

**Beetles
in a suburban environment:
a New Zealand case study**

G. Kuschel



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**The identity and status of Coleoptera
in the natural and modified habitats
of Lynfield, Auckland (1974–1989)**

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G. Kuschel

Research Associate, DSIR Plant Protection
Mount Albert Research Centre
Private Bag, Auckland, New Zealand

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Etiam pristina in natura || *Also in a natural setting*
summa securitas et futura || *sweet tranquility and hope*



FRONTISPIECE

The pollen-feeding nemomychid beetle *Rhinothyrus rufus* (Broun) on its native podocarp host kahikatea (*Dacrydium dacrydioides*) from the Lynfield beetle survey area, Auckland, New Zealand. The white granules on the beetle are pollen clusters and frass pellets. This beetle has a relic status not unlike that of the tuatara (*Sphenodon*), as fossil evidence shows that the weevil group was thriving in Jurassic times, way back in the era of the dinosaurs and gymnosperms more than 140 million years ago.

FOREWORD

As a small boy in the 1930s I used to collect butterflies on the South Downs in southern England. On one occasion I met an elderly gentleman collecting beetles. He explained to me that most entomologists started with butterflies but later they graduated to more important groups such as beetles. I have been in awe of coleopterists ever since! This splendid publication by Dr Willy Kuschel has reinforced my awe.

I have been asked to write this foreword as a conservation biologist. I can say with conviction that conservation cannot be effective unless it is based on good taxonomy and knowledge of the habitat requirements of species. The Lynfield Beetle Survey will not only be a valuable study for New Zealand entomologists, but will also be a very significant contribution to conservation biology.

Movement of people and goods will increase in the future, and therefore the number of foreign species will increase in all biotopes. It will become more and more important to discover the extent to which autochthonous species – especially endemic ones – survive increased competition from foreign species.

If we are to retain endemic species we must establish reserves of native habitat. As the years go by more of these will become habitat islands in a sea of crop and urban land, where foreign species predominate. This situation raises a host of difficult practical problems. How large should the reserves be? How close to each other? Are habitat corridors necessary between reserves? These problems can best be tackled by recording what happens in the field.

Joseph Banks, who noted "a few Butterflies and Beetles" in New Zealand in the eighteenth century, would have been amazed by the number of beetle species recorded by Willy Kuschel. Thanks to the hospitality of Willy Kuschel and Beverley Holloway I have some first-hand experience of the Lynfield district. This much less distinguished visitor would never have guessed how many endemic species remain in it: Willy Kuschel shows that more than three-quarters of the beetle species in the area are endemic. This is both interesting and encouraging. As nearly all the endemic species are confined to the remaining fragments of bush, it is vital that such places be retained within Lynfield and similar districts.

The conservation value of quite small areas of native habitat within urban and suburban areas has been demonstrated in several countries. It is particularly interesting that so many endemics survive in New Zealand where the proportion of foreign species is so great. Only monitoring will show the extent to which the endemic species will remain in their habitat islands.

Willy Kuschel's masterly study provides a firm base on which others can build. The scene, which he has studied so thoroughly, will increase in significance; future generations will be deeply grateful for his pioneer work.

Norman W. Moore

The Farm House
Swavesey
Cambridge

[Norman Moore was formerly Senior Principal Scientific Officer
with the Nature Conservancy Council of the United Kingdom]

18 May 1990

ABSTRACT

The Auckland suburb of Lynfield, on the northern side of the Manukau Harbour, presents a typical picture of urban development under topographical constraint. Contour and substrate along the coastline have kept urbanisation away, with the result that substantial areas of vegetation remained relatively unmodified. These are now set aside as reserves. There is also some farmland and recreational land in the area, apart from domestic gardens. The proximity of these varied environments to each other and to the author's home has made possible an intensive study of aspects of their natural history.

Between 1974 and 1989, but especially 1975–81, the area was subjected to regular and intensive sampling of its beetles, the insect group chosen for a survey. No accessible habitat type was left unshaken, unswept, unseived, or otherwise unsampled. The several collecting methods employed to secure examples of the beetle fauna are outlined, and the habitats and diversity of life are discussed.

Although the domestic gardens had a high content of indigenous plant species, only 9% of the native beetle species were found to be present also outside the native bush. To expose and partly explain the low adaptability of the indigenous fauna to modified environmental conditions, the geological background is briefly outlined; plant genera that thrive equally well in the bush and in gardens, and that are known to be highly attractive to many beetle species are scrutinised; and the ecological preferences of beetle genera represented by native and foreign species are examined.

At the conclusion of the field work 982 beetle species in 65 families had been obtained, 753 of them endemic. Some general statistics on their overall status are tabulated, and these are followed by a systematic tabulation, species by species, of such variables as provenance, wing condition, relative abundance, and habitat preference. More expansive information is given in an annotated list of the species, which includes for each family an illustration of a representative member. Essential nomenclatural changes are formalised in a separate section; these include new synonymies, new combinations, new status, and a few new genera and species from among the many awaiting description in this material.

The work is illustrated with habitat photographs, habitus and morphological drawings, a topographical map, and aerial photos. A brief account by A. E. Esler of the botany of the survey area is appended, with a vegetation map.

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CHECKLIST OF FAMILIES

Aderidae	34, 66	Curculionidae	36, 70	Phalacridae	31, 57
Agyrtidae	25, 41	Dermeistidae	30, 53	Phycosecidae	30, 55
Anobiidae	30, 54	Dytiscidae	24, 40	Prostomidae	33, 64
Anthicidae	34, 65	Elateridae	29, 52	Pselaphidae	27, 48
Anthribidae	35, 69	Erotylidae	31, 58	Ptilidae	24, 40
Archaeocrypticidae	33, 62	Eucnemidae	30, 53	Ptilodactylidae	29, 52
Belidae	36, 70	Helodidae	29, 50	Plinidae	30, 54
Brentidae	36, 70	Histeridae	28, 50	Rhipiphoridae	33, 63
Buprestidae	29, 52	Hydrophilidae	28, 49	Rhizophagidae	31, 56
Byrrhidae	29, 52	Languriidae	31, 57	Rhysodidae	24, 39
Cantharidae	30, 53	Lathridiidae	32, 60	Salpingidae	34, 65
Carabidae	24, 39	Leiodidae	25, 41	Scaphidiidae	25, 43
Cerambycidae	34, 66	Lucanidae	29, 51	Scarabacidae	29, 51
Cerylidae	31, 58	Lycidae	30, 53	Scraptidae	34, 66
Chrysomelidae	35, 68	Melandryidae	33, 62	Scydmaenidae	25, 42
Ciidae	33, 62	Melyridae	30, 55	Staphylinidae	25, 43
Clambidae	29, 50	Merophysidae	32, 61	Tenebrionidae	34, 64
Cleridae	30, 55	Mordellidae	33, 63	Trogossitidae	30, 54
Coccinellidae	32, 59	Mycetophagidae	32, 61	Zopheridae	33, 64
Colydiidae	33, 63	Nemonychidae	35, 69		
Corylophidae	31, 58	Nitidulidae	31, 55		
Cryptophagidae	31, 57	Ocdemeridae	34, 65		
Cucujidae	31, 56	Peltidae	30, 54		

Pages cited are those on which each family appears in the 'Tabular Summaries of Species Data' and in the 'Annotated List of Species'.

INTRODUCTION

Increasing concern is expressed by city dwellers all over the world about the condition of their environment. This is reflected in the fact that more and more large cities are subject to studies of the quality of their 'inner space'. Of special interest are the green islands – parks, playing fields, cemeteries, and gardens – scattered about in a maze of streets and homes.

Any urban development is almost invariably preceded by a total destruction of the plant and animal life on the site. The green areas are subsequently landscaped into the suburbs by home owners and civic administrations using purposefully selected plants. There is hardly ever room for plants not intended to be on the sites. Consequently only easily dispersed species or weeds may gain a hold spontaneously for a while. The green areas of cities are, therefore, man-made, artificial, and inimical to anything not planned. Animals, excepting pets, are as a rule not part of planned schemes. They must come into cities incidentally or of their own accord. Vertebrates and flying insects can invade urban areas with relative ease, but flightless insects and other small invertebrates generally find streets almost impossible to traverse.

It is precisely the small fauna of invertebrates and the spontaneous flora of weeds, mosses, and lichens that are commonly chosen by researchers to monitor either the diversity of biota or the ecology of individual plant and animal species, particularly for industrial cities that are facing problems with emissions and effluents that are impairing the quality of air and waters (Buck 1955, 1959, Steele 1973, Hawksworth 1974, Davis 1978, Frankie & Ehler 1978, Klausnitzer & Seiler 1986).

The study described here is apparently the first of its kind undertaken in New Zealand. It deals with a relatively well known group of insects, the Coleoptera or beetles. This survey seeks to determine the species diversity in the recently developed residential area of Lynfield, a suburb of Mt Roskill in Auckland City, and in the natural vege-

tation adjacent to the homes and gardens, which covers the high cliffs and deep depressions on the north side of the Manukau Harbour. The area seemed to be attractive for such a survey because of ready accessibility to the author, the suitability of the parks and gardens as regards their relatively high content of native plant species, and also the availability of some rural land.

The pages of this report show at a glance that the beetle fauna of Lynfield is rich and varied in both major recognised habitats: the native bush or forest, which is densely vegetated, and hence affords shelter against desiccation and exposure; and the gardens and parks, which usually leave the ground exposed to wind, light, and insolation. They also demonstrate that most indigenous beetle species have no tolerance or only a very low tolerance of ecological changes, and are unable to live outside the native bush, whereas a large proportion of the foreign species are equally at home in both habitats.

The Gondwanic fragment that is now New Zealand, or Aotearoa, has inherited floral and faunal elements from the massive ancient continent that occur nowhere else in the world. These elements are a legacy from Cretaceous times, 70 or more million years ago in the era of the dinosaurs, which only New Zealand inherited and only New Zealand can safeguard within its unique patrimony.

For species to be systematically, biologically, and ecologically valuable it is not necessary that they be as conspicuous as, for instance, a kauri tree or a takahe. Much of the native forest fauna is small, cryptic, elusive; and many species were rare for a start in New Zealand, before the arrival of the Polynesians and, later, the Europeans. They are now on the way to sure extinction unless the indigenous vegetation, which contains the special habitats that are so vital to their survival, is preserved. As this survey has demonstrated, even the relatively small bush patches that so far have escaped destruction may contain faunas of unsuspected richness and diversity.

ACKNOWLEDGMENTS

W.A. Subritzky kindly permitted me freedom of access to paddocks, animal yards, and the Wairaki Stream bush. My thanks to Beverley Bennett, Grace Hall, Peggy Herbert, Lillian Martin, Margaret Tocker, and Annette Walker for processing the many samples and specimens from Lynfield. I gratefully acknowledge the assistance with identifications provided by many specialists, notably D.E. Bright, R.M. Dobson, S. Endrödy-Younga, F. Español, H. Franz, L.R. Gillogly, Y. Gomy, D.G.H. Halstead, P.M. Hammond, C.M.F. von Hayek, B.A. Holloway, K.J. Houston, C. Johnson, J.F. Lawrence, I. Löbl, B.P. Moore, A.F. Newton, R.D. Pope, B.J. Selman, R.T. Thompson, J.I. Townsend, J.C. Watt, F.G. Werner, and W. Wittmer for beetles; Alan Esler for phanerogams and ferns; Jessica Beaver for mosses; and Joan Dingley for fungi. Grace

Hall and Robin Craw devoted much time and effort to preliminary processing of data from the extensive collections from Lynfield. Alan Esler has generously provided an outline account of the botany of the Lynfield area (see appendix). I am grateful to Tony Harris and Des Helmore for their painstaking work in creating most of the habitus illustrations; to Mavis Lessiter and Krzys Pfeiffer for preparation of the photographs; and to Trevor Crosby and Cleveland Duval for advice on the content and presentation of this report, and for making it a reality through the medium of DSIR Plant Protection's desktop publishing unit. Finally, my sincere thanks to John Longworth, Director of DSIR Plant Protection, for the continuing logistical support which has enabled me, as a Research Associate, to bring this study to completion.

STRUCTURE AND PRESENTATION OF SURVEY REPORT

This report is essentially a statement of the background, techniques, and findings of a rather simple but long-term biotic survey. It is not intended as a guide to identification, although it will perhaps be found helpful in that regard. Nor does it seek to draw any comprehensive ecological conclusions or speculations, even though there is a basis for this implicit in the findings. It is felt that the data of *themselves* make a most eloquent statement regarding species diversity in what might too easily be dismissed as 'just a little bit of bush' in suburbia.

The section 'Collection Methods' (p. 9) outlines the techniques employed in obtaining beetles from the many different kinds of habitat found in the survey area. It necessarily mentions some of the floristic elements of certain habitats, but these are described in detail in the next section, 'Habitat Types and their Beetle Faunas' (p. 11). Further information on the Lynfield flora may be found in Alan Esler's appendix to this report (p. 102), which includes a list of native plant species and a vegetation map.

In the two subsequent sections (pp. 20, 21), consideration is given to the influences which have shaped the Lynfield area and its biota into their present-day form, and to some particular features and associations found there. Emphasis is given to the relative species diversity apparent in the native element of the flora, the vertebrate fauna, and the Coleoptera.

On p. 23 is a table of statistics which summarises and contrasts quantitatively some of the biological features of the 982 beetle species found in the survey. This is followed on p. 24 by a comprehensive tabulation of species data, in systematic sequence of families. The legend at the foot of each left-hand page of this section indicates the meaning of the data codes used in the table, and it is possible to quickly gain an impression of the status of individual species and of larger taxonomic groupings for a number of biological variables.

The meat of the report is to be found in the section 'Annotated List of Species' (p. 39), in which information is given regarding each of the beetle species recorded at Lynfield during this survey. The same sequence of taxa is used as in the tabulation of species data. At the family-group level this sequence, and the names used, represent either the best current opinion available to me from specialist collaborators, or – for the Curculionoidea in particular – my own view of the systematics of the group. The genera and species of each family-group taxon are presented in alphabetical order.

For all species, even those as yet undescribed, information is given on their apparent ecological affinities at Lynfield. For introduced species, this is supplemented where possible by an indication of the earliest New

Zealand record and its source, and present distribution, both in New Zealand and worldwide. By means of superscript key letters, attention is drawn to those species which (a) are introduced, (b) are first reported for New Zealand in this publication, (c) have Lynfield as their type locality, and (d) are involved in some taxonomic change.

In the course of this study it has become apparent that a number of taxonomic changes – new combinations, new synonymies, and new taxa – would be desirable. These have been grouped together under the section 'Taxonomic Notes' (p. 76), for the convenience of readers with a particular interest in such concerns. Only a very few new taxa are erected here; a substantial body of material remains to be formally described. Three pages of line figures are given in support of the descriptions of new taxa.

The section devoted to References (p. 86) is by no means comprehensive. It is confined to citations of first records of foreign species in New Zealand, and to authors cited in the section 'Taxonomic Notes'. Background information on established taxa may be sought in such standard works as Junk's *Coleopterorum Catalogus*.

For each family in the Annotated List, a habitus drawing is given near the family heading as an aid to visualisation. Note, though, that some of the illustrations used are of species not recorded at Lynfield; they stand as examples only. However, habitus drawings of many of the Lynfield species were already available at the time of writing. They are incorporated in this volume as a series of plates (p. 90), in the hope that keen students will find them useful in putting names to a number of common beetles. Some duplication of figures between the plates and the Annotated List has been inevitable.

A taxonomic index (to the Coleoptera only) has been included with this report, for the convenience of readers. However, the alphabetical 'Checklist of Families' (p. 6) and the alphabetical sequence of genera and species under family-group headings provide easy alternate access.

The terms native, indigenous, and endemic are often used in the text, and may require clarification to prevent uncertainty or ambiguity. 'Native' and 'indigenous' are synonymous, and refer to species which may occur also outside the territory under consideration (in the present context, New Zealand plus outlying islands) but are considered to occur naturally in the area, i.e., their presence is not the result of human traffic. 'Endemic' is reserved for those species that occur solely in the territory under consideration.

The voucher specimens from the Lynfield beetle survey are housed in the New Zealand Arthropod Collection (NZAC), DSIR Plant Protection, Mt Albert Research Centre, 120 Mt Albert Rd, Auckland 3, New Zealand.

COLLECTION METHODS

The principal collecting methods used to retrieve the beetle fauna for the Lynfield survey are outlined below. Beetles occur in practically every conceivable niche of both natural and modified environment, be they terrestrial or aquatic, endophytic or aerial, topical or interstitial. Beetles may readily fly, or may be flightless and just crawl. Some are active in the daytime, others at night; a few are almost indifferent to the time of day. The collecting of organisms of such immensely diverse lifestyles requires a whole series of techniques to be applied for years through the four seasons, should a thorough survey be attempted.

(1) Beating vegetation. This is done by holding a beating sheet or tray under the foliage of trees, shrubs, lianes and higher ground plants while giving one or two sharp jarring blows with a stick. The sheet is then scanned, and either the specimens are picked up by hand, or with aspirators or tweezers, or the entire beaten material is transferred to bags for processing through Tullgren extraction funnels or for sorting by eye under shelter. The operation may be repeated on the same plant species until sufficient material has been secured to ascertain possible biological or ecological associations of individual beetle species with a particular plant species or niche. The material is then labelled and put aside before beating another plant species. Canopy beetles are more readily collected earlier in the morning and into the evening. The canopy usually becomes more accessible for this operation at bush margins, on regenerating vegetation around paths and clearings, and on the upper part of steep slopes, gullies, and cliffs.

(2) Sweeping vegetation. The insects living or resting on vegetation can be obtained by sweeping with a firm net. This method is particularly practical for the low vegetation of meadows, roadsides, wastelands, and wetlands in the open and for grasses, sedges, and ferns in the bush. If clean specimens are required from night sweeping, this must be done in the early hours of a breezy night, especially on the open vegetation of paddocks and roadsides, where slugs and snails commonly abound on wet and dewy nights.

(3) Sifting natural litter. In this context litter is any organic matter breaking down on the ground under native vegetation or washed up onto the sea-shore. Included in this concept are twigs, branches, logs, fallen trees, and the lower part of the trunk of standing dead trees. Litter samples are taken by scraping with a trowel ground debris and the loose top layer of humus into a sifter made of tough material, which has a top handle on a firm ring, another handle below attached to a 1-cm-mesh sieve, and a collecting bag tied below this. The gathered litter is shaken about with a turning or tumbling action, and the finer materials and insects fall through into the bag. The procedure is repeated on the same type of litter until 2 or 3 cubic decimetres have been sifted. The sample is then emptied

into a holding bag, which is labelled with a numbered tag. The particulars of the site are entered in a notebook: relevant information on the vegetation that formed the canopy and the undergrowth, and the conditions on the ground. Four main types of litter were sampled: (a) the loose or free litter of dropped twigs, leaves, flowers, fruits, and seeds; (b) the litter and mould in hollows in the trunks and major limbs of living and dead trees; (c) the litter from decaying wood, crumbled or chopped over and into a sifter; and (d) the wrack by the sea-shore. The ground litter in the area surveyed was as varied as the canopy and topography were diverse, requiring large numbers of samples to ensure adequate coverage of its rich fauna. Holes in trees were rather uncommon. A few were found in *Vitex lucens*, *Dysoxylum spectabile*, and *Sophora microphylla* among the native plants, and only in *Salix fragilis* among the foreign element. Scrapings of the caudex of tree ferns and necrotic areas of tree trunks induced by *Phellinus* and other fungi were included as litter samples. Litter was taken continually for seven years, amounting to 824 samples processed through Tullgren funnels, but only the first 104 were numbered and entered into the Systematic Group litter book at Mt Albert Research Centre, Auckland.

(4) Sifting garden and farm litter. This litter may be compost heaps of lawn clippings, plant prunings, vegetables, fruits and kitchen refuse, pure or combined, as well as hen-house straw and feed, chicken and sheep manure, and stored foodstuffs. Bags of lawn clippings mixed with fermenting fruits and vegetables were frequently taken into the Wairaki Stream bush to test the adaptability of native species to this unusual litter, and to see whether the foreign beetles that were so common in the exposed compost heaps in gardens would take to it even when placed in dense native bush.

(5) Floating from stream-bed deposits. Only the lower 200 m or so of two streams have a bed, and only the Wairaki Stream has some gravel. The areas above and around the streams are urbanised, and storm-water run-off from properties and streets carries down litter, which is heaped up as flood debris in sedges and obstacles on the way to the sea. Stream-bed carabids and staphylinids are easily disturbed by splashing the ground with the water nearby, or floated out by scooping gravel, sand, and silt into a bucket of water. As flood debris can hold all sorts of beetles from outside and inside the bush, and many of them are rather lethargic, the material is bagged unsifted if too wet, or sifted if dryish for subsequent processing through Tullgren funnels.

(6) Washing and sifting soil. This method consists of washing soil through sieves of progressively finer mesh, and is extensively used to extract nematodes and other small organisms from the soil. Although no species were extracted in this way that had not been obtained in deep pit-traps as well, the method was very handy to check

quickly for other species or for more specimens from new sites, and to collect soil-dwelling larvae and pupae.

(7) **Netting aquatic and splash zone species.** The dytiscids and aquatic hydrophilids are easily seen either swimming in clear waters or whilst surfacing to pick up air in murky waters. The net is used down-stream from boulders (disturbed), trapped litter (washed), and moss (splashed), and also to scoop up leaves and twigs from still waters. The netted material is bagged for subsequent examination.

(8) **Baiting with plant cuttings.** Cut branches of trees, shrubs, and lianes are bundled up and tied on to branches of their own kind in such a way that at least part of the bundle touches the plant, allowing flightless beetles to get to the cut material, and a beating sheet can be held underneath without hindrance. Each bundle is tagged with the name of the plant and the date it was set up. This was done simultaneously in the forested areas and in gardens 200–250 m away across a paddock whenever the same plant species was available in both. The bundles were checked fortnightly for as long as activity was observed. This may have lasted for a few weeks only, as with *Parsonsia heterophylla* and *Rubus cissoides*; or months, as for species of *Coprosma*, *Pittosporum*, and *Pseudopanax*; or even years, as for *Sophora microphylla*.

(9) **Baiting for carrion beetles.** Fish, bones, cooked and raw meat, and small dead mammals and birds occasionally picked up from roadsides were placed inside native vegetation and in a slightly more exposed area in an *Acacia mearnsii* grove beside a patch of native forest.

(10) **Pit-trapping.** Shallow pit-traps are used for ground fauna and deep pit-traps for hypogean (soil-inhabiting) faunas. As shallow pit-traps are too selective and inefficient in a bush situation they were used rather rarely, and then almost solely under or next to carrion bait. A dozen deep pit-traps were set up at Wattle Bay and Wairaki Stream and kept serviced for several years. This type of pit-trap is prepared by boring a hole up to 50 cm deep into the ground with a 10 cm soil auger. A jar containing ethanol (75%) is placed at the bottom. The gaps between the jar and the sides of the pit are sealed off with kneaded clay, or an expandable foil funnel is lowered over the jar (the former procedure turned out to be easier and cleaner). The top of the pit is then tightly sealed off with an appropriate piece of board to prevent surface fauna from entering, and covered with a large plastic sheet to keep rain-water out. The sites for pit-trapping must be flood-free. Ethanol was found to be practical not only because of negligible evaporation and hardly any loss of concentration, but also in proving rather attractive to soil species. The traps were serviced once a month in normal weather, and more often in wet spells.

(11) **Malaise trapping.** Two Malaise traps were set up at Wattle Bay, one in dense bush at the upper part of the main rivulet, right beside the stream bed, and the other in a drier area under a canopy of *Vitex lucens* and *Dysoxylum spectabile*. They were left there only from January to March 1981, because of frequent and serious interference from passers-by. Two further Malaise traps were put up in the Wairaki Stream bush away from human traffic. One, over 3 m high, was placed in a small clearing surrounded by an assortment of native trees and shrubs and a ground cover consisting in the main of *Schoenus tendo*, with a fair amount of *Hakea sericea*, *Solanum mauritianum*, *Acacia verticillata*, and *Ulex europaeus*. The other trap was placed on a channel holding only a trickle of water, and flanked by *Pseudopanax lessonii*, *Olearia furfuracea*, *Cyathodes fasciculata*, *Geniostoma rupestre*, *Hedycarya arborea*, *Coprosma robusta*, and *Melicactus ramiflorus*, with the only flowering specimen in the entire study area of the palm *Rhopalostylis sapida* a few metres downstream. The holding jars with 75% ethanol were cleared weekly.

(12) **Misting with repellents or insecticides.** This method is used to disturb insects hiding in wood fissures, stream-bank and cliff-face cracks, and the epiphytes and climbers on trunks and logs, on vertical and overhanging inland and coastal cliff faces, and on supralittoral and intertidal rocks covered with algae or studded with barnacles. Cloth sheets are laid on the ground below the areas to be surveyed. The faces are sprayed with a fine mist. Some insects react instantly and drop; others take several minutes before becoming sufficiently disturbed to be easily noticed. The insecticide used is pyrethrum-based, with rapid knock-down but short persistence.

(13) **Rearing.** Immature stages may be collected and reared to secure adult specimens of elusive species, to relate larvae and pupae with adults, and to associate a beetle species with its particular host or niche. For example, the branch-cutting longhorns *Gastrosarus nigricollis* and *Astetholida lucida* were common judging by the numbers of branches on the ground, but they were rarely seen and even more rarely caught. Although the bundles of cut branches (method 8 above) were checked at least once a fortnight, some beetle species not caught while ovipositing were reared in numbers.

Every one of the thirteen collecting methods just dealt with has yielded beetle species of interest. Although ant nests and termite colonies were thoroughly searched for beetle 'guests' none were found. The runs of the ant *Mesoponera castanea*, however, are quite frequently lived in by the blind *Carpelimus* staphylinid, the ptiliids *Notoptenidium crassum* and *N. oblongum*, and the Australian pselaphid immigrant *Gerallus punctipennis*.

HABITAT TYPES AND THEIR BEETLE FAUNAS

(1) **Forest canopy.** Healthy and diseased buds, leaves, flowers, and fruits of trees, shrubs, and lianes, together with the parasitic and epiphytic flora and dying branches and twigs up in the crowns, provide a rich source of food for many beetles that feed directly on plants or that prey upon or parasitize canopy-dwelling arthropods. There is a tremendous amount of activity going on day and night in the canopy, especially in the growing and flowering season. Most canopy beetles are capable of flight. Most live and shelter there, but a few – for example the scarabaeids *Stethaspis longicornis* and the *Costelytra* species – visit the foliage in the early evenings only to return to the ground afterwards. Of the 753 native beetle species collected at Lynfield, 371 (49%) may be found in and on the canopy; of the 229 foreign species found to occur at Lynfield, 95 (42%) may live in and on tree crowns. No wonder, then, that nearly half the total beetle fauna of Lynfield could eventually be obtained by the beating method alone.

(2) **Tree trunks.** The trunks of trees are often lined with the lianes *Metrosideros perforata* or *M. fulgens* or the ferns *Pyrrosia serpens* and *Phymatosorus* species, or covered with moss, liverworts, lichens, and filmy ferns interspersed with *Tmesipteris* species and *Asplenium flaccidum*. Such trunks are frequented by a handsomely patterned corylophid of the genus *Holopsis*, and by the flightless alticine chrysomelid *Trachytetrarugulosa*. The trunks of *Leptospermum scoparium* affected by sooty mould are inhabited by the nitidulid *Soronia hystrix*, and the caudex of tree ferns by the cryptorhynchine weevil *Agacalles formosus* and the two cossonines, both of the genus *Heteropsis*. Rough trunks, like those of *Pinus radiata*, provide ideal conditions for the Australian lebiine carabid *Philophloeus luculentus*, reported here for the first time from New Zealand.

(3) **Ground plants.** The ground flora is made up of monocot and dicot herbs, non-arboreal ferns, clubmosses, mosses, and liverworts in native forest, bush tracks, clearings, and wetlands. The phanerogamic element of the ground flora consists mainly of the grass genera *Oplismenus*, *Microlaena*, and *Cortaderia*, the sedge genera *Carex*, *Uncinia*, *Gahnia*, *Lepidosperma*, *Morelotia*, *Schoenus*, *Scirpus*, and *Cyperus*, the bullrush or raupo *Typha orientalis*, the liliaceous genera *Astelia* and *Dianella*, and the agavaceous genus *Phormium* and species *Cordyline pumilio*. Some beetles shelter in moss mats, dense clusters of grasses, sedges, rushes, astelias, and native flax; others are associated with litter trapped at the bases of plants or underneath. A few are highly host-specific. Among those closely associated with special plants may be mentioned *Adrioepa pallidata* on *Gahnia*; *Psilocnaeia parvula*, *Novitas dispar*, and *Phloeophagosoma pedatum* on *Phormium* species; *Psilocnaeia asteliae*, *Microlamia pygmaea*, and *Microtribus huttoni* on the same *Phormium* species plus *Astelia banksii*; the leaf-mining weevil *Microcryptorhynchus* species 1 on *Astelia*

banksii; and the marsh weevil *Steriphus ascitus* on *Scirpus* and *Typha*. The species of the chrysomelid genus *Aphilon* are associated with liverworts, the weevil *Bryocatus polytrychi* with various moss species, and the weevils *Gromilusthoracicus*, *Agacalles integer*, and *Pogonorhinus opacus* with ground ferns. The flightless clerid *Paupris aptera* was found to be invariably on inflorescences of *Gahnia lacera*, and the equally flightless chrysomelid *Peniticus suffusus* on leaves of the forest floor species of *Carex*, *Uncinia*, and *Gahnia*.

(4) **Live wood.** Only six species attacking healthy trees, shrubs, and subshrubs were found at Lynfield. Two are wood borers, two are branch cutters, one is a pith borer, and one a gall maker. The wood borers and branch cutters are longhorns, the others weevils. One of the wood borers is *Ochrocydus huttoni*, the larva of which works up and down in the lower part of the trunks of *Leptospermum scoparium* and *Kunzea ericoides*, affecting most severely the former. The larvae keep the galleries clean by disposing of the frass through pin-holes. The second borer is *Oemona hirta*, possibly the most versatile of all cerambycids of the world, as it is capable of attacking completely healthy as well as dead trees, shrubs, and herbs of conifers, dicots, and monocots. The larvae also keep the tunnels free of frass by emptying the shavings and sawdust through pin-holes to the outside. Observations perhaps worthy of mention are: larvae found boring and doing well in live branches of healthy *Chamaecyparis lawsoniana* and *Cupressus macrocarpa* trees (Cupressaceae); larvae in 3-year-old, rather decayed cut branches of *Sophora microphylla* (Fabaceae); larvae in dead twining stems of the liane *Ripogonum scandens* (Smilacaceae); and larvae in the green, sound culms of the tussock sedge *Gahnia setifolia* (Cyperaceae) (one of them preyed upon by the rhipiphorid *Allocinops brookesi*). The branch cutters are *Gastrosarus nigricollis*, which can attack a number of different trees but was observed only in *Leptospermum scoparium*; and *Astetholida lucida*, which also attacks many species of trees but was pruning most severely *Tristania conferta* and *Eucalyptus* species. The gall maker is *Nyxetes bidens*, larvae of which were reared from stems of the vine *Clematis paniculata* (Ranunculaceae) and branches of *Nestegis lanceolata* (Oleaceae). The pith borer is *Rhadinomus acuminatus*, which is host-specific on *Haloragis erecta*. The larva works its way down into the partly lignified stems, having started at more or less herbaceous upper parts.

(5) **Sound wood.** Sound wood is that of freshly dead trees and shrubs or any firm wood that does not show clear signs of decay. As fungal spores are always present in nature, those of ascomycetes and especially basidiomycetes start developing as soon as the right conditions are given. The whole process of degradation of the wood is greatly accelerated if insects affect bark and wood in the early stages. The insects that do this early work are almost exclusively Coleoptera, principally longhorns, weevils,

and bark and ambrosia beetles. Bark-beetle adults work their way into or through the bark to lay eggs. The larvae feed in the cambium, engraving patterns that are characteristic for each species. These host-specific beetles are usually the first to arrive at a new site. Thus all nine phloeophagous scolytines occurring in the Lynfield area have a restricted host association, the three *Dendrotrupes* species living on *Pseudopanax* (Araliaceae), *Chaetoptilius mundulus* on *Pittosporum* (Pittosporaceae), a species of *Hypocryphalus* on *Sophora* (Fabaceae), and another species of the same genus on *Parsonsia* (Apocynaceae). The three foreign bark-beetles are associated specifically with *Ficus*, *Pinus*, and *Cupressus*. Four species of weevil tunnel into wood as adults. They lay their eggs in niches, usually at 2–3-cm intervals around the galleries. The larvae then mine away from the tunnel in a radiate fashion. *Psephenax sulcatus* and *Strongylopterus hylobioides* attack a variety of trees, but the two species of *Mesoreda* are associated with *Pseudopanax* species only. A further group of beetles that tunnel into wood as adults are species that culture their own gardens of ambrosia fungi, on which adults and larvae graze. They are representatives of the scolytine genera *Amasa* and *Xyleborinus* and the platypodine genus *Platypus*. Beetles that do not bore into wood but have xylophagous larvae lay eggs in cracks, broken twigs, or lesions; or, in the case of weevils, prepare an oviposition site by chewing a pit with the rostrum. The families that contribute important wood-boring species at Lynfield are Cerambycidae, Curculionidae, Anthribidae, Lucanidae, Elateridae, Tenebrionidae, and Anobiidae. A number of weevils and longhorns of sound wood are host-specific, as shown in the Annotated List of Species.

(6) **Decayed wood.** Once fungi, bacteria, and insects have degraded wood to a degree that fruiting bodies of the fungi sprout from stems, stumps, and logs and the wood crumbles easily, it has reached the stage of rotten or decayed wood. This wood is inhabited by all sorts of insects, mites, and worms. Not all types of wood rot evenly. Some trees, like *Sophora microphylla* and *Dysoxylum spectabile*, decay rapidly on the outside but leave a hard core; others, like *Knightia excelsa*, *Corynocarpus laevigatus*, and *Hedycarya arborea*, may rot rather evenly or become pulpy if *Ganoderma applanatum* has been through the wood while the trees were still alive. Beetles of decayed wood are almost invariably glabrous, flightless, inconspicuous, and small, some actually exceedingly minute. There is a rich variety of fungus feeders and predators. The families which prevail in decayed wood are Ptiliidae, Staphylinidae, Pselaphidae, Scydmaenidae, Scaphidiidae, Histeridae, Peltidae, Colydiidae, and Tenebrionidae. Most species inhabiting decayed wood remain unnamed in New Zealand except for the Lynfield Ptiliidae and Scydmaenidae described from specimens obtained during the beetle fauna survey. One of the smallest beetles in the world, *Microscydus lynfieldi*, which measures only 0.55–0.60 mm, was discovered at Lynfield and named after this area of Auckland City. To this day it is known only from the Wairaki Stream Reserve at Lynfield.

(7) **Wood mould.** The trunk and main limb cores of old trees tend to become hollow in some species. Only a few individuals of *Vitex lucens*, *Dysoxylum spectabile*, *Sophora microphylla*, *Metrosideros excelsa*, and the adventive *Salix fragilis* have provided this niche at Lynfield. The central part of the trunks that has broken down over the years accumulates at the bottom of trunks or in limbs as humus or wood mould. This particular humus is microclimatically different from that under the forest floor litter because it is so sheltered. To emphasise its distinctiveness it is conveniently termed wood mould. Old hollow trees are an important ecological element in any forest, as they provide the unique conditions that some animal species require for survival. Over a dozen species of Scydmaenidae and Pselaphidae were found to be exclusively in wood mould or closely associated with it, in particular the four species of *Neuraphoconnus*, two species of *Stenichnaphes*, and the pselaphid species *Eupines altula* and *E. punctata*. All the wood mould species are small and, with the sole exception of a still unnamed *Neuraphoconnus* species, fully winged. The rather large flightless anthicid *Cotes optima*, which is often seen on foliage at night, seems to prefer hollow trees for hide-outs in the daytime.

(8) **Fungi.** Mushrooms, toadstools, jelly and bracket or shelf fungi, gall-rusts, moulds, ambrosia fungi, and other deuteromycetes are a rich source of energy which Coleoptera perhaps more than any other group of insects are able to exploit. The Lynfield area, and indeed New Zealand as a whole, has a large fauna of beetles associated with fungi, some species occurring on a wide range of fungal groups, others on specific fungi. Because of the usually sporadic occurrence and generally ephemeral nature of fungi, mycetophagous beetles are almost invariably full-winged and gregarious, frequently congregating in the thousands at new sites. They tend to be small and sparsely pubescent or glabrous. Most, for instance Scaphidiidae, Staphylinidae, Leiodidae, and Lathridiidae, feed as adult and larva on the outside; some, for instance Ciidae and Anthribidae, live as adult and/or larva in the fruitbodies. The largest, most conspicuous fungus on tree trunks, logs, and stumps is the cosmopolitan and ubiquitous *Ganoderma applanatum*, a polypore that has a fruitbody with a pure white underside. It is found on many live and dead hardwoods and softwoods. In Lynfield it is particularly common on *Knightia excelsa*, killing trees prematurely, and *Acacia mearnsii*. Relatively young fruitbodies are attractive to many ectophytic beetles, especially Leiodidae, and in particular the species *Zearagytodes maculifer*, the agile adults and larvae of which often congregate in the hundreds on the bright white underside of the fungal shelves. Older fruitbodies are invaded by *Cis zealandicus* and various other ciids. The trunk of a dying *Melicetus ramiflorus* lying waterlogged on seeping ground was found affected by *Phellinus punctatus*; the effused, resupinate fruitbody of the fungus was covering part of the trunk. This fungus was visited regularly over several years. Three beetle species – the scaphidiid *Scaphisoma* species I and the staphylinids *Sternotropa zealandica* and

Gyrophæna species 2 – were observed almost always simultaneously through the seasons, but mostly in small numbers. An extensive white-rot spot on a large, live *Vitex lucens* tree apparently induced by a *Phellinus* species had unusually large numbers of three beetle species which were found exclusively there or only exceptionally elsewhere. The beetles were the rhysodid *Kupeus arcuatus*, an undescribed scydmaenid with small eyes of the genus *Microscydms*, and the large anobiid *Hadrobregmus crowsoni*, which was known before only from the Whangarei area. Mushrooms and toadstools that grow on the ground are highly attractive to all sorts of beetles, but especially to the staphylinid *Atheta atriceps* and the mycetophagid *Triphyllus punctulatus*, two full-winged native species found to be consistently present in the bush while always absent only metres away in the open field. The gall-rust *Uromycladium notabile* found on most *Acacia* species severely attacks *A. mearnsii* at Lynfield. The fungus is host to *Phalacrus uniformis frigidicola* while the galls are fresh, and *Araecerus palmaris*, alongside the voracious Australian pyralid moth *Gauna aegusalis*, in older galls. The powdery mildews, notably those on Cucurbitaceae, are intensively browsed by adults and larvae of *Illeis galbula*, an Australian ladybird vividly patterned in yellow and black, noticed in the country only since March 1985 but already very common in Auckland gardens. Finally, there are a few beetles that culture their own fungi, known as ambrosia. The fungus is carried by the adult on the body in special cavities or mycetangia into the tunnels the beetles bore. The ambrosia quickly thrives in the galleries, lining the walls with a fungal carpet that adults and larvae crop while moving to and fro. One endemic platypodine and three foreign scolytines have this special life habit in the Lynfield area. Among these is *Xyleborinus eucalypticus*, whose presence in the country was discovered during the early stages of the Lynfield beetle survey in March 1975. It had well established populations in dead, sound *Acacia decurrens*, *Corynocarpus laevigatus*, and *Melicetyus ramiflorus*. On an unusually warm and humid late winter day, 27 August 1980, this species was observed swarming everywhere – in the bush, on beaches, open fields, and urban gardens, indeed over the entire Lynfield area and surrounding districts, getting into homes through every open door and window.

(9) **Leaf litter.** The leaves, flowers, and fruits shed and fallen from the treetops and undergrowth constitute the leaf litter. This organic matter may be sparsely scattered all over or gathered together, in places forming thick carpets, according to the topographic conditions at a particular site. Apart from helping to retain soil moisture and to prevent raindrops from directly hitting the soil surface, leaf litter is a food source for different organisms as it gradually breaks down, and shelter for others, be they scavengers or predators. Leaf litter beetles are usually drab, and are mostly active at night. Many are flightless, small, and because hardly noticed are still waiting to be described and named. The list of species occurring in leaf litter is appreciable, made up of representatives of many

families, particularly Staphylinidae, Pselaphidae, Scydmaenidae, Leiodidae, Colydiidae, and Curculionidae. Some species are so common and ubiquitous that no matter how small an area they are invariably there. Thus it would be hard not to spot or collect in samples at least some specimens of the ptiliid *Notoptenidium lawsoni*, the scydmaenid *Euconnus calvus*, the staphylinid *Ocalea fuscicornis*, the pselaphid *Eupines impar*, the corylophid *Holopsis pallida*, the lathridiid *Lithostygnus sinuosus*, the curculionid *Dermothrius farinosus*, and several others. If dropped flowers pile up under *Alseuosmia macrophylla* or *Sophora microphylla*, or fruits gather under *Corynocarpus laevigatus*, the rather large alcocharine rove beetle *Tramiathea cornigera*, the male of which has on two tergites a robust, prominent tubercle, may be present in large numbers. The three species of the carabid genus *Ctenognathus* are very active and common on the ground at night.

(10) **Garden compost.** Lawn clippings, prunings, vegetables, and fruits gradually piled up in the open and in bins make up the organic matter for compost. This basic compost material was taken into the native bush to test its suitability for the endemic fauna, and the ecological versatility of the foreign beetles that are attracted to this fermenting and decomposing vegetable matter in gardens. The biota in compost are extraordinarily rich and varied, regardless of whether compost is in gardens, paddocks, or bush. The composition of the beetle fauna, however, differs markedly with the location of the compost. No fewer than 80 species were found to be closely associated with compost heaps in gardens and open fields. All without exception are foreign, and all but *Thalycrodes australis* are full-winged. These species comprise some 35% of the foreign element registered for the Lynfield area. The family Staphylinidae has provided 33 species, Nitidulidae 7, Ptiliidae 6, and Lathridiidae 5; the remaining 29 species are distributed among 11 further families. In a native bush situation, the same type of compost is capable of luring at least half the foreign species just alluded to, in addition to many species from the endemic element.

(11) **Open fields.** The areas away from beaches and open stream beds not covered in forest or dense scrub are designated as open fields. Paddocks, urban parks, recreational fields, and even densely planted gardens if not contiguous with native bush come under this heading. The beetles commonly found on such open grounds are associated with grasses or herbs or are predators. Some are diurnal, others nocturnal in habit. Clay banks, slopes, and flats, especially if partly denuded, are often found to be pitted with perfectly circular holes leading to burrows. These are seen throughout the year, and are inhabited by larvae of the native tiger beetle *Neocicindela tuberculata*. The extremely agile adults are easily recognised by their distinctly patterned elytra, but are around only during the summer months. A second species of the same genus, *N. spilleri*, although dull in appearance is commonly and

easily seen on the ground even in the darkest interior of the native bush. As more specimens of this species than of *N. tuberculata* were found in swimming pools 200–300 m from the native vegetation, it must be assumed that it lives also in gardens, although never actually sighted there at Lynfield. Several scarab beetles are common in the gardens and fields of Lynfield, among them the native *Costelytra zealandica* and *Odontria xanthosticta*, the South African *Heteronychus arator*, the Australian *Aphodius tasmaniae*, and the South American *Ataenius picinus*, all but the last species doing considerable harm to pastures. It is possible to observe a lot of activity on the ground, in the daytime mainly because of the presence of five Australian species, the rove beetles *Thyreocephalus orthodoxus* and *Astenus guttula*, the ladybird *Diomus notescens*, and the ant beetles *Anthicus hesperi* and *A. kreusleri*, and at night principally because of the five roaming carabids, two *Clivina* and three *Lecanomerus* species; four of these are Australian, the other is allegedly Zelandic. Damper sites are favoured by the presumed endemic staphylinid *Carpelimus zealandicus*, the European *C. corticinus*, and the Australian carabid *Tachys australis*, and a further foreign carabid species of uncertain provenance, *Paratachys crypticola*. Other beetles feed on grasses and herbs. Among the weevils associated with varied herbs are the South American *Graphognathus leucoloma*, *Listroderes difficilis*, and *L. foveatus*, the European *Otiorhynchus rugosostriatus* and *O. sulcatus*, and the Australian *Steriphys diversipes lineatus*. Among the weevils associated with specific plants are the European *Gymnetron pascuorum* on *Plantago lanceolata* and *Sitona discoideus* on *Medicago* species, the Australian *Rhinoncus australis* on *Rumex* and *Polygonum* species, and the South American *Listronotus bonariensis* on various grasses and *Linogeraeus urbanus* specifically on the trailing grass *Paspalum distichum*. To the list of pasture beetles may be added the Australian anthribid *Euciodes suturalis* on grasses, and the presumably Australian chrysomelid *Longitarsus fuliginosus*, which is common in meadowy grasslands at Lynfield.

(12) Dung. Sheep and free-range hens provided abundant, steadily available dung at Lynfield. The sheep flock consisted of around 40 adult animals and, in spring and summer, their lambs. The sheep were grazing in approximately 3.7 hectares of pasture subdivided into five fenced paddocks, each with a water-trough and some trees. One field had an *Acacia mearnsii* grove adjacent to native bush, which was a highly favoured site for resting and for sheltering from sun and stormy weather. The fowl manure came from two or three dozen hens kept in a yard and hen-house not far from the paddocks on the same property. The hen-house was lined with a thick layer of straw, and had besides perches, nesting boxes, and troughs of feed and water. Sheep manure is not greatly different from well broken down compost made from lawn clippings. The faunas in lawn compost and sheep dung are, therefore, rather similar, but mycetophagous beetles are absent or rarer in dung because it dries out faster. Common in sheep

dung are *Aphodius pseudolividus*, *Cercyon haemorrhoidalis*, *C. atricapillus*, *Neohypnus andinus*, several species of *Philonthus*, and all five species of *Anotylus* found in the area. The Australian dung beetle *Onthophagus granulatus*, known to be in the country at least since 1872, was seen only occasionally at Lynfield. All these species are capable of flight, and all are adventive. The fowl manure holds a greater variety of beetles than the sheep dung, mainly because of the mix with straw, feed, and damp areas around the water trough. Thus *Sitophilus oryzae*, *Gnatocerus cornutus*, *Alphitobius diaperinus*, and *Ahasverus advena* were there primarily because of the chicken feed. Three species reported for Lynfield were obtained only in the hen-house—the rove beetles *Omalium allardi* and *Cratarea suturalis*, and the cryptic beetle *Cryptophagus pilosus*; the first two are reported here for the first time from New Zealand. Other species associated with the hen-house were the staphylinids *Oxytelus sculptus* and *Philonthus sordidus*, the hydrophilid *Dactylosternum abdominale*, the histerids *Carcinops pumilio*, *Gnathoncus rotundatus*, and *G. schmidtii*, and the ant beetle *Anthicus floralis*. All the species associated with the domestic fowl at Lynfield are fully winged and foreign. *Trox scaber*, a beetle frequently present in hen-houses in New Zealand, was strangely enough not found at Lynfield.

(13) Carrion. Conditions in an urban environment normally do not allow carrion species to prosper. Bait for luring this special fauna was therefore set in an isolated small grove of *Acacia mearnsii* and adjacent native bush. Only six species out of the hundreds of endemic Coleoptera obtained at Lynfield are attracted to carrion: the leiodids *Mesocolon alacre*, *Paracatops lugubris*, and *Pseudonemadus lituratus*, the agyrtid '*Necrophilus*'

Figures 1–7 (opposite page)

- 1 Paddocks with sheep and scattered trees of *Quercus*, *Eucalyptus*, *Platanus*, *Acer*, *Acacia*, *Pinus*, *Cryptomeria*, and *Cupressus*. Beyond the housing are pines on the Maungakiekie golf course.
- 2 Sheep paddock and the Wairaki Stream bush at its eastern end. The taller trees to the left are kahikatea (*Dacrydium dacrydioides*); on the right are exotics.
- 3 Pond on the Maungakiekie golf course flanked by raupo (*Typha*) and native bush, with tree-fern species prevalent.
- 4 Western slopes of the Wattle Bay bush, showing regeneration of indigenous species in a plantation of diseased and dying wattles (*Acacia decurrens*, *A. mearnsii*) and healthy pines (*Pinus pinaster*, *P. radiata*).
- 5 Wattle Bay bush at the lower course of the stream.
- 6 Large puriri (*Vitex lucens*) in the Wattle Bay bush. The trunk, affected by white-rot, proved particularly attractive to the rhysodid *Kupeus arcuatus*, the anobiid *Hadrobregmus crowsoni*, and a microphthalmous species of the scydmaenid genus *Microscydum*.
- 7 Branches of tanekaha or celery pine (*Phyllocladus trichomanoides*) cut and suspended as 'bait' for beetles, Wairaki Stream bush.



(1)



(2)



(3)



(4)



(5)



(6)



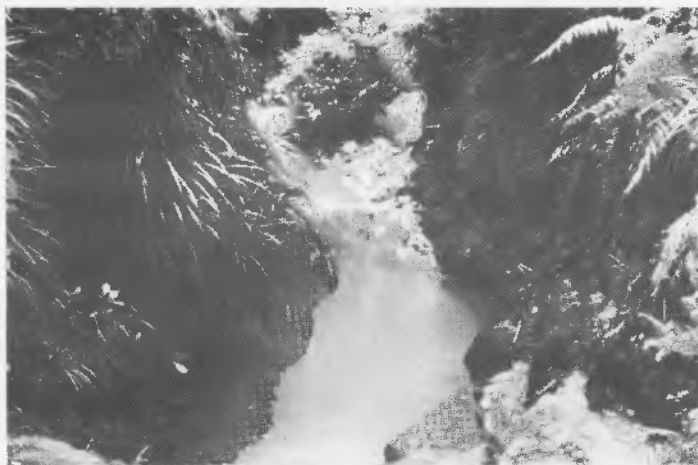
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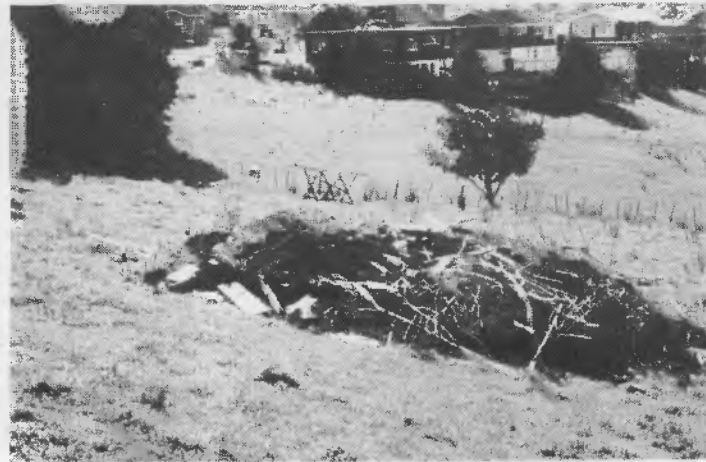
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(14)



(15)

prolongatus, the histerid *Saprinus detritus*, and the staphylinid *Stenomalius helmsi*. The histerid was among the very first New Zealand insects to be described, but Fabricius (1775) had listed it, in error, as an Australian species collected during Captain Cook's first voyage on the 'Endeavour'. All the common foreign carrion beetles already reported from New Zealand were present: *Creophilus oculatus*, *Philonthus politus*, *Necrobia ruficollis*, *N. rufipes*, *Dermestes maculatus*, and *Omosita colon*. (The large rove beetle *Creophilus oculatus* is an Australian species, but was already in New Zealand at the time of Captain Cook's visit in 1769.) Five further species associated with carrion are reported here for the first time from New Zealand, two having been found first elsewhere in the country, the other three only at Lynfield. These are *Aleochara puberula*, *Gabronthus sulcifrons*, *Nitidula carnaria*, *Omosita discoidea*, and *Litargus balteatus*. A specimen of the European burying beetle *Nicrophorus vespillo* in the Brookes Collection (New Zealand Arthropod Collection, DSIR) was collected at St Heliers, Auckland City, by A.T. Pycroft in 1928. As this beetle has not turned up at Lynfield, and has not been collected in the 60 years since it was picked up at St Heliers, the species is presumably not established in and around Auckland.

(14) **Stream banks.** The lower part of the Wairaki Stream and the upper part of the Wattle Bay Stream have sandstone banks and run on sandstone beds, but farther down the Wattle Bay Stream has soil banks 0.5–1.5 m high as a result of carving through old landslides. Some sandstone banks, especially along the Wairaki Stream, are covered in rather delicate vegetation, and the overhanging earth banks elsewhere have forest floor plants on top. The stream banks may be flanked by steep, sandy loam slopes, which are mostly seeping and covered in low vegetation

that consists in the main of ferns, mosses, and liverworts. The two streams and the other trickles scattered about in the small gullies are sheltered from direct sunlight by forest canopy. Clean, crumbly, and cracked banks devoid of vegetation have a few beetle species which are always there in numbers, some probably just hiding in the damp cracks, others sheltering in the daytime. The two carrion beetles '*Necrophilus*' *prolongatus* and *Colon hirtale* and the rove beetle *Sepedophilus largulus*, the latter usually associated with the large shelf fungus *Ganoderma applanatum*, occasionally come out of the crevices in startling numbers when disturbed with repellent sprays. '*N.*' *prolongatus* was otherwise obtained only by using bait appropriate for carrion beetles. Specimens of the scarabaeids *Saphobius edwardsi* and *Odontria xanthosticta* have occasionally emerged from the cracks too. *O. xanthosticta* occurs the whole year round at Lynfield; it seems to like, particularly in the winter months, damp niches and coastal caves. Stream banks are frequented also by the subglabrous *Melanophthalma* species 5, and foremost by a ptilodactylid resembling closely *Byrrhocryptus* species but belonging to an undescribed genus which is, in fact, widespread in New Zealand, and has terrestrial instead of aquatic larvae. Common in the vegetation at the top of the banks and adjacent steep slopes is the small cerambycid *Spilotrogia elongata* and the tyrine pselaphid *Zeatyryus lawsoni*. Some of the rare species found at Lynfield were obtained only in this vegetation, such as the ptiliid *Actidium angulicolle*, the staphylinids *Agnosthaetus brouni*, *Hyperomma dispersum*, and *H. mandibulare*, and the pselaphids *Microtyrus punctatus* and *Hamotulus mutandus*.

(15) **Stream beds.** Each of the only two permanent streams has a bed approximately 300 m long by 1.5–4.0 m wide covered by forest canopy. The flanking undergrowth is relatively sparse. The Wairaki Stream bed is sandstone with the odd small gravel patch. Sandstone bed surfaces are usually covered with a dense carpet of mosses made up of *Hypnodendron marginatum*, *Fissidens asplenioides*, *Thamnobryum pandum* and *Thuidium furfursum* at wet areas and of *Tridontium tasmanicum* and *Fissidens rigidulus* at the splash-zone or in the water. The Wattle Bay Stream bed is sandstone in its steeper upper course, then gravel, and finally silt, since stormwater run-off from a recent housing development above the northern heights of Wattle Bay washed considerable amounts of soil into the bush. The stream ends up at a *Carex* swamp with *Scirpus*, *Cyperus*, *Typha*, *Juncus*, and naturalised *Lonicera japonica* and a stand of *Salix fragilis* with a dense ground cover of *Tradescantia fluminensis* and some *Hedychium gardnerianum* and *Phormium tenax*. As the *Carex* swamp prevented an easy outflow of flood waters, the stream backed up above the swamp, depositing sand and silt and raising the water-table at the lower 25 m or so of the bush stream by 60 cm. As a consequence several large trees of *Vitex lucens*, *Dysoxylum spectabile*, and *Corynocarpus laevigatus* and a number of *Cyathea* and *Dicksonia* tree ferns became waterlogged and died within

Figures 8–15 (opposite page)

- 8 Ground cover of wandering jew (*Tradescantia fluminensis*) in a grove of brittle willow (*Salix fragilis*), Wattle Bay.
- 9 Wattle Bay sedge swamp (*Carex*, *Scirpus*, *Typha*); branches of brush wattle (*Albizia lophantha*) at top right.
- 10 The Wairaki Stream's sandstone bed exposed at one of its pools, flanked by *Freyinetia* and *Blechnum*.
- 11 Mouth of the Wattle Bay stream at low tide, with a band of flax (*Phormium tenax*) and with *Macropiper*, *Albizia*, and *Salix* farther back.
- 12 Small patch of halophilous plants, comprising *Cotula coronopifolia* interspersed with *Scirpus cernuus*, *Triglochin striatum*, and *Sarcocornia quinqueflora*, Wattle Bay.
- 13 West side of Wattle Bay, showing coastal belt of large pohutukawa trees (*Metrosideros excelsa*).
- 14 A pit-trap site at Wattle Bay. The deep pit is covered to prevent flooding during heavy rain.
- 15 Garden refuse heap in paddock, 20 m from the Wairaki Stream bush; highly attractive to foreign beetles but not to native species.

3–5 years, opening up the stream bed to direct sunlight. The silted part of the stream is rapidly being invaded by *Carex lessoniana* and *Cyperus eragrostis*. The beetle species regularly found on the stream beds are almost exclusively carabids and staphylinids, the former family having the common species *Notagonum lawsoni* and *Scopodes elaphroides* and the less common *Syllectus anomalus* and *Pentagonica vittipennis*. The staphylinids or rove beetles are represented by three species of *Carpe-linus*, species 3 and species 4 of the undetermined Genus 1, and the European *Myllaena intermedia*, here reported for the first time for New Zealand; all these in silt or amongst mosses, liverworts, and herbs on areas of sandstone. More or less confined to stream gravel is a further European rove beetle, *Aloconota sulcifrons*, and restricted to two mosses of the splash-zone, *Tridontium tasmanicum* and *Fissidens rigidulus*, is a very agile species of the same rove beetle family, listed here as Genus 2 species 1. Old specimens of many other native and foreign beetle species may be picked up on the stream beds, particularly shortly after floodings.

(16) Soil. The soils of Lynfield are friable loams from strongly weathered sandstone and siltstone of the Lower Miocene Waitemata Formation. They are imperfectly drained northern yellow-brown earths of silt loam texture. Lynfield soils have a fair amount of animal life in them; earthworms, flatworms, nematodes, Symphyla, mealybugs, cicada nymphs, springtails, ants, and beetles. Most beetles living in or boring into soil do so in the larval stage only. The main beetle groups with soil-inhabiting larvae at Lynfield are the tiger beetle species of *Neocicindela*, all the scarabaeids with the exception of one or two aphodiines, the ptilodactylid Genus 1 species 1, the elaterid species of *Conoderus*, the chrysomelid species of *Peniticus* and *Eucolaspis*, and the broad-nosed weevil species. Three beetle species occurring in the Lynfield area are wholly hypogean as adult and larva, and are depigmented, apterous, and completely blind. One is a still unnamed species of the widespread staphylinid genus *Carpelimus*, usually associated with damp silty ground. Such conditions are rather common under the dense vegetation of the native bush of Lynfield, and also favour colonies or runs of the ant *Mesoponera castanea*. This particular ant is known to host pselaphid species in some areas of the country. The blind *Carpelimus* species, although relatively common and easily caught in deep pit-traps, was discovered at Lynfield, and is known solely from this locality. The cerylid or kingfisher beetle *Anommatus duodecimstriatus*, another blind species that has turned up at Lynfield, is European in origin. It occurs sporadically in disjunct parts of the globe, undoubtedly taken on ships with soil of potted plants or ballast. The record from Lynfield is the first and only one so far from New Zealand. The third soil beetle species, also first discovered during the Lynfield Survey, is a weevil that has since been found to be widespread in coastal areas and on islands from Auckland City northwards. It has turned out to be the smallest weevil thus far known in the world. As it lacked a name, it is

described in the section 'Taxonomic Notes' (p. 76) with the name *Myrtonymus zelandicus*. It is related to a group of weevils which are associated normally with aquatic and subaquatic horsetails, ferns, and monocots but in New Zealand with terrestrial mosses. One such moss weevil has turned up in Lynfield also, and is named *Bryocatus polytrychi* in the taxonomic section. Numerous soil samples taken from around rootlets of Myrtaceae and other trees all over the country in the past 15 years to map the distribution of *Myrtonymus zelandicus* have shown no traces of other related blind species. The genus *Myrtonymus* is not restricted to New Zealand; it also occurs over large areas of Queensland, New South Wales, and Western Australia. As some of the Australian species are closely related to *M. zelandicus*, the possibility that it too is Australian cannot be ruled out.*

(17) Beach sand. The parent rock in the Waitemata Formation, to which the Lynfield area belongs, is sandstone and mudstone. Accordingly the sea-shore above and behind the high tide level is fine sand, but mixed with variable amounts of shell and a little leaf litter and driftwood. Shells of pipi (*Paphies australis*), blue mussel (*Mytilus edulis*), Pacific oyster (*Crassostrea gigas*), and rock oyster (*Saccostrea glomerata*) can accumulate considerably locally, washed up during the storms that intermittently sweep the Manukau Harbour. Where sandstone cliffs are profusely cracked, and large blocks tend to break off, the shore is littered with boulders. The beaches from Wattle Bay to Lynfield Cove are sheltered to landward by high flanking cliffs and to seaward by extensive mud-flats of the almost landlocked Manukau Harbour. Two species are common in the daytime on the surface of bare sand: the small, variously patterned beach beetle *Phycosecis limbaia*, and the tiger beetle *Neocicindela tuberculata*. These two beetle species were noticed and picked up by the scientists accompanying Captain Cook during his first voyage on the 'Endeavour' (1769) and later described by Fabricius (1775, 1781). Further back, among *Pennisetum clandestinum*, *Festuca arundinacea*, *Apium prostratum*, *Haloragis erecta*, *Calystegia sepium*, *Atriplex prostrata*, *Raphanus raphanistrum*, *Picris echioides*, *Sonchus asper*, *Fumaria muralis*, and *Veronica persica* are commonly found the darkling beetle *Mimopeus elongatus*, the ant beetle *Anthicus* species 1 with a striking, pale yellow terminal antennal segment, and the weevils *Cecyropa discors*, *Mandalotus miricollis*, and *Mandalotus* species

* Another Lynfield discovery is worth mentioning in this connection. During a study of the edaphic and phreatic faunas from alluvial deposits of the Waimea Basin, Nelson (NN), several blind bembidiine carabids and the subterranean pseudoscorpion *Paraliochthonius caecatus* Beier (1976) were obtained from a depth of 4 m. No carabids were collected at Lynfield, but the same pseudoscorpion species has turned up twice in deep pit-trap jars from soils that have little in common with those of the Waimea Plains. One of the Lynfield specimens, included in the original description as a paratype of the species, came from a 60-cm-deep pitfall trap set in the Wairaki Stream bush.

1. These endemic species are frequently mingled with the naturalised weevils *Listroderes foveatus*, *Listronotus bonariensis*, and *Steriphus diversipes lineatus*. The widespread and, in open beaches, common beetles *Thelyphassa diaphana* and *Pericoptus truncatus* associated with driftwood, and *Cecyropa modesta* and *Lagrioida brouni* associated with sand vegetation, are absent on the Manukau shores of Lynfield. The small driftwood weevil *Macrorhyncholus littoralis* was found only once.

(18) Wrack and intertidal zone. Wrack is seaweed and other marine algae cast ashore and accumulated against the sandy beach at high tide level, or even further back in stormy weather. The intertidal zone extends over the shallow mudflats for the most part, and over a hard bottom of tilted sandstone and mudstone strata in the remaining areas. The harder, less erodible sandstone layers stand out as ridges studded with oysters, mussels, and barnacles. The splash zone is coated with algae, and here and there are salt-tolerant plants such as *Scirpus nodosus*, *Leptocarpus similis*, *Apium prostratum*, *Lobelia anceps*, *Samolus repens*, and two or three grass species. A small patch at Wattle Bay has a community of halophilous plants consisting of *Cotula coronopifolia*, *Scirpus cernuus*, *Triglochin striatum*, and *Sarcocornia quinqueflora*. Although the mangrove *Avicennia resinifera* is common in parts of the Manukau Harbour, and fruits and seedlings often arrive in numbers with incoming tides on the Lynfield shore, no plants become established beyond a few weeks. By far the main group of beetles represented in wrack is the family Staphylinidae or rove beetles, with the oxytelines *Teropalpus coloratus*, *T. unicolor*, and *Blediotrogus guttiger*, the omaliine *Omaliomimus litoreus*, and the staphylinines *Cafius algophilus* and *C. quadriimpressus*, followed by the endemic feather-winged beetles *Ptiliodes amplicollis* and *P. austerus*, the European *Ptenidium punctatum* of the same family, and the European water scavenger beetle *Cercyon depressus*, which was unknown from New Zealand until discovered during the Lynfield survey. The larvae of the *Teropalpus* species run to and fro with the receding and advancing tidal ripples, behaving not unlike wrybills and plovers chasing outgoing waves and retreating from incoming surf on shores. Kelp-dwelling beetles of the genus *Chaerodes*, which seem to be present on open shores at all times, are absent from the sheltered sands at Lynfield. A special effort was made to secure certain intertidal beetle species at Lynfield, in case some were present in the particular conditions provided by the estuarine waters of the Manukau Harbour. The trechine carabid *Temnostega rangitotoensis*, discovered by A.E. Brookes in 1920 among plants of the eel-grass genus *Zostera* on Rangitoto Island in the Hauraki Gulf, and described by him a few years later (1932), was sought without success. Several limnichid species of the genus *Hyphalus* occur from the Coromandel Peninsula to the far north of Northland, apparently in association with communities of barnacles. The barnacle genera *Chamaesipho* and *Elminius* are common at Lynfield, but only the intertidal pseudoscorpion *Maorichthonius mortenseni* was

found to be present among them, and then only sporadically so. Although the oxyteline rove beetles of wrack are primarily land dwellers inhabiting cast-up algae, they are occasionally found in numbers also in the intertidal zone. By using the flotation collecting method a gravelly patch to the west of Wattle Bay was repeatedly checked during outgoing tides. The gravel was scooped into buckets of water and stirred. As soon as beetles that stayed in air pockets under the gravel and boulders are disturbed, they come up to the surface, becoming very active. Of the three wrack oxytelines listed above, only *Teropalpus unicolor* was found regularly in intertidal gravel, always in low numbers not exceeding three per square metre.

(19) Bush streams. Only two streams have permanently running water, over a stretch of a few hundred metres. One, at the eastern end of the surveyed area, is 500 m long and flows down the Wattle Bay valley. Its upper course is steep, with the water channelled over a sandstone bed. The watercourse suddenly flattens out, to continue partly on a gravelly bed but mostly on a muddy bed sheltered and shaded by a forest canopy of broadleaf trees and giant tree-ferns until it opens up into a *Carex lesssoniana* wetland. It then meanders through to a stand of the Palearctic brittle willow (*Salix fragilis*) and then through *Phormium tenax* to the beach. The Wairaki Stream is situated at the western end of the surveyed area. Its various small tributaries are piped, discharging into a 600-m-long stretch of water that flows through native bush under a more open canopy than that at Wattle Bay. The upper 500 m of open water flows on a sandstone bed with rills, slides, small cascades, waterholes, and pools; the lower 100 m is tidal and muddy. It is followed by a further 100 m stretch of piped waters discharging into Lynfield Cove. Apart from the two obvious streams, there are a few gullies and drainage lines with trickles of water at Wattle Bay, in the Wairaki Stream bush, and elsewhere between Wattle Bay and Lynfield Cove. No aquatic Dytiscidae or Hydrophilidae and no Elmidae are present in the bush waters of Lynfield. Although the shady streams and trickles seem admirably suited to lowland hydraenid species, none was found. This absence was somewhat unexpected, because a rather common North Island species, *Podaena latipalpis* Ordish (1984), occurs at Huia, only some 15 km SW of Lynfield on the same side of the Manukau. Elmidae and Hydraenidae require well oxygenated waters, which are not available in the Lynfield area because the waters originate through seepage and percolation from headland hills, flowing too slowly and smoothly and for too short a distance to become sufficiently aerated. Two very similar comb-waisted beetles (Ptilodactylidae) are present, both of them chestnut-brown in colour. They are short-lived, and stand out from other Lynfield beetles in having the hind margin of the prothorax distinctly crenulated, with rounded off teeth. The smaller one, a species of *Byrrhocryptus*, is 5.0–5.5 mm long and has a distinctly granulated pronotum and simple claws. It flies from early February and has aquatic larvae. The other species belongs to a still undescribed genus; it is 5.5–6.5 mm long, has a relatively

smooth pronotum, and its claws have a more or less laminate swelling near the base. It flies from mid February to late March, and has terrestrial larvae in seeping soils. A further group of beetles associated with aquatic environments are the marsh beetles (Helodidae). This family is represented by 22 species at Lynfield. Adults visit flowers or rest on foliage, always quite close to water. The onisciform larvae of all the Lynfield species live in still waters among trapped plant debris.

(20) Ponds and troughs. As there is no pond anywhere in the Lynfield study area, one nearby on the Maungakiekie golf course was included in the survey. It is fed by a little stream that runs through a *Typha orientalis* marsh, and is flanked on one side by *Cyathea medullaris*, *C. dealbata*, *Leptospermum scoparium*, *Melicytus ramiflorus*, *Pittosporum eugenoides*, *Myrsine australis*, *Coprosma robusta*, *Geniostoma rupestre*, and *Cyathodes fascicu-*

lata. Apart from the bullrush *Typha orientalis*, the pond itself contains *Elodea canadensis*, *Myriophyllum propinquum*, *Polygonum hydropiper*, and *Alternanthera philoxeroides*. It supports a steady mixed population of one or two dozen mallard ducks (*Anas platyrhynchos*) and grey ducks (*A. superciliosa*); these are sometimes joined by muscovy ducks (*Cairina moschata*). The overflow from the pond traverses the golf course into a channel to the Waitemata Harbour, on the other side of the Auckland isthmus. Drinking troughs in nearby sheep paddocks and domestic swimming pools proved to be attractive to some aquatic beetles, too. The only two water beetles (Dytiscidae) collected at Lynfield were found in the pond and in drinking troughs. The European species *Rhantus suturalis* does occasionally get into chlorinated swimming pools, where it was observed to stay for up to 3 or 4 weeks if not unduly disturbed. The only aquatic hydrophilid caught at Lynfield, *Enochrus tritus*, is common in the pond.

RELATIVE BIOTIC DIVERSITY IN THE SURVEY AREA

The Lynfield beetle survey has produced 753 endemic beetle species in the few years over which the systematic collecting was undertaken. This number, although substantial and unexpectedly high, is by no means final. Further species were still turning up at a rate of one or two per fortnight from litter and decayed wood samples during the months prior to ending the main field work. The canopy of several tree species known to host special beetles – notably the crowns of *Prumnopitys ferruginea*, *Elaeocarpus dentatus*, *Knightia excelsa*, and *Nestegis lanceolata* – could not be reached, and Malaise traps could not be set long enough or high enough for rare and elusive species to be eventually secured. It would be reasonable to assume that the number of species thus far obtained could be increased by up to 15%, to a total of something like 850 endemic species. Beetle species generally amount to about one-quarter of the insect fauna on a site under normal conditions, which would mean that the surveyed area at Lynfield ought to house approximately 3400 different indigenous insect species.

This area that holds literally thousands of invertebrate species has only nine native vertebrates, the copper skink (*Cyclodina aenea*) and a bird population of seven resident and one migratory species. This latter comprises three or four pairs of the New Zealand pigeon (*Hemiphaga novaeseelandiae*), two or three moreporks (*Ninox novaeseelandiae*), a few tui (*Prosthemadera novaeseelandiae*) and grey warblers (*Gerygone igata*), and moderate numbers of fantails (*Rhipidura fuliginosa*), silvereyes (*Zosterops lateralis*), and kingfishers (*Halcyon sancta*). Only in the spring and summer months are there a few shining cuckoos (*Chrysococcyx lucidus*), a species that unfailingly

commutes annually between New Zealand and a number of Melanesian islands. These have been observed every year at Lynfield since the beetle survey started in 1974. The paucity of native vertebrates in the Lynfield bush is compensated by a strong representation of introduced birds. The leaf litter is searched by blackbirds (*Turdus merula*), thrushes (*T. philomelos*), and the occasional flock of Californian quail (*Lophortyx californica*). In the canopy feed or perch greenfinches (*Chloris chloris*), chaffinches (*Fringilla coelebs*), goldfinches (*Carduelis carduelis*), house sparrows (*Passer domesticus*), starlings (*Sturnus vulgaris*), mynas (*Acridotheres tristis*), and the odd small flock of rosella parakeet (*Platycercus eximius*).

In the appendix to this report, Esler lists 162 species of native phanerogams for Lynfield, which constitute roughly 8% of the 2000 or so gymnosperm and angiosperm species of New Zealand and its outlying islands. My estimate of the total native beetle fauna of New Zealand is around 10 000 to 10 500 species, so the Lynfield population would represent 8.0–8.5%, as for the plants. However, the plant list includes a fair number of species that occur naturally also outside New Zealand, whereas the figure for beetles excludes all the non-endemic species, regardless of their mode of arrival.

A number of Lynfield beetles were described from New Zealand while the survey was in progress. Some of these had their primary types drawn from specimens collected at Lynfield. Thus, this small suburban area of metropolitan Auckland is currently the type locality for 22 species, and this number will undoubtedly increase once the 130 indigenous species as yet unnamed that occur at Lynfield are described.

DOES THE INDIGENOUS FAUNA EASILY ADAPT TO MODIFIED ENVIRONMENTAL CONDITIONS?

In order to decide whether the indigenous fauna is constitutionally able to overcome the challenge of environmental changes brought about by urban and rural development, it is necessary first to have in mind the type of vegetation that was covering New Zealand in geological times, and then to consider apparent adaptations of the native fauna to such changes. A few telling examples can be drawn from a simple survey such as that reported here, as follows.

(1) Geological background. It is generally believed that forests clothed the whole of New Zealand for more than 100 million years before the Kaikoura Orogeny gradually built up the present mountain chains, starting in the Pliocene (Fleming 1977). Mountain uplift interrupted the eastward-drifting cyclonic cycle of the weather, reducing the rainfall on the leeward side of the ranges. Only a small part of the North Island, from Hawkes Bay to the Wairarapa, and nearly half the South Island, from Marlborough to Otago, were affected. The remainder of New Zealand continued to be covered in forest except during the relatively short periods of the various Pleistocene glaciations. As the northern half of the North Island was hardly influenced by these events, forests persisted over all but the narrow littoral zones. Abundant, well distributed rainfall and a lack of past climatic extremes have produced a rather uniform cover of evergreen forests with very dense undergrowth, contrasting the conditions found in the temperate forests of the Northern Hemisphere and the Magellanic forest of southern Chile.

(2) Historical background. As soon as the first Polynesian people arrived, in the 11th century AD or shortly before, the clearing of forests by fire began. At the time of arrival of the Europeans, at least half of the pristine forests had disappeared. Burning off was done only partially by the Maori, leaving a mosaic of native vegetation in place. European settlers, however, tended to remove millable trees first and then clear everything else, not only from arable flatlands but also from deep gullies and steep hillsides. The native bush was frequently extirpated so thoroughly that not a tree was left for miles on end in many parts of the country. The Auckland isthmus has been heavily populated by Maori and European alike since their respective arrival in New Zealand. It would be hard to find a patch of indigenous forest that had not been heavily disturbed by milling, cutting, or burning in any span of 50 years or so. Useful trees such as matai (*Prumnopitys spicata*) and totara (*Podocarpus totara*) were almost certainly wiped out at Lynfield, and rimu (*Dacrydium cupressinum*), another excellent timber species, is represented by a single seedling at present. The absence of mature nikau palm (*Rhopalostylis sapida*) in the Lynfield area is rather puzzling. The palm is common elsewhere on the northern side of the Manukau Harbour. At the time the beetle survey commenced, in 1975, only six seedlings

were located in the Wairaki Stream bush and three in the upper part of Wattle Bay valley. Now, 15 years later, the number of seedlings has increased manyfold in both areas, owing presumably to the return of the native pigeon (*Hemiphaga novaeseelandiae*) to these sites. Pigeons like the small, brick-red fruit of nikau, digesting the pericarp and dropping the remainder with the seed. Most saplings are sprouting under puriri (*Vitex lucens*), the tree these birds prefer to perch on. Only one palm plant has developed a trunk as yet, and this has been flowering for nine or ten years. Part of the Lynfield area is of special interest in that the missionary and botanist William Colenso happened to visit the Wairaki Stream bush on 4 February 1842, on his way from Otahuhu to the Kaipara Harbour. A passage in his 'Memoranda of an excursion' reads as follows: "I ... discovered a shrub of a genus altogether unknown to me. This plant bears an oblong succulent crimson-coloured bacca [Latin for berry], containing several large angular and irregularly shaped seeds; its growth is diffuse and slender with but few branches, and its height is 5-9 feet. In habit alone it closely approaches to some species of the *Coprosma* genus. There were several of them here, on the immediate banks of a little rivulet [Wairaki Stream] which ran through this dell; I did not, however, observe it in any other locality" (Colenso 1845). This particular plant species, afterwards recognised as *Alseuosmia macrophylla*, continues to thrive in the Wairaki Stream bush, where it is a rather showy and important constituent of the undergrowth.

(3) Numbers of native species occurring in urban and rural habitats. Out of the 753 indigenous beetle species collected at Lynfield, 10 or so are restricted to beach or wrack and 2 others to beach and open fields. The great majority of species are more at home in the native bush than anywhere else, with the possible exception of the branch-cutting longhorns *Gastrosarus nigricollis* and *Astetholida lucida*. Although 68 beetles, amounting to some 9% of the 744 non-littoral species, figure in the table under the column 'open fields of urban and rural habitats', the actual subsistence of some species of open environments was marginal or doubtful, and the endemic status of others was uncertain.

(4) The *Pittosporum* and *Pseudopanax* beetle fauna in gardens. *Pseudopanax* and *Pittosporum* species are known to be specific and highly attractive hosts to a whole series of beetle species that are agile on the wing. Both plant genera are as common in gardens as in the bush, and were repeatedly tested and checked at all times of the year for associated fauna. The test garden, on Tropicana Drive, was only 225 m due north from the Wairaki Stream bush, with 45 m of gardens and 180 m of paddocks bridging the gap. None of the six common foliage weevils of *Pittosporum* and *Pseudopanax* were ever found on garden specimens, although some were occasionally seen on

windowpanes and clothes lines. Cut branches, which proved very attractive to seven weevil, six longhorn, and four bark beetle species in the bush during the first 10 weeks after being set up, have failed to yield a single specimen in the garden.

(5) **The *Coprosma* beetle fauna in gardens.** *Coprosma* species are everywhere in the bush, and are well represented also in gardens. This rubiaceous genus has six host-specific beetle species that are common in the Lynfield bush: the longhorn *Hybolasius crista*, the leaf-beetle *Pleuraltica cyanea*, and four species of weevils, three of them in the genus *Praolepra* and the other being *Tychanus gibbus*, the only flightless species among the six. No beetles were found on garden *Coprosma*.

(6) **The *Phormium* and *Cordyline* beetle fauna in gardens.** A third group of plants worthy of mention comprises three species of Agavaceae which are popular with gardeners, the cabbage tree (*Cordyline australis*) and the two species of New Zealand flax, *Phormium tenax* and *P. cookianum*. The cabbage tree supports two fully winged cossonine weevils, *Eucossonus setiger* and *Tanysona comatum*. The flax species have the fully winged cossonine *Phloeophagosoma pedatum*, the flightless cossonines *Novitas dispar* and *Microtribus huttoni*, and three flightless lamiine longhorns, *Microlamia pygmaea*, *Psilocnaeia parvula*, and *P. astelliae*. Once more, none of the nine beetle species which are so common under natural conditions has shown up on garden plants.

(7) **The pollen-feeding diurnal species of weevils and longhorns in gardens.** There are ten species of eugnomine weevils in the bush which feed indiscriminately on the pollen of a wide range of flowering plants. Although all excellent flyers, none was found on native or exotic plants in the gardens. Only four out of the thirteen species of cerambycine longhorns occurring at Lynfield have the finely faceted eyes characteristic of diurnal habits. All four can be seen in gardens, *Coptomma variegatum* and *Gastrosarus nigricollis* rarely, *Zorion minutum* and *Navomorpha sulcata* not only rather frequently but also in numbers on *Ligustrum sinense*, *Leptospermum scoparium*, and various weed species of *Rubus*.

(8) **Ecological flexibility of indigenous and foreign species belonging to the same genus.** There are 16 beetle genera which have native as well as adventive species at Lynfield, involving altogether 55 species. All 22 native species were found only in the bush; all 33 foreign species are at home in gardens and fields, but 14 of them occur quite readily in a native bush environment. Much the same situation is found in all but one species of Ptiliidae, all but one species of non-aquatic Hydrophilidae, all non-carrier Histeridae, and all entomine and rhytirhinine Curculionidae – native species occur solely in the bush, and foreign species solely or predominantly in gardens and fields.

The Lynfield genera sharing native and adventive species with ecologically contrasting preferences are as follows. The best examples are *Anabaxis*, *Sphaerotherax*, *Conoderus*, and *Anisomeristes*.

CARABIDAE

Tachys – 1 native, 2 adventive

Notagonum – 1 native, 2 adventive (2 also in bush)

STAPHYLINIDAE

Lithocharis – 1 native, 1 adventive

Atheta – 2 native, 9 adventive (4 also in bush)

Myllaena – 1 native, 1 adventive (this also in bush)

Oligota – 3 native, 1 adventive (this also in bush)

PSELAPHIDAE

Anabaxis – 1 native, 1 adventive

CLAMBIDAE

Sphaerotherax – 2 native, 1 adventive

SCARABAEIDAE

Ataenius – 1 native, 1 adventive (this also in bush)

Saprosites – 1 native, 1 adventive (this also in bush)

ELATERIDAE

Conoderus – 1 native, 3 adventive

ANOBIIDAE

Hadrobregmus – 1 native, 1 adventive

NITIDULIDAE

Epuraea – 2 native, 2 adventive

CUCULIIDAE

Cryptamorpha – 1 native, 1 adventive (also in bush)

CORYLOPHIDAE

Anisomeristes – 2 native, 3 adventive (2 also in bush)

ANTHICIDAE

Anthicus – 1 native, 4 adventive (2 also in bush)

TABULAR SUMMARIES OF SPECIES DATA


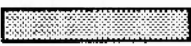





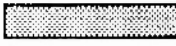







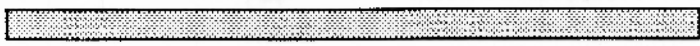

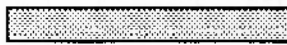






Species category	<i>n</i>	%	
Total endemic species	753	76.7	
Total foreign species	229	23.3	
Winged endemic species	521	69.2	
Winged foreign species	220	96.1	
Flightless endemic species	232	30.8	
Flightless foreign species	9	3.9	
Endemic species in bush	742	98.4	
Foreign species in bush	49	21.6	
Endemic species in fields	68	9.1	
Foreign species in fields	207	90.8	
Endemic ground species	417	55.3	
Foreign ground species	179	78.1	
Endemic canopy species	371	49.2	
Foreign canopy species	95	41.9	
Identified endemic species	624	82.9	
Identified foreign species	202	88.2	
'Familiar' foreign species	147	64.5	
'Novel' foreign species	81	35.4	
Australian adventives	113	49.3	
European "	90	39.3	
S. American "	13	5.7	
N. American "	6	2.6	
S.E. Asian "	4	1.8	
S. African "	3	1.3	

Table of statistics: Beetle species from Lynfield survey in specified categories (N = 982)

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
RHYSODIDAE (2)					
<i>Kaveinga orbitosa</i> (Broun)	E		WD	SS	BU GR
<i>Kupeus arcuatus</i> (Chevrolat)	E		WD	CC	BU GR
CARABIDAE : Cicindelinae (2)					
<i>Neocicindela spilleri</i> Van Nidek	E		WD	CC	BU OP GR
<i>Neocicindela tuberculata</i> (Fabricius)	E		WD	VC	OP GR
: Scaritinae (2)					
<i>Clivina basalis</i> Chaudoir	I AU		WD	RR	BU OP GR
<i>Clivina vagans</i> Putzeys	I AU		WD	CC	OP GR
: Bembidiinae (4)					
<i>Paratachys crypticola</i> (Britton)	I PA(?)		WD	CC	BU OP GR
<i>Tachys antarcticus</i> Bates	E		FL	VR	BU GR
<i>Tachys australis</i> Shaum	I AU		WD	CC	OP GR
<i>Tachys captus</i> Blackburn	I AU	FR	WD	RR	OP GR
: Psydriinae (1)					
<i>Mecyclothorax rotundicollis</i> (White)	I AU		WD	RR	OP GR
: Pterostichinae (4)					
<i>Aulacopodus calathoides</i> (Broun)	E		FL	RR	BU GR
<i>Aulacopodus sharpianus</i> (Broun)	E		FL	SS	BU GR
<i>Laemostenus complanatus</i> (Dejean)	I PA		WD	CC	BU OP GR
<i>Rhytisternus miser</i> Chaudoir	I AU		WD	RR	BU OP GR
: Agoninae (5)					
<i>Ctenognathus bidens</i> (Chaudoir)	E		FL	VC	BU GR
<i>Ctenognathus cardiophorus</i> (Chaudoir)	E		FL	CC	BU GR
<i>Ctenognathus novaezelandiae</i> Fairmaire	E		FL	CC	BU BE GR
<i>Notagonum lawsoni</i> (Bates)	E		WD	VC	BU GR
<i>Notagonum submetallicum</i> (White)	I AU		WD	VC	BU OP GR CA
: Harpalinae (6)					
<i>Haplaner</i> species 1	I AU	FR	WD	VR	BU OP GR
<i>Hypharpax australis</i> (Dejean)	I AU		WD	SS	BE GR
<i>Lecanomerus atriceps</i> (Macleay)	I AU		WD	VC	BU OP GR
<i>Lecanomerus sharpi</i> (Csiki)	E		FL	CC	BU OP BE GR
<i>Lecanomerus vestigialis</i> (Erichson)	I AU		FL	RR	OP BE GR
<i>Syllectus anomalus</i> (Bates)	E		WD	VR	BU GR
: Lebiinae (4)					
<i>Anomotarus illawarrae</i> (Macleay)	I AU		WD	RR	BU BE GR
<i>Anomotarus variegatus</i> Moore	I AU		WD	CC	BU OP GR
<i>Demetrida nasuta</i> White	E		FL	SS	BU CA
<i>Philophloeus luculentus</i> (Newman)	I AU	FR	WD	VC	BU OP CA
: Pentagonicinae (2)					
<i>Pentagonica vittipennis</i> Chaudoir	I AU		WD	CC	BU OP GR
<i>Scopodes elaphroides</i> (White)	E		FL	CC	BU GR
DYTISCIDAE (2)					
<i>Hyphydrus elegans</i> (Montrouzier)	I AU		WD	CC	OP GR
<i>Rhantus suturalis</i> (Macleay)	I PA		WD	CC	OP GR
PTILIIDAE (27)					
<i>Acrotrichis inconspicua</i> (Matthews)	I AU(?)		WD	VC	OP GR
<i>Acrotrichis montandoni</i> (Allibert)	I PA		WD	SS	OP GR
<i>Acrotrichis subcognata</i> Johnson	I NA		WD	VC	OP GR
<i>Actidium angulicollis</i> Johnson	E*		WD	RR	BU GR
<i>Actidium lineare</i> Matthews	E		WD	SS	BE GR
<i>Cissidium foveolatum</i> Johnson	E*		WD	CC	BU GR
<i>Dipentium zelandicum</i> Johnson	E		WD	VC	BU GR
<i>Kuschelidium maori</i> Johnson	E*		WD	VR	BU GR
<i>Nellosana grandis</i> Johnson	E*		WD	RR	BU GR
<i>Nellosana intermedia</i> Johnson	E*		WD	SS	BU GR
<i>Nellosana minima</i> Johnson	E*		WD	CC	BU GR
<i>Nephanes titan</i> (Newman)	I PA		WD	VC	OP GR
<i>Notoptenidium crassum</i> Johnson	E*		WD	VC	BU GR
<i>Notoptenidium lawsoni</i> (Matthews)	E		WD	VC	BU GR
<i>Notoptenidium oblongum</i> Johnson	E*		WD	VR	BU GR
<i>Oligella foveolata</i> (Allibert)	I PA		WD	VC	OP GR
<i>Ptenidium laevigatum</i> Erichson	I PA		WD	CC	OP GR
<i>Ptenidium punctatum</i> (Gyllenhal)	I PA		WD	VC	OP GR
<i>Ptenidium pusillum</i> (Gyllenhal)	I PA		WD	CC	OP GR
<i>Ptiliodes amplipollis</i> Johnson	E*		WD	RR	BE GR
<i>Ptiliodes austerus</i> Johnson	E*		WD	CC	BE GR
<i>Ptinella acaciae</i> Johnson	E*		WD FL	VC	BU GR
<i>Ptinella cavelli</i> (Broun)	E		WD FL	VR	BU GR
<i>Ptinella confusa</i> Johnson	E*		WD FL	SS	BU GR
<i>Ptinella ferruginea</i> Johnson	E*		WD FL	VC	BU GR

LEGEND Provenance: E, endemic; *, Lynfield type locality; I, introduced, foreign; AU, Australian; PA, Palearctic; NA, North American; SA, South American; ET, Ethiopian; IM, Indo-Malayan FR: first report from New Zealand Wing (condition): WD, winged; FL, flightless; WD FL, winged and flightless individuals Abundance: SS, single specimen; VR, very rare (2 or 3); RR, rare (4-10); CC, common (11-50); VC, very common (more than 50) Habitat: BU, bush; OP, open; BE, beach; GR, ground; CA, canopy.

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Ptinella taylorae</i> Johnson	E		WD FL	VC	BU GR
<i>Ptinella wattii</i> Johnson	E*		WD FL	CC	BU GR
AGYRTIDAE (1)					
' <i>Necrophilus</i> ' <i>prolongatus</i> (Sharp)	E		WD	VC	BU OP GR
LEIODIDAE : Leiodinae (7)					
<i>Colenisia</i> sp.	E		WD	VR	BU GR
<i>Isocolon hilare</i> Broun	E		WD	CC	BU GR
<i>Zeadolopus maoricus</i> Daffner	E		WD	CC	BU GR
<i>Zeadolopus spinipes</i> Broun	E		WD	CC	BU GR
<i>Zeadolopus validipes</i> Daffner	E		WD	CC	BU GR
Genus 1 species 1	E		WD	CC	BU GR
Genus 1 species 2	E		WD	VR	BU GR
: Camiariae (8)					
<i>Aglyrtodes disparatus</i> Szymczakowski	E		WD	CC	BU GR
<i>Aglyrtodes hunuensis</i> (Broun)	E		WD	CC	BU GR
<i>Aglyrtodes nebulosus</i> (Broun)	E		WD	CC	BU GR CA
<i>Baeosilpha rufescens</i> Broun	E		WD	VR	BU GR
<i>Camiarites convexus</i> (Sharp)	E		FL	RR	BU GR
<i>Camiarus thoracicus</i> Sharp	E		FL	RR	BU GR
<i>Inocatops concinnus</i> (Broun)	E		FL	RR	BU GR
<i>Zearagytodes maculifer</i> (Broun)	E		WD	VC	BU GR
Genus 1 species 1	E		WD	CC	BU GR
: Colinae (1)					
<i>Colon hirtale</i> (Broun)	E		WD	VC	BU GR
: Cholevinae (3)					
<i>Mesocolon alacre</i> (Broun)	E		WD	VC	BU GR
<i>Paracatops lugubris</i> (Sharp)	E		WD	VC	BU GR
<i>Pseudonemadus lituratus</i> (Broun)	E		WD	CC	BU GR
SCYDMAENIDAE (23)					
<i>Euconnus calvus</i> (Broun)	E		WD	CC	BU GR
<i>Euconnus setosus</i> (Sharp)	E		FL	RR	BU GR
<i>Euconnus</i> species 1	E		WD	SS	BU GR
<i>Magellanoconnus galerus</i> (Broun)	E		FL	VR	BU GR
<i>Maorinus angulatus</i> (Broun)	E		FL	RR	BU GR
<i>Microscydmus lynfieldi</i> Franz	E*		WD	CC	BU GR
<i>Microscydmus</i> species 1	E		WD	CC	BU GR
<i>Microscydmus</i> species 2	E		WD	SS	BU GR
<i>Microscydmus</i> species 3	E		WD	VR	BU GR
<i>Neuraphoconnus kuscheli</i> Franz	E*		WD	SS	BU GR
<i>Neuraphoconnus</i> species 1	E		FL	CC	BU GR
<i>Neuraphoconnus</i> species 2	E		WD	CC	BU GR
<i>Neuraphoconnus</i> species 3	E		WD	RR	BU GR
<i>Sciacharis fulva</i> Broun	E		WD	CC	BU GR
<i>Sciacharis lanosa</i> (Broun)	E		WD	SS	BU GR
<i>Sciacharis puncticollis</i> (Broun)	E		FL	CC	BU GR
<i>Sciacharis sannio</i> (Franz)	E*		FL	RR	BU GR
<i>Sciacharis taranakii</i> Franz	E		FL	SS	BU GR
<i>Stenichnaphes newtoni</i> Franz	E		WD	VR	BU GR
<i>Stenichnaphes urbanus</i> Franz	E*		WD	CC	BU GR
<i>Stenichnaphes</i> species 1	E		WD	SS	BU GR
<i>Stenichnus kuschelianus</i> Franz	E*		WD	VR	BU GR
<i>Stenichnus</i> species 1	E		WD	VR	BU GR
SCAPHIDIIDAE (7)					
' <i>Baeocera</i> ' <i>scutellaris</i> (Redtenbacher)	E		WD	RR	BU GR
<i>Brachynopus latus</i> (Broun)	E		FL	VC	BU GR
<i>Scaphisoma actuosum</i> Broun	E		WD	CC	BU GR
<i>Scaphisoma sternale</i> Broun	E		FL	RR	BU GR
<i>Scaphisoma</i> species 1	E		WD	RR	BU GR
<i>Scaphisoma</i> species 2	E		WD	RR	BU GR
Genus 1 species 1	E		WD	CC	BU GR
STAPHYLINIDAE : Proteininae (2)					
<i>Nesoneus acuticeps</i> (Bernhauer)	E		WD	CC	BU GR
<i>Silphotelus nitidus</i> Broun	E		WD	VC	BU GR
: Omaliinae (13)					
<i>Brouniellum hilarum</i> (Broun)	E		WD	RR	BU CA
<i>Ischnoderus genalis</i> (Broun)	E		WD	RR	BU CA
<i>Ischnoderus tectus</i> (Broun)	E		WD	VC	BU CA
<i>Microsilpha</i> sp.	E		WD	RR	BU GR
<i>Omaliomimus litoreus</i> (Broun)	E		WD	RR	BU GR
<i>Omalius allardi</i> Fairmaire & Brisout	I PA	FR	WD	SS	OP GR
<i>Paraphloeostiba gayndahensis</i> (Macleay)	I AU	FR	WD	VC	OP GR
<i>Stenomalius cottieri</i> Bernhauer	E		WD	VR	BU BE GR
<i>Stenomalius helmsi</i> (Cameron)	E		WD	RR	BU BE GR
<i>Stenomalius moniliferum</i> (Broun)	E		WD	CC	BU CA
<i>Stenomalius philpotti</i> (Broun)	E		WD	SS	BU CA

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Stenomalius spadix</i> (Broun)	E		WD	VC	BU GR
<i>Stenomalius sulcithorax</i> (Broun)	E		WD	CC	BU GR
: Oxytelinae (14)					
<i>Anotylus brunneipennis</i> (Macleay)	I AU		WD	VC	OP GR
<i>Anotylus complanatus</i> (Erichson)	I PA		WD	VC	OP GR
<i>Anotylus semirufus</i> (Fauvel)	I AU		WD	VC	OP BE GR
<i>Anotylus vinsoni</i> (Cameron)	I AU		WD	VC	BU OP GR
<i>Anotylus</i> species 1	I AU	FR	WD	VC	OP GR
<i>Blediotrogus guttiger</i> Sharp	E		WD	SS	BE GR
<i>Carpelimus bilineatus</i> (Stephens)	I PA	FR	WD	RR	OP BE GR
<i>Carpelimus corticinus</i> (Gravenhorst)	I PA	FR	WD	VC	BU OP BE GR
<i>Carpelimus pusillus</i> (Gravenhorst)	I PA	FR	WD	SS	BU GR
<i>Carpelimus zealandicus</i> (Sharp)	E		WD	VC	BU OP GR
<i>Carpelimus</i> species 1	E		FL	CC	BU GR
<i>Oxytelus sculptus</i> Gravenhorst	I PA		WD	RR	OP GR
<i>Teropalpus coloratus</i> (Sharp)	E		WD	VC	BE GR
<i>Teropalpus unicolor</i> (Sharp)	E		WD	CC	BE GR
: Oscorinae (1)					
<i>Paratorchus brevipennis</i> (Broun)	E		FL	CC	BU GR
: Eleusininae (1)					
<i>Zeoleusis virgula</i> (Fauvel)	E		WD	RR	BU CA
: Paederinae (11)					
<i>Astenus guttula</i> Fauvel	I AU	FR	WD	VC	OP GR
<i>Hyperomma dispersum</i> Broun	E		FL	RR	BU GR
<i>Hyperomma mandibulare</i> Broun	E		FL	VR	BU GR
<i>Hypomedon debilicornis</i> (Wollaston)	I PA	FR	WD	CC	OP GR
<i>Lithocharis nigriceps</i> Kraatz	I PA		WD	CC	OP GR
<i>Lithocharis ventralis</i> (Broun)	E		WD	RR	BU GR
<i>Lithocharis vilis</i> (Kraatz)	I PA	FR	WD	CC	OP GR
<i>Lobrathium bipartitum</i> (Fauvel)	I AU	FR	WD	VR	OP GR
<i>Medon zealandicus</i> Redtenbacher	E		WD	RR	BU GR
<i>Scimbalium laetum</i> Blackburn	I AU	FR	WD	RR	OP GR
<i>Sunius propinquus</i> (Brisout)	I PA		WD	RR	OP GR
: Staphylininae (19)					
<i>Cafius algophilus</i> (Broun)	E		WD	CC	BE GR
<i>Cafius quadriimpressus</i> (White)	E		WD	VC	BE GR
<i>Creophilus oculatus</i> (Fabricius)	I AU		WD	CC	OP BE GR
<i>Gabrius nigrifrons</i> (Gravenhorst)	I PA		WD	VR	BE GR
<i>Gabronthus sulcifrons</i> (Sharp)	I PA	FR	WD	CC	OP GR
<i>Gyrophypnus fracticornis</i> (Mueller)	I PA		WD	VR	OP GR
<i>Leptacinus pusillus</i> (Stephens)	I PA	FR	WD	RR	OP BE GR
<i>Neohypnus andinus</i> (Fauvel)	I SA	FR	WD	CC	OP GR
<i>Neoxantholinus brouni</i> (Sharp)	E		WD	VR	BU CA
<i>Notolinus socius</i> (Fauvel)	I AU		WD	RR	OP GR
<i>Pachycorynus fulvipes</i> (Broun)	E		FL	VR	BU GR
<i>Paracorynus arecae</i> (Broun)	E		WD	RR	BU CA
<i>Philonthus longicornis</i> Stephens	I PA		WD	CC	OP GR
<i>Philonthus parvus</i> Sharp	I PA	FR	WD	CC	OP GR
<i>Philonthus politus</i> (Linnaeus)	I PA		WD	CC	OP GR
<i>Philonthus pyropterus</i> Kraatz	I SA	FR	WD	CC	OP GR
<i>Philonthus rectangulus</i> (Sharp)	I PA	FR	WD	VC	OP GR
<i>Philonthus sordidus</i> (Gravenhorst)	I PA		WD	VC	OP GR
<i>Thyreocephalus orthodoxus</i> (Olliff)	I AU		WD	CC	OP GR
: Euaesthetinae (2)					
<i>Agnosthaetus brouni</i> Bernhauer	E		FL	VR	BU GR
<i>Edaphus beczedesi</i> Reitter	I PA	FR	WD	SS	OP GR
: Tachyporinae (12)					
<i>Sepedophilus acerbus</i> (Broun)	E		WD	RR	BU GR CA
<i>Sepedophilus atricapillus</i> (Broun)	E		WD	VC	BU CA
<i>Sepedophilus auricomus</i> (Broun)	E		WD	VC	BU GR CA
<i>Sepedophilus austerus</i> (Broun)	E		WD	VC	BU GR
<i>Sepedophilus brevicornis</i> (Broun)	E		FL	RR	BU GR
<i>Sepedophilus flavithorax</i> (Broun)	E		WD	VC	BU CA
<i>Sepedophilus laetulus</i> (Broun)	E		FL	RR	BU GR
<i>Sepedophilus largulus</i> (Broun)	E		WD	CC	BU GR CA
<i>Sepedophilus maculosus</i> (Broun)	E		WD	RR	BU CA
<i>Sepedophilus nubilus</i> (Broun)	E		WD	RR	BU GR
<i>Sepedophilus</i> species 1	E		FL	VR	BU GR
<i>Tachyporus nitidulus</i> (Fabricius)	I PA		WD	CC	OP GR
: Aleocharinae (70)					
<i>Aleochara puberula</i> (Klug)	I (PA)	FR	WD	CC	OP GR
<i>Aloconota sulcifrons</i> (Stephens)	I PA	FR	WD	VC	BU GR
<i>Amischa analis</i> (Gravenhorst)	I PA		WD	CC	OP GR
<i>Amischa decipiens</i> (Sharp)	I PA	FR	WD	SS	OP GR

LEGEND Provenance: E, endemic; *, Lynfield type locality; I, introduced, foreign; AU, Australian; PA, Palearctic; NA, North American; SA, South American; ET, Ethiopian; IM, Indo-Malayan FR: first report from New Zealand Wing (condition): WD, winged; FL, flightless; WD FL, winged and flightless individuals Abundance: SS, single specimen; VR, very rare (2 or 3); RR, rare (4-10); CC, common (11-50); VC, very common (more than 50) Habitat: BU, bush; OP, open; BE, beach; GR, ground; CA, canopy.

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Aphytopus gracilis</i> Sharp	E		WD	VR	BU GR
<i>Aphytopus porosus</i> (Broun)	E		WD	RR	BU GR
<i>Atheta amacula</i> (Stephens)	I PA		WD	CC	OP GR
<i>Atheta atriceps</i> (Broun)	E		WD	CC	BU GR
<i>Atheta coriaria</i> (Kraatz)	I PA	FR	WD	RR	OP GR
<i>Atheta cottieri</i> Cameron	I AU	FR	WD	RR	BU OP BE GR
<i>Atheta politula</i> Fauvel	I AU	FR	WD	CC	BU OP GR
<i>Atheta zealandica</i> Cameron	I	ET	WD	VC	OP BE GR
<i>Atheta</i> species 1	I PA	FR	WD	CC	BU OP GR
<i>Atheta</i> species 2	E		WD	VR	BU GR
<i>Atheta</i> species 3	I AU	FR	WD	VR	OP GR
<i>Atheta</i> species 4	I AU	FR	WD	SS	OP GR
<i>Atheta</i> species 5	I AU	FR	WD	VR	BU GR
<i>Austrocalea brookesi</i> (Cameron)	I AU		WD	CC	OP GR
<i>Botromana vulcanica</i> (Broun)	E		WD	CC	BU GR
<i>Botromana</i> species 1	E		WD	CC	BU GR
<i>Botromana</i> species 2	E		WD	SS	BU GR
<i>Crataraea suturalis</i> (Mannerheim)	I PA	FR	WD	VR	OP GR
<i>Digrammus miricollis</i> (Fauvel)	E		WD	VR	BU CA
<i>Encephalus latulus</i> (Broun)	E		WD	CC	BU GR
<i>Falagria concinna</i> (Erichson)	I PA	FR	WD	SS	OP GR
<i>Gyronotus rufipennis</i> (Broun)	E		WD	CC	BE GR
<i>Gyrophana oligotina</i> Cameron	E		WD	CC	BU GR
<i>Gyrophana punctata</i> Broun	E		WD	RR	BU GR
<i>Gyrophana</i> species 1	E		WD	CC	BU GR
<i>Gyrophana</i> species 2	E		WD	CC	BU GR
<i>Gyrophana</i> species 3	E		WD	CC	BU GR
<i>Gyrophana</i> species 4	E		WD	CC	BU GR
<i>Gyrophana</i> species 5	E		WD	RR	BU GR
<i>Gyrophana</i> species 6	E		WD	SS	BU GR
<i>Halobrecta flavipes</i> (Thomson)	I PA	FR	WD	RR	BE GR
<i>Ischnoglossa bituberculata</i> (Broun)	E		WD	SS	BU GR
<i>Ischnoglossa pectinata</i> Cameron	E		WD	RR	BU GR
<i>Myllaena intermedia</i> (Erichson)	I PA	FR	WD	CC	BU OP GR
<i>Myllaena magnicollis</i> (Cameron)	E		FL	RR	BU GR
<i>Nehemitropia sordida</i> (Marshall)	I PA		WD	CC	OP GR
<i>Ocalea fuscicornis</i> (Broun)	E		WD	VC	BU GR
<i>Ocalea socialis</i> (Broun)	E		WD	CC	BU CA
<i>Oligota fungicola</i> Williams	E		WD	SS	BU CA
<i>Oligota parva</i> Kraatz	I PA		WD	CC	BU OP GR
<i>Oligota setigera</i> Williams	E		WD	VR	BU CA
<i>Oligota speculicollis</i> (Cameron)	E		WD	VR	BU GR
<i>Paraphytopus</i> species 1	E		WD	RR	BU GR
<i>Polylobus sternalis</i> (Broun)	E		WD	VC	BU GR
<i>Silusa parallela</i> (Bernhauer)	E		WD	RR	BU GR
<i>Silusa puber</i> (Broun)	E		WD	VR	BU GR
<i>Silusa</i> species 1	E		WD	SS	BU GR
<i>Silusa</i> species 2	E		WD	VR	BU GR
<i>Stenomastax dentata</i> Cameron	E		WD	SS	BU GR
<i>Sternotropa versicolor</i> (Broun)	E		WD	RR	BU GR
<i>Sternotropa zealandica</i> (Cameron)	E		WD	RR	BU GR
<i>Sytus aerarius</i> (Broun)	E		WD	RR	BU CA
<i>Sytus flavescens</i> (Broun)	E		WD	RR	BU CA
<i>Sytus granifer</i> (Broun)	E		WD	CC	BU GR
<i>Sytus</i> species 1	E		WD	RR	BU CA
<i>Tramiathaea cornigera</i> (Broun)	E		WD	VC	BU GR
Genus 1 species 1	I AU	FR	WD	CC	OP GR
Genus 1 species 2	I AU	FR	WD	SS	BU GR
Genus 1 species 3	E		WD	RR	BU GR
Genus 1 species 4	E		WD	VR	BU GR
Genus 1 species 5	I AU	FR	WD	CC	OP GR
Genus 2 species 1	E		WD	VR	BU GR
Genus 3 species 1	E		WD	RR	BU GR
Genus 4 species 1	E		WD	CC	BU GR
Genus 5 species 1	E		WD	SS	BE GR
Genus 6 species 1	E		WD	CC	BU GR
PSELAPHIDAE : Faroninae (14)					
<i>Exeirarthra enigma</i> Broun	E		WD	RR	BU GR
<i>Exeirarthra planicula</i> (Broun)	E		WD	SS	BU GR
<i>Sagola duplicata</i> Broun	E		WD	CC	BU GR
<i>Sagola excavata</i> Broun	E		WD	SS	BU GR
<i>Sagola genalis</i> Broun	E		WD	RR	BU GR
<i>Sagola laminata</i> Broun	E		WD	VC	BU GR
<i>Sagola longipennis</i> Broun	E		WD	CC	BU GR
<i>Sagola major</i> Sharp	E		WD	SS	BU GR
<i>Sagola monticola</i> Broun	E		WD	VR	BU GR
<i>Sagola notabilis</i> Broun	E		WD	VC	BU GR
<i>Sagola</i> species 1	E		WD	SS	BU GR

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Sagola</i> species 2	E		WD	RR	BE GR
<i>Sagola</i> species 3	E		WD	SS	BU CA
<i>Sagola</i> species 4	E		WD	VR	BU GR
: Euplectinae (24)					
<i>Alloplectus claviger</i> (Broun)	E		WD	SS	BU GR
<i>Alloplectus</i> species 1	E		WD	SS	BU GR
<i>Alloplectus</i> species 2	E		WD	VR	BU GR
<i>Eleusomatus allocephalus</i> (Broun)	E		WD	CC	BU GR
<i>Eleusomatus</i> species 1	E		WD	SS	BU GR
<i>Euplectopsis antiqua</i> (Broun)	E		WD	RR	BU GR
<i>Euplectopsis opaca</i> (Sharp)	E		WD	RR	BU GR
<i>Euplectopsis ovicollis</i> (Broun)	E		WD	RR	BU GR
<i>Euplectopsis tuberigera</i> (Broun)	E		WD	CC	BU CR
<i>Euplectopsis</i> species 1	E		WD	VC	BU GR
<i>Leptoplectus</i> species 1	E		WD	CC	BU CR
<i>Leptoplectus</i> species 2	E		WD	VR	BU GR
<i>Microtyrus iracundus</i> Broun	E		WD	SS	BU GR
<i>Microtyrus punctatus</i> Broun	E		WD	SS	BU GR
<i>Microtyrus</i> species 1	E		WD	SS	BU GR
<i>Paraplectus</i> species 1	E		WD	VR	BU GR
<i>Philiopsis</i> species 1	I AU	FR	WD	CC	OP GR
<i>Plectomorphus sculpturatus</i> (Broun)	E		WD	CC	BU GR
<i>Plectomorphus trisulcicollis</i> (Broun)	E		WD	VR	BU GR
<i>Whitea</i> species 1	E		WD	SS	BU GR
<i>Zelandius clevedonensis</i> (Broun)	E		WD	CC	BU GR
<i>Zelandius obscurus</i> (Broun)	E		WD	RR	BU GR
<i>Zelandius sandageri</i> (Broun)	E		WD	CC	BU GR
Genus 1 species 1	E		WD	CC	BU GR
: Brachyglutinae (13)					
<i>Anabaxis electrica</i> (King)	I AU		WD	SS	OP CA
<i>Anabaxis foveolata</i> (Broun)	E		FL	RR	BU GR
<i>Eupines altula</i> (Broun)	E		WD	CC	BU GR
<i>Eupines glabrata</i> (Broun)	E		WD	CC	BU GR
<i>Eupines grata</i> (Sharp)	E		WD	RR	BU GR
<i>Eupines impar</i> (Sharp)	E		WD	VC	BU GR
<i>Eupines punctata</i> (Broun)	E		WD	CC	BU GR
<i>Eupines</i> species 1	E		WD	RR	BU GR
<i>Eupines</i> species 2	E		WD	RR	BU GR
<i>Gastrobothrus abdominalis</i> (Broun)	E		FL	RR	BU GR
<i>Gastrobothrus sharpi</i> (Broun)	E		FL	CC	BU GR
<i>Physobryaxis inflata</i> (Sharp)	E		FL	SS	BU GR
<i>Startes sculpturata</i> Broun	E		FL	VR	BU GR
: Tyrinae (3)					
<i>Gerallus punctipennis</i> Schaufuss	I AU	FR	FL	CC	BU GR
<i>Hamotulus mutandus</i> (Sharp)	E		WD	VR	BU GR
<i>Zeatyrys lawsoni</i> Sharp	E		FL	CC	BU GR
: Pselaphinae (4)					
<i>Pselaphus citinus</i> (Broun)	E		FL	VR	BU GR
<i>Pselaphus delicatus</i> Broun	E		FL	CC	BU GR
<i>Pselaphus dulcis</i> Broun	E		FL	SS	BU GR
<i>Pselaphus pauper</i> Sharp	E		WD	CC	BU CR
HYDROPHILIDAE (12)					
<i>Adolopus altulus</i> (Broun)	E		WD	VC	BU GR
<i>Cercyon analis</i> (Paykull)	I PA	FR	WD	CC	OP BE GR
<i>Cercyon atricapillus</i> (Marshall)	I PA	FR	WD	VC	OP GR
<i>Cercyon depressus</i> Stephens	I PA	FR	WD	CC	BE GR
<i>Cercyon haemorrhoidalis</i> (Fabricius)	I PA		WD	VC	OP GR
<i>Cyloma lawsoni</i> Sharp	E		WD	CC	BU GR
<i>Dactylosternum abdominale</i> (Fabricius)	I SA		WD	VC	OP GR
<i>Dactylosternum marginale</i> (Sharp)	I AU		WD	SS	OP GR
<i>Enochrus tritus</i> (Broun)	I AU		WD	RR	OP GR
<i>Exydrus flavicornis</i> (Broun)	E		FL	CC	BU OP GR
<i>Hydrostygne frontalis</i> (Broun)	E		FL	CC	BU GR
<i>Rygmodes modestus</i> White	E		WD	CC	BU GR
HISTERIDAE (8)					
<i>Acritus nigricornis</i> (Hoffmann)	I PA	FR	WD	RR	OP GR
<i>Carcinops pumilio</i> (Erichson)	I PA		WD	VC	OP GR
<i>Gnathoncus rotundatus</i> (Kugelann)	I PA		WD	CC	OP GR
<i>Gnathoncus schmidtii</i> Reitter	I PA	FR	WD	CC	OP GR
<i>Parepius abrogatus</i> (Broun)	E		WD	SS	BU GR
<i>Parepius purus</i> (Broun)	E		WD	VC	BU CR
<i>Platysoma bakewellii</i> Marseul	I AU		WD	VC	OP CR

LEGEND Provenance: E, endemic; *, Lynfield type locality; I, introduced, foreign; AU, Australian; PA, Palearctic; NA, North American; SA, South American; ET, Ethiopian; IM, Indo-Malayan FR: first report from New Zealand Wing (condition): WD, winged; FL, flightless; WD FL, winged and flightless individuals Abundance: SS, single specimen; VR, very rare (2 or 3); RR, rare (4-10); CC, common (11-50); VC, very common (more than 50) Habitat: BU, bush; OP, open; BE, beach; GR, ground; CA, canopy.

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Saprinus detritus</i> (Fabricius)	E		WD	CC	BU OP BE GR
CLAMBIDAE (4)					
<i>Clambus domesticus</i> Broun	I AU		WD	CC	BU OP GR
<i>Sphaerotherax kuscheli</i> Endrödy-Younga	E		WD	RR	BU GR
<i>Sphaerotherax suffusus</i> (Broun)	E		WD	RR	BU GR
<i>Sphaerotherax tierensis</i> (Blackburn)	I AU		WD	RR	OP GR
HELODIDAE (22)					
<i>Cyphanus punctatus</i> Sharp	E		WD	VR	BU CA
<i>Cyphon genalis</i> Sharp	E		WD	SS	BU CA
<i>Cyphon graniger</i> Sharp	E		WD	RR	BU CA
<i>Cyphon huttoni</i> Sharp	E		WD	CC	BU CA
<i>Cyphon oscillans</i> Sharp	E		WD	VR	BU CA
<i>Cyphon parviceps</i> Sharp	E		WD	VC	BU CA
<i>Cyphon remotus</i> Broun	E		WD	CC	BU CA
<i>Cyphon suffusus</i> Sharp	E		WD	RR	BU CA
<i>Cyphon viridipennis</i> Broun	E		WD	CC	BU CA
<i>Cyphon waikatoensis</i> Broun	E		WD	VR	BU CA
<i>Cyphon zealandicus</i> Sharp	E		WD	RR	BU CA
<i>Cyphon</i> species 1	E		WD	CC	BU CA
<i>Cyphon</i> species 2	E		WD	RR	BU CA
<i>Cyphon</i> species 3	E		WD	VR	BU CA
<i>Cyphon</i> species 4	E		WD	CC	BU CA
<i>Cyphon</i> species 5	E		WD	CC	BU CA
<i>Cyphon</i> species 6	E		WD	RR	BU CA
<i>Cyphon</i> species 7	E		WD	SS	BU CA
<i>Cyphon</i> species 8	E		WD	SS	BU CA
<i>Cyprobius nitidus</i> Sharp	E		WD	SS	BU CA
Genus 1 species 1	E		WD	CC	BU CA
Genus 2 species 1	E		WD	SS	BU CA
LUCANIDAE (2)					
<i>Ceratognathus irroratus</i> (Parry)	E		WD	VC	BU CA
<i>Ceratognathus parrianus</i> (Westwood)	E		WD	VC	BU CA
SCARABAEIDAE : Aphodiinae (7)					
<i>Aphodius granarius</i> (Linnaeus)	I PA		WD	RR	OP GR
<i>Aphodius pseudolividus</i> (Balthasar)	I SA		WD	CC	OP GR
<i>Aphodius tasmaniae</i> Hope	I AU		WD	VC	OP GR
<i>Ataenius browni</i> (Sharp)	E		WD	VR	BU GR
<i>Ataenius picinus</i> Harold	I SA		WD	CC	BU OP GR
<i>Saprosites communis</i> (Broun)	E		WD	CC	BU GR
<i>Saprosites mendax</i> (Blackburn)	I AU		WD	CC	BU OP GR
: Scarabaeinae (3)					
<i>Onthophagus granulatus</i> Boheman	I AU		WD	RR	OP GR
<i>Saphobius edwardsi</i> Sharp	E		FL	RR	BU GR
<i>Saphobius squamulosus</i> Broun	E		FL	VC	BU GR
: Malolonthinae (6)					
<i>Costelytra macrobrunnea</i> Given	E		WD	RR	OP GR
<i>Costelytra zealandica</i> (White)	E		WD	CC	BU OP GR
<i>Odontria xanthosticta</i> White	E		WD	CC	BU OP GR
<i>Pyronota laeta</i> (Fabricius)	E		WD	CC	BU CA
<i>Sericospilus costella</i> (Broun)	E		WD	VR	BU CA
<i>Stethaspis longicornis</i> (Arrow)	E		WD	CC	BU GR CA
: Dynastinae (1)					
<i>Heteronychus arator</i> (Fabricius)	I ET		WD	CC	OP GR
BYRRHIDAE (1)					
<i>Synorthus rotundus</i> (Broun)	E		FL	RR	BU GR
<i>Synorthus setarius</i> (Broun)	E		FL	CC	BU GR
BUPRESTIDAE (1)					
<i>Maoraxia eremita</i> (White)	E		WD	RR	BU CA
PTILODACTYLIDAE (2)					
<i>Byrrhocryptus</i> species 1	E		WD	RR	BU GR
Genus 1 species 1	E		WD	CC	BU GR
ELATERIDAE (22)					
<i>Aglophus modestus</i> Sharp	E		WD	SS	BU CA
<i>Agrypnus variabilis</i> (Candèze)	I AU		WD	VC	OP GR CA
<i>Amphiplatys lawsoni</i> Sharp	E		FL	VC	BU GR CA
<i>Conoderus exsul</i> (Sharp)	I AU		WD	VC	OP GR CA
<i>Conoderus maritimus</i> (Broun)	E		WD	CC	BU GR CA
<i>Conoderus posticus</i> (Eschscholtz)	I SA	FR	WD	CC	OP GR
<i>Conoderus submarmoratus</i> (Macleay)	I AU	FR	WD	RR	OP CA
<i>Ctenicera antipoda</i> (Candèze)	E		WD	SS	BU CA
<i>Ctenicera strangulata</i> (White)	E		WD	RR	BU GR CA
<i>Lomemus elegans</i> Sharp	E		WD	VR	BU CA
<i>Lomemus flavipes</i> Sharp	E		WD	RR	BU CA

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Lomemus fuscicornis</i> Broun	E		WD	RR	BU CA
<i>Lomemus lateristrigatus</i> (White)	E		WD	SS	BU CA
<i>Lomemus similis</i> Sharp	E		WD	VC	BU CA
<i>Lomemus suffusus</i> Sharp	E		WD	SS	BU CA
<i>Metablax cinctiger</i> (White)	E		WD	CC	BU CA
<i>Metablax approximans</i> (White)	E		WD	RR	BU CA
<i>Ochosternus zealandicus</i> (White)	E		WD	CC	BU CA
<i>Panspoeus guttatus</i> Sharp	E		WD	RR	BU CA
<i>Parinus villosus</i> (Sharp)	E		WD	SS	BU CA
<i>Thoramus perblandus</i> Broun	E		WD	SS	BU CA
<i>Thoramus wakefieldi</i> Sharp	E		WD	SS	BU GR
EUCNEMIDAE (2)					
<i>Dromaeolus nigellus</i> (White)	E		WD	SS	BU CA
<i>Talerax distans</i> Sharp	E		WD	VR	BU CA
LYCIDAE (1)					
<i>Porrostoma rufipenne</i> (Fabricius)	I AU		WD	CC	OP CA
CANTHARIDAE (3)					
<i>Asilis dugdalei</i> Wittmer	E		WD	VR	BU CA
<i>Asilis piliventer</i> (Broun)	E		WD	VR	BU CA
<i>Malthodes pumilus</i> (Brebisson)	I PA		WD	SS	BE GR
DERMESTIDAE (8)					
<i>Anthrenocerus australis</i> (Hope)	I AU	FR	WD	RR	OP CA
<i>Anthrenus verbasci</i> (Linnaeus)	I PA		WD	RR	OP CA
<i>Dermestes haemorrhoidalis</i> Kuester	I PA	FR	WD	RR	OP GR
<i>Dermestes maculatus</i> DeGeer	I PA		WD	CC	OP GR
<i>Trichelodes vulgata</i> (Broun)	E		WD	CC	BU CA
<i>Trogoderma granulatum</i> Broun	E		WD	SS	BU CA
<i>Trogoderma maestum</i> Broun	E		WD	VR	BU CA
<i>Trogoderma signatum</i> Sharp	E		WD	CC	BU OP CA
ANOBIIDAE (8)					
<i>Anobium punctatum</i> (DeGeer)	I PA		WD	VC	OP CA
<i>Dorcatoma pilosa</i> (White)	E		WD	VR	BU CA
<i>Hadrobregmus australiensis</i> Pic	I AU		WD	CC	BU OP CA
<i>Hadrobregmus crowsoni</i> Español	E		WD	RR	BU CA
<i>Holcobiuss wattii</i> Español	E?		WD	RR	BU OP CA
<i>Mothemus griseipilus</i> (Broun)	E		WD	RR	BU CA
<i>Microsternomorphus oblongus</i> (Broun)	E		WD	RR	BU CA
<i>Xenocera sericea</i> (Broun)	E		WD	RR	BU CA
PTINIDAE (1)					
<i>Ptinus speciosus</i> Broun	E		WD	RR	BU GR CA
TROGOSSITIDAE (2)					
<i>Lepidopteryx brouni</i> (Pascoe)	E		WD	CC	BU GR CA
<i>Lepidopteryx nigrosparsa</i> (White)	E		WD	SS	BU CA
PELTIDAE (8)					
<i>Australiodes vestitus</i> (Broun)	E		WD	VC	BU CA
<i>Rentonellum species 1</i>	E		FL	CC	BU GR
<i>Rentonellum species 2</i>	E		FL	RR	BU GR
<i>Rentonellum species 3</i>	E		FL	VR	BU GR
<i>Rentonium species 1</i>	E		WD	RR	BU GR
<i>Rentonium species 2</i>	E		FL	SS	BU GR
Genus 1 species 1	E		FL	RR	BU GR
Genus 2 species 1	E		WD	VC	BU CA
CLERIDAE (5)					
<i>Necrobia ruficollis</i> (Fabricius)	I PA		WD	VC	OP GR
<i>Necrobia rufipes</i> (DeGeer)	I PA		WD	CC	OP GR
<i>Parmius longipes</i> Sharp	E		WD	SS	BU CA
<i>Paupris aptera</i> Sharp	E		FL	RR	BU CA
<i>Phymatophaea opilooides</i> Pascoe	E		WD	CC	BU CA
PHYCOSECIDAE (1)					
<i>Phycosocis limbata</i> (Fabricius)	F		FL	CC	BE GR
MELYRIDAE (7)					
<i>Dasytes laticeps</i> Broun	E		WD	SS	BU CA
<i>Dasytes planifrons</i> (Broun)	E		WD	VC	BU CA
<i>Dasytes stewarti</i> Broun	E		WD	VR	BU CA
<i>Dasytes subcyaneus</i> Broun	E		WD	SS	BU CA
<i>Dasytes species 1</i>	E		WD	RR	BU GR

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Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Halyles nigrescens</i> Broun	E		WD	VC	BU CA
<i>Halyles scmidilutulus</i> Broun	E		WD	RR	BU CA
NITIDULIDAE (15)					
<i>Carpophilus davidsoni</i> Dobson	I AU	FR	WD	RR	OP GR
<i>Carpophilus dimidiatus</i> (Fabricius)	I PA	FR	WD	RR	OP GR
<i>Carpophilus gaveni</i> Dobson	I AU	FR	WD	VC	OP GR
<i>Carpophilus hemipterus</i> (Linnaeus)	I PA		WD	VC	OP GR
<i>Carpophilus marginellus</i> Motschulsky	I PA	FR	WD	VC	OP GR
<i>Epuraea antarctica</i> (White)	E		WD	VR	BU GR
<i>Epuraea imperialis</i> (Reitter)	I AU	FR	WD	VC	OP GR
<i>Epuraca scutellaris</i> (Broun)	I AU		WD	VC	OP GR
<i>Epuraea signata</i> Broun	E		WD	RR	BU GR
<i>Homepuraea amoena</i> (Broun)	E		WD	RR	BU CA
<i>Nitidula carnaria</i> (Schaller)	I PA	FR	WD	VC	OP GR
<i>Omosita colon</i> (Linnaeus)	I PA		WD	RR	OP GR
<i>Omosita discoidea</i> (Fabricius)	I PA	FR	WD	RR	OP GR
<i>Platipidia asperella</i> Broun	E		WD	CC	BU CA
<i>Soronia hystrix</i> Sharp	E		WD	CC	BU CA
<i>Thalycrodes australis</i> Blackburn	I AU	FR	WD	SS	OP GR
RHIZOPHAGIDAE (4)					
<i>Monotoma longicollis</i> Gyllenhal	I PA		WD	CC	OP GR
<i>Monotoma picipes</i> Herbst	I PA		WD	CC	OP GR
<i>Monotoma spinicollis</i> Aubé	I PA		WD	VC	OP GR
<i>Monotoma testacea</i> Motschulsky	I PA		WD	SS	OP GR
CUCUJIDAE (3)					
<i>Ahasverus advena</i> (Waltl)	I NA	FR	WD	CC	OP GR
<i>Cryptamorpha brevicornis</i> (White)	E		WD	CC	BU CA
<i>Cryptamorpha desjardinsi</i> (Guérin)	I AU		WD	VC	BU OP CA
PHALACRIDAE (1)					
<i>Phalacrus uniformis frigidicola</i> Thompson	I AU		WD	VC	OP CA
CRYPTOPHAGIDAE (13)					
<i>Atomaria lewisi</i> Reitter	I PA		WD	VC	OP GR
<i>Cryptophagus pilosus</i> Gyllenhal	I PA		WD	RR	OP GR
<i>Ephistomus globulus</i> (Paykull)	I PA		WD	VC	BU OP GR
<i>Micrambina discoidea</i> (Broun)	E		WD	VR	BU CA
<i>Micrambina helmsi</i> Reitter	E		WD	SS	BU GR CA
<i>Micrambina insignis</i> Reitter	E		WD	VC	BU OP CA
<i>Micrambina rutila</i> (Broun)	E		WD	VC	BU CA
<i>Micrambina silvana</i> (Broun)	E		WD	RR	BU CA
<i>Micrambina tumida</i> (Broun)	E		WD	RR	BU CA
<i>Micrambina species 1</i>	E		WD	CC	BU GR
<i>Micrambina species 2</i>	E		WD	SS	BU CA
<i>Salitius ruficeps</i> (Broun)	E		FL	CC	BU GR
Genus 1 species 1	E		WD	VC	BU OP CA
LANGURIIDAE (4)					
<i>Cathartocryptus maculosus</i> (Broun)	E		WD	VR	RU CA
<i>Hapalips prolixus</i> (Sharp)	E		WD	VC	BU CA
<i>Loberus depressus</i> (Sharp)	E		WD	RR	OP CA
<i>Loberus nitens</i> (Sharp)	E		WD	RR	BU GR
EROTYLIDAE (2)					
<i>Cryptodacne brouni</i> (Pascoe)	E		FL	VC	BU GR
<i>Cryptodacne synthetica</i> Sharp	E		FL	CC	BU GR CA
CERYLIDAE (2)					
<i>Anommatus duodecimstriatus</i> (Mueller)	I PA		FL	RR	BU GR
<i>Hypodacne rubripes</i> (Reitter)	E		WD	VC	BU GR
CORYLOPHIDAE (20)					
<i>Anisomeristes apicalis</i> (Lea)	I AU		WD	VR	OP GR
<i>Anisomeristes ater</i> Matthews	E		WD	VC	BU GR CA
<i>Anisomeristes sharpi</i> Matthews	E		WD	VC	BU GR
<i>Anisomeristes thoracicus</i> (Erichson)	I AU	FR	WD	VC	BU OP GR CA
<i>Anisomeristes species 1</i>	I AU		WD	VC	BU OP GR CA
<i>Corylophus species 1</i>	E		WD	RR	BU GR
<i>Holopsis pallida</i> Broun	E		WD	VC	BU GR
<i>Holopsis rotundata</i> Broun	E		FL	CC	BU GR
<i>Holopsis species 1</i>	E		FL	CC	BU GR
<i>Holopsis species 2</i>	E		FL	VC	BU GR CA
<i>Holopsis species 3</i>	E		FL	VC	BU GR
<i>Holopsis species 4</i>	E		FL	VC	BU GR CA
<i>Orthoperus aequalis</i> Sharp	I NA	FR	WD	VR	OP GR
<i>Orthoperus atomarius</i> (Heer)	I PA	FR	WD	CC	BU OP GR
<i>Orthoperus species 1</i>	I PA	FR	WD	SS	BU GR
<i>Sacina oblonga</i> Braun	E		WD	VC	BU CA
<i>Sacium pulchellum</i> (Lea)	I AU	FR	WD	CC	OP CA

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
Genus 1 species 1	E		WD	RR	BU CA
Genus 1 species 2	E		WD	VR	BU CA
Genus 2 species 1	E		FL	CC	BU GR
COCCINELLIDAE (27)					
<i>Adalia bipunctata</i> (Linnaeus)	I PA		WD	CC	OP CA
<i>Adoxellus flavihirtus</i> (Broun)	E		FL	CC	BU GR
<i>Coccinella undecimpunctata</i> Linnaeus	I PA		WD	CC	OP CA
<i>Coelophora inaequalis</i> (Fabricius)	I AU	FR	WD	RR	OP CA
<i>Cryptolaemus montrouzieri</i> Mulsant	I AU		WD	RR	OP CA
<i>Diomus notescens</i> (Blackburn)	I AU		WD	RR	OP GR
<i>Diomus</i> species 1	I AU	FR	WD	VR	OP CA
<i>Halmus chalybeus</i> (Boisduval)	I AU		WD	VC	BU OP CA
<i>Harmonia conformis</i> (Boisduval)	I AU		WD	CC	OP CA
<i>Illeis galbula</i> (Mulsant)	I AU		WD	CC	OP CA
'Midus' pygmaeus Blackburn	I AU	FR	WD	CC	OP CA
<i>Rhyzobius acceptus</i> (Broun)	E		WD	CC	BU CA
<i>Rhyzobius consors</i> (Broun)	E		WD	CC	BU CA
<i>Rhyzobius fagus</i> (Broun)	I AU		WD	CC	OP CA
<i>Rhyzobius forestieri</i> (Mulsant)	I AU		WD	CC	OP CA
<i>Rhyzobius minutulus</i> (Broun)	E		FL	VC	BU GR CA
<i>Rhyzobius rarus</i> (Broun)	E		FL	VC	BU GR
<i>Rhyzobius suffusus</i> (Broun)	E		FL	CC	BU GR
<i>Rhyzobius tristis</i> (Broun)	E		WD	RR	BU CA
<i>Rhyzobius ventralis</i> (Erichson)	I AU		WD	SS	OP CA
<i>Rhyzobius</i> species 1	E		FL	CC	BU GR
<i>Rhyzobius</i> species 2	E		FL	RR	BU GR
<i>Rhyzobius</i> species 3	E		FL	RR	BU GR
<i>Scymnus loewi</i> (Mulsant)	I NA	FR	WD	CC	OP CA
<i>Stethorus bifidus</i> Kapur	E		WD	RR	OP CA
<i>Stethorus griseus</i> Chazeau	E		WD	SS	OP CA
<i>Stethorus histrio</i> Chazeau	I AU		WD	RR	OP CA
LATHRIDIIDAE (32)					
<i>Aridius bifasciatus</i> (Reitter)	I AU		WD	CC	BU OP GR
<i>Aridius costatus</i> (Erichson)	I AU		WD	VC	BU OP GR
<i>Aridius nodifer</i> (Westwood)	I AU		WD	VC	BU OP GR CA
<i>Bicava illustris</i> (Reitter)	E		WD	CC	BU CA
<i>Bicava latulipennis</i> (Broun)	E		WD	CC	BU GR
<i>Bicava terricola</i> (Broun)	E		WD	CC	BU CA
<i>Bicava variegata</i> (Broun)	E		WD	VC	BU CA
<i>Corticaria elongata</i> (Gyllenhal)	I PA		WD	RR	BU GR CA
<i>Corticaria fenestralis</i> (Linnaeus)	I PA		WD	SS	OP GR
<i>Corticaria hirtalis</i> (Broun)	I AU		WD	VC	BU OP GR
<i>Corticaria meridiana</i> Johnson	I AU		WD	CC	OP GR
<i>Dienerella filum</i> (Aubé)	I PA	FR	WD	SS	BU CA
<i>Enicmus bifoventus</i> (Broun)	E		WD	CC	BU OP GR
<i>Enicmus caviceps</i> (Broun)	E		WD	CC	BU GR
<i>Enicmus floridus</i> (Broun)	E		WD	CC	BU CA
<i>Enicmus foveatus</i> Belon	E		WD	CC	BU CA
<i>Enicmus sharpi</i> Belon	E		WD	CC	BU OP GR
<i>Lithostygnus minor</i> Broun	E		FL	RR	BU GR
<i>Lithostygnus sinuosus</i> (Belon)	E		FL	VC	BU GR
<i>Lithostygnus</i> species 1	E		FL	RR	BU GR
<i>Melanophthalma alacris</i> (Broun)	E		FL	CC	BU GR
<i>Melanophthalma diversicollis</i> Belon	E		WD	VR	BU CA
<i>Melanophthalma puber</i> (Broun)	E		WD	VC	BU CA
<i>Melanophthalma pudibunda</i> (Broun)	E		WD	CC	BU CA
<i>Melanophthalma tarsalis</i> (Broun)	E		WD	CC	BU CA
<i>Melanophthalma zelandica</i> Belon	E		WD	VC	BU CA
<i>Melanophthalma</i> species 1	E		WD	RR	BU CA
<i>Melanophthalma</i> species 2	E		WD	VC	BU CA
<i>Melanophthalma</i> species 3	E		WD	CC	BU CA
<i>Melanophthalma</i> species 4	I AU	FR	WD	RR	OP GR
<i>Melanophthalma</i> species 5	E		WD	CC	BU GR CA
Genus 1 species 1	I AU	FR	WD	CC	BU GR
MEROPHYSIIDAE (2)					
<i>Holoparamesus tenuis</i> Reitter	E		WD	VC	BU GR CA
<i>Holoparamesus</i> species 1	E		WD	RR	BU GR
MYCETOPHAGIDAE (8)					
<i>Litargus balteatus</i> LeConte	I NA	FR	WD	RR	OP GR
<i>Litargus vestitus</i> (Sharp)	I AU	FR	WD	VC	BU OP GR CA
<i>Triphyllus adpersus</i> (Broun)	E		WD	CC	BU CA

LEGEND Provenance: E, endemic; *, Lynfield type locality; I, introduced, foreign; AU, Australian; PA, Palearctic; NA, North American; SA, South American; ET, Ethiopian; IM, Indo-Malayan FR: first report from New Zealand Wing (condition): WD, winged; FL, flightless; WD FL, winged and flightless individuals Abundance: SS, single specimen; VR, very rare (2 or 3); RR, rare (4-10); CC, common (11-50); VC, very common (more than 50) Habitat: BU, bush; OP, open; BE, beach; GR, ground; CA, canopy.

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Triphyllus fuliginosus</i> (Broun)	E		WD	CC	BU CA
<i>Triphyllus hispidellus</i> (Broun)	E		WD	RR	BU OP CA
<i>Triphyllus punctulatus</i> (Broun)	E		WD	VC	BU GR
<i>Triphyllus serratus</i> (Broun)	E		WD	CC	BU GR CA
<i>Typhaea stercorea</i> (Linnaeus)	I PA		WD	CC	OP GR
ARCHEOCRYPTICIDAE (1)					
<i>Archeocrypticus topali</i> Kaszab	I SA		WD	VC	OP GR
CIIDAE (17)					
<i>Cis asperrimus</i> Broun	E		WD	RR	BU CA
<i>Cis assimilis</i> Broun	E		WD	RR	BU CA
<i>Cis boettgeri</i> (Reitter)	E		WD	VC	BU GR CA
<i>Cis illustris</i> Broun	E		FL	VR	BU GR
<i>Cis lineicollis</i> Broun	E		WD	CC	BU CA
<i>Cis minutus</i> Bayford	E		FL	VC	BU GR CA
<i>Cis rufulus</i> Broun	E		WD	CC	BU GR CA
<i>Cis zeelandicus</i> Reitter	E		WD	VC	BU GR CA
<i>Cis</i> species 1	E		FL	CC	BU GR
<i>Cis</i> species 2	E		WD	RR	BU GR
<i>Cis</i> species 3	E		WD	CC	BU CA
<i>Cis</i> species 4	E		WD	VR	BU CA
<i>Cis</i> species 5	E		WD	SS	BU GR
' <i>Ennearthron</i> ' species 1	E		WD	RR	BU OP CA
<i>Orophius dilutipes</i> Blackburn	I AU	FR	WD	VR	BU CA
<i>Scolytocis</i> species 1	E		WD	SS	BU GR
<i>Xylographus fultoni</i> (Broun)	E		WD	CC	BU CA
MELANDRYIDAE (8)					
<i>Allopterus ornatus</i> (Broun)	E		WD	CC	BU CA
<i>Ctenoplectron fasciatum</i> (Redtenbacher)	E		WD	RR	BU OP CA
<i>Hylobia calida</i> Broun	E		FL	VC	BU GR CA
<i>Hylobia</i> species 1	E		WD	CC	BU CA
<i>Lycoprocharis</i> species 1	E		FL	CC	BU GR
<i>Mecorchesia spectabilis</i> Broun	E		WD	VR	BU CA
<i>Neorchesia divergens</i> Broun	E		FL	CC	BU GR
Genus 1 species 1	E		FL	CC	BU GR
MORDELLIDAE (6)					
<i>Mordella antarctica</i> White	E		WD	SS	BU CA
<i>Mordella detracta</i> Pascoe	E		WD	CC	BU CA
<i>Mordella jucunda</i> (Broun)	E		WD	CC	BU CA
<i>Mordellistena</i> species 1	I AU	FR	WD	VR	BU CA
<i>Stenomordellaria neglecta</i> (Broun)	E		WD	VC	BU CA
<i>Zeamordella monacha</i> Broun	E		WD	RR	BU CA
RHIPIPHORIDAE (1)					
<i>Allocinops brookesi</i> Broun	E		WD	SS	BU CA
COLYDIIDAE (24)					
<i>Bitoma insularis</i> White	E		WD	VC	BU OP CA
<i>Bitoma nana</i> Sharp	E		WD	RR	BU CA
<i>Bitoma rugosa</i> Sharp	E		WD	VC	BU OP CA
<i>Bitoma vicina</i> Sharp	E		WD	CC	BU CA
<i>Coxelus dubius</i> Sharp	E		FL	CC	BU GR
<i>Coxelus similis</i> Sharp	E		FL	RR	BU OP GR
<i>Enarsus bakewelli</i> Pascoe	E		FL	CC	BU GR
<i>Epistranus hirtalis</i> Broun	E		FL	VR	BU GR
<i>Epistranus lawsoni</i> Sharp	E		FL	VC	BU GR
<i>Glenentela serrata</i> Broun	E		FL	RR	BU GR
<i>Ithris gracilis</i> Sharp	E		WD	RR	BU CA
<i>Notoulus crassulus</i> Broun	E		WD	CC	BU GR CA
<i>Pristoderus asper</i> (Sharp)	E		WD	CC	BU CA
<i>Pristoderus scaber</i> (Fabricius)	E		WD	CC	BU OP CA
<i>Protarphius decorus</i> Broun	E		FL	CC	BU GR
<i>Pycnomerus depressiusculus</i> (White)	E		WD	VC	BU OP GR
<i>Pycnomerus latitans</i> Sharp	E		FL	VR	BU GR
<i>Pycnomerus minor</i> Sharp	E		WD	CC	BU CA
<i>Pycnomerus simplex</i> Broun	E		FL	VC	BU GR
<i>Recyntus tuberculatus</i> (Broun)	E		FL	RR	BU GR
<i>Rhizonium antiquum</i> Sharp	E		WD	CC	BU CA
<i>Syncalus hystrix</i> Sharp	E		FL	CC	BU GR
<i>Syncalus optatus</i> Sharp	E		FL	CC	BU GR
<i>Tarphiomimus indentatus</i> Wollaston	E		WD	VC	BU CA
PROSTOMIDAE (1)					
<i>Dryocora howitti</i> Pascoe	E		WD	CC	BU GR
ZOPHERIDAE (1)					
<i>Brouniphylax squamiger</i> (Broun)	E		FL	VR	BU GR

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
TENEBRIONIDAE (21)					
<i>Alphitobius diaperinus</i> (Panzer)	I IM		WD	RR	OP GR
<i>Amarosoma simulans</i> Redtenbacher	E		FL	VR	BU GR
<i>Amarygmus tristissensu</i> Blackburn	I AU		WD	CC	BU OP CA
<i>Aphtora rufipes</i> Bates	E		WD	CC	BU OP GR
<i>Archaeoglenes costipennis</i> Broun	E		FL	VR	BU GR
<i>Artystona rugiceps</i> Bates	E		FL	CC	BU CA
<i>Edalus opacus</i> Broun	E		FL	SS	BU GR
<i>Gnatocerus cornutus</i> (Fabricius)	I IM		WD	CC	OP GR
<i>Loxolium crassicornis</i> Broun	E		WD	VC	BU CA
<i>Loxolium latulus</i> Broun	E		WD	RR	BU GR CA
<i>Loxolium priscus</i> Sharp	E		WD	VC	BU CA
<i>Menimus batesi</i> Sharp	E		FL	CC	BU GR
<i>Menimus caecus</i> Sharp	E		FL	VC	BU GR
<i>Menimus crassus</i> Sharp	E		FL	VC	BU GR
<i>Mimopeus elongatus</i> (Brême)	E		FL	CC	BU BE GR
<i>Pheloneis aucklandicus</i> (Broun)	E		FL	RR	BU GR
<i>Tanychilus metallicus</i> White	E		WD	SS	BU CA
<i>Tanychilus sophorae</i> Broun	E		WD	RR	BU CA
<i>Tribolium navale</i> (Fabricius)	I IM		WD	RR	OP GR
<i>Uloma tenebrionoides</i> (White)	E		WD	VC	BU OP GR
<i>Xylochus tibialis</i> Broun	E		WD	CC	BU CA
OEDEMERIDAE (2)					
<i>Parisopalpus macleayi</i> (Champion)	I AU		WD	SS	BE GR
<i>Parisopalpus nigronotatus</i> (Boheman)	I AU		WD	VR	BE GR
SALPINGIDAE (8)					
<i>Salpingus angusticollis</i> Broun	E		WD	VC	BU OP CA
<i>Salpingus bilunatus</i> Pascoe	E		WD	VC	BU CA
<i>Salpingus hirtus</i> Broun	E		WD	VC	BU CA
<i>Salpingus perpunctatus</i> Broun	E		WD	VC	BU CA
<i>Salpingus quisquilius</i> Broun	E		WD	CC	BU OP CA
<i>Salpingus reductus</i> (Blair)	E		WD	RR	BU CA
<i>Salpingus swalei</i> (Blair)	E		WD	RR	BU CA
<i>Salpingus</i> species 1	E		WD	CC	BU CA
ANTHICIDAE (12)					
<i>Anthicus floralis</i> (Linnaeus)	I PA		WD	CC	OP GR
<i>Anthicus glaber</i> King	I AU	FR	WD	RR	OP GR CA
<i>Anthicus hesperi</i> King	I AU	FR	WD	CC	BU OP GR
<i>Anthicus kreusleri</i> King	I AU	FR	WD	CC	BU OP GR
<i>Anthicus pellucidipes</i> Broun	E		WD	VC	BU CA
<i>Anthicus</i> species 1	E		FL	VC	BU OP BE GR
<i>Cotes bullata</i> (Broun)	E		FL	SS	BU GR
<i>Cotes crispus</i> (Broun)	E		FL	CC	BU GR
<i>Cotes dorsalis</i> Broun	E		FL	CC	BU CA
<i>Cotes optima</i> Broun	E		FL	CC	BU CA
<i>Macratris exilis</i> Pascoe	E		WD	CC	BU CA
<i>Trichanassa</i> species 1	E		WD	VR	BU CA
ADERIDAE (5)					
' <i>Xylophilus</i> ' <i>nitidus</i> (Broun)	E		WD	SS	BU CA
' <i>Xylophilus</i> ' species 1	E		WD	VR	BU CA
' <i>Xylophilus</i> ' species 2	E		WD	SS	BU CA
' <i>Xylophilus</i> ' species 3	E		WD	VR	BU CA
' <i>Xylophilus</i> ' species 4	E		WD	SS	BU CA
SCRAPTIIDAE (3)					
<i>Nothotelus nigellus</i> (Broun)	E		WD	CC	BU CA
<i>Nothotelus usitatus</i> (Broun)	E		WD	VR	BU CA
<i>Nothotelus</i> species 1	E		WD	CC	BU CA
CERAMBYCIDAE : Prioninae (1)					
<i>Prionoplus reticularis</i> White	E		WD	VC	BU OP CA
: Aseminae (1)					
<i>Arhopalus tristis</i> (Fabricius)	I PA		WD	VC	OP CA
: Cerambycinae (17)					
<i>Ambeodontus tristis</i> (Fabricius)	E		WD	CC	BU OP CA
<i>Astetholea pauper</i> Bates	E		WD	VC	BU OP CA
<i>Astetholida lucida</i> Broun	E		WD	VC	OP CA
<i>Bethelium signiferum</i> (Newman)	I AU		WD	VC	OP CA
<i>Callidiopsis scutellaris</i> (Fabricius)	I AU		WD	SS	OP CA
<i>Coptomma variegatum</i> (Fabricius)	E		WD	CC	BU OP CA
<i>Eburia sublineata</i> White	E		WD	CC	BU OP CA
<i>Gastrosarus nigricollis</i> Bates	E		WD	RR	BU OP CA

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Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Navomorpha sulcata</i> (Fabricius)	E		WD	VC	BU OP CA
<i>Oemona hirta</i> (Fabricius)	E		WD	VC	BU OP CA
<i>Ochrocydus huttoni</i> Pascoe	E		WD	CC	BU CA
<i>Phoracantha semipunctata</i> (Fabricius)	I AU		WD	VC	OP CA
<i>Stenopotes pallidus</i> Pascoe	E		WD	VC	BU OP CA
<i>Tessaromma undatum</i> Newman	I AU		WD	CC	OP CA
<i>Votum mundum</i> Broun	E		WD	VR	BU CA
<i>Xuthodes punctipennis</i> Pascoe	E		WD	CC	BU OP CA
<i>Zorion minutum</i> (Fabricius)	E		WD	VC	BU CA
: Lamiinae (37)					
<i>Adrioepa pallidata</i> Broun	E		FL	CC	BU CA
<i>Hybolasius crista</i> (Fabricius)	E		WD	VC	BU CA
<i>Hybolasius modestus</i> Broun	E		WD	VR	BU CA
<i>Hybolasius pedator</i> Bates	E		WD	VC	BU CA
<i>Hybolasius promissus</i> (Broun)	E		WD	RR	BU CA
<i>Hybolasius simplex</i> Bates	E		WD	VC	BU CA
<i>Hybolasius sticticus</i> (Bates)	E		WD	CC	BU CA
<i>Hybolasius vegetus</i> Broun	E		WD	CC	BU OP CA
<i>Hybolasius viridescens</i> Bates	E		WD	VC	BU OP CA
<i>Microlamia pygmaea</i> Bates	E		FL	CC	BU CA
<i>Nodulosoma angustum</i> (Broun)	E		FL	CC	BU GR
<i>Polyacantha flavipes</i> (White)	E		WD	RR	BU CA
<i>Psilocnaeia asteliae</i> Kuschel	E*		FL	VC	BU CA
<i>Psilocnaeia brouni</i> Bates	E		WD	VC	BU CA
<i>Psilocnaeia linearis</i> Bates	E		WD	CC	BU CA
<i>Psilocnaeia nana</i> (Bates)	E		FL	VC	BU OP CA
<i>Psilocnaeia parvula</i> (White)	E		FL	CC	BU CA
<i>Ptinosa convexum</i> (Broun)	E		FL	CC	BU GR
<i>Ptinosa ptinoides</i> (Bates)	E		FL	VC	BU GR
<i>Somatidia antarctica</i> (White)	E		FL	CC	BU OP GR CA
<i>Spilotrogia elongata</i> (Broun)	E		FL	CC	BU GR CA
<i>Spilotrogia fragilis</i> (Bates)	E		WD	CC	BU CA
<i>Spilotrogia maculata</i> Bates	E		WD	CC	BU CA
<i>Spilotrogia pictula</i> (Bates)	E		FL	SS	BU CA
<i>Stenellipsis bimaculata</i> (White)	E		WD	CC	BU CA
<i>'Stenellipsis' gracilis</i> (White)	E		WD	RR	BU CA
<i>'Stenellipsis' latipennis</i> Bates	E		WD	CC	BU CA
<i>Tenebrosoma albicoma</i> (Broun)	E		FL	CC	BU GR
<i>Tenebrosoma tenebricum</i> (Broun)	E		FL	CC	BU GR
<i>Tenebrosoma terrestre</i> (Broun)	E		FL	RR	BU GR
<i>Tetrorrea cilipes</i> White	E		WD	CC	BU CA
<i>Xylotoles costipennis</i> (Breuning)	E		FL	RR	BU CA
<i>Xylotoles griseus</i> (Fabricius)	E		FL	VC	BU OP GR CA
<i>Xylotoles humeratus</i> Bates	E		WD	CC	BU CA
<i>Xylotoles laetus</i> White	E		FL	VC	BU OP CA
<i>Xylotoles nudus</i> Bates	E		FL	CC	BU CA
<i>Xylotoles rugicollis</i> Bates	E		FL	CC	BU CA
CHRYSOMELIDAE : Cryptocephalinae (2)					
<i>Arnomus brouni</i> Sharp	E		WD	CC	BU CA
<i>Ochrosopsis subfasciata</i> (Saunders)	I AU	FR	WD	CC	OP CA
: Eumolpinae (6)					
<i>Eucolaspis brunnea</i> (Fabricius)	E		WD	RR	BU OP CA
<i>Eucolaspis colorata</i> Broun	E		WD	VC	BU OP CA
<i>Eucolaspis jucunda</i> (Broun)	E		WD	VC	BU OP CA
<i>Eucolaspis pallidipennis</i> (White)	E		WD	RR	BU OP CA
<i>Eucolaspis picticornis</i> Broun	E		WD	VC	BU OP BE CA
<i>Peniticus suffusus</i> Sharp	E		FL	VC	BU GR
: Chrysomelinae (6)					
<i>Aphilon enigma</i> Sharp	E		FL	CC	BU GR
<i>Aphilon minutum</i> Broun	E		FL	VC	BU GR
<i>Aphilon monstrosus</i> Broun	E		FL	CC	BU GR
<i>Aphilon species 1</i>	E		FL	SS	BU GR
<i>Pyrgoides species 1</i>	I AU	FR	WD	CC	OP CA
<i>Paropsis charybdis</i> Stål	I AU		WD	RR	OP CA
: Galerucinae (2)					
<i>Adoxia puncticollis</i> (Sharp)	E		WD	VR	BU CA
<i>Adoxia vulgaris</i> (Broun)	E		WD	CC	BU CA
: Alticinae (4)					
<i>Alema paradoxa</i> (Sharp)	E		WD	VC	BU CA
<i>Longitarsus fuliginosus</i> (Broun)	I AU		WD	VC	OP GR CA
<i>Pleuraltica cyanea</i> (Broun)	E		WD	VC	BU CA
<i>Trachytetra rugulosa</i> (Broun)	E		FL	VC	BU CA
NEMONYCHIDAE (1)					
<i>Rhinorhynchus rufulus</i> (Broun)	E		WD	VC	BU CA
ANTHRIBIDAE : Anthribinae (10)					
<i>Cacephatus huttoni</i> (Sharp)	E		WD	VC	BU OP CA
<i>Dasyanthribus purpureus</i> (Broun)	E		FL	CC	BU CA

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Etnalis spinicollis</i> Sharp	E		WD	RR	BU CA
<i>Eucloides suturalis</i> Pascoe	I AU		WD	CC	OP GR
<i>Garyus altus</i> (Sharp)	E		WD	CC	BU OP CA
<i>Lawsonia variabilis</i> Sharp	E		WD	CC	BU CA
<i>Lophus rudis</i> (Sharp)	E		WD	VC	BU CA
<i>Phymatus hetaera</i> (Sharp)	E		WD	VC	BU OP CA
<i>Pleosporius bullatus</i> (Sharp)	E		WD	VC	BU OP CA
<i>Sharpius browni</i> (Sharp)	E		WD	VC	BU OP CA
: Choraginae (7)					
<i>Araecerus palmaris</i> (Pascoe)	I AU		WD	CC	OP CA
<i>Dysnocryptus dignus</i> (Broun)	E		FL	CC	BU GR
<i>Dysnocryptus inflatus</i> (Sharp)	E		FL	VC	BU OP GR
<i>Dysnocryptus rugosus</i> (Sharp)	E		FL	VC	BU GR CA
<i>Micranthrribus atomus</i> (Sharp)	E		FL	VC	BU GR
<i>Notochoragus crassus</i> (Sharp)	E		WD	CC	BU CA
<i>Notochoragus thoracicus</i> (Broun)	E		FL	CC	BU GR
BELIDAE : Aglycyderinae (1)					
<i>Aralius wollastoni</i> (Sharp)	E		WD	CC	BU CA
BRENTIDAE : Apioninae (2)					
<i>Apion ulicis</i> (Forster)	I PA		WD	VC	OP CA
<i>Neocyba metrosideros</i> (Broun)	E		WD	RR	BU CA
CURCULIONIDAE					
: Brachycerinae: Entimini (16)					
<i>Asynonychus cervinus</i> (Boheman)	I SA		FL	RR	OP GR
<i>Brachyolus species 1</i>	E		FL	RR	BU GR CA
<i>Catoptes binodis</i> (White)	E		FL	RR	BU CA
<i>Cecyropa discors</i> Broun	E		FL	RR	BE GR
<i>Graphognathus leucoloma</i> (Boheman)	I SA		FL	RR	OP GR
<i>Irenimus compressus</i> (Broun)	E		FL	CC	BU BE CA
<i>Lyperobates asper</i> Broun	E		FL	CC	BU GR
<i>Mandalotus irritus</i> (Pascoe)	E		FL	VC	BU GR
<i>Mandalotus miricollis</i> (Broun)	E		FL	CC	OP BE GR
<i>Mandalotus species 1</i>	E		FL	VR	BE GR
<i>Otiiorhynchus rugosostriatus</i> (Goeze)	I PA		FL	VR	OP GR
<i>Otiiorhynchus sulcatus</i> (Fabricius)	I PA		FL	VR	OP GR
<i>Paelocharis corpulentus</i> (Broun)	E		FL	VC	BU GR
<i>Paelocharis setifer</i> (Broun)	E		FL	CC	BU GR
<i>Phlyctinus callosus</i> Boheman	I ET		FL	CC	OP GR
<i>Sitona discoideus</i> Gyllenhal	I PA		WD	RR	OP GR
: Brachycerinae: Aterpini (1)					
<i>Rhadinomus acuminatus</i> (Fabricius)	E		WD	CC	BU OP GR
: Brachycerinae: Gonipterini (1)					
<i>Gonipterus scutellatus</i> Gyllenhal	I AU		WD	SS	OP CA
: Brachycerinae: Diabathrariini (4)					
<i>Geochus inaequalis</i> (Broun)	E		FL	CC	BU GR
<i>Geochus politus</i> (Broun)	E		FL	VC	BU GR
<i>Geochus similis</i> Broun	E		FL	VR	BE GR
<i>Geochus species 1</i>	E		FL	SS	BU GR
: Brachycerinae: Rhytirhinini (7)					
<i>Gromilus setosus</i> (Broun)	E		FL	CC	BU GR
<i>Gromilus thoracicus</i> (Broun)	E		FL	CC	BU GR
<i>Listroderes difficilis</i> Germain	I SA		WD	SS	OP GR
<i>Listroderes foveatus</i> (Lea)	I SA		WD	SS	BE GR
<i>Listronotus bonariensis</i> (Kuschel)	I SA		WD	VC	OP BE GR
<i>Steriphus ascitus</i> (Pascoe)	E		FL	RR	OP GR
<i>Steriphus diversipes lineatus</i> (Pascoe)	I AU		WD	SS	OP GR
: Curculioninae: Erirhinini (2)					
<i>Bryocatus polytrichi</i> Kuschel	E*		FL	CC	BU GR
<i>Myrtonymus zelandicus</i> Kuschel	E*		FL	VC	BU OP GR
: Curculioninae: Eugnomini (13)					
<i>Gonoproterus spinicollis</i> Broun	E		WD	SS	BU CA
<i>Hoplocneme hookeri</i> White	E		WD	RR	BU CA
<i>Hoplocneme squamosa</i> Broun	E		WD	RR	BU CA
<i>Nyxetes bidens</i> (Fabricius)	E		WD	RR	BU CA
<i>Pactola demissa</i> Pascoe	E		WD	VC	BU CA
<i>Pactola variabilis</i> Pascoe	E		WD	VC	BU CA
<i>Rhopalomerus fucosus</i> (Pascoe)	E		WD	SS	BU CA
<i>Scolopterus aequus</i> Broun	E		WD	CC	BU CA
<i>Scolopterus penicillatus</i> White	E		WD	CC	BU CA
<i>Stephanorhynchus crassus</i> Broun	E		WD	CC	BU CA
<i>Stephanorhynchus curvipes</i> White	E		WD	CC	BU CA

LEGEND Provenance: E, endemic; *, Lynfield type locality; I, introduced, foreign; AU, Australian; PA, Palearctic; NA, North American; SA, South American; ET, Ethiopian; IM, Indo-Malayan FR: first report from New Zealand Wing (condition): WD, winged; FL, flightless; WD FL, winged and flightless individuals Abundance: SS, single specimen; VR, very rare (2 or 3); RR, rare (4-10); CC, common (11-50); VC, very common (more than 50) Habitat: BU, bush; OP, open; BE, beach; GR, ground; CA, canopy.

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Stephanorhynchus lawsoni</i> Sharp	E		WD	CC	BU CA
<i>Tysius bicornis</i> (Fabricius)	E		WD	CC	BU CA
: <i>Curculioninae: Curculionini</i> (17)					
<i>Aneuma fasciatum</i> (Broun)	E		WD	CC	BU CA
<i>Aneuma fulvipes</i> Pascoe	E		WD	CC	BU CA
<i>Aneuma rubricale</i> (Broun)	E		WD	VC	BU CA
<i>Gymnetron pascuorum</i> (Gyllenhal)	I PA		WD	CC	BU OP BE GR
<i>Neomycta rubida</i> Broun	E		WD	RR	BU CA
<i>Peristoreus cruciger</i> (Broun)	E		WD	RR	BU CA
<i>Peristoreus fulvus</i> (Broun)	E		WD	RR	BU CA
<i>Peristoreus fusconotatus</i> (Broun)	E		WD	SS	BU CA
<i>Peristoreus leucocomus</i> (Broun)	E		WD	RR	BU CA
<i>Peristoreus maorinus</i> (Broun)	E		WD	RR	BU CA
<i>Peristoreus sexmaculatus</i> (Broun)	E		WD	CC	BU CA
<i>Peristoreus sudus</i> (Broun)	E		WD	SS	BU CA
<i>Peristoreus viridipennis</i> (Broun)	E		WD	RR	BU CA
<i>Praolepra fultoni</i> Broun	E		WD	RR	BU CA
<i>Praolepra infusca</i> Broun	E		WD	CC	BU CA
<i>Praolepra squamosa</i> Broun	E		WD	RR	BU CA
<i>Storobus albosignatus</i> Blackburn	I AU		WD	VC	OP CA
: <i>Curculioninae: Ceutorhynchini</i> (1)					
<i>Rhinoncus australis</i> Oke	I AU		WD	CC	OP GR
: <i>Curculioninae: Baridini</i> (1)					
<i>Linogeraeus urbanus</i> (Boheman)	I SA		WD	RR	OP GR
: <i>Curculioninae: Magdalinini</i> (1)					
<i>Neolaemosaccus narinus</i> (Pascoe)	I AU		WD	CC	OP CA
: <i>Curculioninae: Cryptorhynchini</i> (62)					
' <i>Acalles</i> ' <i>certus</i> Broun	E		FL	CC	BU GR
' <i>Acalles</i> ' <i>cingulatus</i> Broun	E		FL	CC	BU GR CA
' <i>Acalles</i> ' <i>conicollis</i> Broun	E		FL	SS	BU GR
' <i>Acalles</i> ' <i>dorsalis</i> Broun	E		FL	CC	BU GR
' <i>Acalles</i> ' <i>hystriculus</i> Pascoe	E		FL	VC	BU CA
' <i>Acalles</i> ' <i>latirostris</i> Broun	E		FL	VR	BU GR
' <i>Acalles</i> ' <i>scitulus</i> Broun	E		FL	RR	BU GR
' <i>Acalles</i> ' <i>terricola</i> Broun	E		FL	CC	BU GR
' <i>Acalles</i> ' species 1	E		FL	SS	BU GR
<i>Agacalles formosus</i> Broun	E		FL	VC	BU CA
<i>Agacalles integer</i> (Broun)	E		FL	VR	BU GR
<i>Agacalles species 1</i>	E		FL	SS	BU GR
<i>Allanalcis allostethus</i> (Broun)	E		FL	RR	BU GR
<i>Allanalcis incultus</i> (Broun)	E		FL	RR	BU GR
<i>Andracalles horridus</i> (Broun)	E		FL	VC	BU CA
<i>Andracalles vividus</i> (Broun)	E		FL	CC	BU CA
<i>Andracalles species 1</i>	E		FL	VR	BU GR
<i>Andracalles species 2</i>	E		FL	RR	BU CA
<i>Clypeolus brookesi</i> (Broun)	E		FL	SS	BU CA
<i>Clypeolus lachrymosus</i> (Broun)	E		FL	CC	BU CA
<i>Clypeolus pascoei</i> (Broun)	E		FL	CC	BU GR CA
<i>Clypeolus signatus</i> (Broun)	E		FL	CC	BU GR
<i>Crisius fasciculatus</i> (Broun)	E		FL	CC	BU CA
<i>Crisius variegatus</i> Broun	E		FL	CC	BU CA
<i>Dermothrius farinosus</i> (Broun)	E		FL	VC	BU GR
<i>Dermothrius ruficollis</i> (Broun)	E		FL	CC	BU GR
<i>Dermothrius sanguineus</i> (Broun)	E		FL	VR	BU GR
<i>Didymus erroneus</i> (Pascoe)	E		FL	VC	BU CA
<i>Didymus intutus</i> (Pascoe)	E		FL	CC	BU CA
<i>Didymus species 1</i>	E		FL	VC	BU OP CA
<i>Euthyrhinus squamiger</i> White	E		WD	RR	BU CA
<i>Getacalles ventralis</i> (Broun)	E		FL	CC	BU GR
<i>Indecentia nubila</i> Broun	E		FL	RR	BU CA
<i>Mecistostylus douei</i> Lacordaire	E		WD	VC	BU CA
<i>Mesoreda sulcifrons</i> Broun	E		WD	CC	BU CA
<i>Mesoreda species 1</i>	E		WD	CC	BU CA
<i>Metacalles aspersus</i> Broun	E		FL	VC	BU GR
<i>Metacalles species 1</i>	E		FL	RR	BU GR
<i>Microcryptorhynchus kronei</i> (Kirsch)	E		FL	VC	BU OP GR CA
<i>Microcryptorhynchus perpusillus</i> (Pascoe)	E		FL	VC	BU OP CA
<i>Microcryptorhynchus vafer</i> (Broun)	E		FL	VC	BU CA
<i>Microcryptorhynchus species 1</i>	E		FL	CC	BU GR
<i>Microcryptorhynchus species 2</i>	E		FL	CC	BU CA
<i>Notacalles leviculus</i> (Broun)	E		FL	VC	BU CA
<i>Notacalles species 1</i>	E		FL	CC	BU CA
<i>Notacalles species 2</i>	E		FL	CC	BU CA
<i>Notacalles species 3</i>	E		FL	RR	BU CA
<i>Omoecalles crisioides</i> (Broun)	E		FL	VC	BU CA
<i>Omoecalles ovatellus</i> (Broun)	E		FL	CC	BU CA
<i>Paromalina setigera</i> Broun	E		FL	CC	BU GR
<i>Paromalina vestita</i> Broun	E		FL	RR	BU GR
<i>Psepholax sulcatus</i> White	E		WD	VC	BU CA

Taxon (and no. of species)	Provenance	FR	Wing	Abundance	Habitat
<i>Scelodolichus altulus</i> Broun	E		FL	VC	BU GR
<i>Scelodolichus hilaris</i> Broun	E		FL	VR	BU GR
<i>Scelodolichus lineithorax</i> (Broun)	E		FL	VC	BU GR
<i>Strongylopterus hylobioides</i> (White)	E		FL	VC	BU CA
<i>Sympedius lepidus</i> Broun	E		FL	CC	BU CA
<i>Sympedius testudo</i> Pascoe	E		FL	CC	BU CA
<i>Sympedius vexatus</i> Pascoe	E		FL	CC	BU CA
<i>Tychanus ferrugatus</i> Pascoe	E		FL	VR	BU GR
<i>Tychanus gibbus</i> Pascoe	E		FL	CC	BU CA
<i>Tychanus verrucosus</i> Pascoe	E		FL	SS	BU CA
: Curculioninae: Molytini (9)					
<i>Arecophaga varia</i> Broun	E		WD	VR	BU CA
<i>Erymneus sharpi</i> Pascoe	E		FL	CC	BU GR
<i>Idus species 1</i>	E		FL	VR	BU GR
<i>Paedaretus hispidus</i> Pascoe	E		FL	VC	BU GR
<i>Phronira simplex</i> (Broun)	E		FL	VC	BU GR
<i>Phrynixus astutus</i> Pascoe	E		FL	VC	BU GR
<i>Phrynixus modicus</i> Broun	E		FL	CC	BU GR
<i>Pogonorrhinus opacus</i> (Broun)	E		WD	CC	BU GR
<i>Sosgenes longicollis</i> Broun	E		FL	RR	BU GR
: Rhynchophorinae (2)					
<i>Dryophthorus species 1</i>	I AU	FR	WD	RR	BU OP GR
<i>Sitophilus oryzae</i> (Linnaeus)	I	IM	WD	VC	OP GR
: Cossoninae (34)					
<i>Agastegnus aeneopiceus</i> (Broun)	E		WD	CC	BU CA
<i>Agastegnus simulans</i> (Sharp)	E		WD	CC	BU CA
<i>Allaorus rugosus</i> (Broun)	E		FL	VC	BU GR
<i>Camptoscopus planiusculus</i> (Broun)	E		WD	RR	BU CA
<i>Eiratus ornatus</i> Broun	E		WD	CC	BU GR
<i>Eiratus parvulus</i> Pascoe	E		WD	VC	BU CA
<i>Eucossonus setiger</i> (Sharp)	E		WD	CC	BU CA
<i>Euophryum rufum</i> (Broun)	E		WD	VC	BU OP BE CA
<i>Exomesites optimus</i> Broun	E		FL	VR	BU GR
<i>Heteropsis latirostris</i> Marshall	E		WD	SS	BU CA
<i>Heteropsis lawsoni</i> Wollaston	E		WD	VC	BU CA
<i>Heteropsis species 1</i>	E		WD	CC	BU CA
<i>Macrorhyncholus littoralis</i> (Broun)	I AU?		FL	SS	BE GR
<i>Macroscytalus parvicornis</i> (Sharp)	E		WD	VC	BU CA
<i>Macroscytalus remotus</i> (Sharp)	E		WD	CC	BU CA
<i>Microtribus brouni</i> (Wollaston)	E		FL	RR	BU CA
<i>Microtribus huttoni</i> Wollaston	E		FL	VC	BU GR
<i>Microtribus species 1</i>	E		FL	VR	BU GR
<i>Novitas dispar</i> Broun	E		FL	CC	BU BE GR
<i>Pachyops dubius</i> (Wollaston)	E		WD	VC	BU CA
<i>Pentarthrum zealandicum</i> Wollaston	E		WD	CC	BU CA
<i>Phloeophagosoma corvinum</i> Wollaston	E		WD	CC	BU GR
<i>Phloeophagosoma dilutum</i> Wollaston	E		WD	VC	BU OP CA
<i>Phloeophagosoma pedatum</i> Wollaston	E		WD	CC	BE GR
<i>Sericotrogus subaenescens</i> Wollaston	E		WD	VC	BU OP CA
<i>Stenotrupis debilis</i> (Sharp)	E		WD	RR	BU CA
<i>Stenotrupis wollastonianus</i> (Sharp)	E		WD	SS	BU CA
<i>Tanyosoma comatum</i> (Broun)	E		WD	VR	BU CA
<i>Torostoma apicale</i> (Broun)	E		WD	CC	BU CA
<i>Toura longirostris</i> (Wollaston)	E		WD	CC	BU CA
<i>Toura sharpiana</i> (Wollaston)	E		WD	CC	BU CA
<i>Touropsis brevirostris</i> (Sharp)	E		WD	CC	BU CA
<i>Touropsis species 1</i>	E		WD	SS	BU CA
<i>Unas conirostris</i> Marshall	E		WD	VR	BU CA
: Scolytinae (12)					
<i>Amasa truncata</i> (Erichson)	I AU		WD	RR	OP BE CA
<i>Chaetoptelius mundulus</i> (Broun)	E		WD	VC	BU CA
<i>Cryphalus waplery</i> (Eichhoff)	I AU		WD	VR	OP CA
<i>Dendrotrupes costiceps</i> Broun	E		WD	VC	BU CA
<i>Dendrotrupes vestitus</i> Broun	E		WD	CC	BU CA
<i>Dendrotrupes species 1</i>	E		WD	CC	BU CA
<i>Hylurgus ligniperda</i> (Fabricius)	I PA		WD	RR	OP CA
<i>Hypocryphalus species 1</i>	E		WD	VC	BU CA
<i>Hypocryphalus species 2</i>	E		WD	VC	BU OP CA
<i>Phloeosinus cupressi</i> Hopkins	I NA		WD	CC	OP CA
<i>Xyleborinus eucalypticus</i> (Schedl)	I AU	FR	WD	VC	BU OP BE CA
<i>Xyleborinus saxeseni</i> (Ratzeburg)	I PA		WD	RR	OP CA
: Platypodinae (1)					
<i>Platypus apicalis</i> White	E		WD	CC	BU CA

LEGEND Provenance: E, endemic; *, Lynfield type locality; I, introduced, foreign; AU, Australian; PA, Palearctic; NA, North American; SA, South American; ET, Ethiopian; IM, Indo-Malayan FR: first report from New Zealand Wing (condition): WD, winged; FL, flightless; WD FL, winged and flightless individuals Abundance: SS, single specimen; VR, very rare (2 or 3); RR, rare (4-10); CC, common (11-50); VC, very common (more than 50) Habitat: BU, bush; OP, open; BE, beach; GR, ground; CA, canopy.

ANNOTATED LIST OF SPECIES

RHYSODIDAE

'heraldic beetles'

Fig. 16
Rhysodidae*Rhyzodiastes
proprius**Kaveinga orbitosa* (Broun, 1880)

REMARKS: Usually found in decayed wood, but the single Lynfield specimen was extracted from a loamy soil sample 13–23 cm deep.

Kupeus arcuatus (Chevrolat, 1873)

REMARKS: Four found singly in decayed logs of *Knightia* and other trees, the remainder in spongy white rot caused by a *Phellinus* fungus (Hymenochaetaceae) in a large necrotic area of a live *Vitex* tree.

CARABIDAE

'ground beetles'

Fig. 17
Carabidae*Ctenognathus
novaeseelandiae*

CARABIDAE: Cicindelinae

'tiger beetles'

Neocicindela spilleri Van Nidek, 1965

REMARKS: Particularly common in the bush and in shady bush tracks; only occasionally in the open in gardens and paddocks.

Neocicindela tuberculata (Fabricius, 1775)

Fig. 117

REMARKS: In open stream beds and bush tracks; common in clay areas of paddocks, gardens, and coastal slopes.

CARABIDAE: Scaritinae

'ground beetles'

(assisted by B. P. Moore)

Clivina basalis Chaudoir, 1843^{a,b}

FIRST REPORTED IN N.Z.: P.J. Cameron and C.F. Butcher, 1980.

EARLIEST N.Z. RECORD: Lake Ohia, ND, 4 Feb 1917, T. Broun.

REMARKS: In stream beds. Recorded from ND, AK, SD.

Clivina vagans Putzeys, 1866^a

FIRST REPORTED IN N.Z.: T. Broun, 1880, under the misidentified name *C. rugithorax* Putzeys.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1870s, T. Broun.

REMARKS: In gardens, paddocks, chicken yards, and stream beds. Widespread in the North I.; also in NN and MC.

CARABIDAE: Bembidiinae

'ground beetles'

(assisted by B. P. Moore)

Paratachys crypticola (Brillon, 1960)^a

FIRST REPORTED IN N.Z.: E.B. Brillon, 1960.

EARLIEST N.Z. RECORD: Okauia, WO-BP, Feb 1924, at light, A.E. Brookes.

REMARKS: An introduced species of uncertain origin, but probably Palearctic. Present in AK, WO, CL, BP, GB, WI, and WN.

Tachys antarcticus Bates, 1874

REMARKS: In sifted decayed wood.

Tachys australis Schaum, 1863^a

FIRST REPORTED IN N.Z.: T. Broun, 1893b, under the name *Bembidium tersatum* Broun.

EARLIEST N.Z. RECORD: Mokohinau I., ND, before 1893, Sandager.

REMARKS: Common in damp ground. Recorded from ND, AK, WI, and WN.

Tachys captus Blackburn, 1888^{a,b}

EARLIEST N.Z. RECORD: Hikurangi, ND, 6 Aug 1927, E. Fairburn.

REMARKS: In a sheep paddock. Represented in NZAC by specimens from ND and AK.

CARABIDAE: Psydrinae

'ground beetles'

(assisted by B. P. Moore)

Mecyclothorax rotundicollis (White, 1846)^a

FIRST REPORTED IN N.Z.: A. White, 1846.

EARLIEST N.Z. RECORD: Bay of Islands, ND, in the early 1840s, Sinclair.

REMARKS: In gardens and paddocks. Treated as a New Zealand sibling of *M. punctipennis* (Macleay) by Moore (1984 and pers. comm.), but its occurrence in open fields makes it an unlikely candidate for endemic status in this country.

CARABIDAE: Pterostichinae

'ground beetles'

Aulacopodus calathoides (Broun, 1886)

REMARKS: Under logs in the daytime.

Aulacopodus sharpianus (Broun, 1893)

REMARKS: In stream bed in bush.

Laemostenus complanatus (Dejean, 1828)^a

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904.

EARLIEST N.Z. RECORD: Tairua, CL, early 1870s, T. Broun.

REMARKS: More commonly found near houses under heaps of wood or garden clippings.

Rhytisternus miser Chaudoir, 1865^a

FIRST REPORTED IN N.Z.: T. Broun, 1880, under the name *Holcaspis* (*Rhytisternus*) *rugifrons* Broun, 1880.

EARLIEST N.Z. RECORD: Auckland, AK, before 1880, Broun.

REMARKS: In open bush tracks, from stream bank and bed litter. Three Kings Is, ND, AK, CL, WO, TK, and WN.

Key to symbols after species names

^a introduced species ^b first report of this species in New Zealand

^c Lynfield is the type locality ^d taxonomic change; see pp. 76–81

CARABIDAE: Agoninae

'ground beetles'

(assisted by B. P. Moore)

***Ctenognathus bidens* (Chaudoir, 1878)**

REMARKS: Common at night on the bush floor.

***Ctenognathus cardiophorus* (Chaudoir, 1878)**

REMARKS: Stream beds and banks and bush floor.

***Ctenognathus novaezelandiae* Fairmaire, 1843^d Fig 17, 118**

REMARKS: On coastal slopes and cliffs, particularly in vegetation of the maritime zone.

Notagonum lawsoni* (Bates, 1874)**REMARKS: Common in stream bed vegetation and *Carex* swamps.Notagonum submetallicum* (White, 1846)^a**FIRST REPORTED IN N.Z.: A. White, 1846, under the name *Colpodes submetallicus* White.

EARLIEST N.Z. RECORD: "New Zealand", in the early 1840s.

REMARKS: On the ground and on vegetation.

CARABIDAE: Harpalinae

'ground beetles'

(assisted by B. P. Moore)

***Haplaner species 1*^{a,b}**

EARLIEST N.Z. RECORD: Mt Te Atuparapara, 1660 m, Ruahine Range, HB, 22 Feb 1970, G.W. Ramsay.

REMARKS: One in stream bed, one in Malaise trap. In NZAC also from BP, HB, WI, and WN. An undescribed species from Australia (B.P. Moore, pers. comm.).

***Hypharpax australis* (Dejean, 1829)^a**

FIRST REPORTED IN N.Z.: L. Redtenbacher, 1868.

REMARKS: Represented in NZAC by specimens from ND, AK, CL, WO, BP, GB, HB, RI, WN, SD, NN, MB, MC, CO, and Chatham Is.

Lecanomerus sharpi* (Csiki, 1932)**REMARKS: Common in *Gahnia setifolia* clusters of coastal slopes; occasionally in gardens and paddocks.Lecanomerus vestigialis* (Erichson, 1842)^a**FIRST REPORTED IN N.Z.: T. Broun, 1886, under the name *Lecanomerus stenopus* Broun.

EARLIEST N.Z. RECORD: Howick, AK, in the early 1880s, T. Broun.

REMARKS: In wrack, behind beaches, and in *Pennisetum* turf in paddock. Represented in NZAC by specimens from ND, AK, CL, GB, HB, WN, and NN.***Lecanomerus atriceps* (Macleay, 1871)^a**

FIRST REPORTED IN N.Z.: R.L.C. Pilgrim, 1963.

EARLIEST N.Z. RECORD: Swanson, AK, 22 Apr 1916, A.E. Brookes.

REMARKS: Widespread in ND, AK, and WN.

***Syllectus anomalus* (Bates, 1878)**

REMARKS: In stream bed.

CARABIDAE: Lebiinae

'ground beetles'

(assisted by B. P. Moore)

***Anomotarus illawarrae* (Macleay, 1873)^a**

FIRST REPORTED IN N.Z.: L. Scott, 1983.

EARLIEST N.Z. RECORD: Swanson, AK, 18 Dec 1955, J.C. Watt.

REMARKS: In *Gahnia setifolia* and coastal vegetation. An Australian species, so far found only in AK and WN.***Anomotarus variegatus* Moore, 1967^a**

FIRST REPORTED IN N.Z.: J.C. Watt, 1983.

EARLIEST N.Z. RECORD: Auckland, AK, 26 Mar 1941, D. Spiller.

REMARKS: Common in garden refuse and compost. In NZAC represented by specimens from ND, AK, WO, HB, WN, and NN.

Demetrida nasuta* White, 1846**REMARKS: Beaten from *Freyinetia banksii*.Philophloeus luculentus* (Newman, 1842)^{a,b}**

EARLIEST N.Z. RECORD: Katikati, BP, 8 Oct 1931, A.E. Brookes.

REMARKS: On plants, particularly in trunks with rough or loose bark. Represented in NZAC by specimens from AK, CL, BP, and TK.

CARABIDAE: Pentagonicinae

'ground beetles'

***Pentagonica vittipennis* Chaudoir, 1877^a**FIRST REPORTED IN N.Z.: T. Broun, 1880, under the name *Wakefieldia vittata* Broun.

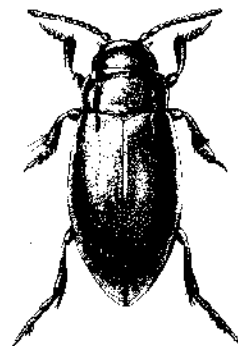
EARLIEST N.Z. RECORD: North I. ("different localities"), in the 1870s, T. Broun.

REMARKS: In stream beds, on *Gahnia setifolia*, and in Malaise trap. Represented in NZAC by specimens from ND, AK, CL, BP, SD, MB, NN, WD, MC, and FD.***Scopodes elaphroides* (White, 1846)**

REMARKS: In stream beds.

———— DYTISCIDAE ————

'water beetles'

Fig. 18
Dytiscidae*Liodessus
plicatus****Hyphydrus elegans* (Montrouzier, 1860)^a**FIRST REPORTED IN N.Z.: T. Broun, 1880, under the name *Hydroporus nitidicornis* Broun.

EARLIEST N.Z. RECORD: Marsden Point, ND, in the 1870s, Munro.

REMARKS: In water troughs and ponds. North I.

***Rhantus suturalis* (Macleay, 1825)^a**FIRST REPORTED IN N.Z.: D. Sharp, 1882, under the name *R. pulverosus* (Stephens).

EARLIEST N.Z. RECORD: "New Zealand", in the 1870s.

REMARKS: In ponds and water troughs.

———— PTILIIDAE ————

'feather-winged beetles'

(assisted by C. Johnson)

***Acrotichis inconspicua* (Matthews, 1874)^a**

FIRST REPORTED IN N.Z.: A. Matthews, 1874.

EARLIEST N.Z. RECORD: Auckland, AK, in the early 1870s, Lawson.

REMARKS: In garden refuse.

***Acrotichis montandoni* (Allibert, 1844)^a**

FIRST REPORTED IN N.Z.: C. Johnson, 1982.

EARLIEST N.Z. RECORD: Lynfield, AK, 1 May 1976, G. Kuschel.

REMARKS: In mixed compost.

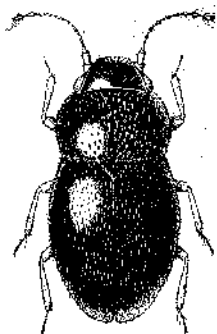


Fig. 19
Ptiliidae

*Notoptenidium
lawsoni*

***Acrotrichis subcognata* Johnson, 1975^a**

FIRST REPORTED IN N.Z.: C. Johnson, 1975a.

EARLIEST N.Z. RECORD: Auckland Is, 19 Apr 1947, J.H. Sorensen.

REMARKS: In garden compost.

***Actidium angulicolle* Johnson, 1982^c**

REMARKS: In moss mats of *Hypnodendron arcuatum* and *Echinodium hispidum* on steep slopes by streams. Known only from Lynfield.

***Actidium lineare* Matthews, 1874**

REMARKS: On the seashore behind the splash-zone.

***Cissidium foveolatum* Johnson, 1982^c**

REMARKS: In litter and decayed wood.

***Dipentium zelandicum* Johnson, 1982**

REMARKS: In humified logs and soil.

***Kuschelidium maori* Johnson, 1982^c**

REMARKS: One specimen found in *Gahnia setifolia*, the other extracted from a moss mat. Lynfield is the only place the genus as well as the species is known from.

***Nellosana grandis* Johnson, 1982^c**

REMARKS: In leaf litter. Known from Lynfield only.

***Nellosana intermedia* Johnson, 1982^c**

REMARKS: In decayed wood. Known from Lynfield only.

***Nellosana minima* Johnson, 1982^c**

REMARKS: In decayed wood, and on branch of *Knightia excelsa* with *Trametes cinnabarinus* (Polyporaceae).

***Nephanes titan* (Newman, 1834)^a**

FIRST REPORTED IN N.Z.: C. Johnson, 1982.

EARLIEST N.Z. RECORD: Lynfield, AK, 2 Mar 1975, G. Kuschel.

REMARKS: In garden compost.

***Notoptenidium crassum* Johnson, 1982^c**

REMARKS: Nearly all collected in association with *Mesoponera* ant runs. Known from Lynfield only.

***Notoptenidium lawsoni* (Matthews, 1873)**

Fig. 19, 119

REMARKS: In leaf litter and decayed wood.

***Notoptenidium oblongum* Johnson, 1982^c**

REMARKS: Two obtained in deep pit-traps set for hypogean fauna, and one in *Mesoponera castanea* ant runs. Known from Lynfield only.

***Oligella foveolata* (Allibert, 1844)^a**

FIRST REPORTED IN N.Z.: C. Johnson, 1982.

EARLIEST N.Z. RECORD: Lynfield, AK, 15 Sep 1974, G. Kuschel.

REMARKS: In garden compost.

***Ptenidium laevigatum* Erichson, 1845^a**

FIRST REPORTED IN N.Z.: C. Johnson, 1982.

EARLIEST N.Z. RECORD: Lynfield, AK, 3 Oct 1974, G. Kuschel.

REMARKS: In gardens and paddocks; common in compost heaps.

***Ptenidium punctatum* (Gyllenhal, 1827)^a**

FIRST REPORTED IN N.Z.: C. Johnson, 1982.

EARLIEST N.Z. RECORD: Lynfield, AK, 23 Jul 1974, G. Kuschel.

REMARKS: Halophilous; found in seashore wrack and occasionally in garden compost.

***Ptenidium pusillum* (Gyllenhal, 1808)^a**

FIRST REPORTED IN N.Z.: C. Johnson, 1982.

EARLIEST N.Z. RECORD: Lynfield, AK, 23 Jul 1974, G. Kuschel.

REMARKS: In garden compost.

***Ptiliodes amplicollis* Johnson, 1982^c**

REMARKS: In wrack on seashore.

***Ptiliodes austerus* Johnson, 1982^c**

REMARKS: In wrack on seashore.

***Ptinella acaciae* Johnson, 1982^c**

REMARKS: In decayed *Acacia mearnsii* and *Knightia excelsa* infested by *Ganoderma applanatum* (Polyporaceae).

***Ptinella cavelli* (Broun, 1893)**

REMARKS: On *Cordyline banksii*.

***Ptinella confusa* Johnson, 1982^c**

REMARKS: In decayed wood. Known from Lynfield only.

***Ptinella ferruginea* Johnson, 1982^c**

REMARKS: In decayed wood.

***Ptinella taylorae* Johnson, 1977**

REMARKS: In decayed wood. A New Zealand species naturalised in England and Ireland.

***Ptinella watti* Johnson, 1982^c**

REMARKS: In decayed wood.

———— **AGYRTIDAE** ————

'burying beetles'

(assisted by A. F. Newton)

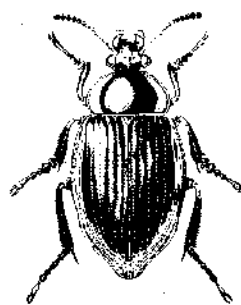


Fig. 20
Agyrtidae

'*Necrophilus*
prolongatus

'*Necrophilus*' *prolongatus* (Sharp, 1881)

Fig. 20, 120

REMARKS: On carrion. Adults hide away in deep cracks and hollows of steep, shady hillsides and stream banks in bush.

———— **LEIODIDAE** ————

'carrion beetles'

(assisted by A. F. Newton)

LEIODIDAE: Leiodinae

***Colenisia* sp.**

REMARKS: In bush-floor litter.

***Isocolon hilare* Broun, 1893**

REMARKS: In amongst ground plants and bush-floor litter.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76–81

LEIODIDAE : LEIODINAE (cont.)

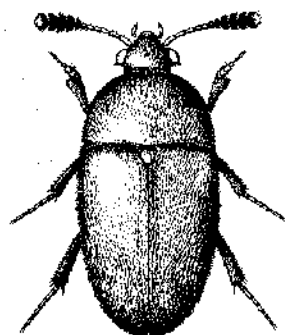


Fig. 21
Leiodidae

Colon hirtale

Zeadolopus maoricus Daffner, 1985

REMARKS: In bush litter.

Zeadolopus spinipes Broun, 1903

REMARKS: In bush litter.

Zeadolopus validipes Daffner, 1985

REMARKS: In bush litter.

Genus 1 species 1

REMARKS: From grass mats of *Oplismenus* and *Microlaena*, and especially from an agaric sample taken in the bush.

Genus 1 species 2

REMARKS: In decayed *Knightia* log.

LEIODIDAE: Camlarinae

Agyrtodes disparatus Szymczakowski, 1966

REMARKS: On *Auricularia polytricha*. Occasionally also on *Phellinus* fungus and in coarse bush floor litter.

Agyrtodes hunuensis (Broun, 1893)

REMARKS: In litter and amongst *Gahnia* plants. Few under logs and in the cracks of stream banks.

Agyrtodes nebulosus (Broun, 1880)

REMARKS: On *Ganoderma applanatum* and in decayed wood.

Baeosilpha rufescens Broun, 1895

REMARKS: In decayed *Melicytus ramiflorus* wood.

Camiarites convexus (Sharp, 1876)

REMARKS: In bush litter.

Camiarus thoracicus Sharp, 1876

REMARKS: Amongst ground plants and in litter.

Inocatops concinnus (Broun, 1880)

REMARKS: In bush floor litter and *Ptychomnion* moss mats.

Zearagyrtodes maculifer (Broun, 1880)

REMARKS: Confined to *Ganoderma applanatum* in Lynfield bush. Adults and larvae in large numbers in the white underside of this bracket fungus at all times.

Genus 1 species 1

REMARKS: In mixed bush litter, under rotten *Pinus radiata* washed into the reserve by flooding, and in decayed *Knightia* logs.

LEIODIDAE: Colinae

Colon hirtale (Broun, 1880)

Fig 21, 121

REMARKS: Occasionally in bush litter; common in cracked, undermined stream banks; numerous in Malaise traps.

LEIODIDAE: Cholevinae

Mesocolon alacre (Broun, 1880)

REMARKS: In carrion, and easily attracted with bait.

Paracatops lugubris (Sharp, 1882)

REMARKS: In carrion, and readily baited.

Pseudonemadus lituratus (Broun, 1880)

REMARKS: In carrion, but much less frequent than the other two cholevine species.

SCYDMAENIDAE

'stone beetles'

(assisted by H. Franz)

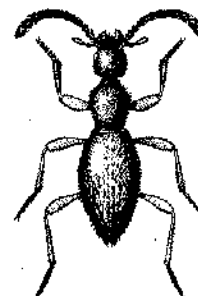


Fig. 22
Scydmaenidae

Adrastia clarkei

Euconnus calvus (Broun, 1880)^d

REMARKS: In leaf litter.

Euconnus setosus (Sharp, 1874)^d

REMARKS: At base of *Carex lambertiana*, *C. dissita*, and *Uncinia banksii* on bush floor, and in *Ptychomnion aciculare* moss mats.

Euconnus species 1

REMARKS: In a hollow *Sophora microphylla*.

Magellanoconnus galerus (Broun, 1885)^d

REMARKS: From sifted wood by *Mesoponera castanea* ant runs under a large *Metrosideros excelsa* tree.

Maorinus angulatus (Broun, 1893)^d

REMARKS: In *Gahnia lacera* litter on coastal cliffs and at bases of large, old *Metrosideros excelsa* trees.

Microscydms lynfieldi Franz, 1977^{c d}

REMARKS: Obtained from decayed wood of various trees. Lynfield is also the type locality for the synonym *M. omahutensis* Franz, 1977. The holotypes were found together in fairly old, decaying *Melicytus ramiflorus* still protected by its bark.

Microscydms species 1

REMARKS: In decayed wood. A series was found in spongy white rot caused by a *Phellinus* fungus (Hymenochaetaeaceae) at a large, necrotic area on a live *Vitex lucens*.

Microscydms species 2

REMARKS: In *Ptychomnion aciculare* moss mat in amongst *Gahnia setifolia* under *Leptospermum scoparium* canopy.

Microscydms species 3

REMARKS: One in decayed *Acacia mearnsii* in native bush, and one in hollow *Sophora microphylla*.

Neuraphoconnus kuscheli Franz, 1977^c

REMARKS: Extracted from leaf mould in hollow of an old, diseased *Knightia excelsa*. Known from Lynfield only.

Neuraphoconnus species 1

REMARKS: In decayed wood and hollow logs.

Neuraphoconnus species 2

REMARKS: In decayed wood and mould in hollow logs.

Neuraphoconnus species 3

REMARKS: In decayed wood and *Salix fragilis* mould.

Sciacharis fulva Broun, 1893^d

REMARKS: In leaf litter.

Sciacharis lanosa (Broun, 1886)^d

REMARKS: At the base of *Astelia banksii* on coastal cliffs.

Sciacharis puncticollis (Broun, 1880)^d

REMARKS: In decayed wood and in the leaf mould of tree hollows.

Sciacharis sannio (Franz, 1977)^c

REMARKS: In decayed wood, especially in large stump roots buried in soil.

Sciacharis taranakii Franz, 1981^d

REMARKS: In leaf litter at base of a large *Vitex lucens* tree.

Stenichnaphes newtoni Franz, 1985

REMARKS: One from *Salix fragilis* wood mould in *Carex lessoniana* swamp, another in Malaise trap. Known also from Tawhiti Rahi (Poor Knights Is) ND, Napier HB, and Pelorus Bridge MB (the type locality).

Stenichnaphes urbanus Franz, 1980^{c,d}

REMARKS: Frequently found at base of *Astelia banksii* and *Phormium tenax*; occasionally in *Phellinus* white rot, in logs, and in hollow trunks of live *Corynocarpus laevigatus*. Easily caught in Malaise trap. Genus and species described from Lynfield specimens only. Recorded from the Moko-hinau Is ND to Pelorus Bridge MB.

Stenichnaphes species 1

REMARKS: Caught in Malaise trap.

Stenichnus kuschelianus Franz, 1977^c

REMARKS: Amongst *Gahnia lacera* plants (holotype); a second specimen found inside a hollow, live *Sophora microphylla*. Known only from Lynfield.

Stenichnus species 1

REMARKS: One found inside hollow *Metrosideros*, another in decayed wood.

SCAPHIDIIDAE

'skiff beetles'

(assisted by I. Löbl)

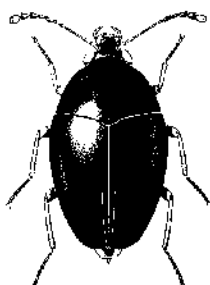


Fig. 23
Scaphidiidae

Baeocera
scutellaris

'Baeocera' scutellaris (Redtenbacher, 1867) Fig. 23, 122

REMARKS: In decayed *Corynocarpus laevigatus*, *Hedycarya arborea*, and *Melicope ternata*.

Brachynopus latus (Broun, 1881)

REMARKS: Common in bush floor litter, occasionally also in decayed wood.

Scaphisoma actuosum Broun, 1881

REMARKS: In decayed wood.

Scaphisoma sternale (Broun, 1914)

REMARKS: In leaf litter of coastal slopes.

Scaphisoma species 1

REMARKS: On *Fuscoporia dryophila* (Hymenochaetaceae) throughout the year.

Key to symbols after species names

^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality. ^d taxonomic change; see pp. 76–81

Scaphisoma species 2

REMARKS: On *Amanita muscaria* under *Pinus radiata* in bush, among small *Carex* and *Uncinia* plants on bush floor, and in Malaise trap.

Genus 1 species 1

REMARKS: In decayed wood.

STAPHYLINIDAE

'rove beetles'

(assisted by P. M. Hammond)



Fig. 24
Staphylinidae

Holotrichus
ferrugineus

STAPHYLINIDAE: Proteininae

Nesoneus acuticeps Bernhauer, 1939

REMARKS: In damp beetle frass under bark of *Melicytus ramiflorus* and *Cordyline banksii* and on standing *Hedycarya arborea* stems infested by *Gloeoporus adustus* fungus (Corticaceae).

Silphotelus nitidus Broun, 1895

REMARKS: In fairly dry leaf litter of *Alseuosmia macrophylla* and *Brachylottis repanda*, but particularly abundant on bush floor Agaricales including *Amanita muscaria*. Occasionally on *Tricholoma pessundatum* fungus, and especially on the polyporoid *Irpex brevis*.

STAPHYLINIDAE: Omaliinae

Brouniellum hilarum (Broun, 1914)

REMARKS: On plants, and especially on days-old cut branches of *Schefflera digitata* hung on trees.

Ischnoderus genalis (Broun, 1880)

REMARKS: Beaten singly from *Hedycarya*, *Melicytus*, and *Vitex*; some caught in Malaise trap.

Ischnoderus tectus (Broun, 1880)

REMARKS: On days-old cut branches of *Schefflera digitata* and *Pütosporum crassifolium*; on dead *Rhopalostylis sapida* palm leaves; occasionally under bark; readily caught in Malaise trap.

Microsilpha sp.

REMARKS: In leaf litter of *Vitex lucens* gathered between root buttresses.

Omaliomimus litoreus (Broun, 1886)

REMARKS: In wrack on estuary shores.

Omalius allardi Fairmaire & Brisout, 1859^{a,b}

EARLIEST N.Z. RECORD: Lynfield, AK, 5 Oct 1974, G. Kuschel, straw sample 74/60.

REMARKS: In poultry straw of hen-house.

Paraphloeostiba gayndahensis (Macleay, 1871)^{a,b}

EARLIEST N.Z. RECORD: Auckland City, AK, 26 Mar 1944, on decaying rock melon, D. Spiller.

REMARKS: On fermenting fruits, in fresh lawn clippings, in compost bin, on *Uromycladium notabile* galls of *Acacia mearnsii*, and among older bracts of *Musa* inflorescences.

STAPHYLINIDAE : OMALIINAE (cont.)

Stenomalius cotti Bernhauer, 1939

REMARKS: One from moss and liverworts above a stream bank, one at back of seashore.

Stenomalius helmsi (Cameron, 1945)

REMARKS: On dead fish at beach and sheep carcass at bush margin.

Stenomalius moniliferum (Broun, 1893)

REMARKS: In hanging dead fronds of *Cyathea medullaris*; also in twigs of *Schefflera digitata*.

Stenomalius philpotti (Broun, 1894)

REMARKS: One obtained from sifted beaten fronds of *Cyathea medullaris* hanging against a tree-fern trunk.

Stenomalius spadix (Broun, 1880)

REMARKS: In forest floor litter, particularly in heaped-up fresh litter.

Stenomalius sulcithorax (Broun, 1880)

REMARKS: In bush floor litter, especially if enriched with fresh lamb or chicken bones.

STAPHYLINIDAE: Oxytelinae

Anotylus brunneipennis (Macleay, 1873)^a

FIRST REPORTED IN N.Z.: M. Cameron, 1950, under the name *Oxytelus crookesi* Cameron.

EARLIEST N.Z. RECORD: Mt Roskill, AK, Mar 1948, A.E. Brookes.

REMARKS: In fermenting fruits, garden refuse, clippings and prunings, and dung.

Anotylus complanatus (Erichson, 1839)^a

FIRST REPORTED IN N.Z.: A. Fauvel, 1900.

EARLIEST N.Z. RECORD: Otago, 1877, F.W. Hutton.

REMARKS: In fermenting fruit, lawn clippings, garden compost, and sheep and chicken manure. Common in cities and farmland throughout the country.

Anotylus semirufus (Fauvel, 1877)^a

FIRST REPORTED IN N.Z.: T. Broun, 1880, under the name *Omalium tibiale* Broun.

EARLIEST N.Z. RECORD: Tairua, CL, in the 1870s, T. Broun.

REMARKS: In fermenting fruits, garden compost, dung, and dryish old carcasses.

Anotylus vinsoni (Cameron, 1936)^a

FIRST REPORTED IN N.Z.: P.M. Hammond, 1976.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.

REMARKS: In garden refuse, chicken yard, and sheep paddock; quite common in native vegetation too, especially in shady stream beds.

Anotylus species 1^{a,b}

EARLIEST N.Z. RECORD: Palmerston North, WI-WN, 25 June 1931, W. Cottier.

REMARKS: In fermenting fruits, lawn clippings, garden compost heap, and dung.

Blediotrogus guttiger Sharp, 1900

REMARKS: Halophilous; in wrack.

Carpelimus bilineatus (Stephens, 1834)^{a,b}

EARLIEST N.Z. RECORD: Mt Te Aroha, BP, undated, Broun Coll. (NZAC).

REMARKS: In compost bins and at back of beach.

Carpelimus corticinus (Gravenhorst, 1806)^{a,b}

EARLIEST N.Z. RECORD: Takaka Hill, NN, 7 Oct 1964, G. Kuschel.

REMARKS: In chicken yard, sheep paddock, and back of seashore, but especially in bare silt of shady stream beds.

Carpelimus pusillus (Gravenhorst, 1802)^{a,b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 14 Sep 1974, G. Kuschel.

REMARKS: In silt of shady stream bed.

Carpelimus zealandicus (Sharp, 1900)

REMARKS: In gardens, paddocks, and chicken yards, but particularly common in silt of stream beds and seepages of coastal mudstone cliffs. Established in British Isles.

Carpelimus species 1

Fig. 123

REMARKS: Depigmented, pale yellow; found in seeping silty loam in the top 20 cm of soil, sometimes at ground level if under a thick mat of *Ptychomnion aciculare* moss or *Oplismenus imbecillus* grass. Readily obtained in deep pit-traps. The only blind staphylinid obtained at Lynfield.

Oxytelus sculptus Gravenhorst, 1806^a

FIRST REPORTED IN N.Z.: T. Broun, 1880 under the name *Omalium pullum* Broun.

EARLIEST N.Z. RECORD: Parua, ND, in the 1870s, T. Broun.

REMARKS: In compost bins and poultry straw.

Teropalpus coloratus (Sharp, 1900)

REMARKS: On seashore. Adults and larvae meet incoming tides or follow outgoing tides to about 10 m from the heaped-up wrack, more so at night than in the daytime. No intertidal adults or larvae observed.

Teropalpus unicolor (Sharp, 1900)

REMARKS: Halophilous. At least the adults of this species can be truly intertidal for two or more hours in coarsely gravelly areas 20 m or more from the high tide wrack. Established in the United Kingdom.

STAPHYLINIDAE: Osoriinae

Paratorchus brevipennis (Broun, 1893)

REMARKS: In litter, but particularly in the leaf mould of hollow trees, e.g., *Sophora microphylla*.

STAPHYLINIDAE: Eleusiminae

Zeoleusis virgula (Fauvel, 1889)

REMARKS: In fibrous tissues of broken branches of *Melicytus ramiflorus* and *Corynocarpus laevigatus* and dead stems of *Cordylus banksii* and *Freycinetia baueriana*.

STAPHYLINIDAE: Paederinae

Astenus guttula Fauvel, 1877^{a,b}

EARLIEST N.Z. RECORD: Beeby's Knob, NN, 1929, E.S. Gourlay.

REMARKS: Exceedingly common in gardens and pastures.

Hyperomma dispersum Broun, 1893

REMARKS: In bush floor litter.

Hyperomma mandibulare Broun, 1893

REMARKS: In amongst moss and ferns of damp slopes by small streams.

Hypomedon debilicornis (Wollaston, 1857)^{a,b}

EARLIEST N.Z. RECORD: Auckland, AK, 6 Jul 1949, in packing straw, M.R. Peace.

REMARKS: In lawn and mixed garden compost, sheep paddock, and hen-house.

Lithocharis nigriceps Kraatz, 1859^{a,b}

EARLIEST N.Z. RECORD: Palmerston North, WI-WN, 27 January 1975, M.J. Esson.

REMARKS: In lawn clippings, compost, and sheep paddock.

Lithocharis ventralis (Broun, 1880)

REMARKS: On bush floor and stream bed.

Lithocharis vilis (Kraatz, 1859)^{a,b}

EARLIEST N.Z. RECORD: Lynfield, Tropicana Drive, AK, 2 Mar 1975, sample 75/16, G. Kuschel.

REMARKS: In garden compost and sheep paddock.

Lobrathium bipartitum (Fauvel, 1878)^{a,b}

EARLIEST N.Z. RECORD: Auckland, AK, 6 Jul 1961, B.M. May.

REMARKS: In garden and paddock.

- Medon zeelandicus* Redtenbacher, 1867 Fig. 124
REMARKS: In litter on bush floor.
- Scimbalium laetum* Blackburn, 1888^{a b}
EARLIEST N.Z. RECORD: Waiheke I., AK, 18 Aug 1941, C. Chamberlain.
REMARKS: In lawn clippings and sheep paddock.
- Sunius propinquus* (Brisout, 1867)^a
FIRST REPORTED IN N.Z.: N.A. Martin, 1983.
EARLIEST N.Z. RECORD: Methven, MC, Dec 1911, T. Hall.
REMARKS: In sheep paddock under *Acacia mearnsii*.

STAPHYLINIDAE: Staphylininae

- Caflus algophilus* (Broun, 1894)
REMARKS: In wrack and in sand under algae.
- Caflus quadriimpressus* (White, 1846)
REMARKS: In wrack and in sand under algae.
- Creophilus oculus* (Fabricius, 1775)^a
FIRST REPORTED IN N.Z.: J.C. Fabricius, 1775.
EARLIEST N.Z. RECORD: "Nova Zelandia", 1769–1770, J. Banks & D. Solander.
REMARKS: On carrion in paddocks and at seashore.
- Gabrieus nigrilulus* (Gravenhorst, 1802)^a
FIRST REPORTED IN N.Z.: T. Broun, 1880, under the name *Staphylinus ovicollis* Broun.
EARLIEST N.Z. RECORD: Whangarei Harbour, ND, in the 1870s, T. Broun.
REMARKS: On seashore.
- Gabronthus sulcifrons* (Sharp, 1889)^{a b}
EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 1 Jan 1975, G. Kuschel.
REMARKS: In sheep paddock, particularly where sheep shelter under an *Acacia mearnsii* grove.
- Gyrophypnus fracticornis* (Mueller, 1776)^a
FIRST REPORTED IN N.Z.: C.M. Wakefield, 1874, as *Xantholinus punctulatus* Paykull.
EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.
REMARKS: In sheep paddock under *Acacia mearnsii*.
- Leptacinus pusillus* (Stephens, 1833)^{a b}
EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 2 Mar 1975, sample 75/16, G. Kuschel.
REMARKS: In lawn clippings, compost bin, sheep paddock, and wrack on seashore.
- Neohypnus andinus* (Fauvel, 1866)^{a b}
EARLIEST N.Z. RECORD: Kaitia, ND, Aug 1973, J. Gourves.
REMARKS: In lawn and garden compost, chicken coop, and sheep paddock.
- Neoxantholinus brouni* (Sharp, 1876)
REMARKS: In *Pinus radiata* stump and hollow *Salix fragilis*.
- Notolinus socius* (Fauvel, 1877)^a
FIRST REPORTED IN N.Z.: T. Broun, 1880 under the name *Xantholinus anthracinus* Broun, 1880.
EARLIEST N.Z. RECORD: Whangarei Harbour, ND, in the 1870s, T. Broun.
REMARKS: In mixed garden compost and chicken yard.
- Pachycorynus fulvipes* (Broun, 1880)
REMARKS: One from wood mould in hollow of old *Knightia excelsa*, another from partly buried stump of *Hedycarya arborea*.
- Paracorynus arecae* (Broun, 1880)
REMARKS: In dead branches, particularly those attacked by *Platypus apicalis*.

- Philonthus longicornis* Stephens, 1832^a
FIRST REPORTED IN N.Z.: A. Fauvel, 1900.
EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.
REMARKS: On fermenting vegetables and in paddock.
- Philonthus parvus* Sharp, 1874^{a b}
EARLIEST N.Z. RECORD: Utiku, RI, 27 July 1917, J. Ford.
REMARKS: In lawn compost, poultry straw, and old carcasses.
- Philonthus politus* (Linnaeus, 1758)^a
FIRST REPORTED IN N.Z.: C.A.A. Fauvel, 1900, as *P. aeneus* auct.
EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.
REMARKS: On carrion.
- Philonthus pyropterus* Kraatz, 1859^{a b}
EARLIEST N.Z. RECORD: Lynfield, AK, 25 Jan 1975, G. Kuschel.
REMARKS: In lawn clippings, garden compost, and sheep paddock.
- Philonthus rectangulus* (Sharp, 1874)^{a b}
EARLIEST N.Z. RECORD: Upper Moutere, NN, 6 Oct 1970, M.J. Esson.
REMARKS: In compost bins, and in sheep paddocks, especially at sheltering areas under trees.
- Philonthus sordidus* (Gravenhorst, 1802)^a
FIRST REPORTED IN N.Z.: T. Broun, 1880, under the name *P. impressifrons* Broun.
EARLIEST N.Z. RECORD: Parua, ND, in the 1870s, T. Broun.
REMARKS: In lawn and mixed compost, paddocks, and hen-house.
- Thyrecephalus orthodoxus* (Olliff, 1887)^a
FIRST REPORTED IN N.Z.: P.J. Cameron & C.F. Butcher, 1980.
EARLIEST N.Z. RECORD: Papatoetoe, AK, Apr 1955, J.C. Wall.
REMARKS: In gardens and paddocks, occasionally in bush.

STAPHYLINIDAE: Euaesthetinae

- Agnosthaetus brouni* Bernhauer, 1939
REMARKS: On a stream bank by a small waterfall, and in ground-plant litter.
- Edaphus beczedesi* Reitter, 1914^{a b}
EARLIEST N.Z. RECORD: Lynfield, AK, 18 Jan 1981, Malaise trap, G. Kuschel.
REMARKS: In a small, open space in the bush 10 m from margin, close to gardens.

STAPHYLINIDAE: Tachyporinae

- Sepedophilus acerbus* (Broun, 1880)
REMARKS: Associated with *Ganoderma applanatum*.
- Sepedophilus atricapillus* (Broun, 1880)
REMARKS: On standing stumps with *Ganoderma applanatum*; also in rotten *Cordyline banksii*.
- Sepedophilus auricomus* (Broun, 1880)
REMARKS: On standing stumps infested by *Ganoderma applanatum*, *Trametes cinnabarina*, *Irpex brevis*, *Auricularia polytricha*, and *Phellinus* spp.; also on *Amanita muscaria*.
- Sepedophilus austerus* (Broun, 1880)
REMARKS: In litter; also on and in rotten logs.
- Sepedophilus brevicornis* (Broun, 1893)
REMARKS: In decayed wood.
- Sepedophilus flavithorax* (Broun, 1880) Fig. 125
REMARKS: On plants, especially *Banksia* and *Freycinetia*, and on freshly broken, hanging branches.
- Sepedophilus laetulus* (Broun, 1914)
REMARKS: In litter of ground plants, e.g., *Carex*, *Uncinia*, *Schoenus*.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76–81

STAPHYLINIDAE : TACHYPORINAE (cont.)

Sepedophilus largulus (Broun, 1880)

REMARKS: On *Ganoderma applanatum* and in hollow trees; also in cracks of stream banks.

Sepedophilus maculosus (Broun, 1880)

REMARKS: In litter and decayed wood, and on *Auricularia polytricha*.

Sepedophilus nubilus (Broun, 1880)

REMARKS: In decayed wood.

Sepedophilus species 1

REMARKS: In a buried tree-fern log.

Tachyporus nitidulus (Fabricius, 1781)^a

FIRST REPORTED IN N.Z.: N.A. Martin, 1983.

EARLIEST N.Z. RECORD: Owairaka, AK, 14 Oct 1941, D. Spiller.

REMARKS: In garden and paddocks, especially in mixed compost and prunings.

STAPHYLINIDAE: Aleocharinae

Aleochara puberula (Klug, 1833)^{a b}

EARLIEST N.Z. RECORD: Haumoana, HB, 26 Jan 1959, B.M. May.

REMARKS: On dry carcasses.

Aloconota sulcifrons (Stephens, 1832)^a

FIRST REPORTED IN N.Z.: A. Fauvel, 1900, as *Atheta pavens* Erichson.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.

REMARKS: In gravel of stream bed.

Amischa analis (Gravenhorst, 1802)^a

FIRST REPORTED IN N.Z.: A. Fauvel, 1900.

EARLIEST N.Z. RECORD: Riccarton, MC, in the 1870s, C.M. Wakfield.

REMARKS: In compost heaps.

Amischa decipiens (Sharp, 1869)^{a b}

EARLIEST N.Z. RECORD: Otaki, WN, 25 Mar 1959, A.C. Eyles.

REMARKS: In paddock under *Acacia mearnsii* tree.

Aphytopus gracilis Sharp, 1886

REMARKS: In litter.

Aphytopus porosus (Broun, 1912)

REMARKS: In litter at base of bush *Carex* species and on *Hymenochaete* fungus.

Atheta amicula (Stephens, 1832)^a

FIRST REPORTED IN N.Z.: A. Fauvel, 1900.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.

REMARKS: In lawn clippings and garden compost, and in sheep paddock.

Atheta atriceps (Broun, 1880)

REMARKS: In bush floor litter, especially when enriched with garden compost; common on *Amanita muscaria* in bush growing under a *Pinus radiata* tree.

Atheta coriaria (Kraatz, 1858)^a

FIRST REPORTED IN N.Z.: A. Fauvel, 1900.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.

REMARKS: In compost bins, chicken yard, and inflorescence of an ornamental *Musa* species.

Atheta cottieri Cameron, 1945^a

FIRST REPORTED IN N.Z.: M. Cameron, 1945.

EARLIEST N.Z. RECORD: Palmerston North, WI-WN, Feb 1930, W. Cottier.

REMARKS: In garden compost, sheep paddock, and stream bed, and on beach.

Atheta politula Fauvel, 1878^a

FIRST REPORTED IN N.Z.: M. Bernhauer, 1943, as *A. splendidicollis* Bernhauer.

REMARKS: In paddock under *Acacia mearnsii* trees and in stream bed in bush.

Atheta zealandica Cameron, 1945^a

FIRST REPORTED IN N.Z.: M. Bernhauer, 1943, as *A. pseudocoriaria* Bernhauer.

EARLIEST N.Z. RECORD: Methven, MC, Dec 1911, T. Hall.

REMARKS: In fermenting fruits, lawn clippings, garden compost, henhouse straw, sheep paddock, and dead fish on sea shore; rarely on *Gloeoporus adustus* on dead *Hedycarya*.

Atheta species 1^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 1 Jan 1975, G. Kuschel.

REMARKS: In compost heaps and bins, chicken yard, and sheep paddock; also on beach.

Atheta species 2

REMARKS: Under *Ptychomnion aciculare* moss and at base of small *Carex* in bush.

Atheta species 3^{a b}

EARLIEST N.Z. RECORD: Lynfield, AK, 12 Sep 1974, sample 74/50, G. Kuschel.

REMARKS: In garden compost.

Atheta species 4^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 2 Feb 1975, G. Kuschel.

REMARKS: In paddock under *Acacia mearnsii* trees.

Atheta species 5^{a b}

EARLIEST N.Z. RECORD: Lynfield, AK, 11 Dec 1976, in stream gravel, G. Kuschel.

REMARKS: In stream bank and gravel.

Austrocalea brookesi (Cameron, 1950)^a

FIRST REPORTED IN N.Z.: M. Cameron, 1950.

EARLIEST N.Z. RECORD: Avondale, AK, 16 May 1939, ex shelf fungus, K. Harrow.

REMARKS: In garden in compost bins, and in paddock and chicken yard.

Botromana vulcanica (Broun, 1894)

REMARKS: In leaf litter.

Botromana species 1

REMARKS: On standing dead *Hedycarya arborea* infested by *Gloeoporus adustus*; easily baited with garden refuse and vegetables placed on bush floor.

Botromana species 2

REMARKS: On carrion.

Crataerea suturalis (Mannerheim, 1830)^{a b}

EARLIEST N.Z. RECORD: Timaru, SC, 5 Dec 1941, D. Spiller.

REMARKS: In henhouse straw.

Digrammus miricollis (Fauvel, 1900)

REMARKS: On *Pittosporum tenuifolium* at fibrous area of broken branch.

Encephalus latulus (Broun, 1894)

REMARKS: In decayed wood and bush floor litter.

Falagria concinna (Erichson, 1840)^{a b}

EARLIEST N.Z. RECORD: Auckland City, AK, 6 Jul 1949, in packing straw, ?N.R. Peace.

REMARKS: A single specimen on ground in garden.

Gyronotus rufipennis (Broun, 1880)

REMARKS: Halophilous; on seashore.

Gyrophana oligotina Cameron, 1945

REMARKS: In decayed wood.

Gyrophana punctata Broun, 1880

REMARKS: In stumps of *Sophora microphylla* and *Melicope ternata*, and in epiphytes on *Salix fragilis*.

Gyrophæna species 1

REMARKS: In decayed wood.

Gyrophæna species 2REMARKS: On decayed wood with *Fuscoporia dryophila* and *Phellinus* spp.**Gyrophæna species 3**REMARKS: In decayed wood and in *Carex* and *Uncinia* litter on bush floor.**Gyrophæna species 4**REMARKS: In decayed *Melicetus ramiflorus* wood and in *Alseuosmia*, *Brachyglottis*, and *Myrsine* litter.**Gyrophæna species 5**

REMARKS: In decayed wood.

Gyrophæna species 6REMARKS: On rotten log with *Ganoderma applanatum*.**Halobrecta flavipes** (Thomson, 1861)^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 27 Dec 1976, in wrack, G. Kuschel.

REMARKS: In wrack on seashore.

Ischnoglossa bituberculata (Broun, 1894)REMARKS: In rotten *Pinus radiata* stump.**Ischnoglossa pectinata** Cameron, 1945

REMARKS: In decayed wood.

Myllaena intermedia (Erichson, 1837)^{a b}

EARLIEST N.Z. RECORD: Saxton Pass, Molesworth, 1067 m, MB, 17 Aug 1966, sample 66/249, in moss on wet bank, A.K. Walker.

REMARKS: In stream beds, in very damp litter of water channels; readily obtained in Malaise trap.

Myllaena magnicollis (Cameron, 1946)

REMARKS: In bush floor litter.

Nehemitropia sordida (Marshall, 1802)^a

FIRST REPORTED IN N.Z.: A. Fauvel, 1900.

EARLIEST N.Z. RECORD: "New Zealand", before 1900.

REMARKS: In sheep paddock, especially under *Acacia mearnsii* trees.**Ocalea fuscicornis** (Broun, 1880)

REMARKS: In leaf litter.

Ocalea socialis (Broun, 1880)

REMARKS: In lower canopy, rarely on or close to ground.

Oligota fungicola Williams, 1976

REMARKS: Beaten from vegetation.

Oligota parva (Kraatz, 1858)^a

FIRST REPORTED IN N.Z.: S.A. Williams, 1976.

EARLIEST N.Z. RECORD: Nelson, NN, 2 May 1966, M.J. Esson.

REMARKS: In garden compost and sheep paddock; also in bush floor litter under *Alseuosmia* and *Brachyglottis*, and in moss and liverworts above stream banks under dense canopy.**Oligota setigera** (Williams, 1976)

REMARKS: Beaten singly from vegetation.

Oligota speculicollis (Cameron, 1945)

REMARKS: One in decayed wood, and another in litter from coastal slopes.

Paraphytopus species 1

REMARKS: On stream bed and in damp litter.

Polylobus sternalis (Broun, 1880)REMARKS: On *Irpex brevis*, *Ganoderma applanatum*, and Hygrophoraceae.**Silusa parallela** (Bernhauer, 1943)

REMARKS: In leaf litter.

Silusa puber (Broun, 1880)REMARKS: In leaf litter and soil under *Dacrycarpus dacrydioides*.**Silusa species 1**

REMARKS: In leaf litter.

Silusa species 2REMARKS: In wood mould inside hollow *Dysoxylum spectabile*.**Stenomastax dentata** Cameron, 1945

REMARKS: In decayed wood.

Sternotropia versicolor (Broun, 1880)REMARKS: From *Gloeoporus adustus* on *Hedycarya arborea* and from *Tricholoma pessundatum*.**Sternotropia zealandica** (Cameron, 1947)REMARKS: On *Fuscoporia dryophila* and *Phellinus* sp.**Sytus aerarius** (Broun, 1880)REMARKS: On *Dysoxylum spectabile* and *Melicetus ramiflorus* stems.**Sytus flavescens** (Broun, 1880)REMARKS: On rotted *Acacia decurrens*.**Sytus granifer** (Broun, 1894)REMARKS: On *Hedycarya* stem infested by *Gloeoporus adustus*, on *Knightia* with *Trametes cinnabarina*, and on decaying *Freycinetia*; also in gravel of stream bed.**Sytus species 1**REMARKS: On *Ganoderma applanatum* and stems infested by *Irpex brevis*.**Tramiathaea cornigera** (Broun, 1880)REMARKS: In leaf litter; especially common when litter mixed with ripe fruits of *Corynocarpus laevigatus*, or baited with garden refuse and vegetables.**Genus 1 species 1^{a b}**

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 14 Mar 1975, sample 75/20, G. Kuschel.

REMARKS: In lawn clippings with fermenting fruits.

Genus 1 species 2^{a b}

EARLIEST N.Z. RECORD: Lynfield, AK, 21 Dec 1980, G. Kuschel.

REMARKS: Netted in Malaise trap.

Genus 1 species 3

REMARKS: In shady stream bed.

Genus 1 species 4REMARKS: In stream bed and in epiphytes growing on *Salix fragilis*.**Genus 1 species 5^{a b}**

REMARKS: In garden compost and in chicken yard.

Genus 2 species 1

REMARKS: In moss at splash zone of shady bush stream.

Genus 3 species 1REMARKS: Most obtained from sifted decayed wood of *Dacrycarpus dacrydioides*; two associated with *Trametes cinnabarina* on *Knightia excelsa*.**Genus 4 species 1**REMARKS: In decayed wood at base of small *Carex* in bush, and in garden leaf litter.**Genus 5 species 1**

REMARKS: Back beach.

Genus 6 species 1REMARKS: In decayed *Sophora*, *Melicetus*, *Dysoxylum*, and *Cyathea*; also on *Hymenochaete* fungus.**Key to symbols after species names**

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76–81

PSELAPHIDAE

'dwarf beetles'

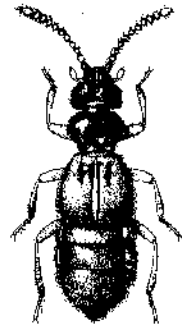


Fig. 25
Pselaphidae

*Sagola
laminata*

PSELAPHIDAE: Faroninae

Exeirarthra enigma Broun, 1893

REMARKS: In decayed *Knightia excelsa*, and in wood mould accumulated in hollows of live *Dysoxylum spectabile*.

Exeirarthra planicula (Broun, 1921)

REMARKS: In soil around *Hedycarya arborea* stump.

Sagola duplicata Broun, 1886

REMARKS: In soil around a *Sophora microphylla* stump and under *Gahnia lacera*.

Sagola excavata Broun, 1886

REMARKS: In decayed wood.

Sagola genalis Broun, 1881

REMARKS: Under coastal *Gahnia lacera* and at base of *Carex flagellifera*.

Sagola laminata Broun, 1893

Fig. 25, 126

REMARKS: In leaf litter; more common amongst sedges of the genera *Gahnia*, *Carex*, *Morelotia*, and *Uncinia*.

Sagola longipennis Broun, 1911

REMARKS: In decayed wood, in hollow trees, and in coastal litter.

Sagola major Sharp, 1874

REMARKS: Under *Phormium tenax* near mouth of Wattle Bay stream.

Sagola monticola Broun, 1912

REMARKS: In decayed wood.

Sagola notabilis Broun, 1880

REMARKS: In decayed wood.

Sagola species 1

REMARKS: In decayed wood.

Sagola species 2

REMARKS: On beach, and in amongst low coastal vegetation.

Sagola species 3

REMARKS: Beaten from dead tree-fern fronds.

Sagola species 4

REMARKS: Under *Gahnia setifolia*.

PSELAPHIDAE: Euplectinae

Allopectus claviger (Broun, 1893)

REMARKS: In leaf litter.

Allopectus species 1

REMARKS: From a litter sample of small *Carex lambertiana*, *C. dissita*, and *Uncinia banksii* under dense canopy.

Allopectus species 2

REMARKS: Amongst moss and lichens on tree trunks, and in litter accumulated under *Gahnia setifolia* and *Metrosideros excelsa*.

Eleusomatus allocephalus (Broun, 1893)

REMARKS: In leaf litter.

Eleusomatus species 1

REMARKS: Under *Gahnia setifolia*.

Euplectopsis antiqua (Broun, 1893)

REMARKS: In wood mould of hollow *Sophora microphylla* and *Metrosideros excelsa* trees.

Euplectopsis opaca (Sharp, 1874)

REMARKS: In leaf litter.

Euplectopsis ovicollis (Broun, 1880)

REMARKS: In stream bed and in *Carex lessoniana* swamp.

Euplectopsis tuberigera (Broun, 1886)

REMARKS: In decayed wood and in soil under rotting logs.

Euplectopsis species 1

REMARKS: In any damp decaying wood.

Leptoplectus species 1

REMARKS: In decayed wood of *Dacrycarpus dacrydioides* and at base of old *Cupressus macrocarpa* stump covered by *Pennisetum clandestinum* grass near bush margins.

Leptoplectus species 2

REMARKS: In dead *Vitex*.

Microtyrus iracundus (Broun, 1893)

REMARKS: In leaf litter.

Microtyrus punctatus Broun, 1893

REMARKS: Among moss and liverworts on wet, steep slope above stream bank.

Microtyrus species 1

REMARKS: Under *Gahnia setifolia*.

Paraplectus species 1

REMARKS: In wood mould of a hollow *Sophora microphylla* tree.

Philiopsis species 1^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 12 Sep 1974, in mixed compost, G. Kuschel.

REMARKS: In garden compost and piled-up prunings, in chicken yard, and under *Pinus radiata* in bush.

Plectomorphus sculpturatus (Broun, 1880)

REMARKS: In decayed wood of nearly all tree species.

Plectomorphus trisulcicollis (Broun, 1880)

REMARKS: In *Dendroligotrichum* moss and *Schoenus*, *Uncinia*, and *Carex* sedges.

Whitea species 1

REMARKS: In decayed wood.

Zelandius clevedonensis (Broun, 1893)

REMARKS: In litter, and in wood mould of hollow trees, e.g., *Dysoxylum spectabile*.

Zelandius obscurus (Broun, 1893)

REMARKS: In wood mould of hollow *Dysoxylum* tree, *Gahnia lacera* litter, and stream bed.

Zelandius sandageri (Broun, 1893)

REMARKS: In wood mould of large, hollow *Metrosideros excelsa*, and in *Gahnia setifolia* litter.

Genus 1 species 1

REMARKS: In litter of water channels, and in moss under *Alseuosmia* and *Brachyglottis*.

PSELAPHIDAE: Brachyglutinae

Anabaxis electrica (King, 1863)^{a d}

FIRST REPORTED IN N.Z.: T. Broun, 1921, under the synonym *A. minor* Broun.

EARLIEST N.Z. RECORD: Tairua, CL, in the 1870s, T. Broun.

REMARKS: In a paddock.

Anabaxis foveolata (Broun, 1880)^d

REMARKS: In *Oplismenus imbecillus* and *Microlaena avenacea* mats, *Dendroligotrichum dendroides* moss, leaf litter, and on *Gahnia setifolia*.

Eupines altula (Broun, 1880)

REMARKS: Most in wood mould of large, hollow *Vitex lucens* trees; some in hollow *Salix fragilis* by Wattle Bay stream.

Eupines glabrata (Broun, 1886)

REMARKS: In leaf litter and rotten wood; especially common in litter of coastal *Astelia banksii* and *Gahnia lacera*.

Eupines grata (Sharp, 1874)

REMARKS: In stream bed.

Eupines impar (Sharp, ?1874)

REMARKS: Everywhere on the ground in leaf and branch litter and in sedge and grass roots.

Eupines punctata (Broun, 1886)

REMARKS: In hollow *Vitex lucens* trees, and in dead, porous, standing stems of *Macropiper excelsum*.

Eupines species 1

REMARKS: In silty mud by *Carex lessoniana* swamp.

Eupines species 2

REMARKS: In coastal *Gahnia lacera* litter.

Gastrobothrus abdominalis (Broun, 1880)

REMARKS: In leaf litter, amongst small ground plants (*Carex*, *Uncinia*, *Oplismenus*), under *Gahnia setifolia*, and in decayed *Knightia excelsa*.

Gastrobothrus sharpi (Broun, 1880)

REMARKS: On the ground in litter, moss, grasses, and sedges; also in hollow trees and decayed wood.

Physobryaxis inflata (Sharp, 1874)

REMARKS: From a rotten *Knightia* log.

Startes sculpturata Broun, 1886

REMARKS: In wood mould of a hollow *Metrosideros excelsa*.

PSELAPHIDAE: Tyrinae

Gerallus punctipennis Schaufuss, 1879^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 2 Aug 1975, in soil under *Dacrycarpus dacrydioides*, G. Kuschel.

REMARKS: In friable soil, often using *Mesoponera castanea* runs but not associated directly with the ant colonies.

Hamotulus mutandus (Sharp, 1874)

REMARKS: In stream litter and on stream bank.

Zeatyus lawsoni Sharp, 1881

REMARKS: In moss, sedges, and grasses; also in decayed wood and hollow trees.

PSELAPHIDAE: Pselaphinae

Pselaphus citimus (Broun, 1893)

REMARKS: In and under rotten logs.

Pselaphus delicatus Broun, 1886

REMARKS: In *Schoenus tendo* sedge and *Blechnum capense* fern litter.

Pselaphus dulcis Broun, 1881

REMARKS: At the base of a large *Vitex lucens* trunk.

Pselaphus pauper Sharp, 1874

REMARKS: In moss mats of *Polytrichadelphus magellanicus* and *Ptychomnion aciculare*; occasionally also in litter.

HYDROPHILIDAE

'water scavenger beetles'

Adolopus altulus (Broun, 1880)

REMARKS: In leaf litter, small ground plants, friable loam, and wood mould gathered in hollow trees.

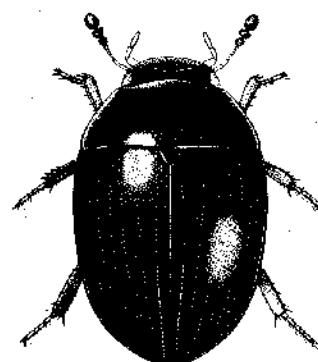


Fig. 26
Hydrophilidae

Adolopus
sp. 1

Cercyon analis (Paykull, 1798)^{a b}

EARLIEST N.Z. RECORD: Ardagh, Methven, MC, 14 Feb 1912, T. Hall.

REMARKS: In lawn clippings, garden compost, poultry straw, chicken yard, and sheep paddock.

Cercyon atricapillus (Marshall, 1802)^{a b}

EARLIEST N.Z. RECORD: Mangere, AK, Apr 1931, K.P. Lamb.

REMARKS: In fresh sheep dung.

Cercyon depressus Stephens, 1829^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, 27 Dec 1976, G. Kuschel.

REMARKS: In wrack and under dead animals on beach.

Cercyon haemorrhoidalis (Fabricius, 1775)^a

FIRST REPORTED IN N.Z.: C.M. Wakefield, 1874, under the synonym *C. flavipes* (F.).

EARLIEST N.Z. RECORD: Auckland and Greymouth, in the 1870s, R. Helms.

REMARKS: In garden compost in the open and in bins, sheep dung in paddock, and bush litter enriched with fruits and garden refuse.

Cyloma lawsoni Sharp, 1872

REMARKS: In leaf litter, especially if enriched with ripe *Corynocarpus* fruits or baited with peaches in heaped-up bush floor litter; also in bush and swamp sedges.

Dactylosternum abdominale (Fabricius, 1792)^a

FIRST REPORTED IN N.Z.: D.H. Todd, 1961.

EARLIEST N.Z. RECORD: Owairaka, AK, 4 Sep 1940, under sacking, D. Spiller.

REMARKS: In garden compost, poultry straw in hen-house and chicken yard, and old animal carcasses.

Dactylosternum marginale (Sharp, 1876)^a

FIRST REPORTED IN N.Z.: D. Sharp, 1876.

EARLIEST N.Z. RECORD: Auckland, AK, in the early 1870s, Lawson.

REMARKS: In compost bin.

Enochrus tritus (Broun, 1880)^a

Fig. 127

FIRST REPORTED IN N.Z.: T. Broun, 1880.

EARLIEST N.Z. RECORD: "in different localities" [between Whangarei ND and Tairua CL], in the 1870s, T. Broun.

REMARKS: In a pond. Known also from the Kermadec Is, Samoa, Rarotonga, and Tahiti.

Exydrus flavicornis (Broun, 1880)

REMARKS: In leaf and twig litter, friable loam, and cracks in stream banks.

Hydrostygnum frontalis (Broun, 1880)

REMARKS: In decayed wood, particularly if infested by *Irpex brevis* fungus (Polyporaceae).

Rygmodus modestus White, 1846

REMARKS: On flowering *Cyathodes fasciculata*, but most caught in Malaise traps.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 78-81

HISTERIDAE

'pill beetles'

(assisted by Y. Gomy and D. G. H. Halstead)

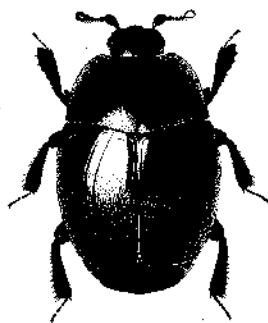


Fig. 27
Histeridae

*Tomogenius
latipes*

Acrilus nigricornis (Hoffmann, 1803)^{a b}

FIRST REPORTED IN N.Z.: Tropicana Drive, Lynfield, AK, 19 Jun 1976, G. Kuschel.

REMARKS: In compost bin.

Carcinops pumilio (Erichson, 1834)^a

FIRST REPORTED IN N.Z.: J.J. Walker, 1904, under the synonym *C. quatuordecimstriatus* (Stephens).

EARLIEST N.Z. RECORD: Lyttelton, MC, Nov 1901, J.J. Walker.

REMARKS: In lawn clippings, garden compost, poultry straw in hen-house and chicken yard, and old carcase in sheep paddock.

Gnathonus rotundatus (Kugelann, 1792)^{a b}

FIRST REPORTED IN N.Z.: J.J. Walker, 1904, as *G. nannetensis* (Marscul).

EARLIEST N.Z. RECORD: Rakaia, MC, Mar 1902, J.J. Walker.

REMARKS: In hen-house straw; also in dried carcase.

Gnathonus schmidtii Reitter, 1894^{a b}

EARLIEST N.Z. RECORD: Kumeu, AK, 31 Jun 1975, in fowl manure, J.C. Watt.

REMARKS: In hen-house and chicken yard straw and manure.

Parepius abrogatus (Broun, 1886)

REMARKS: Under a piece of wood.

Parepius purus (Broun, 1880)

REMARKS: In bush floor litter, in decayed wood mould inside hollow trees, on trunks of *Hedycarya arborea* infested by *Gloeoporus adustus*, and on trunks of *Myrsine australis* with *Ganoderma applanatum*.

Platysoma bakewellii Marseul, 1864^a

FIRST REPORTED IN N.Z.: D. Sharp, 1876, under the synonym *P. cognatum* Sharp.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1870s, R. Lawson.

REMARKS: In garden compost.

Saprinus detritus (Fabricius, 1775)

REMARKS: On dead animals, including fish on beaches.

CLAMBIDAE

'clam beetles'

(assisted by S. Endrödy-Younga)

Clambus domesticus Broun, 1886^a

Fig. 28, 128

FIRST REPORTED IN N.Z.: T. Broun, 1886.

EARLIEST N.Z. RECORD: Tairua, CL, in the early 1880s, "on the windows of my house", T. Broun.

REMARKS: In lawn clippings, garden prunings, and compost; occasionally in native bush litter.

Sphaerotherax kuscheli Endrödy-Younga

REMARKS: On old tree stumps and in loose moss mats of Polytrichaceae.

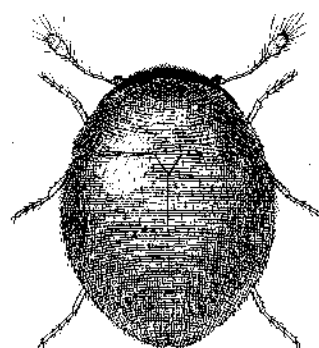


Fig. 28
Clambidae

*Clambus
domesticus*

Sphaerotherax suffusus (Broun, 1886)

REMARKS: In litter.

Sphaerotherax tierensis (Blackburn, 1902)^{a b}

FIRST REPORTED IN N.Z.: S. Endrödy-Younga, 1990.

EARLIEST N.Z. RECORD: Rarangi, MB, 2 Sep 1969, litter sample 69/149 taken in *Pittosporum* and *Melicytus* scrub at the foot of a high coastal cliff, G. Kuschel.

REMARKS: In heap of *Eucalyptus* branches and cut bamboo in sheep paddock. Represented in NZAC by specimens from ND and BR in addition to AK and MB.

HELODIDAE

'marsh beetles'

(assisted by T. Nyholm)



Fig. 29
Helodidae

*Veronatus
tricornatus*

Cyphanus punctatus Sharp, 1878

REMARKS: Obtained by beating.

Cyphon genalis Sharp, 1878

REMARKS: On plants near fresh water.

Cyphon graniger Sharp, 1878

REMARKS: On plants by streams.

Cyphon huttoni Sharp, 1878

REMARKS: On plants near fresh water.

Cyphon oscillans Sharp, 1878

REMARKS: On plants by streams.

Cyphon parviceps Sharp, 1878

REMARKS: On plants near streams; particularly abundant on *Rhopaloslylis sapida* flowers.

Cyphon remotus Broun, 1886

REMARKS: On plants near streams.

Cyphon suffusus Sharp, 1878

REMARKS: On plants near fresh water.

Cyphon viridipennis Broun, 1880

REMARKS: On plants near streams.

Cyphon waikatoensis Broun, 1886

REMARKS: On vegetation by stream.

Cyphon zealandicus Sharp, 1878

REMARKS: On vegetation by fresh water.

Cyphon species 1

REMARKS: On plants near fresh water.

Cyphon species 2

REMARKS: On plants near streams.

Cyphon species 3

REMARKS: On plants near fresh water.

Cyphon species 4

REMARKS: On plants near streams.

Cyphon species 5

REMARKS: On plants near streams.

Cyphon species 6

REMARKS: On plants by fresh water.

Cyphon species 7

REMARKS: On plants near streams.

Cyphon species 8

REMARKS: On plants by fresh water.

Cyprobius nitidus Sharp, 1878

REMARKS: On vegetation near streams.

Genus 1 species 1

REMARKS: On plants near streams.

Genus 2 species 1

REMARKS: Sweeping at night.

LUCANIDAE

'stag beetles'

(assisted by B. A. Holloway)

*Ceratognathus parrianus*Fig. 30
Lucanidae**Ceratognathus irroratus** (Parry, 1845)

REMARKS: Adults in logs and trunks, larvae in decaying wood. The adults are easily trapped in Malaise netting.

Ceratognathus parrianus (Westwood, 1863) Fig. 30, 129

REMARKS: Adults in trunks and branches, larvae in sound or quite decayed wood. Adults easily Malaise trapped.

SCARABAEIDAE

'scarab beetles'

SCARABAEIDAE: Aphodiinae

'lesser dung beetles'

Aphodius granarius (Linnaeus, 1767)^a

FIRST REPORTED IN N.Z.: C.M. Wakefield, 1874.

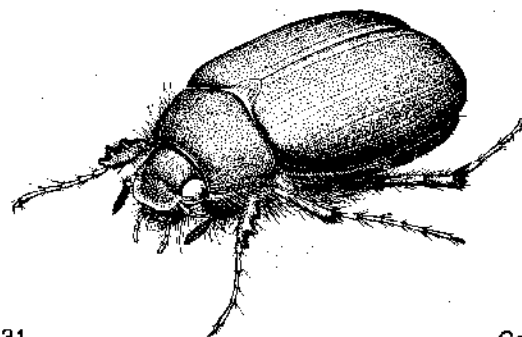
EARLIEST N.Z. RECORD: Canterbury, 1872, C.M. Wakefield.

REMARKS: In sheep paddock.

Aphodius pseudolividus (Balthasar, 1941)^a

FIRST REPORTED IN N.Z.: J.G. Brown, 1967.

EARLIEST N.Z. RECORD: Karikare, AK, Feb 1916, A.E. Brookes.

Key to symbols after species names^a introduced species ^b first report of this species in New Zealand^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81Fig. 31
Scarabaeidae*Costelytra zealandica*

REMARKS: In fresh sheep dung.

Aphodius tasmaniae Hope, 1847^a

Fig. 130

FIRST REPORTED IN N.Z.: W. Collier, 1956, under the synonym *A. howitti* Hope.

EARLIEST N.Z. RECORD: Mt Grey, MC, 9 Sep 1916, S. Lindsay.

REMARKS: In gardens, parks and paddocks.

Ataenius brouni (Sharp, 1876)

REMARKS: In stream bed.

Ataenius picinus Harold, 1861^aFIRST REPORTED IN N.Z.: A.M. Richards, 1959, under the synonym *Saprosites rugosus* Richards.

EARLIEST N.Z. RECORD: Auckland, AK, 4 May 1939, on decaying banana squash, D. Spiller.

REMARKS: In dung, garden compost, and fermenting fruits.

Saprosites communis (Broun, 1880)REMARKS: In rotten wood of *Melicetus ramiflorus*, *Dysoxylum spectabile*, *Vitex lucens*, *Pinus radiata* in the bush, *Dacrycarpus dacrydioides*, *Hedycarya arborea*, and *Pseudopanax arboreus*.**Saprosites mendax** (Blackburn, 1892)^aFIRST REPORTED IN N.Z.: A.M. Richards, 1959, under the synonym *S. punctatus* Richards.

EARLIEST N.Z. RECORD: Owhiraka, AK, 7 May 1943, D. McKenzie.

REMARKS: In garden compost and prunings; common in rotten wood of *Pseudopanax*, *Hedycarya*, *Melicetus*, and *Dysoxylum*, often together with the endemic *S. communis*.**SCARABAEIDAE: Scarabaeinae**

'dung beetles'

Onthophagus granulatus Boheman, 1858^a

FIRST REPORTED IN N.Z.: C.M. Wakefield, 1873.

EARLIEST N.Z. RECORD: Nelson, early 1872, R.W. Fereday.

REMARKS: In sheep dung.

Saphobius edwardsi Sharp, 1873

REMARKS: In stream bed and bank.

Saphobius squamulosus Broun, 1886

REMARKS: In leaf litter, wood mould of hollow trees and trunks, under decaying logs, and in old, dry sheep carcasses.

SCARABAEIDAE: Melolonthinae

'chafers'

(assisted by J. C. Watt)

Costelytra macrobrunnea Given, 1952

REMARKS: In gardens, and Malaise trapped in native bush.

Costelytra zealandica (White, 1846)

Fig. 31

REMARKS: More common in paddocks and gardens than in native bush.

Odontria xanthosticta White, 1846

REMARKS: Adults year-round in bush, paddocks, and garden; occasionally hiding in numbers in coastal caves.

SCARABAEIDAE : MELOLONTHINAE (cont.)

Pyronota laeta (Fabricius, 1775)

REMARKS: Particularly common on *Leptospermum scoparium*; active in the daytime.

Sericospilus costella (Broun, 1880)

REMARKS: One beaten, two in Malaise trap.

Stethaspis longicornis (Arrow, 1924)

REMARKS: Flying in the early evening.

SCARABAEIDAE: Dynastinae

'horned scarabs'

Heteronychus arator (Fabricius, 1775)^a

Fig. 131

FIRST REPORTED IN N.Z.: G.H. Cunningham, 1940, under the name *Pentodon australe*.

EARLIEST N.Z. RECORD: Waiheke I., AK, Mar 1937, G. Chamberlain (fide D. Spiller and E.G. Turbott, 1944).

REMARKS: In garden and paddocks.

BYRRHIDAE

'moss beetles'

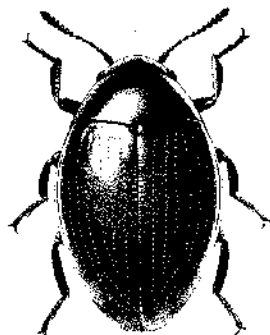


Fig. 32
Byrrhidae

Liochoria huttoni

Synorthus rotundus (Broun, 1881)

REMARKS: On old logs.

Synorthus setarius (Broun, 1880)

REMARKS: On fairly damp ground and stream beds with moss and liverworts.

BUPRESTIDAE

'jewel beetles'

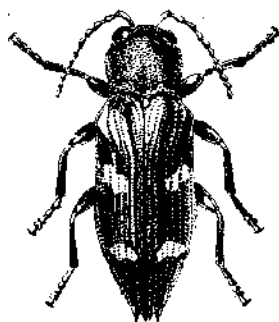


Fig. 33
Buprestidae

Nascioides enysi

Maoraxia eremita (White, 1846)

REMARKS: Attracted to cut branches of *Myrsine australis* and successfully reared from these.

PTILODACTYLIDAE

'comb-waist beetles'

Byrrhocraptus species 1

REMARKS: Malaise trapped at stream; caught only between 11 Jan and 3 Feb. Larvae aquatic.

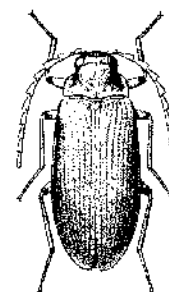


Fig. 34
Ptilodactylidae

Byrrhocraptus urquharti

Genus 1 species 1

REMARKS: Underneath overhanging stream banks and amongst fern and moss on a steep, seeping slope. It flies between 15 Feb and 25 Mar. Larvae terrestrial, in soil of seeping banks covered with ferns, moss, and liverworts.

ELATERIDAE

'click beetles'

(assisted by C. M. F. von Hayek and J. C. Watt)

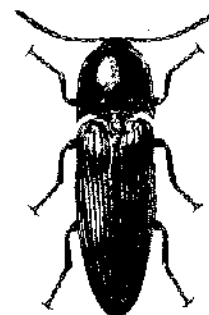


Fig. 35
Elateridae

Thoramus wakefieldi

Aglophus modestus Sharp, 1877

REMARKS: Beating vegetation.

Agrypnus variabilis (Candèze, 1857)^a

FIRST REPORTED IN N.Z.: D. Sharp, 1877.

EARLIEST N.Z. RECORD: Auckland, AK, in the early 1870s.

REMARKS: Associated in the main with *Acacia* and *Eucalyptus* species.

Amphiplatys lawsoni Sharp, 1877

REMARKS: Common in bush litter and on low-growing plants at night.

Conoderus exsul (Sharp, 1877)^a

FIRST REPORTED IN N.Z.: D. Sharp, 1877.

EARLIEST N.Z. RECORD: Wellington, WN, Feb 1875, Wakefield.

REMARKS: In paddocks and gardens, sometimes coming to light in large numbers.

Conoderus maritimus (Broun, 1893)

REMARKS: Readily Malaise trapped.

Conoderus posticus (Eschscholtz, 1822)^{a b}

EARLIEST N.Z. RECORD: "Bayleys Coast" [Baylys Beach], Dargaville, ND, 20 Nov 1944, B. Given.

REMARKS: In paddocks and gardens, leaf litter and prunings, and under bark.

Conoderus submarmoratus (Macleay, 1872)^{a b}

EARLIEST N.Z. RECORD: Grey Lynn, AK, Feb 1958, R.W. Taylor.

REMARKS: In gardens.

Ctenicera antipoda (Candèze, 1863)

REMARKS: In Malaise trap.

Ctenicera strangulata (White, 1846)

REMARKS: Beaten off vegetation, Malaise trapped, and taken in deep, sealed-off pit-trap.

Lomemus elegans Sharp, 1877

REMARKS: One from sifted decaying wood, one beaten off vegetation.

Lomemus flavipes Sharp, 1877

REMARKS: On vegetation.

Lomemus fuscicornis Broun, 1893

REMARKS: One beating vegetation, others Malaise trapped.

Lomemus lateristrigatus (White, 1846)

REMARKS: Reared from *Knightsia excelsa* wood.

Lomemus similis Sharp, 1877

REMARKS: Some by beating vegetation, most in Malaise trap.

Lomemus suffusus Sharp, 1877

REMARKS: In Malaise trap.

Metablax cinctiger (White, 1846)

REMARKS: Off vegetation and in Malaise trap.

Metablax approximans (White, 1846)

REMARKS: Caught in flight early in the morning and in Malaise trap.

Ochosternus zealandicus (White, 1846)

REMARKS: Adults in the canopy, larvae in decaying wood.

Panspoeus guttatus Sharp, 1877

REMARKS: Sweeping at night. Common in the Auckland area, AK, and now well established in England (first discovered 19 Jul 1981, Windsor Great Park, Berkshire).

Parinus villosus (Sharp, 1877)

REMARKS: Beaten off vegetation.

Thoramus perblandus Broun, 1880

REMARKS: Beaten off vegetation.

Thoramus wakefieldi Sharp, 1877

REMARKS: Reared from *Pinus radiata* boards abandoned in native bush.

Fig. 35, 132

EUCNEMIDAE

'false click beetles'

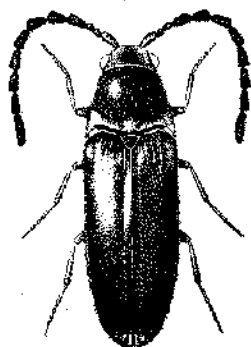


Fig. 36
Eucnemidae

*Neocharis
simplex*

Dromaeolus nigellus (White, 1846)

REMARKS: Under bark of *Pinus radiata* log lying in the bush.

Talerax distans Sharp, 1877

REMARKS: In decayed wood.

LYCIDAE

'net-winged beetles'

Porrostoma rufipenne (Fabricius, 1801)^a

Fig. 37, 133

FIRST REPORTED IN N.Z.: T. Broun, 1893b, under the synonym *Metriorrhynchus erraticus* Broun.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81

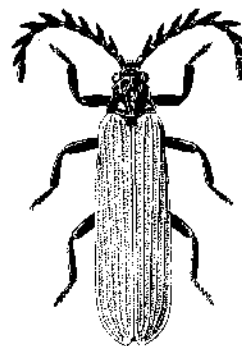


Fig. 37
Lycidae

*Porrostoma
rufipenne*

EARLIEST N.Z. RECORD: Drury, Pokeno, and Clevedon, AK, in the 1880s, T. Broun.

REMARKS: Seen flying in the daytime with some frequency.

CANTHARIDAE

'soldier beetles'

(assisted by W. Wittmer)



Fig. 38
Cantharidae

*Asilis
fulvithorax*

Asilis dugdalei Wittmer, 1979

REMARKS: On *Hoheria populnea* and in Malaise trap.

Asilis piliventer (Broun, 1881)

REMARKS: One beaten off vegetation, one visiting *Ligustrum sinense* flowers in swamp at back of Wattle Bay.

Malthodes pumilus (Brebisson, 1835)^a

FIRST REPORTED IN N.Z.: W. Wittmer, 1979, as *Malthodes* sp.
EARLIEST N.Z. RECORD: Riccarton Bush, Christchurch, MC, 10 Dec 1941, E.S. Gourlay.

REMARKS: Sweeping grass and weeds at back of Wattle Bay beach. Known only from females in New Zealand (AK, HB, MC, and CO).

DERMESTIDAE

'hide beetles'

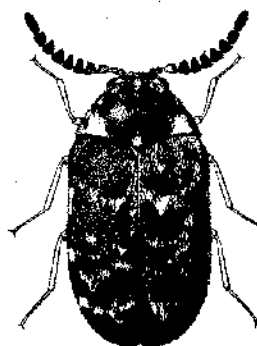


Fig. 39
Dermestidae

*Trogoderma
maestum*

Anthrenocerus australis (Hope, 1843)^{a, b}

EARLIEST N.Z. RECORD: Dunedin, DN, 22 Feb 1942, D. Spiller.

DERMESTIDAE (cont.)

REMARKS: In garden on *Pseudopanax arboreus* flowers.

Anthrenus verbasci (Linnaeus, 1767)^a

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904, as *A. museorum* (nec Linnaeus, 1761).

EARLIEST N.Z. RECORD: Christchurch, in the 1880s, F.W. Hutton.

REMARKS: Occasionally in flowers of *Zantedeschia*, *Daucus*, *Foeniculum*, *Achillea*.

Dermestes haemorrhoidalis Kuester, 1852^{a,b}

EARLIEST N.Z. RECORD: Eltham, TK, Feb 1932, from stored calves' stomachs.

REMARKS: Indoors.

Dermestes maculatus DeGeer, 1774^a

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904.

EARLIEST N.Z. RECORD: Christchurch, MC, in the 1880s.

REMARKS: On older carrion.

Trichelodes vulgata (Broun, 1880)

REMARKS: On cut twigs of *Parsonsia* and *Carmichaelia*; one reared from dead culms of *Gahnia lacera*.

Trogoderma granulatum Broun, 1881

REMARKS: In Malaise trap.

Trogoderma maestum Broun, 1880

Fig. 39, 134

REMARKS: On *Ligustrum sinense* flowers and on a log.

Trogoderma signatum Sharp, 1877

REMARKS: On flowers of *Pseudopanax arboreus* and *Leptospermum scoparium*; some on logs and stumps.

ANOBIIDAE

'borer beetles'

(assisted by F. Español)



Fig. 40
Anobiidae

*Hadrobregmus
magnus*

Anobium punctatum (DeGeer, 1774)^a

FIRST REPORTED IN N.Z.: T. Broun, 1880, under the synonym *A. amplicolle* Broun.

EARLIEST N.Z. RECORD: Tairua, CL, in the 1870s, T. Broun.

REMARKS: In the wallboards of old sheds and homes; in *Cupressus macrocarpa* and *C. torulosa* in parks.

Dorcatoma pilosa (White, 1846)

REMARKS: Trapped at night.

Hadrobregmus australiensis Pic, 1901^a

FIRST REPORTED IN N.Z.: F. Español, 1976.

EARLIEST N.Z. RECORD: Titirangi, AK, 14 Nov 1937, A. J. Hipwell.

REMARKS: Adults and larvae in wood of *Cupressus torulosa*, *Acacia mearnsii*, *Pinus radiata*, *Metrosideros excelsa*, and *Cyathodes fasciculata*; also in outdoor plywood.

Hadrobregmus crowsoni Español, 1976

REMARKS: In a necrotic area of a large *Vitex lucens* tree.

Holcobiatus watti Español, 1982

REMARKS: Beaten off *Pinus radiata* and *Cortaderia jubata*.

Methemus griseipilus (Broun, 1881)

REMARKS: On *Hakea sericea* and *Acacia mearnsii* in native bush.

Microsternomorpha oblongus (Broun, 1880)

REMARKS: Eight specimens reared from *Acacia decurrens*.

Xenocera sericea Broun, 1880

REMARKS: On *Astelia banksii*.

PTINIDAE

'spider beetles'

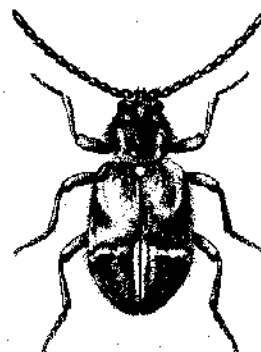


Fig. 41
Ptinidae

*Ptinus
speciosus*

Ptinus speciosus Broun, 1880

Fig. 41, 135

REMARKS: Under *Cortaderia jubata*, in dry fronds of *Cyathea medullaris*, and in leaf litter of *Alseuosmia macrophylla*.

TROGOSSITIDAE

'cadelle beetles'



Fig. 42
Trogossitidae

*Lepidopteryx
nigrosparsa*

Lepidopteryx brouni (Pascoc, 1876)

REMARKS: In decayed wood, in outdoor plywood, and in hollow *Salix fragilis*.

Lepidopteryx nigrosparsa (White, 1846)

Fig. 42, 136

REMARKS: On cut *Phyllocladus trichomanoides* branches.

PELTIDAE

'shield beetles'

Australiodes vestitus (Broun, 1881)

REMARKS: On vegetation; attracted by recently cut branches hung in trees.

Rentonellum species 1

REMARKS: In decayed wood of *Dacrycarpus dacrydioides*, *Melicytus ramiflorus*, and *Hedycarya arborea*.

Rentonellum species 2

REMARKS: In litter from ground covered with *Oplismenus imbecillus* and *Microlaena avenacea* grasses.

Rentonellum species 3

REMARKS: In rotten wood.

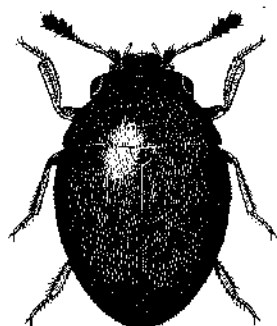


Fig. 43
Peltidae

Rentonidium
costiventris

***Rentonium* species 1**

REMARKS: Under *Gahnia lacera*, in decayed wood.

***Rentonium* species 2**

REMARKS: In stream bed moss.

Genus 1 species 1

REMARKS: In leaf litter from under *Phyllocladus trichomanoides* and *Olearia furfuracea*, and in rotten wood.

Genus 2 species 1

REMARKS: On bark of thick branches of trees, especially *Dysoxylum spectabile*, *Vitex lucens*, and *Schefflera digitata*, often congregating.

CLERIDAE

'checkered beetles'



Fig. 44
Cleridae

Phymatophaea
violacea

***Necrobia ruficollis* (Fabricius, 1775)^a**

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904.

EARLIEST N.Z. RECORD: Christchurch, MC, in the 1880s, F.W. Hutton.

REMARKS: On carrion.

***Necrobia rufipes* (DeGeer, 1775)^a**

FIRST REPORTED IN N.Z.: J.J. Walker, 1904.

EARLIEST N.Z. RECORD: Auckland, AK, 1875, T. Broun.

REMARKS: On carrion.

***Parmius longipes* Sharp, 1877**

REMARKS: On a plant.

***Paupris aptera* Sharp, 1877**

REMARKS: On *Gahnia lacera* at night; one reared from culms of this sedge species.

***Phymatophaea opilioideus* Pascoe, 1876**

REMARKS: Scattered on vegetation.

PHYCOSECIDAE

'beach beetles'

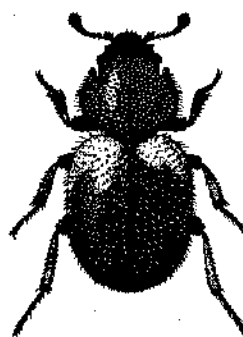


Fig. 45
Phycosecidae

Phycosecis
limbata

***Phycosecis limbata* (Fabricius, 1781)**

Fig. 45, 137

REMARKS: On beach sand.

MELYRIDAE

'flower beetles'

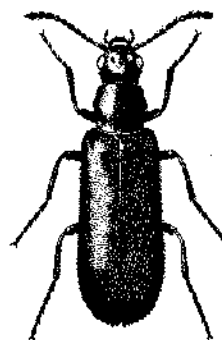


Fig. 46
Melyridae

Dasytes
subcyaneus

***Dasytes laticeps* Broun, 1880**

REMARKS: On vegetation.

***Dasytes planifrons* (Broun, 1883)**

REMARKS: On vegetation; a visitor to flowers, and attracted in numbers to *Cyathodes fasciculata* flowers. The name *Arthracanthus* Broun, 1883 is preoccupied by Schmarda, 1852.

***Dasytes stewarti* Broun, 1881**

REMARKS: Two taken in Malaise trap.

***Dasytes subcyaneus* Broun, 1880**

Fig. 46, 138

REMARKS: On vegetation.

***Dasytes* species 1**

REMARKS: On *Carex virgata* in swamp at back of Wattle Bay under canopy of *Salix fragilis*.

***Halyles nigrescens* Broun, 1883**

REMARKS: On vegetation.

***Halyles semidilutus* Broun, 1883**

REMARKS: On *Hoheria populnea*.

NITIDULIDAE

'sap beetles'

(assisted by R. M. Dobson, L. R. Gillogly,
R. D. Pope, and R. T. Thompson)

***Carpophilus davidsoni* Dobson, 1952^a**

EARLIEST N.Z. RECORD: Avondale, Auckland, AK, 14 Feb 1941, D. Spiller.

REMARKS: On flowers of *Ligustrum sinense* and rotten wood.

***Carpophilus dimidiatus* (Fabricius, 1792)^{a b}**

EARLIEST N.Z. RECORD: Greymouth, WD, in the 1870s, R. Helms.

REMARKS: On almonds.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81

NITIDULIDAE (cont.)

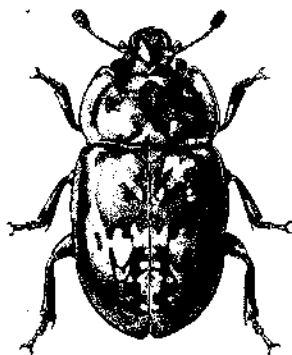


Fig. 47
Nitidulidae

*Platipidia
asperella*

***Carpophilus gaveni* Dobson, 1964^{a b}**

EARLIEST N.Z. RECORD: Whangarei, ND, 12 Apr 1929, E. Fairburn.

REMARKS: On fermenting fruits and vegetables.

***Carpophilus hemipterus* (Linnaeus, 1758)^a**

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904.

EARLIEST N.Z. RECORD: Christchurch, MC, in the 1880s, F.W. Hutton.

REMARKS: On fermenting fruits and vegetables.

***Carpophilus marginellus* Motschulski, 1858^{a b}**

EARLIEST N.Z. RECORD: Nelson, NN, 4 May 1935, E.S. Gourlay.

REMARKS: On fermenting fruits and vegetables.

***Epuraea antarctica* (White, 1846)**

REMARKS: On old sheep carrion at bush margin.

***Epuraea imperialis* (Reitter, 1877)^{a b}**

EARLIEST N.Z. RECORD: Whangarei, ND, 12 Apr 1929, E. Fairburn.

REMARKS: In garden compost and fermenting fruits and vegetables. Common from ND to NN; also on the Kermadec Is.

***Epuraea scutellaris* (Broun, 1880)^a**

FIRST REPORTED IN N.Z.: T. Broun, 1880.

EARLIEST N.Z. RECORD: Whangarei Heads, ND, in the 1870s, T. Broun.

REMARKS: In fermenting fruits and vegetables, garden litter, lawn clippings, paddocks, and parks.

***Epuraea signata* Broun, 1880**

REMARKS: On old logs.

***Homepuraea amoena* (Broun, 1880)**

REMARKS: On sap oozing from *Vitex lucens* trunks.

***Nitidula carnaria* (Schaller, 1783)^{a b}**

EARLIEST N.Z. RECORD: Takapuna, AK, 22 Mar 1941, K. Hattow.

REMARKS: On dry carrion.

***Omosita colon* (Linnaeus, 1758)^a**

FIRST REPORTED IN N.Z.: J.J. Walker, 1904.

EARLIEST N.Z. RECORD: Christchurch, MC, in the 1880s, F.W. Hutton.

REMARKS: On dry sheep carrion.

***Omosita discoidea* (Fabricius, 1775)^{a b}**

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 14 Mar 1975, sample 75/20 (week-old lawn clippings with fermenting peaches), G. Kuschel.

REMARKS: In mixed compost and dry sheep carrion.

***Platipidia asperella* Broun, 1893**

Fig. 47, 139

REMARKS: On trunks and thicker branches of trees, particularly at areas of oozing sap.

***Soronia hystrix* Sharp, 1876**

REMARKS: On sooty mould of *Leptospermum scoparium*.

***Thalycrodes australis* Blackburn, 1891^{a b}**

EARLIEST N.Z. RECORD: Lynfield, AK, 17 Jun 1978, G. Kuschel.

REMARKS: On fermenting fruits in garden.

———— **RHIZOPHAGIDAE** ————

'root beetles'

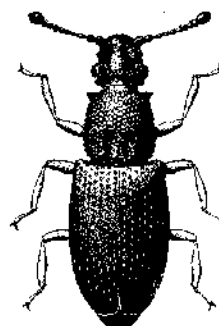


Fig. 48
Rhizophagidae

*Monotoma
spinicollis*

***Monotoma longicollis* Gyllenhal, 1827^a**

FIRST REPORTED IN N.Z.: G. Kuschel, 1979.

EARLIEST N.Z. RECORD: Mt Roskill, AK, 10 Jan 1944, A.E. Brookes.

REMARKS: In lawn and mixed compost, and in sheep shelters under an *Acacia mearnsii* grove.

***Monotoma picipes* Herbst, 1793^a**

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904.

EARLIEST N.Z. RECORD: Christchurch, MC, in the 1880s, F.W. Hutton.

REMARKS: In garden compost and litter in sheep paddock, particularly in heaps of drying *Pennisetum clandestinum* grass, but considerably less frequent than *M. spinicollis*.

***Monotoma spinicollis* Aubé, 1837^a**

Fig. 48, 140

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904.

EARLIEST N.Z. RECORD: Christchurch, MC, in the 1880s, F.W. Hutton.

REMARKS: Very common in lawn clippings, garden litter, and compost, in paddocks where sheep shelter, and in chicken straw.

***Monotoma testacea* Motschulsky, 1845^a**

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904, under the synonym *A. subquadrioveolata* (Watson for) Waterhouse.

EARLIEST N.Z. RECORD: Christchurch, MC, in the 1880s, F.W. Hutton.

REMARKS: In hen-house straw.

———— **CUCUJIDAE** ————

'flat beetles'

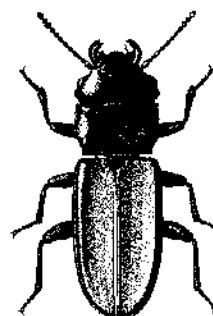


Fig. 49
Cucujidae

*Platisus
sp.*

***Ahasverus advena* (Waltl, 1834)^{a b}**

EARLIEST N.Z. RECORD: Matamata, WO, Mar 1924, A.E. Brookes.

REMARKS: In garden compost and henhouse straw.

Cryptamorphia brevicornis (White, 1846)

REMARKS: On *Rhopalostylis sapida*, *Cordyline australis*, and *Gahnia setifolia*.

Cryptamorphia desjardinsi (Guérin, 1844)^a

FIRST REPORTED IN N.Z.: T. Broun, 1880, under the name *C. suturalis* White.

EARLIEST N.Z. RECORD: Whangarei ND, Auckland AK, and Tairua CL, in the 1870s, T. Broun.

REMARKS: Found on all sorts of vegetation, but seems to prefer monocots, especially *Gahnia*, *Phormium*, *Freyinetia*, *Cordyline*, *Cortaderia*, *Musa*, and *Pennisetum*.

———— PHALACRIDAE ————

'bald beetles'

(assisted by R. T. Thompson)

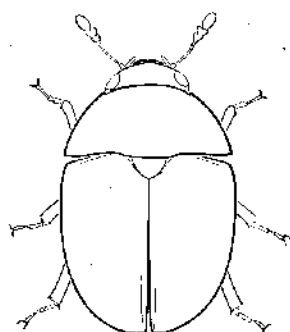


Fig. 50
Phalacridae

Phalacrus uniformis frigoricola

Phalacrus uniformis frigoricola Thompson, 1980^a

Fig. 50, 141

FIRST REPORTED IN N.Z.: R.T. Thompson and J.E. Marshall, 1980.

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 14 Sep 1974, G. Kuschel.

REMARKS: Extremely common in *Acacia* galls caused by the rust fungus *Uromycladium*.

———— CRYPTOPHAGIDAE ————

'cryptic beetles'

(assisted by C. Johnson)

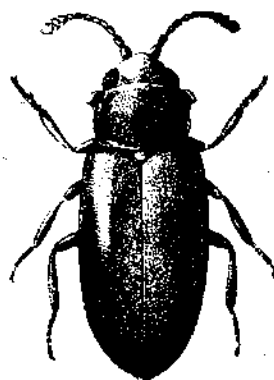


Fig. 51
Cryptophagidae

Cryptophagus acutangulus

Atomaria lewisi Reitter, 1877^a

FIRST REPORTED IN N.Z.: C. Johnson, 1971.

EARLIEST N.Z. RECORD: Whangarei, ND, 16 Mar 1927, A.E. Brookes.

REMARKS: In gardens and paddocks; particularly abundant in heaps of prunings, lawn clippings, and garden compost.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change: see pp. 76-81

Cryptophagus pilosus Gyllenhal, 1827^a

FIRST REPORTED IN N.Z.: E.S. Gourlay, 1954.

EARLIEST N.Z. RECORD: Morrinsville, WO, 10 Dec 1941, D. Spiller.

REMARKS: In hen-house straw.

Ephistemus globulus (Paykull, 1786)^a

FIRST REPORTED IN N.Z.: N.A. Martin, 1983.

EARLIEST N.Z. RECORD: Okauia, WO-BP, Mar 1924, A.E. Brookes.

REMARKS: In garden and paddocks, lawn clippings, compost heaps, and leaf litter of gardens and bush.

Micrambina discoidea (Broun, 1893)

REMARKS: On freshly cut branches of *Pittosporum tenuifolium*.

Micrambina helmsi Reitter, 1880

REMARKS: On *Phellinus* fungus.

Micrambina insignis Reitter, 1880

REMARKS: Common on vegetation, especially on freshly cut branches of *Sophora*, *Dysoxylum*, *Hedycarya*, *Melicope*, and *Acacia*; on *Gahnia setifolia*, in hollow *Vitex* trees, and on *Auricularia polytricha* and *Amanita muscaria*; found on the latter fungus up to 40 m outside the native bush.

Micrambina rutila (Broun, 1880)

REMARKS: As common as *M. insignis* Reitter; attracted to cut branches of *Rubus cissoides*, *Schefflera digitata*, *Parsonsia*, *Eucalyptus*, *Cupressus*, *Macropiper*, and *Lagunaria*; on fallen *Rhopalostylis sapida* leaves; and occasionally on plants in gardens, especially *Zantedeschia aethiopica*.

Micrambina silvana (Broun, 1880)

REMARKS: Some beaten from tree ferns; most obtained in Malaise traps.

Micrambina tumida (Broun, 1893)

REMARKS: One from beaten *Cyathea medullaris* fronds, the others in Malaise trap.

Micrambina species 1

REMARKS: Associated with the sedge *Gahnia setifolia*.

Micrambina species 2

REMARKS: On a tree fern.

Sallius ruficeps (Broun, 1880)

REMARKS: Associated with ground plants, especially *Phormium cookianum* and *Gahnia setifolia* by seaside cliffs.

Genus 1 species 1

REMARKS: On monocots and dicots, attracted particularly to days-old cut branches hung in trees; common also on *Uromycladium notabile* gall, alongside *Phalacrus uniformis frigoricola* Thompson (Phalacridae).

———— LANGURIIDAE ————

'slender beetles'

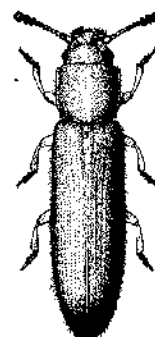


Fig. 52
Languriidae

Hapalips proluxus

Cathartocryptus maculosus (Broun, 1881)

REMARKS: On *Dysoxylum spectabile* and on dead branches.

LANGURIIDAE (cont.)

Hapalips prolixus (Sharp, 1876) Fig. 52, 142
REMARKS: On *Rhopalostylis sapida*, *Cordyline banksii*,
Cyathea medullaris, *Cyathea dealbata*, and *Dicksonia*
squarrosa.

Loberus depressus (Sharp, 1876)
REMARKS: In a garden 20–30 m from the bush margin.

Loberus nitens (Sharp, 1876)
REMARKS: On ground at base of coastal cliff plants (*Phor-*
mium, *Gahnia*, grasses).

EROTYLIDAE

'handsome beetles'

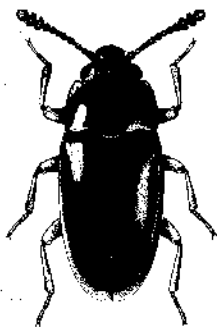


Fig. 53
Erotylidae

Thallis
polita

Cryptodacne brouni (Pascoe, 1876)
REMARKS: In moist decayed wood.

Cryptodacne synthetica Sharp, 1878
REMARKS: In decayed wood and in wood mould of large,
hollow *Vitex* trees.

CERYLIDAE

'kingfisher beetles'

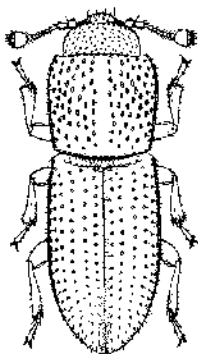


Fig. 54
Cerylidae

Anommatus
duodecimstriatus

Anommatus duodecimstriatus (Mueller, 1821)^a Fig. 54, 143
FIRST REPORTED IN N.Z.: G. Kuschel, 1979.
EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 25
Apr 1975, G. Kuschel.

REMARKS: A depigmented, blind hypogean immigrant from
Europe obtained in deep pit-traps sealed off at the top.

Hypodacne rubripes (Reitter, 1880)
REMARKS: In rich, moist humus under logs and boards, in
hollow trees, and in decayed wood.

CORYLOPHIDAE

'hooded beetles'

Anisomeristes apicalis (Lea, 1895)^{a d}
FIRST REPORTED IN N.Z.: N.A. Martin, 1983.
EARLIEST N.Z. RECORD: D'Urville I., SD, 14 Apr 1941, E.S.
Gourlay.

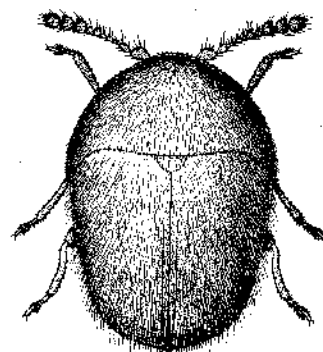


Fig. 55
Corylophidae

Anisomeristes
sharpi

REMARKS: One on *Cortaderia jubata*, another amongst
Carex lesssoniana in the Wattle Bay swamp. Occurs in AK,
SD, and NN, but very rare.

Anisomeristes ater Matthews, 1886

REMARKS: In leaf litter, on *Cortaderia jubata*, *Gahnia*
setifolia, and *Freyinetia baueriana*, and particularly on
beaten and sifted dead fronds of the tree-ferns *Cyathea*
dealbata and *C. medullaris*.

Anisomeristes sharpi Matthews, 1886

Fig. 55, 144

REMARKS: In leaf litter, on and under *Gahnia lacera*, *G.*
setifolia, *Uncinia banksii*, *U. uncinata*, *Carex lambertiana*,
C. dissita, and *Phormium cookianum*; more common in
coastal cliff vegetation.

Anisomeristes thoracicus (Erichson, 1842)^{a b d}

EARLIEST N.Z. RECORD: Epsom, Auckland City, AK, Oct
1911, T. Broun (BMNH).

REMARKS: Very abundant in garden, paddock, and bush
litter, compost heaps, and mouldy areas of plants. Occurs
in the North I., South I., Chatham Is, and Kermadec Is.

Anisomeristes species 1^a

FIRST REPORTED IN N.Z.: N.A. Martin, 1983.

EARLIEST N.Z. RECORD: Owairaka, AK, 8 May 1939, on
celery in glasshouse, O. Winn.

REMARKS: Usually alongside *A. thoracicus*, and just as abun-
dant. Occurs in the North I., South I., and Chatham Is.

Corylophus species 1

REMARKS: In decayed wood and palm and tree-fern litter.

Holopsis pallida Broun, 1883

REMARKS: In leaf litter, and on *Cortaderia jubata*, *Gahnia*
setifolia, *Astelia banksii*, and *Rhopalostylis sapida*.

Holopsis rotundata Broun, 1893

REMARKS: In litter under large *Metrosideros excelsa* tree in
the bush with *Gahnia lacera* clusters.

Holopsis species 1

REMARKS: In *Ptychomnion aciculare* moss mats, *Oplis-*
menus imbecillus grass mats, and moss and liverworts on
damp slopes near streams.

Holopsis species 2

REMARKS: On logs and trunks, usually overgrown with
Metrosideros perforata.

Holopsis species 3

REMARKS: In leaf litter, at the base of ground plants (*Carex*,
Uncinia, *Astelia*, *Gahnia*, *Phormium*), and on mouldy
trunks and logs.

Holopsis species 4

REMARKS: In leaf litter under shrubs and trees, at the bases of
ground plants, and on logs and trunks.

Orthoperus aequalis Sharp, 1885^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 20
Jul 1974, G. Kuschel.

REMARKS: In compost heaps in garden and paddock.

***Orthoperus atomarius* (Heer, 1841)^{a b}**

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 9

Jun 1974, on *Tricholoma pesundatum* fungus, G. Kuschel.

REMARKS: Equally common in the bush, gardens, and paddocks in fermenting plants; also in decayed wood.

***Orthoperus species 1*^{a b}**

EARLIEST N.Z. RECORD: Lynfield, AK, 28 Aug 1977, G. Kuschel.

REMARKS: One specimen extracted from a sifted litter and decayed wood sample.

***Sacina oblonga* Broun, 1893**

REMARKS: On foliage; congregating in large numbers in recently cut branches suspended from the canopy; also on mouldy trunks and stumps. Variable in colour and size.

***Sacium pulchellum* (Lca, 1895)^{a b}**

EARLIEST N.Z. RECORD: Titirangi, AK, 28 Dec 1915, A.E. Brookes.

REMARKS: One on *Phormium cookianum* in garden, remainder on trunks of burnt *Pinus radiata* trees. Widespread in ND, AK, and on the Kermadec Is.**Genus 1 species 1**REMARKS: On trunk of dead *Dysoxylum spectabile* tree.**Genus 1 species 2**

REMARKS: On tree trunk.

Genus 2 species 1REMARKS: In stream bed, *Gahnia* litter, and wood mould of *Dysoxylum* log.**COCCINELLIDAE**

'ladybirds'

(assisted by K. J. Houston and R. D. Pope)

Fig. 56
Coccinellidae*Coccinella
leonina****Adalia bipunctata* (Linnaeus, 1758)^a**

FIRST REPORTED IN N.Z.: W. Cottier, 1956.

EARLIEST N.Z. RECORD: Christchurch, MC, 30 Mar 1936, E. Fairburn.

REMARKS: In gardens and parks on plants, especially willows (*Salix* spp.).***Adoxellus flavihirtus* (Broun, 1880)**REMARKS: On *Astelia banksii* and *Phormium cookianum* of coastal cliffs.***Coccinella undecimpunctata* Linnaeus, 1758^a**FIRST REPORTED IN N.Z.: W. Colenso, 1888, under the synonym *C. novaezealandiae* Colenso, 1888.

EARLIEST N.Z. RECORD: Imported in 1874.

REMARKS: Sporadically on garden plants, preying on aphids.

***Coelophora inaequalis* (Fabricius, 1775)^{a b}**

EARLIEST N.Z. RECORD: Cornwallis, AK, 5 Jun 1966, B.M. May.

REMARKS: Sporadically on garden plants. Represented in NZAC from AK and CL (Great Barrier I.) only.

***Diomus notescens* (Blackburn, 1889)^a**

FIRST REPORTED IN N.Z.: E.S. Gourlay, 1964.

EARLIEST N.Z. RECORD: Palmerston North, WI-WN, 29 Apr 1933, on apple tree, W. Cottier.

REMARKS: On weedy lawns. Present in ND, AK, WI, NN, and BR.

***Diomus species 1*^{a b}**

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 1 Sep 1974, G. Kuschel.

REMARKS: On *Leptospermum scoparium* in paddock alongside bush margin.***Halmus chalybeus* (Boisduval, 1835)^a**

FIRST REPORTED IN N.Z.: W.W. Froggatt, 1902.

EARLIEST N.Z. RECORD: Imported in 1899 from New South Wales, Australia.

REMARKS: The steel-blue ladybird is visible everywhere on native and introduced plants, in native bush as well as in gardens and parks. Represented in NZAC from ND, AK, CL, BP, TO, and NN.

***Harmonia conformis* (Boisduval, 1835)^a**

FIRST REPORTED IN N.Z.: T. Kirk, 1896.

EARLIEST N.Z. RECORD: Imported in 1896.

REMARKS: On *Eucalyptus* and *Albizia*, in ND and AK.***Illeis galbula* (Mulsant, 1850)^a**

FIRST REPORTED IN N.Z.: R. Baker, 1985.

EARLIEST N.Z. RECORD: Pt Chevalier, Auckland City, AK, 15 Mar 1985, on *Cucurbita pepo*, B.A. Philip.REMARKS: On powdery mildews, especially those of *Cucurbitaceae*, in gardens.**'Midus' pygmaeus Blackburn, 1892^{a b}**EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 13 Oct 1974, on *Acacia mearnsii*, G. Kuschel.REMARKS: Some on *Acacia mearnsii*, most on *Sophora microphylla* in garden.***Rhyzobius acceptus* (Broun, 1880)**REMARKS: On *Hedycarya arborea* and *Schefflera digitata*, but most Malaise trapped.***Rhyzobius consors* (Broun, 1880)**

REMARKS: Some beaten off plants, others trapped.

***Rhyzobius fagus* (Broun, 1880)^a**

FIRST REPORTED IN N.Z.: T. Broun, 1880.

EARLIEST N.Z. RECORD: Tairua, CL, in the 1870s, T. Broun.

REMARKS: On *Acacia mearnsii*.***Rhyzobius forestieri* (Mulsant, 1853)^a**FIRST REPORTED IN N.Z.: D. Sharp, 1889, under the synonym *Scymnus circularis* Sharp, 1889.

EARLIEST N.Z. RECORD: Picton, SD, 1884, R. Helms.

REMARKS: Incorrectly referred to under the name *R. ventralis* (Erichson) in the New Zealand literature.***Rhyzobius minutulus* (Broun, 1880)**REMARKS: On bush floor sedges, cut branches, and old trunks of *Sophora microphylla*, *Nestegis lanceolata*, *Hedycarya arborea*, *Meliclytus ramiflorus*, and *Mezotideros perforata*.***Rhyzobius rarus* (Broun, 1880)**REMARKS: Largely associated with *Gahnia* and *Carex* species growing on the bush floor and coastal cliffs.***Rhyzobius suffusus* (Broun, 1880)**REMARKS: On bush floor sedges (*Gahnia*, *Morelotia*, *Carex*, *Uncinia*) and on the trunk of a dying *Sophora microphylla*.***Rhyzobius tristis* (Broun, 1880)**

REMARKS: On bush canopy.

***Rhyzobius ventralis* (Erichson, 1843)^a**

FIRST REPORTED IN N.Z.: T.W. Kirk, 1900.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81

COCCINELLIDAE (cont.)

EARLIEST N.Z. RECORD: Auckland, 1898, T. Broun.

REMARKS: On *Eucalyptus*. Represented in NZAC from AK, WO, BP, HB, TK, NN, MB, and MC, but rather uncommon. Preys on *Eriococcus coriaceus* also.

Rhyzobius species 1

REMARKS: On *Astelia banksii*, *Phormium cookianum*, and *Gahnia lacera* of coastal cliffs.

Rhyzobius species 2

REMARKS: On coastal cliff monocots.

Rhyzobius species 3

REMARKS: All eight specimens found together on a *Melicope ternata* stump.

Scymnus loewi (Mulsant, 1850)^{a b}

EARLIEST N.Z. RECORD: Auckland, 21 Feb 1941, swept from carrots, C.S.W. Reid.

REMARKS: On *Aucuba*, *Eucalyptus*, and *Phormium* in garden, and in a heap of *Eucalyptus* and *Bambusa* prunings in paddock.

Stethorus bifidus Kapur, 1948

REMARKS: On *Phormium* and *Angelica* in garden. The endemic status of the species must be questioned.

Stethorus griseus Chazeau, 1979

REMARKS: In a garden.

Stethorus histrio Chazeau, 1974^a

FIRST REPORTED IN N.Z.: V.B. Whitehead, 1967.

EARLIEST N.Z. RECORD: Wellington, WN, in the 1960s, E. Collyer.

REMARKS: On garden plants.

LATHRIDIIDAE

'mildew beetles'

(assisted by C. Johnson)



Fig. 57
Lathridiidae

*Enicmus
caviceps*

Aridius bifasciatus (Reitter, 1877)^a

FIRST REPORTED IN N.Z.: T. Broun, 1914, under the synonym *Lathridius dualis* Broun, 1914.

EARLIEST N.Z. RECORD: Methven, MC, 1912, T. Hall.

REMARKS: In lawn clippings and garden compost; occasionally on plants (*Phormium*, *Cortaderia*, *Eucalyptus*).

Aridius costatus (Erichson, 1842)^a

FIRST REPORTED IN N.Z.: T. Broun, 1880, under the synonym *Lathridius costulatus* Broun, 1880.

EARLIEST N.Z. RECORD: Tairua, CL, in the 1870s, T. Broun.

REMARKS: In lawn and mixed compost, poultry straw, cut branches, and prunings in gardens, paddocks, and bush.

Aridius nodifer (Westwood, 1839)^a

FIRST REPORTED IN N.Z.: A. White, 1846, under the synonym *Lathridius antipodus* White, 1846.

EARLIEST N.Z. RECORD: North I., in the 1840s, F.J.S. Party. REMARKS: In lawn clippings, garden litter, and compost, especially in heaps of prunings.

Bicava illustris (Reitter, 1880)

REMARKS: On *Fuscoporia dryophila* and *Ganoderma applanatum*; also in old, hollow *Salix fragilis*.

Bicava latulipennis (Broun, 1914)

REMARKS: On decaying trunks and stumps, in wood mould of old, hollow *Salix fragilis*, and at base of *Phormium cookianum* and *Astelia banksii* of coastal cliffs.

Bicava terricola (Broun, 1893)

REMARKS: On dead trunks with *Auricularia polytricha* fungus and bundled cut branches of *Pittosporum crassifolium*; some on *Gahnia setifolia*, *Acacia mearnsii*, and *Sophora microphylla*.

Bicava variegata (Broun, 1880)

REMARKS: Found on most plants, often congregating in numbers on *Ganoderma applanatum*, *Irpex brevis*, *Gloeoporus adustus*, and *Phellinus* fungi.

Corticaria elongata (Gyllenhal, 1827)^a

FIRST REPORTED IN N.Z.: M.J. Belon, 1884.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1860s, Lawson.

REMARKS: In bush floor leaf litter and on *Ganoderma applanatum* bracket fungus from a *Myrsine australis* tree.

Corticaria fenestralis (Linnaeus, 1758)^a

FIRST REPORTED IN N.Z.: T. Broun, 1910, under the synonym *C. longula* Broun, 1910.

EARLIEST N.Z. RECORD: Waitakere Range, AK, 1875, T. Broun.

REMARKS: In garden.

Corticaria hirtalis (Broun, 1880)^a

FIRST REPORTED IN N.Z.: T. Broun, 1880.

EARLIEST N.Z. RECORD: Auckland, AK, in the 1970s, T. Broun.

REMARKS: In garden compost, on grass and weeds of gardens and paddocks, in starling nest materials, and occasionally in the bush on *Cortaderia jubata*.

Corticaria meridiana Johnson, 1975^a

FIRST REPORTED IN N.Z.: C. Johnson, 1975b.

EARLIEST N.Z. RECORD: Mt Moehau, CL, 1956, J.G. Pendergrast.

REMARKS: On *Phormium*, grasses, and reeds in gardens and paddocks.

Dienerella filum (Aubé, 1850)^{a b}

EARLIEST N.Z. RECORD: Hamilton, WO, 7 Aug 1978, in stores, Grey.

REMARKS: In a hollow *Sophora microphylla* tree in the bush.

Enicmus bifoveatus (Broun, 1886)

REMARKS: In bush leaf litter; also in shady corner of garden under an old, large *Fatsia papyrifera*.

Enicmus caviceps (Broun, 1893)

Fig. 57, 145

REMARKS: In leaf litter, especially around *Carex*, *Uncinia*, and *Schoenus* sedges.

Enicmus floridus (Broun, 1880)

REMARKS: Some in moss and liverworts of tree trunks or logs; most Malaise trapped.

Enicmus foveatus Belon, 1884

REMARKS: On *Kunzea ericoides* and *Leptospermum scoparium*; found also in numbers in an old, hollow *Vitex lucens* tree.

Enicmus sharpi Belon, 1884

REMARKS: Most found in garden together with *E. bifoveatus* in the leaf litter of a *Fatsia papyrifera* growing in shade.

Lithostygnus minor Broun, 1893

REMARKS: In decayed wood, especially of *Metrosideros excelsa*.

Lithostygnus sinuosus (Belon, 1884)

REMARKS: In leaf litter of bush floor.

Lithostygnus species 1

REMARKS: In decayed wood, particularly of coastal cliffs.

Melanophthalma alacris (Broun, 1880)

REMARKS: At base of *Carex*, *Uncinia*, and coastal cliff tussock.

Melanophthalma diversicollis Belon, 1884

REMARKS: On fallen fronds of *Rhopalostylis sapida* and on *Carmichaelia aligera*.

Melanophthalma puber (Broun, 1880)

REMARKS: On various plants, especially *Parsonsia heterophylla* and *Pseudopanax arboreus*.

Melanophthalma pudibunda (Broun, 1880)

REMARKS: On *Melicytus ramiflorus* trunks and cut branches, mossy trunks, and in hollow *Vitex lucens* and *Salix fragilis*.

Melanophthalma tarsalis (Broun, 1882)

REMARKS: On cut branches of *Beilschmiedia* and *Acacia*; on *Rhopalostylis sapida* and *Cyathea dealbata* fronds; rather common on *Cortaderia jubata* inside native bush.

Melanophthalma zelandica Belon, 1884

REMARKS: Singly on any plant by beating; in numbers on cut branches of *Schefflera*, *Pseudopanax*, *Hedycarya*, *Metrosideros*, *Melicytus*, *Rubus*, *Carmichaelia*, *Acacia*, *Brachyglottis*, *Pittosporum*, *Macropiper*, and *Gloeoporus adustus* fungus of *Hedycarya arborea*.

Melanophthalma species 1

REMARKS: In epiphytes on *Salix fragilis* at Wattle Bay swamp. Species near *M. zelandica* Belon.

Melanophthalma species 2

REMARKS: May be found on *Sophora*, *Metrosideros*, *Salix*, and *Vitex*, but can be very common on monocots such as *Cortaderia jubata* and *Freycinetia baueriana*.

Melanophthalma species 3

REMARKS: On various plants, especially on *Cyathea dealbata*, cut *Beilschmiedia tawa*, and *Freycinetia baueriana*. Species near *M. puber* (Broun).

Melanophthalma species 4^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 3 Oct 1974, G. Kuschel.

REMARKS: In mixed garden compost and Malaise traps at bush margin. Distinctive for its very small first antennal club segment. Probably an Australian immigrant.

Melanophthalma species 5

REMARKS: On *Phellinus* fungus and in fungicised old *Salix fragilis*; rather common on vertical or overhanging stream banks under dense canopy of *Vitex lucens*.

Genus 1 species 1^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 10 Jul 1976, G. Kuschel.

REMARKS: Some on old logs; most on *Ganoderma applanatum* growing on old log of *Acacia mearnsii* in native bush. A striking beetle with shiny, setiferous tubercles on the elytra. An immigrant from Australia, where it occurs from Queensland to Victoria.

MEROPHYSIIDAE

'waisted mildew beetles'

Holoparamesus tenuis Reitter, 1879

Fig. 58, 146

REMARKS: On trunks, logs, and stumps covered with fruiting bodies of larger fungi; in damp, rotted wood and wood mould inside hollow trees and logs; and in humus under decayed logs.

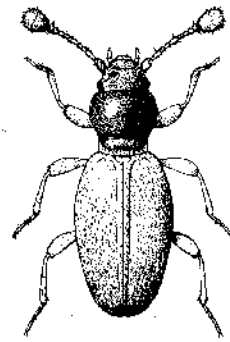


Fig. 58
Merophysiidae

*Holoparamesus
tenuis*

Holoparamesus species 1

REMARKS: At base of ground plants (*Astelia*, *Carex*, *Uncinia*), and in stream bed litter and decayed wood.

MYCETOPHAGIDAE

'fungus beetles'



Fig. 59
Mycetophagidae

*Triphyllus
hispidellus*

Litargus balteatus LeConte, 1856^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 3 May 1975, on a sheep carcass, G. Kuschel.

REMARKS: In coarse prunings, on old sheep carcass, and in starling (*Sturnus vulgaris*) nests, all in a paddock.

Litargus vestitus (Sharp, 1879)^{a b}

EARLIEST N.Z. RECORD: Penrose, Auckland, AK, 14 Jul 1958, rotting seed head of *Cynara scolymus*, V.A.L. May.

REMARKS: In prunings, lawn clippings, and compost on ground; common everywhere on trees and shrubs.

Triphyllus adspersus (Broun, 1880)

REMARKS: On *Brachyglottis repanda*, *Olearia furfuracea*, and *Gahnia* on coastal cliffs.

Triphyllus fuliginosus (Broun, 1880)

REMARKS: On old, fungus-infested stems of *Melicytus ramiflorus*, *Melicope ternata*, and *Corynocarpus laevigatus*.

Triphyllus hispidellus (Broun, 1880)

Fig. 59, 147

REMARKS: On *Hedycarya arborea*, *Melicope ternata*, and *Leptospermum scoparium* in the bush; one specimen found on *Leptospermum scoparium* in garden.

Triphyllus punctulatus (Broun, 1880)

REMARKS: Very common on toadstools in the bush only; not found on fungi growing in the open (paddocks, gardens).

Triphyllus serratus (Broun, 1880)

REMARKS: On trunks of *Knightsia excelsa*, *Dysoxylum spectabile*, *Vitex lucens*, *Sophora microphylla*, and *Melicope ternata*; occasionally on *Amanita muscaria* under a *Pinus radiata* tree growing in the bush.

Typhaea stercorea (Linnaeus, 1758)^a

FIRST REPORTED IN N.Z.: T. Broun, 1880, under the names *T. curvipes* Broun and *T. hirta* Broun.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81

MYCETOPHAGIDAE (cont.)

EARLIEST N.Z. RECORD: Auckland, AK, and Whangarei Heads, ND, in the 1870s, T. Broun.

REMARKS: In compost heaps and bins, pastures, and hay.

ARCHEOCRYPTICIDAE

'ancient fungus beetles'

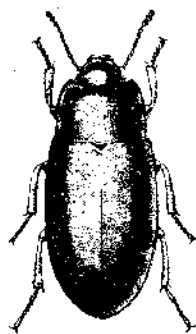


Fig. 60
Archeocrypticidae

Archeocrypticus
topali

Archeocrypticus topali Kaszab, 1964^a

Fig. 60

FIRST REPORTED IN N.Z.: Z. Kaszab, 1981.

EARLIEST N.Z. RECORD: 3 km N of Takapau, HB, 16 Apr 1942, under *Eucalyptus*.

REMARKS: In gardens, parks, and paddocks.

CIIDAE

'shelf fungus beetles'

(assisted by J. F. Lawrence)

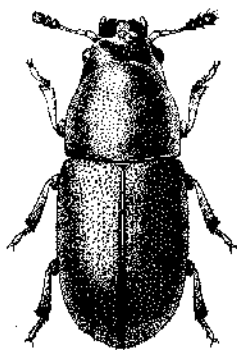


Fig. 61
Ciidae

Cis
zeelandicus

Cis asperimus Broun, 1880

REMARKS: On *Olearia furfuracea* and various dead wood.

Cis assimilis Broun, 1880

REMARKS: On *Muehlenbeckia australis* and *Hedycarya arborea*.

Cis boettgeri (Reitter, 1880)

REMARKS: On stems of *Hedycarya*, *Melicope*, *Melicytus*, and *Sophora*, and in *Ganoderma applanatum* and *Gloeoporus adustus*.

Cis illustris Broun, 1880

REMARKS: One in buried wood, one from a litter sample.

Cis lineicollis Broun, 1880

REMARKS: On cut branches of *Parsonsia heterophylla* and *Pinus radiata* in the bush.

Cis minutus Bayford, 1931

REMARKS: In decayed wood of most trees, and in *Ganoderma applanatum*.

Cis rufulus Broun, 1880

REMARKS: In leaf litter and on *Olearia furfuracea*, *Acacia mearnsii*, and *Astelia banksii*.

Cis zeelandicus Reitter, 1880

Fig. 61, 148

REMARKS: In *Ganoderma applanatum* growing on *Myrsine australis* and *Acacia mearnsii*.

Cis species 1

REMARKS: In *Phyllocladus trichomanoides* and *Dacrycarpus dacrydioides* litter.

Cis species 2

REMARKS: In rotting wood.

Cis species 3

REMARKS: In *Gloeoporus adustus* on *Hedycarya arborea* stem.

Cis species 4

REMARKS: Beaten.

Cis species 5

REMARKS: In flood debris.

'*Ennearthron*' species 1

REMARKS: On rotting *Dacrycarpus dacrydioides*, *Melicytus ramiflorus*, and *Cupressus macrocarpa* in garden near bush.

Orophius dilutipes Blackburn, 1891^{a,b}

EARLIEST N.Z. RECORD: Kirks Bush, Papakura, AK, 30 Aug 1977, in rotten wood, G. Kuschel.

REMARKS: On *Trametes cinnabarina* growing on *Knightia excelsa*.

Scolytocis species 1

REMARKS: On decaying *Knightia excelsa*.

Xylographus fultoni (Broun, 1886)

REMARKS: On dead, uprooted *Metrosideros excelsa* tree.

MELANDRYIDAE

'leaping beetles'

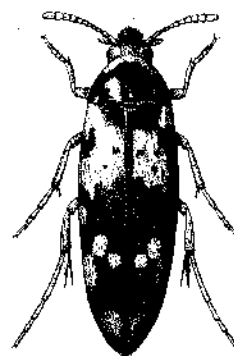


Fig. 62
Melandryidae

Hylobia
nubeculosa

Allopterus ornatus (Broun, 1880)

REMARKS: A very agile, hard-to-catch diurnal beetle, more often seen than caught; mostly Malaise trapped. Some found on *Ligustrum sinense* flowers, others baited with cut branches of *Pseudopanax arboreus*.

Ctenoplectron fasciatum (Redtenbacher, 1867)

REMARKS: An agile, hard-to-get beetle, often seen on coarse prunings in paddock. One reared from *Ulex europaeus* adjacent to native bush.

Hylobia calida Broun, 1880

REMARKS: On trunks of dead or dying trees (*Sophora*, *Knightia*, *Vitex*, *Acacia*); also in leaf litter and on logs.

Hylobia species 1

REMARKS: On cut branches of *Pittosporum tenuifolium*.

Lyperocharis species 1

REMARKS: Scattered in various leaf litter.

Mecorchesia spectabilis Broun, 1914

REMARKS: One reared from *Dracophyllum sinclairi*, a second one found in an *Astelia banksii* rosette.

Neorchesia divergens Broun, 1914

REMARKS: In leaf litter; most from litter gathered under and amongst *Gahnia setifolia* and *G. lacera*.

Genus 1 species 1

REMARKS: Consistently found at base of bush floor sedges (*Uncinia*, *Carex*, *Schoenus*).

— MORDELLIDAE —

'pintail beetles'

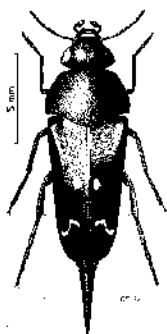


Fig. 63
Mordellidae

Mordella
antarctica

Mordella antarctica White, 1846

Fig. 63, 149

REMARKS: On flowering *Leptospermum scoparium*.

Mordella detracta Pascoe, 1876

REMARKS: On *Leptospermum scoparium* flowers.

Mordella jucunda (Broun, 1880)

REMARKS: Reared from dead stem of *Olearia furfuracea* and dead stalks of *Gahnia lacera*.

Mordellistena species 1^{a b}

EARLIEST N.Z. RECORD: Lynfield, AK, 4 Jan 1981, caught in Malaise trap, G. Kuschel.

REMARKS: Two specimens Malaise trapped in bush site close to an orchard.

Stenomordellaria neglecta (Broun, 1880)

REMARKS: On flowering *Leptospermum scoparium* and *Schefflera digitata*; one extracted from *Ulex europaeus* bordering native bush.

Zeamordella monacha Broun, 1886

REMARKS: Reared from *Ulex europaeus* at bush margin.

— RHIPIPHORIDAE —

'antlered beetles'



Fig. 64
Rhipiphoridae

Rhipistena
lugubris

Allocinops brookesi Broun, 1921

REMARKS: A pupa was extracted from an *Acacia mearnsii* log mined by the cerambycids *Coptomma variegatum* and *Oemona hirta*. *Allocinops* is a predator of *Oemona* larvae.

— COLYDIIDAE —

'rough mould beetles'

(assisted by R. D. Pope)



Fig. 65
Colydiidae

Pristoderus
antarcticus

Bitoma insularis White, 1846

REMARKS: On *Sophora microphylla*, *Corynocarpus laevigatus*, and *Acacia mearnsii*; frequently on the bracket fungus *Ganoderma applanatum*.

Bitoma nana Sharp, 1876

REMARKS: Some beaten off *Leptospermum scoparium* and *Pseudopanax arboreus*, most obtained in Malaise trap.

Bitoma rugosa Sharp, 1876

REMARKS: On branches and trunks of *Sophora microphylla*, *Pittosporum crassifolium*, *Schefflera digitata*, *Dysoxylum spectabile*, *Acacia mearnsii*, and *Pinus radiata*; quite common in gardens and parks also.

Bitoma vicina Sharp, 1876

REMARKS: On cut branches of *Pseudopanax arboreus* and *Pittosporum tenuifolium*.

Coxelus dubius Sharp, 1876

REMARKS: On decaying logs (*Knightia*, *Acacia*, *Dysoxylum*), on *Fuscoporia dryophila* fungus.

Coxelus similis Sharp, 1876

REMARKS: In bush and garden leaf litter.

Enarsus bakewelli Pascoe, 1866

REMARKS: In leaf litter and old rotting logs.

Epistranus hirtalis Broun, 1893

REMARKS: In ground swards and stream-bed litter.

Epistranus lawsoni Sharp, 1876

REMARKS: In decayed wood of various kinds; especially abundant in standing stems of *Hedycarya arborea* infested by polyporaceous fungi.

Glenentela serrata Broun, 1893

REMARKS: In *Vitex lucens* leaf litter.

Ithris gracilis Sharp, 1876

REMARKS: On *Sophora microphylla*.

Notoulus crassulus Broun, 1914

REMARKS: In ground litter and dead trees (*Sophora*, *Knightia*).

Pristoderus asper (Sharp, 1876)

REMARKS: On various trees and shrubs in bush (*Leptospermum scoparium*, *Sophora microphylla*, *Acacia mearnsii*, *Ulex europaeus*, *Eucalyptus* sp.).

Pristoderus scaber (Fabricius, 1775)

REMARKS: On dying or dead *Corynocarpus laevigatus*, *Sophora microphylla*, and *Melicope ternata*.

Protarphius decorus Broun, 1914

REMARKS: In sifted ground litter, including decayed wood.

Pycnomerus depressiusculus (White, 1846)

REMARKS: In decaying wood of *Dacrycarpus dacrydioides*, *Cupressus macrocarpa*, *Acacia decurrens*, *Melicytus ramiflorus*, and *Hedycarya arborea*; also in rotting *Cordyline banksii*.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81

COLYDIDAE (cont.)

Pycnomerus latitans Sharp, 1886

REMARKS: A blind beetle with up to four rudimentary ommatidia. In decayed *Melicytus ramiflorus* wood and in stream-bed litter.

Pycnomerus minor Sharp, 1876

REMARKS: In the decaying wood of a hollow *Salix fragilis* by a *Carex* swamp.

Pycnomerus simplex Broun, 1880

REMARKS: In leaf litter and decayed wood of *Dacrycarpus dacrydioides*, *Melicytus ramiflorus*, *Hedycarya arborea*, and *Acacia mearnsii*; also in decaying *Pinus pinaster* cones on the ground in native bush.

Recyntus tuberculatus (Broun, 1880)

REMARKS: In decaying wood; also on stems with *Irpex brevis* and in *Gahnia* litter.

Rhizonium antiquum Sharp, 1876

Fig. 150

REMARKS: In decaying wood of *Hedycarya arborea* and *Sophora microphylla*; also in dead fronds of *Cyathea medullaris*.

Syncalus hystrix Sharp, 1876

REMARKS: In leaf litter.

Syncalus optatus Sharp, 1876

REMARKS: In leaf litter.

Tarphiomimus indentatus Wollaston, 1873

REMARKS: On branches and trunks of many dicot and monocot species.

PROSTOMIDAE

'red log beetles'

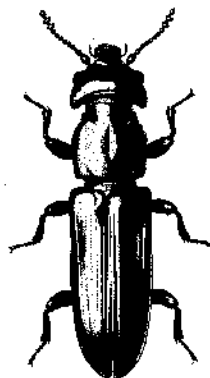


Fig. 66
Prostomidae

Dryocora
howitti

Dryocora howitti Pascoe, 1868

REMARKS: In decayed wood.

Fig. 66, 151

ZOPHERIDAE

'false darkling beetles'



Fig. 67
Zopheridae

Syrphetodes
marginatus

Brouniphylax squamiger (Broun, 1880)

REMARKS: In dead Polyporaceae on decaying logs.

TENEBRIONIDAE

'darkling beetles'

(assisted by J. C. Watt)

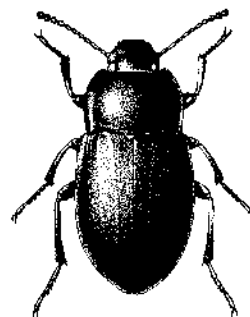


Fig. 68
Tenebrionidae

Mimopeus
elongatus

Alphitobius diaperinus (Panzer, 1797)^a

FIRST REPORTED IN N.Z.: G.V. Hudson, 1934.

EARLIEST N.Z. RECORD: Auckland, AK, 19 Oct 1909, T. Broun.

REMARKS: In chicken yard.

Amarosoma simulans Redtenbacher, 1867

REMARKS: Under coastal *Gahnia lacerata*.

Amarygmus tristis sensu Blackburn, 1893

FIRST REPORTED IN N.Z.: B.M. May, 1963, as *A. tristis* Fabricius.

EARLIEST N.Z. RECORD: St Mary's Lodge, Auckland, AK, 20 Nov 1956, S.A. Rumsey.

REMARKS: On old woody plants (*Solanum mauritianum*, *Acacia mearnsii*, *Eucalyptus* spp., *Virgilina capensis*), in holes or under bark in the daytime; rather common in gardens.

Aphthora rufipes Bates, 1872

REMARKS: In decayed wood of various trees; also in *Cupressus macrocarpa* in a park.

Archaeoglenes costipennis Broun, 1893

REMARKS: In decayed wood.

Artystona rugiceps Bates, 1874

REMARKS: On and in old trees, especially *Myrsine australis* and *Metrosideros excelsa*, feeding on lichens at night.

Edalus opacus Broun, 1880

REMARKS: In bush floor litter.

Gnatocerus cornutus (Fabricius, 1798)^a

FIRST REPORTED IN N.Z.: F.W. Hutton, 1904.

EARLIEST N.Z. RECORD: Christchurch, in the 1860s, Wakefield.

REMARKS: In hen-house and chicken yard.

Lorelus crassicornis Broun, 1880

REMARKS: On *Cyathea medullaris* and *C. dealbata*.

Lorelus latulus Broun, 1910

REMARKS: On *Astelia banksii* and *Cordyline australis*.

Lorelus priscus Sharp, 1876

REMARKS: On *Cordyline australis*, *Macropiper excelsum*, *Rubus cissoides*, *Hedycarya arborea*, *Schefflera digitata*, and *Pseudopanax arboreus*.

Menimus batesi Sharp, 1876

REMARKS: In decaying wood of *Vitex lucens*, *Corynocarpus laevigatus*, *Melicytus ramiflorus*, and *Salix fragilis*. The largest and least common of the three *Menimus* species obtained in the survey.

Menimus caecus Sharp, 1876

REMARKS: In rotting wood of *Hedycarya arborea*, *Vitex lucens*, *Melicytus ramiflorus*, *Acacia decurrens*, and *A. mearnsii*; also in wood mould of hollow *Sophora micro-*

phylla. A small, blind, depigmented species with eyes reduced to a few rudimentary ommatidia.

***Menimus crassus* Sharp, 1876**

REMARKS: In decaying wood of various dicot trees, but particularly common in *Hedycarya arborea*. A small, pigmented species with eyes variable in size, having 5–15 normal ommatidia.

***Mimopeus elongatus* (Brême, 1842)**

Fig. 68, 152

REMARKS: In ground vegetation at back of beaches and on coastal slopes and cliffs.

'*Pheloneis*' *aucklandicus* (Broun, 1880)

REMARKS: In amongst *Phormium cookianum*, *Gahnia setifolia*, and bush floor *Uncinia* and *Carex* species.

'*Tanychilus*' *metallicus* White, 1846

REMARKS: Caught in Malaise trap.

'*Tanychilus*' *sophorae* Broun, 1880

REMARKS: On *Knightia excelsa*, *Acacia mearnsii*, and *Schefflera digitata*.

***Tribolium castaneum* (Herbst, 1797)^a**

FIRST REPORTED IN N.Z.: J.C. Fabricius, 1775, under the senior but officially suppressed name *T. navale* (Fabricius). EARLIEST N.Z. RECORD: "Nova Zelandia", on board ship, 1769–70, J. Banks.

REMARKS: Indoors in fish food and almonds.

***Uloma tenebrionoides* (White, 1846)**

REMARKS: In decayed wood of most trees and shrubs, including *Pinus* and *Cupressus* species.

***Xylochus tibialis* Broun, 1880**

REMARKS: On freshly cut *Rubus cissoides*, *Metrosideros perforata*, and *Eucalyptus* sp. at bush margin; also on *Collospermum hastatum* epiphytic on *Metrosideros excelsa*.

— OEDEMERIDAE —

'lax beetles'

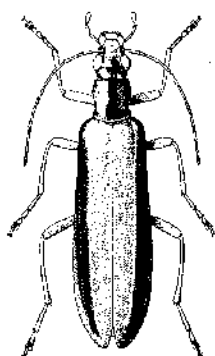


Fig. 69
Oedemeridae

*Thelyphassa
lineata*

***Parisopalpus macleayi* (Champion, 1895)^a**

FIRST REPORTED IN N.Z.: T. Broun, 1917, under the synonym *Sessinia brookesi* Broun.

EARLIEST N.Z. RECORD: Waipu Beach, near Whangarei, ND, 10 Jan 1914, A.E. Brookes.

REMARKS: At light.

***Parisopalpus nigronotatus* (Boheman, 1858)^a**

FIRST REPORTED IN N.Z.: T. Broun, 1914, under the synonym *Sessinia sticticus* Broun.

EARLIEST N.Z. RECORD: Motueka, NN, in the 1900s.

REMARKS: At light.

Key to symbols after species names

^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change: see pp. 76–81

— SALPINGIDAE —

'bark mould beetles'

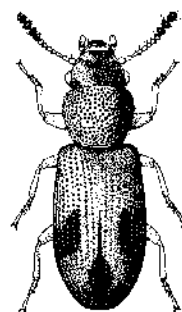


Fig. 70
Salpingidae

*Salpingus
bilunatus*

***Salpingus angusticollis* Broun, 1880**

REMARKS: On *Acacia mearnsii*, *Dysoxylum spectabile*, *Hedycarya arborea*, *Melicope ternata*, *Eucalyptus* sp., *Albizia lophantha*, *Acacia verticillata*, *Pittosporum crassifolium*, *Corynocarpus laevigatus*, *Pseudopanax arboreus*, *Pittosporum tenuifolium*, and *Pinus radiata*.

***Salpingus bilunatus* Pascoe, 1876**

Fig. 70, 153

REMARKS: On *Acacia mearnsii*, *Eucalyptus* sp., *Rubus cissoides*, *Dysoxylum spectabile*, *Dacrycarpus dacrydioides*, *Melicopus ramiflorus*, *Pseudopanax arboreus*, *Cortaderia jubata*, and *Solanum mauritianum*.

***Salpingus hirtus* Broun, 1886**

REMARKS: On *Melicopus ramiflorus*, *Melicope ternata*, *Hedycarya arborea*, *Corynocarpus laevigatus*, *Dysoxylum spectabile*, *Vitex lucens*, and *Solanum mauritianum*.

***Salpingus perpunctatus* Broun, 1880**

REMARKS: On *Carex lessoniana*, *Dysoxylum spectabile*, *Collospermum hastatum*, *Hedycarya arborea*, *Pseudopanax arboreus*, *Uncinia* and *Carex* species of the bush floor, *Cortaderia jubata*, *Rubus cissoides*, *Pittosporum tenuifolium*, *Schefflera digitata*, *Corynocarpus laevigatus*, *Sophora microphylla*, and *Solanum mauritianum*.

***Salpingus quisquilius* Broun, 1886**

REMARKS: On *Sophora microphylla* in garden and *Acacia mearnsii* in paddock by bush margin.

***Salpingus reductus* (Blair, 1925)**

REMARKS: In *Gahnia* litter and Malaise trap.

***Salpingus swalei* (Blair, 1925)**

REMARKS: On *Acacia mearnsii* and *Dysoxylum spectabile*, and in *Irpex brevis* on *Hedycarya arborea* stem.

***Salpingus* species 1**

REMARKS: On a *Melicopus ramiflorus* stump.

— ANTHICIDAE —

'ant beetles'

(assisted by F. G. Werner)

***Anthicus floralis* (Linnaeus, 1758)^a**

FIRST REPORTED IN N.Z.: T. Broun, 1893b, under the synonym *A. fallax* Broun.

EARLIEST N.Z. RECORD: Howick, AK, before 1893, T. Broun.

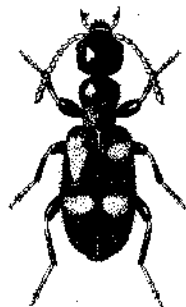
REMARKS: In poultry straw of hen-house, in garden compost, and in heaps of prunings in paddock.

***Anthicus glaber* King, 1869^{a b}**

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 25 Jan 1975, on *Pinus* in paddock, G. Kuschel.

REMARKS: In a paddock on *Pinus* and amongst *Cortaderia* and *Pennisetum*.

ANTHICIDAE (cont.)

Fig. 71
Anthicidae*Anthicus
hesperi*

Anthicus hesperi King, 1869^{a b} Fig. 71, 154
EARLIEST N.Z. RECORD: Owairaka, AK, 12 May 1941, D. Spiller.

REMARKS: In paddock, heaped-up coarse prunings, and sometimes in stream bed in the bush.

Anthicus kreusleri King, 1869^{a b}
EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 17 Aug 1974, under *Phormium cookianum* in garden, G. Kuschel.

REMARKS: Common in lawns; occasionally in stream beds in the bush.

Anthicus pellucidipes Broun, 1880

REMARKS: More or less confined to monocots such as *Freyinetia baueriana*, *Gahnia setifolia*, *G. lacera*, and *Carex* and *Uncinia* species of the bush floor; particularly abundant on the South American *Cortaderia jubata* growing in the bush.

Anthicus species 1 Fig. 155

REMARKS: Particularly common on the ground under *Gahnia setifolia* and *Acacia mearnsii*, and at back of beaches.

Cotes bullata (Broun, 1923)

REMARKS: In leaf litter from small bush floor *Uncinia* and *Carex* species.

Cotes crisp (Broun, 1880) Fig. 156

REMARKS: Under *Phormium tenax*, *Astelia banksii*, and *Gahnia setifolia*; a few in deep pit-traps.

Cotes dorsalis Broun, 1893

REMARKS: On *Astelia banksii*, and on vegetation at night.

Cotes optima Broun, 1893

REMARKS: In hollow *Metrosideros excelsa*, and on plants at night.

Macratia exilis Pascoe, 1877 Fig. 157

REMARKS: On vegetation near streams.

Trichananca species 1 Fig. 158

REMARKS: One on *Leptospermum scoparium* at bush margin; one on *Salix fragilis* at mouth of Wattle Bay stream.

ADERIDAE

'puppet beetles'

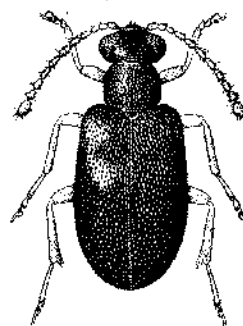
'*Xylophilus*' *nitidus* (Broun, 1893) Fig. 72, 159
REMARKS: On mixed vegetation.

'*Xylophilus*' species 1
REMARKS: Malaise trap.

'*Xylophilus*' species 2
REMARKS: Malaise trap.

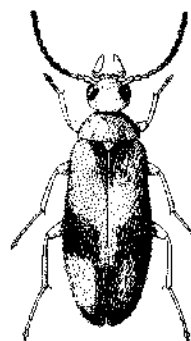
'*Xylophilus*' species 3
REMARKS: One in Malaise trap, one on mixed vegetation.

'*Xylophilus*' species 4
REMARKS: Beaten from mixed vegetation.

Fig. 72
Aderidae'*Xylophilus*'
nitidus

SCRAPTIIDAE

'soft leaping beetles'

Fig. 73
Scraptiidae*Nothotelus
usitatus*

Nothotelus nigellus (Broun, 1880)

REMARKS: On flowering *Muehlenbeckia australis*, and on vegetation in general. One reared from *Olearia furfuracea* wood.

Nothotelus usitatus (Broun, 1880) Fig. 73, 160

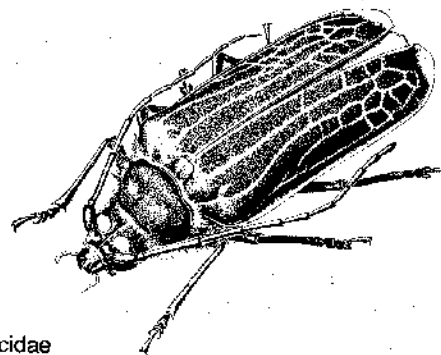
REMARKS: One on *Freyinetia baueriana*, another on mixed vegetation.

Nothotelus species 1

REMARKS: On mixed vegetation; most in Malaise trap.

CERAMBYCIDAE

'longhorn beetles'

Fig. 74
Cerambycidae*Prionoplus
reticularis*

CERAMBYCIDAE: Prioninae

Prionoplus reticularis White, 1843 Fig. 74

REMARKS: Larvae abundant in freshly dead and very decayed wood of *Pinus radiata* and *P. pinaster*. Fully grown larva found by J.C. Watt in an old log of *Acacia mearnsii* in Wattle Bay Reserve.

CERAMBYCIDAE: Aseminae

Arhopalus tristis (Fabricius, 1787)^a

FIRST REPORTED IN N.Z.: R.H. Milligan, 1970.

EARLIEST N.Z. RECORD: Otua Bay, AK, Jan 1963.

REMARKS: In dead *Pinus radiata*; particularly common in a patch of trees charred by fire.

CERAMBYCIDAE: Cerambycinae

Ambeodontus tristis (Fabricius, 1775)REMARKS: In *Chamaecyparis lawsoniana*, *Cupressus macrocarpa*, *C. torulosa*, and *Dacrycarpus dacrydioides*. This New Zealand cerambycid is established in southern Chile (collected in Puerto Varas by a teacher in a school building in Feb 1958, and since found also in Valdivia, 168 km to the north).*Astetholea pauper* Bates, 1874REMARKS: Attracted in numbers to freshly cut *Rubus cissoides* (native) and *R. fruticosus* (adventive). The sub-cortical larvae are similar to those of *Zorion*.*Astetholida lucida* Broun, 1880REMARKS: Several reared from larvae. One adult caught in flight in the daytime, but none obtained by beating or in Malaise trap. Larva cuts live branches 6–30 mm thick. No damage observed in native bush plants, although looked for. Hosts: *Acmena smithii*, *Betula pendula*, *Callistemon citrinus*, *C. speciosus*, *Camellia japonica*, *Eucalyptus* spp. (of all kinds, including *lehmannii* and *ficifolius*), *Metrosideros kermadecensis*, *Platanus acerifolia*, *Prunus persica*, *Psidium cattleianum*, *Pyrus communis*, *Salix caprea*, *S. tortuosa*, *Tibouchina granulosa*, and *Tristania conferta*.*Bethelium signiferum* (Newman, 1840)^aFIRST REPORTED IN N.Z.: A. White, 1846, under the name *Callidium diversicorne* White.

EARLIEST N.Z. RECORD: North I., in the early 1840s.

REMARKS: On dead *Acacia decurrens*, *A. mearnsii*, *A. podalyriifolia*, *A. verticillata*, and *Albizia lophantha*.*Callidiopsis scutellaris* (Fabricius, 1801)^a

FIRST REPORTED IN N.Z.: R. Zondag, 1957.

EARLIEST N.Z. RECORD: Wakarara, Waipawa, HB, 20 Dec 1935, F. Gardner.

REMARKS: On *Eucalyptus* sp. under loose bark.*Coptomma variegatum* (Fabricius, 1775)REMARKS: On and in dead *Acacia decurrens*, *A. mearnsii*, *Albizia lophantha*, and *Sophora microphylla*.*Eburida sublineata* White, 1846^dREMARKS: Attracted to cut *Metrosideros excelsa* and *Eucalyptus* spp. Some larvae from *Eucalyptus* reared through to adults.*Gastrosarus nigricollis* Bates, 1874REMARKS: One Malaise trapped. Several larvae seen in ringed *Leptospermum scoparium* branches, and one of these reared through to adult.*Navomorpha sulcata* (Fabricius, 1775)REMARKS: Adults in numbers on flowering plants, particularly *Muehlenbeckia australis*. Hosts: *M. australis*, *Olearia furfuracea*, and *Phyllocladus trichomanoides*.*Ochrocydus huttoni* Pascoe, 1876REMARKS: Larvae severely attack *Leptospermum scoparium* trunks, and to a lesser degree those of *Kunzea ericoides*.*Oemona hirta* (Fabricius, 1775)

Fig. 161

REMARKS: The most versatile of the native longhorns. Host genera: *Acacia*, *Acer*, *Albizia*, *Azara*, *Betula*, *Brachyglot-**tis*, *Casuarina*, *Chamaecyparis*, *Citrus*, *Coriaria*, *Cupressus*, *Fraxinus*, *Freycinetia*, *Gahnia*, *Hakea*, *Hedycarya*, *Hoheria*, *Idesia*, *Juglans*, *Ligustrum*, *Macropiper*, *Malus*, *Melicytus*, *Muehlenbeckia*, *Olearia*, *Parsonsia*, *Pittosporum*, *Prunus*, *Punica*, *Pyrus*, *Quercus*, *Ripogonum*, *Salix*, *Schefflera*, *Solanum*, *Sophora*, *Tabebuia*, *Ulex*, *Ulmus*, and *Virgilia*.*Phoracantha semipunctata* (Fabricius, 1775)FIRST REPORTED IN N.Z.: C. M. Wakefield, 1874, under the name *P. recurva* Newman.

EARLIEST N.Z. RECORD: Middleton, MC, Feb 1873, Tully.

REMARKS: Larvae cortical, subcortical, and xylophagous; abundant in dead trunks and branches of *Eucalyptus* spp.*Stenopotes pallidus* Pascoe, 1875REMARKS: Beaten and reared from *Dacrycarpus dacrydioides*, *Metasequoia glyptostroboides*, *Phyllocladus trichomanoides*, *Pinus radiata*, and *Prumnopitys ferruginea*.*Tessaromma undatum* Newman, 1840^a

FIRST REPORTED IN N.Z.: J.J. Walker, 1904.

EARLIEST N.Z. RECORD: Auckland, AK, May 1902, J.J. Walker.

REMARKS: On *Eucalyptus* species.*Votum mundum* Broun, 1880

REMARKS: Two caught in Malaise trap.

Xuthodes punctipennis Pascoe, 1875REMARKS: Mostly Malaise trapped. Hosts: *Betula* sp., *Fraxinus excelsa*, *Melicytus ramiflorus*, and *Populus nigra*.*Zorion minutum* (Fabricius, 1775)REMARKS: In large numbers on flowering *Ligustrum sinense* in the bush at Wattle Bay. A female ovipositing in cut branches of *Eucalyptus* sp. at bush margin. Most specimens are of the violet variant ('*batesi*').

CERAMBYCIDAE: Lamiinae

Adrioepa pallidata Broun, 1910REMARKS: On sedges of the genera *Carex*, *Gahnia*, and *Scirpus*. Some larvae in culms of *Gahnia lacera* reared through to adults.*Hybolasius crista* (Fabricius, 1775)REMARKS: On *Coprosma lucida*, *C. macrocarpa*, and *C. robusta*.*Hybolasius modestus* Broun, 1880^dREMARKS: Baited with cut branches of *Pittosporum tenuifolium*.*Hybolasius pedator* Bates, 1876REMARKS: Confined to *Pseudopanax*; particularly common on dead *P. arboreus*.*Hybolasius promissus* (Broun, 1880)

REMARKS: Isolated specimen beaten off various vegetation.

Hybolasius simplex Bates, 1874REMARKS: In *Pittosporum crassifolium* and *P. tenuifolium*. Baited in large numbers with cut branches of the hosts in the bush, but not in gardens, although adults found at times on windows and house walls.*Hybolasius sticticus* (Bates, 1874)REMARKS: In *Pittosporum tenuifolium*. Readily attracted by cut branches of the host.*Hybolasius vegetus* Broun, 1881^dREMARKS: Ovipositing on cut branches of *Myrsine australis*, *Pittosporum tenuifolium*, and *Pinus radiata*.*Hybolasius viridescens* Bates, 1874^dREMARKS: Easily baited with cut branches. Hosts: *Dysoxylum spectabile*, *Hedycarya arborea*, *Hibiscus sinensis*, *Hoheria populnea*, *Parsonsia heterophylla*, *Pseudopanax arboreus*, *Solanum mauritianum*, *Ulex europaeus*, and *Vitex lucens*.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76–81

CERAMBYCIDAE : LAMIINAE (cont.)

Microlamia pygmaea Bates, 1874

REMARKS: On *Phormium tenax*, *P. cookianum*, and *Astelia banksii*. Apparently known from monocots only.

Nodulosoma angustum (Broun, 1880)^d

REMARKS: Usually obtained from ground litter. Larvae reared through from dead *Parsonsia heterophylla* and rotten stump of *Leptospermum scoparium*.

Polyacanthia flavipes (White, 1846)

REMARKS: Four in Malaise trap; one each beaten off cut branches of *Muehlenbeckia australis* and *Schefflera digitata*.

Psilocnaeia asteliae Kuschel, 1987^{c,d} Fig. 85-89

REMARKS: Found on *Astelia banksii*, *Collospermum hastatum*, *Cordyline australis*, *Phormium cookianum*, and *P. tenax*.

Psilocnaeia brouni Bates, 1876^d

REMARKS: On *Pseudopanax arboreus* and *P. lessonii*.

Psilocnaeia linearis Bates, 1874^d

REMARKS: Attracted in large numbers to cut parts of stems of the vine *Parsonsia heterophylla*.

Psilocnaeia nana (Bates, 1874)^d

REMARKS: On a variety of hosts, the larvae in wood or pithy tissues; also in very dry fruit (*Lagunaria*). Hosts: *Araujia hortorum*, *Cordyline australis*, *Eucalyptus* spp., *Hoheria populnea*, *Lagunaria pattersonii*, *Melicytus ramiflorus*, *Parsonsia heterophylla*, *Pittosporum crassifolium*, and *Pseudopanax lessonii*.

Psilocnaeia parvula (White, 1846)^d

REMARKS: On *Phormium tenax* and *P. cookianum*.

Ptinoma convexum (Broun, 1893)^d

REMARKS: Most specimens obtained by sifting litter under *Phormium cookianum*, *Gahnia setifolia*, *G. lacera*, and *Cortaderia jubata* by coastal slopes and cliffs.

Ptinoma ptinoides (Bates, 1874)^d

REMARKS: Common in litter of monocots (*Cortaderia*, *Gahnia*, *Carex*, *Uncinia*); larvae in culms and old tillers.

Somatidia antarctica (White, 1846)

REMARKS: In litter and on trunks; larvae in dead wood. Hosts: *Dacrycarpus dacrydioides*, *Eucalyptus lehmannii*, *Hedycarya arborea*, *Leptospermum scoparium*, *Parsonsia heterophylla*, *Pittosporum tenuifolium*, *Rubus cissoides*.

Spilotrogia elongata (Broun, 1883)^d

REMARKS: One beaten off *Freycinetia baueriana*; several obtained by aerosol spot-spraying on stream banks.

Spilotrogia fragilis (Bates, 1874)^d

REMARKS: Beaten from vegetation and netted.

Spilotrogia maculata Bates, 1874^d

REMARKS: On cut *Rubus cissoides* and *Muehlenbeckia australis*, but most beaten or netted.

Spilotrogia pictula (Bates, 1876)^d

REMARKS: One beaten.

Stenellipsis bimaculata (White, 1846)^d

REMARKS: One beaten from *Parsonsia heterophylla*, one caught on house wall, a few swept from vegetation, most Malaise trapped.

'Stenellipsis gracilis' (White, 1846)^d

REMARKS: A few beaten from vegetation.

'Stenellipsis latipennis' Bates, 1874^d

REMARKS: Some on cut branches of *Coprosma robusta* and *Leptospermum scoparium*; most Malaise trapped.

Tenebrosoma albicoma (Broun, 1893)^d

REMARKS: Adults in bush floor litter; larvae reared through to adult from decayed cones of *Pinus pinaster* on bush floor and from rotten base of *Leptospermum scoparium*.

Tenebrosoma tenebricum (Broun, 1893)^d

REMARKS: In litter and amongst *Phormium cookianum*, *Cortaderia jubata*, *Gahnia setifolia*, and bush floor *Uncinia* and *Carex* species; larvae likely to be in monocot and dicot plants advanced in decay.

Tenebrosoma terrestre (Broun, 1880)

REMARKS: In ground litter; one reared from larva from a *Melicytus ramiflorus* stump.

Tetrorrea cilipes White, 1846

REMARKS: In *Pseudopanax arboreum*, *P. lessonii*, and *Pittosporum tenuifolium*.

Xylotoles costipennis (Breuning, 1982)^d Fig. 90-93

REMARKS: On and in various monocot and dicot plants. Hosts: *Carex lessoniana*, *Cortaderia jubata*, *C. splendens*, and *Gahnia setifolia*.

Xylotoles griseus (Fabricius, 1775)

REMARKS: Well adjusted to bush and gardens; larvae in woody and herbaceous plants. Hosts: *Aeonium* sp., *Araujia hortorum*, *Aucuba japonica*, *Begonia* sp., *Chrysanthemum* sp., *Corynocarpus laevigatus*, *Eucalyptus* spp., *Fatsia japonica*, *Hedycarya arborea*, *Lagunaria pattersonii*, *Macropiper excelsum*, *Meryta sinclairii*, *Parsonsia heterophylla*, *Pittosporum crassifolium*, *P. tenuifolium*, *Pseudopanax arboreus*, *Rubus cissoides*, *Salix caprea*, *S. fragilis*, *Schefflera digitata*, *Senecio cruentus* (*cineraria*), *Solanum mauritianum*, and *Vitex lucens*.

Xylotoles humeratus Bates, 1874

REMARKS: On and in recently cut *Parsonsia heterophylla*.

Xylotoles laetus White, 1846

REMARKS: Usually on trunks and thicker branches of dead trees and shrubs. Hosts: *Acacia mearnsii*, *Cupressus macrocarpa*, *Dysoxylum spectabile*, *Eucalyptus* spp., *Hedycarya arborea*, *Hoheria populnea*, *Parsonsia heterophylla*, *Phyllocladus trichomanoides*, *Pinus radiata*, *Pittosporum crassifolium*, *P. tenuifolium*, *Rubus cissoides*, *R. fruticosus*, *Vitex lucens*, and *Weinmannia silvicola*.

Xylotoles nudus Bates, 1874

REMARKS: Most on *Cortaderia jubata* in the bush.

Xylotoles rugicollis Bates, 1874

REMARKS: On and in various monocot and dicot plants. Hosts: *Dysoxylum spectabile*, *Pittosporum tenuifolium*, *Pseudopanax arboreus*, *Scirpus fluviatilis*, and *Sophora microphylla*.

CHRYSMELIDAE

'leaf beetles'

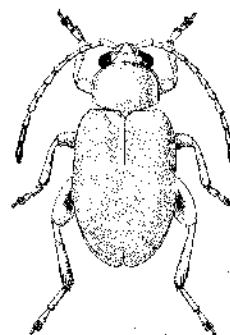


Fig. 75
Chrysomelidae

Longitarsus jacobaeae

CHRYSMELIDAE: Cryptocephalinae

Arnomus brouni Sharp, 1876

REMARKS: Some beaten off flowering *Leptospermum scoparium*; most Malaise trapped.

Ochropsis subfasciata (Saunders, 1845)^{a,b}

EARLIEST N.Z. RECORD: Lynfield, AK, 2 Feb 1980, at win-

dow, C.A. Kuschel.

REMARKS: In numbers on *Eucalyptus nicholsii*.

CHRYSOMELIDAE: Eumolpinae

(assisted by R. C. Craw)

Eucolaspis brunnea (Fabricius, 1792) Fig. 162

REMARKS: Malaise trapped. The synonymy published by Shaw (1957) is best ignored, as the author didn't appreciate the distinct differences in the male genitalia.

Eucolaspis colorata Broun, 1893

REMARKS: Often in numbers on flowering *Leptospermum scoparium*, together with *E. jucunda* (Broun).

Eucolaspis jucunda (Broun, 1880)

REMARKS: Especially common in the summer on flowering *Leptospermum scoparium*.

Eucolaspis pallidipennis (White, 1846)

REMARKS: In Malaise traps.

Eucolaspis picticornis Broun, 1893

REMARKS: Common at night on understorey vegetation in the bush; sometimes in numbers on *Coprosma* and *Haloragis*; also on *Calystegia sepium* on sandy beaches.

Peniticus suffusus Sharp, 1876

REMARKS: Readily obtained by sifting litter in bush floor associations of *Gahnia*, *Carex*, and *Uncinia* species; climbing on to undergrowth at night.

CHRYSOMELIDAE: Chrysomelinae

(assisted by B. J. Selman)

Aphilon enigma Sharp, 1876

REMARKS: On moss and liverworts.

Aphilon minutum Broun, 1880

REMARKS: On moss and liverworts.

Aphilon monstrosum Broun, 1886

REMARKS: On moss and liverworts. This and the two preceding species are very shiny under torch-light, and hence easily spotted at night.

Aphilon species 1

REMARKS: On moss.

Pyrgoides species 1^{a b}

EARLIEST N.Z. RECORD: Tropicana Drive, Lynfield, AK, 11 Dec 1976, on the ground under an *Acacia mearnsii* grove.

REMARKS: Rather common at times on *Acacia mearnsii*.

Paropsis charybdis Stål, 1860^a

FIRST REPORTED IN N.Z.: G.M. Thomson, 1922, as *Paropsis* sp.

EARLIEST N.Z. RECORD: Coopers Knob, Lytleton, MC, Nov 1916, J. Drummond.

REMARKS: A *Eucalyptus* leaf beetle which is rather sparsely represented at Lynfield.

CHRYSOMELIDAE: Galerucinae

Adoxia puncticollis (Sharp, 1886)

REMARKS: Exceedingly common in *Sophora microphylla* in springtime.

Adoxia vulgaris (Broun, 1880)

REMARKS: On *Brachyglottis repanda* and *Olearia rani*, but sometimes so common as to be found resting on other plants.

CHRYSOMELIDAE: Alticinae

Alema paradoxa (Sharp, 1876)

REMARKS: Malaise trapped in large numbers; host plant uncertain.

Longitarsus fuliginosus (Broun, 1880)^a

FIRST REPORTED IN N.Z.: T. Broun, 1880.

EARLIEST N.Z. RECORD: Tairua, CL, in the 1870s, T. Broun.

REMARKS: In pasture and lawns; host unknown.

Pleuraltica cyanea (Broun, 1880)

REMARKS: Common in the summer on *Coprosma* species, particularly *C. robusta*.

Trachytetra rugulosa (Broun, 1880)

REMARKS: Rather common on tree trunks with ferns, epiphytes, or climbing *Metrosideros perforata*.

NEMONYCHIDAE

'pine catkin weevils'



Fig. 76
Nemonychidae

Rhinorhynchus rufulus

Rhinorhynchus rufulus (Broun, 1880)

Fig. 76, 163

REMARKS: On *Phyllocladus trichomanoides*, *Prumnopitys ferruginea*, and especially *Dacrycarpus dacrydioides*.

ANTHRIBIDAE

'fungus weevils'

(assisted by B. A. Holloway)



Fig. 77
Anthribidae

Gynarchaeus ornatus

ANTHRIBIDAE: Anthribinae

Cacephatus huttoni (Sharp, 1876)

Fig. 164

REMARKS: On dead plants. Hosts: *Coprosma* spp., *Corynocarpus laevigatus*, *Eucalyptus* spp., *Hedycarya arborea*, *Macropiper excelsum*, *Melicytus ramiflorus*, *Parsonsia heterophylla*, *Pseudopanax arboreus*, *Ripogonum scandens*, and *Rubus cissoides*.

Dasyanthribus purpureus (Broun, 1880)

Fig. 165

REMARKS: Beaten from *Freycinetia baueriana*, *Salix fragilis*, and *Vitex lucens*.

Etnalis spinicollis Sharp, 1873

Fig. 166

REMARKS: On *Hoheria populnea*.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81

ANTHRIBIDAE : ANTHRIBINAE (cont.)

Euciodes suturalis Pascoe, 1866 ^a Fig. 167
 FIRST REPORTED IN N.Z.: R.A. Cumber, 1959, as *Exilis* sp.
 EARLIEST N.Z. RECORD: Hastings, HB, 24 Nov 1921, J.G. Myers.

REMARKS: In paddock; larvae in old culms of grasses.

Garyus altus (Sharp, 1876) Fig. 168
 REMARKS: Beaten off dead branches of *Acacia mearnsii*, *A. verticillata*, *Corynocarpus laevigatus*, *Cupressus macrocarpa*, and *Hedycarya arborea*.

Lawsonia variabilis Sharp, 1873 Fig. 169
 REMARKS: On *Parsonsia heterophylla* and *Muehlenbeckia complexa*.

Lophus rudis (Sharp, 1876) Fig. 170
 REMARKS: On trunks and thicker branches of dead trees. Found in large numbers for several months on a dead *Dysoxylum spectabile* 1 year after its death through water-logging.

Phymatus hetaera (Sharp, 1876)
 REMARKS: On dead trunks and branches of *Corynocarpus laevigatus*, *Hedycarya arborea*, *Parsonsia heterophylla*, *Pseudopanax arboreus*, and *Sophora microphylla*.

Pleosporius bullatus (Sharp, 1876) Fig. 171
 REMARKS: On dead branches of various trees. Hosts: *Beilschmiedia tawa*, *Corynocarpus laevigatus*, *Eucalyptus lehmannii*, *Parsonsia heterophylla*, *Pittosporum tenuifolium*, *Solanum mauritianum*, and *Ulex europaeus*.

Sharpius brouni (Sharp, 1876)
 REMARKS: Readily beaten off various dead branches. Hosts: *Acacia mearnsii*, *A. verticillata*, *Albizia lophantha*, *Cortaderia jubata*, *Corynocarpus laevigatus*, *Dysoxylum spectabile*, *Eucalyptus* spp., *Fraxinus excelsa*, *Gahnia lacera*, *Hedycarya arborea*, *Meliclytus ramiflorus*, *Muehlenbeckia complexa*, *Nestegis lanceolata*, *Olearia furfuracea*, *Pinus radiata*, *Populus nigra*, *Pseudopanax arboreus*, *Schefflera digitata*, *Sophora microphylla*, and *Ulex europaeus*.

ANTHRIBIDAE : Choraginae

Araecerus palmaris (Pascoe, 1882) ^a Fig. 172
 FIRST REPORTED IN N.Z.: T.W. Kirk, 1895, under the name *Doticus pestilens* Olliff.

EARLIEST N.Z. RECORD: Wellington, WN, 1894, in shrivelled apples, T.W. Kirk.

REMARKS: Found on *Acacia mearnsii*, *A. verticillata*, and *Lagunaria patersonii*. Larvae observed in *Uromycladium notabile* galls of *Acacia* species and in very old, dry fruit capsules of *Lagunaria*.

Dysnocryptus dignus (Broun, 1880)
 REMARKS: On and under bush floor monocots of the genera *Carex*, *Cortaderia*, *Gahnia*, and *Uncinia*.

Dysnocryptus inflatus (Sharp, 1876)
 REMARKS: In litter of monocots and dicots, and on low undergrowth of *Carex*, *Gahnia*, *Lepidosperma*, *Schoenus*, and *Uncinia*; some reared from culms of *Gahnia lacera*.

Dysnocryptus rugosus (Sharp, 1876)
 REMARKS: Apparently restricted to monocots, occurring on bush floor *Carex* and *Uncinia* species, *Cortaderia jubata*, *Cyperus ustulatus*, *Freyinetia baueriana*, *Gahnia lacera*, and *Phormium tenax*.

Micranthribus atomus (Sharp, 1876) Fig. 173
 REMARKS: Common in litter under the monocot *Astelia banksii*, *Carex* spp., *Cortaderia jubata*, *C. splendens*, *Cyperus ustulatus*, *Gahnia lacera*, *G. setifolia*, *Phormium cookianum*, and *P. tenax*.

Notochoragus crassus (Sharp, 1876) Fig. 174
 REMARKS: On decayed wood of various trees.

Notochoragus thoracicus (Broun, 1893)

REMARKS: In bush litter.

BELIDAE

Aglycyderinae



Fig. 78
Belidae

Aralius wollastoni

Aralius wollastoni (Sharp, 1876) ^d Fig. 78, 175

REMARKS: Subcortical in dying or dead branches of *Pseudopanax arboreus* and *P. lessonii* 1–5 cm thick. The often cited statement of Hudson (1934) that this species is associated with the tree fern *Cyathea dealbata* is incorrect.

BRENTIDAE

Apioninae



Fig. 79
Brentidae

Apion ulicis

Apion ulicis (Forster, 1771) ^a Fig. 79, 176

FIRST REPORTED IN N.Z.: D. Miller, 1931.

EARLIEST N.Z. RECORD: Liberated in Nelson 25 Feb 1931 and in Alexandra 27 Feb 1931.

REMARKS: Imported for the control of *Ulex europaeus*.

Neocyba metrosideros (Broun, 1880) Fig. 177

REMARKS: On *Metrosideros excelsa*.

CURCULIONIDAE

'weevils'

CURCULIONIDAE: Brachycerinae: Entimini

'broad-nosed weevils'

Asynonychus cervinus (Boheman, 1840) ^{a d} Fig. 178

FIRST REPORTED IN N.Z.: E.S. Gourlay, 1940, under the synonym *A. godmani* Crotch.

EARLIEST N.Z. RECORD: Nelson, NN, 1937, E.S. Gourlay.

REMARKS: Parthenogenetic in New Zealand. Occasionally seen in garden plants, or crawling on the ground or up walls.

Brachyolus species 1

REMARKS: In more open areas of the bush, with *Schoenus tendo* dominant on the ground in a *Leptospermum scoparium* grove.

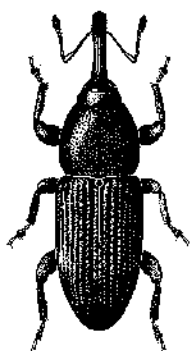


Fig. 80
Curculionidae

*Arecophaga
varia*

***Catoptes binodis* (White, 1846)**

REMARKS: Here and there on foliage of dicots.

***Cecyropa discors* Broun, 1881**

REMARKS: In maritime vegetation of sandy beaches.

***Graphognathus leucoloma* (Boheman, 1840)^a Fig. 179**

FIRST REPORTED IN N.Z.: R.A. Harrison, 1955.

EARLIEST N.Z. RECORD: Hastings, HB, Nov 1944.

REMARKS: Parthenogenetic in New Zealand. Sporadically in gardens and paddocks. Feeding on various dicots, but with a preference for Fabaceae, especially *Medicago* and *Trifolium* species.

***Ireninus compressus* (Broun, 1880)**

REMARKS: On various understorey dicot plants.

***Lyperobates asper* Broun, 1893**

REMARKS: Scattered in the bush, but more common on a slight ridge under *Phyllocladus trichomanoides* and *Olearia furfuracea*.

***Mandalotus irritus* (Pascoe, 1877)**

REMARKS: In bush floor litter.

***Mandalotus miricollis* (Broun, 1917) Fig. 180**

REMARKS: Sandy beach and coastal vegetation; occasionally in gardens in clusters of *Phormium tenax*. Considered by Kuschel (1972) as a likely adventive species from Australia, but this now seems improbable.

***Mandalotus* species 1**

REMARKS: In maritime vegetation at Wattle Bay.

***Otiorthynchus rugosostriatus* (Goeze, 1777)^a Fig. 181**

FIRST REPORTED IN N.Z.: E.S. Gourlay, 1955.

EARLIEST N.Z. RECORD: Napier, HB, May 1940, L. Bisley (NZAC).

REMARKS: In garden and pastures. Parthenogenetic.

***Otiorthynchus sulcatus* (Fabricius, 1775)^a Fig. 182**

FIRST REPORTED IN N.Z.: R.I. Kingsley, 1890.

EARLIEST N.Z. RECORD: Mt Eden, Auckland City, AK, 1866, T. Broun (BMNH).

REMARKS: In gardens and pastures. Parthenogenetic.

***Paelocharis corpulentus* (Broun, 1880)**

REMARKS: In damper areas of the bush, especially by streams and seeping slopes.

***Paelocharis setifer* (Broun, 1893)^d**

REMARKS: In bush floor litter.

***Phlyctinus callosus* Boheman, 1834^a Fig. 183**

FIRST REPORTED IN N.Z.: T. Broun, 1893c, under the synonym *Rhyncogonus germanus* Broun.

EARLIEST N.Z. RECORD: Mt Egmont, near Stratford, TK, before 1893, A.T. Urquhart (BMNH).

REMARKS: Sporadic on ground and low plants in gardens and paddocks.

***Sitona discoideus* Gyllenhal, 1834^a Fig. 184**

FIRST REPORTED IN N.Z.: M.J. Esson, 1975, as *S. humeralis*.

EARLIEST N.Z. RECORD: Awatoto, Napier, HB, larvae Sep and adults 8 Oct 1974, M.J. Esson and B.M. May (NZAC).

REMARKS: In garden (on washing on clothesline, 4 Feb 1977, B.A. Holloway) and sweeping pasture. Associated with *Medicago* species.

CURCULIONIDAE: Brachycerinae: Aterpini

***Rhadinosomus acuminatus* (Fabricius, 1775)**

REMARKS: Associated with *Haloragis erecta*, the larvae mining live stems.

CURCULIONIDAE: Brachycerinae: Gonipterini

***Gonipterus scutellatus* Gyllenhal, 1833^a Fig. 185**

FIRST REPORTED IN N.Z.: T. Broun, 1893a, as *Gonipterus* sp.

EARLIEST N.Z. RECORD: Wellington, WN, 1890, W.M. Maskell.

REMARKS: Associated with *Eucalyptus* species.

CURCULIONIDAE: Brachycerinae: Diabathrariini

***Geochus inaequalis* (Broun, 1880)**

REMARKS: In bush floor litter, especially *Gahnia lacerata* debris from under *Metrosideros excelsa* trees, but also under *G. setifolia*.

***Geochus politus* (Broun, 1881)**

REMARKS: Common in most bush floor litter of cryptogams, dicots, and monocots.

***Geochus similis* Broun, 1893**

REMARKS: In litter and wrack at beach.

***Geochus* species 1**

REMARKS: A single specimen from a litter sample (74/47) taken under *Dacrycarpus dacrydioides*.

CURCULIONIDAE: Brachycerinae: Rhytirhinini

***Gromilus setosus* (Broun, 1893)**

REMARKS: In litter, mostly from *Gahnia* and *Blechnum*. No feeding observed, and never found on vegetation at night.

***Gromilus thoracicus* (Broun, 1893)**

REMARKS: Associated with ferns, especially with species of *Blechnum*, *Polystichum*, and *Pteris*; adults notching the fronds, larvae in the soil.

***Listroderes difficilis* Germain, 1895^a Fig. 186**

FIRST REPORTED IN N.Z.: J. Muggeridge, 1933, under the name *Listroderes costirostris*.

EARLIEST N.Z. RECORD: Wellington, WN, Dec 1920, attacking tomatoes (NZAC).

REMARKS: Only parthenogenetic populations in New Zealand. Adults and larvae feeding on a wide range of herbaceous dicots in paddocks and gardens.

***Listroderes foveatus* (Lea, 1928)^a**

FIRST REPORTED IN N.Z.: G. Kuschel, 1972.

EARLIEST N.Z. RECORD: Brooklands, New Plymouth, TK, Dec 1950 (NZAC).

REMARKS: Amongst maritime vegetation at Wattle Bay. All New Zealand populations are parthenogenetic. Now known to be widespread in the North I.

***Listronotus bonariensis* (Kuschel, 1955)^a Fig. 187**

FIRST REPORTED IN N.Z.: G.A.K. Marshall, 1937, as *Hyperodes griseus*.

EARLIEST N.Z. RECORD: Nelson, NN, 9 Apr 1927, E.S. Gourlay.

REMARKS: In pastures and urban lawns, feeding as adults and larvae on various grasses, especially *Lolium* species.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76-81

CURCULIONINAE : RHYTHIRHINI(cont.)

Steriphus ascitus (Pascoe, 1876)^d

REMARKS: In *Carex lesssoniana* swamp with interspersed *Typha orientalis* and *Scirpus fluviatilis*; adults found more commonly on *Scirpus*. The larvae feed on roots, and are adapted to an aquatic substrate (B.M. May 1970).

Steriphus diversipes lineatus (Pascoe, 1873)^{a d} Fig. 188

FIRST REPORTED IN N.Z.: A.F. Clark, 1932, as *Desiantha maculata*.

EARLIEST N.Z. RECORD: Nelson, NN, Nov 1914, Broun Coll. in Brookes Coll. (NZAC).

REMARKS: Sheep paddock. Feeds on various herbaceous dicots in pastures and gardens.

CURCULIONIDAE: Curculioninae: Eriirhinini

Bryocatus polytrichi Kuschel^d Fig. 97-105, 189

REMARKS: Associated with mosses (*Polytrichadelphus*, *Campylopus*, *Fissidens*) of bush tracks, bush margins, and stream banks.

Myrtonymus zelandicus Kuschel^d Fig. 106-116

REMARKS: In soil from ground surface to about 60 cm deep, depending on moisture levels, around rootlets of myrtaceous trees such as *Metrosideros excelsa*, *M. perforata*, *Leptospermum scoparium*, *Kunzea ericoides*, and *Lophomyrtus bullata*.

CURCULIONIDAE: Curculioninae: Eugnomini

Gonopteris spinicollis Broun, 1909^d

REMARKS: Associated with *Nestegis* species, the larvae in the fruit.

Hoplocneme hookeri White, 1846

REMARKS: Pollen feeders as adults, on various flowering plants; larvae in dead branches of *Coprosma*.

Hoplocneme squamosa Broun, 1880

REMARKS: A few adults Malaise trapped.

Nyxetes bidens (Fabricius, 1775)

REMARKS: Pollen feeder as an adult, on various plants; gall-inducing larva in some lianes and trees.

Pactola demissa Pascoe, 1876

REMARKS: Large numbers attracted by cut branches of *Parsonia heterophylla*.

Pactola variabilis Pascoe, 1876

REMARKS: Associated with *Schefflera digitata* and *Pseudopanax* species; larvae subcortical in dying branches.

Rhopalomerus fucosus (Pascoe, 1877)

REMARKS: Adult feeding on pollen, larvae in decaying wood.

Scolopterus aequus Broun, 1880^d

REMARKS: Pollen feeder on almost every flowering plant; larva in decaying wood and fern fronds.

Scolopterus penicillatus White, 1846^d

REMARKS: Pollen feeder on all sorts of monocots and dicots; larva in decaying wood.

Stephanorhynchus crassus Broun, 1880^d Fig. 190

REMARKS: Associated with *Pittosporum*; larva in the fruit.

Stephanorhynchus curvipes White, 1846

REMARKS: Adults feeding on pollen on many dicots and monocots; larva in dead bark of *Pseudopanax* species.

Stephanorhynchus lawsoni Sharp, 1876

REMARKS: Adults feeding on pollen of a wide range of angiosperms; larva subcortical in dead branches of *Coprosma*.

Tysius bicornis (Fabricius, 1781)

REMARKS: Pollen feeder on many flowering plants; especially common on *Nestegis lanceolata*.

CURCULIONIDAE: Curculioninae: Curculionini

Aneuma fasciatum (Broun, 1880)^d

REMARKS: On *Pittosporum tenuifolium*, the larvae mining the leaves.

Aneuma fulvipes Pascoe, 1876

REMARKS: Associated with *Pittosporum tenuifolium*, the larva in flower buds.

Aneuma rubricale (Broun, 1880)

REMARKS: Associated with *Pittosporum tenuifolium*, the larva in open flowers.

Gymnetron pascuorum (Gyllenhal, 1813)^a Fig. 191

FIRST REPORTED IN N.Z.: G. Kuschel, 1972.

EARLIEST N.Z. RECORD: Auckland City, AK, 22 Jun 1971, J.L. Burton (NZAC).

REMARKS: Associated with *Plantago lanceolata*; common in wastelands, paddocks, gardens, parks, and roadsides.

Neomycta rubida Broun, 1880

REMARKS: Associated with *Metrosideros excelsa*.

Peristoreus cruciger (Broun, 1881)^d

REMARKS: Associated with *Nestegis lanceolata*.

Peristoreus fulvus (Broun, 1886)

REMARKS: Associated with *Muehlenbeckia australis*.

Peristoreus fusconotatus (Broun, 1880)^d

REMARKS: Associated with *Olearia furfuracea*; larva in the heads.

Peristoreus leucomus (Broun, 1921)

REMARKS: Associated with *Olearia furfuracea*; larva feeding on achenes in flower heads.

Peristoreus maorinus (Broun, 1913)

REMARKS: Associated with *Dracophyllum sinclairii* of coastal cliffs; larva feeding on flowers.

Peristoreus sexmaculatus (Broun, 1881)

REMARKS: Associated with *Carmichaelia aligera*; larva developing in flower buds.

Peristoreus sudus (Broun, 1881)

REMARKS: Associated with *Carmichaelia aligera*; larva in pods.

Peristoreus viridipennis (Broun, 1880)

REMARKS: Associated with *Muehlenbeckia australis* and *M. complexa*.

Praolepra fultoni Broun, 1886

REMARKS: On *Coprosma* species.

Praolepra infusca Broun, 1880

REMARKS: On *Coprosma* species.

Praolepra squamosa Broun, 1880

REMARKS: On *Coprosma* species.

Fig. 192

Storeus albosignatus Blackburn, 1890^a

FIRST REPORTED IN N.Z.: G. Kuschel, 1972.

EARLIEST N.Z. RECORD: Titoki, Whangarei, ND, 12 Oct 1935, E. Fairburn (NZAC).

REMARKS: Associated with *Acacia verticillata*, and especially frequent on *A. mearnsii*.

Fig. 193

CURCULIONIDAE: Curculioninae: Ceutorhynchini

Rhinoncus australis Oke, 1931^{a d}

Fig. 194

FIRST REPORTED IN N.Z.: G. Kuschel, 1972, as *R. bruchoides* (in error).

EARLIEST N.Z. RECORD: Ihumatao, Mangere, AK, 9 Mar 1960, B.M. May (NZAC).

REMARKS: In gardens and paddocks, congregating at times at bases of *Phormium tenax*. Larva inducing galls in stem of *Polygonum persicaria* in New Zealand (B.M. May 1987); adults apparently associated with *Rumex* in Australia (E.C. Zimmerman, pers. comm.).

CURCULIONIDAE: Curculioninae: Baridini

Linogeraeus urbanus (Boheman, 1859)^a Fig. 195

FIRST REPORTED IN N.Z.: B.M. May, 1984.

EARLIEST N.Z. RECORD: Lynfield, Auckland City, AK, Feb 1975, B.A. Holloway (NZAC).

REMARKS: Associated with *Paspalum distichum* (syn. *paspalodes*); larva mining live stolons. Adults appear in second half of January; very active in turf during warmer hours of daytime. This bisexual species arrived in New Zealand via Australia.

CURCULIONIDAE: Curculioninae: Magdalinini

Neolaemosaccus narinus (Pascoe, 1872)^{a,d} Fig. 196

FIRST REPORTED IN N.Z.: R.H. Milligan, 1970.

EARLIEST N.Z. RECORD: Auckland City, AK, 27 Oct 1939, D. Spiller (NZAC).

REMARKS: Associated with *Acacia mearnsii* and *Albizia lophantha*; larva in dead branches.

CURCULIONIDAE: Curculioninae: Cryptorhynchini

'Acalles' certus Broun, 1880REMARKS: In monocot and dicot litter on bush floor, especially from a *Gahnia lacera* / *G. setifolia* association under large *Metrosideros excelsa* trees. Some reared from very decayed *Pinus pinaster* cones half buried in bush floor litter.*'Acalles' cingulatus* (Broun, 1886)REMARKS: Some in *Parsonsia heterophylla*, most from litter of sedges, especially coastal *Gahnia lacera* and *Blechnum 'capense'*.*'Acalles' conicollis* Broun, 1913

REMARKS: From a litter sample.

'Acalles' dorsalis Broun, 1881REMARKS: In litter under *Alseuosmia macrophylla* and among bush floor *Carex* and *Uncinia*.*'Acalles' hystriculus* Pascoe, 1876REMARKS: Attracted in numbers to cut *Rubus cissoides* and *Parsonsia heterophylla*; also on adventive *Rubus fruticosus* at bush margins.*'Acalles' latirostris* Broun, 1883REMARKS: Amongst *Astelia banksii* clusters.*'Acalles' scitus* Broun, 1880REMARKS: From decayed *Dacrycarpus dacrydioides* wood and *Salix fragilis* wood mould at Wattle Bay *Carex* swamp.*'Acalles' terricola* Broun, 1883REMARKS: In litter and wood mould taken from an old, hollow *Metrosideros excelsa* trunk.*'Acalles' species 1*REMARKS: Found at base of *Blechnum 'capense'*.*Agacalles formosus* Broun, 1886

Fig. 197

REMARKS: Readily obtained by scraping and chopping tree fern trunks (*Cyathea* and *Dicksonia*).*Agacalles integer* (Broun, 1893)^dREMARKS: On rhizomes of *Blechnum 'capense'*.*Agacalles species 1*

REMARKS: From a sample of sifted decayed wood.

Allanalcis allostethus (Broun, 1893)REMARKS: In sifted *Vitex lucens* leaf litter and decayed wood.*Allanalcis incultus* (Broun, 1893)REMARKS: In leaf litter of *Vitex lucens*.*Andracalles horridus* (Broun, 1881)

Fig. 198

REMARKS: On various trees and shrubs. Hosts: *Beilschmiedia tawa*, *Carmichaelia aligera*, *Corynocarpus laevigatus*, *Dysoxylum spectabile*, *Hoheria populnea*, *Kunzea ericoides*, *Leptospermum scoparium*, *Muehlenbeckia australis*, *Nestegis lanceolata*, *Pittosporum tenuifolium*, and *Sophora microphylla*.*Andracalles vividus* (Broun, 1880)REMARKS: On *Metrosideros excelsa* and *Vitex lucens*.*Andracalles species 1*

REMARKS: In bush floor litter.

*Andracalles species 2*REMARKS: On *Metrosideros excelsa*.*Clypeolus brookesi* (Broun, 1923)^dREMARKS: A single specimen reared from a dead branch of *Coprosma macrocarpa*.*Clypeolus lachrymosus* (Broun, 1881)^dREMARKS: Most specimens associated with *Solanum mauritianum* in bush at Wattle Bay.*Clypeolus pascoei* (Broun, 1880)REMARKS: In bush floor litter, especially under *Gahnia* sedge and *Cortaderia* grass. Some reared from larvae on *Freyinetia baueriana* and *Olearia furfuracea*.*Clypeolus signatus* (Broun, 1880)REMARKS: Usually obtained from litter of sedges (*Carex*, *Gahnia*, *Uncinia*, *Schoenus*, *Lepidosperma*); some reared from well decayed culms of *Gahnia lacera*.*Crisius fasciculatus* (Broun, 1893)REMARKS: On *Freyinetia baueriana*, decayed wood, and amongst bush floor sedges (*Carex*, *Gahnia*, *Uncinia*).*Crisius variegatus* Broun, 1880REMARKS: On *Sophora microphylla* and *Parsonsia heterophylla*; larvae in live plants, heavily attacking the exposed roots of an uprooted *Sophora microphylla* tree.*Dermothrius farinosus* (Broun, 1898)^d

REMARKS: In leaf litter.

Dermothrius ruficollis (Broun, 1898)^d

Fig. 199

REMARKS: From *Brachyglottis repanda*, *Alseuosmia macrophylla*, *Myrsine australis*, and *Blechnum 'capense'* litter.*Dermothrius sanguineus* (Broun, 1881)REMARKS: Under *Blechnum 'capense'* beneath clay bank.*Didymus erroneus* (Pascoe, 1876)REMARKS: On a variety of woody plants. Hosts: *Acacia mearnsii*, *Eucalyptus* sp. in bush, *Hoheria populnea*, *Leptospermum scoparium*, *Nestegis lanceolata*, *Olearia furfuracea*, *Parsonsia heterophylla*, *Pittosporum tenuifolium*, *Pseudopanax arboreus*, and *Rubus cissoides*.*Didymus intutus* (Pascoe, 1876)

Fig. 200

REMARKS: On *Olearia furfuracea*; some reared through from larvae in dead wood of this shrub.*Didymus species 1*REMARKS: Common in dead trunks and branches of trees and shrubs. Hosts: *Acacia mearnsii*, *A. verticillata*, *Albizia lophantha*, *Corynocarpus laevigatus*, *Knightia excelsa*, *Metrosideros excelsa*, *Muehlenbeckia australis*, *Pittosporum tenuifolium*, *Populus nigra*, *Sophora microphylla*, and *Weinmannia silvicola*.*Euthyrhinus squamiger* White, 1846

Fig. 201

REMARKS: Only the remains of specimens trapped by the bracket fungus *Ganoderma applanatum* invading the trunk and thick branches of *Knightia excelsa*. May be just a New Zealand variant of the common and widespread *E. mediotabundus* (Fabricius) from Australia and the SW Pacific.*Getacalles ventralis* (Broun, 1885)

Fig. 202

REMARKS: Mostly in coastal monocot litter.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 75-81

CURCULIONINAE: CRYPTORHYNCHINI (cont.)

- Indecentia nubila*** Broun, 1880 Fig. 203
REMARKS: On *Schefflera digitata*.
- Mecistostylus douei*** Lacordaire, 1866 Fig. 204
REMARKS: Restricted to *Pseudopanax* species; particularly abundant in *P. arboreus*.
- Mesoreda sulcifrons*** Broun, 1909
REMARKS: On *Pseudopanax lessonii*.
- Mesoreda* species 1**
REMARKS: On *Pseudopanax arboreus*.
- Metacalles aspersus*** Broun, 1893 Fig. 205
REMARKS: In mixed bush floor litter.
- Metacalles* species 1**
REMARKS: In *Gahnia setifolia* litter.
- Microcryptorhynchus kronei*** (Kirsch, 1877)
REMARKS: In bush floor litter and on vegetation, principally on dead trunks, branches, and twigs. Hosts: *Carmichaelia aligera*, *Coprosma macrocarpa*, *C. robusta*, *Eucalyptus* sp., *Leptospermum scoparium*, *Pinus radiata* in paddock, and *Solanum mauritianum*.
- Microcryptorhynchus perpusillus*** (Pascoe, 1877)^d
REMARKS: On dead trunks, branches, and twigs of a variety of trees and shrubs, especially on the more exposed ones at the bush margin, but readily extending to adjacent garden and orchard plants, and getting on to monocots too. Hosts: *Acacia decurrens*, *A. verticillata*, *Astelia banksii*, *Citrus* spp., *Collospermum hastatum* on *Metrosideros excelsa*, *Cortaderia splendens*, *Cupressus torulosa*, *Eucalyptus* spp., and *Phormium cookianum*.
- Microcryptorhynchus vafer*** (Broun, 1881)
REMARKS: On dead branches of trees and shrubs. Hosts: *Beilschmiedia tawa*, *Dysoxylum spectabile*, *Knightia excelsa*, *Leptospermum scoparium*, *Metrosideros excelsa*, *M. perforata*, *Nestegis lanceolata*, *Olearia furfuracea*, *Pinus radiata* at bush margin, and *Sophora microphylla*.
- Microcryptorhynchus* species 1**
REMARKS: On *Astelia banksii* and adjacent *Phormium cookianum*. A leaf miner on *Astelia* (B.M. May 1987).
- Microcryptorhynchus* species 2**
REMARKS: On various dicots and monocots. Hosts: *Carex lessoniana*, *Dysoxylum spectabile*, *Melicytus ramiflorus*, *Parsonsia heterophylla*, *Salix fragilis*, and *Sophora microphylla*.
- Notacalles leviculus*** (Broun, 1881)
REMARKS: On old trunks of *Elaeocarpus dentatus*, *Hoheria populnea*, *Pseudopanax arboreus*, and *Sophora microphylla*; also cut branches of *Parsonsia heterophylla*.
- Notacalles* species 1**
REMARKS: On *Carex lessoniana*, *Sophora microphylla*, *Corynocarpus laevigatus*, and *Salix fragilis* by the *Carex* swamp in Wattle Bay.
- Notacalles* species 2**
REMARKS: On tree ferns and *Hoheria populnea*.
- Notacalles* species 3**
REMARKS: On *Carmichaelia aligera* and *Olearia furfuracea*.
- Omoeacalles crisioides*** (Broun, 1880)
REMARKS: On branches and trunks of most trees and shrubs. Hosts: *Acacia mearnsii* in bush, *Corynocarpus laevigatus*, *Cupressus torulosa* at bush margin, *Dysoxylum spectabile*, *Eucalyptus* sp. in bush, *Freyinetia baueriana*, *Hedycarya arborea*, *Macropiper excelsum*, *Melicope ternata*, *Melicytus ramiflorus*, *Olearia furfuracea*, *Parsonsia heterophylla*, *Pseudopanax arboreus*, *Schefflera digitata*, *Solanum mauritianum* in bush, and *Sophora microphylla*.
- Omoeacalles ovatellus*** (Broun, 1881) Fig. 206
REMARKS: On trees and shrubs. Hosts: *Corynocarpus laevigatus*, *Dysoxylum spectabile*, *Hedycarya arborea*, *Vitex lucens*, and *Cordyline australis*.
- Paromalisa setigera*** Broun, 1880 Fig. 207
REMARKS: In bush and coastal cliff litter; also in a large, hollow *Metrosideros excelsa*.
- Paromalisa vestita*** Broun, 1880
REMARKS: Mostly among bush floor sedges (*Gahnia*, *Carex*, *Uncinia*).
- Psepholax sulcatus*** White, 1846 Fig. 208
REMARKS: Attacking various dead and dying trees. Hosts: *Albizia lophantha*, *Coprosma robusta*, *Cordyline australis*, *Corynocarpus laevigatus*, *Elaeocarpus dentatus*, *Melicope ternata*, *Melicytus ramiflorus*, *Myrsine australis*, and *Pittosporum tenuifolium*.
- Scelodolichus altulus*** Broun, 1886
REMARKS: In leaf litter, especially of *Gahnia setifolia*.
- Scelodolichus hiliaris*** Broun, 1893
REMARKS: In bush floor litter.
- Scelodolichus lineithorax*** (Broun, 1881)
REMARKS: Associated with bush floor sedges (*Carex*, *Gahnia*, *Lepidosperma*, *Schoenus*, *Uncinia*), and *Freyinetia baueriana*.
- Strongylopterus hylobioides*** (White, 1846) Fig. 209
REMARKS: Common on trees of the coastal belt and cliffs, especially on *Metrosideros excelsa*, *Melicytus ramiflorus*, and *Olearia furfuracea*.
- Sympedius lepidus*** Broun, 1885
REMARKS: On various vegetation; some attracted by cut *Pittosporum tenuifolium*.
- Sympedius testudo*** Pascoe, 1876 Fig. 210
REMARKS: On cut *Nestegis lanceolata* and *Sophora microphylla*.
- Sympedius vexatus*** Pascoe, 1876
REMARKS: Easily baited with cut branches of *Parsonsia heterophylla* and *Rubus cissoides*.
- Tychanus ferrugatus*** Pascoe, 1876
REMARKS: In bush floor litter.
- Tychanus gibbus*** Pascoe, 1876 Fig. 211
REMARKS: On *Pittosporum tenuifolium*.
- Tychanus verrucosus*** Pascoe, 1876
REMARKS: Common to the south of Auckland, but extremely rare at Lynfield, and replaced there by *Sympedius vexatus* Pascoe on the host plant (native *Rubus* species).

CURCULIONIDAE: Curculioninae: Molytini

- Arecophaga varia*** Broun, 1880 Fig. 212
REMARKS: Three specimens Malaise trapped. Usually common where *Rhopalostylis sapida* occurs, but at the Wairaki Stream and Wattle Bay the host palm has only recently established from drupes dispersed by the native pigeon *Hemiphaga novaeseelandiae*.
- Erymneus sharpi*** Pascoe, 1877
REMARKS: In forest floor litter.
- Idus* species 1**
REMARKS: A small, blind, bush-floor litter species.
- Paedaretus hispidus*** Pascoe, 1876 Fig. 213
REMARKS: In decaying wood of conifers, monocots, and dicots; extracted or reared from *Acacia decurrens*, *A. mearnsii*, *Brachyglottis repanda*, *Cordyline australis*, *Hedycarya arborea*, *Metrosideros excelsa*, *Olearia furfuracea*, *Pinus radiata* boards on bush floor, *Pseudopanax lessonii*, *Salix fragilis* in *Carex* swamp, and *Sophora microphylla*.

- Phronira simplex* (Broun, 1881) Fig. 214
REMARKS: In litter and decaying wood.
- Phrynixus astutus* Pascoe, 1876
REMARKS: In bush floor litter.
- Phrynixus modicus* Broun, 1880
REMARKS: Mostly from sifted decaying wood of *Pseudopanax arboreus* and *Dacrycarpus dacrydioides*; one reared from the latter.
- Pogonorhinus opacus* (Broun, 1880)
REMARKS: Nearly all caught in Malaise trap set across upper Wattle Bay stream under dense canopy of *Vitex lucens* and *Dysoxylum spectabile*, the site luxuriant with ferns. Associated with ferns.
- Sosgenes longicollis* Broun, 1914
REMARKS: Litter from base of bush floor *Uncinia*, *Carex*, and *Schoenus* species. A blind ground-litter species.

CURCULIONIDAE: Rhynchophorinae

- Dryophthorus species 1*^{a b} Fig. 215
EARLIEST N.Z. RECORD: Lynfield, AK, 22 Feb 1975, G. Kuschel.
REMARKS: In partly decayed *Pinus radiata* board deposited above stream bank by flood waters in bush; and in a *Cupressus macrocarpa* stump overgrown by *Pennisetum clandestinum* alongside a fence.
- Sitophilus oryzae* (Linnaeus, 1763)^a Fig. 216
FIRST REPORTED IN N.Z.: J.C. Fabricius, 1781, under the name *Curculio bituberculatus* Fabricius.
EARLIEST N.Z. RECORD: Collected during Captain Cook's voyages between Oct 1769 and Feb 1777.
REMARKS: In chicken feed.

CURCULIONIDAE: Cossoninae

- Agastegnus aeneopiceus* (Broun, 1880)^d
REMARKS: Reared from dead *Coprosma macrocarpa*.
- Agastegnus simulans* (Sharp, 1878)^d
REMARKS: On *Corynocarpus laevigatus*, *Parsonsia heterophylla*, and *Schefflera digitata*.
- Allaorus rugosus* (Broun, 1893)
REMARKS: At base of *Uncinia* and *Carex* species in bush and in mixed litter of *Vitex*, *Dysoxylum*, *Coprosma*, *Myrsine*, *Hedycarya*, *Cyathea*, and *Dicksonia*.
- Camptoscopus planiusculus* (Broun, 1880)^d
REMARKS: Beaten singly on different plants.
- Eiratus ornatus* Broun, 1886
REMARKS: In decayed *Corynocarpus laevigatus*, *Kunzea ericoides*, and *Pinus radiata*.
- Eiratus parvulus* Pascoe, 1876
REMARKS: Associated with *Pseudopanax arboreus* and *P. lessonii*; larva subcortical in dead branches.
- Eucossonus setiger* (Sharp, 1878)
REMARKS: Associated with *Cordyline australis* and *C. banksii*.
- Euophryum rufum* (Broun, 1880)
REMARKS: In dead *Macropiper excelsum*, *Metrosideros excelsa*, *Pinus radiata*, and *Salix fragilis*. In damp floor and weatherboards in England, where established since 1934 and reported by F.D. Buck in 1948.
- Exomesites optimus* Broun, 1886
REMARKS: In stream bed, and at base of bush floor *Carex* spp.
- Heteropsis latirostris* Marshall, 1926^d
REMARKS: From a sample of sifted wood.

- Heteropsis lawsoni* Wollaston, 1873
REMARKS: On caudex of dead *Cyathea* and *Dicksonia* tree ferns.

Heteropsis species 1

- REMARKS: On caudex of dead *Cyathea* and *Dicksonia* tree ferns.

- Macrorhyncolus littoralis* (Broun, 1880)^a Fig. 217
FIRST REPORTED IN N.Z.: T. Broun, 1880, as an indigenous species.

EARLIEST N.Z. RECORD: Tairua, CL, in the late 1870s, T. Broun (BMNH).

REMARKS: In driftwood.

- Macroscytalus parvicornis* (Sharp, 1878)^d
REMARKS: Beaten from tree ferns and monocots.

- Macroscytalus remotus* (Sharp, 1878)^d Fig. 218
REMARKS: Beaten from various trees; reared from *Coprosma macrocarpa*.

- Microtribus brouni* (Wollaston, 1874)^d
REMARKS: On the epiphyte *Collospermum hastatum*.

- Microtribus huttoni* Wollaston, 1873
REMARKS: On *Astelia banksii*, *Collospermum hastatum*, and *Carex geminata*; especially common on *Phormium cookianum* and *P. tenax*.

- Microtribus species 1*
REMARKS: Nothing has been noted regarding this weevil.

- Novitas dispar* Broun, 1893
REMARKS: Associated with *Phormium tenax* and *P. cookianum*.

- Pachyops dubius* (Wollaston, 1873)
REMARKS: In dry, dead wood of various trees and lianes; especially common in *Parsonsia heterophylla*.

- Pentarthrum zealandicum* Wollaston, 1873
REMARKS: In *Corynocarpus laevigatus*, *Fraxinus excelsa* near bush margin, *Macropiper excelsum*, and *Melicytus ramiflorus*.

- Phloeophagosoma corvinum* Wollaston, 1873
REMARKS: In dead *Dysoxylum spectabile*, *Gahnia lacerata*, *Macropiper excelsum*, *Melicytus ramiflorus*, *Salix fragilis*, and *Vitex lucens*.

- Phloeophagosoma dilutum* Wollaston, 1874
REMARKS: In dead *Acacia decurrens*, *Albizia lophantha*, *Beilschmiedia tawa*, *Coprosma macrocarpa*, *Cordyline banksii*, *Cupressus torulosa*, *Dacrycarpus dacrydioides*, *Macropiper excelsum*, *Melicytus ramiflorus*, *Pinus radiata*, *Pseudopanax arboreus*, *Sophora microphylla*, and *Vitex lucens*.

- Phloeophagosoma pedatum* Wollaston, 1874
REMARKS: Associated with *Phormium tenax*.

- Sericotrogus subaenescens* Wollaston, 1873
REMARKS: Ubiquitous on ferns, conifers, monocots, and dicots; recorded also from Kermadec, Norfolk, and Lord Howe islands.

- Stenotrupis debilis* (Sharp, 1878)
REMARKS: On dead leaves of *Rhopalostylis sapida*.

- Stenotrupis wollastonianus* (Sharp, 1878)
REMARKS: On dead leaves of *Rhopalostylis sapida*.

- Tanysona comatum* (Broun, 1886)^d
REMARKS: Associated with *Cordyline australis*.

- Torostoma apicale* (Broun, 1880)
REMARKS: In dead *Acacia decurrens* in bush and *Cupressus torulosa* at bush margin.

- Toura longirostris* (Wollaston, 1873)^d
REMARKS: In dead fronds of *Cyathea medullaris* and *C. dealbata*.

Key to symbols after species names

- ^a introduced species ^b first report of this species in New Zealand
^c Lynfield is the type locality ^d taxonomic change; see pp. 76–81

Toura sharpiana (Wollaston, 1874)^d

REMARKS: In dead fronds of *Cyathea medullaris* and *C. dealbata*.

Touropsis brevirostris (Sharp, 1878)

REMARKS: In dead branchlets of *Pittosporum tenuifolium*.

Touropsis species 1

REMARKS: Beating mixed vegetation.

Unas conirostris Marshall, 1953

REMARKS: In a *Phellinus*-induced necrotic area on trunk of a large *Vitex lucens* tree.

CURCULIONIDAE: Scolytinae

Amasa truncata (Erichson, 1842)^a

Fig. 219

FIRST REPORTED IN N.Z.: R.H. Milligan, 1969.

EARLIEST N.Z. RECORD: Canterbury, 1930.

REMARKS: Adults extracted from *Kunzea ericoides* and *Metrosideros excelsa*.

Chaetoptelius mundulus (Broun, 1881)

REMARKS: Associated with dying or recently dead *Pittosporum crassifolium* and *P. tenuifolium*.

Cryphalus wapleri (Eichhoff, 1871)^a

Fig. 220

FIRST REPORTED IN N.Z.: R.H. Milligan, 1970.

EARLIEST N.Z. RECORD: Kerikeri, ND, 23 Sep 1946, Orch. Inst. (NZAC).

REMARKS: Associated with *Ficus* species, but the Lynfield specimens were collected one in Malaise trap, the other drowned in a pool.

Dendrotrupes costiceps Broun, 1881

REMARKS: Associated with dying and freshly dead *Pseudopanax arboreus*, in thicker branches than *D. vestitus*.

Dendrotrupes vestitus Broun, 1881^d

REMARKS: Associated with dying and freshly dead *Pseudopanax arboreus* and *P. lessonii*.

Dendrotrupes species 1

REMARKS: Associated with recently dead and dying *Pseudopanax arboreus*; usually in branches less than 15 mm thick. The three *Dendrotrupes* species often coexist on the same branch of a tree, *D. costiceps* in the thicker part, *D. sp. 1* in the thin branches, and *D. vestitus* in the area in between.

Hylurgus ligniperda (Fabricius, 1792)^a

Fig. 221

FIRST REPORTED IN N.Z.: J. Bain, 1977.

EARLIEST N.Z. RECORD: Whitford, AK, 1974 (FRNZ).

REMARKS: In *Pinus radiata* stumps.

Hypocryphalus species 1

REMARKS: Associated with *Parsonia heterophylla*.

Hypocryphalus species 2

REMARKS: Associated with *Sophora microphylla*.

Phloeosinus cupressi Hopkins, 1903^a

Fig. 222

FIRST REPORTED IN N.Z.: R. Zondag, 1953.

EARLIEST N.Z. RECORD: Auckland, AK, 1943 (FRNZ).

REMARKS: On *Cupressus torulosa*.

Xyleborinus eucalypticus (Schedl, 1938)^{a,b}

Fig. 223

EARLIEST N.Z. RECORD: Lynfield, AK, 23 Mar 1975, G. Kuschel (NZAC).

REMARKS: Adults and larvae in *Acacia decurrens*, *Corynocarpus laevigatus*, and *Melicactus ramiflorus*.

Xyleborinus saxeseni (Ratzeburg, 1837)^a

FIRST REPORTED IN N.Z.: R. Zondag, 1964.

EARLIEST N.Z. RECORD: Mamaranui, ND, June 1963 (FRNZ).

REMARKS: Netted in Malaise traps.

CURCULIONIDAE: Platypodinae

Platypus apicalis White, 1846

Fig. 224

REMARKS: In *Corynocarpus laevigatus* and *Dysoxylum spectabile* waterlogged owing to raised stream level.

TAXONOMIC NOTES

CARABIDAE

Ctenognathus novaezelandiae Fairmaire, 1843 = *Dicrochile ovicollis* Motschulsky, 1864 n.syn.

Motschulsky's type specimen was examined. The species represented by it is common in the Lynfield bush, and is known in the collections by the senior name of *C. novaezelandiae*.

SCYDMAENIDAE

Adrastia Broun, 1881, reinstated genus = *Austroscydmaenus* Franz, 1975 n.syn., *Zeemicrus* Lhoste, 1938 n.syn.

Adrastia clarkei (Franz, 1975) (*Scydmaenus*) n.comb., n.emend. (named after C.E. Clarke, but spelled *clarcki*)

Euconnus calvus (Broun, 1880) = *E. latiusculus* (Broun, 1893b) n.syn., *E. planiceps* (Broun, 1893b) n.syn.

Euconnus setosus (Sharp, 1874) = *E. russatus* (Broun, 1893b) n.syn., *E. tapuanus* Franz, 1975 n.syn.

Magallanoconnus Franz, 1967 new status (from subgenus of *Euconnus* Thomson)

Magallanoconnus galerus (Broun, 1885) n.comb. (*Euconnus*)

Maorinus Franz, 1980 new status (from subgenus of *Euconnus* Thomson)

Maorinus angulatus (Broun, 1893b) n.comb. (*Euconnus*) = *Euconnus trispinosus* Franz, 1975 n.syn.

Microscydmus lynfieldi Franz, 1977 = *M. omahutensis* Franz, 1977 n.syn.

Sciacharis fulva Broun, 1893c = *S. greymouthi* (Franz, 1975) n.syn., *S. pseudofragilis* (Franz, 1975) n.syn.

Sciacharis lanosa (Broun, 1886) = *S. munroi* (Broun, 1893b) n.syn., *S. nelsonia* (Franz, 1975) n.syn., *S. pseudolanosa* (Franz, 1975) n.syn.

Sciacharis puncticollis (Broun, 1880) = *S. nugalii* (Franz, 1977) n.syn.

Sciacharis taranakii Franz, 1980 = *S. copiae* Franz, 1980 n.syn.

Stenichnaphes urbanus Franz, 1980 = *S. peloriensis* Franz, 1985 n.syn.

PSELAPHIDAE

Anabaxis electrica (King, 1863) = *A. minor* Broun, 1921 n.syn.

Anabaxis foveolata (Broun, 1880) n.comb. (*Euplectus*) = *A. euplectoides* (Broun, 1893b) n.syn.

CORYLOPHIDAE

Anisomeristes apicalis (Lea, 1895) n.comb. (*Sericoderus*)

Anisomeristes thoracicus (Erichson, 1842) n.comb. (*Sericoderus*)

CERAMBYCIDAE

Eburida White, 1846 reinstated (not syn. with *Didymocantha* Newman, 1840)

Hybolasius modestus Broun, 1880 = *H. genalis* Broun, 1903 n.syn., *H. modestior* Breuning, 1940 n.syn., *H. thoracicus* Broun, 1893b n.syn.

Hybolasius vegetus Broun, 1881 = *H. brevicollis* Broun, 1883 n.syn., *H. fasciatus* Broun, 1881 n.syn., *H. gnarus* Broun, 1893b n.syn., *H. gracilipes* Broun, 1903 n.syn., *H. rufescens* Broun, 1893b n.syn., *H. sinuatofasciatus* Breuning, 1940 n.syn.

Hybolasius viridescens Bates, 1874 = *H. laticollis* Broun, 1903 n.syn.

Nodulosoma Breuning, 1950 new status (from subgenus of *Somatidia* Thomson) = *Laevisoma* Breuning, 1950 n.syn., *Spinosa* Breuning, 1950 n.syn.

Readily separated from *Somatidia* by the absence of spurs on all the tibiae and by the anteriorly non-marginate pronotum.

Nodulosoma angustum (Broun, 1880) n.comb. (*Somatidia*) = *Somatidia costifera* Broun, 1893b n.syn., *S. discoidea* Broun, 1913 n.syn., *S. nodularia* Broun, 1913 n.syn., *S. websteriana* Broun, 1909 n.syn.

Psilocnaeia Bates, 1874 reinstated (from synonymy with *Stenellipsis* Bates, 1874). Type species by monotypy *P. linearis* Bates.

This genus shares with *Stenellipsis* a robust, usually loop-like basal sclerite contained in the main tubular section of the internal sac and a special mating chamber at the end of the bursa, but differs from it in having the eye lobes connected by a bridge not wider than the diameter of 2 ommatidia at the narrowest point, an elongated prothorax, and elytra dorsally flat in lateral view and holed with pores. Some species here transferred to *Psilocnaeia* were previously in *Xylotoles* solely because of flightlessness.

Psilocnaeia aegrota (Bates) n.comb. (*Xylotoles*) Fig. 81–84

Psilocnaeia asteliae n.sp. Fig. 85–89

Integument reddish brown, antennae and legs paler. Pubescence moderately dense, leaving most of integument exposed, greyish with subdued, often coalescent darkish dots on elytra, the pale pubescence only slightly denser towards sides of pronotum, there forming weak linear patterns. Head alutaceous, very finely and shallowly punctate, glabrous or nearly so behind lower part of upper eye lobe. Eye bridge consisting of a single row of rather loose ommatidia. Prothorax slightly longer than broad, alutaceous, very finely and shallowly punctate; apical rim dorsally incomplete, basal rim fine, complete, ciliate; subapical and subbasal constrictions weak, with 1 scitiferous pit near apical angle and 2 towards basal angle. Elytra widest at middle, very slightly tapering towards base and apex, apices broadly rounded, humeral area nearly effaced; 1 or 2 rows of pores extending beyond middle, sides behind humeral area with 0–6 pores. Wings strongly reduced, about one-third elytral length, linear, membranous. Hind femora not extending beyond ventrite 4.

MALE. Acdeagus somewhat variable in dorsal view, as in Fig. 85 or a little slenderer. Basal sclerite as in Fig. 87, 88, the loop

0.25–0.30 mm long, the pedestal or attachment area short in northern populations, longer in the southern and Chatham Island populations.

FEMALE. Bursa and spermatheca as in Fig. 89; special mating chamber at end dorsally opaque, lacking any pigmentation.

LENGTH 3.4–5.3 mm; width 1.0–1.5 mm.

MATERIAL EXAMINED. New Zealand (279 specimens in all). AK: Lynfield, Mt Roskill, Auckland City (56, G. Kuschel); Green Bay, Auckland City (7, G. Kuschel); Huia (10, B.M. May); Waitakere Range (13, R.A. Harrison, B.A. Holloway, G. Kuschel, D. Spiller); Matuku Reserve, Bethells (3, R.C. Craw). WO: Hakarimata (1, J.C. Watt); Okauia, Matamata (1, A.E. Brookes); Mahoenui (1, G.W. Ramsay). CL: Mayor Island (1, J.C. Watt). BP: Blue Lake, Rotorua (1, J.I. Townsend and R. Zondag). GB: Te Araroa (1, J.M. Hoy); Lake Waikaremoana (5, G. Kuschel). HB: White Pine Bush, Tangoio (1, J.C. Watt); Waewaepa Range (1, R.C. Cumber). TO: Ohakune (1, T.R. Harris). WI: Wanganui (1, J.S. Dugdale); Paiaaka (3, R.C. Cumber); Foxton (1). WN: Otaki Beach (1, R.M. Bull); Waikanae (1); Red Rocks (6, D. Spiller); Island Bay (5, E.S. Gourlay). MB: Stephens Island (18, E.S. Gourlay, G. Kuschel, J. McBurney, G.W. Ramsay); D'Urville Island (11, E. Fairburn, E.S. Gourlay, G.W. Ramsay); Chetwode Island (1, E.S. Gourlay); French Pass (8, G. Kuschel, J. McBurney, L. Mcray, G.W. Ramsay, S. Wild); Ship Cove (51, G. Kuschel, J. McBurney). NN: Nelson (5, E.S. Gourlay). BR: Punakaiki (1, E.S. Gourlay). WD: Okarito (8, G. Kuschel). DN: Dunedin (7). CHATHAM ISLANDS: Waitangi (34, E.S. Gourlay, G. Kuschel, G.W. Ramsay, A.K. Walker); Tuku (5, G. Kuschel); Pitt I. – Paramata (6, G. Kuschel), Glory Bay (3, G. Kuschel); South East Island (1, J.I. Townsend).

TYPE DATA. Holotype male, 4.3 x 1.15 mm, Wattle Bay, Lynfield, Auckland City, AK, 18 March 1979, on *Astelia banksii*, G. Kuschel (NZAC); paratypes in the main museums of New Zealand.

HOST PLANTS. To be found on species of *Astelia* and *Collospermum* (Liliaceae), *Phormium* and *Cordyline* (Agavaceae).

REMARKS. *Psilocnaeia asteliae* is hard to distinguish from *P. aegrota* (Bates) on external characters alone. The armature at the base of the internal sac of the males and the feature of the mating chamber in the bursa of the females separate the two species readily. These two species and *P. parvula* (White) share the same hosts. *P. parvula* occurs from the Three Kings to Stewart Island, *P. aegrota* in Northland (inclusive of the Poor Knights, Hen and Chickens, and Mokohinau islands), northern Auckland (Mt Auckland), and Coromandel. *P. asteliae* seems to be absent from the Coromandel with the exception of Mayor Island, where all three species are found side-by-side. The pedestals or pigmented attachment points of the basal sclerites vary in length, short as in Fig. 5 for the populations from the northern half of the North Island, longer for the populations from the southern half of the North Island, South Island, and the Chatham Islands.

Psilocnaeia brouni Bates (from subsequent placement in *Stenellipsis*).

Psilocnaeia bullata (Bates, 1876) n.comb. (*Stenellipsis*) = *Stenellipsis viridipes* Breuning, 1940 n.syn.

Psilocnaeia linearis Bates, 1874 = *Stenellipsis parallela* Breuning, 1940 n.syn.

Psilocnaeia nana (Bates) n.comb. (*Xylotoles*)

Psilocnaeia parvula (White, 1846) n. comb. (*Xylotoles*) = *Xylotoles apicicauda* Breuning, 1943 n.syn.

Ptinostoma Breuning, 1950 new status (from subgenus of *Somatidia* Thomson) = *Odontosoma* Breuning, 1950 n.syn. Separated from *Somatidia* and *Tenebrosoma* by the absence of spurs on the fore tibiae and from *Nodulosoma* by the presence of 1 or 2 distinct spurs on the hind tibiae.

Ptinostoma convexum (Broun, 1893b) n.comb. (*Somatidia*) = *Somatidia latula* Broun, 1893b n.syn., *S. pennulata* Broun, 1921 n.syn.

Ptinostoma ptinoides (Bates, 1874) n.comb. (*Somatidia*) = *S. ruficornis* Broun, 1914 n.syn., *S. sericophora* Broun, 1909 n.syn.

Spilotrogia Bates, 1874 reinstated (from synonymy with *Stenellipsis* Bates, 1874) = *Eurychaena* Bates, 1874 (from synonymy with *Stenellipsis*), *Trichocnaeia* Breuning, 1959 n.syn. Type species *Spilotrogia maculata* Bates.

Spilotrogia differs from *Stenellipsis* and *Psilocnaeia* by having a long flagelliform basal sclerite reinforced with 2 non-deflecting bars, and 1 or 2 guiding sclerites in the internal sac, by lacking a special mating chamber at the end of the bursa, and by having the spermathecal duct entering the bursa at the blind end. To this genus belong the following species (last generic position in parenthesis):

Spilotrogia elongata (Broun, 1883) n.comb. (*Corestetha*) = *Xylotoles pygmaeus* Broun, 1923 n.syn.

Spilotrogia fragilis (Bates, 1874) n.comb. (*Stenellipsis*)

Spilotrogia hilarula Broun (*Trichocnaeia*)

Spilotrogia maculata Bates, 1874 = *Stenellipsis maculipennis* Breuning, 1940

Spilotrogia pictula (Bates) n.comb. (*Xylotoles*)

Spilotrogia pulchella (Bates, 1874) n.comb. (*Xylotoles*) = *Xylotoles fasciatus* Sharp, 1886 n.syn., *X. germanus* Sharp, 1886 n.syn., *X. gracilis* Broun, 1910 n.syn., *X. persimilis* Breuning, 1940 n.syn.

Stenellipsis Bates, 1874. Type species *S. bimaculata* (White)

This genus differs from *Xylotoles* Newman and *Spilotrogia* Bates by the lack of a flagellum in the internal sac and the presence of a special mating chamber at the end of the bursa, and from *Psilocnaeia* Bates by having the eyes more shallowly emarginate, the eye lobes connected by at least 4 rows of ommatidia at the narrowest point, the prothorax transverse, and the elytra dorsally convex in the lateral view beyond the basal third, without pores. The characters just listed render the genus monobasic. Four species of the New Zealand fauna have a facies similar to that of *S. bimaculata* but have instead of a loop-like basal sclerite a long, fine tube extended beyond the main part of the internal sac, reinforced by a pair of very fine, flexible parallel bars deflected before the end to form an arrow-like apex similar to that of *Xylotoles* (Fig. 16). The species concerned, without a

generic assignment as yet, are *S. cuneata* Sharp, *S. gracilis* (White), *S. latipennis* Bates, and *S. sculpturata* (Broun). These, as well as *S. longula* Breuning and the New Caledonian species assigned by Breuning to *Stenellipsis*, are left incertae sedis in the genus for the time being.

'*Stenellipsis*' *gracilis* (White, 1846) = *S. mediofasciata* Breuning, 1982 n.syn.

Tenebrosoma Breuning, 1950 new status (from subgenus of *Somatidia* Thomson)

Characterised by having fore tibiae with 2 spurs, non-fasciculate elytra, and a marginal stria that ascends close to the basal margin of the elytra.

Tenebrosoma albicoma (Broun, 1893b) n.comb. (*Somatidia*)

Tenebrosoma tenebricum (Broun, 1893b) n.comb. (*Somatidia*)

Tenebrosoma terrestre (Broun, 1880) n.comb. (*Somatidia*) = *Somatidia fuscata* Broun, 1893b n.syn.

Xylotoles costipennis (Breuning, 1982) n.comb. (*Stenellipsis*)

Fig. 90-93

REDESCRIPTION. Similar to and confused with *X. rugicollis* Bates (Fig. 94-96), but differing in having a small ochreous spot on the frons against the eyes, and another spot on the genae against the lower eye-lobe; the frons not bossed under the ochreous spot; the elytra usually with a slight constriction behind the base, with more pointed and extended tips and the interstriae 3, 5, 7, and 9 glabrous and raised to low but distinct costae; the upper part of the mesepisternum with a faint ochreous spot at most; and the hind tibiae less densely pubescent.

MALE. Tegmen with contiguous parameral lobes bearing long, strong setae at apex and on the entire underside of lobes. Aedeagus dorsally and laterally as in Fig. 90 and 91, subangularly expanded on each side at apex, with 3 sharp carinae on underside.

FEMALE. Spermatheca as in Fig. 92, but variable; main body of illustrated spermatheca 0.75 x 0.2 mm, and very long, cylindrical gland 11.0 x 0.4 mm.

LENGTH 10.0-14.0 mm, width 2.8-4.2 mm.

Material examined. Forty-nine examples from ND, AK, CL, and BP.

HOST PLANTS. In dead parts of monocots and dicots; those reared were from old culms of *Gahnia* (Cyperaceae) and dead branches of *Nothofagus menziesii* (Fagaceae).

REMARKS. *Xylotoles costipennis* and *X. rugicollis* are not only sympatric over most of their range but are often on the same plant at the same time, particularly on the adventive *Cortaderia jubata* growing in the more open parts of the forest and the native *C. splendens*. A third species of the genus, *X. nudus* Bates, is a frequent companion of these two species on the same *Cortaderia* grasses. *X. rugicollis* is on average smaller, 7.5-12.5 mm; it is represented from ND, AK, CL, and WO.

Xylotoles laetus White, 1846 = *Somatidia* (*Laewisoma*) *metallica* Breuning, 1982 n.syn.

BELIDAE

Aralius new name for *Platycephala* Montrouzier, 1861 (not Fallén, 1820); gender masculine

The name is derived from Araliaceae, the host-plant family of the New Caledonian and New Zealand species.

Aralius olivieri (Montrouzier, 1861) n.comb. (*Platycephala*)

Aralius wollastoni (Sharp, 1876) n.comb. (*Platycephala*) = *Aglycyderes badius* Broun, 1880 n.syn., *Platycephala jean-neli* Paulian, 1944 n.syn.

CURCULIONIDAE

Agacalles integer (Broun, 1893c) n.comb. (*Acalles*)

Agastegnus Broun, 1883 = *Glyphorhamphus* Broun, 1886 n.syn., *Selocomis* Broun, 1909b n.syn.

Agastegnus aeneopiceus (Broun) n.comb. (*Selocomis*)

Agastegnus simulans (Sharp, 1878) = *A. biimpressus* Broun, 1909b n.syn., *A. gratus* (Broun, 1880) n.syn., *A. longipes* (Broun, 1880) n.syn., *A. nitidirostris* Broun, 1893 n.syn., *A. ruficollis* Broun, 1883 n.syn.

Aneuma fasciatum (Broun) n.comb. (*Peristoreus*)

Asynonychus cervinus (Boheman)

As A.A. Lanteri's (1986) grounds for reinstating *A. godmani* Crotch, 1867 for parthenogenetic populations are rather unconvincing, her stance is not adopted.

Bryocatus polytrichi n.sp.

Fig. 97–105

Integument of body, rostrum, antennae, and tarsi dark brown, of coxae, femora, tibiae, and apical third of elytra reddish brown. Vestiture consisting of a dense coating of agglutinated greyish scales, but scales free on middle of mesosternum and part of coxae; tip of rostrum up to antennal insertions, ventral surface of rostrum and head, antennae, tarsi, and most of last ventrite scale-free. Front transversely impressed. Eyes not protruding. Rostrum curved, subcylindrical, without lateral groove. Prothorax with broad ocular lobes, uneven, with 2 larger, widely separate nodules on middle of disc, and 2 smaller subcontiguous nodules close to base, these nodules and other slight elevations topped with one or more large, strongly curled, squamiform setae. Scutellum visible, punctiform. Elytra striate, distinctly nodulose on uneven interstriae. Tibiae not denticulate, without premucro. Tarsal segment 3 distinctly wider than segment 2.

MALE. Ventrite 5 flat. Sternite 8 as in Fig. 99; sternite 9 as in Fig. 100. Aedeagus as in Fig. 101, 102, broadly rounded at apex; internal sac abruptly constricted just cephalad from a sclerite consisting of 2 narrowly connected plates, these situated about level with bifurcation of apodemes; no other armature in exposed part of internal sac.

FEMALE. Ventrite 5 flat, slightly impressed. Tergite 8 as in Fig. 104, but marginal denticulation quite variable. Sternite 8 as in Fig. 105. Genitalia as in Fig. 24; spermatheca without a long stalk at duct insertion; duct thin, short, inserted ventrally at apical third of bursa.

LENGTH 1.30–1.65 mm, width 0.7–0.9 mm.

MATERIAL EXAMINED. New Zealand. AK: Lynfield, Mt Roskill, 10 males, 33 females collected between 12 Jun 1976 and 27 Mar 1979, extracted from moss of bush tracks, bush margins, and stream banks, G. Kuschel; Piha, 1 female, from moss on stream bank, G. Kuschel. CL: Hongiora I., The Aldermen, 1 female, 11 Nov 1972, ex litter sample 72/194, D. Merton.

TYPE DATA. Holotype male, 1.35 x 0.7 mm, Lynfield, AK, 19 Mar 1977, in moss from stream bank, G. Kuschel (NZAC); paratypes in NZAC.

ECOLOGICAL NOTE. To be found in the loose colonies of two mosses of the family Polytrichaceae, *Polytrichadelphus magellanicus* and *Pogonatum subulatum*, growing side-by-side on rather bare clay banks and on silt of bush track sides more or less exposed to light.

REMARKS. A nodulose species of the general appearance of *B. nodicollis* Broun and *B. jugosus* Broun from Mid Canterbury, South Island. *B. polytrichi* is closely related to *B. nodicollis*, from which it differs by an apically broadly rounded aedeagus versus tapering at apex to a point, a shorter blade-like sclerite, and a pair of small, square sclerites at a rather abruptly narrowed internal sac.

Camptoscopus planiusculus (Broun, 1880) = *C. conicollis* (Broun, 1881) n.syn., *C. sanguineus* Broun, 1893c n.syn.

Clypeolus brookesi (Broun) n.comb. (*Acalles*)

Clypeolus lachrymosus (Broun) n.comb. (*Tychanus*)

Dendrotrupes Broun

There are three rather common species of this genus in New Zealand, all three associated with *Pseudopanax* species (Araliaceae). They often occur simultaneously on the same plant specimen but in different areas of the tree. Broun has named two species, *D. vestitus* and *D. costiceps*. He used to write identification labels for one specimen only and the others of the series got just the species number. Original specimens of species described in 1883 or before by Broun had the species number on green labels, those of later years on white labels. In July 1978 I examined the *Dendrotrupes* specimens in the various Broun collections known to exist. Only four of the many specimens seen had green species number labels and thus qualified as syntypes, 2 males each bearing the number 1314 for *D. vestitus*, and 2 females the number 1315 for *D. costiceps*. There was only one hand-written identification label per species. The specimen with the identification label was selected as lectotype, and thus the two names refer to two distinct species, contrary to statements by Schedl (1962) and Wood (1966), Schedl having synonymised *D. costiceps* under *D. vestitus*, Wood the other way round, *D. vestitus* under *D. costiceps*.

Dendrotrupes costiceps Broun reinstated (from synonymy with *vestitus* Broun)

Lectotype female, 2.4 x 0.95 mm, no. 1315 on green label, Tairua, with identification label (BMNH). Paralectotype female, 2.1 x 0.85, other data as above but no identification label (BMNH) (= *D. vestitus* Broun).

Readily separated from *D. vestitus* Broun by having the whitish fringed scales spread also to the sides of the metasternum and over most of the ventrites, and by having the vestiture on the elytral declivity not at all ruffled. It attacks mainly the trunk and thick branches of the host plant.

***Dendrotrupes vestitus* Broun**

Lectotype male, 2.0 x 0.85 mm, no. 1314 on green label, Tairua, with identification label (BMNH). Paralectotype male, 2.4 x 0.95 mm, other data as above but no identification label (BMNH) (= *D. costiceps*).

The whitish-fringed scales are more or less restricted to the pleurites, and the vestiture on the declivity is distinctly ruffled outwards, at least on interstriae 2 and 3. This species goes mainly for the medium-sized branches of the host plant.

***Gonoropterus* Broun, 1904 = *Pseudancistropterus* Voss, 1936 n.syn.**

***Gonoropterus spinicollis* Broun, 1904 = *Pseudancistropterus horni* Voss, 1936 n.syn.**

***Heteropsis latrostris* Marshall, 1926 = *Pentarthrum planum* Marshall, 1937 n.syn.**

***Macroscytalus* Broun, 1881 = *Baeorhopalus* Broun, 1883 n.syn., *Rhinanisus* Broun, 1883 n.syn.**

***Macroscytalus parvicornis* (Sharp, 1878) n.comb. (*Rhinanisus*) = *Rhinanisus contiguus* (Broun, 1880) n.syn., *R. fulvicornis* (Broun, 1880) n.syn., *R. subconvexus* Broun, 1909 n.syn., *R. sulcirostris* Broun, 1909 n.syn., *R. suturalis* Broun, 1909 n.syn.**

***Macroscytalus remotus* (Sharp, 1878) = *M. badius* (Broun, 1880) n.syn., *M. crenatus* Broun, 1909 n.syn., *M. depressus* Broun, 1883 n.syn., *M. frontalis* Broun, 1893c n.syn., *M. laticollis* Broun, 1881 n.syn., *M. russulus* Broun, 1881 n.syn.**

***Microcryptorhynchus perpusillus* (Pascoe) n.comb. (*Miocalles*)**

***Microtribus* Wollaston, 1873 = *Mesoxenophasis* Wollaston, 1874 n.syn.**

***Microtribus brouni* (Wollaston) n.comb. (*Mesoxenophasis*)**

***Myrtonymus* n.gen. (Curculioninae: Eirrhiniini)**

Derivation of name: from Greek *myrtos* = myrtle, and *onyma* = name or designation; gender masculine

Depressed, depigmented, blind, with fine, short erect or suberect sensory setae. Head and rostrum porrect, only slightly diverted downward from axis of body, converging in dorsal view in straight line from base of head to insertion point of antennae, without any constriction between head and rostrum. Head smooth, glabrous, without a distinct frontal impression. Eyes absent. Rostrum thick, as long as or shorter than prothorax, very slightly curved, strongly converging in dorsal view to apical third, a little wider at apical portion, converging in lateral view to apex; setae directed backwards on postrostrum, forwards on prerostrum. Scrobes short, nearly foveiform, directed obliquely downwards; secondary scrobes on sides of rostrum absent. Antennae slender; scape distinctly dilated at apical third in lateral view, extending to just beyond base of rostrum; funicle 7-segmented, 1st segment thicker and considerably longer than 2nd, segments 2-7 moniliform, very slightly widening towards club; club wide, elongate-oval, 1st segment about as long as remainder, with a basal and a median whirl of setae, the last sometimes slightly constricted. Prothorax distinctly longer than wide, without ocular lobes, with or without an apical constriction, with annular

constriction at rounded base, sparsely punctate; setae directed towards median line, those near apex longer. Scutellum distinct. Elytra oblong-elliptic, jointly concavely rounded at base; lateral margins curved under, partly embracing underside, without an inner flange; elytra diffusely striate-punctate on dorsum, less so toward sides, but stria 9 quite well defined; setae on dorsum directed straight backwards near suture, slightly outwards further to the sides. Hind wings entirely absent. Prosternum not emarginate, not canaliculate; apical margin descending nearly vertically from pronotum. Mesosternum moderately long, longer than a mid-coxal diameter; metepisternum distinct when not hidden under elytral margin. Ventrites 1 and 2 fused, with or without a partly discernible suture; ventrite 3 completely free; ventrites 4 and 5 fused to variable degrees, the suture at times distinct, at times obsolescent and with a low flange on floor of abdominal cavity. Front coxae contiguous; middle coxae narrowly separate. Trochanters with a longer seta. Femora pedunculate, clavate, unarmed, not sulcate underneath. Tibiae with spurs, or apparently so, without mucro or uncus; front tibiae without a dorsal comb but with a ventral comb; middle tibiae with a long dorsal comb on apical half or more; hind tibiae without a dorsal comb but with an ascending internodorsal comb. Tarsi stout; first 3 segments subequal in length and width, with pilose soles; claw segment robust, projecting well beyond segment 3, with strong, long, diverging claws. Hind gut with a rectal ring.

MALE. Tergite 7 without pruinose patches (wing-folding structure). Tergite 8 well exposed beyond tergite 7, visible underneath beyond last ventrite. Sternite 8 partly sclerotised, this part undivided, with a distinct, strongly sclerotised apodeme. Sternite 9 slightly asymmetric, with quite strongly diverging arms, without sclerotised lobes. Tegmen large, nearly as long as aedeagus, with a stretched, elongate ring and with jointly broad, setiferous parameres. Aedeagus with separate pedon and tectum; apodemes robust, longer than aedeagal body, with double, well sclerotised arms, one fused to upper angle of pedon, the other to tectum. Internal sac long, with a large basal sclerite partly protruding at base of sac, with a tubular or flagelliform extension; ejaculatory duct inserting at base of basal sclerite; with 3 major additional sclerites, 1 median and 2 apical near ostium, and occasionally with other smaller, faintly pigmented sclerites as well; walls of sac with finely spinulose vestiture.

FEMALE. Tergite 8 entire at apical margin. Sternite 8 with 2 strongly diverging arms; apodeme usually directed slightly off median line to the right. Hemisternites weakly pigmented, with a small, elongate apical stylus; bursa large; spermatheca large, annulate throughout, with a very small gland close to duct insertion; spermathecal duct not pigmented, variable in width and length, inserting dorsoapically on bursa.

TYPE SPECIES: *Myrtonymus zelandicus* n.sp.

DISTRIBUTION: New Zealand and Australia.

HOST PLANT. Unknown for larvae; adults found consistently in soil around rootlets of Myrtaceae in New Zealand and Australia.

REMARKS. *Myrtonymus* differs from the hypogean Eirrhiniini of Europe and North America in the subtribe Raymondionymina in having the rostrum stretched almost straight forward, the head and rostrum viewed dorsally jointly tapering towards the insertion points of the antennae and the scutellum amply exposed. These features are diagnostic for *Myrtonymina* new subtribe, which is widespread and apparently well represented in Australia, although no species are yet described.

Myrtonymus zelandicus n.sp.

Fig. 106–116

Pale yellowish or reddish brown; antennae and legs usually a shade paler; antennal club paler than funicle. Rostrum with fine, elongate, partly confluent sparse puncta. Prothorax $1.21\text{--}1.31\times$ longer than wide, usually $1.21\text{--}1.25\times$ so in female and $1.26\text{--}1.31\times$ in male, flattish on disc, variably but always sparsely punctate, with some coarser puncta near median line. Elytra flattish across dorsum, with variable, fine punctation lined up to obsolescent striae. Ventral surface very finely punctate, occasionally with isolated larger puncta on metasternum and ventrites; abdomen of male shiny throughout, flattish but not impressed at base and apex. Legs moderately clavate (Fig. 107–109); hind tibiae with long setae on internodorsal comb.

MALE. Sternite 8 with sclerotised part and apodeme as in Fig. 112. Sternite 9 as in Fig. 113. Tegmen and aedeagus as in Fig. 114; pedon broadly rounded at apex; basal sclerite robust, with a rigid, downcurving tubular extension; median sclerite distinct, plate-like, twisted; apical sclerites distinct.

FEMALE. Sternite 8 as in Fig. 115. Genitalia as in Fig. 116; spermathecal duct less than 0.2 mm long, expanded at bursal end.

LENGTH 0.70–0.82 mm, width 0.23–0.27 mm.

MATERIAL EXAMINED. New Zealand. ND: Mt Camel, near Houhora, 2 males, 1 female, 20 Oct 1982, ex soil around rootlets of *Metrosideros excelsa*, C.F. Butcher; Waitangi, fragments only, 2 Nov 1981, ex soil of *M. excelsa*, G. Kuschel; Tawhiti Rahi, Poor Knights Is, many fragments, 10 Dec 1980, ex soil of *M. excelsa*, G. Kuschel; Tutukaka, many fragments, 30 Nov 1980, ex soil of *M. excelsa*, G. Kuschel. AK: Kawau I., fragments only, 26 Feb 1984, ex soil of *M. excelsa*, G. Kuschel; Waiwera, fragments only, 27 Nov 1980, ex soil of *M. excelsa*, G. Kuschel; Huia, 1 female, 15 Jul 1978 and 1 male, 21 Jan 1980, in *Ptychomnion aciculare* moss-mat under *Leptospermum scoparium*, B.M. May; Lynfield, Mt Roskill, Auckland City, from Wairaki Stream to Wattle Bay, 39 males, 36 females, 2 Aug 1975 to 7 May 1980, ex soil around rootlets of *Metrosideros excelsa*, *M. perforata*, *Leptospermum scoparium*, *Kunzea ericoides*, and *Lophomyrtus bullata*, G. Kuschel. CL: Te Maraeroa, Little Barrier I., 1 male (hind body), 7 Apr 1984, ex soil sample 84/59 of *M. excelsa*, C.T. Duval.

TYPE DATA. Holotype male, 0.77 x 0.25 mm, Lynfield, 2 August 1975, G. Kuschel (NZAC); paratypes in NZAC.

HOST PLANTS. Adults associated with *Metrosideros*, *Leptospermum*, *Kunzea*, and *Lophomyrtus* species, all Myrtaceae.

REMARKS. *M. zelandicus* is the smallest weevil so far known in the world. Its wide distribution, occurrence in some rather remote places, and some geographical variation in the shape of the basal sclerite suggest that this species could be endemic to New Zealand or, at least, that it has been established for some considerable time. Like the other blind erirhinine weevils, *Myrtonymus zelandicus* adults are to be found mainly in the top 10 cm of soil during the wetter season and at greater depths, down to 30 and 40 cm, during a prolonged dry period. The first specimens were obtained in Lynfield from dense mats of the moss *Ptychomnion aciculare* associated with *Leptospermum scoparium* on an imperfectly drained northern yellow-brown earth of silt loam texture, formed from strongly weathered rocks

of the Waitemata Formation, which consists of interbedded fine sandstone, siltstone, and mudstone. It has subsequently been established that these minute blind weevils are consistently present around the finer roots of all native species of Myrtaceae from which samples have been taken. The washing-sieving technique was applied to nearly all soil samples. The larva remains unknown. Fine roots were screened for larvae or their workings without success. Adults were kept on such roots, but no actual feeding was observed.

Neolaemosaccus Hustache, 1937 = *Saccolaemus* Kuschel, 1972 n.syn.

Neolaemosaccus narinus (Pascoe) n.comb. (*Saccolaemus*)

Omoecalles crisioides (Broun, 1880) n.comb. (*Acalles*)

Omoecalles ovatellus (Broun, 1881) n.comb. (*Acalles*)

Paelocharis setifer (Broun) n.comb. (*Notiopatulae*)

Peristoreus cruciger (Broun, 1881) = *P. anchoralis* (Broun, 1881) n.syn., *P. gracilirostris* (Broun, 1881) n.syn.

Peristoreus fusconotatus (Broun, 1880) = *P. asperirostris* (Broun, 1881) n.syn., *P. varius* (Broun, 1881) n.syn.

Peristoreus maorinus (Broun, 1913) = *P. consonus* (Broun, 1913) n.syn.

Rhinoncus australis Oke reinstated (not synonymous with *R. bruchoides* (Herbst))

Scolopterus aequus Broun, 1880 = *S. aeneorufus* Broun, 1881 n.syn., *S. submetallicus* Colenso, 1882 n.syn.

Scolopterus penicillatus White, 1846 = *S. pectoralis* Broun, 1880 n.syn.

Stephanorhynchus crassus Broun, 1880 = *S. fatuus* Broun, 1881 n.syn.

Steriphus Erichson, 1842 = *Desiantha* Pascoe, 1870 n.syn. fide E.C. Zimmerman (pers. comm.)

Steriphus ascitus (Pascoe) n.comb. (*Desiantha*)

Steriphus diversipes (Pascoe) n.comb. (*Desiantha*)

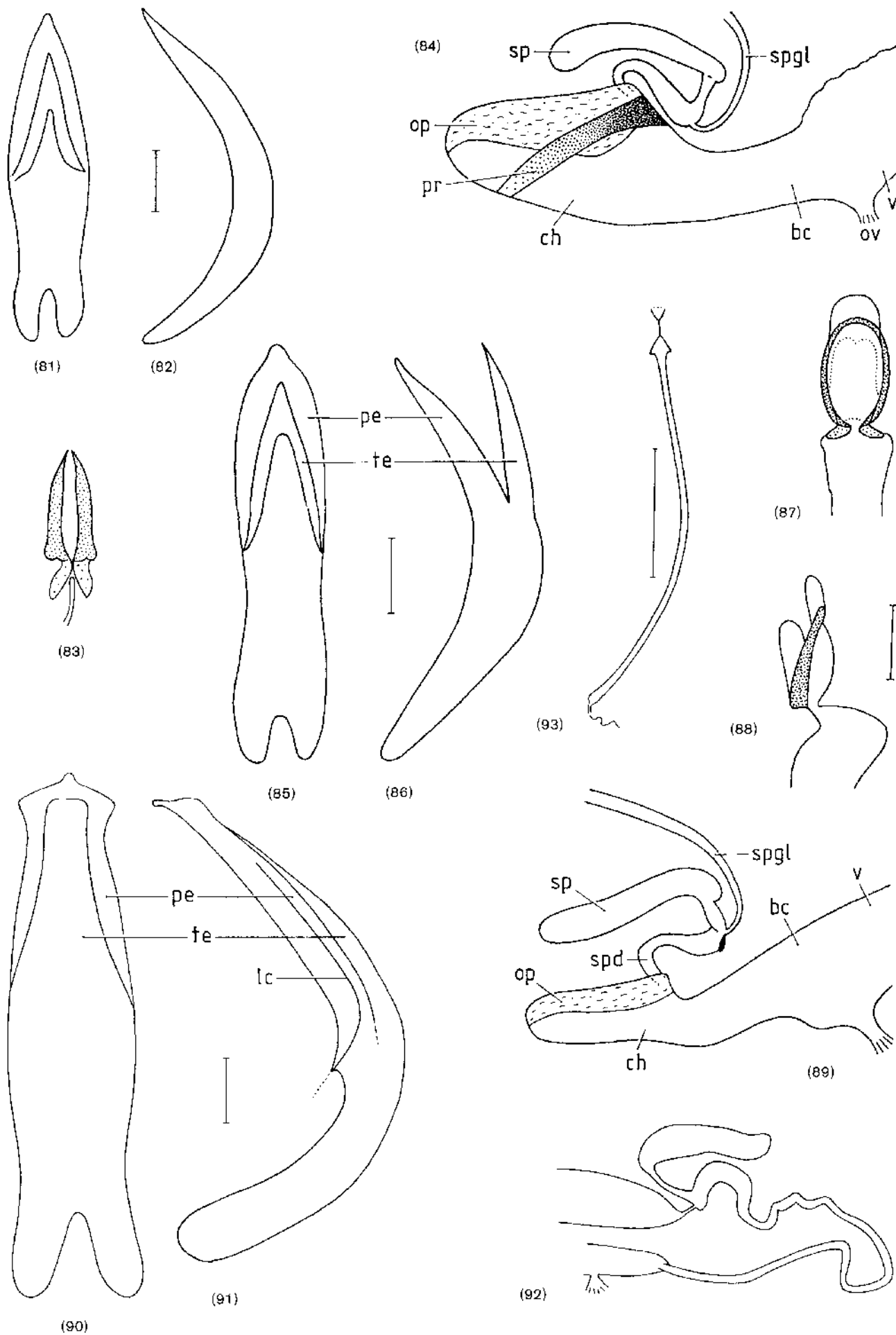
Tanysona Broun, 1909 = *Eutassa* Broun, 1909 n.syn.

Tanysona comatum (Broun) n.comb. (*Eutassa*)

Toura Broun, 1909 = *Merisma* Broun, 1909 n.syn., *Protagonum* Broun, 1909 n.syn.

Toura longirostris (Wollaston, 1873) = *T. fulva* Broun, 1893b n.syn.

Toura sharpiana (Wollaston, 1873) n.comb. (*Merisma*) = *Merisma aurantiaca* (Broun, 1893b) n.syn., *Stenotoura prolixa* Broun, 1909 n.syn.



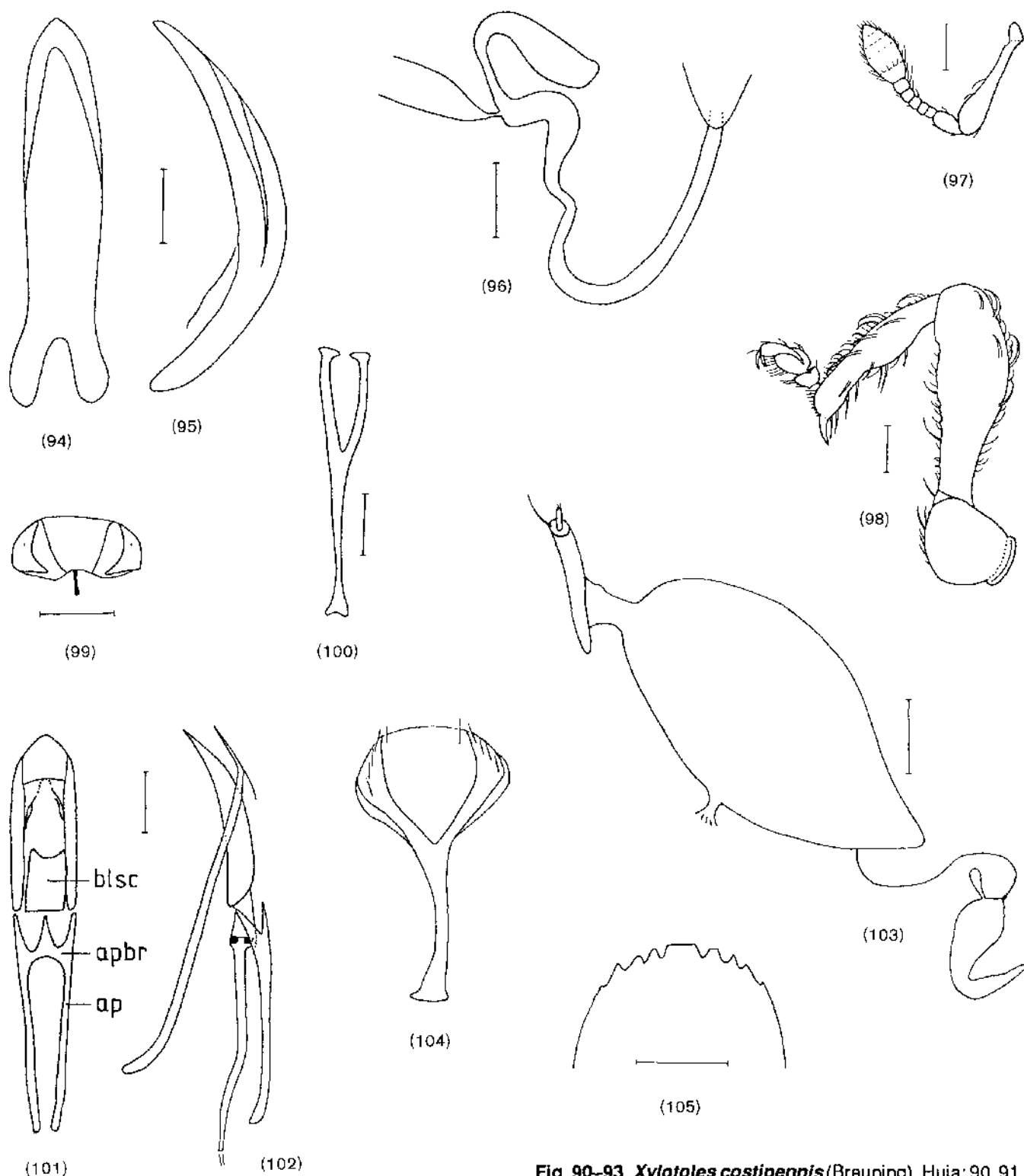


Fig. 81–84 *Psilocnaeia aegrota* (Bates), Poor Knights Is: 81, 82, aedeagus, dorsal and lateral; 83, basal sclerite, dorsal; 84, spermatheca plus bursa.

Fig. 85–89 *Psilocnaeia asteliae* n.sp., Lynfield: 85, 86, aedeagus, dorsal and lateral; 87, 88, basal sclerite, dorsal and lateral; 89, spermatheca plus bursa.

Scale bars = 0.2 mm. Abbreviations: bc, bursa copulatrix; ch, mating chamber; op, white, opaque area of mating chamber; ov, common oviduct; pe, pedon; pr, pigmented ring; sp, spermatheca; spd, spermathecal duct; spgl, spermathecal gland; v, vagina.

Fig. 90–93 *Xylotoles costipennis* (Breuning), Huia: 90, 91, aedeagus, dorsal and lateral; 92, spermatheca with duct; 93, flagelliform basal sclerite.

Fig. 94–96 *Xylotoles rugicollis* Bates, Lynfield: 94, 95, aedeagus, dorsal and lateral; 96, spermatheca with duct. Scale bars = 0.2 mm. Abbreviations: lc, lateral carina; pe, pedon; te, tectum.

Fig. 97–105 *Bryocatus polytrichi* n.sp., Lynfield: 97, antenna; 98, foreleg; 99, 100, sternites 8 and 9, male, ventral; 101, 102, aedeagus, dorsal and lateral; 103, female genitalia, lateral; 104, sternite 8, female, ventral; 105, tergite 8 denticulation, female, dorsal.

Scale bars = 0.1 mm. Abbreviations: ap, apodeme; apbr, apodermal bridge; blsc, blade-like sclerite.

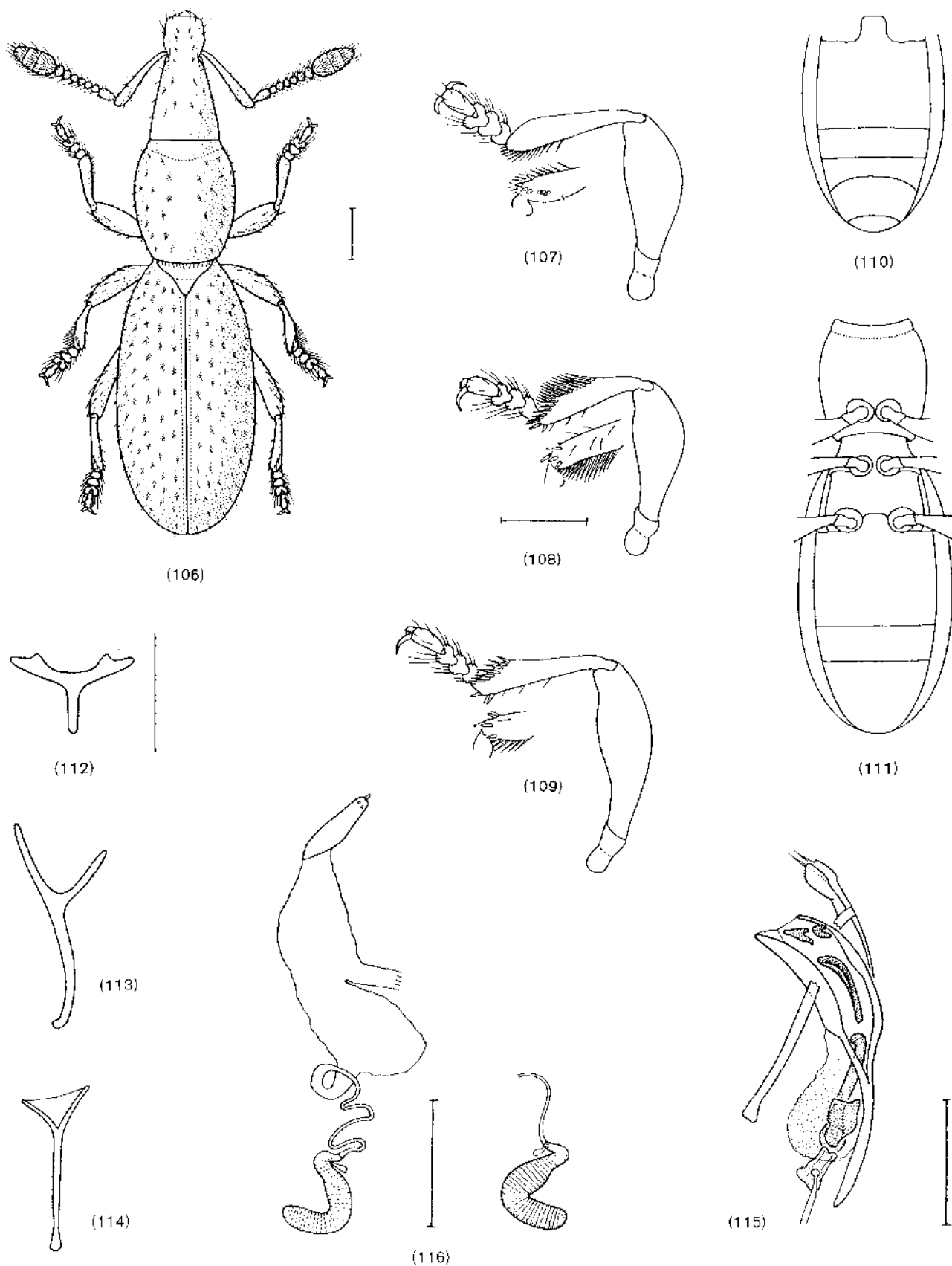


Fig. 106–116 *Myrtonymus zelandicus* n. sp., Lynfield: 106, habitus; 107, right foreleg; 108, left middle leg; 109, left hind leg; 110, abdomen, male, showing tergite 8 at end; 111, ventral surface, female; 112, sternite 8, male; 113, sternite 9, male;

114, sternite 8, female; 115, 116, genitalia, male and female, lateral.

Fig. 106, 110, 111 to same scale, 107–109 to same scale, 112–116 to same scale.

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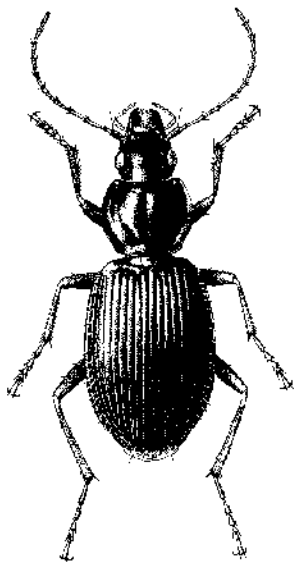
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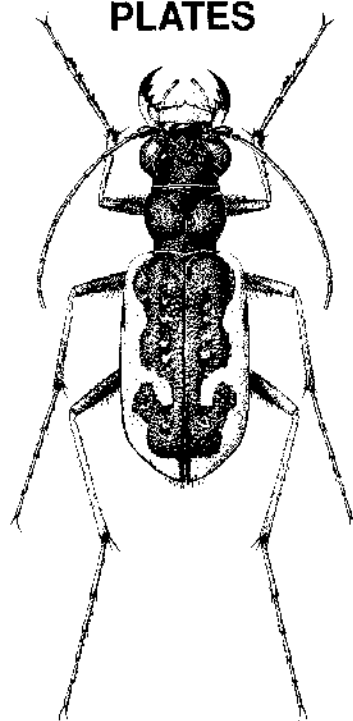
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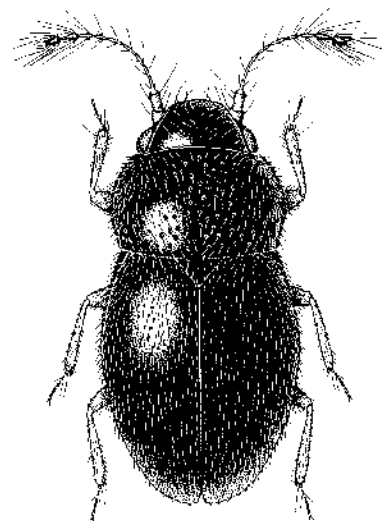
PLATES



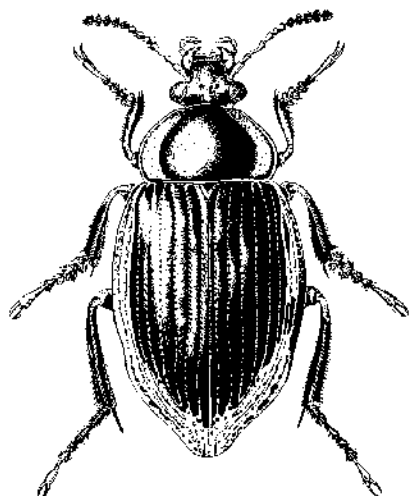
118 *Ctenognathus novaezelandiae*



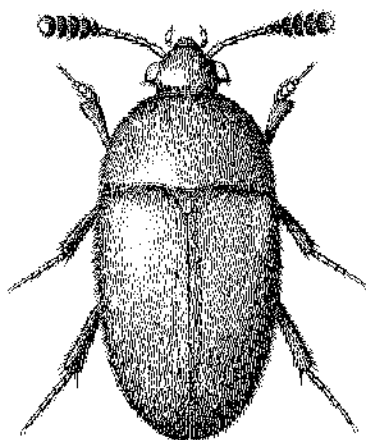
117 *Neocicindela tuberculata*



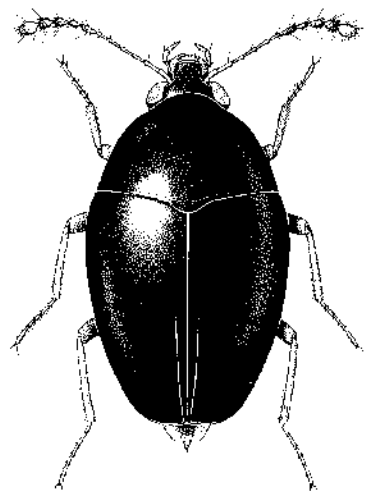
119 *Notoptenidium lawsoni*



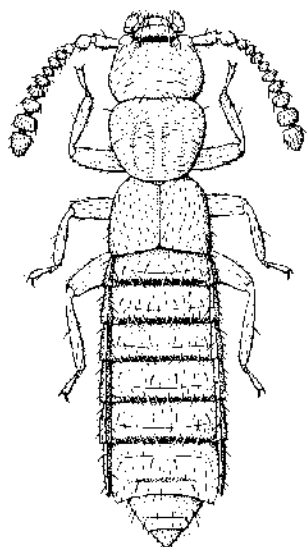
120 '*Necrophilus*' *prolongatus*



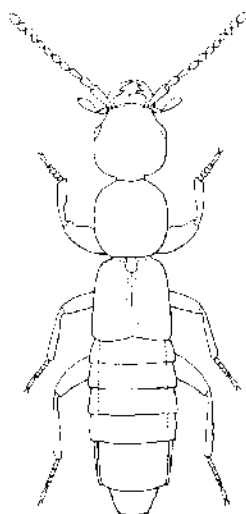
121 *Colon hirtale*



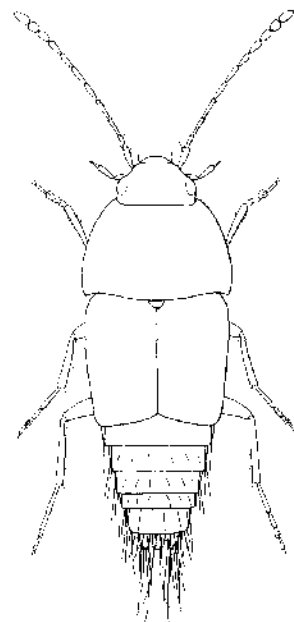
122 '*Baeocera*' *scutellaris*



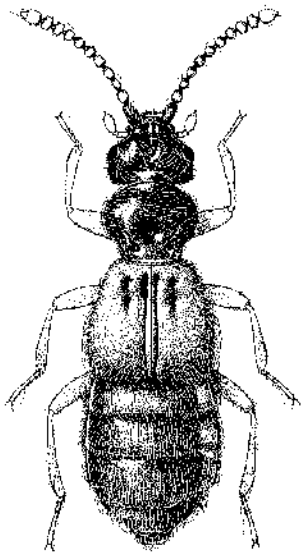
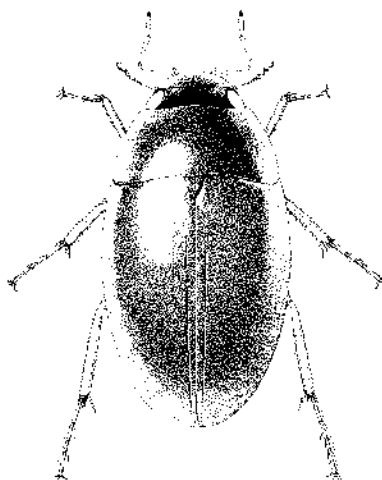
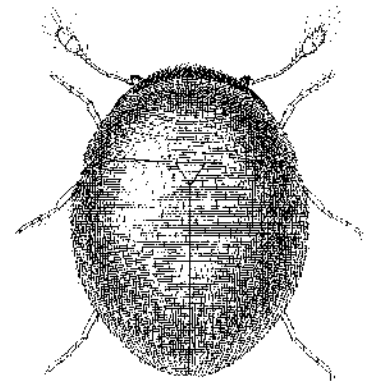
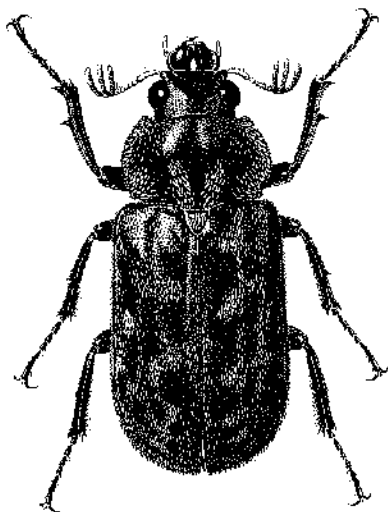
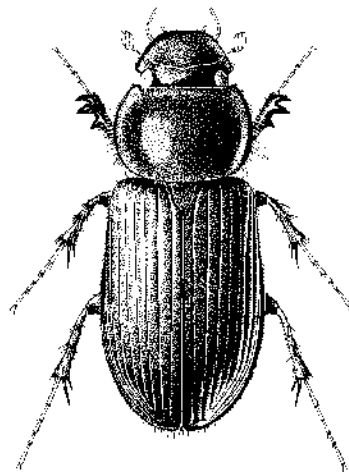
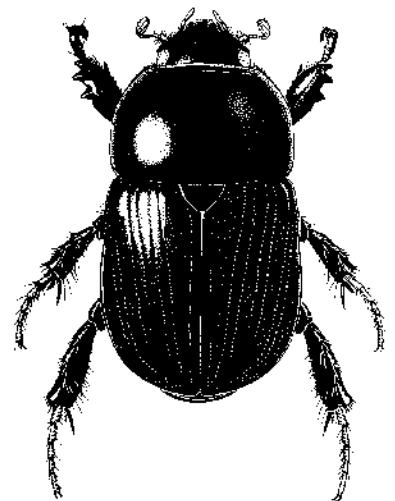
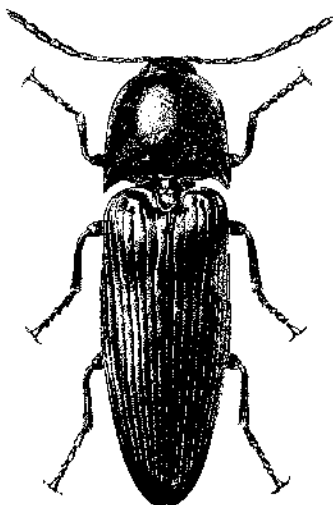
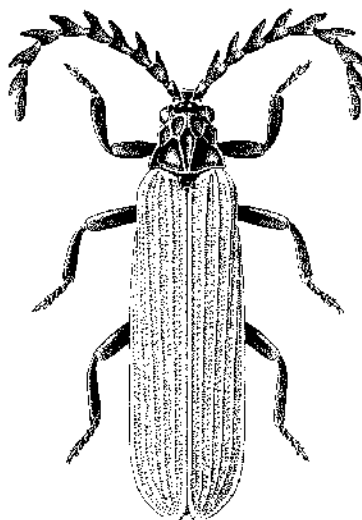
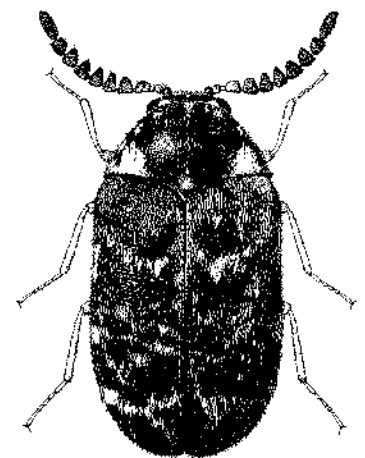
123 *Carpelimus* sp. 1

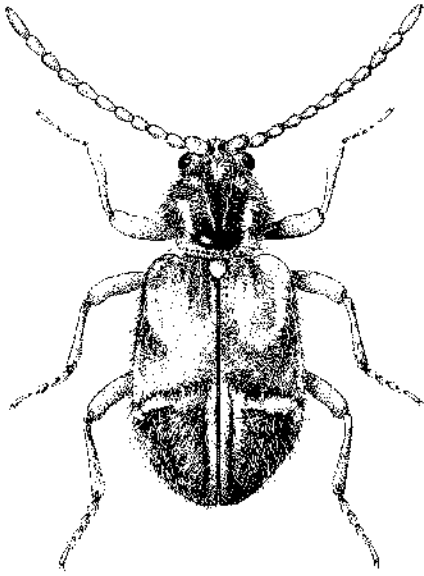


124 *Medon zeelandicus*

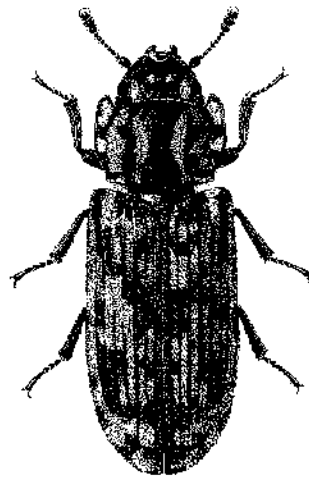


125 *Sepedophilus flavithorax*

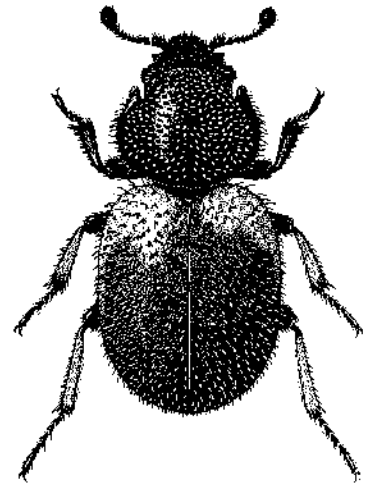
126 *Sagola laminata*127 *Enochrus tritus*128 *Clambus domesticus*129 *Ceratognathus parrianus*130 *Aphodius tasmaniae*131 *Heteronychus arator*132 *Thoramus wakefieldi*133 *Porrostoma rufipenne*134 *Trogoderma maestum*



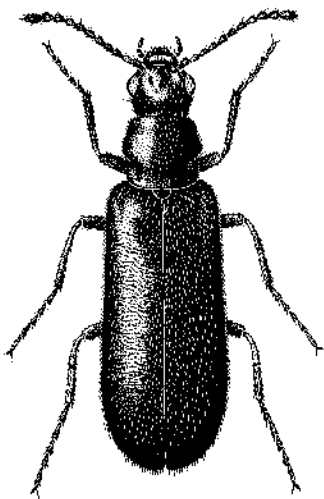
135 *Ptinus speciosus*



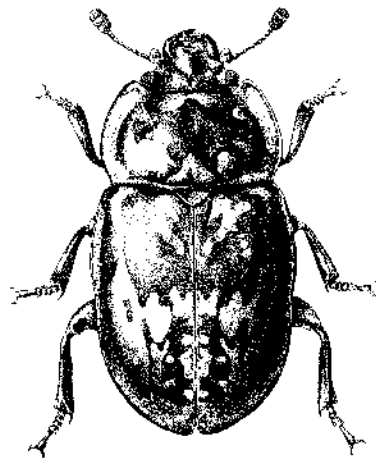
136 *Lepidopteryx nigrosparsa*



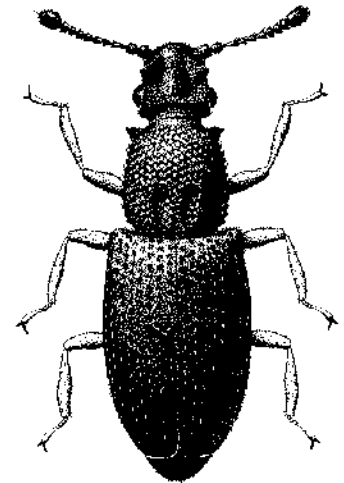
137 *Phycosecis limbata*



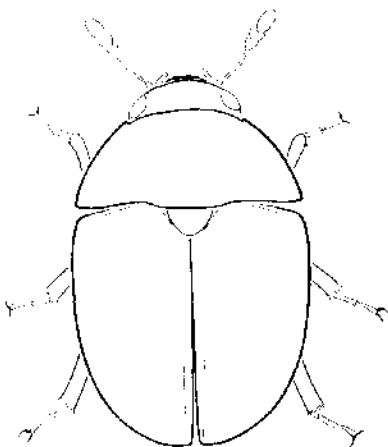
138 *Dasytes subcyaneus*



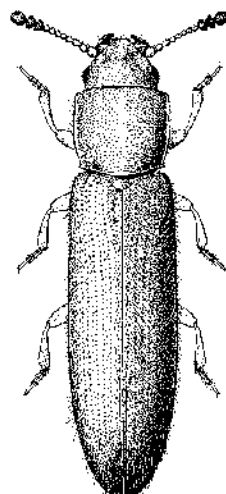
139 *Platipidia asperella*



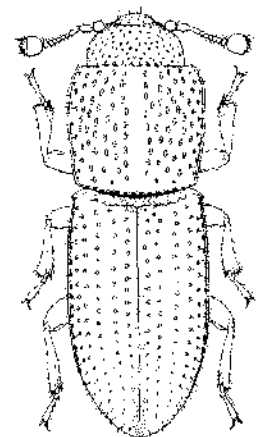
140 *Monotoma spinicollis*



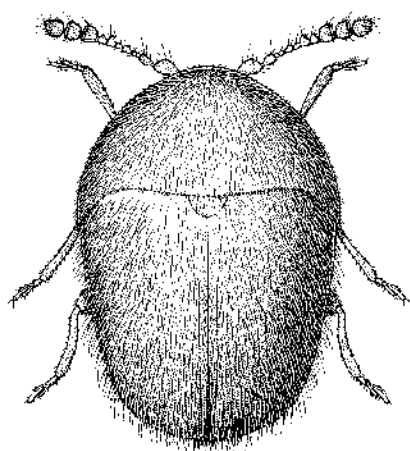
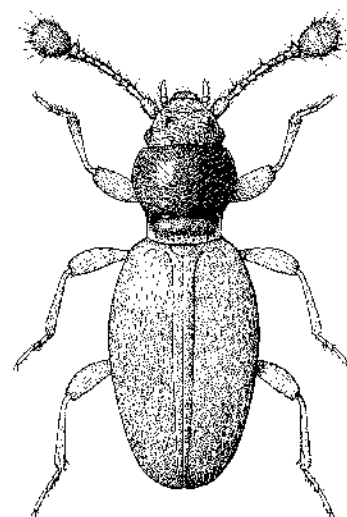
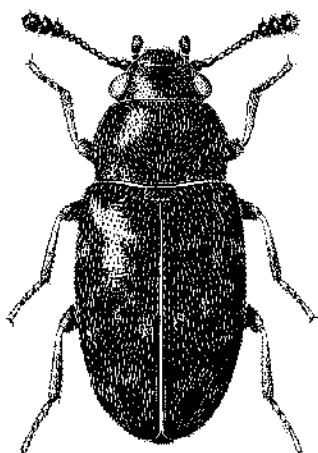
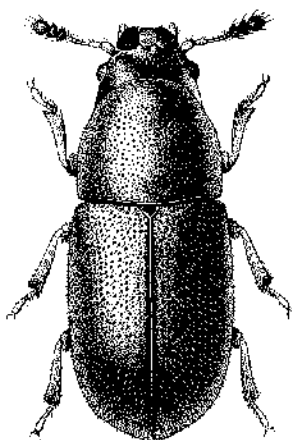
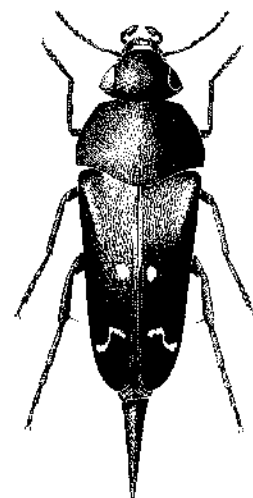
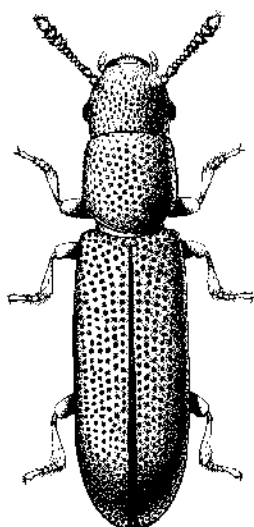
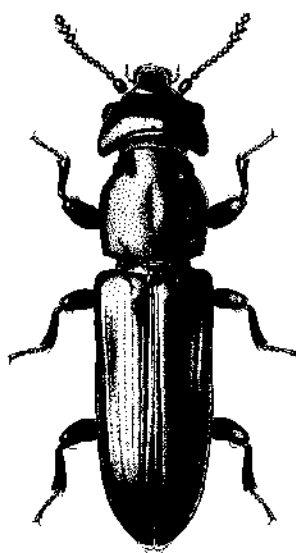
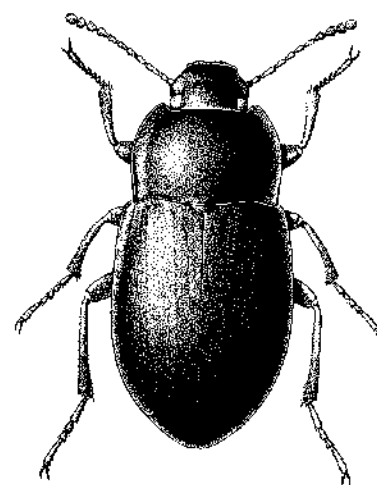
141 *Phalacrus uniformis frigidicola*

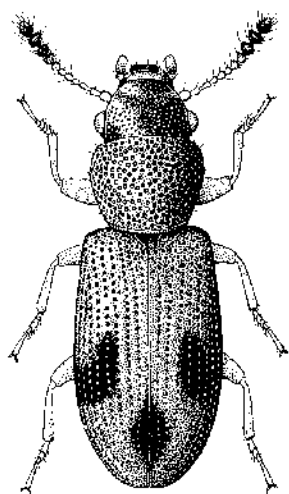


142 *Hapalips prolixus*

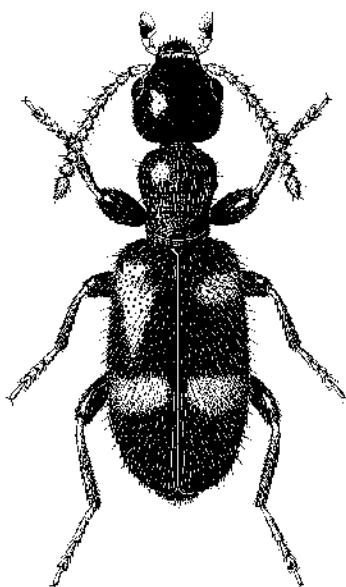


143 *Anommatus duodecimstriatus*

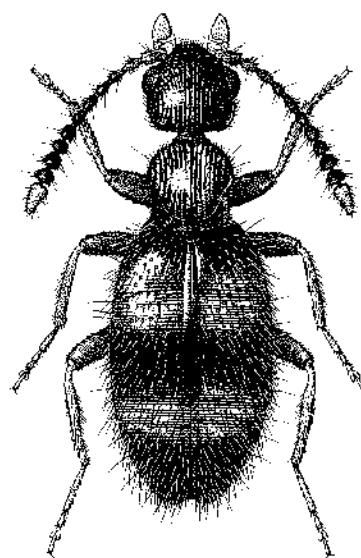
144 *Anisomoristes sharpi*145 *Enicmus caviceps*146 *Holoparamesus tenuis*147 *Triphyllus hispidellus*148 *Cis zeelandicus*149 *Mordella antarctica*150 *Rhizonium antiquum*151 *Dryocora howitti*152 *Mimopeus elongatus*



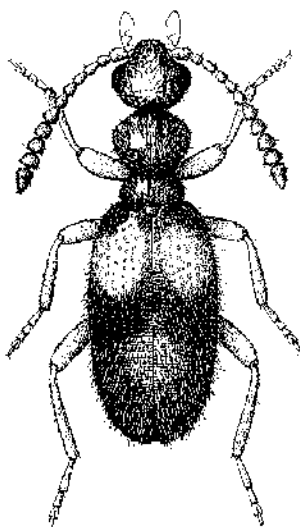
153 *Salpingus bilunatus*



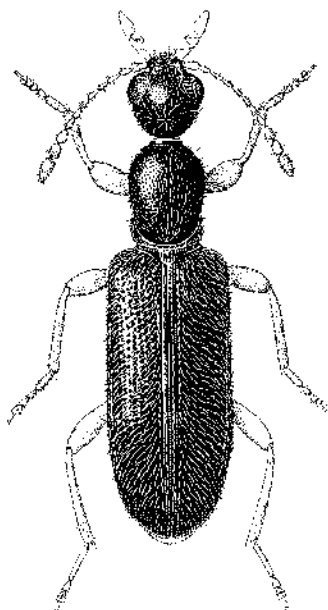
154 *Anthicus hesperi*



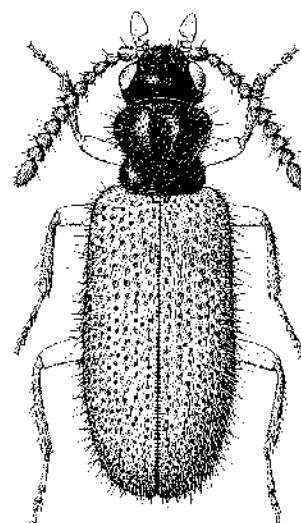
155 *Anthicus* sp.



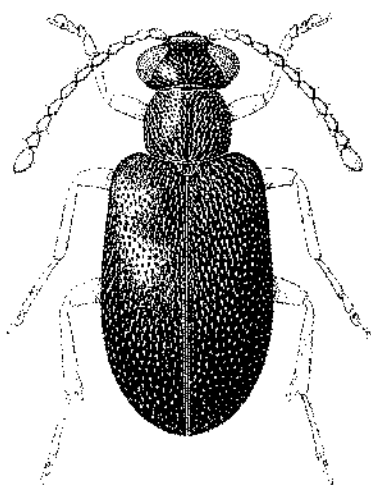
156 *Cotes crispi*



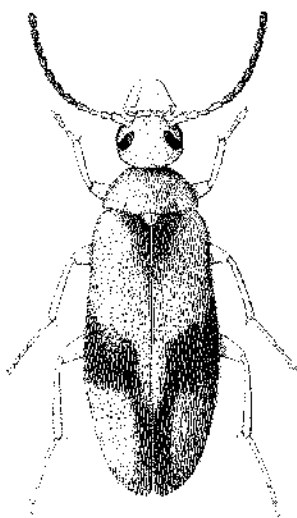
157 *Macratia exilis*



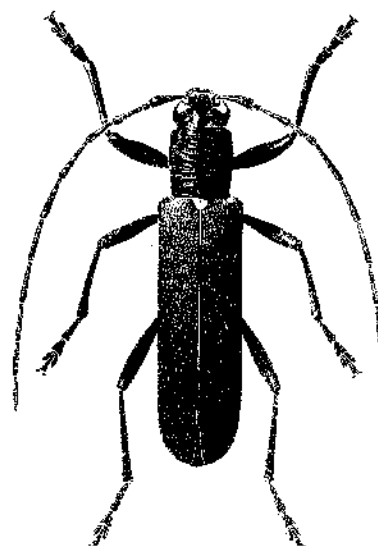
158 *Trichananca* sp. 1



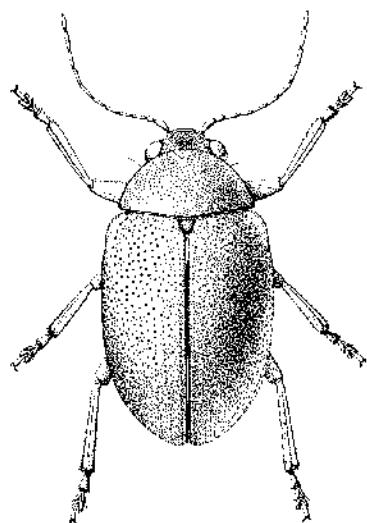
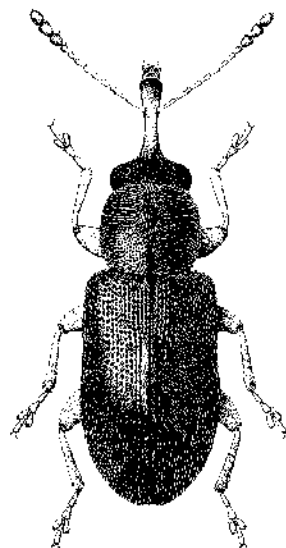
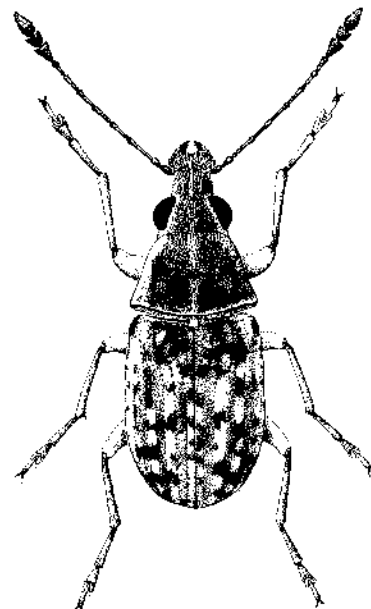
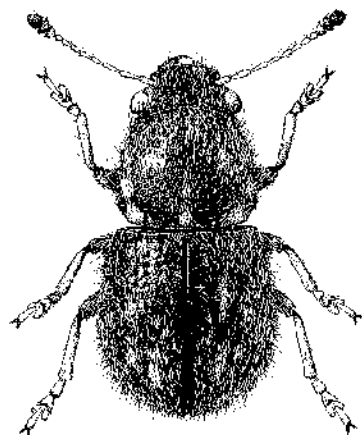
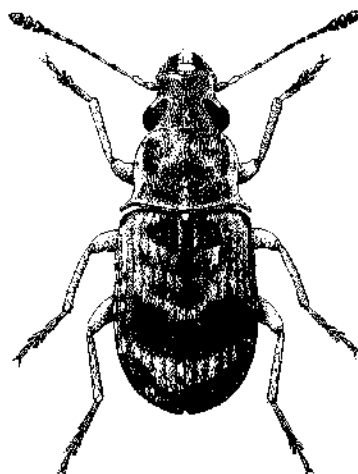
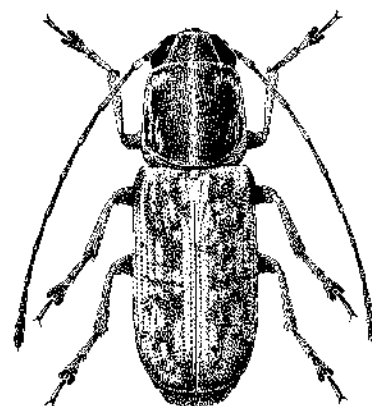
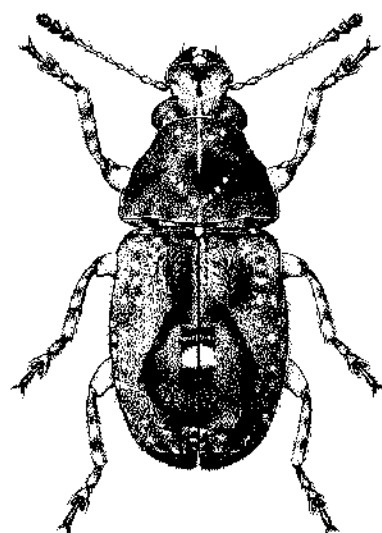
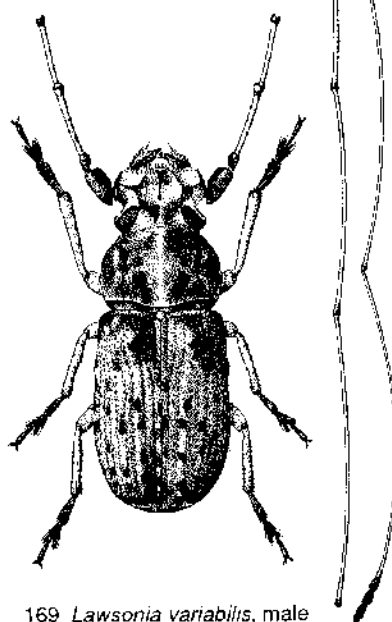
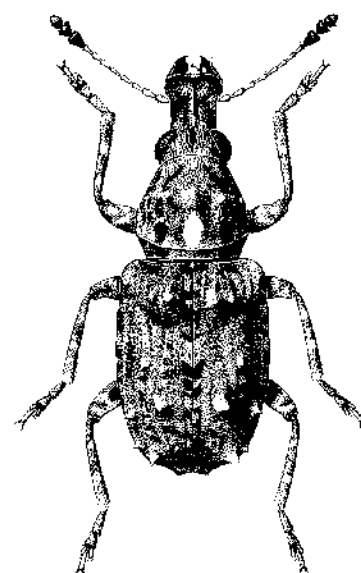
159 *'Xyconilus' nitidus*

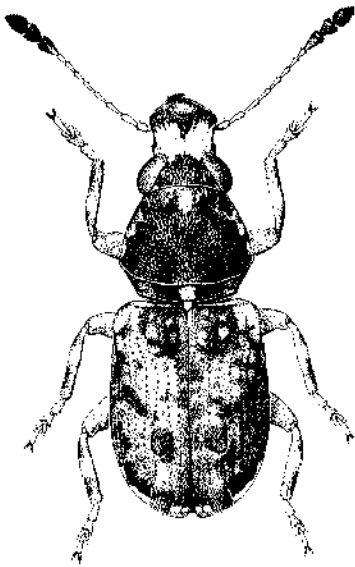


160 *Nothotelus usitatus*

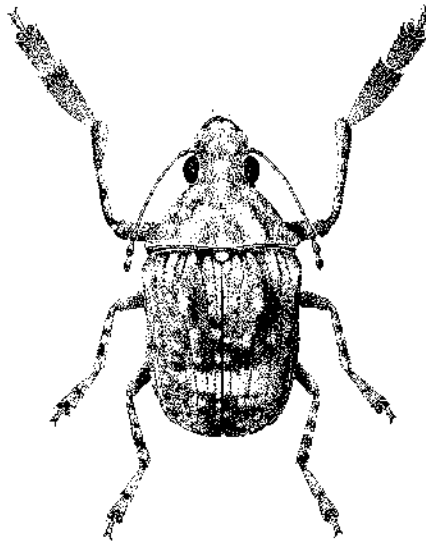


161 *Ocmona hirta*

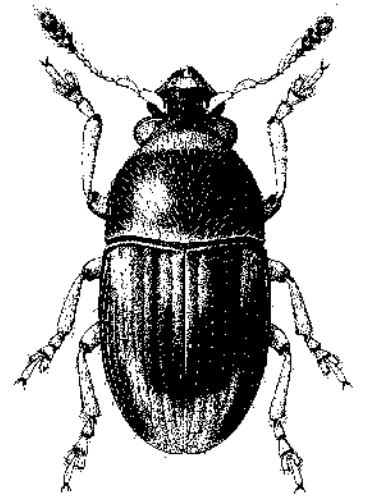
162 *Eucolaspis brunnea*163 *Rhinorhynchus rufulus*164 *Cacephatus huttoni*165 *Dasyanthribus purpureus*166 *Etnalis spinicollis*167 *Euciodes suturalis*, female168 *Garyus altus*169 *Lawsonia variabilis*, male170 *Lophus rudis*



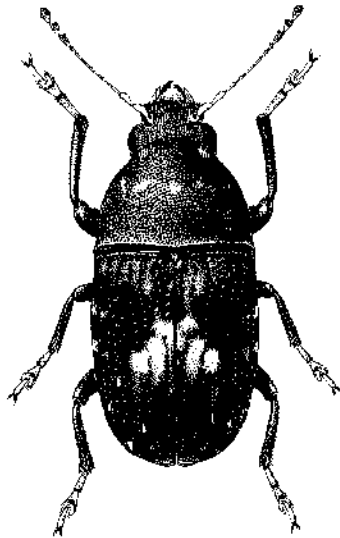
171 *Pleosporius bullatus*, male



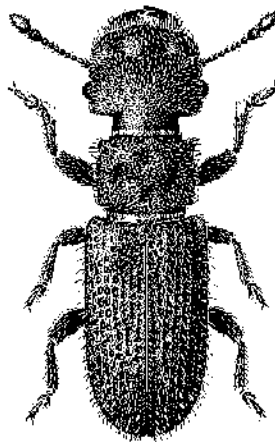
172 *Araecerus palmaris*, male



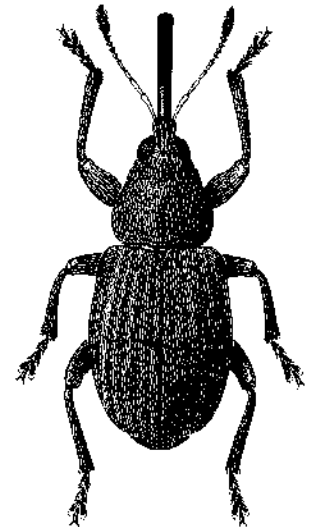
173 *Micranthribus atomus*



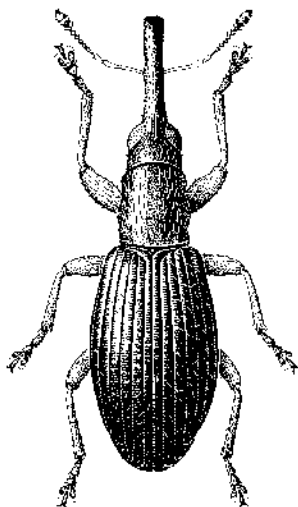
174 *Notochoragus crassus*



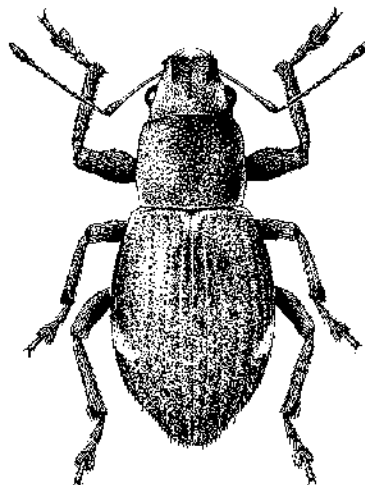
175 *Aralius wollastoni*, male



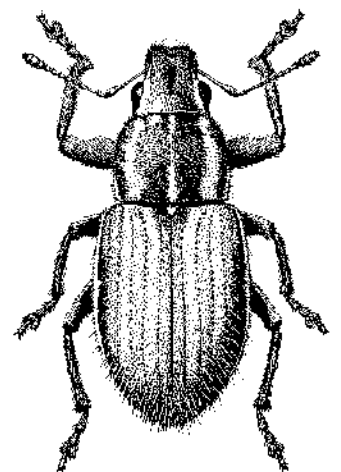
176 *Apion ulicis*, female



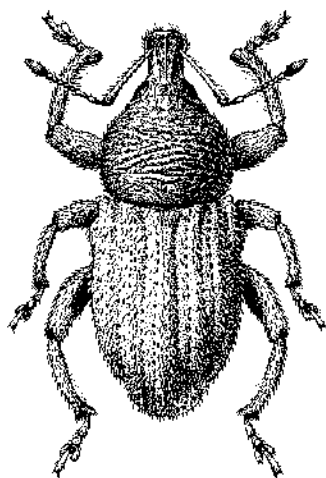
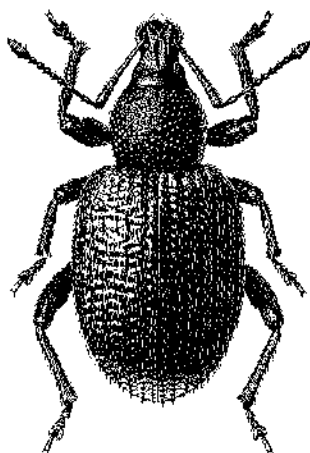
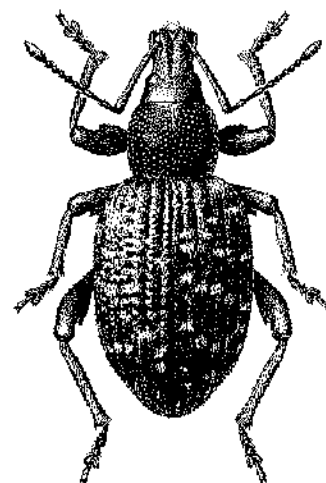
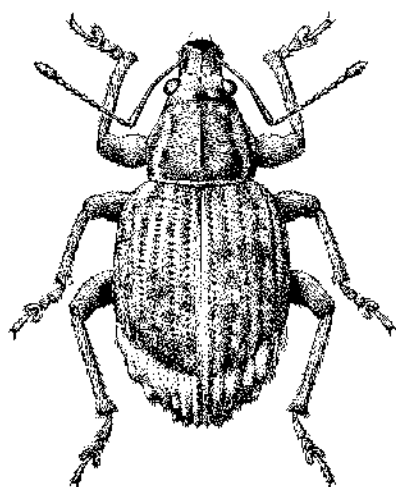
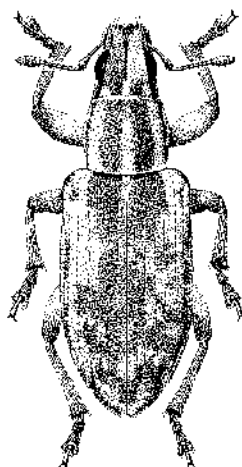
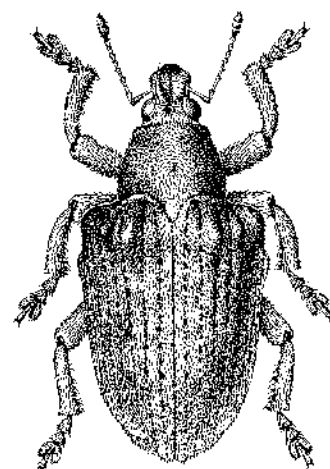
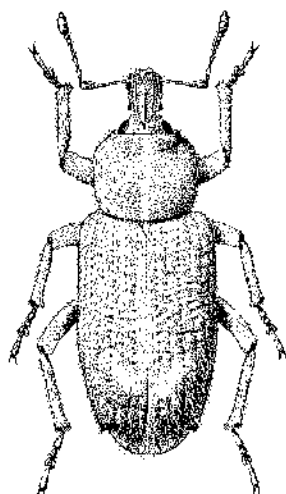
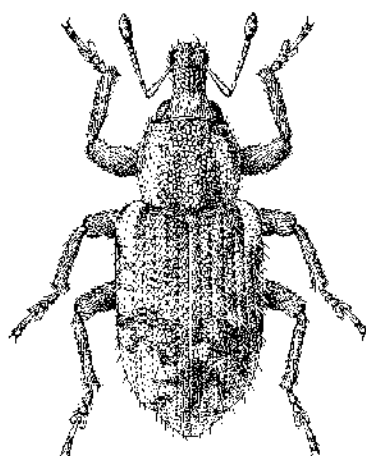
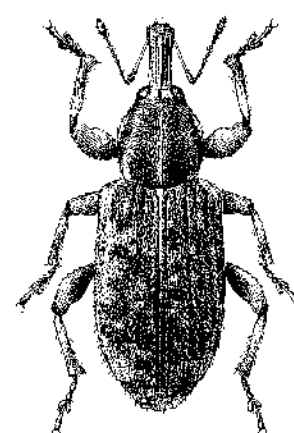
177 *Neocyba metrosideros*

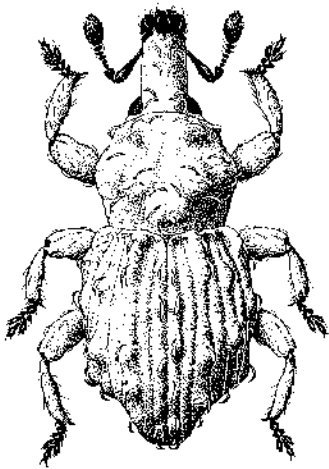


178 *Asynonychus cervinus*

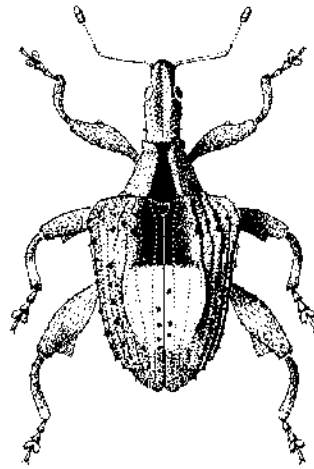


179 *Graphognathus leucoloma*

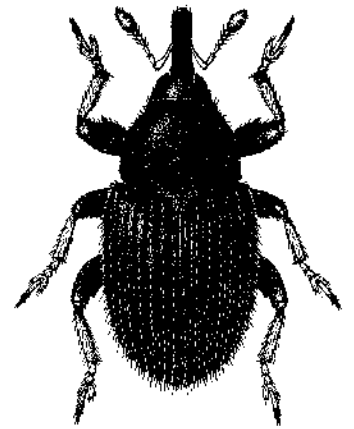
180 *Mandalotus micicollis*181 *Otiorhynchus rugosostriatus*182 *Otiorhynchus sulcatus*183 *Phlyctinus callosus*184 *Sitona discoideus*185 *Gonipterus scutellatus*186 *Listroderes difficilis*187 *Listronotus bonariensis*188 *Steriphus diversipes lineatus*



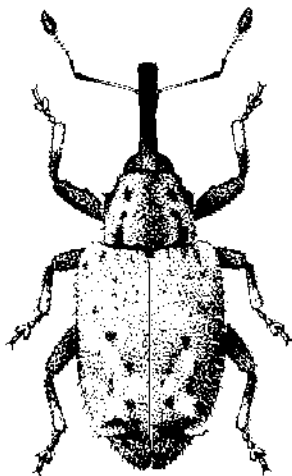
189 *Bryocatus polytrichi*



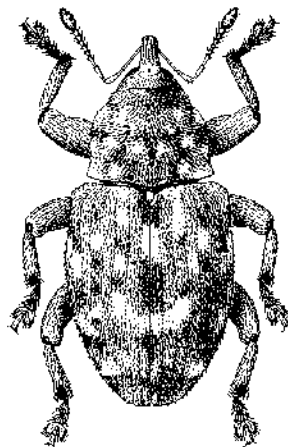
190 *Stephanorhynchus crassus*



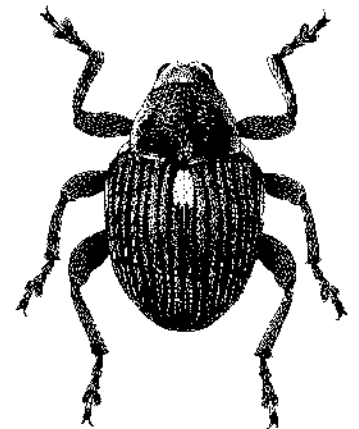
191 *Gymnetron pascuorum*



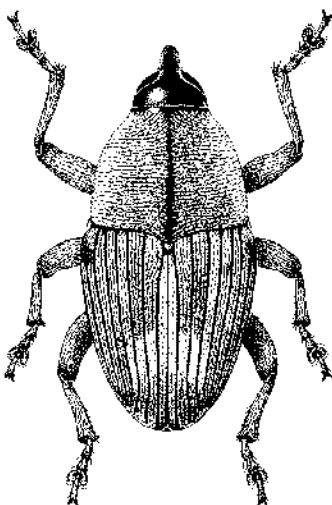
192 *Praolepra squamosa*



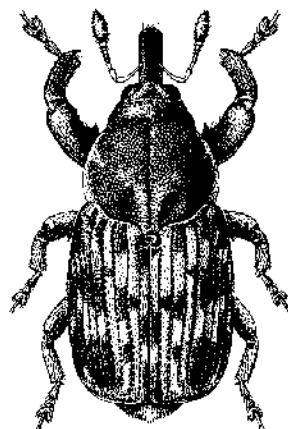
193 *Storeus albosignatus*



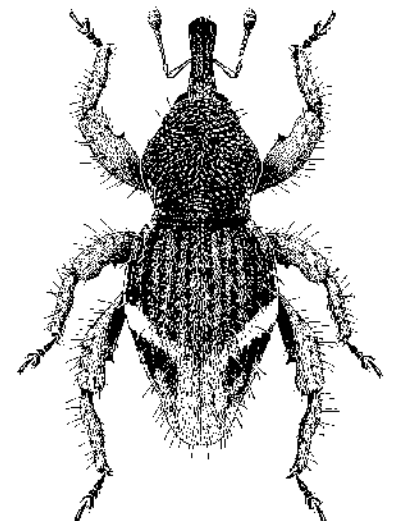
194 *Rhinoncus australis*



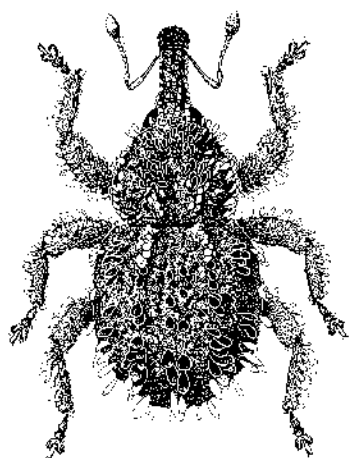
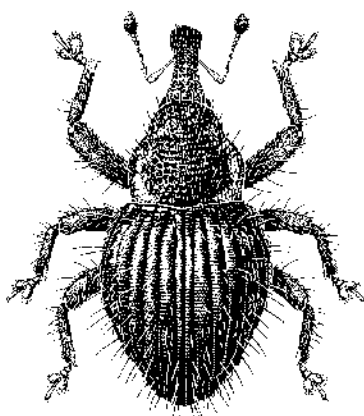
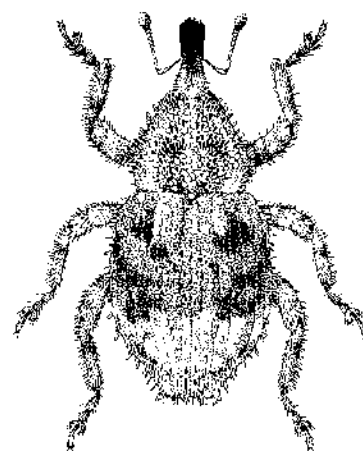
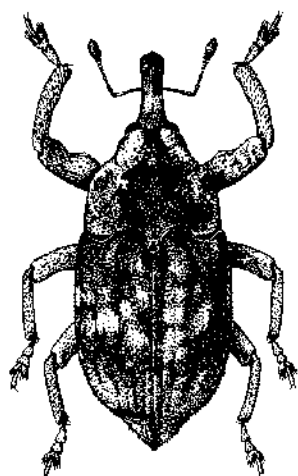
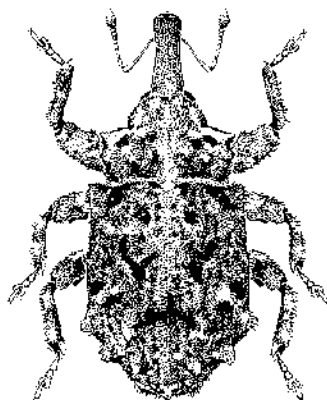
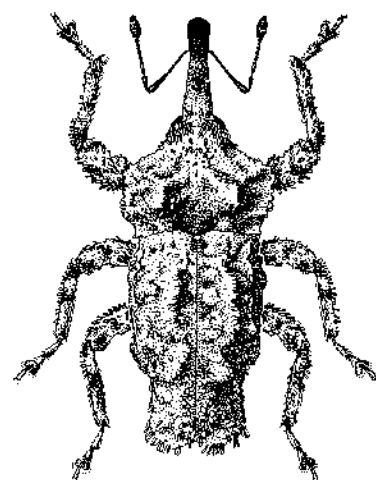
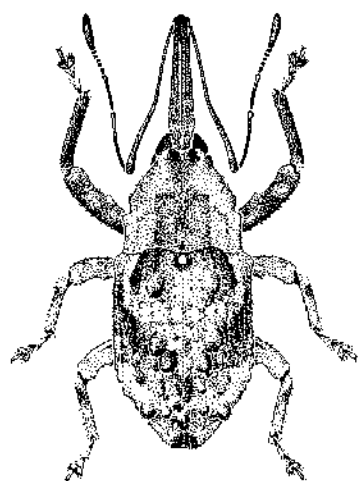
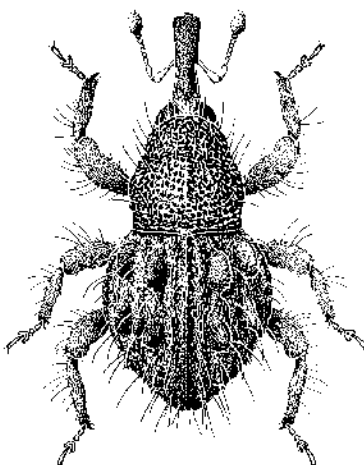
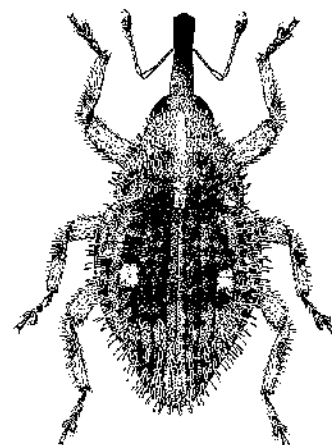
195 *Linogeraeus urbanus*

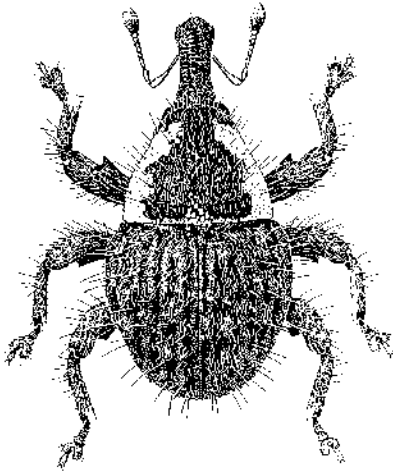


196 *Neolaemosaccus narinus*

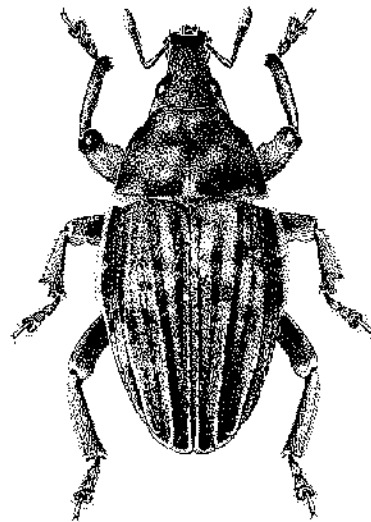


197 *Agacalles formosus*

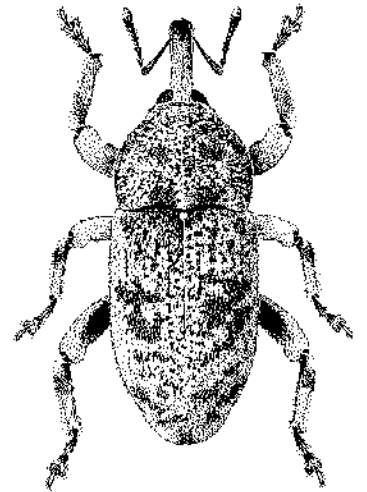
198 *Andracalles horridus*199 *Dermothrius ruficollis*200 *Didymus intulus*201 *Euthyrhinus squamiger*202 *Getacalles ventralis*203 *Indecentia nubila*204 *Mecistostylus douei*205 *Metacalles aspersus*206 *Omocalles ovatellus*



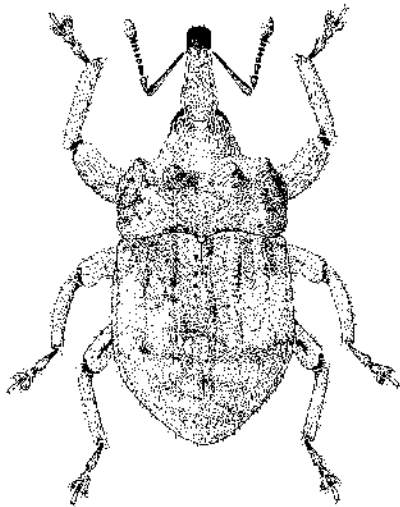
207 *Paromalina setigera*



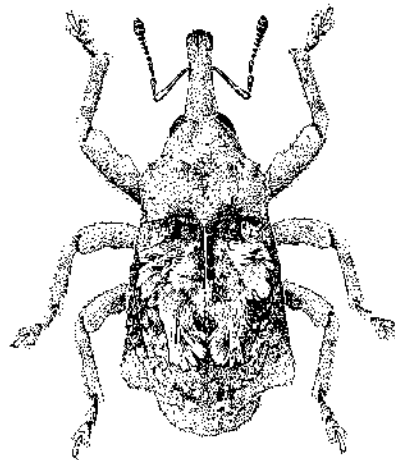
208 *Psepholax sulcatus*



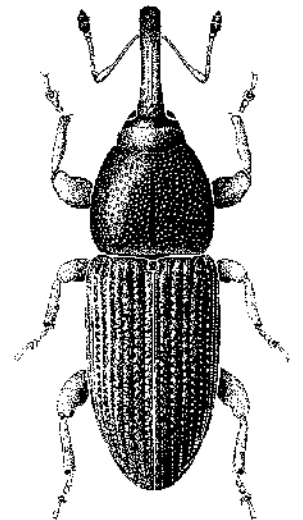
209 *Strongylopterus hylobioides*



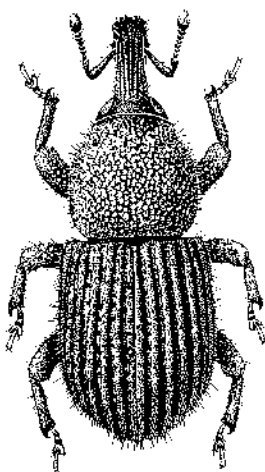
210 *Sympedius testudo*



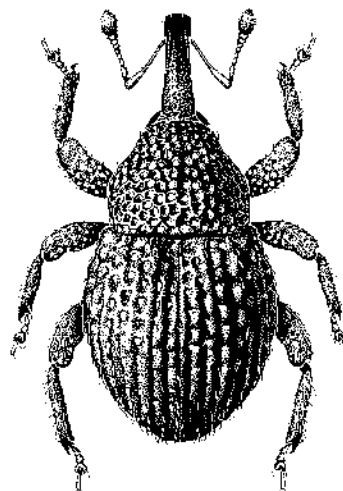
211 *Tychanus gibbus*



212 *Arecophaga varia*



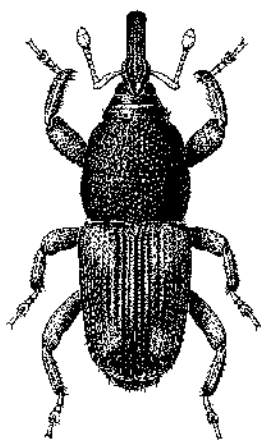
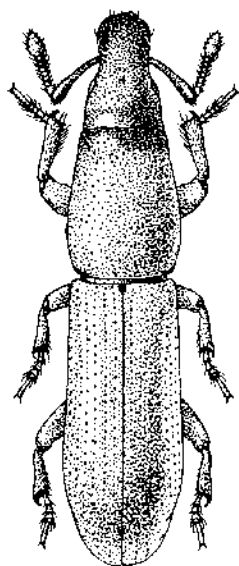
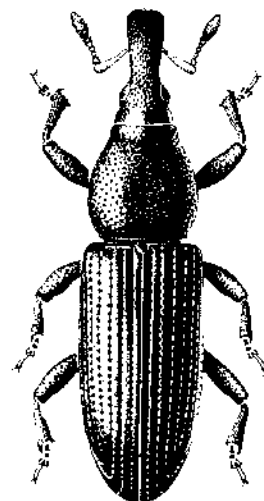
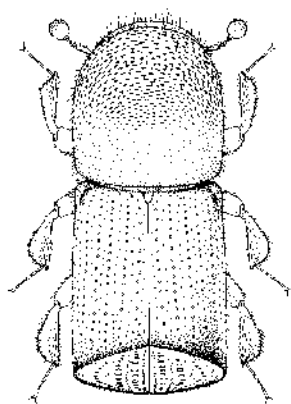
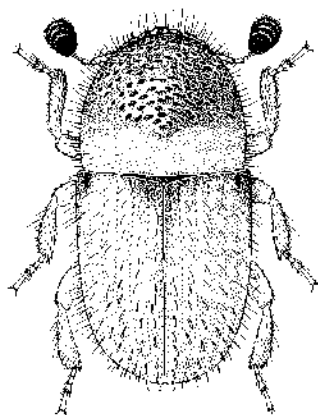
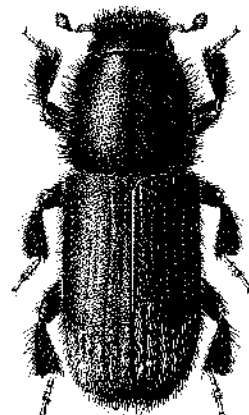
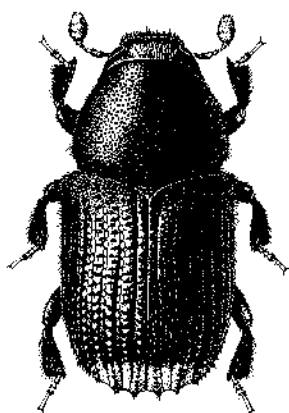
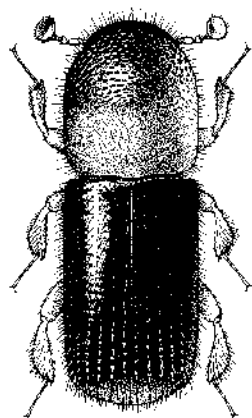
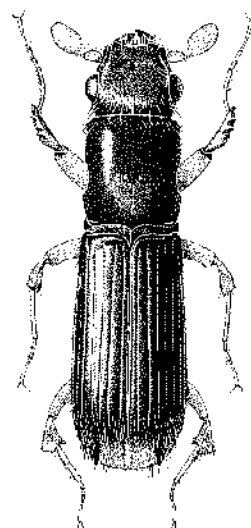
213 *Paedaretus hispidus*



214 *Phronira simplex*



215 *Dryophthorus* sp. 1

216 *Sitophilus oryzae*217 *Macrorhyncholus littoralis*218 *Macroscytalus remotus*219 *Amasa truncata*220 *Cryphalus wapleri*221 *Hylurgus ligniperda*222 *Phloeosinus cupressi*223 *Xyleborinus eucalypticus*224 *Platypus apicalis*

Appendix

VEGETATION OF THE MANUKAU COAST AT LYNFIELD, AUCKLAND

A.E. Esler

Native vegetation

The vegetation of the coast between Wairaki Stream and Wattle Bay is predominantly indigenous, some quite modified, and some in a more or less natural state. The Auckland isthmus in 1840 was mainly scrub-covered with scattered remnants of forest in gullies. Most of the usable land was thereafter cleared for farming. In many places along the steep Manukau coast the farmed land reverted to a wild state with a predominance of native plants. In parts the present vegetation dates from the abandonment of farming, in others from the last fire, disturbance from the laying of the sewer line, or slumping of the land surface.

The underlying sandstone with bands of siltstone is fairly uniform in composition, but topographic differences promoted vegetation of several kinds. This pattern has persisted through a long period of depletive Maori occupation and the post-1840 changes. Many centuries ago kauri (*Agathis australis*) grew on the easy topography of the ridges and left behind in the soil lumps of resin which have given rise to the name 'gumland' for *Leptospermum* scrub which replaced the kauri. The valley sides favoured broadleaf forest of *Vitex lucens* and *Dysoxylum spectabile*. The soil here is more fertile because gravitational movement and mixing allows the subsoil to yield more of its nutrients. Examples of forest of this kind remain in deep gullies where it was reached less frequently by fires, was burnt less intensively, and recovered more quickly. After the fires, shrubs and small trees established. On the exposed slopes above the shore, forest of a special kind developed, with *Metrosideros excelsa* as its dominant tree. In the splash zone on the shore are pockets of salt-resistant herbs. At the mouths of the larger streams erosion debris accumulated behind sandy beaches to form small wet patches which developed into open swamps and semi-swamp forest.

Leptospermum zone

The nature of the original kauri forest can only be assumed from the structure and composition of other kauri forest in the region, but some typical gumland persisted into the 1970s. It derived much of its character from the very impoverished soil and the frequent burning which promoted *Leptospermum scoparium* as its dominant plant. After a burn gumland has some colourful shrubs, and is rich in sedges, ferns, and orchids until sombre *Leptospermum* and the rush-like sedge *Schoenus tendo* take over a decade or so later. When Colenso passed through here in 1841 he saw "open barren heaths" and "dreary sterile wilds". There is some advanced gumland vegetation in Manukau Domain. In the canopy with *Leptospermum* and the naturalised *Hakea sericea* are *Myrsine australis*,

Olearia furfuracea, and *Cyathodes fasciculata*. There is a dense ground cover of rank *Schoenus tendo* and tussocks of *Gahnia setifolia*. Gumland vegetation grew with *Acacia mearnsii* nearby on the Sylvania block, until recently it was cleared for housing. At the upper edge of Subritzky's bush by the Wairaki Stream the presence of *Melicytus ramiflorus* suggests a more fertile soil, but *Lepidosperma laterale*, *Schoenus tendo*, and other sedges indicate its gumland origin. Near Strathnaver St up till the late 1970s there remained some poor pasture with *Ulex europaeus* and *Gahnia setifolia*. Scrub on its edges above the gullies grew *Pomaderris kumeraho*, *P. phyllifolia*, and *Morelotia affinis*, all typical gumland species. Much of the gumland has now been taken over for housing because of the easy topography.

Gully forest zone

Ribbons of gully forest along streams have some large *Vitex lucens* and *Dysoxylum spectabile* trees which are relics of a former vegetation. The epiphytic asteliad *Collospermum hastatum* is mostly confined to this older vegetation. In this moist atmosphere are many ferns and the vines *Ripogonum scandens* and *Freycinetia baueriana*. This is the prime habitat of the tall tree fern *Cyathea medullaris* and the palm *Rhopalostylis sapida*. This kind of vegetation almost certainly covered the hillsides. Its canopy would have contained also *Beilschmiedia tawa*, *B. tarairi*, and *Corynocarpus laevigatus*, and above them scattered emergent *Dacrydium cupressinum*, *Prumnopitys ferruginea*, and *Metrosideros robusta*. The tall *Dacrydium dacrydioides* grew along the streams mainly, and is still represented there.

A single burn would have killed many large trees and promoted a phase of tree ferns, shrubs, and small trees. A new succession began from bare ground after repeated burns, and from pasture. *Leptospermum scoparium* may have been the first woody pioneer. Little of this can now be seen because of its replacement by *Myrsine australis*, *Hedycarya arborea*, and *Cyathea dealbata*, and in the more fertile places by *Melicytus ramiflorus* and *Cyathea medullaris*. On some of the ridges are groves of *Sophora microphylla*, and here and there isolated *Metrosideros excelsa*. The gully forest contains many minor elements such as *Dodonaea viscosa*, *Pittosporum tenuifolium*, *Schefflera digitata*, *Alectryon excelsus*, *Elaeocarpus dentatus*, and *Kunzea ericoides*. The role of *Kunzea* is not clear. Most likely it established in minor amounts at the same time as *Leptospermum* and, being longer-lived, has persisted. There is also the possibility that it replaced *Leptospermum* locally, or was more general and was removed for firewood. It is less tolerant of poor soils than *Leptospermum*, and was not prolific on the gumlands.

Coastal forest zone

Pohutukawa forest develops directly by establishing on open ground, or less often after a series of vegetational stages which stabilise a slope, at least temporarily. The succession that began on slips with *Hebe stricta*, *Coriaria arborea*, *Astelia banksii*, *Entelea arborescens*, *Cordyline banksii*, and *Brachyglottis repanda* now has fewer of these species and more alien plants. If further slipping does not occur these are joined by *Pseudopanax lessonii*, *Pittosporum crassifolium*, *Metrosideros excelsa*, *Sophora microphylla*, and others, sometimes *Corynocarpus laevigatus*. The lower layer usually contains *Macropiper excelsum*, *Coprosma macrocarpa*, *Polystichum richardii*, *Gahnia lacera*, and *Carex flagellifera*.

The seaward fringe provides a habitat for other species. Near the splash zone *Poa anceps* and *Scirpus nodosus* have a foothold, and in the wind funnels at the mouths of some minor streams there is a local abundance of *Phormium tenax*, *Coprosma robusta*, and *Cortaderia splendens*, usually growing with *Pseudopanax lessonii*.

A stand of *Metrosideros excelsa* near Wattle Bay is the most natural piece of forest vegetation along this coast, and is the finest example of Auckland's coastal forest.

Splash zone

Small portions of the splash zone are stable enough to support higher plants. They are species commonly seen in salt marshes (*Sarcocornia quinqueflora*, *Stipa stipoides*, *Selliera radicans*, *Samolus repens*) or coastal sand and estuary margins (*Leptocarpus similis*, *Scirpus nodosus*, *Apium prostratum*, *Triglochin striatum*, *Lilaeopsis novaezelandiae*). *Lobelia anceps*, the most versatile of these splash zone plants, grows in many diverse habitats.

Missing from this part of the coast are *Senecio lautus* and *Coprosma repens*, which require a more stable substrate.

Wetlands

Where accumulating beach sand restricted the stream outfall at Wattle Bay there would have been a wetland of *Dacrycarpus dacrydioides*, *Cordyline australis*, *Phormium tenax*, *Scirpus fluviatilis*, *Typha orientalis*, and the native form of *Calystegia sepium*. The *Dacrycarpus* has gone, and in its place grows *Salix fragilis*. Silt carried by the stream from disturbed land at the head of the catchment, and bulldozing, altered the flat in the late 1970s, reducing the relic native community but promoting *Carex lessoniana* and the exotic *Lonicera japonica*. *Festuca arundinacea* and *Pennisetum clandestinum* grow in abundance on the stable beach sand, and *Atriplex prostrata* where it is disturbed. A similar but smaller delta may have existed at the mouth of Wairaki Stream.

Other wetlands are very small. A depression contains *Typha orientalis*, *Baumea huttonii*, *B. teretifolia*, *Calystegia sepium*, and *Isachne globosa*. A few individuals of wetland species grow on open stream margins (*Carex geminata*, *Cyperus ustulatus*, *Polygonum decipiens*, *Scirpus fluviatilis*, *S. medianus*), on wet tracks (*Calli-*

triche muelleri, *Juncus* spp., *Scirpus chlorostachyus*, *S. reticularis*), and where water seeps down sandstone slopes (*Machaerina sinclairii*, *Blechnum* sp. 'black spot', *Cotula membranacea*).

Exotic vegetation

Plantations. Some of the plant communities are man-made or man-induced. Most conspicuous are plantations of *Pinus* and *Acacia* on the Sylvania block, established perhaps 40 or 50 years ago. The vegetation at that time was probably low scrub. *Acacia mearnsii* reached maturity, and many of the large trees collapsed. Seedlings have established to a limited extent. Native scrub persists beneath this open canopy. In the gaps *Leptospermum scoparium*, *Ilakea sericea*, *Cyathodes fasciculata*, and *Ulex europaeus* are prominent. Elsewhere there are conspicuous amounts of *Cyathea dealbata*, *Geniostoma rupestre*, *Gahnia setifolia*, and *Schoenus tendo*.

These communities were reduced in size when much of the easier topography was taken over for housing in the mid and late 1980s. On the steeper slopes vigorous gully forest prevented any re-establishment of *Acacia mearnsii* and of *A. decurrens* except in some disturbed places.

The *Pinus radiata* plantation on the spur in this region is quite open beneath and, typical of pine plantations, has an understorey of native plants – mostly of species with bird-borne seeds, particularly *Melicytus ramiflorus* and *Myrsine australis*.

Grassy areas. Little pasture remains, and the grassy areas are mainly lawns and playing fields. These consisted of a wide range of species until the invasion of *Axonopus affinis* in the 1970s. The overwhelming advance of *Pennisetum clandestinum* is further reducing the variety.

Domestic gardens. Absence of severe drought and of very low winter temperatures make the climate favourable for plants from many parts of the world. Although temperate plants predominate, Northern Hemisphere broadleaved trees (*Quercus*, *Ulmus*, *Fagus*, *Fraxinus*) and conifers (*Pinus*, *Cupressus*, *Cedrus*) are less favoured than in cooler parts of New Zealand. More prominent are Australian genera (*Eucalyptus*, *Acacia*, *Acmena*, *Syzygium*, *Tristania*) and New Zealand trees (*Agathis*, *Dacrydium*, *Podocarpus*, *Sophora*, *Metrosideros*), and a few from warmer climates (*Jacaranda*, *Melia*).

Among smaller plants are cultivars of native plants (*Hebe*, *Pittosporum*, *Coprosma*, *Phormium*) and many species from Australia (*Callistemon*, *Grevillea*, *Banksia*, *Telopea*) and from southern Africa (*Protea*, *Leucospermum*). Some of the most popular garden subjects are citrus, *Nerium oleander*, and *Hibiscus rosa-sinensis*. Fruit trees, herbaceous perennials, bedding plants, and vegetables are predominantly of Northern Hemisphere origin.

Escapes from cultivation. Introduced plants which have escaped from cultivation are a conspicuous part of the Auckland landscape. However, the Manukau coast is not as seriously infested as some other districts, because of the

competition offered by the native vegetation and the low incidence of dumping of garden refuse.

There were two waves of invasion. The first was in the farming period when shelter plants escaped. Among them were *Albizia lophantha*, *Acacia mearnsii*, *Hakea sericea*, *H. salicifolia*, *Pinus radiata*, and *Ulex europaeus*. At the same time birds carried the seeds of *Solanum mauritianum* and *Rubus fruticosus*. In the second wave in the last few decades were *Asparagus asparagoides*, *A. scandens*, *Hedychium gardnerianum*, *Ligustrum lucidum*, and *L. sinense* with bird-borne seeds, and *Araujia sericifera*, *Rumex sagittatus*, and *Cortaderia* spp., particularly *C. jubata*, with seeds carried by wind. *Tradescantia fluminensis* almost certainly arrived as garden refuse.

The native flora

The principal habitats are: C, coastal forest zone; G, gully forest zone; L, *Leptospermum* zone; S, splash zone; W, wetland; O, other – track margins, etc.

PTERIDOPHYTES

ASPLENIACEAE

- Asplenium bulbiferum* Forst.f. G
- A. flaccidum* Forst.f. G
- A. hookerianum* Col. G
- A. lamprophyllum* Carse G
- A. oblongifolium* Col. G
- A. polyodon* Forst.f. G

BLECHNACEAE

- Blechnum chambersii* Tindale G
- B. filiforme* (A. Cunn.) Ettingsh. G
- B. membranaceum* (Hook.) Mett. G
- B. minus* (R. Br.) Ettingsh. L
- B. sp.* (Green Bay form) G
- B. sp.* (black spot form) G L W
- Doodia media* R.Br. ssp. *australis* Parris G
- D. mollis* Parris G

CYATHEACEAE

- Cyathea dealbata* (Forst.f.) Swartz L G
- C. medullaris* (Forst.f.) Swartz G

DENNSTAEDTIACEAE

- Histiopteris incisa* (Thunb.) J. Smith G
- Lindsaea linearis* Swartz L
- Paesia scaberula* A. Rich. (Kuhn) G
- Pteridium esculentum* (Forst.f.) Cockayne L

DICKSONIACEAE

- Dicksonia squarrosa* (Forst.f.) Swartz G

DRYOPTERIDACEAE

- Lastraeopsis glabella* (A. Cunn.) Tindale G
- L. hispida* (Swartz) Tindale G
- L. microsora* Tindale
- ssp. *pentangularis* (Col.) Tindale G
- L. velutina* (A. Rich.) Tindale G
- Polystichum richardii* (Hook.) J. Smith C
- Rumohra adiantiformis* (Forst.f.) Ching G

GLEICHENIACEAE

- Sticherus cunninghamii* (Heward ex Hook.) Ching L

HYMENOPHYLLACEAE

- Hymenophyllum demissum* (Forst.f.) Swartz G

- H. dilatatum* (Forst.f.) Swartz G
- H. flabellatum* Labill. G
- H. rarum* R.Br. G
- Trichomanes elongatum* A. Cunn. G
- T. venosum* R.Br. G

LYCOPODIACEAE

- Lycopodium cernuum* L. L
- L. deuterodensum* Herter L

MARATTIACEAE

- Marattia salicina* J.E. Smith G

OSMUNDACEAE

- Leptopteris hymenophylloides* (A. Rich.) C. Presl. G

POLYPODIACEAE

- Phymatosorus diversifolius* (Willd.) Pichi Serm. G
- P. scandens* (Forst.f.) Pichi Serm. G
- Pyrrosia serpens* (Forst.f.) Ching G C

PSILOTACEAE

- Tmesipteris elongata* P.A. Dangeard G
- T. lanceolata* P.A. Dangeard G
- T. tannensis* (Sprengel) Bernh. G

PTERIDACEAE

- Adiantum cunninghamii* Hook. G
- A. fulvum* Raoul G
- Pellaea rotundifolia* (Forst.f.) Hook. G
- Pteris macilenta* A. Rich. G
- P. tremula* R.Br. G

SCHIZAEACEAE

- Lygodium articulatum* A. Rich. G

THELYPTERIDACEAE

- Pneumatopteris pennigera* (Forst.f.) Holttum G

GYMNOSPERMS

PODOCARPACEAE

- Dacrycarpus dacrydioides* (A. Rich.) Laubent. G
- Dacrydium cupressinum* Lambert G
- Phyllocladus trichomanoides* D. Don G
- Prumnopitys ferruginea* (D. Don) Laubent. G

MONOCOTYLEDONS

AGAVACEAE

- Cordyline australis* (Forst.f.) Endl. G W
- C. banksii* Hook.f. G C
- C. pumilio* Hook.f. G L
- Phormium cookianum* Le Jolis C G
- P. tenax* J.R. et G. Forst. C W

CYPERACEAE

- Baumea huttonii* (Kirk) Blake W
- B. teretifolia* (R.Br.) Pallas W
- Carex dissita* Boott in Hook.f. G
- C. flagellifera* Col. C G
- C. geminata* Schkuhr W
- C. lambertiana* Boott in Hook.f. G
- C. lessoniana* Steud. W
- C. ochrosaccus* (Cheesem.) Hamblin G
- C. solandri* Boott in Hook.f. G
- C. spinirostris* Col. C
- C. virgata* Boott in Hook.f. W
- Cyperus ustulatus* A. Rich. W
- Eleocharis acuta* R.Br. W
- Gahnia lacera* Steud. C G
- G. pauciflora* Kirk G

G. setifolia (A. Rich.) Hook.f. L G
G. xanthocarpa (Hook.f.) Hook.f. G
Lepidosperma australe (A. Rich.) Hook.f. L
L. laterale R.Br. L
Machaerina sinclairii (Hook.f.) Koyama W
Morelotia affinis (Brong.) Blake L
Schoenus brevifolius R.Br. L
S. maschalinus Roem. et Schult. W
S. tendo (Hook.f.) Hook.f. L
Scirpus cernuus Vahl S
S. chlorostachyus Levyns W
S. fluviatilis (Torr.) Gray W
S. inundatus (R.Br.) Spreng. W
S. medianus Cook W
S. nodosus Rottb. S
S. reticularis (Col.) Edgar W
Uncinia banksii Boott in Hook.f. G
U. uncinata (Linn.f.) Kuk. G L

IRIDACEAE
Libertia ixioides (Forst.f.) Spreng. G

JUNCACEAE
Juncus australis Hook.f. O
J. planifolius R.Br. W
J. prismatocarpus R.Br. W

JUNCAGINACEAE
Triglochin striatum Ruiz et Pav. S

LEMNACEAE
Lemna minor L. W

LILIACEAE
Arthropodium cirratum (Forst.f.) R.Br. G
Astelia banksii A. Cunn. C
A. solandri A. Cunn. G
Collospermum hastatum (Col.) Skottsb. G
Dianella nigra Col. G L

ORCHIDACEAE
Pterostylis alobula (Hatch) L.B. Moore G
P. banksii A. Cunn. in Hook. G

PALMAE: ARECACEAE
Rhopalostylis sapida Wendl. et Drude G

PANDANACEAE
Freycinetia baueriana Endl.
 ssp. *banksii* (Cunn.) Stone G

POACEAE
Cortaderia splendens Connor C
Deyeuxia billardieri Kunth S
D. quadriseta Benth. L
Dichelachne crinita Hook.f. C
Isachne globosa (Thunb.) Kuntze W
Lachnagrostis filiformis (Forst.f.) Trin. S
Microlaena avenacea (Raoul) Hook.f. G
M. stipoides (Lab.) R.Br. L O
Optismenus imbecillus G
Poa anceps Forst.f. C
Rytidosperma biannulare (Zotov) Connor & Edgar L
Stipa stipoides (Hook.f.) Veldk. S

RESTIONACEAE
Leptocarpus similis Edgar S

SMILACACEAE
Ripogonum scandens J.R. et G. Forst. G

TYPHACEAE
Typha orientalis C.B. Presl. W

DICOTYLEDONS

ALSEUOSMIACEAE

Alseuosmia macrophylla A. Cunn. G

APIACEAE

Apium prostratum Labill. ex Vent. S

Centella uniflora (Col.) Nannf. L

Hydrocotyle moschata Forst.f. O

Lilaeopsis novae-zelandiae (Gand.) A.W. Hill S

APOCYNACEAE

Parsonsia heterophylla A. Cunn. G

ARALIACEAE

Pseudopanax arboreus (Murray) Philipson G

P. crassifolius Sol. ex A. Cunn. G

P. lessonii (DC.) C. Koch C

P. lessonii x crassifolius G

Schefflera digitata J.R. et G. Forst. G

ASTERACEAE

Brachyglottis repanda J.R. et G. Forst. C G

Cotula coronopifolia L. S

C. membranacea D. Lloyd W

Gnaphalium luteoalbum L. O

G. sphaericum Willd. O

Olearia turfuracea (A. Rich.) Hook.f. L

O. rani (A. Cunn.) Druce G

Senecio glomeratus Desf. ex Poiret O

S. hispidulus A. Rich. O

CALLITRICHACEAE

Callitriche muelleri Sond. W

CAMPANULACEAE

Wahlenbergia gracilis (Forst.f.) Schrad. O

CHENOPODIACEAE

Sarcocornia quinqueflora (Ung.-Stemb.) A.J. Scott S

CONVOLVULACEAE

Calystegia sepium (L.) R.Br. W

C. tuguriorum (Forst.f.) R.Br. ex Hook.f. G

CORIARIACEAE

Coriaria arborea Lindsay C

CORYNOCARPACEAE

Corynocarpus laevigatus J.R. et G. Forst. G

CUNONIACEAE

Weinmannia silvicola Sol. ex A. Cunn. G

DROSERACEAE

Drosera peltata Thunb.

 ssp. *auriculata* (Planchon) Conn. L

ELAEOCARPACEAE

Elaeocarpus dentatus (J.R. et G. Forst.) Vahl G

EPACRIDACEAE

Cyathodes fasciculata (Forst.f.) Allan L G

C. juniperina (J.R. et G. Forst.) Druce L

Dracophyllum sinclairii Cheesem. L

ESCALLONIACEAE

Carpodetus serratus J.R. et G. Forst. G

FABACEAE

Carmichaelia aligera Simpson G

Sophora microphylla Ait. G C

GESNERIACEAE

Rhabdothamnus solandri A. Cunn. G

GOODENIACEAE

Selliera radicans Cav. S

HALORAGACEAE

- Gonocarpus micranthus* Thunb. L
G. montanus (Hook.f.) Orch. K
Haloragis erecta (Banks ex Murr.) Eichl. O

LAURACEAE

- Beilschmiedia tawa* (A. Cunn.) Benth.
 ex Hook.f. ex Kirk G

LOBELIACEAE

- Lobelia anceps* Linn.f. S O

LOGANIACEAE

- Geniostoma rupestre* Forst. et Forst.f.
 var. *ligustrum* (Cunn.) Conn. L G C

MALVACEAE

- Hoheria populnea* A. Cunn. G
Plagianthus divaricatus J.R. et G. Forst. S (Waikari)

MELIACEAE

- Dysoxylum spectabile* (Forst.f.) Hook.f. G

MONIMIACEAE

- Hedycarya arborea* J.R. et G. Forst. G

MORACEAE

- Paratrophis microphylla* (Raoul) Ckn. G

MYOPORACEAE

- Myoporum laetum* Forst.f. C

MYRSINACEAE

- Myrsine australis* (A. Rich.) Allan G L

MYRTACEAE

- Kunzea ericoides* (A. Rich.) J. Thompson G
Leptospermum scoparium J.R. et G. Forst. L G
Lophomyrtus bullata (Sol. ex A. Cunn.) Burret G
Metrosideros diffusa (Forst.f.) Smith G
M. excelsa Sol. ex Gaertn. C
M. excelsa x robusta G
M. fulgens Sol. ex Gaertn. G
M. perforata (J.R. et G. Forst.) A. Rich. G

OLEACEAE

- Nestegis lanceolata* (Hook.f.) L. Johnson G

PASSIFLORACEAE

- Passiflora tetrandra* Banks et Sol. ex DC. G

PIPERACEAE

- Macropiper excelsum* (Forst.f.) Miq. G C
Peperomia urvilleana A. Rich. G C

PITTOSPORACEAE

- Pittosporum crassifolium* Banks et Sol. ex A. Cunn. C
P. tenuifolium Sol. ex Gaertn. L G

POLYGONACEAE

- Muehlenbeckia australis* (Forst.f.) Meissn. G
M. complexa (A. Cunn.) Meissn. G
Polygonum decipiens R.Br. W

PRIMULACEAE

- Samolus repens* (J.R. et G. Forst.) Pers. S

PROTEACEAE

- Knightia excelsa* R.Br. G

RANUNCULACEAE

- Clematis paniculata* Gmel. G
Ranunculus reflexus Garnock-Jones G

RHAMNACEAE

- Pomaderris kumeraho* A. Cunn. L
P. phyllifolia Lodd. ex Link L

ROSACEAE

- Rubus cissoides* A. Cunn. G

RUBIACEAE

- Coprosma australis* (A. Rich.) Robinson G
C. lucida J.R. et G. Forst. G
C. macrocarpa Cheesem. C
C. rhamnoides A. Cunn. G L
C. robusta Raoul G K C

RUTACEAE

- Melicope simplex* A. Cunn. G
M. ternata J.R. et G. Forst. G

SAPINDACEAE

- Alectryon excelsus* Gaertn. G
Dodonaea viscosa Jacquin G

SAPOTACEAE

- Planchonella costata* (Endl.) Pierre ex H.J. Lam. C

SCROPHULARIACEAE

- Hebe macrocarpa* (Vahl) Ckn. et Allan G C
H. stricta (Benth.) L.B. Moore G C

SOLANACEAE

- Solanum americanum* Miller G

TILIACEAE

- Entelea arborescens* R.Br. C

VERBENACEAE

- Vitex lucens* Kirk G

VIOLACEAE

- Melicytus ramiflorus* J.R. et G. Forst. G

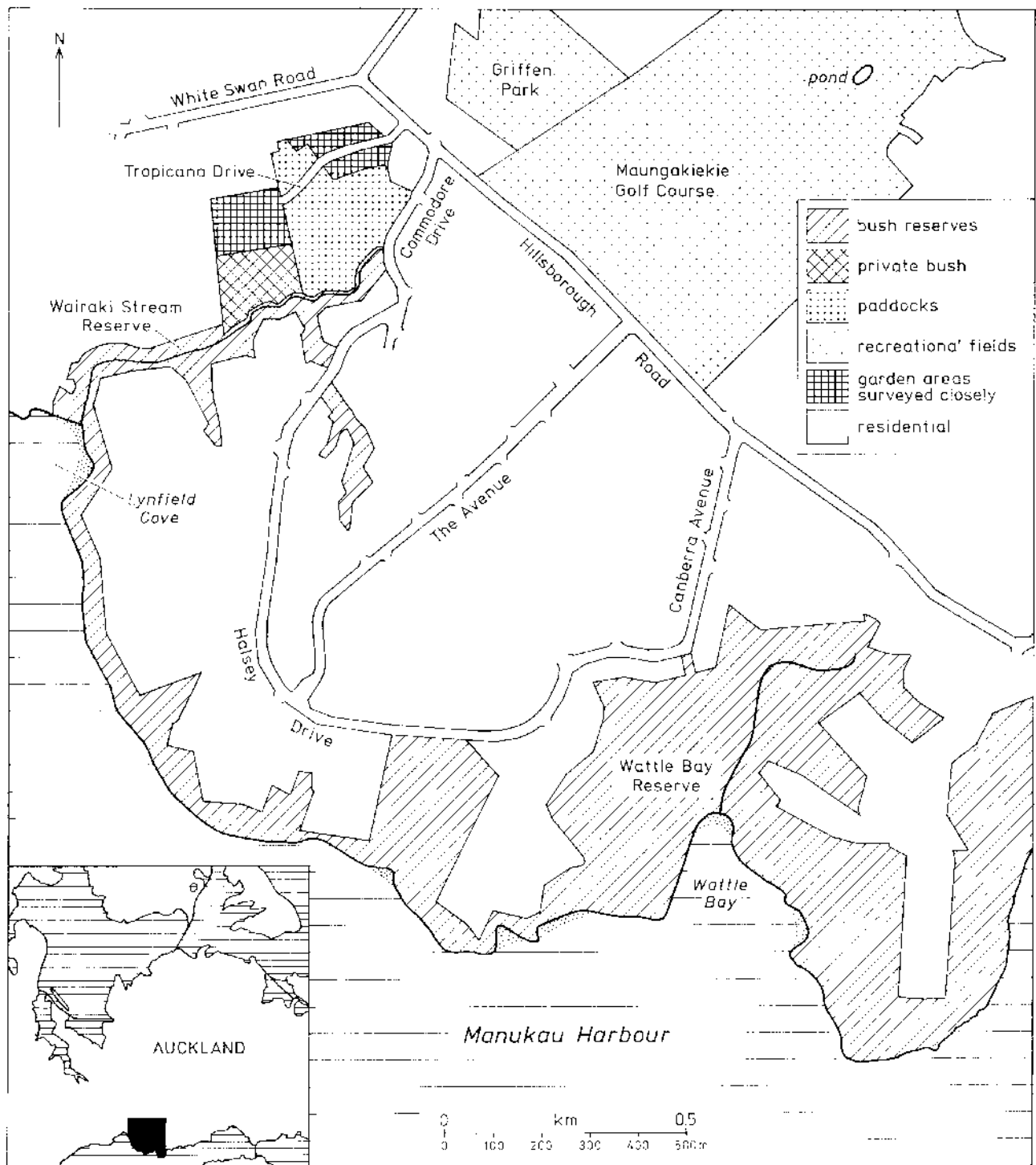


Fig. 225 Study area for the Lynfield Beetle Survey, showing principal features of land use and tenure; inset, the study area in relation to the Auckland isthmus. Note that by holding pp. 107–108 vertically, it is possible to examine together this map and the equivalent aerial photograph on p. 109.

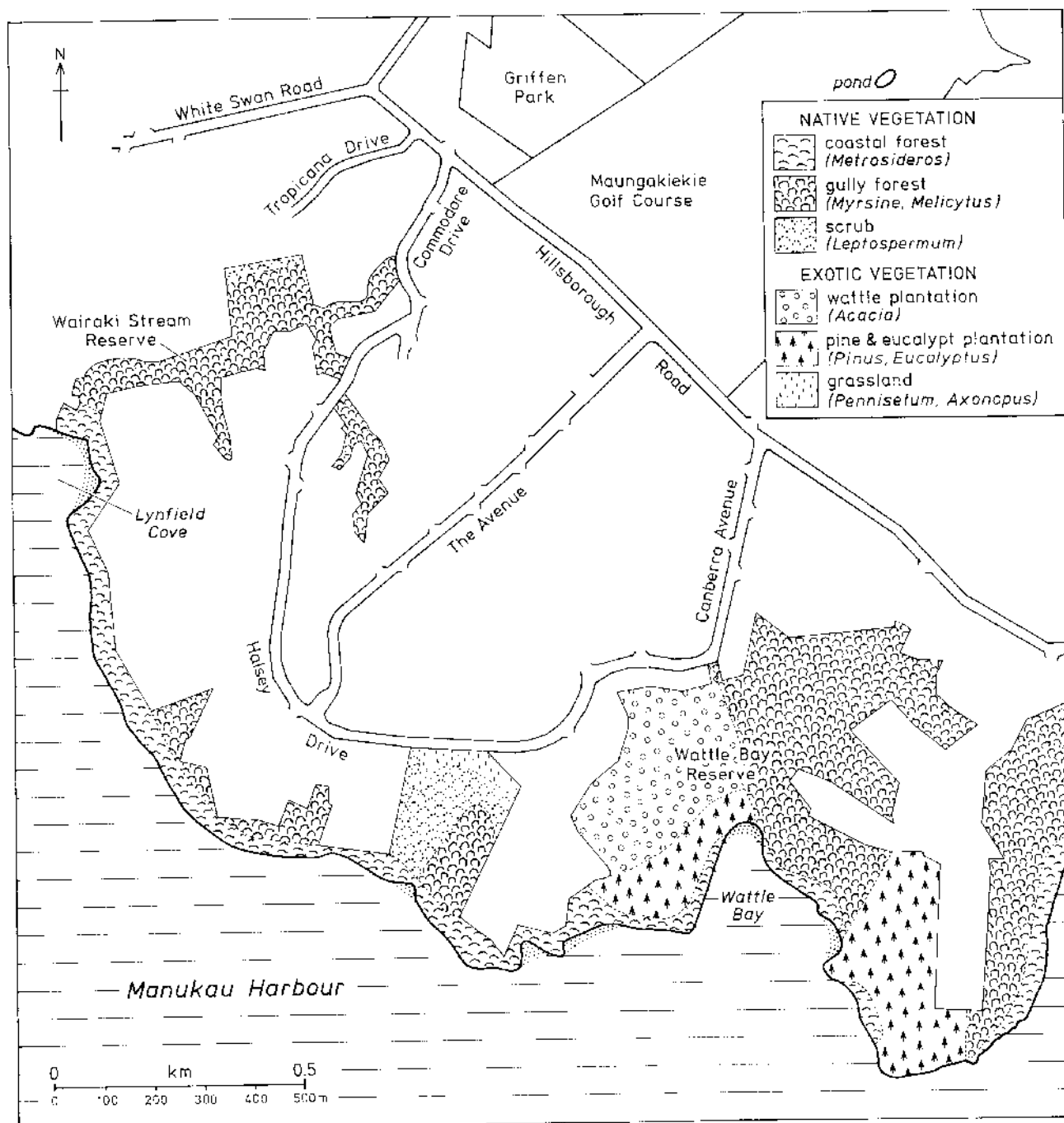


Fig. 226 Principal vegetation zones of the Lynfield Beetle Survey area. This map provides a visual frame of reference to the text and photographs on pp. 11–20 and to the Appendix on pp. 101–105. Dotted areas indicate coastal sediments harbouring halophytic floral elements.





Fig. 227–229 Aerial photographs of the Lynfield Beetle Survey study area: 227 (*opposite, upper*) Wairaki Stream Reserve; 228 (*opposite, lower*) Wattle Bay Reserve; 229 (*above*) the entire area – see also map on p. 106. From vertical survey no. 8772, February 1988, N.Z. Aerial Mapping Ltd. Reproduced with the permission of the Surveyor General, Dept of Survey and Land Information, New Zealand.

North Island

AK - Auckland
 BP - Bay of Plenty
 CL - Coromandel
 GB - Gisborne
 HB - Hawkes Bay
 ND - Northland
 RI - Rangitikei
 TK - Taranaki
 TO - Taupo
 WA - Wairarapa
 WI - Wanganui
 WN - Wellington
 WO - Waikato

South Island

BR - Buller
 CO - Central Otago
 DN - Dunedin
 FD - Fiordland
 KA - Kaikoura

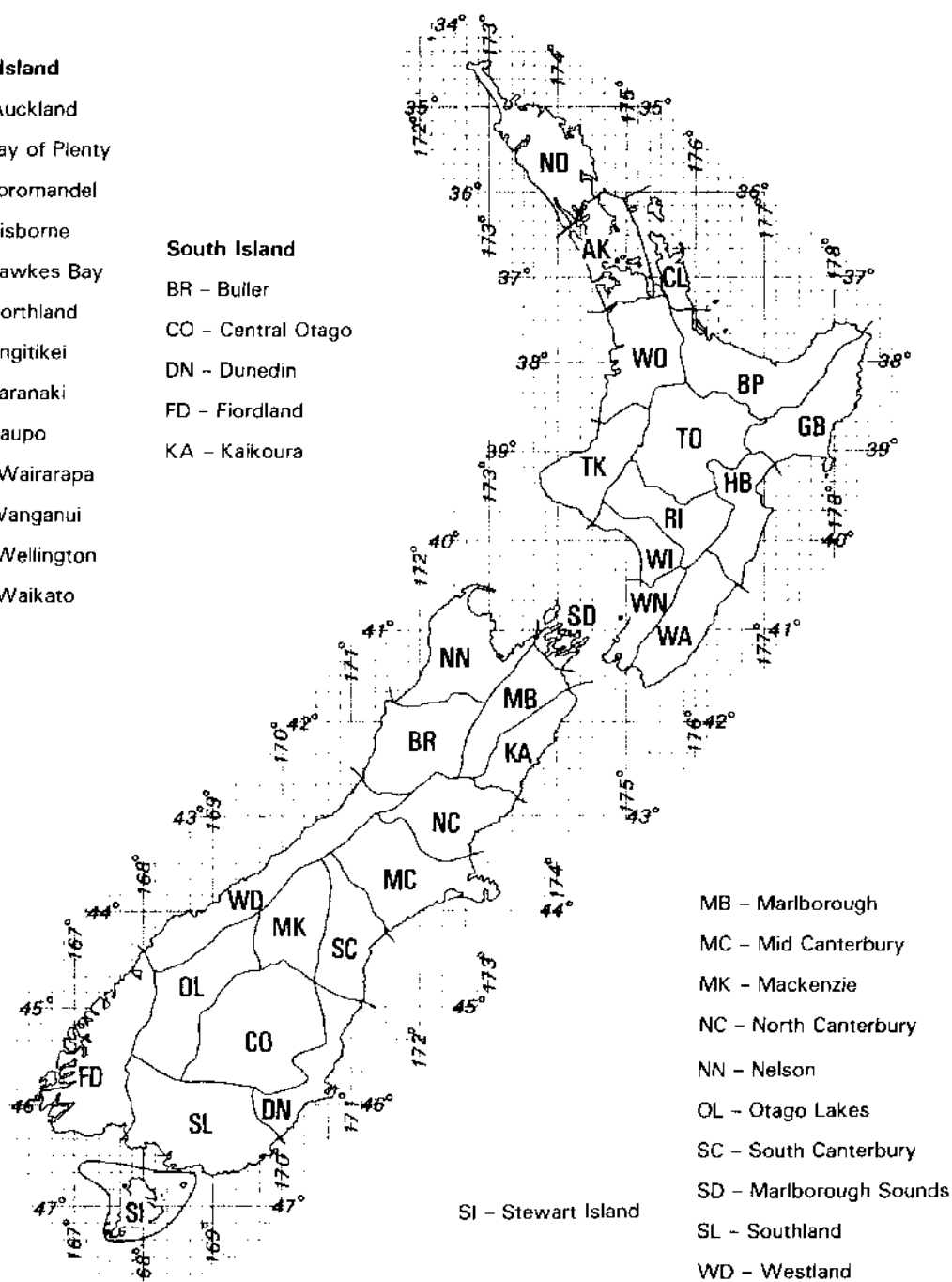


Fig. 230 Area codes and boundaries proposed by Crosby et al. (1976) for use with specimen locality data.

TAXONOMIC INDEX (Coleoptera only)

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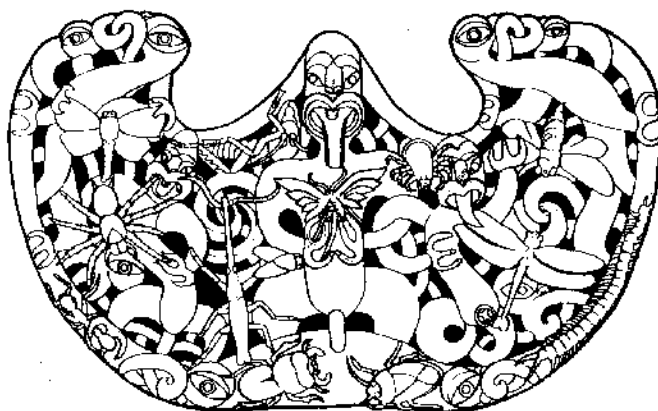
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