cypress. Ko Aotearoa anake te kāinga e kitea ai te puninga tuawhā o te whānau whāiti Apioninae (a *Neocyba*). Noho tahi ai ngā momo e 2 o tēnei puninga ki te rātā me te pōhutukawa (ngā momo *Metrosideros*). Nō te kāwai kotahi tēnei puninga me tētahi o New Caledonia.

Translation by **H. Jacob**
Huatau Consultants, Levin



Dedicated to the late

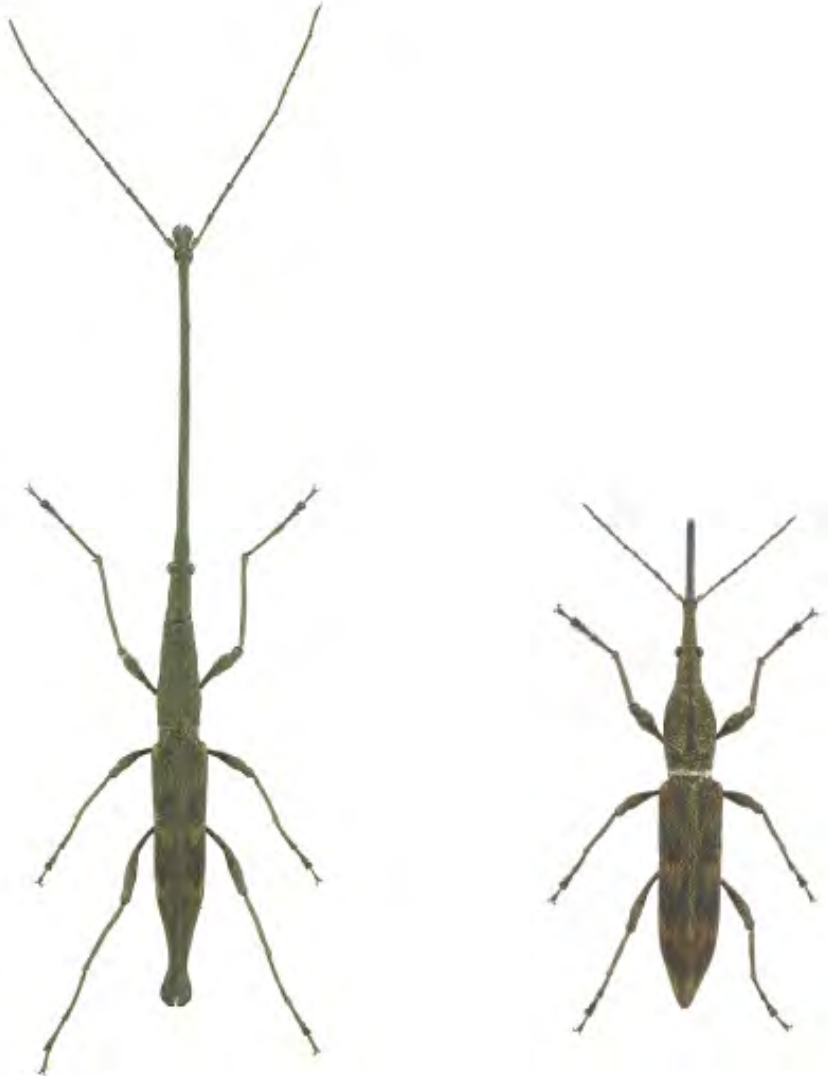
Dr William (Bill) Cottier

Director of Entomology Division (1956-1964)

Department of Scientific and Industrial Research

initiator of my long association with New Zealand entomology.

* * * * *



Frontispiece: The giraffe weevil (pepeke nguturoa), *Lasiornychus barbicornis* (Fabricius, 1775), was collected by Captain Cook's crew in 1769 and was the first weevil from New Zealand to be described scientifically: Swedish entomologist Christian Fabricius described it in 1775 as two separate species because he was misled by its striking sexual dimorphism. The giraffe weevil has larger specimens than any other species in the family. Male (left), size range 16–90 mm, female (right), size range 13–46 mm (photographs prepared by B. E. Rhode, Landcare Research)

ABSTRACT

The curculionoid families Nemonychidae, Belidae, and Brentidae are revised: Nemonychidae comprising 4 species in 1 genus; Belidae 6 species in 4 genera; and Brentidae 7 species in 6 genera (including 1 species introduced for biological control). The Nemonychidae and the 5 species of Belinae are associated with the conifer families Podocarpaceae and Phyllocladaceae, the species of Aglycyderinae with Araliaceae, the winged native Apioninae with Cupressaceae, Fagaceae, and Myrtaceae, and the introduced Apioninae with Fabaceae (*Ulex*). The species of Brentinae lives in dead wood of various dicotyledonous trees, and the host of the flightless apionine remains unknown. Introductory sections deal with faunal richness, composition, fossil families of Curculionoidea, biogeography, and deposition of types and other specimens. A further section completes information on female pouches and rectifies a past error on the nature of some of these.

Four new genera proposed are: *Rhiconobelus* n.gen. (Belidae, type-species *Pachyura metallicus* Pascoe), *Zelapterus* n.gen. (Brentidae: Apioninae, type-species *Apion terricola* Broun), *Cecidophyus* n.gen. (Apioninae, type-species *C. nothofagi* n.sp.), and *Strobilobius* n.gen. (Apioninae, type-species *S. libocedri* n.sp.). *Agathinus* Broun is removed from synonymy with *Cyrotypus* Pascoe. Six new species are erected: *Rhinorhynchus halli* n.sp., *R. halocarpi* n.sp., *R. phyllocladi* n.sp., *Cecidophyus nothofagi* n.sp., *Strobilobius libocedri* n.sp., and *Neocyba regalis* n.sp.. There are 4 new combinations proposed: *Rhiconobelus aenescens* (Broun), *R. metallicus* (Pascoe), and *R. rubicundus* (Broun) are transferred from *Pachyura* to *Rhiconobelus*; and *Z. terricola* (Broun) is transferred from *Apion* to *Zelapterus*. New synonymies are: *Pachyura albocoma* (Broun), *P. brookesi* (Broun), *P. sumptuosus* (Broun), and *P. venustus* (Broun) are synonymised with *Rhiconobelus metallicus* (Pascoe); and *Pachyura pilosus* (Broun) and *P. violaceus* (Broun) are synonymised with *Rhiconobelus rubicundus* (Broun).

The ratios for weevil groups on conifers with straight vs geniculate antennae (Orthoceri over Gonatoceri) show markedly different percentages in the northern and southern hemispheres. The percentage of conifer-associated Orthoceri over Gonatoceri is 63% in New Zealand, 61% in Australia, 52% in Chile, and only 2.5% in Europe. It is estimated that the New Zealand weevil fauna amounts to approximately 1800 species. It currently numbers 1500 validly established names, but about one-quarter of these are expected to fall into synonymy. Of the six recognised orthocerous families, Attelabidae and Caridae are not represented. The Anthribidae, Aglycyderinae (Belidae), and Apioninae (Brentidae) are most closely related to the fauna of New Caledonia, Belinae with Australia, and Nemonychidae with Chile. The early fossil fauna is summarised with comments on the status of four weevil families based on strata imprints. The phylogenetic relationships of 28 terminal taxa of Belinae are discussed in Appendix 1, and the genus *Atractuchus* is synonymised with *Dicordylus*.

Keywords. Nemonychidae, Belidae, Brentidae, Curculionoidea, species richness, composition, biogeography, taxonomy, hosts, systematics, cladistics, keys.

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CHECKLIST OF TAXA

Family Nemonychidae	17
Genus Rhinorhynchus Sharp, 1882	17
<i>rufulus</i> (Broun, 1880)	19
<i>zealandicus</i> Sharp, 1882	
<i>halocarpi</i> sp. nov.	20
<i>phyllocladi</i> sp. nov.	20
<i>halli</i> sp. nov.	21
Family Belidae	21
Subfamily Belinae	
Genus Pachyurinus Kuschel, 1959	22
<i>sticticus</i> (Broun, 1893)	23
Genus Rhiconobelus gen. nov.	24
<i>rubicundus</i> (Broun, 1880) comb. nov.	24
<i>pilosus</i> Broun, 1909, <i>Pachyura rubicunda</i> var ..	
syn. nov.	
<i>violaceus</i> Broun, 1909, <i>Pachyura</i> syn. nov.	
<i>metallicus</i> (Pascoe, 1877) comb. nov.	25
<i>albocoma</i> Broun, 1893, <i>Pachyura</i> syn. nov.	
<i>brookesi</i> Broun, 1921, <i>Pachyura</i> syn. nov.	
<i>sumptuosus</i> Broun, 1880, <i>Pachyura</i> syn. nov.	
<i>venustus</i> Broun, 1909, <i>Pachyura</i> syn. nov.	
<i>aenescens</i> (Broun, 1915) comb. nov.	26
Genus Agathinus Broun, 1880 reval. nov.	27
<i>tridens</i> (Fabricius, 1775)	28
<i>sextuberculatus</i> White, 1846, <i>Rhinaria</i>	
Subfamily Aglycyderinae	
Genus Aralius Kuschel, 1990	28
<i>Platycephala</i> Montrouzier, 1861 (non Fallén, 1820)	
<i>wollastoni</i> (Sharp, 1876)	30
<i>badius</i> Broun, 1880, <i>Aglycyderes</i>	
<i>jeanneli</i> Paulian, 1944, <i>Platycephala</i>	
Family Brentidae	31
Subfamily Brentinae	
Genus Lasiorhynchus Lacordaire, 1866	31
<i>barbicornis</i> (Fabricius, 1775)	33
<i>assimilis</i> Fabricius, 1775, <i>Curculio</i>	
Subfamily Apioninae	34
Tribe Rhadinocybini	
Genus Zelapterus gen. nov.	34
<i>terricola</i> (Broun, 1923) comb. nov.	35
Genus Cecidophyus gen. nov.	36
<i>nothofagi</i> sp. nov.	37
Genus Strobilobius gen. nov.	38
<i>libocedri</i> sp. nov.	39
Genus Neocyba Kissinger, 1968	39
<i>metrosideros</i> (Broun, 1880)	40
<i>regalis</i> sp. nov.	41
Tribe Apionini	
Genus Exapion Bedel, 1887	42
<i>ulicis</i> (Forster, 1771)	42

CONTENTS

Abstract	9
Checklist of taxa	10
Acknowledgments	10
Introduction	11
Richness of the N.Z. weevil fauna	12
Composition of the N.Z. weevil fauna	13
Fossil evidence	14
Biogeographical notes	15
Pouches in females	16
Conventions	16
Key to families	17
Descriptions	17
References	44
Appendices	
Appendix 1 Phylogenetic relationships of the gen-	
era of Belinae	48
Appendix 2 Collection details of specimens examined	
.....	55
Illustrations	61
Distribution maps	89
Taxonomic index	94

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INTRODUCTION

This contribution to the *Fauna of New Zealand* series is the fourth on weevils. Weevil, a word of Germanic origin, was used indiscriminately for any coleopteron in the 9th to 15th century (Klausnitzer 1983), but became gradually displaced by beetle, Käfer, chafer, biller, and others in Ger-

manic languages. It is now almost exclusively reserved for beetles of the superfamily Curculionoidea. Derived from a number of spelling forms, such as webila, uubil, wibil, wibel, and wiebel, it ended up as weevil in modern English. The group of beetles it now represents stands out amongst all others by having the head extended forward to a kind of snout or proboscis called a rostrum. Because the group is well represented in Europe in forests, orchards, fields, and barns, it was given vernacular names in most countries. Apart from weevil in English, these beetles are known as Rüsselkäfer (snout-beetle) in German, snudebiller in Danish, charançon in French, gorgojo in Spanish, and gorgulho in Portuguese. The last two names were derived from the Latin word “curculio”, which Linnaeus (1758) adopted as a genus to embrace nearly all Curculionoidea described by him, and Latreille (1802) then selected this name as the basis for his family Curculionites.

Schoenherr (1826), who pioneered the study of weevils, distinguished in his ‘tabula synoptica familiae curculionidum’ two groups — ordo Orthoceri and ordo Gonatoceri — basing the division on an obvious feature of their antennae: those with straight antennae he called Orthoceri, and those with geniculate antennae he named Gonatoceri. This division is not strictly phylogenetic, but has been, and still is, popular and practical to the current day.

Under the name of Orthoceri are grouped five (Kuschel 1995) or six families (Oberprieler 2000), and four of these are represented in New Zealand: Nemonychidae, Anthribidae, Belidae, and Brentidae. Absent are Attelebidae and Caridae, the latter having just a few relict forms in Australia and in the Andes of Chile and Argentina. Orthocerous weevils are perceived as primitive because of the plesiomorphic state of their antennae and other external and internal morphological structures. They are consequently regarded as ancestral and are expected to appear early in the fossil record. A section is devoted to the paleontological evidence of the earliest, mainly Mesozoic, Orthoceri known with some comments on the reliability of their systematic placement.

Orthoceri constitute a small minority of the New Zealand weevil fauna, amounting to only 74 endemic species at present, out of some 1100 species estimated as valid amongst 1500+ names already proposed, or only 6.7% of the total known fauna. This percentage will probably be lowered to about 4% once hundreds of Gonatoceri weevils awaiting description are dealt with. The largest of the orthocerous weevil families is Anthribidae, with 60 species, all but two endemic (Holloway 1982). The other three families have 17 species, 16 of them endemic, and one introduced for partial biological control of gorse (*Ulex europaeus*).

If Orthoceri appeared earlier in geological times, the question arises whether the plants they were associated with were of the early type as well. Host associations can, of course, only be surmised when dealing with fossils, but it can be done with some confidence if the contemporary fossil flora is also known and the host plant associations of the extant weevil fauna shows a disproportionately high incidence of species confined to ancestral groups of plants. Considering only phanerogamic hosts, 12 orthocerous species are host-specifically linked with gymnosperms in New Zealand (if two anthribid species of the genus *Cacephatus* are included) and 62 with angiosperms and/or their fungi, or 16% versus 84% respectively. On the other hand, of all of the weevils known or presumed to occur exclusively on conifers, the ratio is 12 Orthoceri to 7 Gonatoceri (63% versus 37%) in New Zealand. By comparison, Australia has 34 Orthoceri and 22 Gonatoceri (61% versus 39%), and Chile 16 Orthoceri and 15 Gonatoceri (52% versus 48%) described weevil species on conifers. These three southern hemisphere countries show patterns in sharp contrast with those of the northern hemisphere where Gonatoceri species on conifers prevail by far over Orthoceri ones. The Orthoceri/Gonatoceri ratio in Europe on conifers is of the order of 2.5% to 97.5%. I am not aware that other workers have considered ratios of their groups for the two hemispheres, or have possibly found similar differences, and, if so, how the phenomenon was explained. I should think that the less severe climate changes of the southern hemisphere and the loss of Araucariaceae and Podocarpaceae in the temperate northern hemisphere has had a good deal to do with it, as well as a most successful proliferation in the northern latitudes of Scolytinae. Table 1 lists the hosts plants for the 17 species of the families revised in this contribution.

Richness of the New Zealand weevil fauna

The marked prevalence of weevils over any other comparable group of beetles in the composition of local faunas is confirmed for New Zealand. Thomas Broun in the years 1880-1923 recorded 4323 beetle species, and Watt (1977) worked out that 1198 of them (27.7%) were weevils. In a survey of a few hectares of a coastal strip of an Auckland city suburb by Kuschel (1990), which included also a rich adventive element, better adapted to rural and urban conditions than the autochthonous component, 198 out of 982, or one fifth (20%) of the total beetle fauna were weevils. Since Fabricius described the first species collected by Captain Cook's *Endeavour*, 1501 names have become available for native weevil species. It is estimated that a good many of these names, at least one quarter (25%), will succumb to synonymy and bring down the number of species to about 1100.

Table 1. Host plants of New Zealand Nemonychidae, Belidae, and Brentidae species.

Excepting *Lasiorhynchus barbicornis*, adults of all other weevil species dealt with in this revision are to a greater or lesser extent host-specific, but larvae may on occasion also develop on plants other than the adult host. If this is the case, the species is marked with an asterisk (*).

Gymnospermae

Araucariaceae

Agathis australis: *Lasiorhynchus barbicornis*

Cupressaceae

Libocedrus bidwillii: *Strobilobius libocedri*

Phyllocladaceae

Phyllocladus alpinus: *Rhynchobelus aenescens*

Rhynchobelus metallicus

Rhinorhynchus halli

Rhinorhynchus halocarp

Rhinorhynchus phyllocladi

Rhinorhynchus rufulus

Phyllocladus toatoa: *Rhynchobelus metallicus*

Phyllocladus trichomanoides: *Rhynchobelus metallicus*

Rhinorhynchus phyllocladi

Rhinorhynchus rufulus

Podocarpaceae

Dacrycarpus dacrydioides: *Rhinorhynchus rufulus*

Dacrydium cupressinum: *Agathinus tridens*

Lasiorhynchus barbicornis

Rhynchobelus metallicus

Rhinorhynchus rufulus

Halocarpus bidwillii: *Agathinus tridens*

Rhinorhynchus halocarp

Rhinorhynchus phyllocladi

Rhinorhynchus rufulus

Lepidothamnus laxifolius: *Rhinorhynchus rufulus*

Manoao colensoi: *Rhinorhynchus phyllocladi*

Rhinorhynchus rufulus

Podocarpus hallii: *Agathinus tridens*

Rhinorhynchus rufulus

Podocarpus nivalis: *Rhinorhynchus rufulus*

Podocarpus totara: *Agathinus tridens*

Rhynchobelus metallicus

Rhynchobelus rubicundus

Rhinorhynchus phyllocladi

Rhinorhynchus rufulus

Prumnopitys ferruginea: *Agathinus tridens*

Rhinorhynchus rufulus

(Table 1 continued)

Angiospermae**Araliaceae**

- Pseudopanax arboreus*: *Aralius wollastoni*
Pseudopanax crassifolius: *Aralius wollastoni*
Pseudopanax lessonii: *Aralius wollastoni*

Asteraceae

- Brachyglottis repanda*: *Lasiorhynchus barbicornis*
Olearia nummulariifolia: *Agathinus tridens**

Cornaceae

- Corokia buddleioides*: *Agathinus tridens**

Corynocarpaceae

- Corynocarpus laevigatus*: *Lasiorhynchus barbicornis*

Eleocarpaceae

- Aristolelia serrata*: *Pachyurinus sticticus**

Epacridaceae

- Cyathodes* sp.: *Agathinus tridens**

Ericaceae

- Gaultheria* sp.: *Agathinus tridens**

Fabaceae

- Ulex europaeus*: *Exapion ulicis*

Fagaceae

- Nothofagus cliffortioides*: *Pachyurinus sticticus**
- Nothofagus menziesii*: *Cecidophyus nothofagi*
- Nothofagus solandri*: *Pachyurinus sticticus**

Malvaceae

- Hoheria* sp.: *Lasiorhynchus barbicornis*

Meliaceae

- Dysoxylum spectabile*: *Lasiorhynchus barbicornis*

Monimiaceae

- Hedycarya arborea*: *Lasiorhynchus barbicornis*
- Laurelia novae-zelandiae*: *Lasiorhynchus barbicornis*

Myrtaceae

- Metrosideros albiflorus*: *Neocyba metrosideros*
- Metrosideros excelsus*: *Neocyba metrosideros*
Neocyba regalis
- Metrosideros robustus*: *Neocyba metrosideros*

Proteaceae

- Knightia excelsa*: *Lasiorhynchus barbicornis*
- Toronia toru*: *Rhichnobelus rubicundus**

Rubiaceae

- Coprosma* sp.: *Agathinus tridens**

Past methods of collecting were largely confined to sweeping or beating vegetation, or turning over rocks, logs, and other objects on the ground. Because of Broun's deep involvement with the study of the New Zealand beetles, the more easily accessible fauna of lowlands was reasonably well covered. The smaller, cryptic beetles of forest litter, even that of the lowlands, together with moss mats and the hardly explored montane environment, remained to a large extent undescribed. Judging by the richness and variety of insects collected since by research centres and museums, the number of native weevils in this country should easily reach 1800 species. Including the adventive species, the ultimate number should come to around 2000.

Composition of the New Zealand weevil fauna

Before dealing with the subject matter of this section, it is necessary to state which classificatory system is being followed, because there is little agreement at present on the number of families of the weevils. If the old tradition of emphasising morphological distinctiveness, including the presence of ancestral features (plesiomorphies) is followed, a proliferation of families is a natural consequence. One hundred years ago six families were recognised: Anthribidae, Aglycyderidae, Proterhinidae, Brentidae, Curculionidae, and Scolytidae. The ambit of these families did not change to any major degree until Crowson (1955) introduced innovations of phylogenetic significance. The result was that Proterhinidae and Scolytidae were demoted, and Nemonychidae, Belidae, Oxycorynidae, and Apionidae were proposed as new, to which the family Allocorynidae was subsequently added (Crowson 1981). Kuschel (1995), by dissecting a large assortment of species of all major weevil groups, produced a matrix of 141 characters, which was processed through PAUP. Six family clades were obtained whereby Oxycorynidae, Allocorynidae, and Aglycyderidae of Crowson were included in Belidae, and Apionidae in Brentidae. Oberprieler (2000), in examining a few controversial taxa in and around Brentidae, removed Carinae from this family to raise it to family status. Kuschel's system, with inclusion of the alteration introduced by Oberprieler, is adopted in the present paper. Thompson (1992), Zimmerman (1994), Zherikhin & Gratshev (1995), and Alonso-Zarazaga & Lyal (1999) proposed or followed other classifications accepting anything from 11 to 18 families. Because these do not provide characters for a phylogenetic analysis and proper systematic assessment, they are not considered here.

Of the seven accepted weevil families, five occur in New Zealand: Nemonychidae with four native species, Anthribidae with 58, Belidae with seven, Brentidae with six native and one introduced species, and Curculionidae

with approximately 1100 valid species. The family Attelabidae is not present in New Zealand, and is present with only one rhynchitine species in New Caledonia and four rhynchitines in Chile. The family Caridae has six extant species — four in Australia and two in Chile — but fossils are known from the Baltic amber (Voss 1953, Kuschel 1992) and others from the Lower Cretaceous are considered probable members of the family (Kuschel 1983).

The present paper revises the families Nemonychidae, Belidae, and Brentidae. The fourth family, Anthribidae, the largest of the four orthocerous families in New Zealand, was revised by Holloway (1982) in great detail and with a profusion of illustrations. The three orthocerous families treated here are poorly represented, but being of basic ancestral groups, are of special biogeographic interest. Nemonychidae, with only 70 known species world-wide, is represented by four species in New Zealand, making up 5.7% of the world fauna. By comparison, the ratio is 1.87% for the world fauna of Anthribidae, 2.0% for Belidae, 0.16% for Brentidae, and 2.29% for Curculionidae. Large groups elsewhere, for instance Dryophthorinae, Baridini, Lixini, Anthonomini, Ceutorhynchini, Zygopini, and Mesoptiliini (Magdaldini), to cite just a few weevil groups, have no native species in New Zealand. On the other hand, groups rather poorly represented elsewhere, in areas of a similar climate, for instance Eugnomini, Molytini, Erihrinini, and Cryptorhynchini, as well as Cossoninae, are very richly represented in this country.

FOSSIL EVIDENCE

No fossils of weevils of Tertiary, or earlier ages, have been described from New Zealand, but many are known from other parts of the globe. Russian entomologists have excelled in describing a rich assortment of fossil Coleoptera from Triassic, Jurassic, and Cretaceous sediments of the Russian Federation of countries, notably from the particularly rich deposits at Karatau in Kazakhstan, and from areas of other continents. A brief account of proposed fossil weevil families is given below, with comments on their validity and relevance to the extant fauna.

Four families have been proposed in the last 25 years:

(1) Eobelidae by Arnoldi (1977), based on 30 species in 15 genera and four subfamilies, from the Upper (Late) Jurassic;

(2) Eccoptarthridae by Arnoldi (1977), on one genus and species from the same deposits, originally in a tribe of Eobelidae, whose status was twice changed, firstly by Zherikhin & Gratshev (1995), by citing it as a subfamily of Nemonychidae, then (1997) by raising it to independent family;

(3) Ulyanidae by Zherikhin (1993) on one genus and species from the Middle Cretaceous of the West Okhot Region;

(4) Obrieniidae Zherikhin & Gratshev (1994), on seven species in five genera and two subfamilies from the Upper Triassic and Upper Jurassic.

Obrieniidae. Obrieniidae was described as the earliest family of Curculionoidea, but there appears to be no or little ground for a placement in the superfamily of weevils. The features regarded as stable and basic for extant weevil groups, as invariably found in Nemonychidae, Anthribidae, Belidae, and Attelabidae, ought to be expected to show up in Obrieniidae, but this is not the case. The only character that seemingly determined a placement of Obrieniidae in Curculionoidea was the presence of a head extended forward into a kind of rostrum. An extended head alone, however, does not define a curculionoid because it is also known in a number of other beetle groups. The 9 main features against a placement of Obrieniidae in Curculionoidea are:

- (1) middle coxae in direct contact with mesepimera and metepisterna, a character not found in any curculionoid;
- (2) absence of a scutellar striole, now the case only in Caridae, Brentidae, and Curculionidae;
- (3) width of the sutural interstria the same throughout, instead of distinctly broader in the basal area;
- (4) a sternopleural suture touching fore coxae anterolaterally, instead of fully laterally on the outer side of the coxae;
- (5) absence of distinct tibial combs;
- (6) first three antennal segments equally robust instead of two at most;
- (7) a compact antennal club instead of a loosely articulated club;
- (8) elytral striae well marked throughout, instead of weak or effaced posteriorly;
- (9) interstriae 2 and 3 joining 9 and 8, instead of joining 10 and 9.

Every one of these nine characters would almost certainly exclude Obrieniidae from Curculionoidea, in particular the contiguity of the middle coxae and the pleurites, and the simultaneous absence of a scutellar striole and a basally broadened sutural interstria. On the other hand, character (1), listed above, seems to be in agreement with what is seen in extant Archostemata.

Eobelidae. A merger of Eobelidae with Nemonychidae was suggested by Kuschel (1983) and accepted by Zherikhin (1986). Some Eobelidae were subsequently transferred by Zherikhin & Gratshev (1995) to Belidae, though with some reservation, in a study of hind wings of Curculionoidea.

These authors had a fragment of a wing, attributed to a *Probelus* species, which was showing little more than the stigmatal area. The radial cell and window of the fossil wing is triangular in shape, similar to those observed in some extant Belidae. The shape of the cell and window, however, varies a good deal in Belidae as well as in Nemonychidae. It can be a narrow, elongate triangle, as in the tribe Belini and the megalopodid genus *Palophagus*, or a broader triangle, as in *Probelus* and the nemonychid genus *Mecomacer*. There can also be a broad cell and window of a tetragonal or pentagonal shape, as in the belid subtribe Agnesiotidina and in *Nemonyx*. Fossil taxa seldom provide a good set of reliable characters and thus become prone to being moved about by different scientists and sometimes by the same scientist at different times. I contend that the features of the rostrum, mandibles, antennae, legs, and elytral striae suggest a much safer position of Eobelidae in Nemonychidae than in Belidae, because the shape of the radial cell and window alone do not define either family.

Ulyanidae. It is admittedly difficult to place the only known fossil in an extant family. It is also difficult to accept that a beetle family has actually become extinct. The abdomen is not that of any brentid or attelabid. The subapical antennae are not those of belids and carids. The elytral sculpture and presence of scales in the fossil rule out Nemonychidae but not Anthribidae. Should a careful re-examination of the fossil bring no changes to the interpretation of the imprints, other fossils may be required to clarify the systematic position of Ulyanidae.

Eccoptarthridae. It was an audacious step by the Russian paleontologists Zherikhin and Gratshev to put together in one family the extant Caridae and the fossil Eccoptarthridae. The identity of these taxa, of such diverse geological ages, was based solely on the presence of one character of doubtful value, the enlargement of the first tarsal segment. Enlarged tarsi are found in some or all species of the nemonychid *Mecomacer* Kuschel and the belid genera *Isocanthodes* Zimmerman, *Rhinotia* Hope, and *Stenobelus* Zimmerman. In the absence of other features in the fossil(s), there can be no justification in replacing, because of priority, the name of an extant group offering a full set of adult and larval attributes with one that happens to also have enlarged basal tarsal segments. Apart from a relatively broad first tarsal segment, Caridae have in profile a dorsally pronounced convexity, a curved rostrum, distinctly postmedian antennae, an elongate antennal scape, and a prothorax that lacks a carinated lateral margin. All these external attributes of extant Caridae are missing from *Eccoptarthrus* Arnoldi (1977) and *Gobicar* Gratshev & Zherikhin (1999). These genera have more features in common with the fossil nemonychid Eobelinae than with present-day Caridae.

BIOGEOGRAPHICAL NOTES

Of the four families of orthocerous weevils in New Zealand, only two extend their relationships to South America. These families replicate a well known southern trans-Pacific pattern, whereas the other two families show a clear connexion with Australia, New Guinea, and New Caledonia only.

Nemonychidae. New Zealand has one nemonychid genus, Australia seven, and Chile four. Representatives of the tribe Rhinorhynchini occur in all three areas. The Australian members of the tribe are associated with Araucariaceae and their larvae move about on their backs, whereas the New Zealand and Chilean species live on Podocarpaceae and Fagaceae and move in the normal way on their venters. The closest affinity of the Zelandic *Rhinorhynchus* Sharp is with the Chilean *Nannomacer* Kuschel, but the interrelationship of the two is remote. All four New Zealand species are oligophagous and confined to Podocarpaceae/Phyllocladaceae, none being confined to just one host species or genus. The two Chilean species of *Nannomacer* are stenophagous, each species is associated with only one host-plant genus: *N. germaini* (Voss) with *Podocarpus*, and *N. wittmeri* Kuschel with *Saxegothaea*.

Anthribidae. Holloway (1982) listed 58 endemic species in 22 genera for New Zealand. She found eleven genera to be eminently endemic, to be regarded as 'part of the archaic (endemic) element of New Zealand biota', and four others endemic but showing relationships towards New Caledonia. The other seven genera are shared with New Caledonia, and two of them also with Australia (Holloway 1982, Kuschel 1998). The genera common to the two areas are *Androporus* Holloway, with one species in New Zealand and three in New Caledonia, *Cacephatus* Blackburn with six and three species respectively, *Dasyanthribus* Holloway with one each, *Helmoresus* Holloway with one and seven, and *Liromus* Holloway and *Micranthribus* Holloway with one or more each. *Cacephatus* and *Helmoresus* also occur in Australia with one species each. In addition, *Hoherius* Holloway is close to *Proscoporhinus* Montrouzier, and *Lophus* Holloway to *Perroudius* Holloway from New Caledonia. By contrast, Chile does not show obvious relationships with New Zealand in its anthribid fauna.

Belidae. Three subfamilies are included in the Belidae and two are represented in New Zealand: Belinae and Aglycyderinae; the third subfamily Oxycoryninae is absent. Belinae are constituted by two major groups or tribes, Pachyurini and Belini; both groups are present in Australia, Chile, Argentina, and Brazil, but in New Zealand only Pachyurini occurs. This tribe has five species in three genera in New Zealand, all endemic. *Agathinus* is a very

close relative of the Australian *Cyrotypus* Pascoe, the other two genera are adelphic to each other and together are adelphic to *Sphinctobelus* Zimmerman of Australia. The subfamily Aglycyderinae is a remarkable group of weevils confined almost entirely to the Pacific islands, with one species extending to New Zealand. This species is a member of *Aralius* Kuschel which has three further species (two still with unpublished names) in New Caledonia.

Brentidae. The New Zealand native fauna consists of one species of Brentinae and five of Apioninae. Brentinae are pantropical, hence poorly represented in New Zealand and not at all in Chile. The brentine *Lasiorynchus* Lacordaire belongs to the tribe Ithystenini which has its main centre in the Oriental and Australian areas. It has no relatives in New Caledonia and remote ones only in Australia, Vanuatu, and Fiji. The genus has consistently been placed alongside the Sulawesian genus *Prodector* Pascoe since Lacordaire (1866) proposed it. The apionine fauna has four endemic genera, but *Neocyba* Kissinger is closely related to the New Caledonian *Rhadinocyba* Faust. The other three genera appear to be closer to the faunal element of New Caledonia and Vanuatu than to Australia.

In summary, out of 32 genera of native orthocerous weevils in New Zealand, 24 (75%) are endemic. The closest biogeographic relationship of this fauna is first with New Caledonia, then with Australia, and then with the area northwest of New Caledonia to Sulawesi and across the southern Pacific to Chile.

POUCHES IN FEMALES

Any accessory tubular or bag-like growth on the female genitalia and terminalia, observed by Kuschel (1987), were classified according to location without specification of their functions. It has since become patent that most, if not all, are of a glandular nature. It was then expressly stated then that the tergal and sternal pouches 'contain filamentous microorganisms attached to the chitinous walls ... ending in elongate (*Lasiorynchus*) or oval (*Karocolens*) head-like structures with radiating canaliculi visible only on electron microscope micrographs (figs 32-36)'. Further work on these pouches has revealed that those 'filamentous microorganisms' were simply parts of glandular tissue.

A pouch or gland that missed being listed in my paper of 1987 was the well known colleterial gland, attached to the posterior wall at the base of the common oviduct at the anterior end of the vagina in some Coleoptera, including Curculionoidea (Fig. 135, 136). It is present in some of the New Zealand apionine genera as a rather deeply obcordate structure in outline, due to two opaque or slightly

pigmented apical lobes (Fig. 136, 148, 156). The gland has crescent or scale-like dark patterns and a dense, papillate or villi-like outer surface (Fig. 167), appearing under high magnification as if covered in dense, fine hairs. The viscous substance secreted by the gland glues eggs together, or attaches them to surfaces, or seals them off after placement in holes or cracks. A similar function may be attributed to the tergal and sternal glands of *Lasiorynchus* (Fig. 104, 106).

CONVENTIONS

It is useful to know where authoritatively identified specimens are held. The institutions housing primary and secondary types of species dealt with in the present paper are listed below. The following acronyms for repositories are used:

- AMNZ Auckland Museum, Auckland, New Zealand
- CMNZ Canterbury Museum, Christchurch, New Zealand
- FRNZ Forest Research, Rotorua, New Zealand
- LUNZ Entomology Research Museum, Lincoln University, New Zealand
- MONZ Museum of New Zealand, Wellington, New Zealand
- NZAC New Zealand Arthropod Collection, Landcare Research, Auckland, New Zealand
- OMNZ Otago Museum, Dunedin, New Zealand

Whenever the New Zealand Arthropod Collection (NZAC) does not house the primary type of a described species, a specimen compared with the primary type and agreeing with it is deposited in it, with a special yellow label. The yellow label has the name of the species as originally published, the name of the person who compared it, and the year the comparison was done.

The area codes of Crosby *et al.* (1976, 1998) are used in collection records.

KEY TO FAMILIES OF ADULT NEW ZEALAND CURCULIONOIDEA

- 1 Antennae straight (orthocerous, non-elbowed), funicle following direction of scape (Fig. 1), if elbowed, or subgeniculate as in Fig. 10, then trochanters elongate, separating femora from coxae 2
- Antennae elbowed (geniculate, gonatocerous), funicle deflected from direction of scape in an angle (Fig. 181), trochanters short, not separating femora from coxae **Curculionidae**
- 2(1) Labrum free, distinct, separated from clypeus by a distinct suture (Fig. 19–26) 3
- Labrum not distinct, fused with clypeus (Fig. 175, 176) 4
- 3(2) Labrum finely braced to clypeus, separated by a fine suture (Fig. 173). Prothorax lacking a transverse carina. Elytral puncta lined up to form perfect striae (Fig. 2). All tibiae having spurs (p. 17) ... **Nemonychidae**
- Labrum loosely articulated to clypeus, separated by a deep, manifest suture (Fig. 174). Prothorax usually with a transverse carina. Elytral puncta not lined up into distinct striae. All tibiae lacking spurs (Fauna N.Z. 3, Holloway 1982) ... **Anthribidae**
- 4(2) Fore tibia with a grooming device on inner face opposite tarsal insertion, consisting of dense, fine vestiture in a broad groove or impression (Fig. 183, 184). Gular suture double or absent. Elytra irregularly punctate; if puncta arranged into striae, then a scutellar striole distinct. Abdomen in lateral view having all ventrites at same level (p. 21) ... **Belidae**
- Fore tibia lacking a grooming device on inner face opposite tarsal insertion (Fig. 182). Gular suture single, distinct. Elytra distinctly striate, always lacking a scutellar striole. Abdomen in lateral view having ventrites 1 and 2 deeper down than 3 to 5 (p. 31) ... **Brentidae**

DESCRIPTIONS

Family NEMONYCHIDAE

The family Nemonychidae in New Zealand is represented solely by the genus *Rhinorhynchus* which comprises four species associated with Podocarpaceae and Phyllocladaceae. All four species are found on the same wide range of hosts and obtained, occasionally, concurrently on the same shrub or tree. *Rhinorhynchus* is the type genus of the subfamily Rhinorhynchinae, to which all the southern hemisphere Nemonychidae belong, as well as a few species from Central America and the United States.

Genus *Rhinorhynchus* Sharp

Fig. 1, 2, 19–26

Sharp, 1882: 88 (type-species *R. zealandicus* Sharp [= *Rhinomacer rufulus* Broun, 1880]). —Voss, 1922: 17, 19; 1932: 101, 106. —Crowson, 1953: 240, 242; 1955: 158. —Kuschel, 1959: 237. —May, 1993: 27 (larva).

Listrorhynchus Voss, 1922: 9, 13 (as subg. of *Rhinomacer*; type-species *Rhinomacer rufulus* Broun, 1880); 1931: 164; 1932: 72.

Head weakly to distinctly constricted a short distance behind eyes. Frons anteriorly twice as wide as rostrum across antennal insertions, or wider. Eyes in lateral view round, with moderately coarse ommatidia. Rostrum moderately long, in male a little shorter than prothorax, in female slightly longer than prothorax; scrobes indistinct, shallow, lacking a defined dorsal edge; pubescence on basal part directed basad. Antennae distant from mandibular sockets by twice width of scape or more; segment 1 (scape) thin, not distinctly thicker than segment 2, a little compressed especially in female; segment 2 slightly thicker and distinctly longer than 3. Labrum as in Fig. 27, small, sinuously triangular, broader in male, with four short peg-like setae at apex and two pairs of setiferous puncta on dorsal surface. Mandibles as in Fig. 28, slender, long, falciform, unarmed, lacking a dorsolateral groove, with a row of fine punctation instead, ending with a long seta. Maxillary palpi (Fig. 28) short, flexible, with segments loosely articulated; segments 2 and 3 subequal, 4 as long as other three combined. Postmentum broad, with lateroapical angles rounded.

Prothorax relatively longer in male, weakly impressed on either side of midline near base. Elytra distinctly, regularly striate, with supernumerary puncta on interstria 10 alongside metasternum. Hind wing (Fig. 45) fully developed; anal veins weakly sclerotised.

Front coxae subconical, much closer to base than apex of prothorax. Front and middle tibiae with rather sharp dorsal edge (less distinct in *R. rufulus*); all tibiae with 2 spurs in both sexes, in male incurved near apex and distinctly mucronate. Claws (Fig. 30) with dentiform appendix.

Male. Tergite 8 partially exposed beyond 7, simple, lacking transverse carina, with basal angles incurved mediad. Sternite 8 almost entirely membranous, with a long, fine, Y-shaped apodeme. Sternite 9 with a Y-shaped, weakly upcurved apodeme. Tegmen with a small, paucisetose parameral sector. Aedeagus with a sclerotised pedon and a narrow, weakly pigmented tectum; pedon in lateral view angularly protruding dorsally and ventrally at base; apodemes articulating in basal emargination of aedeagal body, with a narrow bridge across connecting apodemes; internal sac usually with a pair of sclerites and with spinules of varying sizes on walls; ejaculatory duct insertion dorsal at base.

Female. Ventricle 5 with a small setiferous pit on either side. Sternite 8 sclerotised at centre, lacking a fork. Vagina and bursa long, of similar length; distal hemisternites slender, cylindrical, with a very small, bulbous lateroapical stylus (Fig. 43); spermatheca as in Fig. 44, broad at either end, with a short, slightly expanding gland; spermathecal duct nearly as long as vagina and bursa combined, inserting ventrally on bursa a short distance from oviduct.

Distribution. New Zealand endemic: North Island, South Island, Stewart Island.

Host plants. Phyllocladaceae, Podocarpaceae.

Remarks. A genus with four species, one ubiquitous (*R. rufulus*), the others geographically apparently more confined and in the main submontane or montane. Judging by the association with Podocarpaceae, the exclusive crawling of larvae on their venters at all stages of development, and the pubescence of the rostrum directed basad, *Rhinorhynchus* shares with the Chilean *Nannomacer* Kuschel more features than with the Australian *Basiliogeus* Kuschel and *Basiliorhinus* Kuschel, which live on Araucariaceae, have larvae that crawl at all stages on their backs, and have the pubescence of the rostrum directed forward. All four species of *Rhinorhynchus* are found on *Phyllocladus*. These same four can occur on most, if not all, podocarpaceous species, thus the range of hosts is wide. In this respect *Rhinorhynchus* differs remarkably from *Nannomacer*; its counterpart from Chile, where each species is confined to one podocarpaceous genus.

Biology. The life cycle of Nemonychidae was inferred in a paper (Kuschel 1983) from observations of the habits of *Rhinorhynchus rufulus*. Adults are found throughout the year. They are especially abundant around the time of hosts exhibiting nearly or fully mature male strobili (cones), usually from September to December, when eggs are laid.

Adults feed on pollen. Larvae start to appear on male strobili a week or two before pollen is released, feeding on pollen and sporophylls. They move rather actively on the surface of the strobili (Fig. 168) and between the sporophylls (scales), dropping to the ground at the end of their development to pupate in the soil. They emerge from May onwards.

Key to species of *Rhinorhynchus* (Nemonychidae)

- 1 Elytra at basal half densely, coarsely punctate, appearing multistriate because of a row of coarse puncta on interstriae (Fig. 1). Vestiture on elytra dense, coarse, subsquamiform, concealing most of integument. Length 1.5–2.7 mm. Ubiquitous from Northland to Stewart Island (p. 19) ... *rufulus*
 - Elytra at basal half neither densely nor coarsely punctate, appearing simply striate because of only fine puncta on interstriae (Fig. 2). Vestiture on elytra sparse, fine, leaving most of integument exposed 2
- 2(1) Antennae reaching eyes with segment 3 in both sexes; at least last antennal segments black or nearly so. Head abruptly constricted towards rostrum (Fig. 21, 22), basal part of rostrum cylindrical or subcylindrical in both sexes. Mandibles angulate or strongly curved on outer margin alongside terminal seta of laterodorsal row of punctuation (Fig. 22). 1.5–2.2 mm. Coromandel, Subalpine Taupo, Nelson, Otago Lakes (p. 20) ... *halocarpis*
 - Antennae reaching eyes with segment 4 in male, with segment 5 in female, reddish throughout although club usually a shade darker. Head more gradually constricted towards rostrum (Fig. 23–26), basal part of rostrum distinctly tapering towards antennal insertions in both sexes. Mandibles gently curved throughout on outer margin 3
- 3(2) Smaller, usually under 2.3 mm. Segment 2 of antennal club not longer than wide, usually distinctly transverse. Rostrum in lateral view distinctly more curved in both sexes. Male: eyes moderately convex; tibiae more robust, distinctly incurved at apex; tegmen with slenderer parameres (Fig. 39); aedeagus (Fig. 37, 38) slender, less than 0.10 mm wide, with main body 5x longer than wide, with apodemes about half length of aedeagal body, with sclerites in the internal sac small (Fig. 37). Length 1.60–2.35 mm. Northland, Auckland, Taupo, Hawkes Bay, Buller ... (p. 20) ... *phyllocladi*

—Larger, 2.3 mm or over. Segment 2 of antennal club longer than wide. Rostrum in lateral view gently curved in male, nearly straight in female. Male: eyes strongly convex; tibiae slenderer, not distinctly incurved at apex; tegmen with wider parameres, with parameral sector not as deeply notched; aedeagus 0.12–0.13 mm wide, with main body 4x longer than wide, with apodemes about three-quarters length of aedeagal body, with sclerites in the internal sac larger (Fig. 40). Length 2.3–2.7 mm. Subalpine in Taupo, Mid Canterbury
 (p. 21) ... **halli**

Rhinorhynchus rufulus (Broun)

Fig. 1, 19, 20, 27–33, 43–45, 168, 169; Map 1
 Broun, 1880: 467. —Voss, 1922: 13, fig. 4 (*Rhinomacer*);
 1932: 72 (*Listrorhinus*). —Tillyard, 1926: 244, fig. R77.
 —Hudson, 1934: 146. —Crowson, 1953: 242 (syn.
zealandicus); 1955: 158. —Kuschel, 1983: 501, fig. 1–
 4; 1990: 3, 35, 69, fig. 76, 163. —May 1993: 28, fig.
 23–32 (larva).
zealandicus Sharp, 1882: 89. —Voss, 1922: 19, fig. 8, 9;
 1932: 106.

Reddish brown or dark brown, femora and tibiae usually yellowish red. Pubescence longer and denser than in other species, particularly on elytra where hairs are coarse, subsquamiform (stramineous), mostly somewhat golden (Fig. 1).

Head as in Fig. 19, 20; temples strongly constricted; frons in both sexes densely and more coarsely punctate than in other species; rostrum in male moderately converging apicad towards antennal insertions, densely, rather coarsely punctate, with a fine, low median carina, with pubescence directed basad; rostrum in female weakly curved, gently converging towards antennal insertions, shiny on sides, with a fine, sparse to moderately dense punctation. Mandible (Fig. 28) nearly evenly curved on outer margin. Antennae extending to eyes with segment 4 in both sexes. Prothorax distinctly longer than wide in male, slightly wider than long in female, with dense, distinctly coarser punctation than in other species. Elytra seemingly multistriate on basal third or half owing to row of coarse puncta, these puncta as coarse as those in striae.

Male. Parameral sector as in Fig. 33. Aedeagus (Fig. 31, 32) with apex broadly and rather deeply emarginate. Length 1.5–2.7 mm.

Types. (1) *Rhinomacer rufulus* Broun. Described from ‘one mutilated specimen’ from Tairua, Coromandel. Seven specimens bearing this name in Broun Collection of The Natural History Museum, London are from Mt Egmont, Wellington, Pakarau, and Taieri: none is from Tairua. The Broun Collection at Landcare Research, Auckland contains sev-

eral specimens of this species identified by Broun, but again none from Tairua. A specimen from Wellington in the Broun Collection is chosen as neotype to replace the lost holotype, so as to assure correct and consistent application of the name in the future. Neotype ♀, 2.2 x 0.9 mm, Wellington, 829 [green], BMNH.

(2) *Rhinorhynchus zealandicus* Sharp. Holotype ♂, 2.20 x 0.85 mm, Greyouth, Helms, BMNH.

Material examined. North Island. ND. Waipoua SF; Waimatenui; Paihia, Opua SF; Ngaiotonga; Parua. **AK.** Lynfield, Tropicana Drive; Lynfield, Wairaki Bush; Titirangi Res; Titirangi; Waitakeres; Huia; Manurewa, Murphys Bush; Manurewa, Olive Davis Res; Clevedon; Manukau Peninsula, Awhitu Central, Kemps Rd. **CL.** Kakatarahae; Kauaeranga Valley. **WO.** Mt Pirongia. **BP.** Mamaku Plateau, Horohoro SF, Tikitiki Stream; Rereauria Swamp; Waiaroho. **TK.** Pouakai Ra, Summit; Pouakai Trig; Pouakai Ra; Mt Egmont. **TO.** Karioi; Ruapehu–Tongariro; Tongariro NPRuapehu, Tk to Taranaki Falls; Ruapehu, Whakapapa; Ruapehu, Iwikau; Ruapehu, Silica Springs; Ohakune; Ohakune Mt Rd, Makotuhu Flat. **GB.** Waimata V; Mt Hikurangi; Gisborne, Greys Bush. **HB.** Kaweka Ra, Makahu Spur. **RI.** Ruahine Ra, Triplex Spur; Taihape, Oraukura Gorge. **WI.** Fielding, Mt Biggs Rd. **WN.** Tararua Ra, Dundas Ridge; Tararua Ra, Waikanae Mtns, Kapakapanui; Wiltons Bush. **South Island. SD.** Kenepuru Sounds, Ft Mt Stokes. **NN.** Wairoa Gorge; 9 miles N Karamea; Dun Mt; Wairoa V; Rough I, Rabbit I; Whangamoia; Totaranui, Pigeon Sdle, Lookout Rock; Waimea West, Eves Valley, Palmers Bush; Nelson, Wakefield; Baigents Bush; Mangarakau; Collingwood, ft of Mt Burnett; Collingwood, Kaituna R. **BR.** Paparoa Ra, Buckland Peaks; Paparoa Ra, Lochnager Ridge; Rapahoe; Mawhera SF, Tutty Plateau, Red Jacks Creek. **WD.** South Westland. **MB.** Pelorus Bridge. **KA.** Kaikoura, Rakautara. **NC.** Arthurs Pass. **MC.** Kaituna, Banks Peninsula; Mt Hutt, 1000 m. **MK.** Cook Ra, Mt Wakefield; Cook Ra, Ball Ridge; Sealy Ra; Kea Point track; Sealy Ra, Hooker V; Hooker Valley, Hoophorn Stm; Mt Sebastopol. **OL.** Dart Hut. **CO.** Kinloch, Wakatipu; N end Pisa Ra. **DN.** Dunedin; Mt Cargill. **SL.** West Plains; Invercargill; Invercargill, Thompsons Bush; Longwood; Longwood Ra, Grassland Smt; Longwood Ra, Orepuke Tk; Pounaweia, E of Owaka. **SI.** Stewart I, Little River; Mt Rakeahua; Rakeahua V; Pegasus, Mt Anglem; Big S. Cape I, SW Stewart I; Codfish I, Sealers Bay. 565 specimens — see Appendix 2 for details of specimens examined.

Distribution. North Island, South Island, and Stewart Island. Common all the way from sea-level to the subalpine

zone. Obtainable in all seasons, being particularly abundant whilst male strobili are nearly or fully mature.

ND, AK, CL, WO, BP, GB, TO, TK, WI / ND, NN, BR, KA, NC, MC, MK, OL, CO, SL, SI.

Host plants. *Phyllocladus* (Phyllocladaceae); *Dacrycarpus*, *Dacrydium*, *Halocarpus*, *Lepidothamnus*, *Manoao*, *Podocarpus*, and *Prumnopitys* (Podocarpaceae).

Remarks. The two names given to this species are confirmed after examination of the type material of Sharp and specimens identified by Broun himself. Voss had two specimens available, one in good condition, the other with the terminal segment of the maxillary palpi missing, a condition he took to be normal. The description of Broun is clearly based on a female. It contains details on rostrum, antennal insertion points, and nature of sculpture and vestiture of elytra applicable to this species only. *R. rufulus* may be found in numbers also on the subalpine prostrate shrubs of *Podocarpus nivalis* and *Lepidothamnus laxifolius*, or equally in high numbers stuck on the sticky scapes or flower stalks of various composites (Asteraceae) of the genera *Celmisia* and *Brachycome* in the same subalpine zone.

***Rhinorhynchus halocarp* spec. nov.**

Fig. 21, 22, 34–36; Map 2

Yellowish red or dark chestnut-brown, antennae partly or entirely dark brown, metasternum and abdomen reddish brown or dark brown, tarsi usually a little darker towards apex than tibiae. Pubescence fine, short, sparse.

Head (Fig. 21, 22) with temples only slightly constricted; frons between eyes finely, sparsely punctate, nearly smooth on middle. Rostrum in male slightly shorter than prothorax, with basal part subcylindrical or very gently converging towards antennal insertions, densely, finely punctate, with a smooth midline rather than a carina, and with pubescence directed strongly inward, nearly transverse; rostrum in female slightly longer than prothorax, moderately curved in lateral view with basal part cylindrical or nearly so, and its punctation fine and sparse. Mandibles more or less angulate on outer margin alongside terminal seta of laterodorsal row of puncta. Antennae reaching eyes with segment 3 in both sexes. Prothorax as long as wide in male, slightly wider than long in female, strongly rounded on sides in both sexes, finely and densely punctate. Elytral interstriae at basal third or half lacking row of coarse puncta.

Male. Parameres (Fig. 36) with long and slender tips. Aedeagus (Fig. 31, 32) with broadly emarginate-truncate

apex; internal sac lacking a pair of sclerites.

Length 1.50–2.15 mm.

Types. Holotype ♂, 1.6 x 0.7 mm, Chateau, on *Halocarpus bidwillii*, NZAC. 108 paratypes AMNZ, BMNH, LUNZ, MONZ, NZAC.

Material examined. North Island. CL. Mt Hobson, Great Barrier I. **TO.** Chateau, Tongariro National Park; Ohakune. **South Island.** NN. Kaituna River, Collingwood Valley; Mt Hope. **OL.** Mt Greenland. 112 specimens — see Appendix 2 for details of specimens examined.

Distribution. CL, TO / NN, OL.

Host plants. *Halocarpus bidwillii*, *Phyllocladus alpinus*.

Remarks. Both host plants are common in a swamp just below the Chateau Hotel in the Tongariro National Park. *R. halocarp* was considerably more abundant on *Halocarpus bidwillii* than on *Phyllocladus alpinus*. None were obtained from *Podocarpus hallii* or *Manoao colensoi* occurring on the same site.

***Rhinorhynchus phyllocladi* spec. nov.**

Fig. 23, 24, 37–39, 44, 173; Map 3

Reddish brown or dark brown; antennae, at least terminal segments, darker than rostrum; abdomen usually reddish brown or dark brown; tarsi same as tibiae or a shade darker. Pubescence fine, short, sparse.

Head as in Fig. 23, 24, weakly constricted at temples; rostrum at base more gradually tapering apicad than *R. halocarp*; frons finely and sparsely punctate, especially in female. Rostrum in male distinctly shorter than prothorax, strongly tapering towards antennal insertions on basal part, densely, finely punctate, with a fine, sharp median carina, and with pubescence directed obliquely inwards; rostrum in female distinctly longer than prothorax, moderately curved, moderately tapering towards antennal insertions, finely and densely punctate, rather dull, subalutaceous on sides. Mandibles nearly evenly curved on outer margin. Antennae reaching eyes with segment 4 in male, with segment 4 or 5 in female. Prothorax distinctly longer than wide in male, as long as wide in female, finely and densely punctate. Elytral interstriae lacking row of coarse punctation on basal area.

Male. Parameres as in Fig. 39. Aedeagus (Fig. 37, 38) slender, 0.09 mm wide, with main body 5x longer than

wide; apex curved downwards, with rather prominent, subdentiform knob laterad of weak emargination; apodemes short, about half length of aedeagal body; internal sac with a pair of very small sclerites.

Length 1.60–2.35 mm.

Types. Holotype ♂, 1.80 x 0.75 mm, Chateau, Tongariro NP, 6 Dec 1978, on *Ph. alpinus*, NZAC. 189 paratypes AMNZ, CMNZ, FRNZ, LUNZ, MONZ, NZAC.

Material examined. North Island. ND. Waitangi State Forest. **AK.** Huia. **TO.** Mahuia Camp, Tongariro NP; Chateau, Tongariro NP; Taurewa. **HB** Puketitiri. **BR.** Mt Tuhua, Paparoa Ra. 190 specimens — see Appendix 2 for details of specimens examined.

Distribution. ND, AK, TO, HB / BR.

Host plants. *Phyllocladus alpinus*, *Ph. trichomanoides*, *Manoao colensoi*, *Halocarpus bidwillii*, and *Podocarpus totara*.

Remarks. *R. phyllocladi* was the more common species in the Tongariro National Park where all four species were collected concurrently.

Rhinorhynchus halli spec. nov.

Fig. 2, 25, 26, 40, 41; Map 4

Reddish brown or dark brown, suture and lateral margins of elytra and ventral surface frequently dark brown; antennae as rostrum but terminal segment usually darker; tarsi as tibiae or slightly darker. Pubescence fine, longer, and denser than in *R. halocarpus* and *R. phyllocladi*, especially on head and pronotum of male (Fig. 2).

Head as in Fig. 25, 26, rather strongly constricted at temples; frons more densely and coarsely punctate in male. Rostrum in male strongly converging towards antennal insertions, densely, finely punctate, with a sharp median carina, and with pubescence directed obliquely inwards; rostrum in female weakly curved, weakly converging apicad at basal part, finely, sparsely punctate, shiny also on sides. Mandibles evenly curved on outer margin, slightly less curved than in other species. Antennae reaching eyes with segment 4 in male, with segment 5 in female. Prothorax slightly longer than wide in male, slightly wider than long in female, finely, densely punctate. Elytral interstriae without row of coarse puncta in basal area.

Male. Parameres not as deeply notched as in *R.*

halocarpus (Fig. 36) and *R. phyllocladi*. Aedeagus (Fig. 40, 41) 0.12–0.13 mm wide, relatively robust, with main body about 4x longer than wide; apodemes three-quarters length of aedeagal body; internal sac with a pair of larger sclerites.

Length 2.3–2.7 mm.

Types. Holotype ♂, 2.60 x 0.95 mm, Mahuia Camp, NZAC. 26 paratypes AMNZ, LUNZ, MONZ, NZAC.

Material examined. North Island. TO. Mahuia Camp, Tongariro NP; Chateau, Tongariro NP; Whakapapa, Tongariro NP; Raurimu. **South Island. NN.** Mt Hope. **MC.** Mistake Basin; Zed Ck Saddle, Mt Hutt. 27 specimens — see Appendix 2 for details of specimens examined.

Distribution. TO / NN, MC.

Host plants. *Phyllocladus alpinus*.

Remarks. Usually darker and distinctly larger than the two preceding species. Named after Thomas Hall, who discovered the first specimen. Broun had Hall's specimens identified as *R. rufulus* also.

Family BELIDAE

Belidae are represented by two highly distinctive subfamilies: Belinae with three genera in five species, and Aglycyderinae with one genus and one species. Adult Belinae are associated with Podocarpaceae and Phyllocladaceae, but the larvae of at least some species are not host-bound by being able to develop on advanced decayed wood of conifers and dicotyledons. The aglycyderine species lives subcortically on Araliaceae. The Belinae are related to the Australian fauna, and the Aglycyderinae species to New Caledonia.

Key to genera of Belidae

- 1 Antennal club distinct, 2-segmented (Fig. 7). Mandibles plurisetose (Fig. 178). Tarsi pseudotrimerous, with 3 normal segments and a cryptotarsite. Prementum large, concealing maxillae and palps (Fig. 178)
..... (p. 28) ... Aglycyderinae ... *Aralius*
- Antennal club rather indistinct, 4- or 5-segmented (Fig. 3). Mandibles paucisetose (Fig. 175). Tarsi pseudotetramerous, with 4 normal segments and a cryptotarsite. Prementum small, not concealing maxillae and palps. Belinae ... 2

- 2(1) Rostral apex weakly bilobed, not bidentate. Pronotum somewhat raised on either side of midline, weakly sinuous at base. Elytra with tubercles on dorsum and sharp spines at apex. Femora armed with teeth on underside (p. 27) ... *Agathinus*
- Rostral apex bidentate, not bilobed. Pronotum not raised either side of midline, strongly sinuous at base. Elytra lacking tubercles and not ending in spines. Femora lacking teeth on underside 3
- 3(2) Pronotum widest about middle, strongly constricted to a collar at apex, with distinct lateral impressions. Elytra dull, non-metallic, lacking transverse rugae, somewhat uneven with shallow depressions (p. 22) ... *Pachyurinus*
- Pronotum widest at or near base, not or hardly constricted at apex, lacking lateral impressions. Elytra shiny, metallic, transversely rugose at least near suture, lacking depressions (p. 24) ... *Rhcnobelus*

Pachyurinus Kuschel

Fig. 3, 49, 58–69

Kuschel, 1959: 253 (in key; type-species *Pachyura stictica* Broun). —May, 1993: 16, 39 (larva). —Zherikhin & Gratshev, 1995: 651 (wing venation).

Moderately elongate body, dull, lacking metallic sheen.

Head elongate; temples longer than a diameter of an eye, distinctly converging basad, somewhat constricted, not forming distinct neck. Frons about twice as wide as rostrum at apex, flat or impressed, with small fovea, lacking grooves. Eyes round, convex, not quite hemispherical, finely faceted. Rostrum slender, three or more times longer than wide at apex, in lateral view thicker or thinner than diameter of eyes; expansion above antennal insertions pronounced; postrostrum rapidly converging towards antennal insertions, lacking median carina; prorostrum considerably longer than postrostrum, diverging apicad, with small tooth on either side of median emargination. Antennae long, extending to beyond humeral callus, reaching eyes with segment 1 or 2, segment 1 much longer than 2, segments 1 and 2 combined longer than 3, segment 7 in width and vestiture halfway between 6 and 8; club 5-segmented but first segment narrower than following segments (Fig. 3).

Prothorax moderately to strongly transverse, strongly bisinuuous at base; basal rim in front of scutellum distinct, narrow, level with or lower than pronotal disc; apical constriction in dorsal view distinct; disc with depressions. Scutellum vertical at base, high, convex.

Elytra parallel-sided or wider behind middle, strongly bisinuuous at base, each elytron with broad lobe advancing on to pronotum, with low subbasal swelling, with or

without depressions; epipleural margin indistinctly raised on basal half, only slightly raised at apical half; surface densely punctate; inferolateral flange present. Hind wing (Fig. 49) with a relatively small apical field, not more than one-third total length; A_1 incomplete, interrupted; crossvein between A_2 and A_3 absent; common vein to A_1 and A_2 long.

Fore- and mid-coxal cavities open laterally; femora unarmed, lacking a row of denticles or coarse granules on dorsal surface, hind ones extending nearly to or passing ventrite 2. Tibiae without a carina on dorsal surface and without a mucro; spur formula 2-2-2; first segment of middle and hind tarsi elongate, parallel-sided or nearly so, twice as long as wide or longer; claw segment passing tarsite 3 by a length of latter.

Male. Tergite 8 (Fig. 58) concealed under 7, divided by membranous strip on midline into two halves, glabrous except for few setae at apex. Sternite 8 (Fig. 59) with large, completely or partially pigmented blade, with apodeme fused. Sternite 9 (Fig. 60) long, with long, slender arms. Tegmen (Fig. 61, 63) with stretched out, nearly horizontal ring; parameral sector relatively short in relation to remainder of tegmen, thickened at apex. Aedeagus (Fig. 62, 63) contained in abdominal cavity, not extending into metathoracic lumen, as long as last four ventrites combined or slightly longer; pedon partly membranous, tapering apicad, simple, with base in lateral view not reinforced with tooth or ridge, with sides moderately rolled up; tectum pigmented throughout, not quite reaching apex of pedon; apodemes considerably shorter than aedeagal body; internal sac with long, largely free flagellum; flagellum entering sac ventromedially at base; sclerites absent, with wall lining of fine vestiture and spinules.

Female. Hemisternites largely membranous, pigmented parts more or less reduced to fine struts; styli well developed; vagina and bursa elongate; spermatheca not falciform, shaped more like a pistol (Fig. 67), with a large common atrium for duct and gland, the duct thick, short, inserted on dorsal surface of bursa a little distance from oviduct; gland large, long, several times longer than spermathecal body.

Distribution. Endemic to New Zealand: North Island and South Island.

Host association. Adults on Podocarpaceae and Phyllocladaceae, larvae subcortical on dead branches of conifers and on a variety of angiosperms.

Remarks. *Pachyurinus* is a monotypic, New Zealand endemic. It is adelphic with *Rhcnobelus* n. gen., also of New

Zealand, and the two genera together being adelphic with the Australian *Sphinctobelus* Zimmerman (see analysis in Appendix 1). Apart from the characters pointed out in the key to genera, it differs from *Rhynchobelus* in having a scutellum that falls vertically onto the mesonotum, and its males lacking a mucro to the tibiae.

Etymology. *Pachyúrinus* from addition of the suffix *-inus* to the belid genus *Pachyura* ('thick tail') of Australia; gender masculine.

***Pachyurinus sticticus* (Broun)**

Fig. 3, 49, 58–64, 176, 183; Map 5

Broun, 1893: 1379 (*Pachyura*). —Hudson, 1934: 146 (*Pachyura*). —Kuschel, 1959: 249, fig. 51 (wing). —May, 1993: 39, fig. 219 (larval gastric caeca).

Reddish brown; frons, dorsal part of head, often also rostrum darker. Vestiture pale on underside, head, pronotum and depressed areas of elytra, dark and inconspicuous on areas of elytra not depressed (Fig. 3).

Head at least dorsally somewhat constricted, in lateral view rather strongly convex between subbasal constriction and frons, densely, coarsely punctate. Frons anteriorly foveate. Antennite 7 usually wider than 6, intermediate in shape and vestiture between 6 and 8.

Prothorax 1.38–1.47x wider than long, subparallel to apical quarter, rapidly constricted to a well marked collar at apex, less densely punctate than head on darkish middle area, with shallow, usually partly smooth depression on either side of disc. Scutellum in lateral view conspicuously prominent above level of prothorax, convex, with dark hairs.

Elytra in lateral view distinctly higher than pronotum, smooth and more or less foveate on either side of scutellum, usually with a broad depression along suture from middle to top of declivity, another elongate depression on sides of dorsum inducing a blunt fold on posterior half, rather flat across dorsum; each elytron converging in straight or slightly convex line to a blunt sutural point; margins at apex not asperate. Wing venation as in Fig. 49, A₁ interrupted.

Femora weakly thickened, hind ones nearly lineal. Tibiae in both sexes not asperate on lower edge, lacking mucro. First tarsal segment long, narrow except on fore leg of male where as broad as segment 3, fringed with long hairs, shiny on most of undersurface. Ventrites 1–4 with a lateral darker, smooth, usually glabrous depression. Tergites pale, weakly pigmented.

Male: Tergite 8 as in Fig. 58; sternite 8 as in Fig. 59; sternite 9 as in Fig. 60. Tegmen as in Fig. 61, 63, with a

subapical dorsal swelling and short setae. Aedeagus as in Fig. 62, 63, as long as ventrites 1–4 combined, over 7x longer than wide; pedon weakly pigmented, membranous along midline; membranous area tapering apicad, abbreviated near pedal apex; tectum not quite reaching apex of pedon, as broad as pedon for most part, weakly pigmented throughout; internal sac not extending to end of apodemes, with an elongated pear-shaped, at base broadly emarginate bag; walls of bag darkened with dense fine vestiture; flagellum long, tape-like, more than half its length free, extending to posterior end of basal bag, entering bag at middle of basal emargination.

Female: Largely agreeing with Fig. 66 of *R. rubicundus* but spermathecal gland as in Fig. 64, sinuously tapering apicad.

Length: 5.5–8.2 mm.

Types. Two syntypes present, collected by A. T. Calvell. Lectotype ♀ (here designated, so as to assure correct and consistent application of the name in the future), 7.4 x 2.2 mm, Boatman's, Reefton, 2408, BMNH. Paralectotype ♀, same data, BMNH.

Material examined. Lectotype, paralectotype, and 159 non-type specimens. **North Island. TO.** Chateau, Ruapehu; Waipakihi R., Kaimanawas; Ohakune Rd. **South Island. NN.** Upper Maitai; Maitai Valley; Saddle Hill; Dun Mtn; Third House; Roding Valley, 2nd Ford; Gordon's Pyramid; Belgrove; Takaka Hill; Canaan; Mt Arthur; Kaituna, Collingwood; Heaphy Track, Aorere Valley; Saxon Hut Heaphy Track; Mt Misery; Mt Hope. **SD.** Picton. **MB.** Pelorus Bridge; St Rowans Well, Upper Wairau Valley; Lake Tennyson. **BR.** Lake Rotoiti; Mt Robert; Boatman's; Punakaiki Scenic Reserve. **WD.** Otira; Barrack Ck; Mahinapua; Goldsborough. **NC.** Arthur's Pass. **MC.** Cass; Moa Hut. 161 specimens — see Appendix 2 for details of specimens examined.

Distribution. TO / SD, NN, MB, BR, WD, NC, MC.

Host plant. Adults in numbers on *Phyllocladus trichomanoides* (Phyllocladaceae) and *Podocarpus totara* (Podocarpaceae), and larvae reared ex dead branches of *N. cliffortioides*, *N. solandri* (Fagaceae), and *Aristotelia ser-rata* (Elaeocarpaceae).

***Rhiconobelus* gen. nov.**

Fig. 4, 5, 70–83

Type-species: *Pachyura metallica* Pascoe

Because of the close relationship with *Pachyurinus*, only the main distinguishing characters of *Rhiconobelus* are here given. Prothorax converging in gentle arc to an indistinct apical constriction, with a fine groove on midline, lacking impressions. Scutellum proclinate. Elytra with metallic sheen, with transverse rugae at least near suture and no depressions. Male tibiae mucronate. The vein A_1 is complete in *R. aenescens*, interrupted in *R. rubicundus*, and absent in *R. metallicus*. The inferolateral flange of elytra is present in *R. aenescens* and *R. rubicundus*, absent in *R. metallicus*.

Distribution. Endemic: North Island, South Island.

Host plant. Adults and larvae found so far associated only with genera of Podocarpaceae and Phyllocladaceae.

Etymology. *Rhiconobelus* ('wrinkled dart') from the Greek *rhiknós* meaning wrinkled, and the weevil genus *Belus* (meaning bullet or dart); gender masculine.

Key to species of *Rhiconobelus*

- 1 Club 5-segmented, by antennae having segment 7 distinctly wider than 6 and vestiture similar to that of segment 8. Elytral rugae weak, usually confined to near suture. Legs bright reddish brown contrastingly paler than body. Length 4.5–6.5 mm. Northland to Marlborough and Nelson (p. 24) ... ***rubicundus***
—Club 4-segmented, by antennae having segment 7 similar to 6 in width and vestiture. Elytral rugae conspicuous, extending to the sides. Legs as dark as remainder of body 2
- 2(1) Metasternal sides with large patch of dense, strikingly white vestiture. Designs on elytra, when present, directed obliquely forward from suture to sides, those on middle of dorsum a V-shaped band. Length 4.5–7.5 mm. From Northland to Southland
..... (p. 25) ... ***metallicus***
—Metasternal sides lacking patch of dense white vestiture. Designs on elytra, when present, directed obliquely backward from suture to sides, those on middle of dorsum jointly an inverted V-shaped band. Length 6.5–8.9 mm. From Gisborne and Wanganui to Central Otago and Dunedin (p. 26) ... ***aenescens***

***Rhiconobelus rubicundus* (Broun) comb. nov.**

Fig. 65–69; Map 6

Broun, 1880: 469 (*Pachyura*). —Waterhouse, 1883: 2, pl. 138, fig. 2 (*Pachyura*). —May, 1987: 45 (host plant); 1993: 39, fig. 208–218 (larva).

pilosus Broun, 1909: 137 (as var. of *Pachyura rubicunda*)

syn. nov

violaceus Broun, 1909: 137 (*Pachyura*). —Hudson, 1934: 147 (*Pachyura*) **syn. nov.**

Black or nearly so, with coppery, brassy or bluish, sometimes iridescent sheen; antennae, legs and often tip of rostrum bright reddish brown; apex of antennal segments and last two tarsal segments usually darkened. Vestiture recumbent, white throughout or in part, rather long, mostly piliform, thicker, subsquamiform when condensed to dots or oblique lines on dorsum, directed straight backwards.

Head conspicuously converging towards constriction, densely punctate. Frons flat, lacking fovea. Prorostrium less than twice as long as wide.

Prothorax 1.22–1.32x wider than long, converging in gentle curve to indistinct collar, with an impression at base followed by a fine sulcus; punctation dense, coarse, similar to that of head, more or less aligned into transverse rows. Scutellum in lateral view not or hardly higher than pronotum, flat, transverse.

Elytra in lateral view slightly ascending for a short distance behind base, parallel or slightly wider postmedially, lacking depressions, evenly convex transversely on dorsum, broadly rounded at apex; margin at apex distinctly asperate; punctation dense, coarse, somewhat aligned transversely. Wing venation as for *P. sticticus* (Fig. 49), A_1 interrupted.

Femora very slender, showing hardly any swelling; middle tibiae in male mucronate, finely denticulate near mucro, slightly incurved; tarsi not obviously different in the sexes. Ventrites 1–4 with bare patch on either side. Tergites heavily pigmented, usually metallic blue.

Male: Tergite 8 as in Fig. 68, heavily pigmented, separated by narrow membrane; sternite 8 as in Fig. 69, shallowly emarginate. Tegmen and aedeagus largely in agreement with *P. sticticus* (Fig. 61–63).

Female: Sternite 8 as in Fig. 65. Genitalia as in Fig. 66; spermatheca as in Fig. 67.

Length: 4.5–6.7 mm.

Types. *Pachyura rubicunda*: described from 5 specimens from Whangarei Heads. Lectotype ♂ (here designated, so as to assure correct and consistent application of the name in the future), 6.1 x 2.0 mm, Manaia, Whangarei Heads, 831, NZAC. Paralectotypes BMNH, NZAC.

Pachyura pilosa: described from one specimen. Holotype ♀, 6.7 x 2.4 mm, Helensville, var. 831 [=rubicunda], *P. villosa* [sic], T Broun, NZAC.

Pachyura violacea: based on one specimen from Karori.
Holotype ♂, 4.6 x 1.5 mm, 2930, BMNH.

Material examined. 7 type specimens and 62 non-type specimens. **North Island.** ND. Waipoua SF; Trounson Kauri Park; Whangarei Heads. AK. Helensville; Kakamatua Ridge, Huia; Destruction Gully, Huia. CL. Tairua. BP. Tarukenga, Rotorua; Maraenui; Motu River Bridge; Motu River; Waiaroho. WN. Johnston's Hill, Karori; Wellington. **South Island.** NN. Belgrove. MB. Jack's Pass, Hanmer. 69 specimens — see Appendix 2 for details of specimens examined.

Distribution. ND, AK, CL, BP, WN / NN, MB.

Host plant. Adults found on *Podocarpus totara* (Podocarpaceae), larvae subcortically in dead branches of *Toronia toru* (Proteaceae).

Remarks. Recognisable at once by vividly pale legs in sharp contrast with the dark, metallic colour of the body. The epithet 'rubicundus' aptly refers to the colour of the extremities and 'violaceus' to that of the body.

Rhincobelus metallicus (Pascoe) comb. nov.

Fig. 4, 5, 70–75; Map 7

Pascoe, 1877: 469 (*Pachyura*). —Broun, 1880: 469 (*Pachyura*). —Hudson, 1934: 146 (*Pachyura*).

albocoma Broun, 1893: 1233 (*Pachyura*) **syn. nov.**

brookesi Broun, 1921: 567 (*Pachyura*) **syn. nov.**

sumptuosus Broun, 1880: 470 (*Pachyura*). —Hudson, 1934: 146 (*Pachyura*). —Styles, 1973: 352 (*Pachyurinus*, host plant, larva) **syn. nov.**

venustus Broun, 1909: 136 (*Pachyura*) **syn. nov.**

Black with steel-blue, coppery, or brassy sheen; antennae, legs and rostral apex reddish brown or dark brown. Vestiture for most part inconspicuous, dark, very short, with long, white pubescence around eyes, on sides of prothorax and underside, condensing considerably on mesepimeron and anterior part of metepisternum, and with a large white patch of very dense pubescence on sides of metasternum; white vestiture often also on midline of pronotum, in humeral depression, on suture at anterior quarter, a V-shaped band on middle of dorsum pointing towards the metasternal patches, a band across end of elytral dorsum, and a band on declivity (Fig. 4, 5).

Head converging towards a weak constriction, coarsely, unevenly punctate, or rather granulate; frons flat, sculptured as on head capsule, with or without sharp fine carina anteriorly on midline. Anterostrium variable in length, twice

or thrice as long as wide at apex. Antennal segment 3 as long as or longer than scape, segment 7 much as 6, segment 8 as wide as and longer than 9.

Prothorax 1.20–1.27x wider than long, converging in gentle curve to an indistinct apical constriction; basal rim on sides nearly level with disc, well below disc in front of scutellum; punctation on disc transversely aligned into grooves. Scutellum level with elytra, variable in shape, flat, rather finely, densely punctate, pubescent.

Elytra parallel or slightly wider beyond middle, lacking impression against sides of scutellum, broadly rounded at apex in both sexes; margin at apex not asperate; dorsal surface slightly impressed at shoulders, obliquely impressed across middle and at end; punctation coarse, aligned in the bottom of deep transverse grooves separated by smooth ridges or rugae. Hind wings with four anal veins only, A_1 missing.

Femora weakly swollen; tibiae straight or incurved, all with small mucro in male; tarsi similar in both sexes. Ventrites on sides with smooth, nearly glabrous impressions.

Male: Tergites intense metallic blue. Sternite 8 as in Fig. 70. Tegmen (Fig. 71, 73) with long apodeme and a slightly thickened parameral apex. Aedeagus (Fig. 72, 73) with pedon tapering to a blunt point; flagellum heavily pigmented, cylindrical, the wall of basal extension with elongate, coarse spinules.

Female. Genitalia as in Fig. 74; hemisternites rather long; styli robust, relatively short; bursa long, narrow; spermatheca (Fig. 75) slender in lateral view.

Length: 4.5–7.5 mm.

Types. 1) *Pachyura metallica*: described from two specimens. Lectotype ♂ (here designated, so as to assure correct and consistent application of the name in the future), 4.8 x 1.3 mm, 830, Christchurch, BMNH; it undoubtedly came from a series collected by Wakefield at Riccarton on 25 Oct 1873.

2) *Pachyura albocoma*: described from one specimen. Holotype ♂, 5.9 x 1.8 mm, 2172, Mt Cook Hermitage, 2600', H Suter, BMNH.

3) *Pachyura brookesi*: described from one specimen. Holotype ♂, 7.5 x 2.3 mm, 4113, Titirangi, 18 Sep 1915, A E Brookes, BMNH.

4) *Pachyura sumptuosa*: described from one specimen. Holotype ♂, 7.0 x 1.9 mm, Parua, BMNH.

5) *Pachyura venusta*: described from one specimen. Holotype ♂, 5.1 x 1.5 mm, 2929, Howick, BMNH.

Material examined. 5 type specimens, and 223 non-type specimens. **North Island.** ND. Mangonui,

Kaiangaroa; Glenbervie; West Okahu Block, Whirinaki Forest; Taupo Bay; Mangakahia; Toatoa Track, Waipoua Forest; Waipoua SF; Te Matua Ngahere, Waipoua; Trounson Kauri Park; Parua; Western Hills, Whangarei; Waimatenui; Waipu; Maunganui Bluff. **AK.** Titirangi; Waitakere Range; Laingholm; Huia; Manukau; Orongo; Howick; Manukau Heads, Kemp Road; Clevedon, Hunua. **CL.** Kaiarara Valley. **WO.** Waitemata, Kaimai Ra; Okauia. **BP.** Waienga Bush; Lottin Pt Road, Waenga. **TO.** Mahuia Res., Mt Ruapehu; Chateau, Tongariro; Taurewa; Tokaanu; Erua; Ohakune; Mangawhero Falls, Ohakune Mtn Rd. **RI.** Hautapu Gorge, Taihape. **WI.** Palmerston North; Marima Domain. **WA.** Mangatiti. **WN.** Wallaceville; Wadestown; Akatarawa; Korokoro; Wellington, Botanical Gardens; Whakariki R, Wainu Forest; Silverstream; Makara Bush; Wilton's Bush. **South Island.** **NN.** Maitai Valley; Dun Mtn; Aniseed Valley; Baigent Park, Wakefield; Wakefield; Motupiko; Takaka Hill; Canaan; Kaituna, Collingwood; Aorere Valley; Hacket Track. **SD.** Picton. **MB.** Red Hills, Wairau Valley. **KA.** Rakautara. **WD.** Otira River; Otira; Mahinapua SF. **NC.** Arthur's Pass. **MC.** Riccarton Bush, Christchurch; Christchurch; Prices Valley, Banks Peninsula; Peel Forest; Cooper's Knob; Moa Basin. **OL.** McKerrow Ra., Makarora; Bold Peak, L. Wakatipu; Mt Earnslaw; Paradise. **SL.** West Plains; Riverton; Haldane. 228 specimens — see Appendix 2 for details of specimens examined.

Distribution. ND, AK, CL, WO, BP, TO, WI, RI, WA, WN / SD, NN, MB, KA, WD, NC, MC, OL, SL.

Host plant. Adults and larvae on *Dacrydium cupressinum*, *Phyllocladus alpinus*, *Ph. trichomanoides*, and *Podocarpus totara*.

Remarks. *R. metallicus* is locally variable in regard to length of rostrum and vestiture design. A large white patch of dense vestiture on either side of the metasternum sets this species apart from the other native belids.

***Rhcnobelus aenescens* (Broun) comb. nov.**

Fig. 76–83; Map 8
Broun, 1915: 338 (*Pachyura*).

Black or nearly so, with steel-blue, coppery, or brassy sheen; antennae, legs, and tip of rostrum reddish brown, antennal club and last tarsal segments darker. Vestiture for most part inconspicuous, dark, short; long and pale on underside, around eyes, sides of prothorax, and elytral declivity, and spots and/or an inverted V-shaped band across middle of dorsum.

Head constricted some distance behind eyes, somewhat asperate, with short transverse rugae; frons more or less flat, densely punctate, sometimes with sharp median carina anteriorly; anterostrum more than twice as long as wide at apex; antennal segment 3 longer than scape; club distinctly 4-segmented.

Prothorax 1.2–1.3x wider than long, converging in gentle arc to an indistinct apical collar, densely punctate, somewhat transversely rugose, with fine shallow groove on midline; basal margin rimmed, well below level of disc. Scutellum not higher than pronotal disc, transverse or as long as wide, subpentagonal, flat, densely punctate.

Elytra subparallel in male, converging apically in straight or convex line, widest behind middle in female, converging in concave line, distinctly impressed on either side of scutellum and inwards of shoulders, usually with an inverted V-shaped impression across middle usually clothed with white pubescence, occasionally with other transverse or longitudinal impressions on posterior half of dorsal surface; punctation transversely aligned into irregular grooves. Wings with all five anal veins complete.

Femora weakly incrassate, a little more swollen than in *R. metallicus*; tibiae in male straight or incurved, all mucronate and asperate on lower edge; fore and middle tibiae in female with inconspicuous mucro, not asperate on lower edge; tarsi apparently similar in both sexes. Ventrites with lateral impressions.

Male: Tergite and sternite 8 as in Fig. 80. Tegmen (Fig. 77, 78) with few long apical setae. Aedeagus as in Fig. 76, 79, a little shorter than combined length of ventrites 2–5; pedon weakly thickened to a small knob at apex; internal sac extending beyond apodemes, constricted at emergence of flagellum, with spherical expansion at aedeagal body base, with long extension over free part of flagellum; basal extension with two zones of fine wall vestiture.

Female: Sternite 8 as in Fig. 81. Genitalia as in Fig. 82; hemisternites relatively short, more extensively pigmented than in the preceding species, with long setae at apex; stylus unusually long, slender. Bursa long, narrow; spermathecal body, duct, and glands as in Fig. 82, 83.

Length: 6.5–8.5 mm.

Type. *Pachyura aenescens*: described from a single specimen. Holotype ♂, 8.9 x 2.8 mm, Ben Lomond, 7 Dec 1912, M. O. Pasco, BMNH.

Material examined. Holotype and 14 non-type specimens. **North Island.** **HB.** Makahu Spur, Kaweka Ra. **WI.** Waitahinga, Wanganui. **WN.** Korokoro. **South Island.** **MB.** Molesworth, Awatere R. **BR.** Buller. **MC.** Urquharts Clearing, Craigieburn. **MK.** Mt Cook; Governor's Bush, Mt Cook. **OL.** Mt Aurum. **CO.** Ben Lomond. **DN.** Cape

Saunders; Dunedin. 15 specimens — see Appendix 2 for details of specimens examined.

Distribution. HB, WI, WN / MB, BR, MC, MK, OL, CO, DN.

Host plant. G. V. Hudson stated in his unpublished register that the species was common on *Phyllocladus alpinus* (Phyllocladaceae) on Mt Aurum.

Remarks. The differences of *R. aenescens* from *R. metallicus* are contained in the key to species. Although widely distributed, few specimens are in collections.

Agathinus Broun, re-instated (from *Cyrotypus*)

Fig. 6, 52, 84–91

Broun, 1880: 470 (type-species *Rhinaria sextuberculata* White [= *Curculio tridens* Fabricius]). —Lea, 1909: 8. —Faust, 1892: 181 (syn. with *Agnesiotis* Pascoe). —Kuschel, 1959: 234 (in key to genera). —May, 1993: 16, 38 (larva). —Zimmerman, 1994: 277 (syn. with *Cyrotypus* Pascoe). —Zherikhin & Gratshev, 1995: 651 (wing venation).

Head elongate, with temples twice as long as eye diameter, diverging basad, not constricted. Frons about as wide as apical width of rostrum, somewhat uneven with shallow lateral grooves and raised median area towards vertex, depressed towards base of rostrum. Eyes circular, strongly protruding, hemispherical, coarsely faceted. Rostrum robust, in lateral view nearly as thick as head deep, about twice as long as wide at apex; postrostrum weakly widening towards eyes; prorostrum as long as postrostrum, strongly widening apicad, bilobed at apex. Antennae long, slender, slightly passing base of elytra (female), or extending to behind subbasal tubercle (male), reaching eyes with segment 3; segment 1 much longer than 2, segments 1 and 2 combined as long as 3, segment 7 slightly wider and more densely pubescent at apex than 6, last four segments loosely articulated, longer than wide, densely pubescent, only slightly wider than 7, hardly forming a club.

Prothorax appearing elongate, about as long as wide, truncate or weakly sinuous at base, converging in straight or gentle curve towards broad, laterally and dorsally well defined collar; basal rim in front of scutellum distinct or not; disc uneven, flattish or weakly depressed on midline, with two low tubercles or swellings on middle and a slight apical swelling on either side of median depression. Scutellum leaning slightly backward at base, raised above level of elytra.

Elytra much wider at apical quarter than at shoulders, with more or less straight sides up to widest part, each elytron ending in a sharp tooth about thickness of a hind femur from suture; surface coarsely, rather sparsely

punctate but largely concealed under dense vestiture; inferolateral flange present. Hind wing (Fig. 52) with relatively large apical field, the field 0.4 or more of wing length, all five anal veins present, A_1 cut off from A_2 , also other veins usually somewhat interrupted.

Fore and middle coxae completely closed laterally; femora armed with one or more teeth underneath, middle and hind femora with row of granules or denticles on dorsal surface; middle and hind tibiae with finely crenulated sharp carina on dorsal edge, all tibiae in both sexes lacking mucro; spur formula 2-2-2, inner spur of fore tibia smaller, often considerably reduced and inconspicuous; first segment of middle and hind tarsi large, as wide as 3, less than 1.5x longer than wide.

Male. Tergite 8 (Fig. 84) a little exposed beyond and below tergite 7, transverse, heavily sclerotised around margins, with relatively large mediobasal membranous area, exposed part abundantly pilose. Sternite 8 (Fig. 84) consisting of a heavily sclerotised rim around a large membranous area, with apodeme articulating, not fused. Sternite 9 (Fig. 84) with long arms. Tegmen (Fig. 87, 88) with rapidly rising ring; parameral sector long in relation to remainder, not pale on midline, not thickened at apex. Aedeagus (Fig. 85, 86) contained in abdominal cavity; pedon completely sclerotised, simple at apex, with rolled-up high sides; tectum reduced to an elongate sclerite over ostial area; apodemes very broad, considerably shorter than aedeagal body; internal sac with long, partly free flagellum, this entering sac ventrally a little off base; sclerites absent, wall lining with fine vestiture.

Female. Tergite and sternite 8 as in Fig. 90, 91. Genitalia (Fig. 89) with hemisternites long, largely membranous, with sclerotised parts reduced to fine struts; bursa with large spherical sac beyond narrow section, with long cylindrical outgrowth dorsally above narrow section somewhat pigmented on either side of insertion point of spermathecal duct; spermatheca extremely reduced, unpigmented except at one end, common atrium taking up more than half spermathecal body; spermathecal gland cylindrical, longer than hemisternites or sternite 8.

Distribution. Endemic: North Island, South Island.

Host plants. Adults on the coniferous families Podocarpaceae and Phyllocladaceae, and larvae in dead wood of various phanerogams.

Biology. Adults are often in numbers in the early evenings on the end of branches, in particular on the swamp pine *Halocarpus bidwillii*. Although essentially a crepuscular species, it may occasionally be seen resting on plants or

flying at other times of the day. Larvae live in dead twigs and branches.

Remarks. *Agathinus* is closely related to the Australian *Cyrotypus* Pascoe from which it differs in having shallow, not engraved frontal grooves, hemispherical eyes, stretched head with temples twice the length of an eye diameter, elytra that broaden considerably through to the apical quarter, and tibiae that lack mucro in both sexes. It comprises a single species.

Etymology. ‘Agáthinus’: from the Greek adjective ágathos meaning excellent, refined, aristocratic, and the suffix -inus; gender masculine.

Agathinus tridens (Fabricius)

Fig. 6, 52, 84–91, 175, 185–187; Map 9

Fabricius, 1787: 122 (*Curculio*); 1792: 483 (*Curculio*); 1801: 537 (*Curculio*). —Gmelin, 1790: 1774 (*Curculio*). —Olivier, 1790: 555 (*Curculio*); 1807: 403, pl. 13, fig. 154 (*Curculio*). —Herbst, 1795: 520, pl. 85, fig. 5 (*Curculio*). —Latreille, 1797: pl. 233, fig. 5 (*Curculio*). —Boisduval, 1835: 458 (*Curculio*). —Broun, 1880: 471. —Sharp, 1884: 298 (syn. *sextuberculatus*). —Lea, 1909: 8, fig. 11. —Hudson, 1934: 146, pl. 13, fig. 4. —Kuschel, 1970: 196. —Styles, 1973: 352 (host plants of larva). —May, 1993: 38, fig. 196–207 (larva).
sextuberculatus White, 1846: 13, pl. 3, fig. 8 (*Rhinaria*). —Broun, 1880: 471.

Reddish brown to black. Vestiture dense, concealing almost completely integument, consisting mostly of lineal or lanceolate scales, greyish white or yellowish grey, brown in part on tubercles or forming variegated dots or spots (Fig. 6). Other features as in the generic description.

Length: 7.5–14.5 (–15.7) mm.

Types. 1) *Curculio tridens*: Holotype ♀, 15.7 x 6.5 mm, no locality, in Banks Coll., BMNH; an unusually large specimen almost certainly collected at Ship Cove, Queen Charlotte Sound in Cook Strait, South Island.

2) *Rhinaria sextuberculata*: Holotype ♂, 11.7 x 4.8 mm, Wellington, Mr Earl, BMNH.

Material examined. 2 Holotypes and 164 non-type specimens. **North Island.** **ND.** Kaitaia. **AK.** Waitakere Range. **CL.** Little Moehau Peak, Mt Moehau; Mt Moehau; Kennedy Bay Rd. **BP.** Mt Te Aroha. **TO.** Waituhi Saddle; Raurimu; Waimarino; Whakapapaiti Valley, Tongariro NP; Tongariro NP; Whakapapa, Ruapehu; Chateau, Ruapehu; Ohakune Mtn Rd; Blyth Track, Ohakune; Mangawhero, Ohakune Mtn Rd; Waikato Valley, Kaimanawas. **GB.** L. Waikaremoana; Makahu Spur, Kaweka Range. **TK.**

Ahukawakawa Track, Pouakai Range; Pouakai Range; Holly Hut, North Egmont; Mt Egmont. **WN.** Tokomaru Gorge; Otaki Gorge; Wharite, South Ruahine; Mt Hector; Mt Holdsworth, Tararua; Tararua; Dundas Hut Ridge, Tararua Range; Bainham; Kaitoke; Akatarawa; Korokoro; Silverstream; Wellington. **South Island.** **SD.** Croisilles. **NN:** Dun Mtn; Ruby Bay; Gordon’s Pyramid; Riwaka; Riwaka Valley; Takaka Hill; Top of Trig K, Canaan; Mt Arthur; Salisbury Opening, Mt Arthur; Balloon Hut, Mt Arthur; Goulund Downs; Cobb Valley; Mt Domett; Quartz Range, W Nelson; Brown Cow Ridge; Mt Stewart; Karamea. **BR.** L. Rotoiti; Travers Valley; Lewis Pass; Rahu Saddle; Mawhera SF; Sewell Pk, Paparoa Range; 1.6 km S of 4-Mile Ck, Charleston; Moana. **WD.** Mahinapua SF. 166 specimens — see Appendix 2 for details of specimens examined.

Distribution. ND, AK, CL, BP, TO, GB, TK, WN / SD, NN, BR, WD.

Host plant. Adults are associated with *Phyllocladus* (*Phyllocladaceae*), *Dacrydium*, *Halocarpus*, *Podocarpus*, and *Prumnopitys* species (*Podocarpaceae*), but larvae develop in dead, usually non-coniferous wood, such as *Cassinia* and *Olearia* (*Asteraceae*), *Coprosma* (*Rubiaceae*), *Corokia* (*Cornaceae*), *Cyathodes* (*Epacridaceae*), *Gaultheria* (*Ericaceae*), and *Hebe* (*Scrophulariaceae*).

Remarks. *A. tridens* is one of the most distinctive species of the New Zealand fauna amongst weevils with straight, non-geniculate antennae because of the presence of a large preapical callus produced over the elytral sides across the top of the declivity. Both specific names refer to three large raised structures present on each elytron of the species.

Aralius Kuschel

Fig. 7, 92–99, 177, 179, 184

Kuschel, 1990: 79 (replacement name for *Platycephala*; type-species *P. olivieri* Montrouzier).

Platycephala Montrouzier, 1861: 268 (not Fallén 1820). —Paulian, 1944: 117.

Head broad, across eyes broader than length from epistome to neck, strongly constricted behind eyes to a cylindrical neck. Frons nearly as wide as head, convex, lacking impression. Eyes strongly protruding, hemispherical or nearly so, coarsely faceted, with coarse interfacetal setae. Rostrum usually sexually conspicuously dimorphic, in male nearly twice as wide as long, with a transverse, medially

sinuous, laterally abbreviated sulcus ending in distinct pit halfway between eyes and epistome, in female about as long as wide, with shallow median depression instead of a transverse sulcus; apical margin rounded or slightly lobed on middle in male, truncate in female, in both sexes ciliate; underside with pit on postmentum bearing tight tuft of bristles; vestiture on dorsal surface directed basad behind transverse sulcus or median depression, apicad in front of sulcus or depression. Antennae short, extending to about middle of prothorax, reaching eyes with segment 2, with segments 1 and 2 similar in length and width to each other, segments 3–8 distinctly slenderer, segment 9 usually a little wider and larger than 8, segments 10–11 loosely articulated, forming a distinct 2-segmented club. Mandibles at distal half relatively slender, subparallel, with the outer edge slightly turned downwards, with three apical teeth; pharyngeal process absent; laterodorsal surface plurisetose. Maxillae with ill-defined galea, with 4-segmented palp. Prementum very large, concealing maxillae, plurisetose, labial palp 3-segmented, invisible, inserting about middle of dorsal surface.

Prothorax quadrangular or rounded, with or without denticulation on lateral margin, with one or more discal impressions. Scutellum small, almost level with mesonotum. Elytra slightly depressed, parallel sided or very slightly converging apicad from base, jointly rounded at apex, 10-striate; striae with perfectly aligned puncta; scutellar striole distinct; sutural and even interstriae with a row of erect squamiform setae; inferolateral flange absent. Hind wing fully developed, long, narrow, with apical field large, 0.6 of total wing length; basal part narrow, Cu at this area equally distant from fore and hind margins; jugular (anal) lobe absent; anterior margin with up to 7 stigmatic setae, hind margin with long cilia from apex to a short distance basad from Cu; venation strongly reduced, C and Sc indistinct at proximal half, R well-pigmented for most part, radial cell incomplete, M indistinct, r-m missing, Cu rather distinct to near hind margin, anals absent except for one running parallel with hind margin.

Underside same level throughout, flat. Coxal cavities closed laterally, notopleural suture obsolete; metepisternal head with a prominent dorsal tooth sharply indenting elytra. Fore coxae separated by 3–4 coxal widths, not protruding, inserted at basal third of prosternum; femora pedunculate, moderately incrassate; tibiae robust, straight, lacking spurs and mucro; tarsi 3-segmented, segment 2 bilobed, rather small.

Ventrite 1 longer than 2, ventrites 2–4 about same length to each other, 1–4 laterally with distinct transverse impression or groove. Tergites 1–7 pigmented, undivided along midline, 7 with large pruinose patches; spiracular area not pigmented. Proventriculus with well defined,

strongly pigmented blades, these with distinct plate anteriorly and brushes elsewhere, nearly twice as long as wide. Rectum with elongate, posteriorly broadened and more intensely pigmented loop (Fig. 99).

Male. Sternite 8 pigmented, strongly transverse, undivided, lacking apodeme; sternite 9 bifurcate. Tegmen (Fig. 92, 93) pigmented, with parameral sector broad, entire, broadly rounded or truncate at apex, finely setose. Aedeagus (Fig. 94, 95) short, slightly longer than last three ventrites combined; aedeagal body tubular, pedon and tectum fused except briefly at apex, tectal part extending to or slightly beyond pedal part, covering it; ostium apical; apodemes much longer than aedeagal body, attached laterally.

Female. Tergite 8 (Fig. 96) denticulate at apex, with 7 or more teeth; sternite 8 as in Fig. 97, tergite 9 absent; rectum outside genital pocket, its loop as in Fig. 99. Genitalia as in Fig. 98, proximal and distal hemisternites without oblique suture, pigmented, setose at apex, without stylus; bursa large; spermatheca very small, not falciform, weakly curved or slightly bent, duct inserted at one end, about 2–3x longer than spermatheca, entering bursa dorsally near base of slender section of bursa; gland large, sessile, heading towards spermathecal apex.

Distribution. New Zealand (Northland to mid Canterbury), New Caledonia.

Host plants. Some if not all *Aralius* species are associated with members of the family Araliaceae in New Zealand and New Caledonia. Hudson (1934) stated that the New Zealand species was 'associated with the tree fern *Cyathea dealbata*', a statement at odds with subsequent field observations carried out in the Nelson and Auckland areas.

Biology. Adults and larvae live and complete the development under bark of recently dead branches of the host species.

Remarks. *Aralius* is readily differentiated from *Proterhinus* and *Aglycyderes* in having antennae that extend only to about the middle of the prothorax, a very short first antennal segment, ventrites 1–4 with transverse lateral impressions or grooves, with a setiferous pit behind postmentum in the male, and a tergite 8 with 7 or more teeth on the apical margin in the female. New Zealand has one species and New Caledonia three (two of these undescribed).

***Aralius wollastoni* (Sharp)**

Figs 7, 92–99; Map 10

Sharp, 1876: 28 (*Aglycyderes*); 1877: 400 (*Aglycyderes*). — Broun, 1880: 426 (*Aglycyderes*). —Hudson, 1934: 159, pl. 10, fig. 3 (*Aglycyderes*). —Ting, 1936: fig. on p. 107, 109, 112 (*Aglycyderes*; mouthparts). —Paulian, 1944: 118, fig. 13, 16 (*Platycephala*). —Crowson, 1955: 159, 162, fig. 212 (*Platycephala*). —Kuschel, 1990: 70, 79, fig. 78, 175 (syn. *badius*, *jeanneli*). —May, 1993: 42, fig. 251–261 (larva).

badius Broun, 1880: 427 (*Aglycyderes*).

jeanneli Paulian, 1944: 118, fig. 14, 15, 18 (*Platycephala*).

Reddish brown or dark brown throughout; integument shiny if not coated with film of waxy exudation. Vestiture consisting of short, fine or subsquamiform decumbent hairs leaving most of surface exposed, and squamiform erect setae on sides of head, on all even interstriae and on declivity of sutural interstria (Fig. 7).

Head reticulate with large, shallow punctation from middle of rostrum to constriction behind eyes; distal half of rostrum finely punctate, nearly smooth on central area of groove or depression.

Prothorax quadrangular, often with slightly prominent apical and basal angles, with three mostly distinct dorsal impressions; lateral margin slightly asperate, not denticulate; punctation largely as on head. Elytra with well marked but not sulcate striae, these distinctly wider than interstriae; setosity consisting mostly of elongate-elliptic scales.

Male. Tegmen and aedeagus as in Fig. 92–95.

Female. Tergite 8, sternite 8 and genitalia as in Fig. 96–98.

Length 1.7–2.8 mm.

Types. 1) *Aglycyderes wollastoni*: described from ‘several specimens’ from Tairua; 8 syntypes located at BMNH, the one marked with a ‘T’ (for type) by Sharp is here designated lectotype. Lectotype ♂ (here designated, so as to assure correct and consistent application of the name in the future), 2.4 x 0.75 mm, BMNH. 7 paralectotypes, same data, BMNH.

2) *Aglycyderes badius*: described from a single specimen. Holotype ♂, 2.0 x 0.70 mm, Parua, BMNH.

3) *Platycephala jeanneli*: described from one male specimen from ‘Nouvelle-Zélande’. Holotype ♂, 2.5 x 0.9 mm, Auckland, 1878, Broun, MNHN; sent by Broun as *Aglycyderes wollastoni* to Paris. The abdomen and the aedeagus were on the same card the specimen was glued on; they now are in glycerine in a minivial. One antenna has the first four segments only and the other is missing totally, so it is not possible to confirm whether the figure published was based on a teratological case or was just a badly executed drawing.

Material examined. 10 type specimens and 237 non-type specimens. **North Island. ND.** Poor Knights Is, Tawhiti Rahi; Parua. **AK.** Goat I; Anawhata; Motuihe I; Lynfield; Noises Is, Motuhoropapa I; Noises Is, Scott; Noises Is, Otata I; Noises Is, Ike I; Green Bay; Auckland Domain; Titirangi; Bethells, Matuku Reserve. **CL.** Tairua; Cuvier I; Mayor I, Opo Bay. **BP.** Rarima Rocks. **WN.** Wellington; Silverstream; Upper Hutt, Te Marua. **South Island. SD.** Picton; Waikawa Bay; Shakespeare Bay; Parangi, Whites Bay; Wooded Peak; Ship Cove; French Pass; D’Urville I, Kapowai. **NN.** Nelson; Upper Maitai; Dun Mtn; Whangamoā; Aniseed Valley. **BR.** Lewis Pass. **MC.** Riccarton Bush; McLennans Bush. **NC.** Mt Grey. 247 specimens examined — see Appendix 2 for details of specimens examined.

Distribution. ND, AK, CL, WN / SD, NN, BR, MC.

Host plants. *Pseudopanax arboreus*, *P. crassifolius*, and *P. lessonii* (Araliaceae).

Remarks. One of the most characteristic and readily recognisable beetles of New Zealand on account of a most peculiar broad head that does not extend forward to a kind of proboscis or rostrum, a feature distinguishing weevils from most other Coleoptera. Sharp (1876) and also Wollaston (1864) were inclined to place *Aglycyderes* in Colydiidae. Paulian (1944) rightly recognised the affinity of *A. wollastoni* with the New Caledonian *Platycephala olivieri* Montrouzier, but missed realising that the generic name *Platycephala* was not available because of homonymy.

Family BRENTIDAE

The family Brentidae is poorly represented with just six endemic species in five endemic genera, and one palearctic species imported for partial biological control of gorse (*Ulex europaeus*). Each endemic genus is highly distinctive; one belonging to Brentinae, the others to Apioninae. The affinity of the brentine is not with Australia, New Caledonia, or Fiji, but apparently with Sulawesi; the affinity of the apionines is with New Caledonia, Vanuatu, and Fiji. There are no gondwanic elements in this family, only australasian and oriental. The monotypic status of four endemic genera out of five suggests that these have been in New Zealand for some considerable time, but the question as to why proliferate speciation did not occur is not easily answered.

Key to genera of Brentidae

- 1 Large species, over 11 mm long excluding rostrum. Antennal club cylindrical, not wider, or hardly wider, than funicle (Fig. 8). Pronotum medially grooved. Elytra parallel-sided. Femora contiguous with coxae. Tibiae with spurs. Claws divergent (Brentinae) ... (p. 31) ... *Lasiorhynchus*
- Small species, less than 5 mm long excluding rostrum. Antennal club elliptical or oval, distinctly wider than funicle (Fig. 10, 12). Pronotum medially not grooved. Elytra round-sided, widest at or behind middle. Femora separated from coxae by elongate trochanters. Tibiae lacking spurs. Claws divaricate (Apioninae) ... 2
- 2(1) Scutellum concealed (Fig. 10). Elytra completely smooth, lacking striae on exposed surface. Antennal club compact, tightly articulated, with first segment at least as large as remainder of club (Fig. 110). Prothorax at base strongly constricted to form a broad collar (Fig. 19). Mesepimeral suture not sulcate. Flightless (p. 34) ... *Zelapterus*
- Scutellum visible (Fig. 12). Elytra sculptured, with distinct striae on exposed surface (Fig. 12–16). Antennal club loosely articulated, showing distinct indentation between first two segments, first segment distinctly smaller than remainder of club (Fig. 127, 137). Prothorax at base not constricted (Fig. 12–16). Mesepimeral suture in a deep, broad sulcus. Fully winged 3
- 3(2) Elytra weakly striate, with semierect pubescence (Fig. 12) (p. 36) ... *Cecidophyus*
- Elytra with deeply engraved striae (Fig. 14–16) 4
- 4(3) Claws simple (Fig. 145). Elytra glabrous (Fig. 14) (p. 38) ... *Strobilobius*
- Claws dentate. Elytra pubescent or squamose (Fig. 15, 16) 5
- 5(4) Vestiture pilose, sparse, leaving integument exposed (Fig. 15, 179). Middle coxae contiguous, thus meso- and metasternal processes not meeting. Antennae submedian, not inserting under a dentiform expansion (Fig. 15) (p. 39) ... *Neocyba*
- Vestiture squamose, dense, concealing integument (Fig. 16). Middle coxae separate, the meso- and metasternal processes meeting. Antennae subbasal, inserting under a dentiform expansion (Fig. 16–19) (p. 42) ... *Exapion*

Lasiorhynchus Lacordaire

Fig. 8, 9, 57, 100–109

Lacordaire, 1866: 465, 469 (type-species *Curculio barbicornis* Fabricius, 1775). —Broun, 1880: 543. —Schönfeldt, 1908: 70, 75. —Kleine, 1937: 98; 1938: 125, 134.

Elongate species with sparse vestiture consisting of conspicuous white hairs and lineal scales applied to integument. Elytra with reddish brown markings.

Head elongate, gently constricted at base, in male cylindrical, at least 3x longer than an eye diameter, in female cylindrical or distinctly converging apicad, 2x longer than an eye diameter; vertex not medially grooved; underside with long, distinct, transversely rugulose, not sulcate, gular suture ending in a deep tentorial pit about half an eye diameter from behind the eye margin. Frons narrower than rostrum at base, with small fovea. Eyes hemispherically protruding, glazed. Rostrum much longer than prothorax, sexually highly dimorphic, in male with a very long postrostrum, at least 8x longer than prorostrum, in female postrostrum distinctly shorter than prorostrum; prorostrum in male broadening apicad, less than twice as long as wide, not longer than first two antennites combined, convex dorsally, with weak dorsolateral margin, neither dorsally nor ventrally sulcate, underside of pro- and postrostrum with a beard of backwardly curved hairs. Antennae in male subapical, bent backwards not reaching to front margin of prothorax, slender except for scape; segment 2 longer than scape, segment 3 longer than 2, from then on gradually shorter; all segments, especially in male, with abundant hairs directed 45° apicad; club long, slender, all club segments much longer than wide, only very slightly wider than funicle, dullish, vellutinous, with few, mostly apical setae.

Prothorax considerably longer than wide, sulcate in male to near apex, in female to the apical one-third and, in profile, convex. Scutellum distinct, small, ascending.

Elytra lacking a humeral tooth, in male spatulately extended at apex by more than one length of last three

ventrites combined, in female tapering to a slightly upcurved apex and only briefly passing end of abdomen; base sloping obliquely towards mesonotum; striae not or hardly sulcate, deeply punctate; interstriae not costate; inferolateral flange parallel to side margin as far as end of striae 6 and 7 and ending there, not followed by an oblique carina or flange. Hind wing as in Fig. 57, conspicuously pigmented, dark, densely microtrichious, but folds pale, lacking microtrichia; about 4x as long as wide, without anal lobe, distinctly sinuous on hind margin just beyond middle; apical field equal or subequal to venational area basad of stigma; radial window distinct, small, triangular, with short Rr; r-m distinct, inserted on Rr well basad of radial window, transverse, slightly curved apicad in middle; m-cu strong, straight; Cu strongly, irregularly sclerotised at junction with m-cu; 3 anal veins present; hind margin ciliate, longest cilia 12 µm long.

Prosternum in male 3x as long as a coxal diameter, in female 2x as long as a coxal diameter, area behind coxae in both sexes half a coxal diameter long; sternopleural suture distinct at least in part, well marked with puncta and short transverse rugae; prosternal process between coxae narrow, half the width of funicle. Femora weakly clavate, pedunculate, not reaching end of abdomen in both sexes; tibiae straight; fore tibiae with a broad, finely pubescent grooming device between outer tooth and spur, lacking an ascending comb on lower edge; spurs 1-2-2, strong; tibiae and tarsi shiny, lacking a grey coating; tarsite 1 longer than 2 and 3 combined, tarsite 3 deeply bilobed, wider than 2; onychium at apex ventrally subtruncate, not extending below the claws, when not showing in dorsal view; claws with with one or more fine, inconspicuous setae.

Male. Tergite 7 elongate, strongly convex across, with rather small, entirely lateral pruinose patch; spiracle in a pale patch. Tergite 8 in lateral view largely exposed beyond 7, in ventral view only briefly visible beyond ventrite 5. Sternite 8 as in Fig. 100, transverse, undivided, not emarginate at apex. Sternite 9 (Fig. 100) with long, rather narrow arms and an elongated basal sclerite with a slight head at posterior end. Tegmen (Fig. 101) as long as aedeagus, articulated on sides, ventral part with long anular arms, dorsal part very long beyond connective membrane, with long, diverging parameral lobes, these setose dorsally and ventrally, with a pale median line beyond connective membrane. Aedeagus as in Fig. 102, 103, pedon parallel-sided, tapering to a point, briefly upturned at apex; tectum continuous with apodemal arms, extended to ostium; apodemes shorter than aedeagal body, pedal arms articulated with aedeagal body; internal sac twice as long as aedeagus, with a flagelliform basal sclerite, this not quite as long as apodemes, with a pair of median sclerites inside aedeagal body.

Female. Tergite 7 elongate, compressed to some extent, deep in lateral view; intersegmental membrane close to base of tergite 8 with a pair of large, 2.7 mm long by 1.9 mm wide glands (Fig. 104), the glands applied with their broadest face against inner walls of tergite, this face with a distinct indentation where touching tracheae of spiracle 7. Tergite 8 as in Fig. 104–105, with few, usually 5 long teeth, with a strongly downcurved apex. Sternite 8 as in Fig. 106, blade subtruncate, with about 20 minute setiferous teeth on apical margin, with an apically split median arm extending to a little beyond middle of blade; apodeme a little more than twice as long as blade; membrane connecting with sternite 7 (ventrite 5) with a large glandular pouch on either side extending to near apex of apodemes. Genitalia as in Fig. 108, hemisternites (Fig. 107) long, undivided, with lateroapical stylus and a few setae; the well pigmented genital sheath with a deeply coloured sclerite near base of hemisternites; vagina about 4x as long as hemisternites, more or less sacciform towards end, continuous with a rather indistinct bursal part; spermatheca (Fig. 109) slender, falciform, duct nearly as long as hemisternites and vagina combined, pigmented and tapering as far as first bend, widening before inserting at bursal end; gland distinctly sclerotised, a little paler than spermathecal body; two long cylindrical vaginal appendages present; colleterial gland absent.

Distribution. Endemic to New Zealand.

Host plants. Woodborer in various dying or freshly dead trees.

Remarks. One species varying greatly in size, some males exceeding the length of any other brentine in the world. The genus is currently placed in the tribe Ithystenini. It is only remotely related to *Ithystenus* Pascoe of Australia and Vanuatu, *Mesetia* Blackburn of Australia, and *Bulbogaster* Lacordaire of Fiji, but may be a little more closely related to *Prodector* Pascoe of Sulawesi.

Lasiorrhynchus appears to be unique in many ways to all other Brentinae, in particular in having:

- (1) a distinct, normal, well-exposed scutellum instead of an entirely concealed one;
- (2) an elytral base that slopes down to the mesonotum instead of falling vertically;
- (3) no oblique carina or flange (the 'submarginal ridge' of Lyal & King, 1998) beyond the inferolateral flange on the underside of the elytral declivity;
- (4) no protruding apical lobe on the ventral surface of the claw segment instead of a distinct one amply visible in dorsal view between the claws;

(5) fore legs with a broad, densely hairy grooming device between outer tooth and spur instead of a long comb leading away from the spur on the lower edge of tibiae;

(6) claws with one or more setae instead of none in any other brentines; and

(7) by females in having four intersegmental glandular pouches instead of two or none.

Because the first six characters are presumed ancestral (plesiomorphic) elsewhere in weevils, *Lasiornychus* will undoubtedly deserve a special consideration in any phylogenetic analysis of the genera of the subfamily.

Schoenfeldt (1908) and Kleine (1938) have placed the Sulawesian *Prodector* Pascoe (1862) alongside *Lasiornychus* thus presumably implying affinity with it. The description of *Lasiornychus* above takes this into account by attending to morphological areas of interest separating these genera.

The principal distinguishing features of *Prodector* in regard to *Lasiornychus* are:

- (1) the base of head has an abruptly cut-off neck;
- (2) the gular suture is very short;
- (3) the tentorium pit is near the base by the neck;
- (4) the beard hairs of the male rostrum are directed apicad;
- (5) the scutellum is concealed;
- (6) the elytral base vertical;
- (7) the shoulders have a tooth between side and base;
- (8) the inferolateral flange of the elytra is continued by an oblique flange to suture;
- (9) the fore tibiae are glabrous and shiny between the outer tooth and the spurs and have a long comb of stiff setae leading away from the spurs;
- (10) the spur formula is 2-2-2;
- (11) the onychium has an advancing ventral lobe visible between the claws in dorsal view;
- (12) the claws have no setae;
- (13) the arms of the male sternite 9 are narrow;
- (14) the basal armature of the internal sac is bulky with diverse pigmentation consisting of a ring at base which has a median tubule for the ejaculatory duct to go through and continue pigmented to the end of the 0.7 mm long basal sclerite;
- (15) the female tergite 8 has nine teeth and the apex of sternite 8 lacks fine denticulation;
- (16) the genital sheath lacks a sclerite near the base of hemisternites;
- (17) the bursa is ventrally concave and apically bilobed;
- (18) the spermathecal gland is unpigmented.

Etymology. *Lasiornychus* ('densely hairy rostrum') is a Greek compound, from *lasis* = densely hairy, and *rhyngchos* = proboscis for weevil; gender masculine.

Lasiornychus barbicornis (Fabricius) giraffe weevil, pepeke nguturoa

Fig. 8, 9, 57, 100–109; Map 11

Fabricius, 1775: 134 (*Curculio*); 1781: 171 (*Curculio*); 1787: 95 (*Brentus*); 1792: 491 (*Brentus*); 1801: 545 (*Brentus*). —Gmelin, 1790: 1739 (*Brentus*). —Olivier, 1790: 190 (*Brentus*); 1807: 432, pl. (84) 1:5, 2:5 (*Brentus*). —Herbst, 1797: 187, pl. 107: 7 (*Brentus*). —Latreille, 1797: (18) pl. 236: 1 (*Brentus*); 1828: 593 (*Nemocephalus*). —Schoenherr, 1833: 353 (*Brenthus*); 1840: 578 (*Brenthus*). —Boisduval, 1835: 317 (*Brenthus*). —White, 1846: 13 (*Brentus*; syn. *assimilis*). —Lacordaire, 1866: 469. —Broun, 1880: 544; 1881: 228 (larva, pupa, biol.). —Sharp, 1899: 297 (biol.). —Schoenfeldt, 1908: 76, pl. 2:5. —Kleine, 1920: 73 ('strid. organ'). —Tillyard, 1926: 240, pl. 19: 14. —Hudson, 1934: 122, pl. (adult, larva). —Kuschel, 1970: 194. —Meads, 1976: 171, fig. 1–5 (biol.)

assimilis Fabricius, 1775: 134 (*Curculio*); 1781: 171 (*Curculio*); 1787: 95 (*Brentus*); 1792: 491 (*Brentus*); 1801: 546. —Gmelin, 1790: 1739 (*Brentus*). —Olivier, 1790: 190 (*Brentus*); 1807: 433, pl. (84) 2:6 (*Brentus*). —Herbst, 1797: 188, pl. 107: 8 (*Brentus*). —Schoenherr, 1826: 69 (*Brenthus*); 1833: 356 (*Brenthus*). —Latreille, 1828: 593 (*Nemocephalus*). —Boisduval, 1835: 317 (*Brenthus*). —Gyllenhal, 1840: 565 (*Teramocerus*).

Dull dark brown, elytra usually with three yellowish or reddish marks each, a humeral mark, a median mark, and a postmedian mark, sometimes with additional smaller markings. Vestiture consisting of sparse white or yellowish piliform or lineal scales, those on underside longer and broader; male with rather dense black, backward directed beard on underside of rostrum (Fig. 8).

Rostrum in male 2.1–3.3x longer than prothorax; prorostrum short, strongly widening apicad, relatively shiny at apex, shallowly depressed lengthwise; postrostrum 6–14x longer than prorostrum (higher ratios corresponding to larger specimens), entirely dull, shallowly, indistinctly punctate dorsally, transversely convex above, sides vertical, lower edge of sides weakly or distinctly tuberculate on basal half. Rostrum in female 1.5x longer than prothorax; prorostrum shiny, 2.1x longer than postrostrum, finely, sparsely punctate, more coarsely punctate on sides near base, lacking scales, with sparse hairs instead; postrostrum dull, cylindrical, with lineal scales.

Prothorax in male 2.0–2.6x longer than wide, with median groove, subcylindrical, mostly gently converging apicad; in female 1.6–1.8x longer than wide, elliptical, widest near middle, with groove from base to middle or slightly

beyond, continued to apex as a bare line. Scutellum variable, convex, flat or grooved, glabrous.

Sides of metasternum, meso- and metepisternum, and mesepimeron punctate. Ventrites 1 and 2 laterally punctate, usually somewhat transversely rugose; ventrite 5 in male flat, truncate, in female transversely convex, rounded at apex. Other characters in generic description.

Length: 16–90 mm for males inclusive of rostrum, 11–50 mm for males exclusive of rostrum, 18–47 mm for females including rostrum, 13–46 mm for females excluding rostrum.

Types. (1) *Curculio barbicornis* Fabricius: lectotype male (selected by Kuschel 1970) 17.3 x 2.5 mm (measured from middle of eyes to tip of elytra), rostrum 9.8 mm (from tip of rostrum to middle of eyes), no locality but presumed from Ship Cove, Queen Charlotte Sound, SD, Banks Collection, BMNH; 2 paralectotype males, one MNHN, the other in Fabricius Collection, Kiel (now in Copenhagen).

(2) *Curculio assimilis* Fabricius: lectotype female (selected by Kuschel 1970), 25.4 x 4.7 mm (from middle of eyes to tip of elytra), rostrum 9.9 mm (from tip of rostrum to middle of eyes), no locality but presumed Ship Cove, Queen Charlotte Sound, SD, Banks Collection, BMNH; one paralectotype female, in Fabricius Collection, Kiel (now in Copenhagen).

Material examined. 2 type specimens and 154 non-type specimens. **North Island.** **ND.** Sth Pandora; Te Pahi Coastal Park; Waipoua SF; Whangarei; Mangamuka; Mangamuka Summit Tk. **AK.** Bethells, Matuku Res; Nihotapu; Titirangi; Auckland; Te Pu Mamaku; Waitakere Ra, Cascade; Mangere; Oratia; Hunua; Swanson; Piha. **CL.** Ongohi Stm; Pokororo; Little Barrier Is; Great Barrier Is, Coopers Castle; Coromandel. **WO.** Hamilton; Otorohonga; Okauia. **BP.** Te Whaiti (nr Rotorua; Mt Te Aroha Smt; Papatea; Omanawa, Tauranga; Motu R, Mangatutara Stm. **TK.** New Plymouth; Ararata. **TO.** Pihanga-Turangi. **GB.** Urewera NP, Te Taita-a-Makora. **HB.** Puketitiri; Waimarama Beach. **RI.** Ngatarua, Upper Rangitikei. **WN.** Ballance Bridge; Ballance Reserve; Tokomaru Gorge; Khandallah; Orongorongo Field Stn. **South Island.** **SD.** Bulwer, Pelorus Sound; Maud Is, Old Homestead. **NN.** Maungatapu Valley; Roding River; Knuckle Hill, Mangarakau; Takaka; Pepin I. **BR.** Greymouth. 156 specimens examined — see Appendix 2 for details of specimens examined.

Distribution. Northland to NW South Island.

ND, AK, CL, WO, BP, TK, TO, GB, HB, RI, WN, WA / SD, NN, BR.

Host plants for adult and larva (in alphabetical order of

plant families): Araucariaceae (*Agathis australis*); Asteraceae (*Brachyglottis repanda*); Corynocarpaceae (*Corynocarpus laevigatus*); Lauraceae (*Beilschmiedia taraira*, *B. tawa*); Malvaceae (*Hoheria* spp.); Meliaceae (*Dysoxylum spectabile*); Monimiaceae (*Hedycarya arborea*, *Laurelia novae-zelandiae*); Podocarpaceae (*Dacrydium cupressinum*); Proteaceae (*Knightia excelsa*); these families involving principally dicotyledons.

Remarks. This spectacular beetle of New Zealand is known as ‘giraffe weevil’. A highly informative paper on its biology was written by Meads (1976). The specific name ‘barbicornis’ is Latin for bearded horn in reference to the relative hairiness of the male antenna.

Apioninae

The taxonomy of Apioninae has undergone radical changes since Alonso-Zarazaga (1990) revised the Palearctic fauna of the subfamily. The genus *Apion* Linnaeus, for instance, had hundreds of species from all over the world, but is now reserved for fewer than 20 Palearctic species, all associated with Polygonaceae. New Zealand has only five native species in four endemic genera. These are here assigned to the tribe Rhadinocybini Alonso-Zarazaga proposed on the basis of the New Caledonian genus *Rhadinocyba* Faust. The introduced species of the genus *Exapion* is a member of the tribe Apionini. The two tribes are readily distinguished by the condition of the middle coxae, which are disjunct in Apionini, and contiguous in Rhadinocybini.

Zelapterus gen. nov.

Fig. 10, 11, 110–121

Type-species *Apion terricola* Broun

Head strongly tapering apicad, not or hardly constricted, not strigose across at base, temples twice as long as an anteroposterior diameter of eyes. Frons as wide as rostrum or a little narrower, flat, lacking impression, appearing somewhat depressed because of a deep saddle (Fig. 111) jointly formed with rostrum. Eyes partially glazed, oval, strongly, almost angularly protruding laterally, small, perched on upper half of sides, dorsoventral diameter only half a rostral depth. Rostrum as in (Fig. 111), as long as prothorax, subcylindrical or slightly widening to antennal insertion point, then gently tapering, in profile strongly curved. Scrobes sulciform, directed to gular angle. Antenna as in Fig. 110, distinctly antemedian in both sexes; scape slender, reaching eyes, weakly clavate, curved outwards; funicle slender, segment 1 much larger and thicker than 2; club large, oblong, subcompact, segment 1 more than half of total length.

Prothorax longer than wide, strongly constricted at basal one-third to an unrimmed broad collar, truncate, without trace of an apical constriction, its axial and tangential convexity pronounced, in profile weakly proclinate, only 1.4x longer dorsally than ventrally; notum lacking impressions. Scutellum concealed.

Elytra broadly elliptical, inflated, lacking humeral callus, jointly rounded to a rather narrow apex, vertical at base, in profile highly humped, strongly, uniformly convex. Striae totally erased on upper surface, but striae conspicuous on underside, here showing nearly as wide as interstriae, also stria 10 visible at posterior end; vestiture highly caducous, whence usually not present anymore; inferolateral flange continued as a fine line a little beyond the locking groove. No hind wings, not even stumps present.

Mesepimeral suture obsolete, not sulcate but occasionally with a slight impression against elytra; meso- and metasternal processes not meeting between coxae; metasternum short, hind margin in front of coxae distinctly concavely curved. Process of ventrite 1 broadly rounded; suture 1 of abdomen laterally distinct; ventrite 5 in male subtruncate, shallowly bisinuous, not rimmed at apex, in female rounded. Tergite 1–6 totally depigmented; membrane between tergites 7 and 8 lacking pouch in both sexes.

Fore coxae long, slender, slightly antemedian owing to prothorax being ventrally rather long, a little less long in front than behind coxae. Trochanters elongate, all on lower edge longer than wide. Femora weakly swollen, hind ones well short of reaching apex of elytra. Tibiae lacking mucro in both sexes. Tarsi lineal, tarsite 2 weakly broadened apicad, tarsite 3 with long, slender lobes; claw segment passing tarsite 3 by half the length of this tarsite; claws divaricate, slender, simple, without a tooth or lamina, Fig. 114.

Male. Tergite 8 as in Fig. 112–113, strongly rounded at apex, a good deal visible ventrally beyond abdomen, lacking carinae or flanges. Sternite 8 as in Fig. 115, with deep emargination. Sternite 9 as in Fig. 115–116, with somewhat symmetrical arms, these not or hardly shorter than apodeme, with a heavily pigmented transverse sclerite articulating with the tips of arms. Tegmen as in Fig. 117–118, as long as aedeagus, distinctly articulated on sides, unusually robust as a whole below articulation; the dorsal sector short, strongly pigmented laterally and apically, entire at apex, with a very short membrane at apex and a pair of short setae, central area uniformly, weakly pigmented, bilobed cephalad. Aedeagus (Fig. 119–120) very long, extending deeply into the thoracic lumen; pedon parallel-sided, weakly pigmented, ending in a long, subuliform apex; tectum and tectal arms weakly pigmented; apodeme slightly longer than main body, tightly articulating with pedon, internal sac extending to a little beyond middle of apodemes, lacking sclerites but with fine wall lining.

Female. Colleterial gland at base of common oviduct absent. Bursa and spermatheca as in Fig. 121; one very large egg present at any one time, a mature egg measuring 0.875 x 0.50 mm in a 1.4 mm long female, the egg extending into the thoracic cavity.

Distribution. New Zealand, endemic.

Host plant. Unknown.

Remarks. One species, usually obtained from sifted bush floor litter. In habitus not unlike the flightless *Apotapion* Zimmerman (1943) of Fiji and Vanuatu and, apparently, nearest to this genus in affinity for sharing similarly gibbous prothorax and elytra, a rather long prosternum in front of coxae, a subcompact antennal club, lack of an apical constriction of prothorax, a concealed scutellum, no humeral callus, no mucro on any tibia in both sexes, and simple claws. *Apotapion* differs, however, considerably in having a short antennal scape, broad tarsi, a shorter first antennal club segment, an intersegmental sclerite near the emargination of sternite 8, a distinct sclerite in the internal sac, no bladal sclerite on sternite 9 of male, and normal eyes without any glaze over ommatidia. One of the dissected females had an egg (Fig. 157) that filled up virtually the entire abdomen and good part of the mesothoracic lumen. It is not uncommon that very small beetles have very large eggs in relation to their size, for instance Ptiliidae (Dybas 1966) and Limnichidae (Britton 1977).

Etymology. *Zelápterus* is derived from ‘zel’, short for the Latin name of New Zealand (Nova Zelandia), and ápterus for the lack of hind wings; gender masculine.

Zelapterus terricola (Broun) n. comb.

Fig. 10, 11, 110–121; Map 12

Broun, 1923: 702 (*Apion*)

Shiny black, antennae and legs reddish or dark brown. Vestiture absent except for some hairs on legs and last ventrite (Fig. 10). Other features are contained in the description of the genus above. Because the original publication shows accurate and detailed observations by Broun, his description of *Apion terricola* is here reproduced in full.

Original description. ‘Minute, elongate, very convex, the elytra especially; glabrous, shining, nigrescent, rostrum, antennae, and legs piceo-rufous, its punctiform sculpture obsolete.’

‘Rostrum rather longer than thorax, arched, stout, cylindrical, slightly narrower in front. Head of equal length and breadth, gradually narrowed to almost the same width

as the rostrum. Eyes as far apart as they are from the thorax, prominent, subrotundate. Thorax truncate at base and apex, a little longer than broad, rounded, widest, and most convex at or before the middle, its basal half much constricted and depressed. Scutellum absent. Elytra oval, apparently truncate and of the same width as thorax at the base, about double its length and almost twice as broad and convex near the middle.'

'Scape inserted evidently before the middle, attaining the eye, moderately stout, subclavate at the extremity. Funiculus hairy, basal joint slightly longer than second and twice as thick; third at apex as broad as fourth, both together slightly longer than second; fifth to seventh transverse, seventh broadest; club abruptly enlarged, subovate, apparently triarticulate.'

'Legs elongate, simple. Tarsi elongate, second joint of the anterior a little shorter than the basal, the third with long narrow lobes, fourth narrow, longer than the first. Underside dull, with a few slender grey hairs. Prosternum truncate in front, the coxae prominent, the intermediate also contiguous, the posterior distinctly separated. Basal two ventral segments apparently connate, large, third and fourth very short.'

'This remarkable little weevil disagrees with 828 [*Apion metrosideros*] in nearly all specific details of form and sculpture.'

Length 1.3–1.5 mm.

Type material. Holotype ♂, 1.5 x 0.70 mm, Pakarau [in error for Pekaeru], no number [4312 in publication], 19 May 1918, BMNH.

Material examined. Holotype and 18 non-type specimens. **North Island. ND.** Te Pahi Coastal Park, North Cape; Te Pahi Trig; Kohuronaki; Pekaeru (holotype); Butterfly Valley, Tauranga Bay; Mangamuka Saddle; Maungataniwha Range, Mangamuka saddle; Waipoua Forest; Waipoua, Toatoa site; Waipoua, Toronui Track; Waitangi State Forest. 19 specimens.

Distribution. ND / –.

Host plant. Unknown.

Cecidophyus gen. nov.

Fig. 12, 13, 122–136

Type-species *C. nothofagi* spec. nov.

Head elongate, behind eyes about twice as long as an anteroposterior diameter of eye, constricted at basal one-

third or quarter, densely strigose across constriction, temples in front of constriction rugose, slightly rounded. Frons in male a little narrower, in female a little wider than rostral apex, shallowly depressed, with shallow median fovea. Eyes round, dorsoventral diameter less than an apical depth of rostrum, slightly more than depth of temples in male, a little less than depth of temples in female, coarsely faceted. Rostrum shorter than prothorax, straight, tapering towards antennal insertions, then cylindrical in male, slightly widening in female, not broader at antennal insertion point; epistome distinct, vertical, bifoveate; scrobes shallow, directed towards gular angle. Antenna (Fig. 127) inserting at rostral middle in male, a little behind middle in female, extending to anterior margin of prothorax, robust; scape reaching eyes, straight, weakly clavate; segment 1 of funicle longer than wide, segment 5 smaller than 4 or 6; club elongate, loosely segmented, segment 1 equal to one-third of club length.

Prothorax longer than wide, with distinct apical collar on sides, rounded on sides, rounded off at basal angles, truncate at base, without basal rim, in profile moderately proclinate, 1.7x longer dorsally than ventrally. Scutellum large, triangular, gently ascending, with large impression.

Elytra slightly widening to just passed the middle, independently rounded at apex, with humeral callus, with sloping basal declivity near scutellum, with vertical basal declivity towards sides not sinuous; longitudinal convexity gentle, transverse convexity pronounced; stria 10 at end shallow, very finely, indistinctly punctate; sutural stria slightly impressed from basal third to apex, more distinctly punctate than 10; striae 7 and 8 only briefly, if at all, coalescent at base. Interstriae slightly convex, sutural one flat at basal one-quarter, raised along stria. Vestiture consisting of sparse, short, and fine erect pilosity intermingled on interstriae 4–7 with usually longer sensory hairs. Inferolateral flange uninterruptedly continued to junction with stria 2. Hind wing largely as in *Strobilobius*, Fig. 130, but differing in having a small, lineal or narrowly elliptical radial window, a wide radial stripe behind R, a radiomedial sclerotisation merging with the radial stripe, a much more extensive pigmentation in the radial area of the apical field divided nearly all the way to the apex of the wing by a clear line that runs parallel with the anterior margin of the wing, and in having a uniformly wide, uninterrupted medial stripe and no pigmentation next to Cu.

Mesepimeral suture deeply sulcate throughout; meso- and metasternal processes disjunct owing to coxae being contiguous. Process of ventrite 1 broadly truncate; first abdominal suture distinct, grooved on sides; ventrite 5 in male broadly truncate, not rimmed at apex, in female subtriangularly rounded, rimmed on sides and apex. Tergites

undivided, deeply pigmented; intersegmental membrane between tergites 7 and 8 in male (Fig. 122, 123) with a simple, deep, broadly open pouch (*p*), the pouch bluntly pointed at bottom, internal walls densely lined with microtrichia.

Fore coxae large; fore and middle trochanters short, their lower edge about as long as trochanters wide; femora weakly swollen, hind ones in male extending to end of elytra, in female a little shorter; all tibiae in male with a small mucro (Fig. 125), this often obscured by pilosity, in female lacking mucro; tarsite 1 slender, a little widening apicad, tarsite 2 triangular, truncate, angulate, wider than 1, tarsite 3 with strongly diverging, elongate-oval lobes, about twice as wide as 2; claw segment slender, passing tarsite 3 by one length; claws (Fig. 126) divaricate, robust, short, strongly curved, with large laminate expansion.

Male. Tergite 8 (Fig. 122–123) lacking carina at top, its posterior declivity vertical, with low subapical carina. Sternite 8 (Fig. 124) transverse, undivided, heavily pigmented except for a median emargination crossed by a membrane. Sternite 9 (Fig. 124) robust, with broad, symmetrical arms and a strong apodeme, with weak, rather indistinct articulation at attachment of connective membrane. Tegmen (Fig. 128–129) with well marked lateral articulation, robust below articulation; dorsal part deeply pigmented on sides and across anterior to membranous apical flaps, with two contiguous, weakly pigmented acute extensions; pilosity inconspicuous, very short, emerging from very fine puncta. Aedeagus as in Fig. 131–133, articulated against apodemes; internal sac extending to beyond apodemes, with five diverticula and a robust, deeply pigmented basal sclerite, sclerite channelled at first, then cylindrical; duct inserting ventrally a good distance from base of sclerite.

Female. Sternite 8 as in Fig. 134, with medially sclerotised blade. Genitalia as in Fig. 135, hemisternites long, heavily pigmented, with elongate stylus; common oviduct with a large bilobed gland at base (Fig. 135–36); spermatheca very slender, with subcylindrical gland close to duct insertion, duct long, thin, inserting at end of bursa.

Distribution. New Zealand, endemic.

Host plant. Larva inducing galls on twigs of *Nothofagus* (Fagaceae).

Remarks. A striking genus within Rhadinocybini because of its vestiture of erect pilosity and weakly impressed striae, and in the male for having all three pairs of tibiae mucronate and an internal sac with five large diverticula and a single sclerite.

Etymology. *Cecidophyus* is derived from the Greek *kekis* (kekid-), meaning gall, and *phyo* meaning induce; gender masculine.

***Cecidophyus nothofagi* spec. nov.**

Fig. 12, 13, 122–136; Map 13

Dull black, fore coxae bright orangy yellow, scape reddish brown, funicle and tarsi dark brown. Vestiture sparse, on elytra and sides of head (temples) semierect, intermingled with some erect sensory hairs on elytra, but vestiture easily rubbed off on dorsal surface (Fig. 12).

Head sparsely punctate, postrostrum in male coarsely and densely punctate, prorostrum more finely and sparsely punctate, in female similarly punctate on postrostrum but much more finely punctate and shiny on prorostrum, in profile distinctly convex, but more so in female than male. Prothorax sparsely, shallowly punctate, faintly rugose transversely, pilosity a little shorter and less raised than on elytra. Elytra faintly rugose transversely, often less asperate and more shiny on basal one third or half.

Other characters in description of genus.

Length 3.5–5.1 mm.

Types. Holotype male, 4.4 x 1.6 mm, [Mt Arthur] Salisbury's Opng., 30.12.1928, E. S. Gourlay, NZAC. [208] paratypes AMNZ, CMNZ, FRNZ, LUNZ, MONZ, NZAC, OMNZ.

Material examined. Holotype and 208 paratypes. **North Island.** **TK.** 2 km W of Waitaanga. **South Island.** **NN.** Mt Arthur; Mt Arthur, Salisbury's Opening; Mt Arthur, Flora Stream; Cobb; Canaan, Takaka Hill; Buller River nr Newtons Flat. **BR.** Mt Murchison; Croesus Knob Track, Paparoa Range. **NC.** Lewis Pass. **FD.** Homer Saddle. 209 specimens — see Appendix 2 for details of specimens examined.

Distribution. TK / NN, BR, NC, FD.

Host plant. *Nothofagus menziesii* (Fagaceae), larva inducing a woody gall on up to 1-cm thick branches.

Remarks. As all attempts to secure specimens from all species of *Nothofagus* have turned out negative, *Cecidophyus nothofagi* is assumed to be associated only with *N. menziesii*.

***Strobilobius* gen. nov.**

Fig. 14, 130, 137–148

Type-species *S. libocedri* spec. nov.

Head in male weakly widening towards base, in female more strongly so, not constricted, rather indistinctly strigose at base; temples about as long as an eye diameter. Frons slightly broader than apical width of rostrum, with large impression. Eyes round, their dorsoventral diameter greater than an apical depth of rostrum, slightly wider than temples, rather finely faceted, ommatidia distinctly convex. Rostrum longer than prothorax, subcylindrical, curved more than the axial convexity of pronotum, shallowly saddled at base; epistome not, if at all, declivous, emarginate; scrobes shallow, directed towards gular angle, invisible in dorsal view. Antenna as in Fig. 137, inserting near basal third of rostrum, long, extending to posterior margin of prothorax, slender; scape slightly overlapping eyes, weakly clavate and curved at apex; club elongate, loosely segmented, segment 1 a third of club length.

Prothorax wider than long, weakly constricted at apex, rounded on sides, right-angled and finely rimmed at base, lacking antebasal impression, truncate; in profile moderately proclinate, 1.7x longer dorsally than ventrally. Scutellum moderate in size, rather steeply ascending to level of elytra, with large impression.

Elytra strongly widening in straight line to middle, then sinuously tapering apicad, with a rather distinct lateral bulge at top of declivity between striae 5 and 8, each elytron briefly rounded at apex; with humeral callus, with vertical, not undermined basal declivity, with weakly sinuous basal margin; dorsum in lateral view not or hardly convex on basal half, strongly convex on apical half, transverse convexity of dorsum gentle; ten striae at apex, all striae deeply engraved and distinctly punctate, striae 7 and 8 coalescent or not below humeral callus; interstriae subcarinate along striae, flat; vestiture extremely minute, indistinct, decumbent; one sensory hair a little behind middle on interstria 7, 1–2 on interstria 8 shortly before junction with 3. Inferolateral flange extended uninterrupted to junction with stria 2 by curving inwards following course of stria 9. Hind wing as in Fig. 130, with distinct, rather large radial window, with distinctly pigmented postradial stripe, a nearly interrupted medial stripe, a cubital sclerotisation, and three anal veins; hind margin lacking cilia.

Mesepimeral suture deeply sulcate; meso- and metasternal processes not meeting between coxae. Process of ventrite 1 broadly rounded; suture 1 of abdomen distinct, grooved on sides; ventrite 5 in male broadly truncate, rimmed on sides and apex, in female rounded. Tergites pigmented, undivided; membrane between tergites 7 and 8 lacking a pouch in both sexes.

Fore coxae of moderate size; fore and middle trochanters short, their lower edge as long as corresponding trochanter wide; femora weakly swollen, hind femora in both sexes well short of reaching end of elytra; tibiae in both sexes lacking mucro; tarsite 1 broadening apicad, tarsite 2 triangular, tarsite 3 distinctly wider than 2, broadly lobed; claw segment short, strongly widening apicad, passing tarsite 3 by about half its length; claws divaricate, thickening basad, without a tooth or laminate expansion, Fig. 145.

Male. Tergite 8 as in Fig. 143–144, convex and smooth as far as a high flange on either side; declivity steep, nearly flat at a deep, pale transverse groove and a sharp carina rimming the groove. Sternite 8 as in Fig. 142, transverse, undivided, broadly, shallowly emarginate. Sternite 9 as in Fig. 142, with narrow, symmetrical arms; junction at attachment of connective membrane appearing slightly articulated. Tegmen as in Fig. 138–139, slightly longer than aedeagus, with conspicuous lateral articulation; dorsal sector peculiarly pigmented on sides and across before apex, with narrow, acutely pointed membranous apical flaps; preapical part with conspicuous puncta centered with a short seta; anterior area above ring weakly pigmented with two acute extensions. Aedeagus as in Fig. 140–141, pedon parallel-sided, downcurved at apex; apodemes hardly longer than aedeagal body, pedal arm distinctly articulated, tectal arms slender, strongly directed apicad to fuse with a narrow tectum; internal sac extending to end of apodemes, with a small, robust basal sclerite and a long, for most part tubular, sclerite, this almost as long as the aedeagal body channeled at base.

Female. Sternite 8 as in Fig. 146, sclerotised along median line of the blade, appearing as a continuation of a long, slender apodeme. Genitalia as in Fig. 147–148, with a bilobed vaginal gland and an elongate bursa; spermatheca unusual, somewhat crescently shaped with incurved ends; duct inserting on a knob of convex side, extremely thick, gradually increasing in thickness from spermatheca to bursa where inserting ventrally near bursal end; gland very small, sacciform, inserting at bottom of an indentation between the duct bulge and the outer curvature of spermatheca.

Distribution. New Zealand; endemic.

Host plant. *Libocedrus* (Cupressaceae).

Remarks. Easily recognised from the characters in the key to genera. The tegmen, aedeagal armature, and the unusual shape of the spermatheca coupled with a very wide spermathecal duct set the internal features of the genus well apart from other Rhadinocybini presently known. One species.

Etymology. *Strobilobius* is a Greek compound formed with the Greek word *strobilos*, meaning vortex as well as pine cone, and *bio* for living; gender masculine.

***Strobilobius libocedri* spec. nov.**

Fig. 14, 130, 137–148; Map 14

May, 1993: 50, fig. 364–372 (as *Neocyba species B*, larva)

Head and rostrum black, shiny, prothorax, sterna, antennae and legs usually dark brown, dull, swollen part of femora reddish, elytra and abdomen yellowish red, moderately shiny, elytral suture darker. Vestiture very fine, inconspicuous on elytra, fine, appressed on pronotum, short and more conspicuous on underside and legs (Fig. 14).

Anterior half or third of head capsule punctate. Rostrum in male 1.9x longer than prothorax, in female 2.25x, finely, sparsely punctate in male, indistinctly punctate in female. Funicular antennites 1–4 longer than wide, 5–7 usually as long as wide, 1 distinctly longer than 2. Prothorax 1.10–1.15x wider than long, alutaceously dull, finely punctate. Elytra 1.4–1.5x longer than wide. Finely transversely coriaceous; interstriae with a row of shallow puncta. Sides of metasternum and ventrites finely punctate. Remainder of characters in generic description.

Length 2.4–2.9 mm.

Types. Holotype male, 2.4 x 1.65 mm, Pouakai Trig, 1400 m, 1 Dec 1975, sweeping, A. K. Walker, NZAC. Paratypes AMNZ, NZAC, FRNZ, MONZ.

Material examined. Holotype and 19 paratypes. **North Island.** TO. Makotuku Flat, Ohakune Mt Road; Turoa, Mt Ruapehu. **TK.** Pouakai Trig, Pouakai Ra; Tatakangi Peak, Pouakai Ra. **South Island.** DN. Dunedin Botanical Gardens. 20 adult specimens — see Appendix 2 for details of specimens examined.

Distribution. TO, TK / DN.

Host plant. *Libocedrus bidwillii* (Cupressaceae), larva in female strobili, two preserved at Forest Research Institute, Rotorua by Len Newman, who had attended to the rearing and found parts of a eulophid parasitic wasp in dissected cones.

Remarks. There are two species of *Libocedrus* in New Zealand, and this weevil was found only on *L. bidwillii*. Kuschel (1995: 20) remarked that Apioninae were highly host-specific, almost exclusively associated with dicotyledons, with the exception, among two others on conifers, of ‘a species of *Neocyba* on *Libocedrus*’.

***Neocyba* Kissinger**

Fig. 15, 149–157

Kissinger, 1968: 7, 17 (type-species *Apion metrosideros* Broun)

Head subcylindrical, faintly constricted a short distance behind eyes, strigose only laterally behind eyes, not across dorsal surface of base; temples as long as an anteroposterior diameter of eye. Frons flat, a little narrower than rostrum. Eyes distinctly elongate, weakly protruding laterally, dorsoventrally a little wider than depth of rostrum, finely faceted. Rostrum nearly as long as prothorax, cylindrical, slightly curved; in lateral view almost continuous with frons; epistome slightly sloping, emarginate; scrobes sulcate, directed towards gular angle, invisible in dorsal view. Antennae short, just reaching fore coxae, slightly antemedian in male, inserting on the middle in female; scape weakly clavate, curved outward at apex; first two segments of funicle elongate; club elongate-oval, outline of segments well defined, segment 1 not or hardly a third of the length of club.

Prothorax longer than wide, subcylindrical, truncate at base, gently constricted at apex, not rimmed at base; in profile moderately proclinate, 1.7x longer dorsally than ventrally. Scutellum small, punctiform, ascending vertically to level of elytra, lacking impression.

Elytra gently widening with a slight curve to middle, more strongly curved on apical half, with humeral callus, without a lateral bulge on top of declivity, base vertical, sinuous, sutural interstria seemingly curved, tapering to the sides as a raised margin at base, dorsum in profile gently convex, nearly level with pronotum, more strongly curved on apical half, transverse convexity on dorsum moderate; ten striae, all deeply sulcate, much narrower than interstriae, indistinctly punctate; striae 7 and 8 coalescent from base to well behind humeral callus; interstriae nearly flat; inferolateral flange abruptly discontinued beyond the locking groove, whence without an incurving line or carina towards stria 2. Vestiture of elytra and pronotum locally variable, from sparse to nearly absent, from obvious to inconspicuous, from prostrate to raised; one sensory hair on the posterior one-quarter of interstria 7, another on interstria 9 near junction with 10, but one or both wanting with some frequency. Hind wing largely as for *Strobilobius*, Fig. 130, but radial window very narrow, elliptical or lineal; the medial stripe interrupted at the middle, and only two anal veins present.

Mesepimeral suture deeply sulcate; meso- and metasternal processes not meeting between coxae. Process of ventrite 1 subtruncate; suture 1 of abdomen indistinct, just traceable; ventrite 5 in male in concave arc, in female broadly rounded, rimmed only on sides. Tergites pigmented, undivided; membrane between tergites 7 and 8 with small, shallow pouch in male.

Fore coxae elongate, subconical, of moderate size; fore and middle trochanters short, their lower edge subequal to width of trochanter; femora gently swollen, hind ones well short of end of elytra in both sexes; fore and middle tibiae in male mucronate; tarsite 1 elongate, 2 triangular, truncate, a little wider than one, 3 wider than 2; claws divaricate, with laminate expansion.

Male. Tergite 8 as in Fig. 150–151, extending cephalad at base, with a small median lobe, in profile nearly flat and smooth dorsally, delimited posteriorly by a weakly raised line on either side, with very small, setiferous puncta, hairs decumbent on basal area, erect on declivity, large part of the tergite (pygidium) tucked under against abdomen and showing in ventral view beyond abdomen. Sternites 8 and 9 as in Fig. 149, sternite 9 with long, slender arms. Tegmen as in Fig. 152–153, with distinct lateral articulation, anular part of ventral sector short, broad; dorsal sector deeply pigmented except for a central window and a pair of short, membranous flaps at apex, with two moderately long apical setae on either side of the pigmented apex, the supra-anular area not pigmented. Aedeagus as in Fig. 154; pedon asymmetric, parallel-sided at first, tapering at distal one-third to a long, narrow apex but left side (right in drawing) with an elongate excision or emargination; apex in profile straight, not up- or downcurved; tectum very narrow, well abbreviated at apex; apodemes a fraction shorter than aedeagal body, pedal arm distinctly articulated with pedon, dorsal arm continuous with tectum; internal sac extending to middle of apodemes, with a basal sclerite consisting of two arms of uneven length and thickness; duct inserting ventrally near base.

Female. Sternite 8 and hemisternites much as described for the other genera above; colleterial gland, bursa, and spermatheca as in Fig. 155–156; spermatheca with large, bulbous base and slender stalk and apex, the gland moderately sacciform, close or far from duct insertion; duct a good deal longer than bursa, thin throughout, inserting ventrally at base of bursa.

Distribution. New Zealand, endemic.

Host plant. *Metrosideros* spp. (Myrtaceae).

Remarks. *Neocyba* is closely related to *Rhadinocyba* Faust from New Caledonia. Two species are recognised, one somewhat variable from North Island and South Island and the offshore islands on the eastern side of North Island, the other is confined to the Three Kings group of islands.

Etymology. It was said that the name ‘neocyba’ was just ‘an arbitrary combination of letters’: it can, however, be

derived from the Greek néos = new, and kýbe = head used as a suffix for related genera; gender feminine.

Neocyba metrosideros (Broun)

Fig. 15, 149–156, 170–172; Map 15
Broun, 1880: 466 (*Apion*). —Kissinger, 1968: 17, fig. 25d–h, 27i, j. —Kuschel, 1990: 36, 70, fig. 177. —May, 1993: 49, fig. 364–372 (larva).

Black or reddish brown with slight bronze coloration, if reddish brown then suture darker; scape and first 1 or 2 funicular antennites reddish brown, legs a shade redder than body. Vestiture sparse, consisting of fine, rather long pubescence applied to surface or, frequently, somewhat raised in the humeral area, the pubescence becoming more obvious on black specimens; frons and base of rostrum in lateral view distinctly hairy (Fig. 15).

Head on sides behind eyes impunctate. Frons dull, finely punctate. Rostrum in male as long as prothorax, dull, finely punctate, in female 1.25x longer than prothorax, shiny, nearly smooth.

Prothorax 1.25–1.35x longer than wide, dull with alutaceous minisculpture, indistinctly punctate.

Elytra shiny, interstriae much wider than striae, slightly convex, with one or two rows of shallow punctation; marginal interstria alongside metepisternum distinctly pubescent, here with trace of stria 10 showing as a slightly impressed line. Remainder of characters as in the description of genus above.

Male. Asymmetry of pedon rather pronounced, with a long indentation or excision on the left side before apex, this excision ending in an obvious angle or tooth on the somewhat upcurved sides.

Female. Bulbous base of spermatheca transverse, without a duct extension, duct and gland far apart.

Length 1.4 - 2.3 mm.

Types. Lectotype female, 2.0 x 0.72 mm, Tairua, 828, *Apion metrosiderae* [sic], T. Broun, BMNH. A paralectotype plus two non-type specimens in T. Broun Coll., BMNH.

Material examined. 2 type specimens and 500+ non-type specimens. **North Island. ND.** Coopers Beach; Mangamuka Saddle, Maungataniwha Range; Fern Flat Road, Maungataniwha Range; Te Matua Ngahere, Waipoua SF; Waipoua Forest, Yakas Track; Warawara SF; Horahora Bush; Tutukaka Harbour; Smugglers Cove, Whangarei Heads; Manaia, Whangarei Heads; Whangarei Heads; Whangarei; Beach Cove, Whangarei Heads; Parahaki; Parua; Waipu; Tawhiti Rahi I, Poor Knights Is; Aorangi, Poor Knights Is; Maori Bay I, Mokohinau Is; Fanal I, Mokohinau

Is. **AK.** Tiritiri Matangi I; Kawau I; Wenderholm; Helensville; Clevedon; Paparoa nr Howick; Titirangi; Waitakere; Scenic Drive, Auckland. **CL.** Little Barrier I; Little Barrier I, Caretaker's Garden; Little Barrier I, Te Maraeroa; Great Barrier I; Kaitoke, Great Barrier I; Rangiwhakaea Bay, Great Barrier I; Coromandel Peninsula, West Coast; Te Hope Beach; Tairua; Pioneer Ridge, Cuvier I; Stanley I, Mercury Is; Red I, Mercury Is; Middle I, Mercury Is; Ohinau (Ohena) I, Ohinau Is; Koruenga I, Ohinau Is; Ruamahua I, Aldermen Is. **TK.** Midhurst. **WN.** Akatarawa. **South Island.** **NN.** Pigeon Saddle, Takaka; Mt Burnett; Oparara. **BR.** Punakaiki. 500+ adult specimens — see Appendix 2 for details of specimens examined.

Distribution. ND, AK, CL, TK, WN / NN, BR

Host plant. *Metrosideros excelsus* (pohutukawa), *M. robustus* (rata), *M. umbellatus* (southern rata), and *M. sp.* (prob. *albiflorus*) (Myrtaceae).

Remarks. A very common species on North Island eastern offshore islands from Poor Knights Is (lat. 35°28'S) south to Mayor I (lat. 37°17'S), rather sparse in the North Island proper but present in the Northland, Auckland, and Coromandel Peninsula districts as far south as Tairua (lat. 37°01'S). Single records only from Taranaki (Midhurst), Wellington (Akatarawa), and Buller (Punakaiki, lat. 42°07'S), and in NW Nelson one record each from Pigeon Saddle and Oparara, and two from Mt Burnett. No records from the northern 70 km of Northland from North Cape (lat. 34°25'S) to Coopers Beach (lat. 34°59'S).

Adults and larvae are associated principally with the arboreal species of the myrtaceous genus *Metrosideros*, the larva living subcortically in one- or two- year-old live twigs (May 1987). Adults and larvae were only once found on a liane species (probably *M. albiflorus*).

Etymology. *Metrosidéros* ('steelmeasure') is the genus of the host plant, here used as a noun in apposition; the gender is determined by that of *sideros* (steel), which is masculine, and is to be treated as such in its transliterated form of *siderus*, whence its genitive or possessive form is *metrosideri* (not *metrosiderae* or *metrosiderosi* as sometimes published).

Neocyba regalis new species

Fig. 157, 179, 180; Map 16

Bronze coloured black, bronzier on pronotum and elytra; head anteriorly, frons, pronotum, apex and sides of elytra, and entire underside of body dull; legs and antennae, except for the reddish shaft of scape, black. Vestiture minute, under 25µm, pronotal disc and elytral dorsum and sides seemingly glabrous; frons and base of rostrum in lateral view not obviously hairy.

Rostrum in male 1.10–1.15x longer than prothorax, in female 1.35–1.40x so, otherwise as in *N. metrosideros*, but punctuation finer, indistinct.

Pronotum as in *N. metrosideros* except for much less conspicuous pubescence.

Elytra similar to those of *N. metrosideros*, but appearing glabrous at 10x magnification; interstriae impunctate, marginal one alongside metepisternum glabrous or with extremely minute pubescence only, here without any indication of a rudimentary stria 10.

Male. Pedon weakly asymmetric, left side before apex without a distinct excision and without a tooth or blunt point.

Female. Bulbous base of spermatheca oblique, with a curved, tubular duct extension, duct and gland insertions rather close (Fig. 157).

Length 1.7–2.2 mm.

Types. Holotype male, 2.2 x 0.9 mm, Tasman Valley, Great I, Nov 1970, on *Metrosideros excelsus*, G. Kuschel, NZAC. 62 Paratypes AMNZ, CMNZ, LUNZ, MONZ, NZAC.

Material examined. Holotype and 62 paratypes. **TH.** Great I; North East I; South West I; West I. 63 adult specimens — see Appendix 2 for details of specimens examined.

Distribution. TH / - / -.

Host plant. *Metrosideros excelsus* (Myrtaceae).

Remarks. *N. regalis* differs strikingly from *N. metrosideros* in having the dorsal surface of elytra glabrous instead of conspicuously pubescent, the apex and sides of elytra and the entire underside dull instead of shiny, and a nearly symmetric aedeagus with a pedon only slightly excised on the left side before the apex.

Etymology. The specific name refers to the geographic area of origin of this apionine.

Exapion Bedel

Fig. 16–18, 158–166

Bedel, 1887: 360 (type-species *Curculio fuscirostris* Fabricius).

–Reitter, 1916: 241. —Schatzmayer, 1925: 9. —Hoffmann, 1958: 1471. —Voss, 1966: 200. —Kissinger, 1968: 35. —Lohse, 1981: 129, 144. —Alonso-Zarazaga, 1986: 199; 1990: 76, 78.

Head spherical, temples shorter than an anteroposterior diameter of eye. Frons flat, as wide as pronotum. Eyes oval, dorsoventral diameter much greater than depth of pronotum. Rostrum longer than prothorax, curved; scrobes lateroventral, short, concealed under a basal rhomboidal expansion ending lateroventrally in a tooth. Antennae long, if folded back reaching hind margin of prothorax, if stretched forward passing by a club length the tip of rostrum in male, not quite reaching the tip in female, slender, subbasal; scape long, weakly thickening apicad, directed down or forwards, not curved outwards at apex; funicle slender, long, slightly deflected from scape; club elongate, subcompact, segment 1 less than half club length.

Prothorax transverse, bisinuous at base, without a basal rim, faintly constricted at apex, rounded on sides, widest near basal third, weakly convex, with prescutellar groove, in profile strongly proclivous, twice as long dorsally as ventrally. Scutellum small, ascending vertically to level of elytra.

Elytra with humeral callus, gradually widening in straight line to middle, converging in convex curve to a faintly rounded-off apex, sinuous at base, falling vertically on to mesonotum; axial convexity on dorsum gentle to middle, tangential convexity more pronounced; with nine deeply sulcate, distinctly punctate striae; interstriae flat or nearly so; vestiture densely squamose, concealing integument, with a sensory seta on middle of interstria 7, occasionally with another at end of interstria 9; lateroventral flange continued as a carina to stria 2 behind preapical bulge. Hind wing lacking radial window and anal lobe, showing only one faintly marked anal vein.

Prosternum and area behind fore coxae very short; mesepimeral suture sulcate; meso- and metasternal processes meeting between coxae; process of ventrite 1 broadly rounded, suture 1 of abdomen obsolescent, ventrite 5 in male truncate, not rimmed at apex, in female rounded. Tergites pigmented, undivided except for 7; intersegmental membrane beyond 7 lacking pouch in both sexes.

Fore and middle trochanters short, their longer edge not greater than width; femora weakly swollen, hind ones slightly passing tip of elytra in male, not quite reaching end of abdomen in female; tibiae lacking mucro in both sexes, first two tarsites elongate, tarsite 3 distinctly broader than 2; claw segment weakly widening apicad, passing 3 by half its length, claw divaricate, with broad tooth.

Male. Tergite 8 as in Fig. 163–64, smooth anterior area cut off by a high flange across, posterior area strongly convex, not or hardly showing in ventral view beyond abdomen. Sternite 8 transverse, undivided, with deep emargination. Sternite 9 as in Fig. 152, with a small, weakly pigmented blade and no arms, with a long, very thin apodeme fused to blade. Tegmen as in Fig. 158–159, distinctly shorter than aedeagus, articulated on sides; ventral section with long arms; dorsal section as long as ventral, with broad, vertical sides embracing compressed part of aedeagal body, with a well-pigmented transverse bridge and an arc enclosing a window, with two long, narrow, contiguous membranous parameres. Aedeagus as in Fig. 160–161, very long, slender, rather weakly pigmented; pedon strongly compressed at basal half, in lateral view deep owing to highly upturned sides; tectum and apodemal tectal arms indistinct; apodemes considerably shorter than aedeagal body, weakly articulated, joining body dorsally; internal sac with fine wall lining.

Female. Sternite 8 as in Fig. 165, blade weakly pigmented, fringed with very short setae, the clear connective membrane usually showing beyond; apodeme slender, about 3x as long as blade. Genitalia (Fig. 166) with long hemisternites and styli, long vagina and bursa, bursa subcylindrical; spermatheca with cylindrical gland on a brief promontory at proximal end; duct insertion on inner face close to gland, duct fine all the way, relatively short.

Distribution. Palearctic.**Host plants.** On the tribe Genisteae (Fabaceae).

Remarks. One species in New Zealand, deliberately brought in for partial control of gorse, *Ulex europaeus*. Easily distinguished from native species by a dense scaly cover and subbasal antennae inserted under a basal rostral expansion.

Etymology. *Exápion*, a Greek compound from the prefix *ex* = from, and the basic genus *Apion*.

Exapion ulicis (Forster)**gorse weevil**

Fig. 16–18, 158–166; Map 17

Forster, 1771: 31 (*Curculio*). —Davies, 1928: 263 (*Apion*). —Miller, 1935: 13; 1936: 584; 1971: 110, fig. 290–292. —Cumber, 1959: 769. —Eyles, 1961: 137. —Kuschel, 1972: 276, 286. —Sharell, 1982: 107.

Black or piceous, scape, funicle, fore femora and tibiae reddish brown, middle and particularly hind femora distinctly darker than fore legs. Vestiture of pronotum and

elytra dense, concealing nearly completely integument, ash grey, consisting of lineal or lanceolate scales, vestiture less dense on head, rostrum, legs and underside except last ventrite (Fig. 16).

Head spherical; temples short, one-third or quarter of an anteroposterior diameter of eyes, sparsely pubescent. Rostrum in male 1.25–1.35x longer than prothorax, rather strongly curved, postrostrum rhomboidal in dorsal view, ending in a lateroventral tooth, dull, sparsely squamose, prostrum shiny, glabrous, finely punctate; rostrum in female 1.75–1.90x longer than prothorax, distinctly less curved, also shiny and finely punctate.

Prothorax 1.15–1.25x wider than long, with a deep median groove on basal third, with a weak lateral constriction. Remainder of characters as in the description of the genus above.

Length 1.7–2.4 mm.

Material examined. North Island. ND. Kawakawa; Whangarei Heads; Bay of Islands, Paroa Bay; Mt Manaia. **AK.** Waiheke, Man O'War Stn; Palm Beach; Mt Albert; Waitakeres; Auckland; Whangaparaoa Peninsula; Auckland Wharf; Noises Is, Motuhoropapa I, Snail Flat; Pollen I; Bethells, Matuku Res; Glen Eden, Waikumete Cemetery; Riverhead SF; Lynfield; Kaukapakapa; East Tamaki. **CL.** Mayor I, Otiore Bay. **WO.** Onewhero. **BP.** Blue Lake, Rotorua; Waitawheta Gorge, nr Waihi; Mt Te Aroha. **HB.** Puketitiri, Little Bush; Ocean Beach. **WI.** Marton. **WN.** Mt Hector; Tararua Ra, River Forks; Dundas Ridge. **WA.** Martinborough. **South Island. SD.** Kenepuru Sound; Okiwi Bay; French Pass. **NN.** Nelson; Aniseed Valley; Richmond; Nelson, Monaco; Mt Fell, Richmond Ra; Mt Arthur; Mt Robert; Mt Johnson Sdle; Parkes Farm, 88 Valley; Dun Mt; Dun Tk, Third House; Nelson, Botanical Hill; Pretty Bridge Valley; Takaka Hill, Canaan Tk; Takaka Hill Saddle; Canaan; Mt Owen; Cawthron Institute; Ben Nevis summit; Ruby Bay; Kaituna R, Collingwood; Mt Peel; Totaranui. **BR.** Lewis Pass; Ada Pass; Mawhera SF; Fletchers Ck; Reefon, Inangahua V; Mt Dewar. **WD.** Lake Paringa. **MB.** Mt Altmarlock; Black Birch Ra; Jollies Pass, Hamner Springs. **KA.** Charwell; Mt Percival; Mt Terako. **NC.** 3 km W Cass; Waipara. **MC.** Banks Peninsula, 4 km E Akaroa; Lincoln; Christchurch; Porters Pass; Ellesmere, Greater Rakaia I; Mt Hutt; Ashburton. **SC.** Opihi R; Orari Gorge; Tengawai R, nr Pleasant Pt; Ikawai R. **MK.** L. Pukaki, Te Kohai I. **OL.** Coronet Peak; Fog Peak; Takatimu Mts. **CO.** Tuapeka County, 2 km E. Beaumonte; Dunstan Ra, Castle Rock; Bannockburn; Alexandra; Earnsclough. **DN.** Oamaru. **SL.** Invercargill; Hedgehope Summit, Hokonui Hills; Orepuki; Lumsden; Orepuki. 431 specimens — see Appendix 2 for details of specimens.

Distribution. North Island. Throughout wherever gorse (*Ulex europaeus*) is established. **South Island.** Everywhere in gorse country.

Type. Not seen, but species well defined and easily recognised.

Host plant. Only on *Ulex europaeus* (gorse) (Fabaceae) in New Zealand; adults feeding on leaves and flowers, larvae feeding on developing seeds in pods.

Remarks. *Exapion ulicis*, known as 'gorse seed weevil', was introduced on purpose for partial biological control of gorse and released in Nelson on 25 Feb 1931 and Alexandra on 27 Feb 1931, becoming quickly established all over the country. It is essentially a lowland species but may, on occasion, be found in enormous numbers also on subalpine and alpine mats and cushion plants. The gorse seed weevil is apparently carried up by thermals in the summer, especially after gorse bush fires in valleys and foothills below.

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Appendix 1. Phylogenetic relationships of the genera of Belinae

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Introduction

The current classification of Belidae follows that of May (1994), Kuschel (1995), and Lawrence & Newton (1995) where three subfamilies are recognised: Belinae Schoenherr, Oxycoyryinae Schoenherr, and Aglycyderinae Wollaston (see also Alonso-Zarazaga & Lyal 1999). We focus our study on the subfamily Belinae because it is the principal group present in New Zealand and Chile and is relatively well known taxonomically.

Belidae is a monophyletic family and its three subfamilies have been defined by Kuschel (1995). Two tribes were recognised in Belinae by Kuschel (1959) — Belini Schoenherr and Pachyurini Kuschel — which were based mainly on mandibular (C9, see list of characters below) and aedeagal characters (C43–45). The tribes were elevated to subfamily rank by Vanin (1976). Zimmerman (1994) added a third tribe, Agnesiotidini Zimmerman, to separate two groups from Pachyurini based on the presence or absence of sulci on the frons (C6 and C7). This character has not been described with sufficient precision in Zimmerman (1994) as it consists of more than one character state. Moreover, the placement of some genera in these two tribes is rendered rather doubtful, because of the variability found in the sulci by Zimmerman (1994).

There are also several problems with the taxonomic limits of some genera as recognised at present. The South American *Atractuchus* and *Dicordylus* seems to be very closely related because they share two unique features, the presence of teeth on the aedeagal pedon and the presence of a submedian dorsal spot on each elytron, while differing in the shape of the prothorax, a character considered of little phylogenetic significance. Because these two genera share two strong synapomorphies and differ only in a weak character, *Atractuchus* is here synonymised with *Dicordylus* (**new synonymy**), although these genera were

placed in different tribes by Zimmerman (Table 1). The genus *Pachyura* was determined to be paraphyletic by Kuschel (1959) who proposed *Pachyurinus* for the *Pachyura* species described by Broun (1880, 1893, 1915) from New Zealand. In this treatment, three species of *Pachyurinus* are placed in the new genus *Rhincobelus*. The monotypic Australian genus *Pachyura* is listed by Zimmerman (1994) in Agnesiotidini, as well as in Pachyurini in the keys because frontal sulci may be present in some specimens and absent in others. The genus *Agathinus* Broun of New Zealand was synonymised by Zimmerman (1994) with the Australian genus *Cyrotyphus* (3 species) though the former differs from *Cyrotyphus* in a number of characters (C3, 4, 7, 12, 19). The species of *Agathinus* and *Cyrotyphus* are treated as terminals in the cladistic analysis.

The genus *Rhinotia* from Australia and Papua New Guinea contains well over 80 species in Zimmerman (1994). It is remarkably diverse and could easily turn out polyphyletic. We include two rather disparate species in the data matrix, among them the type-species *R. haemoptera*.

Methods

A total of 28 species in 22 genera were examined (Table 1) for the data matrix (Table 2). The sample includes all of the New Zealand and Chilean species. The taxa selected represent the full spectrum of variation of the subfamily of Australasia and South America. Only the following four genera were left out of consideration because no specimens were available for examination:

Habrobelus Zimmerman (Pachyurini, 1 sp., Queensland). Distinguished by the following jointly occurring characters of an elongated prosternum, long temples, and no concave curvature between head and rostrum.

Isacanthodes Zimmerman (Belini, 2 described and 5 undescribed spp., widespread in Australia). This genus has the facies of *Isacantha*, but differs considerably from all other Belini in femoral, tibial, and elytral features, particularly in having long hind femora that extend beyond ventrite 2.

Pachybelus Zimmerman (Pachyurini, 1 sp., Queensland and New South Wales). The presence of elytral tubercles and tufts render this genus unique amongst Pachyurini.

Rhinotiodes Zimmerman (Belini, 1 sp., Queensland and New South Wales). Said to be rather similar to *Rhinotia haemoptera*, but has a very inflated metasternum, an elytral suture that ends in a prominent tooth, and dentate femora.

To root the trees we chose the basal chrysomeloid *Palophagus* (Megalopodidae) because this genus has the ancestral features considered basal for Curculionoidea

Table 1. Terminal taxa selected for phylogenetic analysis of Belinae (Belidae). Placement according to Alonso-Zarazaga & Lyal (1999).

Agnesioidini

Agathinus tridens (Fabricius)
Agathobelus bivittatus Zimmerman
Agnesioidis pilosula Pascoe
Apagobelus brevirostris (Lea)
Basiliobelus flavovittatus Zimmerman
Cyrotiphys blandus (Faust)
Cyrotiphys fascicularis Pascoe
Cyrotiphys variegatus Lea
Dicordylus binotatus (Philippi)
Dicordylus marmoratus (Philippi)
Macrobelus insignis Lea

Belini

Araibelus filum (Jekel)
Homalocerus lyciformis (Germar)
Isacantha dermestiventris (Boisduval)
Rhinotia bidentata (Donovan)
Rhinotia haemoptera Kirby
Stenobelus tibialis (Blackburn)
Trichophthalmus miltomerus (Blanchard)

Pachyurini

Arhinobelus agathophagus Zimmerman
Atractuchus annulifer (Philippi)
Callirhynchinus exquisitus (Fairmaire & Germain)
Hadrobelus undulatus (Zimmerman)
Pachyura australis Hope
Pachyurinus sticticus (Broun)
Rhcnobelus aenescens (Broun)
Rhcnobelus metallicus (Broun)
Rhcnobelus rubicundus (Broun)
Sphinctobelus cinereus (Blanchard)

Palophaginae (Megalopodidae)

Palophagus bunyae Kuschel

(Kuschel and May 1990, 1996a,b). A total of 48 characters from adults of both sexes were scored for a cladistic analysis.

The data were coded and entered into MacClade version 3 (Maddison and Maddison 1992) and analysed using PAUP* Version 4.0b8 for Macintosh (Swofford 2001). The settings used in PAUP* for heuristic tree searches included a 100 random addition sequence with stepwise addition (holding 25 trees at each step) set with steepest descent; character states were treated as unordered; TBR branch swapping on all trees; and zero-length branches

were collapsed. Polarity of character states was determined after the trees were produced. To further resolve relationships and find consistency for character congruence in these trees, successive approximations character weighting (SAW; Farris 1969; Carpenter 1988, 1994), an *a posteriori* weighting method, was performed on the resulting trees (weights were set at 10 and based on the consistency index with analyses truncated). Ambiguous characters were plotted onto trees using standard ACCTRAN and DELTRAN optimisations (Maddison *et al.* 1984) and in the discussion below, characters that reverse to other states are indicated by the superscript C^r.

Character list and argumentation

1. *Shape of temples in dorsal view*. Converging caudad (0); parallel-sided or broadening caudad (1). This character is to be observed with the head in normal position, not extruded.
2. *Length of temples (t) to length of eyes (e)*. $t = \text{or} < e$ (0); $t > e$ (1). A usually unequivocal character, but is marginally distinct for *Cyrotiphys* and the *Atractuchus/Dicordylus* complex.
3. *Breadth of frons in relation to apex of rostrum*. Equal or narrower (0); wider (1). The frons is the whole area between the eyes when viewed from above. The breadth of the frons is the minimum distance between the eyes. Variations may be encountered, particularly in *Cyrotiphys* and the *Atractuchus/Dicordylus* complex, rendering a safe scoring somewhat difficult.
4. *Surface of frons in lateral view*. Flat or convex (0); depressed (1). A depression at the front and base of rostrum is ignored for coding this character. It is primitive if the frons above the middle is level or convex in relation to the upper margin of the eyes.
5. *Frontal carina*. Absent (0); present (1). This character refers only to the presence of elongate, high carinae; consequently a small, inconspicuous carina sometimes present is not considered. This feature is exclusive of *Hadrobelus* and *Pachyura*.
6. *Sides of frons near eyes*. Lacking depressions (0); with superficial or well defined grooves (1). A superficial groove, longitudinal depression, or deep groove may be present on many beline taxa.
7. *Form of groove of frons near eyes*. Shallow (0); deep (1); inapplicable for taxa coded as 6-0. A shallow superficial groove is a longitudinal, rather broad depression without sharp sides and with microsculpture at the bottom; a deeply engraved or incised groove is a narrow sulcus with sharply defined sides and a smooth,

Table 2. Data matrix for Belinae. * = polymorphic characters.

	10	20	30	40	
Palophagus	000000?000	0000000000	0000000000	0000000000	0000?000
Agathinus	1111010010	0101011122	0010010110	0010010100	0101?110
Agathobelus	101000?110	1001001121	1100000001	?000000011	1001?010
Agnesiotis	101011010	1001100102	0010000110	0010010110	1101?110
Apagobelus	1010011110	1011001011	1100000001	?001000011	1001?010
Araiobelus	111000?100	1010000010	1101000000	0100101101	10111010
Arhinobelus	001000?110	1000001001	1100000000	1010000011	1001?010
Atractuchus	1100010010	0000111122	0010000110	0010010100	1101?111
Basiliobelus	1010011110	1011001011	1100000001	?001000011	1001?010
Callirhynchinus	001000?110	1010011020	1100001000	0000000011	1001?010
C. blandus	1110011010	0001011102	0010010110	0010010100	0101?110
C. fascicularis	1000011010	0001011102	0010010110	0010010100	0101?110
C. variegatus	1000011010	0001011102	0010010110	0010010100	0101?110
D. binotatus	1101010010	0101111102	0010010110	0010010100	1101?111
D. marmoratus	1100010010	0000111122	0010000110	0010010100	1101?111
Hadrobelus	1010110110	1011011021	1100000000	1000000011	1000?010
Homalocerus	101000?001	1010011101	1100000000	0100101101	10110010
Isacantha	101000?100	1011011100	1100000000	0100101111	11111000
Macrobelus	1100010110	1001001121	1101001000	1000000010	1001?010
Pachyura	111010?110	1001011121	1100000000	*000000000	1000?010
R. rubicundus	011000?110	1010010010	1100101001	?010000000	1001?010
P. sticticus	011000?110	1010011110	1100000001	?010000000	0001?010
R. aenescens	011000?110	1010011020	1100101001	?000000000	1001?010
R. metallicus	011000?110	1010011010	1100101001	?010000000	1001?010
R. bidentata	101000?100	1001011110	1101000000	0100101111	11111001
R. haemoptera	101000?100	1011011110	1101000000	0100101111	1*111000
Sphinctobelus	011000?110	1010011010	1100000001	?000000011	1000?010
Stenobelus	101000?000	1010001010	1101000000	0100101101	11111010
Trichophthalmus	101000?001	1010001101	1100000010	0100101101	10110010

impunctate bottom. Shallow impressions in some species are often covered by setae or scales, and the latter state is a rather distinctive feature given prominent status by Zimmerman (1994) when proposing his tribe Agnesioidini.

8. *Apex of epistome*. Truncate or bilobed (0); bidentate (1). There often is a slight emargination or fovea on either side of a median emargination or excision of the epistome that induces a pointed or blunt tooth. The difference between the two states is obvious except in *Sphinctobelus* which has a minute, punctiform fovea not producing a distinct bidentate epistome.
9. *Apical tooth of mandibles in dorsal view*. Exposed in front of median tooth (0); hidden, tucked under the median tooth (1). Closed mandibles of Belini and Pachyurini are noticeably different if viewed from the side, the front and above. Some practice with viewing this character is required to assess it safely.
10. *Labial palp*. 3-segmented (0); 1-segmented (1). It is advisable to dissect the mouthparts to count the palpal segments with confidence. The derived state is found only in the South American *Homalocerus* and *Trichophthalmus*.
11. *Ommatidia*. Coarse (0); fine (1). The varying coarseness of eyes is the result of the time of prevalent activity; fine eyes for diurnal species and coarse ones for nocturnal species. Careful observations are required to distinguish character states. If, for instance, the eyes

- of *Rhcnobelus* and *Rhinotia* are checked against those of *Agathinus* and *Cyrotypus*, the difference is immediately apparent. If, on the other hand, the eyes of *Pachyura* are examined, it may not be easy to decide its state. Colour appears to also vary with development of the ommatidia. In general, if the integument of the species has a metallic sheen and its tergites are heavily pigmented, that would indicate a diurnal habit.
12. *Protrusion of eyes*. Moderately convex (0); hemispherical (1). The eyes of all Belinae protrude to the sides, but the convexity varies. This character is of limited value; the extreme, spherical state is found only in the New Zealand *Agathinus* and the Chilean *Dicordylus binotatus*.
 13. *Insertion of antennae*. Antemedian or median (0); postmedian (1). The measurements are done from the suprainsertional knob to the epistomal apex and from the middle of the knob to the anterior margin of the eyes.
 14. *Antennomere reaching eyes*. 1 or 2 (0); 3 (1) These states are easily determined if antennae are folded back and/or the first two segments, excluding the condyle of the scape, are measured to verify whether their combined length would reach the eyes. The first segment reaches the eyes in *Homalocerus* and *Trichophthalmus*. The character is of limited value in certain taxa, because the two segments pass the front margin in *Atractuchus*, only slightly in *D. marmoratus*, and not at all in *D. binotata*.
 15. *Length of antennal segment 3 in relation to 1+2 combined*. Equal or shorter (0); longer (1). The 3rd antennal segment is distinctly longer than the first two combined in *Agnesiotis* and *Atractuchus*, and is only marginally longer in *Dicordylus*.
 16. *Pronotal impressions on either side of median line*. Absent (0); present (1). Impressions on the pronotum are present in some Agnesiotidini and Pachyurini.
 17. *Groove at midline of pronotum*. Absent (0); present (1). A median groove is usually obvious as a sulcus or a median scaly stripe; it is rather weak in *Rhcnobelus* and *Sphinctobelus*.
 18. *Sides of prothorax at apex in dorsal view*. Not or hardly constricted (0); strongly constricted to form a collar (1). If the constriction is distinct enough, it shows as a collar on the sides and sometimes also on the dorsal surface.
 19. *Widest breadth of prothorax*. Near middle (0); at basal third (1); at basal angle (2). The lateral outline of the prothorax can vary individually a good deal in some species. The derived states are sometimes difficult to separate if the widths of the sides and hind angles are about the same.
 20. *Surface of scutellum*. Flat (0); impressed (1); convex (2).
 21. *Anterior declivity of scutellum*. Sloping (0); vertical (1); proclinate (2). A sloping condition is always evident, but the prothorax and elytra must be slightly apart to see whether the anterior declivity of the scutellum is vertical or overhanging, i.e., inclined forward or proclinate.
 22. *Base of elytra and prothorax in dorsal view*. Elytra with weak or no lobe, prothorax subtruncate (0); elytra with large lobe, prothorax strongly bisinuous (1). The shape of the base of the prothorax is a direct response to the degree of protrusion and overhang of the elytral lobes, the two features being directly interdependent.
 23. *Base of elytra in profile relative to pronotum*. Level or lower (0); higher (1). This character may define two distinct groups in Pachyurini. Elytra that are present at a lower level than the pronotum are found in a number of Belini.
 24. *Elytral declivity at apex in profile*. Pronounced (0); absent or gentle (1). State 1 is characteristic for most *Rhinotia* species, their elytral apex with some frequency somewhat upturned. *Macrobelus* is the sole pachyurine genus approaching this feature which otherwise is common in Belini.
 25. *Transverse rugae on elytra*. Absent (0); present (1). An autapomorphy for *Rhcnobelus*.
 26. *Tubercles and/or tufts on elytra*. Absent (0); present (1). State 1 is present only in *Agathinus*, *Cyrotypus*, and *D. binotatus*.
 27. *Integumental sheen*. Non-metallic (0); metallic (1). Among the selected terminal taxa, *Callirhynchinus*, *Macrobelus*, and *Rhcnobelus* have a metallic, usually bronze sheen.
 28. *Shape of radial cell window of hind wing*. Trigonal (0); pentagonal or tetragonal (1). For trigonal state see Fig. 46–49, 54–56, for the other state see Fig. 50–53.
 29. *Extension of Cu in relation to hind margin of wing*. Extending to the hind margin or very nearly so (0); ending some distance from it (1). Samples of an abbreviated Cu are shown in Fig. 50–53 and 56, a feature of Agnesiotidini and the South American Belini.

30. *Crossvein* a_2 - a_3 . Present (0); absent (1). Individual variations in the wing venation occur and discrepancies even in the two wings of the same specimen may be noticed on occasions. The crossvein a_2 - a_3 is usually present, though the length may vary (see next character) and it may be absent where veins a_2 and a_3 are fused at their bases (Fig. 49).
31. *Crossvein* a_2 - a_3 . Present as a relatively long vein (0); rudimentary (1); inapplicable for taxa coded as 30-1. Samples of a long a_2 - a_3 are shown in Fig. 46–48, 59–53 [correct fig??]. No figure is provided for a crossvein of state (1), but it is considered rudimentary if the crossvein is only about as long as wide.
32. *Shared track of* A_1 + A_2 *apicad of* a_2 - a_3 *or junction of the shared track with* A_3 . Long (0); short (1). This character separates Pachyurini and Belini. Vanin's (1976) Figure 23 for *Trichophthalmus*, showing a long shared track, is at odds with our observations and Fig. 56.
33. *Vein* A_1 . Complete (0); interrupted or absent (1). This vein is consistently interrupted in Agnesiotidini (Fig. 50–53) and two species of New Zealand Pachyurini (Fig. 49) and absent only among the taxa surveyed in *Rhincobelus metallicus*.
34. *Direction and distance of* a_3 - a_4 *in relation to* *cu-a*. Oblique and distant (0); transverse and close (1). There is no figure here provided to illustrate this character. State 1 is peculiar to *Apagobelus* and *Basiliobelus*.
35. *Position of procoxae*. Slightly postmedian (0); slightly antemedian (1). The position of the procoxae relative to the front and hind margin of the prothorax distinguishes the two tribes Belini and Pachyurini.
36. *Sides of pro- and mesocoxae*. Partially or entirely open (0); completely closed (1). The coxal cavities are completely closed if the lobes that enclose the coxae show not even an indentation at the suture. In state 0 the lobes leave at least a triangular gap right next to the coxae. Closed coxal cavities may constitute a strong apomorphy for Agnesiotidini.
37. *Length of hind femora in relation to hind margin of ventrite 2*. Passing it (0); at most reaching it (1). This character may be useful for separating the tribes Belini and Pachyurini.
38. *Crenulated ridge on laterodorsal surface of tibiae*. Absent (0); present (1). Tibiae must be seen at the right light and turn to be certain of the presence or absence of the ridge. A crenulated ridge is present in all taxa of Belini and Agnesiotidini.
39. *Tibial formula of spurs*. 2-2-2 (0); 1-2-2 (1). Spurs are always distinct and hardly ever different in size on the middle and hind tibiae. If the protibiae have two spurs, these may be small and of uneven length, and could be missing from a tibia because of breakage.
40. *Denticulation on lower edge of tibiae*. Absent (0); present (1). Presence of denticulation on the protibiae is observed in all Belini and in over half of the terminal taxa of Pachyurini selected, but the denticulation is sometimes rather fine (e.g., *R. metallicus*).
41. *Mucro on fore and/or middle tibia in male*. Absent (0); present (1). Among the taxa considered, a mucro is absent only in *Agathinus*, *Cyrotiphus*, and *Pachyurinus*.
42. *Spines on lower edge on one or more femora*. Absent (0); one spine present (1); two or more spines present (2). Having femoral teeth is a feature of the Agnesiotidini (except in odd males of *Atractuchus annulifer argus*) and the vast majority of Belini.
43. *Pedon and tectum of aedeagus*. Free throughout (0); at least partially fused to a tubular structure (1). This character invariably separates the two recognised tribes.
44. *Basal and guide sclerites in internal sac*. Absent (0); present (1). A basal sclerite is absent from *Macrobelus*, *Pachyura*, and *Sphinctobelus*, the remainder of Pachyurini have a rigid basal sclerite, apart from other small sclerites.
45. *Form of basal and guide sclerites in internal sac*. Basal sclerite present as a rigid 'flagellum' (0); basal and a long sclerite with a snare-like structure when viewed in profile (1). Belini have a very strange sclerite illustrated by Zimmerman's (1994) Figure 216a with a conspicuous 'snare'. The South American genera *Homalocerus* and *Trichophthalmus* have a weakly sclerotised guide-sclerite much like that of *Stenobelus* illustrated in Figure 235 of Zimmerman (1994).
46. *Length of parameral sector relative to apodeme*. Shorter or equal (0); distinctly longer (1). A long parameral sector is a salient feature for Agnesiotidini.
47. *Length of spermathecal duct relative to hemisternites*. As long as or longer than hemisternites (0); very short, sessile, or subsessile (1). All Belinae examined have a thick and short spermathecal duct, but some among these may be as long as or even a little longer than the hemisternites.
48. *Median or postmedian spots of elytra*. Absent (0); present (0). *Rhinotia haemoptera* has spots, but these are more laterally placed on the elytra and are considered not homologous to those present in *Atractuchus annulifer*, *Dicordylus binotatus*, *D. marmoratus*, and *Rhinotia bidentata*.

Table 3. Groups supported in various analyses. AW = *a priori* weighting, SAW = *a posteriori* (successive approximation) weighting.

Higher Taxa	Adult SAW	Adult AW	Adult AW-SAW	Adult	Larval	Larval SAW	Combined	Combined SAW	Combined AW	Combined AW-SAW
Agnesiotidini	no	no	no	no	no	no	yes ¹	no	no	no
Belini	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Pachyurini	no	no	no	no	no	yes	no	no	no	no
Agathinus-group	yes	yes	yes	yes	no	no	yes ¹	yes	yes	yes

¹Note that a broad selection of larval Agnesiotidini were not available and the included species are representative of the *Agathinus*-group.

Results

Support for the tribes and generic groups we discuss here are provided in Table 3. An initial analysis resulted in 309 equally parsimonious trees (Tree length (TL) = 125; Consistency Index (CI) = 0.40; Retention Index (RI) = 0.77), and a consensus of these trees is shown in Fig. 188. In this tree only Belini (B in Fig. 188) are monophyletic, as well as a group that includes *Agathinus*, *Agnesiotis*, *Atractuchus*, *Cyrotypus*, and *Dicordylus* (we call this the *Agathinus*-group, A in Fig. 188). Successive weighting of these trees resulted in 12 trees by 2 iterations (the consensus of these is shown in Fig. 189). In this tree the *Agathinus*-group is monophyletic and is sister group to the remaining Belinae with a monophyletic tribe Belini.

The relatively poor resolution in the initial parsimonious trees suggests that some of the characters we recognise may be either too variable, intrinsically difficult to score due to ambiguous character states, or morphological features that are simply not useful for recognising monophyletic groups. We decided to *a priori* weight characters 9, 23, 28, 30, 36, 43, and 46 because these were recognised as critical characters in the classification of the group. We applied a base weight of 10 to the aforementioned characters and 8 trees were produced in this analysis (TL = 191; CI = 0.59; RI = 0.90), a consensus of these trees is shown in Fig. 190. In these trees, Belini and the *Agathinus*-group are monophyletic, but in this case Belini is sister taxa to the remaining members of Belinae which includes a monophyletic *Agathinus*-group. SAW analysis of these trees resulted in the same consensus tree (of 6 total trees).

Since adult characters have not been completely useful to resolve the beline tree, we decided to determine if larval data could provide useful phylogenetic signal to resolve relationships in Belinae, and we scored 6 larval characters to this matrix based on the larval work of May (1993, 1994). The larvae that have been described thus far are *Agathinus*, *Cyrotypus blandus*, *Hadrobelus*, *Rhiconobelus rubicundus*, *Pachyurinus sticticus*, *Sphinctobelus niger*

Zimmerman, *Rhinotia bidentata*, and *R. haemoptera* as well as the outgroup taxon *Palophagus* (Kuschel & May 1990, 1996). Note that a broad selection of larval Agnesiotidini is not available and only represent taxa from the *Agathinus*-group. The characters are as follows (data matrix in Table 4):

49. *Mandible*. Bidentate (0); tridentate (1); adentate (2). The number of teeth present on the mandible varies from one to two, and in *Rhinotia*, the mandibles lack teeth altogether (May 1994).
50. *Tormae*. Present (0); absent (1).
51. *Frontal horn*. Absent (0); present (1).
52. *Ocelli*. Six (0); one (1); two (2).
53. *Occipital foramen*. Closed (0); open (1).
54. *Median suture*. Present (0); absent (1).
55. *Form of spiracles*. Annular (0); bicameral (1).
56. *Placement of anus*. Terminal or subdorsal (0); ventral or subterminal (1).

Before combining larval data with the original data matrix we ran the larval data separately with the terminals represented in the data matrix (Table 4) which resulted in 12 trees (TL = 17, CI = 0.59, RI = 0.63). In these trees (a

Table 4. Larval data matrix, characters 49-56.

Palophagus	01	000000
Agathinus	00	010110
C. blandus	00	020110
Hadrobelus	10	001111
R. rubicundus	10	021000
P. sticticus	10	021000
R. bidentata	21	100101
R. haemoptera	21	020101
Sphinctobelus	10	111110

consensus is shown in Fig. 191) Belini is monophyletic and an SAW analysis resulting in 9 trees (by two iterations, consensus tree shown in Fig. 192) resulted in a monophyletic Belini which is sister group to the remaining taxa which includes a monophyletic Pachyurini. Using these exemplar taxa, we added the adult characters which resulted in 1 tree (TL = 83, CI excluding uninformative characters = 0.63, RI = 0.6824) shown in Fig. 193. This tree shows a monophyletic Agnesiotidini which is sister taxon to the remaining taxa which includes a monophyletic Belini.

A completely combined analysis (all taxa and characters) resulted in 536 trees (TL = 144, CI = 0.42, RI = 0.76) with the same relationships shown in Fig. 188 (the SAW analysis resulted in the same trees as shown in the consensus tree in Fig. 189). A priori weighting of characters 9, 23, 28, 30, 36, 43, and 46 resulted in 168 trees (TL = 209, CI = 0.59, RI = 0.89) that are similar to those seen with in Fig. 190 but with poorer resolution (consensus tree in Fig. 194). A consensus of 12 trees found by SAW is shown in Fig. 195.

Agnesiotidini

To this group we add *Atractuchus* from Pachyurini and formally remove *Agathobelus*, *Apagobelus*, *Basiliobelus*, and *Macrobelus*, which are transferred to Pachyurini. The Agnesiotidini is monophyletic based on the following characters (reference tree in Fig. 189 and unique characters indicated by an *): shape of temples in dorsal view parallel-sided or broadening caudad (1-1, present also in Belini), sides of frons near eyes with superficial or well defined grooves (6-1), third antennomere reaching eyes (14-1^r, reverses in *Atractuchus* and *Dicordylus marmoratus*), surface of scutellum convex (20-2*), base of elytra in profile relative to pronotum higher (23-1*), shape of radial cell window of hind wing pentagonal or tetragonal (28-1*), extension of Cu in relation to hind margin of wing ending some distance from it (29-1, present outside this group in *Trichophthalmus*), sides of pro- and mesocoxae completely closed (36-1*), crenulated ridge on laterodorsal surface of tibiae present (38-1, present outside this group in all Belini), one spine present on lower edge on one or more femora (42-1, present outside this group in some Belini), length of parameral sector relative to apodeme distinctly longer (46-1*). The following characters are concordant with these, including larval characters which are coded as missing for most terminals: sides of prothorax at apex in dorsal view strongly constricted to form a collar (18-1, equivocal ancestral reconstruction), median suture absent (54-1), and spiracles bicameral (55-1). If Agnesiotidini are a derived group in Pachyurini (Fig. 190), the following characters support its monophyly: apex of epistome truncate or bilobed (8-0), ommatidia coarse (11-0^r, reverses in

Agnesiotis), (20-2*), (22-0*), (23-1*), (28-1*), (29-1), crossvein a₂-a₃ present as a relatively long vein (31-0, DELTRAN), vein A₁ interrupted or absent (33-1), (36-1*), (38-1), (42-1), and (46-1*).

Dicordylus marmoratus is more closely related to *Atractuchus annulifer* than it is to *D. binotatus*, according to characters 4-0, 12-0, 19-2, and 26-0, which would suggest that these two species could be merged under one genus or that an additional genus would have to be proposed for *D. marmoratus*. We adhere to the synonymy of the two genera as stated previously as their differences are too slight to warrant independent status, although appearing in the trees as separate taxa. Though *Agathinus* groups as sister taxon to *Cyrotypus* in one case it should not be included in this genus (see Remarks in taxonomic section, p. 28).

Belini

Belini is a monophyletic group based on (reference tree in Fig. 190): shape of temples in dorsal view parallel-sided or broadening caudad (1-1, present also in Agnesiotidini), shared track of A₁+A₂ apicad of a₂-a₃ or junction of the shared track with A₃ short (32-1*), position of procoxae slightly antemedian (35-1*), length of hind femora in relation to hind margin of ventrite 2 not or just reaching it (37-1*), crenulated ridge on laterodorsal surface of tibiae present (38-1, present outside this group in all Agnesiotidini), aedeagus with pedon and tectum at least partially fused to a tubular structure (43-1*), insertion of antennae postmedian (13-1, equivocal ancestral reconstruction), and ventral or subterminal placement of anus (56-1, larval character that is coded as missing for most terminals) are concordant with these. If Belini is derived within Pachyurini (Fig. 189), then the following characters support its monophyly: (1-1), apical tooth of mandibles in dorsal view exposed in front of median tooth (9-0*), elytral declivity at apex in profile absent or gentle (24-1^r, reverses in *Homalocerus*, *Isacantha*, and *Trichophthalmus*), (32-1*), (35-1*), (37-1*), (38-1), (43-1*), mandible adentate (49-2, unique and probably specialised in *Rhinotia*), tormae absent (50-1, unique and probably specialised in *Rhinotia*), occipital foramen closed (53-0, shared with Agnesiotidini).

Pachyurini

As stated above to this group we add *Agathobelus*, *Apagobelus*, *Basiliobelus*, and *Macrobelus* from Agnesiotidini, and formally transfer *Atractuchus* to Agnesiotidini. By fixing Pachyurini as a monophyletic group in MacClade, this group is supported by the absence of a crenulated ridge on laterodorsal surface of tibiae

(38–0, primitive) and two larval characters confined to this group: mandible tridentate (49–1) and occipital foramen open (53–1). The genera *Rhiconobelus*, *Pachyurinus*, and *Pachyura* are separate taxa and support the generic separation of these taxa. Although, *Pachyurinus* is consistently placed a sister taxon to *Rhiconobelus* and it would seem that the later name is unnecessary.

Discussion

Based on the analyses it is clear that some genera must be shifted around between the paraphyletic tribes Agnesiotidini (sensu lato) and Pachyurini, while the placement of the monophyletic tribes Agnesiotidini (sensu stricto) and Belini is uncertain as to whether they are basal or included within a paraphyletic Pachyurini. While there are several excellent adult characters that define the monophyly of Agnesiotidini (sensu stricto) and Belini, there are two larval characters that may actually be evidence for the monophyly of Pachyurini. Unfortunately larvae are known for only a few terminals, so additional larval material and a detailed study of chaetotaxy and other characters would be useful towards understanding the monophyly of the groups.

We propose to maintain three tribes, whilst recognising the fact that there is little evidence for maintaining these groups because of problems with paraphyly. However, Agnesiotidini (sensu stricto) and Belini are demonstrably monophyletic, though their placements vary among the trees, and Pachyurini is clearly a paraphyletic group recognised only for convenience.

APPENDIX 2: Collection details of specimens examined

Family Nemonychidae

Rhinorhynchus rufulus (Broun, 1880)

North Island. ND. SH12, Waipoua SF, 1, 20 Sep 1977, L. L. Deitz, sweeping; Waipoua SF, 4, 26 Nov 1980, G. Kuschel, ex *Phyllocladus glaucus*; Waipoua SF, 3, 26 Nov 1980, G. Kuschel; Waipoua SF, 1, 13 Nov 2000, G. Kuschel, on *Dacrydium cupressinum*; Waipoua SF, 6, 26 Nov 1980, G. Kuschel, on *Agathis australis* log; Waipoua SF, 1, 12 Oct 1967, J. S. Dugdale, beating; Waipoua SF, Kauri Rickers Tk, 1, Oct 1967, J. C. Watt, shrubs; Waipoua SF, 1, Oct 1967, J. C. Watt, beating; Waimatenui, 1, 10 Jan 1951, A. E. Brookes, A. E. Brookes Collection; Paihia, Opua SF, 1, 23 Jan 1981, G. Kuschel; Ngaioatonga, 1, 3 Nov 1981, G. Kuschel; Parua, 1, 4 Nov 1981, G. Kuschel. **AK.** Lynfield, 1, 25 Oct 1975, 1, 21 Jun 1975, 1, 19 Oct 1980, 1, 15 Jan 1975, 1, 29 Jun 1975, Tropicana Drive, 2, 5 Apr 1975, G. Kuschel; Lynfield, Wairaki Bush, 2, 4 Oct 1997, G. Kuschel, *Dacrydium dacrydioides*; Titirangi Res, 1, 11 Oct 1958, K. A. J. Wise; Titirangi, 6, 2 Sep 1916, VAR 829, 1, 30 Nov 1915, 829, 1, 25 Sep 1948, 1, 26 Nov 1916, A. E. Brookes, A. E. Brookes Collection; Waitakeres, 366 m, 1, 13 May 1946, E. D. Pritchard; Huia, 1, 23 Nov 1973, B. M. May, *Podocarpus totara*; Manurewa, Murphys Bush, 2, 2 May 1981, G. Kuschel, rotten wood 81/59; Manurewa, Olive Davis Res, 30, 7 Aug 1983, J. C. Watt, Beating; Clevedon, 1, 14 Jun 1955, J. C. Watt, manuka bark; Manukau Peninsula, Awhitu Central, Kemps Rd, 2, 28 Oct 1982, G. Hall, B. G. Bennett, beating *Podocarpus totara*. **CL.** Kakatarahae, 700 m, 8, 27 Nov 1982, J. C. Watt, beaten from flowering shrubs; Kaueranga Valley, 1, 18–20 Jan 1960, J. I. Townsend, R. Zondag. **WO.** Mt Pirongia, 962 m, 11, 16 Jan 1977, A. K. Walker, sweeping flowering *Weinmannia*; Mt Pirongia, 854 m, 1, 9 Jun 1977, B. M. May, moss 77/57. **BP.** Mamaku Plateau, Horohoro SF, Tikitiki Stream, 79, 24 Jul 1976, J. S. Dugdale, Epiphytes 76/56; Rereauri Swamp, 6, 16 Sep–20 Oct 1992, J. S. Dugdale, Malaise trap; Rereauri Swamp, 1, 20 Oct 1992, J. S. Dugdale, ex *Pittosporum tenuifolium* branch trap; Rereauri Swamp, 2, 20 Oct–24 Nov 1992, G. Hall, Malaise trap; Rereauri Swamp, 1, 29 Sep 1993, G. Hall, beating; Waiaroho, 1, 26–29 Apr 1993, G. Hall, Pit traps edge of forest nr stream; Waiaroho, 1, 29 Apr 1993, R. C. Henderson, *Dacrydium cupressum*; Waiaroho, 2, 29 Apr 1993, J. S. Dugdale, beating *Streblus*. **TK.** Pouakai Ra, Summit, 1400 m, 2, 9 Jan 1978, J. C. Watt, sweeping; Pouakai Trig, 1400 m, 4, 9 Jan 1978, J. S. Dugdale, sweeping; Pouakai Ra, 1250–1340 m, 5, 9 Jan 1978, J. S. Dugdale, sweeping; Pouakai Ra, Sth Flank, 1, 30 Nov 1975, A. K. Walker, beating *Hebe stricta*; Mt Egmont, 1, 24 Feb 1983, C. F. Butcher, sweeping herbfield; Mt Egmont, 1067 m, 1, 2–4 Jan 1961, G. Kuschel, *Gahnia*. **TO.** Karioi, 1, 17 Dec 1961, G. Kuschel, *Dracophyllum*; Ruapehu–Tongariro, 1, 14 Dec 1961, G. Kuschel; Tongariro NP, 1000 m, 3, 6 Dec 1978, G. Kuschel, *Phyllocladus apinus*; Tongariro NP, 1000 m, 2, 6 Dec 1978, G. Kuschel, *Dacrydium colensoi*; Tongariro NP, 1000 m, 1, 6 Dec 1978, G. Kuschel, *Podocarpus hallii*; Ruapehu, Tk to Taranaki Falls, 1219 m, 1, J. I. Townsend; Ruapehu, Whakapapa, 1128 m, 1, 27 Nov 1965, J. I. Townsend, general beating; Tk to Kehitahi Springs, 2, 30 Nov 1965, L. P. Marchant, beating; Ruapehu, Iwikau, 1372 m, 5, 19 Feb 1965, G. Kuschel, *Podocarpus nivalis*; Ruapehu, Silica Springs, 1280–1310 m, 1, 20 Feb 1965, G. Kuschel, *Hebe tetragena*; Ohakune, 1, 12 Oct 1920, A. C. O'Connor; Ohakune Mt Rd, Makotuhu Flat, 1402 m, 1, 28 Nov 1985, R. C. Craw, on flowering *Nothofagus solandri*. **GB.** Waimata V, 1, 30 Nov–7 Dec 1994, 1, 21–28 Dec 1994, J. S. Dugdale, Malaise trap 2 ECK 8, Kahikatea/tawa-pukatea-mahoe-supplejack forest remnant; Waimata V, 1, 30 Nov–7 Dec 1994, J. S. Dugdale, Malaise trap 2 ECK 7, Kahikatea/tawa-pukatea-mahoe-supplejack forest remnant; Waimata V, 1, 7–14 Dec 1994, J. S. Dugdale, Malaise trap 6 2ECK 6, >60yr Kanuka/*Car. ser. Ole. rani*/*Cop. rha.* Diverse shrubland; Waimata V, 1, 13–20 Dec 1993, J. Hutcheson, Malaise trap 1 ECK 7, Kahikatea/tawa-pukatea-mahoe-supplejack forest remnant; Mt Hikurangi, 1750 m, 1, 14 Jan 1979, A. K. Walker, M. H. Benn, moss and tussock 79/2; Gisborne, Greys Bush, 1, 7 Apr 1975, J. S. Dugdale. **HB.** Kaweka Ra, Makahu Spur, 1464 m, 1, 26 Feb 1971, J. I. Townsend. **RI.** Ruahine Ra, Triplex Spur, 915–1220 m, 3, 26 Dec 1983, J. C. Watt, beating; Taihape, Oraukura Gorge, 1, 18 Sep 1982, J. C. Watt, under bark logs. **WI.** Fielding, Mt Biggs Rd, 1, 19 Dec 1956, beaten from native shrubs. **WN.** Tararua Ra, Dundas Ridge, 1350–

1400m, 1, Dec 1984, J. S. Dugdale, sweeping; Tararua Ra, Waikanae Mtns, Kapakapanui, 500–3000m, 2, 3 Jan 1992, G. W. Ramsay, beating; Tararua Ra, Ridge to Dundas Hut, 950 m, 1, 6 Dec 1984, R. C. Craw; Wiltons Bush, 1, 14 Nov 1977, E. Schlinger. **South Island.** **SD.** Kenepuru Sounds, Ft Mt Stokes, 2, 10 Oct 1967, J. I. Townsend, beating. **NN.** Wairoa Gorge, 16, 22 Oct 1971, G. Kuschel, *Podocarpus totara*, *Dacrydium cupressinum*; Wairoa Gorge, 5, 16 Sep 1972, G. Kuschel; Wairoa Gorge, 1, 5 Nov 1971, G. Kuschel, *Carmichaelia*; 9 m N Karamea, 6 m inland, 1, 20 Jun 1967, F. Alack; Dun Mt, 914 m, 1, 9 Jan 1922, A. Philpott; Dun Mt, 610 m, 1, 25 Jan 1931, 1, 3 Jan 1933, E. S. Gourlay; Wairoa V, 1, 26 Nov 1963, B. B. Given, *Podocarpus ferrugineus*; Rough I, Rabbit I, 4, 3 Aug 1967, J. S. Dugdale; Whangamoa, 1, 7 Dec 1963, B. A. Holloway; Totaranui, Pigeon Sdle, Lookout Rock, 3, 12 Mar 1971, G. W. Ramsay; Waimea West, Eves Valley, 10, 16 Sep 1972, G. Kuschel; Eves valley, 1, 23 Sep 1972, G. Kuschel, *Nothofagus*; Eves Valley, Palmers Bush, 1, 30 Oct 1972, J. S. Dugdale, sweeping; Eves Valley, Palmers Bush, 10, 30 Oct 1972, A. K. Walker, beating; Nelson, Wakefield, 16, 1 Oct 1964, G. Kuschel, reared from dead totara twigs; Nelson, Wakefield, 2, 30 Aug 1967, J. S. Dugdale; Nelson, Wakefield, 1, 30 Aug 1967, J. C. Watt, under bark dead *Pseudopanax arboreum*; Wakefield, 2, 9 Sep 1965, J. I. Townsend, ex *Lonicera*; Wakefield, 1, 27 May 1965, J. I. Townsend, leaf litter; Baigents Bush, 1, 19 Aug 1965, J. I. Townsend, litter under totara; Baigent Park, 3, 29 Dec 1963, B. A. Holloway; Baigent Park, 8, 21 Dec 1963, 5, 31 Dec 1963, G. Kuschel; Mangarakau, 27 Jan 1972, G. Kuschel; Collingwood, ft of Mt Burnett, 16, 26 Oct 1965, J. I. Townsend; Collingwood, Kaituna R, 1, 7 Oct 1964, G. Kuschel. **BR.** Paparoa Ra, Buckland Peaks, 2, 25 Nov 1984, B. A. Holloway, sweeping on tops; Paparoa Ra, Lochnager Ridge, 1160–1310 m, 1, 3 Dec 1969, J. S. Dugdale; Rapahoe, 1, 8 Feb 1940, E. S. Gourlay; Mawhera SF, Tutty Plateau, Red Jacks Creek, 1, 19 Apr 1972, J. S. Dugdale, litter 72/145, Beech Forest Utilisation Project; Mawhera SF, 3, 11 Nov 1975, G. Kuschel, *Dacrydium cupressinum*, Beech Forest Utilisation Project. **WD.** South Westland, 1, 3 Sep–3 Oct 1984, 1, 3 Oct–1 Nov 1984, R. Stewart, Malaise trap. **MB.** Pelorus Bridge, 6, 10 Oct 1964, G. Kuschel; Pelorus Bridge, 1, 25 Jul 1967, J. S. Dugdale, sweeping; Pelorus Bridge, 21 Sep 1967, J. S. Dugdale. **KA.** Kaikoura, Rakautara, 24 Oct 1964, J. I. Townsend, A. C. Eyles. **NC.** Arthurs Pass, 1, 14 Feb 1941, M. R. Renn Foord, E. S. Gourlay Acc. 1970, Ent. Div. **MC.** Kaituna, Banks Peninsula, 1, 22 Aug 1964, G. Kuschel, litter; Mt Hutt, 1000 m, 2, 12 Dec 1974, G. Kuschel. **MK.** Cook Ra, Mt Wakefield Ridge 303–1403 m, 2, 5 Apr 1977, J. S. Dugdale; Cook Ra, Ball Ridge, 1158–1372m, 2, 1 Apr 1977, J. S. Dugdale; Sealy Ra, 5, 10–15 Mar 1953, A. E. Brookes; Sealy Ra, Hooker V, 4, 15 Mar 1953, A. E. Brookes, A. E. Brookes Collection; Hooker Valley, Hoophorn Stm, 762–914 m, 3, 30 Mar 1977, J. S. Dugdale; Mt Sebastopol, 1463 m, 1, 8 Jan 1966; Sebastopol Tk, 884 m, 1, 7 Jan 1966, J. I. Townsend, Sebastopol Tk, 884 m, 2, 8 Jan 1966, J. I. Townsend, *Podocarpus nivalis*; Tk to Kea Point, 884 m, 4, 10 Jan 1966, J. I. Townsend, various shrubs and *Olearia mammularifolia*. **OL.** Dart Hut, 1, 15 Feb 1980, J. S. Dugdale, sweeping; Dart Hut, 2, 13–15 Feb 1980, J. S. Dugdale, malaise trap in open. **CO.**; Kinloch, Wakatipu, 1, Jan 1915; N end Pisa Ra, 700 m, 5, 23 Nov 1974, J. S. Dugdale, beaten from *Podocarpus hallii*. **DN.** Dunedin, 1, 23 Feb 1944, M. R. Renn Foord; Mt Cargill, 400 m, 2, 21 Oct 1981, J. C. Watt, beating. **SL.** West Plains, 2; Invercargill, 1; Invercargill, Thompsons Bush, 2, 16 Mar 1977, A. K. Walker, general beating of native trees; Longwood, 2, 1913, ?Lany, 829, A. E. Brookes Collection; Longwoods, 1, Jan 1913, 829; 3, 829; Longwood Ra, 20 Jan 1965, G. Kuschel, J. I. Townsend; Longwood Ra, Grassland Smt, 700 m, 1, 1 Feb 1976, L. L. Deitz, sweeping; Longwood Ra, Orepuke Tk, SW face 1, 1 Feb 1976, L. L. Deitz, sweeping; Pounaweia, E of Owaka, 18 Jan 1978, G. Kuschel. **SI.** Stewart Is, W. side, Little River, 3, 26 Dec 1975–2 Jan 1976, A. C. Harris, Malaise trap; Mt Rakeahua, 305–610m, 3, 10 Feb 1968, G. Kuschel; Mt Rakeahua, 610 m, 4, 14 Feb 1968, G. Kuschel; Rakeahua V, 19 Feb 1968, G. Kuschel; Rakeahua V, South bank bush, 1, 12 Feb 1968, J. S. Dugdale; Pegasus, 1, 21–25 Feb 1968, G. Kuschel, Mt Anglem, 914 m, 10, 29 Jan 1962, G. Kuschel, *Dracophyllum*; Big S. Cape Is, SW Stewart Is, 1, 18 Feb 1969, J. I. Townsend, *Olearia colensoi*; Codfish Is, Sealers Bay, 1, 8 Dec 1966, J. I. Townsend, *Hebe salicifolia* sand dune; Codfish Is, Sealers Bay, 1, 7 Dec 1966, J. I. Townsend, *Carpodetus serratus*. 565 specimens.

Rhinorhynchus halocarpi sp. nov.

North Island. **CL.** Mt Hobson, Great Barrier I., 1 ♂, 2 ♀♀, 19 Nov–21 Dec 2002, Malaise trap, K. Parsons. **TO.** Chateau, Tongariro National Park, 1000 m, 53 ♂♂, 50 ♀♀, 16 Nov 1978 and 6 Dec 1978, and 19 Nov 1991, mostly on *Halocarpus bidwillii*, few on *Phyllocladus alpinus*, G. Kuschel; Ohakune, 1 pair, 20 Nov 1991, G. Thiele. **South Island.** **NN.** Kaituna River, Collingwood Valley, 1 pair, 5 Nov 1938, E. S. Gourlay; Mt Hope, 1 ♀, 15 Nov 1914, T. Hall. **OL.** Mt Greenland, 1 ♂, 8 Jan 1943, C. E. Clarke. 112 specimens.

Rhinorhynchus phyllocladi sp. nov.

North Island. **ND.** Waitangi State Forest, 1 ♂, 22 Jul 1981, ex leaf-litter 81/78, R. Kleinpaste. **AK.** Huia, 4 ♂♂, 1 ♀, 4 Oct 1986, on *Phyllocladus trichomanoides*, B. M. May. **TO.** Mahuia Camp, Tongariro NP, 900 m, 4 ♂♂, 4 ♀♀, 23 Nov 1977, on *Ph. alpinus*, G. Kuschel; Chateau, Tongariro NP, 1000 m, 106 ♂♂, 65 ♀♀, 159 of them on *Ph. alpinus*, 10 on *Manoao colensoi*, 2 on *Halocarpus bidwillii*, 16 Nov and 6 Dec 1978, G. Kuschel; Taurewa, 850 m, 2 ♂♂, 16 Nov 1978, on *Podocarpus totara*, G. Kuschel. **HB.** Little Bush, Puketitiri, 1 specimen, 10 Jun 1983, malaise trap, T. H. Davies. **South Island.** **BR.** Mt Tuhua, Paparoa Ra, 1066 m, 2 specimens, 20 Nov 1984, C. F. Butcher. 190 specimens.

Rhinorhynchus halli sp. nov.

North Island. **TO.** Mahuia Camp, Tongariro NP, 900 m, 5 ♂♂, 4 ♀♀, 23 Nov 1977, on *Phyllocladus alpinus*, G. Kuschel; Chateau, Tongariro NP, 1000 m, 4 ♀♀, 16 Nov and 6 Dec 1978, on *Ph. alpinus*, G. Kuschel; Whakapapa, Tongariro NP, 1300 m, 1 specimen, 19 Nov 1991, on *Ph. alpinus*, G. Kuschel; Raurimu, 760 m, 1 ♀, 21 Nov 1965, G. Kuschel. **South Island.** **NN.** Mt Hope, 1 ♂, T. Hall. **MC.** Mistake Basin, 14 km WNW of Mt Algidus, 900 m, 3 ♂♂, 5 ♀♀, 9 Oct 1913, T. Hall; Zed Ck Saddle, Mt Hutt, 3 ♀♀, 27 Nov 1981, floating in pond, J. W. Early, C. A. Muir & R. A. McAnulty. 27 specimens.

Family Belidae

Subfamily Belinae

Pachyurinus sticticus (Broun, 1893)

North Island. **TO.** Chateau, Ruapehu, 1080 m, 1 ♀, 25 Feb 1965, G. Kuschel; Mt Ruapehu, 1050 m, 1 ♀, 10 Apr 1965, in beech forest, B. M. May; Chateau, Mt Ruapehu, 1280 m, 2 ♂♂, 3 ♀♀, 16 Jan 1975, J. C. Watt; Waipakihiri R., Kaimanawas, 1110 m, 1 ♀, 23 Nov 1961, M.N.; Ohakune Rd, 760 m, 1 ♂, 30 Jan 1977, K. J. Fox. **South Island.** **SD.** Picton, 1 ♀, 6 Apr 1918, A. O'Connor. **NN.** Upper Maitai, 1 ♂, 4 ♀♀, 22 Nov 1925, E. S. Gourlay; Maitai Valley, 2 ♀♀, 22 Nov 1957, J. I. Townsend; Saddle Hill, 900 m, 1 ♂, 2 ♀♀, 12 Jan 1961, E. S. Gourlay; Dun Mtn, 1 ♂, 14 Jan 1909, no coll.; 600 m, 2 ♀♀, 6 and 14 Dec 1920, A. Philpott; 900 m, 2 ♀♀, 23 Feb 1921 and 9 Jan 1922, A. Philpott; 1 ♂, 1 ♀, 2 Jan 1930, E. Fairburn; 600 m, 2 ♀♀, 25 Jan 1931 and 3 Jan 1933, E. S. Gourlay; 900 m, 1 ♂, 7 Jan 1934, E. S. Gourlay; 1 ♀, 15 Dec 1962, B. A. Holloway & G. Kuschel; Third House, 600 m, 10 ♂♂, 8 ♀♀, 13 Dec 1953, E. S. Gourlay; Roding Valley, 2nd Ford, 1 ♂, 28 Sep 1967, reared ex *Nothofagus solandri*, J. S. Dugdale & J. I. Townsend; Gordon's Pyramid, 1 ♂, 6 Apr 1918, no coll.; Gordon's Pyramid Ridge, 1080 m, 3 ♂♂, 5 ♀♀, 12–13 Jan 1918, on *Podocarpus totara*, A. O'Connor; Belgrove, 1 ♀, 16 Jan 1933, E. Fairburn; Takaka Hill, 1050 m, 1 ♂, 1 ♀, 19 Dec 1933, E. S. Gourlay; Takaka Valley, 1 ♀, 26 Nov 1963, J. I. Townsend; Canaan, 4 ♂♂, 3 ♀♀, 12–30 Jan 1949, A. E. Brookes; Canaan, Takaka Hill, 1 ♂, 2 ♀♀, 20 Jan 1972, on *Phyllocladus trichomanoides*, G. Kuschel; Mt Arthur, 1050 m, 1 ♀, 30 Dec 1928, E. S. Gourlay; Kaituna, Collingwood, 2 ♂♂, 1 ♀, 4 Dec 1964, G. Kuschel; Heaphy Track, Aoreere Valley, 2 ♂♂, 1 ♀, 30 Dec 1971, on *Podocarpus totara*, G. Kuschel; Saxon Hut Heaphy Track, 2 ♀♀, 12 Jan 1995, swept, R. R. Scott; Mt Misery, 600 m, 1 ♀, em. 7 Nov 1977, ex *Nothofagus*, J. S. Dugdale; Glenhope, 6 ♂♂, 10 Dec 1915, T. Hall; Mt Hope, 2 ♂♂, 3 ♀♀, 13 Dec 1915, T. Hall. **MB.** Pelorus Bridge, 7 ♂♂, 8 ♀♀, 3 em. 24 Oct and 6 Nov 1967, ex dead branches of *Aristotelia serrata* remainder em. 20 Sep–29 Oct 1968 (W67/82), J. C. Watt; St Rowans Well, Upper Wairau Valley, 2 ♂♂, 7 ♀♀, ex dead branches of *Nothofagus cliffortioides* coll. 7 Sep 1966, em. 14 and 18 Oct 1966, J. C. Watt; Lake Tennyson, 1 ♂, 11 Nov 1978; Reared ex pupa from

under bark of *Nothofagus*, J. W. Early. **BR.** Lake Rotoiti, 1♂, 7 Feb 1965, A. K. Walker; Mt Robert, 1200 m, 1♂, 15 Mar 1968, J. M. McBurney; 760–850 m, 2♂♂, 1♀, 16 Jan 1976, A. K. Walker; 2♀♀, 5 Feb 1982, C. F. Butcher; Boatman's, 1♂, 1♀, A. T. Calvell; Punakaiki Scenic Reserve, 1♀, Feb 1983, C. F. Butcher. **WD.** Otira, 1♀, 2 Jan 1943, C. E. Clarke; 2♂♂, 2♀♀, 21 Feb 1962, J. I. Townsend & G. F. Woods; 1♂, 13 Feb 1976, R. H. Blank; Barrack Ck, 450 m, 2♂♂, 2♀♀, 19 Dec 1959, J. S. Dugdale; Mahinapua, 1♂, 12 Nov 1959, J. M. McBurney; Goldsborough, 1♂, 10 Dec 1972, swept, R. A. Harrison. **NC.** Arthur's Pass, 4♂♂, 2♀♀, Jan 1923, A. L. Tonnoir; 1♂, 2♀♀, Jan 1923, C. E. Clarke; 2♂♂, 1♀, 28 Dec 1940 and 2 Jan 1941, S. Lindsay; 1♂, 8–11 Jan 1957, E. S. Gourlay; 1500 m, 1♂, 3♀♀, 16 Dec 1959, J. I. Townsend & J. S. Dugdale; Cass, 1♀, 30 Nov 1924, A. L. Tonnoir. **MC.** Moa Hut, 1♂, 20 Oct 1913, T. Hall. 161 specimens.

Rhynchobolus rubicundus (Broun, 1880) comb. nov.

North Island. ND. Waipoua SF, 1♂, 13 Nov 2000, on *Podocarpus hallii*, G. Kuschel; Trounson Kauri Park, 1♂, 28 Nov 1964, under bark of *Agathis australis*, B. M. May; Whangarei Heads, 2♂♂, 3♀♀, T. Broun. **AK.** Helensville, 1♀, T. Broun; Kakamatua Ridge, Huia, 1♂, Dec 1970, on *Phyllocladus trichomanoides*, B. M. May; Destruction Gully, Huia, 3♂♂, 14♀♀, 21 Oct and 6 Nov 1975, reared from dead branches of *Toronia toru* (W75/16), B. M. May. **CL.** Tairua, 5♂♂, 6♀♀, 21 Nov 1962, on *Agathis australis*, A. E. Marsack. **BP.** Tarukeya, Rotorua, 1♂, 22 Nov 1984, T. Broun; Maraenui, 7♂♂, 4♀♀, 2 Dec 1928, A. E. Brookes; Motu River Bridge, 3♂♂, 2♀♀, 25 Nov 1928, A. E. Brookes; Motu River, 2♀♀, 2 Dec 1928, A. E. Brookes; Waiaroho, 1♂, 21 Oct–25 Nov 1992, Malaise trap, G. Hall. **WN.** Johnston's Hill, Karori, 2♂♂, 3♀♀, 2 Feb 1902, A. O'Connor; Wellington, 1♀, Lewis. **South Island. NN.** Belgrove, 1♀, 16 Jan 1933, E. Fairburn. **MB.** Jack's Pass, Hanmer, 1♂, 1♀, 9 Feb 1931, S. Lindsay. No data, 2♂♂, 1♀. 69 specimens.

Rhynchobolus metallicus (Pascoe, 1877) comb. nov.

North Island. ND. Manganui, Kaiangara, 3♂♂, 1♀, 18 Nov 1917, A. E. Brookes; Glenbervie, 3♂♂, 2♀♀, 12 Nov 1959, J. M. Cox; West Okahu Block, Whirinaki Forest, 2♂♂, 1♀, 15 Dec 1959, N. O. C.; Taupo Bay, 1♀, 14 Dec 1976, on *Podocarpus totara*, B. M. May; Mangakahia, 1♂, 3♀♀, 29 Oct 1932, E. Fairburn; Toatoa Track, Waipoua Forest, 2♀♀, 26 Nov 1980, on *Phyllocladus toatoa*, G. Kuschel; 1♂, 17 Nov 1997, G. Kuschel; Waipoua SF, 2♀♀, 31 Oct 1985, on dead *Phyllocladus*, R. C. Craw; Trounson Kauri Park, 1♂, 1♀, 17 Nov 1997, on *Podocarpus hallii*, G. Kuschel; Parua, 1♂, R. Peace; Western Hills, Whangarei, 1♀, 23 Oct 1926, E. Fairburn; Waimatenui, 1♂, 10 Dec 1951, A. E. Brookes; Waipu, 1♀, 19 Nov 1964, D. J. Allan; Te Matua Ngahere, Waipoua, 1♀, 14 Feb 1975, S. E. Nichols; Maunganui Bluff, 1♂, 27 Apr 1957, R. A. C. [umber]. **AK.** Titirangi, 1♂, 18 Sep 1915, A. E. Brookes; 1♂, 28 Dec 1915, A. E. Brookes; 1♀, 29 Oct 1915, A. E. Brookes; 1♀, Nov 1952, C. R. Thomas; Waitakere Range, 2♀♀, 23 Oct 1916, A. E. Brookes; Laingholm, 1♂, 11 Oct 1980, R. H. Kleinpaste; 1♂, 31 Oct 1982, R. H. Kleinpaste; Huia, 1♂, 1♀, 25 Oct 1973, on *Dacrydium cupressinum*, B. M. May; 1♂, 3♀♀, 7 Nov 1973, on *Dacrydium cupressinum*, B. M. May; 1♂, 3♀♀, 7 Nov 1973, on *Phyllocladus trichomanoides*, B. M. May; Manukau, 1♂, 4♀♀, 28 Oct 1982, G. Hall & B. G. Bennett; Manukau Heads, Kemp Road, 1♂, 3♀♀, 24 Oct 1984, on *Podocarpus totara*, B. G. Bennett; Orongo, 1♂, 23 Oct 1938, no coll.; Howick, 1♂, coll. A. E. Brookes; 10 Nov 1982, J. C. Watt; Clevedon, Hunua, 1♂, T. Broun; Hunua, 1♀, 1 Jan 1916, no coll. **CL.** Kaiarara Valley, 1♂, 2♀♀, 27 Nov 1957, J. C. Watt. **WO.** Waitemata, Kaimai Ra, 2♀♀, 30 Dec 1945, A. E. Brookes; Okauia, 1♂, 28 Dec 1947, A. E. Brookes. **BP.** Waienga Bush, 1♂, 1♀, 16 Sep + 20 Oct 1992, on *D. cupressinum*, J. S. Dugdale; Lottin Pt Road, Waenga, 1♀, 27 Jan 1993, on *Dacrydium cupressinum*, J. S. Dugdale. **TO.** Mahuia Res, Mt Ruapehu, 900 m, 1♂, 19 Feb 1979, on *Phyllocladus alpinus*, B. M. May; Chateau, Tongariro, 1000 m, 1♂, 1♀, 6 Dec 1978, G. Kuschel; Taurewa, 7♂♂, 7♀♀, 13 Dec 1961, on *Podocarpus totara*, G. Kuschel; Tokaanu, 4♂♂, 11 Dec 1949, G. B. R.; Erua, 1♀, 31 Dec 1940, no coll.; 1♀, 5 Jan 1941, C. E. Clarke; Ohakune, 700 m, 1♂, 1♀, Oct 1921, T. R. Harris; 750 m, 1♀, 31 Oct 1970, on *Dacrydium cupressinum*, B. M. May; Mangawhero Falls, Ohakune Mtn Rd, 1♂, 2♀♀, 28 Nov 1985, on *Phyllocladus alpinus*, R. C. Craw. **RI.** Hautapu Gorge, Taihape, 2♀♀, 10 Nov 1982, J.

C. Watt. **WI.** Palmerston North, 1♀, Jan 1957, no coll.; Marima Domain, 1♀, 29 Dec 1976, J. C. Watt. **WA.** Mangatiti, 2♂♂, 2♀♀, 25 Nov 1917, no coll. **WN.** Wallaceville, 4♂♂, 4♀♀, 27 Dec 1907, on *Podocarpus totara*, A. O'Connor; 2♀♀, 25 Dec 1908, A. O'Connor; Wadestown, 1♀, Sandager; Akatarawa, 4♂♂, 1♀, Jan 1908, on *Dacrydium cupressinum*, A. O'Connor; Korokoro, 1♂, 6 Dec 1915, no coll.; 2♀♀, 5 Dec 1915, A. O'Connor; 1♂, 30 Nov 1920, G. V. Hudson; 2♂♂, 22 Oct and 29 Dec 1923, T. Cockcroft; Wellington, Botanical Gardens, 1♀, 30 Sep 1970, on *Cupressus macrocarpa*, A. C. Eyles; Whakariki R., Wainui Forest, 11 Nov 1923, no coll.; Silverstream, 3♀♀, Jan 1908, on *Dacrydium cupressinum*, A. O'Connor; Silverstream, 2♂♂, 1♀, 13 Dec 1908, 24 Oct and 31 Oct 1909, A. O'Connor; Makara Bush, 1♂, 1♀, 19 Nov 1921, G. V. Hudson; Makara Bush, 1♂, 29 Oct 1935, G. V. Hudson; Wilton's Bush, 3♂♂, 1♀, 29 Oct 1924, on *Podocarpus totara*, G. V. Hudson. **South Island. SD.** Picton, 1♂, 29 Nov 1968, A. C. Eyles. **NN.** Maitai Valley, 2♂♂, 2♀♀, Jan 1910, A. O'Connor; Dun Mtn, 2♀♀, 2 Jan 1939, S. Lindsay; 1♂, 11♀♀, 20 Jan 1921, A. Philpott; 900 m, 2♂♂, 1♀, 7 Jan 1934, E. S. Gourlay; 600 m, 1♂, 28 Nov 1943, E. S. Gourlay; 750 m, 1♂, 13 Nov 1961, G. Kuschel; 760m, 1♀, 6 Feb 1973, J. M. McBurney; Aniseed Valley, 1♂, 24 Nov 1949, A. W. Parrott; Baigent Park, Wakefield, 1♀, 21 Dec 1963, G. Kuschel; Wakefield, 1♂, 4♀♀, reared ex dead twigs of *Podocarpus totara*, 1 Oct 1964, G. Kuschel; Motupiko, 1♂, 3 Feb 1935, G. G. Hole; Takaka Hill, 1♂, 19 Dec 1933, no coll.; 1♂, 4 Nov 1949, A. C. O'Connor; Canaan, 1♂, 1♀, 17–26 Jan 1949, A. E. Brookes; Kaituna, Collingwood, 1♂, 7 Oct 1964, G. Kuschel; 1♂, 1♀, ex small branches of *Dacrydium cupressinum* gathered 6 May 1965, em. 29 May and 18 Oct 1965, J. I. Townsend; Aorere Valley, 1♂, 28 Oct 1963, M. Johns; Hackett Track, 1♂, 10 May 1993, J. T. Smith. **MB.** Red Hills, Wairau Valley, 910 m, reared ex *Phyllocladus alpinus* gathered 24 Mar 1972, em. 28 Sep–10 Oct 1972, J. S. Dugdale. **KA.** Rakautara, 1♂, 24 Oct 1962, J. I. Townsend & A. C. Eyles. **WD.** Otira River, 1♂, Dec 1908, G. V. Hudson; Otira, 1♀, 21 Feb 1962, J. I. Townsend & G. F. Woods; Mahinapua SF, 1♀, 15 Jan 1960, J. M. McBurney. **NC.** Arthur's Pass, 780 m, 1♂, 22 Dec 1922, J. Hughs; 5♂♂, Jan 1923, A. L. Tonnoir; 2♂♂, 30 Dec 1940, S. Lindsay; 900 m, 1♀, 15–19 Dec 1959, J. I. Townsend & J. S. Dugdale. **MC.** Riccarton Bush, Christchurch, 2♂♂, 2♀♀, 25 Oct 1973, Wakefield; Christchurch, 1♂, 5 Sep 1951, no coll.; Prices Valley, Banks Peninsula, 1♀, 7 Dec 1988, sweeping, C. A. Muir; Peel Forest, 1♂, 1♀, 18 Oct 1960, J. M. McBurney; Cooper's Knob, 2♀♀, 26 Mar 1939, S. Lindsay; Moa Basin, 1♂, 20 Oct 1913, T. Hall. **OL.** Mckerrow Ra, Makarora, 900m, 1♂, 23 Jan 1978, G. Kuschel; Bold Peak, L. Wakatipu, 1080 m, 10 Jan 1921, G. V. Hudson; Mt Earnslaw, 7♂♂, 5♀♀, 9 Jan 1945, E. S. Gourlay; Paradise, 1♂, 9 Jan 1941, C. E. Clarke. **SL.** West Plains, 1♀, A. Philpott; Riverton, 1♀, 4 Feb 1938, A. C. O'Connor; Haldane, 1♂, 24 Jan 1941, C. E. Clarke. 228 specimens.

Rhynchobolus aenescens (Broun, 1915) comb. nov.

North Island. HB. Makahu Spur, Kaweka Ra, 1220 m, 1♀, 26 Feb 1971, on *Phyllocladus*, A. C. Eyles. **WI.** Waitahinga, Wanganui, 1♀, 11 Dec 1971, D. Holdom. **WN.** Korokoro, 1♀, 5 Dec 1915, A. O'Connor. **South Island. MB.** Molesworth, Awatere R, 1♂, 26 Dec 1943, A. E. Clarke. **BR.** Buller, 1♀, 17 Jan 1915, T. Hall. **MC.** Urquharts Clearing, Craigieburn, 1♂, 14 Nov 1960, R. J. Muck. **MK.** Mt Cook, 1♀, 4 Jan 1929, A. Philpott; Governor's Bush, Mt Cook, 2♀♀, 2 Jan 1942, no coll. **OL.** Mt Aurum, 3♂♂, 1♀, 13–18 Jan 1921, on *Phyllocladus alpinus*, G. V. Hudson. **CO.** Ben Lomond, 1♂, 7 Dec 1912, M. O. Pasco. **DN.** Cape Saunders, 1♂, 30 Oct 1921, no coll.; Dunedin, 1♂, no coll. 15 specimens.

Agathinus tridens (Fabricius, 1775)

North Island. ND. Kaitaia, 1♂, 29 Dec 1962, E. S. Gourlay. **AK.** Waitakere Ra, 1♂, 10 Nov 1985, in dead wood of *Corokia buddleioides* with larvae, B. M. May. **CL.** Little Moehau Peak, Mt Moehau, 870 m, 3♂♂, 1♀, 22 Mar 1958, flying midday at top, K. A. J. Wise; 875 m, 1♂, 12 Feb 1978, flying in sun, C. A. Muir & R. M. Emberson; 600 m, 1♂, 1♀, 19 Mar 1980, G. Kuschel; Kennedy Bay Rd, 5♂♂, 26 Oct 1981, on *Prumnopitys ferruginea*, C. F. Butcher. **BP.** Mt Te Aroha, 1♂, 6 Mar 1985, C. F. Butcher. **TO.** Waituhi Saddle, 1♀, 11 Feb 1960, M. J. Esson; 1♀, 16 Nov 1983, *Aristotelia serrata*, C. F. Butcher; Raurimu, 2♂♂, 21 Nov 1965, G. Kuschel; Waimarino, 1♂, 1♀, 27 Dec 1951, E. Fairburn; Whakapapa Valley, Tongariro NP, 1050 m, 2♂♂, 1♀, 28 Dec 1953, R. W.

Taylor; Tongariro NP, 1♀, 8–11 Nov 1955, G. B. R.; Whakapapa, Ruapehu, 1100 m, 1♂, 1♀, 27 Nov 1965, J. I. Townsend; Chateau, Ruapehu, 1000 m, 1♀, 23 Nov 1965, G. Kuschel; 1♀, 23 Nov 1977, reared ex dead *Olearia nummulariifolia*, J. S. Dugdale; 1200 m, 1♂, 23 Nov 1977, reared ex dead *O. nummulariifolia*, G. Kuschel; 1000 m, 1♂, 2♀♀, 6 Dec 1978, on *Halocarpus bidwillii*, G. Kuschel; 1000 m, 1♂, 2♀♀, 6 Dec 1978 on *Halocarpus bidwillii*, G. Kuschel; on Ohakune Mtn Rd, 750 m, 2♂♂, 2♀♀, 31 Oct 1970, on *Dacrydium cupressinum*, B. M. May; Okahune Mtn Rd, Ruapehu, 650 m, 1♀, 1 Dec 1965, J. I. Townsend; Blyth Track, Ohakune, Mt Ruapehu, 1380 m, 1♂, 19 Nov 1965, J. I. Townsend; Mangawhero, Ohakune Mtn Rd, 950 m, 2♂♂, 2♀♀, 28 Nov 1985, R. C. Craw; Waikato Valley, Kaimanawas, 870–1150 m, 2♂♂, 1♀, 21–23 Mar 1958, J. S. Dugdale; no data 1♂. **GB**. L. Waikaremoana, 1♀, 1 Dec 1929, J. S. Armstrong; 1♀, Dec 1946, R. R. Forster; Makahu Spur, Kaweka Range, 1220 m, 1♂, 2♀♀, 26 Feb 1971, on *Phyllocladus*, A. C. Eyles. **TK**. Ahukawakawa Track, Potukai Range, 1067 m, 1♂, 2♀♀, 11 Jan 1978, on *Podocarpus cunninghamii*, J. C. Watt; Pouakai Range, 935–1070 m, 1♀, 11 Jan 1978, J. S. Dugdale; Holly Hut, North Egmont, 950 m, 1♀, 27 Nov 1975, J. S. Dugdale; Mt Egmont, 1♂, 7♀♀, 11 Dec 1928, E. Plank; 1050 m, 2–4 Jan 1962, G. Kuschel. **WN**. Tokomaru Gorge, 1♂, 7 Jan 1959, R. M. Bull; Otaki Gorge, 2♂♂, 26 Apr 1959, R. M. Bull; Wharite, South Ruahine, 2♂♂, 2 Feb 1959, R. M. Bull; Mt Hector, 1050–1500 m, 1♂, 3♀♀, 10–12 Jan 1962, on *Dacrydium cupressinum*, J. I. Townsend & M. J. Esson; Mt Holdsworth, Tararua, 1♂, 27 Dec 1948, J. M. Rudge; Tararua, 1♂, Dec 1920, L. Jones; Dundas Hut Ridge, Tararua Range, 950 m, 1♀, 6 Dec 1984, R. C. Craw; Bainham, 1♀, 11 Mar 1925, R. Clouston; Kaitoke, 2♂♂, 2♀♀, Nov 1903, Lewis coll.; Akatarawa, 1♂, 1♀, 22 Nov 1953, M. Redington; Korokoro, 1♀, 13 Oct 1923, A. O'Connor; Silverstream, 1♂, 3♀♀, 15 Dec 1923, A. O'Connor; Wellington, 1♂, no other data. **South Island**. **SD**. Croisilles, 1♀, 3 Jan 1950, A. W. Parrott. **NN**. Dun Mtn, 1♂, 23 Jan 1923, R. J. Tillyard; 2♂♂, 2♀♀, no other data: 600 m, 2♂♂, 1♀, 13 Jan 1933, E. S. Gourlay; 1♂, 2 Jan 1959, R. M. Bull; 1♀, 15 Dec 1962, G. Kuschel & B. A. Holloway; 600 m, 1♀, 18 Jan 1972, G. Kuschel; 760 m, 1♀, 6 Feb 1973, J. M. McBurney; Ruby Bay, 1♂, 23 Nov 1963, G. Kuschel; Gordon's Pyramid, 1140 m, 3♀♀, 12–13 Jan 1918, on *Podocarpus totara*, A. O'Connor; Riwaka, 1♀, 10 Nov 1962, A. K. Walker; Riwaka Valley, 1♀, 31 Jan 1949, A. E. Brookes; Takaka Hill, 600 m, 1♂, 28 Dec 1953, E. S. Gourlay; Top of Trig K, Canaan, 1♀, no date, G. Kuschel; Mt Arthur, 1050 m, 3♀♀, 30 Dec 1928, on *Halocarpus bidwillii*, E. S. Gourlay; Salisbury Opening, Mt Arthur, 1♂, 2♀♀, 5 Jan 1930, E. Fairburn; 1♂, 14 Jan 1946, E. S. Gourlay; 2♂♂, 2♀♀, 14 Feb 1946, on *H. bidwillii*, E. S. Gourlay; Balloon Hut, Mt Arthur, 1♂, 15 Jan 1943, E. S. Gourlay; ♀, 15 Feb 1931, on *H. bidwillii*, E. S. Gourlay; Gouland Downs, 2♀♀, 7 Feb 1922, A. Philpott; Cobb Valley, 1♀, 23 Nov 1943, R. M. Bull; Mt Domett, 1250 m, 1♀, Nov/Dec 1971, G. Kuschel; Quartz Range, W Nelson, 2♂♂, Nov 1941, A. O'Connor; Brown Cow Ridge, 1♂, 31 Aug 1993, M. Wing; Mt Stewart, 1♂, 10 May 1993, sweeping at summit, J. T. Smith; Karamea, 1♂, 27 Jan 1950, R. R. Forster. **BR**. L. Rotoiti, 1♀, 1 Jan 1965, A. K. Walker; Travers Valley, 600 m, 3♂♂, 1 Jan 1965, A. K. Walker; Lewis Pass, 10♂♂, 12♀♀, 18–24 Nov 1961, on *H. bidwillii*, G. Kuschel; Rahu Saddle, 960 m, 1♀, Jan 1966, B. B. Given; Mawhera SF, 1♂, 11 Nov 1971, J. M. McBurney; Sewell Pk, Paparoa Range, 1♀, 19 Feb 1974, no coll.; 1.6 km S of 4-Mile Ck, Charleston, 1♀, 7 Nov 1972, J. C. Watt; Moana, 1♂, 3 May 1980, P. J. Devlin. **WD**. Mahinapua SF, 1♂, 23 Mar 1960, on *Chamaecyparis lawsoniana*, J. M. McBurney. Specimens examined: 166.

Subfamily Aglycyderinae

Aralius wollastoni (Sharp, 1876)

North Island. **ND**. Poor Knights Is, Tawhiti Rahi, 17, 4 Dec 1980, G. Kuschel, *Pseudopanax lessonii*; Parua, no details. **AK**. Goat I, 8, 19 May 1981, G. Kuschel; Goat I, 6, 742; Goat I, 1, 3 Feb 1976, G. Kuschel, ex *Pseudopanax arboreum*; Goat Is, 11, 3 Feb 1976, G. Kuschel, sifted decayed wood; Anawhata, 1, 9 Oct 1977, B. M. May, reared from dead branchlets, *Pseudopanax lessonii*, em: 7 Feb 1978, W77/88; Motuihe I, 6, 4 Mar 1961, B. M. May, under bark; Lynfield, 8, 21 Jan 1977, G. Kuschel, reared ex *Pseudopanax arboreum*; Lynfield, 13, 6 Mar 1976, G. Kuschel, on 15 mm branch; Lynfield, 7, 13 Mar 1976, 1, 13 Jan 1976, G. Kuschel, *Pseudopanax arboreum*; Noises Is, Motuoropapa I, Snail Flat, 1, 4 Nov 1977, J. C. Watt, beating; Noises Is, Motuoropapa I, nr hut, 2, 25 Oct 1978, D. W. Helmore, Malaise trap; Noises Is, Motuoropapa I, Main

Tk, 1, 24 Apr 1979, B. G. Bennett, ex dead *Pseudopanax lessonii*; Noises Is, Motuoropapa I, 1, 17 Feb 1978, J. S. Dugdale, Beating; Noises Is, Motuoropapa I, The Knob, 4, 21 Aug 1978, G. W. Ramsay, litter 2, 78/177; Noises Is, Motuoropapa I, 1, 17 Dec 1978, D. W. Helmore, J. M. Cleary, litter 5, 78/294; Noises Is, Scott I, 2, 20 Aug 1978, G. W. Ramsay, Litter 78/176; Noises Is, Scott I, 1, 27 Oct–18 Dec 1978, D. W. Helmore, J. M. Cleary, pit trap 2; Noises Is, Otata I, 1, 18 Dec 1978–25 Feb 1979, D. W. Helmore, J. M. Cleary, M. F. Tocker, pit trap 8; Noises Is, Ike I, 1, 24 Aug–22 Oct 1978, G. W. Ramsay, D. W. Helmore, pit trap 2; Green Bay, 1, 23 Nov 1976, M. F. Tocker, beating; Auckland Domain, 1, 12 Dec 1977, S. M. Reed, nest of *Turdus philomelos* 77/196; Titirangi, 1, 17 May 1942, M. W. Carter, ex *Pseudopanax arboreum*; Bethells, Matuku Reserve, 3, Dec 1985, 1, Jan 1986, 4, Feb 1986, R. C. Craw, *Pseudopanax lessonii*; Bethells, Matuku Reserve, 2, Feb 1986, R. C. Craw, *Pseudopanax crassifolium*. **CL**. Tairua, no details; Cuvier I, NW Ridge, 200 m, 3, 22 Jan 1972, B. M. May, *Pseudopanax lessonii*; Mayor I, Opo Bay, 4, 16 Nov 1959, J. C. Watt. **BP**. Rarima Rocks, 1, 21 May 1986, I. McFadden, 86/9; Rarima Rocks, 3, 9 Jul 1987, I. McFadden, litter 87/15. **WN**. Wellington, 1, O'Connor, 747; Silverstream, 1, 25 Sep 1910; Upper Hutt, Te Marua, 1, 10 Nov 1976, S. Millar, reared ex dead branchlets *Pseudopanax arboreum* em: 18 Apr 1977, W76/19. **South Island**. **SD**. Picton, 8, Sep 1969, G. Kuschel; Waikawa Bay, 9, 25 Feb 1965, W. A. Holloway, ex dead *Pseudopanax*; Shakespeare Bay, 3, 11 Aug 1969, J. McBurney, litter; Shakespeare Bay, W. side, 6, 11 Aug 1969, G. Kuschel, litter; Shakespeare Bay, W. side, 6, 11 Aug 1969, G. Kuschel, beating; Rangiri, Whites Bay, 1, 14 Nov 1999, R. Leschen, R. Hoare, beating; Wooded Peak, Ridge, S Branch, 1, 14 Feb 1963, dead Beech; Ship Cove, 1, 27–30 Jan 1972, G. Kuschel; French Pass, 19, 16 Feb 1971, G. Kuschel, *Pseudopanax arboreum*; French Pass, 1, Feb 1971, G. W. Ramsay; D'Urville I, Kapowai, 10, 17 Feb 1971, G. Kuschel, *Pseudopanax arboreum*; D'Urville I, Kapowai, 1, Feb 1971, G. W. Ramsay; D'Urville I, 1, G. V. Hudson. **NN**. Nelson, 15, 13 Dec 1952, E. S. Gourlay; Nelson, Apr 1967, B. A. Holloway; Upper Maitai, 1, 18 Dec 1956, E. S. Gourlay; 1, 25 Mar 1938, E. S. Gourlay; Dun Mtn, 1, 3 Jan 1933, E. S. Gourlay; Whangamoa, 213 m, 14, 29 Nov 1963, 3, 29 Jun 1964, G. Kuschel, old dead *Pseudopanax arboreum*; Whangamoa, 213 m, 3, 13 Dec 1963, G. Kuschel; Whangamoa, 1, 14 Oct 1964, J. I. Townsend, reared ex *Pseudopanax crassifolium*, em: 17–20 Oct 1964; Whangamoa, 1, 13 Mar 1964, J. I. Townsend, *Pseudopanax*; Aniseed Valley, 2, 25 Oct 1972, G. Kuschel, *Pseudopanax arboreum*. **BR**. Lewis Pass, 1, 8–12 Dec 1957, E. S. Gourlay. **MC**. Riccarton Bush, 4, 10 Dec 1941, E. S. Gourlay; McLennans Bush, 9–10 Dec 1941, E. S. Gourlay. **NC**. Mt Grey, 4, 16 Jan 1958, E. S. Gourlay; Mt Grey, 914 m, 1, 7 Dec 1941, E. S. Gourlay. No Locality, 2, 1922, Phillpott. Specimens examined: 247.

Family Brentidae

Subfamily Brentinae

Lasiorhynchus barbicornis (Fabricius, 1775)

North Island. **ND**. Sth Pandora, Te Pahi Coastal Park, 1♀, 7 Feb 1975, J. C. Watt, ex dead standing *Beilschmiedia tarairi*; Waipoua SF, 1♀, 1♂, 18 Oct 1967, J. C. Watt, on dead *Brachyglottis repanda* trunk; 1♂, 1♀, 14 Oct 1967, J. C. Watt, *Beilschmiedia tarairi* stump, reared em. 11 Dec 1967; Whangarei, 1♂, 18–20 Mar 1931, E. S. Gourlay; 1♀; Mangamuka, 1♀, 30 Mar–5 May 1999, R. Leschen, G. Hall, R. Hoare, FIT A, RL407; 1♀, 5 May–12 Jun 1999, R. Leschen, E. Hilario, FIT A, RL422; Mangamuka Summit Tk, 1♂, 21 Jan 1999, R. Leschen, G. Hall, R. Hoare. **AK**. Bethells, Matuku Res, 8♂♂, 5♀♀, 10 Jan 1985, R. C. Craw in dead standing *Corynocarpus laevigatus*; 1♂, Jan 1986, R. C. Craw, branch trap *Pittosporum eugenoides*; 1♂, 1♀, 21 Feb 1993, S. Fergie, ex karaka tree; 1♂, 1986, P. A. Maddison; 1♂, 14 Dec 1990–21 Mar 1991, Malaise trap on tree platform; 1♀, 25 Oct–13 Dec 1991, Malaise trap on tree platform; 1♂, 20 Aug 1983, G. Hall, on *Corynocarpus laevigatus*; Huia, 1♀, 2♂♂, 4 Feb 1966, J. C. Watt, on trunk of dead fallen rimu; Nihotapu, 1♂, 30 Mar 1955, Mrs A. E. Hughes; Titirangi, 1♂, 11 Feb 1981, E. Willis; 1♂, 24 Feb 1979, O. Hope, on wall; 1♂, 9 Nov 1951, H. M. Lewis; 1♀, 20 Oct 1915; 1♂, 20 Dec 1945, B. Molesworth; Auckland, 1♂, 11 May 1972, B. M. May; Te Pu Mamaku, 1♀, 1♂, 14 Feb 1959, *Beilschmiedia tarairi*; Waitakere Ra, Cascade, 1♂, 6 Apr

1942, T. R. Rabone; Mangere, 1♂, Mar 1959, R. Nodder; Oratia, 1♂, 15 Jan 1991, J. Vesey, flew into house; Hunua, 1♀, 1957; Swanson, 1♀, 14 Mar 1959, J. C. Watt, ex *CollospERMUM* flies; Piha, 1♂, 7 Mar 1950. **CL.** Ongohi Stn, 50 m, 2♂♂, 2♀♀, 18 Mar 1980, B. M. May, B. A. Holloway; Pokororo, 1♂, 1926, H. Mytton; Little Barrier Is, Main track to Hauturu Mt, 198 m, 1♂, 20–23 Feb 1976, A. K. Walker & T. K. Crosby; Malaise trap; Little Barrier, 1♂, Mar 1922, Milligan; 1♂, Nov 1947, J. M. Dingley; Bunkhouse Area, 1♂, 7 Apr 1984, S. Anderson; Great Barrier Is, Coopers Castle, 400 m, 1♂, 23–28 Mar 1978, E.S.N.Z. Field trip, under stones; Coromandel, 1♂, 1♀, J. S. Edwards, J. C. Watt Collection, Ent. Div. 1966. **WO.** Hamilton, 1♂, 7 Oct 1949, Inst. of Agric, 1816; Otorohonga, 1♀, 12 Nov 1929, H. McDonald; Okauia, 1♀, 5 Dec 1920. **BP.** Te Whaiti (nr Rotorua) 4♂♂, 6♀♀, G. B. Rawlings; Mt Te Aroha Smt, 3♀, 9 Apr 1986, Transmitter Bldg; 1♂, Feb–Dec 1985, W. R. Stewart; Papatea, 1♂, 4 Dec 1992–25 Jan 1993, J. S. Dugdale, Malaise trap; Omanawa, Tauranga, 1♂, 17 Jan 1951, M. Crapp, ex native bush. **TK.** New Plymouth, 1♂, 1♀, 20 Sep 1932, 1♂, 1932, W. W. Smith; 1♀, 24 Aug 1950, A. Davies, ex vegetation; Ararata, 1♀, 1950, R. M. Bull Collection; 1♂, 14 Nov 1957, R. M. Bull, R. M. Bull Collection. **TO.** Pihanga-Turangi, 10♂♂, 8♀♀, 18 Jan 1959, R. M. Bull, R. M. Bull Collection. **GB.** Urewera NP; Te Taita-a-Makora, 1♀, 14–18 Feb 1994, A. Larochelle, M.-C. Larivière, Beech forest clearing; Motu R, Mangatutara Stn, 1♀, 5 Nov 1997, P. Thompson (DoC). **HB.** Puketitiri, 1♀, 27 Nov 1934, J. S. Armstrong, J. S. Armstrong Collection; Waimarama Beach, 1♂, 28 Jan 1957, in house H. 430. **RI.** Ngatarua, Upper Rangitikei, 1♂, 23 Oct 1962, R. A. L. Batley. **WN.** Ballance Bridge, 1♂, 1♀, 3 Feb 1959, on trunk of native fuschia, R. M. Bull Collection; Ballance Reserve, 1♂, Mar 1957, R. M. Bull, R. M. Bull Collection; Tokomaru Gorge, 9♂♂, 1♀, 10 Jan 1961, R. M. Bull, R. M. Bull Collection; 1♀, 4 Feb 1959, E. B. DeCleene, R. M. Bull Collection; Khandallah, 1♂, May 1967, G. W. Ramsay; Orongorongo Field Stn, 1♂, 17 Sep 1969, J. C. Watt, *Laurelia novaecelandiae* branch, reared em. 26 Jan 1970. **South Island.** **SD.** Bulwer, Pelorus Sound, 1♂, Feb 1928, C. M. Fraser; Maud Is, Old Homestead 1♂, 28 Nov 1980, P. R. Notman, caught in spiderweb on outside window. **NN.** Maungatapu Valley, 1♀, 19 Jan 1962, B. Schultz; Roding River, 1♂, 20 Nov 1942; Knuckle Hill, Mangarakau, 1♀, 22 Feb 1978, C. A. Fleming, J. Townsend; Takaka, 1♀, 8 Apr 1926, F. C. Sparrow; Pepin Is. 2♀, 1♂, 10 Feb 1924, E. S. Gourlay. **BR.** Greymouth, 1♂, 20 Sep 1953, E. L. Kehoe. Unknown locality. DeCleene's Bush, 1♀, 6 Jan 1969, R. DeCleene, R. M. Bull Collection, B31; 10 Jan 1920, 1♀; No locality data: 1♂, 1♀, Voucher specimens illustrated by G. Cox, Mobil/Reed 1984; 6♂♂, 2♀♀, illustrated D. W. Helmore 1 Nov 1983; 961, 2♂♂; 3♀♀; 4♂♂. Specimens examined: 156.

Subfamily Apioninae

Tribe Rhadinocybini

Zelanterus terricola (Broun, 1923)

North Island. **ND.** Te Paki Coastal Park, North Cape, 1♂, 7 Feb 1975, litter 75/81, J. C. Watt; Te Paki Trig, 310 m, 1♂, 23 Nov 1982, sifted litter and decayed wood 82/116, G. Kuschel; Kohuronaki, 270 m, 1♂, 24 Nov 1982, sifted litter and decayed wood 82/123, G. Kuschel; Pekaerau, 1♂ (holotype), 19 May 1918, leafmould, A. E. Brookes; Butterfly Valley, Tauranga Bay, 1♂, 1♀, 25 Sep 1966, sample 1375 of pohutukawa [*Metrosideros excelsus*] leaf litter, K. A. J. Wise; Mangamuka Saddle, 380 m, 1♂, 5 Nov 1967, ex moss sample, J. I. Townsend & J. McBurney; 400 m, 1♀, 21 Sep 1976, G. Kuschel; Maungataniwha Range, Mangamuka saddle, 400 m, 2♂♂, 13 Dec 1976, litter 76/104 and 76/109, B. M. May; Waipoua Forest, 1♂, 3♀♀, 7 Dec 1961, leafmould, G. Kuschel; Waipoua State Forest, 1♀, 7–16 Jun 1966, litter, J. C. Watt & J. I. Townsend; 1♂, 20 Sep 1977, ex sifted rotten stumps/trees 77/102, D. W. Helmore; Waipoua, Toatoa site, 1♂, 29 Oct 1980, litter 80/94, G. Kuschel; Waipoua, Toronui Track, 1♂, 30 Oct 1980, litter 80/95, G. Kuschel; Waitangi State Forest, 1♀, 5 Oct 1981, litter 81/97, R. Kleinpaste. Specimens examined: 19.

Cecidophyus nothofagi sp. nov.

North Island. **TK.** 2 km W of Waitaanga, 1♀, 18 Dec 1981, on *Nothofagus menziesii*, J. S. Dugdale. **South Island.** **NN.** Mt Arthur, 1♀, Jan 1918, A. O'Connor; 1♀, 26 Jan 1924, A. Philpott, A. E. Brookes Coll.; 1♂, 22 Jan 1948, R. R. Forster; 1200 m, 2♂♂,

3 Feb 1965, on *N. menziesii*, G. Kuschel & A. K. Walker; Mt Arthur, Salisbury's Opening, 32♂♂, 32♀♀ 30 Dec 1928, and 1♂, 1♀ 23 Jan 1943, on *N. menziesii*, E. S. Gourlay; Mt Arthur, Flora Stream, 1200 m, 1♂, 2♀♀, 4 Feb 1965 m on *N. menziesii*, G. Kuschel & A. K. Walker; Cobb, 1♂, 16 Jan 1923, E. E. Walker; Cobb Ridge, 49♂♂, 49♀♀, 7 Jan 1959, on *N. menziesii*, E. S. Gourlay; Canaan, Takaka Hill, 1♂, 17–26 Jan 1949, A. E. Brookes; Buller River nr Newtons Flat, 1♀, Dec 1918, G. V. Hudson. **BR.** Mt Murchison, 1200 m, 9♂♂, 11♀♀, 14 Feb 1964, on *N. menziesii*, J. I. Townsend; Croesus Knob Track, Paparoa Range, 1070–1190 m, 1♂, 1♀, 19 Jan 1982, J. W. Early & R. M. Emberson. **NC.** Lewis Pass, 2♀♀, 6 Feb 1982, J. S. Dugdale. **FD.** Homer Saddle, 7♂♂, 1♀, 31 Dec 1943, J. T. Salmon. Specimens examined: 209.

Strobilobius libocedri sp. nov.

North Island. **TO.** Makotuku Flat, Ohakune Mt Road, 1♀, 28 Nov 1985, R. C. Craw; Turoa, Mt Ruapehu, 5 larvae, 14 Apr 1989, ex female strobili of *Libocedrus bidwillii*; B. M. May. **TK.** Pouakai Trig, Pouakai Ra, 1400 m, 4♂♂, 4♀♀, 1 Dec 1975, sweeping, A. K. Walker; 1400 m, 1♀, 9 Jan 1978, sweeping, J. S. Dugdale; Pouakai Ra, 1250–1300 m, 1♂, 1♀, 9 Jan 1978, sweeping, J. S. Dugdale; Tatakangi Peak, Pouakai Ra, 1♀, 10 Jan J. S. Dugdale. **South Island.** **DN.** Dunedin Botanical Gardens, 5♂♂, 1♀ (all teneral), emerged 7 Jun to 27 Jul 1960 ex female strobili of *Libocedrus bidwillii* collected 11 Apr 1960, K. W. Prior. Adult specimens examined: 20.

Neocyba metrosideros (Broun, 1880)

North Island. **ND.** Coopers Beach, 1♂, 2♀♀ (+ larvae), 14 Dec 1976, on *Metrosideros excelsus*, B. M. May; Mangamuka Saddle, Maungataniwha Range, 300 m, 4♂♂, 4♀♀, 10 Dec 1976, on *Metrosideros robustus*, B. M. May; Fern Flat Road, Maungataniwha Range, 300 m, 3♂♂, 5♀♀, 15 Dec 1976, on *M. excelsus*, B. M. May; Te Matua Ngahere, Waipoua SF, 1♂, 3♀♀ reared from *M. sp.* (prob. *M. albiliflorus*), W67/100, collected 14 Oct 1967, emerged 27 Feb 1968, J. S. Dugdale; Waipoua Forest, Yakas Track, 1♂, 1♀, 24 Mar 1993, J. W. Early; Wārawara SF, 1♂, 10 Oct 1974, J. C. Watt; Horahora Bush, 1♂, 27 Nov 1944, B. B. Given; Tutukaka Harbour, 6♂♂, 1♀, 12 Dec 1980, J. C. Watt; Smugglers Cove, Whangarei Heads, 2♂♂, 1♀, 6 Dec 1958, B. M. May & K. A. J. Wise; Manana, Whangarei Heads, 1♀, 828, T. Broun; 1♂, 6 Dec 1958, B. M. May & K. A. J. Wise; 10♂♂, 4♀♀, 7 Dec 1961, G. Kuschel; Whangarei, 2♂♂, 1♀, 24 Nov 1944, B. B. Given; Beach Cove, Whangarei Heads, 1♂, 8 Jul 1957, J. C. Watt; Parahaki, 1♂, 26 Dec 1944, B. B. Given; Parua, 1♀, 828, T. Broun; Waipu, 6♂♂, 6♀♀, Jan 1914, A. E. Brookes; Tawhiti Rahi I, Poor Knights Is, 14♂♂, 9♀♀, 1 Jan 1956, J. C. Watt; 110♂♂, 109♀♀, 2–11 Dec 1980, on *M. excelsus*, C. F. Butcher, R. H. Kleinpaste, G. Kuschel, M. F. Tocker & J. C. Watt; Aorangī, Poor Knights Is, 1♀, 1 Jan 1956, J. C. Watt; 2♂♂, 3♀♀, 11–15 Nov 1981, J. C. Watt; Maori Bay I, Mokohinau Is, 6♂♂, 7♀♀, 28 Feb 1978, on *M. excelsus*, G. Kuschel; 3♂♂, 2♀♀, 4–6 Jan 1984, beating *Metrosideros Phormium*, A. B. Grace, P. D. MacDonald; Fanal I, Mokohinau Is, 1♂, 3♀♀, 1 Mar 1978, on *M. excelsus*, G. Kuschel. **AK.** Tiritiri Matangi I, 2♂♂, 1♀, 16 Nov 1995, on *M. excelsus*, G. Hall; Kawau I, 5♂♂, 1♀, 25 Apr 1943, on *M. excelsus*, N. M. Carter & M. A. Lowly; Wenderholm (18 larvae); 1♂, 1 Jan 1984, J. C. Watt; Helensville, 1♀, 828, T. Broun, A. E. Brookes Coll.; Clevedon, 1♀, T. Broun; Paparoa nr Howick, 1♂, T. Broun; Titirangi, 1♀, 28 Dec 1916, A. E. Brookes; Waitakere, 1♂, 1♀, 30 Dec 1914, A. E. Brookes; Scenic Drive, Auckland, 1♂, 2♀♀, 6–29 Jan 1951, D. Spiller. **CL.** Little Barrier I, 4♂♂, 2♀♀, 29 Dec 1931–10 Jan 1932, A. E. Brookes; 1♂, 26 Nov 1947, J. M. Dingley; 400 m, 2♂♂, 8 Feb 1976, A. K. Walker; 183 m, 1♂, 29 Feb 1976, A. K. Walker; Little Barrier I, Caretaker's Garden, 1♀, 22 Feb 1976, A. K. Walker; Little Barrier I, Te Maraeroa, 1♀, 21 Feb 1976, A. K. Walker; Great Barrier I, 1♀, 29 Jan 1930, A. E. Brookes; Kaitoke, Great Barrier I, 2♂♂, 1♀, 25 Nov 1957, J. C. Watt; Rangiwahakaea Bay, Great Barrier I, 1♀, 30 Nov 1957, J. C. Watt; Coromandel Peninsula, West Coast, 1♀, 23 Mar 1958, K. A. J. Wise; Te Hope Beach (32 larvae), B. M. May; Tairua, 1♀ (lectotype), T. Broun; Pioneer Ridge, Cuvier I, 2♀♀, 24 Jan 1972, on *M. excelsus*, B. M. May; Stanley I, Mercury Is, 2♂♂, 1♀, 23 Nov 1972, on *M. excelsus*, G. W. Ramsay; Red I, Mercury Is, 1♀, Aug 1971, leaf litter, J. M. Johannesson; 2♂♂, 2♀♀, 24 Nov 1972, on *M. excelsus*, G. W. Ramsay; Middle I, Mercury Is, 1♀, 20 Nov 1972, G. W. Ramsay; Ohinau (Ohena) I, Ohinau Is, 19♂♂, 23♀♀, 25–26 Nov 1972, on *M. excelsus*, G. W. Ramsay; Koruenga I, Ohinau Is, 1♂, 27 Nov 1972, G. W. Ramsay; Ruamahua I,

Aldermen Is, 51 ♂♂, 40 ♀♀, 8–12 Nov 1972, on *M. excelsus*, G. W. Ramsay. **TK**. Midhurst, 1 ♀, Broun Coll., A. E. Brookes. **WN**. Akatarawa, 1 ♀, 17 Jan 1909, A. O'Connor. **NN**. Pigeon Saddle, Takaka, 1 ♂, 1 Feb 1949, E. S. Gourlay; Mt Burnett, 600 m, 1 ♂, 1 ♀, 8 Feb 1981, R. M. Emberson; Oparara, 1 ♀, 13 May 1949, A. E. Brookes. **BR**. Punakaiki, 1 ♀, 1 Apr 1934, E. S. Gourlay. Adult specimens examined: 500+.

Neocyba regalis sp. nov.

TH. Great I, 17 ♂♂, 10 ♀♀, Nov 1970, *Metrosideros excelsus*, G. Kuschel, G. W. Ramsay, J. C. Watt; 3 ♂♂, 3 ♀♀, 9 Dec 1996, *Metrosideros* leaves, J. M. W. Marris; North East I, 1 ♂, 1 ♀, 1 Dec 1983, J. C. Watt; South West I, 10 ♂♂, 7 ♀♀, 1 Dec 1970, on *M. excelsus*, G. Kuschel; West I, 6 ♂♂, 5 ♀♀, 6 Dec 1963, on *M. excelsus*, P. M. Johns. Specimens examined: 63.

Tribe Apionini

Exapion ulicis (Forster, 1771)

North Island. ND. Kawakawa, 4, 15 Jan 1951, D. Spiller; Whangarei Heads, 1, 7 Dec 1961, G. Kuschel; Bay of Islands, Paroa Bay, 1, 28 Feb 1983, O. Long; Mt Manaia, 400 m, 2, 21 Jan 1981, B. A. Holloway, beating mixed shrubs. **AK**. Waiheke, Man O'War Stn, 4, 18 Dec 1990, B. Merrilees, ex gorse; Palm Beach, 26, 27 Aug 1977, L. L. Deitz, sweeping in swamp; Mt Albert, 2, 26 Feb 1976, J. C. Watt, under bark *Eucalyptus viminalis*; Waitakeres, 4, 267A, 1, 102A, 1, 162A, 2, 162B; Auckland, 1, 22 Jan 1966, A. K. Walker, B. M. May; 1, 19 Dec 1950, P. Everett, ex garden; Whangaparaoa Peninsula, 3, 15 Mar 1949, D. Spiller; Auckland Wharf, 1, 5 Feb 1976, R. N. Battrick; Noises Is, Motuhoropapa I, Snail Flat, nr hut, 1, 11–18 Jan 1978, L. L. Deitz, malaise trap; Pollen I, 1, 11 Jan–23 Feb 1990, G. Hall, P. A. Maddison, Malaise trap; 1, 23 Feb–23 May 1990, G. Hall, Malaise trap, 2, 26 Oct 1990–11 Jan 1991, G. Hall, Malaise trap; Bethells, Matuku Res, 1, 14 Dec 1990–21 Mar 1991, Malaise trap on ground below tree platform; Glen Eden, Waikumete Cemetery, 2, 9 Jan 1999, P. A. Maddison, general sweeping Singer Park; 7, 8 Jan 1999, P. A. Maddison, sweeping gorse; Riverhead SF, 1, 25–27 Apr 1982, P. A. Maddison, Malaise trap; Lynfield, 1, 1 Jan 1984, B. A. Holloway, in house; Kaukapakapa, 1, 23 Sep 1977, B. A. Holloway, on flowers of *Pomaderris*; East Tamaki, 1, Jan–Feb 1980, H. M. Raudon. **CL**. Mayor I, Otiore Bay, 1, Nov 1959, J. C. Watt. **WO**. Onehero, 1, 23 Feb 1985, 2, 27 Jan 1985, 1, Nov–Dec 1984, R. A. Galbreath, S. Grant, Malaise trap South in *Beilschmeidia tairairi* forest. **BP**. Blue Lake, Rotorua, 1, alighting on car, R. M. Bull Collection; Waitawheta Gorge, nr Waihi, 1, 30 Jan 1957, B. M. May; Mt Te Aroha, 957 m, 2, 6 Mar 1985, R. C. Craw. **HB**. Puketitiri, Little Bush, 1, 21 Apr 1986, T. H. Davies; Ocean Beach, 1, 1991, C. Duffy (DoC) pit traps. **WI**. Marton, 2, 19 Jan 1961, B. F. Gregory, oats. **WN**. Mt Hector, 1372–1524 m, 1, 10–12 Jan 1962, J. I. Townsend, M. J. Esson, *Olearia lacunosus*, Taranua Ra, River Forks, 8–11 Feb 1985, G. W. Gibbs, Malaise trap at *Nothofagus* tree; Dundas Ridge, 1430 m, 1, 6 Feb 1985, G. Hall, beating tussock; Dundas Ridge, 2, 8 Feb 1985, C. F. Butcher, sweeping tussock at sunset; 1, 5 Feb 1985, C. F. Butcher, on track above hut at night; Mt Dundas, 1500 m, 3, 9 Feb 1985, C. F. Butcher, sweeping; Mt Dundas summit, 2, 9 Feb 1985, B. A. Holloway, sweeping. **WA**. Martinborough, 1, 8 Apr 1959, A. C. Eyles, Lucerne. **South Island. SD**. Keneperu Sound, 1, Jan 1955, B. B. Given; Okiwi Bay, Mar 1984, G. Simpson, Malaise trap in second growth bush; Okiwi Bay, 1, Sep 1984, T. Jones, Malaise trap; French Pass, 1, Feb 1971, G. W. Ramsay. **NN**. Nelson, 10, 3 Oct 1958, J. I. Townsend; 24, 4–5 Apr 1962, E. S. Gourlay; 8, 28 Jan 1943, J. Kelsey, ex gorse seed; 1, Sep 1963, L. P. Marchant; Anised Valley, 1, 6 Mar 1950, A. W. Parrott; Richmond, 3 Apr 1951, A. Carson 52/51; Nelson, Monaco, 6, 4 Jan 1968, R. Power, sweeping seeding grass at night; Mt Fell, Richmond Ra, 1300 m, 7, 13 Mar 1969, E. W. Valentine, sweeping; Fell Pk, Richmond Ra, 2, 13 Mar 1969, A. C. Eyles; Mt Arthur, 1249 m, 2, 22 Mar 1971, A. C. Eyles, sweeping; 1493 m, 1, 22 Mar 1971, A. C. Eyles, sweeping; summit, 1788 m, 1, 22 Mar 1971, J. McBurney, moss 71/82; 914–1219 m, 1, 3 Feb 1965, A. K. Walker, G. Kuschel; Mt Robert, 1219 m, 1, 15 Mar 1965, J. McBurney, beating; 732 m, 13, 15 Mar 1968, E.

W. Valentine, Tussock; Mt Johnson Sdle, 750 m, 4, 13 Mar 1969, E. W. Valentine; Parkes Farm, 88 Valley, 1, 24 Nov 1970, N. A. Martin; Dun Mt, 762 m, 2, 13 Nov 1961, G. Kuschel; Dun Tk, Third House, 609 m, 1, 7 Mar 1972, G. W. Ramsay, ex *Coprosma foetidissima* & *propinqua*; Nelson, Botanical Hill, 1, 29 Sep 1967, *Meliclytus ramiflorus*; Pretty Bridge Valley, 1, 21 Sep 1966, G. Hitchings, in pasture; 1, 28 Sep 1968, G. Hitchings, pit trap in pasture; Takaka Hill, Canaan Tk, 1, 15 Feb 1949, A. W. Parrott, under stones; Takaka Hill Saddle, 1, 21 Nov 1977, E. Schlinger; Canaan, 1000 m, 2, 1 Feb 1978, A. K. Walker, sweeping *Leptospermum scoparium*; 1, under logs; Mt Owen, 1524 m, 2, 22–26 Feb 1960, J. I. Townsend, W. P. Thomas; Cawthron Institute, 1, 2 Dec 1936, J. T. Salmon, parasitic weevil of gorse, Dominion Museum exchange; Ben Nevis summit, 1, 23 May 1965, A. K. Walker, moss; Ruby Bay, 1, 25 Sep 1965, G. Kuschel; Kaituna R, Collingwood, 1, 3 Apr 1964, J. I. Townsend, litter; Mt Peel, 1219 m, 3, 26 Jan 1964, M. J. Esson, J. I. Townsend, *Dracophyllum*; Totaranui, 1, 23 Nov 1970, E. Schlinger. **BR**. Lewis Pass, 914 m, 1, 20 Jan 1976, A. K. Walker, near tam; Ada Pass, 1, 25 Apr 1966, G. W. Ramsay, moss in open nr bush edge; Mawhera SF, 4, 8 Mar 1972, *Pinus radiata*, Beech Forest Utilisation Project; Fletchers Ck, 2, 7 Mar 1972, beating *Pinus radiata*, Beech Forest Utilisation Project; Reefton, Inangahua V, 1, 7 Mar 1972, Beech Forest Utilisation Project; Mt Devar, 1069 m, 1, 2 Dec 1969, J. C. Watt, beating *Dracophyllum longifolia*. **WD**. Lake Paringa, 1, 7 Feb 1965, N. A. Walker, litter. **MB**. Mt Altmarlock, 1676 m, 4, 16 Nov 1970, G. Kuschel, mat plants; 1200–1800 m, 15, 16 Feb 1970, G. Kuschel, swards; 7, 16 Feb 1970, G. Kuschel, mats; 2, 17 Feb 1970, G. Kuschel; 1200–1800 m, 8, Feb 1970, A. C. Eyles; 5, sweeping grass; 1402–1676 m, 10, 16 Feb 1970, J. S. Dugdale; 12, 1463–1646 m, 16 Feb 1970, J. S. Dugdale; 12, Feb 1970, A. C. Eyles, sweeping *Celmisia sessiliflora*; Black Birch Ra, 1371 m, 11, 20 Feb 1970, A. C. Eyles, in swamp; 2, 17 Feb 1970, A. C. Eyles, sweeping grass; 1082 m, 4, Feb 1970, A. C. Eyles, mat plants; 1, 18 Feb 1970, G. White, on *Cassinia* in gully; 1371 m, 1, 17 Feb 1970, A. C. Eyles, *Cassinia*; 1402 m, 1, 16 Feb 1970, A. C. Eyles, on *Cassinia*; 1402 m, 3, 16 Feb 1970, A. C. Eyles, sweeping grass; Jollies Pass, 840 m, Hamner Springs, 1, 20 Jan 1976, A. K. Walker, sweeping. **KA**. Charwell, 1, 28 Oct 1962, A. C. Eyles & J. I. Townsend; Mt Percival, 1524 m, 6, 28 Oct 1962, A. C. Eyles, J. I. Townsend, *Helichrysum selago*, *Helichrysum chorallades*; Mt Terako, 1524 m, 2, 12 Feb 1962, J. I. Townsend, G. F. Woods, *Olearia*. **NC**. 3 km W Cass, 2, 30 Nov 1977, E. Schlinger, Marsh; Waipara, 14 Feb 1969, R. Macfarlane, flowering lucerne. **MC**. Banks Peninsula, 4 km E Akaroa, 1, 22 Feb 1976, L. L. Deitz; Lincoln, 1, 14 Feb 1976, T. K. G. Stomfield; 2, 21 Sep 1967, A. Fergusson, swept gorse; 1, 3 Feb 1960, T. C. Jessop, ex sticky trap; Christchurch, 1, Dec 1970, C. J. Horning; 1, 12 Mar 1974, D. I. Vanev, inside University Bldg; Porters Pass, 2, 17 Mar 1966, L. J. Dumbleton, swept from *Dracophyllum*; Ellesmere, Greater Rakaia I, 1, 28 Sep 1973, N. Westend, on Kowhai, S. S. Wier Collection; Mt Hutt, 1, 1 Feb 1962, J. I. Townsend; Ashburton, 22, 1957, ex gorse. **SC**. Opihi R, Highway 1, 2, 21 Feb 1976, L. L. Deitz, sweeping; Orari Gorge, 4, 17 Mar 1943, A. Hamilton, ex grass, No 889, 688; Tengawai R, nr Pleasant Pt, 20 km NE Timaru, 1, L. L. Deitz, sweeping; Ikawai R, 3 miles Nkawai, 1, 10 Feb 1982, C. F. Butcher, sweeping. **MK**. L. Pukaki, Te Kohai I, 3, 27 Jan 1976, C. Smith, beaten from *Ulex*. **OL**. Coronet Peak, 1450 m, 1, 16 Dec 1995, 1, 13 Jan 1996, 1, 27 Jan 1996, 1, 3 Mar 1996, B. I. P. Barratt, Malaise trap; Takatimu Mts, 1219 m, 1, 12 Feb 1963, J. I. Townsend; Fog Peak, 1768 m, 6, 13 Feb 1952, P. M. Johns, Tussock. **CO**. Tuapeka County, 2 km E. Beaumont, 1, 19 Feb 1974, G. W. Ramsay, sweeping roadside; Dunstan Ra, Castle Rock, 1000 m, 2, 24 Feb 1980, J. C. Watt; Bannockburn, 1, 1 Oct 1975, above bridge; Alexandra, 1, Oct–Nov 1982, A. K. Walker, Malaise trap grassland in gully; Earnsclough, 1, 6 Mar 1980, G. McLaren, suction trap. **DN**. Oamaru, 1, 8 Apr 1964, J. G. Richards, B. ex Kauru Hills. **SL**. Invercargill, 10, 15 Mar 1977, A. K. Walker, in seeding *Ulex europaeus*; 2, sweeping *Daucus carota*; 5, 3 Dec 1957, ex gorse, W178; Hedgehope Summit, 610 m, Hokonui Hills, 1, 10 Feb 1976, L. L. Deitz, sweeping; Orepuke, 4, 8 Feb 1976, L. L. Deitz, sweeping grassland; Lumsden, 1, 2 Jan 1977, T. K. Crosby, sweeping roadside vegetation; Orepuke, 9 May 1949, R. R. Forster. No locality Ex Dep of Agriculture, 1, 10 Jan 1951; Introduced, 10, E. S. Gourlay, A. E. Brookes Collection. 431 specimens examined.

ILLUSTRATIONS

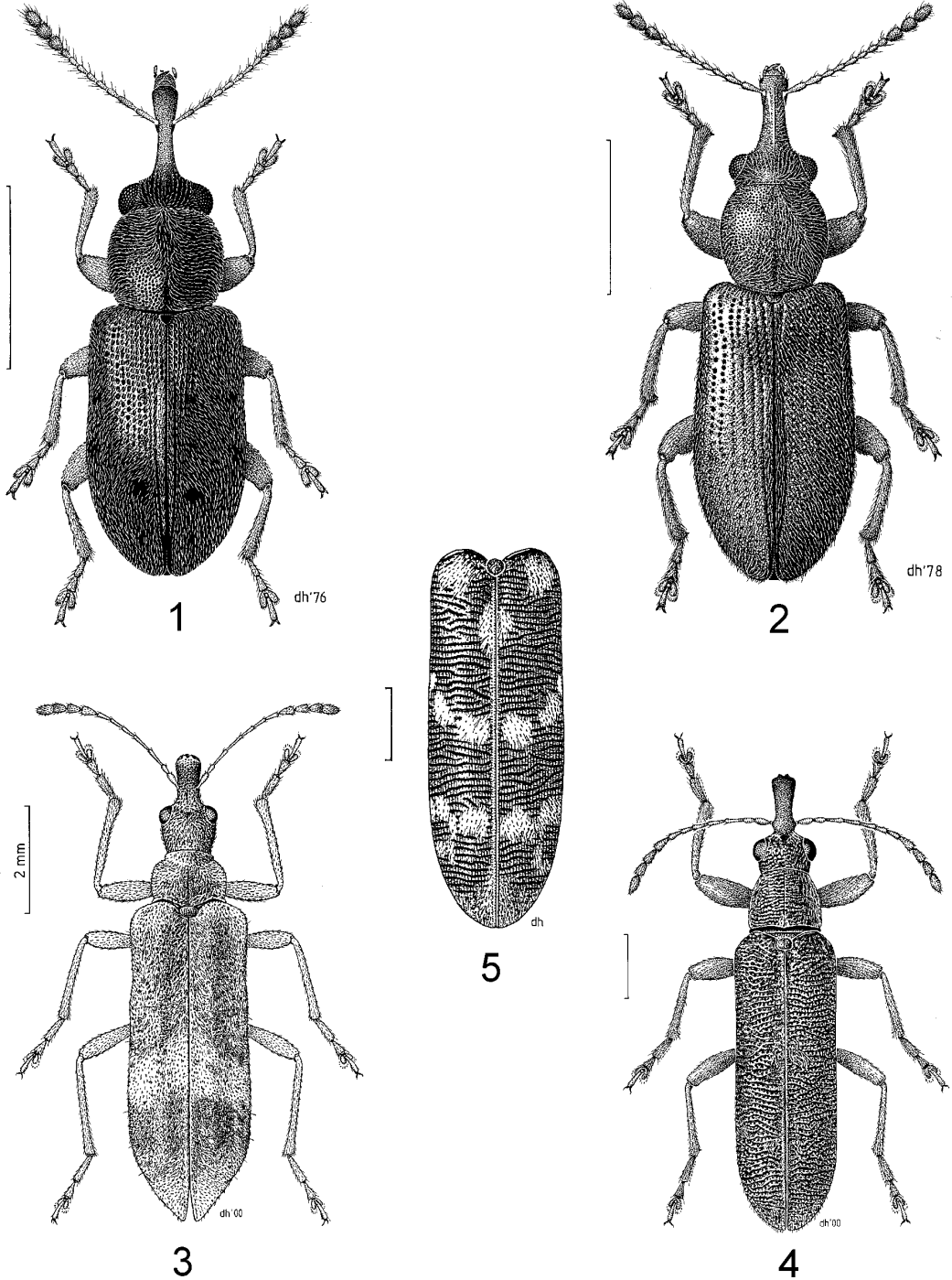


Fig. 1–5 (1–4) Habitus: (1) *Rhinorhynchus rufulus*; (2) *R. halli*; (3) *Pachyurinus sticticus*; (4) *Rhicnobelus metallicus*; (5) *Rhicnobelus metallicus* variant with scaly elytral designs.

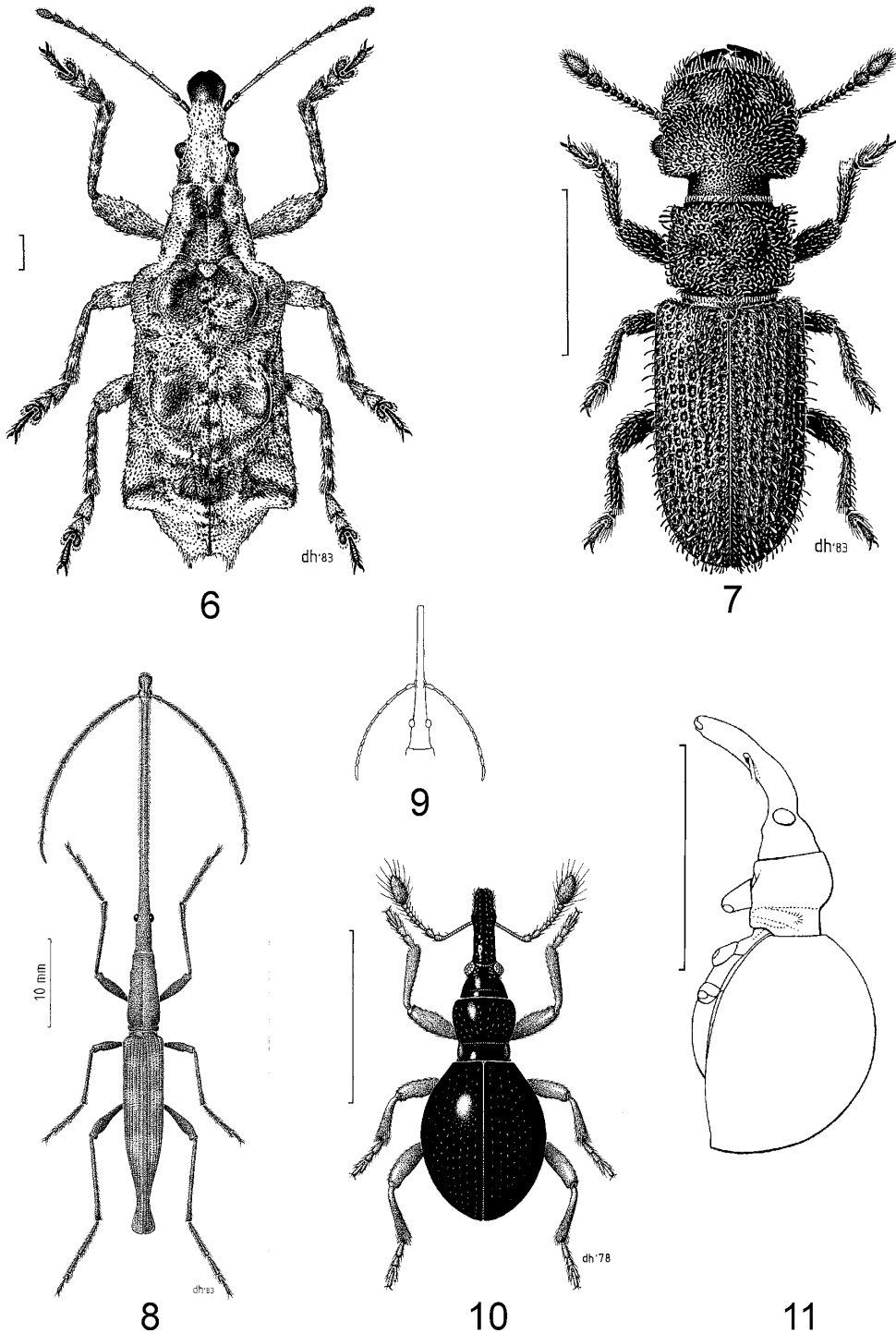


Fig. 6–11 (6–8, 10) Habitus: (6) *Agathinus tridens*; (7) *Aralius wollastoni*; (8) *Lasiorhynchus barbicornis*; (9) *Lasiorhynchus barbicornis*, head of female. (10) *Zelapterus terricola*; (11) *Zelapterus terricola*, lateral view.

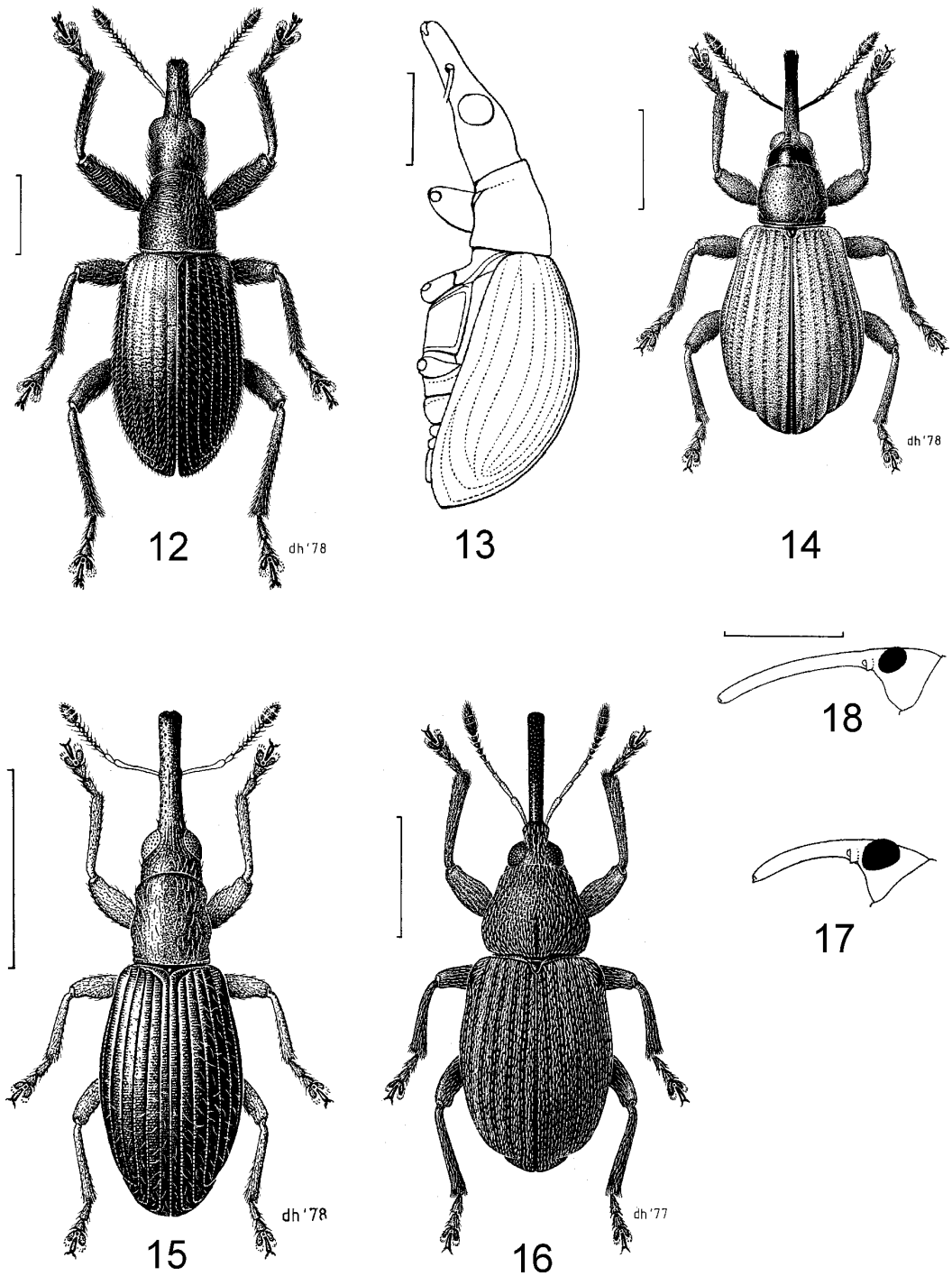


Fig. 12–18 (12, 14–16) Habitus: (12) *Cecidophyus nothofagi*; (13) *C. nothofagi*, lateral view; (14) *Strobilobius libocedri*; (15) *Neocyba metrosideros*; (16) *Exapion ulicis*; (17) *E. ulicis*, head of male; (18) *E. ulicis*, head of female.

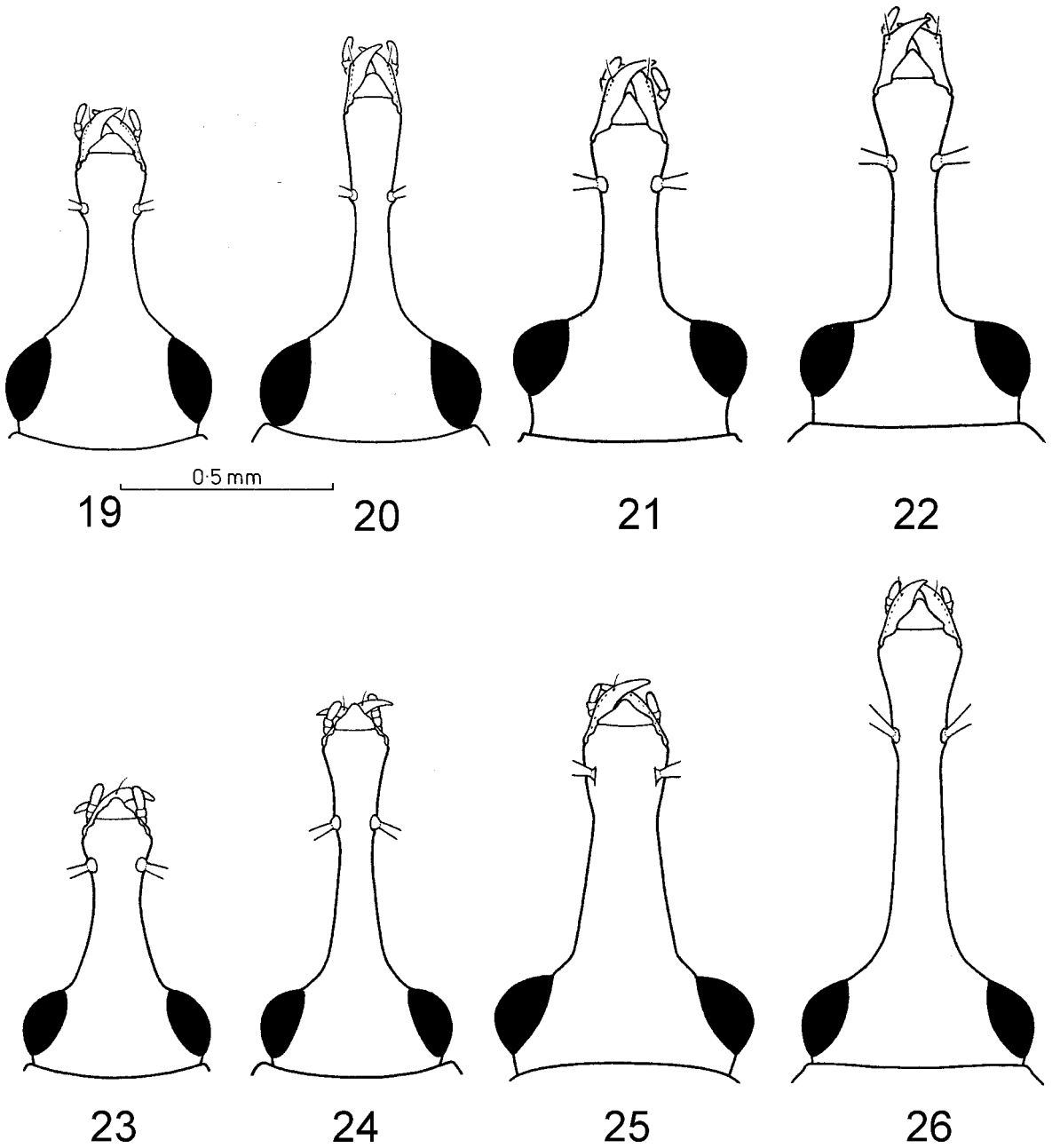


Fig. 19–26 Heads (male on left, female on right): (19, 20) *Rhinorhynchus rufulus*; (21, 22) *R. halocarpus*; (23, 24) *R. phyllocladi*; (25, 26) *R. halli*.

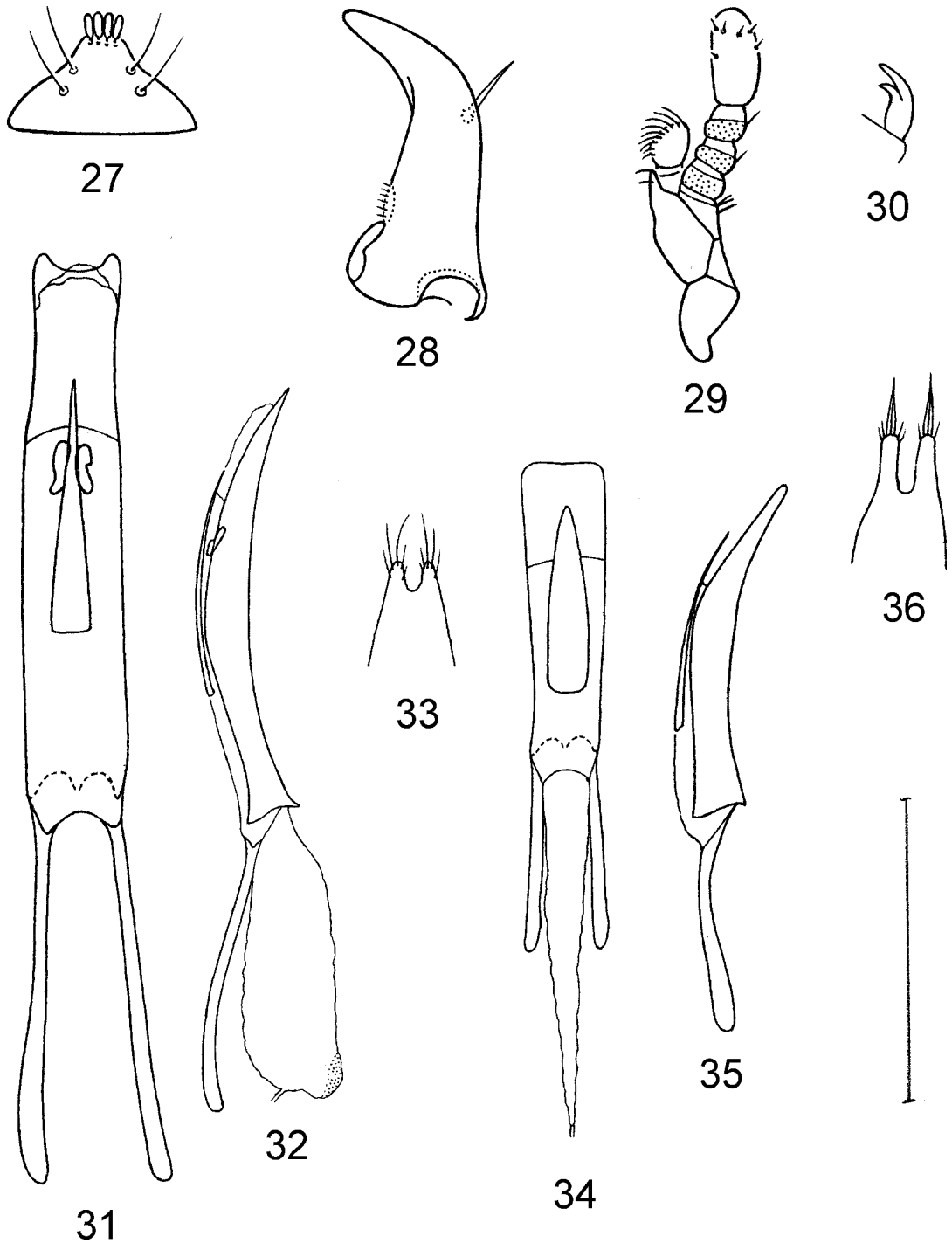


Fig. 27–36 (27–33) *Rhinorhynchus rufulus*: (17) Labrum; (28) Left mandible; (29) Maxilla; (30) Claw; (31, 32) Aedeagus, dorsal and lateral view; (33) Parameral sector of tegmen; (34–36) *R. halocarpus*: (34, 35) Aedeagus, dorsal and lateral view; (36) Parameral sector of tegmen.

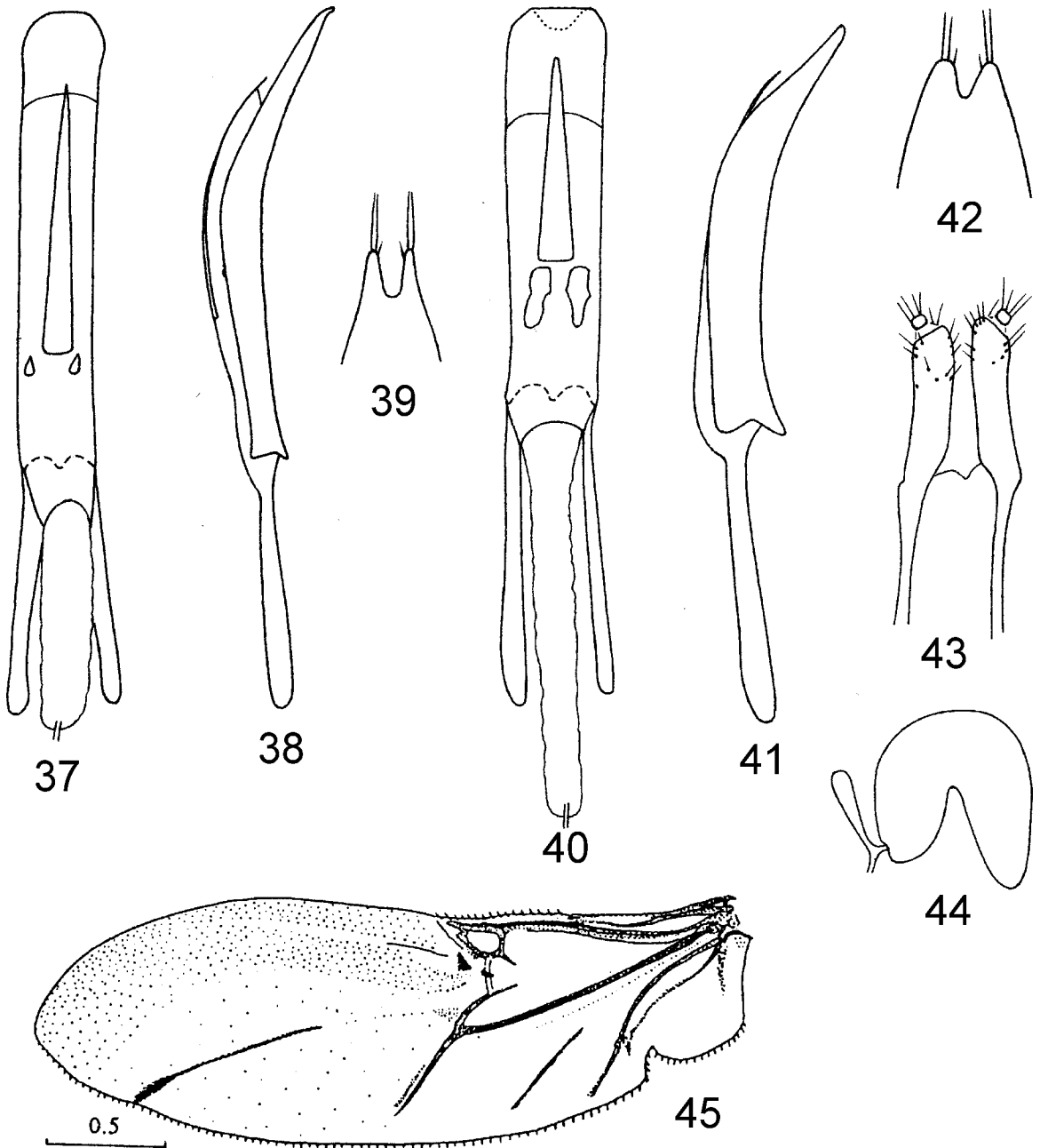


Fig. 37–45 (37–39) *Rhinorhynchus phyllocladi*: (37, 38) Aedeagus, dorsal and lateral view; (39) Parameral sector of tegmen; (40–42) *R. halli*: (40, 41) Aedeagus, dorsal and lateral view; (42) Parameral sector; (43) *R. rufulus*, hemisternites, in part; (44) *R. phyllocladi*, spermatheca; (45) *R. rufulus*., hind wing (after Zherikhin 1998).

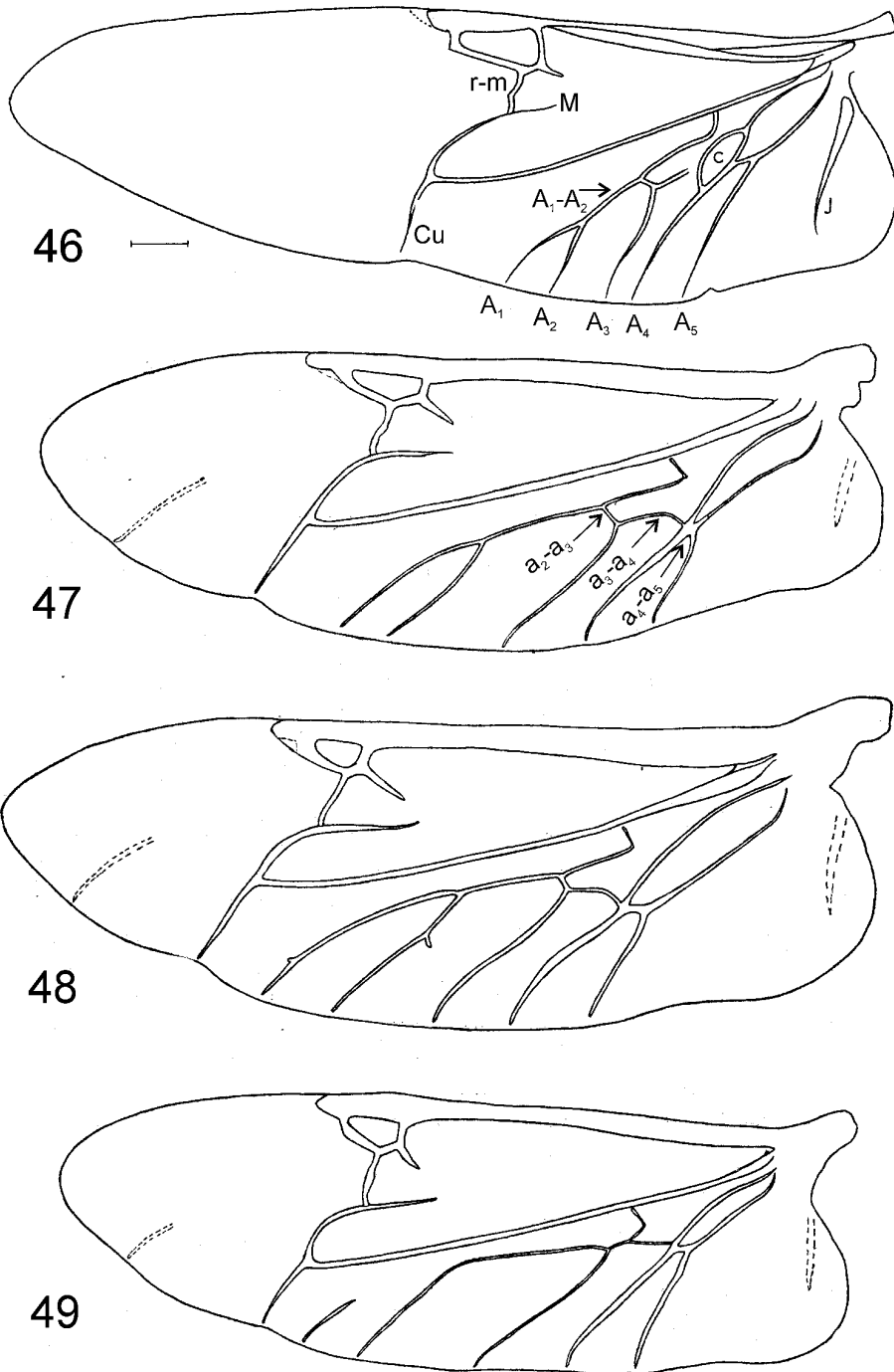


Fig. 46–49 Hind wing: (46) *Palophagus bunyae* (after Kuschel 1990); (47) *Callirhynchinus exquisitus*; (48) *Pachyura australis*; (49) *Pachyurinus sticticus* (47–49 after Kuschel 1959).

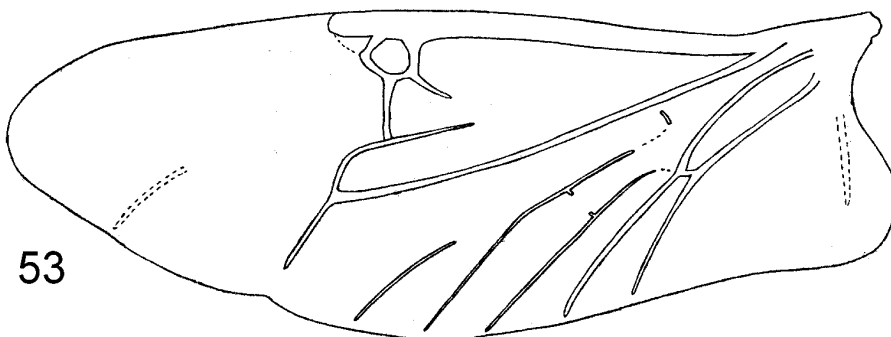
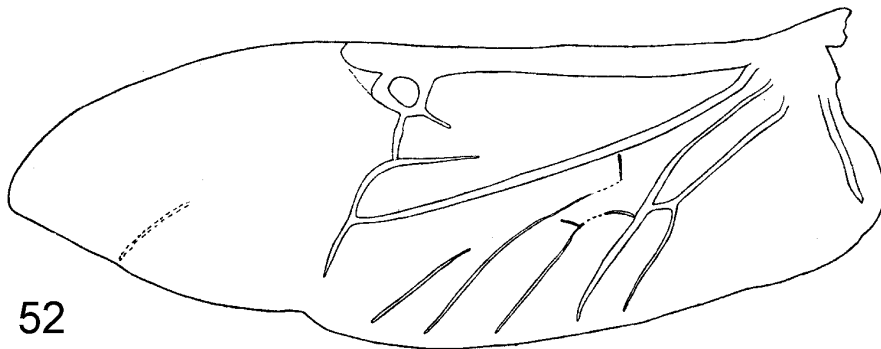
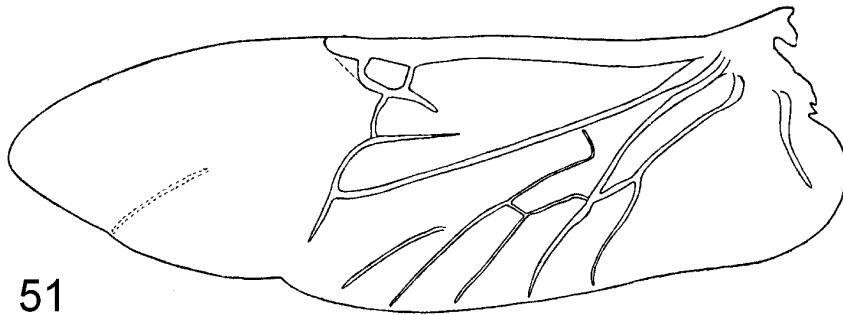
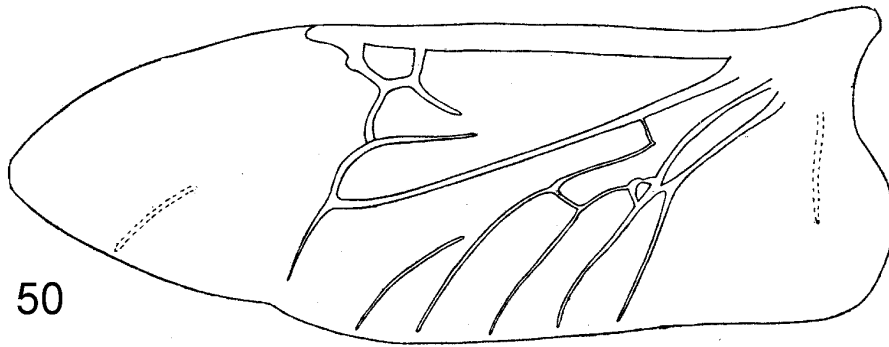


Fig. 50–53 Hind wing: (50) *Cyrotypus fascicularis*; (51) *Dicordylus marmoratus*; (52) *Agathinus tridens*; (53) *Agnesiotis pilosula* (all after Kuschel 1959).

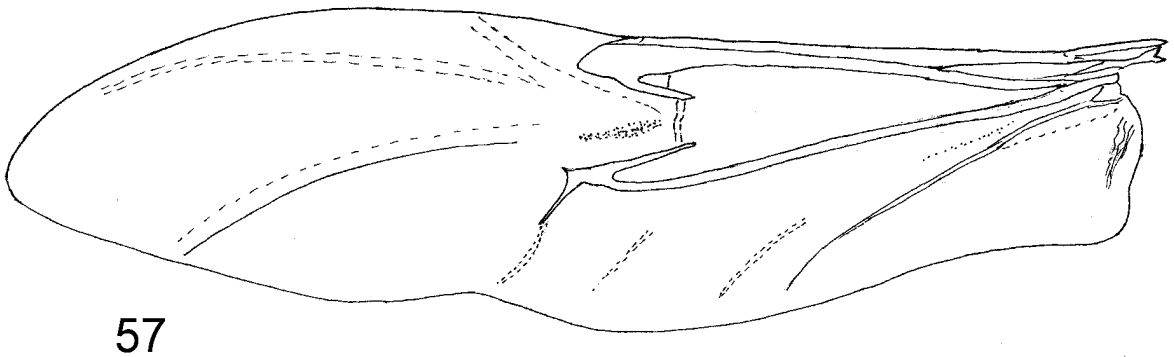
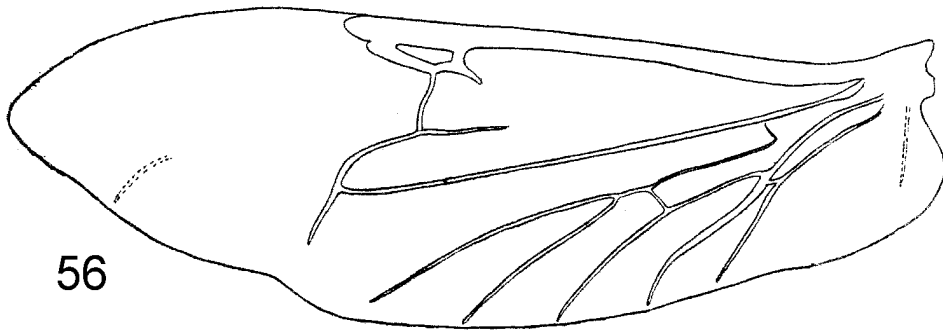
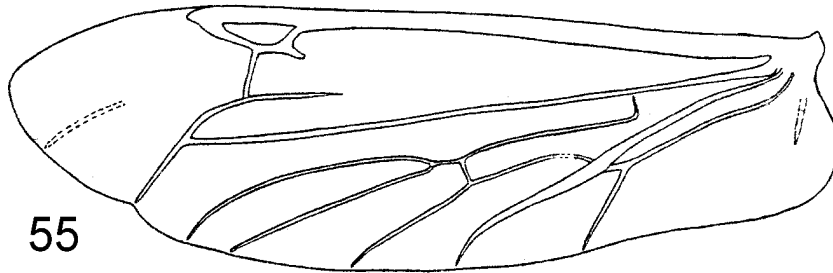
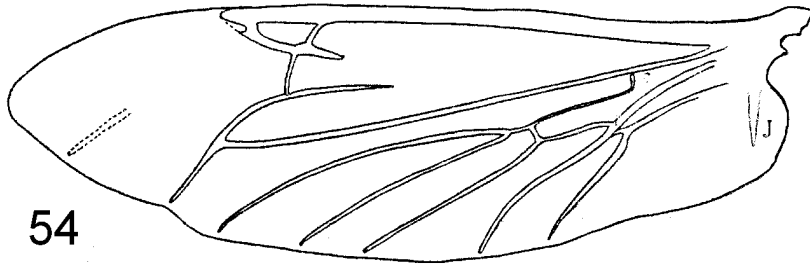


Fig. 54–57 Hind wing: (54) *Rhinotia haemoptera*; (55) *Rhinotia* sp.; (56) *Trichophthalmus miltomerus*; (57) *Lasiorhynchus barbicornis* (fig. 54–56 after Kuschel 1959).

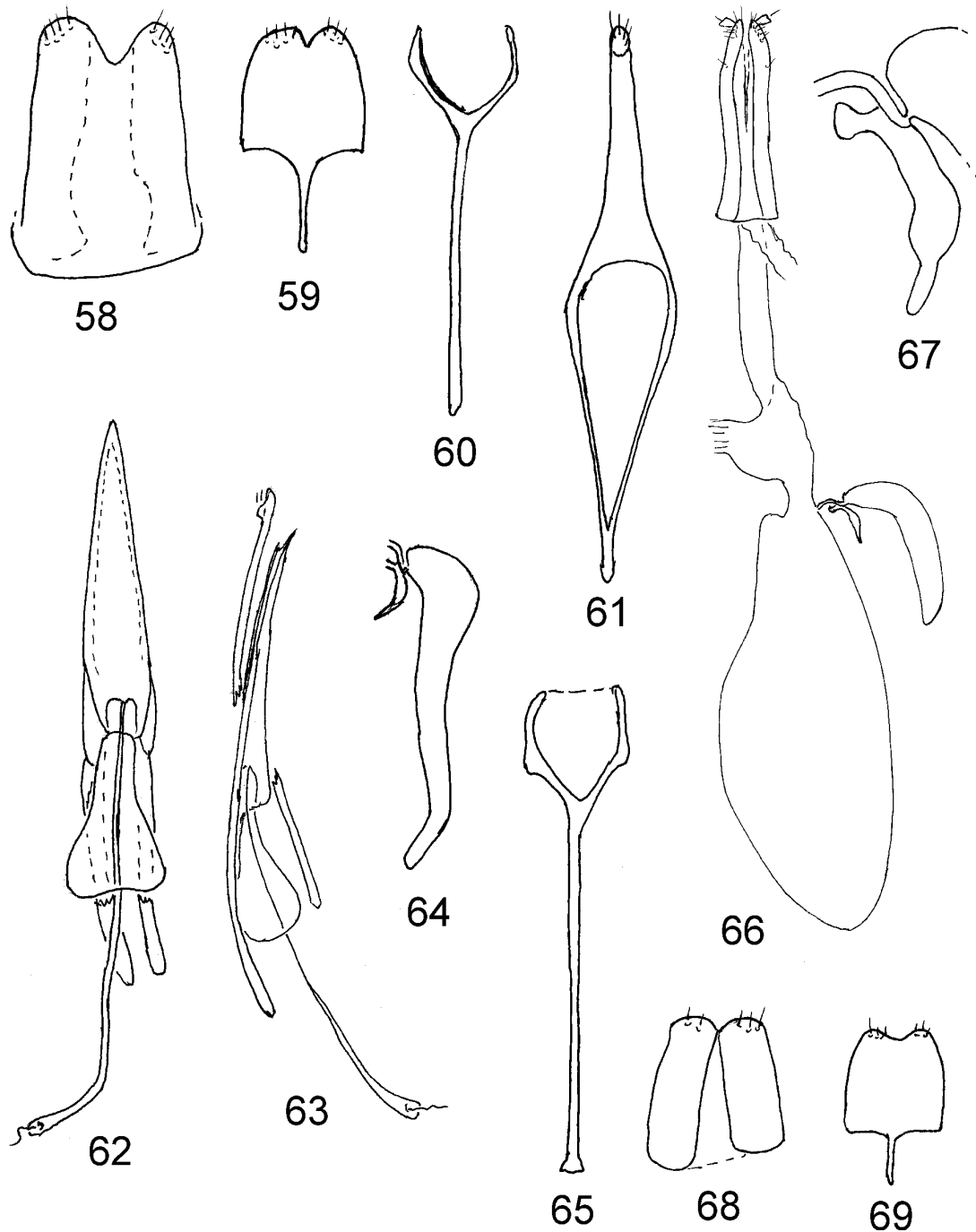


Fig. 58–69 (58–64) *Pachyurinus sticticus* (Dun Mountain): (58) Tergite 8 of male; (59) Sternite 8 of male; (60) Sternite 9 of male; (61, 63) Tegmen, dorsal and lateral view; (62, 63) Aedeagus, dorsal and lateral view; (64) Spermatheca with gland; (65–69) *P. rubicundus*: (65) Sternite 8 of female; (66) Female genitalia; (67) Enlarged spermatheca; (68) Tergite 8 of male; (69) Sternite 8 of male.

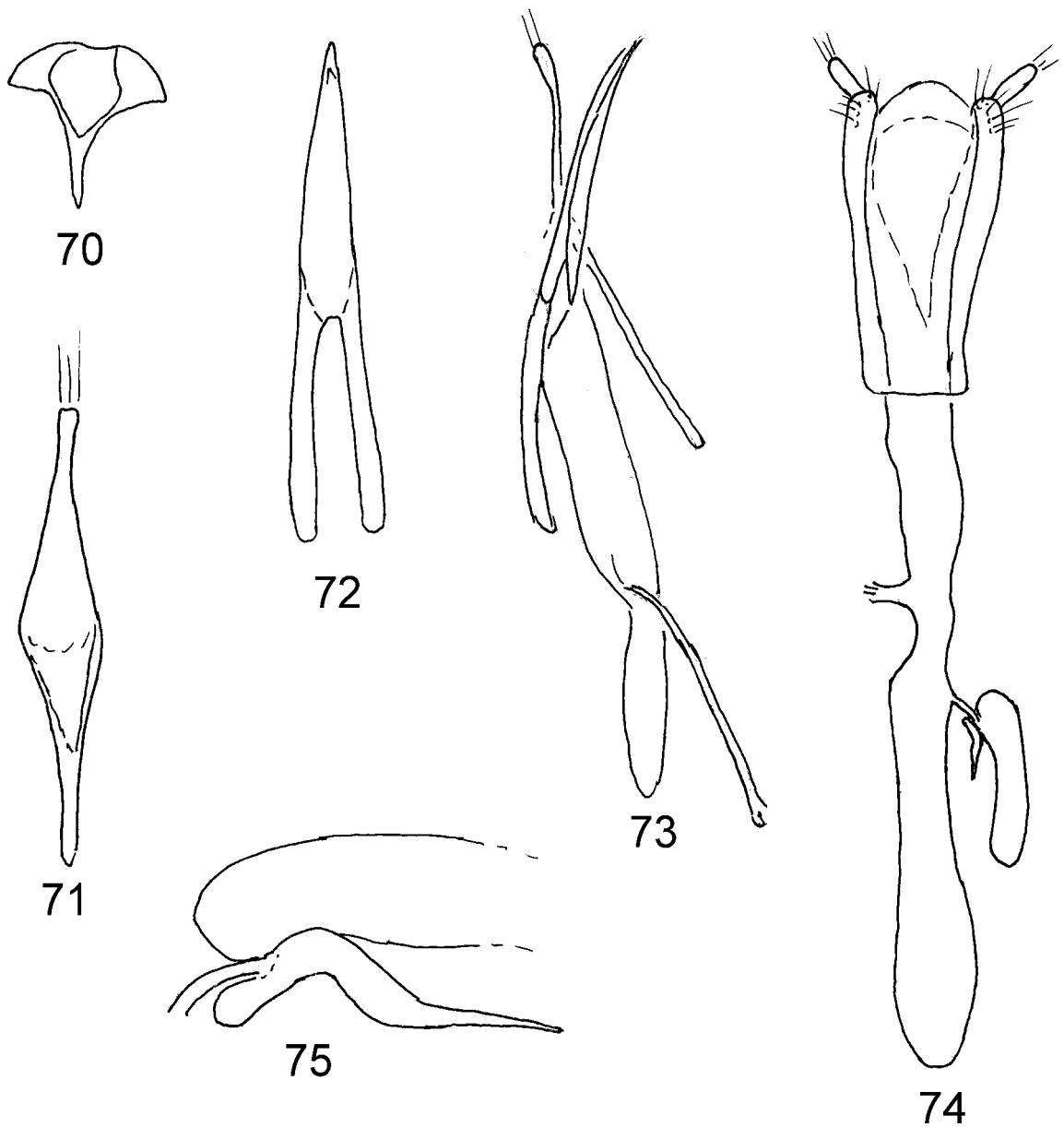


Fig. 70–75 *Rhicnobelus metallicus* (Christchurch): (70) Sternite 8 of male; (71, 73) Tegmen, dorsal and lateral view; (72, 73) Aedeagus, dorsal and lateral view; (74) Female genitalia; (75) Enlarged spermatheca.

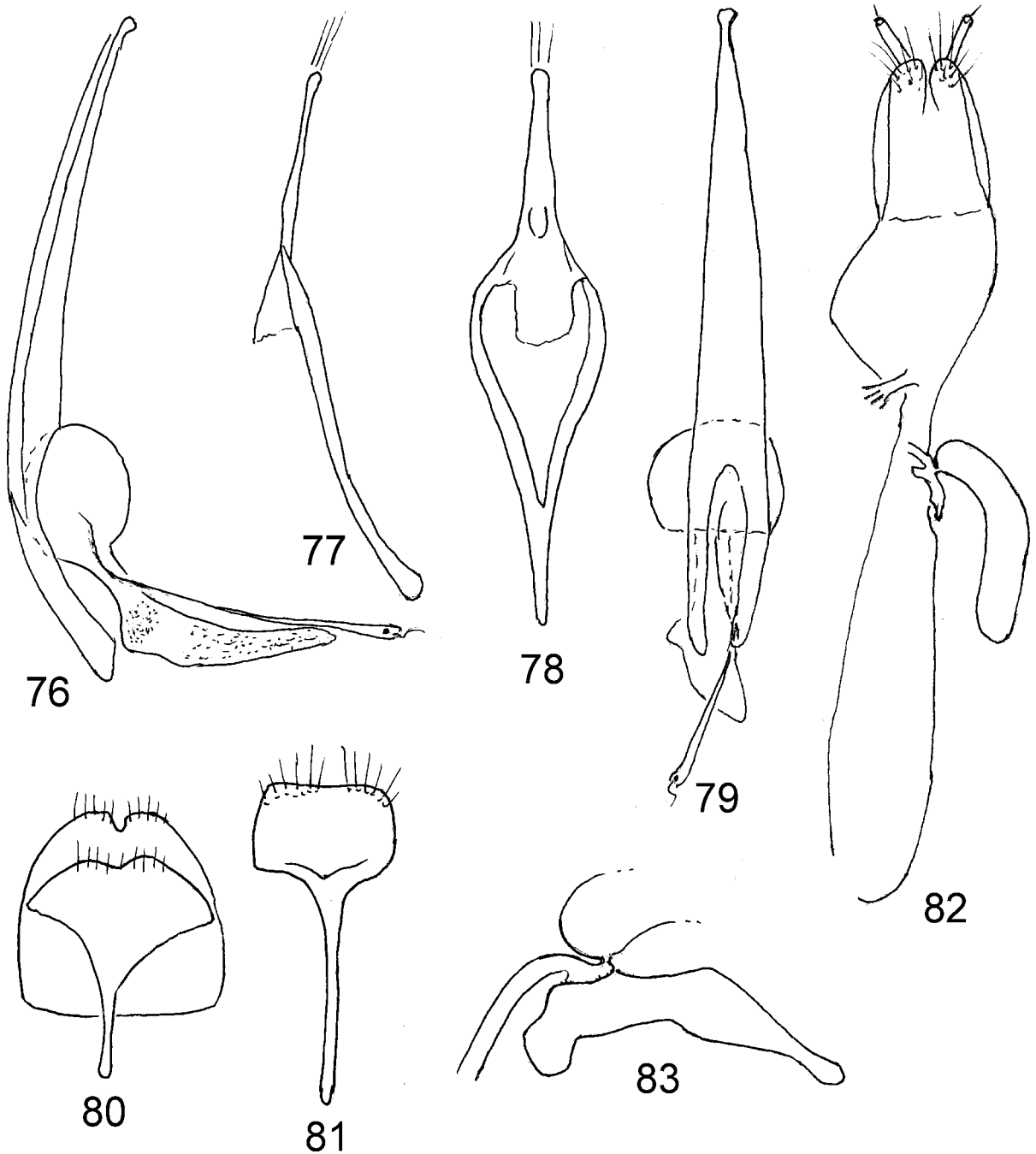


Fig. 76–83 *Rhicnobelus aenescens*: (76, 79) Aedeagus, lateral and dorsal view; (77, 78) Tegmen, lateral and dorsal view; (80) Tergite 8 and sternite 8 of male, ventral view; (81) Sternite 8 of female; (82) Female genitalia; (83) Enlarged spermatheca.

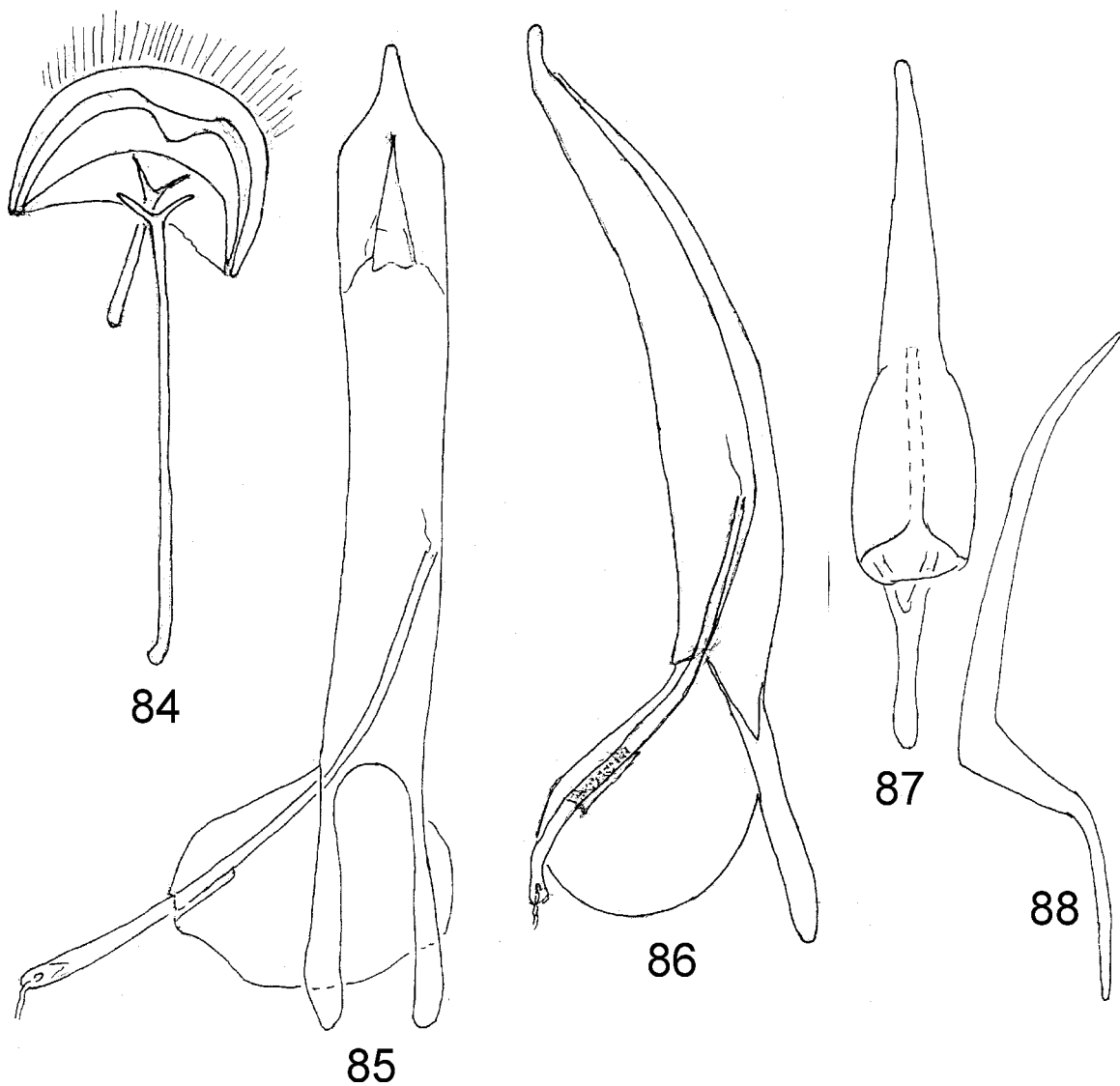


Fig. 84–88 *Agathinus tridens*, male (Lewis Pass): (84) Tergite 8, sternites 8 and 9, ventral view; (85, 86) Aedeagus, dorsal and lateral view; (87, 88) Tegmen, dorsal and lateral view.

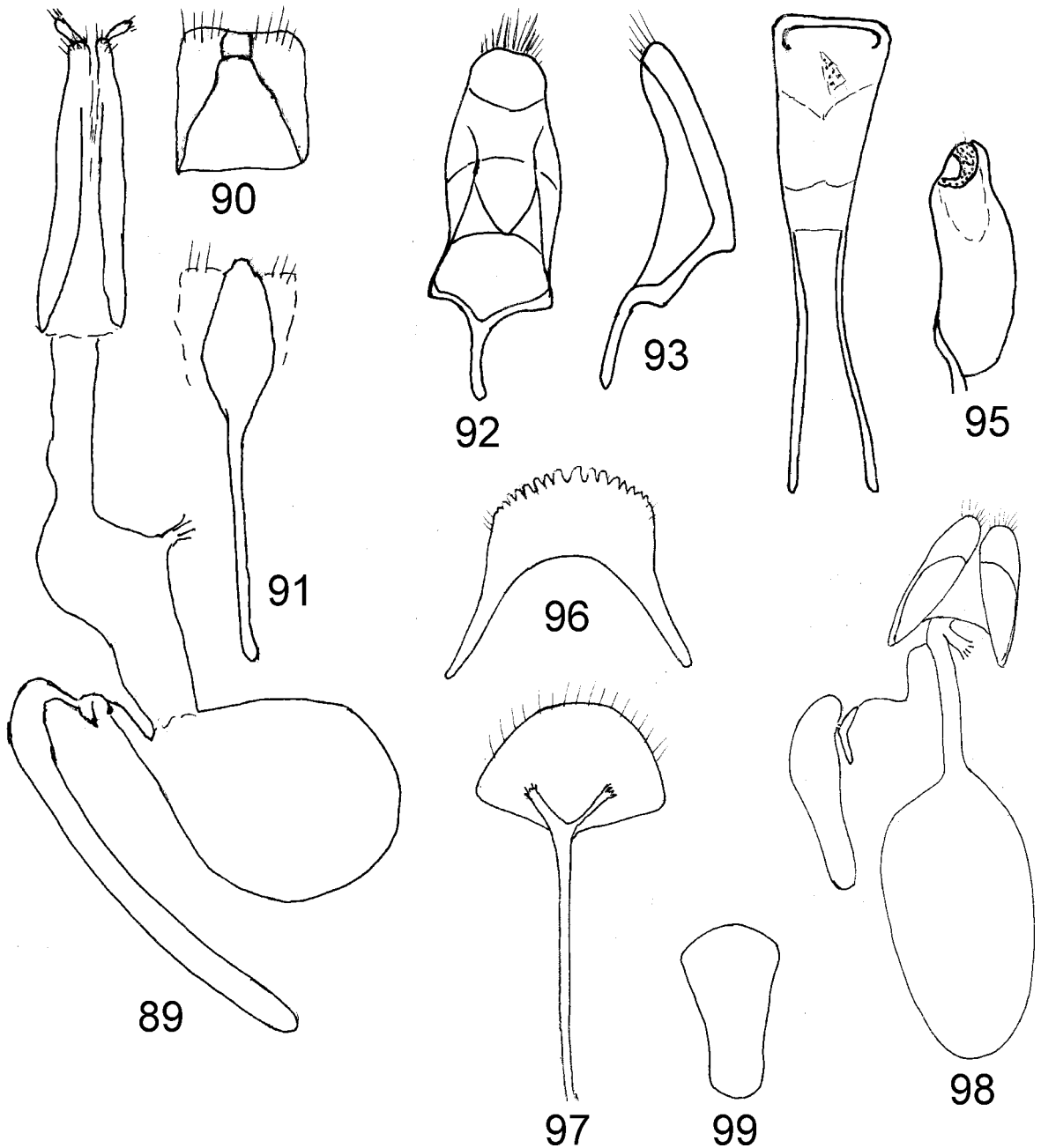


Fig. 89–99 (88–91) *Agathinus tridens*, female (Goulard Downs): (89) Genitalia; (90) Tergite 8; (91) Sternite 8; (92–99) *Aralius wollastoni* (Lynfield): (92, 93) Tegmen, dorsal and lateral view; (94, 95) Aedeagus, dorsal and lateral view; (96) Tergite 8 of female; (97) Sternite of female; (98) Genitalia; (99) Rectal loop.

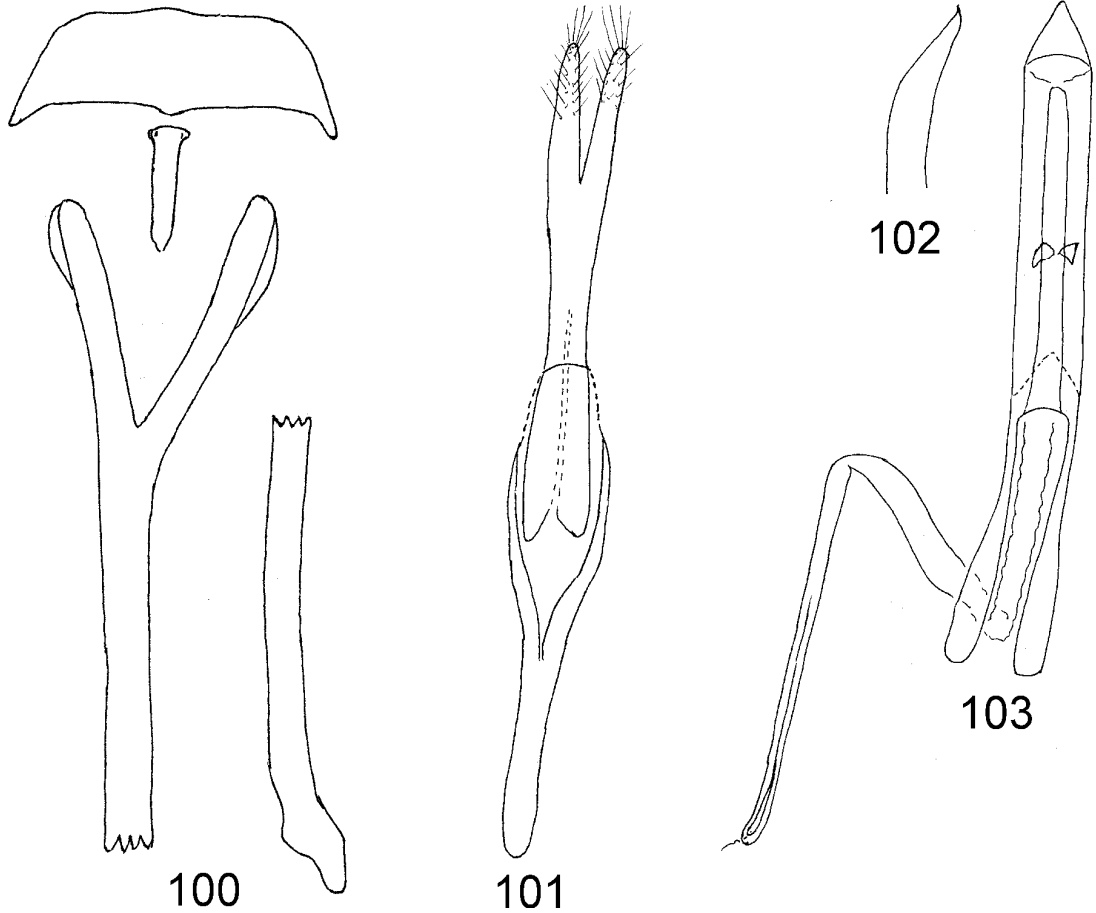


Fig. 100–103 *Lasiorhynchus barbicornis*, male: (100) Sternites 8 and 9, ventral view; (101) Tegmen, dorsal view; (102) Aedeagal apex, lateral view; (103) Aedeagus, dorsal view.

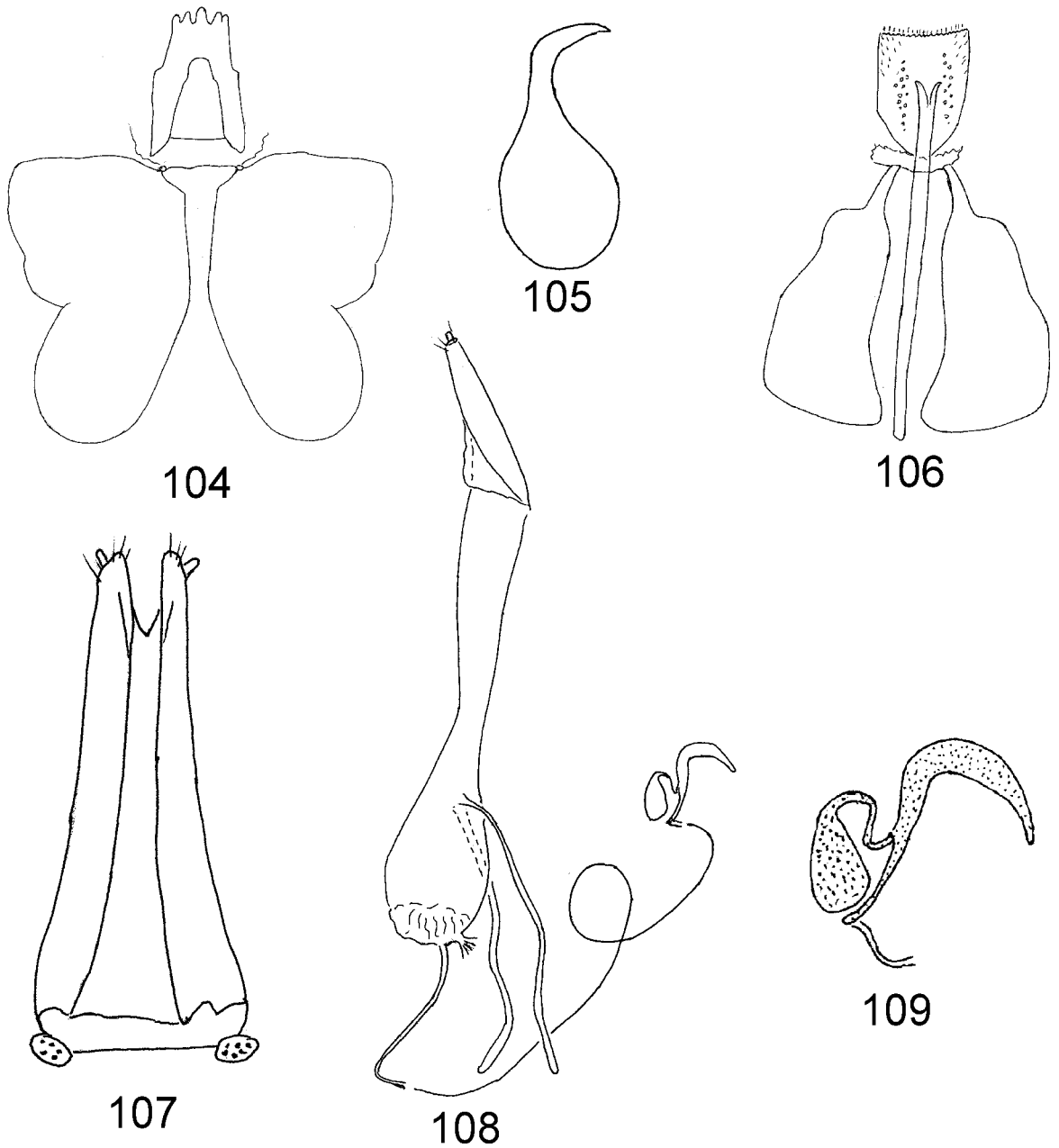


Fig. 104–109 *Lasiorhynchus barbicornis*, female: (104) Tergite 8 with intersegmental glands; (105) Tergite 8, lateral view; (106) Sternite 8 and glands on connective membrane; (107) Hemisternites; (108) Genitalia, with pair of vaginal tubules; (109) Enlarged spermatheca, pigmented part stippled.

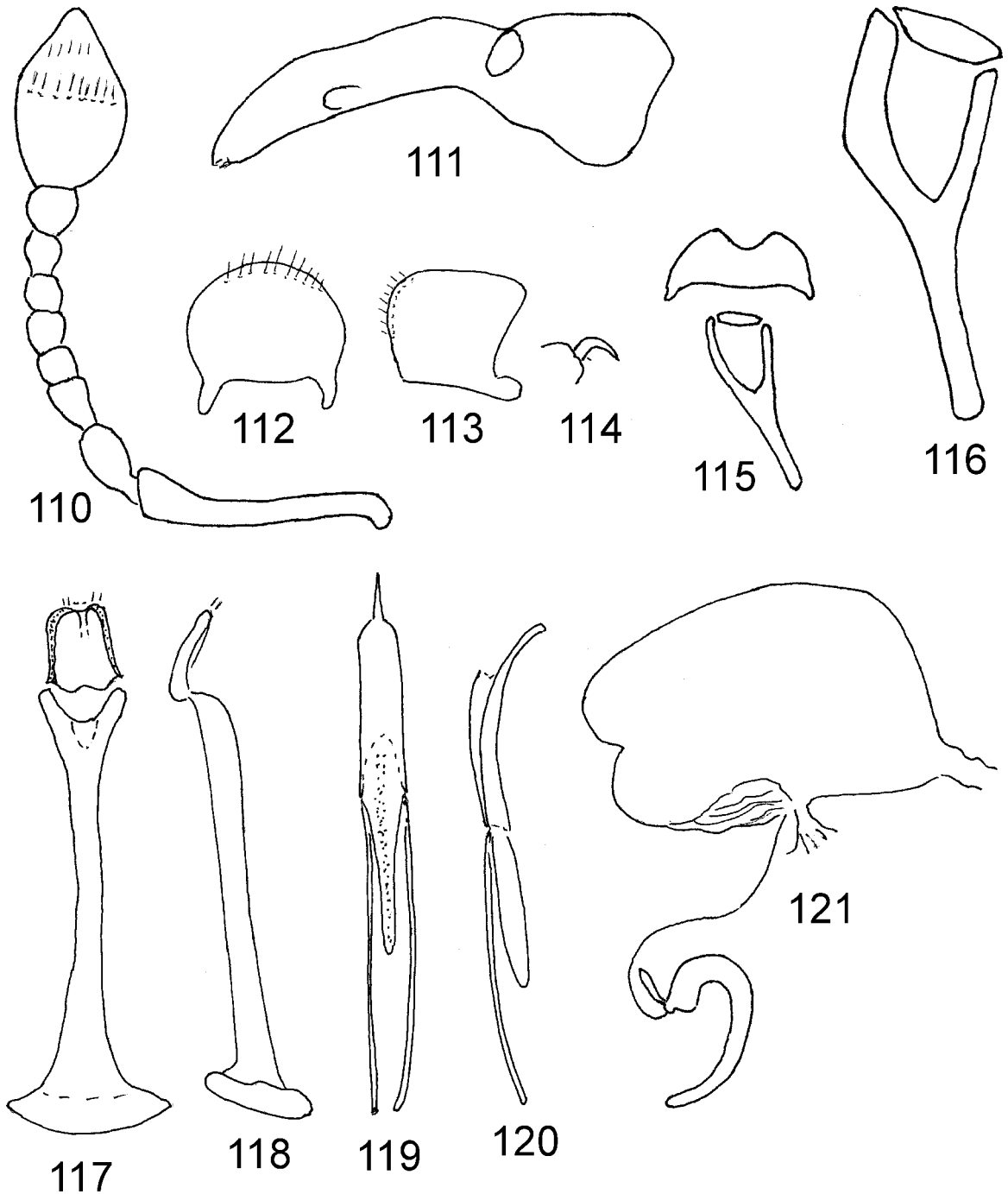


Fig. 110–121 *Zelapterus terricola*: (110) Antenna; (111) Head; (112, 113) Tergite 8 of male, dorsal and lateral view; (114) Claw; (115) Sternites 8 and 9 of male, ventral view; (116) Enlarged sternite 9 with basal sclerite; (117, 118) Tegmen, dorsal and lateral view; (119, 120). Aedeagus, dorsal and lateral view; (121) Bursa and spermatheca

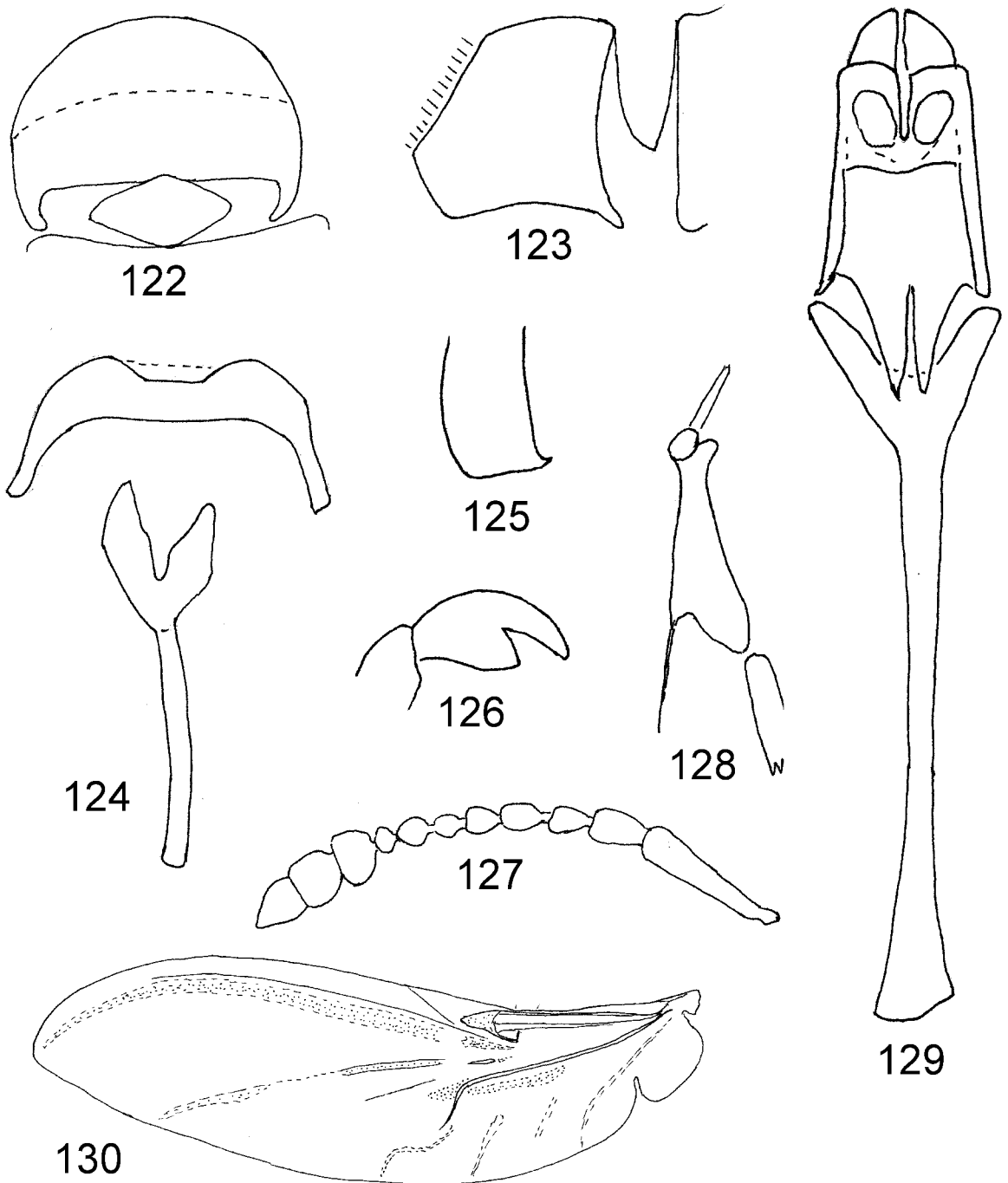


Fig. 122–130 *Cecidophyus nothofagi* (Flora Hut), male: (122, 123) Tergite 8 with intersegmental pouch (*p*), dorsal and lateral view; (124) Sternites 8 and 9, ventral; (125) Mucro on fore tibia; (126) Claw; (127) Antenna; (128) Dorsal sector of tegmen, lateral view; (129) Tegmen, dorsal; (130) Hind wing.

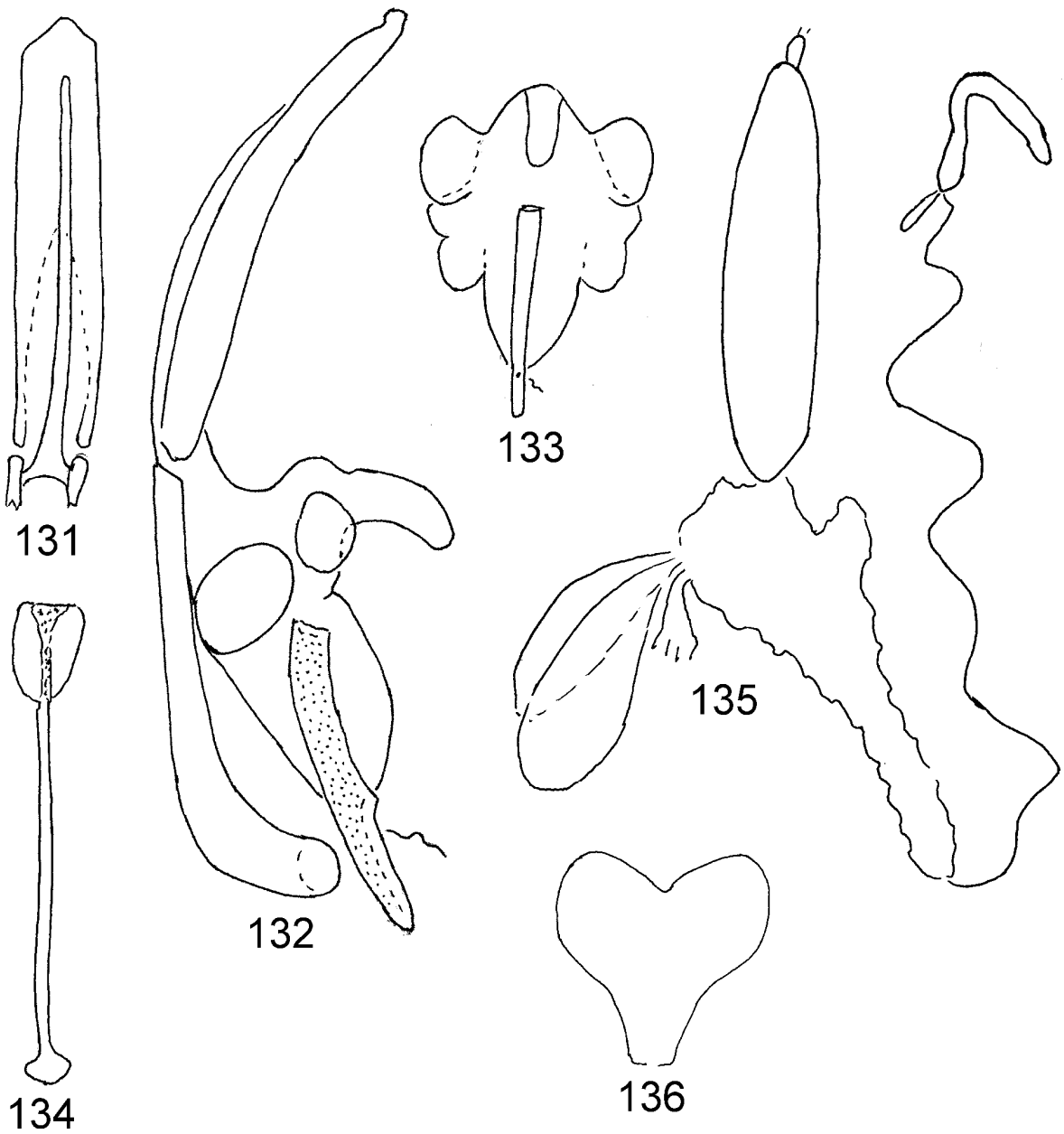


Fig. 131–136 *Cecidophyus nothofagi* (Flora Hut): (131) Aedeagus, dorsal view; (132) Aedeagus with turgid internal sac, lateral view; (133) Diverticula and lobes of internal sac, ventral view; (134) Sternite 8 of female; (135) Female genitalia; (136) Colleterial gland, posterior view.

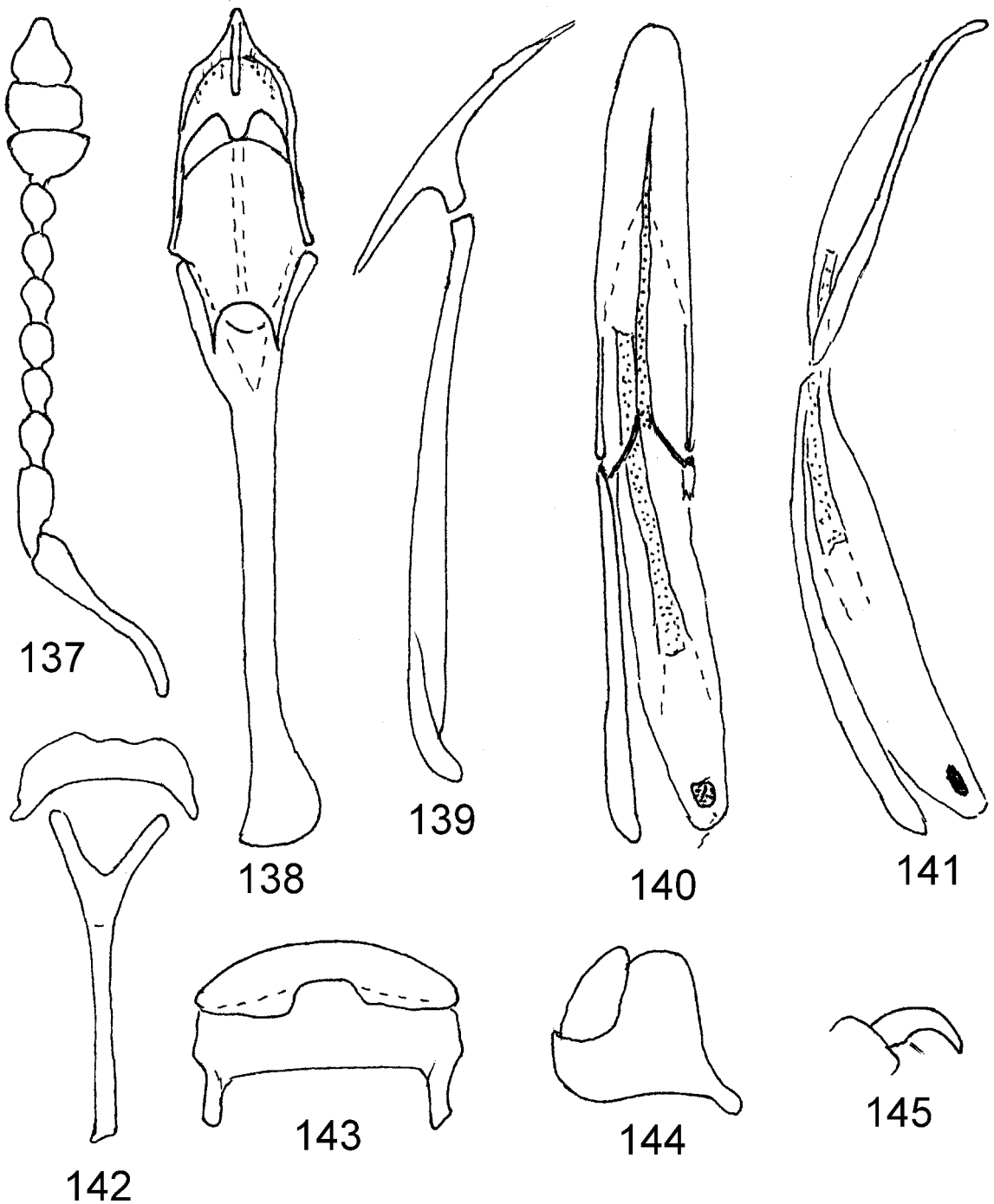


Fig. 137–145 *Strobilobius libocedri*, male: (137) Antenna; (138, 139) Tegmen, dorsal and lateral view; (140, 141) Aedeagus, dorsal and lateral view; (142) Sternites 8 and 9, ventral view; (143, 144) Tergite 8 of male, dorsal and lateral view; (145) Claw.

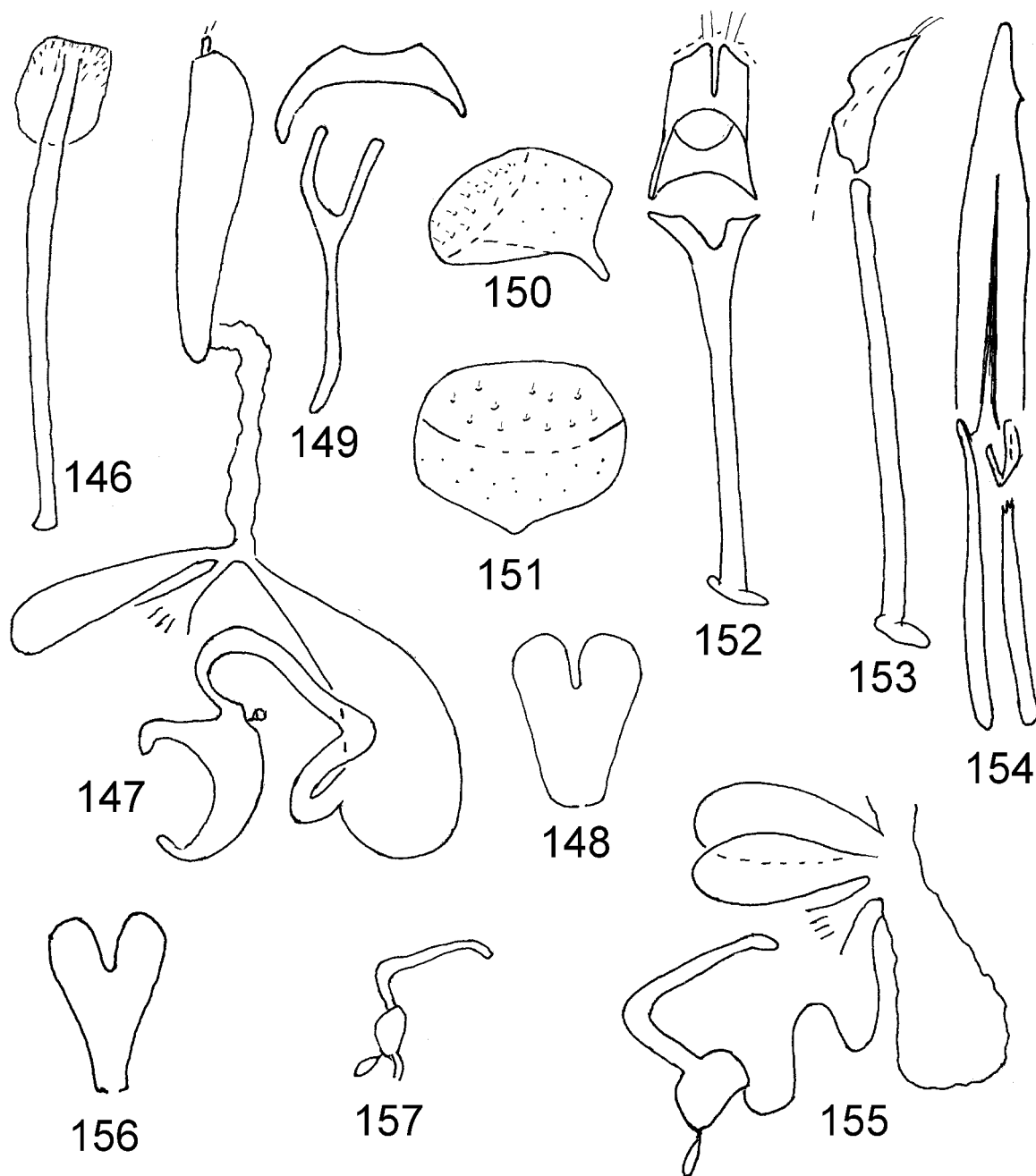


Fig. 146–157 (146–148) *Strobilobius libocedri*, female: (146) Sternite 8; (147) Genitalia; (148) Colleterial gland, posterior view; (149–156) *Neocyba metrosideros*: (149) Sternites 8 and 9 of male; (150, 151) Tergite 8 of male; (152, 153) Tegmen, dorsal and lateral view; (154) Aedeagus, dorsal view; (155) Female genitalia, in part; (156) Colleterial gland, posterior view; (157) *N. regalis*, Spermatheca.

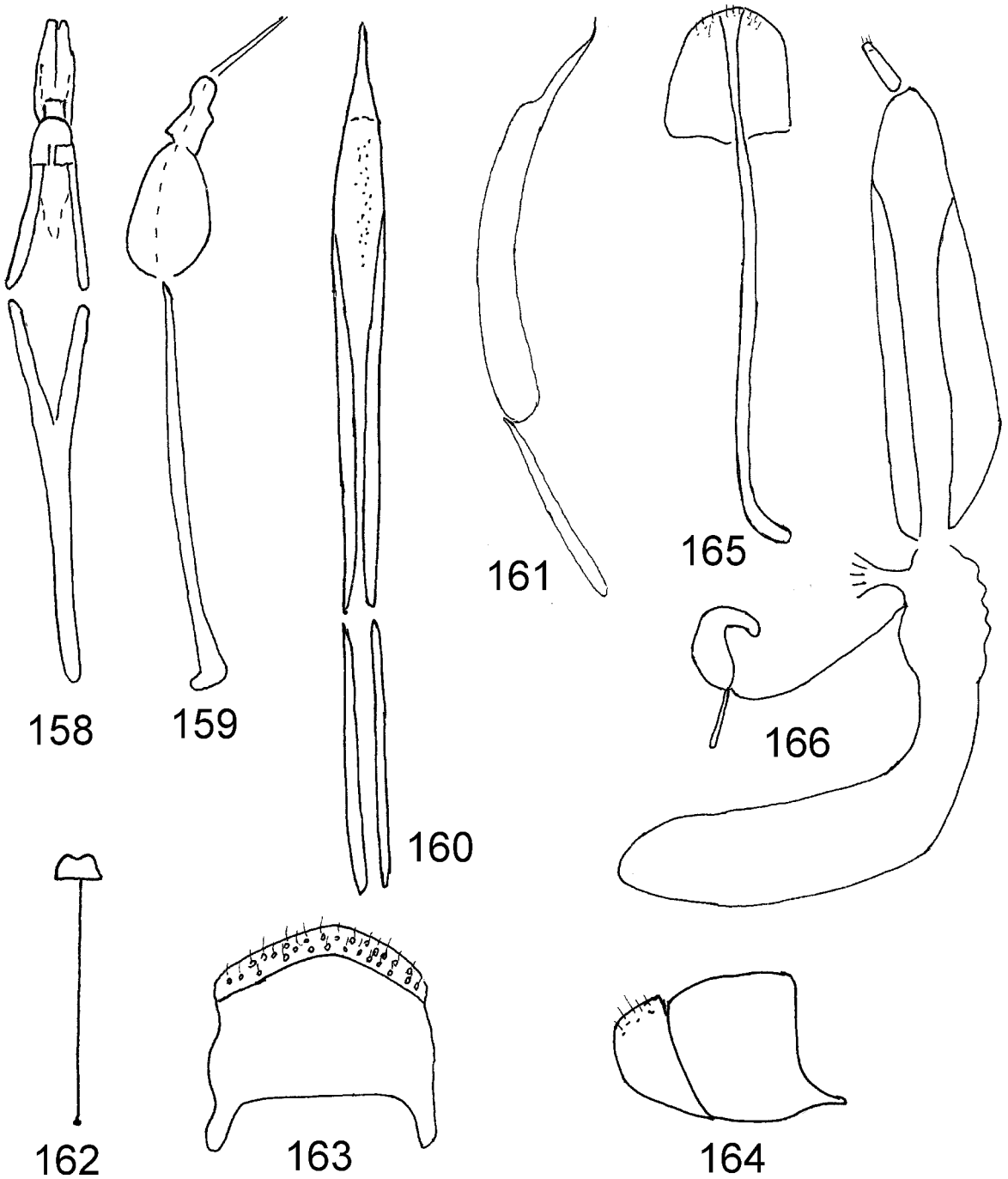


Fig. 158–166 *Exapion ulicis*: (158, 159) Tegmen, dorsal and lateral view; (160, 161) Aedeagus, dorsal and lateral view; (162) Sternite 8 of male; (163, 164) Tergite 8 of male, dorsal and lateral view; (165) Sternite 8 of female, ventral view; (166) Female genitalia.

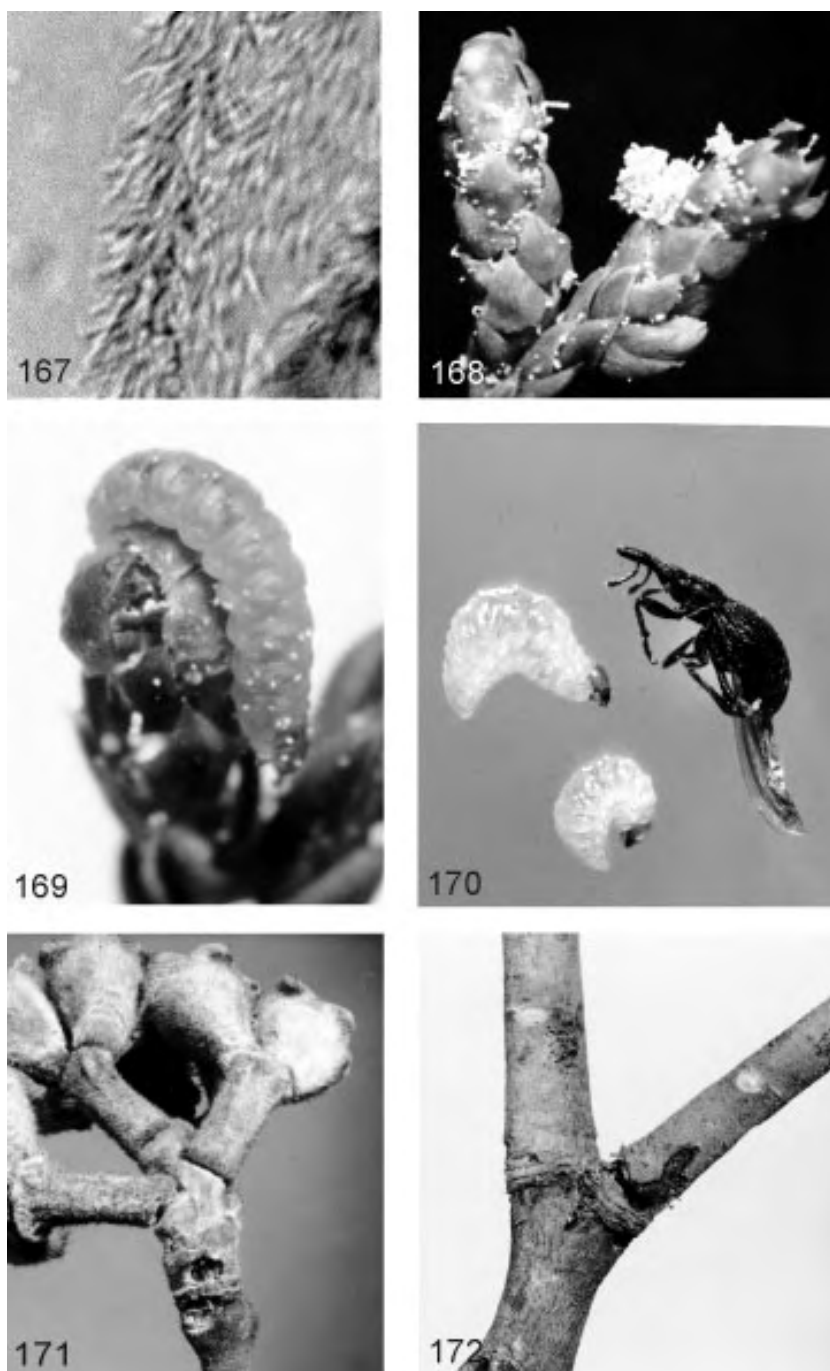


Fig. 167–172 (167) *Cecidophyus nothofagi*, section of external surface of colleterial gland; (168–169) *Rhinorhynchus rufulus*: (168) frass pellets of compacted pollen on male strobili of *Dacrycarpus dacrydioides*.; (169) Larva on a male strobilus; (170–172) *Neocyba metrosideros*: (170) Adult and larvae; (171, 172) Mine damage on one- and two-year-old wood of *Metrosideros excelsa*.

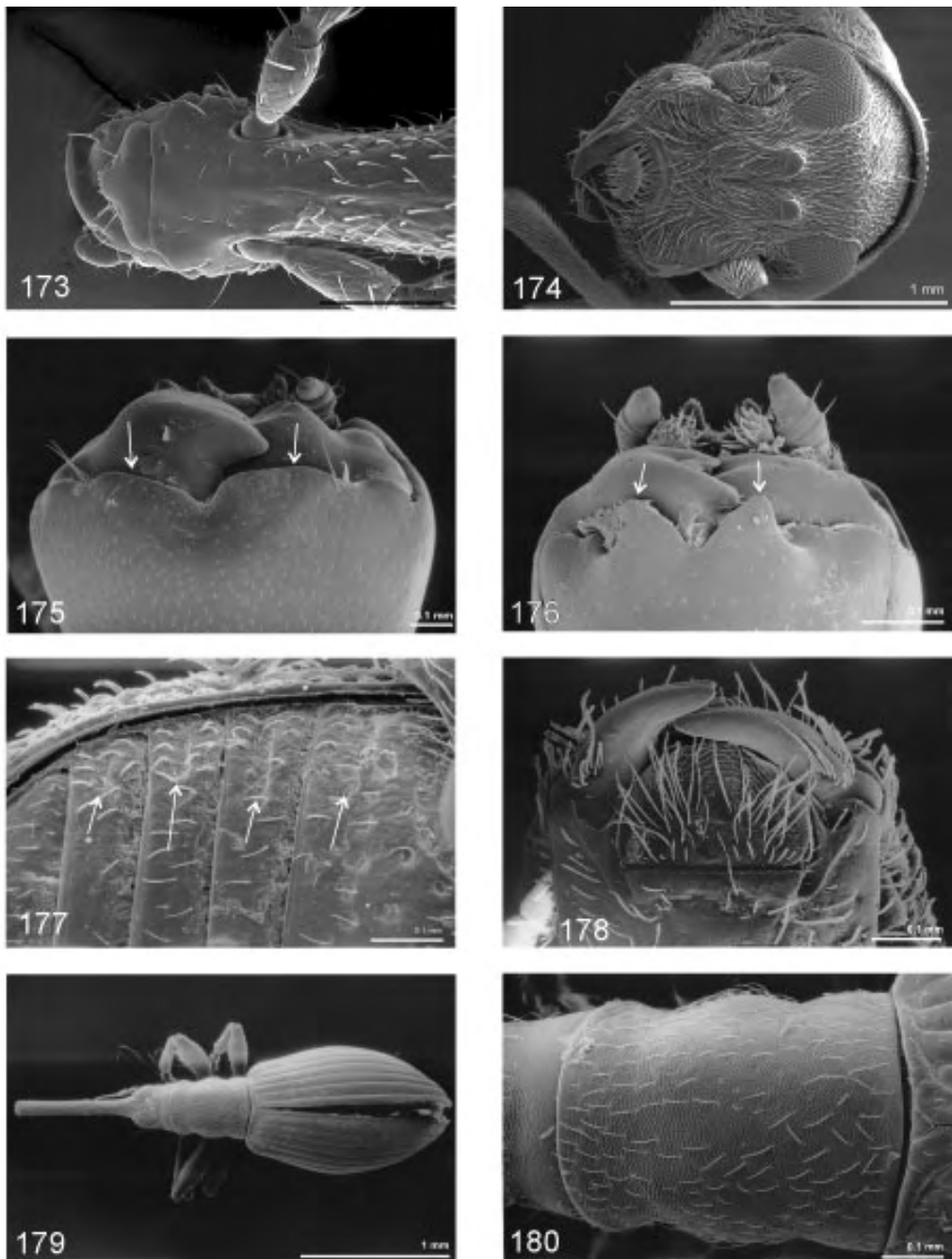


Fig. 173–180 (173) *Rhinorhynchus phyllocladi n.sp.*, showing labrum [apex of rostrum with tight labrum]; (174) *Phymatus hetaera* (Sharp), head with loose labrum at apex; (175) *Agathinus tridens* (F.), bilobed epistome; (176) *Pachyurinus sticticus* (Broun), bidentate epistome; (177–178) *Aralius wollastoni* (Sharp): (177) Male, showing postmental tuft of setae and transverse abdominal grooves; (178) Female, showing typical large aglycyderine prementum. (179–180) *Neocyba regalis n.sp.*: (179) Habitus of female; (180) Prothorax showing alutaceous (granular) minisculpture.

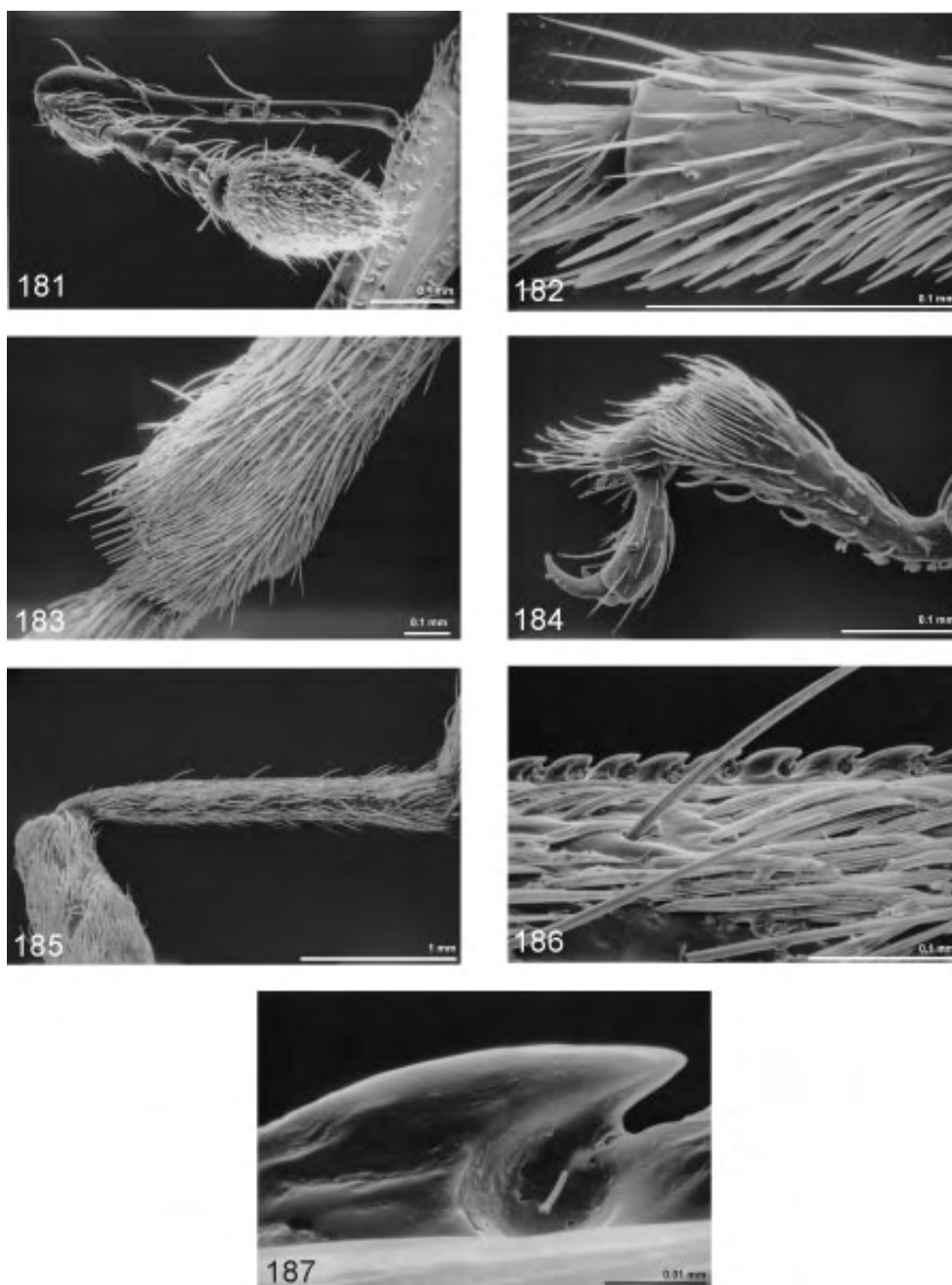


Fig. 181–187 (181) *Peristoreus innocens* Kirsch, geniculate antenna; (182) *Sharpius brouni* (Sharp), unmodified inner face of fore tibia; (183) *Pachyurinus sticticus* (Broun), belid grooming device consisting of dense pilosity on inner lateral face of fore tibia; (184) *Aralius wollastoni* (Sharp), same belid type of grooming device; (185–187) *Agathinus tridens* (F.): (185) Hind femur and tibia showing dorsal teeth on the femur and crenulated (serrated) ridge on tibia; (186) Crenulated ridge (appearing as serrate at higher magnification); (187) A single tooth of the ridge, with its sensory seta.

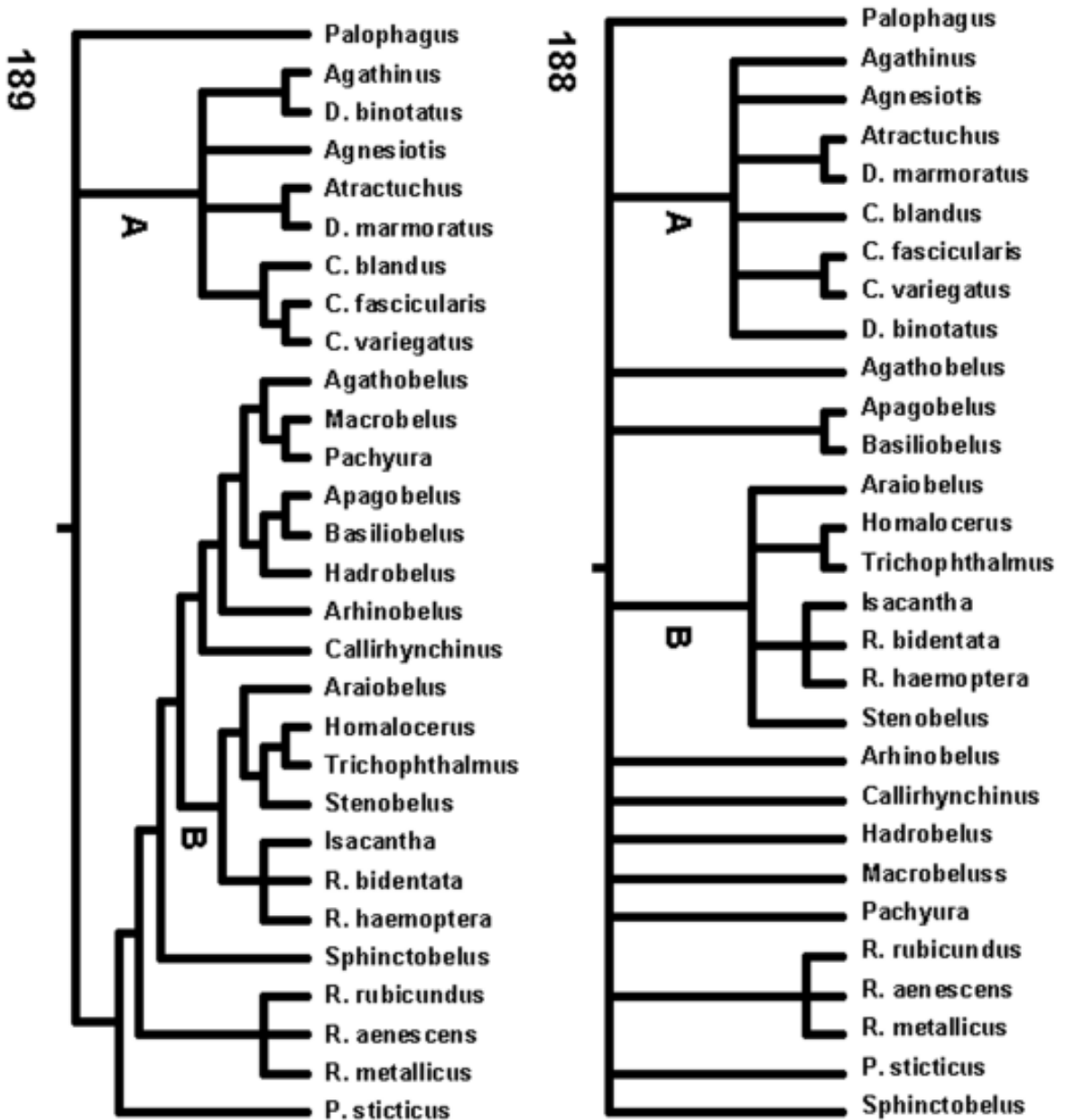
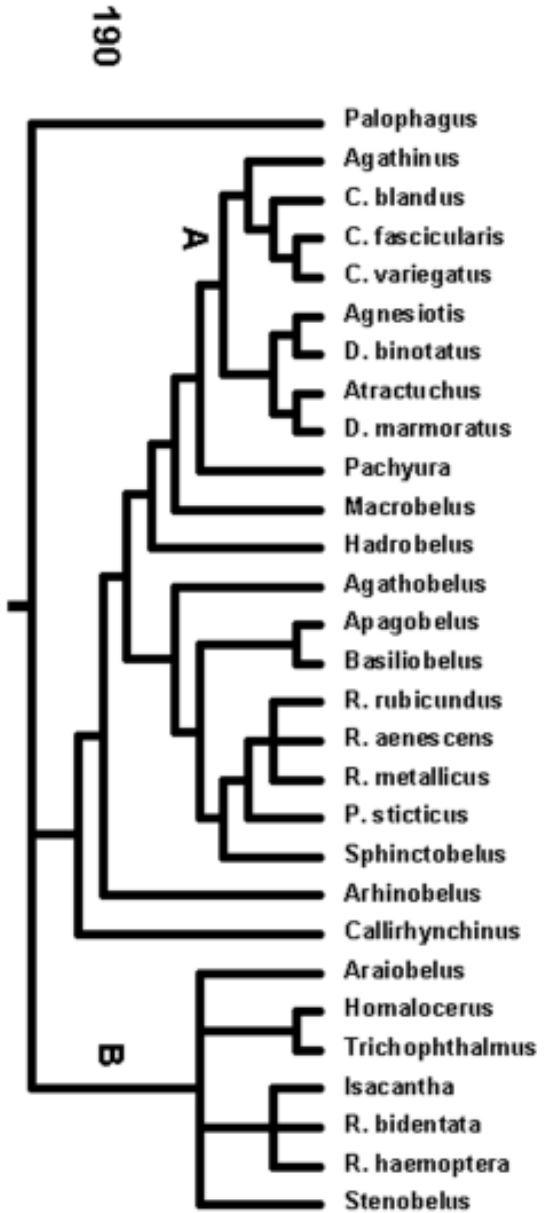
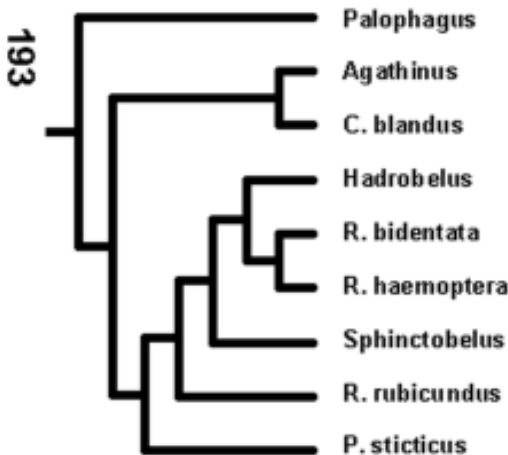
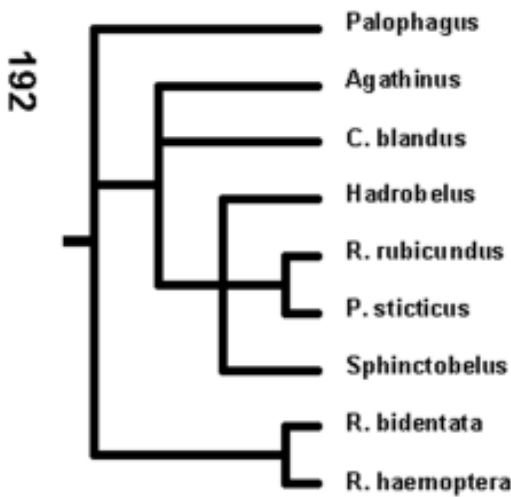
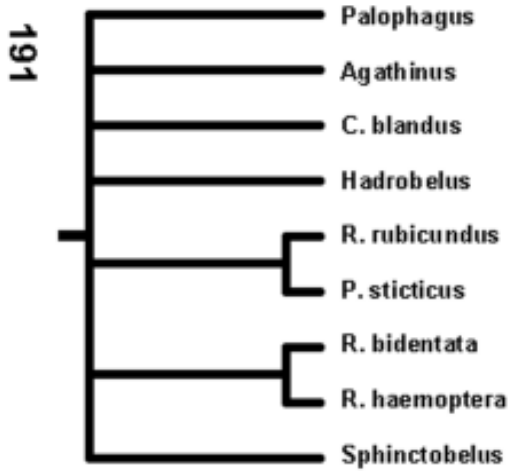
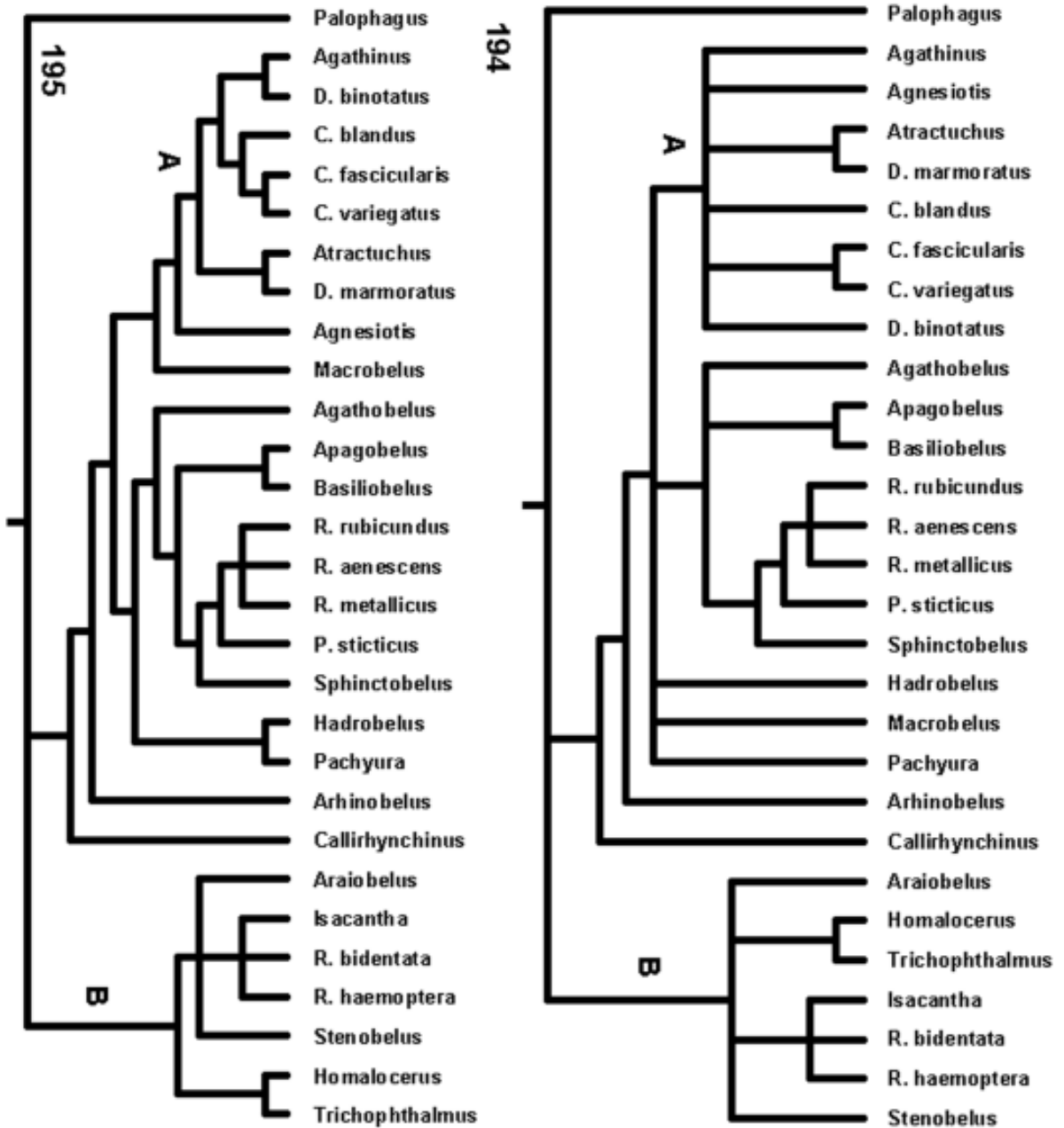
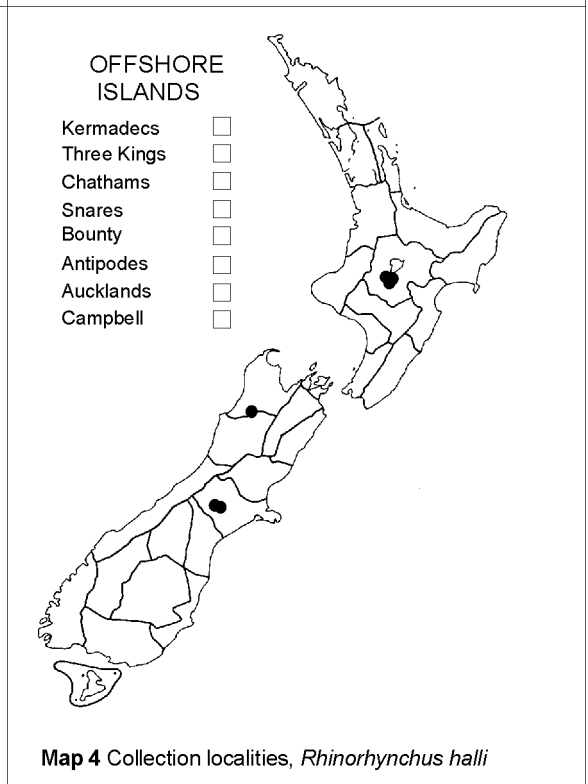
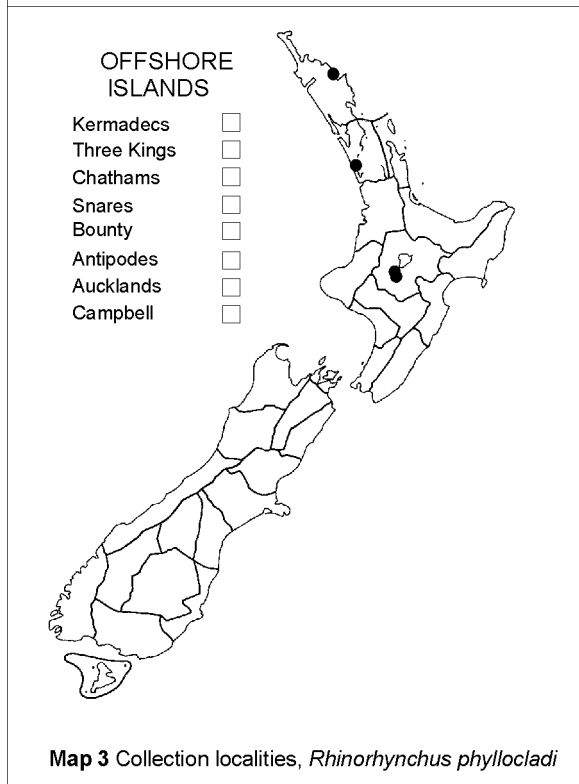
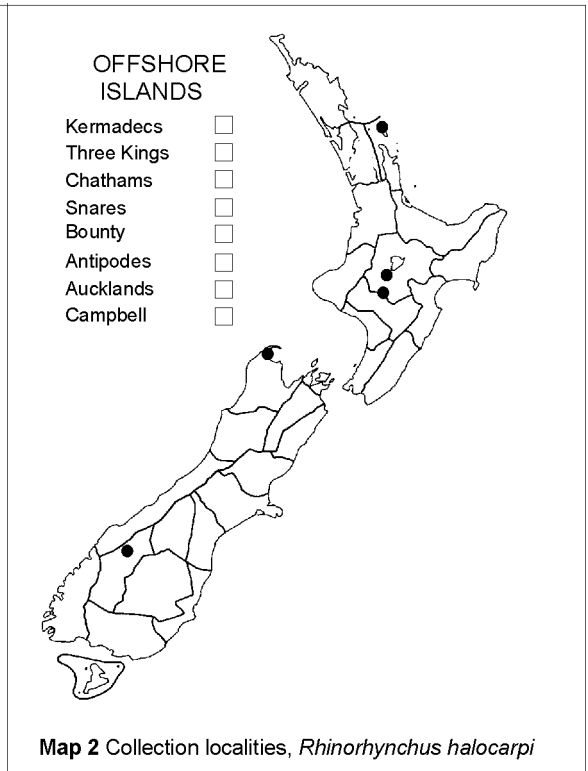
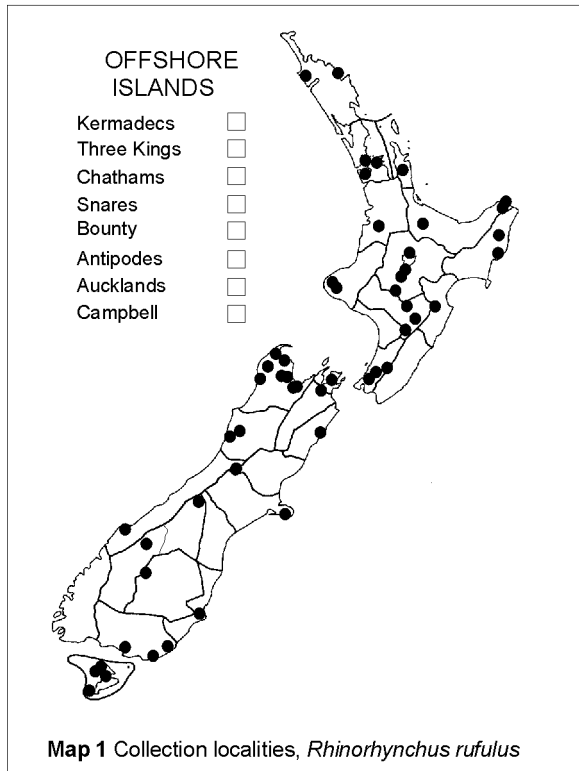
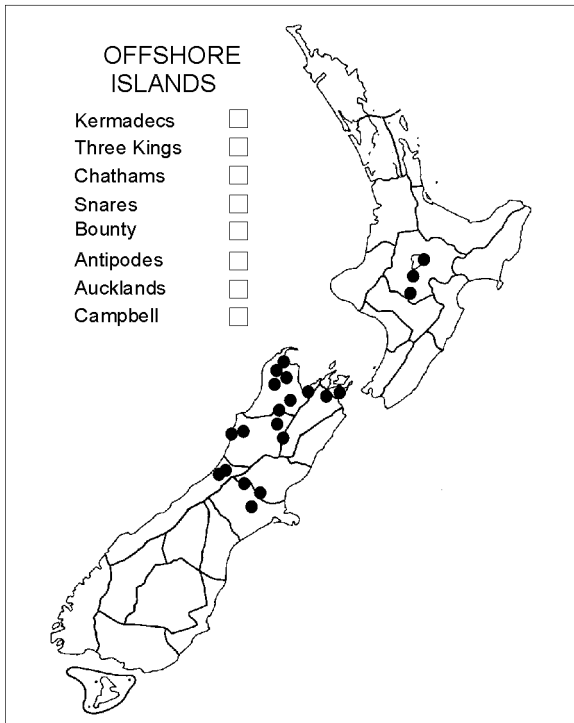


Fig. 188–195. Phylogenetic trees of Belinae: 188. Consensus tree of 309 parsimonious trees; 189. Consensus of 12 trees after successful weighting by two iterations; 190. Consensus of 8 trees after weighting 10x seven characters recognised as critical; 191. Consensus of 12 trees based on larval characters; 192. Consensus of 9 trees from an SAW analysis; 193. Tree by combining adult and larval characters; 194. Consensus of 168 trees from weighting some characters; 195. Consensus of 12 trees from an SAW analysis

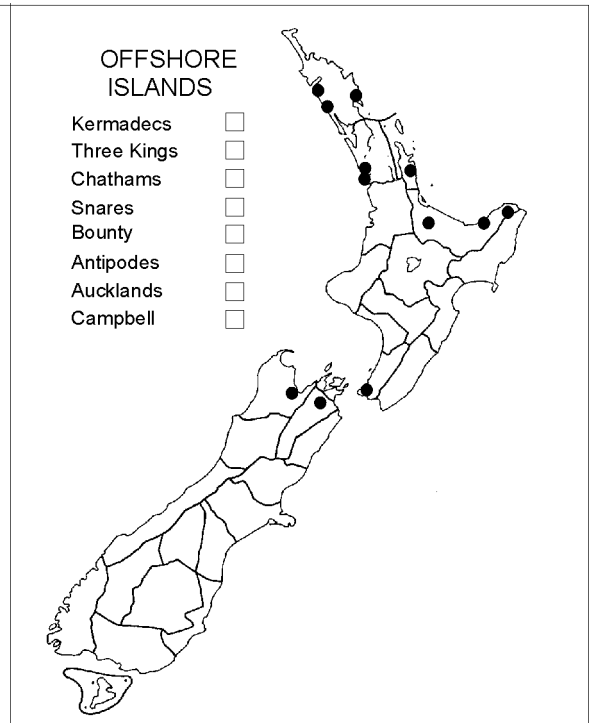




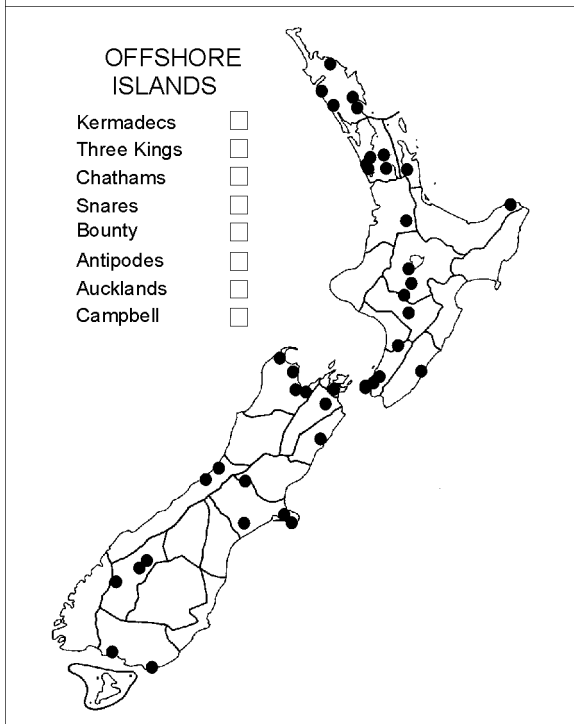




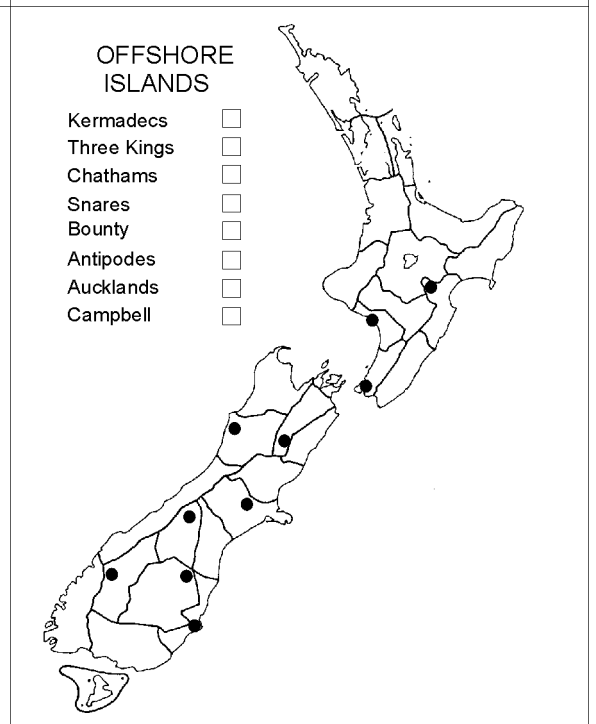
Map 5 Collection localities, *Pachyurinus sticticus*



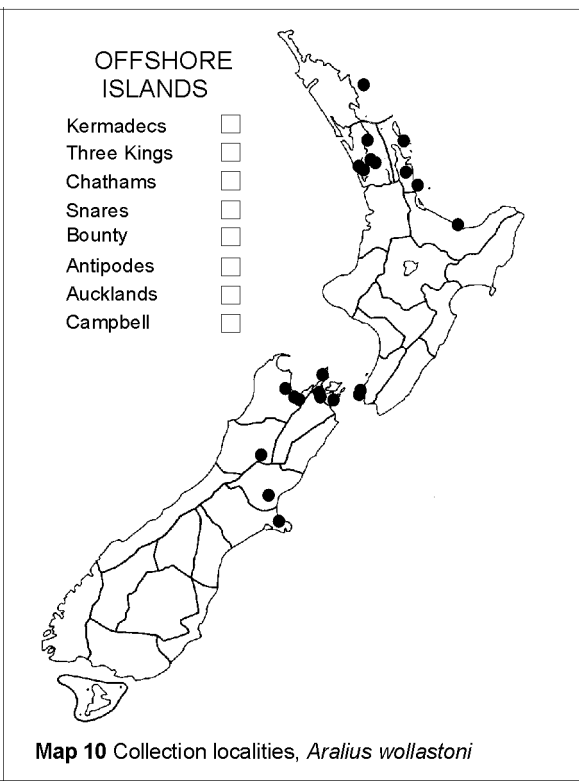
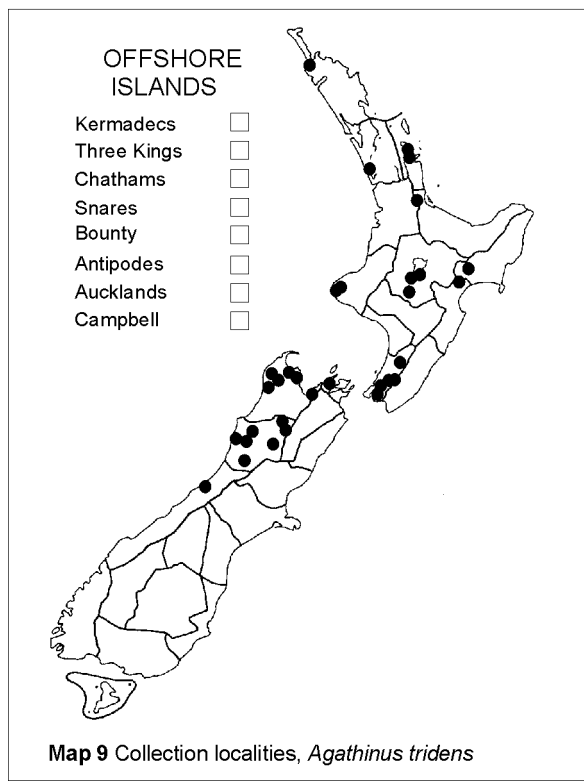
Map 6 Collection localities, *Rhicnobelus rubicundus*

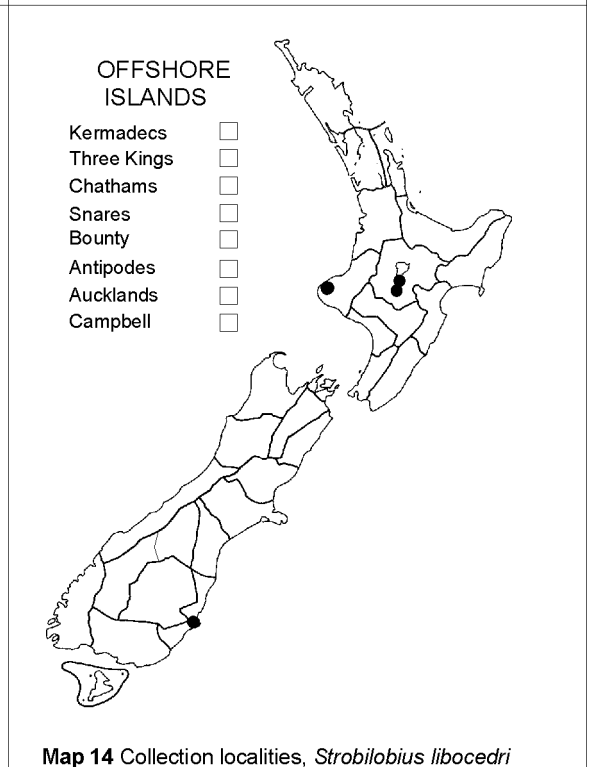
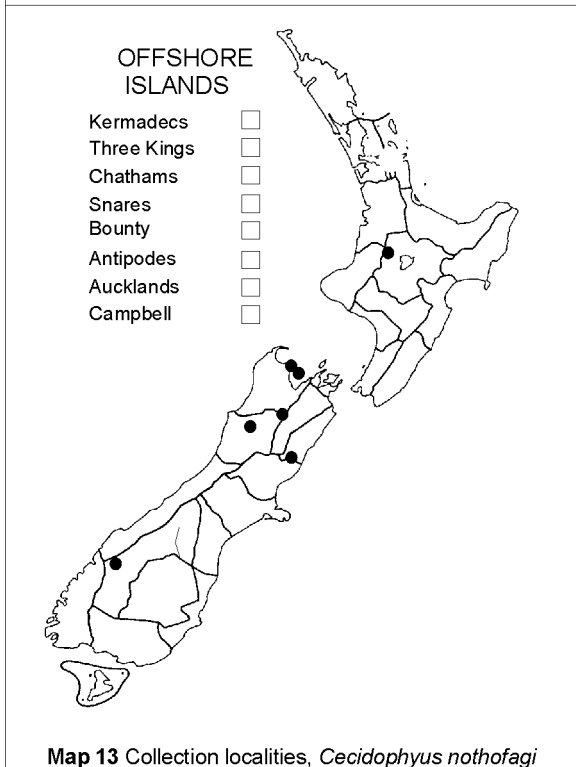
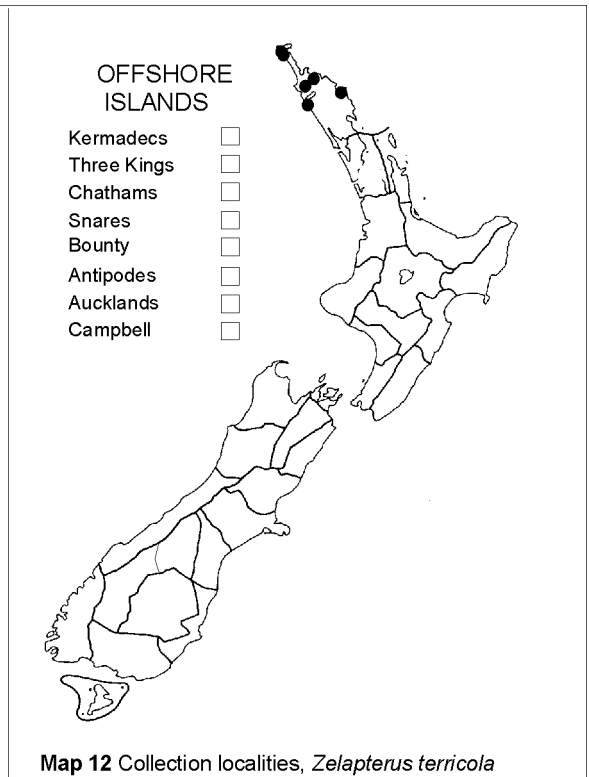
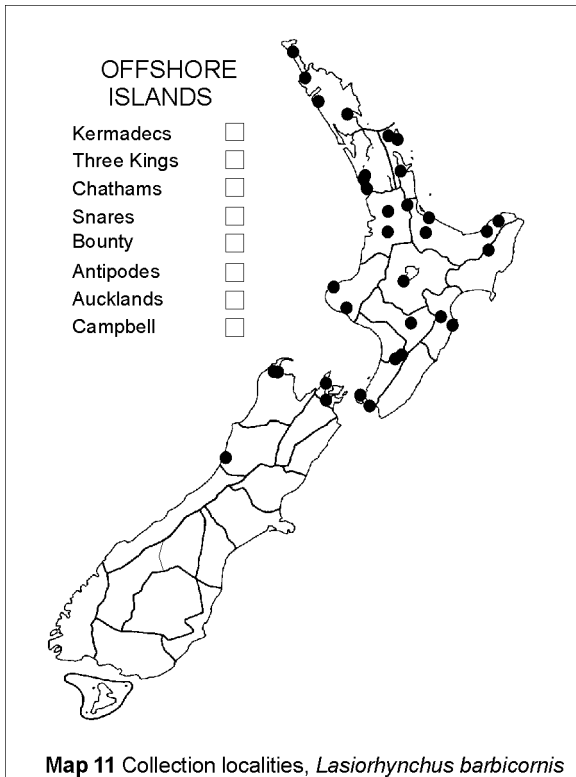


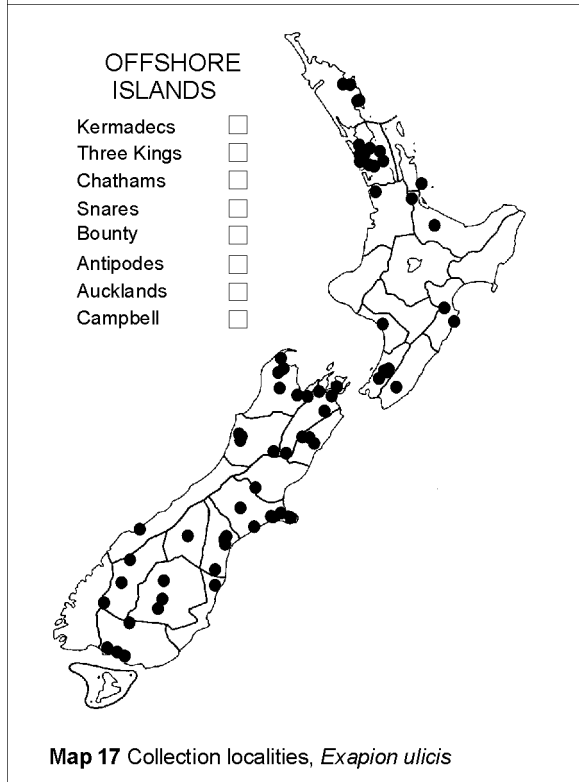
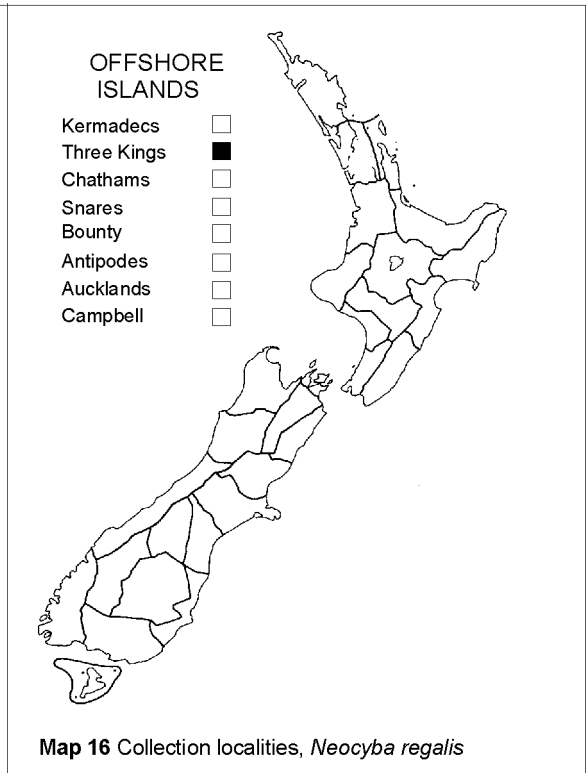
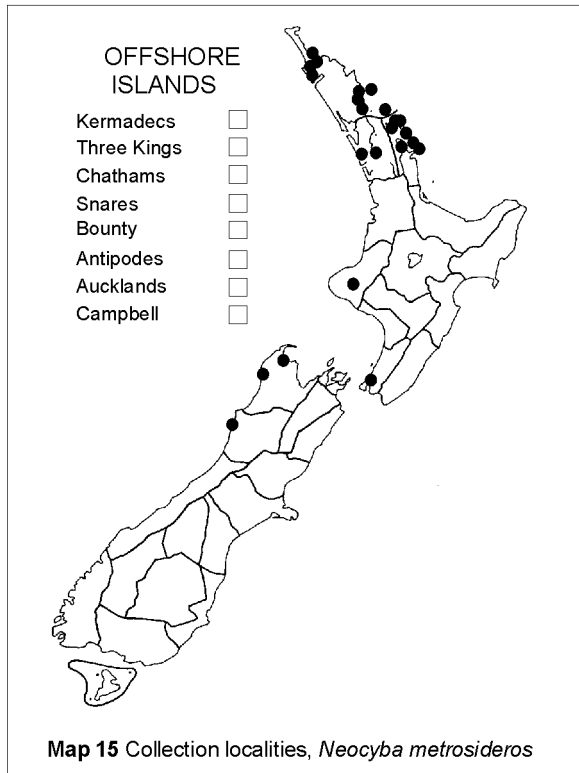
Map 7 Collection localities, *Rhicnobelus metallicus*



Map 8 Collection localities, *Rhicnobelus aenescens*





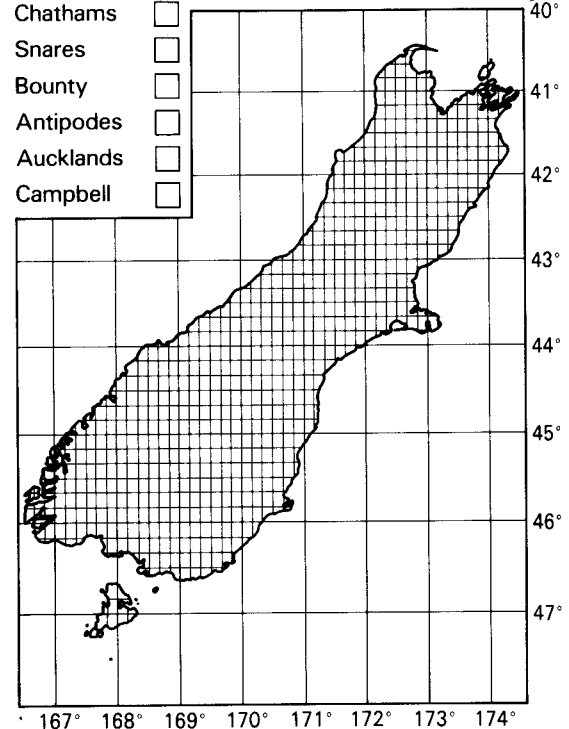
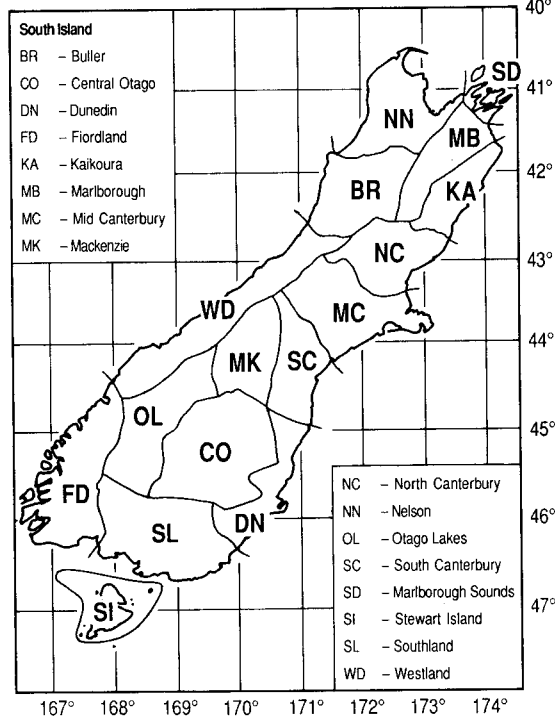
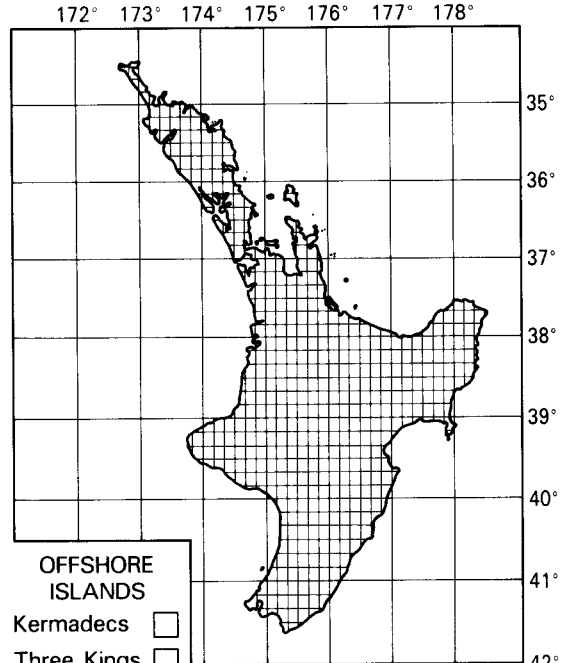
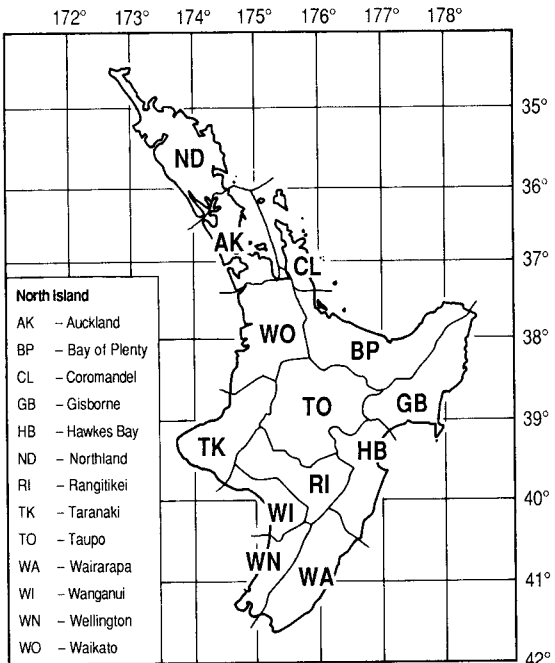


TAXONOMIC INDEX

Page numbers in **bold** type denote a description, and in *italic* type illustrations. A suffixed letter 'k' indicates a key, and 'm' a map.

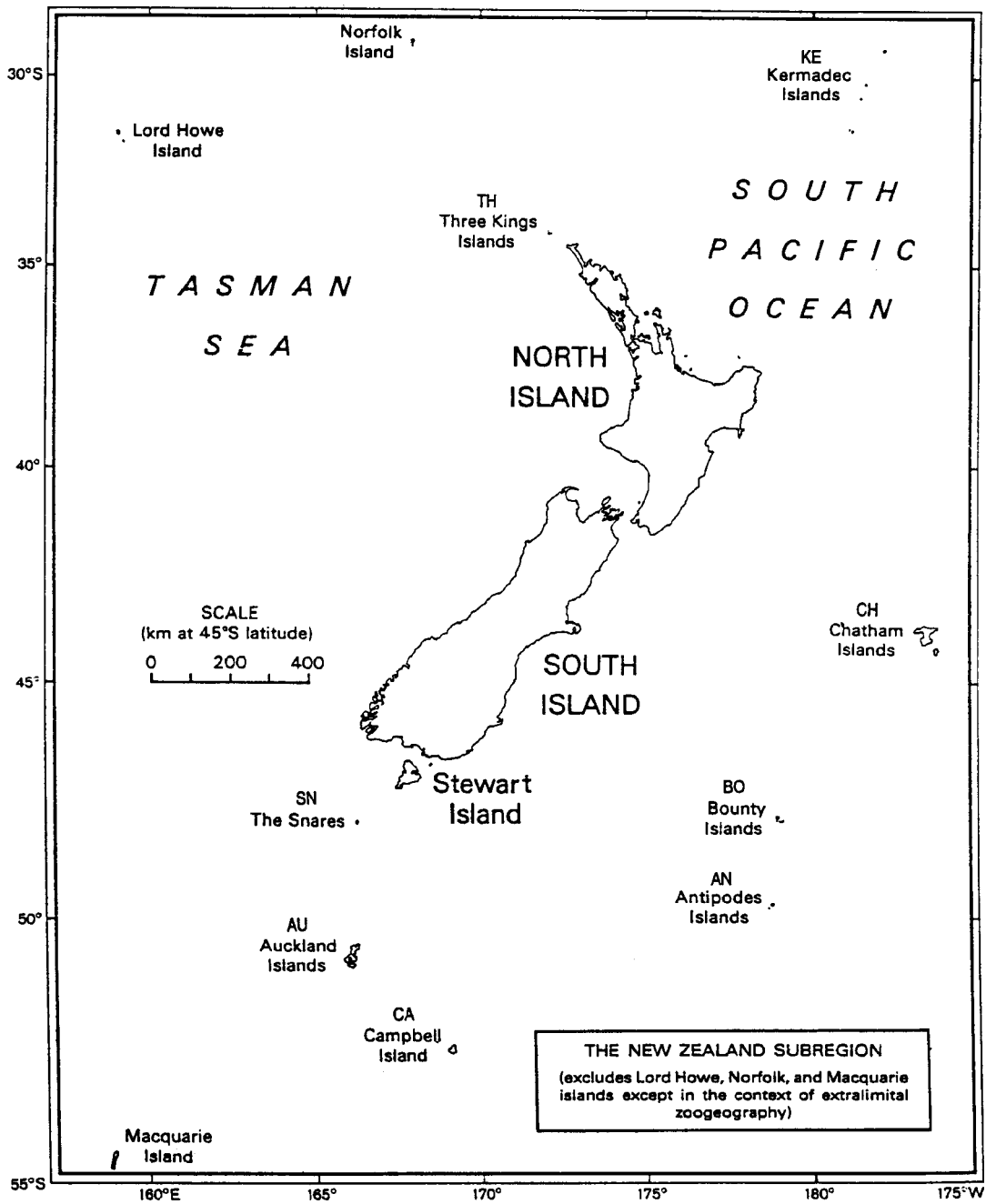
- aenescens** (Broun), *Rhynchobelus* 9, 10, 12, 24k, **26**, 49, 50, 57, 72, 90m
aenescens Broun, *Pachyura* 26
Agathinus 50
Agathinus Broun 9, 10, 15, 22k, **27**, 28, 48, 50–53
Agathinus tridens (Fabricius) 10, 12, 28, 49, 57, 62, 68, 73, 74, 84, 85, 91m
Agathinus-group 53
Agathobelus 50, 54
Agathobelus bivittatus Zimmerman 49
agathophagus Zimmerman, *Arhinobelus* 49
Aglycyderes 29
Aglycyderes badius Broun 10, 30
Aglycyderes wollastoni Sharp 30
 Aglycyderidae 13
Aglycyderinae 9, 10, 15, 16, 21, 48, 58
 Agnesiotidina 15
 Agnesiotidini 48–55
Agnesiotis Pascoe 27, 50, 51, 53
Agnesiotis pilosula Pascoe 49, 68
alboboma Broun, *Pachyura* 9, 10, 25
 Allocorynidae 13
Androporus Holloway 15
annulifer (Philippi), *Atractuchus* 49, 52, 54
 Anthonomini 14
Anthribidae 9, 11, 13, 14, 15, 17
Apagobelus 50, 52, 54
Apagobelus brevis (Lea) 49
Apion Linnaeus 9, 34
Apion metrosideros Broun 39, 40
Apion terricola Broun 9, 34, 35
Apion ulicis (Forster) 42
 Apionidae 13
Apioninae 9, 10, 16, 31k, 34, 59
 Apionini 10, 34, 60
Apotapion Zimmerman 35
Araiobelus 50
Araiobelus filum (Jekel) 49
Aralius Kuschel 10, 16, 21k, **28**, 29
Aralius wollastoni (Sharp) 10, 13, 30, 58, 62, 74, 84, 85, 91m
Arhinobelus 50
Arhinobelus agathophagus Zimmerman 49
assimilis (Fabricius), *Brenthus* 33
assimilis (Fabricius), *Brenthus* 33
assimilis (Fabricius), *Nemocephalus* 33
assimilis (Fabricius), *Teramocerus* 33
assimilis Fabricius, *Curculio* 10, 33, 34
Atractuchus 9, 48–54
Atractuchus annulifer (Philippi) 49, 52, 54
 Attelabidae 9, 11, 14
australis Hope, *Pachyura* 49, 67
badius Broun, *Aglycyderes* 10, 30
barbicornis (Fabricius), *Brenthus* 33
barbicornis (Fabricius), *Brenthus* 33
barbicornis (Fabricius),
Lasiorhynchus 10, 12, 13, **33**, 58, 62, 69, 75, 76, 92m
barbicornis (Fabricius),
Nemocephalus 33
barbicornis Fabricius, *Curculio* 31, 32
 Baridini 14
Basiliobelus 50, 52, 54
Basiliobelus flavovittatus Zimmerman 49
Basiliorhinus Kuschel 18
Basiliogeus Kuschel 18
Belidae 9–11, 13–15, 21, 48, 49, 56
Belinae 9, 10, 15, 21k, 48, 49, 53, 56, 86–88
 Belini 15, 48, 49, 52–55
bidentata (Donovan), *Rhinotia* 49, 50, 52, 53
binotatus (Philippi), *Dicordylus* 49–52, 54
bivittatus Zimmerman, *Agathobelus* 49
blandus (Faust), *Cyrotypus* 49, 50, 53
Brenthus assimilis (Fabricius) 33
Brenthus barbicornis (Fabricius) 33
Brentidae 9–11, 13, 14, 16, 31, 58
Brentinae 9, 10, 16, 31, 58
Brenthus assimilis (Fabricius) 33
Brenthus barbicornis (Fabricius) 33
brevirostris (Lea), *Apagobelus* 49
brookesi (Broun), *Pachyurinus* 9
brookesi Broun, *Pachyura* 10, 25
brouni (Sharp), *Sharpius* 85
Bulbogaster Lacordaire 32
bunyah Kuschel, *Palophagus* 49, 67
Cacephatus Blackburn 12, 15
Callirhynchus 50, 51
Callirhynchus exquisitus (Fairemaire & Germain) 49, 67
 Caridae 9, 11, 13–15
 Carinae 13
Cecidophyus gen. nov. 9, 10, 31k, 36
Cecidophyus nothofagi sp. nov. 9, 10, 13, 36, **37**, 59, 63, 78, 79, 83, 92m
 Ceutorhynchini 14
cinereus (Blanchard), *Sphinctobelus* 49
 Colydiidae 30
 Cossoninae 14
 Cryptorhynchini 14
Curculio assimilis Fabricius 10, 33, 34
Curculio barbicornis Fabricius 31, 32
Curculio fuscirostris Fabricius 42
Curculio tridens Fabricius 27, 28
Curculio ulicis Forster 42
Curculionidae 13, 17
Cyrotypus blandus (Faust) 49, 50, 53
Cyrotypus fascicularis Pascoe 49, 50, 68
Cyrotypus Pascoe 9, 16, 27, 28, 48, 49, 51–54
Cyrotypus variegatus Lea 49, 50
Dasyanthribus Holloway 15
dermestiventris (Boisduval),
Isacantha 49
Dicordylus 9, 48, 49, 53
Dicordylus binotatus (Philippi) 49–52, 54
Dicordylus marmoratus (Philippi) 49–52, 54, 68
 Dryophthorinae 14
 Eccoptarthridae 14, 15
Eccoptarthrus Arnoldi 5
 Eobelidae 14
 Eobelinae 15
 Erirhinini 14
 Eugnomini 14
Exapion Bedel 10, 31k, 34, **42**
Exapion ulicis (Forster) 10, 13, **42**, 60, 63, 82, 93m
exquisitus (Fairemaire & Germain),
Callirhynchus 49, 67
fascicularis Pascoe, *Cyrotypus* 49, 50, 68
filum (Jekel), *Araiobelus* 49
flavovittatus Zimmerman,
Basiliobelus 49
fuscirostris Fabricius, *Curculio* 42
 Gobacar Gratshev & Zherikham 15
 Gonatoceri 9, 11
Habrobelus Zimmerman 48
Hadrobelus 49, 50, 53
Hadrobelus undulatus (Zimmerman) 49
haemoptera Kirby, *Rhinotia* 48–50, 53, 69
hali sp. nov., *Rhinorhynchus* 9, 10, 12, 19k, **21**, 56, 61, 64, 66, 89m
halocarp sp. nov., *Rhinorhynchus* 9, 10, 12, 18k, **20**, 56, 64, 65, 89m
Helmocorus Holloway 15
hetaera (Sharp), *Phymatus* 84
Hoherius Holloway 15
Homalocerus 50–52, 54
Homalocerus lyciformis (Germar) 49
innocens Kirsch, *Peristoreus* 85
insignis Lea, *Macrobelus* 49
Isacantha 48, 50, 54
Isacantha dermestiventris (Boisduval) 49
Isocanthodes Zimmerman 15, 48
Ithystenini 16, 32
Ithystenus Pascoe 32
jeanneli Paulian, *Platycephala* 10, 30
 Karocolens Kuschel 16
Lasiorhynchus barbicornis (Fabricius) 10, 12, 13, **33**, 58, 62, 69, 75, 76, 92m
Lasiorhynchus Lacordaire 10, 16, **31k**, 32, 33
libocedri sp. nov., *Strobilobius* 9, 10, 12, 38, **39**, 59, 63, 80, 81, 92m
 Limnichidae 35
Lirromus Holloway 15
Listorhinus rufulus 19

- Listrorhinus* Voss 17
Lixini 14
Lophus Holloway 15
lyciformis (Germar), *Homalocerus* 49
- Macrobelus* 50–52, 54
Macrobelus insignis Lea 49
Magdaldini 14
marmoratus (Philippi), *Dicordylus* 49–52, 54, 68
Mecomacer 15
Mesetia Blackburn 32
Mesoptiliini 14
metallicus (Pascoe), **Rhcnobelus** 9, 10, 12, 24k, **25**, 49, 50, 52, 57, 61, 71, 90m
metallicus Pascoe, *Pachyura* 25
metrosideros (Broun), **Neocyba** 10, 13, **40**, 59, 63, 83, 93m
metrosideros Broun, *Apion* 39, 40
Micranthribus Holloway 15
miltomerus (Blanchard),
Trichophthalmus 49, 69
Molytini 14
- Nannomacer* Kuschel 15, 18
Nemocephalus assimilis (Fabricius) 33
Nemocephalus barbicornis (Fabricius) 33
Nemonychidae 9–11, 13–15, 17, 55
Nemonyx 15
Neocyba Kissinger 10, 16, 31k, **39**
Neocyba metrosideros (Broun) 10, 13, **40**, 59, 63, 83, 93m
Neocyba regalis sp. n. 9, 10, 13, **41**, 60, 81, 84, 93m
Neocyba species B of May 39
niger Zimmerman, *Sphinctobelus* 53
nothofagi sp. nov., **Cecidophyus** 9, 10, 13, 36, **37**, 59, 63, 78, 79, 83, 92m
- Obrieniidae 14
olivieri Montrouzier, *Platycephala* 28
Orthoceri 9, 11
Oxycorynidae 13
Oxycoryninae 15, 48
- Pachybelus* Zimmerman 48
Pachyura 48–52, 55
Pachyura aenescens Broun 26
Pachyura albocoma Broun 9, 10, 25
Pachyura australis Hope 49, 67
Pachyura brookesi Broun 9, 10, 25
Pachyura metallicus Pascoe 25
Pachyura rubicunda var *pilosa* Broun 9, 10, 24
Pachyura sticticus Broun 23
Pachyura sumptuosus Broun 10, 25
Pachyura venusta Broun 9, 10, 25
Pachyura violacea Broun 9, 10, 24, 25
Pachyurini 15, 48, 49, 51, 52, 53, 54, 55
Pachyurinus Kuschel 9, 10, **22k**, 24, 48, 52, 55
Pachyurinus pilosus (Broun) 9
Pachyurinus sticticus (Broun) 10, 13, 22, **23**, 24, 49, 50, 53, 56, 61, 67, 70, 84, 85, 90m
- Pachyurinus sumptuosus* (Broun) 9, 25
Palophagus 15, 48, 50, 53
Palophagus bunyae Kuschel 49, 67
Peristoreus innocens Kirsch 85
Perroudius Holloway 15
phylocladi sp. nov., **Rhinorhynchus** 9, 10, 12, 18k, **20**, 56, 64, 66, 84, 89m
Phymatus hetaera (Sharp) 84
pilosula Pascoe, *Agnesiotis* 49, 68
pilosa Broun, *Pachyura rubicunda* var 9, 10, 24
Platycephala jeanneli Paulian 10, 30
Platycephala Montrouzier (non Fallén) 10, 28
Platycephala olivieri Montrouzier 28
Platycephala wollastoni (Sharp) 30
Probelus 15
Prodector Pascoe 16, 32, 33
Proscoporhinus Montrouzier 15
Proterhinidae 13
Proterhinus 29
Ptiliidae 35
- regalis** sp. n., **Neocyba** 9, 10, 13, **41**, 60, 81, 84, 93m
Rhadinocyba Faust 17, 34, 40
Rhadinocybini 10, 34, 37, 59
Rhcnobelus aenescens (Broun) 9, 10, 24k, **26**, 49, 50, 57, 72, 90m
Rhcnobelus gen. nov. 9, 10, 22k, **24**, 48, 51, 55
Rhcnobelus metallicus (Pascoe) 9, 10, 12, 24k, **25**, 49, 50, 52, 57, 61, 71, 90m
Rhcnobelus rubicundus (Broun) 9, 10, 12, 23, **24k**, 49, 50, 57, 70, 90m
Rhinaria sextuberculatus White 10, 27, 28
Rhinomacer (*Listrorhinus*) Voss 17
Rhinomacer rufulus Broun 17, 19
Rhinorhynchus zealandicus Sharp 10, 17, 19
Rhinorhynchini 17
Rhinorhynchus halli sp. nov. 9, 10, 12, 19k, **21**, 56, 61, 64, 66, 89m
Rhinorhynchus halocarpus sp. nov. 9, 10, 12, 18k, **20**, 56, 64, 65, 89m
Rhinorhynchus phylocladi sp. nov. 9, 10, 12, 18k, **20**, 56, 64, 66, 84, 89m
Rhinorhynchus rufulus (Broun) 10, 12, 18k, **19**, 55, 61, 64, 65, 66, 83, 89m
Rhinorhynchus Sharp 10, 15, **17**, 18
Rhinotia bidentatata (Donovan) 49, 50, 52, 53
Rhinotia haemoptera Kirby 48, 49, 50, 53, 69
Rhinotia Hope 15, 48, 51, 54
Rhinotiodes Zimmerman 48
rubicunda var *pilosa* Broun
Pachyura 9, 10, 24
rubicundus (Broun), **Rhcnobelus** 9, 10, 23, **24k**, 49, 50, 53, 57, 70, 90m
- rufulus** (Broun), **Rhinorhynchus** 10, 12, 18k, **19**, 51, 61, 64, 65, 66, 83, 89m
rufulus Broun, *Rhinomacer* 17, 19
rufulus, *Listrorhinus* 19
- Scolytidae 13
sextuberculatus White, *Rhinaria* 10, 27, 28
Sharpus brouni (Sharp) 85
species B of May, *Neocyba* 39
Sphinctobelus 50, 52
Sphinctobelus cinereus (Blanchard) 49
Sphinctobelus niger Zimmerman 53
Sphinctobelus Zimmerman 16, 51
Stenobelus 50, 52
Stenobelus tibialis (Blackburn) 49
Stenobelus Zimmerman 15
sticticus (Broun), **Pachyurinus** 10, 13, 22, **23**, 24, 49, 50, 53, 56, 61, 67, 70, 84, 85, 90m
sticticus Broun, *Pachyura* 23
Strobilobius gen. nov. 10, 31k, **38**
Strobilobius libocedri sp. nov. 9, 10, 12, 38, **39**, 59, 63, 80, 81, 92m
sumptuosus (Broun), *Pachyurinus* 9, 25
sumptuosus Broun, *Pachyura* 10, 25
- Teramocerus assimilis* (Fabricius) 33
terricola (Broun), **Zelapterus** 9, 10, **35**, 59, 62, 77, 92m
terricola Broun, *Apion* 9, 34, 35
tibialis (Blackburn), *Stenobelus* 49
Trichophthalmus 50, 51, 52, 54
Trichophthalmus miltomerus (Blanchard) 49, 69
tridens (Fabricius), **Agathinus** 10, 12, **28**, 49, 57, 62, 68, 73, 74, 84, 85, 91m
tridens Fabricius, *Curculio* 27, 28
- ulicis* (Forster), *Apion* 42
ulicis (Forster), **Expasion** 10, 13, **42**, 60, 63, 82, 93m
ulicis Forster, *Curculio* 42
Ulyanidae 14, 15
undulatus (Zimmerman), *Hadrobelus* 49
- variegatus* Lea, *Cyrotiphus* 49, 50
venusta Broun, *Pachyura* 9, 10, 25
violacea Broun, *Pachyura* 9, 25
violaceus Broun, *Pachyura* 10, 24
- wollastoni* (Sharp), *Platycephala* 30
wollastoni (Sharp), **Aralius** 10, 13, **30**, 58, 62, 74, 84, 85, 91m
wollastoni Sharp, *Aglycyderes* 30
- zealandicus* Sharp, *Rhinorhynchus* 10, 17, 19
Zelapterus gen. nov. 9, 10, 31k, **34**
Zelapterus terricola (Broun) 9, 10, **35**, 59, 62, 77, 92m
Zygopini 14



Area codes and boundaries used to categorise specimen locality data (after Crosby *et al.* 1998)

Base-map for plotting collection localities; this may be photocopied without copyright release



The New Zealand subregion with area codes (from Crosby *et al.* 1998).

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He titiro whāiti tā tēnei pukapuka ki ngā mea noho whenua, kāore he tuarā; i pēnei ai i te mea kei te mōhio whānuitia ngā mea whai tuarā, ā, ko ngā mea noho moana, koirā te tino kaupapa o te huinga pukapuka *Marine Fauna of N.Z.*

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Te utu (tirohia "Titles in print", whārangi 98). Ko te kōpaki me te pane kuini kei roto i te utu. Me utu te hunga e noho ana i Aotearoa me Ahitereiria ki ngā tāra o Aotearoa. Ko ētahi atu me utu te moni kua tohua, ki ngā tāra Merikana, ki te nui o te moni rānei e rite ana.

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