NINE

Phylum ARTHROPODA

SUBPHYLUM HEXAPODA

Protura, springtails, Diplura, and insects

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A defining feature of the Hexapoda, as the name suggests, is six legs. Also, the body comprises a head, thorax, and abdomen. The number of abdominal segments varies, however; there are only six in the Collembola (springtails), 9–12 in the Protura, and 10 in the Diplura, whereas in all other hexapods there are strictly 11. Insects are now regarded as comprising only those hexapods with 11 abdominal segments.

Whereas crustaceans are the dominant group of arthropods in the sea, hexapods prevail on land, in numbers and biomass. Altogether, the Hexapoda constitutes the most diverse group of animals – the estimated number of described species worldwide is just over 900,000, with the beetles (order Coleoptera) comprising more than a third of these. Today, the Hexapoda is considered to contain four classes – the Insecta, and the Protura, Collembola, and Diplura. The latter three classes were formerly allied with the insect orders Archaeognatha (jumping bristletails) and Thysanura (silverfish) as the insect subclass Apterygota ('wingless'). The Apterygota is now regarded as an artificial assemblage (Bitsch & Bitsch 2000). Though fewer in numbers of species than the beetles, Collembola (springtails) are perhaps the most abundant arthropods on earth, especially in soil litter. Found in the same environment, Protura are very small pale arthropods that are rarely encountered; Diplura include a few families of larger pale arthropods. The vast majority of hexapod species are insects, classified among 26–30 orders (some gene-sequencing studies suggest the amalgamation of some orders).

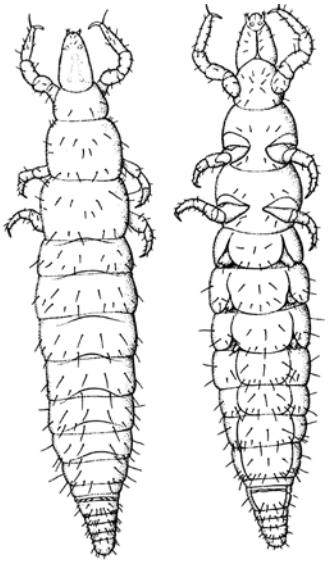
The earliest known hexapods in the fossil record are a Collembolon and an insect, both terrestrial, from the Early Devonian Rhynie Chert in Scotland (Engel & Grimaldi 2004). Both have relatively advanced features, showing that insects must have originated earlier, in the Silurian. Traditionally, springtails, Protura, and Diplura were united in a group called Entognatha, so named because members of these classes all have the base of the mouthparts internalised, so that the

Celatoblatta vulgaris.
Alastair Robertson and Maria Minor, Massey University

Summary of New Zealand hexapod taxonomic diversity

Taxon	Described living species+ subspecies	Known undescribed/ unrecorded species+ subspecies	Estimated unknown species	Adventive species+ subspecies	Endemic species+ subspecies	Endemic genera named +new
Protura	17	1	0–10	2	10	0
Collembola	346+34	0	650	44+3	266+29	20
Diplura	8+1	2	0–5	4?	6	0
Archaeognatha	2	0	0–2	0	2	0
Thysanura	3	8	>8	2	8	0+2
Ephemeroptera	48	3	10	0	51	20
Odonata	17	0	0	3	10	3
Plecoptera	99	21	20	0	120	19
Blattodea	35	9	2–5	13	31	5+1
Isoptera	9	0	0	5	3	0
Mantodea	2	0	0	1	1	0
Dermaptera	21	1	0–3	9?	13?	0
Orthoptera	116	69	<5	7?	173	27+1
Phasmatodea	22	7	7	1?	29	10
Hemiptera	1,079+15	78	235–440	280?	826?+14	119+1
Thysanoptera	122	1	>10	55	65?	11
Psocoptera	62	7	30	5	31	3
Phthiraptera	340+8	10	20*	90	29	1
Megaloptera	1	0	0	0	1	0
Neuroptera	14	0	0	7	7	0
Coleoptera	5,062+29	417–420+1	3,000	418+29	5,002–5,005+30	533+2
Mecoptera	1	0	0	0	1	0
Siphonaptera	28+6	0	0–5	11	17	0
Diptera	2,483+9	736–785	130–1,640	195	3,030–3,026+9	192+17
Strepsiptera	2	1	2?	0	4	0
Hymenoptera	721	820–934	>500	259?	740–742	55+21
Trichoptera	228	26	10–50	0	241	33+2
Lepidoptera	1,686+8	14	>100	139+1	1,389+9	140
Totals	**12,573+110**	**2,231–2,397**	**4,735–6,525**	**~1,585+33**	**12,105–12,091+91**	**1,188+48**

* Not including possible species on vagrant birds



Dorsal and ventral views of *Amphientulus zelandicus*.
R. Nielsen, from Tuxen 1986

mandible and maxilla are partly contained within the head capsule. In addition to this similarity in mouth structure, these three classes share reduced Malpighian tubules. The precise relationships of these groups to one another and to Insecta are still uncertain, however; analyses of morphological and developmental characters and gene sequencing give conflicting results (Cook et al. 2001; Giribet et al. 2004; Regier et al. 2005; Carapelli et al. 2007; Dell'Ampio et al. 2008; Timmermans et al. 2008). The majority of studies support the monophyly of Hexapoda.

All hexapods undergo several moults as they develop and grow in size, necessitated by the fact that the exoskeleton, particularly in insects, is inelastic and cannot expand. The newly moulted insect has a soft, flexible, lightly pigmented cuticle; it swallows air or water and so increases its volume before the cuticle hardens and darkens and increases in thickness. Life-cycles vary. In some groups the young are called nymphs, which are similar in form to the adult except that the wings are not developed until the adult stage. This is called incomplete metamorphosis and insects showing this are termed hemimetabolous. Representative orders include Ephemeroptera (mayflies), Odonata (damselflies and dragonflies), Plecoptera (stoneflies), Orthoptera (crickets and kin), Dermaptera (earwigs), Hemiptera (true bugs, cicadas, and kin), and Thysanoptera (thrips) among others. Holometabolous insects pass through a complex metamorphosis always accompanied by a pupal stage. The wings develop internally and the larvae are usually specialised. Representative orders include

the Coleoptera (beetles), Hymenoptera (ants, wasps, and kin), Diptera (true flies), Trichoptera (caddis), and Lepidoptera (moths and butterflies) among others.

Living hexapods range in size from tiny hymenopteran parasites less than a fifth of a millimetre to a slender 56 cm-long stick insect that lives on the island of Borneo. While the overall largest insects today are Goliath beetles, the heaviest documented species is the Little Barrier giant weta (*Deinacrida heteracantha*), which used to live on the northern North Island mainland; one specimen weighed more than 70 grams.

Although many hexapods are major pests, parasitising humans and livestock, causing damage to crops and stored products, or transmitting diseases, others are profoundly beneficial, as pollinators of economic crops or sources of products ranging from honey to silk. Scavenging hexapods help recycle dead animals and fallen trees; in fact insects of soil litter are responsible for much of the process by which topsoil is made. About 1200 species are used as human food.

Geographically, hexapods range from polar zones to the equator and can be found even in hot springs and deserts. Not only soils, but fresh waters support their own extensive insect faunas, and a number of species are adapted to life in the sea shore and, as larvae, in the shallow subtidal. There is not a single species of seed plant that does not provide food for one or more species of insect. Hexapods are so ubiquitous and important that our terrestrial planetary ecosystems could not survive without them.

Class Protura

Sometimes referred to as coneheads, Protura are possibly the simplest of all living hexapods. The name means 'first tail', first in this context implying original, alluding to the primitive form of the abdomen lacking specialised structures at the rear end. These small white to transparent creatures, only 0.6–1.5 millimetres long in New Zealand, are quite distinct because they lack antennae, eyes, and wings. In consequence of lacking antennae, the front legs, which are somewhat hairy, are raised in front of the body to act as sensory detectors. The abdomen is tubular with up to 12 segments and the legs are simple with five segments. Protura are unique among hexapods in that eggs hatch into larvae with only a few abdominal segments, with the number increasing with subsequent moults to the full adult complement. Proturan sperm is unique too, differing from any other hexapod sperm and also very different in the two proturan orders.

Protura live only in humid places, mainly in acid soils, sometimes in rotten wood, as part of the community of decomposers that help break down and recycle organic nutrients. They are frequently associated with leaf litter and moss under trees where they may feed on fungi.

The first Protura were not discovered until 1907, in New York State. About 500 species have been named so far, arranged in two orders – Eosentomoida and Acerentomoida – segregated not only on sperm characters but the presence or absence of spiracular openings to a tracheal respiratory system.

Tuxen (1986) described seven new species out of the 18 species currently known from New Zealand. *Eosentomon* is the most diverse genus, with seven species. Protura cannot disperse widely owing to their vulnerability to desiccation and saline water and their habitat restriction to soil or rotting wood. It is therefore not surprising that ~56% of the species are endemic and 30% are indigenous with Gondwanan distributions. Two species are accidental introductions from Europe. Within New Zealand, distributional records are very limited for 14 of the species, with only one to six locality records for each. Collection and identification involve extraction of specimens from soil or logs and careful preparation for mounting on microscope slides. The specimens in Tuxen's study were derived from three major collections – New Zealand Arthropod Collection (NZAC), Landcare Research; Museum of New Zealand Te Papa Tongarewa (MONZ); and Lincoln University (LUNZ), but geographic

Eosentomon australicum.
Alistair Robertson & Marie Minor, Massey University

Summary of New Zealand hexapod diversity by environment

(species plus subspecies)

Taxon	Marine*	Freshwater*	Terrestrial*	Fossil†	
				pre-Holocene	Holocene
Protura	0	0	18	0	0
Collembola	0	0	346+34	0	0
Diplura	0	0	10+1	0	0
Archaeognatha	0	0	2	0	0
Thysanura	0	0	11	0	0
Ephemeroptera	0	51	0	0	0
Odonata	0	15	2	0	0
Plecoptera	0	120	0	0	0
Blattodea	0	0	44	0	0
Isoptera	0	0	9	0	0
Mantodea	0	0	2	0	0
Dermaptera	0	0	22	0	0
Orthoptera	0	0	185	1	0
Phasmatodea	0	0	29	0	0
Hemiptera	1	10	1,146+15	2	0
Thysanoptera	0	0	123	0	0
Psocoptera	0	0	69	0	0
Phthiraptera	169+5	47+2	134+1	0	0
Megaloptera	0	1	0	0	0
Neuroptera	0	5	9	0	0
Coleoptera	5	83	5,391–5,394	113	106
Mecoptera	0	1	0	0	0
Siphonaptera	11+5	0	18+3	0	0
Diptera	12	265	2,942–2,991+9	2	0
Strepsiptera	0	0	3	0	0
Hymenoptera	0	0	1,541–1,655	0	0
Trichoptera	5	249	0	1	0
Lepidoptera	0	1	1,699+8	2	0
Totals	**197+10**	**848+2**	**13,755–13,918+68**	**121**	**106**

* For any significant part of life-cycle; 'marine' pertains to individuals or hosts that are regularly living or feeding in or on the sea or below high-tide mark; 'freshwater' means fully submerged, as in the case of larvae, not merely riparian.

† 219 species are known only from fossil remains. Eight of these are Pleistocene through Holocene in temporal distribution, the Holocene being taken as the latter part of the Quaternary that started approximately 12,000 years before the present day, i.e. around 10,000 BCE.

Gracilentulus gracilis.
Alastair Robertson and Maria Minor, Massey University

sampling has been limited. No identifications are recorded for the eastern half of the North Island, the Taranaki and Wellington regions, or the Marlborough, Otago, and Southland regions except for *Tasmanentulus intermedius* from Otago and Marlborough. Conversely, three species have been recorded from Little Barrier Island alone. But the rest of the northern offshore islands and Chatham and Stewart Islands remain unstudied. The presence of *Acerentulus kermadecensis* on the relatively recent and quite isolated small Kermadec islands is somewhat surprising. If this species is not present in at least the upper part of the North Island, could the Kermadec record be based on an accidental introduction there?

The most recent study, conducted in the Wanganui–Manawatu region (Minor 2008), compared proturan diversity in native and exotic (*Pinus radiata*) forests. The mean density of Protura was significantly higher in pine plantations than native broadleaf forests. Among native forests, Protura were most abundant under native beech (*Nothofagus*). These abundance patterns may reflect the association between Protura and mycorrhizal fungal communities in the soil, making Protura promising bioindicators of forest health, particular of exotic conifers in the Southern Hemisphere.

Class Collembola: Springtails

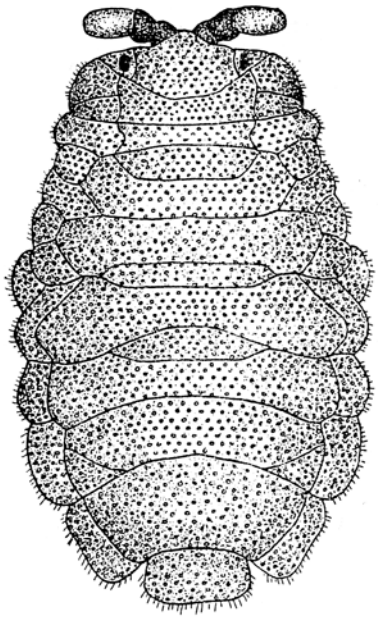
Triacanthella setacea (Arthropleona, Hypogastruridae).
From Salmon 1941

Collembola are minute soft-bodied arthropods that look superficially similar to the larvae of some insects. This is because they have a body divided into three parts – a head with antennae, a three-segmented thorax with a pair of jointed legs on each segment, and a segmented abdomen with paired appendages ventrally on some segments. They differ from insects in lacking a hard exoskeleton and wings, in the mouthparts being internal, and in possessing simple eyes, up to eight, on each side of the head. Their common name, springtail, refers to the ability of many species to leap considerable distances when disturbed. There are three orders of Collembola that can be easily distinguished by body shape. The Arthropleona, to which most species belong, are elongate with most body segments separate and equal in length. The Symphypleona are globular with anterior body segments fused, and the Neelipleona are a very small group of minute globular animals that live deep in the soil. There are about 25 families worldwide, mostly of Arthropleona.

Because of their small size and cryptic habits, springtails are not well known. The class as a whole is, however, extremely widespread, with a global distribution that includes polar and arid regions and is particularly diverse in tropical and temperate rainforests. Although springtails are predominantly soil and litter dwellers, they also occur in a wide range of other habitats, such as on vegetation including tree canopies, in caves, in the marine littoral zone, and in freshwater systems. As detritus feeders, springtails are important in nutrient cycling and thus can be generally considered to be beneficial as very few species feed on live plant material. The biology and widespread nature of springtails ought to warrant more attention from biologists.

Worldwide, about 7900 species of Collembola in more than 580 genera have been described. For information on the New Zealand fauna we are dependent on the pioneer work of J. T. Salmon who worked on the indigenous Collembola from about 1940 to 1970 (see, for example, Salmon 1964). Later, Wise (1977) meticulously documented the species known from New Zealand and provided a complete list of synonyms and new combinations together with all the relevant references. Only one species has been described from New Zealand since Wise's checklist, but there have been numerous new combinations and a number of synonyms published of genera and species (Deharveng & Wise 1987; Christiansen & Bellinger 2000; Greenslade 1982, 1984, 1986, 1989, 1994). Currently 380 species and subspecies in 103 genera are known from New Zealand, which is about five per cent of the world fauna. However, from more recent but unstudied collections that exist, it is clear that only a small proportion of the fauna has been described.

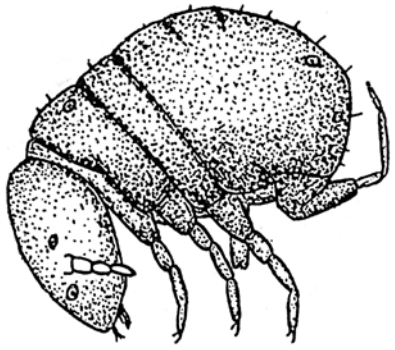
A new compilation of New Zealand Collembola has been made (see end-chapter checklist) that includes all name changes and the new species described since 1977. References to the changes can be found on the World List of Collembola (Bellinger et al. 2009). The taxonomic arrangement used in the checklist follows that of recent revisions, although recent morphological and molecular studies are finding that most of the tribes and subfamilies are not supported phylogenetically. They are used here for convenience and until an improved higher classification has been published and adopted.



Platanurida marplesi (Arthropleona, Neanuridae).
From Salmon 1941

Diagnostic morphology of Collembola

Springtails are white or coloured, sometimes darkly pigmented and often patterned. Normally 1–2 millimetres long, they can range from 0.2 to 10 millimetres. Their bodies are furnished with chaetae (also called setae), which can be numerous or sparse, fine or thick, long or short, serrated, clublike, and with hair-like structures or smooth. Scales and bothriotricha (long chaetae inserted in pits) are found in some families. The mouth is anterior and the head is aligned with the main body axis, except in Symphypleona, and Neelipleona, where the head is at right angles to the body. Mouthparts are elongate and adapted either



Zelandothorax novaezealandiae
(Neelipleona, Neelidae).
From Salmon 1944

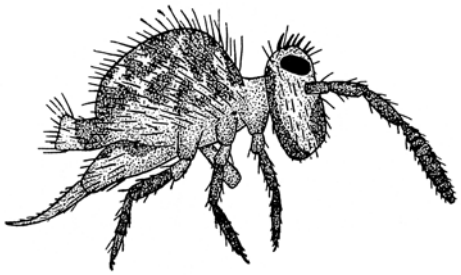
Percentages of Collembola species per family in New Zealand, Australia, the world

(Excluded are 14 small families with no Australasian species)

Family	New Zealand no. of species	% of total	Australia no. of species	% of total	World no. of species	% of total
Brachystomellidae	3	0.8	21	5.6	129	1.6
Entomobryidae	98	25.8	90	23.9	1661	21.1
Paronellidae	17	4.5	20	5.3	506	6.4
Hypogastruridae	22	5.8	28	7.4	666	8.4
Isotomidae	87	22.9	56	14.9	1,311	16.6
Neanuridae	41	10.8	46	12.2	1,410	17.9
Odontellidae	6	1.6	4	1.1	129	1.6
Onychiuridae	10	2.6	6	1.6	555	7.0
Tomoceridae	14	3.7	7	1.9	147	1.9
Tullbergiidae	7	1.8	17	4.5	214	2.7
Arrhopalitidae	1	0.3	2	0.5	131	1.7
Bourlettiellidae	5	1.3	24	6.4	245	3.1
Dicytomidae	4	1.1	4	1.1	199	2.5
Katiannidae	51	13.4	33	8.8	205	2.6
Sminthuridae	6	1.6	6	1.6	145	1.8
Sminthurididae	4	1.1	7	1.9	145	1.8
Spinothecidae	1	0.3	1	0.3	6	0.1
Neelidae	3	0.8	3	0.8	33	0.4
Onopoduridae	0	0	1	0.3	52	0.7
Totals	**380**	**100**	**376**	**100**	**7,889**	**100**
% of world fauna		**4.8**		**4.8**		

for biting and chewing/grinding, or for fluid feeding. They consist of a pair of maxillae, a median labium and labrum, and a pair of mandibles. The pleural folds, together with the labrum and the labium, completely enclose the mouthparts to form the buccal cone, which occasionally projects anteriorly. A postantennal organ is usually present, and up to eight, sometimes fewer, ocelli on each side of the head or these simple eyes may be totally absent. The antennae are four-segmented, sometimes subsegmented, with muscles within all segments.

The thorax has three segments; the first segment sometimes lacks chaetae and is shorter than the other segments. The thoracic segments are conspicuous in the Arthropleona but not in Symphypleona or Neelipleona, where they are fused and form a single mass with the abdomen. The legs and the abdomen are both six-segmented but two or three posterior segments in the abdomen are sometimes fused. Specialised appendages – ventral tube, tenaculum, and furca – are found ventrally on abdominal segments I, III, and IV respectively. The ventral tube consists of a column with a pair of enclosed tubes distally, which are normally retracted within the column, but which can be extruded. Their cuticle is permeable to water and the tubes can provide adhesion to the substratum after a leap. The jumping organ or furca is normally folded forward beneath the body and held in place by the teeth of the tenaculum. When suddenly released from the tenaculum, the furca springs backwards to the resting position and so hits the ground with considerable force, propelling the animal into the air. Jumping is both a reaction to disturbance and a means of dispersal, and some directional ability has been demonstrated. The genital opening is in a ventral position on abdominal segment V and the anal aperture is on abdominal segment VI. Cerci are absent, but anal spines are sometimes present. There is no metamorphosis.

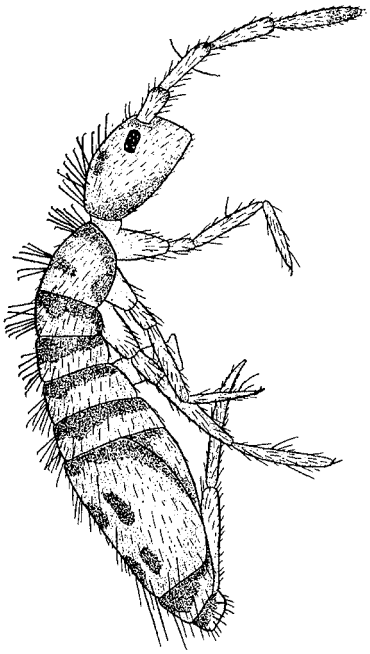


Katianna purpuravirida
(Symphypleona, Katiannidae).
From Salmon 1941

Life-history

The life-histories of only a few springtails have been studied in detail anywhere in the world, but there is a general pattern. Most species reproduce sexually, although

parthenogenesis is common in soil-inhabiting forms. Sperm transfer is indirect in most families, the males depositing a globular, stalked spermatophore on the ground in which sperm are encysted. In some Symphypleona (Bourletiellidae and Sminthurididae), there may be an elaborate dance in which the male grasps the female by means of the specialised spines and hairs on the antennae, head, or legs and directs her to the spermatophore. There is strong sexual dimorphism in these families and all truly aquatic species belong to this group. Springtails lay their eggs singly or in clusters in protected sites such as in soil, in leaf litter, under stones, or in crevices. Eggs are spherical and pale. In some Symphypleona they are covered with freshly eaten soil mixed with a rectal fluid voided through the anus after oviposition. This covering protects the eggs against dehydration and fungal attack. In other species, eggs are kept free of fungal hyphae by the grazing of adults. The juvenile instars are similar to the adult in general appearance, the only difference being smaller size, lack of genital apparatus, and a reduced arrangement of chaetae (chaetotaxy). Complete adult chaetotaxy and colour gradually develop during the pre-adult instars. There can be from 3 to 13 stages before maturity but four or five stages are common. The complete life-cycle from egg to adult can take (on average) from one to three months but this varies in different species and at different temperatures. Individuals of some species may live for five years, yet in other species, males mate with pre-adult females and then die, living only a few days. Adults continue moulting throughout life, and may undergo up to 60 moults in some species, although usually no further increase in size occurs after about moult 15.



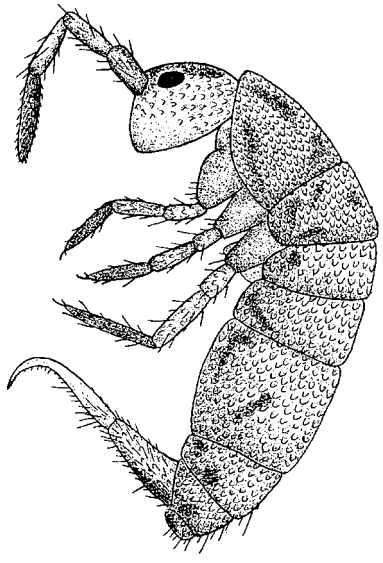
Entomobrya aniwaniwaensis (Arthropleona, Entomobryidae).
From Salmon 1941

Ecology

Springtails are virtually ubiquitous, being found in all biomes including mountain tops, polar regions, and deserts, the only exception being the ocean. Terrestrial springtails are found in a wide variety of usually moist habitats, predominantly in soil and leaf litter and other decomposing materials such as logs and dung. Many species inhabit caves. Others are found on grasses, in flowers, under the bark of trees or in tree canopies. Some aquatic species live exclusively on water surfaces but others live more intimately with the aquatic environment

Number of introduced (naturalised-alien) species per family

Family	New Zealand no. of species	% of total	No. of alien species	% exotic
Brachystomellidae	3	0.8	1	33
Entomobryidae	98	25.8	8	8
Paronellidae	17	4.5	0	0
Hypogastruridae	22	5.8	7	32
Isotomidae	87	22.9	10	11
Neanuridae	41	10.8	2	5
Odontellidae	6	1.6	0	0
Onychiuridae	10	2.6	5	50
Tomoceridae	14	3.7	1	7
Tullbergiidae	7	1.8	1	14
Arrhopalitidae	1	0.3	1	100
Bourlettiellidae	5	1.3	4	80
Dicytomidae	4	1.1	1	25
Katiannidae	51	13.4	1	2
Sminthuridae	6	1.6	1	17
Sminthurididae	4	1.1	3	75
Spinothecidae	1	0.3	0	0
Neelidae	3	0.8	1	33
Onopoduridae	0	0	0	0
Totals	**380**	**100**	**47**	**12**



Novacerus spinosus (Arthropleona, Tomoceridae).
From Salmon, 1941

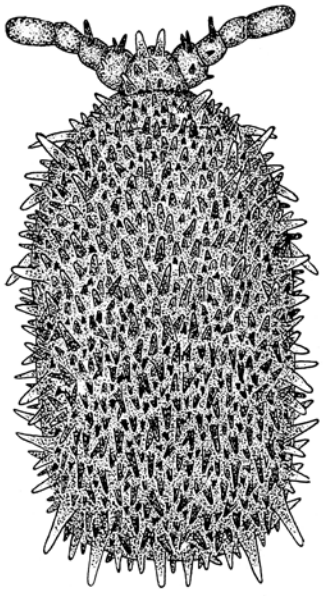
Pseudoparonella dorsanota (Arthropleona, Paronellidae).
From Salmon, 1941

interstitially in sand and under submerged stones and rocks in streams and on the seashore. As the cuticle of springtails is water repellent, being composed of triangular granules that may be fused into larger raised tubercles, rendering it hydrophobic, the animals are able to float on water. Some species seem to be distributed in surface run-off; others disperse on the wind or actively migrate in aggregations.

Most species feed on micro-organisms associated either with the soil around roots (rhizosphere), decomposing organic matter, the water surface, and fungal fruiting bodies, or to a lesser extent with the aerial surfaces of plants. They do not feed readily on sterile leaves. A few species are predatory and feed on small organisms such as rotifers and nematodes; others are saprophytic and pollen is also sometimes a food source. Springtails act as catalysts in the breakdown of organic matter and in the cycling of plant nutrients by grazing on and distributing propagules of micro-organisms and, through their feeding and other activities and the deposition of faecal material, they can alter the physical properties and structure of soils.

Average densities in soils are usually between 10,000 and 30,000 per square metre but can be as high as a million in rare situations. Some factors influencing the distribution and abundance of springtails are the location of food, moisture, and soil pore space. Springtails are also sensitive indicators of disturbances such as chemical pollution, fire, vegetation clearance, tillage, etc., and therefore are of value in environmental assessment.

Many arthropods prey on springtails as do coral-reef fish, birds, small reptiles, and frogs. The predatory arthropods, some of which have evolved elaborate catching devices, include carabid and staphylinid beetles, dacetine ants, Hemiptera, empidid and dolichopodid flies, spiders, harvestmen, pseudoscorpions, centipedes, and prostigmatid and mesostigmatid mites; for example, springtails comprise the main items of diet for bdellid, cunaxid, and anystid mites. Some springtail families, however, notably the Onychiuridae and Neanuridae, seem immune from predators, probably because they contain and sometimes exude a toxic or distasteful chemical. Apart from leaping and cryptic coloration, springtails have a number of defence mechanisms against predation. These include immobility, mimicry, and a spiny dorsum. Viruses, bacteria, fungi, and protozoans as well as nematodes have been found to be parasites of springtails.



Holacanthella spinosa (Athropleona, Neanuridae).
From Salmon 1941

Characteristics of the New Zealand fauna

Nearly 80% (291) of the species listed here are currently considered endemic to New Zealand and 20% (105) of the genera. This level of endemism is very high and similar to that of Tasmania at the species level. The most highly endemic families are the Neanuridae, Paronellidae, and Katiannidae followed by the Entomobryidae and Isotomidae. Most taxa in the first three families are found in humid undisturbed forest leaf litter and include a large element with affinities with other southern regions such as southern South America and southeastern Australia. It has been shown for Tasmania that the highest level of endemism is found in temperate *Nothofagus* (southern beech) rainforests, on mountaintops, and in caves (Greenslade 1987) and it is to be expected that New Zealand would show similar patterns. However, much of the country has been cleared for agriculture or forestry, both in the North Island and in the eastern plains of the South Island, leaving only very little of the original vegetation. It is likely that suites of locally endemic species that were present before human settlement are now extinct so that a reliable comparison of endemism between vegetation types and regions cannot now be made.

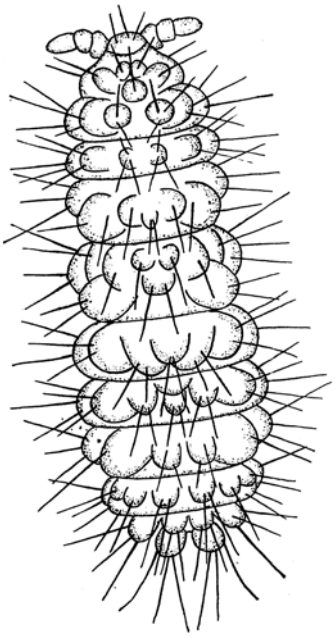
The number of New Zealand species expressed as a percentage of the total world species is 4.8%. Coincidentally, this is the exact same percentage of the world fauna recorded for Australia, however the proportion that some families contribute to the total differs between the northern and southern hemispheres.

The Onychiuridae and Arrhopalitidae contribute a higher proportion of species to the total world fauna than they do in either Australia or New Zealand, three and four times respectively. The latter family is well developed in caves in the northern hemisphere but does not seem to occur in caves in New Zealand or Australia. Conversely the diversity of Katiannidae is greater in Australia (3 times) and New Zealand (10 times) than in the rest of the world. The two southern regions also differ. In Australia, the Brachystomellidae and Bourletiellidae contribute a higher percentage of species to the total than do these two families to the New Zealand fauna, five and seven times more, respectively. Species of both families are tolerant or prefer warmer conditions and possess strategies to survive in low humidities.

There are 47 naturalised-alien species recorded from New Zealand. The proportions of exotic species vary with family. Considering only those families with five or more species, exotics comprise a high proportion of the total in Hypogastruridae (32%), Onychiuridae (50%), and Bourletiellidae (80%). When the fauna of these families is revised, it may be that all Onychiuridae and Bourletiellidae species found in New Zealand are exotic. Alternatively, the Katiannidae, although a species-rich family, has only 2% exotic species recorded.

A genus of considerable interest from a conservation viewpoint is *Holacanthella*, comprising five species (Stevens et al. 2007a,b). All species are large and conspicuous with a dark bluish-black background and profusely covered with small brightly coloured orange, yellow, or red digitations. Specimens are rarely encountered and are confined in habitat to well-rotted logs in old-growth native forest. Phylogenetically they are close to the Australian genera *Acanthanura*, *Megalanura*, and *Womersleymeria*, also found only in old-growth vegetation, usually forest.

The publications of the late John Salmon, from 1937 until the mid-1970s, resulted in a very large increase in new genera and species in the New Zealand fauna. As there has been hardly any revision of Salmon's taxa since he first described them, it is likely that a number of his new genera and species are synonyms and that some of his species are incorrectly assigned to genus. For instance, based on the structure of the dens and tibiotarsus, it is likely that *Schoettella subcorta* belongs to the genus *Xenylla*. The genus *Metakatianna* was erected on the basis of an immature specimen of Katianninae and *M. nigraoculata* is now recognised as belonging to *Pseudokatianna*. Based on the figures and original description the genus *Isotomedia* may be synonymous with *Folsomotoma*. Additionally, species he described as endemic to New Zealand in some families, notably the Onychiuridae and Hypogastruridae, are now proving to be well-known cosmopolitan species. As not all of these synonyms and new combinations have been published, the level of endemism shown in the list published in this work may be less than stated. Notwithstanding, as many new species and some new genera remain to be discovered, the difference between the current levels and actual levels may eventually prove to be similar.



Crossodonthina radiata (Arthropleona, Neanuridae).
Salmon 1941

Class Diplura

Diplura means 'two tails', referring to the forked sensory structures (cerci) at the end of the body, which in one group are modified as pincers. Hence some Diplura resemble small wingless earwigs while others resemble primitive rove-beetle larvae (called campodeiform because of their resemblance to the dipluran genus *Campodea*). Two-pronged bristletails is another name for the group. Diplura have no compound eyes, only simple ocelli like springtails, but the antennae have many segments, like beads, and are up to three times as long as the head. The mouthparts are enclosed in the head capsule and the body is mainly white. The abdomen is long and slender with 10 segments and most species are 5–10 millimetres long, but some reach 40 millimetres. Diplura (and some stick insects) are the only terrestrial arthropods known to be able to regenerate lost body parts.

Heterojapyx novaezeelandiae.
Alastair Robertson and Maria Minor, Massey University

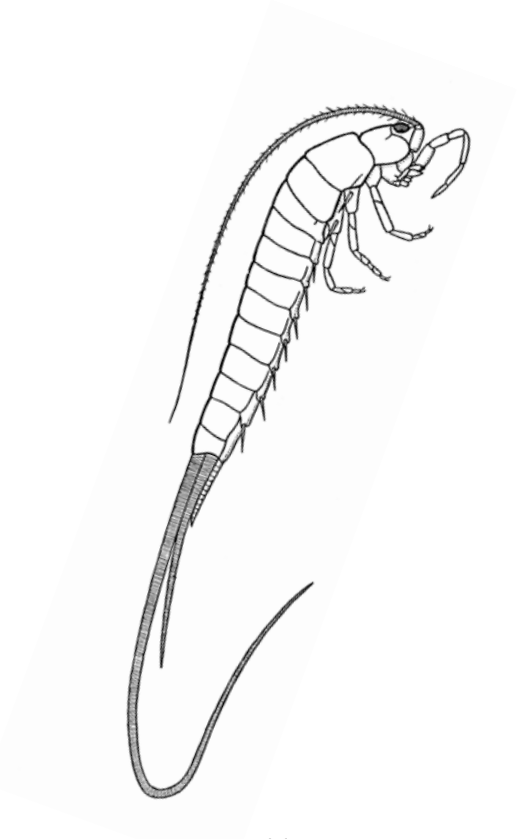
Legs, antennae, and cerci can be regenerated over the course of several moults.

Diplura inhabit damp sheltered places, mainly in soil and leaf litter, but also under stones and logs, where they feed on other soil dwellers (Collembola, mites, Symphyla, insect larvae, and even other Diplura). Some survive on plant litter and fungal mycelia but most seem to prefer animal prey. Some of the few New Zealand records are from forests (Moeed & Meads 1987a). There are 10 New Zealand species (cf. about 800 worldwide), distributed in three families in the single order Diplura (Tillyard 1924b; Hilton 1939; Pagés 1952; Townsend 1970; Wise 1970a). This diversity compares to only one family in Britain, but species diversity per square kilometre is similar in both countries. The four species of Campodeidae in New Zealand are likely to be herbivores, while the other species are likely to be predatory. An undetermined *Burmjapyx*, which is apparently an undescribed species, has been found in caves in Nelson (McGuiness 2001). The largest New Zealand dipluran is endemic *Heterojapyx novaezeelandiae*, which grows to 36 millimetres long. Townsend (1970) provided a translation of the original description of *H. novaezeelandiae* and commented on variation in the antennae. This species lays eggs in clusters in small cavities in the soil under stones or logs in the Nelson, Marlborough, and Westland districts from sea level (Greymouth) to 900 metres. An undetermined dipluran has been collected from the Poor Knights Islands (Watt 1982).

Class Insecta

What has made the insects so successful? There are more kinds of insects than any other group of multicellular organisms. Exact numbers are uncertain, but insects (around 909,000 species) account for about half of all named species of life. Moreover, among the insects some groups are much more diverse than the rest, including the ants, bees, and wasps (Hymenoptera) with ca. 110,000 species, flies (Diptera) ca. 120,000 species, moths and butterflies (Lepidoptera) ca. 170 000 species, and beetles (Coleoptera) ca. 360,000 species. Among insects, these groups have in common wings that flex and life cycles with complete metamorphosis, and these features have been implicated in their diversification along with parallel evolution with flowering plants. Famously, but possibly apocryphally, the evolutionary biologist J. B. S. Haldane was moved to quip that the Creator had an 'inordinate fondness for beetles', but it would be more accurate to include other winged insects in this perception – while beetles may have diversified faster than some sister lineages from their time of origin, they do not stand out relative to other closely related branches of the evolutionary tree (Mayhew 2002).

Following the classification used in the *Nomina Insecta Nearctica* for the insects of North America, and based on modern morphological and molecular studies, the Insecta is divided into two subclasses, the Archaeognatha, with a single order of the same name, and the Dicondylia, comprising all the remaining orders. The Archaeognatha ('ancient jaws') have several primitive features, one of which is that their mandibles are monocondylic, that is, with only one condyle articulating with the head capsule. All other insects, including the Thysanura (silverfish) with which they were previously included, have two condyles (dicondylic). Alternative classifications include the Archaeognatha and Thysanura in the subclass Pterygota (the primitively wingless insects), a group that used also to include the Protura, Collembola, and Diplura.



Nesomachilus maorica.
From Tillyard 1924

Subclass Archaeognatha

Order Archaeognatha: Bristletails

This small but ancient group of insects, sometimes called Microcoryphia ('small heads'), comprises about 350 described species worldwide, but there are only two in New Zealand. Based on Museum of New Zealand (Te Papa) collection

records, *Nesomachilis maorica* (Tillyard 1924a) is found on Cuvier Island (Wygodzinsky 1948; Sturm 1980), the Poor Knights Islands (Watt 1982), and indeed most of the islands off the Northland east coast that have been checked for soil insects (Moeed & Meads 1987b). A second species, *N. novaezelandiae*, was described seven decades later (Mendes et al. 1994)

Bristletails resemble thysanurans with eyes, except for the simple, small, paired appendages known as styli under each abdominal segment. In addition, at the tip of the abdomen, the three cerci are parallel, unlike the splayed cerci of Thysanura. In *N. maorica*, all three cerci are directed backwards, with the inner one distinctly longer than outer pair. The compound eyes are prominent and meet near the middle – another bristletail distinctive. The antennae are directed backwards and are long and thin with many segments. The legs have three tarsal segments. Bristletails are omnivores and nocturnal, feeding on algae, lichens, vegetable debris from rock crevices, litter, and bark. When disturbed, they can jump, thanks to specialised muscles in the abdomen that snap it against the ground. It is this capacity that gives these creatures an alternate common name – jumping bristletails. A good source of information on the order is that of Sturm and Bach (1993), who revised generic concepts and gave an overview of ecological variation.

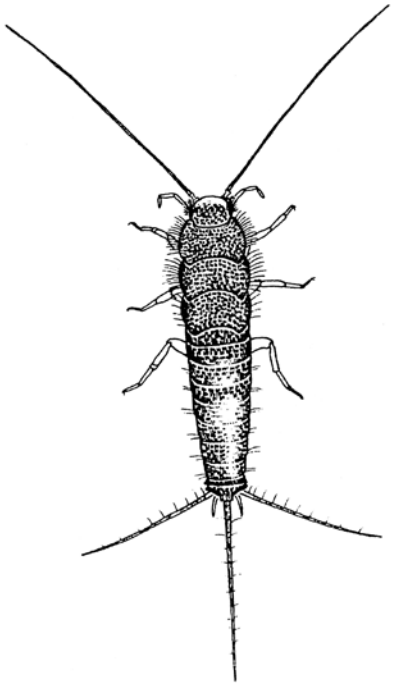
Subclass Dicondylia

Order Thysanura: Silverfish

Silverfish are well known from the introduced house pest *Lepisma saccharina* that feeds on books and clothing. The order includes about 200 species worldwide but should be split into two separate orders, Zygentoma and Monura, according to Larink (1997). These wingless insects are easily recognisable, with three cerci at the end of the abdomen that are long, thin and near-equal in length. The outer pair of cerci is splayed out, sometimes almost horizontally. Compared to bristletails, silverfish eyes are small or absent. The antennae are long and thin, with many segments, and pointed forward. The elongate body (up to 15 millimetres long) may have scales with short appendages under the last three abdominal segments. The legs have 2–4 tarsal segments. Silverfish are agile runners. Generally, they are scavengers, living under bark, in litter, among undisturbed paper, and in cupboards with dried food.

The New Zealand fauna includes 10 or 11 species, not all named. Members of the family Lepismatidae have eyes, the scales can be dark, and the legs have only 3–4 tarsal segments. This family includes both of the accidentally introduced species, *Lepisma saccharina* from Europe and *Ctenolepisma longicauda* from South Africa. According to Scott (1984), *L. saccharina* is mainly found either in undisturbed piles of paper and tins with food in kitchens. These silverfish begin to lay eggs at the ninth or tenth instar (a stage between moults) and can live for over 2.5 years and undergo 30 moults. Some of the later instars undergo arrested development (diapause) at 25° C and below but there is no diapause at 28° C (Nishizaka et al. 1998).

Tillyard (1924b) described a native lepismatid species, *Heterolepisma zelandica*. There are apparently seven or eight undescribed species in several genera in the families Ateluridae and Tricholepidiidae (as Lepidotrichidae) (Wise 1970a). Species in these families lack eyes and scales, are white or yellow, and the tarsi have five segments, so they can be readily distinguished from the described species. An undetermined silverfish has been collected from the Poor Knights Islands (Watt 1982). The status of all these forms needs proper determination.

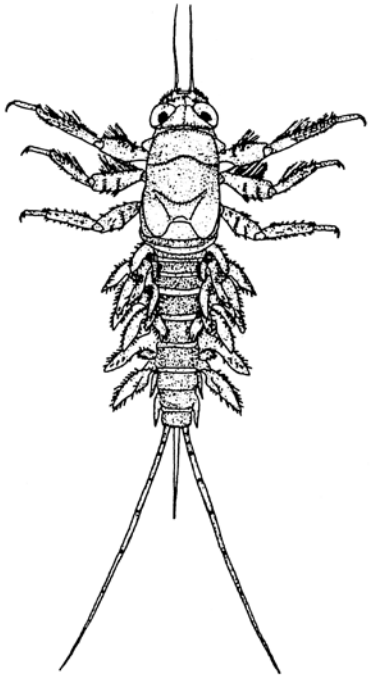


Lepisma saccharina.
From Grant 1999

Order Ephemeroptera: Mayflies

The mayflies seen today in running waters throughout New Zealand are representatives of the most primitive winged insects still in existence. Their ancestors

Nesameletus ornatus adult male (imago).
W.J. Crawford



Coloburiscus humeralis larva.
Craig Dolphin, from Winterbourn et al. 2006

first appeared as fossils in the Carboniferous over 300 million years ago (Hubbard 1987). Mayflies comprise a relatively small portion of the global fauna of aquatic insects but are almost cosmopolitan, with species on all continents except Antarctica and many islands except those that are truly oceanic.

Naturalists have long been interested in mayflies because of their brief adult life – hence the ordinal name 'ephemeral wings'. The immature stages of mayflies are fully aquatic nymphs, usually inhabiting relatively unpolluted standing and running waters where they may remain for up to three years. Nymphs of most species are herbivores but a few are filter-feeders or predators (Peters & Campbell 1991). Once mayflies enter the terrestrial environment, however, they stop feeding; the two terrestrial stages, the subimago and imago, are essentially for reproduction and dispersal. For most species, the terrestrial stages last little more than 48 hours, but for some it is much shorter. In some North American species the female never reaches the adult state at all, moulting from nymph to subimago, mating, laying its eggs, and dying within the space of a few hours (Edmunds et al. 1976).

Because mayflies usually inhabit unpolluted waters, they have frequently been used as indicators of water quality (Williams 1980). In some circumstances, mayflies respond positively to nutrient enrichment of aquatic systems. In the USA, mayflies such as *Hexagenia* became so abundant following enrichment of the Mississippi River, the emerging adults blocked bridges and had to be removed using snowplows (Edmunds et al. 1976). This sensitivity to nutrient levels, dissolved-oxygen concentrations, and other chemical and physical attributes of fresh water, has led to the development of biotic indices, where combinations of species are used to rank water quality (Williams 1980). Such indices are now applied in many countries, including New Zealand (e.g. Stark 1993, 1998).

The value and use of mayflies to assess changes in aquatic systems is a relatively recent development. There is a longer history of interest in the role of mayflies as food for sports fish (especially salmonids), and a huge scientific and popular literature developed around the use of artificial baits to imitate aquatic insects such as mayflies following the first documented account in 1496: 'The Treatyse of Fysshynge wyth an Angle' by Dame Juliana Berners (see Williams 1980). This interest has produced a distinctive vocabulary based around stages of the life cycle of mayflies and the lures used to imitate them. The aquatic stages of nymph or larva and emerging subimago are thus imitated by the 'wet fly', and the terrestrial stages of subimago and imago are imitated by 'dry flies', referred to respectively as the dun and spinner. Local accounts are now available that recommend the construction and use of flies specifically to imitate New Zealand species of mayflies (e.g. Draper 1997).

Historical overview of studies on mayfly diversity

The history of descriptions of selected groups of mayflies in New Zealand was outlined by Towns and Peters (1996) and Peters (2001). The first mayflies were described from New Zealand by Walker (1853) and are now known as *Coloburiscus humeralis* and *Neozephlebia scita*. With these two species there began a series of descriptions based largely on specimens collected, dried, and pinned in New Zealand and sent to recognised authorities in Britain. By the end of the 19th century, at least 11 species had been described in this way (Eaton 1899). But the use of pinned adult specimens, the distortions of male genitalia during drying, the limited series of specimens, and communication difficulties all contributed to subsequent identification problems, sometimes resulting in descriptions of the same species under different names. Some of these problems have yet to be resolved (see below). The first comprehensive account of the fauna added to this confusion when two of the species, *Deleatidium lillii* and *Neozephlebia scita*, were misidentified (Lillie 1898).

At the beginning of the 20th century, naturalists resident in New Zealand began collecting and describing new species of mayflies. The known fauna grad-

Families and species in mayfly faunas of New Zealand, Australia, and New Caledonia

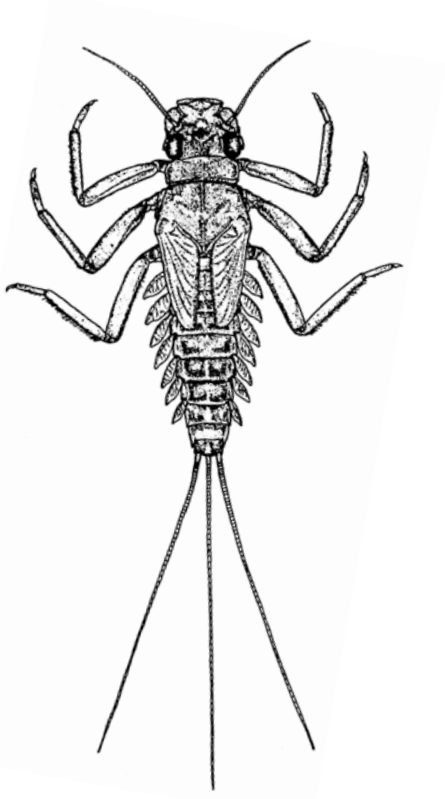
Family	New Zealand	Australia[1]	New Caledonia[2]
Ameletopsidae	1	3	0
Baetidae	0	13	1?
Caenidae	0	5	0
Coloburiscidae	1	3	0
Ephemeridae	2	0	0
Ephemerellidae	0	1	0
Leptophlebiidae	35	54	46
Nesameletidae	6	1	0
Oniscigastridae	3	3	0
Prosopistomatidae	0	1	0
Rallidentidae	2	0	0
Siphlaenigmatidae[3]	1	0	0
Total endemic spp.	**51**	**84**	**46**

1. Peters and Campbell (1991)
2. Peters (2001)
3. Claims of Siphlaenigmatidae in Australia by Lugo-Ortiz and McCafferty (1998) have since been traced to curatorial errors (McCafferty 1999)

ually increased following work by Hudson (1904), Tillyard (1923c), and Phillips (1930b). The usefulness of this work was compromised, however, because neither Hudson nor Phillips identified specific type localities or nominated type series in recognised institutions. Nevertheless, for several decades the revision provided by Phillips (1930a, b) was the most comprehensive account of the mayfly fauna, recognising 22 species in what were then three families. By the middle of last century, the first ecological studies on New Zealand streams were under way (e.g. Allen 1951), especially when it was discovered that immature mayflies were amongst the most abundant organisms in some running waters. Biologists were hampered, however, by a lack of reference material – types were either held in Britain or had never been deposited. The confusion over identity prevailed within some genera until fairly recently, leading Winterbourn (1977) to describe the situation as a 'taxonomists' nightmare'.

The situation improved with the descriptions of new families, genera, and species by Penniket (1961, 1962a, b, 1966) and the description of *Atalophlebioides aucklandensis* by Peters (1971). The latter was the first comprehensive description of nymphs and adults to be accompanied by accurate, high-quality diagnostic illustrations for any species in the New Zealand Leptophlebiidae. A subsequent review of New Zealand aquatic insects by Wise (1973a) listed a mayfly fauna of 27 species in 10 genera and four families, representing a 23% increase in the number of species since 1930. The end-chapter checklist of Epheremoptera provided here is the first comprehensive update since Wise's list and represents an 89% increase in the number of species since 1973.

Most modern taxonomists have included New Zealand collections as repositories for part of the type series of species descriptions. The most comprehensive of these collections is the New Zealand Arthropod Collection held by Landcare Research in Auckland. Earlier workers were more likely to submit collections to the provincial museums and there are useful collections in the Auckland Institute and Museum, National Museum of New Zealand (Te Papa), and Canterbury Museum. Although Phillips collected mostly around Wellington, only a few specimens attributable to him are in the National Museum collections (Towns & Peters 1978); most of his material was found by T. Hitchings in the Canterbury Museum (Towns & Peters 1996) and some appears to have reached the Natural History Museum, London (Towns 1983a). This museum



Deleatidium sp. larva.
Craig Dolphin, from Winterbourn et al. 2006

remains the repository of much of the material described in the late 19th century. Some material has also been deposited at Bernice P. Bishop Museum, Honolulu, Hawaii. Probably the largest overseas collection is held in the Entomology Department of Florida Agricultural & Mechanical University, Tallahassee, as part of a comparative collection of Ephemeroptera of the world. This collection also includes some reference material (especially Leptophlebiidae) previously deposited at the University of Utah, Salt Lake City. Reference collections of Siphlaenigmatidae, previously held at the University of Utah, are now held at the Entomology Department of Purdue University, West Lafayette, Indiana.

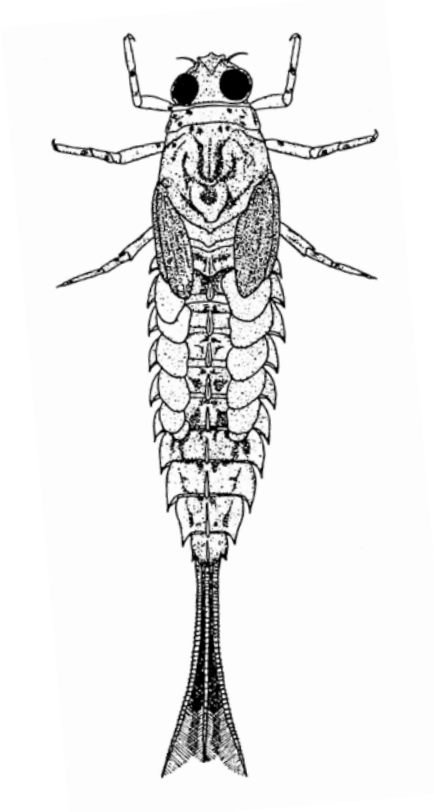
Species diversity, endemism, and biogeography of mayflies

A revision of the family-level classification of Ephemeroptera (Kluge et al. 1995) and revisions of the New Zealand Leptophlebiidae (Towns & Peters 1978, 1979a, b, 1996; Towns 1983a) reveal a fauna of at least 52 species in 20 genera and eight families. This fauna is distinctive in two ways – high levels of endemism and patchy levels of radiation within genera and families. All genera are endemic to New Zealand, but there are also two endemic families, Rallidentidae and Siphlaenigmatidae. The latter family is of great scientific interest as it shares features with both an ancient group like the Siphlonuridae and the more modern Baetidae (Penniket 1962b). Although the Baetidae are almost cosmopolitan in distribution, they did not reach New Zealand. Despite high distinctiveness within families, few of them have radiated into complexes of genera or species. Rather, six families comprise only a single genus with one to three species. In a few cases (e.g. *Coloburiscus tonnoiri* and *Oniscigaster intermedius*) species names may be synonymised. In contrast, two families have shown moderate to high levels of radiation, with more species present than had been realised. The Nesameletidae, currently under revision, has at least six species in one genus (Hitchings & Staniczek 2003) and the Leptophlebiidae has at least 35 species in 13 genera, the latter thus comprising almost 70% of the species and 65% of the genera in the fauna.

New Zealand and Australia have a similar number of mayfly families, but there are qualitative differences between them. New Zealand lacks modern families such as Baetidae, Caenidae, and Ephemerellidae and the tropical Prosopistomatidae. On the other hand, Australia lacks the apparently ancient families Rallidentidae and Siphlaenigmatidae. A particularly puzzling absence from the Australian fauna is the Ephemeridae, a family present in New Zealand, Madagascar, and all of the major continents (Edmunds et al. 1976). Like New Zealand, Australia shows low levels of species radiation within most mayfly families along with contrasting high levels in a few families. Most (64%) of Australian species are also leptophlebiids.

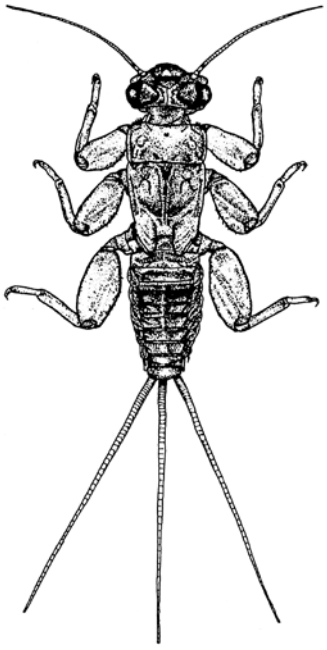
The most extreme predominance of Leptophlebiidae is found in New Caledonia, where the entire mayfly fauna, wholly endemic, belongs to this one family. Of the 19 genera known, 18 have close evolutionary relationships with New Zealand, the remaining one being most closely related to a genus in Madagascar (Peters 2001). In New Zealand, six evolutionary lineages of genera have been recognised (Towns & Peters 1996), four with close links to New Caledonia, and all six with links throughout much of the Southern Hemisphere. They are: *Deleatidium* plus *Atalophlebioides*, with other representatives in South America, Australia, Celebes, Sri Lanka, southern India and Madagascar; *Austroclima* and *Mauiulus*, with other representatives in South America; *Arachnocolus, Zephlebia*, and *Austronella*, with other representatives in South America and New Caledonia; an enigmatic group comprising *Isothraulus* and *Tepakia*, having affinities with *Arachnocolus* and its relatives as well as a tropical genus in Australia and genera in Madagascar and the Seychelles; *Neozephlebia*, represented also by genera in New Caledonia; and *Acanthophlebia*, as part of a lineage with representatives in Africa, South America, Australia and New Caledonia.

Sister-group relationships that link Chile and Australia with New Zealand



Oniscigaster distans larva.
Craig Dolphin, from Winterbourn et al. 2006

were also demonstrated by Edmunds (1975) for the families Coloburiscidae, Oniscigastridae, Ameletopsidae, and Nesameletidae using nymphal morphology. These analyses indicate that the New Zealand fauna occupies a unique position when compared with the mayflies of Australia, South America, and New Caledonia. On the one hand, New Zealand has retained ancient families not represented elsewhere; on the other, there are families and genera that indicate very ancient linkages to Australia and Chile. In addition, some Leptophlebiidae show close taxonomic affinities with New Caledonia, indicating relatively recent past direct links to the north. These relationships between the families and genera of New Zealand mayflies and those elsewhere in the Southern Hemisphere loosely correlate with proposed sequences of the fragmentation of Gondwana (cf. Edmunds 1975). Some authors have also suggested that many New Zealand forms may have evolved more slowly than related groups elsewhere (Edmunds 1975; Lugo-Ortiz & McCafferty 1998). Consequently, whereas the fauna of New Caledonia has lost all but one family – and that of Australia has gained more recent and tropical elements – we conclude that the mayflies of New Zealand provide the most intact representation of a Cretaceous Gondwanan aquatic biota.



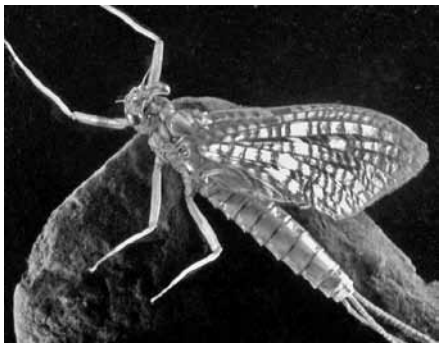
Austroclima sepia larva.
Craig Dolphin, from Winterbourn et al. 2006

Distribution and ecology

New Zealand mayflies show particularly close ties to running water; no species are primarily inhabitants of ponds, lakes, or slow-flowing rivers. Even where families or genera have strong representation in standing waters overseas, in New Zealand they inhabit streams, e.g. *Acanthophlebia cruentata* (Leptophlebiidae) and *Ichthybotus* spp. (Ephemeridae). The few species present in New Zealand lakes are found either near the mouths of streams or on lake margins where there is frequent wave action, which, presumably, maintains high oxygen concentration. Perhaps related to the predilection for running water, mayfly faunas on offshore islands are greatly reduced where permanent flowing water is limited (Towns 1987). Even where it is present, the fauna is usually small on all but the largest islands. For example, Riddell (1981) found only three species (all Leptophlebiidae) in a permanent stream on Cuvier Island (170 ha) but Watson (1972) was unable to find any in apparently permanent streams on Red Mercury Island (225 ha). Further afield, no mayflies have reached (or survived on) the Chatham Islands, and a single unique genus and species of Leptophlebiidae, *Cryophlebia aucklandensis*, inhabits streams on the subantarctic Auckland Islands.

Most New Zealand mayflies are thus confined to the two main (North and South), islands. Only 10 species in four families have been recorded on Stewart Island – Ameletopsidae, Coloburiscidae, Leptophlebiidae, and Nesameletidae, (Hitchings 2001). This low total may reflect the level of collecting effort, but Towns (1987) found a similarly low family diversity (five families) on Great Barrier Island, even after extensive sampling. Within the two main islands, several genera and species have enigmatic, patchy, or restricted distributions and a few genera have separate North Island and South Island representatives. Examples include a burrowing mayfly with one species, *Ichthybotus hudsoni*, in the North Island, and a second, *I. bicolor*, in the South Island. Several genera of leptophlebiids are confined to the North Island. For example, the distinctive orange mayfly *Acanthophlebia cruentata* is widespread through lowland North Island, is present in several streams on Great Barrier Island and southern North Island, but has not been found in the South Island (Towns 1987). *Deleatidium* also has separate North Island and South Island species. The patchy distribution of several other species in the North Island may reflect availability of specific habitats or variable collecting effort; if the latter, then some may yet be found to be more widely distributed.

A distinctive feature of the mayfly faunas of the North Island is the particularly high species diversity in some forested streams. The highest diversity so far recorded (28 species in the Waitakere River catchment) is more than twice



Subadult of *Zephlebia* sp..
Stephen Moore, Landcare Research

the number of species recorded in the entire South Island (Towns 1987 and references therein). Furthermore, northern North Island sites are dominated by species of Leptophlebiidae (19–21 species), which is an extraordinarily high diversity anywhere (Towns 1987). Although many mayflies appear associated with well-oxygenated waters (Collier 1994), the most species-rich faunas in northern New Zealand are not necessarily where water velocity (and hence dissolved oxygen levels) are highest. Instead, small, forested headwater streams of third order or less often support the most species-rich mayfly faunas (Towns 1987).

Where families are shared with southern South America and Australia (Peters & Campbell 1991; Edmunds 1975), the New Zealand species include highly mobile predators (Ameletopsidae), filter-feeders (Coloburiscidae), surface-feeders capable of burrowing (Oniscigastridae), free-swimming species that graze substratum surfaces (Nesameletidae), and sprawling species that graze the surfaces of rock, wood, leaves, and plants growing in water (Leptophlebiidae). Unlike Australia, New Zealand has Ephemeridae that burrow in stream sediments.

The diversity of leptophlebiid genera is a consequence of adaptive radiation into specific habitats, reflected, for example, in gill morphology. For example, the fringed highly tracheated gills of *Isothraulus abditus* may enable nymphs to inhabit pools in small headwater streams, whereas the single greatly expanded gills of some species of *Deleatidium* allow them to inhabit torrential waters in steep mountain streams. In some genera, body shape and gill morphology can vary greatly. This is particularly well demonstrated in *Deleatidium – D. myzobranchia*, which inhabits very fast-flowing waters, has compressed limbs, hairs on the ventral abdomen, and expanded gills to aid in adhesion, whereas *D. cerinum* is less compressed, has leaf-shaped gills, and occupies pools and slack water (Collier 1994; Towns & Peters 1996).

One of the most remarkable aspects of New Zealand leptophlebiids is the number of species in the same genus that can coexist in the same stream. For example, five species of *Deleatidium* and at least seven species of *Zephlebia* live together in streams in northern New Zealand, a degree of congeneric overlap that is rarely matched elsewhere in the world. How this overlap is maintained remains unclear but previously unsuspected ecological divergence into specific flow regimes and habitats may provide part of the explanation (Towns 1987). Perhaps this was a consequence of the poorly synchronised life-cycles shown by many New Zealand species. In northern hemisphere mayflies, closely related species often have staggered hatching and development periods, presumably in response to limited resources that are used sequentially. In contrast, leptophlebiids in one northern New Zealand stream have life-cycles ranging from univoltine (one generation per year) to bivoltine (two per year), as well as overlapping generations and cohorts and a high degree of habitat and life-history overlap (Towns 1983b). The role of competition in determining life-history strategies needs re-examining, and the weakly seasonal and poorly synchronised life histories found in some New Zealand mayflies also suggest that non-biological effects may play a larger role in influencing life-histories than was assumed in the past (Towns 1983b).

Deleatidium myzobranchia larva.
Stephen Moore, Landcare Research

Biological interactions, conservation, and management

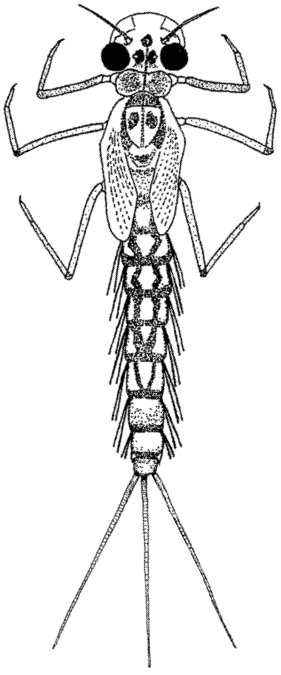
Mayflies are significant components of freshwater food webs, forming part of the diet of a range of invertebrates, including stoneflies, caddisflies, freshwater crayfish, some fly larvae, and even a predatory mayfly (*Ameletopsis perscitus*) (McIntosh 2000). They are also a major part of the diet of native vertebrates; for example *Deleatidium* species are important food for bullies, torrentfish, and eels (McIntosh 2000) and species of *Deleatidium*, *Nesameletus*, and *Coloburiscus* dominate the diet of some whitebait (*Galaxias*) populations (Cadwallader 1975). The distinctive birds that inhabit braided rivers in the South Island – endemic black-fronted tern (*Sterna albostriata*), wrybill (*Anarhynchus frontalis*), and black

stilt (*Himantopus novaezelandiae*) – all feed on mayflies, especially nymphs of *Deleatidium* (Robertson et al. 1983; Pierce 1986) and mayflies form part of the diet of an endemic torrent duck, the blue duck *Hymenolaimus malacorhynchos* (Veltman et al. 1995). Studies of primary production in streams in the South Island have demonstrated that grazing by invertebrates (including *Nesameletus* and *Deleatidium* mayflies) in streams lacking introduced trout is sufficient to suppress the standing crop of algae on stone surfaces. Once trout are introduced, the density of *Nesameletus* and *Deleatidium* nymphs foraging on stone surfaces is reduced and algae increase (McIntosh & Townsend 1996). Interestingly, this control on algae was not observed in streams containing native galaxiid fish (Huryn 1998).

Observations like these have conservation implications, not only for mayflies but also for their natural predators. Three species of *Galaxias* are listed amongst the rarest New Zealand vertebrates, as are black-fronted tern, wrybill, and black stilt (Molloy & Davis 1994). At least six species of mayflies are found in no more than three Ecological Regions, and are therefore regarded as highly restricted in distribution (Collier et al. 2000). There are thus three levels of concern. The first includes subtle ecosystem effects, such as trophic shifts resulting from the presence of trout, which may cause reductions in the diversity and density of mayflies in streams. The second level of concern includes reductions of species diversity caused through predation by introduced organisms. For both examples, streams may show little external evidence of modification, but ecological processes may be sufficiently altered to cause detrimental effects throughout a food web. The third level of concern includes extreme modification of stream channels through removal of riparian vegetation, channelisation, water abstraction, siltation, or pollution by substances that are either directly or indirectly toxic (Collier et al. 2000).

Extreme modification of the riparian vegetation of stream catchments is of particular concern, probably because it is so widespread, especially in lowland areas. Catchment modification can affect water temperature and this in turn may influence the distribution of particular species. Two species of leptophlebiid mayfly were the most temperature-sensitive of a range of aquatic species tested by Quinn et al. (1994), who suggested that elevated stream temperatures will very likely limit such species in the North Island, where many species – even in unmodified streams – are naturally near the upper limits of their thermal tolerance. Other studies have shown that removal of shade by deforestation results in reduced abundances of a range of mayfly species, apparently because of changes (some with combined effects) in temperature, suspended solids, suspended inorganic sediment, woody debris, periphyton (attached-algal) biomass and productivity, and the availability of leaf litter (Quinn et al. 1997). Furthermore, since the most species-rich faunas are often in headwater streams, removal of forest cover from headwaters could conceivably reduce mayfly diversity through entire catchments, even where native forest cover is retained downstream of the headwaters. Consequently, changes to stream systems, either subtly or through extreme modification, may have reinforced the isolation of several species of mayflies that now appear to exist in localised relict populations. Examples include *Austronella planulata* and *Tepakia caligata*, in scattered localities from Northland to Wellington, and *Deleatidium magnum*, in a few locations around the central North Island (Towns & Peters 1996). Collier (1993) has advocated the protection of rare and representative aquatic habitats as a means of maintaining species and genetic diversity of aquatic invertebrates. Perhaps it is necessary to go beyond this, and develop methods of restoring stream systems in order to re-establish connectivity between isolated catchments (e.g. Collier et al. 2000). Whether isolated populations of rare mayflies are capable of reinvading restored stream systems, however, remains unclear.

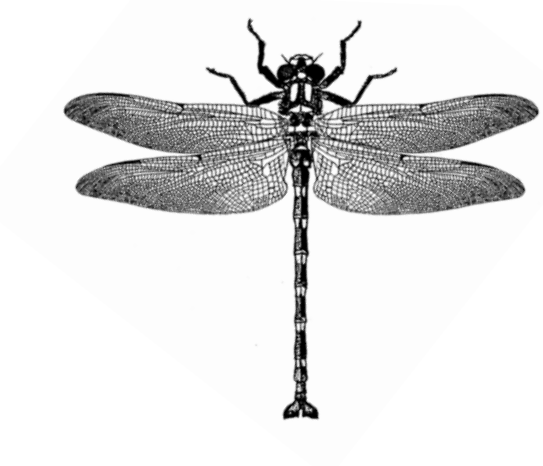
The effects of introduced salmonid fish on the species richness of mayfly assemblages in New Zealand streams are still unclear (McIntosh 2000). Early



Aupouriella pohei.
From Winterbourn 2009

last century, Tillyard (1920) was of the opinion that in the 'hot springs region' (the lakes and streams around Rotorua) 'the largest May-flies, which form the very finest possible food for trout, have been practically exterminated, while the smaller forms have been reduced, at a moderate estimate, by over 50%.' This contention has yet to be tested. Approaches similar to those applied in terrestrial systems where introduced predators have been controlled locally (Saunders & Norton 2001), may well prove instructive in aquatic systems. There may also be subtle effects on mayflies in stream systems modified by species other than trout. For example, insectivorous birds feed on emerging mayflies (T. Hitchings pers. obs.), but whether the birds' effects are modified by changes in the extent of riparian forest cover remains unknown.

Order Odonata: Dragonflies and damselflies



Male giant dragonfly *Uropetala carovei*
Modified after Grant 1999

Dragonflies are among the largest and most agile insect fliers in New Zealand. They are instantly recognisable from their long abdomen and two pairs of wings held at right angles to the body. The head has large eyes but the antennae are short, ending in a fine bristle. Other features include short appendages (cerci) at the end of the abdomen, a stigma (darkened area) on the front outer margin of each wing, and spiny legs (Rowe 1987). In New Zealand the order is represented by two suborders. The generally smaller damselflies (suborder Zygoptera) have widely separated eyes and wings of similar size with a narrow base, while dragonflies (suborder Anisoptera) have larger hind wings with a wide base and the eyes usually touch at the top (except for *Uropetala*). The bodies of seven of the smaller species (damselflies and the smaller dragonflies) are brightly coloured with red, blue, or green. In contrast, the larger dragonflies (41–86 millimetres long) have a contrasting pattern with yellow and dark-black marks or bands.

The diversity of species of Odonata in New Zealand (15, plus two non-breeding migrants) is low compared with Tasmania and Britain, with 26 species, i.e. seven times more species per square kilometre (Watson et al. 1991), and 45 species, i.e. two and a half times more species per square kilometre (Kloet & Hinks 1964), respectively. Nevertheless, what New Zealand lacks in diversity it makes up for in distinctiveness – three genera and 10 species are endemic. Rowe (1987) mapped known species distribution, which showed a lack of identified specimens from northeastern North Island and most of Marlborough. Rowe (1987) recorded *Uropetala chiltoni*, *Xanthocnemis sinclairi and X. zealandica, Austrolestes colensonis*, and *Procordulia smithii* and *P. grayi* from higher inland locations between altitudes of 600 and 900 metres (e.g. Lake Waikaremoana, the Hermitage) and noted that *X. zealandica* uses alpine tarns. Macfarlane (unpubl.) has noted both *U. chiltoni* up to 800–900 metres and *X. zealandica* above the bushline in subalpine snow tussock based in the Omarama saddle and Mt Dun areas. *Xanthocnemis zealandica* females were observed ovipositing in springs above 1550 metres and flying at the top of the Whether/Dunstan Range (1750 metres). *Xanthocnemis sinclairi* is known only from the upper Rakaia River at around 1250 metres.

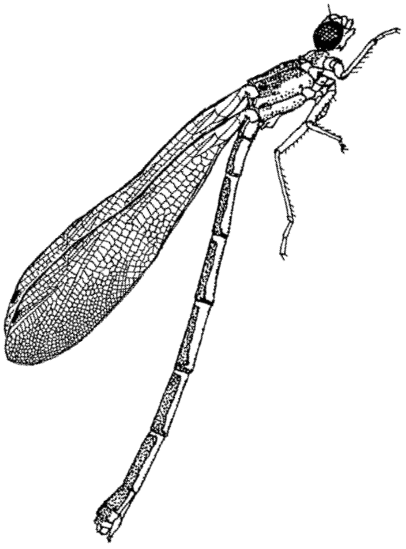
Procordulia grayi
Stephen Moore, Landcare Research

The slender red, greenish (22–41 millimetres long), and blue (40–47 millimetres long) damselflies are represented by two families (Coenagrionidae, Lestidae), three genera, and six species. *Xanthocnemis sinclairi* is confined to a few known upland sites in snow tussock in Canterbury, *X. sobrina* to the Auckland province, and *X. tuanuii* to the Chatham islands. The self-introduced and smallest (22–33 millimetres long) gossamer damselfly *Ischnura aurora* is still confined to the North Island, so damselfly species diversity is limited over much of New Zealand. Conversely, *X. zealandica*, *Austrolestes colensonis*, and the dragonfly *Procordulia smithii* inhabit Stewart Island (Rowe 1987).

The stouter and mainly longer (41–86 millimetres length) dragonflies are represented by nine resident species in seven genera and four families. In addition, *Pantala flavescens* and *Tramea transmarina* are migratory dragonfly species

(Libellulidae), which are periodically recorded in the North Island and the west coast of the South Island (Rowe 1987). The other eight resident dragonfly species have black with yellow patterns (*Uropetala*, *Procordulia*, *Aeshna brevistyla*), greenish markings *Hemianax papuensis*, or dark with few markings *Antipodochlora braueri*. Their larger size allows them quickly to be distinguished from damselflies even in flight. Only *Diplacodes bipunctata* (smaller, at 29–34 millimetres length) is mainly red among the resident mainland dragonfly species. It is apparently confined to western New Zealand, where it is commoner in warmer areas. *Uropetala chiltoni* is the only dragonfly confined to the South Island on the east coast. Only *Procordulia smithii* extends to Stewart Island among the eight South Island species. A species of *Uropetala*, possibly *U. chiltoni*, has been reported from Banks Peninsula (Ward et al. 1999), which extends the known distribution of *Uropetela* (Rowe 1987). Generally, it appears these large dragonflies are unable to disperse and freely colonise above distances of 60 kilometres. *Antipodochlora braueri* and the recent immigrant *Hemianax papuensis* are confined to the North Island.

On offshore islands, *Tramea transmarina* resides in the Kermadec Islands and is only a migrant to the North Island. Wise (1983b) summarised northern records while Wilkinson and Wilkinson (1952) recorded four species, with records from Kapiti Island, while Moeed and Meads (1987b) reported two species (one undetermined) from Red Mercury Island. Thus *Ischnura aurora* has been seen at the Poor Knights, Cuvier, Mercury, and Kapiti Islands, *X. zealandica* and *A. colensonis* at Little Barrier, Great Barrier, and Kapiti Islands, and *X. zealandica* at Red Mercury and Mayor Islands. *Uropetala carovei* is present on Kapiti Island (Wilkinson & Wilkinson 1952). It is not always clear if these records represent breeding populations, so more critical observations are needed on the distribution of Odonata on offshore islands to understand the dispersal and colonisation ability of each species. The lack of apparent resident species on the Alderman Islands (Early 1995) and perhaps also the Poor Knights (Watt 1982) could be because seasonal stability and quantity of freshwater resources on these smaller islands is insufficient to allow for colonisation. At least *X. zealandica* has colonised the more substantial area of lakes and swamp on Mayor Island (Bayly et al. 1956).

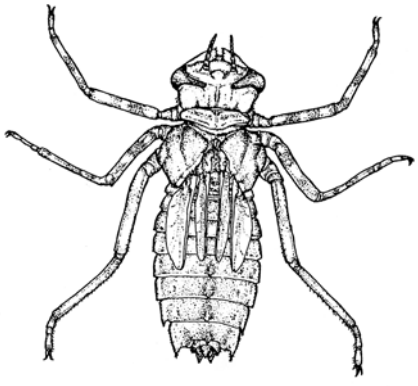


Blue damselfly *Austrolestes colensonis*.
Modified after Grant 1999

Habitats and biological associations

Both nymphs and adults prey on insects and other small animals, and Rowe (1987) has compiled details on the limited records of species preyed on by the commoner species. His monograph also gives details about habitat, emergence, and other aspects of ecology as well as behavioural habits such as mating, oviposition, and flight. The nymphs of most species live in still to slowly running water (Rowe 1987; Winterbourn et al. 2000) with some apparently subtle differences in use of different vegetation. Among resident New Zealand species, only *Procordulia smithii* and the commonest damselfly, *Xanthocnemis zealandica*, may be found in slow-flowing streams among vegetation or in muddy sediments, but *P. smithii* mainly uses raupo (*Typha*) areas and ponds, while *X. zealandica* uses rush-sedge bases for shelter. The two *Uropetala* dragonfly species are associated with damp ground near bogs and seepages, either shaded by forest in the case of *U. carovei* or in more open sites for *U. chiltoni* (Rowe 1987), including snow-tussock grassland. Conversely, only the North Island dusk dragonfly *Antipodochlora braueri* inhabits stony streambeds. The limited occupation of Odonata in running fresh water contributes to their lack of importance in the diet of freshwater fish compared with other aquatic insects (Collier & Winterbourn 2000). All species require fresh water of at least moderate quality.

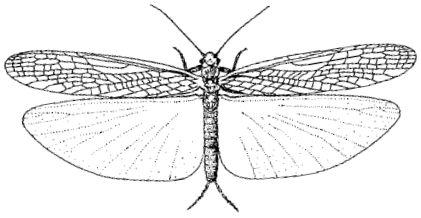
Damselfly enemies include large orb-web and *Tetragnatha* spiders, the larger robber flies (adults of *Neoitamus*), and dragonflies amongst invertebrate predators (Rowe 1987). Cats include dragonflies as a minor item of their prey (King 1990; Ryan 1994). Even the largest dragonfly species are not immune from predation



Larva of *Antipodochlora braueri*.
From Winterbourn et al. 2000

by the smaller German wasps, apart from being eaten by rats, kingfishers, harrier hawks, tuis, and sparrows (Rowe 1987). Of these predators, only the kingfisher is regularly associated with feeding in the freshwater environment. Harrier hawks include insects as a minor component (less than 10%) of their diet (Higgins & Marchant 1993). Other birds observed feeding on odonates include moreporks, shining cuckoos (Rowe 1987; Higgins et al. 1999), starlings, and mynas, which feed damselflies to nestlings (Moeed 1975).

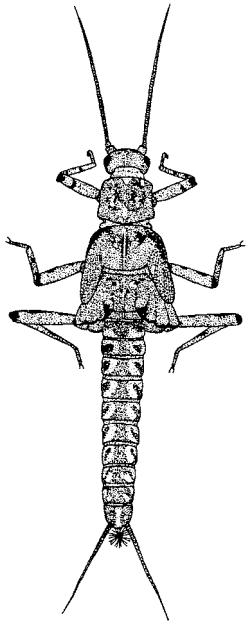
Order Plecoptera: Stoneflies



Large green stonefly *Stenoperla prasina*.
From Grant 1999

The Plecoptera ('folded wings') is another ancient order of insects, with a fossil record dating back about 260 million years ago to the Late Paleozoic era. A widespread group, with about 2000 species, they are found throughout the world except in polar regions. They are soft-bodied with clearly separated thoracic segments, and usually with four wings, which are folded straight back and closely applied to the abdomen. Superficially they resemble and share some primitive characters with orthopterans. Strictly, however, plecopterans do not show close relationships to any other neopteran ('new wing') insects, and may be an evolutionary sister group to all neopterans. A number of species do not have full wings and may be brachypterous (shortwinged) or apterous (without wings). Immature stoneflies are typically found under stones in streams or stream margins, hence the common name for the group.

Abdominal cerci may be long (e.g. Gripopterygidae) or reduced to one segment (e.g. Notonemouridae). Nymphs are normally aquatic and may have filamentous gills – in the form of an anal rosette in Gripopterygidae or in Austroperlidae as a few beaded filaments on the appendages of the abdominal apex. The Notonemouridae have no gills. Nymphs usually live in cool, running fresh water, but in New Zealand and southern South America some wingless species have terrestrial nymphs living in cool humid microclimates beneath stones or vegetation in alpine or subantarctic situations. At low altitudes there are winged species with semiterrestrial nymphs that, early in their existence, move out of the water to spend the winter under stones of stream flood-plains. The nymphs of stoneflies, being dependent on cool, well-oxygenated conditions, are very susceptible to human abuse of their environment. Even quite minor pollution sources such as farm drainage can eliminate stoneflies from nearby streams. Impoundment of water, which can raise water temperature, is also unfavourable to their existence. Plecopterans, then, are indicators of healthy streams and rivers.



Larva of *Nesoperla fulvescens*.
From Winterbourn et al. 2000

New Zealand's stoneflies belong to four families that have an austral distribution only, on lands derived from Gondwana fragments, i.e. Australia, New Zealand, South America, Falkland Islands, South Africa, and Madagascar.

Zwick (1973) divided the order Plecoptera into two suborders – Arctoperlaria and Antarctoperlaria. The Antarctoperlaria belong exclusively to the Southern Hemisphere, whereas Arctoperlaria are those of Northern Hemisphere origin. Two families of Arctoperlaria are found into the Southern Hemisphere, however. The Perlidae, widespread in the Northern Hemisphere, extends to South Africa and South America, and the Notonemouridae is actually restricted to the south. McLellan (1991) revised New Zealand representatives of Notonemouridae.

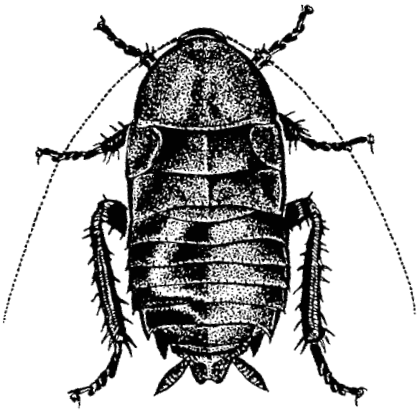
The Antarctoperlaria is divided into two superfamilies. The Eusthenioidea comprises the families Diamphipnoidae (South America, five species) and Eustheniidae (Australia, 14 species; New Zealand, four species; South America, one species). The Leptoperloidea presents a less clear-cut picture – Zwick (1973) recognised the families Austroperlidae and Gripopterygidae but separated the subfamily Antarctoperlinae from the Gripopterygidae and the genus *Crypturoperla* from the Austroperlidae. Hence, the Gripopterygidae sensu Zwick (1973) is found in Australia, New Zealand, South America, and the Falkland Islands, with the subfamily Antarctoperlinae in New Zealand, South America, and the

Falkland Islands. The Austroperlidae occurs in New Zealand, South America, andn Australia. *Crypturoperla* is endemic to Australia.

The New Zealand fauna comprises 99 described species but there may be 21 more undescribed species. All genera and species are endemic to New Zealand apart from the genus *Notonemoura*, which is shared with Australia although the species are endemic to each country. Some New Zealand genera are locally restricted. *Rakiuraperla* is endemic to Stewart Island and *Aucklandobius* and *Rungaperla* are found only on subantarctic Auckland and Campbell Islands, respectively.

Order Blattodea: Cockroaches

Most New Zealanders might be surprised to learn that they share their country with 44 species of cockroach, only 13 of which are introduced. They are among the most cosmopolitan of insect pests and are associated with human dwellings throughout the world. Their flattened body is well suited to hiding in cracks and crevices. Although they do not sting or bite, some species are usually associated with unsanitary conditions and may carry a variety of human pathogens in some parts of the world. But cockroaches are truly remarkable creatures in many ways and have proved useful as research tools in the study of insect physiology and behaviour (one species can actually run on two legs when disturbed) and toxicology. Cockroaches are an ancient group, dating from the Carboniferous period 317 million years ago. Today there are about 4000 described species. The ordinal name Blattodea is derived from *blatta*, the Greek word for cockroach.



Native black cockroach *Maoriblatta novaeseelandiae*.
From Grant 1999

Taxonomic knowledge of the New Zealand fauna has changed little since the review of Johns (1966), but new knowledge has accrued concerning their distribution, through extensive collections now held in various museums, available from Peter M. Johns. Zervos (1983, 1984, 1987) has described bivoltine life-cycles (two generations per year) and the parasites of two lowland species. All species appear active throughout the year with only slight seasonal changes in age structure.

All native species are probably endemic. The largest genus is *Celatoblatta*, in which Princis (1974) included *Austrostylopyga*, thereby including eight Australian (mainly Queensland), one New Guinean, and three New Caledonian species. He also included two large native black cockroaches in the Australasian subgenus *Platyzosteria* (*Melanozosteria*), but these are now placed in *Maoriblatta* along with two New Caledonian species. As with several other native groups, flightlessness is a feature, and some species have strong local distributions, being confined to areas like Banks Peninsula and the Chatham Islands. Such geographically restricted species are not necessarily restricted to one habitat, however. One new Canterbury species is found in conditions ranging from subalpine shrub-tussock vegetation, rocky screes, and stony riverbed terraces, to salty coastal cliffs and stony beach ridges. Several species are well adapted to low temperatures. *Celatoblatta quinquemaculata*, *C. anisoptera*, *C. montana*, and two new species in the Otago mountains live above the winter snowline. None shows any degree of arrested development (diapause) – all between-moult instars may be found immediately after winter. *Celatoblatta anisoptera* tolerates freezing conditions by increasing blood glycerols, and presumably other species in similar habitats have a comparable cold-tolerance mechanism. *Celatoblatta qinquemaculata* is tolerant of freezing up to 74% of its water volume. It may go through up to 23 freeze/thaw cycles per month (Sinclair 1997a). Two widespread, short-winged, southern *Parellipsidion* species occur in many types of open shrubland, forest, tussock, and fellfield habitats from two to 2000 metres in the South Island. A related winged (but rarely flying) species is confined to lowland forests of the North Island and coastal Marlborough Sounds.

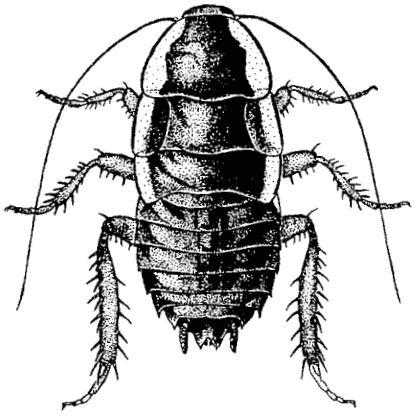
Celatoblatta undulivitta
Alastair Robertson and Maria Minor, Massey University

Most North Island species are widespread within the island, although those in North Auckland and especially on the Three Kings Islands need further

taxonomic analysis – some may represent new species. *Parellipsidion pachycercum* is the only cockroach species to be found in the subantarctic islands and then only in a small area centred on the site of flax (*Phormium tenax*) introduced to the Auckland Islands in the middle of the 19th century. Six new species of *Celatoblatta* and two others, perhaps belonging to new genera, await description. All of these species are restricted in distribution. Five are known from a few specimens from single sites. It is thought that basic speciation patterns are related to the Early Tertiary archipelagic nature of New Zealand and that present ecological tolerances and distributional patterns are associated with Late Tertiary and Pleistocene events. This hypothesis is now being tested through DNA analyses of Canterbury mountain species. At higher taxon levels, the New Caledonian connection is of particular interest and examples of all genera need to be compared closely with species from Queensland and New Caledonia. Especially pertinent is the finding of a relatively large tryonicine roach (Blattidae) in Northland. This group is otherwise known only from eastern Australia (mainland Queensland) and New Caledonia.

Adventive cockroach species

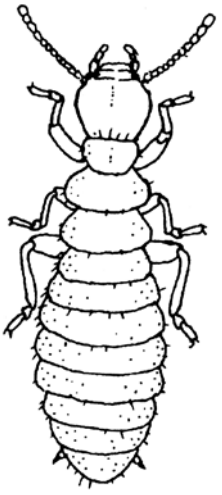
There are at least 13 introduced species. Only two are at all widespread – *Blattella germanica* and *Drymaplaneta semivitta*. *Blattella germanica* probably became established many years ago, as it occurs throughout the country. It has been seen in houses, university and hospital restaurants, cafes, and old and new hotels everywhere. *Drymaplaneta semivitta* gradually spread through much of the North Island during the 1980s and 1990s and in 1999 was found established in Nelson. A new adventive is *Drymaplaneta heydeniana*, from Australia. Its colour pattern is very similar to the native species of *Celatoblatta*. It is spreading quite quickly out from Auckland. *Drymaplaneta semivitta*, *Paratemnopteryx couloniana*, and *Neotemnopteryx fulva* come from Western Australia, perhaps indicative of the huge numbers of telephone poles, wharf piles and planking, and railway sleepers imported from that state. *Paratemnopteryx couloniana* and *Blatta orientalis* are yet to get far (in terms of only hundreds of metres) beyond their original established sites in Auckland and Dunedin (Harris 1988), respectively. In late 1999, the Australian (NSW–Queensland) *Panesthia cribata* was found in Kerikeri. It is also in Auckland, as is another Australian species, *Tryonicus parvus*. *Periplaneta americana* is established in Auckland. For many years it has been reared by schools and universities for teaching. Cultures have to be carefully tended as the animals do not readily maintain natural populations in New Zealand. It is known from factories where heat processes are used regularly in production (e.g. tyre factories). Juveniles of what is thought to be *Periplaneta fuliginosa* have been collected from a garden in Mairangi Bay, Auckland. A single live *Periplaneta australasiae* was caught on a house site in Rangiora to which bricks had been imported from Rockhampton, Queensland. It has also been captured at Taumarunui, Masterton, and Dunedin, but as yet it has not become established. It was perhaps more because of good luck than good management that the pest *Periplaneta brunnea* did not become established in Timaru, where it was found in imported second-hand cars from Japan. It is, however, present at Raoul Island (Kermadecs). The worldwide household pest *Supella longipalpa* is now known from Wellington. *Shelfordina orchidae*, a species fairly well known in Australia and Japan associated with orchids, is now established in the orchid hothouse of the Auckland City Domain (Winter Gardens). Other tropical species still arrive occasionally in imported goods (fruit from the Americas and Pacific Islands, and, reputedly, oil-refinery pipes from India) but are yet to be confirmed as established. *Pelmatosilpha vagabunda* Princis, 1954 has as its type locality a ship in Auckland Harbour (ex banana cargo from Colombia), but it is not found in New Zealand! Cockroaches have been, and always will be, a biosecurity threat in both inward and outward goods.



Introduced Gisborne cockroach
Drymaplaneta semivitta
From Grant 1999

Order Isoptera: Termites

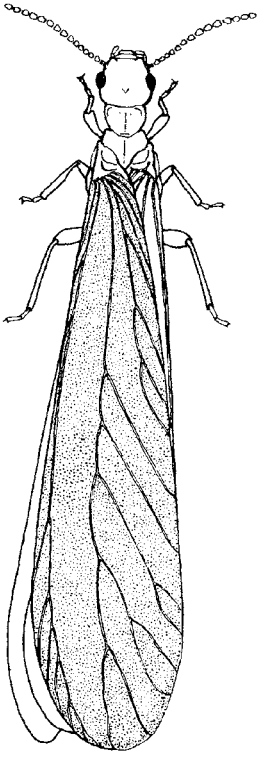
In the minds of most New Zealanders, termites are generally associated with Australia. The New Zealand fauna is quite small, comprising only eight or nine named species including three endemics. In Australia there are ca. 350 species, but fewer than 270 have validated available names (Watson & Abbey, 1993). These social, wood-inhabiting insects with pale bodies are quite small (seldom exceeding 10 millimetres in length), and hence are sometimes referred to as white ants. The termite body is soft, the abdomen is tubular, and the wings, when present, are finely veined, a character that aids in family identification (Kelsey 1944; CSIRO 1991). The many-segmented, filamentous antennae are often longer than the head, and only the sexual forms are initially winged. The wings are longer than the body and clear and flat when at rest. The wingless workers have small heads, unlike the soldiers, which have enlarged heads and prominent mandibles. Keys, descriptions, and illustrations of the New Zealand species can be found in Hill (1942), Kelsey (1944), Gay (1969, 1976) and Bain and Jenkin (1983). Kelsey (1944) gave line drawings and measurements of adults and their cerci for four families and 14 species that had been reported from New Zealand.



Kalotermes brouni worker.
From Grant 1999

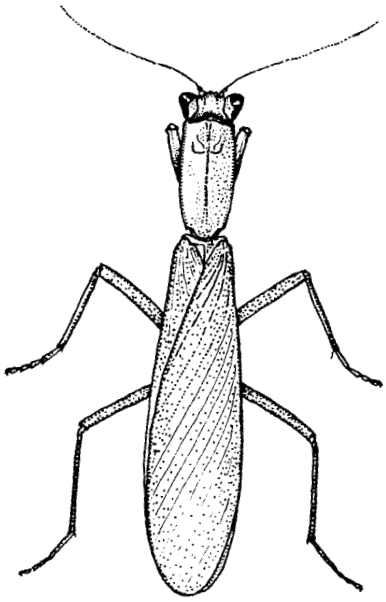
Only seven or eight species of termites still exist on the main islands of New Zealand (Wise 1977; Bain & Jenkin 1983). Apart from the three known endemic species, the rest originated from Australia (Hill 1942; Wise 1977). At least one *Kalotermes* species has colonised and remained on White island despite periodic destruction of vegetation by the volcano (Hutcheson 1992) and at least one undetermined species exists on the Poor Knights Islands (Watt 1982). These very limited records from the offshore islands suggest that the native species may be present on many of the wooded islands, because the extent of forest on White island is quite limited and these are among two of the more remote northern offshore islands.

Symbiotic flagellates in the gut of termites (Nurse 1945) allow them to feed on dry or damp wood above or below the soil surface. The two *Stolotermes* species (Termopsidae) are damp-wood-inhabiting termites that colonise logs, poles, and posts, but not buildings. *Stolotermes ruficeps* inhabits wood of both native and introduced tree species and a royal pair can consume 6–16 cubic centimetres of wood per six months (Morgan 1959). This is more than 10 times the amount of wood consumed by a dry-wood-inhabiting species. Morgan (1959) also gave details on the habits, communication and defensive behaviour, colony structure, and growth of *S. ruficeps* as well as other insects associated with them in rotting wood. This species swarms in autumn (Morgan 1959). Typically, *Stolotermes* colonies have several hundred termites but can reach up to 6000 per colony (Milligan 1984a; Thorne & Lenz 2001). Malaise (Moeed & Meads 1984; Macfarlane unpubl.) and intercept traps (McWilliam & Death 1998) capture only a few of these termites in summer and autumn. *Stolotermes inopus* is mainly confined to the North Island. *Kalotermes brouni* (Kalotermitidae) is the commonest and most uniquitous species in New Zealand, extending to the Chatham Islands. It inhabits dry decaying wood of semi-hollow native trees, untreated power poles, fence posts, and buildings (Milligan 1984b). *Kalotermes cognitus* is confined to the Kermadec, Norfolk and Lord Howe Islands (Gay 1976).



Winged reproductive form (alate) of New Zealand dry-wood termite *Kalotermes brouni*.
From Grant 1999

Subterranean colonies are limited to two species of *Coptotermes* (Rhinotermitidae), which were serious pests in Auckland but are now apparently confined to four sites. *Glyptotermes brevicornis* has been recorded from imported poles, wharf timbers, and decaying logs and *Kalotermes banksiae* has been found in logs, driftwood, and dead trees in various North Island and Nelson locations (Bain & Jenkin 1983). None of these introduced species has been found in forests. *Neotermes insularis* is one of several species now considered to no longer exist (Bain & Jenkin 1983) in any of the North Island sites where they were originally detected (Kelsey 1944).



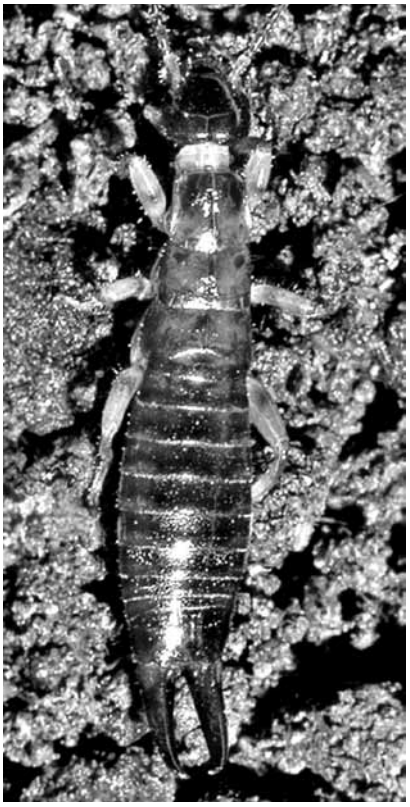
Praying mantis *Orthodera novaezelandiae*.
From Grant 1999

Order Mantodea: Mantids

There are two species of mantids in New Zealand, one endemic, the other introduced. For many years the endemic New Zealand species (*Orthodera novaezealandiae*) was considered to be conspecific with the Australian *O. ministralis*, but Ramsay (1984, 1990) has clarified their status, giving illustrations and noting differences in body features. A South African praying mantid, *Miomantis caffra*, was first detected in Auckland in 1978 (Ramsay 1984). *Orthodera novaezealandiae* is always green, and is found on both main islands of New Zealand and the nearer offshore islands (Moeed & Meads 1987a; Ramsay 1990) that remained connected to the main islands during the last ice age. *Miomantis caffra*, which is often green and only rarely brown, had by 1990 spread to the Waikato and near to the Bay of Plenty (Ramsay 1990). It has also been collected from Blenheim (LUNZ collection). For excellent general information and a bibliography of New Zealand studies on mantids the reader should consult Ramsay (1990).

Praying mantids are relatively large insects (32–52 millimetres long). Their front legs are enlarged, with spines to aid in grasping prey. Further, the basal segment (coxa) of the leg is large and mobile and the front thorax segment is much longer than combined middle and hind segments. The wings cover much of the abdomen and the front wing is narrower than the hind wing. After mating, praying mantids deposit leathery eggs cases (oothecae) containing, on average, 34 eggs (Suckling 1984). These predators either walk slowly, or quite fast when disturbed, and although can males fly the gravid female flies poorly (Castle 1988). They inhabit gardens, shrublands (Ramsay 1990), and native forest (Moeed & Meads 1992), and may also be found in bracken fern (Winterbourn 1987). Unlike the omnivorous European earwig (Macfarlane 2002), mantids have not been recorded in surveys of grassland, lucerne (alfalfa – *Medicago sativa*), fodder crops, or cereals, where small potential fly prey is common (Macfarlane & Andrew 2001). Perhaps they favour firm vegetation to perch on so they can see their prey properly and then attack it. Only insects that move are preyed on (Castle 1988). Prey can include blow flies, house flies, *Drosophila* fruit flies (Suckling 1984), the forest-inhabiting looper moth *Pseudocoremia suavis* (Valentine 1967a), honey bees (Ramsay 1990) and even *Vespula* wasps on ivy flowers (Andrew pers. comm.). Little is known of mantid prey under field conditions or their natural feeding capacity.

In New Zealand, mantid predators include sparrows, mynahs, bats, and cats. Other bird species and skinks probably prey on adults, too. Evidence of insect predation on mantid eggs is sketchy in New Zealand (Ramsay 1990). Hymenopteran parasites of three species affect only the eggs and the main species almost certainly are *Eupelmus antipoda* (Eupelmidae), and *Pachytomoides* ?*frater* and *Podagrion* sp. (Torymidae). Seasonal activity of these parasites remains unstudied. The limited information on the level of parasitism of the eggs suggests that this complex of parasites can cause considerable mortality (Ramsay 1990).



European earwig *Forficula auricularia*.
Alastair Robertson and Maria Minor, Massey University

Order Dermaptera: Earwigs

The Dermaptera is one of the most easily recognised insect orders, owing to the distinctive forceps or pincers at the end of the abdomen. Other characteristics include the leathery front wings that give the order its technical name (literally 'skinwings') – these cover only the thorax – and the semicircular hind wings that fold under the front wings when at rest. 'Earwig' is possibly a misinterpretation of 'earwing', a reference to the small, hardened forewings. If true, it may well be partially responsible for the mistaken belief that earwigs will crawl into a sleeping person's ear and then burrow into their brain, thus killing them. There are around 1200 species worldwide, of which rare, if not extinct, *Labidura herculeana* from St Helena is the largest at around eight centimetres long.

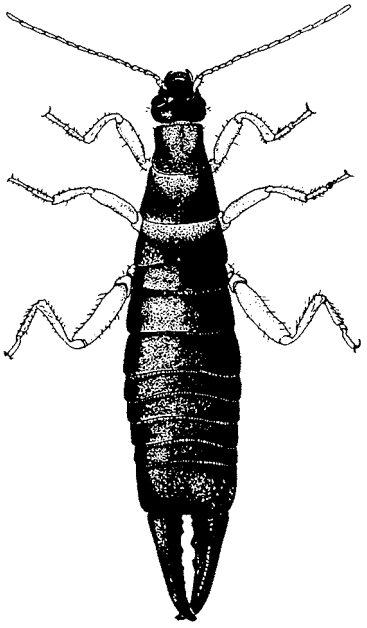
There are 22 earwig species in New Zealand, but the establishment of the two chelisochids and *Carcinophora occidentalis* needs to be rechecked. Of these 22 species, 13 (59%) are endemic and the rest are adventive. The adventive species contribute three families – viz *Forficula auricularia* (Forficulidae) from Europe, two species of Chelisochidae, three species of Spongiphoridae, and *Labidura truncata* (Labiduridae) (Hudson 1973; Cassis 1998). Hudson (1973) provided information on the distribution of each species based on the four main collections in New Zealand and provided an illustrated key. Since then, three genera have been redefined and Cassis (1998) also recorded *Hamaxas feae* from New Zealand. A review by CSIRO (1991) explains specialist descriptive terms (used also by Hudson) and has a key to families. It also illustrates three species found in New Zealand and complements Hudson's study. Brindle (1987) gave a key to the nymphs of most of the introduced genera of earwigs (not *Paraspania*). The habitat in which a specimen is found can aid species identification.

Biology and habits of endemic species

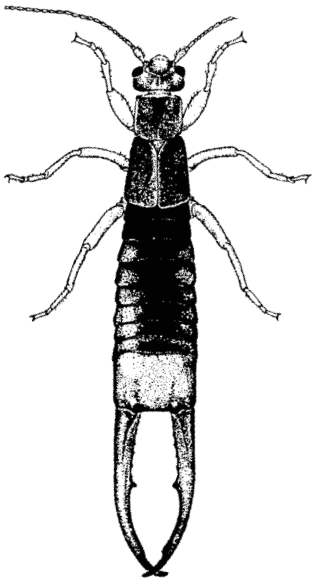
The biology and ecology of the 13 native earwigs are best known for the large coastal species *Anisolabis littorea*, thanks to the study by Giles (1953), who also studied copulation, egg-laying, and parental care. The body and legs of this earwig are uniformly yellow-brown, unlike the adventive European species *Euborellia annulipes* that also inhabits the seacoast. At 23–31 millimetres long, *A. littorea* is among the largest native species. It inhabits damp beach drifts of seaweed or wood, but its range may extend to gardens and wasteland provided that sheltering stones and logs do not rest on soil. Individuals shelter under stones and logs among damp debris, and the drier beaches are important for maintaining their warmth in winter. Adults feed on slaters and millipedes, cutting their prey with their forceps. They can be raised in captivity on a diet of flies, slaters, and raw liver. Introduced species have been reared on cat food (Shepard et al. 1975).

Despite being wingless, *Anisolabis littorea* is known from nine northern offshore islands as far as the Three Kings, Mokohinau, the recent volcano of White Island (Giles 1958; Wise 1970b; Hudson 1973), and Stephens Island (Wall 1981) but apparently not Kapiti Island (Moeed & Meads 1987b). The species is also present on Chatham and Pitt Islands and Martins Bay in the South Island (Giles 1953) through to Dunedin (Otago Museum records). On the Poor Knights Islands, which were separated from Northland during the last glacial period, a possibly endemic species of *Anisolabis* or a variety of *A. kaspar* is present (Watt 1982). *Anisolabis kaspar* inhabits bush, unlike *A. littorea* (Hudson 1973).

Parisolabis novaezeelandiae is the only species in this genus found in both North and South islands (Hudson 1973). Collection records, some of which include only the locality, indicate that *Parisolabis* species inhabit litter and moss and that some may live in both forest and grassland habitats. Species that occupy both habitats definitely include *P. novaezeelandiae* (Hudson 1973; Moeed & Meads 1987a) and *P. forsteri* from Otago (Hudson 1973; Barratt & Patrick 1987). In the Orongorongo Valley, Wellington, only pitfall trapping collected a few earwigs from the surface of the forest floor, and none was collected from the litter or on tree trunks. This might mean that forest species prefer to shelter and feed in decaying logs and stumps. *Parisolabis tapanuiensis* and an undetermined species have been collected from snow-tussock grassland (Barratt & Patrick 1987). Locality records indicate that both *P. nelsoni* and *P. boulderensis* from northwest Nelson (Hudson 1973) inhabit grassland. Conversely, *P. johnsi* inhabits broadleaf forest, and *P. setosa* from Fiordland is associated with shrubland and scree. The habitat association of *P. iti* is unclear from collection records. Perhaps the widespread species are more flexible in their use of habitat, but very little has been recorded about their ecology. The grasslands and forests of the former island of Banks Peninsula lack any native earwigs.



Female seashore earwig *Anisolabis littorea*.
From Grant 1999



Male Australia earwig *Labidura truncata*.
From Grant 1999

Studies on the ecology, biology, behaviour, and biochemistry of the introduced species provide guidance on aspects of the life of the endemic species that could reveal valuable comparisons.

Biology of naturalised alien earwigs

Females of at least three introduced species (*Euborellia annulipes*, *Forficula auricularia*, and *Labidura riparia*) protect their eggs and first-instar nymphs and brood their young (Lamb 1976; Radl & Linsenmair 1991; Rankin et al. 1996). This subsocial behaviour is the first basic step towards social organisation. In the male the forceps are used for display and a tactile stimulus for the female (Walker & Fell 2001).

The European earwig *F. auricularia* is omnivorous. The damage it caused to ripening stone- and sometimes pipfruit as well as soft berry fruits (e.g. black currant, strawberry) drew attention to it as a horticultural pest in New Zealand. In addition, various flowers (e.g. dahlias) and vegetables (lettuce, celery, potatoes, seedling beans, beet, and sweetcorn flower stalks) can be fed on. As well, these earwigs are attracted to both the pollen resources gathered by bees and the sheltered habitat the bees inhabit. If they become numerous in shelters they can displace nesting lucerne leaf-cutter bees (*Megachile rotundata*) (Barthell et al. 1998). Aggregations in hives set out for occupation by bumble bees (*Bombus* spp.) appeared to discourage nesting and could also have caused the queens to desert their founding brood. How important pollen is in the diet of earwigs and whether it originates from flowers or bee-collected sources has not been investigated. Nocturnal activity ensures that the role of *F. auricularia* as a predator is much under-appreciated. Night sampling with light traps took only the European earwig from hill-country pasture (McGregor et al. 1987) as did night sweeping in lucerne (Macfarlane 1970; Leathwick & Winterbourn 1984). Day-time sweeping of pasture (Cumber 1958), fodder (Eyles 1960), and cereal crops (Cumber 1962; Bejakovich et al. 1998), or vacuuming in lucerne (Rohitha et al. 1985) failed to collect any earwigs. Pitfall traps were effective in pasture (Moeed 1976), while soil, pitfall, and sweep sampling in short dry pasture collected only one specimen each of *F. auricularia* and *L. riparia* (Martin 1983). In Christchurch insect-community studies, Macfarlane (unpubl.) found *F. auricularia* only among rotting trunks of kowhai trees in dry danthonia grassland or in leaf litter among the rushes and long grass in wetlands.

Solomon et al. (2000) found the European earwig to be the commonest predator in apple and pear orchards in Europe. In New Zealand apple orchards, Suckling et al. (2006) tested shelters and baiting to monitor these earwigs because of their potential importance in devouring leaf roller egg batches. Perhaps continental climates similar to that in central Otago favour this species. Its role as a predator of the currant clearwing (*Synanthedon tipuliformis*) has been examined in New Zealand (Scott 1979). Hill et al. (2005) considered earwigs to be the cause of heavy mortality of armoured scale (Diaspididae) on kiwifruit. In England there have been detailed studies of its role as an aphid predator in grasslands and barley (Carillo 1985). An analysis of its stomach contents has shown that *F. auricularia* can be one of the most important aphid predators during aphid buildup in cereal crops (Sunderland & Vickerman 1980). Since 1985, world literature on the European earwig has considered its predatory role on the black scale *Sissetia oleae,* red-legged earth mite *Halotydeus destructor,* psyllids, and moth caterpillars on grape vines. These earwigs are more effective predators of the woolly apple aphid *Eriosoma lanigerum* than ladybird species (Solomon et al. 2000). Unspecified earwigs, the commonest probably being *F. auricularia*, can also be opportunistic predators in ganging together to prey on the much larger puriri moths temporarily stunned by lights (Green 1983).

The European earwig has been caught in baited traps in open areas and not in forests (Kocarek 1998), although more are found where there is deciduous leaf litter (Thomas et al. 1992) such as from poplars (Macfarlane unpubl.). It is a better

coloniser of offshore islands than *Labidura riparia*, which may inhabit salt marshes (Taglianti 1995). Earwigs aggregate together in response to a pheromone released in frass (Sauphanor & Sureau 1993) and the same pheromone is secreted from the tibia (Walker et al. 1993). Conversely, *L. riparia* does not aggregate, but earwigs are attracted to shelters previously occupied by their own species (Sauphanor & Sureau 1993), which suggests that a marker compound may be active.

Frost kills European earwigs in winter. Even the hardier females and eggs can withstand only –2° to –3° C, so females must find more-protected sites within soil or in cracks along house foundations (Gringas & Tournier 2001). Even so, the species is found in Central Otago and the Mackenzie Basin. In spring, a threshold of 6° C is needed to begin development in nymphs and an accumulation of 600–750 day degrees to reach the fourth and last nymphal instar (Helson et al. 1998). The number of segments on the antenna increases from the nymphal instar stage to the adult (Hincks 1949a). Scott (1984) and Thomas (1989a) summarised the pest status of European earwigs and the main aspects of their biology as well as control options.

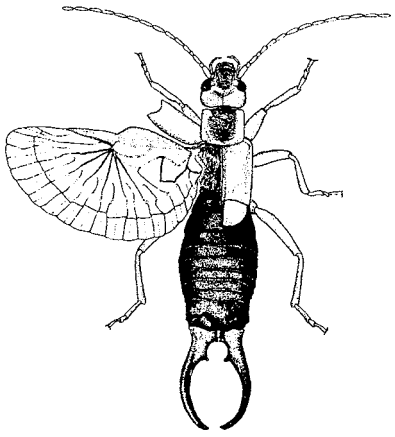
Among the other accidentally introduced species, both *Labidura riparia* and *Euborellia annulipes* favour beaches. Ring-legged *E. annulipes*, at only 10–13 millimetres long, is distinctly smaller than both *L. riparia* and *Anisolabis littorea*. Both of these introduced species have spread around the North Island as well as to Nelson in the South Island (Hudson 1973). *Labidura riparia* has also spread as far offshore as Great Barrier Island. It prefers sandy habitats, but is a predator in orchards and among brassica, soybean, and maize crops. Prey includes codling moth caterpillars (CSIRO 1991), diamond-backed moths (Strandberry 1981), armyworm, aphid, scale insects, and mites (Schlinger et al. 1959; Shepard et al. 1973). One of these earwigs can consume two looper pupae and 5–38 caterpillars per day (Price & Shepard 1978). *Euborellia annulipes* can be a storage pest of potatoes, flour and corn, and roots in glasshouses as well as in gardens, nurseries, and even meat-packing plants, but it needs moist conditions to survive (Bharadwaj 1966). But it also preys on pests (Klostermeyer 1942) and may be associated with human corpses (Goff 1991). There is apparently no evidence that *Chelisoches morio* breeds in New Zealand (Hudson 1973) even though it was collected from a garden in Christchurch and at Titirangi, Auckland (Hincks 1949b). The collections of Lincoln and Canterbury Universities, Canterbury and Otago Museums, and Ministry of Agriculture & Forestry, Lincoln, have no specimens of any *Chelisoches* species. Unlike other species in New Zealand, *C. morio* is active during the day. Throughout its range in the Pacific and in Australasia, it shelters among debris, coconut shells, and decaying banana stalks and lays it eggs in leaf sheaths of grasses. It feeds on leafhoppers, scale insects, beetle larvae, and caterpillars (Brindle 1972, 1987). *Paraspania brunneri*, which originated from Australia, is mainly black centrally and red-brown at the body extremes and is about half the size of most European earwigs. It has been collected from logs and stumps in forests of pine and other introduced conifers in Canterbury (Hincks 1949b). *Labia minor* has been in New Zealand since before 1893, originating from Europe. The species can be associated with compost heaps (Ramsay 1997), straw, and dry dung (Allen 1985) and may prey on house fly eggs and larvae (Mourier 1986). Both *L. minor* and the doubtfully endemic *Paralabia kermadecensis* are small, with little colour difference in their brown to dark brown bodies (Hinks 1949a). The latter was initially found around Auckland in 1967 and identified as *Labia curvicauda* (Hudson 1973), but Hudson (1976) correctly identified this species.

Natural enemies of earwigs

The natural enemies of the European earwig have been studied extensively in the Northern Hemisphere (Crumb et al. 1941; Barthell & Stone 1995; Kuhlmann 1995). One enemy, the tachinid fly *Triarthia setipennis*, was released in New Zealand in 1928–29. It apparently failed to establish (Thomas 1989a)

but discriminating it from other tachinids in New Zealand has not been easy (Macfarlane & Andrew 2001) – a recent redescription of *Triarthia* and its four species (O'Hara 1996) should help with recognition of this species. Any New Zealand tachinids introduced against the European earwig could be free of both main parasitic wasps (*Dibrachys cavus* and *Phygadeuon vexator*), but taxonomic work on *Dibrachys* and the large ichneumonid subfamily Phylacteophaginae has been minimal. By contrast, tachinid establishment was achieved in North America (Barthell & Stone 1995) where such wasp parasitism varies from at least 1% to 18% compared with up to 49% in Europe (Kuhlman 1995).

Cool moist habitats are thought to favour earwig parasites, and the first generation of earwigs may be more severely affected, as for example by the nematode *Mermis subnigrescens*, which is common in Canterbury (Thomas 1989a; Macfarlane unpubl.). This internal parasite sterilises the adult hosts. The effect on earwigs of the many other possible pathogens (fungi, gregarines) present in New Zealand has not been determined. Nor has the likely level of mortality caused by ground beetles (Miller & Walker 1984).



European earwig *Forficula auricularia*.
From Grant 1999

A decline in European earwig populations in New Zealand coincided with the spread of hedgehogs (Thomas 1989a) so predation may be important in keeping their populations in check. The hedgehog is commonest in open, warmer, coastal pastureland, dunes, and settled areas (King 1990). Earwigs (*F. auricularia, A. littorea*) are one of the most important dietary components of the hedgehog (Brockie 1959; Campbell 1973), with ca. 5–10% of hedgehog food in pasture, suburban areas, and dune habitats being earwigs, although fewer are eaten in orchards. Ship rats and mice consume earwigs (species not specified) as a minor part of their diet (Miller & Miller 1995). The tuatara includes *A. littorea* as a minor item of its diet (Wall 1981). The common skink *Oligosoma nigriplantare* was reported to feed on earwigs (possibly *F. auricularia* judging from the habitat) as a minor component (Berwick 1959).

Various species of bird capture earwigs, especially those that are active at night or which feed on the ground, unlike most of the common bush birds. The European earwig is a minor item of the food (1–10% frequency) gathered by ground- and day-feeding magpies (McIlroy 1968; Moeed 1976), mynahs (Moeed 1975), and starlings (Moeed 1975, 1976, 1980; Coleman 1977) with only a modest increase in seasonal incidence in the diet compared to the peak in numbers revealed by pitfall trapping (Moeed 1976). Sparrows infrequently feed nestlings on *F. auricularia* (MacMillan 1981; MacMillan & Pollock 1983), but if adult sparrows feed on them they do so less often (MacMillan 1981). This earwig is also a minor item in the diet of the little owl (Soper 1963). Giles (1953) examined *A. littorea* extensively for parasites without finding any. Introduced *Vespula* wasps capture earwigs in native forest very occasionally (Harris 1991) but apparently not elsewhere.

Order Orthoptera: Weta, grasshoppers, crickets, and kin

Orthopterans ('straight wing') have a generally cylindrical body, with hind legs elongated for jumping. They have mandibulate mouthparts and large compound eyes, and may or may not have ocelli, depending on the species. They have two pairs of wings, which are held overlapping the abdomen at rest. New Zealand has a very mixed bag of orthopteran insects. There are many endemics in a few families yet the commonest species seen by most people are introduced. The literature is large and scattered but early references can be obtained through the *BUGS* database (Ramsay & Crosby 1992).

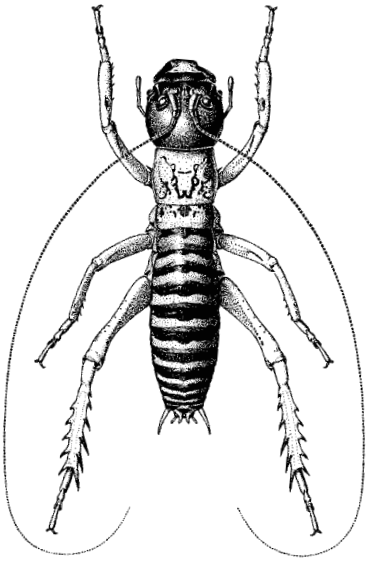
Weta: A New Zealand icon

There are many weta species in New Zealand, classified in two families – Anostostomatidae (tree and ground weta) and Rhaphidophoridae (cave or jumping

Summary of species numbers of Orthoptera

Family	Described	Known undescribed	Adventive
Prophalangopsidae*	1	0	–
Anostostomatidae	29	>33	0
Rhaphidophoridae	54	>30	0
Tettigoniidae	5	0	3?
Gryllidae	8	1	4?
Gryllotalpidae	1	0	0
Acrididae	19	3	0
Totals	**117**	**>67**	**7?**

* Extinct



Male Canterbury weta *Hemideina femorata*.
Des Helmore

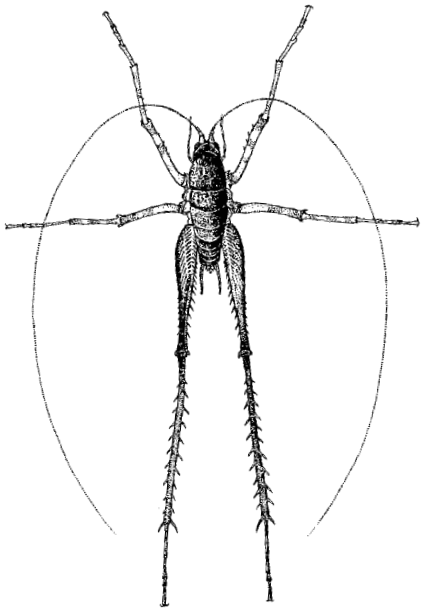
weta). All genera and species are endemic. A fossil prophalangopsid orthopteran indicates that the New Zealand fauna may have evolved during a long period of isolation, well before New Zealand's separation from the Gondwana supercontinent some 120 million years ago.

Anostostomatidae: Tree, giant, and ground weta

Everyone knows about weta, often referring only to *the* weta and implying that all the details of the two that are common can be applied to others. Adults often find weta repulsive, yet their supposed ugliness fascinates children. Most details apply to the well-known Auckland and Wellington tree weta, *Hemideina thoracica* and *H. crassidens*, respectively. It is the enlarged heads of the males and spiny legs that people find so abhorrent. Ironically, giant weta (*Deinacrida* species), among the world's heaviest insects, seem much less fearsome. Their conservation status is currently much discussed (Gibbs 1998). Discoveries of two species of horned weta on Red Mercury Island (Johns 1997) and the Raukumara Range of East Cape region (Gibbs 2002), four giant weta in South Island mountains (Gibbs 1999), and 35 species of ground weta throughout New Zealand (P. M. Johns, pers. obs.) have more than doubled the known fauna, indicating the real paucity of our understanding of these remarkable creatures. Furthermore, many gene sequences have now been prepared, pointing to additional 'hidden' species such as *Hemideina trewicki* (Morgan-Richards 1995). Population genetics has also shown that there are many separate populations that have developed through prehistoric restriction of gene flow by rising sea level or land sinking below the sea, leaving isolated islands and peninsulas (Morgan-Richards 1997). Similarly, populations of alpine species have diverged to a considerable degree, and studies have been made on their behaviour and behavioural evolution (McVean & Field 1996; Gwynne 1995) and genetic divergence (Trewick et al. 2000).

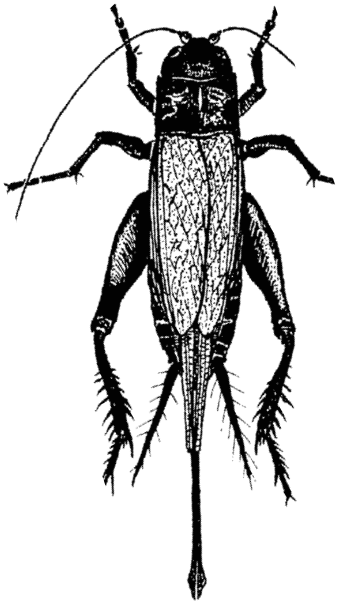
Rhaphidophoridae: Cave or jumping weta

Cave weta need revising. All species are endemic and there are many awaiting description or perhaps even discovery (Johns 1991, and subsequent observations). A name that was long forgotten (130 years) can now be applied to one recently collected form. A number have needed slight changes to their names, as indicated in the end-chapter checklist, to follow the ICZN rules of nomenclature concerning gender agreement. *Talitropsis* has recently been placed in its own tribe (Gorochov 1995) and is said to be primitive, and other genera may well be allied to it. But the entire family is in need of revision at higher taxonomic levels inasmuch as one nominally key character is contravened – normally, stridulatory pegs on the abdomen, similar to those present in the ground weta (Anostostomatidae), should be lacking but they are present and often well developed in many New Zealand species. There is still much confusion at the generic level, which the work of Ward (1997) partly remedied. But it is the dozen



Cave weta *Gymnoplectron edwardsii*.
From Grant 1999

or so new species in *Isoplectron* and *Neonetus* that will pose a great problem with their merging variation in presently fixed generic characters. *Talitropsis* is already known to vary in 'key' characters. New Zealand's subantarctic islands (Antipodes, Auckland, Bounty, Campbell, and Snares) each have a monospecific genus (except Antipodes – a species has been seen there but not caught). These, too, may represent the ends of variation in one (especially *Pleioplectron*) or more mainland New Zealand genera. The species of *Gymnoplectron* should be combined with the older name *Pachyrhamma*. The situation concerning cave species in northwest Nelson and northern Westland (Johns 1981) is now even more complex as some, previously thought to be in *Gymnoplectron*, are certainly members of the poorly known genus *Macropathus*.



Female black field cricket *Teleogryllus commodus*.
From Grant 1999

Crickets, mole crickets, and grasshoppers

Gryllidae: Crickets

There are relatively few black crickets in New Zealand – only nine species, comprising four shared with Australia, one introduced from Europe, and three small ones that are very similar to their close Australian relatives (Swan 1972; MacIntyre 1977a; Ramsay 1991). One very small species, known for at least 40 years and quite exceptional, is still undescribed. It has no wings, and thus neither sings nor has any organs for hearing cricket song. Crickets normally live in open, grassland/shrubland associations, but this unusual native species lives in thick moss in high-rainfall forests. It represents a new genus.

The large black cricket *Teleogryllus commodus* is widespread in Australia and the Pacific Islands. In New Zealand it is a well-known inhabitant of suburban gardens and lawns and a pest of pastures in the northern part of the North Island, but its range extends south to Kaikoura. The Kaikoura population is different, however (Chen et al. 1967), and the differences pose a problem concerning the time of its origination in Kaikoura and subsequent genetic differentiation. North Island and Nelson populations are genetically very close to Australian populations. The Kaikoura population is separate, yet if the species *was* introduced, even the 200 years since European colonisation would seem insufficient for genetic divergence. Perhaps it is part of a wider Polynesian introduction and the North Island populations have been genetically infused with later introductions from Australia.

Rarely seen little brown crickets are placed in the genus *Metioche*. Whether this placement is correct or merely convenient is not known; much study is needed. They appear to be throughout the country and, although only one species has been described, many species may be present. Thus the status of *Gryllodes maorius* Saussure, 1877, *Metioche maorica* (Walker, 1869), and *Ornebius* 'Paihia' of Ramsay (1993) need urgent revision.

Gryllotalpidae: Mole crickets

There is only the one burrowing cricket, *Trimescaptor aotea*, and it too is songless, unlike its very noisy Australian relatives.

Tettigoniidae: Katydids and long-horned grasshoppers

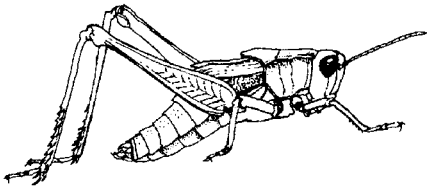
There are three long-horned grasshoppers in New Zealand, all within the worldwide genus *Conocephalus*, and one katydid, *Caedicia simplex*. One *Conocephalus* species has had a name change (Pitkin 1980) – *C. modestus* to *C. albescens.* The species are either shared with Australia or have close relatives there. A Kermadec Island record of *Solomona solida* needs confirmation.

Acrididae: Grasshoppers

There are 22 species of grasshopper in the fauna. The locust *Locusta migratoria* is widespread around the world, whereas the other 21 species are endemic. *Phaulacridium marginale* and those species presently in *Sigaus* have close relatives in Australia. There is a real need to re-examine *Sigaus* and Key (1991) has already

suggested that it needs dividing into three genera. Three new species are thought to be present, two in Fiordland (Morris 2003).

All groups have been intensively studied biologically (MacIntyre 1977b; Richards 1954a, b, 1962, 1965a, b, 1973; White 1975, 1978; White & Sedcole 1991; Westerman & Ritchie 1984) and many examples have been successfully reared (Barrett 1991). Devolving from their icon status, intensive efforts are now being made to assess the rarity of the species (Gibbs 1998).



Grasshopper *Phaulacridium marginale*.
From Grant 1999

Order Phasmatodea: Stick insects

Phasmatodeans are stick and leaf insects but only the former occur in New Zealand. Masters of camouflage, their greatest diversity is in the tropics, where veritable giants have been recorded. The largest species, found on the island of Borneo, exceeds half a metre in length including the legs (Hennemann & Conle 2008). Phasmatodeans are related to other insect orders such as Embioptera and Orthoptera. Altogether, there are around 3000 species worldwide.

In New Zealand there are 22 described and several undescribed species (Jewell & Brock 2002; Buckley et al. 2009a). All of them are flightless slow-moving, night-feeding herbivores. They have a long body (40–150 millimetres) with widely separated tubular legs. Salmon (1991) provided keys to adults and eggs and provided coloured figures. Jewell and Brock (2002) published keys to adults (both sexes) and eggs of the genera, including two new genera, and gave notes on the taxonomic status of particular species, including synonyms and a bibliography for stick insects. Trewick et al. (2005) and Buckley et al. (2009a,b) proposed synonyms within *Argosarchus* and *Clitarchus* based on DNA sequence analysis. The most recent taxonomic addition is that of Buckley and Bradler (2010) for an endemic genus and species from Northland. Males are most easily identified by the shape of the claspers and the number, size, and arrangement of teeth on the claspers. Females are best identified by the terminalia including size and shape of the cerci, and internal valves. The distribution of spines on the body can be useful for identifying genera but are often too variable to be of use for species-level identification. Each species has diagnostic characters associated with the eggs (Salmon 1991; Jewell & Brock 2002).

All New Zealand species are endemic and, with the exception of *Clitarchus*, all genera are endemic. However, once a taxonomic revision of *Clitarchus* is completed this genus is likely to be endemic also (Buckley & Bradler pers. comm.). Following the taxonomic classification of Günther (1953) the genera *Acanthoxyla*, *Argosarchus*, *Clitarchus*, and *Pseudoclitarchus* and are placed in the Phasmatinae and the remaining genera – *Asteliaphasma*, *Micrarchus*, *Niveaphasma*, *Tectarchus*, and *Spinotectarchus* – are placed in the Pachymorphinae. However, it is known that neither of these groups is monophyletic (Günther 1953; Bradler 2001, 2009; Whiting et al. 2003; Trewick et al. 2008; Buckley et al. 2009c, 2010). Analysis of morphology and DNA sequences (Buckley et al. 2009c, 2010) shows that New Zealand taxa are all members of the clade Lanceocercata (Bradler 2001). This is supported by key apomorphies including absence of a vomer, the male clasping the female at the base of sternite X, claspers orientated medially, and cerci leaf like and flattened. The molecular phylogenetic studies of Buckley et al. (2009c, 2010) showed that the New Zealand fauna is not monophyletic and in fact forms two clades both nested within a larger and morphologically diverse New Caledonian radiation. The first clade contains only *Spinotectarchus acornutus* and the second clade contains all of the remaining genera. Many of the New Caledonian species are winged or have wing pads, suggesting that the ancestor of the New Zealand lineages may have been winged. The loss of flight in the New Zealand taxa is consistent with the evolution of island insects in general.

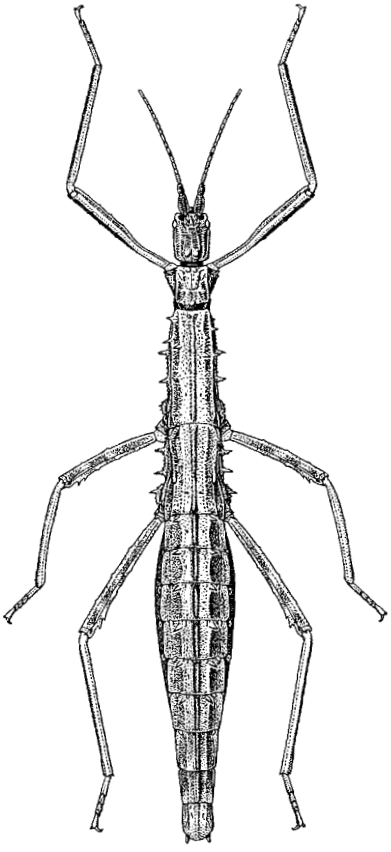
Tectarchus salebrosus.
Thomas Buckley

Most New Zealand stick-insect species are found only or mainly at lower altitudes below 900 metres, which reflects the tropical origin of these insects.

A notable exception is *Niveaphasma annulata* with several populations that are found in alpine areas up to 1500 metres in the central to southern South island (Jewell & Brock 2002; O'Neill et al. 2009). There is also at least one undescribed species of *Micrarchus* that is found above the tree line in northern Westland and Nelson (Salmon 1991). *Tectarchus salebrosus* has also been found in the Seaward Kaikoura Range well above the tree line (Jewell pers. obs.).

The genus *Asteliaphasma* contains two nominal species, *A. naomi* and *A. jucundum*, but it is not clear if these are taxonomically distinct. They are relatively common in forest in the upper North Island and usually associated with *Meterosideros* vines and sometimes *Leptospermum scoparium*. *Asteliaphasma* are relatively gracile phasmatodeans but some individuals are adorned with lobes and crests and vary in colour (Salmon 1991). This variation does not appear to be of taxonomic significance, with both body morphs being observed in the same population.

The genus *Tectarchus* contains four species and these species range from just south of Auckland to the central South Island. *Tectarchus huttoni* and *T. ovobessus* are found in both North and South Islands and *T. semilobatus* is restricted to the South Island. *Tectarchus salebrosus* is commonest in the South Island, but Salmon (1991) reported it from the lower North Island, although this observation has not been replicated (Buckley unpubl.). *Tectarchus huttoni* is found on Kapiti Island (Wilkinson & Wilkinson 1952; Moeed & Meads 1987) and islands in the Marlborough Sounds. *Tectarchus* species are found on a broad range of plant species including *Leptospermum scoparium* and *Meterosideros* spp. (Myrtaceae), *Rubus* spp. (Rosaceae), *Weinmannia racemosa* (Cunoniaceae), *Astelia* spp. (Asteliaceae), *Raukaua anomalus* (Araliaceae), and *Gahnia* spp. (Cyperaceae). Species of *Tectarchus* are most easily diagnosed by their smooth body and ridge-shaped tergites. Most species come in two colour morphs, green and brown of various shades.



Micrarchus n. sp.
Des Helmore

Niveaphasma annulata is confined to the southern two thirds of the South Island where it is found from sea level to at least 1500 metres. It is associated with *Muehlenbeckia axillaris*, *M. complexa*, and more rarely *M. australis* (Polygonaceae). It is also commonly found on *Rubus* spp., especially *R. schmidelioides*, and also on *Coriaria angustissima* and *C. plumosa* (Coriariaceae), *Leptospermum scoparium,* and *Weinmannia racemosa* (Salmon 1991; Jewell and Brock 1991; O'Neill et al. 2009).

Micrarchus is another genus of small spiny stick insects and currently contains one recognised species and several undescribed species in the South Island. *Micrarchus hystriculeus* is found in lowland habitats and feeds on *Leptospermum scoparium*, *Rubus* sp., *Acaena* spp. (Rosaceae), *Muehlenbeckia* spp., and *Meterosideros perforata*. This species is found in the upper South Island and lower North Island. As mentioned above an undescribed species is present about the tree line in the upper South Island and can be found on tussock, sedges, *Astelia* spp., *Muehlenbeckia axillaris* and *Leptospermum scoparium* (Salmon 1991; Buckley & Jewell, unpubl.).

Argosarchus horridus is the longest New Zealand stick insect, reaching slightly over 150 mm in the female. It is found most commonly on *Rubus* spp., *Plagianthus regius* (Malvaceae), *Lophomyrtus bullata*, and *Muehlenbeckia australis*. It is widespread throughout the North Island, with the exception of Northland, and at mainly coastal and low-elevation regions of the South Island (Salmon 1991; Buckley et al. 2009a). It is also recorded from the Chatham Islands (Brunner 1907), which is notable given that the species is flightless (Trewick et al. 2005; Buckley et al. 2009a). Within the Chathams group *A. horridus* is found on at least two of the islands (Buckley et al. 2009a). *Argosarchus horridus* is notable as being a geographic parthenogen (Trewick et al., 2005; Buckley et al., 2009a) with males extremely rare in the South Island and common in the North Island (Buckley et al., 2009a).

Pseudoclitarchus sentus is restricted to the Three Kings Islands where it is

found on Great Island and South West Island. Salmon's (1991) record of this species from Great Barrier Island is dubious, having not been recorded there since, while other species are common. This species is commonly found on *Kunzea ericoides* (Myrtaceae) and Salmon (1948) also recorded it from *Litsea calicaris* (Lauraceae) and *Streblus smithii* (Moraceae).

Clitarchus hookeri is perhaps the commonest species on the North Island and is known from the northern offshore locations of Little Barrier, Mercury Islands, Cuvier, and Kapiti, and islands in the Marlborough Sounds (Johannesson 1972, Hicks et al. 1975; Moeed & Meads 1987; Salmon 1991; Buckley et al. 2009b). There is an undescribed species on the Poor Knights islands (Watt 1982; Buckley et al. 2009b). *Clitarchus hookeri* is most commonly found on *Leptospermum scoparium* but also feeds on *Rubus* spp. and *Meterosideros* spp. Populations in the upper North Island are predominantly bisexual whereas males are completely unknown from the South Island (Buckley et al. 2009b), a pattern similar to *A. horridus*.

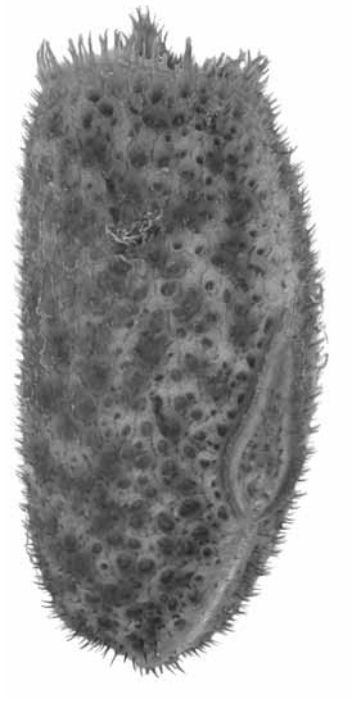
The genus *Acanthoxyla* is remarkable for its complete lack of males (Salmon 1991), extremely unusual for an animal genus. There are nine recognised species (Jewell & Brock 2002) but these are difficult to identify and it is not clear how many species there actually are (Morgan-Richards & Trewick 2005; Buckley et al. 2008). Most individuals are green with black-tipped spines, but some individuals are brown and *A. inermis* lacks black-tipped spines. *Acanthoxyla* is found from Northland southwards to Stewart Island and in the South Island it is mainly restricted to lowland areas. *Acanthoxyla* species can be found on podocarps, particularly *Podocarpus totara*, *Dacrydium cupressinum*, and less commonly *Phyllocladus* spp. It is also common on *Metrosideros* vines, *Rubus* spp., *Leptospermum scoparium*, *Weinmannia racemosa*, and *Muehlenbeckia* spp. Despite the lack of males it appears that lineages of *Acanthoxyla* have repeatedly hybridised with *C. hookeri* (Morgan-Richards & Trewick 2005; Buckley et al. 2008) and it also appears that the *Acanthoxyla* lineages are themselves the result of hybrid events between sexual species of *Acanthoxyla*, which may now be extinct (Buckley et al. 2008).

The newly described genus *Tepakiphasma* contains one species, *T. ngatikuri*, and is known only from two specimens collected from Te Paki at the far north of the North Island (Buckley & Bradler 2010). Among other characters, this relatively gracile genus is diagnosed by having a perforated capitulum, which is unique amongst New Zealand phasmatodeans. The specimens were collected from *Metrosideros perforata* but reared on *M. excelsa* and *Lophomyrtus bullata*. It is likely to be restricted to the Te Paki region, which is well known as a centre of endemism for many taxa. Owing to the restricted known distribution and small number of specimens collected it is clear that *T. ngatikuri* requires urgent conservation attention.

Spinotectarchus acornutus has a very similar distribution to *Asteliaphasma* and is found in similar habitats. In addition to mainland localities, *Spinotectarchus acornutus* also occurs on Little Barrier Island (Salmon 1991), Great Barrier Island (Hutton 1898) and the Hen and Chickens Islands (Buckley, unpubl.). It is commonly found on *Meterosideros* vines as well as *Leptospermum scoparium*, *Cyathodes* spp., *Astelia* spp., *Gahnia* spp., *Weinmannia racemosa*, and *Podocarpus totara*. *Spinotectarchus acornutus* has highly distinctive male claspers with the teeth clustered at the apex of the hemitergites (Buckley et al. 2010). The structure of the claspers is similar to its New Caledonian sister taxon and reflects its phylogenetic isolation from the remaining New Zealand phasmatodean genera (Buckley et al. 2010).

Published details of the distribution of New Zealand species were based mainly on records from the Museum of New Zealand (Salmon 1948, 1954, 1991) and Canterbury Museum (Wise 1977) until Jewell and Brock (2002) re-evaluated the species and types. The Canterbury Museum has many unpublished locality records. The largest New Zealand phasmatodean collection is housed in the New

Pseudoclitarchus sentus mating pair.
Thomas Buckley



Egg of *Spinotectarchus acornutus*
Thomas Buckley

Zealand Arthropod Collection, which contains over 1500 specimens including several undescribed species and genera. Databasing and mapping of all specimens is underway and will reveal how many species are of conservation concern.

Stick insects can be found in almost all types of vegetation from just above high-tide mark to the high alpine zone. Eggs are dropped haphazardly to the ground and take several months to hatch (Salmon 1991). Identification of nymphs of most species is difficult as most are green on hatching, but *Argosarchus horridus* is brown with distinctive white banding on the legs (Salmon 1991). Young nymphs then walk up tree trunks or other plants in search of the host plant (Moeed & Meads 1983). Salmon (1991) remarked that phasmatodean requirements of host plants to achieve development through to adult are strict. However, more recent rearing studies reveal that many species can be successfully reared on hosts rarely supporting them in the wild. More critical study of food sources that favour particular species are warranted, as these would improve the ability to map and monitor their presence and obtain specimens for rearing in captivity. The number of moults from nymph to adult has not been determined for all species but Stringer (1970) reported that *C. hookeri* took six moults and Salmon (1991) claimed that other species had fewer moults.

The nocturnal feeding habits of phasmatodeans lower their risk of predation. This behaviour and their camouflage notwithstanding, several forest birds feed on stick insects. Some are captured by the mainly nectar-feeding tui (*Prosthemadera novaeseelandiae*) (Merton 1970; Higgins et al. 2000a) as well as by silvereye (*Zosterops lateralis*) (Gill 1979) and even fantail (*Rhipidura fuliginosa*) (Moeed & Fitzgerald 1982), which feeds mainly on flying insects (Gravatt 1971; Gill 1980). Robins (*Petroica* spp.) catch stick insects mainly in late summer–autumn but are occasionally deterred from capturing them when the spiny legs of the stick insect are used in defence (Powlesland 1981). Bellbirds (*Anthornis melanura*) possibly catch them too, because some nectar-rich flowers (rata, pohutukawa) used by bellbirds and tui (Higgins et al. 2000b) are also favoured by stick insects. During the night, moreporks (*Ninox novaeseelandiae*) (Clark 1992; Haw et al. 2001) and little owls (*Athene noctua*) (Soper 1963) take stick insects as a small part of their diet.

Possums are significant predators (Cowan & Moeed 1987) and among the smaller mammals in New Zealand, only ship rats (*Rattus rattus*) are known to feed on stick insects (Daniel 1973; Innes 1979). Mice (*Mus musculus*), Norway rats (*R. norvegicus*), and kiore rats (*R. exulans*) keep to the ground more than ship rats (King 1990), so they are less likely to feed on stick insects often but may take a toll on eggs. Cats and introduced birds also catch and eat stick insects. Ferrets (*Mustela furo*), which can feed in trees on birds, could possibly consume stick insects to some extent. Tuatara (*Sphenodon* spp.), now confined to offshore islands, occasionally consume stick insects (Wall 1981). Native lizards readily capture and eat stick insects and in some habitats could be a significant natural predator; some of the host plants such as *M. complexa*, *Leptospermum scoparium* and *Kunzea ericoides*, are also strongly favoured by certain lizard species. Both vespulid and other wasps are major predators and have devastated stick-insect communities in forests where they have reached plague proportions. Parasites of New Zealand stick insects have not been well studied, but mites are often observed on them and Yeates and Buckley (2009) recorded unknown species of mermithid nematodes emerging from *Clitarchus* spp., *Asteliaphasma naomi*, and *Acanthoxyla* spp.

Order Hemiptera: Bugs, cicadas, scale insects, aphids etc.

The Hemiptera is by far the largest and most successful of the hemimetabolic insects, i.e. those having young that look like wingless adults and an incomplete metamorphosis that does not involve a pupa. There are about 82,000 named species, and probably many more, and the Hemiptera has the dubious distinction

of including probably more destructive and costly pest species than any other insect order.

These insects used to be grouped into the orders Heteroptera and Homoptera (the latter with two suborders, Sternorrhyncha and Auchenorrhyncha), based basically on wing structure. A number of recent studies, integrating molecular and morphological data, divide the order into four suborders – Sternorrhyncha, Auchenorrhyncha, Coleorrhyncha, and Heteroptera, with the Auchenorrhyncha believed to be more closely related to the Heteroptera than to the Sternorrhyncha. The Sternorrhyncha, especially members of the superfamily Psylloidea (jumping plant-lice), are closer to the basal hemipteran body-plan than the other groups.

Hemiptera means 'half wing' and refers to the fact that the basal part of the forewings is tough and hard while the outer part and the hindwings are membranous. The differentiation of the forewings is also implied in the name Heteroptera ('different wings'), in contrast to the Homoptera ('same wings'). All hemipterans are characterised by piercing and sucking mouthparts. Some suck plant juices and are plant pests, while others can bite painfully. The order dates back to the Permian period and is fairly well represented by fossils.

Suborder Sternorrhyncha

Included in this suborder are the psyllids or jumping plant-lice, whiteflies, aphids, coccids, mealybugs, and scale insects. All are plant suckers, mostly of the phloem (the food-conducting tissue) of flowering plants, but some also on conifers, on which they probably evolved.

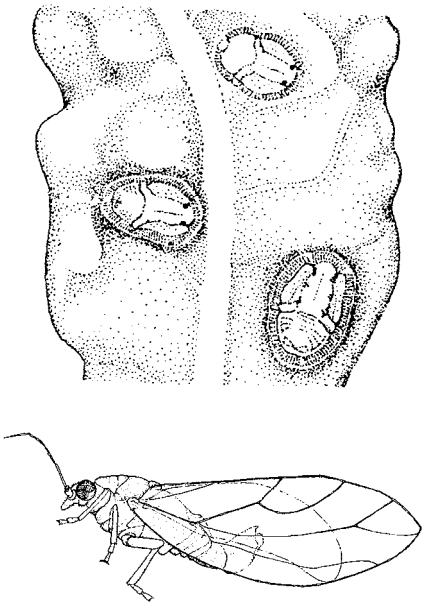
Superfamily Psylloidea: Jumping plant-lice

These small plant-suckers attack plants as nymphs, feeding on the phloem via stomatal pores in leaves. Nymphs tend to be confined to one host species or to a group of closely related species. They are flattened and non-jumping. Adults, which are winged, are less discriminating and sometimes feed and oviposit on plants that do not support their nymphs. Leaf pit-galls and closed woody galls are a common feature of species of Triozidae and some Psyllidae also form galls.

The New Zealand psylloid fauna has 19 described genera, of which 12 are represented only by adventive species, mostly from Australia. Others are shared with Australia, with endemic species on both sides of the Tasman (e.g. *Acizzia*, *Anomalopsylla*, *Ctenarytaina*). Notable in the present classification is the absence of endemic genera, although a small number of endemic species are likely to fill some of this gap in the future. In all, there are more than 90 described and undescribed species. Of the six families of Psylloidea worldwide, only the Phacopteronidae and Carsidaridae are not found in New Zealand, but two other families – Calophyidae and Homotomidae – are each represented by only a single adventive species. The Psyllidae has 40 species and one subspecies, of which 23 (60%) are adventive. In contrast, the Triozidae has 54 species, only three of which are adventive (though not all yet determined to species); all the rest are endemic, including 19 undescribed species. The number of adventive species has grown over recent decades in parallel with the increase in aircraft traffic and the availability of exotic host plants such as plantation eucalypts. About a third of the New Zealand psyllid species are adventive.

Psyllids are usually fairly narrowly host-specific, with related species feeding on related plant groups. In New Zealand, the genus *Trioza* has radiated on host-plants in five genera of Asteraceae, particularly *Olearia* – 10 of 15 described species of *Trioza* are on that genus. This loyalty to particular plant groups does not prevent psyllids from using more unusual host groups when circumstances allow or demand, e.g. the endemic spondyliaspidine *Ctenarytaina fuchsiae* on *Fuchsia* (Onagraceae). Although most psyllids worldwide use host plants among dicotyledonous angiosperms, in New Zealand two endemic triozine species complete their development on gymnosperm species (*Halocarpus*, Podocarpaceae).

Trioza vitreoradiata – male (left) and female (right) (upper photo) and male in profile (lower photo).
Nicholas Martin



Trioza vitreoradiata adult (lower) and nymphs on leaf of lemonwood (*Pittosporum eugenioides*) (upper).

From Grant 1999

Parasitoids and predators recorded attacking psyllids in New Zealand

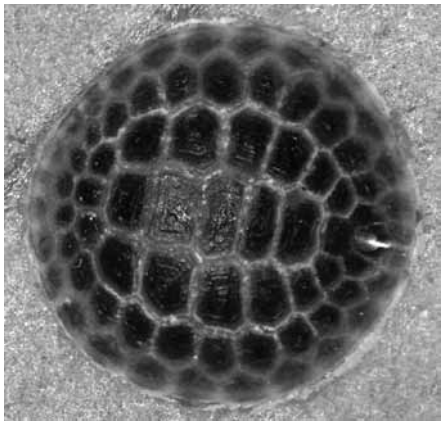
Order/Family	Parasitoid/predator species	Psyllid host/prey
Hymenoptera: Encyrtidae (parasitoid)	*Adelencyrtoides variabilis*	*Trioza irregularis*
	Coccidoctonus gemitus	*Cardiaspina fiscella**
	Psyllaephagus acaciae	*Acizzia acaciaebaileyanae*
	Psyllaephagus gemitus	*Cardiaspina fiscella*
	Psyllaephagus pilosus	*Ctenarytaina eucalypti*
	Psyllaephagus richardhenryi	*Anoeconeossa communis*
Coleoptera: Coccinellidae (predatory)	*Adalia bipunctata*	*Acizzia acaciae*
		Acizzia uncatoides
	Cleobora mellyi	*Acizzia acaciae*
		Acizzia acaciaebaileyanae
		Acizzia uncatoides
	Halmus chalybeus	*Trioza vitreoradiata*
		Acizzia acaciae
		Acizzia uncatoides
	Harmonia conformis	*Acizzia acaciae*
		Acizzia uncatoides
Hemiptera: Miridae (predatory)	*Idatiella albisignata*	*Psyllopsis fraxini*
		Psyllopsis fraxinicola
Neuroptera: Hemerobiidae (predatory)	*Boriomyia maorica*	*Trioza vitreoradiata*
	Drepanacra binocular	*Trioza vitreoradiata*
		Acizzia acaciae
		Acizzia albizziae
		Acizzia uncatoides
	Micromus tasmaniae	*Trioza vitreoradiata*

* via *Psyllaephagus gemitus*

Psylloids affect many native plant genera, including *Alseuosmia*, *Carmichaelia*, *Dacrydium*, *Discaria*, *Dodonaea*, *Fuchsia*, *Pseudopanax*, and *Schefflera*. Some psylloids severely modify their host, like the psyllid on *Pittosporum*, pitting and causing yellow streaks to appear on distorted leaves.

Superfamilies Aleyrodoidea and Coccoidea: Whiteflies, scale insects, and mealybugs

Scale insects (Coccoidea) are soft-bodied sap-suckers that produce honeydew through their anal apparatus and are sexually dimorphic, that is, the adult males are winged insects and the adult females are neotenic (larvaeform). Worldwide there are about 7600 species in 21 families. Individuals may be found feeding on all parts of a host plant, from the roots, stems, and leaves to the fruit. One New Zealand species, *Newsteadia myersi* (Ortheziidae), lives exclusively in litter and mosses and is thought to feed on roots. Soil-inhabiting, root-feeding genera of mealybugs such as *Rhizoecus* are pests in the garden nursery industry where plants are grown in pots. The vast majority of scale insects feed on leaves and young stems or through the bark of larger branches and tree trunks. Those that feed on fruit bear the risk of a short time-span before the fruit falls or is eaten by other animals, and are of economic importance where the fruit is a horticultural crop. Aleyrodoidea (whiteflies), with about 1450 species worldwide, have a similar lifestyle to scales, except that both male and female adults are fully winged.



Endemic scale insect *Epelidochiton piperis* (Coccidae).

Rosa Henderson

Aspects of life-cycles

Male and female coccoids go through very different post-embryonic development. Males develop similarly to holometabolous insects, i.e. through prepupal and pupal stages to winged adults quite different from the females. They have no

Diversity of Coccoidea in New Zealand and globally

Superfamily/Family	No. of species in New Zealand Total	Endemic	Approx. no. world species	References*
Aleyrodoidea				
Aleyrodidae (whiteflies)	14	8	1450	Dumbleton 1957; Mound & Halsey 1978; Jesudasan & David 1991
Coccoidea				
Asterolecaniidae (pit scales)	3	2	232	Russell 1941; Stumpf & Lambdin 2006
Cerococcidae (false pit scales)	3	3	72	Lambdin & Kosztarab 1977; Lambdin 1998
Coccidae (soft scales)	59	45	1151	Hodgson & Henderson 1998, 2000; Henderson & Hodgson 2005
Diaspididae (armoured scales)	~90	~62	2413	Green 1914, 1929; Brittin 1915a,b, 1916, 1937; McKenzie 1960; Borchenius & Williams 1963; Morrison & Morrison 1966; Ben-Dov 1976; De Boer & Valentine 1977; Takagi 1985; Danzig 1993
Eriococcidae (felted scales)	102	96	554	Hoy 1961, 1962; Hodgson 1994; Hodgson & Henderson 1996; Henderson 2006, 2007a,b
Halimococcidae (halimococcids)	1	1	21	Deitz 1979a,b
Margarodidae (margarodids)	11	10	445	Morales 1991
Ortheziidae (ensign scales)	3	1	196	Green 1929; Kozár & Konczné Benedicty 2000
Phenacoleachiidae (phenacoleachiids)	2	2	2	Maskell 1891; Beardsley 1964
Pseudococcidae (mealy bugs)	116	96	2224	Cox 1987; Williams & Henderson 2005

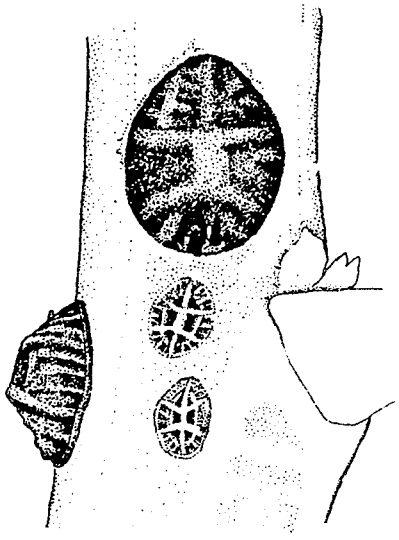
* General reference: ScaleNet [www.selbarc.usda.gov/scalenet/scalenet.html]

mouthparts and are short-lived. The 1st-instars, known as crawlers, are usually indistinguishable as males or females, and are the main dispersal stage. They reach new sites by walking, either on their natal host plant or on suitable plants close by, or they may be blown by wind to more-distant sites. They soon settle, put their feeding stylets into the plant tissue and usually become sessile for varying periods. Nymphs in the families Asterolecaniidae, Cerococcidae, Diaspididae, Halimococcidae, and species of *Cryptococcus* (Eriococcidae) lose their legs at the first moult and their antennae reduce to several short setae on a sensory base, so individuals are quite sessile thereafter. The legs of whiteflies are reduced when nymphs and they remain sessile until becoming adult.

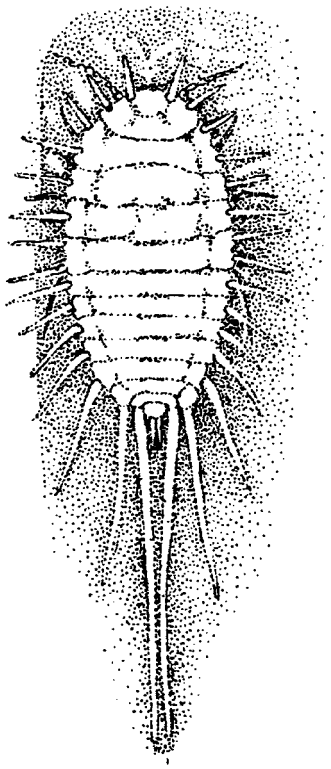
In New Zealand, the coccoid life-cycle shows greatest variation in endemic genera of the family Margarodidae. All crawlers have normal legs and antennae and all settled 1st- and 2nd-instars have reduced legs and antennae and inhabit waxy cysts. Females of *Coelostomidia* and *Platycoelostoma* species proceed through the 3rd-instar phase in this state, then redevelop normal legs and antennae and become mobile adult females; females of *Ultracoelostoma* species, on the other hand, retain reduced legs and antennae and continue to inhabit cysts. The male stages in *Coelostomidia* and *Platycoelostoma* revert to normal legs and antennae after the 2nd-instar, developing through prepupal and pupal stages to become fully winged adults (no males are known for *Platycoelostoma*). Species of Coccidae and Eriococcidae retain functional legs throughout their lives in most genera but females become more sessile when reaching adulthood. The mealybugs, phenacoleachiids, and ortheziids are mobile throughout their lives.

Protective coverings

A distinctive feature of scale insects is their different types of protective waxy coverings. These can broadly identify each family or closely related groups of families. Of the more mobile families, the mealybugs have bodies coated with powdery wax like a dusting of flour, hence the name 'mealy'. Phenacoleachiids tend to live in clusters surrounded by fluffy cocoons. Ortheziids are also known as ensign scales, for the large white plates of wax extending posteriorly from their



Introduced black scale *Saissetia oleae* (Coccidae).
From Grant 1999



Introduced long-tailed mealybug *Pseudococcus longispinus* (Pseudococcidae).
From Grant 1999

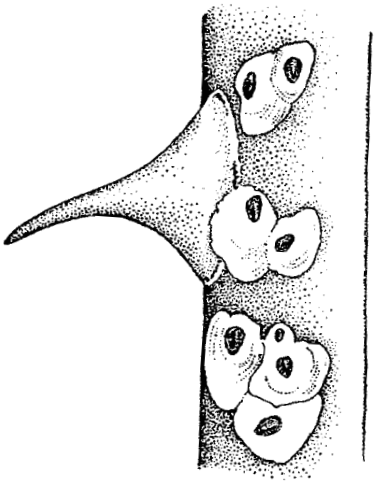
bodies. Margarodids inhabit stout waxy cysts, often hidden in crevices in the bark of host trees, once they are completely sessile with reduced legs. Their long anal tube extends from the cyst so that honeydew droplets fall away from the insect, incidentally providing a sweet, dripping 'tap' for birds and other invertebrates to feed from. Pit- and gall-formers in Halimococcidae and Eriococcidae need little covering other than some waxy strands near the opening of their dwelling. The common name for eriococcids – felted scales – derives from the adult covering (both female and the penultimate male instars) of a woven waxy sac on the majority of species. Members of the Aleyrodidae, Asterolecaniidae, Cerococcidae, and Coccidae in New Zealand all have covers of glassy wax called tests, in variable form, although females of the species in the coccid genus *Lecanochiton* lose this wax after the larval stage and develop a strongly sclerotised derm instead. Lastly, the so-called armoured scales (Diaspididae) construct a cap from the moulted skin of the previous instar, incorporating added waxy secretions whereby each succeeding instar can be seen as a ring on the cap.

Historical perspective

New Zealand scale insects were first studied by W. M. Maskell between 1879 and 1898 (e.g. Maskell 1887). He described about 300 species of Sternorrhyncha worldwide, including 94 species from New Zealand (Deitz & Tocker 1980). Since Maskell, there have been a number of studies on the New Zealand Coccoidea and Aleyrodidae. The Eriococcidae were completely revised by Hoy (1962), as were the Margarodidae by Morales (1991) and the Pseudococcidae by Cox (1987). A full revision of the Coccidae was published by Hodgson and Henderson (2000), with descriptions of 25 new species and seven new genera. Species in the other families have been described by various authors over many years.

Economic importance of whiteflies and scale insects

By the 1880s, the adventive species already present were causing economic damage to the horticultural enterprises of early settlers. Maskell (1887) summarised advice on how to control scale-insect pests in an extensive chapter in his book on the nuisance New Zealand species. In a reversal on controlling scales, they were subsequently used as a means of biological control. Between 1948 and 1952, the self-introduced felted scale *Eriococcus orariensis* (manuka blight) was deliberately spread by farmers wishing to control the growth of manuka scrub, *Leptospermum scoparium* (Hoy 1961). Eventually, populations of adventive scale species stabilised, including the manuka blight scale which has been overtaken by another less noxious scale, *Eriococcus leptospermi*, as the dominant eriococcid on manuka. Hoy (1961) attributed the decline of *E. orariensis* to the sudden appearance of the entomogenous (parasitic) fungus *Angatia thwaitesii* (generally known as *Myriangium thwaitesii*). It is interesting to note that manuka trees may still be covered in sooty mould growing on the honeydew produced by these scales and margarodids, leading the casual observer to assume that it is still 'manuka blight'.



Introduced rose scale *Aulacaspis rosae* (Diaspididae).
From Grant 1999

Worldwide, whiteflies and scale insects (Aleyrodidae, Coccidae, Diaspididae, Margarodidae, Pseudococcidae, and to a lesser extent Eriococcidae) are the cause of millions of dollars of economic loss yearly to growers of agricultural and horticultural crops. By sucking the plant sap, these insects deplete their host plant's resources and vigour and may distort plant tissues. Further, by producing honeydew, they allow the usual growth of sooty moulds, with consequent spoilage of fruit and reduction in photosynthesis. Citrus crops in New Zealand suffer damage by adventive species of Coccidae and Diaspididae; the greenhouse whitefly *Trialeurodes vaporariorum* damages soft fruit, such as indoor and outdoor tomatoes. Scale insects may also transmit or cause plant diseases. For example, a strain of the sweet potato whitefly *Bemisia tabaci* causes leaf-silvering in cucurbits. Quarantine regulations between exporting and importing nations may require zero tolerance for certain listed pest species of scale insects, adding

to compliance costs for fruit producers, and this is so for New Zealand's exports of pip-fruit and kiwifruit.

Endemic scale insects are not crop pests as they are restricted to native host plants and only rarely are found on exotic host plants – with some exceptions among grass-feeding mealybugs (Cox 1987). On the other hand, most adventive species prefer exotic host plants, although eight mealybug species, five soft-scale species, three armoured-scale species, and the single adventive margarodid species *Icerya purchasi* have migrated into natural ecosystems and also feed on native plants.

Endemic *Leucaspis podocarpi* (Diaspididae).
Rosa Henderson

Inglisia patella (Coccidae).
Rosa Henderson

Diversity

New Zealand has about 390 species of Coccoidea in 10 families and another 14 species in the Aleyrodidae (whiteflies). In comparison with the rest of the world, New Zealand is depauperate in the three largest families – the Pseudococcidae (mealybugs) have 116 species out of a worldwide total of 2224; Diaspididae (armoured scales) have ca. 90 species out of a total of 2413; and Coccidae (soft scales) have 59 known species out of a worldwide total of 1151. New Zealand is relatively species-rich, however, in the Eriococcidae, with 102 known species out of a total of 554 species worldwide. Endemism is high overall, at about 80%, but varies among families, e.g. 94% in the felt scales (Eriococcidae), 68% in the armoured scales, and 57% in the whiteflies. One family, the Phenacoleachiidae, is wholly endemic. Hodgson and Henderson (2000) considered all of the coccid genera to be endemic; exotic species ascribed to two of the genera, *Ctenochiton* and *Inglisia*, will need to be reassigned to other genera.

Special features

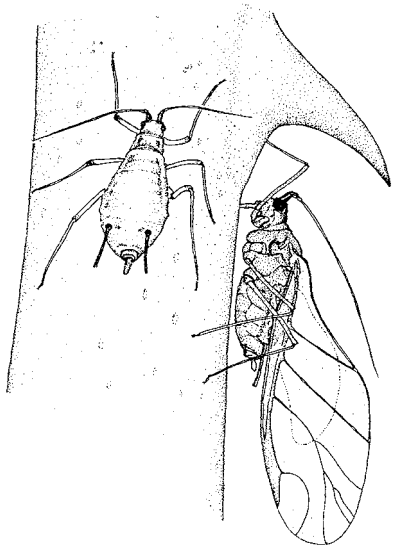
All of the indigenous soft scales (Coccidae), apart from the two *Pounamococcus* species, are probably unique in the way the wax test (protective covering) is constructed of rows of hexagonal wax plates. The males in this group have tests with a distinctive flexibly hinged plate that allows egress of the newly emerged adult male, itself more fragile than the protective waxy covering.

The large amount of honeydew produced by margarodids in beech forests is considered a very important food source for other invertebrates including honeybees and wasps, and for geckos and native birds. The availability of this food to the native fauna has recently been greatly reduced by the invasion of vespid wasps into South Island beech forests. The survival of New Zealand's endemic scale-insect species is dependent on the survival of their native host plants in their natural forest habitat. Owing to their limited dispersal capacity, few endemic scale species are able to recolonise patches of newly planted native forest unless they are very close to natural habitats. Hence the indigenous fauna will probably not benefit from new plantings in urban restoration schemes, but rather from enrichment of existing forest remnants.

Superfamily Aphidoidea: Aphids and kin

The great majority of Aphidoidea are in the family Aphididae (aphids) with the characteristics of polymorphism, complex life histories, the ability to reproduce both sexually and asexually, giving birth to live young, telescoping of generations, and high fecundity (Blackman & Eastop 1984; Minks & Harrewijn 1987; Dixon 1998). Aphids are major pests of temperate agricultural and horticultural crops and forest trees, causing damage either directly by feeding or indirectly by transmitting plant virus diseases (Minks & Harrewijn 1989). Two other families are included in the superfamily – the Adelgidae and Phylloxeridae. Adelgids and phylloxerids, although closely related to aphids, are quite distinct from them and retain a number of primitive features, including the absence of viviparity and the absence of siphunculi (the backward-pointing erect tubes found on the dorsal side of the last segment of the body of most aphid species).

The superfamily classification used here follows that of Carver et al. (1991),



Rose aphids *Macrosiphium rosae*.
From Grant 1999

Blackman and Eastop (1994), and Remaudière and Remaudière (1997) in recognising three families. Classification of aphids follows Remaudière and Remaudière (1997) and Nieto Nafría et al. (1997). Key characteristics of the Aphidoidea are found in Heie (1980), Blackman and Eastop (1984), and Foottit and Richards (1992).

Aphids were first recorded in New Zealand in 1861 (probably *Eriosoma lanigerum*) (Thompson 1922) and 1862 (probably *Brevicoryne brassicae*) (Travers 1864). The first adelgid (*Pineus* sp.) and phylloxerid (*Viteus vitifoliae*) were found in about 1880 (Maskell 1885) and 1865 (Thompson 1922), respectively. Most of the early records of New Zealand aphidoids were of introduced species on economically important plants. Hutton (1904) listed nine species of Aphidoidea (including six aphids), Myers (1922) 15 species (12 aphids), and Tillyard (1926) 18 species (16 aphids). Cottier's (1953) seminal work *Aphids of New Zealand* significantly increased the number of aphid species to 59, with the most recently published estimate being 80 species (Lowe 1973). Adelgids and phylloxerids were not considered by Cottier and Lowe. Recent records of new species are found in Sunde (1973, 1984, 1988), Cox and Dale (1976), and Blackman and Eastop (1984, 1994), among others.

Major repositories of New Zealand specimens

The Natural History Museum, London, has the most comprehensive and best-organised collection of New Zealand aphidoid species. The New Zealand Arthropod Collection, Auckland, is extensive but has been neglected in recent years. Most type specimens of endemic species are found in these two collections. The two Ministry of Agriculture and Forestry National Plant Pest Reference Laboratory collections, in Tamaki (Auckland) and Lincoln (Canterbury), are comprehensive but comprise mostly pest species. A collection held by Plant & Food Research, Lincoln, contains most of the recent collections of indigenous aphid species. Some specimens, including some types of endemic species, are also found in the Australian National Insect Collection, Canberra.

Current known natural diversity

The Aphidoidea is predominantly a northern temperate group, richest in species in North America, Europe, and Central and East Asia (Blackman & Eastop 1984) with about 4700 species in 599 genera in the Aphididae (Remaudière & Remaudière 1997), 50 species in the Adelgidae, and fewer than 50 species in the Phylloxeridae (Foottit & Richards 1992).

Aphid genera and species are considered to be under-represented in the tropics and Southern Hemisphere (including New Zealand) compared to the Northern Hemisphere, possibly as a result of the tropics acting as a barrier to movement of the species-rich subfamilies Aphidinae and Lachninae, which underwent adaptive radiation in the Northern Hemisphere in the Late Tertiary (Heie 1994). Only seven (1%) of the world genera are from subtropical and temperate regions of the Southern Hemisphere (Heie 1994).

The present number of recognised aphidoid species in New Zealand is three adelgids, three phylloxerids, and at least 121 aphid species. The majority of aphidoid species in New Zealand (90%) are aliens (Teulon & Stufkens 2002). There are no endemic phylloxerids or adelgids and the relatively few endemic aphids (at least 12 species) are mostly rare. Only introduced aphids have been reported from subantarctic islands (Cottier 1964; Palmer 1974; Marris 2000; Horning unpubl.). Only seven of the endemic species have been described. *Thripsaphis foxtonensis*, which was first recorded in New Zealand and at one time considered to be endemic (Cottier 1953), is probably of North American origin.

In the Neophyllaphidinae, *Neophyllaphis totarae* lives on more than one species of *Podocarpus* and an undescribed *Neophyllaphis* is thought to occur on snow totara, *P. nivalis* (M. Carver pers. comm.). Worldwide, about 12 *Neophyllaphis* species are found on Podocarpaceae and Araucariaceae, with a distribution

that includes the southern hemisphere and mountains of the tropics, extending northwards into China and Japan (Blackman & Eastop 1994). *Neophyllaphis* species exhibit a number of primitive characters and are considered to resemble the hypothesised ancestral aphid (Heie 1987; Carver et al. 1991).

Sensoriaphis nothofagi, subfamily Taiwanaphidinae, lives on several *Nothofagus* species in New Zealand. Three further species of *Sensoriaphis* are found on *Nothofagus* in Australia and the genus is closely related to *Neuquenaphis* (~10 species) on *Nothofagus* in South America and *Taiwanaphis* (about nine species) in southeastern Asia.

Within the Aphidinae, four *Aphis* species (*A. coprosmae*, *A. cottieri*, *A. healyi*, and *A. nelsonensis*) and two *Paradoxaphis* species (*P. aristoteliae*, *P. plagianthi*) have been described from New Zealand. Several other species have also been recognised. *Paradoxaphis* appears to be an endemic genus. At least four species of the *Aphis/Paradoxaphis* group appear to form a genetically distinct lineage within the subtribe Aphidina (von Dohlen & Teulon 2003).

At least two undescribed endemic species belonging to *Euschizaphis* have been recorded from *Dracophyllum* and *Aciphylla*, respectively. An undescribed *Casimira* species has been recorded from *Ozothamnus*.

Wingless *Rhopalosiphum maidis*, a pest of cereals.
Robert Lamberts, Plant and Food Research

Adventive aphid species

As already noted, about 90% of the New Zealand aphids are not endemic (Teulon & Stufkens 2002). A similar proportion of non-endemic species has been recorded from Australia (Carver et al. 1991). All adelgids and phylloxerids in New Zealand are aliens. In terms of the ratio between introduced and indigenous species (111/14), the aphids probably represent one of the most invasive insect groups in New Zealand. Furthermore, the introduced aphids also constitute a significant proportion of the 2600 exotic insect species estimated to be in New Zealand by Emberson (2000). Since the 1950s, an average of one new alien aphid species per year has been found in New Zealand.

Pest species

Aphids are *the* major pests of temperate agriculture, causing damage either directly by feeding or by transmitting plant virus diseases (Minks & Harrewijn 1987, 1989). In New Zealand, many of the introduced aphids, as well as the adelgids and phylloxerids, are also important pests of agricultural and horticultural crops and forest trees (see Lowe 1973; Scott 1984). Endemic species are not considered to be pests although *Neophyllaphis totarae* causes some damage to the growing tips of totara.

Taxonomic novelty

New Zealand endemic aphids constitute a distinctive taxonomic component of the New Zealand insect fauna and of the world aphid fauna. Specific characteristics of aphids and parasitic wasp associates include the following:

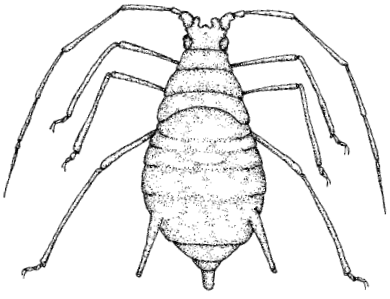
Neophyllaphis and *Sensoriaphis* are primitive genera with Gondwanan distributions (Carver et al. 1991). *Neophyllaphis* is considered the closest living relative of the ancestral aphid form.

Paradoxaphis appears to be endemic to New Zealand (Sunde 1988; Remaudière & Remaudière 1997).

Casimira might be an endemic austral genus. The type species, *C. canberrae*, is native to Australia. The only other nominal species, *C. bhutanensis*, was described from India, but the validity of its generic assignment is questionable.

The recent characterisation of the two New Zealand *Euschizaphis* species now means that half the known species of this genus are found in New Zealand.

Accepted dogma is that the austral Aphidinae (i.e. *Aphis*, *Casimira*, *Euschizaphis*, *Paradoxaphis*) are descendants of recent chance trans-tropical immigrants from the Northern Hemisphere (Eastop 2001; von Dohlen & Teulon 2002). However, recent molecular work has found that a group of four New Zealand



Wingless green peach aphid *Myzus persicae*.
Lincoln University

endemic aphids belonging to the genera *Aphis* and *Paradoxaphis* form a highly supported lineage (possibly basal in the tribe Aphidini) estimated to be ca. 15–30 million years old. These results place this New Zealand group as central to the evolution of the species-rich Aphidinae, which contains many agricultural pests (von Dohlen & Teulon 2003).

The braconid wasp subfamily Aphidiinae (all parasitoids of aphids), although now much more numerous in the Northern Hemisphere, probably originated in the Southern Hemisphere (Belshaw et al. 2000).

Rarity of endemic aphids

Of the endemic taxa, only three – *Neophyllaphis totarae*, *Sensoriaphis nothofagi*, and the undescribed aphids on *Dracophyllum* – can be considered relatively common. Despite some effort in recent years seeking populations of the remaining species (see Teulon & Stufkens 1998) they have been difficult to find and should be considered rare. For example, *A. nelsonensis* has not been found for over 30 years. Only three sites (non-current) for *A. coprosmae* populations have ever been observed (Teulon & Stufkens 1998; Stufkens pers. obs.). Other species are only slightly commoner (see Teulon & Stufkens 1998).

The 'mummy' of an external native parasitoid underneath the native aphid *Neophyllaphis totarae*.
Robert Lamberts, Plant and Food Research

Threats to endemic aphids

New Zealand's indigenous aphids face a number of threats to their continued survival, although the relative importance of these threats has yet to be determined. Threats include:

Habitat destruction, with consequent major disruptions in distribution owing to the complete removal of host plants as well as less obvious destruction in the form of animals browsing the young growing shoots of host plants, e.g. *Aphis healyi* on the native broom *Carmichaelia*.

The high ratio of alien to indigenous aphid species, which is increasingly steadily because of continued introductions (see above). Some indigenous aphid species may be threatened as a result of displacement from their host plants by introduced species. For example, *Aphis nelsonensis*, not recorded for over 30 years, may have been displaced on *Epilobium* by *Aphis* nr. *epilobii*.

Indigenous aphids may be threatened by attack from alien parasitoids and predators including vespid wasps. At least one introduced aphid predator, the ladybird *Coccinella unidecimpunctata*, is reported to have displaced its indigenous counterpart, *C. leonina*, in many areas of New Zealand (Watts 1986) and probably includes indigenous aphids among its prey. A number of introduced parasitoids have been found to attack and kill several indigenous aphid species in the laboratory (Stufkens & Farrell 1994; Teulon & Stufkens unpubl.) and an introduced parasitoid, *Aphidius ervi*, appears to attack *Aphis cottieri* in the field (Carver 2000).

Climate change represents a significant threat to global biodiversity and ecosystem integrity, including New Zealand indigenous aphid species and their host plants. For example, a species of *Paradoxaphis* that lives on *Plagianthus* may be susceptible to rising environmental temperature. A constant level of 25° C in the laboratory will kill it (J. Kean pers. comm.).

Life-histories

Phylloxerids and adelgids produce only eggs whereas aphids usually produce live young, with eggs produced only at certain times of the year. Aphids are peculiar in that they reproduce without mating during most of the growing season of their plant hosts. Complex life histories involving both winged and wingless generations are characteristic of many species of aphids (Blackman & Eastop 1994). In New Zealand, introduced aphid species tend to follow the life-histories found in their area of origin but with some tendency for the overwintering-egg diapause stage to be lost and replaced by continuous parthenogenesis throughout the year (e.g. *Rhopalosiphum padi*). Although very

little is known about the biology of the indigenous aphids, sexual females, males, and/or eggs, indicating sexual reproduction, have been found in many of the Aphidini. *Neophyllaphis totarae* produces sexuales (sexual forms) and eggs in spring and early summer like some Australian species (Carver et al. 1991).

Ecological associations

All aphids, adelgids, and phylloxerids are phloem feeders and many are host specific. Most aphids are autoecious, living on one or a few closely related species of plants. Only about 10% are heteroecious, spending autumn, winter, and spring on a primary host plant and summer on a secondary host plant (sometimes more than one species) that is rarely closely related to the primary host plant (Dixon 1987). In general, introduced aphidoid species in New Zealand have similar associations with introduced plants as in their area of origin (Cottier 1953). Some introduced aphid species are also found on closely related indigenous hosts (e.g. *Cavariella aegopodii* on *Aciphylla*) and some polyphagous (having multiple host plants) aphid species are found on a number of indigenous plants (e.g. *Aulacorthum solani* on various species) (Cottier 1953). Indigenous aphids appear to be autoecious and mostly restricted to a single indigenous shrub or tree genus. Little is known about aphid–ant and aphid–microorganism associations in New Zealand.

Non-endemic and probably endemic species are prey to a number of generalist predators including ground beetles (Carabidae), ladybird beetles (Coccinellidae), lacewings, midges, nabid bugs, syrphid flies, and harvestmen and spiders (e.g. Valentine 1967a; Leathwick & Winterbourne 1984; Thomas 1989b). A large number of these predators, including the probable first purposeful attempt at classical biological control in New Zealand (*Coccinella undecimpunctata*), were introduced for control of aphids (Thomas 1989b). Braconid and aphelinid wasp parasitoids are known to attack a number of non-endemic species, which in turn are attacked by several hymenopteran hyperparasitoids (Valentine & Walker 1991). Some of these parasitoids were introduced as control agents for pest aphid species (Cameron & Walker 1989; Farrell & Stufkens 1990; Stufkens & Farrell 1994). A number of fungal pathogens from the Zygomycetes (Entomophthorales) have been recorded on aphids in New Zealand but no pathogenic viruses, bacteria, rickettsiae, protozoans, or nematodes (Glare et al. 1993).

It appears that most of the indigenous aphid species are hosts to hymenopteran parasitoids and hyperparasitoids but the taxonomic status of these has not yet been determined (D. A. J. Teulon unpubl.). A parasitoid very similar to the introduced biological control agent *Aphidius ervi* has been found to attack an indigenous aphid species (Carver 2000).

Gaps in knowledge

The total number of aphidoid species in New Zealand is about 130 (three adelgids, three phylloxerids, 124 aphids). There are at least 14 endemic aphid species of which at least six are undescribed. Only two endemic species have been described in the last 10 years (Carver 2000; Eastop 2001) but work is under way to describe up to three more in the near future. There is some uncertainty as to the exact identity of a number of introduced species (see below). Currently there are no New Zealand taxonomists working on this taxon.

Cottier's (1953) *Aphids of New Zealand* provides the most comprehensive information on New Zealand aphids but is now out of date. Teulon (1999) and Teulon et al. (1999) have developed illustrated multiple-entry keys for winged and wingless adult aphids in New Zealand for use by non-specialists. These focus on pest species and give no information about the phylogeny, biology, and ecology of New Zealand species.

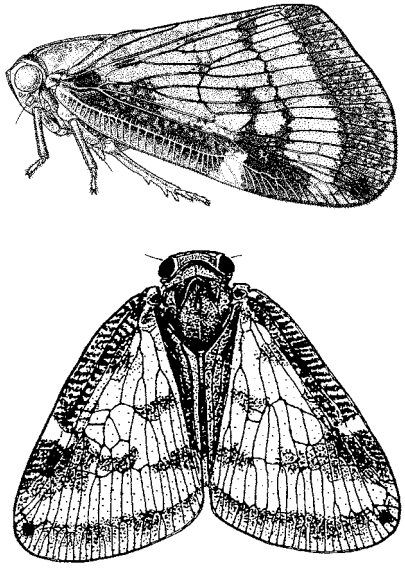
One of the main areas of concern regarding this group in New Zealand is the state of collections. The major one in the New Zealand Arthropod Collection has

Wingless specimens of an undescribed native species of *Aphis* on *Hebe*.
Robert Lamberts, Plant and Food Research

been neglected in recent years. Specimen names have not been updated and new material has not been incorporated. This, along with the absence of an aphidoid taxonomist in New Zealand, makes it difficult for non-specialist workers in this field, who have to resort to international experts for accurate identifications and other advice. This is unfortunate considering the importance of aphids, phylloxerids, and adelgids as pests in New Zealand. A database specifying the location of specimens in the numerous collections in New Zealand and overseas is near completion (http://www.landcareresearch.co.nz/research/biosystematics/invertebrates/nzac/tfbis/index.asp) and will be very useful for aphid workers.

For indigenous aphids, the most important areas for future work include naming of the remaining species, locating and identifying new species, and determining their evolutionary relationships with faunas elsewhere. Very little is known about the biology of any indigenous species (Kean 2002), including explanations for their rarity. For the introduced aphids, the main issues relate to the exact identity of several species (e.g. *Akkaia* ?*taiwana*, *Aphis* nr *epilobii*, *Micromyzus* nr *katoi*) and the makeup of several potential species complexes (e.g. *Aphis gossypii* group, *Rhopalosiphum insertum* group, *Therioaphis* sp.).

Studies on introduced pest aphidoids would aid in managing their populations in New Zealand and elsewhere. Notwithstanding, it is indigenous aphids that are of most interest. Understanding their evolution would have importance for reconstructing the phylogenetic relationships of the major Aphidoidea lineages worldwide. New Zealand's native species are a key to resolving the debate over why aphids are common in the Northern Hemisphere compared with the tropics and the Southern Hemisphere (Dixon et al. 1987; Heie 1994; von Dohlen & Teulon 2002). Indigenous aphids also provide excellent models for research on rarity and the impact of introduced faunas on indigenous faunas. A New Zealand Marsden-funded project – The Population Dynamics of Rarity: Why are rare animals rare? – using indigenous aphid species as model organisms, was completed early in the new millennium (see Kean 2002; Kean & Barlow 2004; Kean & Stufkens 2005). Some other research funded by the New Zealand Foundation for Research, Science & Technology is being carried out on the impact of introduced aphid parasitoids on indigenous aphids but this could be expanded to look at displacement of indigenous aphids by introduced aphids and the impacts of other introduced natural enemies such as predators and pathogens.



Alien passionvine hopper *Scolypopa australis* (Ricaniidae).
Des Helmore (upper) and Grant 1999 (lower)

Suborder Auchenorrhyncha: Cicadas, spittlebugs, leafhoppers, and planthoppers

This overview of New Zealand Auchenorrhyncha has been extracted from Larivière (2005) and Larivière et al. (2006–10), with slight modifications.

The Auchenorrhyncha is a highly diverse suborder of Hemiptera that includes the cicadas, spittlebugs, leafhoppers, treehoppers (infraorder Cicadomorpha), and planthoppers (infraorder Fulgoromorpha). As a group they account for a major component of the plant-feeding insect fauna in most terrestrial ecosystems in New Zealand and around the world. They have adopted a variety of life habits on nearly all continents and islands (except Antarctica). Auchenorhhyncha have piercing-sucking mouthparts and most species feed on plant sap (phloem or xylem) or the content of plant cells (cell ruptures or parenchyma) although a number of species feed on mosses and fungi. This is an economically important group of insects that includes several plant pests and vectors of plant diseases (e.g. pathogens, including phytoplasmas, bacteria, and viruses). The world fauna is estimated to include around 42,000 described species distributed in 30 to 40 families.

The first modern checklist of New Zealand Auchenorrhyncha was provided by Wise (1977) and it included 64 genera, 160 species, and 11 families. Auchenorrhyncha have been collected extensively since the 1970s and became well repre-

Families, genera, and species of NZ Auchenorrhyncha

Australian and world figures are from Carver et al. (1991), Fletcher (1999), and other sources as indicated. Numbers of endemic taxa are bracketed.
(Prepared by M.-C. Larivière and M. J. Fletcher.)

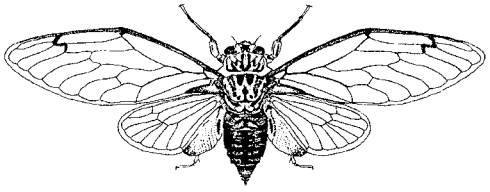
Family	New Zealand genera	New Zealand species	Australian genera	Australian species	World species
Achilidae	2 (1)	2 (1)	15	21	350
Aphrophoridae*	4 (1)	15 (12)	21[1*]	34[1*]	2,400
Cicadellidae	29 (6)	78 (54)	191[2]	603[2]	20,000
Cicadidae	5 (3)	34 (34)	38[3]	202[3]	2,000
Cixiidae	11 (9)	26 (26)	17	49	>1,000
Delphacidae	10 (5)	18 (14)	40	71	300
Derbidae	1 (0)	1 (1)	18	48	800
Dictyopharidae	1 (0)	1 (1)	4	12	540
Flatidae	2 (0)	2 (0)	22	84	1,000
Membracidae	1 (0)	1 (0)	29[2]	74[2]	2,400
Myerslopiidae	2 (2)	16 (16)	0	0	>20
Ricaniidae	1 (0)	1 (0)	11	29	360
Totals	**69 (27)**	**195 (159)**	**406**	**1227**	**>31,170**

Sources: 1. Evans (1966); 2. Day & Fletcher (1994); 3. Moulds (1990)
* Includes Machaerotidae, absent from New Zealand

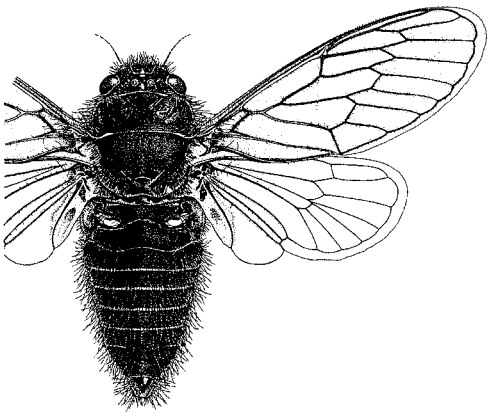
sented in New Zealand's entomological collections, leading to the publication of several taxonomic treatments since 1975. Larivière (2005) and Larivière et al. (2010, in press) provide the most up-to-date catalogue of this fauna, which now totals 68 genera and 196 species in 12 families. Once fully described, it is estimated that the fauna may comprise as many as 300–350 species.

Fabricius (1775) described the first native Auchenorrhyncha from New Zealand, the cicadas (Cicadidae) *Amphipsalta cingulata* and *Rhodopsalta cruentata*. Subsequently, until about the 1930s, several taxa were added to the fauna by European researchers such as Walker (1850–58) and White (1879a,b), and by two New Zealand workers, Hudson (1891) and Myers (1921–26). Little taxonomic discovery occurred during the 1940s and 1950s, although Evans (1941, 1942, 1947) and Hudson (1950) described a few leafhoppers (Cicadellidae) and cicadas (Cicadidae) respectively. The years from 1965 to 1984 were more prolific, resulting in several new taxa and important taxonomic revisions, mainly due to the efforts of Fennah (1965; Delphacidae), Evans (1966; Cicadellidae), Knight (1973–76; Cicadellidae), Fleming (1969, 1973, 1984; Cicadidae), Dugdale (1972; Cicadidae genera), and Dugdale and Fleming (1969, 1978; Cicadidae). The most recent period of active taxonomic research has occurred since 1992, as demonstrated by the following works: Hamilton and Morales (1992; Aphrophoridae), Larivière (1997a, 1999; Cixiidae), Larivière and Hoch (1998; Cixiidae), Hamilton (1999; Myerslopiidae genera), Emeljanov (2000; Cixiidae genera), Larivière and Fletcher (2004; identification of leafhopper genera and species), Szwedo (2004a; Myerslopiidae), Larivière et al. (2006–10), Larivière and Fletcher (2008; *Zeoliarus*, Cixiidae), and Fletcher and Larivière (2009; *Anzygina*, Cicadellidae).

Some groups or part of groups previously worked on are in need of further taxonomic research. A key to Aphrophoridae genera is urgently needed. The cicadellid genera *Arahura*, *Arawa*, *Horouta*, *Limotettix*, *Matatua*, *Novothymbris*, *Paradorydium*, *Scaphetus*, and *Zelopsis* need additional revisionary work. Knight's revisions of leafhoppers and Fennah's review of the Delphacidae need re-evaluation in view of large amount of new unidentified material accumulated in collections since the end of the 1970s. Four of five Cicadidae genera have never



Male chorus cicada *Amphipsalta zelandica* (Cicadidae).
From Grant 1999



High-alpine cicada *Maoricicada nigra nigra* (Cicadidae).
Des Helmore

been revised taxonomically. The available literature on Myerslopiidae and Ulopinae (Cicadellidae) is insufficient to provide a good understanding of these groups.

Compared to larger continental faunas, the New Zealand fauna may appear depauperate but New Zealand can still be regarded as a biodiversity 'hot spot' for Auchenorrhyncha with >80% of species and >40% of genera recognised as endemic.

Auchenorrhyncha are characterised by piercing-sucking mouthparts in the form of a beak extending from the back of the head – hence the name of this hemipteran suborder, which literally means 'neck-beaks', rather short and bristle-like antennae, and forewings of uniform texture, resting rooflike over the body.

These insects are generally active during the day and live from lowland to subalpine environments in a wide range of open or forested habitats. Native species usually live within the confines of natural habitats but some species also live in modified ecosystems. Depending on families and genera, species can be planticolous (occurring on low plants), arboreal (occurring on shrubs and trees), or sometimes epigean (living at the surface of the ground). Host plants are known for less than one-fifth of the fauna. The biology and morphology of immature stages are unknown for most species. There is anecdodal evidence of parasitic wasps, birds, predatory beetles, spiders, and mites being major natural enemies of New Zealand Auchenorrhyncha.

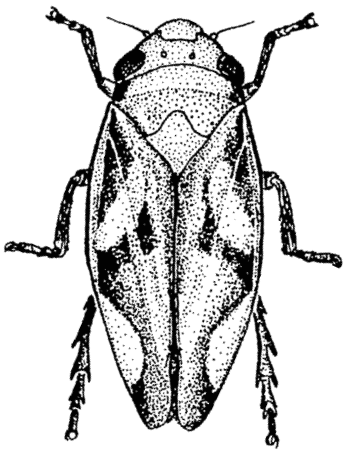
The described New Zealand fauna is about 13% the size of the known Australian fauna (about 1500 species), with 15 families present in Australia not represented in New Zealand. Twenty-four species (or 12% of the fauna) are currently recognised as introduced (adventive) in New Zealand. No family is endemic to this country but all ground-dwelling leafhoppers (family Myerslopiidae), or 70% of the world fauna, are endemic. The three most diverse families of Auchenorrhyncha in New Zealand are the leafhoppers (Cicadellidae), cicadas (Cicadidae), and cixiid planthoppers (Cixiidae). These families are also well represented in Australia.

The majority of species shared with Australia and elsewhere are cosmopolitan and probably introduced in New Zealand. Greatest faunal affinities are with eastern continental Australia and in the taxonomically diverse worldwide families Cicadellidae (leafhoppers) and Delphacidae (delphacid planthoppers). Faunal affinity is less between New Zealand and Tasmania or Norfolk Island, and even less so between New Zealand and Lord Howe Island or New Caledonia. These faunal relationships may be indicative of an old Gondwanan origin. Forty percent of native Auchenorrhyncha genera and 5% of native species are shared with Australia.

In terms of species distribution, a greater number of species (133) occur in the South Island, with 64 native species restricted to this island. A slightly lower number of species (119) occur in the North Island, with 44 native species restricted to this island. As many as 65 species are shared between North and South Islands. Offshore-island groups harbour a limited number of species: Chatham Islands (12) Kermadec Islands (10), and Three Kings Islands (21). Auchenorrhyncha are not known to occur on New Zealand's subantarctic islands.

On New Zealand's main islands, the North Island regions of Northland, Auckland, and Wellington and the South Island regions of Northwest Nelson and Mid Canterbury, show the highest overall species diversity but these regions contain many introduced species. The regions known to harbour the greatest number of local endemics – species only found in a single area and nowhere else in the world – are more interesting to the biologist. These regions are Northland and Wellington (North Island), northwest Nelson, Mid-Canterbury, Fiordland, and Southland (South Island). Fiordland is a largely unexplored and unspoilt area that may prove to be an even greater reservoir of endemic taxa than currently estimated.

The main trading ports or agricultural areas of New Zealand (Auckland, Hawke's Bay, Nelson, Christchurch) account for the greatest number of adventive (introduced) species, many of which have fully developed wings, a tendency to be attracted to lights, and an ability to adapt to life in partly or highly modified environments, hence they generally have good dispersal abilities.



Spittlebug *Carystoterpa* sp. (Aphrophoridae).
From Grant 1999

Infraorder Cicadomorpha

Spittlebugs (family Aphrophoridae) are not abundant in New Zealand. They are xylem-feeders. In many cases nymphs are visible as frothy masses or 'cuckoo-spit' on the stems of small trees or shrubs. This froth is used by nymphs either to reduce the risk of dehydration or to deter enemies such as parasites. *Carystoterpa* is a native genus with species occurring mostly in the North Island. *Carystoterpa* species are usually found on native trees and shrubs such as species of *Coprosma* (Rubiaceae). *Pseudaphronella jactator* is a North Island species and the largest New Zealand spittlebug. It usually occurs on trees and shrubs in montane and subalpine environments. Both genera are characterised by wide-ranging species with fully winged adults.

Cicadas (family Cicadidae) are probably among the most familiar New Zealand insects owing to their loud song at the height of summer. The fauna comprises 34 endemic species distributed among five genera. New Zealand cicadas occur in a wide range of habitats from lowland coastal areas to subalpine and alpine zones (e.g. coastal sand dunes, riverbeds, grasslands, scrublands, shrublands and native forests, exotic tree plantations, and garden and orchard hedges). Most forest species live in the North Island while the South Island is mostly characterised by cicadas of rocky open spaces. Clapping cicadas (*Amphipsalta* species) can often be heard singing in urban environments on garden trees, buildings, fences, and even lamp posts. The clay-bank cicada *Notopsalta sericea* can also be an urban dweller in the North Island, often signing from any sun-warmed flat concrete surface. The genus *Kikihia* is native to New Zealand and comprises 13 endemic species traditionally placed in three groups mainly based on habitat preferences – the shade singers, the green-foliage cicadas, and the grass and scrub cicadas. 'Kikihi', the stem-base of the name *Kikihia*, is the word generally used by Maori, who have a considerable body of nature lore concerning insects, to refer to cicadas in general. The black cicadas (*Maoricicada* species), with 14 endemic species, favour open habitats from montane to subalpine environments where they occupy a wide range of ecological niches.

The closest relatives of New Zealand cicadas are Australian and New Caledonian. The evolution of the New Zealand fauna appears to have originated from multiple dispersal events (at least two) across the Tasman Sea from Australia and possibly New Caledonia within the last 12 million years. More recently, approximately within the last five million years, speciation events led to the highly diverse genera *Kikihia* and *Maoricicada*, most likely through adaptive radiation in new habitats created by the rise of the Southern Alps and the last glaciations.

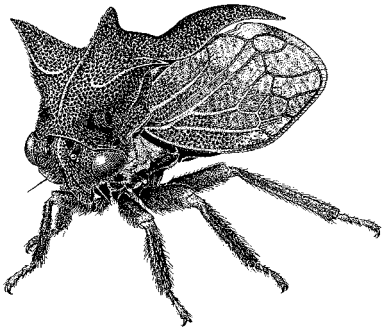
Cicadas mostly spend their life in the nymphal stage, underground, feeding on the roots of plants. Limited knowledge is available about life span but some species are known to spend three to five years as nymphs, and two to four months as adults. Parasitic wasps, predatory beetles, fungal diseases, kiwis and various other birds, as well as spiders are among the main natural enemies of cicadas and other Auchenorrhyncha.

The economic importance of cicadas is low, but when they occur in large numbers damage may be caused by the female creating open cuts in plant tissue where eggs are laid, thus providing suitable entry points for pathogens and boring insects. Mass emergences of cicadas can become an annoyance to workers in horticulture and forestry owing to work disruption by loud song and repeated contact with flying individuals.

Leafhoppers (family Cicadellidae) are the most diverse group of Auchenorrhyncha in New Zealand. They occur in almost every type of vegetation. For example, the genera *Arahura*, *Arawa*, *Horouta*, and *Limotettix* live predominantly on low plants, the genera *Scaphetus* and *Novothymbris* occur on trees and shrubs, and the genus *Paradorydium* is found on or very close to the ground surface. In general, leafhoppers living close to the ground surface are more frequently short-winged. Most New Zealand leafhopper genera feed on phloem sap, but introduced and probably also native members of the subfamily Typhlocybinae feed on plant tissue.

A handful of leafhoppers have an economic impact on crops in New Zealand – *Edwardsiana froggatti* (adventive) on pipfruits, *Ribautiana tenerrima* (adventive) on commercial berries, *Batracomorphus angustatus* (possibly adventive) on potato and tomato, *Anzygina dumbletoni* (possibly adventive) on strawberries and cane fruit, *Anzygina zealandica* (native) on grass in orchards, and *Eupteryx melissae* (adventive) on commercial aromatic herbs. *Nesoclutha phryne* (native) and *Orosius argentatus* (adventive) are recognised plant-disease vectors in Australia but not in New Zealand.

Ground-dwelling leafhoppers (family Myerslopiidae) are an ancient group of small southern-hemisphere leafhoppers living as adults and nymphs in leaf litter and other ground debris of forests with high organic content. Species are characterised by large heads, spined hindlegs, compact almost barrel-shaped bodies with extensions on head and thorax, and prominences and punctures on their hardened forewings and other parts of the body (usually encrusted with soil and litter particles offering nearly perfect camouflage with their surroundings). All species lack functional hindwings and active dispersal by flight is excluded for this family. Myerslopiidae are thought to feed on fungi from the decomposing leaf and soil debris in which they live. Two endemic genera are known from New Zealand, viz *Myerslopia* (eight species-group taxa) and *Pemmation* (12 species-group taxa), together accounting for 70% of the world fauna.



Alien treehopper *Acanthucus trispinifer* (Membracidae).
Des Helmore

Horned treehoppers (family Membracidae) are represented in New Zealand by a single species, *Acanthuchus trispinifer*, an Australian introduction. Membracids are usually sedentary but they are capable of jumping strongly if disturbed. Adults and nymphs are often gregarious (occurring in groups) and nymphs may be attended by ants.

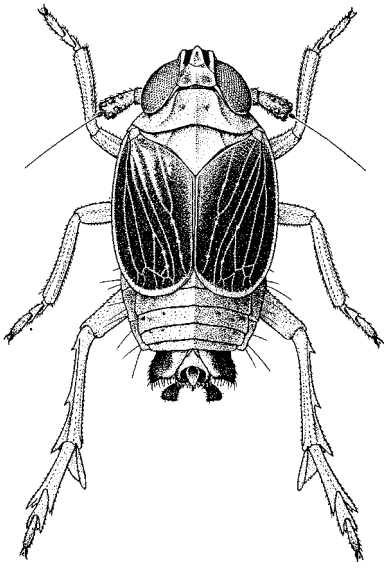
Infraorder Fulgoromorpha

Achilid planthopper (family Achilidae) nymphs may generally be found in logs, under loose bark, or in leaf litter. They are believed to feed on fungi. Adults feed on phloem. Females generally lay their eggs by attaching them to woody particles in the leaf litter or to soil debris. Little is known about the biology of *Agandecca annectens*, New Zealand's only native and endemic species. Adults have fully developed wings, which may assist in their dispersal.

Cixiid planthopper (family Cixiidae) nymphs are thought to live primarily underground and feed on plant roots. Adults are phloem-feeders. Females usually lay their eggs in the soil and surround them with a waxy secretion. The majority of New Zealand species appear to favour woody plants, a lesser number are associated with ferns, and very few species feed on gymnosperms. New Zealand cixiids inhabit forested or bush environments such as scrublands and shrublands, and range from coastal lowlands to the subalpine zone although most genera are found in lowland to lower mountain mixed podocarp-broadleaf habitats. The genus *Aka* possibly represents an older lineage with an evolutionary history closely associated with *Nothofagus* forests. *Semo* is strictly a subalpine genus with highly similar species displaying entirely separate distribution

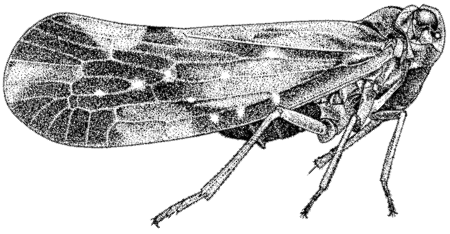
ranges, which may indicate relatively recent speciation. *Confuga persephone* is the only cave-dwelling species known from New Zealand. In this country, cixiid planthoppers are mostly characterised by fully winged forms, with a tendency towards brachyptery (short-winged forms) more strongly demonstrated in the genera *Aka* and *Chathamaka*. The main economic importance of Cixiidae is as vectors of plant diseases (e.g. *Zeoliarus atkinsoni*, on flax).

Delphacid planthoppers (family Delphacidae) may be the most economically important planthopper family in the world. Delphacid species feed on or transmit virus diseases to cereals, an important food source for humans. Adult delphacids feed on the phloem of grassy plants. Nymphs roam freely as do adults. *Toya dryope* is the only species currently recorded as adventive in New Zealand. The native biostatus of *Opiconsiva dilpa* is uncertain. However, neither of these species is recognised as a plant pest or plant-disease vector in New Zealand. *Nilaparvata lugens* is a vector of virus disease of rice in South-East Asia but there is no evidence of this from its New Zealand relative *Nilaparvata myersi*. Other species of Delphacidae are all endemic to New Zealand. Multiple wing forms can be displayed by single species, but most New Zealand endemics are brachypterous (short winged) or, in a few cases (e.g. *Sulix*), species may have well-developed forewings and vestigial hindwings. Consequently, dispersal power by flight is thought to be low for New Zealand delphacids.



Planthopper *Sulix tasmani* (Delphacidae).
Des Helmore

Derbid planthopper (family Derbidae) nymphs sometimes feed on fungi but most adults take their food from vascular-plant phloem. *Eocenchrea maorica* is the only native and endemic derbid so far known from New Zealand. Very little is known about the biology of this North Island lowland-montane forest species. Adults including newly emerged individuals (tenerals) have been found on *Astelia banksii* (Asteliaceae), which may serve as a food plant. Adults of *Eocenchrea maorica* have fully developed wings, which may assist dispersal.



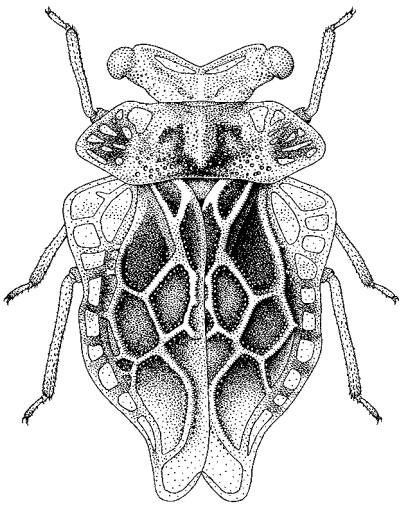
Treefern hopper *Eocenchrea maorica* (Derbidae).
Des Helmore

Dictyopharid planthoppers (family Dictyopharidae) are poorly represented in the Australasian region and, in New Zealand, by a single endemic species *Thanatodictya tillyardi*. Species of this genus, also occurring in Australia, have the head extending considerably in front of the eyes into a long process. All life stages feed on grass.

Flatid planthoppers (family Flatidae) occurring in New Zealand are Australian introductions. Nymphs produce abundant wax filaments and cement themselves onto hostplants. Adults have long wings, feed on the phloem of a great variety of vascular plant families, and are wide-ranging in New Zealand. *Anzora unicolor* is a vector of fireblight on apple and pear.

Ricaniid planthoppers (family Ricaniidae) are represented by a single species in New Zealand, *Scolypopa australis* (the passionvine hopper), an Australian introduction that occurs on a wide range of hostplants. It is a pest of vine crops (e.g. kiwifruit). In addition, *S. australis* sometimes feeds on poisonous plants (e.g. tutu, *Coriaria arborea*) ands secrete honeydew that, in times of low nectar supply, may be gathered by honey bees and incorporated into honey that then becomes poisonous to humans. *Scolypopa australis* is a fully winged species and disperses easily. It occurs in large numbers during the summer months and it is not unusual to find individual plants (native or exotic) covered by hundreds of individuals.

The Auchenorrhyncha catalogue of Larivière et al. (2006–10) provides extensive additional information on nomenclature (including colour photos of types), geographic distribution, natural history, wing condition (including dispersal power), and a bibliography of over 500 references.



The moss bug *Oiophysa distincta* (Peloridiidae).
Des Helmorre

Suborder Coleorrhyncha: Moss bugs

All living Coleorrhyncha belong to the family Peloridiidae or moss bugs, with 17 genera and 32 species known from New Caledonia, New Zealand, southeastern Australia, and southern South America (Burckhardt 2009; Larivière et al. 2010). They are generally viewed as a relict Gondwanan group that was probably represented by a much richer world fauna in the Upper Permian and Upper Cretaceous. The phylogenetic position of moss bugs within the Hemiptera has been controversial for a long time although, since the 1990s, a sister-group relationship with Heteroptera has been supported by a number of studies based on morphological and molecular evidence.

Peloridiids are minute cryptically coloured bugs of 2–5 mm body length and have been said to be probably the rarest and most remarkable of all Hemiptera (Helmsing & China 1937). They are characterised by a flattened body, areolate dorsal surface (head, thorax and forewings), and a transverse opisthognathous head (with receding 'jaws' or suctorial mouthparts positioned posteroventrally). Apart from one South American species displaying wing dimorphism (winged and wingless forms) all known peloridiids are wingless and consequently incapable of flight. This makes them ideal test-organisms to study Gondwanan dispersal and vicariance hypotheses.

Moss bugs are found in permanently moist habitats among water-saturated mosses, on which they feed, and liverworts, often in association with southern beech (*Nothofagus*). Practically nothing is known about specific relationships between peloridiid bugs and mosses, and possibly also liverworts. Other known biological and behavioural attributes of peloridiids include five larval instars (Estévez and de Remes Lenícov 1990), spring mating and overwintering eggs (Cassis & Gross 1995), and, as in other sap-sucking Hemiptera, endosymbiotic micro-organisms present in special mycetomes (Müller 1951; Pendergrast 1962; Schlee 1969) as well as, in *Hacheriella veitchi* (Australia), vibrational communication (Hoch et al. 2006) and jumping ability (Burrows et al. 2007).

The New Zealand fauna is 100% endemic, with three genera and nine species described, representing about 28% of the known world species.Very little is known of the distribution and biology of individual New Zealand species and there are a few additional taxa remaining to be described.

Evans (1981) published a general world review of this very special group of bugs, based on a limited number of specimens (approximately 600). Burckhardt (2009) has revised the taxonomy and phylogeny of the world fauna based on substantially more material collected by Evans or accumulated in museums (mostly outside New Zealand) since the 1980s. Burckhardt (2009) described two new species for New Zealand (*Oiophysa paradoxa* and *Xenophysella greensladeae*) and synonymised three others (*Oiophysa fusca* = *O. ablusa*; *Xenophysella dugdalei* and *X. pegasusensis* = *X. stewartensis*). He also provided keys, descriptions, and figures to all genera and species as well as basic information on geographic distribution and habitat.

The distribution of the New Zealand taxa is known only in very general terms. Three species (33% of the fauna) occur in both North and South Islands (*Oiophysa cumberi*, *O. pendergrasti*, *Xenophyes cascus*). Of these, *Xenophyes cascus*, also found on Stewart Island, is by far the commonest and most wide-ranging New Zealand species. *Oiophysa cumberi* and *O. pendergrasti* are so far known from fewer than 10 populations in the North Island (only one population in the case of *O. pendergrasti*). These two species – the only ones shared between both islands – have also been recorded from a few populations (only one in *O. cumberi*) around Takaka Hill near Nelson in the South Island. No species is so far known to be endemic to the North Island.

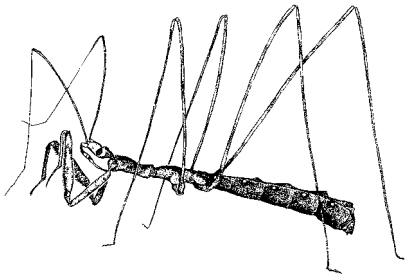
Published records suggest that three species (33% of the fauna), *Oiophysa ablusa*, *Xenophyes kinlochensis*, and *Xenophysella greensladeae*, are endemic to the South Island. *Xenophyes kinlochensis* and *Xenophysella greensladeae* have so

far been collected in a handful of locations around the greater Milford Sound area (Hollyford Valley, Key Summit, Routeburn Valley, Tutoko River Valley) and Secretary Island in Fiordland National Park (Burckhardt 2009; Larivière et al. 2010). *Oiophysa distincta* is shared between the southwestern areas of the South Island and Stewart Island. Two species (*Oiophysa paradoxa* and *Xenophysella stewartensis*) are endemic to Stewart Island. Peloridiidae have not been recorded from the Chatham Islands or from any of New Zealand's subantarctic islands.

The scope of Burckhardt's (2009) world revision did not allow him the opportunity to analyse critically the rather large amount of predominantly unidentified material deposited in New Zealand entomological collections and museums. This material is described in the most recent volume in the *Fauna of New Zealand* series (Larivière et al. 2010) and provides a comprehensive taxonomic treatment of the New Zealand fauna, including detailed information on distribution and biology.

Suborder Heteroptera: Bugs

The following overview of New Zealand Heteroptera and the end-chapter species list have been extracted from Larivière and Larochelle (2004) and Larivière (2005), with slight modifications.



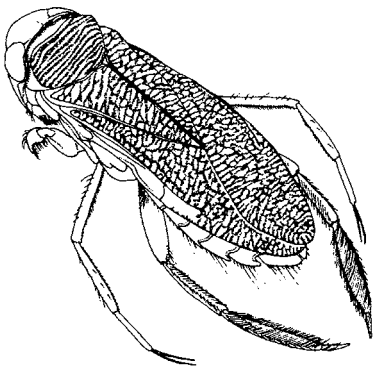
Antipodean assassin bug *Ploiaria antipodum* (Reduviidae).

From Grant 1999

Australasian and global diversity of Heteroptera

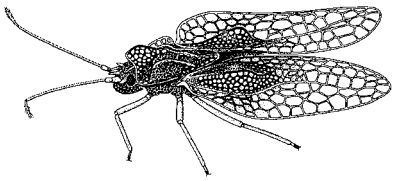
Australian and world figures are from Cassis and Gross (1995, 2002). Numbers of endemic taxa are bracketed (modified from Larivière & Larochelle (2004).

Family	New Zealand		Australia		World	
	Species	Genera	Species	Genera	Species	Genera
Acanthosomatidae	2 (1)	4 (4)	17 (12)	45 (43)	47	180
Aenictopecheidae	3 (2)	4 (4)	2 (1)	2 (2)	10	20
Anthocoridae	6 (1)	8 (4)	16 (5)	29 (19)	81	523
Aradidae	19 (12)	39 (38)	39 (18)	143 (127)	230	1,909
Artheneidae	1 (1)	1 (1)	1 (1)	2 (2)	8	20
Berytidae	1 (0)	1 (1)	6 (0)	7 (6)	36	172
Ceratocombidae	1 (0)	2 (2)	1 (0)	1 (1)	7	35
Cimicidae	1 (0)	1 (0)	1 (0)	1 (0)	23	108
Coreidae	1 (0)	1 (0)	43 (26)	83 (59)	252	1,802
Corixidae	2 (0)	6 (6)	5 (0)	31 (25)	36	556
Cydnidae	4 (1)	4 (1)	21 (9)	83 (76)	120	751
Cymidae	1 (0)	1 (0)	4 (0)	10 (6)	9	54
Enicocephalidae	3 (2)	4 (4)	3 (1)	5 (5)	50	180
Gerridae	1 (0)	1 (0)	10 (3)	29 (17)	69	586
Heterogastridae	1 (0)	1 (0)	3 (1)	5 (4)	23	97
Hydrometridae	1 (0)	1 (0)	1 (0)	6 (4)	7	119
Lygaeidae	4 (2)	33 (32)	22 (7)	81 (70)	101	972
Mesoveliidae	2 (1)	2 (1)	2 (0)	5 (3)	11	41
Miridae	39 (28)	115 (98)	91 (40)	186 (148)	1,300	9,800
Nabidae	2 (0)	4 (2)	7 (0)	22 (16)	31	380
Notonectidae	1 (0)	2 (2)	6 (2)	39 (25)	11	350
Pentatomidae	8 (1)	8 (1)	134 (94)	363 (333)	642	4,110
Reduviidae	3 (0)	7 (4)	100 (62)	226 (198)	961	6,601
Rhyparochromidae	22 (10)	42 (34)	75 (32)	185 (142)	368	1,824
Saldidae	1 (0)	7 (7)	3 (0)	10 (9)	28	274
Schizopteridae	1 (0)	1 (1)	13 (9)	61 (16)	42	221
Tingidae *sensu lato* (incl. Cantacaderidae)	4 (1)	1 (1)	56 (25)	147 (133)	250	2,025
Veliidae	1 (0)	1 (1)	4(0)	17(14)	46	673
Totals	**136 (55)**	**305 (249)**	**794 (390)**	**2,093 (1,734)**	**5,470**	**39,308**



Common water boatman *Sigara arguta* (Corixidae).

From Grant 1999



Lacebug *Tanybyrsa cumberi* (Tingidae).
Des Helmore

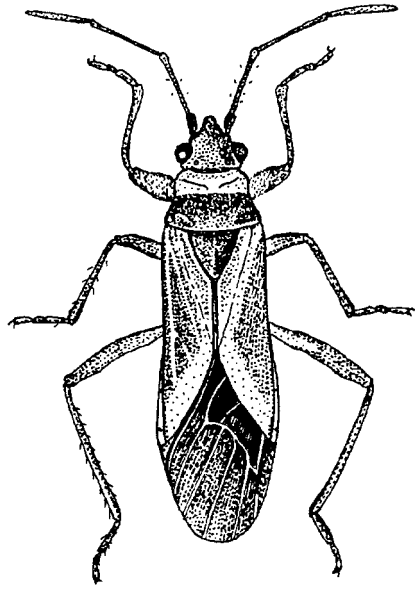
Around 37,000 species of true bugs are described worldwide, with possibly another 25,000 species remaining to be described (Schaefer & Panizzi 2000). The world fauna is divided into approximately 75 families. Better-known continental faunas such as those of North America, Europe, or Australia include thousands of species. By comparison, the New Zealand fauna – currently comprising 29 families, 138 genera, and 309 species – may appear relatively small, but what it lacks in size it makes up for in its uniqueness, with >80% of known species and 40% of known genera currently recognised as endemic. From this point of view New Zealand can be regarded as a biodiversity 'hot spot' for true bugs. Once fully described, the New Zealand fauna is likely to comprise 400 to 500 species.

The largest heteropteran families in New Zealand are the plant bugs (Miridae; 120 species or 39% of the fauna), rhyparochromid seed bugs (Rhyparochromidae; 42 species or 14%), flat bugs (Aradidae; 39 species or 13%), and lygaeid seed bugs (Lygaeidae; 33 species or 11%). In Australia, the four largest families are the stink bugs (Pentatomidae; 360 species or 18%), assassin bugs (Reduviidae; 226 species or 11%), flat bugs (Aradidae; 207 species or 10%), and plant bugs (Miridae; 186 species or 9%) (ABRS, 2009), but these numbers will change because large portions of the Australian fauna are still unrevised. The rhyparochromid seed bugs (Rhyparochromidae; 170 species) and lace bugs (Tingidae including 'Cantacaderidae'; 147 species) are also well represented in Australia. The largest heteropteran genus in New Zealand is *Chinamiris* (Miridae, 31 species). More than 30 unrevised heteropteran genera are currently represented in New Zealand by a single species.

Faunal affinities are greatest with southeastern continental Australia. A number of native taxa are also shared with Tasmania, Norfolk Island, Lord Howe Island, or southern Chile, suggesting a Gondwanan origin. The New Zealand fauna does not appear closely related to that of New Caledonia, with only a few generic and subgeneric level affinities supporting this relationship.

The New Zealand fauna is about 15% the size of the Australian fauna. More than 35 families present in Australia are not represented in New Zealand. New Zealand shares about 10% of its native true bug genera with Australia and only 5% of its native species. No family of Heteroptera is endemic to New Zealand.

Nearly all species of Heteroptera possess the following three diagnostic features – piercing-sucking mouthparts in the form of a segmented beak extending from the front of the head and running backward along its underside; slightly overlapping forewings lying almost flat over the abdomen; and each forewing base being much thicker than the tip (hence the name Heteroptera, derived from the Greek words *heteros* (different or other) and *pteron* (wing), referring to the non-uniform texture of the forewings).



Seed bug *Arocatus rusticus* (Lygaeidae).
From Grant 1999

The Heteroptera are the largest and most diverse group of insects with incomplete metamorphosis (hemimetabolous insects). Their life cycle involves an egg stage, a series of nymphs (usually 5), or growing stages that progressively look similar to the adult, and finally an adult stage.

The true bugs comprise a highly adaptable group that has managed to occupy most terrestrial as well as many aquatic and semi-aquatic habitats and to evolve remarkably diverse life habits on nearly all continents and most islands, suggesting a long evolutionary history for the group.

True bugs have been well collected in New Zealand and are well represented in entomological collections and museums. The first heteropteran species described from this country was the acanthosomatid stink bug *Oncacontias vittatus* (Fabricius, 1781). Subsequently, until the 1930s, most taxa were described by European workers, in particular White (1876–1879) and Bergroth (1927).

Renewed taxonomic activity from 1950 to 1970 yielded several new taxa and important revisions, mainly due to the efforts of Woodward (especially 1950, 1953, 1954, 1956, 1961) and Usinger and Matsuda (1959). These workers described more than 20 genera and 45 species in several families and provided

identification keys and detailed taxonomic descriptions. In addition, a number of other researchers described individual taxa from a range of families, which meant that by the end of the 1960s there were twice as many taxa known from New Zealand as there were 30–40 years earlier.

Much of the taxonomic effort between 1970 and 1977 was devoted to the family Lygaeidae *sensu lato* (Artheneidae, Cymidae, Heterogastridae, Lygaeidae, Rhyparochromidae, in this book). The solid contributions of Malipatil (especially 1976–79), particularly on the tribe Targaremini, are noteworthy.

The most active period of taxonomic description and revision, however, was still to come. Over the last 30 years or so the highly prolific work of one New Zealander, A. C. Eyles, especially on the families Lygaeidae and Miridae (e.g. Eyles 1990–2008) yielded more than 100 new species and several new genera. Other key publications are by Kirman (1985–1989) and Heiss (1990, 1998) who revised parts of the family Aradidae, Larivière (1995) who revised the Acanthosomatidae, Cydnidae, and Pentatomidae, Larivière and Larochelle (2004, 2006) who described the New Zealand Ceratocombidae and reviewed the genera of Aradidae, and Buckley and Young (2008) who updated the taxonomy of Corixidae.

As far as comprehensive taxonomic revisions are concerned, they currently cover approximately 175 species, or about 55% of the described New Zealand fauna. Consequently, apart from the Miridae, Lygaeidae, Pentatomoidea, and part of the Rhyparochromidae, all other families (>24) are in great need of modern revisionary treatment. Furthermore, so much new material has been collected and deposited in New Zealand collections in the last 30 years that numerous new taxa remain to be described, even in groups that have already been worked on.

Taxonomic works published until now generally deal with the adult stage. Less than 15% of described New Zealand Heteroptera have immature stages described. Only the last instar nymphs of Acanthosomatidae, Cydnidae, and Pentatomidae have been better documented, together with a few species of the superfamily Enicocephaloidea and the families Lygaeidae, Miridae, Rhyparochromidae, and Veliidae.

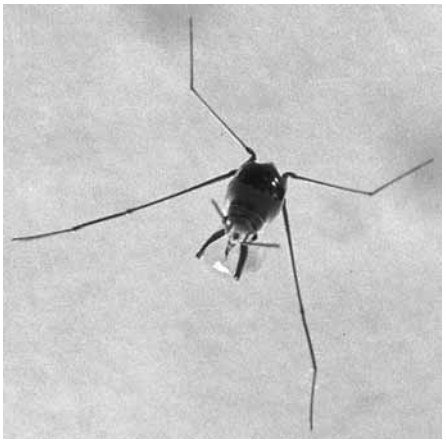
Identification keys are scarce. The most up-to-date keys to identify New Zealand Heteroptera at the family level are provided by *The Insects of Australia*, *Hemiptera* (Carver et al. 1991) and *A key to the bugs of Australia* (Elliott & Cassis 2001; LUCID key – http://www.faunanet.gov.au/).

Below the family level, identification is problematic and for most groups one has to rely on often inadequate original descriptions. With the exception of some recent works that include keys to taxa of Lygaeidae, Miridae, Pentatomoidea (Acanthosomatidae, Cydnidae, Pentatomidae), and Rhyparochromidae, the diagnostics literature is scattered. Eyles (2000b), however, provided a very useful overview of introduced Mirinae (Miridae).

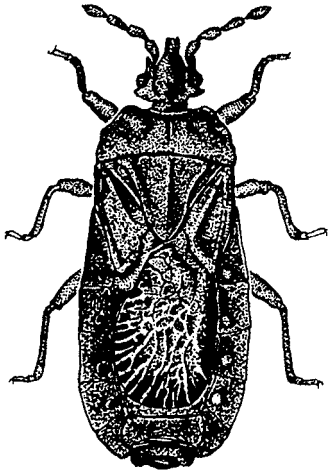
Keys to Heteroptera so far recorded from New Zealand are being prepared by Marie-Claude Larivière (Landcare Research, Auckland) and electronic versions will be made available on the internet (The New Zealand Hemiptera website – http://hemiptera.landcareresearch.co.nz).

The majority of Heteroptera families occurring in New Zealand are terrestrial. Less than 7% of the fauna is semi-aquatic (living on or near water) or aquatic (living in water). The only species of Gerridae occurring in New Zealand is the sea skater *Halobates sericeus*, a true bug living on the surface of the ocean. Terrestrial species can be either epigean (living on the ground), planticolous (living on low-growing plants), or arboreal (living on trees and shrubs).

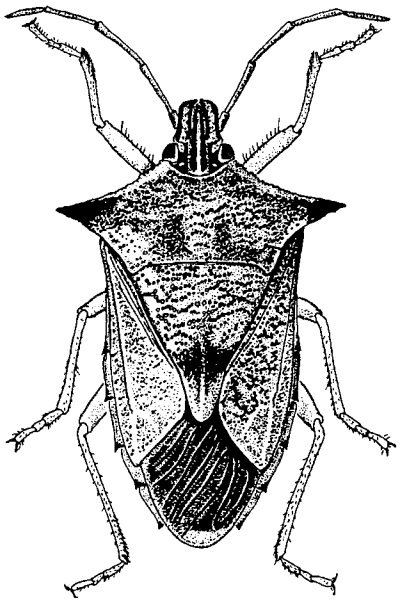
The two native terrestrial habitats harbouring the greatest number of species are forests and shrublands (in the lowlands and on mountains). Tussock grasslands and open subalpine environments also harbour their own suites of unique species. In general, native species tend to live within the confines of native habitats, but many species also survive in modified environments. Introduced (adventive) species seem to be able to invade natural habitats, but only to a slight degree.



Sea skater *Halobates sericeus*.
Lanna Cheng, Scripps Institution of Oceanography



Bark bug *Ctenoneurus hochstetteri* (Aradidae).
From Grant 1999



Schellenberg's soldier bug *Oechalia schellenburgii* (Pentatomidae).
From Grant 1999

Very few native species live exclusively in coastal lowlands. On the other hand, most coastal sand dunes, estuarine habitats, and coastal wetlands are typically inhabited by adventive species. Some adventive species are synanthropic (living around human dwellings).

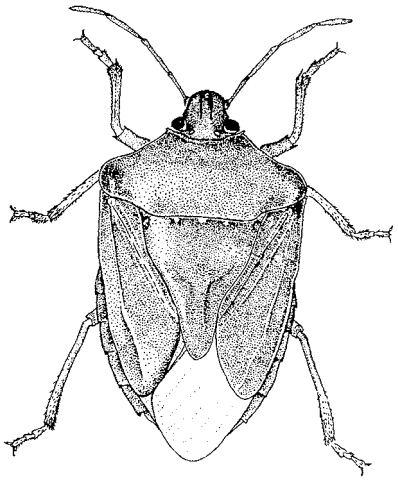
Very little is known about the life history of native true bugs. Host plants (the plants on which true bugs breed, develop, and feed) have been confirmed for less than one-fourth of known species, and mainly for seed bugs (Lygaeidae, Rhyparochromidae) and plant bugs (Miridae). Adults of Heteroptera are probably diurnal in most families. Although adult true bugs of most species are active for much of the year, their peak of activity is between November and March, i.e. the end of spring (September–November), summer (December–February), and early autumn (March–May). The seasonal activity of immature stages (nymphs) as well as the time of the year when adults mate and reproduce, are mostly undocumented. Population biology and means of dispersal remain virtually unknown.

The majority of Heteroptera found in New Zealand are phytophagous (plant-feeding), extracting sap directly from the plant vascular system (in most families) or feeding on seeds, developing fruits or flowers, or sometimes pollen. The majority of species of the flat bugs (Aradidae) feed on the mycelia or fruiting bodies of various wood-rotting fungi.

Almost all families of Heteroptera also include species that prey on insects and other arthropods. There are also entire families that are predominantly predatory (e.g. Anthocoridae). Only the introduced bed bug *Cimex lectularius* (Cimicidae) is haematophagous (feeding on the blood of vertebrates, including humans); there does not appear to be any evidence of disease transmission.

Little is known about the natural enemies of New Zealand Heteroptera. Hymenopteran egg-parasites, some birds (e.g. pipits, rooks, starlings), spiders, damsel bugs, ground beetles, and mites have been observed as enemies of some true bugs in New Zealand, but published observations are rare. Spiders could be the most important predators, especially in open habitats such as alpine environments and tussock grasslands.

In terms of economic importance, direct damage to crops or disease transmission by a single species may be lower in Heteroptera than in other major insect groups including the hemipteran suborder Auchenorrhyncha. Nevertheless, some native and adventive species have limited economic impact in New Zealand, e.g. the green vegetable bug *Nezara viridula* (adventive Pentatomidae) on vegetable crops, *Engytatus nicotinianae* (adventive Miridae) on tobacco, *Closterotomus norwegicus* (adventive Miridae) on various seed and vegetable crops, and *Nysius huttoni* (native Lygaeidae) on crucifers and wheat. However, species with pest status in other parts of the world, including neighbouring island countries and other parts of Australasia, represent potential biosecurity risks for countries like New Zealand that rely heavily on primary industry for their economy. For example, chinch bugs (*Nysius* species) and other species in the seed bug family Lygaeidae have historically been among the most destructive plant-feeding pests in several countries of the world. Consequently there is a constant need to update the inventory of New Zealand's and neighbouring faunas, through sustained fieldwork and taxonomic reassessments.



Green vegetable bug *Nezara viridula* (Pentatomidae).
From Grant 1999

As a group, Heteroptera can also serve humans and the environment in positive ways, especially those predatory species that can be useful biological control agents (e.g. in integrated pest-management programmes). As a general rule, predatory and zoophytophagous species native to New Zealand have not been investigated for use as biocontrol agents although true bugs belonging to the same families have been used overseas to control thrips, mites, moth eggs and caterpillars, leafhoppers, mosquitoes, and planthoppers.

Finally, seemingly economically unimportant groups of true bugs may be important to humans or to nature conservation. Aquatic and some semi-aquatic Heteroptera, for example, may prove important as foodstuffs for fish and as

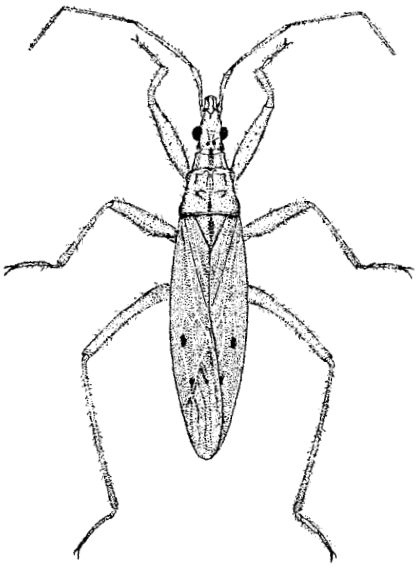
indicators of water quality. From an insect-conservation point of view, at least 130 endemic Heteroptera (42% of the total fauna) are known from 10 populations or fewer – many from the type locality only – and many of these species also live in habitats that are at risk or being lost or highly modified.

As for geographic distribution, about 73% of species occur in the South Island, although only around 25% of all native species are restricted to this island. A slightly lower number of species, about 68%, occur in the North Island, with about 20% of all native species restricted to this island. At least 45% of native species are shared between North and South Islands. Northland, Auckland, Wellington, northwest Nelson, and Mid-Canterbury are the regions currently showing the highest overall species diversity, taking into account several adventive species.

The areas of the country so far known to have the greatest number of local endemics are Northland, Wellington, northwest Nelson, and Fiordland. The warmer areas of New Zealand and its main trading ports and agricultural regions (Northland, Auckland, Gisborne, Bay of Plenty, Northwest Nelson, Mid Canterbury) include the largest number of adventive species. No true bugs have been recorded from the Antipodes Islands, Bounty Islands, Campbell Island, or Snares Islands.

Overall, about 25% of the fauna is flightless, but in flat bugs (Aradidae) and rhyparochromid seed bugs (Rhyparochromidae) flightlessness reaches 65–70%. Thus a large proportion of New Zealand species is limited in its dispersal abilities.

The Heteroptera catalogue of Larivière and Larochelle (2004) provides extensive additional information on nomenclature (including colour photos of types), geographic distribution, natural history, wing condition (including dispersal power), and a bibliography exceeding 1000 references.



Tussock damsel bug *Nabis maoricus* (Nabidae).
From Grant 1999

Order Thysanoptera: Thrips

Thrips are small slender insects with a tubular abdomen and mouthparts that punch and suck. Worldwide, there are almost 5000 species. They range in length from half a millimetre to 15 millimetres, but most are in the range of 1.5–2.5 millimetres. The short antenna has 6–9 segments and a pointed tip. The two pairs of narrow wings, when present, are quite distinctive. They are fringed with long hairs (Thysanoptera means 'fringed wing') and have only 1–3 longitudinal veins and a pointed tip. In only one family (Aeolothripidae) are there species with cross-veined wings. Wing size (full, small, wingless) quite often varies within a species, some of which have wingless males or females. Development is peculiar in that there are nymph-like early instars (stages between moults) but a pre-adult pupa stage. A large number of species feed on sap in flowers, but some are predacious and feed on smaller insects and mites.

There are two suborders, most easily distinguished by differences in the wings. In the Terebrantia, the wings have three parallel veins, the fringe hairs are socketed, and the wings lie parallel when at rest. In the Tubulifera, the wings lack veins, the hairs are not socketed, and the wings overlap when at rest.

The New Zealand fauna consists of 121 species, of which about 65 are endemic. The systematic work of Mound and Masumoto (2005) and Rugman-Jones et al. (2006) builds on the earlier revisions of Mound and Walker (1982, 1986). Most species in New Zealand are small, but the adventive *Idolothrips spectrum* reaches 10.5 millimetres long. Among the 65 native species, 17.2% are wingless in both sexes.

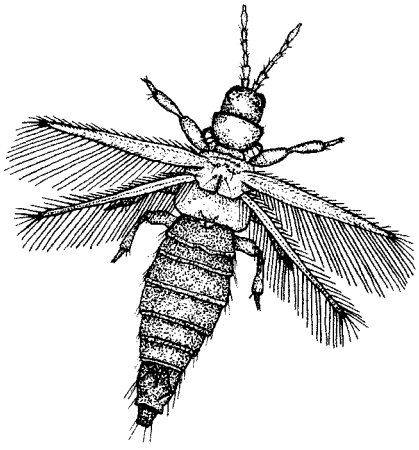
Endemism is relatively high in both suborders – 32% in Terebrantia and 69% in Tubilifera. These percentages may decrease, however, when the thrips of Australia (CSIRO 1991) and New Caledonia are more adequately investigated. *Desmidothrips* is an example of a genus shared between New Zealand and New Caledonia. The genus *Physemothrips*, with two species, is endemic to Stewart Island and the subantarctic islands. *Adelphithrips dolus* is endemic to the Snares

Australian bottlebrush thrips
Teuchothrips disjunctus.
From Grant 1999

Islands. None of the 11 species recorded from the Chatham Islands or the eight species known from the Three Kings Islands is endemic. No thrips have been identified from the Kermadec or Poor Knights Islands, where other orders have endemic species.

Some 47 species of herbivorous Thripidae and only three species of Phlaeothripidae feed on plants (see end-chapter checklist). They feed mainly on leaves but some species are abundant among flowers. Foliage and flower damage can become apparent as paler spots with dark speckles. Many of the species of Phlaeothripidae and the two species of Merothripidae dwell among leaf-litter or are found on dead twigs and branches. Analysis of gut contents shows that some genera feed on fungi. The three species of Aeolothripidae are apparently omnivorous, living on other immature thrips in flowers as well as feeding on the plants. *Haplothrips kurdjumovi* preys on moth eggs and mites in orchards. One of the alien species, the foliage thrips *Sericothrips staphylinus*, was deliberately introduced for release against gorse in 1990 and has become established (Hill et al. 2001; Hayes 2007).

Some native species, such as *Adelphithrips nothofagi*, *Thrips coprosmae*, and *Thrips phormiicola* are host-specific. Conversely, the New Zealand flower thrips, *Thrips obscuratus*, is found on at least 225 plant species (Teulon & Penman 1990) and is the main native pest species. Martin and Mound (2005) and Mound and Masumoto (2005) provided new well-defined host records for seven of the endemic species. The only introduced species found frequently among native vegetation is *Thrips tabaci.* Among four of the main pest species of the suborder Terebrantia, white backgrounds are preferred by *T. obscuratus* and yellow by *T. tabaci* and *Ceratothrips frici*, while foliage-feeding *Limothrips cerealium* shows no preference for different coloured traps (Teulon & Penman 1992).



Onion thrips *Thrips tabaci*.
Lincoln University

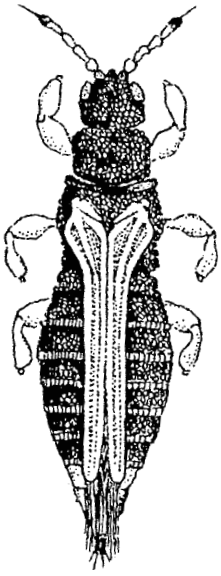
Several endemic species have been shown to have quite extensive distributions, but other species are recorded from only the type locality or a few places (Mound & Walker 1982, 1986). Beech forest has a greater diversity of Phlaeothripidae than broadleaf–podocarp forest (Mound & Walker 1986) and Evans et al. (2003) reported that species in this family favour soil under litter more than that under rotting logs in red beech (*Nothofagus fusca*) forests. The species of thrips and their diversity in some habitats remain unstudied. These include thrips of the grey shrubland (key taxa *Discaria toumatou* and *Olearia* spp.) of the South Island

Native *Thrips obscuratus* is a major pest of introduced plants, especially horticultural crops (Teulon & Penman 1990). Much damage is done to the surface of stonefruit, where white stippling and loss of colour can lead to rejection of fruit. There is zero tolerance for this pest in export fruit (McLaren & Fraser 2000). Populations gradually build up to an autumn peak on unsprayed trees (Teulon & Penman 1996; McLaren & Fraser 2001), but adults cause most damage during flowering while not affecting fruit set (McLaren & Fraser 2000). Reflective mulch has helped reduce populations in stonefruit orchards and carbaryl is the most effective spray (MacLaren & Fraser 2001). Thrips can also carry spores of the brownrot fungus (Ellis et al. 1988). This thrips is the main species among kiwifruit flowers, too, but on fruit and foliage the greenhouse thrips is the main pest (Tomkins et al. 1992). Post-harvest disinfestation may be needed to avoid rejection of cut flowers (Carpenter 1987) and other exported horticultural produce. *Thrips obscuratus* is apparently one of the main thrips species in lucerne (alfalfa) flowers (Macfarlane 1970, Teulon & Penman 1990), along with *Apterothrips secticornis* (Somerfield & Burnett 1976), but its role in disrupting pollination by consuming pollen remains unstudied.

Conversely, *T. obscuratus* is among the thrips species of broom flowers (Teulon & Penman 1990), where feeding on pollen may reduce pollen viability to some extent. Flowers of seed crops of red clover and white clover can be adversely affected by *Haplothrips niger* (Yates 1952), while the main thrips species in lotus seed crops remain unstudied. Timothy thrips (*Chirothrips manicatus*) may

be found on timothy and other grass seedheads, where it can cause considerable (but inadequately documented) damage to developing seeds (Doull 1956; Scott 1984). *Limothrips cerealium* is the main thrips of wheat, barley, oats, and ryegrass, but it is apparently less common in brome grass and ryecorn crops (Bejakovich et al. 1998). Grass thrips *Aptinothrips rufus* and the American grass thrips *Anaphothrips obscurus* can be common among grass or cereal crops (Cumber 1959a, Mound & Walker 1982), where they feed mainly on the foliage. Flower thrips *Frankliniella occidentalis* and the onion thrips *Thrips tabaci* can transfer tomato spotted wild virus (Scott 1984; Cameron et al. 1992). Both introduced species have a wide host range, but the onion thrips is of main importance as a vegetable pest (Scott 1984); it is of secondary importance among nectarines and peaches in the spring (McLaren 1992; Teulon & Penman 1994). Reducing litter and weeds in the crop helps control populations of several pest thrips of asparagus (Townsend & Watson 1984). The greenhouse thrips *Heliothrips haemorrhoidalis* is of most importance as a pest in citrus fruit (Scott 1984). Other ornamental plants adversely affected by thrips include bottlebrushes by *Teuchothrips* species and gladiolus by *Thrips simplex* (Mound & Walker 1982; Scott 1984). Thrips populations can particularly build up in greenhouses because of warm conditions and few natural pests, producing up to 12 generations in a season. Among greenhouse capsicums, flower thrips *Frankliniella occidentalis* has developed resistance to tau-flavinate spray (Martin & Workman 1994), so it is important to develop biological controls where possible. *Frankliniella intonsa* has been found in the Auckland area since 2002 on strawberries, dahlias, capsicum, and sunflowers (Teulon & Nielson 2005; O'Donnell pers. comm.). Of the two species, *F. occidentalis* has a much wider distribution, as evidence by monitoring of capsicum flowers (Teulon & Nielson 2005). The main impact of the gorse thrips, *Sericothrips staphylinus*, in the field is on seedlings and young plants (Hill et al. 2001).

The natural enemies of thrips in New Zealand include four native species of *Spilonema* wasps (Sphecidae) (Harris 1994a), which nest in holes in twigs. Hymenopterans are important in control – thrips nymphs may be parasitised by the introduced eulophid *Ceranisus* (Valentine & Walker 1991), thrip eggs by *Megaphragma* (Trichogrammatidae) (Mound & Walker 1982), and *Thripobius semiluteus* (Eulophidae) has been imported for control of greenhouse thrips (Froud et al. 1996). So far, two pathogens are known to affect the New Zealand flower thrips – the fungus *Entomophthora* and the nematode *Thripinema* sp. (Allantonematodidae) (Teulon et al. 1997).



Greenhouse thrips *Heliothrips haemorrhoidalis*.
From Grant 1999

Order Psocoptera: Psocids, booklice, barklice

There are about 5500 species of Psocoptera, which probably represents at most 50% of existing species. Only 69 species are so far recorded from what must be a much greater New Zealand fauna. On present inadequate data, the fauna appears to be a reduced Australian fauna with a New Caledonian connection in some groups. Psocoptera are now known to be important components of ecosystems, especially through their role in freeing resources locked in the microflora. Detailed information on biology and ecology of most species other than some European and North American forms is meagre.

Surprisingly few entomologists, whether professional or not, have more than a nodding acquaintance with the Psocoptera. This is probably because most general textbooks include somewhere in their introductory paragraphs some such statement as 'a little-known order of insects' and an 'order of small insects, from 1–10 millimetres in length' or some such equally discouraging statement. They are then usually referred to as booklice or barklice and the member illustrated is often a member of the very atypical genus *Liposcelis*, relegated to the status of 'a pest in houses and granaries' or some similar emotively inferred undesirable status. Even the author of the words that you are reading has been unwittingly

Liposcelis corrodens.
Landcare Research

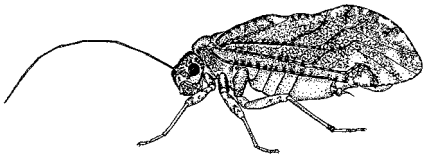
guilty of this type of denigration when preparing general texts. The truth of the matter is that, like most 'minor' orders of insects, there are many more species than most entomologists realise. Few species have pest status, they are often common in the field in a wide variety of habitats, not difficult to recognise or collect, and their biology poses many fascinating questions. Populations are at times extremely large, and many species are ecologically very important. Many are aesthetically very pleasing, a not-unimportant factor when many of the working hours of one's life are spent looking at them.

The 5500 described species of Psocoptera worldwide are currently grouped into more than 340 genera in 41 families (Lienhard & Smithers 2002). Estimates of the number of undescribed species cannot realistically be made on any logical basis at present, but intuitively there must be very many. There are already considerable numbers of undescribed species in some major museums and it is obvious that many smaller collections have undescribed species, too, which collectively could add many more species to the tally. Nearly 250 species are known from the Euro-Mediterranean region (Lienhard 1998), yet even in this otherwise well-worked part of the world many undescribed species have been found in recent years. There are several European countries for which the species list is very short. Considering that some parts of the world, such as South America, Asia, and much of Africa have very rich faunas in other insect orders, the relatively few species of Psocoptera that have been recorded indicates that there remains an enormous number of undescribed species to be collected and described. Until this is done, many of the most interesting problems associated with the order will remain unsolved.

There are 69 species listed here for New Zealand and its adjacent islands (including seven species probably not yet named). For comparison, in one study area of only just over 200 hectares in temperate eastern Australia, 78 species have been recorded. There is little doubt that there are additional species to come from the New Zealand region. This indicates the measure of neglect that has been accorded the Psocoptera in New Zealand and the ease with which interesting additions to the fauna would be found in a country that has as wide a range of altitudes, climatic regimes, and distinct ecological communities as New Zealand. We are fortunate to have an excellent general introductory account of the order that covers all the topics needed as background for their study, including collecting and study methods (Lienhard 1998). Perusal of this work will also soon reveal where the major gaps in knowledge lie.

Classification

The families of Psocoptera are currently grouped into three suborders, the Trogiomorpha, the Troctomorpha, and the Psocomorpha. This classification has been arrived at by modification of an outline sketch of a classification provided by Pearman (1936) that was far superior to any earlier scheme. In his outline, Pearman established a number of families without giving detailed definitions but with mention of a typical genus for each family. He did not erect formal superfamilies, but united families into a series of informal groups that he considered to indicate likely relationships. One of these, Homilopsocidea, contained families that he could not definitely place in his other groups. Roesler (1944) provided a very useful key to the genera, at the same time rearranging some genera in Pearman's suprafamilial groups and dispersing the elements of the Homilopsocidea. Unfortunately, the rearrangement obscured some relationships, but the work was a strong stimulus to studies of what had become a difficult group to approach. Badonnel (1951) used a classification that was a combination of those of Pearman and Roesler, with modifications suggested by other authors. Smithers (1972) proposed a more phylogenetically orientated reclassification but suggested at the time that, because so many psocopteran genera were still poorly known, it would be preferable to retain the earlier arrangement for practical descriptive purposes while the new arrangement could



Myopsocus australis.
From Grant 1999

be tested against additional information as it became available. Smithers (1972) also tabulated these classifications in relation to one another. Mockford and Garcia Aldrete (1976) made the first attempt at formal definition of superfamilies by erecting two of them (Asiopsocoidea and Caecilioidea) to replace one of Pearman's informal groups, the Caecilietae, thus setting a welcome trend towards formalising the classification of the Psocoptera in line with terminology of other insect orders. Continuation of progress in this process will depend on more information becoming available on the insects themselves.

History of studies on the New Zealand psocopteran fauna

Kolbe (1883) described the first psocopteran from New Zealand, the large *Myopsocus novaezealandiae*, which had already been described from Australia as *Psocus australis* by Brauer (1865). Hudson (1892) described *Myopsocus zelandicus*, which McLachlan (1894) considered to be the same as *M. novaezealandiae*. Hutton (1899) redescribed this species and Enderlein (1903) repeated Kolbe's description. Not much progress was made until Tillyard (1923a) added 15 new species from New Zealand and gave a general account (Tillyard 1926) of the fauna. Cumber (1958, 1959b, 1962) recorded species found in pastures and cereal crops in the North Island, and Cumber and Eyles (1961a) recorded psocids from fodder crops from the same area. Thornton (1962) discussed the generic position of two of Tillyard's species. Three species were recorded from Campbell Island by Smithers (1964). Smithers (1969) described 15 new species, added further new records for New Zealand, and provided keys to all the species from the New Zealand subregion, bringing the number of species to 43. Gressitt and Wise (1971) included Psocoptera in their discussion of the insects of Auckland Island, Smithers (1973) added a species from the Kermadecs, and Smithers (1974) gave a summary of records from subantarctic islands, including those relevant to New Zealand. Wise (1977) provided an up-to-date list of species from the subregion. Smithers (1999) described a remarkable new genus and species from the Bounty Islands and recorded the Trichopsocidae for the first time in New Zealand (Smithers 2002). Progress in species recognition in the fauna can be followed in the literature cited in the references. The list deliberately includes papers not specifically mentioned in the text so that it effectively forms a bibliography of the New Zealand Psocoptera which should facilitate entry into the literature by anyone wishing to study the group.

With such a small proportion of species known, it is obvious that almost any conclusions regarding the fauna as a whole must be considered very preliminary because the proportion of species still to be recorded is so high that new discoveries will inevitably have considerable influence on conclusions.

Distribution of New Zealand psocopteran species

New Zealand species can be placed in four groups based on their distribution. These are not rigid categories, because of overlap, but are convenient for discussing the fauna. New Zealand's offshore territorial islands – Chathams, Snares, Auckland, Campbell, Bounty, and Kermadecs are included in the discussion.

Species associated with humans (six species)

There are many species of Psocoptera that have become habitual inhabitants of man-made environments, such as granaries and domestic and commercial buildings. They are, of course, found elsewhere in the wild. They tend to be distributed worldwide and have been at least partly spread through human activities. In New Zealand these include *Cerobasis guestfalica*, *Lepinotus inquilinus*, *L. patruelis*, *Liposcelis corrodens*, and *Trogium pulsatorium*. There is no doubt that many more species of *Liposcelis*, a cosmopolitan and economically significant genus, are present in domestic situations and in stored products in New Zealand. They

simply await collection and identification, some of them having undoubtedly been listed in the past as *'L. divinatorius'*, a species that cannot be recognised from its description and of which the types cannot be found. A few species in this first group (e.g. *Psyllipsocus ramburii*) appear to have spread naturally to human habitations from habitats such as caves. This species is widespread in caves and has probably been transported by bats.

Naturally occurring widespread species (six species)
Some naturally occurring widespread habitats, such as dead leaves or leaf litter, are rapidly and regularly colonised by some species of Psocoptera without human assistance. In New Zealand, *Echmepteryx madagascariensis* (pantropical, especially associated with dead banana leaves), *Ectopsocus briggsi*, *E. californicus*, *Propsocus pulchripennis* (widespread in tropical and temperate countries), and *Pteroxanium kelloggi* (sometimes domestic), probably fall into this group. Some species of *Ectopsocus* have, however, been found in packaging materials, which suggests that they could also be spread with human assistance. In the case of *E. briggsi*, *E. californicus*, and *P. pulchripennis*, they occur so widely in nature that it seems unlikely that human intervention has necessarily been a major factor in their spread. *Peripsocus milleri* appears to be widely self-spread, living on the bark of twigs and stems of woody plants. *Cerobasis guestfalica* can also be included in this category on the basis of its very frequent occurrence in natural habitats.

Species common to New Zealand and Australia (17 species)
Species of limited distribution that appear to be native to the Australasian Region, and common to New Zealand and Australia (including Tasmania) and/or Norfolk Island, include *Aaroniella rawlingsi*, *Austropsocus hyalinus*, *Blaste tillyardi*, *Ectopsocus petersi*, *Haplophallus maculatus*, *Chorocaecilius brunellus*, *Philotarsopsis guttatus*, *Lepinotus tasmaniensis*, *Maoripsocus semifuscatus*, *Paedomorpha gayi*, *Paracaecilius zelandicus*, *Pentacladus eucalypti*, *Peripsocus maoricus*, and *P. morulops*. One of these (*E. petersi*) has also been found on Lord Howe Island. Of the remaining three species in this group, *Myopsocus australis* has a somewhat more extensive range that includes Norfolk Island, the Kermadecs, and the Solomon Islands. *Trogium evansorum* occurs in New Zealand and Norfolk Island but has not yet been found in Australia. These species appear to have evolved in the Australasian Region and to have undergone some limited dispersal within it, somewhat extended in the case of *M. australis*. It is not possible to decide which of these have dispersed naturally and which, if any, may have been spread by importation on commercial material such as timber or horticultural produce. This group can be considered as essentially Australasian in origin. The distribution of *Ectopsocus axillaris* cannot be easily categorized. It is known from New Zealand (on introduced pines), Tasmania, and Ireland, which strongly suggests human influence, but in which direction this might have taken place is impossible to determine. On present records, it appears to be fairly localised in all three countries (Smithers 1978).

New Zealand endemic species (31 species)
Apparent New Zealand region endemics are listed in the end-chapter checklist. They belong to the following 14 genera: *Austropsocus*, *Bryopsocus*, *Echmepteryx*, *Ectopsocus*, *Latrobiella*, *Maoripsocus*, *Mepleres*, *Pteroxanium*, *Rhyopsocus*, *Sabulopsocus*, *Sandrapsocus*, *Spilopsocus*, *Valenzuela*, and *Zelandopsocus*.

Affinities of the New Zealand psocopteran fauna
The first two species groupings (above) can be expected to throw little reliable light on the likely affinities of the New Zealand fauna. The first group comprises widespread species, easily dispersed by human action and closely associated with domestic, suburban, and industrial habitats. The second comprises species

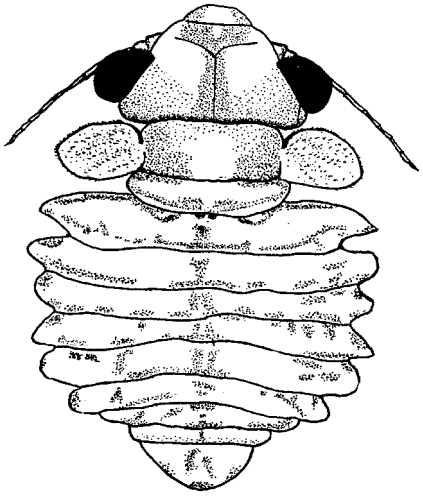
that habitually inhabit widely distributed ecosystems, which they can enter after natural long- or short-distance dispersal. They have probably not evolved in New Zealand or adjacent areas.

The third group comprises species that are not found beyond New Zealand or adjacent areas and have probably evolved within the Australasian region. The fourth group comprises probable endemics. The last two groupings can be expected to be the best indicators of faunal affinities. In reality, the fact that the New Zealand fauna is very poorly known makes any consideration of faunal affinities tentative at present. The faunas of Lord Howe Island and New Caledonia have also not yet been well documented for all families. The different psocopteran families are not equally represented in different parts of Australasia, making comparisons very unreliable because of the lack of equivalence of knowledge from group to group.

The two endemic species of Lepidopsocidae belong to a very large, mainly tropical, widespread genus, *Echmepteryx*. *Pteroxanium marrisi* from the Chatham Islands is the only species of the genus endemic to New Zealand – three others are endemic to Norfolk Island, another to Chile, and two to Mexico, in addition to the one worldwide, sometimes domestic, species. The only psoquillid in New Zealand (*Rhyopsocus conformis*) is an endemic member of an otherwise mainly North American family. It may well be a species that, while not yet recorded from its original country, was introduced to New Zealand and first recorded here, which is the case for a number of species in Europe and Kerguelen Island.

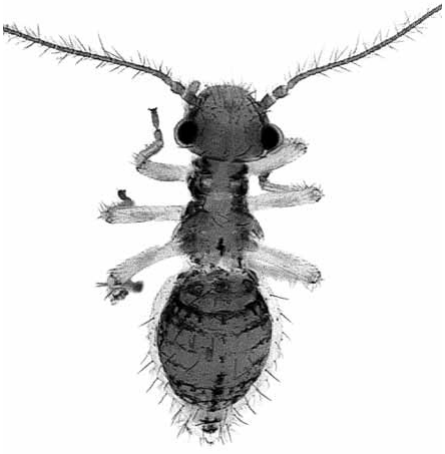
There is only one family endemic to New Zealand, the Bryopsocidae, which includes two species. It is clearly an offshoot of the Pseudocaeciliidae–Zealandopsocinae, discussed below. The Caeciliusidae (previously Caeciliidae) is a very large worldwide family. The relationships of the New Zealand species to those of other Australasian and Pacific areas are for the present unknown.

The Ectopsocidae is a family comprising species that mainly inhabit dried leaves. There are many species, with every zoogeographical region having its own complement of endemics. The New Caledonian fauna of this family has, unfortunately, not yet been fully studied. The New Zealand species of Elipsocidae are interesting – a large part of the family (subfamily Elipsocinae) is non-Australasian except for *Sabulopsocus*, a monotypic New Zealand endemic, and *Drymopsocus*, with three species in Chile and one in Australia. In the Propsocinae, two genera (*Kilauella* and *Palistreptus*) have undergone considerable speciation in the Hawaiian Islands. *Kilauella* may be closely related to *Drymopsocus* but the Hawaiian species of the group need closer study. *Pentacladus* is restricted to Australasia, with one species endemic to Lord Howe Island. *Sandrapsocus* is monotypic and apparently endemic to the Bounty Islands, the only known population being restricted to the few hectares of rocky, windswept Proclamation Island. *Spilopsocus* has species in New Zealand, Lord Howe Island, and Australia but, so far as is known, all are endemic to their own areas.



Endemic *Sandrapsocus clarki* from Bounty Island.
From Smithers 1999

There are no New Zealand endemics of Peripsocidae, a very widespread family. Neither this nor the equally widespread large family Philotarsidae, with one endemic in New Zealand, throw much light on faunal affinities. It should be noted that the Philotarsidae as presently constituted differs from that discussed by Thornton (1985) – the important genera *Austropsocus* and *Zelandopsocus* are now included in the Pseudocaeciliidae and his discussion of the Philotarsidae should be read with this in mind. The Pseudocaeciliidae–Zelandopsocinae includes three species of *Zelandopsocus* endemic to New Zealand, 27 endemic to New Caledonia, and one known only from Queensland. *Austropsocus,* the other genus in the subfamily, has eight species endemic to New Zealand, seven to New Caledonia, and 13 to Australia, with one found in both Australia and New Zealand. The Pseudocaeciliidae is otherwise a very large family with very strong Asian and Pacific Island representation. It does, however, indicate links between New Caledonia and New Zealand. The



Unidentified psocopteran.
Landcare Research

single New Zealand species of the extremely large worldwide family Psocidae also occurs also in Australia. The family can, for practical purposes, almost be considered absent from New Zealand, as is the case of the Myopsocidae, which also has a single New Zealand species. There is one unidentified species of Trichopsocidae known from New Zealand. The family is a small one, essentially western Palaearctic, with one other species in Chile and another in Australia and New Zealand.

Need for future work on Psocoptera

Considering the distributions given above, it would be unwise at present to make sweeping statements regarding the faunal relationships of the New Zealand Psocoptera. Thornton (1985) suggested that it is a 'reduced Australian fauna'. To this, perhaps, should be added: 'with the possibility of a New Caledonian connection'. There is clearly a need for a concerted effort to carry out the remaining descriptive taxonomy of the Psocoptera as a reliable basis for all other studies. In simple terms, it is necessary to find out how many and which psocopterans live in New Zealand and where they are found. The recent enormous interest in ecosystems and their sustainable management has resulted in an unprecedented number of faunal surveys. These are producing previously unheard-of quantities of material for taxonomic study. There is no reason to suppose that New Zealand is any less well endowed than any other part of the world so far as the Psocoptera are concerned.

It is known that many Psocoptera occur in very large populations. As a result, they are extremely important ecologically as grazers of microflora. The sheer bulk of this resource is not often appreciated, mainly because of the small size of its components. Psocoptera are prime intermediaries in the release of microbially derived nutrients into food webs. Psocopteran biology in general is very poorly known, so their ecological roles cannot be effectively quantified in any whole-ecosystem studies. Almost everything known (which is relatively little) about psocopteran biology and behaviour is based on work carried out in Europe and North America. There is remarkably little known about even elementary aspects of the biology of most of the species, so that what is known from the few case studies is applied uncritically to other parts of the world. In fact, there are many peculiar forms outside the Palaearctic Region, such as the morphologically unusual *Sandrapsocus clarki* from New Zealand's Bounty Islands and the wood-boring *Psilopsocus mimulus* from Australia.

There is a need for individual life-history studies to establish habitat and food preferences and behavioural interactions with other species. Closely related species of Psocoptera are sometimes found in very narrow habitats. These should prove fruitful areas for study of interspecific competition. There is a need for detailed studies in comparative morphology, only one species (European) having been thoroughly examined from this point of view. There are also interesting physiological phenomena displayed by psocopterans, such as the remarkable process of atmospheric moisture uptake involving their lingual sclerites (Rudolph 1982). Finally, phylogenetic studies and faunal comparisons are needed to understand the origins of the New Zealand taxa. Given that New Zealand has been an archipelago for much of its history makes it a potentially fruitful region to test hypotheses of island colonisation and the origins, importance, and functions of sexual polymorphism in adults.

All of these studies, however, rest squarely on a basis of sound taxonomy, which must, therefore, assume highest priority in planning research programmes.

Order Phthiraptera: Lice

Lice are wingless, highly modified, flat-bodied insects that live as obligate ectoparasites on birds and mammals, i.e. they spend their complete life-cycle on the host, being totally dependent on the heat, humidity, and secretions

produced by the host. Both adults and nymphs have a similar diet that, depending on the species, may be blood, feathers, skin debris, mucus, or serum (Marshall 1981). Their geographical distribution is, with some exceptions, that of their hosts.

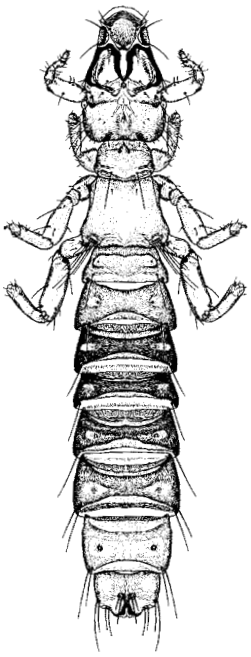
The name Phthiraptera is derived from the Greek *phtheir*, louse; the suffix *aptera* denotes winglessness. This highly specialised order probably evolved from psocopteroid ancestors. It is divided into four very different suborders – the Amblycera and Ischnocera (chewing or biting lice, previously grouped together as the Mallophaga), Rhynchophthirina (restricted to elephants and African hogs and also previously included in the Mallophaga), and Anoplura (sucking lice). More than 5000 species are known worldwide and there is a huge diversity of body form (Durden & Musser 1994; Price et al. 2003). Adults range in size from half a millimetre to 10 millimetres and males are usually smaller than females (Calaby & Murray 1991).

Because lice live as obligate parasites, their ecology, behaviour, and evolution are intimately linked to the attributes of the host; lice have developed morphological, behavioural, and physiological adaptations to survive on the host. Similarly, because lice are detrimental to host health and fitness, hosts have developed adaptations to control their lice (Murray 1990; Clayton 1991). This reciprocal natural-selection pressure has led to the co-evolution of hosts and lice (Clayton & Moore 1997). Thus the phylogenetic relationships of lice often parallel those of their hosts and may help both to elucidate the relationships of the latter and to distinguish closely related host taxa that are otherwise poorly defined.

A total of 347 identified species and subspecies of lice, belonging to 100 genera and subgenera in 13 families, have been recorded from birds and mammals in the New Zealand region and the Ross Sea area of Antarctica as defined in the Ornithological Society of New Zealand (1990) checklist (see Tenquist & Charleston 1981; Pilgrim & Palma 1982; Palma 1999; Palma & Price 2000, 2004, 2005). [Phthiraptera that may first have been recorded on birds in the Ross Sea area are included in the New Zealand checklist if their hosts range to the New Zealand EEZ.] This total represents about 7% of species worldwide. Only 29 species (8.42%) are endemic to the region (including one now extinct, in the *Rallicola* subgenus *Huiacola*, also extinct), while at higher taxonomic levels the degree of endemism is even lower (3%), with one endemic living genus and two endemic subgenera. Ninety species and subspecies (25.9%) have been introduced into the region, together with their hosts, by human agency.

As expected in a land where there are no native terrestrial mammals other than two bat species – neither of which is parasitised by lice – most of the New Zealand louse fauna is parasitic on birds. As many as 253 species (72.9%) live on native birds and 54 species (15.6%) on birds introduced by humans. In contrast, only four louse species (1.1%) parasitise the few native pinnipeds, with the remaining 36 species (10.4%) living on introduced mammals including humans. About 10 more louse species have been collected from native birds but have not been described yet. A much greater number of species is expected, however, especially from the considerable number of breeding and vagrant bird species that have not yet been sufficiently searched for lice.

Both chewing and sucking lice can have significant economic and health impacts. Heavy infestations on sheep, cattle, horses, goats, red deer, and poultry can cause anaemia and other conditions, resulting in production losses. Livestock have to be controlled by dipping or spraying with insecticides. Humans are not exempt from sucking lice. The head louse (*Pediculus humanus capitis*), a subspecies of the body louse, used to be found only in small, localised parts of New Zealand, but has been spreading in recent decades (Pilgrim 1975). Notwithstanding, archaeological evidence shows that, whatever recent introductions may have occurred, the presence of this louse in New Zealand predates European contact. Nits, the eggs of head lice, have been found attached

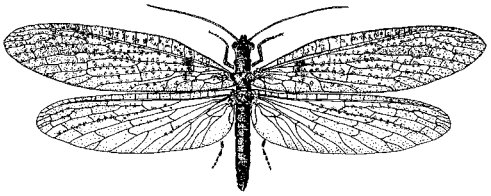


Male *Naubates thieli* from Providence petrel *Pterodroma solandri*, a vagrant species in New Zealand.

Ricardo Palma

Male of *Apterygon okarito* from Okarito brown kiwi *Apteryx rowi*.

Jean-Claude Stahl, Museum of New Zealand Te Papa Tongarewa

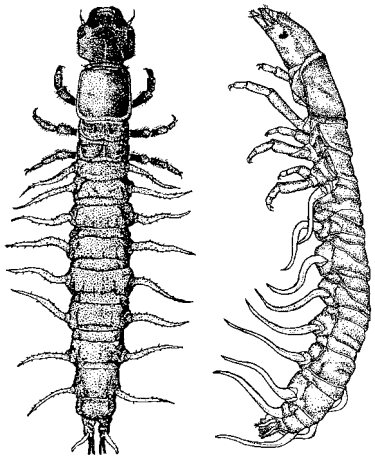


Dobsonfly *Archichauliodes diversus*.
From Grant 1999

to preserved Maori heads and bundles of hair, the latter from habitations dated at between 400 and 800 years ago (Savill 1990). There is a strong possibility that body and pubic lice were also present in pre-European populations. The latter species (*Phthirus pubis*), known as the crab louse from its stout, claw-like legs, is transferred during sexual intercourse. It is being found with increasing frequency in New Zealand, as in the rest of the world. Fortunately, it is not a disease carrier, though the body louse (*Pediculus humanus humanus*) has been associated with transmission of epidemic typhus (Calaby & Murray 1991).

Order Megaloptera: Dobsonflies

The Megaloptera ('great wing') are regarded as the most primitive of the holometabolous insects, i.e. those having a complete metamorphosis and three distinct life stages – larva, pupa, and adult. They used to be classified as a suborder of lacewings. This small order (ca. 300 species worldwide) is represented in New Zealand by only one species, *Archichauliodes diversus*. The flying adults are up to 40 millimetres long and the larvae, known as toebiters from their large mandibles, are of good size too, startling the discoverer when encountering them in streams. Dobsonfly adults are grey, unlike the four dark species of larger lacewings with broader wings (Osmylidae), and the prothorax is longer than mid- or hind thoracic segments. The four wings are flat and the veins delimit many (50 or so) small sectors (cells) but do not branch towards the end as in lacewings. The hind wings are broader at the base with an enlarged anal area that folds fanwise.



Dorsal and lateral views of the larva ('toe biter') of *Archichauliodes diversus*.
Left from Grant 1999, right from Winterbourn et al. 2000

Larvae are common in stony to gravelly streams, especially in shallower water, at temperatures that range from around 4.5 to 21.5° C (Hamilton 1940; Winterbourn et al. 2000). The sides of the larvae have finger-like gills. Adults begin flight at dusk and are noctural (Hamilton 1940). They are found in both partly wooded farmland (McGregor et al. 1987) and native hardwood bush, but are readily attracted to lights. The dobsonfly is widespread in North and South Islands and is found on those offshore islands that have dependable streams (Little and Great Barrier, Cuvier) (Riddell 1981; Wise 1983b, 1992a); none has been detected on the smaller Alderman and Poor Knights Islands (Watt 1982; Early 1995).

Larvae mainly consume *Deleatidium* mayflies or midges, but also capture various caseless caddisfly species (Devonport & Winterbourn 1976; Edwards 1986). Elmid beetles, their own larvae, and stoneflies are a very minor part of their diet. Hamilton (1940) and Edwards (1986) have provided further information on their biology. In turn, fish consume dobsonfly larvae. They constitute about 3.2 and 1.1% of the diet of Canterbury *Galaxias* and brown trout, respectively (Collier & Winterbourn 2000). Other galaxiids and some of the bully species apparently consume the larvae even less often. Notwithstanding, toebiters are the largest insects among the running-water species, so their contribution by volume to the diet of the smaller freshwater fish is more important than data on proportionate numerical consumption of stream insects would indicate.

Order Neuroptera: Lacewings

Although the Neuroptera ('nerve wing') is a relatively large order, with more than 4000 species worldwide, there are only 14 species in six families in New Zealand. Lacewings on the main islands have brown, dark brown, or grey wings of nearly equal size. The main veins define many (50–80) cells and have end branches. The antennae are thin and medium in size with many segments, while the chewing mouthparts are small. The larvae have prominent pincer mandibles (New 1988; Winterbourn et al. 2000) and consume mostly soft-bodied prey such as aphids.

Only eight of New Zealand's lacewing species are endemic, and new species are very unlikely to be discovered. The level of diversity of non-introduced

Species distributions and sources of information and figures of New Zealand lacewings

Species	Family illustrations	Distribution	References	Species
Cryptoscenea australiensis	Coniopteridae	N, S	8	3
Drepanacra binocula	Hemerobiidae	K, N, S, C	9	1, 8
Euosmylus stellae	Osmylidae	N, S, uplands	14	2
Heteroconis ornata	Coniopteridae	N	13	13
Kempynus citrinus	Osmylidae	N	14	2
Kempynus incisus	Osmylidae	N, S	14	2
Kempynus latiusculus	Osmylidae	N, S, uplands	14	2
Micromus bifasciatus	Hemerobiidae	N, S, St	12	1, 16
Micromus tasmaniae	Hemerobiidae	N, S, St, offshore islands	2, 3, 5, 6, 12	1, 9, 16
Protobiella zelandica	Berothidae	N, S	19	1, 15
Psectra nakaharai	Hemerobiidae	N, northern S	19	9, 10
Sisyra rufistigma	Sisyridae	N	19	17
Weeleus acutus	Myrmeleontidae	N, S	19	8, 18
Wesmaelius subnebulosus	Hemerobiidae	N, S, mainly lowland	19	1

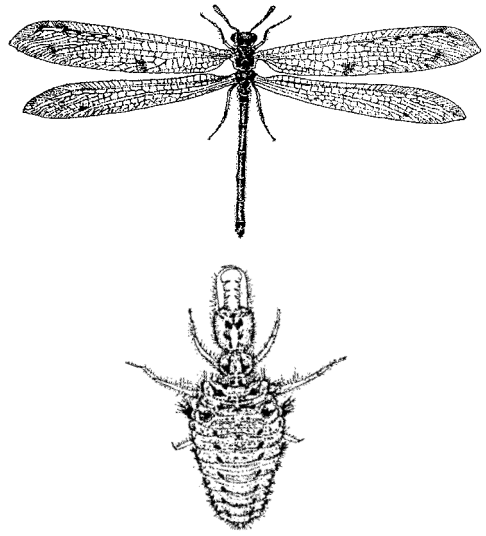
C, Chatham Island; K, Kermadec Islands; N, North Island; S, South Island; St, Stewart Island.
Sources: 1, Tillyard 1923b; 2, Kimmins 1940; 3, Cumber 1959a; 4, Cumber & Eyles 1961b; 5, Kimmins & Wise 1962; 6, Hilson 1964; 7, Macfarlane 1970; 8, 9, New 1983, 1988; 10–17, Wise 1973b, 1983a, b, 1988, 1992a, b, 1993, 1998a; 18, Grant 1999; 19, Macfarlane unpubl.

species is only a fifth of the equivalent diversity per square kilometre of Great Britain (Kloet & Hinks 1964) and is also low compared with Australia (CSIRO 1991). Although Wise (1992a) assessed other species in common with Australia as indigenous, he later inferred they were adventive (Wise 1995). This conclusion is supported by the co-occurrence in New Zealand of *Anacharis zealandica*, a parasitoid of the brown lacewings *Micromus tasmaniae* and *Drepanacra binocula* in both countries (New 1982; Valentine & Walker 1991). This parasitoid is the only member of its family (Figitidae) in New Zealand and was probably introduced, with its host, on plant material.

Wise (1992a) mapped the general distribution of the species in New Zealand and there are further location records and illustrations for the relatively uncommon *Protobiella zelandica* (Wise 1992b), the two *Micromus* species (Wise 1993), and *Sisyra rufistigma* (Wise 1998a). Four indigenous or adventive species inhabit the more remote offshore islands (Kermadecs: four species; Chathams: two species; subantarctic islands: two species).

Since its introduction prior to 1869, *Micromus tasmaniae* has become widespread within New Zealand and is certainly the commonest species of offshore islands, even those as small as the Alderman Islands (Early 1995). In the south, *M. tasmaniae* extends to the seldom-visited Antipodes Islands as well as the more regularly visited Auckland Islands. The possible lack of indigenous lacewings on the Three Kings and Poor Knights Islands could mean North Island offshore-island distribution resembles dispersal achieved by European bumble bees (Macfarlane & Gurr 1995). Both of these island groups were isolated from the main islands by moderate distances only in the last glacial period about 12,000 years ago, but this isolation is enough for there to be modest levels of endemic flies (Macfarlane & Andrew 2001) and beetles (Watt 1982). Introduced insect species are the main prey, but *M. tasmaniae* is associated with native aphids on *Olearia* shrubland (Derraik et al. 2001; Teulon unpubl.). Typical prey species include the main aphids of grassland and cereals (Valentine 1967b; Farrell & Stufkens 1990) and aphids in lucerne (alfalfa) before (Macfarlane 1970) and after the accidental establishment of three new species (Thomas 1977; Henderson 1980; Bates & Miln 1982; Leathwick & Winterbourn 1984; Rohitha et al. 1985).

Clovers are also associated with their distribution (Scott 1984; Cameron et



Adult and ant-lion larva of lacewing *Weeleus acutus*.
From Grant 1999

Tasmanian lacewing *Micromus tasmaniae*.
From Grant 1999

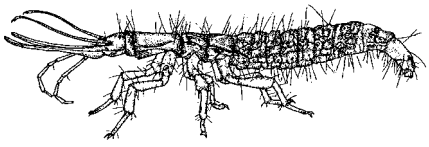
Kempynus incisus.
From Grant 1999

al. 1989). *Micromus tasmaniae* also occurs on fodder beet along with *Aulacorthum solani* and *Myzus persicae* (Pearson & Goldson 1980). In general, *M. tasmaniae* has been assessed as the most important enemy of these aphids, but the species also preys on mealy bugs, woolly apple aphid in orchards and vineyards, and aphids and the pine adelgid on conifers. The only recorded endemic prey other than aphids is the pittosporum psyllid on lemonwood (*Pittosporum eugenioides*). *Drepanacra binocula* is associated with endemic aphids on *Podocarpus totara*, the pittosporum psyllid on lemonwood, and accidentally introduced species (woolly apple aphid, spruce aphid, and pine adelgid) on apple trees and conifers. It can be associated with *Olearia* shrubland (Derraik et al. 2001), but is much less common in pastures and lucerne.

Three more Australian species have reached New Zealand in the last 30 years. *Sisyra rufistigma* was first found near Auckland in 1997 (Wise 1998a). The larva feeds on freshwater sponges (Spongillidae). *Psectra nakahari* was detected in Auckland in 1971 (recorded initially as *Sympherobius* (Wise 1988)) and is associated with wattles (Wise 1995). It reached the Manawatu (Canterbury Museum collection) and Wellington regions (Wise 1988) by 1986–87 and by 1996 it had spread at least as far south as Conway Flats (Canterbury Museum collection). *Heteroconis ornata* was collected from Auckland in 1988 (Wise 1988) and is assumed to have established (Wise 1992a). *Cryptoscenea australiensis* was first collected from Hastings in 1921 and has spread through the North Island and to Nelson (Wise 1963) and Christchurch (Canterbury Museum collection). It preys on mealy bugs on orchard trees and rushes and among undergrowth (Kimmins & Wise 1962).

These accidental introductions contrast with considerable efforts to establish green lacewings (Chrysopidae) in New Zealand, primarily against aphids (Cameron et al. 1989; Wise 1995). Between 1891 and 1928, importations of probably four *Chrysopa* species were made from the USA/Canada (five times) and Europe (once), as well as *Plesiochrysopa ramburi* from Australia (once) (Wise 1995). Six later importations of lacewings should have benefited from more rapid air transport that would have allowed them to arrive in better condition. *Chrysopa plorabunda* and *C. oculata* were imported from North America, and two releases were achieved against the oak aphid and aphids generally. Then *C. plorabunda* and *C. nigricornis* were imported again over three seasons between 1968 and 1976 for pasture and crop aphids (Cameron et al. 1989). Over 9000 Holarctic *Chrysoperla carnea* (= *downesi*) (Garland 1985) were sent from central British Columbia in 1927 for release against the pine adelgid or pine woolly aphid. In Europe, *C. carnea* inhabits decidous woodlands (Fraser 1959). Known prey that now exist in New Zealand include orchard pests (codling and oriental moth eggs, European red mite, and psyllid nymphs), cutworm eggs, and small caterpillars. It develops up to 20% faster on beetle eggs than on the aphid *Rhopalosiphum maidis* and greasy cutworm caterpillers (Obrycki et al. 1989), feeds on the early instars of grape mealy bug under bark (Grimes & Cone 1985), and is affected by its diet (Boszik 1992; Hodek 1993; Osman & Salmon 1996). Adults are nectar feeders, so release into evergreen, largely nectarless, pine forests may have been a major cause of this failure.

The type of vegetation and habitat is important for lacewings (Hodek 1993; Boszik 1994; Clark & Messina 1998). A lengthy shipment period and the strongly continental origin of *C. carnea* probably did not help either. *Chrysoperla carnea* of European origin was imported into New Zealand (Cameron et al. 1989; Wise 1995) for general aphid control, but *C. carnea* inhabits decidous woodland (Fraser 1959) so it is uncertain how well targeted the release sites were. Recent literature on electronic databases refers to *C. oculata* as predatory on aphids in sugarbeet and on apple trees. On the basis of suitable host availability, it is difficult to understand why green lacewing releases failed. Reviews of their role in biological control (Clausen 1978) and information on their biology (Carnard et al. 1984; Boszik 2000) may provide some alternative explanations. The extensive



Aquatic larva of *Kempynus* sp.
From Winterbourn et al. 2000

information on *C. carnea* also provides guidance on how to conduct ecological studies of this species, which may be useful if applied in the New Zealand context. A 1904 European importation of lacewings was possibly the source of the brown lacewing *Wesmaelius subnebulosus*. This species was not captured until 1920 (Wise 1995), but only when Tillyard (1923b) provided the means for species identification was it possible to distinguish the species. In Australia, *Plesiochrysopa ramburi* is among the commonest and widespread chysopodids, but there are few records of it from the colder uplands and Victoria (New 1980).

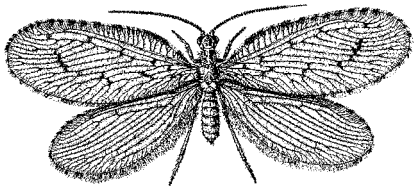
Since these introductions, extensive research and commercial rearing of *C. carnea* has been achieved (McEwan et al. 1999; Tauber et al. 2000; Vinkatensen et al. 2000). With this technical background, is *M. tasmaniae* sufficiently flexible in prey consumption of glasshouse and garden pests like rose aphids to merit research on its rearing? Also, is augmentative release of lacewings early in the season an option for control of certain crop pests, and can lessons from trials with *C. carnea* (Daane & Vokota 1997; Ehler et al. 1997) be applied or will the parasitoid *Anacharis zealandica* limit this possibility unduly?

Two species of *Mallada*, which are also green lacewings, inhabit the Kermadec Islands (Wise 1972a) and *Mallada basalis* has been recorded from Whale Island in the Bay of Plenty (Wise 1983b) while not yet being recorded from the mainland (Wise 1993). Also, a species of *Chrysopa* has been intercepted alive in Auckland (Wise 1988a).

Among endemic species, larvae of the four species of Osmylidae inhabit margins of streams, including the spray zone of waterfalls, where they shelter under stones (Winterbourn et al. 2000). In Britain, other osmylid species feed mainly on chironomids and other fly larvae (Fraser 1959). Larvae of the large antlion *Weeleus acutus* make pitfall shelters (Miller & Walker 1984) in sandy banks exposed to the sun (Hamilton 1921). Larvae feed on ants, flies, woodlice, spiders, and wetas. The adult is distinct from other Neuroptera because of the clubbed antenna, and the wingspan is up to 700 millimetres. *Protobiella zelandica* is associated with dead cabbage tree (*Cordyline australis*) and tree-fern foliage, but its prey is unknown (Wise 1992a). *Micromus bifasciatus* is associated with podocarp forest and mealy bugs (Wise 1993).

Lacewings are themselves prey of vertebrates. Most insectivorous bushbirds, for example the fantail *Rhipidura fuliginosa* (Moeed & Fitzgerald 1982), consume some. In more open country, known consumers of *Micromus tasmaniae* include rock wrens (*Xenicus gilviventris*) (Higgins et al. 2001).

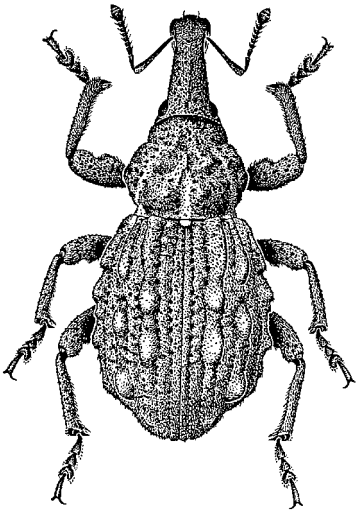
Identification of adults of the larger lacewing species between 25 and 35 millimetres long can be quite readily achieved by consulting Kimmins (1940) and Grant (1999). However, identification of the smaller brown species, which are 3–8 millimetres long, is not easy for several reasons – details of wing venation patterns are scattered in the literature and the Australian family key (CSIRO 1991) is unduly complicated and not very user-friendly for beginners. New (1988) provided keys and illustrations of the Hemerobiidae of Australia and hence a means of distinguishing three of the genera in this family that also occur in New Zealand.



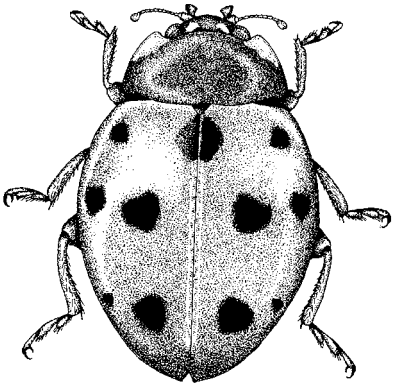
Protobiella zelandica.
J. Lyddiard, Auckland Museum

Order Coleoptera: Beetles

Beetles make up roughly one-fifth to one-quarter of the total insect fauna of the world and comprise one of the oft-cited cases of adaptive radiation of organisms. World estimates of the number of beetles vary, though there is general agreement that Coleoptera represent the highest number of described organisms. For example, Nielsen and Mound (1999) estimated 300,000 to 450,000 species worldwide. Calculating the total number of species is like counting stars, and indeed Grove and Stork (2000) emphasised that the question about the number of species overshadows more important questions about the taxonomy and biology of the species.



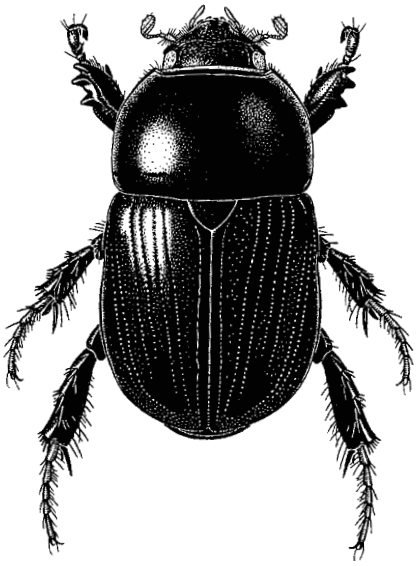
Canterbury knobbled weevil *Hadramphus tuberculatus* (Curculionidae), near extinction owing to habitat loss and predation by rodents.
From Young et al. 2008



Eleven-spotted ladybird *Coccinella undecimpunctata* (Coccinellidae).
Lincoln University

The order is well defined by having several diagnostic characters, of which the most distinctive is the hardened forewings, called elytra. It is from these that beetles get their formal name (*koleos*, sheath; *pteron*, wing). The elytra protect the more delicate hind wings and abdomen. During flight the forewings are opened enough to allow the hind wings to unfold and function. Other characters of beetles (see Lawrence & Britton 1994) include: holometabolous development (complete metamorphosis); adult antennae with 11 segments (sometimes fewer, or more in some Rhipiceridae and Cerambycidae); chewing mandibles that move in a horizontal plane; palp-bearing maxillae; well-developed prothorax that with the head forms a distinct tagma; body more or less dorsoventrally compressed so that leg bases (coxae) and the pleural region where they join the body lie ventrally; meta-sternum (hardened ventral part of hind thoracic segment) well developed with invaginated endosternite (cryptosterny); abdominal sternites typically more sclerotised (hardened) than the dorsal tergites and basal one or two sternites invaginated; and terminalia (genital and pregenital structures) usually enclosed within the apical segments of the abdomen. In larvae, the head capsule is complete and sclerotised with antennae and mandibulate mouthparts and the maxillae have well-developed palps; also the lip-like labium below the mouth lacks a silk gland and abdominal prolegs are usually absent. In the pupa, functional mouthparts are lacking (a condition known as adecticous) and the legs and wings are generally free from the body (exarate).

The oldest beetle fossil dates from 296 million years ago in the Mazon Creek (Illinois) deposit (Bethoux 2009) of upper Carboniferous (Pennsylvanian) age and since then the group has diversified globally into many different forms ranging in size from tiny featherwing beetles (Ptiliidae) as small as 0.3 millimetres long to giant Goliath and Hercules beetles (Scarabaeidae) well over 15 centimetres. The order is considered monophyletic (but see Whiting 2002a), although there are different opinions regarding the relationships of the Strepsiptera as a sister taxon to Coleoptera (cf. Kukalova-Peck & Lawrence 1993; Whiting et al. 1997). There are four suborders – Archostemata, Myxophaga, Adephaga, and Polyphaga. The latter two suborders comprise 99% of all beetles and the Archostemata are the most primitive group. No Archostemata or Myxophaga occur in New Zealand. Evolutionary relationships among the suborders are contentious (Beutel & Haas 2000; Caterino et al. 2002) and a full analysis using all available characters is warranted. There are at least 167 extant families and over 450 subfamilies contained in Coleoptera worldwide (Lawrence & Newton 1995), but new higher taxa are recognised annually, including at the family level.



Black beetle *Heteronychus arator* (Scarabaeidae).
Des Helmore

The New Zealand beetle fauna

Most of the New Zealand beetle taxa were described between 1880 and 1923 by Thomas Broun, who named a total of 4323 species. His descriptions were based to a large extent on single specimens collected in the North Island lowlands, while the considerably more varied South Island fauna, in particular the rich but then still largely unknown subalpine and alpine component, had only scanty treatment. Hundreds of native and foreign species have since been added, though many groups require detailed taxonomic study, especially since there are many undescribed species and some that are incorrectly assigned to northern-hemisphere Holarctic genera.

In the absence of a full compilation of beetle species (such as that given in the end-chapter checklist), attempts were made in recent decades to estimate the total number of described and undescribed species in New Zealand. Watt (1983) estimated 4300 species, while Klimaszewski and Watt (1997) estimated over 5223 species and Emberson (1998) 6740 species. Based on the number of beetle species and potential host plants recorded in the Lynfield Survey in suburban Auckland, Kuschel (1990) estimated that 10,000 to 10,500 species are likely to occur in the fauna. Leschen et al. (2003) published a checklist of the known coleopteran genera of New Zealand, arriving at a total of 1091 in 82 families

and 180 subfamilies. The species tally currently stands at 5479. The most diverse families in New Zealand are Staphylinidae (1232 species), Curculionidae (1225 species), Carabidae (557 species), and Zopheridae (191 species). These groups are also well represented in other parts of the world. The least diverse families, with one endemic species each, are Eucinetidae, Heteroceridae, Phycosecidae, Cucujidae, Prostomidae, Chelonariidae, Bostrichidae, and Monotomidae. The latter three families contain monotypic genera that may be primitive members of their group.

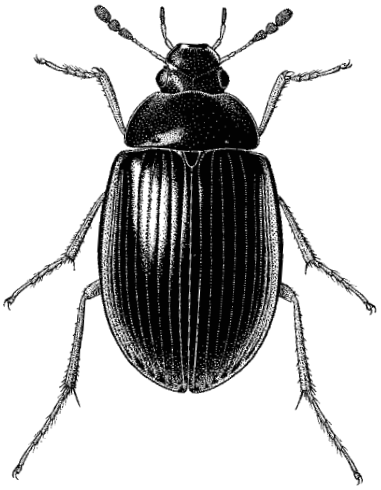
The fauna of New Zealand is disharmonic, consisting of ancient lineages that have been present long before the break-up of Gondwana and more-derived lineages and species that have arrived more recently from elsewhere (mainly Australia, the Pacific, Asia, and Indonesia). Very old amphitropical or bipolar groups are found in New Zealand and include broscine Carabidae, Derodontidae, and Byrrhidae, to name a few (Crowson 1980). Only one endemic family is present in New Zealand (Cyclaxyridae), but there are other groups representing more widespread Gondwanan elements. For example, the family Chaetosomatidae occurs only in New Zealand and Madagascar, and there are many examples of other family-group taxa found in New Zealand, southern South America, Australia, New Caledonia, and South Africa (e.g. migadopine Carabidae, camiarine Leiodidae, Cavognathidae, priasilphine Phloeostichidae, and Chalcodryidae).

Areas of endemism have not yet been established for New Zealand Coleoptera, but it is quite evident that certain groups are regionalised (Campbell Plateau, northwest Nelson area of the South Island, northern North Island, offshore islands, etc.) or restricted to certain communities (sooty moulds, *Nothofagus* forests, caves, and tussock grasslands).

With so many beetle species in New Zealand, it is clear that they will have significant ecological roles, economic impacts, and interesting stories to tell, and such is the case. Take, for instance, ladybirds (Coccinellidae), among the most commonly encountered and appreciated beetles. Several species are used in biological control, as they feed on aphids, mites, or scale insects. Probably the most successful is the cardinal ladybird *Rodolia cardinalis*, which reduced cottony cushion scale, a serious pest of citrus, to very low levels.

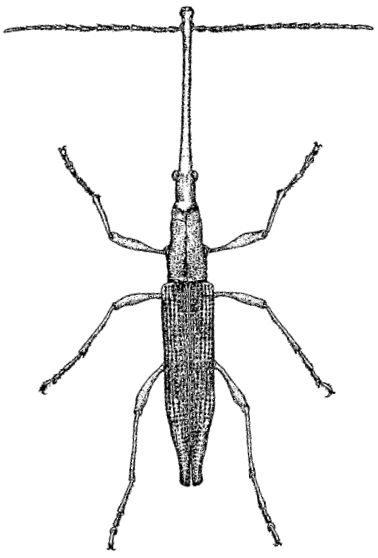
The tough forewings, the elytra, are probably one of the major contributing factors in the successful diversification and radiation of beetles into habitats that other insects with fragile, exposed wings cannot occupy. Beetles are also less vulnerable than other insects to predators and to weather in exposed situations. The elytra are also important in reducing water loss in dry conditions. New Zealand beetles are found in a wide range of situations, from beach sands to alpine heights, and, while the fauna of lakes, ponds, and streams is relatively small, a variety of species can be found in wet leaf axils of plants, saturated moss, and moist soil. Almost all native beetles are endemic, having evolved in isolation in New Zealand or are the sole survivors of groups that have died out overseas. Native species have suffered from habitat loss and very few have adapted themselves to modified landscapes, pastures, crops, and gardens. Most beetles in these situations have been introduced, usually accidentally, from overseas.

The longest New Zealand beetle is the slender giraffe weevil (*Lasiorhynchus barbicornis*), up to 80 millimetres long, but the heaviest is probably the huhu (*Prionoplus reticularis*). The smallest, around half a millimetre in length, are feather-winged beetles. The largest group of predatory beetles is the ground beetles (Carabidae). Many are large, powerful, and flightless, with small or vestigial hind wings and sometimes fused elytra (e.g. *Ctenognathus*, *Holcaspis*, *Mecodema*, *Megadromus*). Walking is their only means of dispersal so their geographic distribution tends to be limited. The presence of some flightless beetles on both the mainland and offshore islands is helpful in formulating hypotheses on the history and isolation of the islands. Some species of *Megadromus* and also *Plocamostethus planiusculus* appear to be unique among ground beetles in showing some degree of parental care (Watt 1974).



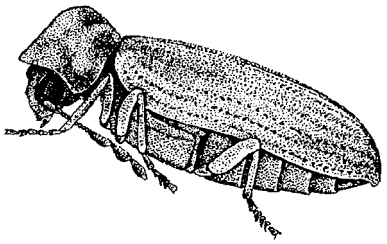
A terrestrial 'water' beetle *Rygmodus tibialis* (Hydrophilidae).

Des Helmore



Male giraffe weevil *Lasiorhynchus barbicornis* (Brentidae).

From Grant 1999

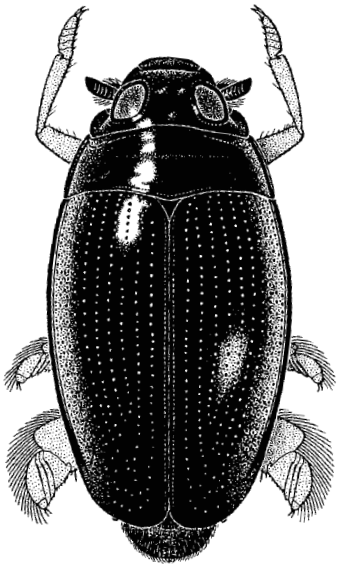


House borer *Anobium punctatum* (Anobiidae).
From Grant 1999

Rove beetles (Staphylinidae) are another important family of predatory beetles, as are tiger beetles (Cicindellidae), the larvae of which (known as penny doctors) inhabit tunnels in clay banks or sand waiting for unsuspecting prey, typically other small arthropods. Wireworms, the larvae of Elateridae (click beetles) are frequently predatory but can also feed on roots. Some beetles are parasites, like the larvae of *Bothrideres* (Colydiidae), which are external parasites on lavae of wood-boring beetles.

Mention wood-borers, and the tiny, brown introduced borer beetle *Anobium punctatum* comes to mind. Its galleries in timber and furniture cause great damage and the holes from which the adult emerges are unsightly. Yet, in its native habitat it serves an important role in breaking down dead wood too dry to support wood-rotting fungi. Other introduced borers include pine-bark beetles (*Ernobius mollis*, *Hylastes ater*), the powder-post beetle *Lyctus brunneus*, keyhole ambrosia beetle *Xyleborus saxeseni*, and pinestump longhorn beetle *Arhopalus ferus*, all from Europe. There is also an introduced Australian group of species, associated with eucalypts and acacias, including five species of longhorns, two ambrosia beetles, a bark beetle, and a weevil. There is also a Californian bark beetle (*Phloeosinus cupressi*) that infects macrocarpa and other cypresses (Watt 1974). It should not be assumed that all New Zealand's anobiids and other borers are exotic, however. Three native species – *Anobium magnum*, *Capnodes griseipilus*, and *Dorcatoma oblonga* – may occur in buildings, though normally they break down wood in decaying stumps of native trees. Other native borers include include two species of Buprestidae (jewel beetles). Larvae of *Nascioides enysi* mine galleries in the bark and sapwood of recently dead or felled *Nothofagus* species, and those of *Neocuris eremita* in *Nothofagus* and *Pittosporum* (Milligan 1975).

The main beetle families of aquatic habitats in New Zealand are the Dytiscidae, Hydrophilidae, Elmidae, and Hydraenidae. Dytiscids (diving water beetles) are aquatic in adult and larval stages. They are carnivorous and closely related to the Carabidae from which they are derived. The hind legs are flattened and paddle-like, acting like a pair of oars. Most dytiscids are able to fly and if they cannot find a suitable water body immediately they can survive without it. The New Zealand species include large-bodied forms that are related to Australian species. For example, New Zealand's largest dytiscid, 26mm-long *Homoeodytes hookeri* is closely related to two species in Australia. The common black water beetle *Rhantus pulverosus*, 10 millimetres long, is cosmopolitan. There are also small subterranean species, found in groundwater, that are among the world's most primitive water beetles. The name Hydrophiliidae ('water-lovers') notwithstanding, many members of this family are terrestrial. The aquatic species feed on decaying vegetation, are somewhat sluggish, and do not have modified legs for swimming. Elmids are small, elongate, crawling beetles of stream and river bottoms but are also very active fliers. Hydraenids are minute aquatic beetles living among dead leaves and algae, though one genus, *Meropathus*, is wholly terrestrial. The New Zealand fauna has not been well studied (Ordish 1975).



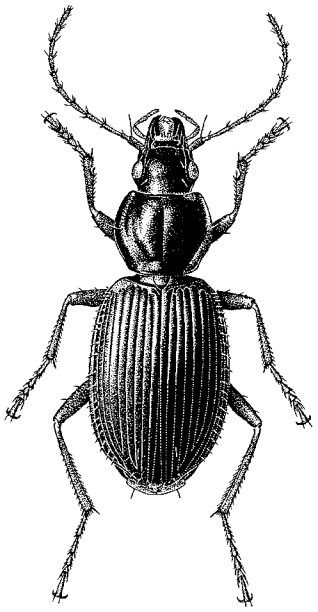
Whirlygig beetle *Gyrinus convexiusculus* (Dytiscidae).
Des Helmore

Shelf and bracket fungi are home to a diverse range of beetles. Most of these feed on the fungus itself, its spores, or other moulds growing on it. Some beetles are specific to a single species but others occupy a range of fungi of the same form or consistency. In fact, a succession of beetle species occupies a bracket fungus at different times as it ages. Almost all bracket fungi are attacked by *Cis* and its relatives (Ciidae), comprising beetles that resemble woodborers. Another group is the Zopheridae, including *Brouniphylax*. Mushrooms and toadstools are less vulnerable to beetle grazing owing to their life-history and fragility. *Triphyllus* species (Mycetophagidae), however, have a short life and may occur in large toadstools (Watt 1974).

A variety of beetles live under loose bark of native trees. Some merely shelter there, but others feed on moulds or the breakdown of plant tissues, including various Colyidiidae and larvae of stag beetles (Lucanidae). Many are flattened, even wafer-thin, including members of the families Cucujidae, Inopeplidae, and

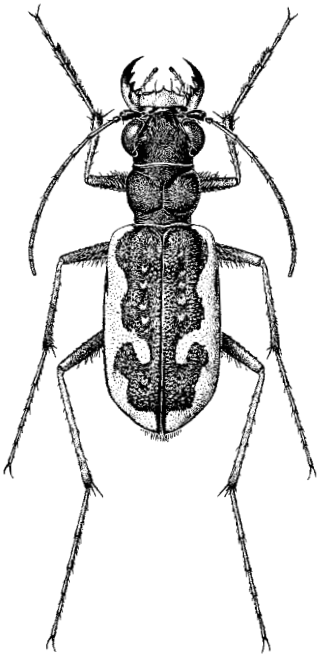
Family-level diversity of New Zealand Coleoptera

Family	Subfamily	Described species and subspecies: Endemic only	Adventive	Indigenous only	TOTAL	Undescribed species E = endemic A = adventive
Rhysodidae		6	0	0	6	
Carabidae	Cicindelinae	12	0	0	12	
	Carabinae	1	0	0	1	1E
	Migadopinae	7	0	0	7	
	Scaritinae	0	4	0	4	
	Trechinae	106+10	0	1	107+10	
	Psydrinae	109+5	5?	0	114+5	25E
	Harpalinae	207+2	25?	2	234+2	52E
Dytiscidae		11	0	8	19	
Gyrinidae		0	0	1	1	
Hydrophilidae		40	8	3	51	5E
Histeridae		21	6	0	27	3E
Hydraenidae		34	1	0	35	
Ptiliidae		44	11	1	56	5E
Agyrtidae		2	0	0	2	
Leiodidae		69	0	0	69	8E
Staphylinidae	Aleocharinae	139?	29?	0	168	45E,13A
	Euasthetinae	13	1	0	14	4E
	Habrocerinae	0	1	0	1	
	Microsilphinae	1	0	0	1	15E
	Omaliinae	55	4	1	60	2E
	Osoriinae	43	0	0	43	1E
	Oxytelinae	13	14?	2	29	2A
	Paederinae	19?	11	0	30	6E,1A?
	Phloeocharinae	1	0	1	2	
	Piestinae	1	0	0	1	
	Proteininae	5	0	0	5	3E
	Pselaphinae	374	2	1	377	21E,2A
	Pseudopsinae	1	0	0	1	1E
	Scaphidiinae	21	2	0	23	
	Scydmaeninae	185	1	0	186	10E
	Staphylininae	106	24	2	132	2E,1A
	Tachyporinae	23	3?	0	26	3E,1A
Lucanidae		35	2	0	37	
Trogidae		0	1	0	1	
Scarabaeidae		135	18	0	153	12E
Scirtidae		124	0	0	124	10E
Eucinetidae		2	0	0	2	
Clambidae		12+3	1	0	13+3	1E
Buprestidae		2	0	0	2	
Byrrhidae		49	0	0	49	2E
Dryopidae		4	0	0	4	
Elmidae		6	0	0	6	16E
Limnichidae		8	0	0	8	
Heteroceridae		1	0	0	1	
Ptilodactylidae		1	0	0	1	5–8E
Chelonariidae		1	0	0	1	
Eucnemidae		19	2	0	21	
Elateridae		117	4	0	121	
Lycidae		0	1	0	1	
Cantharidae		43+1	1	0	44+1	
Derodontidae		2	0	0	2	
Jacobsoniidae		1	0	0	1	4E
Nosodendridae		2	0	0	2	
Dermestidae		11	16	0	27	
Bostrichidae		1	5	0	6	2A
Anobiidae		34+1	6	0	40+1	1E
Ptinidae		6	9	0	15	
Trogossitidae		29	2	0	31	7E
Chaetosomatidae		3	0	0	3	1E
Cleridae		30	4	0	34	
Metaxinidae		1	0	0	1	



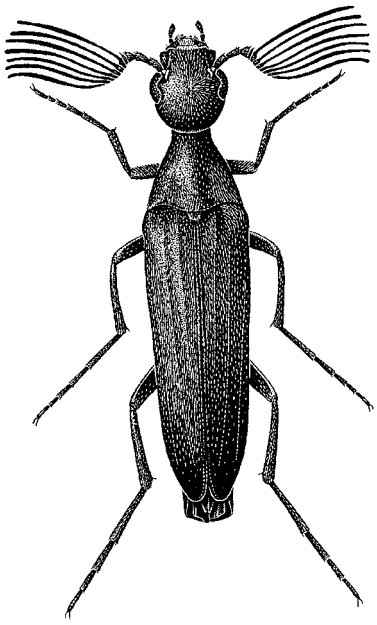
Coastal ground beetle *Ctenognathus novaezealandiae* (Carabidae).

Des Helmore

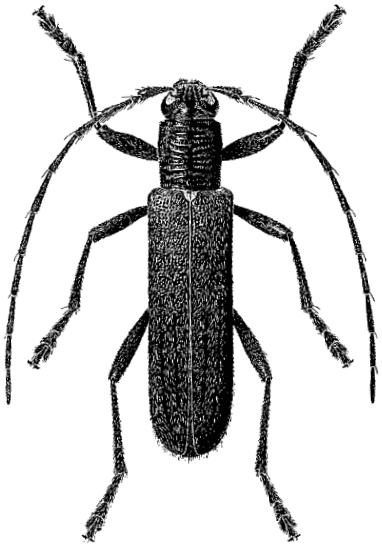


Common tiger beetle *Neocicindela tuberculata* (Carabidae).

Des Helmore



Antlered beetle *Rhipistena lugubris* (Ripiphoridae).
Des Helmore

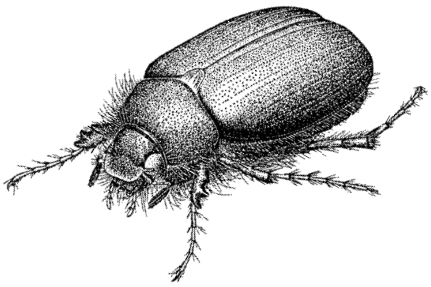


Lemon tree borer *Oemona hirta* (Cerambycidae).
Des Helmore

Family	Subfamily	Described species and subspecies: Endemic only	Adventive	Indigenous only	TOTAL	Undescribed species E = endemic A = adventive
Phycosecidae		1	0	0	1	
Melyridae		32	0	0	32	2E
Nitidulidae		17	17	0	34	
Monotomidae		1	5	0	6	
Agapythidae		1	0	0	1	
Priasilphidae		7	0	0	7	
Silvanidae		9	7	0	16	1E
Cucujidae		1	0	0	1	
Laemophloeidae		1	4	0	5	1E,1A
Phalacridae		0	1	0	1	1A
Cyclaxyridae		2	0	0	2	
Cavognathidae		4	0	0	4	
Cryptophagidae		19	4	0	23	1E
Erotylidae		16	1	0	17	
Bothrideridae		6	1	0	7	
Cerylonidae		5	0	0	5	
Endomychidae		2	1	0	3	4E
Coccinellidae		25	19	0	44	5E
Corylophidae		14	6	0	20	7E,2A
Latridiidae		39	15	0	54	8E,1A
Mycetophagidae		16	3	0	19	3E
Archeocrypticidae		0	1	0	1	
Ciidae		24	3	0	27	7E
Melandryidae		35	0	0	35	3E
Mordellidae		3	2	1	6	
Ripiphoridae		5	0	0	5	
Zopheridae		190	0	0	190	1A
Ulodidae		21	0	0	21	2E
Chalcodryidae		5	0	0	5	
Tenebrionidae		136	12	0	148	1A
Prostomidae		1	0	0	1	
Oedemeridae		18	3	0	21	
Pyochroidae		6	0	0	6	3E
Salpingidae		26	0	0	26	2E
Anthicidae		17	10?	0	27	2A
Aderidae		9	0	0	9	4E
Scraptiidae		4	0	0	4	2E,1A
Tenebrionoideaincertaesedis		2	0	0	2	
Cerambycidae		171	9	0	180	3E
Chrysomelidae		141+4	22	0	163+4	1E
Nemonychidae		4	0	0	4	
Anthribidae		58	3	0	61	2A
Belidae		5	0	0	5	
Oxycorinidae		1	0	0	1	
Brentidae		1	0	0	1	
Apionidae		5	1	0	6	
Dryophthoridae		0	4	0	4	1A
Erirhinidae		42	0	0	42	
Raymondionymidae		1	0	0	1	
Curculionidae	Baridinae	0	1	0	1	
	Ceutorhynchinae	0	3	0	3	
	Cossoninae	143	5	0	148	4E
	Cryptorhynchinae	259	1	0	260	19E
	Curculioninae	235	6	0	241	6E,1A
	Cyclominae	80+3	7	0	87+3	4E
	Entiminae	231	12	0	243	6E+1E,1A
	Lixinae	0	2	0	2	
	Molytinae	164	0	0	164	1E
	Platypodinae	4	0	0	4	
	Scolytinae	7	13	0	20	10E
Totals		**4620+29**	**418**	**24**	**5062+29**	**382–385+1E, 35A**

Prostomidae. Rotten wood is inhabited by larvae and adults of darkling beetles (Tenebrionidae), larvae of pintail beetles (Mordellidae), and others (Watt 1974).

Forest leaf litter is generally a favourable habitat for beetles, including larvae of scarabs (Scarabaeidae), which also inhabit grassland soils. One example is an economic pest, grass-grub (larvae of *Costelytra zealandica*), one of the few native beetles that have successfully adapted to improved pastures and can occur in staggering numbers if not checked. Other scarabs can be found at high altitudes in subalpine soils and litter. Some of the large scarabs of Otago and Southland (*Prodontria*, *Scythrodes*) are wingless, including rare *P. lewisi*, modified for life in sand under native grasses near Cromwell. Several beetles, in fact, are specialised to live in sand, having hard body parts, stouter limbs, and thick bristles. Tenebrionids *Choerodes* and *Actizeta*, the scarabs *Pericoptus*, and the sand weevil *Cecyropa* (Curculionidae) are examples (Watt 1974). Maori were familiar with grass-grub beetles, their larvae, and relatives, having several names for them. They used to eat one species – *kekerewai*, the manuka beetle – which was collected in large numbers, crushed, and baked with the pollen of bullrush (*Typha*) to make a kind of scone (Miller 1971).



Grass grub beetle *Costelytra zealandica* (Scarabaeidae).
Des Helmore

Future work

Refining the end-chapter Coleoptera checklist will be an ongoing task; few genera and species have been revised since the major work done by Thomas Broun. Nevertheless, even some undescribed species have conservation status (McGuiness 2001), which illustrates the need for continuing taxonomic work. There is an ever-present time lag between the discovery of a new species and the availability of a published name, sometimes spanning decades. For example, a species of *Platisus* from the Three Kings that is the only known member of the genus in New Zealand was first collected by E. S. Gourlay in the 1960s and was not described until almost 40 years later by Watt et al. (2001). This process underpins the problems that systematists are faced with regarding modern taxonomy in general, which involves deep investigation in understanding character variation, evolutionary relationships, and classification, but all too often with a paucity of study material. Most systematists would certainly argue for more workers and students to describe New Zealand's Coleoptera fauna, but modern times are much different from those in the 19th and 20th centuries when taxonomic names were mass produced, and, in some ways, the taxonomic impediment (Heywood 1995) did not exist. Increased funding for training and research would go along way towards remedying the paucity of coleopterist expertise in New Zealand. Apart from obvious applications to conservation, biological control, and biosecurity and border control, future research should include surveys in New Zealand's inaccessible mountaintops, valleys, and offshore islands; descriptions of species and revising groups based on sound classification; and producing catalogues and databases to contain the vast amount of taxonomic information.

Order Mecoptera: Scorpionflies

Scorpionflies are an archaic group of insects dating from the Early Permian, some 260 million years ago. Today, there are only about 590 species worldwide, known variously as scorpionflies (from their upturned abdomen tip), hanging-flies, and snowfleas. (Mecoptera means long-winged.) There is a single representative in New Zealand, *Nannochorista philpotti*, widely distributed around small, stable streams in the South Island.

The Nannochoristidae to which *N. philpotti* belongs is a small family of just eight species, having a circum-Antarctic distribution – three species occur in Argentina and Chile, four in Australia, and one in New Zealand. It originated in the Late Permian, and, according to Willmann (1987), represents the earliest evolutionary branch among living scorpionfly families. No fossils are reported

Nannochorista philpotti.
Birgit Rhode, Landcare Research

from New Zealand, but nannochoristid wings have been found in the Late Permian of New South Wales. The family is distinct enough to have been separated as a separate order, Nonnomecoptera [sic], by Hinton (1981, vol. 2, p. 722, but as Nannomecoptera in Hinton 1981, vol. 1, p. 10). In Willmann's (1987) classification of the Mecoptera this group is regarded as a suborder. Whiting (2002b) concluded from gene-sequence data that the Mecoptera is paraphyletic with two major lineages – one comprising Nannochoristidae, the mecopteran family Boreidae, and the flea order Siphonaptera, and the other all other Mecoptera. On the other hand, detailed studies of head structures in adults and larvae give evidence that the Nannomecoptera may be segregated as an order in a clade that also includes Siphonaptera and Diptera (Beutel & Baum 2008; Beutel et al. 2009). The question remains open.

Tillyard (1917) erected the genus *Choristella* for the New Zealand species, separating it from his Australian genus *Nannochorista*, but the name *Choristella* was preoccupied by a gastropod mollusc so Byers (1974) proposed *Microchorista* as a replacement. Kristensen (1989) was of the opinion that differences in the New Zealand form were not significant above the species level and located *philpotti* in *Nannochorista*, but Ferrington (2008) has accepted *Microchorista* for the New Zealand species and an undescribed form from Tasmania.

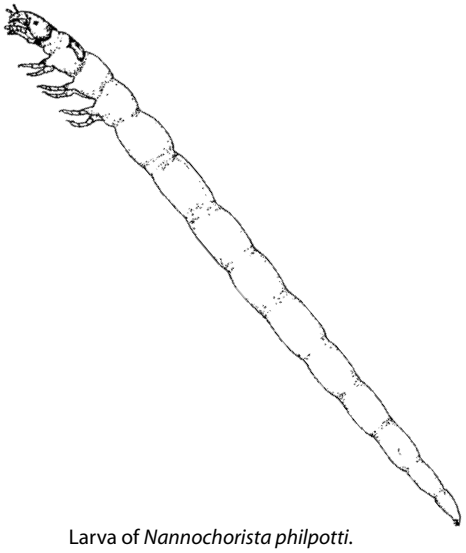
Ecology

Known immature stages of other families of Mecoptera involve a relatively short-lived terrestrial larva, living in soil and feeding on plant roots and other vegetation, or emerging from burrows to eat dead insects and other animal matter. Pupation occurs in the burrows, and immature adults prey on other insects.

Immature stages of Nannochoristidae, however, are aquatic, a finding that was first documented by University of Canterbury's Bob Pilgrim (1972) in *Nannochorista philpotti*. He found pupae in the Hawdon River valley, near Cass, mid-Canterbury, alongside a small stream in *Nothofagus* forest. When first discovered they could not be placed in a known insect order, but were reared to adults, thus revealing their identity. Many larvae were subsequently reared through several instars to pupae and thence to adults. The larval habitat is fresh, slow-moving but well-aerated water of streams that are not subject to flooding and scouring. The fine silt accumulating in pockets and meanders contains an abundance of other insect larvae, particularly of small chironomid flies, especially species of *Paucispinigera* and *Polypedilum* (Chironominae) and *Macropelopia* (Tanypodinae). These appear to be a major food source for *N. philpotti* larvae – a large number of dissected larvae revealed predominantly chironomid larvae in the gut and smaller numbers of caddisflies, mayflies, and other insects, mites, and aquatic Oligochaeta.

First-instar larvae have been captured in November and the last prepupal forms of the previous generation may be present as late as December. The duration of larval life is thus very much longer than that reported for the terrestrial larvae of other families. Pupation occurs in wet moss and other vegetation on rocks and fallen tree trunks, just above the water line. The flying phase is shorter than in other families. Adults have been captured mostly from November to January but some have been collected in October and up to March in various localities; nevertheless, the species appears to have just one generation per year. Adults frequent streamside vegetation from which they may be collected by sweep-netting.

No observations on the food and feeding habits of the adult are available. It may be expected that, in common with most Mecoptera, they feed on other insects captured in flight. Eggs have not been found, but Australian species oviposit in wet litter near the water's edge (Lambkin 1996).



Larva of *Nannochorista philpotti*.
From Winterbourn et al. 2000

Larval morphology and behaviour

Larvae are very active and wriggle vigorously through the silt in streams. There are well-developed thoracic legs but no abdominal prolegs; the last segment bears a pair of hook-like structures only. The mandibles have several sharply

pointed teeth and are well suited to impaling live prey. An unusual feature is the presence of a movable 'lacinia mobilis'-type of lobe on the inner face of the mandible. This lobe, itself well-toothed, presumably acts as a supplementary device for securing active prey. It is present from the first instar through to the early phase of the fourth, but is shed during that instar as the larva enters the prepupal phase. The mandible shows a scar where the lobe is lost and at this time the colour and general appearance of the larva undergo marked changes (Pilgrim 1972). Such conspicuous differentiation of phases within the fourth larval stadium are not reported elsewhere in the Mecoptera. Another feature unique to the larva is the presence of two papillae arising from the end of the hindgut; each contains the terminal portion of one of the six excretory Malpighian tubules. Pilgrim (1972) suggested that the papillae might function in relation to Malpighian tubule physiology by acting as a region for ion/metabolite exchange, but no experiments have been published on this possibility; they contain only minute tracheal branches, making it unlikely that they have a significant respiratory function.

Following the discovery of the aquatic stages of the New Zealand species, the same was made for Australian forms (see Riek in Lambkin 1996). Professor Pilgrim collected larvae of several species from many streams in Tasmania and Australian Capital Territory and also examined larvae (unidentified as to species) from streams in Chile. All of these forms are extremely similar, but no detailed comparison has been published. It is clear, however, that the overall morphology and habit of the larvae are characteristic of the family.

Distribution of Nannochoristidae

The family may be considered an outstanding example of Gondwanan distribution. Within New Zealand, adults and/or larvae have been collected from Stewart Island and Big South Cape Island, numerous localities in Southland (including Longwoods, the type locality), Otago, Westland, Nelson, and Marlborough. In Canterbury, it is present at lower altitudes along the main alpine range and in the foothill ranges; there is a gap over much of the Canterbury Plains, but the insect is widespread on Banks Peninsula.

It is typically found associated with the smaller streams in native forest or second-growth bush, but collections have been made in open country, e.g. in a peat-bog creek in the Umbrella Range region (Otago) and in the Glentui River (Canterbury). These occurrences are perhaps the result of downstream drift from small tributaries. Its altitudinal range is from near sea level (Stewart Island, Macandrew Bay (Dunedin), and Abel Tasman National Park) to about 1000 metres above sea level.

The only known specimens from the North Island are two pinned adults in the 'C. E. Clarke Collection' in the Auckland Museum, comprising a male and a male abdomen labelled 'Mamaku 28.12.[19]20'. No further specimens were found in recent visits to the Mamuku area, but the Mamaku forests have been severely reduced and the area now appears unlikely to harbour the insect. It is significant that no specimens were collected or reported in the Wellington area by G.V. Hudson, who certainly knew the insect (together with his daughter Stella he collected it in the Queenstown area and the specimens are in the Museum of New Zealand), yet there are habitats that appear suitable even in Karori, where Hudson lived for many years. Present evidence is that the insect is confined south of Cook Strait, but further collecting in the southeast of the North Island, including Kapiti Island, should be carried out. Although the insect is a weak flier, it could have been wind-assisted across Cook Strait (if indeed it had not been present in the area before the strait itself was established).

Future work

Investigations are needed to find sites where eggs are laid. More information is desirable on the physical parameters of the larval and pupal environment, as

well as on detailed associations of the larval instars with their ambient fauna. The function of the anal papillae of the larva is worthy of experimentation. There is no published information on feeding, mating, or oviposition in the adult stage. Kristensen (1989, p. 113) has emphasised the phylogenetic interest of this archaic family of Mecoptera and called for '... penetrating comparisons of adults and immatures alike to reach a trustworthy phylogeny'. Additional molecular-phylogenetic work, currently being undertaken in laboratories in Germany and the USA, should clarify the status of the Nannomecoptera.

Order Siphonaptera: Fleas

Fleas are obligate blood-sucking parasites of warm-blooded vertebrates. About 95% of flea species worldwide parasitise mammals; the rest are found on birds. All are wingless (Siphonaptera means 'sucking-wingless') and their life-history includes complete metamorphosis, having larval and pupal stages. The larvae are with very rare exceptions non-parasitic 'maggot-like' grubs living in the nest debris of their adult hosts. Their food is organic detritus, including excess blood excreted by their adults and, in part, probably other tiny creatures inhabiting the nest. Fleas are famous for their prodigious ability to spring 150 times their body length – a feat achieved by a combination of muscle power and energy stored in a compressed springy pad of protein called resilin.

The fossil history of the order is poorly known. The very rare specimens recovered from Baltic amber (Eocene) and from Dominican amber (Miocene) belong to existing genera. No fossil fleas are reported from New Zealand. There are more than 2000 species worldwide. The largest is North American *Hystricopsylla schefferi*, a giant at 12 millimetres long.

New Zealand's flea fauna

The most recent account of fleas in New Zealand and its offshore islands is that of Smit (1979), who listed 34 species and subspecies, reviewed earlier literature, and described several new taxa. Later, Smit (1984) described a subspecies from the remote Bounty Islands. This is the latest described flea from the region. Collecting has been sporadic but widespread throughout New Zealand and the offshore islands, especially over the past several decades and it appears unlikely that many new taxa will be forthcoming, although many bird hosts have yet to be thoroughly investigated. It is probable, therefore, that we now have a complete taxonomic account of the adult flea fauna of the New Zealand region. This is unusual for most countries, but understandable in view of the size of New Zealand and its fauna, and of the efforts on the part of numerous collectors.

Eleven of the 35 species/subspecies are accidental introductions (10 on mammals, one on birds), six are naturally indigenous (all on birds), 17 are endemic (one on a bat, 16 on birds), and there is one deliberate introduction (on rabbit). New Zealand's flea fauna has many peculiarities:

1. There is a complete absence of members of the large family Ctenophthalmidae and the Hystrichopsyllidae, which together comprise ca. 30% of the world Siphonaptera.
2. The families Leptopsyllidae and Pulicidae are represented in New Zealand by introduced species only, but several have become well established.
3. The very large family Ceratophyllidae, c. 20% of the world fauna, typically Holarctic in character, is represented by three introduced taxa and one aberrant monospecific genus confined to Antarctica.
4. Of the world flea species, the vast majority normally parasitise mammals. In New Zealand, in contrast, the native/endemic flea taxa include only one on mammals and 22 on birds. These strange proportions are clearly related to the peculiarities of the New Zealand mammal and bird faunas – an extreme paucity of suitable land mammals but a large number (disproportionately so in

global terms) of seabirds, particularly of procellariiforms, penguins, and shags.
5. The affinities of the major families of endemic/native fleas are largely within the Southern Hemisphere.

Individual flea families

Ischnopsyllidae occur worldwide wherever bats are found. *Porribius pacificus* is host-specific to *Chalinolobus tuberculatus*; the record from *Mystacina tuberculata* (Smit 1979) has not been repeated and is probably an error owing to accidental laboratory contamination. Two other species of *Porribius* are found in Australia and one in New Guinea.

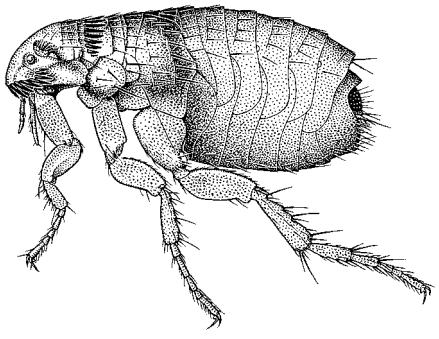
Pygiopsyllidae are well represented in Australia–Papua New Guinea, with some genera also in South America and southern Asia and a few reaching Japan, the Philippines, and India (see Mardon 1981). All six taxa of the genus *Notiopsylla* are found in the New Zealand region, four of them endemic. *Notiopsylla corynetes* is the only species from the mainland, where it is host-specific on *Puffinus huttoni*, nesting at high altitudes in the South Island; the remaining endemic and native taxa are associated with seabirds nesting near the shores of offshore and subantarctic islands. *Hoogstraalia imberbis* was described from a single female of unknown host association in the Auckland Islands. Extra-limital species of the genus are hosted by land birds in Tasmania, New Guinea, and the Philippines. Closely related *Pagipsylla galliralli* was described from a weka but has since been found more commonly on other ground-nesting birds and some introduced hosts. The two species of *Pygiopsylla* are associated with rats, especially *Rattus exulans*, presumably its primary host from which it has invaded the more recently introduced *R. norvegicus* and *R. rattus*; both species of the flea are native to Australia, where other species also occur, and there is one species in Papua New Guinea.

Rhopalopsyllidae are chiefly Neotropical in distribution where the hosts are mostly mammals, but the many species of *Parapsyllus* are bird fleas, distributed around coastal Australasia, South America, South Africa, and islands in the circumpolar seas south of about 60° S (see Smit 1987). Most species are found on seabirds nesting at or near the shore, but *P. lynnae alynnae*, like *Notiopsylla corynetes* (above), is host-specific on *Puffinus huttoni* in coastal mountains of the South Island. *Parapsyllus nestoris nestoris*, too, is unusual in specifically parasitising a parrot, *Nestor notabilis*, that also nests in alpine South Island, while *P. n. antichthones* is associated with parakeets in subantarctic islands. The remaining endemic species/subspecies are confined to the subantarctic islands.

Some introduced fleas

Pulicidae

Pulex irritans was formerly widespread on humans and pigs; it has become less abundant with improvements in human hygiene. *Ctenocephalides felis felis*, very common on domestic cats, is the flea most likely responsible for human infestation by the tapeworm *Dipylidium caninum*; it also occurs on dogs. *Ctenocephalides canis*, found on dogs, is less common than the previous species. *Xenopsylla cheopis* is the famous plague flea. It is probably not established in New Zealand but was recorded in the early 1900s at the time of an outbreak of bubonic plague in Auckland, which caused nine deaths (MacLean 1955). Specimens are still occasionally intercepted in shipping from overseas. As the rodent vectors (rats) are present in abundance here, the accidental introduction of plague-infected fleas could potentially lead to repeated outbreaks of the disease. *Xenopsylla vexabilis* is widespread in many parts of the Pacific and was presumably introduced to New Zealand along with the kiore *Rattus exulans*, its normal host. It is now known only in association with this rat, and confined to offshore islands.



Cat flea *Ctenocephalides felis felis*.
Des Helmore

Leptopsyllidae

Leptopsylla segnis is abundant on mice, worldwide.

Ceratophyllidae

Ceratophyllus gallinae is abundant on introduced passerines (starling, house sparrow, blackbird). Although associated with domestic fowl in Europe, it is not widespread on this or other galliform hosts in Nw Zealand; it was perhaps introduced with chickens released on one of Captain Cook's voyages. It has been recorded from fernbird (*Bowdleria punctata caudata*) on the Snares Islands and has also been taken from *Petroica traversi* and *Gerygone albofrontata* nests in the Chatham Islands. Interestingly, *Parapsyllus struthophilus*, the typical flea of *Petroica traversi* and other endemic birds, has become a parasite of introduced birds (blackbird and hedge sparrow) in the Chatham Islands. *Nosopsyllus fasciatus* is abundant on brown and Norway rats. *Nosopsyllus londiniensis londiniensis* is taken mostly from mice within about 100 km of ports, suggesting that it is a relatively recent, but perhaps repeated, introduction, escaping from shipping.

Some noteworthy absences

Although the hedgehog *Erinaceus europaeus* is well established throughout much of mainland New Zealand, the flea *Archaeopsylla erinacei erinacei* has not been found here yet it is abundant on that host in the United Kingdom. Hedgehog mites, for example *Caparinia tripilis*, are, however, very abundant in New Zealand.

The opossum *Trichosurus vulpecula* lacks the several species of fleas normally found on it in Australia, but it does carry mites, e.g. *Trichosurolaelaps crassipes*.

In most of the New Zealand region, rabbits (*Oryctolagus cuniculus*) and hares (*Lepus europaeus*) are without the flea *Spilopsyllus cuniculi*, which is normally associated with them in Europe, even though they carry their normal complement of sucking lice (Anoplura) and mites (Acari). This flea has, however, been introduced to Macquarie Island to act as a vector in controlling rabbit populations there; it is the only deliberate introduction to the wider region.

Among introduced birds, the rock pigeon *Columba livia* does not carry *Ceratophyllus columbae*, but several species of feather lice are abundant (Pilgrim 1976) as are mites. The house sparrow *Passer domesticus* and hedge sparrow *Prunella modularis* lack their normal *Dasypsyllus* and *Ceratophyllus* spp. Domestic chickens are fortunately without *Echidnophaga gallinacea*, the 'stick-tight flea', which otherwise would be a great nuisance in the commercial poultry industry.

It might be speculated that the absence of the typical fleas from hosts that have been deliberately introduced is related to the disposal of cage litter during long voyages from the northern hemisphere to this country. This would have broken the life-cycles of the fleas since the non-parasitic larval phase occurs in nest debris; however, birds were presumably collected for introduction to New Zealand outside the breeding season, when they would be unlikely to carry fleas. Bird fleas are most abundant in nests, from which they make feeding forays onto the host, but the larvae are dependent on nest debris for their survival. Mammal fleas, on the other hand, are commonly found in the pelage of their hosts at all seasons; nevertheless, their larvae are also dependent on nest debris. If this were discarded *en route* to New Zealand, the life-cycle would likewise be broken.

The arrival of mites and lice on these same hosts, however, is not surprising as they are permanent obligate ectoparasites in all phases of their life-history. Information on the occurrence of the Mallophaga (chewing/ feather lice) and Acari (mites and ticks) of birds is given by Bishop and Heath (1998) and lists of bird Mallophaga are given by Pilgrim and Palma (1982, updated by Palma 1999). Mallophaga (chewing lice), Anoplura (sucking lice), and Acari of mammals are included in lists compiled by Tenquist and Charleston (1981).

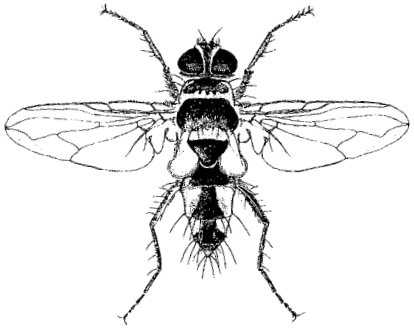
Future work

Examination of a wider range of birds, especially indigenous and endemic species, is needed to seek possible additional taxa. Investigations are highly

desirable on the larval phase, especially in bird fleas. The families Pygiopsyllidae and Rhopalopsyllidae are found almost entirely in the Southern Hemisphere and their larvae possess many morphological features quite unknown among the families of the Northern Hemisphere, where most of the published work on larvae has been done. Some of these features are presented by Pilgrim (1998) for the six taxa of the genus *Notiopsylla* (Pygiopsyllidae).

Order Diptera: Flies

Many flying insects are referred to as flies, but only Diptera are true flies. The ordinal name name means two-winged, alluding to the two functional flight wings. The second pair of wings is reduced to a pair of tiny knob-ended halteres that probably function as stabilisers or air-speed detectors. These are easily seen in crane flies (so-called flying daddy-longlegs) but a flap (calypter) behind the wing base in the nine families of calyptrate flies obscures the haltere from above for the casual observer. Beginners may confuse members of the Hymenoptera (ants, bees, and kin) with Diptera, but winged hymenopterans always have two pairs of wings. The pattern of veins in Diptera also differs from that in Hymenoptera. Diptera have only sucking mouthparts, sometimes modified for piercing, but Hymenoptera also have mandibles for chewing. Flies of the division Cyclorrhapha and some of the Orthorrhapha have an arista (a plain or plumose bristle) on the last antennal segment an often a pad-ended sucking tongue and palps. This special tongue helps distinguish the more than 900 species of these flies in New Zealand from other insects. True flies are also generally characterised by large compound eyes. Their antennae may be long (Nematocera) or short (Brachycera).



Male Australian leafroller parasite *Trigonospila brevifacies* (Tachinidae).
After Grant 1999

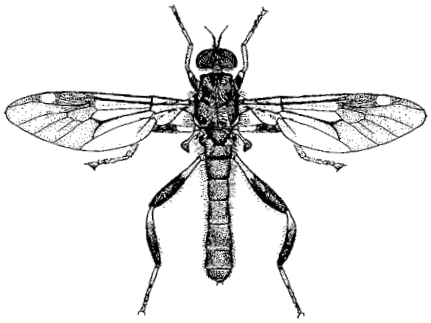
Dipterans include house flies, blow flies, mosquitoes, midges, sand flies, crane flies and a host of other forms. About 120,000 species have been described globally out of an estimated 153,000 species (Pape et al. 2009). They typically have sucking mouthparts but these may be modified as piercing structures.

Flies are among the largest and most important insect groups as pests of livestock, fruit, crops, and pasture and also include nuisance blood feeders. But many species are valued biological control agents of pests and weeds. A few introduced species help in the biological control of pest insects and some help to reduce weed vigour. Tachinid flies are especially important as natural enemies of caterpillars. Predatory and parasitic flies help keep populations of grass grub, stag and longhorn beetles, and sedge bugs in check. Flies can be common pollinators of some native plants. Flies can accelerate decomposition of carrion, dung, and leaf litter and they are important food sources for other invertebrates and for native birds, reptiles, and fish.

Certainly there is much more to flies in New Zealand than pest species that get up close and personal with humans and livestock. Fortunately, flies are much less of a health and veterinary menace in New Zealand than they are in some tropical countries. Nevertheless, New Zealanders and visitors need to assist quarantine services by not bringing into the country fruit and other produce that can establish further serious fly pests. At present, pest species account for only 0.5% of the 3225 known species of New Zealand Diptera.

Native flies live in a very wide range of habitats, from the tidal zone and salt pools to forests, grasslands, fresh waters (thermal to glacial), subalpine vegetation, and soil. Most species feed on various decaying materials, fungi, or algae in water. Herbivores include gall-midges, fruit flies, leaf miners and others that contribute part of the distinctive insect fauna dependent on native plants in New Zealand. For most species, much still needs to be recorded on habitat preferences, food use, season of activity, and egg-laying.

The comprehensive account that follows reviews what is known about the ecological and economic importance of Diptera and their diversity in New Zealand.



Garden soldier fly *Exaireta spinigera* (Stratiomyidae).
After Grant 1999

Zygomyia sp. (Mycetophilidae).
Rod Macfarlane

Beneficial roles of flies

Pollinators

Adult flies visit flowers to enhance their own survival and boost reproduction, and so flies contribute part of the pollinating service for plants. Flies visit pollen-rich kiwifruit quite readily (Macfarlane & Ferguson 1984) as well as spring-flowering fruit trees with nectar, where they make a minor contribution to pollination. Carrot and onion flowers are rather unattractive to honey bees and bumble bees (Macfarlane 1995a, unpubl.), so flies are likely to be relatively important in their pollination; introduced social bees (family Apidae) usually pollinate other crops and flowers in gardens adequately. Flies are more prominent on smaller and more open-flowered native species in: shrubland and bush, e.g. matagouri (*Discaria toumatou*), kanuka/manuka (*Kunzea*, *Leptospermum*), cabbage trees (*Cordyline* spp.), *Olearia* spp., tauhinu (*Cassinia* spp.) and ratas (*Meterosideros* spp.); in tussock and cushion-fields, e.g. spear grasses (*Aciphylla* spp.), *Pimelea*, *Raoulia*, *Dracophyllum*, *Phyllachne*; and in springs and bogs, e.g. *Eupatorium* (Heine 1937; Spencer 1977; Primack 1978; Heath 1982; Harrison 1990; Macfarlane unpubl.). At least on *Raoulia* they remain active in cooler and windier conditions than those that favour native bee flight.

During the day, the main flies that pollinate native and garden flowers are the hairier Syrphidae, Tabanidae, Bibionidae, and Stratiomyidae (*Odontomyia*) and the bristly blow flies, tachinid, and muscid flies. The former hairier flies carry much more pollen than the bristly flies (Macfarlane & Ferguson 1984). Survival of the pollinating flies, in contrast to bees, is independent of flowers, because the larvae do not require nectar. In gardens or wayside areas, energy-saving platform-like flower clusters (e.g. carrots, yarrow, thistles) attract fly visitors in summer and autumn when there is a narrower range of nectar and pollen sources for flies. Fly pollinators are attracted to a limited range of flower species, e.g. arum lilies (*Zantedeschia*), ivy (*Hedera helix*), *Fatsia japonica*) that have an aroma that attracts them. The role of midges such as *Forcipomyia* and Chironomidae during the evening or at night in New Zealand remains to be investigated, but overseas studies show they may visit flowers freely (McAlpine et al. 1981, 1987; Macfarlane 1995a).

Flies are likely to be considerably less efficient than bees as general pollinators for several reasons (Macfarlane 1995b). The major factor that limits the effectiveness of flies as pollinators is the inability of even the hairier flies to retain 10% of the pollen carried by bees, which have densely plumose-haired bodies. In addition, flies do not move so readily from plant to plant and so effect cross-pollination. Smaller fly species may often not contact the stigma during flower visits. In an extensive survey of flower visits to more than 50 native and 300 introduced plant species by bumble bees and native bees, flies were noted to visit more flowers per minute than beetles.

Small flies are specialist pollinators of certain ground orchids. Species of Mycetophilidae visit *Pterostylis* and *Corybas* in Australia (Bernhardt 1995) and both of these genera occur in New Zealand. The mycetophilid *Zygomyia* sp. has been observed bearing pollinia in *Pterostylis* flowers in New Zealand (C. Lehnebach, pers. comm.). Epiphytic orchids such as *Earina* spp. are pollinated by a wider range of insects.

Biocontrol agents of noxious weeds

Some flies, including species of Tephritidae, Anthomyiidae, and Agromyzidae, have been specifically introduced for controlling noxious weeds. Scott (1984) and Cameron et al. 1989) provided summaries for fly species (Tephritidae, two species; Anthomyziidae, *Botanophila seneciella;* Cecidomyiidae, *Zeuxidiplosis giardi*) that affect ragwort (*Senecio jacobaea*), mexican devil weed (*Ageratina adenophora*), Californian thistle (*Cirsium arvense*), and St John's wort (*Hypericum perforatum*). The website landcare research.co.nz/research/biocons/weeds/book has data for several species of biocontrol Diptera, viz Tephritidae (five species), Agromyzidae (two species), Cecidomyidae (two species), and Syrphidae (two European species of *Cheilosia*).

For each species a colour photo is provided, often with the overall wing pattern, release date and status, type of damage, and provisional effectiveness against thistle, *Hieraceum* and other Asteraceae, and old man's beard (*Clematis vitalba*).

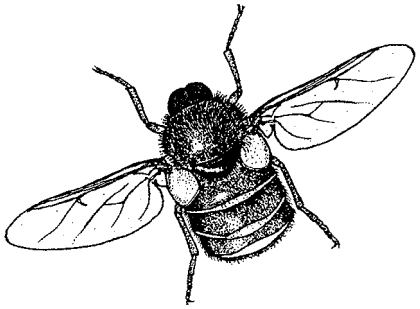
Natural enemies of pests and other invertebrates

Some Diptera are important natural enemies of moths and soil pests. Most of the entomophagous (insect-eating) flies are members of the family Tachinidae, with 188 known species in New Zealand and records of hosts for 29 species on caterpillars, grassgrub, and longhorn larvae (Dugdale 1962; Valentine 1967b; Cantrell 1986; Cameron et al. 1989; Munro 1998, Schnitzler et al. 2004). Merton (1982) made the only critical investigation of the link between the biology of the host and a tachinid parasite for the main grassgrub pest, *Costelytra zealandica*. Other New Zealand examples include Australian-derived *Cryptochetum iceryae* (Cryptochetidae), which parasitises cottony-cushion scale (*Icerya purchasi*) on citrus (Valentine 1967b; Scott 1984), and South American *Leucopis tapiae* (Chamaemyiidae), which usually keeps pine-twig chermes (*Pineus laevis*) populations in check (Cameron et al. 1989).

In soil and sand, two important families with nearly 100 species between them (Therevidae and Asilidae) have larvae that are known or believed to be usually predatory. The mainly fine-haired grey stilletto flies (Therevidae) inhabit the driest sand (Sutherland 1966; Lyneborg 1992) and soil. Up to 20 species of stiletto flies are likely to prey on scarabs, weevils, and other insects in dune sands. In gravel, *Anabarhynchus* larvae prey on larvae of the solitary wasps *Podagritus* (Harris 1990). Adult collection data suggest that robber flies (Asilidae) prefer uncultivated grassland, but they are not found in wetland, where some crane-fly larvae may be predatory. Robber flies perch on elevated sites in vegetation among grassland or towards the edge of tree twigs. Females may prey on their own males in New Zealand, and prey selection is just one of several interesting aspects of behaviour and ecology that can be investigated and compared with overseas studies (Lavigne et al. 1978). Adults of Empididae can be active predators. Ian McLellan has seen *Thinempis takaka* adults attack and feed on beach amphipods and W. J. Crawford (pers. comm.) noticed adults of an undescribed species of *Hilara* preying on the mayfly *Coloburiscus humeralis.* An undescribed *Spilogona* species (Muscidae) has been observed to catch mayfly subadults as they emerged from a stream onto stones (Harris 1990). Most endemic muscids are probably predatory, at least as adults. John Early saw adults of apparent Hemerodromiinae with *Stylaclista* (Diapriidae) prey between the front legs at Waipoua forest. Adults of many Dolichopodidae may well be predatory on small soft-bodied insects such as aphids.

Larvae in the families Empididae, Dolichopodidae, and Muscidae are not often reported in freshwater surveys (Winterbourn et al. 2000) but there are some records of adults concentrated near running and boggy water. As well, there are a few records of concentrations of undetermined larvae associated with even more abundant midge larvae in lagoons (Knox & Bolton 1978). This evidence indicates a possible predatory role for larvae of such species on midge larvae and the smaller larvae of other characteristic flies active in the biological zone, e.g. shore flies *Scatella* and *Ephydrella*. The invertebrate fauna of the wet soil zone below and at the sides of fresh and semi-saline water bodies remains almost unstudied and difficult to assess (Collier & Winterbourn 2000).

Among hover flies of the subfamily Syrphinae (24 described species), large *Melangyna novaezealandiae* and smaller *Melanostoma fasciatum* have adapted best to modified grassland and cropping environments. Hover-fly larvae can be the major predators of white-butterfly caterpillars on cabbages (Ashby 1974; Ashby & Pottinger 1974). Adult hover flies are conspicuous in pastoral habitats from late spring when aphid populations increase (Cumber & Harrison 1959b; McLean et al. unpublished). There are at least three predatory genera of gall midges in New Zealand orchards. *Arthrocnodax* preys on pest mite species (Cottier 1934; Collyer 1964), *Diadiplosis koebelei* consumes long-tailed mealy bug (Charles 1981), and an



Bladder fly *Ogcodes brunneus* (Acroceridae).
After Grant 1999

unknown gall midge preys on the margarodid scale insect *Coelostomidia wairoensis* (Morales 1991). The latter is also found among Lucerne (alfalfa) infested with blue-green aphids (Thomas 1977). The hosts are unknown for the predatory gall midge genera *Trisopsis* and *Lestodiplosis* that occur in New Zealand.

More than 260 fly species are parasitic on other invertebrates. Valentine (1967b) reviewed the literature on flies as insect parasitoids up till 1966. In North America, Phasiinae species may be parasites of Heteroptera (McAlpine et al. 1987), but apart from the common and widespread *Huttonobesseria verecunda* there are only six rare phasiine species in New Zealand. Larvae of *H. verecunda* larvae live within the heteropteran sedge bugs *Rhopalimorpha.* Members of a few other fly families are also parasitic on invertebrates. Two species of cluster flies (*Pollenia rudis, P. pseudorudis*) became established in New Zealand by the early 1980s (Dear 1985; Macfarlane & Andrew 2001), and they parasitise *Aporrectodea* (= *Eisenia*) *rosea* (Rognes 1987), which forms a small component of the introduced earthworm species of cultivated grasslands (Fraser et al. 1995). The spider *Matachia ramulicola* (Psechridae) is a host for *Ogcodes brunneus* (Dumbleton 1941). Harris (unpub.) has reared a species resembling *Ogcodes nitens* from various spiders of the family Clubionidae. The hosts for 24 other species of Acroceridae, Pipunculidae, and Bombyliidae remain unknown in New Zealand. Among 26 species of Sciomyzidae, *Eulimnia* species feed on freshwater fingernail clams (Sphaeriidae) (Barnes 1980a), whereas *Neolimnia* species feed on gastropod snails, with aquatic snail hosts for the subgenus *Pseudolimnia* and terrestrial hosts for the subgenus *Neolimnia* (Homewood 1981).

Vegetation recycling

Flies are probably most beneficial as decomposers of litter and carrion. In forests and gorse shrubland, fungus gnats (Mycetophilidae, Keroplatidae, Ditomyiidae), together with some Phoridae and Cecidomyiidae, feed on fungi in leaf litter and in logs. Members of these five families, plus crane flies (Tipulidae) and other flies feeding in logs, must consume a high proportion of the fungi eaten by invertebrates (Skerman 1953; Somerfield 1974; Anderson 1982). This conclusion is based on their biomass compared to other fungus-consuming insects taken by malaise traps (Ward et al. 1999; Harris et al. 2004) or impact traps (Didham 1992).

Removers of carrion and dung

Blow flies and certain other flies (some Muscidae, Sphaeroceridae) consume much livestock, bird, rodent, and fish carrion biomass before it reaches the greatly reduced dry stage. Larger vertebrate carcasses (sheep, pigs) become heated during decomposition, when flies are most active (Dymock & Forgie 1993). Temperatures and features of the site affect the rate of decomposition and the availability of certain blow flies within medium-sized (hare, opposum) carcasses (Boswell 1967; Appleton 1993). Medium-sized mammal (opossum) or larger bird (magpie) carrion provide a higher percentage (2–2.5 times) of flystrike species than a blackbird (Heath & Appleton 2000). Mice carrion has been studied in New Zealand pastoral farmland, but published information states that no flystrike species were involved and that shade favours blow-fly colonisation (Heath & Appleton 2000). In North and South America, where *Lucilia sericata* and the secondary sheep strike *Calliphora vicina* are also present, these were the main species reared from rodent, fish and bird-gut carrion (Tomberlin & Butler 1998; Figueroa-Roa & Linhares 2002). The composition of blow-fly species is affected by the availability of kanuka (*Kunzea ericoides*) scrub and native bush (Robinsons Bay, Banks Peninsula) compared to areas with mainly nectarless conifer shelter belts (Lincoln University, Cheviot) or, on Chatham island, with sheep (based on a collection of 38,890 blow flies with baited western Australian traps in 1991–1992 (Macfarlane unpubl.)). *Lucilia sericata* averaged 91% of the blow flies caught at Lincoln and Cheviot, 74% at Robinsons Bay, but only 4% on Chatham Island. *Calliphora stygia* (primary blow-fly species) made up 22% at

Bladder fly *Ogcodes brunneus* (Acroceridae).
After Grant 1999

Robinsons Bay, 13% on the Chathams, and 5% and 3% at Lincoln and Cheviot, respectively. Similarly, *Calliphora quadrimaculata* made up 2.3% at Robinsons Bay, but only 0.1% elsewhere in Canterbury. *Calliphora vicina* averaged 5% (range 2–8%) at the Canterbury sites. *Xenocalliphora hortona* averaged 0.4% (range 0.2–0.6%) in Canterbury, but 81.7% of the catch on Chatham Island. *Xenocalliphora hortona* and *Lucilia sericata* are among the commoner species at beaches, where fish, mollusc, crab and seabird carrion is available. Thus rodent and small-bird carrion could well also suit these blow-fly species in lowland pastures in New Zealand. Some Sphaeroceridae, Phoridae, and Chloropidae feed on larger invertebrate carrion.

Flesh flies, for example *Oxysarcodexia varia* (Sarcophagidae), and also *Lasionemopoda hirsuta* (Sepsidae) and some Sphaeroceridae, complement earthworms in the consumption of livestock dung in summer.

Aid in forensic science, water evaluation, and reserve quality

As a corollary to their role in decomposition of carrion, the stages of fly development and species can be helpful in forensic science (Heath 1982), i.e. in determining how long a corpse has been around.

In the aquatic environment, fly species composition varies considerably with changes in water bodies (Quinn & Hickey 1990a,b; Stark 1993) so that some species can be useful as indicators of water quality. This role will become more apparent when Empididae, Muscidae, Chironomidae, and Ceratopogonidae have been adequately studied and mapped at the species level.

Surveys of urban reserves have shown that fly species can include regionally uncommon or characteristic habitat species (Macfarlane et al. 1998, 1999, 2005, 2007), and this can help to define the biological value of public reserves. Tenure surveys of South Island high-country farms are beginning to demonstrate the importance of some fly species as indicators of naturalness of relatively intact insect communities and for conservation.

Food for other animals

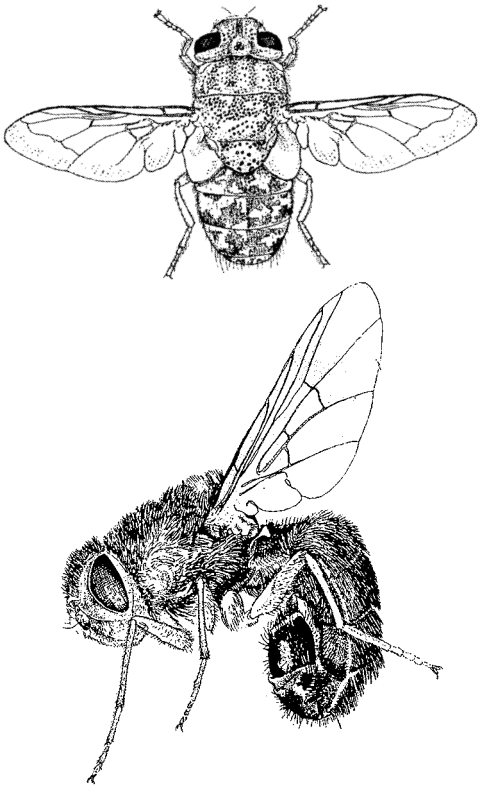
An additional major role of flies is as food for other creatures, mainly birds, spiders, and other invertebrates. The larger and less mobile forest flies provide valuable protein and at times fat-rich sources for bush birds. Fantails forage on flying insects and other birds capture inactive insects among twigs and on branches. Other flies provide prey for various fly, beetle, and spider species along beaches. These include kelp flies, which breed in stranded kelp on rocky shores and nearby beaches. About 80 species of flies, including many *Paralimnophora* species (Muscidae), make up the distinctive fly faunas of sandy beaches and rocky shores (Macfarlane & Andrew 2001; Harrison & Macfarlane unpubl.). On estuary foreshores, midges are abundant primary scavengers, while dolichopodid larvae and predatory saldid bugs are part of the estuary insect community (Knox et al. 1978; Knox & Bolton 1978). Most species of aquatic flies live in fresh water (Macfarlane & Andrew 2001) where they can be locally significant insects for biomass (Quinn & Hickey 1990a,b), especially in cool mountain waters or more degraded lowland waters. Immature flies, especially midges, are an important part of the invertebrate food of fish (McDowall 1990; Collier & Winterbourn 2000).

Larva of midge *Chironomus* sp. (Chironomidae).
Stephen Moore, Landcare Research

Introduced pest and other species

In 1950 only 45 introduced species of flies were listed among the 1731 species then known in New Zealand (Miller 1950). Now, with a sounder taxonomic base, almost four times more introduced species are known, which represents 7% of the described fly species in New Zealand. Most of the introduced species were accidentally derived from Europe (71–72%) or Australia (21%) (Evenhuis 1989). Many European and American species probably arrived well before 1945 (Macfarlane & Andrew 2001).

Flies are a familiar group of insects to the general public, although their



Two livestock pests – sheep nasal bot fly *Oestrus ovis* (upper) and *Gasterophilus intestinalis* of horses (lower) (Oestridae).

After Grant 1999

negative impact as pests to livestock and as disease carriers to humans is more widely understood and researched than their positive values. Only 0.5–1% of the species in New Zealand are pests and all the main fly pest species were accidentally introduced. Useful older works on pest species include those of Cottier (1956), who illustrated damage by many fly species, Helson (1974), who illustrated life-cycles of seven pest species including the threatening Mediterranean fruit fly, and Scott (1984), who provided an extensive outline of pest recognition, life history, economic significance, and control. The range of plant and animal species affected adversely by flies is moderate compared with the other main herbivorous and wood-feeding insect orders (Coleoptera, Lepidoptera, Hemiptera). In New Zealand, these three orders probably have more primary plant-consuming species than Diptera.

Flies in human and animal health

Some of the best-known flies affect the health of animals and humans, notably blow flies, bot flies, and blood-sucking flies such as mosquitoes and sand flies. On pastoral farms, pest blow-fly species can kill sheep or lower their wool quality (mainly the two *Lucilia* species and *Calliphora stygia*, which cause the initial blow-fly strike). Other blow-fly species such as *Calliphora vicina, C. quadrimaculata*, and *Xenocalliphora hortona* may then add to blow-fly strike as secondary species. Control measures and losses to farmers rank these blow flies among the major insect pests in New Zealand (Heath 1980; Dear 1985). With the arrival of *Lucilia cuprina*, strike activity has been extended from December until late autumn (Heath et al. 1983; Dymock et al. 1990) and it reached Cheviot by January 1992 (Macfarlane unpubl.). Nasal bot flies (*Oestrus ovis*) are common in sheep nostrils (Kettle 1973; Miller & Walker 1984) and they cause severe irritation and loss of condition in sheep (Scott 1984). The larvae of two bot-fly (*Gasterophilus*) species live in horse intestines, affecting horse health (Miller & Walker 1984). Both the adults and the larvae distress horses (Scott 1984).

Other pests, such as mosquitoes, are discussed below in the accounts of fly families.

Pests of pastures, crops, and gardens

There are no recent comprehensive reviews of plant hosts for flies. The latest is based on literature up to 1960 in Dale and Maddison (1982), who listed insect species and references concerning host-plant species. Only a minority of the plant-feeding flies can be considered pests, while some are actually beneficial.

In pastures and maize crops, the root-feeding Australian soldier fly *Inopus rubriceps* is a major pest in northern North Island (Helson 1974; Robertson & Blank 1982; Scott 1984; Macfarlane & Andrew 2001). In addition, several soil-dwelling *Leptotarsus* species may feed on both roots and dead organic matter, mostly in uncultivated pastures (Macfarlane & Andrew 2001). A number of root-gnat species (Sciaridae) can cause extensive damage to a wide range of greenhouse ornamental plants (Scott 1984). There are also sporadic reports of European-derived *Bradysia* ?*brunnipes* (*'Sciara annulata'*) damaging cucumber and other cucurbit seedlings in New Zealand (Stacey 1969; Dennis 1978). Control of *Bradysia difformis* (= *pauparea*) has been investigated (Martin & Workman 1999) because this species can be a threat to root development in pots. Naturalised populations of daffodils or hyacinths may become depleted when narcissus bulb fly *Merodon equestris* and the lesser bulb- or onion flies (*Eumerus* species; Cottier 1956) feed in their bulbs. Commercial crops are vulnerable too (Scott 1984).

On cropping farms, other small flies can damage cereal and brassica crops. The hessian fly *Mayetiola destructor* feeds in stems of wheat, maize, other cereals, and prairie grass and can be common (Withers et al. 1995; Bejakovich et al. 1998). Resistant cereal varieties and burning of stubble mainly keep this pest in check (Cameron et al. 1989). *Cerodontha australis* (Agromyzidae), *Hydrellia*

tritici (Ephydridae), and *Lonchoptera furcata* (Lonchopteridae) are all widespread and very common in grasslands (Macfarlane & Andrew 2001), but these small flies have been assessed to cause little or no economic damage (Barker et al. 1984; Cameron et al. 1989). *Cerodontha australis* is often found in cereal crops, but damage is slight (Bejakovich et al. 1998). A drosophilid leaf-miner, *Scaptomyza flava*, disfigures brassica and pea crops but causes economic damage only in exceptional circumstances (Seraj & Fenemore 1993). The beet leaf-miner *Liriomyza chenopodii* can cause extensive leaf damage to beet crops (Scott 1984). It is common in central Canterbury crops (Pearson & Goldson 1980). No control measures have been devised for it.

Several groups of flies, particularly the gall midges and leaf miners, damage aerial parts of flowers. In orchards and gardens, apple foliage can become badly distorted by the gall midge *Dasineura mali*, and *D. pyri* can cause similar damage to pears. At times, the leaf and flower galls of *Rhopalomyia chrysanthemi* may affect chrysanthemums in gardens (Wise 1957). This gall midge is a threat to the cut-flower industry. Leaves of cineraria (*Pericallis* × *hybrida*, often as *Senecio cruentus*) in gardens and chrysanthemum leaves in glasshouses can be attacked by the leaf-mining *Chromatomyia syngenesiae* (Cottier 1956; Scott 1984). Further breeding sites for it are common composite weeds like sowthistle (*Sonchus asper*), fireweed (*Senecio bipinnatisectus*), and other *Senecio* species (Spencer 1976; Macfarlane et al. 1999).

Flies affect native garden shrubs adversely. The rosette-making gall of *Oligotrophus oleariae* can disfigure at least three *Olearia* species, including *O. paniculata* (golden akeake), a useful hedge shrub. Kakabeak (*Clianthus* spp.) can be threatened by insect, mite, and mollusc pests, including the host-specific leaf miner *Liriomyza clianthi* (Watt 1923). Other gall midges affect seed crops of meadow foxtail (*Alopecurus pratensis*) and cocksfoot (*Dactylis glomerata*) (Jacks & Cottier 1948; Barnes 1940; Macfarlane & Andrew 2001).

Mushroom spoilers

Flies can be a threat to mushroom producers and often cause premature decay of mushrooms gathered in the field. The sciarid *Lycoriella castanescens* is the main pest species in New Zealand, but the sphaerocerid *Pullimosina heteroneura* can transmit the nematodes that attack commercial mushrooms (McAlpine et al. 1987) and *Phthitia emarginata* affects rotting mushrooms (Marshall et al. 2009). The phorid *Megaselia halterata* is often found in mushrooms in Europe and North America, so it will feed among mushrooms in New Zealand too. Most species of Mycetophilidae feed on fungi, but are probably of no economic significance. There is no summary of fly use of fungal species in New Zealand. Simon Hodge (unpubl.) recently investigated a range of habitats with mushrooms as bait in Canterbury and Wilding et al. (1989) summarised overseas findings.

Fruit flies

Fruit flies of the family Tephritidae are major potential pests, discussed below in the accounts of fly families. Frampton (1990) explained the extensive measures undertaken to monitor for any accidental establishment of fruit flies. White and Elson-Harris (1992) provided a modern summary of the pest species of fruit flies as well as species affecting weeds.

Natural enemies of flies

Insect numbers are to a large extent controlled by predators, pathogens, parasites, and parasitoids (parasitic insects that normally kill the host before it has matured). Birds, spiders, and many predatory insect species play a major role in controlling the populations of many fly species, as do insect parasitoids that develop on or inside a fly host. Nematode and protozoan parasites, fungi, and bacterial pathogens also profoundly affect fly populations. Larval mites (Arrenuridae and Microtrombidiidae) parasitise adult mosquitoes and crane flies (Snell & Heath 2006).

Predators

The role of birds and spiders is obvious. Small flies such as psychodids and sciarids are often caught in large numbers in the webs of the common orbweb spider (Laing 1988; Macfarlane et al. 1999). Apart from the ecological investigations of predation on pest species (Boswell 1967; Valentine 1967b; Allsopp & Robertson 1988; Appleton 1993), little has been recorded about predation of other invertebrates on fly larvae and pupae. Ground beetles, rove beetles, and click beetles can cause important mortalities in outbreaks of Australian soldier fly (Allsopp & Robertson 1988). Flies are also recorded as prey of predatory bugs (Hemiptera) (Valentine 1967b) and species of the sphecid wasp genera *Podagritus* and *Rhopalum* (Harris 1994a). In water, chironomid larvae prey on *Austrothaumalea* (Thaumaleidae) larvae (McLellan 1983).

Striped dung fly *Oxysarcodexia varia* (Sarcophagidae).
After Grant 1999

Parasitoids

The most prominent parasitoids of Diptera and other arthropods belong to the order Hymenoptera. Thirty-eight species of parasitic Hymenoptera from 10 families have been reared from at least 39 New Zealand fly species in 14 families (Valentine 1967b; Valentine & Walker 1991). Gall midges, kelp flies, and the glow-worm (a fungus gnat), are known to host 10 diapriid species, three braconid species, two *Fusiterga* species (Pteromalidae), one species of Encyrtidae, and one of Torymidae.

The parasitoids of introduced and pest species have been more extensively investigated, with records from 14 introduced fly species. The remaining 130–143 species of introduced flies may have few parasitoids affecting them apart from the more adaptable native species that have extended their host range to include these species.

Parasitoids of 26 species have been introduced deliberately or arrived with hessian flies, blow flies, pest muscid flies, and agromyzid leaf miners. Some have extended their host range to dung-inhabiting *Oxysarcodexia varia* and to kelp flies (Cameron et al. 1989; Valentine & Walker 1991). At least four species of beneficial hover flies are parasitised by the accidentally introduced *Diplazon laetatorius* (Ichneumonidae). The incidence of parasitism per host fly species varies with habititat, the origin of the species, and which of the three immature stages of the fly are parasitised. Also, species-rich fly genera are unlikely to support a high average of parasitoid species, especially if these genera are affected by the generally less host-specific external parasitoid species.

Hymenopterans very seldom parasitise immature stages of flies that live in water (Smith 1989; Stehr 1991; Goulet & Huber 1993; Ashe et al. 1998). Also, soil-inhabiting Therevidae and Asilidae larvae have no records of parasitic insects reared from them elsewhere in the world (Knutson 1972; Lavigne et al. 1978; Dennis & Knutson 1988). It seems that immature flies in soil and wetlands are more difficult for winged parasites to reach and detect, so parasitism per species is expected to be low.

Different parasitoid species may affect eggs, larvae, and pupae, and internal parasitoids tend to be more host-specific and allow the host to develop (Gauld & Bolton 1988; Quicke 1997). The undescribed species of Hymenoptera include a relatively diverse fauna of egg parasites (Noyes & Valentine 1989a,b; Berry, this chapter). Variation in the incidence of egg parasitism between fly taxa is unknown in New Zealand. The more-exposed eggs of Syrphidae on plants and of some Acroceridae on twigs (Miller & Walker 1984) may well host parasitoids more consistently than eggs protected within particular substrata (e.g. the Tipulidae, Sepsidae, and some Asilidae of soil or rotting logs, and the Anthomyiidae, Agromyzidae and some Cecidomyiidae of plants) (Watt 1923; Hinton 1981).

Most parasitic species of Hymenoptera in New Zealand remain undescribed, including about 200 species of Diapriidae, dipteran parasitoids. Many more may await discovery. Clearly, much more research on the immature stages of flies and their parasitoids is needed before a reasonably confident prediction can be made about their importance as hosts of New Zealand Hymenoptera.

Diversity and endemicity of New Zealand Diptera and offshore-island distributions

Fly family	New Zealand genera		New Zealand species†		Described species		Families found on offshore islands
	No. genera	% endemic	No. known	% undet.	% endemic	% offshore	
NEMATOCERA	260	30	1,638–1,654	19–20	95	4.1	
Bibionidae	1	0	8	0	100	0	Ch
Blephariceridae	3	100	13	38	100	0	No, Ch, **Ca**
Cecidomyiidae	31	19	229	59	85	4	All, **Sub**
Ceratopogonidae	10	0	39	13	100	9	All, **Sub**
Chironomidae	67	39	146	23	94	17	No, **Ch,** Sn, **Sub**
Culicidae	6	33	15	0	69	6	No, **Ch,** Sn, Su
Ditomyiidae	2	0	25	7	100	0	No
Dixidae	3	33	9	0	100	0	Ch, Sub
Keroplatidae	12	0	50	2	98	0	All, **Sub**
Mycetophilidae	33	45	266	27	99	2	All, Sn, Sub
Psychodidae	9	11	62–78	21–38	87	13	Ch, Sub
Rangomaramidae	4	**75**	12	0	92	8	
Scatopsidae*	5	0	10	50	50	0	Sub
Sciaridae	13	**8**	71	3	87	3	All, **Ch,** Ca
Simuliidae*	1	0	15	0	100	15	**Sub**
Thaumaleidae	2	0	11	0	100	0	
Tipulidae	48	33	619	8	100	2.5	**All**
Trichoceridae	4	25	19	5	94	0	**Sub**
Five other families	6	33	19	16	94	0	**Sub**
ORTHORRHAPHA	106	40	630	28	99	2.9	
Acroceridae	4	50	14	29	100	0	
Asilidae	6	33	30	43	100	6	**No,Ch**
Dolichopodidae	31	45	147	10	98	6	**All**
Empididae	41	42	283	37	100	1*	All, **Ak, Ca**
Stratiomyidae	13	46	59	46	88	3	No, **Ch,** Sn
Tabanidae*	3	0	20	15	100	0	
Therevidae	3	33	71	4	100	0	**TK, PK**
Four other families	5	40	6	57	100	0	
ASCHIZA	38	21	151	41	58	2.3	
Phoridae	18	44	44	14	74	0	All
Pipunculidae	3	0	14	64	100	0	
Syrphidae	13	**8**	90	51	86	4.5*	All, **Ch,** Sn, **Ca**
Three other families	4	0	3	33	33	0	Ch, Sn
SCHIZOPHORA Acalyptratae	115	22	386	12	81	7.3	
Agromyzidae	7	0	41	2	76	2.5	All, **Sn, An**
Canacidae	4	25	12	0	100	**27**	Sn, **Sub**
Chloropidae	12	**8**	45	2	86	5	?No, **Ch,** Sn
Drosophilidae*	3	0	19	21	27	0	All, **Ch,** Sn
Ephydridae	19	**5**	66	61	79	8	All, **No**, **Ch**
Heleomyzidae	8	63	32	3	90	6.5	**Bo,** Sn
Helosciomyzidae	6	**83**	11	0	100	27	No, **Ch**
Huttoninidae	2	100	9	0	100	0	Ch, **Sn, Ak**
Lauxaniidae	4	25	17	0	100	0	
Pallopteridae	1	100	10	10	100	0	
Sciomyzidae	2	100	18	0	100	0	
Sphaeroceridae	18	11	43	19	40	6	No, Sub
Tephritidae	5	0	20	5	80	0	Ch
Sixteen other families	24	17	43	17	80	19	All, **Ch, Sub, Sn, LB?**
SCHIZOPHORA Calyptratae	102	63	420	35	86	7.6	
Calliphoridae	8	25	58	5	82	15	All, **Sn, Sub**
Fanniidae	2	0	8	50	0	0	No, **Ch,** Sn
Muscidae	17	41	145	59	88	21	All, **Ch**, Sn, **Sub**
Tachinidae	61	90	190	30	98	0	No, **Ch**
Four other families	14	0	19	16	0	0	Ch, Sub
Total DIPTERA	**621**	**33**	**3,225–3,241**	**23**	**91**	**4.6**	

† not including subspecies

* All genera shared with Australia.

Ak, Auckland Is; All, all islands except subantarctic; An, Antipodes Is; Bo, Bounty Is; Cp, Campbell I.; Ch, Chatham I.; LB, Little Barrier; No, all northern islands; PK, Poor Knights Is; St, Stewart I.; Sub, subantarctic islands; TK, Three Kings Is. Island groups: northern = Northland–Bay of Plenty; subantarctic = Snares, Antipodes, Bounty, Auckland, Campbell.

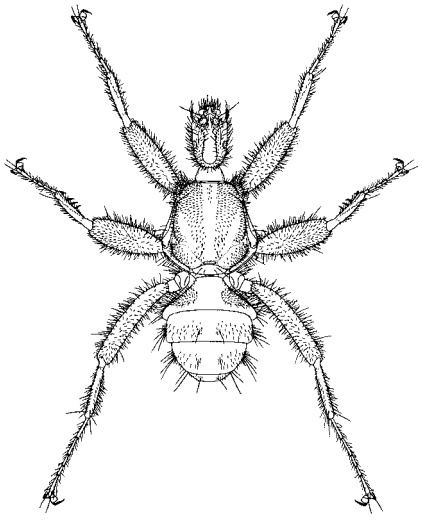
Pathogens

Seven of the 10 specified records of fungi (eight species), nematodes (three species), and protozoans (three species) that affect Diptera in New Zealand pertain to aquatic species (Glare et al. 1993). International interest in the control of mosquitoes and black flies has centred on the possible use of bacteria (Lacey 1997). Sixteen papers from New Zealand on fly pathogens (Glare et al. 1993) provided records of the protozoan *Herpetomonas muscorum* from the native blow fly *Calliphora quadrimaculata* and the fungi *Tolypocladium extinguens* from the glow-worm and *Beauveria bassiana* from the hover fly *Melangyna novaezealandiae*. In the field, *Metarhizium anisopliae* is the main fungus known to affect larvae and pupae of the Australian soldier fly under a range of soil moistures. In Australia, efforts have been made to develop effective strains for control of this fly (Allsopp & Robertson 1988). More recently, strains of the bacterium *Serratia* have been investigated for their possible impact on one of the pest blow-fly species (O'Callaghan et al. 1996). There is not enough information on how many pathogens affect a particular fly host to gain any appreciation of how many protozoans, nematodes, and fungal species the flies of New Zealand may host, but many of the better-known soil-fungal pathogens affect a wide range of insect species (Steinhaus 1963; Tanada & Kaya 1993).

New Zealand fly diversity and scientific importance

Diversity and endemism

The Diptera is the second-largest order for family- and species-level diversity in New Zealand. This position will almost certainly still apply when the diversity of all New Zealand insects is eventually determined, even although Emberson (1998) predicted that species numbers of Hymenoptera may be similar to Diptera. Evenhuis (1989) catalogued New Zealand species among Australasian and Oceanian flies and his checklist has been updated to the present in the present review. The known biology of each family has been summarised in Evenhuis (1989) and in the Australian (CSIRO 1991), North American (McAlpine et al. 1981, 1987), and British reviews (Smith 1989). Macfarlane and Andrew (2001) summarised habitat use mainly at the family level for the New Zealand Diptera. They summarised what has been recorded on species mapping and the distribution of most dipteran pests within New Zealand. Prominent or readily identified species from the more restricted habitats of carrion, dung, caves, seashores, parasites, and aquatic habitats were also summarised, and known details for species are listed in the end-chapter Diptera checklist. The compilation of habitat use and feeding sources by species in the checklist demonstrates that much remains to be learnt about the basic ecology of flies in New Zealand. The checklist also compiles records for 739–758 undescribed species in 25 families, but the practical experience of the authors is insufficient to provide estimates for several major families (e.g. Cecidomyiidae, Chironomidae, Ceratopogonidae, Lauxaniidae and much of the Dolichopodidae). The checklist has records for subantarctic and Snares islands species; these are not listed in Evenhuis's (1989) catalogue of Diptera from Australasia and Oceania.



Bat fly *Mystacinobia zelandica* (Calliphoridae).
Des Helmore

The tabulation below and the end-chapter checklist of Diptera cover 78 known families. The only certain endemic fly family in New Zealand is the Huttoninidae, collected from forest and subalpine sites (Harrison 1959, CMNZ, LUNZ), but the family status of *Starkomyia inexpecta* remains unresolved among Mycetophiloformia. The sole endemic subfamily Mystacinobiinae (Calliphoridae) has a single species, *Mystacinobia zelandica.* This fly survives on the guano and debris (Holloway 1976) of the New Zealand short tailed bat *Mystacina tuberculata*, which roosts in trees or caves.

The checklist includes 622 genera (17 undescribed), including six (*Ceonosia*, *Empis*, *Limnia*, *Platura*, *Sciara*, *Tachina*) that are almost certainly not valid for New Zealand and six others (*Anatopynia*, *Cerdistus*, *Dipsomyia*, *Neoitamus*, *Spilogona*, *Tanypus*) that are either endemic or need critical generic re-evaluation. Accidental

introductions of flies, supplemented by biological-control introductions, have added 75 genera to the New Zealand fauna. In all, 211 of the genera in New Zealand are present in the British Isles (Chandler 1998) and 236 are shared with North America (McAlpine et al. 1981, 1987). New Zealand and Australia share 247 genera. About 33% of the genera existing in New Zealand prior to European settlement are endemic, a figure that is 4.7 times the level recorded for New Caledonia and Tasmania, which are our nearest relatively old or large neighbouring islands.

The apparent level of endemism is somewhat elevated owing to the existence of many monotypic genera, most notably in the Chironomidae. Overall, the percentage of all New Zealand Diptera that belong to endemic genera is quite high at about 22% (23% in pre-European times). The family that surpasses all others in numbers of endemic genera and species is the Tachinidae, with 90% of its 61 genera endemic and 83% of its 190 species in the endemic genera. For the rest of the calyptrate flies, the level of endemism is about average at 24%, but is low (2.9%) for Orthorrhapha. Five other smaller families, with at least eight species each, have high levels of endemism (60–100%). Conversely, three fully freshwater fly families (Simuliidae, Pelecorhynchidae, Tabanidae) and the mainly aquatic Ceratopogonidae each have around 12 genera, none of which is endemic. This may mean that these families became established in New Zealand later than Chironomidae, Blephariceridae and Tanyderidae, which have about average or higher levels of endemic genera for Nematocera flies. The level of generic endemism is quite variable among Acalyptrate flies.

There are no endemic genera of herbivorous Agromyzidae and Drosophilidae (fruit flies) and only one endemic genus in each of the families Ephydridae, Chloropidae, and Sphaeroceridae. The important herbivorous fly family Cecidomyiidae (gall midges) has some endemic genera, though six of the 30 genera were accidentally introduced and two were deliberately introduced for biocontrol of weeds. Further endemic genera are likely to be described from undescribed gall-making species associated with shrubs, forest trees, tree ferns, creepers, perennials, and grasses (Martin unpubl.).

The New Zealand dipteran fauna comprises 2483 described species, 736 known undescribed species, and a further 49 indeterminate species that might represent accidental introductions. Three methods were used by Macfarlane and Andrew (2001) to estimate a likely range of 999–2510 undescribed species for the Diptera. Despite a 160-year history of mainly accidental introductions, which have allowed for 171–190 species to become established, the species list still has a high level of endemicity (95%). Most of the estimated 2000 or so undescribed species of Diptera in New Zealand are probably mainly in forests and the mountains (Macfarlane & Andrew 2001).

The 15 groups of offshore islands have 121 known fly species confined to them (Evenhuis 1989; Bickel 1991; Lyneborg 1992; Marshall & Rohácek 2000; Macfarlane & Andrew 2001; checklist). The subantarctic islands more consistently appear to have their own endemic species. However, when the Diptera of the Three Kings, Poor Knights, and Chatham Islands have been thoroughly studied then perhaps the offshore islands could have 150–200 endemic species. Either way, these figures are indicative of the high conservation value of offshore-island habitats for fly species. The figures also suggest that ecological maintenance of offshore reserves is likely to be important to avoid placing further fly species under threat. Macfarlane and Andrew (2001) assessed the status of published information on fly diversity of offshore islands relative to the isolation, age, and botanical diversity of the islands. Speciation in several family-rank taxa that inhabit seashores is highest in Australasia and/or on subantarctic islands is highest on subantarctic islands, e.g. Canacidae (Zaleinae), Helcomyzidae, and Coelopidae (Macfarlane & Andrew 2001; McAlpine 2007). The Snares islands are the southern limit of distribution for Stratiomyzidae, Drosophilidae, Heleomyzidae, and Chloropidae (Harrison 1976; Macfarlane & Andrew 2001).

Miller (1950) listed the locations of the types of the 1731 species of New Zealand Diptera known to 1950. Since then most of the types have been lodged in the New Zealand Arthropod Collection with a minority kept in overseas collections (Macfarlane & Andrew 2001). Macfarlane & Andrew (2001) tabulated the main literature sources for the identification of each fly family and compiled isolated records of species additional to those listed in Evenhuis (1989) and other revisions. The larger fly faunas of Australia (CSIRO 1991) and North America (McAlpine et al. 1981, 1987) share all of the genera in New Zealand for 24 and 20 fly families, respectively, including eight large families. Consequently, for the mainly smaller families, overseas generic keys provide a guide for identification where there is no key to New Zealand genera.

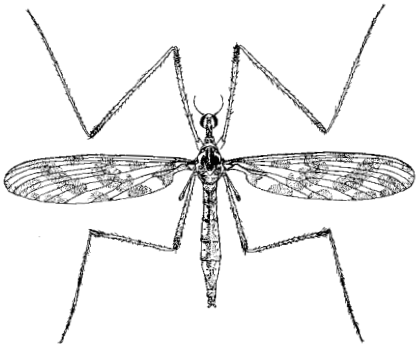
Ecology, biology, and status of families

There are two suborders of Diptera – Nematocera and Brachycera. The latter is divided into two divisions, the Brachycera Orthorrhapha (referred to as Brachycera or Orthorrhapha) and the Cyclorrhapha (or Muscomorpha). The Cyclorrhapha include two sections – Aschiza (including hover flies and scuttle flies) and Schizophora. The latter are the 'acalyptrate' and 'calyptrate' flies, discussed under separate headings below and in the species list.

There has been no review of the immature stages of Diptera in New Zealand apart from those in fresh water (Winterbourn et al. 2000) and no recent review of the biology of New Zealand species, hence some new information is given here, particularly from the Manawatu (I. Andrew, pers. obs.) and Canterbury (R. Macfarlane, pers. obs.). Miller (1956) listed references to publications on immature stages and life-histories of New Zealand flies. An adapted family-level key to the larvae is needed to remove the difficulty of larval identification in New Zealand. It is not easy to investigate fly biology and glean information on habitat preferences if immature specimens cannot be distinguished on the basis of their morphology.

Suborder Nematocera

The 23 families of Nematocera form a major component of the litter-dwelling and fungus-feeding flies and of freshwater species.



Mischoderus sp. (Tanyderidae).
From Grant 1999

Tipulidae

Crane flies have more species diversity than either the 29 acalyptrate families or the nine calyptrate families. Endemism of species is high at 99.6%. The range of habitat use in generally wetter environments is quite considerable, with major use of forest soil, litter, and rotting logs, as well as freshwater and even semi-saline water, and even reasonably drought-prone soils (Macfarlane & Andrew 2001). Habitats also range from the coastal foreshore to alpine fellfields (Edwards 1923a; Macfarlane & Andrew 2001. This family is treated in more detail below.

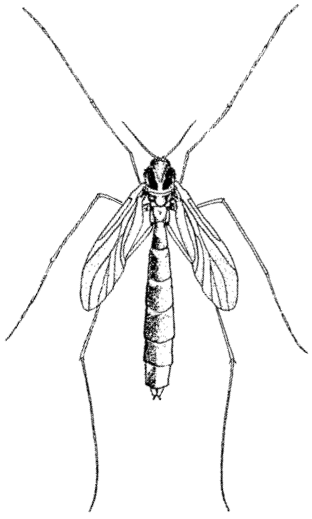
Trichoceridae, *Tanyderidae*. Winter crane flies (Trichoceridae) and the aquatic Tanyderidae resemble true crane flies quite closely (Edwards 1923a; McAlpine et al. 1981; Grant 1999) with their long legs and wings with several closed cells and quite complex venation. Most of the species are found in the Southern Hemisphere (McAlpine et al. 1981). Two overseas dipterists are investigating the taxonomy of both of these families. Trichoceridae are 3–9 millimetres long, the bodies range from brown to white and they have a strongly bent inner hind anal vein. Krzeminska (2001, 2003, 2005) has revised the 15 paracladurine species and allocated them to two new genera. These species are associated with native forest and are generally represented by limited specimens in the collections. Tanyderidae are 10–17 millimetres long and include species with circular spots in the wings (Edwards 1923a).

Ditomyiidae, *Keroplatidae*, *Mycetophilidae*. Among these, mycetophilidae is the main family of fungus gnats. The three families (including Keroplatidae and Ditomyiidae) are most readily distinguished from other Nematocera by their coxae being of a similar length to the femora and by their wings, with a moderate amount of venation and cells largely not closed. Tonnoir and Edwards (1927) illustrated the variation in wing-vein patterns and male genitalia in these three families. Zaitzev (2001, 2002a, b) has revised the genera *Brevicornu*, *Zygomyia*, and *Aneura*, describing a further 14 new species, but his *Zygomyia submarginata* is a preoccupied name. Jaschhof and Jaschhof (2009) and Jaschhof and Kallweit (2009) described three new genera and seven new species. Toft and Chandler (2005) provided the means to recognise three species that originated from Europe and Chile. Most species are expected to be fungus-feeders, but fungal associations have not been investigated to any extent. Some common species will be generalist feeders, but the high degree of sympatric speciation in some species (e.g. *Tetragoneura*, *Zygomyia*) suggests that some specialist associations will occur (R. J. Toft pers. comm.).

The species are concentrated in forests (Didham 1992; Ward et al. 1999; Toft et al. 2001). Habitats with large quantities of dead wood, such as exotic gorse (*Ulex europaeus*) and kanuka (*Kunzea ericoides*), support 102 fungus-gnat species (Harris et al. 2004). Very few species (2–4) have been collected in extensive surveys of pasture grassland (Cumber & Harrison 1959b; Martin 1983), two from lucerne (Macfarlane 1970), and none in grass seed or cereal crops (Bejakovich et al. 1998). *Anomalomyia guttata* is apparently the most tolerant species, extending its habitat from forests to wet grasslands (Macfarlane 1970; Martin 1983; Macfarlane et al. 1998). There is still a great amount of taxonomic and faunistic work required before the species can be reliably identified and their distribution mapped in New Zealand.

Despite recent revisions, there are still more than 55 species of undescribed Mycetophilidae in New Zealand and even on a generic level our knowledge is far from complete. Phylogenetic and biogeographic relationships to fungus gnats in other parts of the world are poorly studied and understood, but relationships with other faunas of Gondwanan origin (Neotropics, Australia, New Caledonia) are obvious, as also with Indo-Malayan and Holarctic faunas (Freeman 1951; Matile 1990, 1993) Extensive malaise trapping of Mycetophilidae in and around regenerating forest at Hinewai Reserve on Banks Peninsula (Ward et al. 1999) produced late spring–early summer and autumn peaks in catches with some flight activity into winter. These flies form a considerable part of the biomass of forest insects and a few species account for large numbers of specimens in native forest (Didham 1996) or regenerating kanuka forest (Harris et al. 2004). These flies are available for insectivorous birds such as fantails (*Rhipidura fuliginosa*) to feed on.

The Keroplatidae include a number of predator species, including the famous New Zealand glow-worm *Arachnocampa luminosa*, which is the most thoroughly studied. The glow-worm is one of the few species of flies in the world whose larvae use light to attract insect prey (Richards 1960; Pugsley 1984). New Zealand glow-worms are a feature of 23 commercial caves, but the 103 New Zealand cave systems include none in the drier eastern areas of both islands (Worthy 1989). New Zealand glow-worms exist under overhanging banks in forests outside of caves and they are apparently absent from at least part of the drier non-forested east coast regions (Macfarlane & Andrew 2001). Among Keroplatidae, *Isoneuromyia* species can be common among gorse (Harris et al. 2004) and low numbers are also found among flax (*Phormium tenax*). The New Zealand Ditomyiidae are primarily associated with dead wood (R. J. Toft pers. comm.), and are therefore most commonly encountered in mature forests (Macfarlane et al. 1998, 1999; Ward et al. 1999) where *Nervijuncta* species may often be collected on mossy tree trunks.

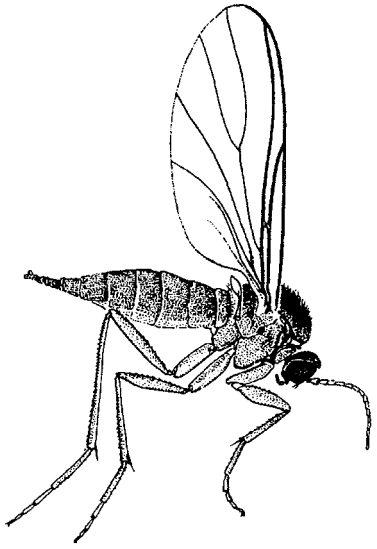


Adult of New Zealand glow-worm *Arachnocampa luminosa* (Keroplatidae)

From Grant 1999

'Fishing lines' of the New Zealand glow-worm.

Alastair Robertson and Maria Minor, Massey University

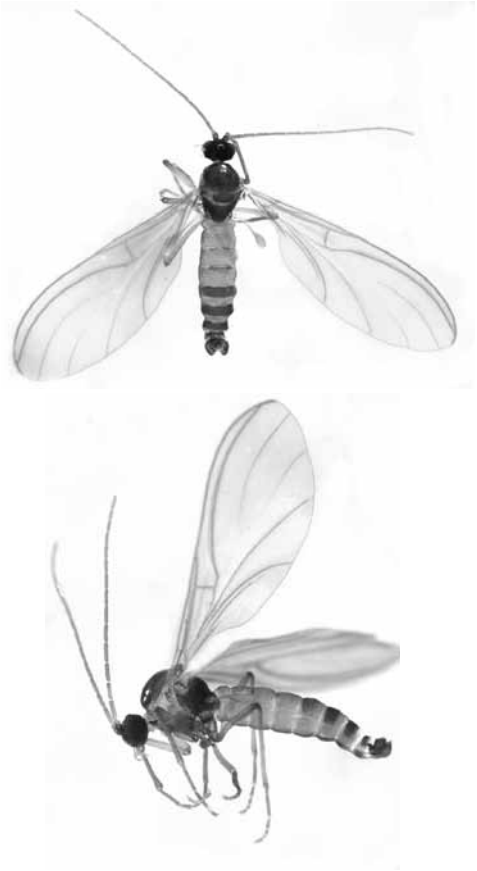


A species of Sciaridae.
After Grant 1999

Sciaridae. The number of New Zealand species of Sciaridae has more than doubled (Mohrig & Jaschhof 1999) since the last list was compiled (Evenhuis 1989). More species, including a flightless *Epidapus* species, await description. Species of *Bradysia* and *Lycoriella* still need verification from a competent authority so that endemic and introduced species can be reliably distinguished (see Checklist). Sciaridae are among the most abundant small flies in beech forest (Harrison & White 1969), broadleaf forest (Davies 1988; Didham 1992; Macfarlane et al. 1998), pine forest (Somerfield 1974; Macfarlane et al. 1999), and wet pasture (Cumber & Harrison 1959a,b; Macfarlane et al. 1998), but they extend to native grassland including braided riverbeds. The accidentally introduced species of root gnats (i.e. Sciaridae) in the genera *Bradysia* and *Lycoriella* are sporadic pests of horticultural crops, especially in glasshouses where these common flies can colonise potted plants before their natural enemies can slow population growth. '*Sciara annulata*' (probably *Bradysia brunnipes*) and *Scythropochroa nitida* have been reared from rotting willow logs (Wisely 1959) and the lack of native species recorded in pasture surveys indicates that most of the native species may favour forests and wetland habitats.

Rangomaramidae and Mycetophiloformia

The study of New Zealand Scairoidea fauna in the last decade led to the recognition of the new family Rangomaramidae, with three of four subfamilies from the Southern Hemisphere (Amorim & Rindal 2007). Placing these and other related genera has stimulated efforts to reinterpret the phylogeny of these flies (Hippa & Vilkamaa 2006) and inclusion of six infraorders within Nematocera (Amorim & Yates 2006). *Rangomarama* (Rangomaraminae) inhabits native forest, especially beech forest, from Auckland to Fiordland (Jaschhof & Didham 2002) and the other genera also inhabit podocarp or beech forest, but the larval habitat is unknown (Jaschhof 2004a,b, 2004, Jaschhof & Hippa 2003). *Starkomyia inexpecta*, which might be a new family or subfamily, is known only from a central North island forest.



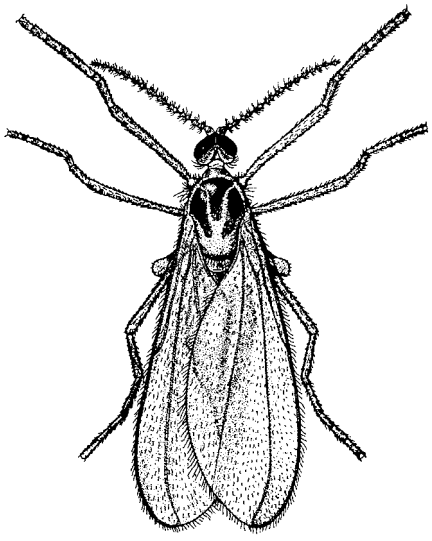
Rangomarama edwardsi dorsal and lateral views (Rangomaramidae).
Uwe Kallweit, Senckenberg Naturhistorische Sammlungen, Dresden

Cecidomyiidae

Gall-midges are an abundant part of the New Zealand fauna, but very poorly known. A conservative estimate of the number of unnamed species lies between 200 and 300 and some will belong to Australian genera or unnamed endemic genera (Jaschhof, pers. comm.). Martin (unpubl.) has recorded a further 130 or so undescribed gall-making species. These small flies (0.7–3.0 millimetres long) have simple wing venation and no tibial spurs, which helps distinguish them from most Sciaridae. Most of the major collections have few if any quality slides or pinned Cecidomyiidae. There is a need to collect, rear, mount, and examine the species in New Zealand as well as a chronic need for an illustrated introduction to the family. Larvae of Lestremiinae and Porricondylinae are considered to feed on fungi or decaying vegetation while Cecidomyiinae are mainly herbivores. The fauna of free-living gall midges of the subfamilies Lestremiinae and Porricondylinae are relatively diverse compared to the herbivores or gall makers, and Porricondylinae could be more speciose than Lestremiinae (M. Jaschhof pers. comm.).

A monograph of the subfamily Lestremiinae (J&J 2003a,b, 2004) revealed 63 species in 11 genera, with *Peromyia* as the main genus. These flies dwell mainly in native forests and shrubland but a few species extend their range into tussock grassland, other open habitats, and exotic forests. Among indigenous forests, beech forests appear to support a more diverse lestremiine community than any kind of podocarp forest. Four predatory genera of Cecidomyiinae have been recorded – *Arthrocnodax* (Cottier 1934), *Trisopsis* (Crosby 1986), *Diadiplosis* (Evenhuis 1989), and *Lestodiplosis* (Macfarlane & Andrew 2001), but *Arthrocnodax* needs verification (Barnes 1936). Adults of the three subfamilies are quite readily distinguishable to subfamily.

However, only 22 of the 30 genera recorded from New Zealand are included in a North American key (McAlpine et al. 1981). A key to the Australian Cecidomyini (Kolesik et al. 2002) includes a considerable number of new genera, so at best only provisional generic identifications can be obtained using these summaries as guides. The generic affiliation of most New Zealand gall-midges, including Porricondylinae and Cecidomyinae, is in urgent need of revision, which will probably add further new genera (Jaschhof pers. comm.). Species recognition is impossible for about half the named New Zealand species (25) because the types named by P. Marshall have been lost (Miller 1950), the hosts are unknown, and Marshall's (1896) descriptions are inadequate for identification. Six further endemic species have been described, and their identification is facilitated by better descriptions, usually illustrated, and by association with plant galls. These are *Dryomyia shawiae* from *Olearia* leaves (Anderson 1935), *Kieffieria coprosmae* from coprosma stems (Barnes & Lamb 1954), the beech-leaf gall *Stephodiplosis nothofagi* (Barnes 1936), the beech-root gall *Protodiplosis radicis* (Wyatt 1963), *Dasineura hebefolia* from leaf galls on *Hebe salicifolia* (Lamb 1951; Miller & Walker 1984), and *Oligotrophus oleariae* from rosette twig galls on *Olearia paniculata* (Maskell 1889; Miller & Walker 1984). Lamb (1960) listed several undescribed gall-midges and others have been recorded since. These include stem galls on native broom (*Carmichaelia* spp.), bush lawyer (*Rubus* spp.), *Hebe* (Smith 1961; Lintott 1981; Miller & Walker 1984), and ngaio (*Myoporum laetum*) (Lintott 1974), bud, leaf and flower galls on *Coprosma* (Martin unpubl.), bud galls on *Raoulia*, *Helichrysum* (Smith 1961; Lintott 1974, 1981), and *Clematis foetida* (Macfarlane unpubl.), a leaf, stem, and fruit gall on putaputaweta (*Carpodetus serratus*) (Smith 1961; Hunt 1992), galls affecting *Parahebe decora* (Smith 1961), buds on a mountain heath (*Dracophyllum*) (Martin 2003), and an apparent gall midge on *Hebe elliptica* (Valentine & Walker 1991). The snow tussock midge *Eucalyptodiplosis chionochloae* feeds on the growing seed of *Chionochloa* species and does not make a gall (Kolesik et al. 2007), and danthonia seed is affected too (Cone 1995), but perhaps not by this species. Additional hosts or types of gall to those previously mentioned include trees of podocarps, broadleaf and beech forests, kowhais (*Sophora* spp.), cabbages trees (*Cordyline* spp.), and *Muehlenbeckia* creepers.

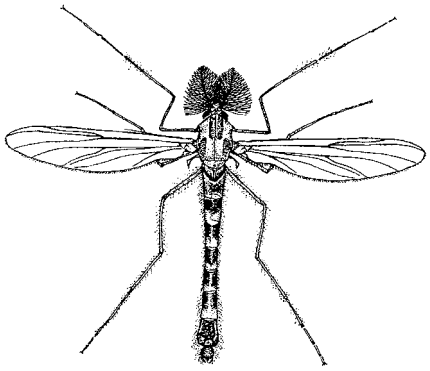


Snow tussock midge *Eucalyptodiplosis chionochloae* (Cecidomyiidae).
Tim Galloway, Lincoln University

Chironomidae

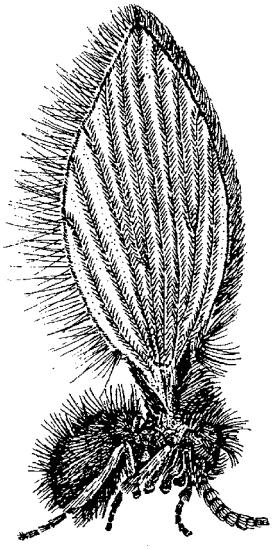
Midges are well known to New Zealanders, especially to Aucklanders who used to suffer plagues of them from the former sewage oxidation ponds in Manukau Harbour. The bright-red larvae of many species are known as blood-worms (not to be confused with tubificids and other annelid worms) and are an important food for aquarium animals in many parts of the world. Classification of midges in New Zealand has followed the European trend of splitting genera into fairly small units and an appreciable proportion (42%) of the genera are apparently endemic, with many monotypic. Freeman (1959) provided sparsely illustrated keys for 22 of the 62 known genera and 41 of 106 described species. Brundin (1966) dealt with four podonomine genera and 17 other species. Identification in field surveys remains a problem. Dubious generic names, probably derived from American keys, such as *Clunio* (Tortell 1981) and *Psectrotanypus* (Knox & Bolton 1978) have been applied to species among the tidal zone. Further species and genera have been described in the last decade (Martin 1998; Macfarlane & Andrew 2001) including some of the immature stages, so their generic placement is now soundly based (Boothroyd 1999, 2002, 2004; Boothroyd & Cranston 1999; Cranston 2007, 2009).

Midges occupy a wide range of freshwater habitats from the lower reaches of the west coast glaciers (Boothroyd & Cranston 1999) to geothermal waters and the seashore (Quinn & Hickey 1990a; Stark 1993; Winterbourn et al. 2000) and a few survive in ephemeral waterways. There are a few terrestrial species, including *Smittia verna* (Martin 1983), the adventive *Camptocladius stercorarius*,



Common midge *Chironomus zealandicus* (Chironomidae).
After Grant 1999

and one or more undescribed endemic species. Midge larvae may be collector-gatherers, collector-filterers, scrapers, shredders, engulfers, or piercers. These differences, along with different uses of food and shelter, permit several species to coexist in the same area (Armitage et al. 1995). At least one species shelters in wood (Anderson 1982) and in North America small carrion in water may suit some species (Tomberlein & Adler 1998). Another New Zealand species is a predator (McLellan 1983). An undescribed *Eukiefferiella* species is a commensal on *Deleatidium* mayfly nymphs (Winterbourn 2004); *Tonnoircladius commensalis* is commmensal or phoretic on immature netwinged flies *Neocurupira* (Cranston 2007), and another shelters in wood (Anderson 1982). A full range of feeding strategies is likely to exist in New Zealand because the midge fauna is so diverse. Elsewhere in the world the larvae of most species are collector-gatherers for at least some larval instars and there is often flexibility in the use of food sources (algae, detritus and associated microorganisms, macrophytes, woody debris, invertebrates). Analysis of gut contents and behavioural investigations in the field have helped sort out differences in food use (Armitage et al. 1995).



Moth fly *Psychoda* sp. (Psychodidae).
From Grant 1999

Psychodidae

Six of the 47 species of moth flies (Psychodidae) described from New Zealand are confined to the subantarctic islands (Quate 1964; Duckhouse 1971). Satchell (1950) described 27 species and included illustrations of wings, antennae, and genitalia for 16 species. He considered there were 40 or so undescribed species, prior to describing eight more (Satchell 1954) and keying 40 species from the main islands. Duckhouse (1980) described a further *Trichomyia* species and discussed limitations of zoogeographic interpretations owing to inadequate collections from a range of habitats. Duckhouse (1990) reassigned the 10 *Pericoma* species to *Didicrum*, *Satchellomyia*, and *Ancyroaspis*, and redescribed the species from New Zealand. Adults are found mainly beside freshwater streams or pools (Duckhouse 1990, 1995), among forests (Evenhuis 1989), and gardens around compost, and a few extend into cropland (Cumber & Eyles 1961a) but usually not grassland, especially during the day (Cumber & Harrison 1959b; Macfarlane 1970; Martin 1983; Bejakovich et al. 1998). Larvae are common in damp soil, rotting vegetation, sewage filter beds (Goldson 1977; Martin 1983; Miller & Walker 1984), dung (Duckhouse 1966; Goldson 1977; Martin 1983), and semiaquatic sites (Goldson 1977; Duckhouse 1980). There is likely to be a large, distributed, wet (alcohol) collection in New Zealand, resulting from malaise- and light-trapping and general collecting, that will need taxonomic analysis before any gaps in habitat, region, or method of collecting different species become apparent.

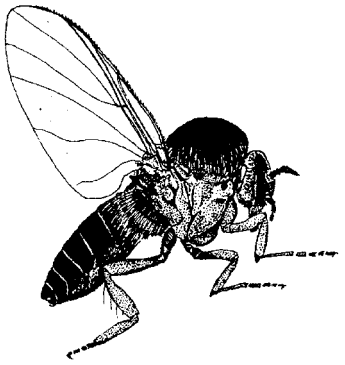
Ceratopogonidae

These are also poorly known in New Zealand. The last revision by Macfie (1932) listed 28 species from a total of 29 then known, based on about 170 specimens. Numerous specimens are now in collections, and sometimes more than 100 can be collected in a day without difficulty. Nevertheless, specimens on pins or slides are relatively uncommon and a systematic collection effort is desirable so the full diversity can become known. There is limited knowledge of phenology, distribution (Igram & Macfie 1931; Macfie 1932; Dumbleton 1971), and habitat use (Dumbleton 1971; Winterbourn et al. 2000; Andrew & Winterbourn unpubl.) of New Zealand species. However, knowledge of ceratopogonid ecology and biology in England (Smith 1989), Australia (Lee 1948; Debenham 1979; Elson-Harris & Kettle 1985), and North America (Saunders 1956, 1964; McAlpine et al. 1981) provides consistent indicators for genera and subgenera shared with New Zealand. On the basis of this literature, all *Atrichopogon* and most *Forcipomyia* species (Forcipomyiinae) are expected to live in wet terrestrial forest and wetland habitats, except for the aquatic *Forcipomyia* subgenus *Trichohelea*. On the other hand, *Dasyhelea* species (Dasyheleinae) live in small and temporary still waters,

which might even be up in trees. In the Manawatu, *Forcipomyia* individuals have been reared from native forest litter, and an undetermined, possibly introduced, species of *Dasyhelea* from water in a garden bucket. Most species of the subfamily Ceratopogoninae are expected to live in still water and seepages. The main larvae found in running fresh water in New Zealand are of Ceratopogoninae, as illustrated in Winterbourn et al. (2000), but *Forcipomyia*-type larvae are also present (Winterbourn unpubl.). At least one species of blood-feeding midge, *Leptoconops myersi*, is present in tidal water and coastal seepages from Northland to Nelson (Dumbleton 1971). Although several species are often encountered in forests, only one species was collected in surveys of North Island pastures and fodder crops (Cumber & Harrison 1959a).

Simuliidae, Culicidae

There are only two prominent families of Nematocera flies with blood-feeding adults in New Zealand. Most New Zealanders will be bitten more often by the small, stout black *Austrosimulium* species than by the slender brown to black mosquitoes. Among the black flies/sand flies (Simuliidae), *A. australense* and *A. ungulatum* are the most likely to feed on humans (Winterbourn et al. 2000). Other species seldom bite humans, but they feed at least on birds. Cursed by trampers, black flies are most abundant in national parks and higher-rainfall areas, which contain the premier hiking trails and wildlife reserves in New Zealand. In lowland areas, recreation spots in the vicinity of running water with shade trees are favoured by *A. ungulatum* (Crosby 1989; Glover & Sagar 1994, Winterbourn et al. 2000), while *A. australense* occurs throughout New Zealand.



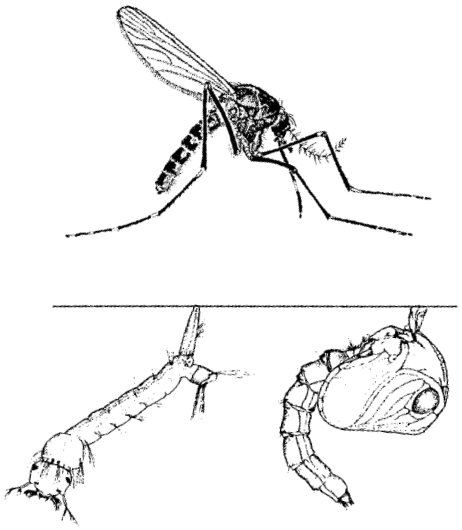
West coast blackfly *Austrosimulium ungulatum* (Simuliidae).

From Grant 1999

There are 16 species of mosquitoes (Culicidae) (Miller & Phillips 1952; Snell 2005a), which breed in a range of standing and slow-flowing fresh to salt water and hot geothermal water in the case of *Culex rotoruae* (Belkin 1968; Holder et al. 1999; Winterbourn et al. 2000). Only the Australian striped mosquito *Aedes notoscriptus* and the native *Culex asteliae* are known to use epiphyte-axil water sources (Derriak 2005a,b), so this is a relatively vacant niche for colonisation by further accidentally transported exotic mosquitoes. Extensive use of discarded tyres on silage has contributed to the spread of *A. notoscriptus* southwards from Auckland (Laird 1995). Introduced *Aedes australis* is now the second mosquito species known on the Snares islands (Macfarlane & Andrew 2001, Snell 2005b).

All four introduced and five native species may bite humans, but *A. subalbirostris*, *A. antipodeus*, and *A. australis* are not known to bite livestock (Holder et al. 1999). The main period of biting or feeding activity is known for all but two species, with five species being nocturnal and four crespuscular to nocturnal (Derraik et al. 2005). *Aedes notoscriptus* and *Opifex fuscus* bite during the day, the others during the evening and night. Of these, the native vigilant mosquito *Culex pervigilans* is the commonest and most widespread species (Belkin 1968; Laird 1995). The winter mosquito (*Aedes antipodeus*) remains active into cooler weather compared to the other species (Miller & Walker 1984). Currently, none of the mosquito species transmits human disease, but the introduced species have potential to transmit viral and bacterial diseases including dengue fever.

New Zealand is also vulnerable to future disease transmission consequent upon the accidental establishment of further species and the potential for the temperate Australian *Anopheles annulipes* to establish here (Boyd & Weinstein 1996). *Anopheles* species are notorious for their ability to transmit malaria, and global warming would make more of New Zealand vulnerable to mosquito species that have already become temporarily established (e.g. *Aedes camptorhynchus*, the southern saltmarsh mosquito). Japanese *Aedes albopictus* is among four species intercepted arriving in New Zealand (Laird et al. 1994). *Culex quinquefasciatus* might transmit avian malaria; other species known to bite birds include *Opifex fuscus*, *Culiseta tonnoiri*, *Culex pervigilans*, and perhaps *A. notoscriptus* and these species can or might transmit viruses or avian flu (Holder et al. 1999). In native



Adult female, larva, and pupa of the striped mosquito *Aedes notoscriptus* (Culicidae).
From Grant 1999

forest some species such as *C. asteliae* and *Maorigoeldia argyropa* are not attracted to carbon dioxide, unlike *C. pervigilans* and *A. notoscriptus*. *Maorigoeldia argyropa* does not bite humans at least (Snell et al. 2005) and the adult feeding habits and hosts also remain unkown for *Culex rotoruae*, *Culiseta tenuipalpis*, and *Aedes chathamensis*.

Blephariceridae

Net-winged midges are slender, long-legged and often black. Their wings (5–11 millimetres long) have numerous delicate cracks and folds that form a network, hence the common name. Adults are usually found close to turbulent bouldery streams where they can be seen either flying just above the rough water of rapids or resting or ovipositing in the splash zone of boulders. Females often have well-developed mouthparts and many species feed on smaller insects, which they catch with their specialised hind tarsi. Male adults generally do not feed but some groups (e.g. Apistomyiini) consume flower secretions. Larvae and pupae live in strong currents on smooth hard surfaces in streams (Dumbleton 1963; Craig 1969; Zwick & McLellan 1999). Larvae have broad bodies with little depth and appear to have only 6 or 7 segments, each separated by deep constrictions and bearing a mid-ventral sucker. Winterbourn et al. (2000) provided a key to larvae. Final-instar (4th) larvae are about 4–14 millimetres long. Pupae are oval, with gill lamellae projecting upwards from the anterior; the flat, soft, ventral face is cemented to the substratum. Larvae are scrapers, grazing on microscopic growths.

Within New Zealand, *Peritheates harrisi* is the only widespread species in the North Island where it has been recorded from Wellington to Te Aroha. *Peritheates turrifer*, a South Island species, has also been recorded in the Wellington region. No blephariceridae have been recorded north of Te Aroha despite the concentrated efforts of Towns (1978) and various collecting expeditions (Entomology Division DSIR, AMNZ). Three species with very restricted distribution are: *Neocurupira chiltoni* only on Banks Peninsula, *Nothohoraia micrognatha* in Fuchsia Creek and nearby streams in the Lower Buller Gorge, and *Neocurupira rotalapisculus* near Dunedin. There are 4–6 undescribed species known from the South Island. The other species are more widespread in the South Island from sea level to 1500 metres and *Neocurupira tonnoiri* extends to Stewart Island.

Thaumaleidae

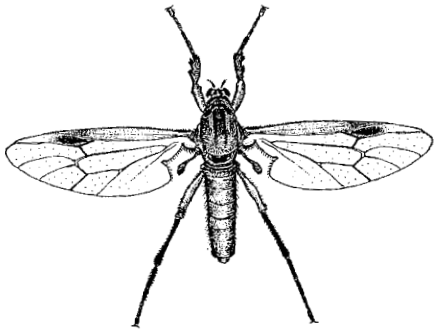
These are among the less commonly collected aquatic fly species, because the stocky shiny yellow to brown adults are tiny (body 1.75–2.25 millimetres long). Immature stages live in a rather specialised way – larvae resemble midge larvae and they move in a typical sideways fashion with the body forming a U shape as one extremity moves while the other anchors (McLellan 1988). They are found in shaded areas on vertical rocks, clay, and other surfaces where there is a cool film of water thin enough not to completely submerge them. Reared species graze the surface of leaves and other substrata, ingesting diatoms or associated fungal spores and hyphae associated with decaying plant material. Pupae are secured by abdominal hooks to the substratum and take 10–20 days to emerge. It is likely that more undescribed species exist in New Zealand.

Dixidae

Dixids resemble mosquitoes, but no wing veins are distinctly hairy and there is a sharply bent radial vein near the wing tip (Belkin 1968). The wings, which may be smaller than the bodies, are 2.5–4.3 millimetres long in the New Zealand species. Adults are black to yellowish-brown. The larvae of *Nothodixa* inhabit very small, steep streams and quiet pools with moderate to strong currents (Belkin 1968; Winterbourn et al. 2000). Larvae of the four *Paradixa* species inhabit pools, seepages, lakes, swamps, and streams and two species prefer either shade or slower-flowing water.

Scatopsidae

Scatopsids can be readily distinguished from other fly families by their wings (prominent darkened front veins contrast with weak hind veins) and their short stout antennae. The two introduced species of Scatopsidae – *Scatopse notata* and to a lesser extent *Coboldia fuscipennis* – are commoner in collections than the two native species of *Anapausis* (Freeman 1989). The previously described *Scatopse carbonaria* is synonymised here with *Coboldia fuscipennis*. In the genera *Colobostemus* and *Rhegmoclemina* there are at least five undescribed species in collections, some of which are found in drier salt meadows and braided riverbeds. It remains to be seen how adequately alcohol collections represent New Zealand forest habitats.



Female bicoloured swamp fly *Dilophus nigrostigma* (Bibionidae).

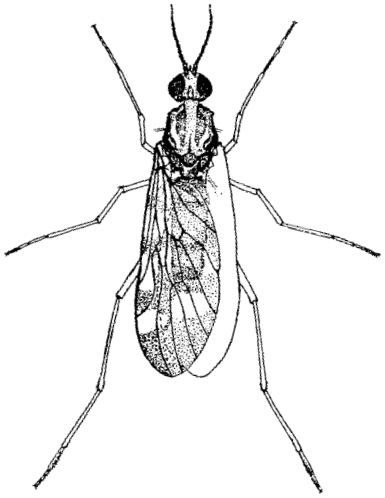
After Grant 1999

Bibionidae

These flies vary from 2 to 16 millimetres long. Harrison (1990) has described all eight native species, providing distribution maps and listing the flower species visited by the flies. Stigmata on the wings and their stout antennae, shorter than the head, distinguish these flies from other nematocerans. They show pronounced sexual dimorphism – males are shiny black with very large eyes while females are usually brown with small eyes placed forwards on an elongate head. The rather spiky larvae of *Dilophus nigrostigma* and *D. segnis* are readily found among fallen leaves (Harris 1983) or under rotting logs before they emerge in spring (Harrison 1990). Flight swarms of adults are often encountered during summer months.

Anisopodidae, Canthyloscelididae

The larger wood gnats or outhouse flies (*Sylvicola* spp.) have patterned wings and mostly live among rotting vegetation or in water in fallen plant material. *Sylvicola neozelandicus* commonly breeds in wet manure. It is the outhouse fly associated with long-drop toilets in forests and has also been recorded from Australia (Fuller 1935). There are illustrations of the wing pattern for three of the four described species in New Zealand (Edwards 1923a, 1923b). The less common *Canthyloscelis* (Canthyloscelididae) are apparently associated with forest areas, but nothing is known of their biology.



Outhouse fly *Sylvicola* cf. *neozelandicus* (Anisopodidae).

From Grant 1999

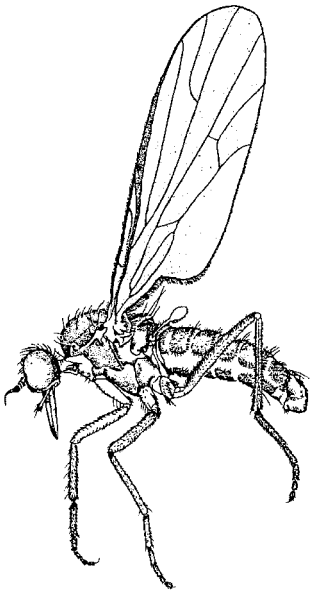
Corethrellidae

Corethrella novaezealandiae, which Belkin (1968) illustrated fully, frequents lake and pond margins along the South Island west coast. Corethrellids typically feed on frogs, and share with other biting Nematocera serrated mandibles and untoothed maxillae, unlike mammal- and bird-feeding mosquitoes. The few known corethrellids are vectors of trypanosome infections in frogs and the call of the frogs attracts female flies. The native species is assumed also to feed on frogs. *Corethrella* larvae prey on other aquatic insects (CSIRO 1991).

Suborder Brachycera: Division Orthorrhapha

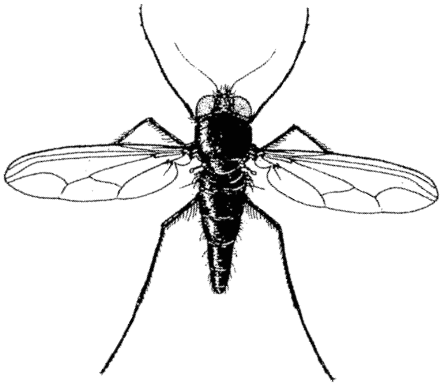
There are 10 families of Orthorrhapha. They often favour moist habitats or live in seepages and freshwater, but this suborder includes soil predators of grassland (Asilidae and Therevidae) and beaches (Therevidae) and a few parasites of spiders (Acroceridae). There are some illustrations of immature stages of Brachycera and often sketchy information on the biology of species or genera for nine families. Lyneborg (1992) described techniques for rearing therevid larvae on tenebrionid beetle larvae and illustrated the larva of *Megathereva atritibia*.

Empididae. The great diversity of form in this family led to proposals to segregate it into four families (Chvála 1983). Sinclair (1995), among others, disputed this division, preferring to retain only the one family Empididae, which has seven subfamilies in New Zealand (Evenhuis 1989; Sinclair 1995). The monograph of Collin (1928) covered only 26 of the 41 genera and 87 of the 287 species



Unidentified dance fly (Empididae).
From Grant 1999

Tetrachaetus bipunctatus (Dolichopodidae).
Rod Macfarlane



Green long-legged fly *Parentia* sp. (Dolichopodidae).
After Grant 1999

now known to occur in New Zealand, which limits its value for identification. Descriptions of new genera and revised keys to the genera of Clinocerinae (Sinclair 1995), Ocydromiinae (Plant 1989), and Ceratomerinae (Sinclair 1997b), the tribes of Empidinae (Bickel 1996) and the presence of Microphorinae (Shamshev & Grootaert 2002) update the higher classification. Further keys to species and descriptions or redescriptions apply to eight genera (Malloch 1931, 1932; Rogers 1982; Plant 1991, 1993, 1997, 2007; Shamshev & Grootaert 2002; Sinclair & McLellan 2004). Two more genera and at least 104 undescribed species are known to occur in New Zealand (see checklist). A consolidated summary of the family and much more systematic research is needed before the fauna and its affiliations are well known. Both adults and larvae prey on other insects, mainly dipterans. The elongated front legs (in eight genera of Hemerodromiinae), middle legs (*Platypalpus*, Tachydromiinae), or hind legs (*Pseudoscelolabes*, Ocydromiinae) with ventral spines are the most clearly adapted for holding captured prey. Adults may sometimes feed on nectar. Some genera, especially of the Empidinae, have an elaborate courtship display in which the prey is used as an essential stimulus initiating copulation. Some species form dancing swarms over vegetation on land (*Empis*, ?*Clinorhampha*) or over water (*Hilara*); such swarms are usually connected with mating behaviour. *Hilara* will take prey trapped in the surface film of water, and some *Hilarempis* species are found on boulders in streams or riparian vegetation. The three *Thinempis* species are confined to beaches from Stewart Island to Northland (Bickel 1996, LUNZ collection), but *Chersodromia* is so far known only from sandy beaches in Otago and at New Brighton (Macfarlane 2005) and *Chimerothalassius ismayi* from the stony beach at Birdlings flat, Canterbury (Shamshev & Grootaert 2002). The recent records from open sandy and gravelly habitats point to the need to collect more flies from these sites. Little has been published on the life history, biology, or behaviour of Empididae from New Zealand. Dumbleton (1966) described the aquatic larvae of *Chelifera tantula* and ?*Clinocera gressitti* from New Zealand. Elsewhere, larvae are known to be predaceous and occur in soil, leaf litter, rotting wood, and dung; others (Clinocerinae, Hemerodromiinae) are aquatic.

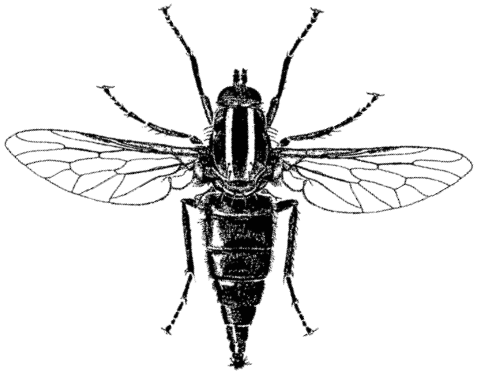
Dolichopodidae

The long-legged flies are likely to be among the top five to eight most diverse fly families in New Zealand. The revision of Parent (1933) is well illustrated but not readily available. Bickel (1991) published an undated key to the genera and descriptions of 30 species in the subfamilies Sciapodinae (*Parentia*) and Medeterinae and one new *Paraclius* is known from New Zealand (Bickel 2008). The metallic green *Parentia* species can be common in grassland (McLean et al. unpubl.) and may feed on insects attracted to honeydew secreted on manuka. Other members of the family are quite common in wetlands (Macfarlane et al. 1998) and forests (Didham 1997; Macfarlane & Andrew unpubl.). An undescribed *Scorporius* species exists in estuaries and lagoons in both main islands and several new species of *Abetatia* can be found along rocky shorelines. An examination of more than 1100 specimens of pinned Dolichopodidae has revealed four obvious undescribed species (Checklist), but the extent of undescribed species cannot be properly gauged until national specimens elsewhere and in alcohol have been adequately examined. There is also the possibility that specialist collecting near waterways and from alpine and northern regions may yield a considerable number of undescribed species. New Zealand collections may be partially deficient because of low use of yellow pan traps, which have been useful in revealing species in Australia (Bickel 1999).

Therevidae

Stiletto fly diversity and classification in New Zealand is relatively well documented (Lyneborg 1992) even though most species of these flies are not particularly common in most habitats apart from some beach and riverbed/

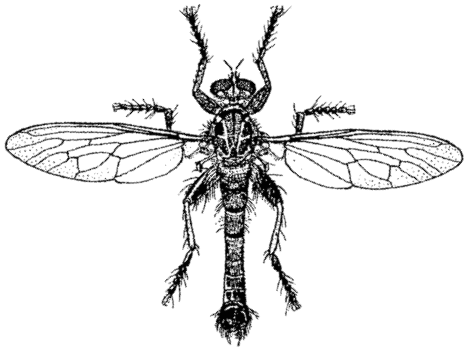
lakeside areas, where at least seven species can be conspicuous. Adults are 5–18 millimetres long. They probably ingest only water or honeydew because they do not have suitable piercing mouthparts for predation and are uncommon on flowers. In appearance they range from evenly dark with obvious white hairs (many *Anabarhynchus* species) to brownish *Ectinorhynchus* species and blackish *Megathereva* with whitish stripes on the thorax. Adult *Ectinorhynchus* species were collected from established broadleaf-podocarp forest margins in coastal Canterbury (Ward et al. 1999, Macfarlane 2007) and the Manawatu. However, at least one species of *Anabarhynchus* has been collected from bush margins in the Manawatu and Banks Peninsula. Therevid larvae have been found in soil under litter in red beech (*Nothofagus fusca*) forests (Evans et al. 2003). The closest biogeographic link is with Tasmanian *Anabarhynchus* and the genus also occurs in Chile. *Ectinorhynchus* is confined to Australia and New Zealand. The mobile larvae (Lyneborg 1992) are quite thin and streamlined (McAlpine et al. 1981; Smith 1989) and prey on other soil invertebrates. *Anabarhynchus harrisi* larvae will feed on paralysed spiders in nests of the spider-hunting *Priocnemus* (Lyneborg 1992; Harris pers. comm.), making such flies apex invertebrate predators.



Stiletto fly *Megathereva bilineata* (Therevidae).
After Grant 1999

Asilidae

If you have ever watched a seemingly large wasp as it quickly flies out to catch another insect in mid-air, you have probably seen a robber fly. Robber flies are often mistaken for bees or wasps but only robber flies hunt in this manner. In the lowlands, the robber-fly life-cycle may take more than one year, according to disparate overseas investigations (Musso 1978), which show that delays in development can occur in both eggs and the first of the five to seven instars. Macfarlane (unpubl.) analysed asiline seasonal occurrences based on New Zealand collection labels and the results showed that adults are mainly active between October and February, with most adult activity at a particular location being confined to two to three months. Most species were found below 920 metres elevation except for four species that extend into the subalpine zone, and most species including *Saropogon* (Dasypogoninae) were collected from uncultivated grassland, although *Neoitamus bulbus* has been reared from kowhai logs (FRNZ collection). *Zosteria novaezealandica* is known only from a single male and is unusual for New Zealand in having been collected from the upper reaches of beech forest near Nelson (Macfarlane et al. 1997). There are NZAC collection records of both *Neoitamus* auctt. and *Saropogon* adults reared from grassgrub infestations, apart from the literature records (Valentine 1967b). Overseas records show a similar prey relationship with grassgrubs for larval Asilini and Dasypogoninae (Knutson 1972; Musso 1978; Dennis & Knutson 1988). Information about identification and distribution of the New Zealand species is unfortunately inadequate. The only existing key (Hutton 1901), to 14 species, lacked illustrations and the descriptions were short. Attempts to classify two problematic smaller asiline genera have resulted in different generic placements in each catalogue (Miller 1950; Hull 1962; Evenhuis 1989) because the Australasian genera have been inadequately studied. Three subfamilies (Apocleinae, Asilinae, and Dasypogoninae) and two tribes of Asilinae (Lehr 1996) are represented in New Zealand compared to five subfamilies and 11 tribes in Australia (Evenhuis 1989; Lehr 1996).



A robber fly, *Neoitamus* sp. (Asilidae).
After Grant 1999

Stratiomyidae

Soldier flies are rather large and stocky flies that resemble hover flies or wasps. They are often encountered 'standing sentry' on flowers. Most soldier flies breed in soil and litter, feeding on decaying vegetation, but Australian *Inopus rubriceps* is a pasture pest of much of the North Island (Macfarlane & Andrew 2001). Hutton (1901) keyed and briefly described 20 species in three subfamilies. His key to the eight described *Odontomyia* species (Stratiomyinae) is still the only published reference for these distinctive green or black flies. Miller (1917) described and

Australian soldier fly *Inopus rubriceps* (Stratiomyidae).
Des Helmore

Scaptia sp. (Tabanidae).
After Grant 1999

illustrated 15 species of Beridinae and included a key, but six *Benhamyia* species were reduced to synonyms (Evenhuis 1989; Woodley 1995). All six genera of Beridinae when they were redefined were found to be endemic (Woodley 1995). Between 1939 and 1958 two more introduced species became established in the North Island (Macfarlane & Andrew 2001) and four new native species were described (Lindner 1958).

Tabanidae

These large, heavy-bodied flies with a strong beak-like proboscis are generally referred to as horse flies. Mackerras (1957) reviewed the New Zealand fauna, describing 17 species and illustrating various features of the head. Adults are often found at flowers such as manuka and cabbage trees, or in riverbeds. *Scaptia* species often hover for prolonged periods, patrolling invisible territories in open sunshine near shrubs or on forest edges. *Dasybasis* species can occasionally be a nuisance by biting swimmers in bush swimming pools. Larvae of some unidentified species are found sporadically among gravel in streams (Winterbourn et al. 2000), and these larvae are relatively tolerant of poor-quality water (Stark 1993). Successful rearing of two new *Dasybasis* species from moss on wet rocks by waterfalls and river banks from Coromandel and Southland and the record of a further new *Scaptia* species among mosses on fallen logs near Lake Brunner indicate that larvae of New Zealand species may occupy both better-quality freshwater sites and consistently moist sites away from flowing water. In Europe, some Tabanidae are even found in drier soils (Chvala et al. 1972). The 20 known New Zealand species of Tabanidae represent two subfamilies – Pangoniinae (*Ectenopsis*, *Scaptia*,) and Tabaninae (*Dasybasis*).

Acroceridae

Small-headed flies may sometimes be locally common but they are among the less common flies in insect collections. They can be swept from shrubs and grasses or seen on fences (Harris & Macfarlane unpubl.). Three genera occur in New Zealand, of which *Ogcodes* is most often encountered. The seven species of *Ogcodes* have straight thickset bodies (Schlinger 1960; CSIRO 1991). Schlinger (1960) commented that early instars of *Ogcodes* can be obtained by rearing immature spiders. The other two genera are very distinctive. *Helle*, with two species, is small, dark and almost V-shaped. *Apsona muscaria*, a metallic blue and turquoise fly, is known from Arthurs Pass National Park, Mt Hutt (CMNZ), and Motueka (OMNZ). Adult acrocerids were not readily collected in malaise traps during summer in forest on Banks Peninsula (Ward et al. 1999) and were not collected in a wetland survey (Macfarlane *et al.* 1998). The eggs of at least some *Ogcodes* species are unusual because they are black (Miller & Walker 1984; Ferrar 1987) and laid in clusters on twigs.

Bombyliidae, Rhagionidae

Bombyliidae (bee flies) and Rhagionidae (snipe flies) are each represented in New Zealand by one described species, and they are seldom seen. Tonnoir (1927) described both *Tillyardomyia gracilis* (Bombyliidae) and *Chrysopilus nitidiventris* (Rhagionidae). The slender *T. gracilis* with a blackened area on the wing is quite distinct and is apparently confined to the South Island. *Chrysopilus nitidiventris* is known from Westland forest (Tonnoir 1927, LUNZ), and one undescribed species occurs in the Paparoa ranges (LUNZ) and and another in Westland also (CMNZ). Overseas, the larvae of other *Chrysopilus* species are predators, preferring wet sites in litter or rotting logs (Oldroyd 1964; McAlpine et al. 1981).

Pelecorhynchidae

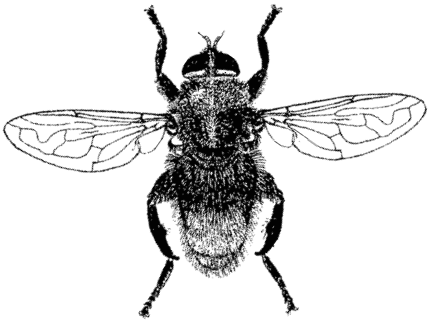
Larvae of the sole *Pelecorhynchus* species have been found in a stream near Dunedin (Winterbourn et al. 2000), but the species needs adults to be reared and identified to confirm the genus identification and determine if it is an endemic species.

Aspilocephalidae
This small family from North America, Tasmania, and New Zealand has just three genera and Kaurimyia from New Zealand is endemic (Winterton & Irwin 2008). The two known specimens have been collected from Northland kauri forest and from Dunedin.

Suborder Brachycera: Division Cyclorrhapha: Section Aschiza

The six families of Aschiza are dominated in species diversity and economic importance by hover flies (Syrphidae) and humpbacked or scuttle flies (Phoridae). Reviews of larvae (Smith 1989; Stehr 1991), Phoridae (Disney 1994), and of New Zealand insects generally (Miller & Walker 1984) provide illustrations of the larvae of *Dohrniphora cornuta*, *Megaselia rufipes*, *M. scalaris*, and *Spiniphora bergenstammi* (Phoridae), and of *Merodon equestris*, *Eristalis tenax*, *Eumerus strigatus*, and *E. tuberculus* (Syrphidae). For eggs, Ferrar (1987) has general family features including the range in size.

Syrphidae
Hover flies or flower flies are among the larger and more strikingly patterned flies in New Zealand. Endemic hover flies do not include mimics of bees and wasps such as exist in overseas countries but the introduced European drone fly *Eristalis tenax* and the narcissus bulb fly *Merodon equestris* mimic the honeybee and European species of bumble bees, respectively. Remarkably, the only overall review is that of Miller (1921), who also provided an illustrated key to the species. Miller and Walker (1984) and Grant (1999) respectively illustrated four common species in colour and black and white. Flies in the two syrphid subfamilies have different food sources and distinct wing venation. The five genera and 24 species of Syrphinae prey as larvae on other slow-moving, soft-bodied insects, while members of subfamily Eristalinae, with six genera and 18 species in New Zealand, feed mainly on decomposing material in wet sites and three European pest species feed on bulbs. Prey items have been recorded for only three common hover fly species (Valentine 1967b; Miller & Walker 1984). The small hover fly *Melanostoma fasciatum* is dominant in lucerne fields with blue-green aphid (Thomas 1977) and pea aphid (Bates & Miln 1982) among cabbages with aphid and caterpillar prey (Ashby 1974; White et al. 1994; 1995), and among grapevines with mealy bugs (Charles 1981). *Melanostoma fasciatum* may be better adapted than *Melangyna novaezealandiae* to relatively unstable pastoral and crop habitats dominated by introduced aphids. Buckwheat (*Fagopyrum esculentum*), coriander (*Coriandrum sativum*), and lacy phacelia (*Phacelia tanacetifolia*) can provide pollen food for hover flies and *M. novaezealandiae* can be dominant on both the latter (Lovei et al. 1993) and pine trees with the woolly pine aphid *Pineus laevis* (Macfarlane & Denholm unpubl.). Known hosts for *Allograpta ropala* are small caterpillars and scale insects among flax and other foliage while unidentified hover-fly larvae feed on cabbage-tree moth caterpillars (Miller & Walker 1984). *Allograpta ventralis* preys on the cabbage-tree mealy bug (Bowie 2001). The immature stages of predatory hover flies, including endemic *A. ropala* (Miller & Watt 1915), have an indistinctly tapering body compared to the 'rat-tailed' larvae of Eristalinae that live in fluids. The long breathing siphon ('rat tail') of drone fly (*Eristalis tenax*) larvae contrasts with the short siphon of the flax-inhabiting *Psilota* (= '*Lepidomyia*') *decessa* (Miller & Walker 1984). Eggs of the predatory syrphine species tend to be laid among vegetation or grass seedheads and singly (Miller & Walker 1984).



Narcissus bulb fly *Merodon equestris* (Syrphidae).
After Grant 1999

Phoridae
These are small flies, often black, and recognised by their distinctive dark and pale venation and head bristle pattern. The commonly encountered species mostly belong to the huge genus *Megaselia*, plus *Aphiura* and *Metopina.* They may be

recognised as phorids by their jerky movements and humpbacked appearance. Identification of most genera is based on head bristle patterns, leg bristles, and wing venation (McAlpine et al. 1987). New Zealand has seven endemic genera (Disney, 1983; Brown & Oliver 2008), often with distinctive features including the head (Schmitz 1939). Phorids can be numerically abundant as scavengers or mushroom-feeders in open country (Macfarlane & Andrew 2001), and some introduced species may affect humans or they can be found in sand dunes (Brown & Oliver 2007). Eight species in New Zealand are introduced from Europe and Australia. Most native species live in forests, but part of the fauna is quite common in denser snow-tussock grassland. Didham (1992), for instance, recorded 20 species from one forest site. Different species may be found by sweep netting, malaise trapping, or by using baited traps or pitfall traps, but the family has not been investigated thoroughly enough to determine the extent of undescribed species.

Pipunculidae

Tonnoir (1925) described the blackish bigheaded fly species from sites with tussock grassland (three species) and bush (*Dasydorylas deansi*). At least two of the *Dasydorylas* species can be locally common (Macfarlane & Andrew 2001; LUNZ), but *Tomosvaryella novaezealandiae* is considerably less common (Macfarlane 2002; Skevington unpubl.). De Meyer (1991) described *Cephalops libidinosus* from New Zealand, which is also relatively well represented in collections. Only genitalia of the species are illustrated (Tonnoir 1925), but the reviews of Australian and North American species illustrate differences in the wing venation of the cosmopolitan *Dasydorylas* (then a subgenus of *Pipunculus*) and *Tomosvaryella*.

Lonchopteridae, Sciadoceridae, Platypezidae

The remaining three families each have only one described species. Only the cosmopolitan small yellowish *Lonchoptera furcata* (Lonchopteridae) is often found in general collecting. Colloquially known as the spearwinged fly, it has a pointed wing tip with veins converging toward the tip (McAlpine et al. 1987; CSIRO 1991) and distinctive flanged larvae (Smith 1989). *Sciadocera rufomaculata* (Sciadoceridae) also occurs in Australia (CSIRO 1991). It is reddish with a dark patch on the wing tip (Oldroyd 1964; Brown 1992). It is somewhat reminiscent of Phoridae and feeds on carrion. Smoke flies (Platypezidae) are represented in New Zealand by *Microsania* and an undetermined species of Callomyiinae (Chandler 1994). Platypezids may need specialist collecting among fungi or smoke, and are expected to dwell in wetland or forests on the basis of overseas studies (Oldroyd 1964).

Lonchoptera furcata (Lonchopteridae).
Amber Sinton

Suborder Brachycera: Division Cyclorrhapha: Section Schizophora

Schizophora can be divided into acalyptrate and calyptrate families. The calyptrate families (in which the haltere is typically concealed by a flap or calyptra) include a fairly compact group, while the acalyptrate groups (lacking the flap, so the halteres are clearly visible) are more disparate, being divided into several superfamilies, some of which show close affinities to calyptrate flies. Calyptrate flies are distinguished by a combination of features including antennal structure, wing venation, a suture across the top of the thorax, and the presence of upper and lower calypters (squamae) beneath the wing base (see Harrison 1959), although some of these features are sometimes lacking, especially in wingless forms. The most comprehensive guides, with illustrations of pupae, larvae, and eggs, are those of Ferrar (1987) and Smith (1989).

Acalyptrate flies

This division was last fully revised by Harrison (1959), who provided an excellent

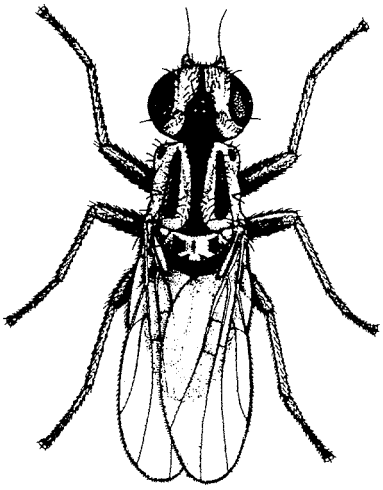
account of all the known species. Some name changes have occurred since then and the work of Harrison (1976) and later reviews of particular families have added many new species. For recognition purposes, the acalyptrate flies can be artificially divided into the generally smaller flies that are often 2–6 millimetres long (e.g. *Drosophila* spp., *Cerodontha australis*, *Hydrellia tritici*) and a minority of larger species 8–16 millimetres long (e.g. some Coelopidae, Sciomyzidae) that are as large or somewhat larger than the house fly. The most extensive illustrations of whole flies of nearly all of the 29 acalyptrate families in New Zealand are in CSIRO (1991) and McAlpine et al. (1987).

Agromyzidae

These are small species (1.25–3.0 millimetres long) and the larvae are generally leaf miners. Some have a very narrow host-specificity, for example *Phytomyza clematadi* was released in 1996 for biocontrol of *Clematis vitalba* (old man's beard) (Fowler et al. 2006), and although it is now common and widespread its effectiveness seems to be adversely affected by parasites (Anon. 2007). The species most often encountered is *Cerodontha australis*, abundant everywhere, feeding on grasses and wheat. *Cerodontha angustipennis* can be abundant where hosts such as Yorkshire fog and tall oat grass are common (Martin 2007). Other abundant species include *Chromatomyia syngenesiae* (on *Sonchus*, cineraria, and other herbaceous Asteraceae), *Liriomyza brassicae* (on *Brassica* crops), *L. chenopodii* (on beet and spinach), and several *Phytomyza* species on *Hebe*. Two *Phytoliriomyza* species have fern hosts. Twenty-one species in various genera mine the leaves of angiosperm trees and shrubs including *Melicytus ramiflorus* (mahoe) and *Urtica ferox* (tree nettle) and species of *Olearia*, *Coprosma*, *Carmichaelia*, *Clianthus*, and *Clematis* or perennial herbs (species of *Ranunculus*, *Wahlenbergia*, *Cerastium*, *Lepidium*, *Gentianella*, *Plantago*, and *Juncus*) (Spencer 1976). Hosts are unknown for 13 of the 42 species (see revision by Spencer 1976; Macfarlane & Andrew 2001). Watt (1923) illustrated the pupae of nine agromyzid species.

Chloropidae

These are also small flies (1.25–5.0 millimetres long). Most species are endemic and there is wing reduction in a number of species of *Tricimba*, including some that are undescribed (see revision by Spencer 1977; Macfarlane unpubl.). Some subantarctic species have no wings. The genus *Gaurax* includes three common species (*G. neozealandicus*, *G. flavoapicalis*, *G. mesopleuralis*), often found in gardens. *Hippelates insignificans* often occurs in great numbers in semi-open country. *Apotropina tonnoiri* is one of the characteristic flies of beaches. Little is known of the larval habits of most New Zealand species. The introduced European species *Dicraeus tibialis* feeds on grass seed (Ismay 1991), endemic *Diplotoxa similis* feeds on seeds of six species of the snow tussock *Chionochloa* (Kelly et al. 1992; Cone 1995), and *D. moorei* feeds on hard tussock *Festuca novae-zelandiae* (Kelly et al. 1992). The grey *Conioscinella badia* can be common among grassland and beach areas, readily sucking on perspiration (Martin 1983) or weeping sores. Some of the other species have been associated with flowers, wetlands, rotting material, and subalpine areas (Spencer 1977; Macfarlane & Andrew 2001).

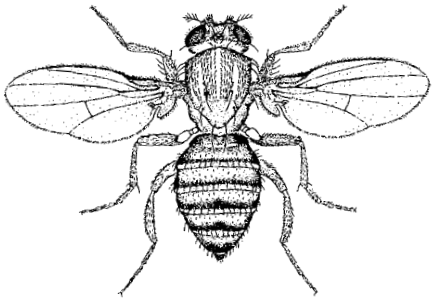


Diplotoxa similis (Chloropidae)
Jon Sullivan, Lincoln University

Ephydridae

Shore flies comprise a well-known family. An extensive revision has begun on the New Zealand fauna, with five new species described (Mathis et al. 2004; Edmiston & Mathis 2007). A distinctive character of the subfamily Ephydrinae is the strongly swollen lower face, while for most other genera in the other subfamilies the arista (a bristle on the last antennal segment) has long branches on the dorsal side only. Most of the common species of *Scatella* have a distinctly grey wing with a pattern formed by a few small white spots between the outer veins. Most species are found close to water, with larvae either aquatic (e.g.

Ephydrella) or semi-aquatic (e.g. *Scatella*). The genus *Hydrellia* is terrestrial and the larvae mine native and introduced grasses and rushes (Martin 2007). Australian *Hydrellia tritici*, with five proven host plants, is one of the commonest flies in New Zealand.



Fruit fly *Drosophila melanogaster* (Drosophilidae).
After Grant 1999

Drosophilidae

Pomace flies, vinegar flies, or fruit flies (not to be confused with tephritid fruit flies, below) are represented in New Zealand by two well-known genera and one or two that are largely unknown. As with the Sphaeroceridae (below), the number of drosophilid species in New Zealand is low, with combined totals for both families about 55 compared with 1130 for the entire Australasian/Oceanian region (Evenhuis 1989) and 189 for Britain (Chandler 1998). Members of the genus *Drosophila* are often known as fruit flies, although the actual association for many is with yeasts of ripe and rotting fruit. Colour illustrations of the introduced species in New Zealand can be found in Peterson's (1943) survey of species in southwestern USA. *Drosophila funebris*, *D. buskii*, and to a lesser extent *D. melanogaster, D. funebris*, and *D. hydei* are strongly associated with human settlement but in Texas they were much less common on dairy farms. Species such as *D. buskii* are associated more with rotting vegetables (including tomatoes) and grass clippings. Indigenous species are associated more with forest fungi. Traps with banana bait can be used to detect *Drosophila* populations. *Scaptomyza* includes six species, two of which are leaf miners (one of them, underscribed, in *Pratia angulata* (Campanulaceae)), and including adventive *S. flava*, which mines leaves of *Brassica* crops, *Tropaeolum*, and other plants (Martin 2004). *Paramycodrosophila* is represented by at least one unidentified species in New Zealand, sometimes found around exudates from holes of puriri moth caterpillars (*Aenetus virescens*). An unidentified species of *Mycodrosophila* was mentioned by Holloway (1976).

Heleomyzidae

The New Zealand species are placed in four tribes, one (Heleomyzini) comprising Palearctic species only, of which *Tephrochlamys rufiventris*, an elongate greyish fly with a reddish abdomen, is quite common, breeding in poultry manure. The South American *Prosopantrum flavifrons* is the sole representative of the Cnemospathidini and is found readily in open garden and pasture sites. The tribes Allophylopsini and Fenwickiini, with many endemic species, are commonly encountered in forests. Most familiar are the larger *Allophylopsis* species and the smaller *Fenwickia* species (Harrison 1959). *Xeneura* and *Aneuria* species have boldly patterned wings and some of the *Fenwickia* species have distinctive shading on the apical veins.

Lauxaniidae (Sapromyzidae)

Superficially resembling heleomyzids, these flies are readily distinguished by the lack of a vibrissa (a bristle on the lower front corner of the face) and details of the wing veins (Harrison 1959). There are four genera in New Zealand, including several common species of *Sapromyza*, which resemble oversized *Drosophila*. The genus *Trypetisoma* is distinctive for its patterned wings, similar to some of the Heleomyzidae and the tephritid *Trupanea*.

A species of subfamily Limosininae (Sphaeroceridae).
Rod Macfarlane

Sphaeroceridae

Lesser dung flies are small (1.5–3.5 millimetres long), dull black or brown species distinguished most readily by the short, robust hind metatarsus. Richards (1973) reviewed Australian species and provided a key covering many New Zealand species. The subfamilies Sphaerocerinae (*Sphaerocera*, *Ischiolepta*) and Copromyzinae (*Borborillus*) comprise only alien species, often encountered on dung (Macfarlane & Andrew 2001), although *Ischiolepta* in particular is often found in rotting vegetable matter such as grass clippings. Limosininae include both

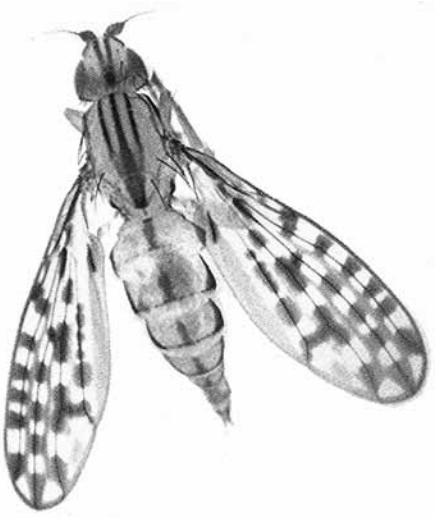
adventive and cosmopolitan species and few of them have any relationship with dung. They are easily distinguished from all other acalyptrates by their venation, with the veins from the discal cell not extending to the wing margin. Some species of Limosininae are extremely abundant, e.g. *Coproica hirtula* and *Spelobia bifrons*, both breeding in grass clippings and other decaying vegetation, and cosmopolitan *Opacifrons maculifrons* along freshwater shorelines (Marshall & Langstaff 1998). Steve Marshall is revising the endemic species, the most abundant of which belong to the genus *Phthitia* (Marshall & Smith 1992; Marshall et al. 2009). Some *Phthitia* species occur in open country but *P. plesioceris* is found along waterway shorelines and *P. emarginata* in rotting mushrooms. *Thoracochaeta* species are characteristic beach flies (Marshall & Rohácek 2000), found on seaweed and carrion. The two species of the endemic genus *Howickia* are wingless, and can be found actively jumping and scuttling about in disturbed forest floor litter.

Sciomyzidae

Marsh flies are relatively large flies (5–9 millimetres long), usually with many dark spots on the wings. The larvae feed on snails. *Neolimnia* species feed either on aquatic or terrestrial forest gastropods (Homewood 1981) while *Eulimnia* species feed on bivalves (Barnes 1980a).

Huttoninidae

Huttonina, formerly included in the Sciomyzidae, is now assigned to its own endemic family (CSIRO 1991) along with *Prosochaeta prima*. The species of these genera have a similar elongate shape to sciomyzids but *Huttonina* individuals are smaller, with two of eight species having many dark spots and three others with paler patterns (Harrison 1959). The wing of *Prosochaeta prima* is distinctive with a dark outer U band and a single inner band. Adults seem to be associated with shrubland or forest rather than open uncultivated grassland. The larvae of huttoninids are unknown.



Huttonina elegans (Huttoninidae).
Rod Macfarlane

Tephritidae

These picture-winged flies are small (3–5 millimetres long) but conspicuous creatures represented in New Zealand by three indigenous genera (*Austrotephritis*, *Sphenella*, *Trupanea* in subfamily Tephritinae) (Hancock & Drew 2003). Three *Urophora* and two *Procecidochares* have been introduced for biocontrol of thistle species, mist weed (*Ageratina riparia*) and Mexican devil weed (*Ageratina adenophora*) (Harman et al. 1996; Macfarlane & Andrew 2001; Hayes 2007). All five species introduced for the biological control of weeds have established (e.g. Cameron et al. 1989, Hayes 2007), but *U. cardui* is still uncommon and rather localized, partly because sheep graze the galls. White (1988) has an identification key for *Urophora* species in Great Britain, which includes illustrations of the wing pattern. *Urophora* and *Procecidochares* have two complete to three clear bands across the wings or the wing is largely clear with just a narrow dark band (*U. stylosa*). The native *Sphenella fascigera* almost has two bands with little or no spotting. By contrast *Austrotephritis* and *Trupanea* wings have at most one irregular band across the outer wing and many (20 plus) small to larger clear spots.

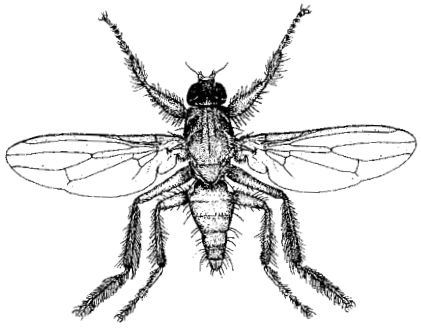
The name of fruit fly is applied generally to the family, although only a few genera feed on fruit. Some of these, including several *Bactrocera* species and *Ceratitis capitata* (Med fly), both in the subfamily Dacinae, are very serious pests in Australia, the Pacific islands and many other areas, causing fruit to disintegrate prematurely. A number of species are closely monitored in New Zealand and at least one accidental introduction has been successfully eradicated (Macfarlane & Andrew 2001). Some of these pest species are larger than native species (5–6 millimetres) and have distinctive wing patterns. All tephritids can be recognised by the disjointed wing, with the costa broken about a third of the way along the wing and the subcosta bent up toward this break at a right angle, together with the acutely pointed lower corner of the anal cell of the wing.

The New Zealand species can further be distinguished from similar-looking flies such as *Trypetisoma* (Lauxaniidae) and some Heleomyzidae (*Aneuria*, *Xeneura*) by their specific wing patterns, illustrated by Harrison (1959). Similar-sized *Huttonina* species (Huttoninidae) with spotted wings and *Zealandortalis* (Platystomatidae) with banded wings are also distinguished by wing pattern (Harrison 1959). Sciomyzids also have heavily spotted wings but they are larger than the endemic tephritids and the wing is unbroken. Endemic tephritids feed mainly on flowers or seedheads. Molloy (1975) found an average of 2.6–6.4 *Trupanea centralis* larvae per seed head in *Celmisia spectabilis*, with 64–96% of the seed consumed by these flies. He reared *Trupanea alboapicata* from *Raoulia mamillaris* and noted that Tephritidae larvae also affect *Senecio bellidioides*. *Sphenella fascigera* has a quite wide host range that includes native *Brachglottis kirki*, six species of introduced *Senecio* (Harrison 1959) and *Euryops pectinatus* (Keall pers. comm.). *Austrotephritis cassiniae* has been reared from *Cassinia leptophylla* (Harrison 1959), but the Asteraceae hosts for other endemic species remain unknown.

Scordalus femoratus (Helosciomyzidae).
Rod Macfarlane

Helosciomyzidae

This family comprises a southern hemisphere group of mostly forest-dwelling flies, centred in Australia and New Zealand and most recently revised by Barnes (1981). They are moderately large, resembling sciomyzids, but usually have unpatterned wings with prominent bristles along the costa. *Polytocus* is a subantarctic genus of two large species, of which the larvae of the Snares Islands species has been described (Barnes 1980c). Barnes (1980b) recorded *Helosciomyza subalpina* from ants' nests and described the larvae.



Kelp fly *Chaetocoelopa littoralis* (Coelopidae).
After Grant 1999

Australimyzidae, Canacidae, Coelopidae, Helcomyzidae

Flies in these small families (28 species total) are confined to seashores or at least are more commonly found there. Kelp fly (Coelopidae) species breed in rotting seaweed and the beach stroller can be almost overwhelmed by their swarms. Whereas some species are widely distributed around the coasts others are confined to southern beaches. Adult kelp flies are dull brown with characteristic flattened bodies and bristly legs and a body length ranging from 3.5–13 millimetres (Harrison 1959; Grant 1999). The family Helcomyzidae (sometimes reduced to a subfamily of Dryomyzidae but here regarded as distinct following D. K. McAlpine, pers. comm.) includes the large endemic southern beach fly *Maorimyia bipunctata*. It is dark reddish-brown, about 10 millimetres long, and has two darker marks on the wing veins. It favours damp coastal sites (Harrison 1959). Canacidae are beach flies, which now include Tethininae. Eight *Zalea* species (Zaleinae, surge flies) have now been described from North and South Island rocky coasts and *Z. horningi* occurs on the South and Snares islands (McAlpine 2007). *Tethinosoma fulvifrons* is also a mainland species; it is a small (3.5 millimetres) grey fly with a deep cheek, widespread on sandy beaches where it is commonly on stranded seaweed with *Thoracochaeta* species (Sphaeroceridae). *Isocanace crosbyi* is so far known only from the Nelson area (Mathis 1999). Mathis and Munari (1996) ascribed the two subantarctic *Macrocanace* beach fly species to Tethinidae as well. Australimyzidae are small flies (1.5–2.5 millimetres long), dark brown, and suspected to be miners of seashore plants (Harrison 1959). They have a generally southern Australian distribution.

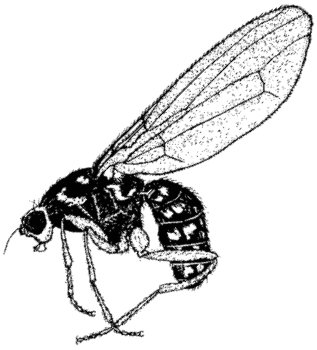
Pallopteridae, Platystomatidae, Asteiidae, Pseudopomyzidae, Milichiidae, Periscelididae, Teratomyzidae, Fergusoninidae, Anthomyzidae

These acalyptrate families together contain about 28 species, of which only about 10 have been described, several of them based on exciting recent discoveries. Seven of the nine species of Pallopteridae (*Maorina*) have a dark patch at the wing tip, which distinguishes them from all small acalyptrate flies in New Zealand except for the ephydrid *Scatella nubeculosa* (Harrison 1959). *Maorina*

species are mostly found in forests, and occasionally in gardens, but their biology is unknown. Platystomatidae are picture-winged flies that sometimes associate with dung as adults. Asteiidae are easily recognised by their venation, having a short radial vein and no posterior crossvein. *Asteia* species are shiny brown flies only 23 millimetres long. Malaise trapping can gather modest numbers in broadleaf forest in coastal areas. Members of the small southern hemisphere family Teratomyzidae (fern flies) feed on ferns (McAlpine & Keyzer 1994) but the larvae of the New Zealand species are unknown. They have two short crossveins close to the wing base (Harrison 1959), which readily distinguishes them from other acalyptrates. *Teratomyza neozelandica* is an elongate yellowish-brown fly about 2.5 millimetres long, common in native forest. All the described New Zealand species of Pseudopomyzidae are in the genus *Pseudopomyza*. They are tentatively associated with bird dung but are also attracted to rotten fruit (Harrison 1959). They are shiny dark brown to black and 2.0–2.5 millimetres long. Milichiidae and Periscelididae have only recently been recognised in New Zealand, and the species have not yet been described. The family Fergusoninidae has likewise only recently been found in New Zealand (Taylor et al. 2007). *Fergusonina metrosiderosi* forms galls on pohutukawa (*Metrosideros excelsa*) in an obligate mutualistic association with the nematode *Fergusobia pohutukawa*. Described in the same year was *Zealanthus thorpei*, a monotypic endemic genus representing the first species of Anthomyzidae from New Zealand (Rohácek 2007). These records considerably extend the known distribution of these two families in Australasia.

Pohutukawa gall fly *Fergusonina metrosiderosi* (Fergusoninidae).
Birgit Rhode, Landcare Research

Sepsidae, Psilidae, Piophilidae, Chamaemyiidae, Cryptochetidae
Each of these families has only one or two introduced species. Dark, metallic Australian *Lasionemopoda hirsuta* (Sepsidae) is one of the larger acalyptrate species (body about 6 millimetres long) of New Zealand pastures, where it is attracted to the dung of livestock (Evenhuis 1989). It is found throughout most of the North Island and has recently reached Canterbury. It is recognised by the ant-like constriction at the base of the abdomen and the round head with no palps. Psilidae is quite a large family of herbivores (Evenhuis 1989), but the European carrot fly *Chamaepsila rosae*, illustrated in Somerfield (1982) and Scott (1984), is the only species in New Zealand. Piophilidae have larvae known as cheese or bacon skippers. Adults are shiny blackish and small (body 3–4 millimetres long) (Harrison 1959). Three species of Chamaemyiidae have been introduced to New Zealand for control of scale insects among fruit crops (*Leucopis* spp., Europe, South America) and gum trees (*Pseudoleucopis benefica*, Australia) (Cameron et al. 1989; Evenhuis 1989). Two of these species have established but were not mentioned in Harrison (1959). A further South American species, *Chamaemyia pilipes*, illustrated by McAlpine et al. (1987), is found at least in Canterbury (Bejackovich et al. 1998). These small (1–4 millimetres long) stout flies, silvery grey to brown, resemble a small lauxaniid. Tiny (1.5–1.75 millimetres), stout and shiny black *Cryptochetum iceryae* (Cryptochetidae) feeds on woolly aphids. These Australian flies have the distinctive features of a tiny arista on the enlarged third antennal segment (Harrison 1959), short abdomen, and large scutellum (Miller & Walker 1984).



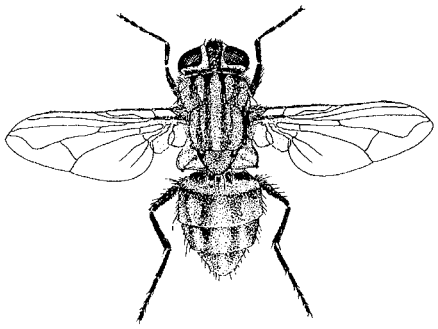
European carrot fly *Chamaepsila rosae* (Psilidae).
Lincoln University

Calyptrate flies
This category includes house flies, blow flies, and related groups, including some vertebrate ectoparasites, as well as species whose larvae are endoparasitoids in insects or other invertebrates. Prior to the arrival of Europeans there were only five families of calyptrate flies in New Zealand – Muscidae, Fanniidae, Calliphoridae, Tachinidae, and the ectoparasitic Hippoboscidae. Investigations into the undescribed diversity of Muscidae (R. A. Harrison, R. P. Macfarlane) and Tachinidae (J. S. Dugdale), together with a report on Fanniidae (Holloway 1985) and a review of Calliphoridae (Dear 1985) demonstrate that species diversity of

these calyptrate families averages 79% of the species diversity of these families in Britain. Despite clear evidence of limited colonisation of calyptrate flies in New Zealand compared to such a recently isolated island as Britain, the families that reached New Zealand have broadly comparable fly species diversity. This check is important in assessing the significance of area comparisons of species diversity to predict what diversity might exist in New Zealand (Macfarlane & Andrew 2001).

Muscidae

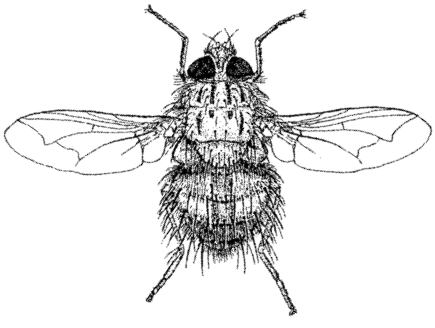
These include four common introduced species and perhaps 134 endemic species. The introduced house fly *Musca domestica*, stable fly *Stomoxys calcitrans*, and false stable fly *Muscina stabulans* are all greyish, while the similar-sized *Hydrotaea rostrata* is shiny black (see Miller 1939; Miller & Walker 1984). Only *Musca domestica* has a medial vein that bends forward sharply to almost close the central cell, as in most blow flies and tachinid flies. However, the medial vein bends only moderately towards the wing tip in these other three introduced species (Miller 1939) and in endemic *Calliphoroides antennatis*, which resembles a blue blow fly or some *Pollenia* species. The orange antenna of *C. antennatis*, a species that breeds in rotting plant material, distinguishes it from these other partly metallic blue species. This vein is straight in the other New Zealand species. Many, if not all, ceonosiine adults are predaceous (Evenhuis 1989), based on observed habits (e.g. Harris 1990) and the presence of teeth at the outer edge of the tongue (Carvalho 2002). Females of the *Millerina* group of '*Spilogona*' and the *Exsul* species have 4–12 distinct black bristles on the ovipositor tip, unlike the rest of the endemic Muscidae. These more rigid tips may enhance penetration during egg-laying into gravelly sand and rotting logs. Coenosiine larvae may well prey on other insects such as shore fly larvae in moist, fine, gravelly to muddy waterway margins and invertebrates in rotting wood, judging by the concentrations of some species in forests and others among seashore driftwood. Species occupy various niches in estuaries, wetlands, and streamsides, extending up to the alpine zone. Many adults seem to need non-shaded waterway margins. The genus *Limnohelina*, whose somewhat elongate, smallish grey species often have patterned wings, are often associated with open, silty, freshwater shorelines. The diversity of forest-inhabiting species remains obscure at present. Most other endemic species are currently undescribed or included in '*Spilogona*'.



House fly *Musca domestica* (Muscidae).
From Grant 1999

Tachinidae

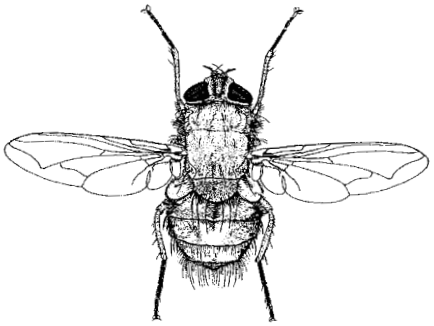
Tachinids parasitise other insects and the extent of information on the hosts of tachinids has already been summarised above in the section on beneficial insects. The Australian leafroller parasitoid *Trigonospila brevifacies* has become a successful natural enemy of pest species in the northern half of New Zealand but the establishment of introduced biological-control agents against grass-grubs has yet to succeed (Cameron et al. 1989; Munro 1998). The accidentally introduced Australian species *Chaetophthalmus bicolor* adds to the New Zealand arsenal against noctuid pests. Tachinids generally have bristly abdomens and similar wing venation to Sarcophagidae and Calliphoridae. Several tachinids, including species of *Pales*, *Occisor*, and *Perissina*, have a semimetallic blue abdomen like blue blow flies. Tachinids are distinguished from these families by a pouchlike bulge under and behind the scutellum. The bristly abdomen and the simple unfeathered arista will also often distinguish tachinids from the other families. There is a high level of endemism amongst the New Zealand genera, although some, such as *Pales*, with many New Zealand species, are widespread in the Australian and Oriental regions. About 180 species are recorded here and the family is particularly well represented in alpine regions. A review by Malloch (1938) is fairly extensive and quite well illustrated, but considerable effort is needed to describe the remaining undescribed genera and species.



Porina parasite *Protohystricia alcis* (Tachinidae).
After Grant 1999

Calliphoridae

Blow flies have been extensively investigated in New Zealand (Ramsay & Crosby 1992) because of their economic significance to pastoral farming. They range from well-known *Calliphora* and *Lucilia* species of farms to poorly known *Pollenia* species, which Dear (1985) revised. The three most prominent pest species, including recently arrived *Lucilia cuprina*, are all accidental introductions from Australia or Europe. Blow flies were one of the better-known groups of insects among Maori (Miller 1939). Among calliphorid blow flies, *Pollenia* is prominent, with 33 native New Zealand species (Dear 1985) compared to only eight in Britain (Chandler 1998) and three immigrant species in North America (McAlpine et al. 1987; Rognes 1987). Native species inhabit lagoonal to subalpine grassland habitats, but whether native species parasitise ground-inhabiting worms has yet to be resolved. The family Mystacinobiidae, erected for the New Zealand bat fly, which feeds on bat dung, is now included as subfamily Mystacinobiinae of Calliphoridae.



Brown blowfly *Calliphora stygia* (Calliphoridae).
After Grant 1999

Sarcophagidae

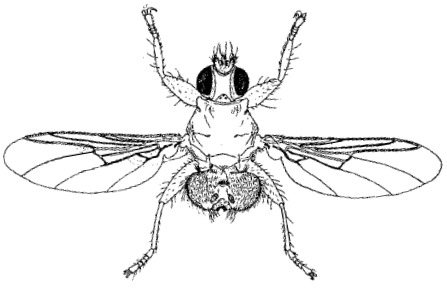
Dung flies are represented by the ubiquitous open-country *Oxysarcodexia varia* (previously known as *Sarcophaga milleri* or *Hybopygia varia*) from South America (Macfarlane & Andrew 2001). The distribution of the other four predominantly coastal species is inadequately known, and at least the larger *Sarcophaga crassipalpis* does not seem to have spread to Canterbury. There is also an unconfirmed report of an endemic species of the subfamily Miltogramminae, based on one specimen in an overseas collection.

Fanniidae

These include the lesser house fly *Fannia canicularis* and other less well-known species. Their distinctive pronged pupae (Miller & Walker 1984) have been investigated and a key produced for the species on the main islands (Holloway 1985). These flies tend to be associated with birds and bumble bee nests (Miller & Walker 1984; Holloway 1985; Macfarlane unpubl.) where they probably scavenge on carrion, broken eggs, and other detritus.

Anthomyiidae

Species include *Botanophila jacobeae*, introduced to control ragwort (Holloway 1983), the cornroot maggot *Delia platura*, a pest of gardens, and *Anthomyia punctipennis*, a common species distinguished by its dark wing-spot pattern (CSIRO 1991). In addition, one or two adventive species of the genus *Fucellia* are associated with decomposing kelp on beaches (Oldroyd 1964). Another species of *Delia* has also been recorded. All species are small (about 3–6 millimetres), and distinguished from other calyptrate flies by an inner hind vein (anal vein) that reaches the wing margin.



Louse fly *Ornithomyia* sp. (Hippoboscidae).
From Grant 1999

Oestridae, Hippoboscidae

These are the ectoparasitic bot flies and louse flies, respectively. The bibliographies of Miller (1956) and Ramsay and Crosby (1992) list the popular summaries on livestock fly pests in New Zealand. Macfarlane and Andrew (2001) reviewed what is known of the four species of louse flies that affect birds.

The Tipulidae or crane flies

Known as crane flies and daddy-long-legs, tipulids are commonly encountered by New Zealanders. Only a few species are strikingly colourful, mainly in the genera *Aurotipula* and *Chlorotipula*, but the patterned wings of many are delicate filigrees of golden-brown that would delight any miniaturist.

Some species can swarm and be a nuisance, but they do not bite like mosquitoes and have no appreciable effect on humans. The larvae of most species are very important in the breakdown of vegetable litter in forests, swamps, bogs, and streams. A few species (especially of *Gynoplistia*) are predators of worms and

larvae. There is one record of a *Leptotarsus* species attacking potatoes but it has certainly not reached the pest status of other tipulines (*Tipula* spp.), as in Europe and North America. There is a great need for life-history studies to elucidate energy requirements relative to emergence, flight, egg production, and the phenomenon of wing reduction. The New Zealand fauna provides a wealth of exemplars.

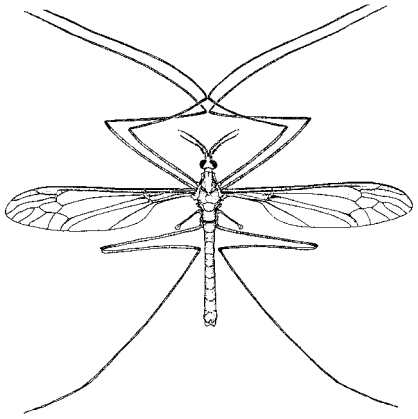
Taxonomic history

In the late 1800s, collectors sent some specimens to European workers and some species were described at that time. In New Zealand, G. V. Hudson and F. W. Hutton also described a few species at the end of that century (4% of the present total). Hudson sent specimens to F. W. Edwards (British Museum) who provided the first major work on the group. His two publications (1923, 1924) account for 16% of the native species, and his keys and figures and the species are still useable today. His material is in the Natural History Museum, London.

Charles P. Alexander, of Amherst, Massachusetts, described most (74%) of the New Zealand species. He received specimens from a number of amateurs, especially two railway workers, two council water-supply employees, a dentist, and several professional entomologists. He engaged in considerable correspondence with them and always asked of their family life and for the biography, education, and of course collecting details of the flies. He carefully conserved those notes (about 3000 pages), now deposited in the U. S. National Museum. These could now give a deep insight into many aspects of New Zealand life and the professional politics of the 1920s to 1950s. Alexander gave short descriptions of each species, concentrating on aspects of colour, wing form, antennae, and male terminalia. These descriptions frustrate today's researchers by their inadequacy, yet one can only admire his conceptual ability as he rarely had to redescribe a species. Most of his types are in the American Museum of Natural History, Washington. Although there has been no detailed discussion since Oosterbroek (1989) the list given here does not follow his in its entirety. The extremely large genus *Limonia* (> 2200 species) is usually subdivided into subgenera (~ 63 for global coverage). Many of these are often informally used as genera, and such is the case here for the distinctive subgenera that occur in New Zealand – *Discobola*, *Idioglochina*, *Metalibnotes*, *Nealexandraria*, and *Zelandoglochina*. The others remain in *Limonia* (*Dicranomyia*), but there are several species, both named and new, that could be better placed in other subgenera or genera and one possibly belongs to a new genus. Likewise treated as genera are the *Leptotarsus* subgenera *Aurotipula*, *Brevicera*, *Chlorotipula*, and *Maoritipula*, and the *Trimicra* subgenus *Erioptera*.

Strictly, all these changes in species combinations would be new, or in some cases reverting to combinations used in the 1920s. All the subspecies listed in Oosterbroek (1989) are treated as full species, and eight species names are relegated to junior synonyms based on recent re-examination of type specimens (senior synonym first) – *Amphineurus campbelli/nox*, *Atarba connexa/confluenta*, *Discobola ampla/milleri*, *Chlorotipula elongata/angustior*, *Leptotarsus atridorsum/harrisi*, *Limonia monilicornis/gracilis*, *Zelandoglochina atrovittata/laterospina*, and *Z. cubitalis/huttoni*. Although synonymised by Hemmingsen and Johns (1975), the species *Zelandoglochina canterburiana* and *Z. allani* were listed separately by Oosterbroek (1989). The synonymy of the latter is also reconfirmed through examination of the types (P. Johns pers. obs.). It is unlikely that there will be many further synonymies (probably fewer than five). Several species have been the subject of recent reviews (Vane-Wright 1967; de Jong 1987; Johns & Jenner 2005, 2006) and *Trimicra* may soon be covered (Andrew 2000).

Some 46 new crane fly species from New Zealand are indicated in the checklist. All are so distinctive (mainly by their short wings) that they cannot be confused with any known species. The number of new species that have less noticeable characters cannot even be estimated from the meagre collections that have been made in recent years. The present state of taxonomy is still in 'catch-



Male crane fly Chlorotipula albistigma (Tipulidae).
After Grant 1999

up' phase and even some described species, especially of the very large genera *Gynoplistia*, *Leptotarsus*, *Limonia*, and *Molophilus* are yet to be recognised in these modern collections.

Biology

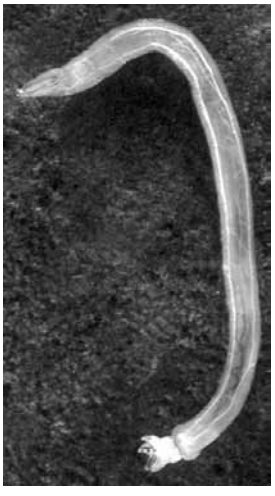
Adult mouthparts are very varied. Most are simple, with the labiae or lips used for dipping into plant juices that are then sucked in. Three species have a greatly elongated tube-like proboscis that may well be used to get into nectaries of narrow, deep flowers such as those of *Dracophyllum*. *Zelandoglochina* species also have elongate mouthparts and are able to cut into the bases of flowers to sup the nectaries (of *Dracophyllum*, *Olearia*, and *Hoheria*). Larval mouthparts are also very varied. Those of the Tipulinae are strong and well muscled and easily chew through soils and litter, taking in much inorganic matter to which various unicellular algae, or fungi and bacteria are attached. *Zelandotipula* larvae browse on the last remnants of decayed vegetable matter in the margins of streams and seepages and are able to digest this material through having a very high alkaline pH in their gut, in striking contrast to the low-pH acidic stomachs of most other animals (Trought 1982).

Behaviours are poorly known. One species, *Rhamphophila sinistra*, flies in a vertically undulating path for several metres through the forest after being disturbed (Johns & Jenner 2005). It then folds its wings and suddenly drops to the forest floor where its brownish colours merge so well with the leafy litter. Two species of *Dicranomyia* vibrate quickly up and down on their legs – one while hanging on spiders' webs (the stickiness has no effect on the hairy legs), the other on the walls of seashore overhangs and caves. Wingless *Gynoplistia pedestris* sits on swamp grasses and sedges where it is a perfect mimic of tetragnathid spiders, with two legs forward and four backwards. Many species are crepuscular or night fliers, the most noticeable being species of *Discobola*, *Zelandoglochina*, and *Zelandotipula*.

Several species lists have been published for specific sites or presented as internal reports to forestry and conservation organisations. A classic is that of Alexander (1929) for Tongariro National Park and the most recent is by Ward et al. (1999). Up to 50 species may be found in any one forest site and it is strongly suspected that their larvae are sequentially partitioning the habitat as the adults merge in sequence over a relatively short period during spring through autumn. There are even a few winter-emergent species.

Distributions within New Zealand. Very high endemism usually points to very restricted distributions, speciation having taken place under the influence of a wide variety of environmental parameters. Such is the case in most New Zealand insects, but not so for the Tipulidae. All but the reduced-wing and alpine species have fairly broad distributions. Indeed, it is very difficult to envisage the parameters that may have stimulated divergence in the many widespread forest and tussockland species of *Gynoplistia*, *Leptotarsus*, *Limonia* and *Molophilus*.

There is a wealth of freshwater species. *Limonia nigrescens* inhabits sodden wood at or below the water surface (Anderson 1982) and *Limonia hudsoni* is a moss eater in montane streams (Suren & Winterburn 1991). The latter is widespread and often abundant, with the adults seen near fast-flowing well-oxygenated streams, usually in bright conditions. Such streams range from the former Kaikoura town water-supply overflow that cascaded over the limestone cliff adjacent to the Edward Percival Field Station at sea level, to alpine streamlets at 1000 metres or more in Arthur's Pass National Park and adjacent mountain ranges. The larvae live in crevices under or amongst the mosses and filamentous green algae near and in riffles and waterfalls. Within this habitat, they construct gelatinous tubes, binding the algal strands and detritus with a mucoid layer. There seems always to be a 'retreat', a crack in the rock, to which the larva goes when disturbed. Prior to pupation, larvae leave the water for a dryer, sheltered position and there secrete a mucoid lump, a mass of jelly; often several (1–6) larvae may occupy this lump.



Aquatic larva of *Molophilus* sp. (Tipulidae).
Stephen Moore, Landcare Research

Aquatic pupa of *Aphrophila* sp. (Tipulidae).
Stephen Moore, Landcare Research

Pupation takes place within it and it is possible that other larvae may enter the lump after it has been formed. One example contained larvae and pupae at very different stages of development that must have been days or weeks apart. One pupa was kept for a week before the adult emerged. The adult sits flat on any nearby sheltered surface, apparently preferring the rough, broken surfaces of the rock banks or stony cliffs. When undisturbed the legs are almost completely spread and the body almost touches the ground. When disturbed the legs are shifted to raise the body and the animal then 'rocks and bounces'. Mating takes place 'tail to tail' on the same surfaces. Egg-laying has not been witnessed. *Limonia hudsoni* and *L. sperata* often occur together at higher altitudes.

Winterbourn (1996) described the larva and habitat of *Aphrophila neozelandica*. At least two other species of *Aphrophila* have been taken with it in light-traps and in all likelihood all species of *Aphrophila* are in flowing fresh waters. Winged and brachypterous species of *Rhabdomastix* occur in the sandy flats of many rivers. Adults of reduced-wing species in the Wanganui River at Harihari are able to withstand rapid rises of this flood-prone river. They hide under stones and wood and may remain submerged in up to a metre of water for hours if not days. As the flood recedes they emerge to run over the new sand banks and mate. The larvae are presumed to be in the margins of the normal river and nearby temporary ponds. *Paralimnophila skusei* is a widespread species, the larvae of which have regularly been taken amongst roots and bases of stream vegetation. Their mouthparts suggest that the larvae are predatory. Similarly, larvae thought to belong to *Gynoplistia* species have been taken in alpine seepages. One was seen feeding on an earthworm.

Endemic species

The one crane fly that is virtually worldwide, *Trimicra pilipes*, has had many forms described from various places around the world. These have been recognised at various taxonomic levels – species, subspecies, or varieties – and present usage favours the last (Alexander 1962). Only in New Zealand are there distinctive related species with different body form or habitats occupying brackish water/soil, highly organic sites (e.g. cowshed drains), and wet guano of bird colonies. The bird colonies of four subantarctic islands have their respective species (Alexander 1962, and two undescribed species).

The fauna in general is related to that of Australia, New Caledonia, and Chile. *Sigmatomera rufa* has a close relative in eastern Australia, and should a few species of *Macromastix* be transferred to *Leptotarsus* (*Habromastix*) then there would be a stronger connection with Australia. Several *Limonia* species are very similar to those in New Caledonia and Chile. *Zelandotipula* is rather odd in that all its close relatives are in the northern parts of South America. However, most others seem to be sufficiently different from known species at subgenus and species levels, suggesting that the New Zealand fauna has long been isolated. *Amphineurus*, *Gynoplistia*, *Limonia*, and *Molophilus* have seemingly explosively speciated in New Zealand, occupying unusual habitats, and many are flightless.

Although it is assumed that all species are native, many are tolerant of human environmental changes. *Limonia vicarians* has apparently emerged from household potplants and it is certainly common in household gardens. *Leptotarsus dichroithorax*, *L. obscuripennis*, *L. tapleyi*, and *L. zeylandiae* are all present in grassland-shrubland or pine plantations (Johns et al. 1980). *Chlorotipula albistigma* lies in rotting *Pinus radiata*, willow, and other exotic trees. Recently, *Leptotarsus* larvae have been studied to determine the effects of heavy-metal pollution on soils after distribution of treated sewage in pine plantations (Denholm pers. comm.).

Adventive species

There are no recorded adventive species in New Zealand, although one, *Trimicra pilipes*, is distributed almost worldwide and it favours wet to swampy, much modified, pastoral habitats.

Speciose genera and flightless species of New Zealand Tipulidae

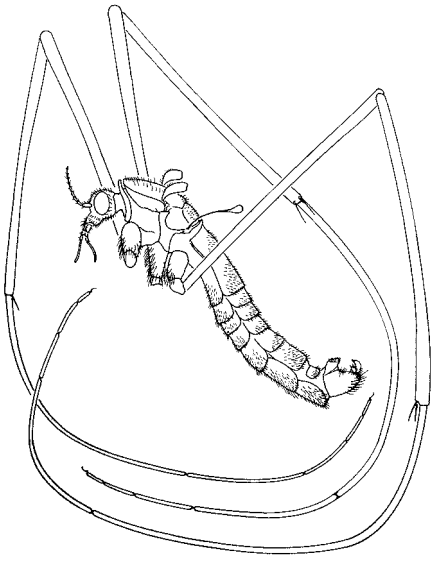
Genus	Known species	New species	Flightless species
Amphineurus	44	1	0
Austrolimnophila	20	3	2
Gynoplistia	101	1	13
Leptotarsus	53	1	10
Limonia	62	12	9
Metalimnophila	18	2	2
Molophilus	92	1	1
Rhabdomastix/Limnophila	27	4	4
Subtotal	390	21	37
Other genera (37)	178	23	14
Unrecorded genera (2)	0	2	0
Totals (48)	**568**	**50**	**55**

Special features

Without doubt, the two features of New Zealand crane flies that separate them from the rest of the world are the inordinate number of flightless species and the richness of the marine intertidal fauna. Flightlessness is the result of a degeneration sequence. Firstly there is a reduction in the diameter of the muscle fibres, then loss of muscles and wing stenoptery (narrow aspect ratio), and brachyptery (short, flabby wing). Finally there is the almost total loss of wings (aptery) and the halteres may even be reduced to small non-functional stubs. In the female, eggs may occupy the thoracic space that holds the wing muscles of flighted species.

Brachyptery occurs in all habitats – marine intertidal, swamps and seepages, open stony and sandy flats of braided rivers, brush and tussock vegetation, dense forests, subalpine tussock, and alpine fellfield. With the progression to aptery, there is a concomitant increase in leg length and the animal has a long-legged, spider-like (or more like an opilione harvestman) form. It may occur in one sex (female) or both. Muscle atrophy is seen in a new species of *Leptotarsus* from the Snares Islands in which muscle diameter is reduced to approx 70% of similar members of the genus. The males are just able to fly, but the females are unable to do so until they have shed most of their eggs. *Leptotarsus zeylandiae* females have no muscles and are brachypterous, those of the males being fully formed. Females emerge from the soil late in an autumn afternoon, and, within a few hours, mate, lay their eggs, then die, even before they become fully sclerotised. The males swarm, especially if there is mist or light rain, and live for another day. The flight period is about four weeks in northern populations but shorter in southern populations. The condition of stenoptery and moderate brachyptery in both sexes occurs in about 10 *Leptotarsus* species, several *Gynoplistia*, *Austrolimnophila stewartiae*, *Trimicra campbellensis*, and in a magnificent 30 millimetre-long new species of *Zelandotipula*. Near-total wing loss is seen in several species of *Gynoplistia*, at least two *Metalimnophila*, *Molophilus*, *Zaluscodes*, *Tonnoiraptera*, two *Austrolimnophila*, three *Trimicra*, several *Rhabdomastix* and *Limnophila*, and at least nine species of *Limonia* (*Dicranomyia*). An estimated 10% of the New Zealand crane fly fauna is flightless.

The halophiles (found in saline, maritime areas) present interesting distributions. There are at least 10 species that are well adapted to the marine environment (Wise 1965; Hemmingsen & Johns 1975). Several (*Idioglochina fumipennis*, *I. kronei*, *Limonia nebulifera*, *Zelandoglochina canterburiana*, *Rhabdomastix* n. sp., and possibly *Geranomyia* n. sp.) live within the intertidal zone and inhabit various types of thick encrusting algae (*Corallina* sp., *Bostrychia* sp.). *Limonia kermadecensis* (also present on the mainland, near Auckland at least) makes a short burrow or occupies a small depression into soft rock in



Leptotarsus sp., a wingless cranefly.
John Dugdale

the high intertidal zone. It encloses itself by secreting a silky cover to which stick sand grains. Larvae emerge at night to feed on fine algae by ingesting sand grains. It can achieve numbers of 100 per square metre and thus could be a minor degrader of soft mudstone shorelines in the north of New Zealand. A close relative, *Limonia fulviceps*, is known from saline marshes at Nelson and the head of Pelorus Sound near Havelock. *Limonia subviridis* has been reared from the intertidal red alga *Gelidium pusillum* (Wise 1965). Three undescribed flightless species are known respectively from Fiordland, Bluff, and Stewart Island, from the Snares, and from the wind- and spray-swept Bounty Islands, and a new *Rhabdomastix* occurs at the Antipodes Islands. *Limonia nebulifera* belongs to a very distinct group of halophiles. Two species are found on southern and eastern Australian coasts and another, its closest relative, in Chile. *Idioglochina* has representatives in Australia, several Pacific Islands, and Japan.

Dipteran zoogeography and speciation

The break-up of the southern landmass of Gondwana and the northern movement of New Zealand are considered to have occurred in the Cretaceous, around 110 to 85 million years ago during which the Tasman sea was formed (Stevens 1985). Stevens et al. (1995) summarised the changes in vegetation and climate that are understood to have occurred when flies began to occupy New Zealand, but the relevance of these changes to the present-day fauna is moot given the uncertainty regarding the possible complete submergence of the Zealandia continental mass at the end of the Oligocene, 23 million years ago (Landis et al. 2008). In a discussion of zoogeography and taxonomic methods, Hennig (1966) and Brundin (1967) advanced the theory of checking sister-group relationships between widely separated continental masses using New Zealand Diptera as an example. Hennig (1966) recorded 23 shared genera confined to Australia–New Zealand–South America and 15 genera shared between New Zealand and Australia. In the division Cyclorrhapha, Hennig (1966), Vockeroth (1969), and McAlpine (1991) reported a complete lack of transantarctic generic/subgeneric sister groups between New Zealand–South America and Australia–New Zealand–South America. However, *Ephydrella* is catalogued with an Australian, New Zealand, and Brazilian distribution (Mathis & Zatwarnicki 1995) and Amorim and Silva (2002) commented that there could be other, unrecognised, examples.

Hennig (1966) tabulated 14 genera with species diversity confined to New Zealand and Chile/South America and 138 endemic New Zealand genera. The 12 families of Nematocera that have been adequately studied show the following examples of genera confined to New Zealand and South America – *Aphrophila*, *Campbellomyia*, *Limnophilella*, *Zelandoglochina*, *Zelandotipula* (Tipulidae), *Nervijuncta* (Ditomyiidae), *Aneura*, *Parvicellula* (Mycetophilidae), *Isoneuromyia* (Keroplatidae), *Canthyloscelis* (Canthyloscelididae), *Corethrella* (Corethrellidae), and *Oterere* (Thaumaleidae). Jaschhof and Didham (2002) described the Rangomaramidae as a new family for the world. However, studies of South American species have enlarged this family to include three new subfamilies (Amorim & Rindal 2007), which allows most of the previously unplaced genera from New Zealand to be included in this family which has a relatively high southern-hemisphere diversity.

Among the larger Brachycera families, the only New Zealand–South American links are for *Filatopus* (Dolichopodidae) and *Oropezella* (Empididae). For the four smaller brachyceran families, there are closer affinities with Australia for Tabanidae and Bombyliidae (Hennig 1966; Greathead 1988), but for Acroceridae the more apparent affinities are with American genera (Paramonov 1955; Hennig 1966) or species groups (Schlinger 1960). Paramonov (1955) noted that New Zealand Acroceridae have their closest links with South America and not Australia and he discussed absences of fly families in New Zealand that cannot tolerate colder climates. In addition, information on the Diptera from the offshore islands has begun to demonstrate further families that are absent or depleted

Approximate numbers of described and recognised species of Coleoptera, Diptera, Hymenoptera, and Lepidoptera in New Zealand

Order	Number of described species	Number of recognised species
Coleoptera	5,235[M]	6,735[M]
Diptera	2,540[Mc]	3,213–3,230[Mc]
Hymenoptera	721[B]	1,535–1,649[B]
Lepidoptera	1,684	1,698

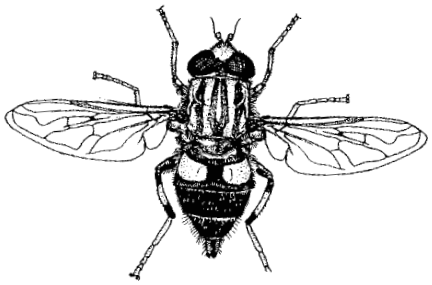
Sources: Maddison (this chapter), Macfarlane et al. (this chapter), Berry (this chapter), Dugdale (1988, with the addition of 22 adventive species recognised since, R. Hoare pers. comm.).

in diversity compared to the three main islands of New Zealand (Macfarlane & Andrew 2001).

Since 1966, revisionary studies have clarified affinities in four larger Brachycera families. For the Empididae, there are some closer links with Chile than for Australia, apart from links between the southern lands and subantarctic islands in the subfamilies Clinocerinae and Trichopezinae (Sinclair 1995). The genus *Heterophlebus* is one such example (Sinclair 1995), along with the 80 or so world species in the subfamily Ceratomerinae centred in New Zealand (Sinclair 1997b, unpubl.). Seashore-inhabiting *Thinempis* (Empidinae, Hilarini) species have affinities with Australia and an undescribed species from New Caledonia (Sinclair unpubl.). Species diversity in New Zealand is centred on the tribe Hilarini rather than Empidini in the Northern Hemisphere (McAlpine et al. 1981; Bickel 1996; Chandler 1998). New Zealand should also have a relatively diverse lot of *Chelipoda* (Plant 2007) even after description of new species from South America, New Caledonia and possibly Australia is achieved. An extensive examination of allied genera of robber flies in New Caledonia, Australia (Daniels 1987; Macfarlane unpubl.), and Chile (Artigas 1970) has revealed closer links with both Australia and New Caledonia for Asilinae genera, but there is very limited generic diversity compared to Australia. Two New Zealand species provisionally assigned to *Rhabdotoitamus* are clearly congeneric with Australian, New Caledonian, and Norfolk Island species. A second, much more distinct Australasian genus (undescribed) has only one certain described species, viz '*Cerdistus*' *lascus* from the North Island, plus a very similar undescribed species from New Caledonia. *Saropogon* (subfamily Dasypogoninae) is somewhat unusual for the Southern Hemisphere because this cosmopolitan genus (Hull 1962) has more species in New Zealand than the Americas or Australia (Artigas 1970; Evenhuis 1989). Malloch (1928), however, noted that New Zealand *Saropogon* species differ from the American ones in hair and bristle patterns on the head.

Of 23 genera with 15 or more species, nine are cosmopolitan, in which the number of New Zealand species is about the expected diversity given the size of New Zealand compared to North America, Australia, or Great Britain (Macfarlane & Andrew 2001). These are: *Molophilus* 93 species, *Limonia* 66 species, *Leptotarsus* 54 species (Tipulidae), *Mycetophila* 52 species, *Tetragoneura* 34 species (Mycetophilidae), *Hilara* 65 species (Empididae), *Corynoptera* 34 species (Sciaridae), *Peromyia* 33 species (Cecidomyiidae), and *Platycheirus* 25 species (Syrphidae). Seven of these genera are more diverse than in South America or Australia. Exceptional species diversity exists in most of the remaining 16 genera, which more than triples the British list (Chandler 1998) or is about equal to that of the much larger areas of Australia (Evenhuis 1989) or North America (McAlpine et al. 1981, 1987). These genera are: *Gynoplistia* 102 species, *Amphineurus* 45 species (Tipulidae, Limoniinae, Tipulinae), '*Spilogona*' auctt. 81 species (Muscidae, Ceonosiinae), *Anabarhynchus* 61 species (Therevidae), *Ceratomerus* 41 species, *Chelipoda* 37 species, *Hilarempis* 23 species (Empididae, Ceratomerinae, Empidinae, Hemerodrominae), *Zygomyia* 54

Mycetophila fagi (Mycetophilidae).
Rod Macfarlane



Rat-tail hover fly *Helophilus trilineatus* (Syrphidae).
After Grant 1999

species (Mycetophilidae, Mycetophilinae), *Pollenia* 34 endemic species (Calliphoridae, Polleniini), *Allograpta* 32 species, *Helophilus* 20 species (Syrphidae, Syrphinae, Eristalinae), *Parentia* 27 species, *Sympycnus* 21 species, *Micropygus* 15 species (Dolichopodidae, Sciapodinae, Sympycninae), *Nervijuncta* 20 species (Ditomyiidae), and *Cycloneura* 15 species (Mycetophilidae).

Conservation of vulnerable and endangered species

Currently, 27 species of flies have been placed on the indeterminate category of the endangered species list (Malloy & Davis 1994; McGuiness 2001). These include three aquatic fly species (*Nothohoraia micrognatha*, Blephariceridae; *Mischoderus*, two spp., Tanyderidae), the subalpine batwing muscid *Exsul singularis*, the New Zealand bat fly *Mystacinobia zelandica*, five robber flies including two undescribed offshore-island species, an undescribed flightless *Austrolimnophila* sp., the cave-dwelling crane fly *Gynoplistia troglophila*, and 12 species of stiletto flies. Some surveys have been conducted for only three of these species.

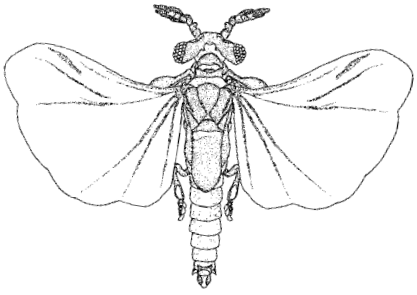
It is possible to specify five groups of flies that may be vulnerable to becoming endangered and at least five types of areas where species are susceptible to becoming rare. The first group is of larger predator flies (Therevidae, Asilidae) with limited mobility for almost all their life because they live as immatures in the soil during that time. Asilid adults feed on other smaller insects from perches, which may limit the time they can disperse compared to the non-predatory adults of Therevidae. A second group comprises any of the parasitic flies (Acroceridae, Bombyliidae, the calliphorid *Pollenia*, Pipunculidae, and Tachinidae) with restricted distributions and host ranges. All these families have reduced diversity on offshore islands in New Zealand, if they are even present there, which supports the theory they are potentially among the more vulnerable fly species. A third possible group is the smaller leaf-mining or gall-midge flies that may rely on rare plant species or those confined to offshore islands. These small flies, which can be encased in plant stems or buds, are vulnerable to extensive and repeated burning as well as spraying of grey shrubland, which is often dominated by matagouri (*Discaria toumatou*). Such rapid and often extensive and prolonged host loss probably decimates fly populations, especially when non-dominant shrub species develop small and fragmented populations. A fourth possible group comprises the more sensitive aquatic insect species such as some of the Empididae with restricted distributions or perhaps insects in thermal waters, e.g. *Tanytarsus* n. sp. (Winterbourn et al. 2000) if they become polluted. There are at least 84 flightless fly species known from New Zealand (Macfarlane & Andrew 2001), some of which occur on small offshore islands or in vulnerable habitats.

Seven types of areas – forests, grassland, offshore islands, wetlands, urban and alpine areas, dunes – can be susceptible to habitat destruction or degradation. Weed invasion, grazing pests, or farming and revegetation may change grasslands or forests. Small isolated offshore islands may be vulnerable, especially if they are more than 20 kilometres from other islands (beyond the flight range of most species), as also may subalpine or upland species on mountains and similar isolated areas, notably Mount Taranaki or Banks Peninsula. Wetlands adjacent to farmland or urban areas are often subject to draining and plant losses, while the loss of specialist native dune plants and removal of seaweed for garden fertiliser and driftwood for fires reduces habitat for coastal insect species that include flies. Extensive areas, especially of distinctive short tussock, have often been moderately to severely degraded, initially by rabbit grazing and burrowing then oversowing with pasture species, and more recently by invasion of four *Hieracium* species. Only a very low number of primary, generalist, foliage-, root-, and flower-feeding species exist in numbers where these weeds are dense (Syrett & Smith 1994; Macfarlane 2002). Snow-tussock grassland continues to decline in naturalness, including host-plant diversity, owing to oversowing, invasion by *Hieracium*, and firing. Grey shrubland in inland and dry regions, especially in the South Island, has already experienced a considerable retraction in area and in the availability

of the less common host-plant species, before fly diversity has been adequately studied in these habitats. On the other hand, most fly species are probably less vulnerable than large flightless insects such as the wetas, many ground beetles, some weevils, and other beetles likely to be favoured as rodent food.

Order Strepsiptera: Twisted-wing parasites

There are only about 535 described species of Strepsiptera worldwide, and just two species in New Zealand. Both are endemic with mainly golden-brown or blackish bodies. Strepsiptera are parasites and all are small (0.5–4 mm long). Female Strepsiptera live within the host and only the males have wings. The hind wings are fan-shaped with few veins and the front wings are club-shaped halteres (in contradistinction to the hind-wing halteres of Diptera). In the New Zealand species *Elenchus maorianus* each antenna has a two-pronged acute-angled fork (Gourlay 1953) whereas *Coriophagus casui* has five close-set projections (Cowley 1984). The compound eyes of the males are distinctive too, looking somewhat like raspberries.



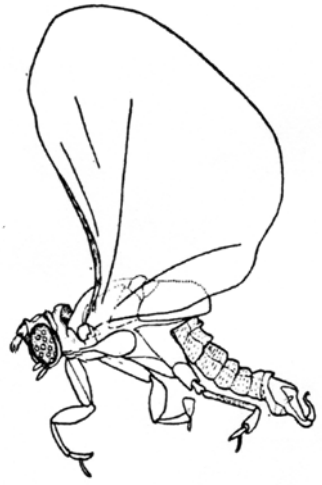
Coriophagus casui.
After Cowley 1984

Overseas, strepsipterans are mainly parasites of leafhoppers, planthoppers, and spittlebugs (suborder Auchenorrhyncha; Hemiptera), and a considerable range of bees and non parasitic wasps (Hymenoptera), and the host range can be quite broad (Kathirithamby 1989ab, 1992, Kathirithamby & Taylor 2005). Silverfish, cockroaches, mantids, and some orthopterans and flies are also hosts. In New Zealand, the recorded hosts are from the leafhoppers *Arawa variegata* (Cicadellidae) (Gourlay 1954, 1964; Prestige 1989) and *Novothymbris vagans* (Cowley 1984) as well as the plant hopper *Notogryps ithoma* (Delphacidae) (Cowley 1984). Male strepsipteran pupae in *Arawa* project on the upper side of the abdomen, while the larva-like adult females are on the underside with an obscure small projecting tip. Most of each strepsipteran pupa is within the host, whereas parasitic Dryinidae larvae (Hymenoptera) are fully exposed. Females produce a free living planidium, which seeks out and parasitises the next host.

Finding strepsipterans in New Zealand is achieved by knowing where to find the host species. *Novothymbris vagans* has been collected only from the west and southwest of the South island where it is associated with beech forest and shrubs of *Coprosma* and *Hebe* (Knight 1974b). A 2010 sampling of a salt-marsh meadow found 3.7% of the adults of the plant hopper *Anchodelphax* ?*olenus* (Delphacidae) to be affected by Strepsiptera; a male *Elenchus maorianus* was collected at the same site. Arawa species from adjacent shore ribbonwood (*Plagianthus divaricatus*) is known to be affected by an undetermined strepsipteran species. *Arawa variegata*, which is found in pasture and tussock grassland (Knight 1975), reportedly hosts *E. maorianus* (Gourlay 1964) but this could be based on an association and not from rearing. At least 12 other *Elenchus* species usually rely on delphacid planthopper hosts (Hassan 1939; Kathirithamby 1989). Cowley (1984) described *Coriophagus casui* from a male and so the host is unknown. Known hosts of *Coriophagus* (Pentatomidae, Coreidae) are based on three of the eight species in the world (Kathirithamby 1992).

The known level of parasitism in New Zealand (4.2%, Prestige 1989) is generally low (i.e. below 5%), but parasitism of *Arawa* was noted to be as high as 61.5% in February and 20.5% in October/November at one shore ribbonwood site and below 1.1% at a second site in spring. Several factors may contribute to males being rare in New Zealand collections, including the apparently overall low levels of parasitism, short male longevity, inadequate collection methods, and unsuitability of the habitat sampled.

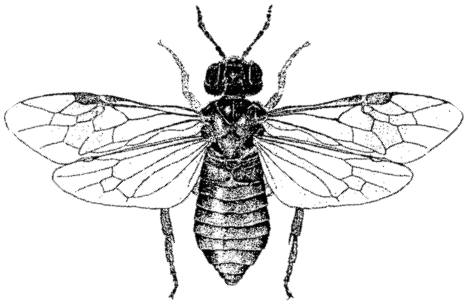
Parasitised Hemiptera and/or Strepsitera males have been collected from pasture and subalpine grassland, salt-marsh meadow, mangove shrubland, and shore ribbonwood. The Auckland collection site for *C. casui* was close to kanuka (*Kunzea ericoides*) and broadleaf/podocarp restored bush (Cowley 1984), and



Elenchus maorianus.
From Gourlay 1953

specimens in the Lincoln University collection may be from within or adjacent to broadleaf forest. Adult males have been collected in malaise traps, pan traps, and even light traps. The Lincoln University collection possibly has undescribed species of Halictophagidae. Identification of delphacids and cicadellids hosting Strepsiptera pupae could soon improve knowledge of host range and seasonal activity. Rearing males from hosts, collecting more males in spring and summer, and descriptions of females will aid species recognition and clarify the hosts in New Zealand.

Order Hymenoptera: Sawflies, wasps, ants, and bees



Cherryslug sawfly *Caliroa cerasi* (Tenthredinidae).
From Grant 1999

The order Hymenoptera ('membrane-winged') is one of the most morphologically and biologically diverse of all the insect orders. This is reflected in the order having no common name in English, unlike the three other megadiverse insect orders Diptera (flies), Coleoptera (beetles), and Lepidoptera (moths and butterflies). Hymenopterans include famous examples of social insects, like bees and ants, with regimented social systems in which members are divided into castes. They are also important pollinators of flowering plants, some species of which have flowers specially adapted to attract and receive the attention of specific hymenopteran visitors.

Like other holometabolous insects, hymenopterans undergo complete metamorphosis. Adults have mandibulate (biting) mouthparts, two pairs of membranous wings (in alates) with the fore and hind wings linked by hooks called hamuli, a lepismatid form of ovipositor (formed from modified vestiges of appendages on the eighth and ninth abdominal segments in females), and prominent antennae (usually with nine or more segments, but fusion or reduction may occur). Gauld and Bolton (1988) have provided an excellent chapter on adult morphology and Goulet and Huber (1993) published a list of diagnostic characters for adults and larvae. Keys to families can be found in the latter work and in Naumann (1991).

There are two hymenopteran suborders – the Symphyta (generally accepted as a paraphyletic assemblage, i.e. including ancestors of a number of evolutionary lineages) and the Apocrita (probably monophyletic). The symphytans (sawflies and woodwasps) are the most primitive members of the order. Most symphytan larvae are caterpillar-like and feed externally on the leaves of plants, but a few, such as siricids, are borers in wood and some species of the Orussidae are carnivorous. Where they impact economically on humans, they tend to be pest species, for example *Sirex* woodwasps, which can be important pests of pine trees.

A leafhopper bearing a parasitic larva of a species of Dryinidae (Chrysidoidea).
Rod Macfarlane

The suborder Apocrita is traditionally divided into the Parasitica and the Aculeata, approximating to the parasitic Hymenoptera and the stinging Hymenoptera. While the Aculeata is demonstrably a monophyletic grouping, the Parasitica is paraphyletic (Gauld & Bolton 1988). These authors and Quicke (1997) have discussed the problems with higher-level classification in the order. The Parasitica represents the most species-rich group of Hymenoptera. Many of its members are physically tiny wasps – possibly the smallest insect known is a mymarid, *Dicopomorpha echmepterygis*, at about 0.13 of a millimetre in length (Mockford 1997). For these reasons (rich species diversity and often small physical size), as well as the high level of morphological variation and the presence of cryptic species (Austin 1999), the taxonomy and biology of the Parasitica is still extremely poorly known in almost all parts of the world. LaSalle and Gauld (1993) estimated that at least 75% of parasitic hymenopteran species (Parasitica and parasitic aculeates) are yet to be described. Some taxa within the Parasitica are secondarily plant feeders or predatory but the majority are insect-eating parasitoids. Possibly no other group of insects is as beneficial to humans as the parasitic wasps, through their role as regulators of other insect populations in natural and managed systems. Most species of natural enemies used in biological control programmes against pest insects are members of the Parasitica.

The Aculeata includes the spider-hunting wasps, vespid wasps, ants, and bees. The ovipositor (egg-laying tube) and associated structures have been modified into a sting, and some species are health hazards for humans. Others are important pollinators. The development of social organisation has reached a peak for invertebrates in the aculeates. Ants, in particular, impact on ecosystems in a way unequaled by any other organism (LaSalle & Gauld 1993), and rank alongside soils and climate as probably one of the most important factors controlling vegetation. In *Science* magazine, Harvard biologist E. O. Wilson (1985) cited studies estimating that about a third of the entire animal biomass of the Amazonian rainforest could be composed of ants and termites.

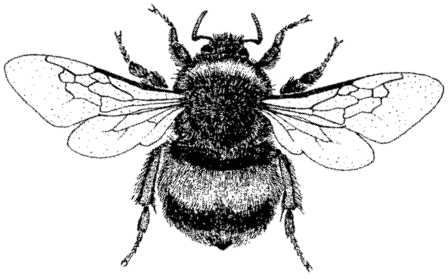
Striated ant *Huberia striata* (Formicidae).
Des Helmore

Current known diversity

There are more than 115,000 described species of Hymenoptera worldwide (LaSalle & Gauld 1993), establishing it as one of the four great insect orders – Coleoptera, Diptera, Hymenoptera and Lepidoptera – each with over 100,000 described species (Goulet & Huber 1993). Despite the well-known quip about God's 'inordinate fondness for beetles', there has been debate in the literature as to which of these orders is the most species-rich (LaSalle & Gauld 1993; Grissell 1999). Stork (1991) found the Hymenoptera to be the most speciose order in tree canopies in Borneo and a number of surveys in tropical forests have supported this finding. Masner (1990) estimated that the Hymenoptera is the largest order in North America, and Gauld and Bolton (1988) likewise showed it to be the most speciose order in the much better known British fauna. Estimates of the true diversity of the Hymenoptera vary widely in the literature, from 250,000 to 2.5 million species (Grissell 1999). Gauld and Bolton (1988) estimated a minimum worldwide species tally of 250,000 in 83 families and Goulet and Huber (1993) more than 300,000 species in 99 families. LaSalle and Gauld (1993) also recognised about 80 families. These authors and Gauld and Bolton (1988) divided the superfamily Apoidea into just two families (Apidae and Sphecidae) whereas Goulet and Huber (1993) recognised 20 apoid families. These numbers are certain to change with increased knowledge and further research into phylogenetic relationships. For convenience, the treatment here generally follows that of LaSalle and Gauld (1993) with some recent changes and some exceptions that allow the classification in the end-chapter checklist to be consistent with New Zealand revisions.

New Zealand hymenopteran diversity

The New Zealand hymenopteran fauna is particularly poorly known. Valentine (1970) provided a historical survey of the order in New Zealand, from the first named hymenopterans (three ichneumonid wasps and a pompilid, described by Fabricius in 1775) until 1970, when 180 species were described. At this time, more than half the named species were described by just four authors – Ashmead, Cameron, Cockerell, and Smith. Valentine and Walker (1991) produced the first comprehensive catalogue, listing 549 species of Hymenoptera recorded in the literature as occurring in New Zealand up to 1988. The present review records about 200 more, for a total nearing 750 described species. Additionally, 775 to 892 undescribed or undetermined species are recorded here, providing a minimum species tally of around 1500 hymenopterans from New Zealand. More than 500 genera are recorded here, compared with 291 in Valentine and Walker (1991). A total of 47 families are recorded, nine of which are represented only by introduced species (Tenthredinidae, Pergidae, Siricidae, Agaonidae, Scoliidae, Scolebythidae, Mutillidae, Vespidae, and Megachilidae). The table given here compares family-level taxon diversity in New Zealand and globally.



Bumble bee *Bombus terrestris* (Apidae).
From Grant 1999

Repositories

The major repository of New Zealand hymenopteran specimens is the New Zealand Arthropod Collection (NZAC), which holds more than 150,000

Common wasp *Vespula vulgaris* (Vespidae).
From Grant 1999

mounted specimens, a small slide collection, and a large collection of specimens in ethanol. The NZAC also houses the largest collection of New Zealand hymenopteran types in the world (Berry 1991) and also an important collection of voucher specimens of arthropods (mostly hymenopterans) introduced into New Zealand for the biological control of weeds and pests. Examples of the value of retaining vouchers of biocontrol introductions have been demonstrated (Berry 1998, 2003). Significant collections of New Zealand Hymenoptera are also held by Lincoln University, Canterbury Museum, Canterbury University, Otago Museum, Forest Research Institute and Auckland Museum.

Endemism

A taxon is endemic if it has only ever been recorded from New Zealand and/or its offshore islands. However, since knowledge of the hymenopteran fauna from most parts of the world is at best incomplete, any statements regarding endemism must remain open to question. For example, the encyrtids *Alamella mira* and *Psyllaephagus acaciae* and the pteromalid *Nambouria xanthops* (all superfamily Chalcidoidea) are presently known only from New Zealand but, based on phylogenetic and/or host relationships, all three are almost certainly Australian (Berry & Withers 2002).

These examples illustrate the point that poor knowledge of both the New Zealand fauna and that of surrounding regions makes discussion of endemism at the species level in a quantitative fashion very difficult. Nonetheless, estimates of endemism for those groups where revisions have been undertaken recently, and where faunas of other areas are well known, are likely to have some significance. The table below compares percentage endemism at the species and genus levels for some such groups. It is evident that endemism at the species level is often reportedly high, whereas at the genus level it is

Family-level diversity of Hymenoptera

Showing the number of families worldwide vs New Zealand. Classification and numbers are based on Goulet and Huber (1993), except Xiphydridae, Proctotrupoidea, and Spheciformes.

Taxon	No. of known families worldwide	No. of known families in New Zealand
Tenthredinoidea	6	2
Siricoidea	2	1
Xiphydrioidea	1	1
Orussoidea	1	1
Xyeloidea	1	0
Evanioidea	3	1
Ceraphronoidea	2	2
Proctotrupoidea	8	1
Diaprioidea sensu Sharkey (2007)	3	2
Platygastroidea	1	1
Cynipoidea	5	3
Chalcidoidea	19	14
Parasitica	48	30
Mymarommatoidea	1	1
Ichneumonoidea	2	2
Chrysidoidea	7	4
Vespoidea	11	5
Apoidea	10	6
Total families	**82**	**47**

Endemism at genus and species levels for selected groups of New Zealand Hymenoptera

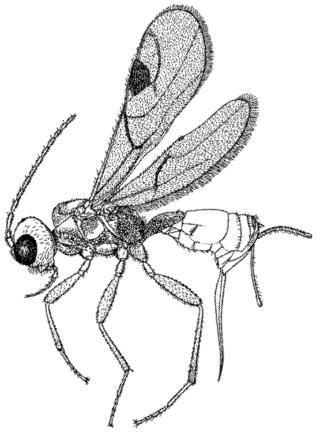
Taxon		Percentage endemism genus level	Percentage endemism species level
Symphyta[B]		25	33
Parasitica			
Chalcidoidea	Encyrtidae[No]	17–20	51
Chalcidoidea	Moranilini[B95]	0	65
Chalcidoidea	Mymaridae[N&V]	48	†
Proctotrupoidea	Ambositrinae[N]	70	100
Aculeata			
Vespoidea	Pompilidae[H87]	0	91
Vespoidea	Sphecidae[H94]	0	82
Apoidea	Colletidae	0	77

Sources: Berry (unpublished), Berry (1995), Donovan (pers. comm.), Harris (1987), Harris (1994a), Naumann (1988), Noyes (1988), and Noyes & Valentine (1989b)
† high number of undetermined species prevents calculation of this figure

extremely variable. At the family level, the chalcidoid family Rotoitidae was thought to be endemic until a second undescribed genus was recognised from Chile (Noyes & Valentine 1989b) and described by Gibson and Huber (2000). The recently described proctotrupoid family Maamingidae is known only from New Zealand (Early et al. 2001).

The groups Symphyta and Aculeata are small and relatively well known in New Zealand. At the species level, endemism is low amongst the Symphyta and high amongst the three aculeate groups that have been revised recently. Within the Parasitica, the Chalcidoidea is the only superfamily well known at the genus level, mainly owing to the works of Boucek (1988), Noyes (1988), and Noyes and Valentine (1989a, b). Boucek (1988) considered the New Zealand chalcidoid fauna to be much poorer than in other parts of Australasia, and he cited only 14 New Zealand chalcidoid genera as being endemic. Conversely, Noyes and Valentine (1989b) considered that the New Zealand chalcidoid fauna shows a high level of endemism, listing 43 genera endemic to New Zealand, which they estimated to be 25% of the total chalcidoid fauna. They estimated endemism at the species level to be up to 50%. Part of the reason for this discrepancy is that Boucek (1988) did not cover the families Encyrtidae and Mymaridae, which both show high generic levels of endemism.

Among other groups of Hymenoptera, Naumann (1988) found that five out of seven (71%) of the genera and all of the species of subfamily Ambositrinae (Proctotrupoidea) occurring in New Zealand are endemic. The superfamily Proctotrupoidea is an older group than the chalcidoids, which may explain the very high levels of endemism found in New Zealand at the genus level. There are several ancestral elements in the New Zealand hymenopteran fauna, for example species of Rotoitidae and the pteromalid genera *Errolia*, *Fusiterga*, and *Zeala*, but the remaining 10 endemic chalcidoid genera listed by Boucek (1988) are closely related to Australian forms. Boucek (1988) considered the latter genera to be probably descendants of forms that arrived at various times from Australia, carried by the wind.

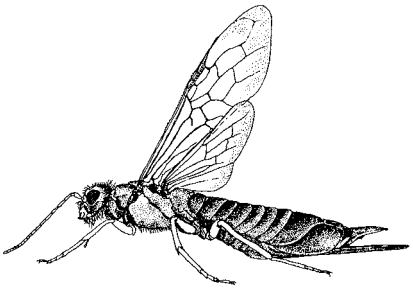


Cryptoxilos thorpei (Braconidae).
Des Helmore

Special features of the New Zealand hymenopteran fauna

Faunal composition

The most striking features of the New Zealand hymenopteran fauna are the paucity of stinging (aculeate) and sawfly/woodwasp (symphytan) species and



Female sirex wood wasp *Sirex noctilio* (Siricidae).
From Grant 1999

Hairy native bee *Leioproctus fulvescens* (Colletidae).
From Grant 1999

the radiation of certain parasitic groups. The Symphyta is represented by five of a total of 12 families, suggestive of a more substantial fauna than actually exists in New Zealand. In fact only nine species are known (of a total of around 4300 worldwide), six of which are accidentally introduced pest species and a mere three endemic. The Australian symphytan fauna is also depauperate, with the family Pergidae predominating (the one pergid known from New Zealand is Australian). Likewise, the Aculeata is poorly represented as a group in New Zealand – only about 130 species are known of a total of 49,000 worldwide. As with the symphytans, a large majority of the species of several aculeate families are introduced, for example the ants and the vespid wasps. New Zealand's ant fauna is strikingly depauperate, in sharp contrast to that of Australia, which is rich in both genera and species – 1275 described native species and probably around the same number undescribed (Shattuck 1999). For New Zealand, the ant fauna is around 40 species, including only 11 endemic species (Don 2007). The family Vespidae is represented solely by five introduced species, but two of these have had significant effects on some native ecosystems (see Alien Species). Three aculeate families are known only from one introduced species each (Mutillidae, Scolebythidae, and Scoliidae) (Berry et al. 2001). Within this sparse aculeate fauna the bees, or Apoidea, are better represented, with more than 40 species (from a world total of more than 20,000). The family Colletidae is dominant, with more than 20 endemic species (Donovan 2007). The colletids, probably basal in the apoid lineage, are abundant in Australia. Donovan (1983) proposed a dispersal model to account for the New Zealand apoid fauna, with species here derived mainly from very few Australian founder species. As evidence for this theory, he cited the similarity and relationships of groups of bees to the Australian bees, and the lack of distinctive characters (apomorphies) peculiar to the New Zealand fauna.

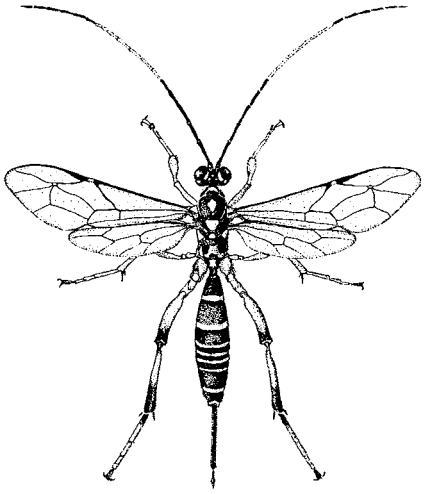
The Parasitica is much more strongly represented in New Zealand, but while there have been several radiations, there are also curious absences. Unlike any other zoogeographic region, the New Zealand hymenopteran fauna is apparently dominated in abundance of individuals by 'proctotrupoids' (in the broad sense), particularly diapriids, and the Chalcidoidea is represented disproportionately by the family Mymaridae (Austin 1988). Noyes and Valentine (1989a) estimated more than 160 New Zealand species of Mymaridae in 42 genera, twice the number known from Britain and around 10% of the described world species. Further, they consider that the study of additional material will certainly yield many more species belonging to the new genera they described. The chalcidoid families Agaonidae, Chalcididae, Eurytomidae, and Signiphoridae are poorly represented and probably have few endemic species (Noyes & Valentine 1989b). Other special features of the chalcidoid fauna noted by these authors are the large number of species of *Pteroptrix* (Aphelinidae) and elachertine eulophids and the moderately speciose endemic encyrtid genus *Adelencyrtoides*. The superfamily Cynipoidea (gall wasps and kin) is very poorly represented – from a total of over 3000 worldwide, fewer than a dozen species are known from New Zealand.

The superfamily Ichneumonoidea is poorly known (see Gaps in Knowledge), but the apparent absence of the cosmopolitan braconid genus *Chelonus* (Austin 1988) is unlikely to be an artefact. *Ascogaster* is the only genus known from the subfamily Cheloninae in New Zealand, and in no other area of the world does *Ascogaster* occur without *Chelonus* (Walker & Huddleston 1987). Among the Ichneumonidae, the campoplegine genus *Diadegma* is represented by around 50 endemic species, and the endemic ichneumonine genera *Aucklandella* and *Degithina* by a total of around 75 species. *Aucklandella* and *Degithina* are likely to be radiations of the large cosmopolitan genus *Cratichneumon* (D. B. Wahl, I. D. Gauld pers. comm.). A single specimen of the ichneumonine genus *Poecilocryptus* has been identified from Fiordland by I. D. Gauld. *Poecilocryptus*, the only known plant-feeding ichneumonid, was previously thought to be restricted to Australia where

several species have been reared from galls in *Eucalyptus* and *Acacia*. The New Zealand species is endemic (I. D. Gauld pers. comm.) but its biology is unknown.

Wing reduction and flightlessness

The New Zealand hymenopteran fauna appears to contain a high proportion of flightless species. Noyes and Valentine (1989a) noted that amongst New Zealand Mymaridae, 40% of the genera include species with abbreviated wings. Naumann (1988) noted wing reduction in 89% of species of New Zealand ambositrine diapriids, as compared with 66% of Australian species. In moraniline pteromalids, 36% of endemic New Zealand species exhibit wing reduction, as opposed to 7% of endemic Australian species (Berry 1995). In a number of species, females exhibit brachyptery (short wings) or aptery (no wings), while males are fully winged (Berry 1999). Wing reduction is often associated with wet forests, seasonally damp habitats, or alpine environments. Noyes and Valentine (1989a) speculated that in dense habitats, such as leaf litter and alpine tussock grasses, flight is not advantageous and wings may be an encumbrance when searching for hosts. Recolonisation of the lowlands by taxa isolated in mountain refugia and subject to such selective pressures may explain the high percentage of aptery and brachyptery in the New Zealand fauna.



Xanthocryptus novozealandicus (Ichneumonidae).
From Grant 1999

Variation within species

A number of authors have commented on the high levels of intraspecific variation exhibited by insects in New Zealand, including ichneumonids and proctotrupoids (broad sense). Noyes (1988) reported generally high levels of variation amongst New Zealand Encyrtidae and further noted that the degree of variation shown by *Tetracnemoidea bicolor* in New Zealand is possibly greater than that recognised in any other species of encyrtid in the world. LaSalle and Boler (1994) discussed the extreme variation found in a new endemic species of eulophid, and Naumann (1988) reported pronounced sexual dimorphism (a form of intraspecific variation) in New Zealand Ambositrinae, particularly amongst wing-reduced forms.

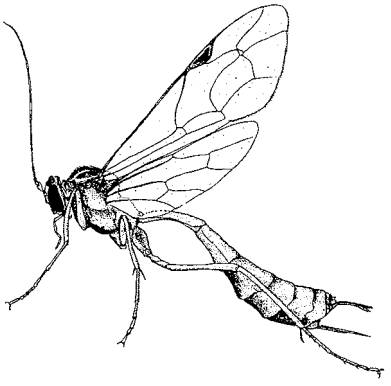
Alien species

Exotic hymenopterans are a significant component of the New Zealand fauna, in terms of numbers of species and the dominance of certain species in natural and managed ecosystems. Although some have been introduced deliberately as pollinators or biological-control agents, many of the exotic hymenopterans in New Zealand have arrived accidentally. Some have very clearly become pests, and some are beneficial, but the impact of many species is less easily definable.

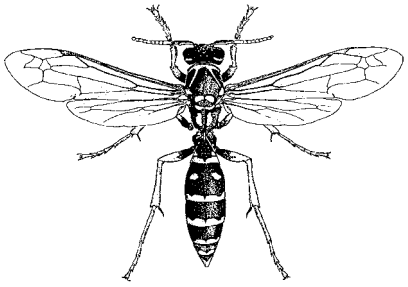
Accidental introductions

Wasps and ants (eusocial aculeates) have perhaps the most readily observable impact on New Zealand's existing biodiversity, affecting natural and human environments dramatically. Two European species of vespid wasp are now considered major pests in both habitats. The German wasp *Vespula germanica* has been present in New Zealand since 1945 and the common wasp *V. vulgaris* probably first established in the late 1970s (Donovan 1984). New Zealand's mild climate, abundance of food, and absence of natural enemies have contributed to the establishment of large populations of both species. In South Island beech (*Nothofagus*) forests, there is documented evidence that *Vespula* species compete for nectar and honeydew, which are important food sources for native bird species (Beggs 2001). Social wasps also prey on native and introduced arthropods (including pest species), and at high densities they may restructure insect communities in native forests, causing flow-on effects throughout the food web, including insectivorous birds (Beggs 2001).

The Asian paper wasp *Polistes chinensis* is a significant urban nuisance. Apart



Orange ichneumon *Netelia producta* (Ichneumonidae).
From Grant 1999



Asian paper wasp *Polistes chinensis* (Vespidae).
From Grant 1999

from its defensive sting, it has an unpopular habit of preying on monarch butterfly caterpillars, though it also includes garden pests in its prey.

Among the ants, several tramp species that have established in New Zealand are known to be highly invasive and to have caused severe ecological disturbances in other places, e.g. *Pheidole megacephala* (big-headed ant) and *Linepithema humile* (Argentine ant). The big-headed ant is believed to be native to Africa, but now rates as one of the most widespread and economically important of all pest ants in the world. It invades houses, stores, and factories, is known to tend homopteran bugs injurious to garden and horticultural crops, and is generally held by naturalists to be one of the most destructive agents of the lowland native Hawaiian invertebrate fauna (Hölldobler & Wilson 1990). In New Zealand the big–headed ant has been collected only from the Auckland region and the Kermadec Islands. Since it is pantropical in distribution, Berry et al. (1997) considered that climatic factors will probably restrict its spread, so that it is unlikely to become an important threat to the endemic invertebrate fauna throughout New Zealand. The Argentine ant has been recorded from as far south as Christchurch (R. Harris pers. comm.), and recently on Tiritiri Matangi, a bird reserve in the Hauraki Gulf. Like another tramp species, *Technomyrmex albipes* (white-footed house ant), the Argentine ant is a significant domestic and commercial nuisance, but it has also had negative impacts on native fauna elsewhere (Human & Gordon 1997; Cole et al. 1992).

Other exotic hymenopteran pests include accidentally introduced phytophagous species. The gall-forming eulophid *Ophelimus eucalypti* is a serious pest of commercially-grown *Eucalyptus* species (Withers et al. 2000), as was the pergid *Phylacteophaga froggatti* prior to the introduction of a successful biocontrol agent (Faulds 1991).

There is little doubt that the impact of these exotic species – in economic terms, in nuisance value, and/or on New Zealand's existing biodiversity – is overwhelmingly negative. The effects of other accidentally (and deliberately) introduced species are more open to debate, for various reasons. The recently introduced willow sawfly (*Nematus oligospilus*) is host-specific to willows (*Salix* spp.) and can cause severe defoliation (Berry 1997b). The pest status of this sawfly is debatable since on the one hand willows are an integral component of soil-conservation and erosion-control programmes, but on the other, feral crack willows (*Salix fragilis*) threaten conservation wetlands. Another example, the European eumenid wasp *Ancistrocerus gazella*, is a solitary predaceous species, first recorded in 1988 (Berry 1989), that provisions its nest with caterpillars. Recorded hosts include pest species, both introduced and endemic (Harris 1994b), as well as endemic non-pest species (Berry 1997a). *Ancistrocerus gazella* is now common throughout the Auckland area, and has also been recorded from Whangarei, the Waikato, Hawke's Bay, Wellington, and Central Otago (Green et al. 1994), as well as Canterbury (M. Bowie pers. comm.).

Ancistrocerus gazella (Vespidae).
Jocelyn Berry

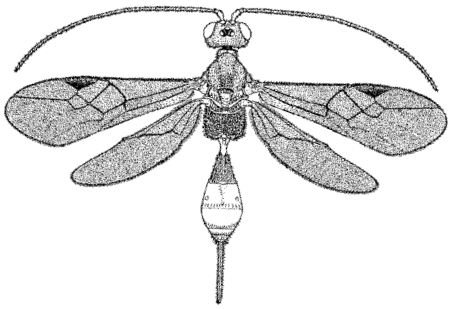
The impact of accidental introductions of parasitic species is more complex. Some records suggest that accidentally introduced natural enemies play an important role in managing pest species in modified habitats, forming natural enemy guilds. Charles (1998) listed 82 hymenopteran natural enemies of fruit pests from the New Zealand literature. Of these, around 90% are exotic and 10% endemic. The majority of exotic species (around 80%) have apparently established in New Zealand accidentally, with only about 20% being deliberate introductions as part of classical biological-control programmes. This research also suggested that, based on records from fruit crops and more specifically for mealybug hosts, exotic parasitoids are largely restricted to exotic hosts and native parasitoids to native hosts. This may also be true in other systems, but very few data are available. One exotic parasitoid known to attack endemic species is the highly polyphagous braconid *Meteorus pulchricornis*, which was first recorded from New Zealand in 1996 (Berry 1997a). It has an extremely wide host range, including hosts from 11 lepidopteran families worldwide, some of

which are economically important pests (Berry & Walker 2004). Most of the hosts recorded from New Zealand are exotic pest species, but native hosts have also been reported, albeit from modified habitats (suburban and orchard). Collection details from native vegetation suggest that *M. pulchricornis* may be moving onto native hosts in native habitats.

Anecdotal evidence suggests that exotic parasitoid species may often enter New Zealand along with their hosts. New records of a number of recently introduced pest species have been followed closely by or even recorded at the same time as their respective parasitoids. Some examples are:

- the ash whitefly *Siphoninus phillyreae* and its parasitoid, the encyrtid *Encarsia inaron*; in fact, when *E. inaron* was first recorded from the field in New Zealand, the species had already been deliberately imported and was being reared in quarantine for possible release as a biocontrol agent of the ash whitefly;
- the psyllid *Glycaspis granulata* and its parasitoid *Psyllaephagus quadricyclus* (Berry 2007b);
- the brown lace lerp *Cardiaspina fiscella* (Psyllidae) and the encyrtid *Psyllaephagus gemitus* (Berry 2006);
- and the psyllid *Anoeconeossa communis*, first recorded in Mangere in 2002, and its parasitoid *Psyllaephagus richardhenryi*, which was reared and described from the first New Zealand collections of the psyllid (Berry 2007b).

These examples suggest that founder members of many pest species may enter the country complete with their own parasitoid complement.



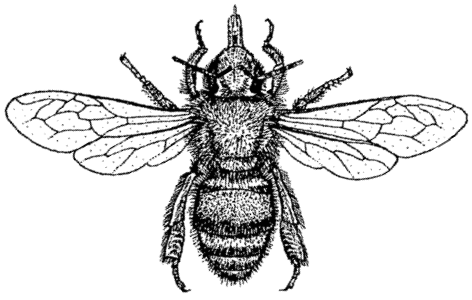
Meteorus pulchricornis (Braconidae).
Des Helmore

Deliberate introductions

These are made for the biological control of weeds and other arthropod pests and for the pollination of various crops. Four species of bumble bee were introduced into New Zealand from England between 1876 and 1906 for the pollination of clover. All four species established successfully and are now a familiar part of the landscape. There is no doubt that these bees are of direct economic benefit to New Zealand agriculture as pollinators of red clover and of lucerne (Donovan 1974). The ubiquitous honey bee (*Apis mellifera*) is also an extremely important introduced pollinator.

Classical biological control, using exotic predators, parasitoids, and pathogens against pests, has a long and in some cases undistinguished history in New Zealand. Increased consumer demand and higher chemical costs, along with ecological concerns and resistance to various pesticides, gave impetus to such projects in the last half of the 20th century. Cameron et al. (1989) comprehensively reviewed the period 1874 to 1987, with evaluations of the impact of the imported organisms. Estimates of the percentage of established agents that have had some impact on the specified target species in New Zealand are around 24% (Cameron et al. 1993) to 30% (Barratt 1996). Some programmes have resulted in very successful control of the target pest (for example, control of *Sirex noctilio* and *Phylacteophaga froggatti* by *Megarhyssa nortoni* and *Bracon phylacteophaga*, respectively). Others have provided significant control of major pest species, for example the control of *Mythimna separata* (cosmopolitan armyworm) by *Cotesia ruficrus*. Estimates of the monetary savings by this biological control programme alone range from NZ$4.5–10 million per year (Hill in Cameron et al. 1989).

These programmes provide undeniable economic benefits, but it is inevitable that the importation of control agents will change the environment in some way, although this change may be small measured against the impact of accidental introductions and the effects of habitat destruction. The environmental implications of biocontrol programmes are imperfectly understood, and their safety in terms of non-target effects, especially on the native fauna, has been questioned by a number of authors (see Barratt et al. 1997; Barratt et al. 2000). Although few biocontrol agents have been shown to have significant non-target effects, in New Zealand or elsewhere, this is more probably because of a lack of



Honey bee *Apis mellifera* (Apidae).
From Grant 1999

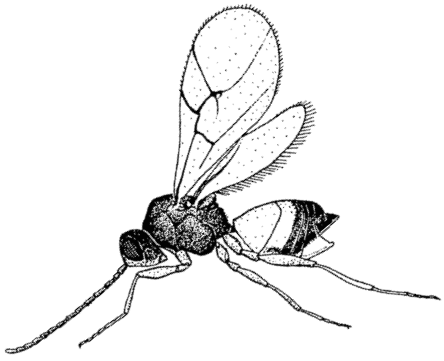
research than the absence of such effects. Currently the only well-documented New Zealand case is that of *Microctonus aethiopoides*, a braconid wasp released against sitona weevil from 1982–1985. *Microctonus aethiopoides* has since been shown to attack 10 native and three other non-target species of weevils, including the weed biocontrol agent *Rhinocyllus conicus* (Barratt et al. 1997). Other examples of biocontrol agents that are suggested to have had significant impacts on non-target species in New Zealand are *Xanthopimpla rhopaloceros* (Ichneumonidae) and *Trigonospila brevifacies* (Tachinidae), both introduced against pest leaf-roller species, and *Pteromalus puparum* (Pteromalidae), introduced against cabbage white butterfly (Barratt 1996). *Xanthopimpla rhopaloceros* and *T. brevifacies* were reported to dominate the parasitoid complex attacking the native moth *Hierodoris atchychioides* (Berry 1990b).

It must be said that most criticism of biocontrol agents affecting non-target organisms relates to releases made 20 years or more ago. Increasingly extensive criteria for approval to release agents have evolved over this time. Since July 1998, the regulatory body ERMA (Environmental Risk Management Authority) has had the authority to make decisions on the importations of new organisms. ERMA is required to weigh up the risks, costs, and benefits in each case. There is no question that progressive legislative development has provided increased consideration of environmental effects (Moeed 2000), but the disadvantages, particularly the increased cost both in time and funding, has led to speculation that biological-control projects may be unsustainable for applicants. One certain impediment to the development of sustainable pest-management programmes is the lack of taxonomic knowledge, emphasising the need for work to be carried out on the New Zealand insect fauna.

Gaps in knowledge

Despite the economic and environmental importance of the group, the taxonomic diversity and ecological roles of New Zealand Hymenoptera are very poorly known indeed. The number of described species of Hymenoptera is a fraction of that of Coleoptera, Diptera, and Lepidoptera. This is unlikely to be a reflection of the real size of the fauna, but instead of a lack of taxonomic resources.

More than 1500 species of Hymenoptera are recognised from New Zealand in the following list. This includes about 700 described and about 900 undescribed or undetermined species. But the actual number of species will be considerably higher. Many species will not yet have been discovered or recognised. Some may already be in collections as unexamined material or they may not have been collected. Estimating the diversity of this portion of the New Zealand hymenopteran fauna is highly problematic because for a number of taxa, in particular the families Braconidae and Platygastridae (see below), our knowledge is too limited to make any meaningful estimate of their diversity. As Packer and Taylor (1997) commented, this is literally 'an exercise in estimating the magnitude of our ignorance'.



Gall wasp *Phanacis hypochoeridis* (Cynipidae).
From Grant 1999

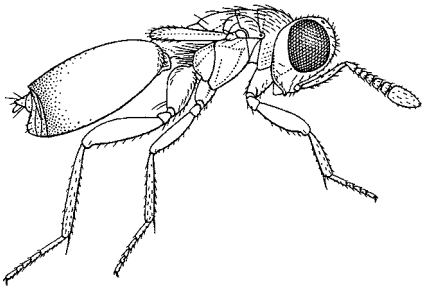
Of the three major hymenopteran groups, the symphytans and aculeates are relatively well known because their numbers are few and they are generally large and conspicuous insects. Conversely, owing to their generally small size and high diversity, the Parasitica is the least well-known group. This is an important gap for a number of reasons. The parasitic Hymenoptera, in their role as density-dependent regulators of host populations, play an important part in maintaining the diversity of natural communities (Quicke 1997). They are of direct economic importance in the biological and integrated control of horticultural, agricultural and forestry pests. While other orders of arthropods are used as control agents, parasitic hymenopterans are the most commonly imported agents, particularly ichneumonids and braconids.

The Chalcidoidea is the only superfamily in the Parasitica that is more or less well known at the generic level, largely thanks to the works of Zdenek

Boucek (1988), John Noyes, and Errol Valentine (Noyes 1988; Noyes & Valentine 1989a,b). The remaining groups – Ceraphronoidea, Cynipoidea, Evanioidea, Ichneumonoidea, and the proctotrupomorphs – are all poorly documented. Taxa within these groups have generally been described sporadically, as parts of offshore-island faunas for example, or as they have been associated with pest species. The superfamilies Ceraphronoidea, Cynipoidea, and Evanoidea are unlikely to be highly speciose in New Zealand. In contrast, the Ichneumonoidea and proctotrupomorphs contain families or lower-rank taxa that have radiated spectacularly in New Zealand, but no generic framework is available for any of these groups. The most important gaps in our knowledge, and thus priority groups for taxonomic revision, are discussed below.

Superfamily Ichneumonoidea (Ichneumonidae + Braconidae)

There are an estimated 60,000 species in the family Ichneumonidae worldwide (Gauld & Bolton 1988). About 2000 species are known from Britain and around 1200 recognised from the much less well-known Australian fauna (Gauld 1984). Valentine and Walker (1991) recorded just 77 described species from New Zealand in 35 genera. More recent estimates, based on the work of I. D. Gauld, suggest more than 300 species in about 70 genera. Of these, 12 are new endemic genera and 14 are described non-endemic genera newly recorded from New Zealand. The only subfamily-level revisions are for the small subfamily Metopiinae, koinobiont endoparasitoids (those that allow the host to continue its development) of lepidopteran larvae (Berry 1990a), and a planned revision of the Tersilochinae, parasitoids of wood-boring Coleoptera, with an estimated fauna of more than 40 species in five genera.



Ophelosia mcglashani (Pteromalidae).
Des Helmore

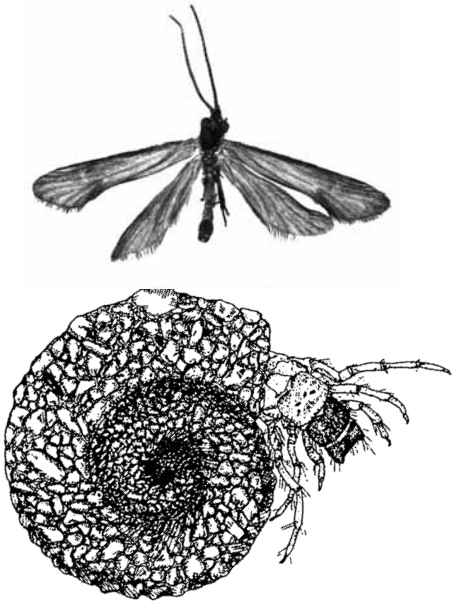
The sister-group of the Ichneumonidae, the Braconidae, is likewise a large family, with an estimated 40,000 species worldwide (Goulet & Huber 1993). Braconid wasps are important parasitoids of many economically significant pest species, yet New Zealand's fauna is exceedingly poorly understood. Around 100 described species are recorded in this list, but there are only 20 or so further undescribed or undetermined species recognised from New Zealand. This is almost certainly a fraction of the true number of braconid species. Subfamily-level revisions have never been carried out on the New Zealand fauna, with the exception of the Alysiinae or 'jaw wasps', important in the biological control of dipteran pests (Berry 2007a). Valentine and Walker (1991) recorded five species of alysiines in four genera in New Zealand; the subfamily revision recorded 21 species in nine genera.

Platygastroidea (Platygastridae and Scelionidae)

Although New Zealand has a small landmass, its platygastrid diversity is apparently high, and it is likely that the centre of platgastrine diversity is in the Southern Hemisphere (Goulet & Huber 1993). However, the extant generic framework was developed in the Northern Hemisphere, making it extremely difficult to apply generic concepts to austral faunas without unrealistically altering the limits of the northern genera. It is almost impossible to work on the New Zealand platygastrid fauna without extensive input from northern-hemisphere collections and taxonomists and no systematic revisions have been carried out.

From 1775, when the first hymenopterans were described from New Zealand, until 1988, when the fauna was first completely catalogued (Valentine & Walker 1991), the average rate of description was around 2.5 species per year. From 1988 to 1999 about 7.5 species were described on average per year. Even at the latter rate, it is clear that centuries will be required even to approach a completely described New Zealand hymenopteran fauna.

Inostemma boscii (Platygastridae).
Birgit Rhode, Landcare Research



Helicopsyche zealandica adult (upper)
Simon Pollard, Canterbury Museum

Helicopsyche sp. larva (lower)
Craig Dolphin, from Winterbourn et al. 2006

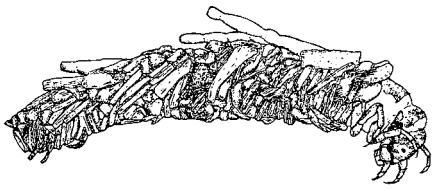
Order Trichoptera: Caddis or caddisflies

The Trichoptera ('hairy wings') comprises more than 12,500 named species inhabiting all continents except Antarctica. Caddis look rather like moths (Lepidoptera), and are generally accepted as their evolutionary sister group, although caddis wings are covered with hairs and not flattened scales. Adults have two pairs of subequal wings, which in New Zealand species range in length from less than two millimetres to about 35 millimetres. The wings are generally dull brown, grey, or black without much colour pattern, although many species can be recognised immediately by wing colour alone. Most caddis, when at rest, hold their wings flat against the sides of the abdomen (some species hold them over the abdomen) with the antennae extended forwards. Caddis adults are unable to chew solid food, but need liquid food to survive and have been seen visiting flowers. Mostly they hide up and rest during daytime, become active at night, and come freely to light. Their aquatic larvae have four feeding regimes – predation, feeding on decomposing vegetable matter or filamentous algae, scraping of microflora of stone surfaces (periphyton), and filtering of food from water currents. Winterbourn (2000) has thoroughly reviewed his own and others' work on larval ecology, diet and lifestyles.

Caddis adults and larvae are a significant component of freshwater biodiversity and of the food chain. They are preyed on by fish (introduced and native), birds (such as New Zealand's endemic blue duck, an endangered species), and many invertebrates. By feeding on coarse organic matter (leaves, twigs) they contribute to the breakdown of this material and release it in a more finely divided form that smaller organisms can utilise. Caddis larvae (in conjunction with other aquatic macroinvertebrates) are useful indicators of water purity in streams because of their sensitivity to pollution. A numerical analysis incorporating them can be performed rapidly (Boothroyd & Stark 2000). The results can reflect periodic sources of pollution not revealed by conventional testing of the water, say for oxygen content and organic matter.

All stream sizes contain caddis larvae, as do trickles and seepages. Medium-sized streams in untouched forest are usually the most speciose, because most human enterprises reduce biodiversity. However, even modified streams in farmland or built-up areas can be quite species-rich. A few caddis species are found in lakes, but New Zealand lacks the distinctive fauna that is specialised to this habitat, such as is found in the northern hemisphere, perhaps because there are no ancient lakes here.

There is a distinct alpine caddis fauna known to extend up to at least 1900 metres, first explored by A. G. McFarlane in the 1930s around Cass and Arthur's Pass, by John Child in the Central Otago uplands in the 1970s, and more recently by Brian Patrick of the Otago Museum. About 17 caddis species live predominantly or solely above 600 metres. Their larvae and pupae pass the winter under snow in mountain streams. Adults emerge early in spring and can be found in snow caves (Patrick 1992), under stones, or on stream banks. They are usually day-active. At higher altitudes, adults tend to be short-winged and are often unable to fly. Alpine species can be found at lower altitudes at the limits of their ranges. For example, *Tiphobiosis childi*, a typical alpine species, also occurs on Banks Peninsula where it is found almost to sea level. This may be the result of its isolation on this gradually eroding 'island'.



Larval marine caddis *Philanisus plebeius* (Chathamiidae).
Craig Dolphin, from Winterbourn et al. 2006

The New Zealand caddis fauna

The New Zealand fauna of about 244 known species is highly endemic, and the 49 New Zealand caddis genera are 73% endemic. Only one species is shared with Australia, the marine caddis *Philanisus plebeius* (but New Zealand *Triplectides cephalotes* is very close to Australian *Triplectides australis*, with which species it was formerly confused). It is surprising that more species are not shared, but caddis are apparently not long-distance dispersers (they are often good short-distance dispersers). There are also interesting examples of local endemism, such as on Banks Peninsula (five endemic species).

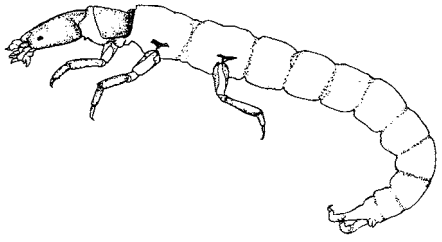
Caddis larvae are nearly all aquatic (a few species live in damp terrestrial situations but this has not yet been demonstrated in the New Zealand fauna). They produce silk from modified salivary glands and this is the foundation of their various lifestyles as larvae – building shelters (moveable or otherwise), spinning capture-nets, and constructing cocoons before pupation. The popular concept of caddis larvae living inside portable tubular cases is true for less than half of the New Zealand species, many of whose larvae rove freely on stream beds, or construct fixed nets or shelters. Classification into three suborders based on adult and larval morphological and molecular data (Morse 1997) also reflects these lifestyles, as follows. (The Spicipalpia may not be a natural group, however (see Kjer et al. 2002.)

Suborder Annulipalpia ('net spinners and fixed retreat-makers')
Family Ecnomidae – the sole New Zealand species, *Ecnomina zealandica* (forewing length 4 millimetres), is one of the most rarely captured New Zealand caddis. Only one male specimen has ever been caught and the larva is unknown. The family occurs worldwide.

Family Hydropsychidae (12 New Zealand species in three genera, forewing length 7–17 millimetres) – adults of *Diplectrona* do not appear at light traps whereas other species come freely. Larvae build tunnel-like retreats in streams on submerged wood and rocks. Coarse-meshed nets, close to the anterior opening of the retreat, filter food materials from the current. Hydropsychid larvae pupate in a cocoon of loose silk inside an enclosure of small stones. The family is distributed worldwide.

Family Philopotamidae (10 New Zealand species in 4 genera, forewing length 5–10 millimetres) – all adults come to light and at least one species flies commonly during the day. Larvae are filter-feeders and build stocking-shaped fine-meshed capture-nets. Larvae pupate inside cocoons in closed stony shelters. Family distribution is worldwide.

Families Polycentropodidae (6 New Zealand species in two genera, forewing length 5–14 millimetes) and *Psychomyiidae* (1 species, *Zelandoptila moselyi*, forewing length 3.5–5 millimetres) – adults in both families come to light freely. Larvae spin silk nets on the surface of rocks in streams. Polycentropodids are found worldwide. Psychomyiidae occur in all faunal regions, but in the Neotropical Region are present only in Mexico.

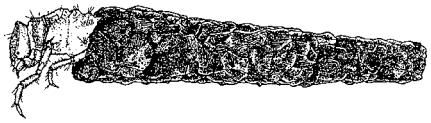


Larva of *Hydrobiosella stenocerca* (Philopotamidae).
Craig Dolphin, from Winterbourn et al. 2006

Suborder Spicipalpia ('cocoon-makers')
Family Hydrobiosidae (105 New Zealand species in 11 genera, forewing length 3.5–25 millimetres) – this largely southern-hemisphere family comprises 43% of the known New Zealand caddis fauna, considerably more than the 7–8% found in the other Gondwanan regions (Ward 1998). The carnivorous larvae are prognathous, with foreleg tibiae, tarsi, and tarsal claws modified into pincer-like structures. Most larvae live in streams, although a few are restricted to seepages (some *Tiphobiosis* and *Edpercivalia* species). The larva of one stream species, *Hydrobiosis parumbripennis*, has been given the common name 'green free-living caddis'. At high altitudes, tarns can also be colonised. To pupate, the larva builds a closed semi-ellipsoidal shelter of small stones attached to the underside of a larger stone, and inside this spins a cigar-shaped cocoon of fine dark-brown silk. All species come freely to light. Mature females swim underwater and lay flat egg masses, enclosed in a film of jelly, on the underside of stones.

Family Hydroptilidae ('micro-caddis', 'purse-case caddis') (21 New Zealand species in three genera, forewing length 2–5 millimetres) – these are tiny caddis less than five millimetres long, with pointed wings fringed with long hairs. Adults come freely to light and on mass-emergence nights can almost cover lighted windows near streams and lakes, running madly around on the glass. Early instar larvae are free-living with long hairs and legs. In the final instar they

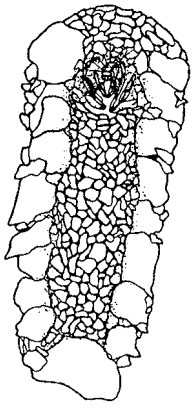
construct flattened cases of silk and their bodies become swollen (this change is called hypermetamorphosis). They feed on algae by piercing individual cells and pupate inside their cases, which are attached to stones, often in large groups. The family is found worldwide.



Larva of *Oeconesus maori* (Oeconesidae).
Craig Dolphin, from Winterbourn et al. 2006

Suborder Integripalpia ('portable case-makers'): Infraorder Plenitentoria
Family Oeconesidae (23 New Zealand species in five genera, forewing length 9–30 millimetres) – New Zealand is the centre of distribution of this family with one species in Tasmania and none elsewhere. They are medium- to large-sized caddis with broad wings, the larvae of which build straight, slightly tapering cases made of gravel and/or plant fragments, and are primarily vegetarian. All species come to light but many more males than females are usually captured in this way. The larvae inhabit bogs, seepages, and small-to-medium-sized streams. *Pseudoeconesus* seems to be confined to boggy sites. *Zelandopsyche ingens* is New Zealand's largest caddis species. In beech-forest streams it feeds on, and constructs its case of, beech-leaf (*Nothofagus*) fragments. If food is scarce, the larva will feed on its case (Winterbourn 1976).

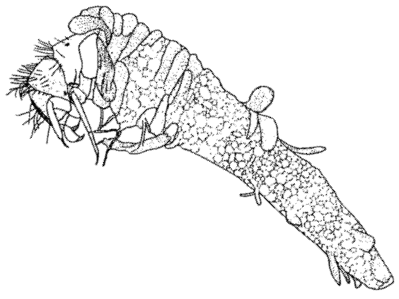
Family Kokiriidae (one New Zealand species, *Kokiria miharo*, forewing length 7–8 millimetres) – this family is also Gondwanan, with three genera and five species in Australia, a few species in New Caledonia, and one known species in South America. Adults have elongated mouthparts, which may be longer than the rest of the head in some species. *Kokiria* larvae inhabit slow streams with a sandy bottom. The distinctive larval case is dorsoventrally flattened with an overhang in front and lateral flanges. Both fore- and midlegs of the larvae have fused tibiae and tarsi, forming raptorial limbs.



Larva of *Kokiria miharo* (Kokiriidae).
Craig Dolphin, from Winterbourn et al. 2006

Suborder Integripalpia ('portable case-makers): Infraorder Brevitentoria
Family Philorheithridae (seven New Zealand species, all in *Philorheithrus*, forewing length 11–16 millimetres) – this is another Gondwanan family, most speciose in Australia but also occurring in South America and Madagascar. Adults have broad, squarish forewings with a sclerotised projection basally on the rear margin. Larvae are carnivorous, with the midleg tibia and tarsus fused. Their tapered and slightly curved cases are constructed of large sand particles held together with dark silk.

Family Leptoceridae ('longhorned caddis') (13 New Zealand species in four genera, forewing length 6–19 millimetres) – the common name is a literal translation of the family name (Greek *leptos*, long; *ceros*, horn), alluding to the antennae that are usually much longer than the wings. The larvae construct a variety of cases of various materials depending on the species. In *Triplectides*, small twigs and pieces of leaf are used and the popular name is 'stick caddis'. Frequently a single twig is used, with a hole bored through it. *Oecetis* and *Hudsonema amabile* make a sandgrain case; *Hudsonema alienum* uses short lengths of vegetable matter arranged longitudinally in a distinctive spiral pattern. Distribution is worldwide.



Larva of *Alloecentrella magnicornis* (Helicophidae).
Craig Dolphin, from Winterbourn et al. 2006

Family Chathamiidae ('marine caddis') (five species in two genera, forewing length 5–11 millimetres, except for *Chathamia brevipennis* which has reduced wings) – larvae live in the intertidal zone and sublittoral fringe to at least one metre depth (Riek 1976). Their cases are composed of sand and seaweed. Female adults have a strong ovipositor; those of *Philanisus plebeius* have shown the bizarre behaviour of ovipositing inside the body cavity of a starfish (Anderson & Lawson-Kerr 1977; Winterbourn & Anderson 1980). The family is confined to New Zealand, the Chatham Islands, and the Kermadec Islands except for *P. plebeius*, which also occurs in Eastern Australia.

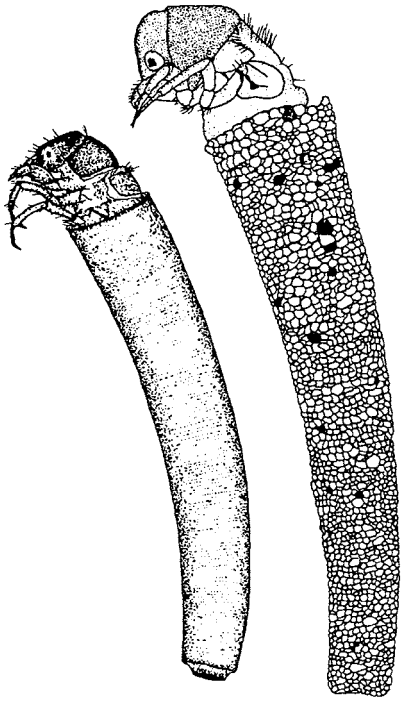
Families Calocidae (one New Zealand species, in *Pycnocentrella*, forewing length 8–11 millimetres, with an Australian and New Zealand distribution), *Conoesucidae* (24 New Zealand species in six genera, forewing length 5–12 millimetres, Australia and New Zealand only), and *Helicophidae* (two New

Zealand species in *Zelolessica*, forewing length 2.5–6.5 millimetres, and four in *Alloecentrella*, the family restricted to Australia, New Zealand, and southern South America) – larvae of these three families make curved, tubular, tapered cases of plant material or small stones depending on the species – mosses and liverworts (*Alloecentrella*) or small sand grains (*Pycnocentrella*, *Zelolessica*). The following species of Conoesucidae have acquired popular names – *Olinga feredayi*, the 'horny-case caddis', with a red-brown case of silk only; *Pycnocentria evecta*, the 'sandy-case caddis', with a case of uniformly sized sand grains arranged circumferentially; and *Pycnocentrodes* species, 'stony-case caddis', with a case of sand with much larger grains placed laterally.

Family Helicopsychidae ('snail-shell case caddis') (eight New Zealand species in two genera, forewing length 4–7 millimetres) – larvae have very distinct spiralled sandgrain cases resembling a small snail. Larvae graze on the periphyton and pupate communally. The family occurs worldwide.

Neboiss' (1986) *Atlas of Trichoptera of the SW Pacific–Australian Region* is a good source of illustrations of wings and genitalia for identification of caddis adults, brought up to date for the New Zealand species by Ward (2002). Recent papers describing new species include those by Ward and Henderson (2004), Ward et al. (2004), Ward (2005), Henderson and Ward (2006, 2007), Henderson (2008), and Smith (2008). Larvae of only about one-third of the New Zealand species have been described, however (Cowley 1976, 1978; Harding 1991; Smith 1998, 2000, 2001, 2002; Winterbourn et al. 2000; Stark 2000 and references therein). There is a key to the larvae by genus by McFarlane (1990), and a more recent one including coloured images is on the NIWA website at http://niwa.co.nz/ncabb/tools. A complete world checklist of Trichoptera taxa is maintained by J. C. Morse on the Clemson University website at http://entweb.clemson.edu/database/trichopt.

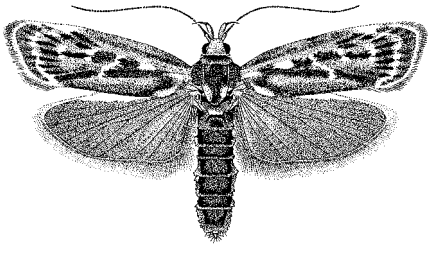
Regarding the deposition of New Zealand material – early workers favoured the British Museum (Natural History) (now the Natural History Museum), London, and the primary types of 35 species are held there. Thirty-six are in the New Zealand Arthropod Collection, 14 in Auckland Museum, five in Te Papa, and two in Oxford Museum, UK. The largest collection, comprising the primary types of more than 100 species, is in Canterbury Museum, Christchurch, New Zealand, and this museum also has the largest holding of the New Zealand Trichoptera, at about 50,000 identified specimens. The second largest holding of about 25,000 identified specimens is in the personal collection of Dr Ian Henderson, Massey University, Palmerston North.



Larvae of *Olinga feredayi* (left) and *Pycnocentria evecta* (right) (Conoesucidae).
Craig Dolphin, from Winterbourn et al. 2006

Order Lepidoptera: Moths and butterflies

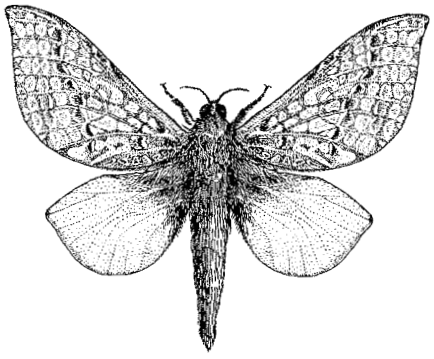
Butterflies and moths have traditionally been among the best loved and most studied of all insects. Their most characteristic feature, and the one that gives the order Lepidoptera its name, is the presence of scales, which are modified setae, on the wings and body. The scales are often highly coloured or refractive, creating the beautiful patterns that have made the order so popular with entomologists and the public alike. Most Lepidoptera also have distinctive mouthparts, with a long, usually coilable proboscis formed from the modified maxillae; the proboscis is absent in only two primitive families (Micropterigidae and Agathiphagidae) and in some more derived lineages with short-lived, non-feeding adults (e.g. Psychidae, Cossidae). Larvae of almost all butterflies and moths feed on flowering plants, most species being host-specific, and therefore lepidopteran diversity throughout the world tends to reflect floristic diversity, with the greatest number of species occurring in the tropics. However, a number of groups, especially amongst the more primitive families of moths, are associated as larvae with lower plants (mosses, liverworts, algae), with fungi and lichens, or with detritus (dead wood and leaf-litter); these groups (Micropterigidae, Psychidae, Tineidae, Oecophoridae) are well represented in New Zealand. The



Hierodoris tygris (Oecophoridae).
Des Helmore

total diversity of the Lepidoptera worldwide is unknown, but there are estimated to be more than 165,000 named species (Robinson et al. 1994).

Overall, the New Zealand lepidopteran fauna (1,703 named species and subspecies in the end-chapter checklist) is not diverse by world standards, but shows a number of features that make it of great interest and importance – for example the high level of endemism, the number of species and groups showing wing reduction and flightlessness, and the representation of primitive groups, including one endemic superfamily, that enhance scientific understanding of lepidopteran evolution. As with so many other animal groups in New Zealand and on other oceanic islands, the fauna is disharmonious, i.e. there are no native species of some otherwise ubiquitous families (e.g. Lymantriidae, Notodontidae, Hesperiidae, Pieridae, Papilionidae), whilst other groups have undergone considerable endemic radiations (e.g. Crambidae: Scopariinae, Oecophoridae: Oecophorinae).



New Zealand's largest lepidopteran, the puriri moth *Aenetus virescens* (Hepialidae).

After Grant 1999

Ecological and economic importance of Lepidoptera in New Zealand

The ecology of adult Lepidoptera has received little systematic study in New Zealand. Even straightforward data on abundance and flight times have rarely been gathered in a quantitative fashion, with the notable exception of the long-term light-trapping studies carried out in the South Island by White (1991, 2002). Adult butterflies and moths undoubtedly have an important role in native ecosystems as pollinators of flowering plants; however, it is generally accepted that most New Zealand flowers are 'generalists' that do not rely on pollination by particular species or even particular orders of insects (Lloyd 1985). There is no known New Zealand equivalent to the long-spurred Madagascan orchid *Angraecum* that relies for pollination on a particular subspecies of hawkmoth (*Xanthopan morgani praedicta*) with an equally long tongue (Pinhey 1975), hence the overall importance of butterflies and moths in comparison to other insect pollinators is very hard to assess in New Zealand.

Likewise, adult Lepidoptera hold significant but largely unquantified importance in the food chain, particularly as food for native (and introduced) insectivorous birds. The New Zealand lepidopterist will be familiar with the experience of disturbing a moth from the forest undergrowth, only to see it caught and consumed by a hungry fantail (*Rhipidura fuliginosa*). The morepork (*Ninox novaeseelandiae*) is a well-known predator of New Zealand's largest lepidopteran, the puriri moth (*Aenetus virescens*) in North Island forests. The two native species of bats must also rely heavily on Lepidoptera for sustenance. The most significant invertebrate predators of adult moths are probably spiders (Arachnida) – New Zealand has an especially diverse fauna, including one genus of orbweb spiders (*Celaenia*) whose species mimic the female pheromones of moths and thus attract the males into their grasp (Forster & Forster 1970).

Knowledge of the ecology of immature Lepidoptera is much better though still incomplete. Larvae in particular form an abundant and important part of the plant-feeding and litter-feeding guilds of invertebrates, as well as providing food for birds and for the larvae of insect parasitoids, especially Hymenoptera and Diptera (Tachinidae). A number of endemic species with polyphagous larvae are considered pests – this is especially true of some leaf-rollers (Tortricidae) in the genera *Ctenopseustis* and *Planotortrix*, which commonly feed on orchard trees (e.g. Dugdale 1990). Late-instar larvae of some endemic *Wiseana* species (Hepialidae) compete with stock for spring pasture growth and have in the past been considered serious pests, although modern pasture management has alleviated the problem (Dugdale 1994). Of greater concern are the exotic pest species that have occasionally established themselves in New Zealand. The most notable examples are the white-spotted tussock moth *Orgyia thyellina* and the painted apple moth *Teia anartoides* (both Lymantriidae), which were accidentally introduced to Auckland in 1996 and 1999 respectively (Hoare 2001a). Such

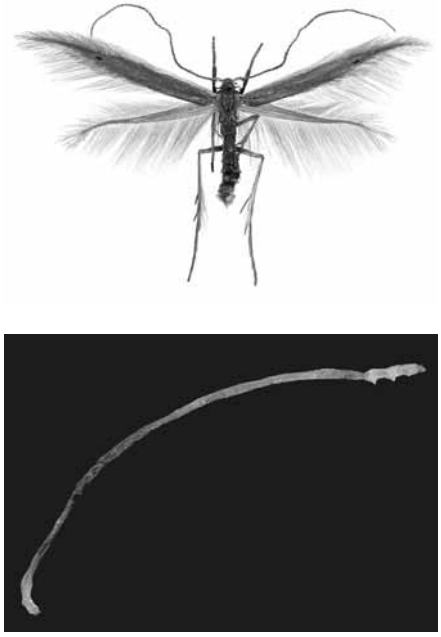
species are believed to represent a serious threat to New Zealand's economy as potential defoliators of orchard and commercial forestry trees. Being highly polyphagous, they may also threaten native forests should they be allowed to establish. The white-spotted tussock moth was successfully eradicated in 1997 by aerial spraying with *Bacillus thuringiensis* var. *kurstaki* (a pathogen of lepidopteran larvae); eradication of the painted apple moth involved a more prolonged spray campaign, but in 2006 was also achieved.

Australia is the main source of foreign Lepidoptera that become established in New Zealand (Hoare 2001a). Much of the influx is natural; moths migrate to New Zealand or are transported by the prevailing westerly winds, especially when a large anticyclone lies over the Tasman Sea (Fox 1978). However, establishment is much more a matter of chance, and has certainly been aided since European settlement of New Zealand by the planting of large numbers of favoured Australian host-plants such as *Eucalyptus* and *Acacia* species. The warmer, drier microclimates created by the destruction of New Zealand's original forest cover also more closely mimic Australian conditions. Thus we should not be surprised that the rate of establishment seems to have increased (Hoare 2001a). Recent arrivals from Australia include the banksia leaf-miner *Stegommata sulfuratella* (Lyonetiidae), the eucalyptus leaf-miner *Acrocercops laciniella* (Gracillariidae), and the gum-leaf skeletonizer *Uraba lugens* (Nolidae).

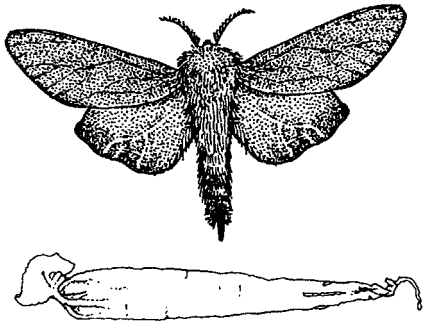
As noted above, New Zealand is especially rich in Lepidoptera with detritivorous larvae, i.e. those that feed on dead wood, fungi, or leaf-litter (Dugdale 1998). In the Oecophorinae, for example, more than 250 New Zealand species are currently recognized – this compares with a figure of approximately 85 for the whole of the former USSR (Lvovsky 2003), a land area more than 80 times as great (Hoare 2005). Undoubtedly the diversity and abundance of these detritivores render them important contributors to the breakdown of organic material and the recycling of nutrients, especially in New Zealand's forest ecosystems. There may be other less benign interactions – for example, in seasons of abundance, high availability of oecophorid larvae as prey may boost numbers of introduced social wasps (*Vespula* spp.) and/or of rodents in certain habitats. The remains of leaf-litter-feeding larvae have been recovered from the stomachs of mice (*Mus musculus*) in beech forest in the Orongorongo Valley, near Wellington (Dugdale 1996). Such interactions are much in need of investigation. Likewise, the impact on New Zealand native detritivores of the increasing number of Australian species that have become established (see Hoare 2001a) is unknown; possibly the introduced species favour different microhabitats than the natives, but there may still be examples of competition. At least one suspected detritivore (*'Schiffermuelleria' orthophanes* – Oecophoridae) appears to have become much scarcer in recent years (cf. Hudson 1928).

One endemic species of Tineidae (*Archyala opulenta*) has been reared only from larvae feeding on the guano of the short-tailed bat *Mystacina tuberculata* (Patrick & Dugdale 2000). The moth is rarely caught as an adult, but its presence in a locality could indicate the presence of the bat, itself regarded as a threatened species. This is the only known example amongst the endemic New Zealand Lepidoptera of a close association with a specific vertebrate 'host'. Amongst herbivorous taxa, and especially leaf-miners, there are many examples of host specificity; a recently discovered example is *Houdinia flexilissima*, the only member of a newly described genus (Hoare et al. 2006). The exceedingly thin larva mines and pupates inside the living stems of the large endemic restiad *Sporadanthus ferrugineus*. The habitat of the rush is threatened, which means that this unique lepidopteran is automatically considered a species of high conservation status.

Several species of Lepidoptera have been introduced to New Zealand as biocontrol agents for weeds. Their impact is seldom spectacular, but they are undoubtedly beneficial in keeping these plants in check. Gorse (*Ulex europaeus*) is attacked by the European *Cydia succedana* (Tortricidae), *Pempelia genistella* (Pyralidae), and *Agonopterix umbellana* (Depressariidae), all deliberately intro-



Houdinia flexilissima and its exceedingly slender larva (Batrachedridae).
Birgit Rhode, Landcare Research



Adult and larval/pupal case of the bag moth *Liothula omnivora* (Tortricidae).
After Grant 1999

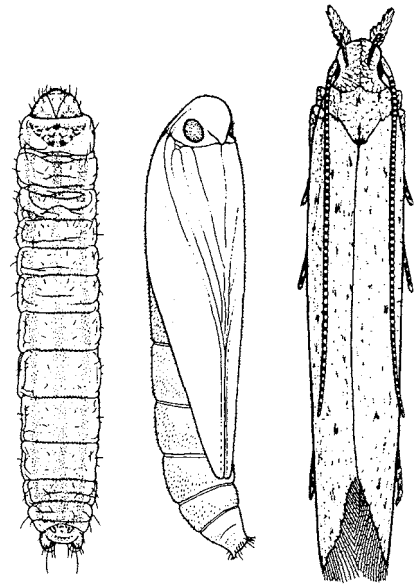
duced. The twigs of Scotch broom (*Cytisus scoparius*) are mined by the tiny larvae of *Leucoptera spartifoliella* (Lyonetiidae), another northern-hemisphere species that has become well established in New Zealand, apparently without being deliberately released. The European cinnabar moth (*Tyria jacobaeae* – Arctiidae) is now found throughout New Zealand following an initial release in the late 1920s. At first it became firmly established only in the Wairarapa, but further releases from this stock in the late 1980s have seen it take hold from Auckland to Southland (C. Winks pers. comm.). Its larvae feed on ragwort (*Senecio jacobaea*), a pasture weed that is poisonous to stock. The moth appears to be a less effective control agent than the introduced flea beetle *Longitarsus jacobaeae*.

The current New Zealand species list

Dugdale (1988) provided an annotated catalogue of New Zealand Lepidoptera and discussed the composition of the fauna in some detail. The current listing is based very firmly on this foundation, and departs from it only in some details of nomenclature and in adopting some subsequent changes in family classification (Nielsen et al. 1996; Kristensen 1999). Changes in the generic assignment of Pterophoridae follow Gielis (2003). Additions to the list are the adventives treated by Hoare (2001a), together with the native Nepticulidae described by Donner and Wilkinson (1989), the Psychidae described by Hättenschwiler (1989), the Tortricidae, Hepialidae, and Plutellidae described by Dugdale (1990, 1994, 1996 respectively), the Geometridae described by Stephens and Gibbs (2003), Wientraub and Scoble (2004), and Stephens et al. (2007), the Oecophoridae described by Hoare (2005), and monotypic genera described by Matthews and Patrick (1998), Dugdale (1995), Hoare and Dugdale (2003), and Hoare et al. (2006). The nomenclatural changes of White (2002) have also been adopted. No new synonymies are introduced here, but *Izatha griseata* is omitted from the list as it will shortly be synonymised with an adventive Australian taxon listed elsewhere. Known undescribed species are not treated, except where they are given separate listing by Dugdale (1988) or Hoare (2001a). The exclusion here of known undescribed species accounts for the differences in numbers between the present list and Table 1 of Dugdale (1988). *Mnesarchaea loxoscia* has been removed from synonymy with *M. fusilella* on the advice of G. W. Gibbs (pers. comm.).

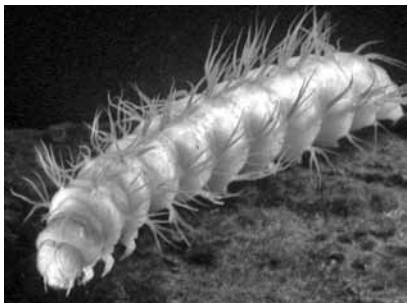
Some incorrect subsequent spellings in Dugdale (1988) have been emended to their original form in accordance with Article 32.5 of the ICZN; these are (with incorrect spelling in parentheses): *Batrachedra tristicta* (*tristictica*), *Asaphodes periphaea* (*peripheraea*), *Orthoclydon praefectata* (*praefactata*), *Tatosoma topea* (*topia*), *Xanthorhoe orophyla* (*orophylla*), *Acrocercops panacivermiforma* (*panacivermiformis*), *Aletia* (s.l.) *sollennis* (*sollenis*), *Euxoa ceropachoides* (*cerapachoides*), *Phalaenoides glycinae* (*Phalaenodes*), *Tinearupa sorenseni aucklandica* (*aucklandiae*), *Rhathamictis perspersa* (*perspera*), *Tephrosara cimmeria* (*Tephrosaria*). Three species named from the Snares (in the genera *Elachista*, *Stigmella* and *Apoctena*) had the species name changed from *laquaeorum* to *laqueorum* by Dugdale (1988); since the error was from incorrect latinization, these corrections are deemed unjustified emendations by the ICZN (2000), and the original spelling is restored.

The following adventive taxa not recorded by Hoare (2001a) are added to the New Zealand list based on material held in NZAC; further details of these finds will be published elsewhere: *Musotima ochropteralis*, *Uresiphita polygonalis maorialis*, *Ephestiopsis oenobarella*, *Pantydia sparsa*, *Proteuxoa sanguinipuncta*, *Oinophila v-flava*, *Isotenes miserana*. All these species are Australian, with the exception of *O. v-flava*, a cosmopolitan species not recorded from Australia. The three adventive Psychidae listed as unnamed species by Dugdale (1988, p. 69) have been determined as *Lepidoscia heliochares*, *L. protorna*, and *L.* cf. *lainodes*; all are Australian in origin. Finally, one native phycitine (Pyralidae), shared with Australia, has been determined as *Ptyomaxia trigonogramma* by M. Horak.



Larva, pupa, and adult of *Megacraspedus calamogonus* (Gelechiidae).
Jon Sullivan, Lincoln University

The family classification follows Kristensen (1999), with the exception of the Gelechioidea, where the more conservative classification of Nielsen et al. (1996) is retained. Families are listed alphabetically rather than in systematic order, and genera and species are listed alphabetically within their respective subfamilies. No subfamily divisions have been adopted for Tineidae because of confusion over subfamily definitions (cf. Dugdale 1988; Robinson & Nielsen 1993) and because the New Zealand species cannot be assigned to subfamily without detailed revision. Likewise, the subfamily classification of world Noctuidae has been substantially modified in recent years (e.g. Kitching & Rawlins 1999; Lafontaine & Fibiger 2006) and is still in a state of flux; a subfamily division of the New Zealand fauna has not been attempted here.

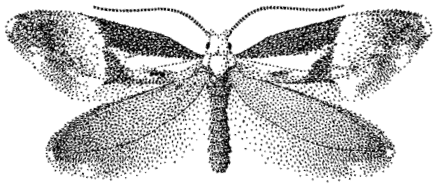


Gilled aquatic larva of *Hygraula nitens* (Crambidae).

Stephen Moore, Landcare Research

Endemism

Of the 1703 species and subspecies listed here, 1490 can be regarded as native and 174 as adventive or vagrant (including species that have subsequently become extinct in New Zealand) (see Dugdale 1988; Hoare 2001a). A further 25 species are known in the New Zealand region only from the Kermadecs, and 13 species represent biological control agents, deliberately or accidentally introduced (including species that are not known to have established). The status of two species (*Cateristis eustyla* and *Hydriomena* (s.l.) *iolanthe*) is considered uncertain. Approximately 33 species are naturally shared with Australia, leaving an endemic fauna of 1457 species, or 85.5%. This is a very high level of endemism, but not unexpected for a country so long isolated from other landmasses. Since most additions to the New Zealand list will be from undescribed endemic species, this percentage is certainly an underestimate. It is difficult to judge endemism at the generic level because many New Zealand Lepidoptera are currently placed in inappropriate (usually Australian or Palaearctic) genera to which they probably or certainly do not belong. At the family level, one taxon, the Mnesarchaeidae (with 14 species, most undescribed), is currently recognised as endemic, and indeed these tiny moths are so distinctive that they also merit their own superfamily, the Mnesarchaeoidea. They represent the sister-group to the diverse and worldwide Hepialoidea (swift or ghost moths), and as such constitute one of the most significant and remarkable elements of the New Zealand fauna. Adult mnesarchaeids are often common in damp bush where their larvae feed in webs amongst mats of liverworts and mosses, but tend to be overlooked by all but the most careful observer. A revision of the family by G. W. Gibbs and N. P. Kristensen is in progress.



Mnesarchaea fusilella (Mnesarchaeidae).

Des Helmore

There are other enigmatic species in New Zealand, for which new taxa of suprageneric level may eventually need to be described. *Titanomis sisyrota* is a large, very rarely collected moth that has some characters in common with the Cossidae or goat moths, a group otherwise absent from New Zealand except as importations. However, further detailed study is required before its true affinities can be ascertained (Dugdale 1988; Hoare 2001b).

Undescribed species

It is difficult to estimate the number of undescribed lepidopteran species currently in New Zealand collections. Certainly, the majority of the fauna has been described, but only a few groups have been recently revised, and in these a surprisingly large number of new species have been added. Thus, of 27 hepialid species treated by Dugdale (1994), 10 (37%) were described as new, and of 28 species of Nepticulidae in Donner and Wilkinson's (1989) revision, 14 (50%) were new. Even more surprisingly, at least 12 new species of Nepticulidae have been recognised or collected since Donner and Wilkinson's work. Some genera of New Zealand Lepidoptera seem to be in an active state of radiation, creating a bewildering array of colour forms or biological races of uncertain taxonomic status. This is the case, for example, with the copper butterflies (Lycaenidae), leading some workers to propose the existence of a number of undescribed

species. Much more work on these problems, preferably involving 'reciprocal illumination' by parallel molecular and morphological studies, is much to be desired. Only then can we hope to know the true diversity of New Zealand's Lepidoptera.

Fossil insects

Fossil fragments representing 121 species of insects have been found from the Triassic up to and including the Pleistocene. One of them is a contender for a role in the next Jurassic Park movie. It is based on a wing impression found in Upper Jurassic rock near Port Waikato (Grant-Mackie et al. 1996). The animal to which it belonged may have been ancestral to the living weta families.

The only fossil fly recorded from New Zealand is based on an impression of a larval bibionid (*Dilophus campbelli*) in Early to Middle Eocene coal near Livingston, Central Otago (Harris 1983).

Fragmentary lepidopteran fossils have been found in New Zealand. Evans (1931) described a wing scale from Late Eocene coal measures in the Waikato District. Recently, a fragment found in sediment at Rakaia Gorge, South Island, has been interpreted as a possible sclerite from the genitalia of a geometrid (Harris & Raine 2002). This is only the second Cretaceous insect fossil known from New Zealand.

The oldest beetle fossils in New Zealand are Triassic and Late Cretaceous fragments of elytra. Predictably, beetle exoskeletal remains are fairly well represented in the Quaternary (Pleistocene and Holocene), including a nearly complete ulodid, representing a new genus, from a cave in the Waitomo region (Leschen & Rhode 2002). The distribution and diversity of Coleoptera in the Holocene allows direct comparison with modern faunas from the same geographical areas and from other parts of New Zealand. Kuschel and Worthy (1996) noted the drastic reduction in the present-day range of large weevils, and one extinction, compared to the Holocene, attributing the cause to extensive clearing of native vegetation for pastures and to the introduction of rats and mice into the country. Beetle remains have proven particularly useful in paleoclimate interpretation, allowing reconstruction of vegetational history and paleotemperatures in interglacial periods at locations in both North and South Islands (Marra 2003; Marra & Leschen 2004; Marra et al. 2004, 2006).

Gaps in knowledge and potential for further research on Hexapoda

Major gaps in our knowledge of the New Zealand hexapod fauna can be divided into five topic areas. They include taxonomic knowledge of the size and distribution of the fauna, the conservation status and security of rare species, the effects of introduced organisms, life-histories and feeding biology, and the capacity for restoration of depleted habitats.

The most pressing need is to obtain a clearer understanding of the size, status, and distribution of the fauna. More specialist monographs, translated into user-friendly interactive electronic keys, would enable new workers to enter the field and encourage non-taxonomists to attempt initial identifications, thus releasing experienced taxonomists to engage in work requiring more specialised experience.

Based on existing collections and what is known of the fauna and what might be expected, it is clear that only a small proportion of the collembolan fauna has been described. Insect groups known to include at least 20 new undescribed species include Orthoptera, Hemiptera, Coleoptera, Diptera, Hymenoptera, and Trichoptera. But most orders will have some undiscovered species. At the present rate of new species description it will take centuries to complete the task of describing the fauna.

Among the endemic whiteflies (Hemiptera), there appears to be a complex of fern-feeding species, currently known as *Trialeurodes asplenii* (Maskell),

and another complex of undescribed species on beech (*Nothofagus* spp.). It is likely that there is more than the one named species of Ortheziidae in New Zealand. The list of Diaspididae in the end-chapter checklist is based on out-of-date taxonomic knowledge and the earlier-named species are likely to harbour some undetected synonymies. A thorough revision of the armoured scales is needed, both for taxonomy of the indigenous fauna and to provide keys to both indigenous and exotic species. This is particularly important for biosecurity, as the potential for the introduction of invasive species is high in this family. The tribe Leucaspidini may need molecular studies to sort out the indigenous species within it. Associated hymenopteran parasitoids are poorly understood and require concerted efforts in collection and rearing-out from scale-insect hosts. Nothing is known about the potential of adventive parasitoid species to cross over into the endemic fauna.

The Coleoptera and Diptera are important groups that are still significantly understudied, with many gaps in knowledge and numerous undescribed species. In the Diptera, families known to include at least 20 undescribed species include Cecidomyiidae, Chironomidae, Dolichopodidae, Empididae, Ephydridae, Muscidae, Mycetophilidae, Stratiomyiidae, Syrphidae, Tachinidae, Tipulidae, and probably also Ceratopogonidae, Lauxaniidae, Phoridae, and Psychodidae. As taxonomic gaps are filled there will still be plenty of interesting behavioural, sex-attractant, and other biochemical studies to flesh out our knowledge of flies, whose species currently outnumber the scientists and hobbyists investigating them by a ratio exceeding 200 species per person. For those with a penchant for natural history, flies offer a rich resource for serious discovery.

The identification of flies would benefit greatly from the publication of a consolidated series similar to the North American summary of flies (McAlpine et al. 1981, 1987) and of English immature flies (Smith 1989). There are few quality line drawings of fly species in New Zealand, but there are extensive illustrations of fly wings, heads, and legs that help to identify genera and species. However, these illustrations are scattered in a considerable number of publications that are often over 40 years old. For the families Phoridae and Dolichopodidae, illustrations and descriptions are neither in English nor in journals that are readily available in New Zealand.

Much more taxonomic work is needed to determine what species are vulnerable or endangered so that a realistic list of insects in the largest insect orders can be developed for the various Department of Conservation conservancies in New Zealand. For Diptera alone, at least two full-time taxonomists dealing with flies should be employed in New Zealand. In fact, 4–5 would be better, in order to described formally the likely 2000 or so remaining species. One impediment to the development of workable keys is lack of information on variation within species. Many species are known from only a single specimen, reflecting patchy collection effort if not actual species and population losses. Although distributional information is patchy on the two main islands, it tends to be poorer for Stewart Island and some of the larger islands with permanent flowing water in the case of aquatic insects.

The number of described species of Hymenoptera that have been recorded from the New Zealand biogeographic region is a fraction of that in the three other mega-diverse insect orders (Coleoptera, Diptera, and Lepidoptera). One of the major impediments to futher ecological research involving the native hymenopteran fauna is scant knowledge of the group's alpha taxonomy. Within the order, the symphytans and aculeates are relatively well known because their numbers are few and they are generally large, conspicuous insects. Conversely, owing to the generally small size and high diversity of its members, the Parasitica is the least known group. Of the seven superfamilies of Parasitica represented in New Zealand, six are poorly documented. Three of these are unlikely to be highly speciose here, but the remaining three contain families or lower-rank taxa that have radiated spectacularly in New Zealand. The most important gaps in

knowledge of the order are within these three superfamilies – Ichneumonoidea, Proctotrupoidea, and Platygastroidea. The priority groups for taxonomic revision include the families Braconidae and Platygastridae.

Coupled with limited knowledge of morphological variation is the lack of knowledge of life-history stages for most hexapod species. Further, studies of life-cycles of the same species in a range of temperature regimes, particularly in aquatic environments, could prove to be useful in determining the role of abiotic versus biotic influences on life-history patterns. Such studies rely on available expertise to accurately identify species and funding to develop and sustain this expertise continues to decline precipitously in New Zealand.

Acknowledgements

Numerous colleagues helped in the preparation of this chapter, supplying information and answering questions. Partial support for the Hexapoda studies in Landcare Research was made possible by FRST (Contract C09X002 to Landcare Research).

Kevin Collier (Environment Waikato, Hamilton), Chris Green (Department of Conservation, Auckland), and Jaap Jasperse (SPREP, Apia) provided helpful comments on the Ephemeroptera review.

Chris Simon (University of Connecticut, Storrs) and J. S. Dugdale (Landcare Research, Auckland) made helpful comments on the cicada checklist. Carol von Dohlen (Utah State University) is thanked for her ideas on aphid phylogenetic relationships. Unpublished correspondence between Don Horning and various workers is held at Crop & Food Research, Lincoln, New Zealand.

Richard Leschen, John Lawrence, Guillermo Kuschel, and Qiao Wang contributed to the initial review and/or compilation of Coleoptera. Rowan Emberson, John Marris, John Nunn, and Margaret Thayer are thanked for helpful comments on the generic list of Coleoptera. Tony Jewell and Steve Trewick gave advice on Phasmatodea.

The advice of the various scientists who co-authored the Diptera checklist and supplied records of undescribed Diptera species have allowed more accurate perspective on the status of dipteran taxonomy in New Zealand. Thomas Pape kindly supplied information on the presence of Miltogramminae in New Zealand. Access to 14 New Zealand collections has been invaluable in reviewing the fauna and compiling the checklist and is gratefully acknowledged. Rod Macfarlane studied Australian genera of robber flies from the CSIRO (Canberra), and Natural History Museum (London) collections and New Caledonian species from the Bishop Museum (Honolulu) and the IRD collection (Nouméa). Access to these and Chilean collections greatly assisted in clarification of generic relationships relevant to New Zealand. Antony Harris (Otago Museum) and Matthias Jaschhof (Greifswald University, Germany) supplied comments and unpublished information on the Diptera and discussions with Dan Bickel (Australian Museum) assisted in the preparation of the review. Trevor Crosby thoroughly checked the Diptera list.

The following people are thanked for information on the Hymenoptera – Eric Grissell (USDA), *Megastigmus* (Torymidae); Tamas Megyaszai (Hungarian Natural History Museum), *Stylaclista* (Diapriidae); John Early (Auckland Museum), all other Diapriidae; Richard Harris (Landcare Research, Auckland), Warwick Don (University of Otago, Dunedin), Olwyn Green and John Keall (MAF), Formicidae; Barry Donovan (Donovan Scientific Insect Research, Christchurch), Apoidea; Serguei Triapitsyn (University of California, Riverside), *Anagrus* (Mymaridae); John LaSalle (CSIRO Division of Entomology), Eulophidae; Celso Azevedo (Universidade Federal do Espirito Santo, Brazil), Bethylidae; Till Osten (Staatliches Museum für Naturkunde, Stuttgart), Scoliidae; and Ian Gauld (NHM, London), Ichneumonidae. Graham Walker (Crop & Food, Christchurch), John Charles (HortResearch, Auckland), Malcolm Kay (FRI, Rotorua), and Richard Harris contributed to the discussion on alien species. Leonie Clunie and M. Anne Austin (Landcare Research, Auckland) assisted with gathering data and helpfully commenting on the text, respectively. Andrew Austin (University of Adelaide) and Ian Gauld commentd on the manuscript generally and Jan Klimaszewski (Canadian Forest Service) discussed aspects of cataloguing.

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Checklist of New Zealand Hexapoda

Checklists of New Zealand arthropods from Landcare Research's *Fauna of New Zealand* are given at: www.landcareresearch.co.nz/research/biosystematics/invertebrates/faunaofnz/.

Taxon status and origin: ? before genus = genus uncertain; ? before species = species uncertain; ? after species = doubt about establishment or presence *in* New Zealand. SI, species inquirenda; *, new record. Single letter codes indicate if a species is E, endemic, or A, adventive (naturalised alien). A? indicates uncertainty as to whether a species is indigenous or introduced. If a putative adventive species has not established with certainty, this is stated. A BC, Biological Control Agent; Do, species of doubtful status; V, vagrant/visitor/migrant (non-breeding). All other species are automatically considered indigenous. Endemic families are indicated by E, wholly adventive families by A. Endemic genera are underlined (first entry only). Offshore island endemics: Ch, Chatham Is.; K, Kermadec Islands; Sn, The Snares; Su, subantarctic islands; TK, Three Kings Islands.

Habitat codes, where given, include: Al, alpine; Be, beach; Ca, carrion; Cr, crops, cereals, vegetables; Cv, cave; D, dung; Fo, forest; F, freshwater (Fr, running freshwater; Fs, still or static pond or lakewater); Ga, garden; Gl, glacier, meltwater; Gr, grassland and tussock; Hs, hot spring; Lc, lichen; Li, litter, compost, or decaying vegetation; Mo, moss; Nb, nest of bird; Nm, nest of mammal; Ns, of social insect – bee, wasp, ant; Or, orchard; Sa, subalpine; Se, sewerage and dairy effluent; Sh, shrubland; So, soil; St, stored products; SW (fully saline to brackish); We, wetland-rush, sedge, raupo, flax, marsh, swamp to bare mud/silt.

Carnivore/predator/parasite codes: BF, blood feeder (mammals, birds); BP, bird parasite or commensal; Ci/IPr, insect predator; Cm, mite predator; EP, earthworm parasitoid; IP, insect parasitoid; LP, livestock parasite; MoP, snail or molluscan predator/parasite; SP, spider parasitoid.

Herbivore codes: Ff, fungal feeder; H, herbivore (generalised); Hb, bulb feeder; Hf, flower specialist; HG, galls; HLG, leaf galls; HL, leaves, including seedlings; HLM, leaf miner; HR, roots; HS, seeds, fruits; HSG seed galls; Sc, scavenger; Tw, tree or shrub wood to twigs.

SUBPHYLUM HEXAPODA
Class PROTURA
[Compiled by R. P. Macfarlane]
Order EOSENTOMOIDEA
EOSENTOMIDAE
Eosentomon australicum (Womersley, 1939)
Eosentomon dawsoni Conde, 1952 E
Eosentomon gracile Tuxen, 1985 E
Eosentomon macronyx Tuxen, 1986 E
Eosentomon maximum Tuxen, 1986 E
Eosentomon wygodzinskyi Bonet, 1950
Eosentomon zelandicum Tuxen, 1986 E
PROTENTOMIDAE A
Proturentomon minimum (Berlese, 1908) A

Order ACERENTOMOIDEA
ACERENTOMIDAE
Acerentulus kermadecensis Ramsay & Tuxen, 1978 E
Amphientulus zelandicus Tuxen, 1986 E
Australentulus tillyardi (Womersley, 1932)
Australentulus sp. E
Berberentulus capensis (Womersley, 1931)
Berberentulus nelsoni Tuxen, 1986
Gracilentulus gracilis (Berlese, 1908) A
Kenyentulus kenyanus Conde, 1948
Tasmanentulus intermedius Tuxen, 1986 E
Yinentulus paedocephalus Tuxen, 1986 E

Class COLLEMBOLA
[Wise 1973, updated by P. Greenslade]
Order ARTHROPLEONA
BRACHYSTOMELLIDAE
Brachystomella parvula (Schäffer, 1896) A
Brachystomella terrafolia Salmon, 1944
Setanodosa tetrabrachta Salmon, 1942 E

ENTOMOBRYIDAE
ENTOMOBRYINAE
Coecobrya caeca (Schött, 1896) A
Drepanura aurifera Salmon, 1941 E
Entomobrya aniwaniwaensis Salmon, 1941 E
Entomobrya atrocincta Schött, 1896 A
Entomobrya auricorpa Salmon, 1941 E
Entomobrya divafusca Salmon, 1941 E
Entomobrya duofascia duofascia Salmon, 1941 E
Entomobrya d. maxima Salmon, 1941 E
Entomobrya d. variabilia Salmon, 1941 E
Entomobrya egmontia Salmon, 1941 E
Entomobrya ephippiaterga Salmon, 1941 E
Entomobrya exfoliata Salmon, 1943 E
Entomobrya exoricarva Salmon, 1941 E
Entomobrya fusca (Salmon, 1943) E
Entomobrya hurunuiensis Salmon, 1941 E
Entomobrya lamingtonensis Schött, 1917
Entomobrya livida Salmon, 1941 E
Entomobrya multifasciata Tullberg, 1871 A
Entomobrya nigranota nigranota Salmon, 1941 E
Entomobrya n. sinfascia Salmon, 1941 E
Entomobrya nigraoculata Salmon, 1944 E
Entomobrya nivalis (Linnaeus, 1758) A
Entomobrya n. immaculata Schäffer, 1896
Entomobrya obscuroculata Salmon, 1941 E
Entomobrya opotikiensis Salmon, 1941 E
Entomobrya penicillata Salmon, 1941 E
Entomobrya rubra (Salmon, 1937) E
Entomobrya salta Salmon, 1941 E
Entomobrya saxatila Salmon, 1941 E
Entomobrya totapunctata Salmon, 1941 E
Entomobrya varia Schött, 1917
Entomobrya (*Mesentotoma*) *exalga* Salmon, 1942 E
Entomobrya glaciata glaciata (Salmon, 1941) E
Entomobrya g. nigralata (Salmon, 1941 E
Entomobrya intercolorata (Salmon, 1943) E
Entomobrya interfilixa (Salmon, 1941) E
Entomobrya miniparva (Salmon, 1941) E
Entomobrya proceraseta (Salmon, 1941) E
Entomobrya processa (Salmon, 1941) E
Lepidobrya mawsoni (Tillyard, 1920) (= *L. aurantiaca* Salmon, 1949) E
Lepidobrya thalassarchia Salmon, 1949 E
Lepidobrya violacea Salmon, 1949 E
Lepidocyrtus assymetrica Salmon, 1937 E
Lepidocyrtus caeruleacrura (Salmon, 1941) E
Lepidocyrtus cyaneus cinereus Folsom, 1924 A
Lepidocyrtus c. cyaneus Tullberg, 1871 A
Lepidocyrtus elongata (Salmon, 1944) E
Lepidocyrtus fimbriatus Salmon, 1944 E
Lepidocyrtus kauriensis Salmon, 1941 E
Lepidocyrtus lindensis Salmon, 1941 E
Lepidocyrtus moorei Salmon, 1941 E
Lepidocyrtus nigrofasciatus Womersley, 1934
Lepidocyrtus rataensis Salmon, 1941 E
Lepidocyrtus submontanus Salmon, 1941 E
Lepidocyrtus unafascius Salmon, 1941 E
Lepidosira anomala Salmon, 1944 E
Lepidosira arborea arborea Salmon, 1944 E
Lepidosira a. pigmenta Salmon, 1944 E
Lepidosira bidentata Salmon, 1938 E
Lepidosira bifasciata (Salmon, 1944) E
Lepidosira bisecta (Salmon, 1944) E
Lepidosira flava dorsalis (Salmon, 1941) E
Lepidosira f. flava (Salmon, 1938) E
Lepidosira fuchsiata (Salmon, 1938) E
Lepidosira fuscata Womersley, 1930 E
Lepidosira glebosa Salmon, 1941 E
Lepidosira ianthina (Salmon, 1941) E

Lepidosira inconstans (Salmon, 1938) E
Lepidosira indistincta Salmon, 1938 E
Lepidosira magna lichenata (Salmon, 1938) E
Lepidosira m. magna Salmon, 1937 E
Lepidosira m. violacea (Salmon, 1938) E
Lepidosira minima Salmon, 1938 E
Lepidosira minuta Salmon, 1938 E
Lepidosira obscura (Salmon, 1944) E
Lepidosira okarita Salmon, 1938 E
Lepidosira omniofusca Salmon, 1941 E
Lepidosira parva (Salmon, 1941) E
Lepidosira purpurea purpurea (Salmon, 1938) E
Lepidosira p. reducta (Salmon, 1938) E
Lepidosira quadradentata (Salmon, 1941) E
Lepidosira rotorua Salmon, 1938 E
Lepidosira sagmaria (Schött, 1917)
Lepidosira sexmacula Salmon, 1938 E
Lepidosira splendida (Salmon, 1941) E
Lepidosira terraereginae Ellis & Bellinger, 1973
Pseudosinella eudyptidus (Salmon, 1949) E
Pseudosinella alba (Packard, 1873) A
Pseudosinella dispadentata Salmon, 1949 E
Pseudosinella fasciata Womersley, 1934
Pseudosinella insoloculata Salmon, 1941 E
Pseudosinella nonoculata Salmon, 1941 E
Pseudosinella spelunca Salmon, 1958 E
Seira setapartita (Salmon, 1944) E
Sinella castanea (Salmon, 1949) E
Sinella pulverafusca Salmon, 1941 E
Sinella termitum Schött, 1917
ORCHESELLINAE A
Heteromurus nitidus (Templeton, 1935) A
PARONELLIDAE
Glacialoca caerulea (Salmon, 1941) E
Micronellides oliveri Salmon, 1944 E
Parachaetoceras pritchardi (Womersley, 1936) E
Paronana bidenticulata (Carpenter, 1925)
Paronana karoriensis (Salmon, 1937) E
Paronana maculosa (Salmon, 1937) E
Paronana pigmenta Salmon, 1941 E
Paronana pilosa (Salmon, 1941) E
Paronana tasmasecta boldensis (Salmon, 1944) E
Paronana t. tasmasecta (Salmon, 1941) E
Paronellides novaezealandiae novaezealandiae Salmon, 1941 E
Paronellides n. purpurea Salmon, 1941 E
Pseudoparonella dorsanota dorsanota (Salmon, 1941) E
Pseudoparonella d. intermedia Salmon, 1944 E
Pseudoparonella d. sufflava (Salmon, 1941) E
Pseudoparonellides badius Salmon, 1941 E
Pseudoparonellides cryptodontus Salmon, 1944 E
HYPOGASTRURIDAE
Ceratophysella armata (Nicolet, 1842) A
Ceratophysella guthriei (Folsom, 1916) A
Ceratophysella longispina (Tullberg, 1876) A
Hypogastrura campbelli Womersley, 1930 E
Hypogastrura manubrialis (Tullberg, 1869) A
Hypogastrura morbillata (Salmon, 1941) E
Hypogastrura obliqua (Salmon, 1949) E
Hypogastrura omnigra (Salmon, 1941) E
Hypogastrura purpurescens (Lubbock, 1868) A
Hypogastrura rossi (Salmon, 1941) E
Hypogastrura viatica (Tullberg, 1872) A
Schoettella subcorta Salmon, 1941 E
Triacanthella alba Carpenter, 1909 E
Triacanthella enderbyensis Salmon, 1949 E
Triacanthella purpurea Salmon, 1943 E
Triacanthella rosea Wahlgren, 1906
Triacanthella rubra Salmon, 1941 E
Triacanthella setacea Salmon, 1941 E
Triacanthella sorenseni Salmon, 1949 E
Triacanthella terrasilvatica Salmon, 1943 E
Xenylla atrata (Salmon, 1944) E
Xenylla maritima Tullberg, 1869 A
ISOTOMIDAE
Acanthomurus alpinus alpinus Salmon, 1941 E
Acanthomurus a. obscuratus Salmon, 1943 E
Acanthomurus rivalis Wise, 1964 E
Acanthomurus setosus setosus Salmon, 1941 E
Acanthomurus s. violaceus Salmon, 1941 E
Acanthomurus womersleyi Salmon, 1941 E
Archisotoma brucei (Carpenter, 1907)
Ballistura aqualata (Salmon, 1941) E
Cryptopygus caecus Wahlgren, 1906
Cryptopygus campbellensis Wise, 1964 E
Cryptopygus decemoculatus (Salmon, 1949) E
Cryptopygus granulatus Salmon, 1943
Cryptopygus lamellatus Salmon, 1941 E
Cryptopygus loftyensis Womersley, 1934
Cryptopygus minimus Salmon, 1941 E
Cryptopygus novaezealandiae (Salmon, 1943) E
Cryptopygus novazealandia (Salmon, 1941) E
Cryptopygus parasiticus (Salmon, 1943) E
Cryptopygus subalpina (Salmon, 1944) E
Desoria fasciata (Salmon, 1941) E
Folsomia candida Willem, 1902 A
Folsomia diplophthalma (Axelson, 1902) A
Folsomia fimetarioides (Axelson, 1903) A
Folsomia miradentata Salmon, 1943 E
Folsomia pusilla Salmon, 1944 E
Folsomia quadrioculata (Tullberg, 1871) A
Folsomia salmoni Stach, 1947 E
Folsomia sedecimoculata (Salmon, 1943) E
Folsomides neozealandia Salmon, 1948 E
Folsomina onychiurina Denis, 1931
Folsomotoma anomala (Salmon, 1949) E
Folsomotoma minuta (Salmon, 1949) E
Folsomotoma octooculata (Willem, 1901) rec. dub.
Folsomotoma ovata (Salmon, 1949) E
Folsomotoma subflava (Salmon, 1949) E
Halisotoma maritima (Tullberg, 1871)
Halisotoma pritchardi (Womersley, 1936)
Halisotoma sindentata (Salmon, 1943) E
Hemisotoma thermophilus (Axelson, 1900) A
Isotoma exiguadentata Salmon, 1941 E
Isotoma pallida fasciata Salmon, 1941 E
Isotoma raffi Womersley, 1934
Isotoma turbotti (Salmon, 1949)
Isotomedia triseta Salmon, 1944 E
Isotomiella minor (Schäffer, 1896) A
Isotomodes productus (Axelson, 1906) A
Isotomurus chiltoni (Carpenter, 1925)
Isotomurus lineatus lineatus (Salmon, 1941) E
Isotomurus l. violaceus (Salmon, 1941) E SI?
Isotomurus novaezealandiae (Salmon, 1941) E
Isotomurus palustris (O.F. Müller, 1776) A
Isotomurus papillatus (Womersley, 1934)
Papillomurus magnificus Salmon, 1949 E SI
Papillomurus parvus (Salmon, 1937) E SI? (Stach placed this species *in Tomocerura*)
Parisotoma confusoculata Salmon, 1944 E
Parisotoma dividua Salmon, 1944 E
Parisotoma notabilis (Schäffer, 1896) A
Parisotoma picea Salmon, 1949 E
Parisotoma postantennala Salmon, 1949 E
Parisotoma quinquedentata Salmon, 1943 E
Procerura dissimilis (Salmon, 1944) E
Procerura fasciata Salmon, 1941
Procerura fusca fusca (Salmon, 1941) E
Procerura f. pallida (Salmon, 1941) E
Procerura montana Salmon, 1941 E
Procerura ochracea (Salmon, 1949) E
Procerura purpurea Salmon, 1941 E
Procerura serrata Salmon, 1941 E
Procerura violacea aequaoculata Salmon, 1941 E
Procerura v. violacea Salmon, 1941 E
Proisotoma atrata (Salmon, 1941) E
Proisotoma haweaensis (Salmon, 1941) E
Proisotoma minuta (Tullberg, 1871) A
Proisotoma niger (Carpenter, 1925) E
Proisotoma octojuga Salmon, 1949 E
Proisotoma okukensis (Salmon, 1941) E
Proisotoma terrigenus (Salmon, 1943) E
Proisotoma xanthella Salmon, 1949 E
Proisotomurus fuscus Salmon, 1944 E SI
Proisotomurus lineatus violaceus Salmon, 1944 E SI
Proisotomurus lapidosus Salmon, 1949 E SI
Setocerura maruiensis (Salmon, 1941) E
Setocerura rubenota (Salmon, 1941) E
Spinocerura capillata Salmon, 1941 E
Tibiolatra latronigra Salmon, 1941 E
Tomocerura colonavia Salmon, 1949 E
Womersleyella niveata Salmon, 1944 E
NEANURIDAE
ANURIDINAE
Anurida granaria (Nicolet, 1847) A
Delamarellina ubiquata (Salmon, 1944) E
Forsteramea megacephala (Salmon, 1954) E
Platanurida lata Carpenter, 1925 E
Platanurida marplesi (Salmon, 1941) E
Platanurida marplesioides Massoud, 1967 E
Pseudachorudina brunnea (Carpenter, 1925) E
Pseudachorudina osextara (Salmon, 1941) E
Pseudachorudina pacifica (Womersley, 1936) E
Quatacanthella proprieta (Salmon, 1941) E
FRIESIINAE
Friesea flava (Salmon, 1949) E
Friesea litoralis (Wise, 1964) E
Friesea mirabilis (Tullberg, 1871) A
Friesea parva (Womersley, 1936) E
Friesea salmoni Massoud, 1967 E
NEANURINAE
Australonura meridionalis (Stach, 1951)
Crossodonthina radiata (Salmon, 1941) E
Gnatholonche angularis (Salmon, 1944) E
Gnatholonche sensilla Salmon, 1948 E
Hemilobella newmani(Womersley, 1933)
Neanura muscorum (Templeton, 1835) A
Neanura rosacea (Schött, 1917) SI
Paleonura guadalcanarae (Yosii, 1960) var. *novaezelandiae* Salmon, 1941 E SI
Zelandanura bituberculata Deharveng & Wise, 1987 E
Zealandmeria harrisi (Salmon, 1944) E
Zealandmeria novaezealandiae (Womersley, 1936) E
PSEUDACHORUTINAE
Ceratrimeria aurea Salmon, 1944 E
Ceratrimeria harrisi Salmon, 1942 E
Ceratrimeria novaezealandiae (Womersley, 1936) E
Pseudachorutes algidensis Carpenter, 1925 E
Pseudachorutes conspicuatus conspicuatus Salmon, 1944 E
Pseudachorutes c. flavus Salmon, 1944 E
Pseudachorutes c. lineatus Salmon, 1944 E
Pseudachorutes c. maximus Salmon, 1944 E
Pseudachorutes decussus (Salmon 1941) E?
Pseudachorutes puniceus Salmon, 1944 E
UCHIDANURINAE
Holacanthella brevispinosa (Salmon, 1942) E
Holacanthella duospinosa (Salmon, 1942) E
Holacanthella laterospinosa (Salmon, 1944) E
Holacanthella paucispinosa (Salmon, 1941) E
Holacanthella spinosa (Lubbock, 1899) E
ODONTELLIDAE
Odontella emineodentata Salmon, 1944 E
Odontella forsteri (Salmon, 1942) E
Odontella anomala Salmon, 1944 E
Odontella caerulumbrosa Salmon, 1944 E
Odontella conspicuata Salmon, 1944 E
Odontella minutissima Salmon, 1941 E
ONYCHIURIDAE
Clavaphorura septemseta Salmon, 1943 E
Deuteraphorura acicindelis (Salmon, 1958) E
Onychiurus ambulans (Linnaeus, 1758) A
Onychiurus a. inermis Agren, 1903 A
Onychiurus fimetarius (Linnaeus, 1758) SI A

Orthonychiurus novaezealandiae (Salmon, 1942) E
Orthonychiurus subantarcticus Salmon, 1949 E
Protaphorura armata (Tullberg, 1869) A
Protaphorura a. inermis (Axelson, 1950) A
Thalassaphorura petallata Salmon, 1958 E
TOMOCERIDAE
Antennacyrtus insolitus Salmon, 1941 E
Lepidophorella australis australis Carpenter, 1925
Lepidophorella a. fusca Salmon, 1941 E
Lepidophorella brachycephala (Moniez, 1894)
Lepidophorella communis Salmon, 1937
Lepidophorella nigra Salmon, 1943
Lepidophorella rubicunda Salmon, 1941 E
Lepidophorella spadica Salmon, 1944 E
Lepidophorella unadentata Salmon, 1941 E
Novacerus insoliatus (Salmon, 1941) E
Novacerus spinosus (Salmon, 1941) E
Pseudolepidophorella longiterga (Salmon, 1937) E
Tomocerus minor (Lubbock, 1862) A
Tomocerus setoserratus Salmon, 1941
TULLBERGIIDAE
Dinaphorura laterospina Salmon, 1941 E
Dinaphorura novaezealandeae Womersley, 1935 E
Mesaphorura krausbaueri Börner, 1901 A ?misid.
Mesaphorura minutissima Salmon, 1944 E
Tullbergia gambiense Womersley, 1935
Tullbergia mixta Wahlgren, 1906
Tullbergia bisetosa Börner, 1902

Order SYMPHYPLEONA
ARRHOPALITIDAE
Arrhopalites caecus (Tullberg, 1871) *sensu* Stach 1956, Bretfeld 1999
BOURLETIELLIDAE
Bourletiella arvalis (Fitch, 1863) *sensu* Stach 1956 A
Bourletiella a. dorsobscura Salmon, 1941 E
Bourletiella hortensis (Fitch, 1963)
Deuterosminthurus pallipes (Bourlet, 1842) A?
Deuterosminthurus sulphureus sulphureus Koch, 1840
DICYRTOMIDAE
Calvatomina superba (Salmon, 1943) E
Dicyrtomina minuta (O. Fabricius, 1783) *sensu* Stach, 1957 A
Dicyrtomina novazealandica Salmon, 1941 E
Dicyrtomina turbotti Salmon, 1948 E
KATIANNIDAE
Katianna antennapartita Salmon, 1941 E
Katianna australis australis Womersley, 1932
Katianna a. tillyardi Womersley, 1932
Katianna gloriosa Salmon, 1946 E
Katianna perplexa Salmon, 1944 E
Katianna purpuravirida Salmon, 1941 E
Katianna ruberoculata reducta Salmon, 1944 E
Katianna r. ruberoculata Salmon, 1944 E
Parakatianna albirubrafrons albirubrafrons Salmon, 1943 E
Parakatianna a. niveanota Salmon, 1943 E
Parakatianna cortica Salmon, 1943 E
Parakatianna diversitata diversitata Salmon, 1943 E
Parakatianna d. viridis Salmon, 1943 E
Parakatianna hexagona Salmon, 1941 E
Parakatianna homerica (Salmon, 1946) E
Parakatianna prospina (Salmon, 1946) E
Parakatianna salmoni (Wise, 1964) E
Parakatianna superba (Salmon, 1946) E
Polykatianna cremea Salmon, 1949 E
Polykatianna davidi (Tillyard, 1920)
Polykatianna flammea Salmon, 1946 E
Pseudokatianna fasciata (Salmon, 1944) E
Pseudokatianna campbellensis Salmon, 1949 E
Pseudokatianna fagophila Salmon, 1946 E
Pseudokatianna livida (Salmon, 1943) E
Pseudokatianna lutea Salmon, 1946 E
Pseudokatianna minuta Salmon, 1946 E
Pseudokatianna nigra Salmon, 1946 E
Pseudokatianna nigraoculata Salmon, 1948 E SI
Pseudokatianna nigretalba aurea Salmon, 1944 E
Pseudokatianna n. nigretalba Salmon, 1944 E
Pseudokatianna niveovata nigra Salmon, 1946 E
Pseudokatianna n. niveovata Salmon, 1946 E
Pseudokatianna triclavata Salmon, 1949 E
Pseudokatianna triverrucata Salmon, 1944 E
Pseudokatianna umbrosalata Salmon, 1946 E
Pseudokatianna zebra Salmon, 1946 E
Sminthurinus aureus (Lubbock, 1862) A
Sminthurinus discordipes Salmon, 1949 E
Sminthurinus duplicatus duplicatus Salmon, 1941 E
Sminthurinus d. obscurus Salmon, 1944 E
Sminthurinus glaucus Salmon, 1943 E
Sminthurinus granulatus Salmon, 1946 E
Sminthurinus kerguelensis Salmon, 1964
Sminthurinus lichenatus Salmon, 1943 E
Sminthurinus muscophilus Salmon, 1946 E
Sminthurinus nigrafuscus Salmon, 1941 E
Sminthurinus oculatus Schött, 1917
Sminthurinus procerasetus Salmon, 1946 E
Sminthurinus mime Börner, 1907 A
Sminthurinus tunicatus Salmon, 1954 E
SMINTHURIDAE
Temeritas denisii (Womerseley, 1934)
Novokatianna cummyxa Salmon, 1944 E
Novokatianna radiata Salmon, 1946 E
Novokatianna venusta (Salmon, 1943) E
Sminthurus multidentatus Salmon, 1943 E
Sminthurus viridis (Linnaeus, 1758)
SMINTHURIDIDAE
Jeannenotia stachi (Jeannenot, 1955) A
Sphaeridia pumilis (Krausbauer, 1898) A
Sphaeridia serrata (Folsom & Mills, 1938)
Sphaeridia sphaera (Salmon, 1946) E
SPINOTHECIDAE
Spinotheca magnasetacea (Salmon, 1941) E

Order NEELIPLEONA
NEELIDAE
Megalothorax incertus Börner, 1903 A
Megalothorax rubidus Salmon, 1946 E
Zelandothorax novaezealandiae (Salmon, 1944) E

Class DIPLURA
[Compiled by R. P. Macfarlane]
Order DIPLURA
CAMPODEIDAE
Campodea fragilis Meinert, 1865 A?
Campodea zelanda Hilton, 1939 E
Campodea sp. indet. Silvestri 1931 ?A
Tricampa philpotti (Tillyard, 1924) E
HETEROJAPYGIDAE
Heterojapyx novaezeelandiae (Verhoeff, 1903) E
JAPYGIDAE
Burmjapyx forsteri archeyi (Pagés, 1952) E
Burmjapyx f. forsteri (Pagés, 1952) E
Burmjapyx michaelseni (Silvestri, 1930) A?
Burmjapyx punamuensis (Pagés, 1952) E
Burmjapyx n. sp. E
Notojapyx tillyardi (Silvestri, 1930) A?

Class INSECTA
Subclass ARCHAEOGNATHA
[Compiled by R. P. Macfarlane]
Order ARCHAEOGNATHA
MEINERTELLIDAE
Nesomachilis maorica Tillyard 1924 E Fo
Nesomachilis novaezelandiae Mendes, Bach de Rocha & Gaju-Ricart, 1994 E

Subclass DICONDYLIA
Infraclass THYSANURA
[Compiled by R. P. Macfarlane]
Order THYSANURA
ATELURIDAE [P. M. Johns]
Atopatelura sp.
Gen. nov. et n. spp. (3) Wise 1970 3E
LEPIDOTRICHIDAE
Gen. nov. et n. spp. (4) Wise 1970 4E
LEPISMATIDAE
Ctenolepisma longicaudata Escherich, 1905 A
Heterolepisma zelandica (Tillyard, 1924) E
Lepisma saccharina Linnaeus, 1758 A St

Infraclass PTERYGOTA
Superorder EPHEMEROPTERA
[Compiled by D. R. Towns & T. R. Hitchings]
Order EPHEMEROPTERA
AMELETOPSIDAE
Ameletopsis perscitus (Eaton, 1899) E
COLOBURISCIDAE
Coloburiscus humeralis (Walker, 1853) E
EPHEMERIDAE
Ichthybotus bicolor Tillyard, 1923 E
Ichthybotus hudsoni (McLachlan, 1894) E
LEPTOPHLEBIIDAE
Acanthophlebia cruentata (Hudson, 1904) E
Arachnocolus phillipsi Towns & Peters, 1979 E
Atalophlebioides cromwelli (Phillips, 1930) E
Aupouriella pohei Winterbourn, 2009 E
Austroclima jollyae Towns & Peters, 1979 E
Austroclima sepia (Phillips, 1930) E
Austronella planulata (Towns, 1983) E
Cryophlebia aucklandensis (Peters, 1971) E
Deleatidium (*Deleatidium*) *angustum* Towns & Peters, 1996 E
Deleatidium (*D.*) *atricolor* Hitchings, 2009 E
Deleatidium (*D.*) *autumnale* Phillips, 1930 E
Deleatidium (*D.*) *branchiola* Hitchings, 2009 E
Deleatidium (*D.*) *cerinum* Phillips, 1930 E
Deleatidium (*D.*) *fumosum* Phillips, 1930 E
Deleatidium (*D.*) *lillii* Eaton, 1899 E
Deleatidium (*D.*) *magnum* Towns & Peters, 1996 E
Deleatidium (*D.*) *myzobranchia* Phillips, 1930 E
Deleatidium (*D.*) *townsi* Hitchings, 2009 E
Deleatidium (*D.*) *vernale* Phillips, 1930 E
Deleatidium (*D.*) n. sp. E
Deleatidium (*Penniketellum*) *insolitum* (Towns & Peters, 1979b) E
Deleatidium (*P.*) *cornutum* Towns & Peters, 1996 E
Isothraulus abditus Towns & Peters, 1979 E
Mauiulus aquilus Towns & Peters, 1996 E
Mauiulus luma Towns & Peters, 1979 E
Neozephlebia scita (Walker, 1853) E
Tepakia caligata Towns & Peters, 1996 E
Zephlebia borealis (Phillips, 1930) E
Zephlebia dentata (Eaton, 1871) E
Zephlebia inconspicua Towns, 1983 E
Zephlebia nebulosa Towns & Peters, 1996 E
Zephlebia pirongia Towns & Peters, 1996 E
Zephlebia spectabilis Towns, 1983 E
Zephlebia tuberculata Towns & Peters, 1996 E
Zephlebia versicolor (Eaton, 1899) E
NESAMELETIDAE
Nesameletus austrinus Hitchings & Staniczek, 2003 E
Nesameletus flavitinctus (Tillyard, 1923) E
Nesameletus murihiku Hitchings & Staniczek, 2003 E
Nesameletus ornatus (Eaton, 1882) E
Nesameletus vulcanus Hitchings & Staniczek, 2003 E
Nesameletus n. sp. (1) E
ONISCIGASTRIDAE
Oniscigaster distans Eaton, 1899 E
Oniscigaster intermedius Eaton, 1899 E
Oniscigaster wakefieldi McLachlan, 1873 E
RALLIDENTIDAE E
Rallidens mcfarlanei Penniket, 1966 E
Rallidens n. sp. E
SIPHLAENIGMATIDAE E
Siphlaenigma janae Penniket, 1962 E

Superorder ODONATA
[Compiled by R. P. Macfarlane]
Order ODONATA
Suborder ZYGOPTERA
COENAGRIONIDAE
Ischnura aurora (Brauer, 1865) A Fs Ci
Xanthocnemis *sobrina* (McLachlan, 1873) E Fs Ci
Xanthocnemis sinclairi Rowe, 1987 E Fs Ci
Xanthocnemis tuanuii Rowe, 1981 E Fs Ci
Xanthocnemis zealandica (McLachlan, 1873) E Fsr Ci
LESTIDAE
Austrolestes colensonis (White, 1846) E Fs Ci

Suborder ANISOPTERA
AESHNIDAE
Aeshna brevistyla (Rambur, 1842) Fsr Ci
Hemianax papuensis (Burmeister, 1839) A Fs Ci
CORDULIIDAE
Antipodochlora braueri (Selys, 1871) E Fr Ci
Hemicordulia australiae Rambur, 1842 A Fsr Ci
Procordulia grayi (Selys, 1871) E Fs Ci
Procordulia smithii (White, 1846) E Fsr Ci
LIBELLULIDAE
Diplacodes bipunctata (Brauer, 1865) Fs Ci
Pantala flavescens (Fabricius, 1798) V Fs Ci
Tramea transmarina Braeur, 1867 V Fs Ci
PETALURIDAE
Uropetala carovei (White, 1843) E We Ci
Uropetala chiltoni Tillyard, 1921 E We Ci

Superorder NEOPTERA
Order PLECOPTERA
[Compiled by I. D. McLellan]
Suborder ANTARCTOPERLARIA
AUSTROPERLIDAE
Austroperla cyrene (Newman, 1845) E
EUSTHENIIDAE
Stenoperla helsoni McLellan, 1996 E
Stenoperla hendersoni McLellan, 1996 E
Stenoperla maclellani Zwick, 1979 E
Stenoperla prasina (Newman, 1845) E
GRIPOPTERYGIDAE
Acroperla flavescens (Kimmins, 1938) E
Acroperla christinae McLellan 1998 E
Acroperla spiniger (Tillyard, 1923) E
Acroperla samueli McLellan, 1977 E
Acroperla trivacuata (Tillyard, 1923) E
Apteryoperla monticola Wisely, 1953 E
Apteryoperla illiesi McLellan, 1977 E
Apteryoperla nancyae McLellan, 1977 E
Apteryoperla ramsayi McLellan, 1977 E
Apteryoperla tillyardi McLellan, 1977 E
Apteryoperla n. spp. (2) 2E
Aucklandobius complementarius Enderlein, 1909 E
Aucklandobius gressitti Illies, 1963 E
Aucklandobius kuscheli (Illies, 1974) E
Aucklandobius turbotti (Illies, 1963) E
Holcoperla angularis (Wisely, 1953) E
Holcoperla jacksoni McLellan, 1977 E
Holcoperla magna McLellan, 1983 E
Megaleptoperla diminuta Kimmins, 1938 E
Megaleptoperla grandis (Hudson, 1913) E
Rungaperla campbelli (Illies, 1963) E
Rungaperla longicauda (Illies, 1963) E
Nesoperla fulvescens Tillyard, 1923 E
Nesoperla johnsi McLellan, 1977 E Sn
Nesoperla n. sp. 1 E
Rakiuraperla nudipes McLellan, 1977 E
Taraperla ancilis (Harding & Chadderton, 1995) E
Taraperla howesi (Tillyard, 1923) E
Taraperla pseudocyrene McLellan, 1998 E
Taraperla n. sp. 1 E
Vesicaperla dugdalei McLellan, 1977 E
Vesicaperla eylesi McLellan, 1977 E
Vesicaperla kuscheli McLellan, 1977 E
Vesicaperla substirpes McLellan, 1967 E
Vesicaperla townsendi McLellan, 1977 E
Vesicaperla n. spp. (2) 2E
Zelandobius alatus McLellan, 1993 E
Zelandobius albofasciatus McLellan, 1993 E
Zelandobius auratus McLellan, 1993 E
Zelandobius brevicauda McLellan, 1977 E
Zelandobius childi McLellan, 1993 E
Zelandobius confusus Tillyard, 1923 E
Zelandobius cordatus McLellan, 1993 E
Zelandobius dugdalei McLellan, 1993 E
Zelandobius edensis Gray, 2009 E
Zelandobius foxi McLellan, 1993 E
Zelandobius furcillatus Tillyard, 1923 E
Zelandobius gibbsi McLellan, 1993 E
Zelandobius illiesi McLellan 1969 E
Zelandobius inversus McLellan, 1993 E
Zelandobius jacksoni McLellan, 1993 E
Zelandobius kuscheli McLellan, 1993 E
Zelandobius macburneyi McLellan, 1993 E
Zelandobius mariae McLellan, 1993 E
Zelandobius montanus McLellan, 1993 E
Zelandobius ngaire McLellan, 1993 E
Zelandobius patricki McLellan, 1993 E
Zelandobius peglegensis McLellan, 1993 E
Zelandobius pilosus Death, 1990 E
Zelandobius takahe McLellan, 1993 E
Zelandobius truncus McLellan, 1993 E
Zelandobius unicolor Tillyard, 1923 E
Zelandobius uniramus McLellan, 1993 E
Zelandobius wardi McLellan, 1993 E
Zelandobius n. spp. (11) 11E
Zelandoperla agnetis McLellan, 1967 E
Zelandoperla decorata Tillyard, 1923 E
Zelandoperla denticulata McLellan, 1967 E
Zelandoperla fenestrata Tillyard, 1923 E
Zelandoperla pennulata McLellan, 1967 E
Zelandoperla tillyardi McLellan, 1999 E
Zelandoperla n. sp. E

Suborder ARCTOPERLARIA
NOTONEMOURIDAE
Cristaperla eylesi McLellan, 1991 E
Cristaperla fimbria (Winterbourn, 1965) E
Cristaperla waharoa McLellan, 1991 E
Halticoperla gibbsi McLellan, 1991 E
Halticoperla tara McLellan, 1991 E
Halticoperla viridans McLellan & Winterbourn, 1968 E
Notonemoura alisteri McLellan, 1968 E
Notonemoura hendersoni McLellan, 2000 E
Notonemoura latipennis Tillyard, 1923 E
Notonemoura spinosa McLellan, 1991 E
Notonemoura winstanleyi McLellan, 1991 E
Omanuperla bruningi McLellan, 1972 E
Omanuperla hollowayae McLellan, 1991 E
Spaniocerca acuta McLellan, 1991 E
Spaniocerca bicornuta McLellan, 1987 E
Spaniocerca hamishi McLellan, 2000 E
Spaniocerca longicauda McLellan, 1977 E
Spaniocerca minor Kimmins, 1938 E
Spaniocerca zelandica Tillyard, 1923 E
Spaniocerca zwicki McLellan, 1991 E
Spaniocerca n. spp. (2) 2E
Spaniocercoides cowleyi (Winterbourn, 1965) E
Spaniocercoides foxi McLellan, 1984 E
Spaniocercoides howesi McLellan, 1984 E
Spaniocercoides hudsoni Kimmins, 1938 E
Spaniocercoides jacksoni McLellan, 1991 E
Spaniocercoides philpotti Winterbourn, 1965 E
Spaniocercoides townsendi McLellan, 1984 E
Spaniocercoides watti McLellan, 1984 E
Spaniocercoides n. sp. E

Order BLATTODEA
[Compiled by P. M. Johns]
BLABERIDAE A
Panesthia cribrata Saussure, 1874* A
BLATTELLIDAE
Blatella germanica Linnaeus, 1767 A
Neotemnopteryx fulva (Saussure, 1863) A
Ornatiblatta maori (Rehn, 1904) E
Parellipsidion conjunctum (Walker, 1868) E
Parellipsidion inaculeatum Johns, 1966 E
Parellipsidion pachycercum Johns, 1966 E
Paratemnopteryx couloniana (Saussure, 1863) A
Shelfordina orchidae (Asahina, 1985) A
Supella longipalpa (Fabricius, 1798) A
Gen. nov. et n. spp. (2)* 2E
BLATTIDAE
Blatta orientalis Linnaeus, 1758 A
Celatoblatta anisoptera Johns, 1966 E
Celatoblatta brunni (Alfken, 1901) E
Celatoblatta fuscipes Johns, 1966 E
Celatoblatta hesperia Johns, 1966 E
Celatoblatta laevispinata Johns, 1966 E
Celatoblatta montana Johns, 1966 E
Celatoblatta notialis Johns, 1966 E
Celatoblatta pallidicauda Johns, 1966 E
Celatoblatta peninsularis Johns, 1966 E
Celatoblatta quinquemaculata Johns, 1966 E
Celatoblatta sedilloti (Bolivar, 1882) E
Celatoblatta subcorticaria Johns, 1966 E
Celatoblatta undulivitta (Walker, 1868) E
Celatoblatta vulgaris Johns, 1966 E
Celatoblatta n. spp. (6)* 6E
Drymaplaneta semivitta (Walker, 1868) A
Drymaplaneta heydeniana (Saussure, 1864) A
Maoriblatta novaeseelandiae (Brunner von Wattenwyl, 1865) E
Maoriblatta rufoterminata (Brunner von Wattenwyl, 1865) E
Periplaneta americana (Linnaeus, 1758) A
Periplaneta brunnea Burmeister, 1868 A
Periplaneta fuliginosa (Serville, 1839) A
Tryonicus parvus (Tepper, 1895) A
Gen et. sp. indet. Tryonicini* E
CHORISONEURIDAE
Celeriblattina major Johns, 1966 E
Celeriblattina minor Johns, 1966 E

Order ISOPTERA
[Compiled by R. P. Macfarlane]
KALOTERMITIDAE
Kalotermes banksiae Hill, 1942 A
Kalotermes brouni Froggatt, 1897 E Fo
Kalotermes cognatus Gay, 1976
RHINOTERMITIDAE A
Coptotermes acinaciformis (Froggatt, 1898) A
Coptotermes frenchi Hill, 1932 A
TERMITIDAE A
Glyptotermes brevicornis Froggatt, 1896 A
TERMOPSIDAE
Stolotermes ruficeps Brauer, 1865 E Fo
Stolotermes inopus Gay, 1967 E Fo
Porotermes adamsoni (Froggatt, 1897) A (doubtful)

Order MANTODEA
[Compiled by R. P. Macfarlane]
MANTIDAE
Miomantis caffra (Saussure, 1871) A Ga
Orthodera novaezealandiae (Colenso, 1882) E Ga Fo Ci

Order DERMAPTERA
[Compiled by R. P. Macfarlane & P. M. Johns]
ANISOLABIDIDAE
Anisolabis kaspar Hudson, 1975 E
Anisolabis littorea (White, 1846) E Be
Brachylabis manawatawhi Giles, 1958 E
Carcinophora occidentalis Kirby, 1896 A?
Euborellia annulipes (Lucas, 1847) A

Parisolabis boulderensis Hudson, 1975 E
Parisolabis forsteri Hudson, 1975 E
Parisolabis iti Hudson, 1975 E
Parisolabis johnsi Hudson, 1975 E
Parisolabis nelsonensis Hudson, 1975 E
Parisolabis novaezeelandiae Verhoeff, 1904 E Fo
Parisolabis setosa Hudson, 1975 E
Parisolabis tapanuiensis Hudson, 1975 E
Parisolabis n. sp. E
CHELISOCHIDAE A?
Chelisoches morio (Fabricius, 1775) A?
Hamaxas feae (Bormans, 1894) A?
FORFICULIDAE A
Forficula auricularia (Linnaeus, 1758) A Ga Gr Or
LABIDURIDAE A
Labidura truncata Kirby, 1903 A
SPONGIPHORIDAE
Labia minor (Linnaeus, 1758) A
Nesogaster halli (Hincks, 1949) A Ga
Paralabella kermadecensis (Giles, 1973) ?E
Paraspania brunneri (Bormans, 1883) A

Order ORTHOPTERA
[Compiled by P. M. Johns]
Suborder ENSIFERA
ANOSTOSTOMATIDAE
Anisoura nicobarica Ander, 1938 E
Deinacrida carinata Salmon, 1950 E
Deinacrida connectens (Ander, 1939) E
Deinacrida elegans Gibbs, 1999 E
Deinacrida fallai Salmon, 1950 E
Deinacrida heteracantha White, 1842 E
Deinacrida mahoenui Gibbs, 1999 E
Deinacrida pluvialis Gibbs, 1999 E
Deinacrida rugosa Buller, 1871 E
Deinacrida talpa Gibbs, 1999 E
Deinacrida tibiospina (Salmon, 1950) E
Hemiandrus bilobatus Ander, 1938 E
Hemiandrus fiordensis (Salmon, 1950) E
Hemiandrus focalis (Hutton, 1897) E
Hemiandrus lanceolatus (Walker, 1869) E
Hemiandrus maculifrons (Walker, 1869) E
Hemiandrus nitaweta Jewell, 2007 E
Hemiandrus pallitarsis (Walker, 1869) E
Hemiandrus subantarcticus (Salmon, 1950) E
Hemiandrus superbus Jewell, 2007 E
Hemiandrus n. spp. (>33) >33E
Hemideina broughi (Buller, 1896) E
Hemideina crassidens (Blanchard, 1851) E
Hemideina femorata Hutton, 1898 E
Hemideina maori (Pictet & Saussure, 1891) E
Hemideina ricta Hutton, 1898 E
Hemideina thoracica (White, 1842) E
Hemideina trewicki Morgan Richards, 1995 E
Motuweta isolata Johns, 1997 E
Motuweta riparia Gibbs, 2002 E
GRYLLIDAE
Bobilla bigelowi (Swan, 1972) E
Bobilla bivitatta (Walker, 1869) A
Bobilla nigrova (Swan, 1972) E
Metioche maorica (Walker, 1869) E
Modicogryllus lepidus (Walker, 1869) A
Ornebius aperta Otte & Alexander, 1983 A
Ornebius novarae (Saussure, 1877)
Teleogryllus commodus (Walker, 1869) A?
Gen. nov. et. n. sp. E
GRYLLOTALPIDAE
Trimescaptor aotea Tindale, 1928 E
RHAPHIDOPHORIDAE
Dendroplectron aucklandense Richards, 1964 E
Insulanoplectron spinosum Richards, 1970 E
Ischyroplectron isolatum Hutton, 1897 E
Isoplectron aciculatum Karny, 1937 E
Isoplectron armatum Hutton, 1897 E
Isoplectron calcaratum Hutton, 1897 E
Isoplectron cochleatum Karny, 1935 E
Isoplectron n. spp. (3) 3E
Macropathus filifer Walker, 1869 E
Macropathus huttoni Kirby, 1906 E
Neonetus huttoni Chopard, 1923 E
Neonetus pilosus (Hutton, 1904) E
Neonetus poduroides (Walker, 1869) E
Neonetus variegatus Brunner, 1888 E
Neonetus n. spp. (9) 9E
Novoplectron serratum Hutton, 1897 E
Notoplectron campbellense Richards, 1964 E
Pachyrhamma acanthocerum (Milligan, 1926) E
Pachrhamma altum (Walker, 1869) E
Pachyrhamma delli (Richards, 1954) E
Pachyrhamma edwardsii (Scudder, 1869) E
Pachyrhamma fuscum (Richards, 1959) E
Pachyrhamma giganteum Richards, 1962 E
Pachyrhamma longicaudum (Richards, 1959) E
Pachyrhamma longipes (Colenso, 1887) E
Pachyrhamma ngongotahaense Richards, 1961 E
Pachyrhamma spinosum Richards, 1961 E
Pachyrhamma tuarti Richards, 1961 E
Pachyrhamma uncatum (Richards, 1959) E
Pachyrhamma waipuense (Richards, 1960) E
Pachyrhamma waitomoense (Richards, 1958) E
Pachyrhamma n. spp. (>11) 11E
Pharmacus brewsterensis Richards, 1972 E
Pharmacus chapmanae Richards, 1972 E
Pharmacus dumbletoni Richards, 1972 E
Pharmacus montanus Pictet & Saussure, 1891 E
Pharmacus? n. spp. (3) 3E
Pallidoplectron peniculosum Richards, 1960 E
Pallidoplectron subterraneum Richards, 1965 E
Pallidoplectron turneri Richards, 1958 E
Pleioplectron diversum Hutton, 1897 E
Pleioplectron hudsoni Hutton, 1897 E
Pleioplectron simplex Hutton, 1897 E
Pleioplectron n. spp. (3) 3E
Paraneonetus multispinus Salmon, 1948 E
Petrotettix cupolensis Richards, 1972 E
Petrotettix nigripes Richards, 1972 E
Petrotettix serratus Richards, 1972 E
Petrotettix spinosus Richards, 1972 E
Setascutum ohauense Richards, 1972 E
Setascutum pallidum Richards, 1972 E
Turbottoplectron cavernae (Hutton, 1897) E
Turbottoplectron unicolor Salmon, 1948 E
Talitropsis crassicruris Hutton, 1897 E
Talitropsis irregularis Hutton, 1897 E
Talitropsis sedilloti Bolivar, 1883 E
Talitropsis megatibia Trewick, 1999 E
Talitropsis n. sp. E
Weta thomsoni Chopard, 1923 E
'*Weta*' *chopardi* Karny, 1937 E
TETTIGONIIDAE
Caedicia simplex (Walker, 1869) E
Conocephalus albescens (Walker, 1869) A
Conocephalus bilineatus (Erichson, 1842) A?
Conocephalus semivitatus (Walker, 1869) E
Salomona solida (Walker, 1869) A?

Suborder CAELIFERA
ACRIDIDAE
Alpinacris crassicauda Bigelow, 1967 E
Alpinacris tumidicauda Bigelow, 1967 E
Brachaspis collinus (Hutton, 1897) E
Brachaspis nivalis (Hutton, 1897) E
Brachaspis robustus Bigelow, 1967 E
Locusta migratoria (Linnaeus, 1758)
Paprides dugdali Bigelow, 1967 E
Paprides nitidus Hutton, 1898 E
Phaulacridium marginale (Walker, 1870) E
Phaulacridium otagense Ritchie & Westerman, 1984 E
Phaulacridium n. spp. (3) 3E
Sigaus australis (Hutton, 1898) E
Sigaus campestris (Hutton, 1898) E
Sigaus childi Jamieson, 1999 E
Sigaus homerensis Morris, 2003 E
Sigaus minutus Bigelow, 1967 E
Sigaus obelisci Bigelow, 1967 E
Sigaus piliferus Hutton, 1898 E
Sigaus takahe Morris, 2003 E
Sigaus villosus (Salmon, 1950) E

Order PHASMATODEA
[Compiled by R. P. Macfarlane and T. R. Buckley]
PHASMIDAE
Acanthoxyla fasciata (Hutton, 1899) E
Acanthoxyla geisovii (Kaup, 1866) E
Acanthoxyla huttoni Salmon, 1955, E
Acanthoxyla inermis Salmon, 1955 E
Acanthoxyla intermedia Salmon, 1955 E
Acanthoxyla prasina (Westwood, 1859) E Fo
Acanthoxyla speciosa Salmon, 1955 E
Acanthoxyla suteri (Hutton, 1899) E
Argosarchus horridus (White, 1846) E Fo
Asteliaphasma jucundum (Salmon, 1991) E Fo
Asteliaphasma naomi (Salmon, 1991) E Fo
Asteliaphasma n. sp. E
Clitarchus hookeri (White, 1846) E
Clitarchus tuberculatus Salmon, 1991 E
Clitarchus n. spp. (2) 2E
Micrarchus hystriculeus Westwood, 1859 E Sh
Micrarchus n. spp. (3) 3E
Niveaphasma annulatum (Hutton, 1898) E
Pseudoclitarchus sentus (Salmon, 1948) E
Spinotectarchus acornutus (Hutton, 1899) E
Tectarchus huttoni (Brunner, 1907) E
Tectarchus ovobessus Salmon, 1954 E
Tectarchus salebrosus (Hutton, 1899) E Fo/Sh
Tectarchus semilobatus Salmon, 1954 E
Tectarchus n. sp. E
Tepakiphasma ngatikuri Buckley & Bradler, 2010 E

Order HEMIPTERA
Suborder STERNORRHYNCHA
[Compiled by R. Henderson, D. A. J. Teulon, P. J. Dale, V. F. Eastop & M. A. W. Stufkens]
The host genus/genera are listed after each entry for Psylloidea. † Belongs to a new genus; genus name to be changed.
PSYLLOIDEA
PSYLLIDAE
Acizzia acaciae (Maskell, 1894) A *Acacia*
Acizzia acaciaebaileyanae (Froggatt, 1901) A *Acacia*
Acizzia albizziae (Ferris & Klyver, 1932) A *Acacia*
Acizzia conspicua (Tuthill, 1952) A *Acacia*
Acizzia dodonaeae (Tuthill, 1952) E *Dodonaea*
Acizzia exquisita (Tuthill, 1952) A *Acacia*
Acizzia hakeae (Tuthill, 1952) A *Hakea*, *Grevillea*
Acizzia jucunda (Tuthill, 1952) A *Acacia*
Acizzia uncatoides (Ferris & Klyver, 1932) A *Acacia*, *Albizzia*, *Paraserianthes*
Acizzia n. sp. A *Acacia*
Anoecoconeossa communis Taylor, 1987 A *Eucalyptus*
Anomalopsylla insignita Tuthill, 1952 E *Olearia*
Anomalopsylla n. spp. (2) 2E *Olearia*
Arytainilla spartiophila (Foerster, 1848) A *Cytisus*
Atmetocranium myersi (Ferris & Klyver, 1932) E *Weinmannia*
Baeopelma foersteri (Flor, 1861) A *Alnus*
Blastopsylla occidentalis Taylor, 1985 A *Eucalyptus*
Cardiaspina fiscella Taylor, 1962 A *Eucalyptus*
Creiis liturata Froggatt, 1990 A *Eucalyptus*
Cryptoneossa triangula Taylor, 1990 A *Eucalyptus*
Ctenarytaina clavata Ferris & Klyver, 1932 E *Kunzea*, *Leptospermum*
Ctenarytaina eucalypti (Maskell, 1890) A *Eucalyptus*
Ctenarytaina fuchsiae (Maskell, 1890) E *Fuchsia*
Ctenarytaina longicauda Taylor, 1987 A *Lophostemon*

Ctenarytaina pollicaris Ferris & Klyver, 1932 E *Kunzea*
Ctenarytaina spatulata Taylor, 1997 A *Eucalyptus*
Ctenarytaina thysanura Ferris & Klyver, 1932 A *Boronia*
Ctenarytaina n. sp. A *Acmena*
Ctenarytaina n. spp. (2) 2E *Leptospermum*
Eucalyptolyma maideni Froggatt, 1901 A *Eucalyptus*
Glycaspis granulata (Froggatt, 1901) A *Eucalyptus*
†*Gyropsylla zealandica* (Ferris & Klyver, 1932) E host unknown
†*Psylla apicalis* Ferris & Klyver, 1932 E *Sophora*
†*Psylla carmichaeliae carmichaeliae* Tuthill, 1952 E *Carmichaelia*
†*Psylla c. indistincta* Tuthill, 1952 E *Carmichaelia*
Psyllopsis fraxini (Linnaeus, 1758) A *Fraxinus*
Psyllopsis fraxinicola (Foerster, 1848) A *Fraxinus*
CALOPHYIDAE A
Calophya schini Tuthill, 1959 A *Schinus*
HOMOTOMIDAE A
Mycopsylla fici (Tryon, 1895) A *Ficus*
TRIOZIDAE
Bactericera cockerelli (Sulc, 1909) A *Capsicum, Solanum* (incl. *Lycopersicon*)
Trioza acuta (Ferris & Klyver, 1932) E *Ozothamnus*
Trioza adventicia Tuthill, 1952 A *Syzygium*
Trioza alseuosmiae Tuthill, 1952 E *Alseuosmia*
Trioza australis Tuthill, 1952 E *Brachyglottis*
Trioza bifida (Ferris & Klyver, 1932) E *Olearia*
Trioza colorata (Ferris & Klyver, 1932) E *Halocarpus*
Trioza compressa Tuthill, 1952 E *Olearia*
Trioza crinita Tuthill, 1952 E *Olearia*
Trioza curta (Ferris & Klyver, 1932) E *Metrosideros*
Trioza dacrydii Tuthill, 1952 E *Halocarpus*
Trioza decurvata Tuthill, 1952 E *Dracophyllum*
Trioza dentiforceps Dumbleton, 1967 E *Olearia*
Trioza discariae Tuthill, 1952 E *Discaria*
Trioza doryphora (Maskell, 1880) E *Olearia*
Trioza emarginata (Ferris & Klyver, 1932) E *Coprosma*
Trioza equalis (Ferris & Klyver, 1932) E *Aristotelia*
Trioza falcata (Ferris & Klyver, 1932) E *Aristotelia*
Trioza fasciata (Ferris & Klyver, 1932) E *Muehlenbeckia*
Trioza flavida Tuthill, 1952 E *Olearia*
Trioza gourlayi Tuthill, 1952 E *Olearia*
Trioza hebicola Tuthill, 1952 E *Hebe*
Trioza irregularis (Ferris & Klyver, 1932) E *Pseudopanax*
Trioza latiforceps Tuthill, 1952 E *Olearia*
Trioza obfusca (Ferris & Klyver, 1932) E *Hebe*
Trioza obscura Tuthill, 1952 E *Hebe*
Trioza panacis Maskell, 1890 E *Pseudopanax*
Trioza parvipennis Tuthill, 1952 E *Brachyglottis*
Trioza scheffl ericola Tuthill, 1952 E *Schefflera*
Trioza scobina Tuthill, 1952 E *Olearia*
Trioza styligera (Ferris & Klyver, 1932) E *Brachyglottis*
Trioza subacuta (Ferris & Klyver, 1932) E *Brachglottis*
Trioza subvexa Tuthill, 1952 E *Olearia*
Trioza vitreoradiata (Maskell, 1879) E *Pittosporum*
Trioza n. spp. (18) 18E
Gen. et spp. indet. (2) 2A *Casuarina*
ALEYRODOIDEA
ALEYRODIDAE
Bemisia sp. N. Martin A?
Dumbletoniella eucalypti (Dumbleton, 1956) A
Aleyrodes fodiens (Maskell, 1896) E
Aleyrodes proletella (Linnaeus, 1758) A
Aleyrodes winterae Takahashi, 1937 E
Asterochiton aureus Maskell, 1879 E
Asterochiton cerata (Maskell 1896) E
Asterochiton fagi (Maskell, 1890) E
Asterochiton pittospori Dumbleton, 1956 E
Asterochiton simplex (Maskell, 1890) E
Bemisia tabaci (Gennadius, 1889) A
Orchamoplatus citri (Takahashi, 1940) A
Pealius azaleae (Baker & Moles, 1920) A
Siphoninus phillyreae (Haliday, 1835) A
Trialeurodes asplenii (Maskell, 1890) E
Trialeurodes vaporariorum (Westwood, 1856) A
Trialeurodes sp. N. Martin E
APHIDOIDEA
ADELGIDAE A
Adelges nordmannianae (Eckstein, 1890) A
Pineus boerneri Annand, 1928 A
Pineus pini (Macquart, 1819) A
APHIDIDAE
APHIDINAE
MACROSIPHINI A
Acyrthosiphon kondoi Shinji, 1938 A
Acyrthosiphon malvae (Mosley, 1841) A
Acyrthosiphon pisum (Harris, 1776) A
Acyrthosiphon primulae (Theobald, 1913) A
Akkaia ?taiwana Takahashi, 1933 A
Amphorophora rubi (Kaltenbach, 1843) A
Aulacorthum solani (Kaltenbach, 1843) A
Brachycaudus helichrysi (Kaltenbach, 1843) A
Brachycaudus persicae (Passerini, 1860) A
Brachycaudus rumexicolens (Patch, 1917) A
Brevicoryne brassicae (Linnaeus, 1758) A
Capitophorus elaeagni (Del Guercio, 1894) A
Capitophorus hippophaes javanicus (Hille Ris Lambers, 1953) A
Cavariella aegopodii (Scopoli, 1763) A
Chaetosiphon fragaefolii (T.D.A. Cockerell, 1901) A
Chaetosiphon sp. nr *fragaefolii* (T.D.A. Cockerell, 1901) A
Chaetosiphon tetrarhodum (Walker, 1849) A
Coloradoa rufomaculata (Wilson, 1908) A
Dysaphis apiifolia (Theobald, 1923) A
Dysaphis aucupariae (Buckton, 1879) A
Dysaphis foeniculus (Theobald, 1923) A
Dysaphis tulipae (Boyer de Fonscolombe, 1841) A
Elatobium abietinum (Walker, 1849) A
Hyadaphis passerinii (Del Guercio, 1911) A
Hyperomyzus lactucae (Linnaeus, 1758) A
Idiopterus nephrelepidis Davis, 1909 A
Illinoia azaleae (Mason, 1925) A
Jacksonia papillata Theobald, 1923 A
Liosomaphis berberidis (Kaltenbach, 1843) A
Lipaphis pseudobrassicae (Davis, 1914) A
Macrosiphoniella sanborni (Gillette, 1908) A
Macrosiphum euphorbiae (Thomas, 1878) A
Macrosiphum hellebori (Theobald & Walton, 1923) A
Macrosiphum rosae (Linnaeus, 1758) A
Macrosiphum stellariae Theobald, 1913 A
Metopolophium dirhodum (Walker, 1849) A
Metopolophium festucae (Theobald, 1917) A
Micromyzus nr *katoi* (Takahashi, 1925) A
Myzaphis rosarum (Kaltenbach, 1843) A
Myzus ascalonicus Doncaster, 1946 A
Myzus cerasi (Fabricius, 1775) A
Myzus cymbalariae Stroyan, 1954 A
Myzus hemerocallis Takahashi, 1921 A
Myzus ornatus Laing, 1932 A
Myzus persicae (Sulzer, 1776) A
Nasanovia ribisnigri (Mosley, 1841) A
Neomyzus circumflexus (Buckton, 1876) A
Neotoxoptera formosana Takahashi, 1965 A
Neotoxoptera oliveri (Essig, 1935) A
Neotoxoptera violae (Pergande, 1900) A
Ovatus crataegarius (Walker, 1850) A
Pseudacaudella rubida (Börner, 1939) A
Rhopalosiphoninus latysiphon (Davidson, 1912) A
Rhopalosiphoninus staphyleae (Koch, 1854) A
Sitobion nr *fragariae* (Walker, 1848) A
Sitobion miscanthi (Takahashi, 1921) A
Uroleucon sonchi (Linnaeus, 1767) A
APHIDINI
Aphis coprosmae Laing *in* Tillyard, 1926 E
Aphis cottieri Carver, 1999 E
Aphis craccivora Koch, 1854 A
Aphis nr *epilobii* Kaltenbach, 1843 A
Aphis gossypii Glover, 1877 A
Aphis healyi Cottier, 1953 E
Aphis hederae Kaltenbach, 1843 A
Aphis idaei Van der Groot, 1912 A
Aphis nelsonensis Cottier, 1953 E
Aphis nerii Boyer de Fonscolombe, 1841 A
Aphis sedi Kaltenbach, 1843 A
Aphis spiraecola Patch, 1914 A
Aphis sp. (ex *Olearia*) E
Casimira n. sp. [ex *Ozothamnus*] E?
Euschizaphis n. spp. (1-2?) [ex *Dracophyllum*] 2E
Euschizaphis n. sp. (ex *Aciphylla*) E
Paradoxaphis aristoteliae Sunde, 1988 E
Paradoxaphis plagianthi Eastop, 2001 E
Rhopalosiphum insertum (Walker, 1849) A
Rhopalosiphum maidis (Fitch, 1856) A
Rhopalosiphum nymphaeae (Linnaeus, 1761) A
Rhopalosiphum padi (Linnaeus, 1758) A
Rhopalosiphum rufiabdominale (Sasaki, 1899) A
Rhopalosiphum sp. Bulman A?
Rhopalosiphum sp. (ex *Cordyline*) A?
Toxoptera aurantii (Boyer de Fonscolombe, 1841) A
Toxoptera citricidus (Kirkaldy, 1907) A
CALAPHIDINAE (MYZOCALLIDINAE) A
Betulaphis brevipilosa Börner, 1940 A
Calaphis flava Mordvilko, 1928 A
Eucallipterus tiliae (Linnaeus, 1758) A
Euceraphis betulae (Koch, 1855) A
Myzocallis boerneri Stroyan, 1957 A
Myzocallis carpini (Koch, 1855) A
Myzocallis castanicola Baker, 1917 A
Myzocallis coryli (Goeze, 1778) A
Pterocallis alni (de Geer, 1773) A
Takecallis arundinariae (Essig, 1917) A
Takecallis taiwanus (Takahashi, 1926) A
Therioaphis trifolii (Monell, 1882) A
Tuberculatus annulatus (Hartig, 1841) A
CHAITOPHORINAE A
Periphyllus californiensis (Shinji, 1917) A
Periphyllus testudinaceus (Fernie, 1852) A
DREPANOSIPHINI A
Drepanosiphum platanoidis (Schrank, 1801) A
ERIOSOMATINAE (PEMPHIGINAE) A
Aploneura lentisci (Passerini, 1856) A
Colophina clematicola (Shinji, 1922) A
Eriosoma lanigerum (Hausmann, 1802) A
Eriosoma pyricola Baker & Davidson, 1916 A
Geoica lucifuga (Zehntner, 1879) A
Melaphis rhois (Fitch, 1866) A
Pemphigus bursarius (Linnaeus, 1758) A
Pemphigus populitransversus Riley *in* Riley & Monell, 1879 A
Smynthurodes betae Westwood, 1849 A
Tetraneura nigriabdominalis (Sasaki, 1899) A
HORMAPHIDINAE A
Cerataphis orchidearum (Westwood, 1879) A
Pseudoregma panicola (Takashi, 1921) A
LACHNINAE A
Cinara fresai Blanchard, 1939 A
Cinara juniperi (de Geer, 1773) A
Cinara louisianensis Boudreaux, 1949 A
Cinara pilicornis (Hartig, 1841) A
Cinara tujafilina (Del Guercio, 1909) A
Essigella californica (Essig, 1909) A
Eulachnus brevipilosus Börner, 1940 A
NEOPHYLLAPHIDINAE
Neophyllaphis totarae Cottier, 1953 E
Neophyllaphis n. sp. [ex *Podocarpus nivalis*] E
PHYLLAPHIDINAE A
Phyllaphis fagi (Linnaeus, 1767) A
SALTUSAPHIDINAE A

Thripsaphis foxtonensis Cottier, 1953 A
TAIWANAPHIDINAE
Sensoriaphis nothofagi Cottier, 1953 E
PHYLLOXERIDAE A
Viteus vitifoliae (Fitch, 1855) A
Moritziella corticalis (Kaltenbach, 1867) A
Phylloxera glabra (von Heyden, 1837) A
COCCOIDEA
ASTEROLECANIIDAE
Asterodiaspis variolosa (Ratzeburg, 1870) A
Asterolecanium vitreum Russell, 1941 E
Asterolecanium n. sp. E
CEROCOCCIDAE
Cerococcus corokiae Maskell, 1890 E
Cerococcus michaeli Lambdin, 1998 E
Solenophora fagi Maskell, 1890 E
COCCIDAE
Aphenochiton chionochloae Henderson & Hodgson, 2000 E
Aphenochiton dierama Henderson & Hodgson, 2000 E
Aphenochiton grammicus Henderson & Hodgson, 2000 E
Aphenochiton inconspicuus (Maskell, 1892) E
Aphenochiton kamahi Henderson & Hodgson, 2000 E
Aphenochiton matai Henderson & Hodgson, 2000 E
Aphenochiton pronus Henderson & Hodgson, 2000 E
Aphenochiton pubens Henderson & Hodgson, 2000 E
Aphenochiton subtilis Henderson & Hodgson, 2000 E
Ceroplastes ceriferus (Fabricius, 1798) A
Ceroplastes destructor Newstead, 1917 A
Ceroplastes sinensis Del Guercio, 1900 A
Coccus hesperidum Linnaeus, 1758 A
Coccus longulus (Douglas, 1887) A
Crystallotesta fagi (Maskell, 1891) E
Crystallotesta fusca (Maskell, 1884) E
Crystallotesta leptospermi (Maskell, 1882) E
Crystallotesta neofagi Henderson & Hodgson, 2000 E
Crystallotesta ornata (Maskell, 1885) E
Crystallotesta ornatella Henderson & Hodgson, 2000 E
Ctenochiton chelyon Henderson & Hodgson, 2000 E
Ctenochiton paraviridis Henderson & Hodgson, 2000 E
Ctenochiton toru Henderson & Hodgson, 2000 E
Ctenochiton viridis Maskell, 1879 E
Epelidochiton piperis (Maskell, 1882) E
Inglisia patella Maskell, 1879 E
Kalasiris depressa (Maskell, 1884) E
Kalasiris paradepressa Henderson & Hodgson, 2000 E
Kalasiris perforata (Maskell, 1879) E
Lecanochiton actites Henderson & Hodgson, 2000 E
Lecanochiton metrosideri Maskell, 1882 E
Lecanochiton minor Maskell, 1891 E
Lecanochiton scutellaris Henderson & Hodgson, 2000 E
Parasaissetia nigra (Nietner, 1861) A
Parthenolecanium corni (Bouché, 1844) A
Parthenolecanium persicae (Fabricius, 1776) A
Plumichiton diadema Henderson & Hodgson, 2000 E
Plumichiton elaeocarpi (Maskell, 1885) E
Plumichiton flavus (Maskell, 1884) E
Plumichiton nikau Henderson & Hodgson, 2000 E
Plumichiton pollicinus Henderson & Hodgson, 2000 E
Plumichiton punctatus Henderson & Hodgson, 2000 E
Poropeza cologabata Henderson & Hodgson, 2000 E
Poropeza dacrydii (Maskell, 1892) E
Pounamococcus cuneatus Henderson & Hodgson, 2000 E
Pounamococcus tubulus Henderson & Hodgson, 2000 E
Pulvinaria floccifera (Westwood, 1870) A
Pulvinaria hydrangeae Steinweden, 1946 A
Pulvinaria mesembryanthemi (Vallot, 1829) A
Pulvinaria vitis (Linnaeus, 1758) A
Saissetia coffeae (Walker, 1852) A
Saissetia oleae (Olivier, 1791) A
Umbonichiton adelus Henderson & Hodgson, 2000 E
Umbonichiton bispinatus Henderson & Hodgson, 2005 E
Umbonichiton bullatus Henderson & Hodgson, 2000 E
Umbonichiton hymenantherae (Maskell, 1885) E
Umbonichiton jubatus Henderson & Hodgson, 2000 E
Umbonichiton pellaspis Henderson & Hodgson, 2000 E
Umbonichiton rimu Henderson & Hodgson, 2005 E
DIASPIDIDAE
Abgrallaspis cyanophylli (Signoret, 1869) A
Anoplaspis maskelli Morrison & Morrison, 1922 E
Anoplaspis metrosideri (Maskell, 1880) E
Aonidiella aurantii (Maskell, 1879) A
Aspidioides corokiae (Maskell, 1891) E
Aspidiotus nerii Bouché, 1833 A
Aulacaspis rosae (Bouché, 1833) A
Aulacaspis rosarum Borchsenius, 1958 A
Carulaspis juniperi (Bouché, 1851) A
Carulaspis minima (Signoret, 1869) A
Chionaspis angusta Green, 1904
Diaspidiotus ostreaeformis (Curtis, 1843) A
Diaspidiotus perniciosus (Comstock, 1881) A
Diaspis boisduvali Signoret, 1869 A
Eulepidosaphes pyriformis (Maskell, 1879) E
Furchadaspis zamiae (Morgan, 1890) A
Hemiberlesia lataniae (Signoret, 1869) A
Hemiberlesia rapax (Comstock, 1881) A
Kuwanaspis pseudoleucaspis (Kuwana, 1902) A
Labidaspis myersi (Green, 1929) E
Lepidosaphes beckii (Newman, 1869) A
Lepidosaphes lactea (Maskell, 1895) E
Lepidosaphes multipora (Leonardi, 1904) A
Lepidosaphes pallida (Maskell, 1895) A
Lepidosaphes pinnaeformis (Bouché, 1851) A
Lepidosaphes ulmi (Linnaeus, 1758) A
Leucaspis brittini Green, 1929 E
Leucaspis carpodeti Brittin, 1937 E
Leucaspis cordylinidis Maskell, 1893 E
Leucaspis elaeocarpi Brittin, 1937 E
Leucaspis gigas (Maskell, 1879) E
Leucaspis greeni Brittin, 1937 E
Leucaspis hoheriae Brittin, 1937 E
Leucaspis maskelli (Brittin, 1915) E
Leucaspis melicytidis Brittin, 1937 E
Leucaspis mixta de Boer, 1977 E
Leucaspis morrisi (Brittin 1915) E
Leucaspis ohakunensis Brittin, 1937 E
Leucaspis pittospori Brittin, 1937 E
Leucaspis podocarpi Green, 1929 E
Leucaspis portaeaureae Ferris, 1942 A/E?
Leucaspis senilobata Green, 1929 E
Leucaspis stricta (Maskell, 1884) E
Leucaspis n. spp. (30) 30E
Lindingaspis rossi (Maskell, 1891) A
Parlatoria desolator McKenzie, 1960 A
Parlatoria fulleri Morrison, 1939 A
Parlatoria pittospori Maskell, 1891 A
Pinnaspis aspidistrae (Signoret, 1869) A
Pinnaspis dysoxyli (Maskell, 1885) E
Poliaspis argentosis Brittin, 1915 E
Poliaspis media Maskell, 1880 E
Poliaspis n. sp. E
Poliaspoides leptocarpi (Brittin, 1916) E
Pseudaulacaspis brimblecombei Williams, 1973 A
Pseudaulacaspis cordylinidis (Maskell, 1879) E
Pseudaulacaspis epiphytidis (Maskell, 1885) E
Pseudaulacaspis eugeniae (Maskell, 1892) A
Pseudaulacaspis phymatodidis (Maskell, 1880) E
Pseudoparlatoria parlatorioides (Comstock, 1883) A
Scrupulaspis intermedia (Maskell, 1891) E
Symeria leptospermi (Maskell, 1882) E
Trullifiorinia acaciae (Maskell, 1892) A
Gen. nov. et n. sp. E
ERIOCOCCIDAE
Affeldococcus kathrinae Henderson, 2007 E
Alpinococcus elongatus Henderson, 2007 E
Bryococcus hippodamus Henderson, 2007 E
Capulinia orbiculata Hoy, 1958 E
Cryptococcus nudatus Brittin, 1915 E
Eriochiton armatus Brittin, 1915 E
Eriochiton brittini Hodgson & Henderson, 1996 E
Eriochiton deboerae Hodgson & Henderson, 1996 E
Eriochiton dracophylli Hodgson & Henderson, 1996 E
Eriochiton dugdalei Hodgson & Henderson, 1996 E
Eriochiton hispidus Maskell, 1887 E
Eriochiton hoheriae Hodgson, 1994 E
Eriochiton propespinosus Hodgson, 1994 E
Eriochiton pseudohispidus Hodgson & Henderson, 1996 E
Eriochiton spinosus (Maskell, 1879) E
Eriococcus abditus Hoy, 1962 E
Eriococcus aconeae Henderson, 2007 E
Eriococcus acutispinatus Hoy, 1962 E
Eriococcus albatus Hoy, 1962 E
Eriococcus araucariae Maskell, 1879 A
Eriococcus arcanus Hoy, 1962 E
Eriococcus argentifagi Hoy, 1962 E
Eriococcus asteliae Hoy, 1962, E
Eriococcus beilschmiediae Hoy, 1962 E
Eriococcus brittini Hoy, 1962 E
Eriococcus campbelli Hoy, 1959 A
Eriococcus cavelli (Maskell, 1890) E
Eriococcus celmisiae (Maskell, 1884) E
Eriococcus chathamensis Hoy, 1962 E
Eriococcus coccineus Cockerell, 1894 A
Eriococcus coprosmae Hoy, 1962 E
Eriococcus coriaceus Maskell, 1893 A
Eriococcus crenilobatus Hoy, 1962 E
Eriococcus dacrydii Hoy, 1962 E
Eriococcus danthoniae Maskell, 1891 E
Eriococcus detectus Hoy, 1962 E
Eriococcus elaeocarpi Hoy, 1962 E
Eriococcus elytranthae Hoy, 1962 E
Eriococcus fagicorticis Maskell, 1892 E
Eriococcus fossor (Maskell, 1884) E
Eriococcus fuligitectus Hoy, 1962 E
Eriococcus gaultheriae Hoy, 1962 E
Eriococcus hebes Hoy, 1962 E
Eriococcus hispidus Hoy, 1962 E
Eriococcus humatus Hoy, 1962 E
Eriococcus kamahi Hoy, 1958 E
Eriococcus kowhai Hoy, 1962 E
Eriococcus latilobatus Hoy, 1962 E
Eriococcus leptospermi Maskell, 1891
Eriococcus maskelli Hoy, 1962 E
Eriococcus matai Hoy, 1962 E
Eriococcus meridianus Hoy, 1962 E
Eriococcus mimus Hoy, 1962 E
Eriococcus montanus Hoy, 1962 E
Eriococcus montifagi Hoy, 1962 E
Eriococcus multispinus (Maskell, 1879) E
Eriococcus myrsinae Hoy, 1962 E
Eriococcus nelsonensis Hoy, 1962 E
Eriococcus neomyrti Hoy, 1962 E
Eriococcus nitidulus Hoy, 1962 E
Eriococcus nothofagi Hoy, 1962 E
Eriococcus orariensis Hoy, 1954 A
Eriococcus pallidus Maskell, 1885 E
Eriococcus parabilis Hoy, 1962 E
Eriococcus parsonsiae Henderson, 2006 E
Eriococcus parvulus Hoy, 1962 E
Eriococcus phyllocladi Maskell, 1892 E

Eriococcus pimeliae Hoy, 1962 E
Eriococcus podocarpi Hoy, 1962 E
Eriococcus pohutukawa Hoy, 1958 E
Eriococcus raithbyi Maskell, 1890 E
Eriococcus rata Hoy, 1958 E
Eriococcus rotundus Hoy, 1962 E
Eriococcus rubrifagi Hoy, 1962 E
Eriococcus setulosus Hoy, 1962 E
Eriococcus sophorae Green, 1929 E
Eriococcus n. spp. (4) 4E
Hoheriococcus fionae Henderson, 2006 E
Kuwanina kiwiana Henderson, 2007 E
Madarococcus cruriamplus Hoy, 1962 E
Madarococcus cunicularius Hoy, 1962 E
Madarococcus maculatus (Maskell, 1980) E
Madarococcus pulchellus (Maskell, 1890) E
Madarococcus totarae (Maskell, 1890) E
Madarococcus viridulus Hoy, 1962 E
Montanococcus graemei Henderson, 2007 E
Montanococcus petrobius Henderson, 2007 E
Montanococcus thriaticus Henderson, 2007 E
Neoeriochiton clareae Hodgson, 1994 E
Noteococcus hoheriae (Maskell, 1880) E
Phloeococcus cordylinidis Hoy, 1962 E
Phloeococcus loriceus Hoy, 1962 E
Scutare fimbriata Brittin, 1915 E
Scutare lanuginosa Hoy, 1962 E
Scutare pittospori Hoy, 1962 E
Sisyrococcus intermedius (Maskell, 1891) E
Sisyrococcus papillosus Hoy, 1962 E
Stegococcus flagellatus Henderson, 2006 E
Stegococcus oleariae Hoy, 1962 E
Tolypecoccus latebrosus Hoy, 1962 E
HALIMOCOCCIDAE
Colobopyga hedyscapes Deitz, 1979 E
MARGARODIDAE
Coelostomidia deboerae Morales, 1991 E
Coelostomidia jenniferae Morales, 1991 E
Coelostomidia montana (Green, 1929) E
Coelostomidia pilosa (Maskell, 1891) E
Coelostomidia wairoensis (Maskell, 1884) E
Coelostomidia zealandica (Maskell, 1880) E
Ultracoelostoma assimile (Maskell, 1890) E
Ultracoelostoma brittini Morales, 1991 E
Ultracoelostoma dracophylli Morales, 1991 E
Platycoelostoma compressa (Maskell, 1892) E
Icerya purchasi Maskell, 1879 A
ORTHEZIIDAE
Newsteadia caledoniensis Kozár & Konczné Benedicty, 2000
Newsteadia gullanae Kozár & Konczné Benedicty, 2000
Newsteadia myersi Green, 1929 E
PHENACOLEACHIIDAE
Phenacoleachia australis Beardsley, 1964 E
Phenacoleachia zealandica (Maskell, 1891) E
PSEUDOCOCCIDAE
Acrochordonus chionochloae Cox, 1987 E
Acrochordonus curtatus Cox, 1987 E
Agastococcus zelandiensis Cox, 1987 E
Antonina socialis Newstead, 1901 A
Asaphococcus agninus Cox, 1987 E
Asaphococcus amissus Cox, 1987 E
Asaphococcus montanus (Brittin, 1938) E
Asteliacoccus zelandigena Cox, 1987 E
Balanococcus aberrans Cox, 1987 E
Balanococcus acerbus Cox, 1987 E
Balanococcus agnostus Cox, 1987 E
Balanococcus alpigenus Cox, 1987 E
Balanococcus botulus Cox, 1987 E
Balanococcus celmisiae Cox, 1987 E
Balanococcus cockaynei (Brittin, 1915) E
Balanococcus conglobatus Cox, 1987 E
Balanococcus contextus Cox, 1987 E
Balanococcus cordylinidis (Brittin, 1938) E
Balanococcus cortaderiae Cox, 1987 E
Balanococcus danthoniae (Morrison, 1925) E
Balanococcus diminutus (Leonardi, 1918) E
Balanococcus dracophylli Cox, 1987 E
Balanococcus gahniicola Cox, 1987 E
Balanococcus mayae Cox, 1987 E
Balanococcus nelsonensis Cox, 1987 E
Balanococcus notodanthoniae Cox, 1987 E
Balanococcus poae (Maskell, 1879) E
Balanococcus sexaspinus (Brittin, 1915) E
Balanococcus tunakinensis Cox, 1987 E
Balanococcus turriseta Cox, 1987 E
Balanococcus wisei (Williams & de Boer, 1973) E
Chorizococcus oreophilus Williams, 1985 A
Chryseococcus arecae (Maskell, 1890) A
Chryseococcus longispinus (Beardsley, 1964) E
Crisicoccus australis Cox, 1987 E
Crisicoccus comatus Cox, 1987 E
Crisicoccus indigenus Cox, 1987 E
Crisicoccus tokaanuensis Cox, 1987 E
Crocydococcus cottieri (Brittin, 1938) E
Cyphonococcus alpinus (Maskell, 1884) E
Cyphonococcus furvus Cox, 1987 E
Cyphonococcus iceryoides (Maskell, 1892) E
Dysmicoccus ambiguus (Morrison, 1925) E
Dysmicoccus arcanus Cox, 1987 E
Dysmicoccus celmisicola (Cox, 1987) E
Dysmicoccus delitescens Cox, 1987 E
Dysmicoccus formicicola (Maskell, 1892) E
Dysmicoccus ornatus Cox, 1987 E
Dysmicoccus rupestris Cox, 1987 E
Dysmicoccus viticis (Green, 1929) E
Eurycoccus antiscius Williams, 1985 A
Laminicoccus asteliae Cox, 1987 E
Laminicoccus eastopi Cox, 1987 E
Laminicoccus flandersi Williams, 1985 A
Maskellococcus nothofagi Cox, 1987 E
Maskellococcus obtectus (Maskell, 1890) E
Nipaecoccus aurilanatus (Maskell, 1890) A
Paracoccus abnormalis Cox, 1987 E
Paracoccus acaenae Cox, 1987 E
Paracoccus albatus Cox, 1987 E
Paracoccus aspratilis Cox, 1987 E
Paracoccus butcherae Cox, 1987 E
Paracoccus canalis (Brittin, 1938) E
Paracoccus cavaticus Cox, 1987 E
Paracoccus coriariae (Brittin, 1938) E
Paracoccus cryptus Cox, 1987 E
Paracoccus deboerae Cox, 1987 E
Paracoccus deceptus Cox, 1987 E
Paracoccus definitus Cox, 1987 E
Paracoccus drimydis (Brittin, 1938) E
Paracoccus glaucus (Maskell, 1879) E
Paracoccus hebes Cox, 1987 E
Paracoccus insolitus (Brittin, 1938) E
Paracoccus leptospermi Cox, 1987 E
Paracoccus longicauda Cox, 1987 E
Paracoccus miro (de Boer, 1967) E
Paracoccus multiductus Cox, 1987 E
Paracoccus nothofagicola Cox, 1987 E
Paracoccus parvicirculus Cox, 1987 E
Paracoccus podocarpi Cox, 1987 E
Paracoccus redactus Cox, 1987 E
Paracoccus zealandicus (Ezzat & McConnell, 1956) E
Paraferrisia podocarpi (Brittin, 1938) E
Phenacoccus graminicola Leonardi, 1908 A
Planococcus dubius Cox, 1987 E
Planococcus mali Ezzat & McConnell, 1956 A
Pseudococcus calceolariae (Maskell, 1879) A
Pseudococcus hypergaeus Williams, 1985 A
Pseudococcus longispinus (Targioni Tozzetti, 1867) A
Pseudococcus viburni (Signoret, 1875) A
Pseudococcus zelandicus Cox, 1987 E
Rastrococcus asteliae (Maskell, 1884) E
Rastrococcus namartini Williams & Henderson, 2005 E
Renicaula chionochloae (de Boer, 1968) E
Renicaula junci (de Boer, 1968) E
Renicaula pauca Cox, 1987 E
Renicaula raouliae (de Boer, 1968) E
Rhizoecus cacticans (Hambleton, 1946) A
Rhizoecus californicus Ferris, 1953 A
Rhizoecus deboerae Hambleton, 1974 E
Rhizoecus dianthi Green, 1926 A
Rhizoecus falcifer Künckel d'Herculais, 1878 A
Rhizoecus graminis Hambleton, 1946 A
Rhizoecus oliveri Cox, 1978 E
Rhizoecus puhiensis Hambleton, 1974 E
Rhizoecus rumicis Maskell, 1892 A
Sarococcus comis Cox, 1987 E
Sarococcus deplanatus Cox, 1987 E
Sarococcus fagi (Maskell, 1891) E
Sarococcus undatus Cox, 1987 E
Spilococcus geoffreyi Cox, 1987 E
Spilococcus mamillariae (Bouché, 1844) A
Ventrispina crebrispina Cox, 1987 E
Ventrispina dugdalei Cox, 1987 E
Ventrispina otagoensis (Brittin, 1938) E
Vryburgia amaryllidis (Bouché, 1837) A

Suborder AUCHENORRHYNCHA
[Compiled by M.-C. Larivière & M. J. Fletcher]
Infraorder CICADOMORPHA
CICADOIDEA
CICADIDAE
Amphipsalta cingulata (Fabricius, 1775) E
Amphipsalta strepitans (Kirkaldy, 1909) E
Amphipsalta zelandica (Boisduval, 1835) E
Kikihia angusta (Walker, 1850) E
Kikihia cauta (Myers, 1921) E
Kikihia cutora cumberi Fleming, 1973 E
Kikihia c. cutora (Walker, 1850) E
Kikihia c. exulis (Hudson, 1950) E K
Kikihia dugdalei Fleming, 1984 E
Kikihia horologium Fleming, 1984 E
Kikihia laneorum Fleming, 1984 E
Kikihia longula (Hudson, 1950) E
Kikihia muta muta (Fabricius, 1775) E
Kikihia m. pallida (Hudson, 1950) E
Kikihia ochrina (Walker, 1858) E
Kikihia paxillulae Fleming, 1984 E
Kikihia rosea (Walker, 1850) E
Kikihia scutellaris (Walker, 1850) E
Kikihia subalpina (Hudson, 1891) E
Maoricicada alticola Dugdale & Fleming, 1978 E
Maoricicada campbelli (Myers, 1923) E
Maoricicada cassiope (Hudson, 1891) E
Maoricicada clamitans Dugdale & Fleming, 1978 E
Maoricicada hamiltoni (Myers, 1926) E
Maoricicada iolanthe (Hudson, 1891) E
Maoricicada lindsayi (Myers, 1923) E
Maoricicada mangu celer Dugdale & Fleming, 1978 E
Maoricicada m. gourlayi Dugdale & Fleming, 1978 E
Maoricicada m. mangu (White, 1879) E
Maoricicada m. multicostata Dugdale & Fleming, 1978 E
Maoricicada myersi (Fleming, 1971) E
Maoricicada nigra frigida Dugdale & Fleming, 1978 E
Maoricicada n. nigra (Myers, 1921) E
Maoricicada oromelaena (Myers, 1926) E
Maoricicada otagoensis maceweni Dugdale & Fleming, 1978 E
Maoricicada o. otagoensis Dugdale & Fleming, 1978 E
Maoricicada phaeoptera Dugdale & Fleming, 1978 E
Maoricicada tenuis Dugdale & Fleming, 1978 E
Notopsalta sericea (Walker, 1850) E
Rhodopsalta cruentata (Fabricius, 1775) E
Rhodopsalta leptomera (Myers, 1921) E
Rhodopsalta microdora (Hudson, 1936) E
CERCOPOIDEA

APHROPHORIDAE
Basilioterpa bullata Hamilton & Morales, 1992
Bathyllus albicinctus (Erichson, 1842) A
Carystoterpa aurata Hamilton & Morales, 1992 E
Carystoterpa chelyon Hamilton & Morales, 1992 E
Carystoterpa fingens (Walker, 1851) E
Carystoterpa ikana Hamilton & Morales, 1992 E
Carystoterpa maori Hamilton & Morales, 1992 E
Carystoterpa minima Hamilton & Morales, 1992 E
Carystoterpa minor Hamilton & Morales, 1992 E
Carystoterpa subtacta (Walker, 1858) K
Carystoterpa subvirescens (Butler, 1874) E
Carystoterpa trimaculata (Butler, 1874) E
Carystoterpa tristis (Alfken, 1904) E
Carystoterpa vagans Hamilton & Morales, 1992 E
Philaenus spumarius (Linnaeus, 1758) A
Pseudaphronella jactator (White, 1879) E
MEMBRACOIDEA
CICADELLIDAE
Anzygina agni (Knight, 1976) E
Anzygina barrattae Fletcher & Larivière, 2009 E
Anzygina dumbletoni (Ghauri, 1963) E
Anzygina ramsayi (Knight, 1976) E
Anzygina toetoe (Cumber, 1952) E
Anzygina zealandica (Myers, 1923)
Arahura dentata Knight, 1975 E
Arahura gourlayi Knight, 1975 E
Arahura reticulata Knight, 1975 E
Arawa dugdalei Knight, 1975 E
Arawa negata (White, 1879) E
Arawa novella (Metcalf, 1968)
Arawa pulchra Knight, 1975
Arawa variegata Knight, 1975 E
Balclutha incisa (Matsumura, 1902) A?
Balclutha lucida (Butler, 1877) A? K
Balclutha viridinervis Matsumura, 1914 A? K
Batracomorphus adventitiosus Evans, 1966
Batracomorphus angustatus (Osborn, 1934)
Batracomorphus punctatus Evans, 1940
Edwardsiana froggatti (Baker, 1925) A
Edwardsiana lethierryi (Edwards, 1881) A
Euacanthella palustris Evans, 1938 A
Eupteryx melissae Curtis, 1837 A
Exitianus plebeius (Kirkaldy, 1906) K
Horouta inconstans Knight, 1975 E
Idiocerus distinguendus Kirschbaum, 1868 A
Kybos lindbergi (Linnavuori, 1951) A
Kybos smaragdula (Fallén, 1806) A
Limotettix awae (Myers, 1924) E
Limotettix harrisi Knight, 1975 E
Limotettix pallidus Knight, 1975 E
Limotettix pullatus (Evans, 1942)
Macrosteles fieberi (Edwards, 1889) A
Maiestas knighti Webb & Viraktamath, 2009
Maiestas samuelsoni (Knight, 1976) K
Maiestas vetus (Knight, 1975)
Matatua maorica (Myers, 1923) E
Matatua montivaga Knight, 1976 E
Nesoclutha phryne (Kirkaldy, 1907)
Novolopa falcata Knight, 1973 E
Novolopa infula Knight, 1973 E
Novolopa kuscheli Knight, 1973 E
Novolopa maculata Knight, 1973 E
Novolopa montivaga Knight, 1973 E
Novolopa townsendi Evans, 1966 E
Novothymbris cassiniae (Myers, 1923) E
Novothymbris castor Knight, 1974 E
Novothymbris cithara Knight, 1974 E
Novothymbris extremitatis Knight, 1974 E
Novothymbris eylesi Knight, 1974 E
Novothymbris hinemoa (Myers, 1923) E
Novothymbris maorica (Myers, 1923) E
Novothymbris notata Knight, 1974 E
Novothymbris notialis Knight, 1974 E
Novothymbris peregrina Knight, 1974 E
Novothymbris pollux Knight, 1974 E
Novothymbris punctata Knight, 1974 E
Novothymbris solitaria Knight, 1974 E
Novothymbris tararua (Myers, 1923) E
Novothymbris vagans Knight, 1974 E
Novothymbris zealandica (Myers, 1923) E
Orosius argentatus (Evans, 1938) A K
Paracephaleus curtus Knight, 1973 E
Paracephaleus hudsoni (Myers, 1923) E
Paradorydium aculeatum Knight, 1973 E
Paradorydium cuspis Knight, 1973 E
Paradorydium gourlayi Evans, 1966 E
Paradorydium insulare Evans, 1966 E
Paradorydium philpotti Myers, 1923 E
Paradorydium sertum Knight, 1973 E
Paradorydium stewartensis Evans, 1966
Paradorydium watti Knight, 1973 E
Paradorydium westwoodi (White, 1879) E
Rhytidodus decimaquartus (Schrank, 1776) A
Ribautiana tenerrima (Herrich-Schäffer, 1834) A
Scaphetus brunneus Evans, 1966 E
Scaphetus simus Knight, 1975 E
Xestocephalus ovalis Evans, 1966 E
Zelopsis nothofagi Evans, 1966 E
MEMBRACIDAE A
Acanthucus trispinifer (Fairmaire, 1846) A
MYERSLOPIIDAE
Myerslopia magna amplificata Knight, 1973 E
Myerslopia m. magna Evans, 1947 E
Myerslopia m. scabrata Knight, 1973 E
Myerslopia rakiuraensis Szwedo, 2004 E
Myerslopia tawhai Szwedo, 2004 E
Myerslopia tearohai Szwedo, 2004 E
Myerslopia triregia Knight, 1973 E
Myerslopia whakatipuensis Szwedo, 2004 E
Penmation asperum asperum (Knight, 1973) E
Penmation a. cognatum (Knight, 1973) E
Penmation bifurca (Knight, 1973) E
Penmation insulare (Knight, 1973) E
Penmation montis (Knight, 1973) E
Penmation parvum (Evans, 1947) E
Penmation simile (Knight, 1973) E
Penmation terrestre (Knight, 1973) E
Penmation townsendi (Knight, 1973) E
Penmation variabile austrinum (Knight, 1973) E
Penmation v. variabile (Knight, 1973) E
Penmation verrucosum (Knight, 1973) E

Infraorder FULGOROMORPHA
ACHILIDAE
Achilus flammeus Kirby, 1818 A
Agandecca annectens White, 1879 E
CIXIIDAE
Aka dunedinensis Larivière, 1999 E
Aka duniana (Myers, 1924) E
Aka finitima (Walker, 1858) E
Aka rhodeae Larivère, 1999 E
Aka westlandica Larivière, 1999 E
Cermada aspilus Walker, 1858
Cermada inexspectata (Larivière, 1999) E
Cermada kermadecensis (Myers, 1924) E K
Cermada punctimargo (Walker, 1858) E
Cermada triregia (Larivère, 1999) E
Chathamaka andrei Larivière, 1999 E
Confuga persephone Fennah, 1975 E
Huttia nigrifrons Myers, 1924 E
Huttia northlandica Larivière, 1999 E
Koroana arthuria Myers, 1924 E
Koroana helena Myers, 1924
Koroana lanceloti Larivière, 1997 E
Koroana rufifrons (Walker, 1858) E
Malpha cockcrofti Myers, 1924 E
Malpha iris Myers, 1924
Malpha muiri Myers, 1924 E
Parasemo hutchesoni Larivière, 1999 E
Semo clypeatus White, 1879 E
Semo harrisi (Myers, 1924) E
Semo southlandiae Larivière & Hoch, 1998 E
Semo transinsularis Larivière & Hoch, 1998 E
Tiriteana clarkei Myers, 1924 E
Zeoliarus atkinsoni (Myers, 1924) E
Zeoliarus oppositus (Walker, 1850) E
DELPHACIDAE
Anchodelphax hagnon Fennah, 1965 E
Anchodelphax olenus Fennah, 1965 E
Eorissa cicatrifrons Fennah, 1965 E
Nilaparvata myersi Muir, 1923 E
Notogryps ithoma Fennah, 1965 E
Notogryps melanthus Fennah, 1965 E
Notohyus erosus Fennah, 1965 E
Opiconsiva dilpa (Kirkaldy, 1907) native?
Sardia rostrata pluto (Kirkaldy, 1906) K
Sulix insecutor Fennah, 1965 E
Sulix miridianalis (Muir, 1917) E
Sulix tasmani (Muir, 1923) E
Sulix vetranio Fennah, 1965 E
Toya dryope (Kirkaldy, 1907) A
Ugyops (*Paracona*) *pelorus* Fennah, 1965 E
Ugyops (*P.*) *raouli* (Muir, 1923) E K
Ugyops (*Ugyops*) *caelatus* (White, 1879) E
Ugyops (*U.*) *rhadamanthus* Fennah, 1965 E
DERBIDAE
Eocenchrea maorica (Kirkaldy, 1909) E
DICTYOPHARIDAE
Thanatodictya (*Niculda*) *tillyardi* Myers, 1923 E
FLATIDAE A
Anzora unicolor (Walker, 1862) A
Siphanta acuta (Walker, 1851) A
RICANIIDAE A
Scolypopa australis (Walker, 1851) A

Suborder COLEORRHYNCHA
[Compiled by M.-C. Larivière & D. Burckhardt]
PELORIDIIDAE
Oiophysa ablusa Drake & Salmon, 1950 E
Oiophysa cumberi Woodward, 1958 E
Oiophysa distincta Woodward, 1952 E
Oiophysa paradoxa Burckhardt, 2009 E
Oiophysa pendergrasti Woodward, 1956 E
Xenophyes cascus Bergroth, 1924 E
Xenophyes kinlochensis Evans, 1981 E
Xenophysella greensladeae Burckhardt, 2009 E
Xenophysella stewartensis (Woodward, 1952) E

Suborder HETEROPTERA
[Compiled by M.-C. Larivière]
Infraorder ENICOCEPHALOMORPHA
AENICTOPECHEIDAE
Aenictocoris powelli Woodward, 1956 E
Maoristolus parvulus Woodward, 1956 E
Maoristolus tonnoiri (Bergroth, 1927) E
Nymphocoris maoricus Woodward, 1956 E
ENICOCEPHALIDAE
Gourlayocoris mirabilis (Gourlay, 1952) E
Phthirostenus magnus (Woodward, 1956) E
Systellodores maclachlani (Kirkaldy, 1901) E
Systellodores notialis Woodward, 1956 E

Infraorder DIPSOCOROMORPHA
CERATOCOMBIDAE
Ceratocombus aotearoae Larivière & Larochelle, 2004 E
Ceratocombus novaezelandiae Larivière & Larochelle, 2004 E
SCHIZOPTERIDAE
Hypselosoma acantheen Hill, 1991 E

Infraorder GERROMORPHA
GERRIDAE
Halobates sericeus Eschscholtz, 1822 SW

HYDROMETRIDAE
Hydrometra strigosa (Skuse, 1893) F
MESOVELIIDAE
Mesovelia hackeri Harris & Drake, 1941 A F
Mniovelia kuscheli Andersen & Polhemus, 1980 E
VELIIDAE
Microvelia macgregori (Kirkaldy, 1899) E F

Infraorder NEPOMORPHA
CORIXIDAE
Diaprepocoris zealandiae Hale, 1924 E F
Sigara (Tropocorixa) arguta (White, 1878) E F
Sigara (T.) infrequens Young, 1962 E F
Sigara (T.) potamius Young, 1962 E F
Sigara (T.) uruana Young, 1962 E F
NOTONECTIDAE
Anisops assimilis White, 1878 E F
Anisops wakefieldi White, 1878 E F

Infraorder LEPTOPODOMORPHA
SALDIDAE
Saldula australis (White, 1876) E
Saldula butleri (White, 1878) E
Saldula laelaps (White, 1878) E
Saldula maculipennis Cobben, 1961 E
Saldula parvula Cobben, 1961 E
Saldula stoneri Drake & Hoberlandt, 1950 E
Saldula trivialis Cobben, 1961 E

Infraorder CIMICOMORPHA
ANTHOCORIDAE
Buchananiella whitei (Reuter, 1884) E
Cardiastethus brounianus White, 1878 E
Cardiastethus consors White, 1879 E
Cardiastethus poweri White, 1879 E
Lyctocoris (Lyctocoris) campestris (Fabricius, 1794) A
Maoricoris benefactor China, 1933 E
Orius (Heterorius) vicinus (Ribaut, 1923) A
Xylocoris (Proxylocoris) galactinus (Fieber, 1836) A
CANTACADERIDAE
Carldrakeana socia (Drake & Ruhoff, 1961)
Cyperobia carectorum Bergroth, 1927 E
CIMICIDAE A
Cimex lectularius Linnaeus, 1758 A
MIRIDAE
Anexochus crassicornis Eyles, 2001 E
Basileobius gilviceps Eyles & Schuh, 2003 E
Bipuncticoris cassinianus Eyles & Carvalho, 1995 E
Bipuncticoris chlorus Eyles & Carvalho, 1995 E
Bipuncticoris convexus Eyles & Carvalho, 1995 E
Bipuncticoris gurri Eyles & Carvalho, 1995 E
Bipuncticoris irroratus Eyles & Carvalho, 1995 E
Bipuncticoris lineatus Eyles & Carvalho, 1995 E
Bipuncticoris longicerus Eyles & Carvalho, 1995 E
Bipuncticoris minor Eyles & Carvalho, 1995 E
Bipuncticoris olearinus Eyles & Carvalho, 1995 E
Bipuncticoris planus Eyles & Carvalho, 1995 E
Bipuncticoris robustus Eyles & Carvalho, 1995 E
Bipuncticoris triplex Eyles & Carvalho, 1995 E
Bipuncticoris vescus Eyles & Carvalho, 1995 E
Bipuncticoris xestus Eyles & Carvalho, 1995 E
Campylomma novocaledonica Schuh, 1984 A
Chaetedus longiceps Eyles, 1975
Chaetedus plumalis Eyles, 1975
Chaetedus reuterianus (White, 1878) E
Chinamiris acutospinosus Eyles & Carvalho, 1991 E
Chinamiris aurantiacus Eyles & Carvalho, 1991 E
Chinamiris brachycerus Eyles & Carvalho, 1991 E
Chinamiris citrinus Eyles & Carvalho, 1991 E
Chinamiris cumberi Eyles & Carvalho, 1991 E
Chinamiris daviesi Eyles & Carvalho, 1991 E
Chinamiris dracophylloides Eyles & Carvalho, 1991 E
Chinamiris elongatus Eyles & Carvalho, 1991 E
Chinamiris fascinans Eyles & Carvalho, 1991 E
Chinamiris guttatus Eyles & Carvalho, 1991 E
Chinamiris hamus Eyles & Carvalho, 1991 E
Chinamiris indeclivis Eyles & Carvalho, 1991 E
Chinamiris juvans Eyles & Carvalho, 1991 E
Chinamiris laticinctus (Walker, 1873) E
Chinamiris marmoratus Eyles & Carvalho, 1991 E
Chinamiris minutus Eyles & Carvalho, 1991 E
Chinamiris muehlenbeckiae Woodward, 1950 E
Chinamiris niculatus Eyles & Carvalho, 1991 E
Chinamiris nigrifrons Eyles & Carvalho, 1991 E
Chinamiris opacus Eyles & Carvalho, 1991 E
Chinamiris ovatus Eyles & Carvalho, 1991 E
Chinamiris punctatus Eyles & Carvalho, 1991 E
Chinamiris quadratus Eyles & Carvalho, 1991 E
Chinamiris rufescens Eyles & Carvalho, 1991 E
Chinamiris secundus Eyles & Carvalho, 1991 E
Chinamiris testaceus Eyles & Carvalho, 1991 E
Chinamiris unicolor Eyles & Carvalho, 1991 E
Chinamiris virescens Eyles & Carvalho, 1991 E
Chinamiris viridicans Eyles & Carvalho, 1991 E
Chinamiris whakapapae Eyles & Carvalho, 1991 E
Chinamiris zygotus Eyles & Carvalho, 1991 E
Closterotomus norwegicus (Gmelin, 1790) A
Coridromius chenopoderis Tatarnic & Cassis, 2008 A
Cyrtodiridius aurantiacus Eyles & Schih, 2003 E
Cyrtorhinus cumberi Woodward, 1950 E
Deraeocoris maoricus Woodward, 1950 E
Diomocoris fasciatus Eyles, 2000 E
Diomocoris granosus Eyles, 2000 E
Diomocoris maoricus (Walker, 1873) E
Diomocoris ostiolum Eyles, 2000 E
Diomocoris punctatus Eyles, 2000 E
Diomocoris raoulensis Eyles, 2000 E K
Diomocoris russatus Eyles, 2000 E
Diomocoris sexcoloratus Eyles, 2000 E
Diomocoris woodwardi Eyles, 2000 E
Engytatus nicotianae (Koningsberger, 1903) A
Felisacus elegantulus (Reuter, 1904)
Halormus velifer Eyles & Schuh, 2003 E
Halticus minutus Reuter, 1885 A
Josemiris carvalhoi Eyles, 1996 E
Kiwimiris bipunctatus Eyles & Carvalho, 1995 E
Kiwimiris coloratus Eyles & Carvalho, 1995 E
Kiwimiris concavus Eyles & Carvalho, 1995 E
Kiwimiris melanocerus Eyles & Carvalho, 1995 E
Kiwimiris niger Eyles & Carvalho, 1995 E
Lincolnia lucernina Eyles & Carvalho, 1988 E
Lopus decolor (Fallén, 1807) A
Macrolophus pygmaeus (Rambur, 1839) A
Maoriphylina dimorpha Cassis & Eyles, 2006 E
Mecenopa albiapex Eyles & Schuh, 2003 E
Megaloceroea recticornis (Geoffroy, 1785) A
Monopharsus annulatus Eyles & Carvalho, 1995 E
Monospatha distincta Eyles & Schuh, 2003 E
Peritropis aotearoae Gorczyca & Eyles, 1997 E
Pimeleocoris luteus Eyles & Schuh, 2003 E
Pimeleocoris roseus Eyles & Schuh, 2003 E
Pimeleocoris viridis Eyles & Schuh, 2003 E
Poecilomiris longirostris Eyles, 2006 E
Poecilomiris planus Eyles, 2006 E
Polyozus galbanus Eyles & Schuh, 2003 E
Reuda mayri White, 1878 E
Romna albata Eyles & Carvalho, 1988 E
Romna bicolor Eyles & Carvalho, 1988 E
Romna capsoides (White, 1878) E
Romna cuneata Eyles & Carvalho, 1988 E
Romna nigrovenosa Eyles & Carvalho, 1988 E
Romna oculata Eyles & Carvalho, 1988 E
Romna ornata Eyles & Carvalho, 1988 E
Romna pallescens Eyles, 2006 E
Romna pallida Eyles & Carvalho, 1988 E
Romna rubisura Eyles, 2006 E
Romna scotti (White, 1878) E
Romna tenera Eyles, 1998 E
Romna uniformis Eyles & Carvalho, 1988 E
Romna variegata Eyles & Carvalho, 1988 E
Sejanus albisignatus (Knight, 1938)
Sidnia kinbergi (Stål, 1859) A
Stenotus binotatus (Fabricius, 1794) A
Sthenarus myersi Woodward, 1950 E
Taylorilygus apicalis (Fieber, 1861) A
Tinginotum minutum Eyles, 2000
Trigonotylus tenuis Reuter, 1893 A
Tuicoris excelsus Eyles & Carvalho, 1995 E
Tuicoris lipurus Eyles, 2001 E
Tytthus chinensis (Stål, 1859) A
Wekamiris auropilosus Eyles & Carvalho, 1995 E
Xiphoides badius Eyles & Schuh, 2003 E
Xiphoides luteolus Eyles & Schuh, 2003 E
Xiphoides multicolor Eyles & Schuh, 2003 E
Xiphoides myersi (Woodward, 1950) E
Xiphoides regis Eyles & Schuh, 2003 E
Xiphoides vacans Eyles & Schuh, 2003 E
NABIDAE
Alloeorhynchus (*Alloeorhynchus*) *myersi* Bergroth, 1927 E
Nabis (*Australonabis*) *biformis* (Bergroth, 1927)
Nabis (*Tropiconabis*) *kinbergii* Reuter, 1872 A
Nabis (*T.*) *maoricus* Walker, 1873 E
REDUVIIDAE
Empicoris aculeatus (Bergroth, 1927) E
Empicoris angulipennis (Bergroth, 1926) E
Empicoris rubromaculatus (Blackburn, 1888)
Empicoris seorsus (Bergroth, 1927) E
Ploiaria antipodum (Bergroth, 1927) E
Ploiaria chilensis (Philippi, 1862)
Stenolemus fraterculus Wygodzinsky, 1956 A
TINGIDAE
Stephanitis rhododendri Horváth, 1905 A
Tanybyrsa cumberi Drake, 1959 E

Infraorder PENTATOMOMORPHA
ACANTHOSOMATIDAE
Oncacontias vittatus (Fabricius, 1781) E
Rhopalimorpha (Lentimorpha) alpina Woodward, 1953 E
Rhopalimorpha (Rhopalimorpha) lineolaris Pendergrast, 1950 E
Rhopalimorpha obscura Dallas, 1851 E
ARADIDAE
Acaraptera myersi Usinger & Matsuda, 1959 E
Acaraptera waipouensis Heiss, 1990 E
Adenocoris brachypterus Usinger & Matsuda, 1959 E
Adenocoris spiniventris Usinger & Matsuda, 1959 E
Aneuraptera cimiciformis Usinger & Matsuda, 1959 E
Aneurus (*Aneurodellus*) *brevipennis* Heiss, 1998 E
Aneurus (*A.*) *brouni* White, 1876 E
Aneurus (*A.*) *maoricus* Heiss, 1998 E
Aneurus (*A.*) *prominens* Pendergrast, 1965 E
Aneurus (*A.*) *salmoni* Pendergrast, 1965 E
Aneurus (*A.*) *zealandensis* Heiss, 1998 E
Aradus australis Erichson, 1842
Calisius zealandicus Pendergast, 1968 E
Carventaptera spinifera Usinger & Matsuda, 1959 E
Chinamyersia cinerea (Myers & China, 1928) E
Chinamyersia viridis (Myers & China, 1928) E
Clavaptera ornata Kirman, 1985 E
Ctenoneurus hochstetteri (Mayr, 1866) E
Ctenoneurus myersi Kormilev, 1953 E
Ctenoneurus pendergrasti Kormilev, 1971 E
Ctenoneurus setosus Lee & Pendergrast, 1977 E
Isodermus crassicornis Usinger & Matsuda, 1959 E
Isodermus maculosus Pendergrast, 1965 E
Isodermus tenuicornis Usinger & Matsuda, 1959 E
Leuraptera yakasi Heiss, 1990 E
Leuraptera zealandica Usinger & Matsuda, 1959 E
Lissaptera completa (Usinger & Matsuda, 1959) E
Mesadenocoris robustus Kirman, 1985 E
Modicarventus wisei Kirman, 1989 E
Neadenocoris abdominalis Usinger & Matsuda, 1959 E
Neadenocoris acutus Usinger & Matsuda, 1959 E
Neadenocoris glaber Usinger & Matsuda, 1959 E

Neadenocoris ovatus Usinger & Matsuda, 1959 E
Neadenocoris reflexus Usinger & Matsuda, 1959 E
Neadenocoris spinicornis Usinger & Matsuda, 1959 E
Neocarventus angulatus Usinger & Matsuda, 1959 E
Neocarventus uncus Kirman, 1989 E
Tretocoris grandis Usinger & Matsuda, 1959 E
Woodwardiessa quadrata Usinger & Matsuda, 1959 E
ARTHENEIDAE
Nothochromus maoricus Slater, Woodward & Sweet, 1962 E
BERYTIDAE
Bezu wakefieldi (White, 1878) E
COREIDAE A
Acantholybas brunneus (Breddin, 1900) A
CYDNIDAE
Chilocoris neozealandicus Larivière & Froeschner, 1994 E
Cydnochoerus nigrosignatus (White, 1878) E
Macroscytus australis (Erichson, 1842)
Microporus thoreyi (Signoret, 1882) A
CYMIDAE
Cymus novaezelandiae Woodward, 1954
HETEROGASTRIDAE A
Heterogaster urticae (Fabricius, 1775) A
LYGAEIDAE
Arocatus rusticus (Stål, 1867) A
Lepiorsillus tekapoensis Malipatil, 1979 E
Nysius convexus (Usinger, 1942) E
Nysius huttoni White, 1878
Nysius liliputanus Eyles & Ashlock, 1969 E
Rhypodes anceps (White, 1878) E
Rhypodes argenteus Eyles, 1990 E
Rhypodes atricornis Eyles, 1990 E
Rhypodes brachypterus Eyles, 1990 E
Rhypodes brevifissas Eyles, 1990 E
Rhypodes brevispilis Eyles, 1990 E
Rhypodes bucculentus Eyles, 1990 E
Rhypodes celmisiae Eyles, 1990 E
Rhypodes chinai Usinger, 1942 E
Rhypodes clavicornis (Fabricius, 1794) E
Rhypodes cognatus Eyles, 1990 E
Rhypodes crinitus Eyles, 1990 E
Rhypodes depilis Eyles, 1990 E
Rhypodes eminens Eyles, 1990 E
Rhypodes gracilis Eyles, 1990 E
Rhypodes hirsutus Eyles, 1990 E
Rhypodes jugatus Eyles, 1990 E
Rhypodes koebelei Eyles, 1990 E
Rhypodes longiceps Eyles, 1990 E
Rhypodes longirostris Eyles, 1990 E
Rhypodes myersi Usinger, 1942 E
Rhypodes rupestris Eyles, 1990 E
Rhypodes russatus Eyles, 1990 E
Rhypodes sericatus Usinger, 1942 E
Rhypodes spadix Eyles, 1990 E
Rhypodes stewartensis Usinger, 1942 E
Rhypodes townsendi Eyles, 1990 E
Rhypodes triangulus Eyles, 1990 E
ORSILLIDAE
Nysius caledoniae Distant, 1920 A
PENTATOMIDAE
Cermatulus nasalis hudsoni Woodward, 1953 E
Cermatulus n. nasalis (Westwood, 1837)
Cermatulus n. turbotti Woodward, 1950 E
Cuspicona simplex Walker, 1867 A
Dictyotus caenosus (Westwood, 1837)
Glaucias amyoti (Dallas, 1851)
Hypsithocus hudsonae Bergroth, 1927 E
Monteithiella humeralis (Walker, 1868) A
Nezara viridula (Linnaeus, 1758) A
Oechalia schellenbergii (Guérin, 1831)
RHYPAROCHROMIDAE
Brentiscerus putoni (White, 1878) E
Dieuches notatus (Dallas, 1852) A
Forsterocoris bisinuatus Woodward, 1953 E
Forsterocoris salmoni (Woodward, 1953) E
Forsterocoris sinuatus Woodward, 1953 E
Forsterocoris stewartensis Malipatil, 1977 E
Geratarma eylesi Malipatil, 1977 E
Geratarma manapourensis Malipatil, 1977 E
Grossander major (Gross, 1965) A
Horridipamera robusta Malipatil, 1978 A
Margareta dominica White, 1878 E
Metagerra angusta Eyles, 1967 E
Metagerra helmsi (Reuter, 1890) E
Metagerra kaikourica Eyles, 1967 E
Metagerra obscura White, 1878 E
Metagerra truncata Malipatil, 1976 E
Millerocoris conus (Eyles, 1967) E
Millerocoris ductus Eyles, 1967 E
Paradrymus exilirostris Bergroth, 1916 A
Paramyocara iridescens Woodward & Malipatil, 1977
Paratruncala insularis (Woodward, 1953) E
Plinthisus (*Locutius*) *woodwardi* Slater & Sweet, 1977 A
Regatarma forsteri Woodward, 1953 E
Remaudiereana inornata (Walker, 1872)
Remaudiereana nigriceps (Dallas, 1852)
Stizocephalus brevirostris Eyles, 1970
Targarema electa White, 1878 E
Targarema stali White, 1878 E
Tomocoris ornatus (Woodward, 1953) E
Tomocoris truncatus Woodward, 1953 E
Truncala hirsuta Woodward, 1953 E
Truncala hirta Woodward, 1953 E
Truncala insularis Malipatil, 1977 E
Truncala sulcata Woodward, 1953 E
Trypetocoris aucklandensis Woodward, 1953 E
Trypetocoris rudis Woodward, 1953 E
Trypetocoris separatus Woodward, 1953 E
Udeocoris levis Eyles, 1971 E
Woodwardiana evagorata (Woodward, 1953) E
Woodwardiana nelsonensis (Woodward, 1953) E
Woodwardiana notialis (Woodward, 1953) E
Woodwardiana paparia Malipatil, 1977 E

Order THYSANOPTERA
[Compiled by R. P. Macfarlane]
Suborder TEREBRANTIA
AEOLOTHRIPIDAE
Aeolothrips fasciatus (Linnaeus, 1758) A Cr Ga Gr O Ci
Aeolothrips melaleucus Haliday, 1852 A Fo Cm
Desmidothrips walkerae Mound, 1977 E Sh Ci
MEROTHRIPIDAE A
Merothrips brunneus Hood, 1912 A Fo Nb Li Tw
Merothrips floridensis Watson, 1927 A Fo Nb Lc Li Tw
THRIPIDAE
Adelphithrips cassinae Mound & Palmer, 1980 E Sh Hf
Adelphithrips dolus Mound & Walker, 1982 E Su Sh Hf
Adelphithrips nothofagi Mound & Palmer, 1980 E Fo Hf
Adelphithrips sp. E Fo Hf
Anaphothrips dubius (Girault, 1926) A Ga Hl
Anaphothrips obscurus (Müller, 1776) A Cr Hl
Anaphothrips varii Moulton, 1935 A Gr H
Anaphothrips woodi Pitkin, 1978 A Gr Al
Anaphothrips zealandicus Mound, 1978 E Gr Al Be We
Anaphrygmothrips otagensis Mound & Walker, 1982 E Sa
Apterothrips apteris (Daniel, 1904) A Gr We Sh Ga Hl
Aptinothrips rufus (Haliday, 1836) A Gr Hl
Aptinothrips stylifer Trybom, 1894 A Gr Hl
Ceratothrips ericae (Haliday, 1836) A Sh H
Chirothrips manicatus (Haliday, 1836) A Gr Hf
Dichromothrips spiranthidis (Bagnall, 1926) E Gr H
Dikrothrips diphyes Mound & Walker, 1982 E Fo
Frankliniella intonsa (Trybom, 1895) A Cr Ga H
Frankliniella occidentalis (Fergande, 1895) A Or Sh Hf
Heliothrips haemorrhoidalis (Bouche, 1833) A Cr Sh Hl
Hercinothrips bicinctus (Bagnall, 1919) A Cr Hl
Karphothrips dugdalei Mound & Walker, 1982 E Gr Hl
Limothrips cerealium (Haliday, 1836) A Cr Hl
Lomatothrips paryphis Mound & Walker, 1982 E Fo Mo Li
Microcephalothrips abdominalis (Crawford, 1910) A Hf
Neohydatothrips samayunkur (Kudo, 1996) A Ga
Parthenothrips draconae (Heeger, 1854) A Or Hl
Pezothrips kellyanus (Bagnall, 1926) A Or Ga Hl
Physemothrips chrysodermus Stannard, 1962 E Su Gr
Physemothrips hadrus Mound, 1978 E Su
Pseudanaphothrips achetus (Bagnall, 1916) A Gr Hf
Pseudanaphothrips annettae Mound & Palmer, 1980 E Sa
Scirtothrips inermis Priesner, 1933 A Or Hl
Scirtothrips pan Mound & Walker, 1982 E Fo Hl
Sericothrips staphylinus Haliday, 1836 A Sh Hl
Sigmothrips aotearoana Ward, 1970 E Fo Hl
Tenothrips frici (Uzel, 1895) A Gr Cr Or Hf
Thrips austellus Mound, 1978 E Fo Hf
Thrips australis (Bagnall, 1915) A Or Fo Hf
Thrips coprosmae Mound, 1978 E Sh H
Thrips ?hawaiensis (Morgan, 1913) A Or H
Thrips imaginis Bagnall, 1926 A O Hf
Thrips martini Mound & Masumoto, 2005 E Sh HL
Thrips nigropilosus Uzel, 1895 A Gr Hf
Thrips obscuratus (Crawford, 1941) E Cr Or Hf
Thrips phormicola Mound, 1978 E We Hl
Thrips physapus Linnaeus, 1758 A Gr H
Thrips simplex (Morrison, 1930) A Ga Cr H
Thrips tabaci Lindeman, 1888 A Ga Cr Gr Hf
Thrips vulgatissimus Haliday, 1836 A Ga Hf

Suborder TUBULIFERA
PHLAEOTHRIPIDAE
Anaglyptothrips dugdalei Mound & Palmer, 1983 E Gr H
Apterygothrips australis Pitkin, 1973 A We Gr Li
Apterygothrips collyerae Mound & Walker, 1986 E Fo Sh Nb
Apterygothrips kohai Mound & Walker, 1986 E Gr
Apterygothrips sparsus Mound & Walker, 1986 E Gr Nb
Apterygothrips viretum Mound & Walker, 1986 E We Gr
Azaleothrips neatus Mound & Walker, 1986 E Al
Baeonothrips moundi (Stannard, 1970) A Gr
Carientothrips badius (Hood, 1918) A Gr
Carientothrips loisthus Mound, 1974 A Gr We Li
Cartomothrips manukae Stannard, 1962 E Sh
Cartomothrips neboissi Mound & Walker, 1982 E Sh
Cleistothrips idolothripoides Bagnall, 1932 E Fo
Cryptothrips okiwiensis Mound & Walker, 1986 E Fo
Deplorothrips bassus Mound & Walker, 1986 E Fo Li Tw
Emprosthiothrips bogong Mound, 1969 A Gr
Gynaikothrips ficorum (Marchal, 1908) A Ga HLG
Haplothrips kurdjumovi Karny, 1913 A O Ci Cm
Haplothrips niger (Osborn, 1883) A Cr Hf
Haplothrips salicorniae Mound & Walker, 1986 E We Be
Heptathrips cottieri Mound & Walker, 1986 E Fo Tw
Heptathrips cumberi Mound & Walker, 1986 E Sh Tw
Heptathrips kuscheli Mound & Walker, 1986 E Fo Li
Heptathrips tillyardi Mound & Walker, 1986 E Fo Tw
Heptathrips tonnoiri Moulton, 1942 E Fo Tw
Hoplandothrips bidens (Bagnall, 1910) A Tw
Hoplandothrips choritus Mound & Walker, 1986 E

Fo ?Ff
Hoplandothrips ingenuus Mound & Walker, 1986 E Fo Tw
Hoplandothrips vernus Mound & Walker, 1986 E Fo Tw
Hoplothrips anobii Mound & Walker, 1986 E Sh Tw
Hoplothrips corticus (De Geer, 1773) A Or Fo
Hoplothrips kea Mound & Walker, 1986 E Fo
Hoplothrips orientalis (Anathakristan, 1969) A Tw
Hoplothrips oudeus Mound & Walker, 1986 ?E Fo Mo Li
Hoplothrips poultoni (Bagnell & Kelly, 1929) A Or
Hoplothrips semicaceus (Uzel, 1895) A Su
Idolothrips? *spectrum* Haliday, 1852 A Fo Ff
Klambothrips annulosus (Priesner, 1928) A Sh Sa
Liothrips vaneeckei Priesner, 1920 A Ga Hb
Lissothrips dentatus Mound & Walker, 1986 E Fo Lc
Lissothrips dugdalei Mound & Walker, 1986 E Fo Mo
Lissothrips gersoni Mound & Walker, 1986 E Fo Mo
Macrophthalmothrips argus (Karny, 1920) A Fo Tw
Nesothrips alexandrae Mound & Walker, 1986 E Or Fo Tw
Nesothrips doulli (Mound, 1974) E Fo
Nesothrips eastopi (Mound, 1974) E Gr We
Nesothrips pintadus Mound & Walker, 1986 E Fo Tw
Nesothrips propinquus (Bagnall, 1916) A Gr Nb Lc Li
Nesothrips rangi Mound & Palmer, 1983 E We
Nesothrips zondagi (Mound, 1974) E Fo Tw
Ozothrips eurytis Mound & Palmer, 1983 E Fo Nb
Ozothrips janus Mound & Palmer, 1983 E We
Ozothrips priscus Mound & Palmer, 1983 E Fo Tw
Ozothrips tubulatus Mound & Walker, 1986 E We Ga
Ozothrips vagus Mound & Walker, 1986 E Tw
Plectrothrips orientalis Okajima, 1981 A
Podothrips orarius Mound & Walker, 1986 E Be Gr
Podothrips turangi Mound & Walker, 1986 E Gr Sa
Poecilothrips albopictus Uzel, 1895 A Or Tw
Priesneriella gnomus Mound & Palmer, 1983 ?E Fo Tw
Psalidothrips moeone Mound & Walker, 1986 E Fo Li
Psalidothrips tane Mound & Walker, 1986 E Fo Tw
Psalidothrips taylori Mound & Walker, 1986 E Fo Mo Li
Sophiothrips alceurodisci Mound & Walker, 1982 E Fo ?Ff
Sophiothrips duvali Mound & Walker, 1982 E Fo
Sophiothrips greensladei Mound & Walker, 1982 A
Strepterothrips tuberculatus (Girault, 1929) E Fo Sh Tw Lc Li
Teuchothrips disjunctus (Hood, 1918) A Sr Hl
Yarnkothrips kolourus Mound & Walker, 1986 E Be Lc

Order PSOCOPTERA
[Compiled by C. Smithers]
Suborder TROGIOMORPHA
LEPIDOPSOCIDAE
Echmepteryx (*Oxypsocus*) *hamiltoni* (Tillyard, 1923) E
Echmepteryx (*Thylacomorpha*) *stylesi* Smithers, 1969 E
Echmepteryx (*Thylacopsis*) *madagascariensis* (Kolbe, 1885)
Pteroxanium kelloggi (Ribaga, 1905)
Pteroxanium marrisi Smithers, 2000 E
PSOQUILLIDAE
Rhyopsocus conformis Smithers, 1969 E
PSYLLIPSOCIDAE
Psyllipsocus ramburii Selys-Longchamps, 1872
TROGIIDAE
Cerobasis guestfalica (Kolbe, 1880) A
Lepinotus inquilinus Heyden, 1850 A
Lepinotus patruelis Pearman, 1931 A
Lepinotus tasmaniensis Hickman, 1934
Trogium evansorum Smithers, 1994
Trogium pulsatorium (Linnaeus, 1758) A

Suborder TROCTOMORPHA
LIPOSCELIDIDAE A
Liposcelis corrodens (Heymons, 1909) A [*Liposcelis divinatorius* Mueller, 1776]

Suborder PSOCOMORPHA
BRYOPSOCIDAE E
Bryopsocus angulatus (Smithers, 1969) E
Bryopsocus townsendi (Smithers, 1969) E
CAECILIUSIDAE
Caecilius sp. 1
Caecilius sp. 2
Maoripsocus fastigatus (Smithers, 1969) E
Maoripsocus semifasciatus Tillyard, 1923
Paracaecilius sp.
Paracaecilius zelandicus (Tillyard, 1923)
Valenzuela flavistigma (Tillyard, 1923) E
Valenzuela flavus (Smithers, 1969) E
ECTOPSOCIDAE
Ectopsocus axillaris (Smithers, 1969)
Ectopsocus briggsi McLachlan, 1899
Ectopsocus californicus (Banks, 1903)
Ectopsocus coronatus Smithers, 1969 E
Ectopsocus dialeptus Thornton & Wong, 1968 E
Ectopsocus gracilis Thornton & Wong, 1968 E
Ectopsocus petersi Smithers, 1978
Ectopsocus sp. 1
Ectopsocus sp. 2
ELIPSOCIDAE
Paedomorpha gayi Smithers, 1963
Pentacladus eucalypti Enderlein, 1906
Propsocus pulchripennis (Perkins, 1899)
Sabulopsocus tractuosus Smithers, 1969 E
Sandrapsocus clarki Smithers, 1999 E
Spilopsocus annulatus Smithers, 1969 E
Spilopsocus avius Smithers, 1964 E
Spilopsocus stigmaticus (Tillyard, 1923) E
MYOPSOCIDAE
Myopsocus australis (Brauer, 1865)
PERIPSOCIDAE
Peripsocus maoricus (Tillyard, 1923)
Peripsocus milleri (Tillyard, 1923)
Peripsocus morulops (Tillyard, 1923)
Peripsocus sp.
PHILOTARSIDAE
Aaroniella rawlingsi Smithers, 1969
Haplophallus maculatus (Tillyard, 1923)
Philotarsopsis basipunctata (Thornton, Wong & Smithers, 1977) E
Philotarsopsis guttatus (Tillyard, 1923)
Philotarsopsis parda (Thornton, Wong & Smithers, 1977) E
PSEUDOCAECILIIDAE
Austropsocus apicipunctatus (Tillyard, 1923) E
Austropsocus australis Thornton, Wong & Smithers, 1977 E
Austropsocus chathamensis Thornton, Wong & Smithers, 1977 E
Austropsocus delli Smithers, 1969 E
Austropsocus fasciatus Thornton, Wong & Smithers, 1977 E
Austropsocus hyalinus Thornton, Wong & Smithers, 1977
Austropsocus insularis Smithers, 1962 E
Austropsocus nimbosus Thornton, Wong & Smithers, 1977 E
Austropsocus ramsayi Thornton, Wong & Smithers, 1977 E
Austropsocus salmoni Smithers, 1969 E
Austropsocus sp.
Chorocaecilius brunellus (Tillyard, 1923)
Mepleres watti (Smithers, 1973) E
Zelandopsocus formosellus Tillyard, 1923 E
Zelandopsocus kuscheli Thornton, Wong & Smithers, 1977 E
Zelandopsocus tectus Thornton, Wing & Smithers, 1977 E
PSOCIDAE
Blaste tillyardi Smithers, 1969
TRICHOPSOCIDAE
Trichopsocus clarus (Banks, 1908)

Order PHTHIRAPTERA
[Compiled by R. Palma]
Suborder AMBLYCERA
BOOPIIDAE A
Boopia notafusca Le Souëf, 1902 A
Heterodoxus ampullatus Kéler, 1971 A
GYROPIDAE A
Gyropus ovalis Burmeister, 1838 A
Gliricola porcelli (Schrank, 1781) A
LAEMOBOTHRIIDAE
Laemobothrion tinnunculi (Linnaeus, 1758)
MENOPONIDAE
Actornithophilus bicolor (Piaget, 1880) M
Actornithophilus ceruleus (Timmermann, 1954) M
Actornithophilus grandiceps (Piaget, 1880) M
Actornithophilus hoplopteri (Mjöberg, 1910)
Actornithophilus limosae (Kellogg, 1908) M
Actornithophilus ochraceus (Nitzsch, 1818) M
Actornithophilus pediculoides (Mjöberg, 1910) M
Actornithophilus piceus (Packard, 1870)
Actornithophilus spinulosus (Piaget, 1880) M
Actornithophilus umbrinus (Burmeister, 1838) M
Amyrsidea (*Argimenopon*) *minuta* Emerson, 1961 A
Amyrsidea (*A.*) *perdicis* (Denny, 1842) A
Ancistrona vagelli (J.C. Fabricius, 1787) M
Apterygon dumosum Tandan, 1972 E
Apterygon hintoni Clay, 1966 E
Apterygon mirum Clay, 1961 E
Apterygon okarito Palma & Price, 2004 E
Austromenopon aegialitidis (Durrant, 1906)
Austromenopon affine (Piaget, 1890) M
Austromenopon atrofulvum (Piaget, 1880) M
Austromenopon beckii (Kellogg, 1906) M
Austromenopon brevifimbriatum (Piaget, 1880) M
Austromenopon bulweriae Timmermann, 1963 M
Austromenopon elliotti Timmermann, 1954 M
Austromenopon enigki Timmermann, 1963 M
Austromenopon fuscofasciatum (Piaget, 1880) M
Austromenopon haematopi Timmermann, 1954 M
Austromenopon himantopi Timmermann, 1954 M
Austromenopon limosae Timmermann, 1954 M
Austromenopon lutescens (Burmeister, 1838) M
Austromenopon meyeri (Giebel, 1874) M
Austromenopon navigans (Kellogg, 1896) M
Austromenopon ossifragae (Eichler, 1949) M
Austromenopon paululum (Kellogg & Chapman, 1899) M
Austromenopon phaeopodis (Schrank, 1802) M
Austromenopon pinguis (Kellogg, 1896) M
Austromenopon popellus (Piaget, 1890) M
Austromenopon stammeri Timmermann, 1963
Austromenopon transversum (Denny, 1842)
Austromenopon spp. (2) M
Bonomiella columbae Emerson, 1957 A
Ciconiphilus decimfasciatus (Boisduval & Lacordaire, 1835) F
Ciconiphilus pectiniventris (Harrison, 1916) F A
Colpocephalum eucarenum Burmeister, 1838 M
Colpocephalum fregili Denny, 1842 A
Colpocephalum leptopygos Nitzsch *in* Giebel, 1874 F
Colpocephalum pilgrimi Price, 1967
Colpocephalum tausi (Ansari, 1951) A
Colpocephalum turbinatum Denny, 1842
Colpocephalum subzerafae Tendeiro, 1988
Eidmanniella albescens (Piaget, 1880) F
Eidmanniella pellucida (Rudow, 1869) F
Eidmanniella pustulosa (Nitzsch, 1866) F
Eidmanniella subrotunda (Piaget, 1880) F

Eucolpocephalum femorale (Piaget, 1880) F
Franciscoloa (*Franciscoloa*) *pallida* (Piaget, 1880) A
Heteromenopon (*Keamenopon*) *kea* (Kellogg, 1907) E
Hohorstiella lata (Piaget, 1880) A
Hohorstiella sp.
Holomenopon leucoxanthum (Burmeister, 1838) F
Holomenopon tadornae (Gervais, 1844) F
Holomenopon sp. F
Kurodaia cryptostigmatia (Nitzsch, 1861)
Longimenopon galeatum Timmermann, 1957 M
Menacanthus eurysternus (Burmeister, 1838)
Menacanthus pallidulus Neumann, 1912 A
Menacanthus rhipidurae Palma & Price, 2005 E
Menacanthus stramineus (Nitzsch, 1818) A
Menopon gallinae (Linnaeus, 1758) A
Myrsidea serini (Séguy, 1944) A
Myrsidea thoracica (Giebel, 1874) A
Myrsidea sp. F
Nosopon lucidum (Rudow, 1869)
Plegadiphilus plegadis (Dubinin, 1938) F
Plegadiphilus threskiornis Bedford, 1939 F
Pseudomenopon concretum (Piaget, 1880)
Pseudomenopon pilgrimi Price, 1974 E
Pseudomenopon pilosum (Scopoli, 1763) F
Pseudomenopon scopulacorne (Denny, 1842)
Trinoton nigrum Le Souëf, 1902 F A
Trinoton querquedulae (Linnaeus, 1758) F

Suborder ISCHNOCERA
PHILOPTERIDAE
Acidoproctus gottwaldhirschi Eichler, 1958 F E
Alcedoecus alatoclypeatus (Piaget, 1885) F
Anaticola anseris (Linnaeus, 1758) F A
Anaticola crassicornis crassicornis (Scopoli, 1763) F
Anaticola magnificus Ansari, 1955 F
Anatoecus dentatus dentatus (Scopoli, 1763) F
Anatoecus d. magnicornutus Zlotorzycka, 1970 F A
Anatoecus icterodes icterodes (Nitzsch, 1818) F
Anatoecus i. oloris Zlotorzycka, 1970 F A
Aquanirmus australis Kettle, 1974 F E
Aquanirmus sp. F
Ardeicola expallidus Blagoveshtchensky, 1940 F
Ardeicola neopallidus Price, Hellenthal & Palma, 2003 M
Ardeicola pilgrimi Tandan, 1972 F
Ardeicola plataleae (Linnaeus, 1758) F
Ardeicola rhaphidius (Nitzsch *in* Giebel, 1866) F
Ardeicola stellaris (Denny, 1842) F
Austrogoniodes antarcticus Harrison, 1937 M
Austrogoniodes concii (Kéler, 1952) M
Austrogoniodes cristati Kéler, 1952 M
Austrogoniodes hamiltoni Harrison, 1937 M
Austrogoniodes macquariensis Harrison, 1937 M
Austrogoniodes mawsoni Harrison, 1937 M
Austrogoniodes strutheus Harrison, 1915 M
Austrogoniodes vanalphenae Banks & Palma, 2003 M E
Austrogoniodes waterstoni (Cummings, 1914) M
Bedfordiella unica Thompson, 1937 M
Brueelia amsel (Eichler, 1951) A
Brueelia cyclothorax (Burmeister, 1838) A
Brueelia delicata (Nitzsch *in* Giebel, 1866) A
Brueelia merulensis (Denny, 1842) A
Brueelia nebulosa (Burmeister, 1838) A
Brueelia semiannulata (Piaget, 1883) A
Brueelia turdinulae Ansari, 1956 A
Brueelia sp.
Campanulotes bidentatus compar (Burmeister, 1838) A
Carduiceps cingulatus (Denny, 1842) M
Carduiceps zonarius (Nitzsch *in* Giebel, 1866) M
Chelopistes meleagridis (Linnaeus, 1758) A
Coloceras novaeseelandiae (Tendeiro, 1972) E
Coloceras harrisoni (Tendeiro, 1972) E
Columbicola columbae columbae (Linnaeus, 1758) A
Cuclotogaster heterographus (Nitzsch *in* Giebel, 1866) A
Cuclotogaster synoicus (Clay, 1938) A
Cuculicola kui Kettle, 1980
Cuculicola latirostris (Burmeister, 1838)
Cuculiphilus (*Cuculiphilus*) *fasciativentris* Carriker, 1955
Cuculiphilus (C.) *platygaster* (Giebel, 1874)
Degeeriella fusca (Denny, 1842)
Degeeriella rufa rufa (Burmeister, 1838)
Docophoroides brevis (Dufour, 1835) M
Docophoroides harrisoni Waterston, 1917 M
Docophoroides murphyi (Kellogg, 1914) M
Docophoroides simplex (Waterston, 1914) M
Episbates pederiformis (Dufour, 1835) M
Forficuloecus meinertzhageni Guimarães, 1974 E
Forficuloecus pilgrimi Guimarães, 1985 E
Fulicoffula lurida (Nitzsch, 1818) F
Goniocotes chrysocephalus Giebel, 1874 A
Goniocotes gallinae (De Geer, 1778) A
Goniocotes pusillus (Nitzsch (in Giebel), 1866) A
Goniodes colchici Denny, 1842 A
Goniodes dispar Burmeister, 1838 A
Goniodes dissimilis Denny, 1842 A
Goniodes ortygis Denny, 1842 A
Goniodes pavonis (Linnaeus, 1758) A
Goniodes retractus Le Souëf, 1902 A
Goniodes stefani Clay & Hopkins, 1955 A
Haffneria grandis (Piaget, 1880) M
Halipeurus (*Halipeurus*) *bulweriae* Timmermann, 1960 M
Halipeurus (*H.*) *consimilis* Timmermann, 1960 M
Halipeurus (*H.*) *diversus* (Kellogg, 1896) M
Halipeurus (*H.*) *falsus pacificus* Edwards, 1961 M
Halipeurus (*H.*) *gravis priapulus* Timmermann, 1961 M
Halipeurus (*H.*) *kermadecensis* (Johnston & Harrison, 1912) M
Halipeurus (*H.*) *leucophryna* Timmermann, 1960 M
Halipeurus (*H.*) *marquesanus* (Ferris, 1932) M
Halipeurus (*H.*) *mirabilis* Thompson, 1940 M
Halipeurus (*H.*) *mundae* Edwards, 1961 M
Halipeurus (*H.*) *noctivagus* Timmermann, 1960 M
Halipeurus (*H.*) *placodus* Edwards, 1961 M
Halipeurus (*H.*) *procellariae* (J.C. Fabricius, 1775) M
Halipeurus (*H.*) *spadix* Timmermann, 1961 M
Halipeurus (*H.*) *theresae* Timmermann, 1969 M
Halipeurus (*H.*) *thompsoni* Edwards, 1961 M
Halipeurus (*H.*) *turtur* Edwards, 1961 M
Halipeurus sp. M
Halipeurus (*Synnautes*) *pelagicus* (Denny, 1842) M
Harrisoniella ferox (Giebel, 1867) M
Harrisoniella hopkinsi Eichler, 1952 M
Ibidoecus bisignatus (Nitzsch *in* Giebel, 1866) F
Ibidoecus dianae Tandan, 1958 F
Ibidoecus plataleae (Denny, 1842) F
Incidifrons fulicae (Linnaeus, 1758) F
Lagopoecus docophoroides (Piaget, 1880) A
Lipeurus caponis (Linnaeus, 1758) A
Lipeurus maculosus maculosus Clay, 1938 A
Lunaceps actophilus (Kellogg & Chapman, 1899) M
Lunaceps drosti Timmermann, 1954 M
Lunaceps incoenis (Kellogg & Chapman, 1899) M
Lunaceps limosella Timmermann, 1954 M
Lunaceps numenii numenii (Denny, 1842) M
Lunaceps n. oliveri (Johnston & Harrison, 1912) M
Lunaceps sp. M
Naubates (*Guenterion*) *clypeatus* (Giebel, 1874) M
Naubates (*G.*) *damma* Timmermann, 1961 M
Naubates (*G.*) *heteroproctus* Harrison, 1937 M
Naubates (*G.*) *lessonii* Palma & Pilgrim, 2002 M
Naubates (*G.*) *prioni* (Enderlein, 1908) M
Naubates (*G.*) *pterodromi* Bedford, 1930 M
Naubates (*Naubates*) *fuliginosus* (Taschenberg, 1882) M
Naubates (*N.*) *harrisoni* Bedford, 1930 M
Naubates (*N.*) *thieli* Timmermann, 1965 M
Neopsittaconirmus albus (Le Souëf & Bullen, 1902) A
Neopsittaconirmus kea (Kellogg, 1907) E
Nesiotinus demersus Kellogg, 1903 M
Ornithobius bucephalus (Giebel, 1874) F A
Ornithobius fuscus Le Souëf, 1902 F A
Ornithobius goniopleurus Denny, 1842 F A
Oxylipeurus clavatus (McGregor, 1917) A
Oxylipeurus ellipticus (Kéler, 1958) A
Oxylipeurus mesopelius colchicus Clay, 1938 A
Oxylipeurus polytrapezius polytrapezius (Burmeister, 1838) A
Paraclisis diomedeae (J.C. Fabricius, 1775) M
Paraclisis hyalina (Neumann, 1911) M
Paraclisis miriceps (Kellogg & Kuwana, 1902) M
Paraclisis obscura (Rudow, 1869) M
Pectinopygus annulatus (Piaget, 1880) M
Pectinopygus australis Thompson, 1948 M
Pectinopygus bassani (O. Fabricius, 1780) M
Pectinopygus carunculatus Timmermann, 1964 F E
Pectinopygus dispar (Piaget, 1880) F
Pectinopygus garbei (Pessôa & Guimarães, 1935) F
Pectinopygus gyricornis (Denny, 1842) F
Pectinopygus punctatus Timmermann, 1964 F E
Pectinopygus setosus (Piaget, 1880) F
Pectinopygus turbinatus (Piaget, 1890) F
Pectinopygus varius Timmermann, 1964 F
Pelmatocerandra setosa (Giebel, 1876) M
Perineus circumfasciatus Kéler, 1957 M
Perineus concinnoides Kéler, 1957 M
Perineus macronecti Palma & Pilgrim, 1988 M
Perineus nigrolimbatus (Giebel, 1874) M
Philoceanus fasciatus (Carriker, 1958) M
Philoceanus garrodiae (Clay, 1940) M
Philoceanus robertsi (Clay, 1940) M
Philopteroides novaezelandiae Mey, 2004 E
Philopteroides xenicus Mey, 2004 E
Philopterus novaezealandiae Palma & Price, 2000 E
Philopterus turdi (Denny, 1842) A
Pseudonirmus charcoti (Neumann, 1907) M
Pseudonirmus gurlti (Taschenberg, 1882) M
Pseudonirmus lugubris (Taschenberg, 1882) M
Psittoecus vanzolini Guimarães, 1974 A
Quadraceps assimilis (Piaget, 1890) M
Quadraceps auratus (Haan, 1829) M
Quadraceps birostris (Giebel, 1874) M
Quadraceps caspius (Giebel, 1874) M
Quadraceps cedemajori Timmermann, 1969 M
Quadraceps charadrii charadrii (Linnaeus, 1758) M
Quadraceps coenocoryphae Timmermann, 1955 M E
Quadraceps dominella Timmermann, 1953 M E
Quadraceps ellipticus (Nitzsch *in* Giebel, 1866) M
Quadraceps hemichrous (Nitzsch *in* Giebel, 1866) M
Quadraceps hopkinsi apophoretus Timmermann, 1969 M
Quadraceps h. hopkinsi Timmermann, 1952 M
Quadraceps houri Hopkins, 1949 M
Quadraceps normifer alpha (Kellogg, 1914) M
Quadraceps n. normifer (Grube, 1851) M
Quadraceps n. parvopallidus (Eichler, 1951) M
Quadraceps novaeseelandiae Timmermann, 1953 M
Quadraceps nychthemerus (Burmeister, 1838) M
Quadraceps ornatus fuscolaminulatus (Enderlein, 1908) M
Quadraceps punctatus (Burmeister, 1838)
Quadraceps renschi Timmermann, 1954
Quadraceps ridgwayi (Kellogg, 1906) M
Quadraceps sellatus (Burmeister, 1838) M
Quadraceps semifissus (Nitzsch *in* Giebel), 1866) M
Quadraceps separatus (Kellogg & Kuwana, 1902) M
Quadraceps strepsilaris (Denny, 1842) M
Rallicola (*Rallicola*) *fulicae* (Denny, 1842) F
Rallicola (*R.*) *harrisoni* Emerson, 1955
Rallicola (*R.*) *lugens* (Giebel, 1874)
Rallicola (*R.*) *ortygometrae* (Schrank, 1781)

Rallicola (*R.*) *tabuensis* Emerson, 1966
Rallicola (*R.*) *takahe* Holloway, 1956 E
Rallicola (*Aptericola*) *gadowi* Harrison, 1915 E
Rallicola (*A.*) *gracilentus* Clay, 1953 E
Rallicola (*A.*) *pilgrimi* Clay, 1972 E
Rallicola (*A.*) *rodericki* Palma, 1991 E
Rallicola (*Huiacola*) *extinctus* (Mey, 1990) E
Saemundssonia sp. M
Saemundssonia (*Puffinoecus*) *enderleini* (Eichler, 1949) M
Saemundssonia (*P.*) *puellula* Timmermann, 1965 M
Saemundssonia (*P.*) *valida* (Kellogg & Chapman, 1899) M
Saemundssonia (*Saemundssonia*) *albemarlensis* (Kellogg & Kuwana, 1902) M
Saemundssonia (*S.*) *antarctica* (Wood, 1937) M
Saemundssonia (*S.*) *bicolor* (Rudow, 1870) M
Saemundssonia (*S.*) *cephalus* (Denny, 1842) M
Saemundssonia (*S.*) *chathamensis* Timmermann, 1977 M E
Saemundssonia (*S.*) *conica conica* (Denny, 1842) M
Saemundssonia (*S.*) *desolata* Timmermann, 1959 M
Saemundssonia (*S.*) *euryrhyncha* (Giebel, 1874) M
Saemundssonia (*S.*) *gaini* (Neumann, 1913) M
Saemundssonia (*S.*) *haematopi* (Linnaeus, 1758) M
Saemundssonia (*S.*) *hexagona* (Giebel, 1874) M
Saemundssonia (*S.*) *incisa* Timmermann, 1950 M
Saemundssonia (*S.*) *inexspectata* Timmermann, 1951 M
Saemundssonia (*S.*) *lari* (O. Fabricius, 1780)
Saemundssonia (*S.*) *limosae* (Denny, 1842) M
Saemundssonia (*S.*) *lobaticeps remota* Timmermann, 1951 M
Saemundssonia (*S.*) *lockleyi* Clay, 1949 M
Saemundssonia (*S.*) *marina* Timmermann, 1956 M
Saemundssonia (*S.*) *melanocephalus* (Burmeister, 1838) M
Saemundssonia (*S.*) *nereis* Timmermann, 1956 M
Saemundssonia (*S.*) *platygaster* (Denny, 1842) s.l. M
Saemundssonia (*S.*) *p. balati* Timmermann, 1969 M
Saemundssonia (*S.*) *pterodromae* Timmermann, 1959 M
Saemundssonia (*S.*) *scolopacisphaeopodis scolopacisphaeopodis* (Schrank, 1803) M
Saemundssonia (*S.*) *stammeri* Timmermann, 1959 M
Saemundssonia (*S.*) *sternae* (Linnaeus, 1758) M
Saemundssonia (*S.*) *thompsoni* Timmermann, 1951 M
Saemundssonia (*S.*) *tringae* (O. Fabricius, 1780) M
Saemundssonia (*S.*) *uppalensis* (Rudow, 1870) M
Strigiphilus aitkeni Clay, 1966
Strigiphilus cursitans (Nitzsch, 1861) A
Strigiphilus vapidus Clay, 1977
Sturnidoecus sturni (Schrank, 1776) A
Trabeculus aviator (Evans, 1912) M
Trabeculus flemingi Timmermann, 1959 M
Trabeculus fuscoclypeatus (Johnston & Harrison, 1912) M
Trabeculus hexakon (Waterston, 1914) M
Trabeculus mirabilis (Kellogg, 1896) M
Trabeculus schillingi Rudow, 1866 M
TRICHODECTIDAE A
Bovicola (*Bovicola*) *bovis* (Linnaeus, 1758) A
Bovicola (*B.*) *caprae* (Gurlt, 1843) A
Bovicola (*B.*) *limbatus* (Gervais, 1844) A
Bovicola (*B.*) *longicornis* (Nitzsch, 1818) A
Bovicola (*B.*) *ovis* (Schrank, 1781) A
Bovicola (*Spinibovicola*) *hemitragi* (Cummings, 1916) A
Tricholipeurus lipeuroides (Megnin, 1884) A
Tricholipeurus parallelus (Osborn, 1896) A
Felicola (*Felicola*) *subrostratus* (Burmeister, 1838) A
Trichodectes (*Trichodectes*) *canis* (De Geer, 1778) A
Trichodectes (*Stachiella*) *ermineae* (Hopkins 1941) A
Trichodectes (*S.*) *mustelae* (Schrank 1803) A
Werneckiella equi (Denny, 1842) A
Werneckiella ocellata (Piaget, 1880) A

Suborder ANOPLURA
ECHINOPHTHIRIIDAE
Antarctophthirus lobodontis Enderlein, 1909 M
Antarctophthirus ogmorhini Enderlein, 1906 M
Antarctophthirus microchir (Trouessart & Neumann, 1888) M
Lepidophthirus macrorhini Enderlein, 1904 M
HAEMATOPINIDAE A
Haematopinus asini (Linnaeus, 1758) A
Haematopinus eurysternus (Nitzsch, 1818) A
Haematopinus suis (Linnaeus, 1758) A
HOPLOPLEURIDAE A
Hoplopleura pacifica Ewing, 1924 A
LINOGNATHIDAE A
Linognathus ovillus (Neumann, 1907) A
Linognathus pedalis (Osborn, 1896) A
Linognathus setosus (von Olfers, 1816) A
Linognathus stenopsis (Burmeister, 1838) A
Linognathus vituli (Linnaeus, 1758) A
Solenopotes burmeisteri (Fahrenholz, 1919) A
Solenopotes capillatus Enderlein, 1904 A
PEDICULIDAE A
Pediculus humanus capitis (De Geer, 1778) A
Pediculus h. humanus (Linnaeus, 1758) A
POLYPLACIDAE A
Haemodipsus lyriocephalus (Burmeister, 1839) A
Haemodipsus ventricosus (Denny, 1842) A
Polyplax serrata (Burmeister, 1839) A
Polyplax spinulosa (Burmeister, 1839) A
PTHIRIDAE A
Pthirus pubis (Linnaeus, 1758) A

Order MEGALOPTERA
[Compiled by R. P. Macfarlane]
CORYDALIDAE
Archichauliodes diversus (Walker, 1853) E Fr Ci

Order NEUROPTERA
[Compiled by R. P. Macfarlane]
BEROTHIDAE
Protobiella zelandica Tillyard, 1926 E Fo IPr
CONIOPTERYGIDAE A
Cryptoscenea australiensis (Enderlein, 1906) A Or We IPr
Heteroconis ornata Enderlein, 1905 A
MYRMELEONTIDAE
Weeleus acutus (Walker, 1853) E IPr
HEMEROBIIDAE
Drepanacra binocula (Newman, 1838) A Fo Or IPr
Micromus bifasciatus (Walker, 1860) E IPr
Micromus tasmaniae (Walker, 1860) A Gr Cr Ga IPr
Psectra nakaharai New, 1988 A IPr
Wesmaelius subnebulosus (Stephens, 1836) A IPr
OSMYLIDAE
Euosmylus stellae (McLachlan, 1899) E We IPr
Kempynus citrinus (McLachlan, 1873) E We IPr
Kempynus incisus (McLachlan, 1863) E We IPr
Kempynus latiusculus (McLachlan, 1894) E We IPr
SISYRIDAE A
Sisyra rufistigma Tillyard, 1916 A Fr IPr

Order COLEOPTERA
[Compiled by P. Maddison]
Suborder ADEPHAGA
CARABOIDEA
RHYSODIDAE
CLINIDIINI
Rhyzodiastes (*Rhyzoarca*) *proprius* (Broun, 1880) E
RHYSODINI
Kupeus arcuatus (Chevrolat, 1873) E
Kaveinga (*Ingevaka*) *bellorum* Emberson, 1995 E
Kaveinga (*Ingevaka*) *orbitosa* (Broun, 1880) E
Kaveinga (*Vakeinga*) *lusca* (Chevrolat, 1875) E
Tangarona pensus (Broun, 1880) E
CARABIDAE
NEBRIIFORMES
CICINDELLINAE
CICINDELINI
S. CICINDELINA
Cicindela (*Neocicindela*) *austromontana* Bates, 1878 E
Cicindela (*N.*) *brevilunata* Horn, 1926 E
Cicindela (*N.*) *dunedensis* Laporte de Castelnau, 1867 E
Cicindela (*N.*) *feredayi* Bates, 1867 E
Cicindela (*N.*) *hamiltoni* Broun, 1921 E
Cicindela (*N.*) *helmsi* Sharp, 1886 E
Cicindela (*N.*) *latecincta* White, 1846 E
Cicindela (*N.*) *parryi* White, 1846 E
Cicindela (*N.*) *perhispida campbelli* Broun, 1886 E
Cicindela (*N.*) *p. giveni* (Brouerius van Nidek, 1965) E
Cicindela (*N.*) *p. perhispida* Broun, 1880 E
Cicindela (*N.*) *spilleri* (Brouerius van Nidek, 1965) E
Cicindela (*N.*) *tuberculata* Fabricius, 1775 E
Cicindela (*N.*) *waiouraensis* Broun, 1914 E
CARABINAE
PAMBORINI
Maoripamborus fairburni Brookes, 1944 E
Maoripamborus n. sp. E
LOXOMERIFORMES
MIGADOPINAE
AMAROTYPINI
Amarotypus edwardsii Bates, 1872 E
MIGADOPINI
Calathosoma rubromarginatum (Blanchard, 1843) E Su
Loxomerus (*Loxomerus*) *nebrioides* (Guérin-Méneville, 1841) E Su
Loxomerus (*Pristancylus*) *brevis* (Blanchard, 1843) E Su
Loxomerus (*P.*) *capito* Jeannel, 1938 E
Loxomerus (*P.*) *huttoni* (Broun, 1902) E Su
Loxomerus (*P.*) *philpotti* (Broun, 1914) E
SCARITINAE A
CLIVININI
S. CLIVININA
Clivina australasiae Boheman, 1858 A Do
Clivina basalis Chaudoir, 1843 A
Clivina heterogena Putzeys, 1866 A
Clivina vagans Putzeys, 1866 A
MELAENIFORMES
TRECHINAE
BROSCINI
S. CREOBIINA
Bountya insularis Townsend, 1971 E Su
S. NOTHOBROSCINA
Brullea antarctica Laporte de Castelnau, 1867 E
Diglymma castigatum Broun, 1909 E Su
Diglymma clivinoides (Laporte de Castelnau, 1867) E
Diglymma marginale Broun, 1914 E
Diglymma obtusum (Broun, 1886) E
Diglymma seclusum (Johns, 2007) E
Mecodema allani Fairburn, 1945 E
Mecodema a. alternans Laporte de Castelnau, 1867 E
Mecodema a. hudsoni Broun, 1909 E Su
Mecodema angustulum Broun, 1914 E
Mecodema atrox Britton, 1949 E
Mecodema brittoni Townsend, 1965 E
Mecodema bullatum Lewis, 1902 E
Mecodema chiltoni Broun, 1917 E
Mecodema costellum costellum Broun, 1903 E
Mecodema c. gordonense Broun, 1917 E
Mecodema c. lewisi Broun, 1908 E
Mecodema c. obesum Townsend, 1965 E
Mecodema costipenne Broun, 1914 E
Mecodema crenaticolle Redtenbacher, 1868 E
Mecodema crenicolle Laporte de Castelnau, 1867 E
Mecodema curvidens (Broun, 1915) E
Mecodema ducale Sharp, 1886 E
Mecodema dunense Townsend, 1965 E
Mecodema dux Britton, 1949 E

Mecodema elongatum Laporte de Castelnau, 1867 E
Mecodema femorale Broun, 1921 E
Mecodema florae Britton, 1949 E
Mecodema fulgidum Broun, 1881 E
Mecodema gourlayi Britton, 1949 E
Mecodema hector Britton, 1949 E
Mecodema howittii Laporte de Castelnau, 1867 E
Mecodema huttense Broun, 1915 E
Mecodema impressum Laporte de Castelnau, 1867 E
Mecodema infimate Lewis, 1902 E
Mecodema integratum Townsend, 1965 E
Mecodema laeviceps Broun, 1904 E
Mecodema laterale Broun, 1917 E
Mecodema litoreum Broun, 1886 E
Mecodema longicolle Broun, 1923 E
Mecodema lucidum Laporte de Castelnau, 1867 E
Mecodema metallicum Sharp, 1886 E
Mecodema minax Britton, 1949 E
Mecodema morio (Laporte de Castelnau, 1867) E
Mecodema nitidum Broun, 1903 E
Mecodema oblongum (Broun, 1882) E
Mecodema occiputale Broun, 1923 E
Mecodema oconnori Broun, 1912 E
Mecodema oregoides (Broun, 1894) E
Mecodema pavidum Townsend, 1965 E
Mecodema persculptum Broun, 1915 E
Mecodema pluto Britton, 1949 E
Mecodema politanum Broun, 1917 E
Mecodema proximum Britton, 1949 E
Mecodema puiakium Johns & Ewers, 2007 E
Mecodema pulchellum Townsend, 1965 E
Mecodema punctatum (Laporte de Castelnau, 1867) E
Mecodema punctellum Broun, 1921 E
Mecodema quoinense Broun, 1912 E
Mecodema rectolineatum Laporte de Castelnau, 1867 E
Mecodema regulus Britton, 1964 E TK
Mecodema rex Britton, 1949 E
Mecodema rugiceps anomalum Townsend, 1965 E
Mecodema r. rugiceps Sharp, 1886 E
Mecodema sculpturatum puncticolle Broun, 1914 E
Mecodema s. sculpturatum Blanchard, 1843 E
Mecodema simplex Laporte de Castelnau, 1867 E
Mecodema spiniferum Broun, 1880 E
Mecodema striatum Broun, 1904 E
Mecodema strictum Britton, 1949 E
Mecodema sulcatum (Sharp, 1886) E
Mecodema validum Broun, 1923 E
Metaglymma *aberrans* Putzeys, 1868 E
Metaglymma moniliferum Bates, 1867 E
Metaglymma tibiale (Laporte de Castelnau, 1867) E
Oregus *aereus* (White, 1846) E
Oregus crypticus Pawson, 2003 E
Oregus inaequalis (Laporte de Castelnau, 1867) E
Oregus septentrionalis Pawson, 2003 E
TRECHINI
S. AEPINA
Kenodactylus audouini (Guérin-Méneville, 1830)
Kiwitrechus *karenscottae* Larochelle & Larivière, 2007 E
Maoritrechus *nunni* Townsend, 2010 E
Maoritrechus rangitotoensis Brookes, 1932 E
Maoritrechus stewartensis Townsend, 2010 E
Neanops *caecus* (Britton, 1960) E
Neanops pritchardi Valentine, 1987 E
Oarotrechus *gracilentus* Townsend, 2010 E
Waiputrechus *cavernicola* Townsend, 2010 E
S. HOMALODERINA
Erebotrechus *infernus* Britton, 1964 E
Kupetrechus *gracilis* Townsend, 2010 E
Kupetrechus lamberti (Britton, 1960) E
Kupetrechus larsonae Townsend, 2010 E
S. TRECHINA
Duvaliomimus (*Duvaliomimus*) *australis* Townsend, 2010 E
Duvaliomimus (*D.*) *chrystallae* Townsend, 2010 E
Duvaliomimus (*D.*) *crypticus* Townsend, 2010 E
Duvaliomimus (*D.*) *maori* (Jeannel, 1928) E
Duvaliomimus (*D.*) *megawattus* Townsend, 2010 E
Duvaliomimus (*D.*) *obscurus* Townsend, 2010 E
Duvaliomimus (*D.*) *orientalis* Giachino, 2005 E
Duvaliomimus (*D.*) *pseudostyx* Townsend, 2010 E
Duvaliomimus (*D.*) *styx* Britton, 1959 E
Duvaliomimus (*D.*) *taieriensis* Townsend, 2010 E
Duvaliomimus (*D.*) *walkeri brittoni* Jeannel, 1938 E
Duvaliomimus (*D.*) *w. walkeri* (Broun, 1903) E
Duvaliomimus (*D.*) *watti* Britton, 1958 E
Duvaliomimus (*Mayotrechus*) *mayae mayae* Britton, 1958 E
Duvaliomimus (*M.*) *m. mayorum* Townsend, 2010 E
Kettlotrechus *edridgei* Townsend, 2010 E
Kettlotrechus marchanti Townsend, 2010 E
Kettlotrechus millari Townsend, 2010 E
Kettlotrechus orpheus (Britton, 1962) E
Kettlotrechus pluto (Britton, 1964) E
Scototrechus *hardingi hardingi* Townsend, 2010 E
Scototrechus h. worthyi Townsend, 2010 E
Scototrechus morti Townsend, 2010 E
Scototrechus orcinus Britton, 1962 E
PSYDRIFORMES
PSYDRINAE
MECYCLOTHORACINI
Mecyclothorax ambiguus (Erichson, 1842) A
Mecyclothorax oopteroides Liebherr & Marris, 2009 E
Mecyclothorax otagoensis Liebherr & Marris, 2009 E
Mecyclothorax rotundicollis (White, 1846) E
MEONINI
Meonochilus *amplipennis amplipennis* (Broun, 1912) E
Meonochilus a. labralis (Broun, 1912) E
Meonochilus eplicatus (Broun, 1923) E
Meonochilus placens (Broun, 1880) E
Selenochilus *fallax* (Broun, 1893) E
Selenochilus frontalis (Broun, 1917) E
Selenochilus oculator (Broun, 1893) E
Selenochilus piceus (Blanchard, 1843) E
Selenochilus ruficornis (Broun, 1882) E
Selenochilus syntheticus (Sharp, 1886) E
Selenochilus n. spp. (2) 2E
TROPOPTERINI
Molopsida *alpinalis* (Broun, 1893) E
Molopsida antarctica (Laporte de Castelnau, 1867) E
Molopsida carbonaria (Broun, 1908) E
Molopsida cincta (Broun, 1893) E
Molopsida convexa (Broun, 1917) E
Molopsida cordipennis (Broun, 1912) E
Molopsida debilis (Sharp, 1886) E
Molopsida diversa (Broun, 1917) E
Molopsida dubia (Broun, 1894) E
Molopsida fovealis (Broun, 1917) E
Molopsida fuscipes (Broun, 1923) E
Molopsida halli (Broun, 1917) E
Molopsida longula (Broun, 1917) E
Molopsida marginalis (Broun, 1882) E
Molopsida optata (Broun, 1917) E
Molopsida oxygona (Broun, 1886) E
Molopsida phyllocharis (Broun, 1912) E
Molopsida polita White, 1846 E
Molopsida pretiosa (Broun, 1910) E
Molopsida propinqua (Broun, 1917) E
Molopsida puncticollis (Sharp, 1883) E
Molopsida robusta (Broun, 1921) E
Molopsida seriatoporus (Bates, 1874) E
Molopsida simplex (Broun, 1903) E
Molopsida simulans (Broun, 1894) E
Molopsida southlandica (Broun, 1908) E
Molopsida strenua (Broun, 1894) E
Molopsida sulcicollis (Bates, 1874) E
ZOLINI
S. ZOLINA
Oopterus atratus (Broun, 1893) E
Oopterus basalis Broun, 1915 E
Oopterus carinatus Broun, 1882 E
Oopterus clivinoides Guérin-Méneville, 1841 E Su
Oopterus collaris Broun, 1893 E
Oopterus femoralis (Broun, 1894) E
Oopterus frontalis Broun, 1908 E
Oopterus fulvipes Broun, 1886 E
Oopterus helmsi (Sharp, 1886) E
Oopterus labralis (Broun, 1921) E
Oopterus laevicollis Bates, 1871 E
Oopterus laevigatus Broun, 1912 E
Oopterus laeviventris (Sharp, 1883) E
Oopterus latifossus Broun, 1917 E
Oopterus latipennis Broun, 1903 E
Oopterus lewisi (Broun, 1912) E
Oopterus marrineri Broun, 1909 E Su
Oopterus minor Broun, 1917 E
Oopterus nigritulus Broun, 1908 E
Oopterus ocularius (Broun, 1917) E
Oopterus pallidipes Broun, 1893 E
Oopterus parvulus Broun, 1903 E
Oopterus patulus (Broun, 1881) E
Oopterus plicaticollis Blanchard, 1843 E Su
Oopterus probus Broun, 1903 E
Oopterus puncticeps Broun, 1893 E
Oopterus pygmeatus Broun, 1907 E
Oopterus sculpturatus ovinotatus Broun, 1908 E
Oopterus s. sculpturatus Broun, 1908 E
Oopterus sobrinus Broun, 1886 E
Oopterus strenuus Johns, 1974 E Su
Oopterus suavis Broun, 1917 E
Oopterus subopacus (Broun, 1915) E
Oopterus spp. n. (21) 21E
Synteratus *ovalis* Broun, 1909 E Su
BEMBIDIINI
S. BEMBIDIINA
Bembidion (*Ananotaphus*) *rotundicolle eustictum* Bates, 1878 E
Bembidion (*A.*) *r. rotundicolle* Bates, 1874 E
Bembidion (*Notaphus*) *brullei* Gemminger & Harold, 1868 A
Bembidion (*Zeactedium*) *musae* Broun, 1882 E
Bembidion (*Z.*) *orbiferum giachinoi* Toledano, 2005 E
Bembidion (*Z.*) *o. orbiferum* Bates, 1878 E
Bembidion (*Zecillenus*) *alacre* (Broun, 1921) E
Bembidion (*Z.*) *albescens* (Bates, 1878) E
Bembidion (*Z.*) *chalmeri* (Broun, 1886) E
Bembidion (*Z.*) *embersoni* (Lindroth, 1980) E
Bembidion (*Z.*) *tillyardi* (Brookes, 1927) E
Bembidion (*Zemetallina*) *anchonoderus* Bates, 1878 E
Bembidion (*Z.*) *chalceipes* Bates, 1878 E
Bembidion (*Z.*) *hokitikense* Bates, 1878 E
Bembidion (*Z.*) *parviceps* Bates, 1878 E
Bembidion (*Z.*) *solitarium* Lindroth, 1976 E
Bembidion (*Z.*) *stewartense* Lindroth, 1976 E
Bembidion (*Z.*) *tekapoense* Broun, 1886 E
Bembidion (*Z.*) *urewerense* Lindroth, 1976 E
Bembidion (*Z.*) *wanakense* Lindroth, 1976 E
Bembidion (*Zeperyphodes*) *callipeplum* Bates, 1878 E
Bembidion (*Zeperyphus*) *actuarium* Broun, 1903 E
Bembidion (*Zeplataphus*) *charile* Bates, 1867 E
Bembidion (*Z.*) *dehiscens* Broun, 1893 E
Bembidion (*Z.*) *granuliferum* Lindroth, 1976 E
Bembidion (*Z.*) *maorinum levatum* Lindroth, 1976 E
Bembidion (*Z.*) *m. maorinum* Bates, 1867 E
Bembidion (*Z.*) *tairuense* Bates, 1878 E
Bembidion (*Z.*) *townsendi* Lindroth, 1976 E
S. TACHYINA
Kiwitachys *antarcticus* (Bates, 1874) E
Kiwitachys latipennis (Sharp, 1886) E
Paratachys crypticola (Britton, 1960) A?
Pericompsus (*Upocompsus*) *australis* (Schaum, 1863) A
Polyderis captus Blackburn, 1888 A
S. ANILLINA
Hygranillus *kuscheli* Moore, 1980 E

Nesamblyops oreobius (Broun, 1893) E
Nesamblyops subcaecus (Sharp, 1886) E
Pelodiaetodes prominens Moore, 1980 E
Pelodiaetodes n. sp. E
Pelodiaetus lewisi Jeannel, 1937 E
Pelodiaetus sulcatipennis Jeannel, 1937 E
Pelodiaetus n. sp. E
Zeanillus pallidus (Broun, 1884) E
Zeanillus phyllobius (Broun, 1893) E
Zeanillus punctiger (Broun, 1914) E
HARPALINAE
PTEROSTICHINI
S. PTEROSTICHINA
Aulacopodus brouni (Csiki, 1930) E
Aulacopodus calathoides (Broun, 1886) E
Aulacopodus maorinus (Bates, 1874) E
Aulacopodus sharpianus (Broun, 1893) E
Aulacopodus n. spp. (2) 2E
Gourlayia regia Britton, 1964 E TK
Holcaspis abdita Johns, 2003 E
Holcaspis algida Britton, 1940 E
Holcaspis angustula (Chaudoir, 1865) E
Holcaspis bathana Butcher, 1984 E
Holcaspis bessatica Johns, 2003 E
Holcaspis bidentella Johns, 2003 E
Holcaspis brevicula Butcher, 1984 E
Holcaspis brouniana (Sharp, 1886) E
Holcaspis catenulata Broun, 1882 E
Holcaspis delator (Broun, 1893) E
Holcaspis dentifera (Broun, 1880) E
Holcaspis egregialis (Broun, 1917) E
Holcaspis elongella (White, 1846) E
Holcaspis falcis Butcher, 1984 E
Holcaspis hispida (Broun, 1877) E
Holcaspis hudsoni Britton, 1940 E
Holcaspis impigra Broun, 1886 E
Holcaspis implica Butcher, 1984 E
Holcaspis intermittens (Chaudoir, 1865) E
Holcaspis mordax Broun, 1886 E
Holcaspis mucronata Broun, 1886 E
Holcaspis obvelata Johns, 2003 E
Holcaspis odontella (Broun, 1908) E
Holcaspis oedicnema Bates, 1874 E
Holcaspis ohauensis Butcher, 1984 E
Holcaspis ovatella (Chaudoir, 1865) E
Holcaspis placida Broun, 1881 E
Holcaspis sinuiventris (Broun, 1908) E
Holcaspis sternalis Broun, 1881 E
Holcaspis stewartensis Butcher, 1984 E
Holcaspis subaenea (Guérin-Méneville, 1841) E
Holcaspis suteri (Broun, 1893) E
Holcaspis tripunctata Butcher, 1984 E
Holcaspis vagepunctata (White, 1846) E
Holcaspis vexata (Broun, 1908) E
Megadromus (*Megadromus*) *alternus* (Broun, 1886) E
Megadromus (*M.*) *antarcticus* (Chaudoir, 1865) E
Megadromus (*M.*) *asperatus* (Broun, 1886) E
Megadromus (*M.*) *bucolicus* (Broun, 1903) E
Megadromus (*M.*) *bullatus* (Broun, 1915) E
Megadromus (*M.*) *capito* (White, 1846) E
Megadromus (*M.*) *compressus* (Sharp, 1886) E
Megadromus (*M.*) *curtulus* (Broun, 1884) E
Megadromus (*M.*) *enysi* (Broun, 1882) E
Megadromus (*M.*) *fultoni* (Broun, 1882) E
Megadromus (*M.*) *guerinii* (Chaudoir, 1865) E
Megadromus (*M.*) *haplopus* (Broun, 1893) E
Megadromus (*M.*) *lobipes* (Bates, 1878) E
Megadromus (*M.*) *memes* (Broun, 1903) E
Megadromus (*M.*) *meritus* (Broun, 1884) E
Megadromus (*M.*) *omaramae* Johns, 2007 E
Megadromus (*M.*) *rectalis* (Broun, 1881) E
Megadromus (*M.*) *rectangulus* (Chaudoir, 1865) E
Megadromus (*M.*) *sandageri* (Broun, 1893) E
Megadromus (*M.*) *speciosus* Johns, 2007 E
Megadromus (*M.*) *temukensis* (Bates, 1878) E
Megadromus (*M.*) *turgidiceps* (Broun, 1908) E
Megadromus (*M.*) *vigil* (White, 1846) E
Megadromus (*M.*) *virens* (Broun, 1886) E
Megadromus (*M.*) *walkeri* (Broun, 1903) E
Megadromus (*M.*) *wallacei* (Broun, 1912) E
Megadromus (*M.*) n. spp. (10) 10E
Neoferonia ardua (Broun, 1893) E
Neoferonia edax (Chaudoir, 1878) E
Neoferonia fossalis (Broun, 1914) E
Neoferonia integrata (Bates, 1878) E
Neoferonia prasignis (Broun, 1903) E
Neoferonia procerula (Broun, 1886) E
Neoferonia prolixa (Broun, 1880) E
Neoferonia straneoi Britton, 1940 E
Neoferonia truncatula (Broun, 1923) E
Neoferonia n. sp. (20) 20E
Onawea pantomelas (Blanchard, 1843) E
Plocamostethus planiusculus (White, 1846) E
Plocamostethus scribae Johns, 2007 E
Prosopogmus oodiformis (Macleay, 1871) A
Psegmatopterus politissimus (White, 1846) E
Rhytisternus liopleurus (Chaudoir, 1865) A
Rhytisternus miser (Chaudoir, 1865) A
Zeopoecilus calcaratus (Sharp, 1886) E
Zeopoecilus caperatus Johns, 2007 E
Zeopoecilus putus (Broun, 1882) E
LICININI
S. DICROCHILINA
Dicrochile anchomenoides Guérin-Méneville, 1846 E
Dicrochile anthracina Broun, 1893 E
Dicrochile aterrima Bates, 1874 E
Dicrochile cephalotes Broun, 1894 E
Dicrochile cordicollis Broun, 1903 E
Dicrochile fabrii Guérin-Méneville, 1846 E
Dicrochile flavipes Broun, 1917 E
Dicrochile insignis Broun, 1917 E
Dicrochile maura Broun, 1880 E
Dicrochile nitida Broun, 1882 E
Dicrochile novaezelandiae (Laporte de Castelnau, 1867) E
Dicrochile rugicollis Broun, 1917 E
Dicrochile subopaca Bates, 1874 E
Dicrochile thoracica Broun, 1908 E
Dicrochile whitei (Csiki, 1931) E
S. LICININA
Physolaesthus insularis Bates, 1878
Physolaesthus limbatus (Broun, 1880) E
HARPALINI
S. ANISODACTYLINA
Allocinopus angustulus Broun, 1912 E
Allocinopus belli Larochelle & Larivière, 2005 E
Allocinopus bousqueti Larochelle & Larivière, 2005 E
Allocinopus latitarsis Broun, 1911 E Ch
Allocinopus sculpticollis Broun, 1903 E
Allocinopus smithi Broun, 1912 E
Allocinopus wardi Larochelle & Larivière, 2005 E
Anisodactylus (*Anisodactylus*) *binotatus* (Fabricius, 1787) A
Gaioxenus pilipalpis Broun, 1910 E
Gnathaphanus melbournensis (Laporte de Castelnau, 1867) A
Hypharpax antarcticus (Laporte de Castelnau, 1867) E
Hypharpax australis (Dejean, 1829) A
Maoriharpalus sutherlandi Larochelle & Larivière, 2005 E TK
Notiobia (*Anisotarsus*) *quadricollis* (Chaudoir, 1878) A?
Parabaris atratus Broun, 1881 E
Parabaris hoarei Larochelle & Larivière, 2005 E
Parabaris lesagei Larochelle & Larivière, 2005 E
Triplosarus novaezelandiae (Laporte de Castelnau, 1867) E
Tuiharpalus clunieae Larochelle & Larivière, 2005 E
Tuiharpalus crosbyi Larochelle & Larivière, 2005 E TK
Tuiharpalus gourlayi (Britton, 1964) E
Tuiharpalus hallae Larochelle & Larivière, 2005 E
Tuiharpalus moorei Larochelle & Larivière, 2005 E
S. HARPALINA
Harpalus (*Harpalus*) *affinis* (Schrank, 1781) A
Harpalus (*Harpalus*) *tardus* (Panzer, 1797) A
Harpalus australasiae Dejean, 1829 A
S. PELMATELLINA
Hakaharpalus cavelli (Broun, 1893) E
Hakaharpalus davidsoni Larochelle & Larivière, 2005 E
Hakaharpalus maddisoni Larochelle & Larivière, 2005 E
Hakaharpalus patricki Larochelle & Larivière, 2005 E
Hakaharpalus rhodeae Larochelle & Larivière, 2005 E
Kupeharpalus barrattae Larochelle & Larivière, 2005 E
Kupeharpalus embersoni Larochelle & Larivière, 2005 E
Kupeharpalus johnsi Larochelle & Larivière, 2005 E
Lecanomerus atriceps (Macleay, 1871) A
Lecanomerus insignitus Broun, 1880 E
Lecanomerus obesulus Bates, 1878 E
Lecanomerus latimanus Bates, 1874 E
Lecanomerus marrisi Larochelle & Larivière, 2005 E
Lecanomerus sharpi (Csiki, 1932) E
Lecanomerus verticalis (Erichson, 1842) A
Lecanomerus vestigialis (Erichson, 1842) A
Syllectus anomalus Bates, 1878 E
Syllectus gouleti Larochelle & Larivière, 2005 E
Syllectus magnus Britton, 1964 E
S. STENOLOPHINA
Egadroma picea (Guérin-Méneville, 1830) A
Euthenarus bicolor Moore, 1985 A
Euthenarus brevicollis Bates, 1874 E
Euthenarus promptus (Erichson, 1842) A
Euthenarus puncticollis Bates, 1874 E
Haplanister crypticus Moore, 1996 A
Kiwiharpalus townsendi Larochelle & Larivière, 2005 E TK
Pholeodytes cerberus Britton, 1964 E
Pholeodytes helmorei Larochelle & Larivière, 2005 E
Pholeodytes nunni Larochelle & Larivière, 2005 E
Pholeodytes palmai Larochelle & Larivière, 2005 E
Pholeodytes townsendi Britton, 1962 E
PLATYNINI
S. SPHODRINA
Laemostenus (*Laemostenus*) *complanatus* (Dejean, 1828) A
S. PLATYNINA
Cerabilia aphela (Broun, 1912) E
Cerabilia major (Broun, 1912) E
Cerabilia maori Laporte de Castelnau, 1867 E
Cerabilia oblonga (Broun, 1910) E
Cerabilia rufipes (Broun, 1893) E
Cerabilia striatula (Broun, 1893) E
Cerabilia n. spp. (15) 15E
Ctenognathus actochares Broun, 1894 E
Ctenognathus adamsi (Broun, 1886) E
Ctenognathus arnaudensis (Broun, 1921) E
Ctenognathus bidens (Chaudoir, 1878) E
Ctenognathus cardiophorus (Chaudoir, 1878) E
Ctenognathus cheesemani (Broun, 1880) E
Ctenognathus colensonis (White, 1846) E
Ctenognathus crenatus (Chaudoir, 1878) E
Ctenognathus deformipes (Broun, 1880) E
Ctenognathus edwardsii (Bates, 1874) E
Ctenognathus helmsi (Sharp, 1881) E
Ctenognathus integratus (Broun, 1908) E
Ctenognathus intermedius (Broun, 1908) E
Ctenognathus libitus (Broun, 1914) E
Ctenognathus littorellus Broun, 1908 E
Ctenognathus lucifugus (Broun, 1886) E
Ctenognathus macrocoelis (Broun, 1908) E
Ctenognathus montivagus (Broun, 1880) E

Ctenognathus munroi Broun, 1893 E
Ctenognathus neozelandicus (Chaudoir, 1878) E
Ctenognathus novaezelandiae (Fairmaire, 1843) E
Ctenognathus oreobius (Broun, 1886) E
Ctenognathus otagoensis (Bates, 1878) E
Ctenognathus parabilis (Broun, 1880) E
Ctenognathus perrugithorax (Broun, 1880) E
Ctenognathus pictonensis Sharp, 1886 E
Ctenognathus politulus (Broun, 1880) E
Ctenognathus punctulatus (Broun, 1877) E
Ctenognathus sandageri (Broun, 1882) E
Ctenognathus simmondsi Broun, 1912 E
Ctenognathus sophronitis (Broun, 1908) E
Ctenognathus suborbithorax (Broun, 1880) E
Ctenognathus sulcitarsis (Broun, 1880) E
Ctenognathus xanthomelas (Broun, 1908) E
Notagonum chathamense (Broun, 1909) E Ch
Notagonum feredayi (Bates, 1874) E
Notagonum lawsoni (Bates, 1874) E
Notagonum submetallicum (White, 1846)
Notagonum n. spp. (2) 2E
Platynus macropterus (Chaudoir, 1879) E
Prosphodrus occultus Britton, 1960 E
Prosphodrus waltoni Britton, 1959 E
PERIGONINI
Perigona (*Trechicus*) *nigriceps* (Dejean, 1831) A
PENTAGONICINI
Pentagonica vittipennis Chaudoir, 1877
Scopodes basalis Broun, 1893 E
Scopodes bryophilus Broun, 1886 E
Scopodes cognatus Broun, 1886 E
Scopodes edwardsii Bates, 1878 E
Scopodes fossulatus (Blanchard, 1843) E
Scopodes laevigatus Bates, 1878 E
Scopodes levistriatus Broun, 1886 E
Scopodes multipunctatus Bates, 1878 E
Scopodes prasinus Bates, 1878 E
Scopodes pustulatus Broun, 1882 E
Scopodes versicolor Bates, 1878 E
LEBIINI
S. PERICALINA
Agonocheila antipodum (Bates, 1867)
Philophlaeus luculentus (Newman, 1842) A
S. ACTENONYCINA
Actenonyx bembidioides White, 1846 E
Actenonyx n. spp. (2) 2E
S. CALLEIDINA
Anomotarus (*Anomotarus*) *illawarrae* (Macleay, 1873) A
Anomotarus (*A.*) *variegatus* Moore, 1967 A
Demetrida (*Demetrida*) *dieffenbachii* (White, 1843) E
Demetrida (*D.*) *lateralis* Broun, 1910 E
Demetrida (*D.*) *lineella* White, 1846 E
Demetrida (*D.*) *longula* Sharp 'n. sp.' [*nomen nudum*] SI
Demetrida (*D.*) *moesta atra* Broun, 1880 E
Demetrida (*D.*) *m. moesta* Sharp, 1878 E
Demetrida (*D.*) *nasuta* White, 1846 E
Demetrida (*D.*) *sinuata maculata* Britton, 1941 E
Demetrida (*D.*) *s. sinuata* Broun, 1917 E
Trigonothops (*Trigonothops*) *pacifica* (Erichson, 1842) A
S. DROMIINA
Dromius (*Dromius*) *meridionalis* Dejean, 1825 A
PSEUDOMORPHINAE A
PSEUDOMORPHINI
Adelotopus macilentus Baehr, 1997 A?
DYTISCIDAE
COLYMBETINAE
COLYMBETINI
Rhantus plantaris Sharp, 1882 E SI F
Rhantus schauinslandi Ordish, 1989 E Ch F
Rhantus suturalis (Macleay, 1825) F
COPELATINAE
COPELATINI
Exocelina australis (Clark, 1863) F-M
DYTISCINAE
CYBISTRINI
Onychohydrus hookeri (White, 1846) E F
Onychohydrus scutellaris (Germar, 1848) V F
DYTISCINI
Dytiscus semisulcatus Müller, 1776 V F
HYDATICINI
Hydaticus consanguineus Aubé, 1838 K F
HYDROPORINAE
BIDESSINI
Allodessus oliveri (Ordish, 1966) [?= *A. bistrigatus* (Clark, 1862)] E K F
Huxelhydrus syntheticus Sharp, 1882 E F
Kuschelydrus phreaticus Ordish, 1976 E F
Liodessus deflectus Ordish, 1966 E F
Liodessus plicatus (Sharp, 1882) E F
Phreatodessus hades Ordish, 1976 E F
Phreatodessus pluto Ordish, 1991 E F
HYDROPORINI
Antiporus femoralis (Boheman, 1858) F
Antiporus uncifer Sharp, 1882 E F
HYPHYDRINI
Hyphydrus (*Apriophorus*) *elegans* (Montrouzier, 1860) V F
LANCETINAE
LANCETINI
Lancetes lanceolatus (Clark, 1863) F
GYRINIDAE
GYRININAE
Gyrinus convexiusculus Macleay, 1871 V F

Suborder POLYPHAGA
STAPHYLINIFORMIA
HYDROPHILOIDEA
HYDROPHILIDAE
HORELOPHINAE
Horelophus walkeri d'Orchymont, 1913 E
HYDROPHILINAE
SPERCHOPSINI
Cylomissus glabratus Broun, 1903 E
BEROSINI
Berosus (*Phelerosus*) *pallidipennis* (Sharp, 1884) E F
Berosus n. spp. (2) 2E F
ANACAENINI
Paracymus pygmaeus (Macleay, 1871) F
Paracymus n. sp. E F
LACCOBIINI
Laccobius (*Platylaccobius*) *arrowi* d'Orchymont, 1925 E F
HYDROPHILINI
Enochrus (*Lumetus*) *abditus* (Sharp, 1884) E SI F
Enochrus (*Lumetus*) *tritus* (Broun, 1880) F
Limnoxenus zealandicus (Broun, 1880) F
Sternolophus (*Neosternolophus*) *marginicollis* (Hope, 1841) A Do F
SPHAERIDIINAE
COELOSTOMATINI
Adolopus altulus (Broun, 1880) E
Adolopus badius (Broun, 1880) E
Adolopus convexus Broun, 1893 E
Adolopus helmsi Sharp, 1884 E
Adolopus rugipennis Broun, 1886 E
Cyloma flemingi (Ordish, 1974) E Su
Cyloma guttulatus Sharp, 1884 E
Cyloma lawsonus Sharp, 1872 E
Cyloma lineatus (Broun, 1893) E
Cyloma nigratus (Broun, 1915) E
Cyloma pictus (Kirsch, 1877) E Su
Cyloma stewarti Broun, 1894 E
Cyloma thomsonus Sharp, 1884 E
Dactylosternum abdominale (Fabricius, 1792) A
Dactylosternum marginale (Sharp, 1876) A
MEGASTERNINI
Cercyodes laevigatus Broun, 1886 E
Cercyon (*Cercyon*) *depressus* Stephens, 1829 A
Cercyon (*C.*) *haemorrhoidalis* (Fabricius, 1775) A
Cercyon (*C.*) *nigriceps* (Marsham, 1802) A
Cercyon (*Paracercyon*) *analis* (Paykull, 1798) A
RYGMODINI
Rygmodus alienus Broun, 1893 E
Rygmodus antennatus (Sharp, 1884) E
Rygmodus cyaneus Broun, 1881 E
Rygmodus femoratus Sharp, 1884 E
Rygmodus incertus Broun, 1880 E
Rygmodus longulus (Sharp, 1884) E
Rygmodus modestus White, 1846 E
Rygmodus oblongus Broun, 1880 E
Rygmodus opimus Broun, 1880 E
Rygmodus pedinoides White, 1846 E
Rygmodus tibialis Broun, 1893 E
Rygmodus n. sp. E
Saphydrus monticola Broun, 1893 E
Saphydrus obesus Sharp, 1884 E
Saphydrus suffusus Sharp, 1884 E
SPHAERIDIINI
Sphaeridium lunatum Fabricius, 1792 A
TORMISSINI
Tormus femoralis (Broun, 1910) E
Tormus helmsi Sharp, 1884 E
Tormus nitidus (Broun, 1893) E
Exydrus gibbosus (Broun, 1880) E
Hydrostygnus frontalis (Broun, 1880) E
Tormissus guanicola (Broun, 1904) E Su
Tormissus linsi (Sharp, 1884) E
Tormissus sp. n. E TK
HISTERIDAE
ABRAEINAE A
ACRITINI
Acritus nigricornis (Hoffman, 1803) A
SAPRININAE
Gnathoncus communis (Marseul, 1862) A
Gnathoncus rotundatus (Kugelann, 1792) A
Neopachylopus lepidulus (Broun, 1881) E
Reichardtia pedatrix (Sharp, 1876) E
Saprinus detritus (Fabricius, 1775) E
Saprinus n. spp. (2) 2E Ch
Tomogenius australis Dahlgren, 1976 E
Tomogenius kuscheli Dahlgren, 1976 E
Tomogenius latipes (Broun, 1881) E
Tomogenius n. sp. E Ch
DENDROPHILINAE
'Abraeus' brunneus Broun, 1881 E
'Abraeus' vividulus Broun, 1880 E
PAROMALINI
Carcinops (*Carcinops*) *pumilio* (Erichson, 1834) A
HISTERINAE
PLATYSOMATINI
Aulacosternus zelandicus Marseul, 1853 E
Eblisia bakewelli (Marseul, 1864) A
Eblisia carolinum (Paykull, 1811) A Do SI
ONTHOPHILINAE
Parepierus abrogatus (Broun, 1886) E
Parepierus crenulatus (Broun, 1886) E
Parepierus planiceps (Broun, 1886) E
Parepierus punctulipennis (Broun, 1880) E
Parepierus purus (Broun, 1880) E
Parepierus rufescens (Reitter, 1880) E
Parepierus rusticus (Broun, 1886) E
Parepierus simplex (Broun, 1886) E
Parepierus spinellus (Broun, 1921) E
Parepierus sylvanus (Lewis, 1879) E
Tribalus brouni (Broun, 1880) E
Tribalus phyllobius (Broun, 1914) E
STAPHYLINOIDEA
HYDRAENIDAE
ORCHYMONTIINAE
Podaena dentipalpis Ordish, 1984 E F
Podaena glabriventris Ordish, 1984 E F
Podaena kuscheli Ordish, 1984 E F

Podaena latipalpis Ordish, 1984 E F
Podaena maclellani (Zwick, 1975) E F
Podaena obscura Ordish, 1984 E F
Podaena trochanteralis Ordish, 1984 E F
Homalaena acuta Ordish, 1984 E F
Homalaena carinata Ordish, 1984 E F
Homalaena dilatata Ordish, 1984 E F
Homalaena dispersa Ordish, 1984 E F
Homalaena nelsonensis Ordish, 1984 E F
Homalaena setosa Ordish, 1984 E F
Homalaena spatulata Ordish, 1984 E F
Orchymontia banksiana Ordish, 1984 E F
Orchymontia bidentata Ordish, 1984 E F
Orchymontia calcarata Ordish, 1984 E F
Orchymontia ciliata Ordish, 1984 E F
Orchymontia crassifemur Ordish, 1984 E F
Orchymontia curvipes Ordish, 1984 E F
Orchymontia dilatata Ordish, 1984 E F
Orchymontia dugdalei Ordish, 1984 E F
Orchymontia laminifera Ordish, 1984 E F
Orchymontia latispina Ordish, 1984 E F
Orchymontia nunni Delgado & Palma 2000 E F
Orchymontia otagensis Ordish, 1984 E F
Orchymontia spinipennis Broun, 1919 E F
Orchymontia vulgaris Ordish, 1984 E F
HYDRAENINAE
HYDRAENINI
Hydraena (*Hydraena*) *ambiflagellata* Zwick, 1977 A F
Hydraena (*H.*) *ordishi* Delgado & Palma, 1997 E F
Hydraena (*H.*) *zealandica* Ordish, 1984 E F
OCTHEBIINAE
OCHTHEBIINI
S. MEROPATHINA
Meropathus aucklandicus Ordish, 1971 E Su
Meropathus campbellensis Brookes, 1951 E Su
Meropathus johnsi Ordish, 1971 E Su
Meropathus zelandicus Ordish, 1984 E
PTILIIDAE
PTILIINAE
NANOSELLINI
Mikado sp. nr *parvicornis* (Deane, 1932) E
Nellosana elegantula Johnson, 1982 E
Nellosana grandis Johnson, 1982 E
Nellosana intermedia Johnson, 1982 E
Nellosana minima Johnson, 1982 E
DISCHERAMOCEPHALINI
Cissidium crowsoni Johnson, 1982 E
Cissidium foveolatum Johnson, 1982 E
PTILIINI
Actidium angulicolle Johnson, 1982 E
Actidium delicatulum Johnson, 1982 E
Actidium lineare Matthews, 1874 E
Dipentium zelandicum Johnson, 1982 E
Kuschelidium maori Johnson, 1982 E
Notoptenidium apterum Johnson, 1982 E TK
Notoptenidium aubrooki Johnson, 1982 E
Notoptenidium crassum Johnson, 1982 E
Notoptenidium kuscheli Johnson, 1982 E
Notoptenidium lawsoni (Matthews, 1873) E
Notoptenidium oblongum Johnson, 1982 E
Notoptenidium parvum Johnson, 1982 E
Notoptenidium similatum Johnson, 1982 E
Notoptenidium sparsum Johnson, 1982 E
Notoptenidium subitum Johnson, 1982 E
Oligella foveolata (Allibert, 1844) A
Ptenidium (*Ptenidium*) *laevigatum* Erichson, 1845 A
Ptenidium (*P.*) *punctatum* (Gyllenhal, 1827) A
Ptenidium (*P.*) *pusillum* (Gyllenhal, 1808) A
Ptenidium n. sp. E Ch
Ptenidotonium longicorne Johnson, 1982 E
PTINELLINI
Ptinella acaciae Johnson, 1982 E
Ptinella atrata Johnson, 1975 E Su
Ptinella bitumida Johnson, 1982 E Ch
Ptinella brunnescens Johnson, 1982 E Ch
Ptinella cavelli (Broun, 1893) E
Ptinella chathamensis Johnson, 1982 E Ch
Ptinella confusa Johnson, 1982 E
Ptinella errabunda Johnson, 1975 A Do
Ptinella fallax Johnson, 1975 E K
Ptinella ferruginea Johnson, 1982 E
Ptinella kermadecensis Johnson, 1975 E K
Ptinella lucida Johnson, 1982 E
Ptinella octopunctata Johnson, 1975 E Su
Ptinella propria (Broun, 1893) E
Ptinella pustulata Johnson, 1982 E
Ptinella simsoni (Matthews, 1878)
Ptinella snarensis Johnson, 1975 E Su
Ptinella taylorae Johnson, 1977 E
Ptinella watti Johnson, 1982 E
Ptinella n. spp. (2) E Ch
Ptinella n. sp. E K
ACROTRICHINAE A
ACROTRICHINI
Acrotrichis (*Acrotrichis*) *fascicularis* (Herbst, 1793) A Do
Acrotrichis (*A.*) *inconspicua* (Matthews, 1874) A
Acrotrichis (*A.*) *insularis* (Mäklin, 1852) A
Acrotrichis (*A.*) *josephi* (Matthews, 1872) A
Acrotrichis (*Ctenopteryx*) *montandoni* (Allibert, 1844) A
NEPHANINI
Nephanes titan (Newman, 1834) A
Ptiliodes amplicollis Johnson, 1982 E
Ptiliodes austerus Johnson, 1982 E
Ptiliodes curtus Johnson, 1982 E
Ptiliodes naufragus Johnson, 1982 E TK
Ptiliodes posticalis (Broun, 1893) E
AGYRTIDAE
NICROPHILINAE
Zeanecrophilus prolongatus (Sharp, 1881) E
Zeanecrophilus thayerae Newton, 1997 E
LEIODIDAE
CAMIARINAE
AGYRTODINI
Agyrtodes bicolor (Broun, 1880) E
Agyrtodes hunuensis (Broun, 1893) E
Agyrtodes labralis (Broun, 1921) E
Agyrtodes lescheni Seago, 2009 E
Agyrtodes monticola (Broun, 1893) E
Agyrtodes nebulosus (Broun, 1880) E
Agyrtodes nemoralis (Broun, 1909) E
Chelagyrtodes crowsoni Szymczakowski, 1973 E
Chelagyrtodes 'davidi Seago, 2008' [*nomen nudum*] E SI
Chelagyrtodes 'glacicola Seago, 2008' [*nomen nudum*] E SI
Chelagyrtodes 'haasti Seago, 2008' [*nomen nudum*] E SI
Chelagyrtodes 'newtoni Seago, 2008' [*nomen nudum*] E SI
Chelagyrtodes 'nunni Seago, 2008' [*nomen nudum*] E SI
Chelagyrtodes 'rotundus Seago, 2008' [*nomen nudum*] E SI
Zeagyrtes antennalis (Broun, 1880) E
Zeagyrtes vitticollis Broun, 1917 E
Zeagyrtoma separanda Szymczakowski, 1966 E
Zeagyrtoma undulata (Broun, 1880) E
Zearagytodes brouni Jeannel, 1936 E
Zearagytodes concinnus (Broun, 1880) E
Zearagytodes maculifer (Broun, 1880) E
CAMIARINI
Baeosilpha rufescens Broun, 1895 E
Camiarites convexus (Sharp, 1876) E
Camiarites indiscretus (Broun, 1880) E
Camiarus estriatus Broun, 1912 E
Camiarus thoracicus (Sharp, 1876) E
Inocatops compactus Broun, 1893 E
Inocatops concinnus (Broun, 1880) E
Inocatops elongellus Broun, 1917 E
Inocatops flectipes Broun, 1893 E
Inocatops granipennis Broun, 1917 E
Inocatops impressus Broun, 1921 E
Inocatops nigrescens Broun, 1893 E
Inocatops separatus Broun, 1917 E
Inocatops spinifer Broun, 1917 E
Zenocolon laevicollis Broun, 1917 E
Camiarini gen. nov. (2) et n. spp. 2E
NEOPELATOPINI
Catopsolius laevicollis Sharp, 1886 E
Catopsolius nitidus (Broun, 1893) E
CHOLEVINAE
ANEMADINI
S. EUNEMADINA
Pseudonemadus (*Pseudonemadus*) *lituratus* (Broun, 1880) E
S. PARACATOPINA
Mesocolon caecum (Broun, 1912) E
Mesocolon castaneum (Broun, 1912) E
Mesocolon clathratum Broun, 1880 E
Mesocolon crassipes Szymczakowski, 1973 E
Mesocolon crenatellum (Broun, 1921) E
Mesocolon microps Jeannel, 1936 E
Mesocolon nesobium Jeannel, 1936 E
Mesocolon puncticeps Broun, 1880 E
Mesocolon retractum Szymczakowski, 1963 E
Paracatops acantharius Szymczakowski, 1973 E
Paracatops alacris (Broun, 1880) E
Paracatops antipoda (Kirsch, 1877) E Su
Paracatops brounianus Jeannel, 1936 E
Paracatops brunneipes (Broun, 1911) E Ch
Paracatops campbellicus (Brookes, 1951) E Su
Paracatops dickensis Jeannel, 1936 E
Paracatops fulvitarsis (Broun, 1886) E
Paracatops granifer (Broun, 1886) E
Paracatops lugubris (Sharp, 1882) E
Paracatops phyllobius (Broun, 1893) E
Paracatops pogonomerus Szymczakowski, 1973 E
Paracatops relatus (Broun, 1893) E
Paracatops suturalis (Broun, 1895) E
Paracatops triangulus Jeannel, 1936 E
COLONINAE
Colon (*Mesagyrtes*) *hirtale* (Broun, 1880) E
LEIODINAE
LEIODINI
Zeadolopus maoricus Daffner, 1985 E
Zeadolopus spinipes Broun, 1903 E
Zeadolopus validipes Daffner, 1985 E
PSEUDOLIODINI
Colenisia zelandica Leschen 2000 E
Zelodes kuscheli Leschen, 2000 E
Zelodes minutus Leschen, 2000 E
SOGDINI
Isocolon frontale Broun, 1921 E
Isocolon hilare Broun, 1893 E
Isocolon modestum Broun, 1921 E
Isocolon oruruense Broun, 1923 E
Isocolon ovale (Broun, 1893) E
STAPHYLINIDAE
ALEOCHARINAE
ALEOCHARINI
S. ALEOCHARINA
Aleochara (*Aleochara*) *aucklandica* Klimaszewski, 1997 E
Aleochara (*A.*) *complexa* Klimaszewski, 1997 E K
Aleochara (*A.*) *hammondi* Klimaszewski, 1997 E
Aleochara (*A.*) *subaenea* Fauvel, 1878 E
Aleochara (*A.*) *watti* Klimaszewski, 1997 E TK
Aleochara (*Xenochara*) *puberula* Klug, 1834 A
ATHETINI
S. ATHETINA
Acronota aterrima (Gravenhorst, 1802) A? Do
Acronota lugens (Motschulsky, 1858) A
Aloconota (*Aloconota*) *planifrons* (Waterhouse, 1863) A

Aloconota plicata (Cameron, 1945) E
Aloconota sulcifrons (Stephens, 1832) A
Amischa analis (Gravenhorst, 1802) A
Amischa decipiens (Sharp, 1869) A
Amischa nigrofusca (Stephens, 1832) A
Amriathaea antipodum (Cameron, 1947) E
Amriathaea microps Cameron, 1948 E
Amriathaea n. spp. (14) 14E
Atheta amicula (Stephens, 1832) A
Atheta brouni Bernhauer & Scheerpeltz, 1926 E
Atheta cottieri Cameron, 1945 E
Atheta kingorum Klimaszewski & Marris, 2003 E TK
Atheta luridipennis (Mannerheim, 1830) A
Atheta maruiana Cameron, 1950 E
Atheta muggeridgei Bernhauer, 1943 E
Atheta nigra (Kraatz, 1856) A
Atheta splendidicollis Bernhauer, 1943 E
Atheta trinotata (Kraatz, 1856) A
Atheta zealandica Cameron, 1945 A
Atheta n. sp. E
Atheta n. spp. (4) 4A
Brundinia semipallidula (Bernhauer, 1943) E
Dalotia coriaria (Kraatz, 1856) A
'Geostiba' n. sp. E? SI
Geostibasoma antipodum (Bernhauer, 1943) E
Halobrecta algophila (Fenyes, 1909) A
Halobrecta flavipes Thomson, 1861 A?
Leptostiba neozelandensis Pace, 2003 E
Leptostiba politula (Fauvel, 1878) A
Leptostiba pseudopolitula Pace, 2003 E
Liogluta n. sp. A?
Mocyta fungi (Gravenhorst, 1806) A
Nehemitropia lividipennis (Mannerheim, 1830) A
Tramiathea cornigera (Broun, 1880) E
S. THAMIARAEINA
Thamiaraea aucklandica Cameron, 1950 E
Thamiaraea fuscicornis (Broun, 1880) E
DIGLOTTINI
Paradiglotta nunni Ashe & Ahn, 2005 E
DIGRAMMINI
Digrammus miricollis Fauvel, 1900 E
FALAGRIINI
Cordalia obscura (Gravenhorst, 1802) A
Dasytricheta funesta (Broun, 1912) E
Dasytricheta haastiana Paśnik, 2007 E
Dasytricheta hookeriana Paśnik, 2007 E
Dasytricheta intermedia Paśnik, 2007 E
Dasytricheta kapuniana Paśnik, 2007 E
Dasytricheta mahitahiana Paśnik, 2007 E
Dasytricheta periana Paśnik, 2007 E
Dasytricheta shotoveriana Paśnik, 2007 E
Dasytricheta spectabilis Bernhauer, 1943 E
Dasytricheta testacea Paśnik, 2007 E
Dasytricheta waihoana Paśnik, 2007 E
Ecomorypora densepunctata Paśnik, 2007 E
Ecomorypora granulata (Broun, 1912) E
Ecomorypora longelytrata Paśnik, 2007 E
Ecomorypora pseudogranulata Paśnik, 2007 E
Ecomorypora n. spp. (3) 3E
Falagria subopaca Broun, 1893 E
Falagria n. spp. (2) E, A
Galafria rufa Cameron, 1945 A
Myrmecocephalus concinnus (Erichson, 1839) A
Myrmecocephalus micans (Broun, 1880) E
Myrmecopora paradoxa Bernhauer, 1943 E
Plesiosipalia arrowi Bernhauer, 1943 E
Plesiosipalia n. sp. E
GYMNUSINI
Stylogymnusa subantarctica Hammond, 1975 E Su
HOMALOTINI
S. BOLITOCHARINA
Austrasilida zealandica (Cameron, 1948) E
Euryusa aliena Cameron, 1945 E
Phymatura neozelandensis Pace 2003 E
S. GYROPHAENINA
?Adelarthra n. sp. A?
'Brachida' minuta Bernhauer, 1941 E
Encephalus latulus Broun, 1894 E
Encephalus zealandicus Cameron, 1945 E
Gyrophaena brookesi Cameron, 1947 E
Gyrophaena densicornis Broun, 1880 E
Gyrophaena glabricollis Bernhauer, 1941 E
Gyrophaena nugax Broun, 1880 E
Gyrophaena oligotina Cameron, 1945 E
Gyrophaena punctata Broun, 1880 E
Gyrophaena n. spp. (6) 6E
Notiomerinx zealandica Ashe, 2003 E
Pseudoligota n. sp. E?
Sternotropa versicolor Broun, 1880 E
S. HOMALOTINA
Coenonica puncticollis Kraatz, 1857 A
Homalota n. spp. (2) 2E
Leptusa (*Halmaeusa*) *antarctica* (Kiesenwetter, 1877) E Su
Pseudopisalia turbotti Cameron, 1950 E TK
Pseudopisalia n. sp. E
Silusa parallela Bernhauer, 1943 E
Silusa puber (Broun, 1880) E
Silusa n. sp. (2) 2E
Stenomastax dentata Cameron, 1945 E
Stenomastax sulcicollis Cameron, 1945 E
HYPOCYPHTINI
Oligota carinulata (Broun, 1914) E
Oligota excavata Williams, 1976 E
Oligota ferruginea Williams, 1976 E
Oligota fungicola Williams, 1976 E
Oligota grandis Williams, 1976 E
Oligota hudsoni Williams, 1976 E
Oligota inconspicua Williams, 1976 E
Oligota inflata (Mannerheim, 1930) A
Oligota longula Cameron, 1945 E
Oligota masculina (Cameron, 1947) E
Oligota parva Kraatz, 1862 A
Oligota pumilio Kiesenwetter, 1858 A
Oligota punctum Williams, 1976 E
Oligota setigera Williams, 1976 E
Oligota speculicollis (Cameron, 1945) E
Oligota transversalis Williams, 1976 E
Oligota watti Williams, 1976 E
Oligota wendyi Williams, 1976 E
Oligota zealandica Bernhauer, 1941 E
LIPAROCEPHALINI
Baeostethus chiltoni Broun, 1909 E Su
Ianmoorea zealandica (Ahn, 2004) E
MESOPORINI
Paraconosoma naviculare Bernhauer, 1941 E
Paraconosoma polita Steel, 1960 E
Paraconosoma n. sp. E
MYLLAEININI
Myllaena intermedia Erichson, 1837 A
Myllaena magnicollis Cameron, 1947 E
Myllaena neozelandensis Pace, 2008 E
OXYPODINI
Anocalea n. sp. A?
Aphytopus gracilis Sharp, 1886 E
Aphytopus granifer Broun, 1912 E
Aphytopus guinnessi Broun, 1912 E
Aphytopus pictulus Broun, 1914 E
Aphytopus porosus Broun, 1912 E
Austrocalea brookesi Cameron, 1950 E?
Austrocalea lewisi Cameron, 1948 E
Brouniana lucida (Cameron, 1945) E
Brouniana vulcanica (Cameron, 1945) E
Brouniana n. sp. (2) 2E
Calodera diversa Broun, 1894 E
Calodera fultoni Broun, 1912 E
Calodera glabra Bernhauer, 1943 E
Calodera grandipennis Bernhauer, 1943 E
Calodera minima Bernhauer, 1943 E
Calodera rhopalicornis Bernhauer, 1943 E
Calodera sericophora Broun, 1894 E
Calodera strandi Bernhauer, 1943 E
Calodera thoracica (Broun, 1880) E
Calodera tumidella Broun, 1894 E
Calodera vestita Broun, 1894 E
Calodera wallacei Broun, 1912 E
Colle campbellensis Steel, 1964 E Su
Crataraea suturalis (Mannerheim, 1830) A
Gastrolamprusa helmsi (Bernhauer, 1941) E
'Gyronotus' rufipennis (Broun, 1880) E
Ischnoglossa bituberculata (Broun, 1894) E
Ischnoglossa parciventris Cameron, 1945 E
Ischnoglossa pectinata Cameron, 1945 E
Ischnoglossa rufa Cameron, 1945 E
Makara hudsoni (Cameron, 1945) E
Neodoxa giachinoi Pace 2008 E
Neodoxa secreta (Cameron, 1950) E TK
Neozelandusa giachinoi Pace 2008 E
Ocalea abdominalis (Cameron, 1945) E
Ocalea brouni Cameron, 1945 E
Ocalea fungicola (Broun, 1894) E
Ocalea hudsoni Cameron, 1945 E
Ocalea rufa (Cameron, 1945) E
Ocalea socialis (Broun, 1880) E
Ocalea suturalis Cameron, 1945 E
Ocalea zelandica Klimaszewski and Marris, 2003 E TK
Ocyusa brouni Bernhauer, 1943 E
Ocyusa brouniana Bernhauer, 1943 E
Ocyusa n. sp. E
Oxypoda haemorrhoa (Mannerheim, 1830) A
Oxypoda zelandica Bernhauer, 1943 E
Paraphytopus brookesi Cameron, 1948 E
Paraphytopus minutus Cameron, 1948 E
Paraphytopus n. sp. E?
Polylobus sternalis (Broun, 1880) E
Sytus aerarius (Broun, 1880) E
Sytus bifossuta (Cameron, 1945) E
Sytus curiosus (Bernhauer, 1941) E
Sytus flavescens (Broun, 1880) E
Sytus fulgens (Broun, 1880) E
Sytus granifer (Broun, 1894) E
Sytus optabilis (Broun, 1880) E
Sytus n. spp. (2) 2E
PHYTOSINI
Arena fultoni Cameron, 1945 E
Aleocharinae n. spp. (10) 5E, 5A
EUAESTHETINAE
AUSTROESTHETINI
Kiwiaesthetus biimpressus Puthz, 2008 E
Kiwiaesthetus carltoni Puthz, 2008 E
Kiwiaesthetus kieneri Puthz, 2008 E
Kiwiaesthetus kuscheli Puthz, 2008 E
Kiwiaesthetus lescheni Puthz, 2008 E
Kiwiaesthetus ramsayi Puthz, 2008 E
Kiwiaesthetus whitehorni (Broun, 1912) E
Kiwiaesthetus n. sp. E
EUASTHETINI
Edaphus beszedesi Reitter, 1914 A
Protopristus minutus Broun, 1909 E
Protopristus n. spp. (2) 2E
STENAESTHETINI
Agnosthaetus bisulciceps (Broun, 1917) E
Agnosthaetus brouni (Broun, 1910) E
Agnosthaetus brouni Bernhauer, 1939, non *Dimerus brouni* (Broun, 1910) [homonym] E
Agnosthaetus cariniceps Bernhauer, 1939 E
Agnosthaetus stilbus (Broun, 1910) E
Agnosthaetus vicinus (Broun, 1921) E
HABROCERINAE A
Habrocerus capillaricornis (Gravenhorst, 1806) A
MICROSILPHINAE
Microsilpha litorea Broun, 1886 E
Microsilpha n. spp. (15) 15E
OMALIINAE
CORNEOLABIINI

Corneolabium mandibulare Steel, 1950 E
Metacorneolabium convexum Thayer, 1985 E
Metacorneolabium gigas Thayer, 1985 E
Metacorneolabium hokitika Thayer, 1985 E
Metacorneolabium minus Steel, 1950 E
Metacorneolabium pyriforme Thayer, 1985 E
Metacorneolabium rangipo Thayer, 1985 E
Metacorneolabium zanotium Thayer, 1985 E
Metacorneolabium n. spp. (2) 2E
Paracorneolabium brouni Steel, 1950 E
OMALIINI
Allodrepa decipiens Steel, 1964 E Su
Allodrepa subcylindrica (Kiesenwetter, 1877) E Su
Austrolophrum cribriceps (Fauvel, 1878) A
Brouniellum australe (Broun, 1894) E
Brouniellum parcum Bernhauer, 1939 E
Brouniellum sagoloide (Sharp, 1886) E
Brouniellum zealandicum Cameron, 1947 E
Crymus kronii (Kiesenwetter, 1877) E
Ischnoderus cognatus Broun, 1910 E
Ischnoderus curtipennis Broun, 1915 E
Ischnoderus fultoni Broun, 1893 E
Ischnoderus genalis (Broun, 1880) E
Ischnoderus morosus Broun, 1893 E
Ischnoderus opaciceps Cameron, 1947 E
Ischnoderus politulus (Broun, 1880) E
Ischnoderus tectus (Broun, 1880) E
Macralymma punctiventre Cameron, 1945 E
Nesomalium campbellense Steel, 1964 E Su
Nesomalium imitator Steel, 1964 E Su
Nesomalium insulare (Kiesenwetter, 1877) E Su
Nesomalium pacificum (Kiesenwetter, 1877) E Su
Omaliomimus actobius (Broun, 1893) E
Omaliomimus albipennis (Kiesenwetter, 1877) E Su
Omaliomimus carinigerus (Broun, 1893) E
Omaliomimus chalmeri (Broun, 1893) E
Omaliomimus conicum (Fauvel, 1878) E
Omaliomimus laetipennis (Broun, 1910) E
Omaliomimus litoreus (Broun, 1886) E
Omaliomimus robustus (Broun, 1911) E Ch
Omaliomimus setipes (Broun, 1909) E
Omaliomimus venator (Broun, 1909) E
Omalium allardii Fairmaire & Brisout de Barneville, 1859 A
Omalium hebes Broun, 1880 E
Paraphloeostiba gayndahensis (MacLeay, 1871) A
Selonomus linearis Steel, 1964 E Su
Stenomalium antipodum (Broun, 1893) E
Stenomalium debile (Broun, 1893) E
Stenomalium micrarthrum (Broun, 1893) E
Stenomalium moniliferum (Broun, 1893) E
Stenomalium parkeri (Bernhauer, 1939) E
Stenomalium philpotti (Broun, 1894) E
Stenomalium tenellum (Broun, 1893) E
Xylodromus (*Omalissus*) *concinnus* (Marsham, 1802) A
Zeolymma brachypterum Steel, 1950 E
Omaliinae Genus E (*'Omalium'*) *helmsi* (Cameron, 1945)
Omaliinae Genus F (*'Omalium'*) *cognatum* (Broun, 1893) E
Omaliinae Genus F (*'Omalium'*) *cottieri* (Bernhauer, 1939) E
Omaliinae Genus F (*'Omalium'*) *sulcithorax* (Broun, 1880) E
Omaliinae Genus F? (*'Omalium'*) *agreste* (Broun, 1880) E
Omaliinae Genus F? (*'Omalium'*) *brookesi* (Cameron, 1947) E
Omaliinae Genus F? (*'Omalium'*) *spadix* (Broun, 1880) E
OSORIINAE
ELEUSININI
Zeoleusis virgula (Fauvel, 1889) E
Zeoleusis n. sp. E
OSORIINI
Nototorchus ferrugineus (Broun, 1893) E
Nototorchus montanus (Broun, 1910) E
Paratorchus aculeatus (McColl, 1982) E
Paratorchus alifer (McColl, 1982) E
Paratorchus angulatus (McColl, 1982) E
Paratorchus angustus (McColl, 1982) E
Paratorchus anophthalmus (Fauvel, 1900) E
Paratorchus arrowi (Bernhauer, 1939) E
Paratorchus bifurcatus (McColl, 1982) E
Paratorchus brevipennis (Broun, 1893) E
Paratorchus brevisetis (McColl, 1982) E
Paratorchus bucinifer (McColl, 1982) E
Paratorchus caecus (Broun, 1910) E
Paratorchus curvisetis (McColl, 1982) E
Paratorchus decipiens (McColl, 1982) E
Paratorchus falcifer (McColl, 1984) E
Paratorchus fiordensis (McColl, 1982) E
Paratorchus flexuosus (McColl, 1982) E
Paratorchus foveatus (McColl, 1982) E
Paratorchus grandis (McColl, 1984) E
Paratorchus hamatus (McColl, 1982) E
Paratorchus helmsi (Fauvel, 1900) E
Paratorchus hermes (McColl, 1982) E
Paratorchus homerensis (McColl, 1982) E
Paratorchus humilis (McColl, 1982) E
Paratorchus insuetus (McColl, 1982) E
Paratorchus maritimus (McColl, 1984) E
Paratorchus microphthalmus (Fauvel, 1900) E
Paratorchus minutus (McColl, 1984) E
Paratorchus monstrosus (Bernhauer, 1939) E
Paratorchus parvulus (McColl, 1982) E
Paratorchus pelorensis (McColl, 1982) E
Paratorchus phaseolinus (McColl, 1982) E
Paratorchus pubescens (McColl, 1982) E
Paratorchus relictus (McColl, 1984) E
Paratorchus retroflexus (McColl, 1982) E
Paratorchus scapulifer (McColl, 1982) E
Paratorchus tardus (McColl, 1982) E
Paratorchus tricarinatus (McColl, 1982) E
Paratorchus trivialis (McColl, 1982) E
Paratorchus tubifer (McColl, 1982) E
Paratorchus vagepunctus (Fauvel, 1900) E
OXYTELINAE
COPROPHILINI
Coprostygnus curvipes Broun, 1921 E
Coprostygnus optandus Broun, 1893 E
Coprostygnus picipennis Broun, 1921 E
Coprostygnus sculptipennis Sharp, 1886 E
OXYTELINI
Anotylus brunneipennis (MacLeay, 1873) A
Anotylus complanatus (Erichson, 1839) A
Anotylus cribriceps (Fauvel, 1878) A
Anotylus pusillimus (Kraatz, 1859) A
Anotylus rugosus (Fabricius, 1775) A
Anotylus semirufus (Fauvel, 1877) A
Anotylus sparsus (Fauvel, 1877) A? Do
Anotylus varius (Fauvel, 1877) A
Anotylus vinsoni (Cameron, 1936) A
Anotylus wattsensis (Blackburn, 1902) A
Anotylus n. sp. A?
Oxytelus sculptus Gravenhorst, 1806 A
Oxytelus n. sp. A?
THINOBIINI
Bledиotrogus cordicollis (Broun, 1907) E
Bledиotrogus cribricollis Fauvel, 1900 E
Bledиotrogus guttiger Sharp, 1900 E
Bledius amplicollis Fauvel, 1900
Bledius bidentifrons Broun, 1912 E
Bledius salinus Cameron, 1947 E
Carpelimus bilineatus (Stephens, 1834) A
Carpelimus corticinus (Gravenhorst, 1806) A
Carpelimus persimilis (Cameron, 1947) E
Carpelimus pusillus (Gravenhorst, 1802) A
Carpelimus zealandicus (Sharp, 1900) E
Teropalpus coloratus (Sharp, 1900) E
Teropalpus maritimus (Broun, 1903) E
Teropalpus unicolor (Sharp, 1900)
PAEDERINAE
PAEDERINI
S. ASTENINA
Astenus guttulus (Fauvel, 1877) A
Astenus zealandicus Cameron, 1945 E?
S. CRYPTOBIINA
Hyperomma discrepans Broun, 1921 E
Hyperomma dispersum Broun, 1893 E
Hyperomma duplicatum Broun, 1893 E
Hyperomma flavipes Broun, 1923 E
Hyperomma lobatum Broun, 1921 E
Hyperomma mandibulare Broun, 1893 E
Hyperomma picipenne Broun, 1921 E
Hyperomma sanguineum Broun, 1894 E
Hyperomma subcaecum Broun, 1921 E
Hyperomma tenellum Broun, 1909 E
Hyperomma n. spp. (4) 4E
S. LATHROBIINA
Lathrobium bipartitum Fauvel, 1878 A
Lathrobium 'longipenne (Broun, 1912)' [preoccupied name] E
Phanophilus comptus (Broun, 1880) E
Scymbalium laetum Blackburn, 1888 A
S. MEDONINA
Lithocharis nigriceps Kraatz, 1859 A
Lithocharis ochracea (Gravenhorst, 1802) A
Lithocharis vilis Kraatz, 1859 A
Lithocharis n. sp. A?
Medon coecus (Broun, 1894) E
Medon granipennis (Broun, 1910) E
Medon mandibularis (Broun, 1880) E
Medon microps Cameron, 1947 E
Medon ventralis (Broun, 1880) E
Medon zeelandicus (Redtenbacher, 1867) E
Pseudomedon obscurellus (Erichson, 1840) A
Pseudomedon obsoletus (Nordmann, 1837) A
Sunius debilicornis (Wollaston, 1857) A
Sunius propinquus (Brisout de Barneville, 1867) A
S. SCOPAEIINA
Scopaeus apterus Cameron, 1950 E TK
Scopaeus n. sp. E?
S. STILICINA
Rugilus orbiculatus (Paykull, 1789) A
PHLOEOCARINAE
Phloeognathus monticola Steel, 1953 E
Pseudophloeocharis australis (Fauvel, 1903)
PIESTINAE
Parasiagonum hudsoni (Cameron, 1927) E
PROTEININAE
ANEPIINI
Eupsorus costatus Broun, 1904 E
Eupsorus n. spp. (3) 3E
NESONEINI
Nesoneus acuticeps Bernhauer, 1939 E
Paranesoneus sparsior (Cameron, 1945) E
SILPHOTELINI
Silphotelus nitidus Broun, 1895 E
Silphotelus obliquus Broun, 1912 E
PSELAPHINAE
EUPLECTITAE
EUPLECTINI
Euplectus auripilus Broun, 1886 E
Euplectus caviceps Broun, 1904 E
Euplectus 'cephalotes Reitter, 1880', non Motschulsky, 1845 [preoccupied name] E
Euplectus frontalis Broun, 1880 E
Euplectus incomptus Broun, 1884 E
Euplectus lepiphorus Broun, 1893 E
Euplectus longulus Broun, 1880 E
Euplectus opacus Sharp, 1874 E
Euplectus ovicollis Broun, 1880 E
Euplectus personatus Broun, 1893 E

Euplectus scruposus Broun, 1893 E
Euplectus sculpturatus Broun, 1880 E
Euplectus semiopacus Broun, 1895 E
Euplectus sulciceps Broun, 1904 E
Euplectus tuberigerus Broun, 1882 E
Euplectus unicus Broun, 1893 E
Euplectus vacuus Broun, 1884 E
Euplectus 'verticalis Broun, 1893', non Reitter, 1884 [preoccupied name] E
Euplectus n. spp. (7) 7E
Leptoplectus n. spp. (2) 2E
TRICHONYCHINI
S. PANAPHANTINA
Adalmus velutinus Reitter, 1885 E
Dalma gigantea Broun, 1914 E
Dalma graniceps Broun, 1921 E
Dalma pubescens Sharp, 1874 E
Dalma tuberculata Broun, 1880 E
Dalmisus batrisodes Sharp, 1886 E
Eleusomatus 'acuminatus (Broun, 1893)', non (Schaufuss 1882) [preoccupied name] E
Eleusomatus allocephalus (Broun, 1893) E
Eleusomatus caudatus (Broun, 1893) E
Eleusomatus oculatus Broun, 1921 E
Eleusomatus ovicollis Broun, 1915 E
Eleusomatus subcaecus Broun, 1921 E
Eleusomatus vidamoides Broun, 1921 E
Euglyptus abnormis Broun, 1921 E
Euglyptus costifer Broun, 1893 E
Euglyptus elegans Broun, 1893 E
Euglyptus foveicollis Broun, 1912 E
Euglyptus iracundus (Broun, 1893) E
Euglyptus longiceps Broun, 1921 E
Euglyptus longicornis Broun, 1912 E
Euglyptus punctatus (Broun, 1893) E
Euglyptus sublaevis Broun, 1921 E
Euplectopsis antennalis Broun, 1912 E
Euplectopsis antiqua (Broun, 1893) E
Euplectopsis biimpressa Broun, 1912 E
Euplectopsis blandiata Broun, 1915 E
Euplectopsis brevicollis (Reitter, 1880) E
Euplectopsis bryocharis Broun, 1915 E
Euplectopsis carinata Broun, 1912 E
Euplectopsis clavatula Broun, 1913 E
Euplectopsis crassipes (Broun, 1884) E
Euplectopsis crassula Broun, 1921 E
Euplectopsis cuneiceps Broun, 1915 E
Euplectopsis curvipennis Broun, 1914 E
Euplectopsis dorsalis Broun, 1915 E
Euplectopsis duplex Broun, 1915 E
Euplectopsis duplicata Broun, 1913 E
Euplectopsis elongella Broun, 1915 E
Euplectopsis eminens (Broun, 1886) E
Euplectopsis eruensis Broun, 1912 E
Euplectopsis fastigiata Broun, 1911 E
Euplectopsis femoralis Broun, 1914 E
Euplectopsis granulata Broun, 1911 E
Euplectopsis heterarthra Broun, 1912 E
Euplectopsis impressa Broun, 1915 E
Euplectopsis inscita (Broun, 1893) E
Euplectopsis longicollis (Reitter, 1880) E
Euplectopsis microcephala (Reitter, 1880) E
Euplectopsis mirifica (Broun, 1884) E
Euplectopsis modesta (Broun, 1895) E
Euplectopsis 'monticola (Broun, 1884)', non (Wollaston, 1864) [preoccupied name] E
Euplectopsis mucronella Broun, 1911 E
Euplectopsis nitipennis Broun, 1915 E
Euplectopsis obnisa (Broun, 1884) E
Euplectopsis ovithorax (Broun, 1884) E
Euplectopsis parvula (Broun, 1895) E
Euplectopsis patruelis (Broun, 1884) E
Euplectopsis perpunctata Broun, 1915 E
Euplectopsis 'pusilla (Broun, 1895)' non (Denny, 1825) [preoccupied name] E
Euplectopsis rotundicollis (Reitter, 1880) E
Euplectopsis sanguinea Broun, 1913 E
Euplectopsis schizocnemis Broun, 1912 E
Euplectopsis terrestris Broun, 1914 E
Euplectopsis tibialis Broun, 1914 E
Euplectopsis trichoniformis (Reitter, 1880) E
Euplectopsis tumida Broun, 1911 E
Euplectopsis tumipes (Broun, 1895) E
Kenocoelus dimorphus Broun, 1911 E
Paraplectus n. sp. E
Patreus lewisi Broun, 1904 E
Philiopsis n. sp. A?
Placodium zenarthrum Broun, 1893 E
Plectomorphus anguliferus Broun, 1921 E
Plectomorphus brevicornis Broun, 1913 E
Plectomorphus collinus Broun, 1921 E
Plectomorphus egenus Broun, 1913 E
Plectomorphus insignis Broun, 1921 E
Plectomorphus laminifer Broun, 1915 E
Plectomorphus longiceps Broun, 1913 E
Plectomorphus longipes Broun, 1912 E
Plectomorphus munroi (Broun, 1893) E
Plectomorphus optandus Broun, 1912 E
Plectomorphus rugiceps Broun, 1921 E
Plectomorphus scitiventris Broun, 1921 E
Plectomorphus 'spinifer (Broun, 1893)' non Casey, 1884 [preoccupied name] E
Plectomorphus trisulcicollis (Broun, 1880) E
Sagolonus arohaensis (Broun, 1895) E
Sagolonus impressus Broun, 1910 E
Sagolonus patronus (Broun, 1893) E
Vidamodes furvus Broun, 1921 E
Vidamus armiferus Broun, 1911 E
Vidamus brevitarsis (Broun, 1880) E
Vidamus bryophilus Broun, 1914 E
Vidamus calcaratus Broun, 1912 E
Vidamus cereus (Broun, 1884) E
Vidamus clavipes Broun, 1915 E
Vidamus congruus Broun, 1915 E
Vidamus convexus (Sharp, 1874) E
Vidamus fossalis Broun, 1921 E
Vidamus gracilipes Broun, 1917 E
Vidamus incertus (Reitter, 1880) E
Vidamus modestus Broun, 1913 E
Vidamus muscicola Broun, 1921 E
Vidamus nitidus Broun, 1921 E
Vidamus ovicollis Broun, 1921 E
Vidamus punctulatus Broun, 1915 E
Vidamus simplex Broun, 1921 E
Vidamus sternalis Broun, 1913 E
Vidamus trochanteralis Broun, 1911 E
Vidamus u-impressus (Broun, 1884) E
Vidamus validus (Broun, 1893) E
Whitea laevifrons (Broun, 1893) E
Zelandius asper (Broun, 1880) E
Zelandius basalis (Broun, 1914) E
Zelandius brookesi (Broun, 1915) E
Zelandius clevedonensis (Broun, 1893) E
Zelandius coxalis (Broun, 1893) E
Zelandius fovealis Broun, 1913 E
Zelandius foveiceps (Broun, 1895) E
Zelandius fulgens (Broun, 1911) E
Zelandius illustris (Broun, 1911) E
Zelandius moerens (Broun, 1893) E
Zelandius obscurus (Broun, 1893) E
Zelandius raffrayi (Broun, 1911) E
Zelandius sandageri (Broun, 1893) E
Zelandius spinifer (Broun, 1914) E
Zelandius tuberalis (Broun, 1915) E
Zelandius usitatus (Broun, 1910) E
S. TRICHONYCHINA
Macroplectus bifoveata (Broun, 1921) E
Macroplectus parallela (Broun, 1921) E
Macroplectus spinipes (Broun, 1910) E
S. TRIMIINA
Allopectus claviger (Broun, 1893) E
Allopectus picipennis Broun, 1911 E
Allopectus subcaecus Broun, 1911 E
TROGASTRINI
S. TROGASTRINA
Neosampa granulata Broun, 1921 E
Platomesus n. sp. E
FARONITAE
FARONINI
Exeirarthra angustula Broun, 1917 E
Exeirarthra enigma Broun, 1893 E
Exeirarthra longiceps Broun, 1917 E
Exeirarthra pallida Broun, 1893 E
Exeirarthra parviceps Broun, 1921 E
Logasa sp. n. A?
Sagola acuminata Broun, 1921 E
Sagola aemula Broun, 1921 E
Sagola affinis Broun, 1921 E
Sagola angulifera Broun, 1911 E
Sagola anisarthra Broun, 1893 E
Sagola arboricola Broun, 1921 E
Sagola auripila Broun, 1911 E
Sagola basalis Broun, 1911 E
Sagola bifida Broun, 1915 E
Sagola bifoveiceps Broun, 1912 E
Sagola biimpressa Broun, 1912 E
Sagola bilobata Broun, 1921 E
Sagola bipunctata Broun, 1886 E
Sagola bipuncticeps Broun, 1921 E
Sagola bituberata Broun, 1914 E
Sagola brevicornis Raffray, 1893 E
Sagola brevifossa Broun, 1921 E
Sagola brevisternis Broun, 1915 E
Sagola brevitarsis Broun, 1886 E
Sagola carinata Broun, 1912 E
Sagola castanea Broun, 1886 E
Sagola cilipes Broun, 1921 E
Sagola citima Broun, 1893 E
Sagola clavatella Broun, 1912 E
Sagola cognata Broun, 1911 E
Sagola colorata Broun, 1914 E
Sagola concolorata Broun, 1915 E
Sagola confusa Broun, 1915 E
Sagola convexa Broun, 1886 E
Sagola cordiceps Broun, 1921 E
Sagola crassulipes Broun, 1915 E
Sagola deformipes Broun, 1880 E
Sagola denticollis Broun, 1880 E
Sagola dickensis Broun, 1917 E
Sagola dilucida Broun, 1914 E
Sagola disparata Broun, 1914 E
Sagola dissonans Broun, 1921 E
Sagola distorta Broun, 1921 E
Sagola diversa Broun, 1911 E
Sagola duplicata Broun, 1886 E
Sagola electa Broun, 1914 E
Sagola elevata Broun, 1886 E
Sagola elongata Broun, 1893 E
Sagola eminens Broun, 1895 E
Sagola excavata Broun, 1886 E
Sagola fagicola Broun, 1921 E
Sagola fasciculata Broun, 1921 E
Sagola flavipes Broun, 1893 E
Sagola fovealis Broun, 1886 E
Sagola foveiventris Broun, 1921 E
Sagola frontalis Raffray, 1893 E
Sagola fulva Broun, 1893 E
Sagola fulvipennis Broun, 1915 E
Sagola furcata Broun, 1921 E
Sagola fuscipalpis Broun, 1914 E
Sagola genalis Broun, 1881 E
Sagola grata Broun, 1912 E
Sagola guinnessi Broun, 1911 E
Sagola halli Broun, 1914 E
Sagola hectorii Broun, 1917 E

Sagola hirtalis Broun, 1893 E
Sagola ignota Broun, 1921 E
Sagola immota Broun, 1893 E
Sagola indiscreta Broun, 1915 E
Sagola insignis Broun, 1893 E
Sagola insolens Broun, 1893 E
Sagola insueta Broun, 1914 E
Sagola laetula Broun, 1915 E
Sagola laminata Broun, 1893 E
Sagola laticeps Broun, 1911 E
Sagola latistriata Broun, 1911 E
Sagola latula Broun, 1912 E
Sagola lawsoni Broun, 1912 E
Sagola lineata Broun, 1893 E
Sagola lineiceps Broun, 1921 E
Sagola longicollis Broun, 1911 E
Sagola longipennis Broun, 1911 E
Sagola longipes Broun, 1915 E
Sagola longula Broun, 1912 E
Sagola macronyx Broun, 1893 E
Sagola major Sharp, 1874 E
Sagola mimica Broun, 1893 E
Sagola minuscula Broun, 1921 E
Sagola misella Sharp, 1874 E
Sagola monstrosa Reitter, 1880 E
Sagola monticola Broun, 1912 E
Sagola nitida Broun, 1911 E
Sagola notabilis Broun, 1880 E
Sagola occipitalis Broun, 1912 E
Sagola opercularis Broun, 1915 E
Sagola osculans Broun, 1886 E
Sagola pallidula Broun, 1912 E
Sagola parallela Broun, 1893 E
Sagola parva Sharp, 1874 E
Sagola pertinax Broun, 1893 E
Sagola planicula Broun, 1921 E
Sagola planipennis Broun, 1921 E
Sagola posticalis Broun, 1915 E
Sagola prisca Sharp, 1874 E
Sagola pulchra Broun, 1880 E
Sagola punctata Broun, 1893 E
Sagola puncticeps Broun, 1911 E
Sagola puncticollis Broun, 1911 E
Sagola punctulata Raffray, 1893 E
Sagola rectipennis Broun, 1921 E
Sagola rectipes Broun, 1893 E
Sagola remixta Broun, 1921 E
Sagola robusta Broun, 1893 E
Sagola robustula Broun, 1917 E
Sagola rotundiceps Broun, 1915 E
Sagola rufescens Broun, 1921 E
Sagola ruficeps Broun, 1893 E
Sagola rugifrons Broun, 1895 E
Sagola rustica Broun, 1915 E
Sagola setiventris Broun, 1915 E
Sagola sharpi Raffray, 1893 E
Sagola sobrina Broun, 1893 E
Sagola socia Broun, 1915 E
Sagola spinifer Broun, 1895 E
Sagola spiniventris Broun, 1912 E
Sagola strialis Broun, 1921 E
Sagola striatifrons Broun, 1921 E
Sagola subcuneata Broun, 1921 E
Sagola sulcator Broun, 1886 E
Sagola suturalis Broun, 1914 E
Sagola tenebrica Broun, 1921 E
Sagola tenuis Broun, 1886 E
Sagola terricola Broun, 1886 E
Sagola unicalis Broun, 1917 E
Sagola valida Broun, 1921 E
Sagola ventralis Broun, 1912 E
Stenosagola connata (Broun, 1911) E
Stenosagola crassicornis (Broun, 1911) E
Stenosagola gracilis (Broun, 1893) E
Stenosagola griseipila Broun, 1921 E
Stenosagola oblongiceps Broun, 1921 E
Stenosagola planiocula Broun, 1921 E
Stenosagola n. spp. (2) 2E
GONIACERITAE
BRACHYGLUTINI
S. BRACHYGLUTINA
Anabaxis electrica (King, 1863) A Do
Anabaxis foveolata (Broun, 1880) E
Eupines (*Eupines*) *calcarata* (Broun, 1886) E
Eupines (*E.*) *grata* (Sharp, 1874) E
Eupines (*E.*) *micans* (Sharp, 1874) E
Eupines (*E.*) *nasuta* (Broun, 1880) E
Eupines (*E.*) *nesobia* Broun, 1914 E
Eupines (*E.*) *piciceps* (Broun, 1880) E
Eupines (*E.*) *platynota* (Broun, 1893) E
Eupines (*E.*) *simplex* Broun, 1913 E
Eupines (*E.*) *sternalis* (Broun, 1893) E
Eupines (*Byraxis*) *acceptus* (Broun, 1923) E
Eupines (*B.*) *allocera* (Broun, 1893) E
Eupines (*B.*) *anisarthra* (Broun, 1914) E
Eupines (*B.*) *bisulcifrons* (Broun, 1914) E
Eupines (*B.*) *clemens* Broun, 1921 E
Eupines (*B.*) *conspicua* (Broun, 1893) E
Eupines (*B.*) *costata* (Broun, 1893) E
Eupines (*B.*) *crassicornis* (Broun, 1880), non *Bryaxis crassicornis* Motschulsky, 1835, 1851 [preoccupied name] E
Eupines (*B.*) *decens* (Broun, 1893) E
Eupines (*B.*) *deformis* (Sharp, 1874) E
Eupines (*B.*) *dispar* (Sharp, 1874) E
Eupines (*B. diversa* (Broun, 1893), non *Reichenbachia diversa* Raffray, 1887, nec *R. diversa* Sharp, 1887 [preoccupied name] E
Eupines (*B.*) *forficulida* (Broun, 1890) E
Eupines (*B.*) *foveatissima* (Broun, 1890) E
Eupines (*B.*) *fraudulenta* (Broun, 1886) E
Eupines (*B.*) *glabrata* (Broun, 1886) E
Eupines (*B.*) *halli* (Broun, 1921) E
Eupines (*B.*) *hectori* (Broun, 1895) E
Eupines (*B.*) *ignotus* (Broun, 1881) E
Eupines (*B.*) *illustris* (Broun, 1914) E
Eupines (*B.*) *impar* (Sharp, 1874) E
Eupines (*B.*) *impressifrons* (Broun, 1880) E
Eupines (*B.*) *lewisi* Broun, 1910 E
Eupines (*B.*) *longiceps* Raffray, 1904 E
Eupines (*B.*) *monstrosa* (Reitter, 1880) E
Eupines (*B.*) *mundula* (Schaufuss, 1888) E
Eupines (*B.*) *munroi* (Broun, 1890) E
Eupines (*B.*) *nemoralis* (Broun, 1886) E
Eupines (*B.*) *paganus* (Broun, 1881) E
Eupines (*B.*) *platyarthra* (Broun, 1893) E
Eupines (*B.*) *rhyssarthra* (Broun, 1912) E
Eupines (*B.*) *rudicornis* Broun, 1882 E
Eupines (*B.*) *sanguinea* (Broun, 1880) E
Eupines (*B.*) *setifer* (Broun, 1893) E
Eupines (*B.*) *sylvicola* (Broun, 1884) E
Eupinogitus sulcipennis Broun, 1921 E
Eupinolus altulus (Broun, 1880) E
Eupinolus punctatus (Broun, 1886) E
Gastrobothus abdominalis (Broun, 1880), non *Brachygluta abdominalis* Aubé, 1833 E
Gastrobothus sharpi (Broun, 1880) E
Physobryaxis inflata (Sharp, 1874) E
Simkinion bimanum Park & Pearce, 1962 E
Simkinion prelaticum Park & Pearce, 1962 E
Startes foveata Broun, 1893 E
Startes sculpturata Broun, 1886 E
PSELAPHITAE
PSELAPHINI
Pselaphogenius citimus (Broun, 1893) E
Pselaphogenius delicatus (Broun, 1886) E
Pselaphogenius ventralis (Broun, 1895) E
Pselaphophus atriventris (Westwood, 1856)
Pselaphotheseus hippolytae Park, 1964 E Su
Pselaphotheseus ihupuku Carlton & Leschen, 2001 E Su
Pselaphus caecus Broun, 1886 E
Pselaphus cavelli Broun, 1893 E
Pselaphus cavidorsis Broun, 1923 E
Pselaphus dulcis Broun, 1881 E
Pselaphus fuscopilus Broun, 1886 E
Pselaphus meliusculus Broun, 1893 E
Pselaphus oviceps Broun, 1917 E
Pselaphus pauper Sharp, 1874 E
Pselaphus pilifrons Broun, 1914 E
Pselaphus pilistriatus Broun, 1880 E
Pselaphus sulcicollis Broun, 1893, non *Trichonyx sulcicollis* (Reichenbach, 1816) E
Pselaphus trifoveatus Broun, 1914 E
Pselaphus urquharti Broun, 1917 E
TYRINI
S. TYRINA
Agatyrus fulvihirtus Broun, 1917 E
Gerallus punctipennis Schaufuss, 1880 A
Hamotulus angulipes Broun, 1914 E
Hamotulus armatus (Broun, 1893) E
Hamotulus cornutus Broun, 1915 E
Hamotulus curvipes (Broun, 1893) E
Hamotulus frontalis Broun, 1914 E
Hamotulus fuscipalpis Broun, 1915 E
Hamotulus mutandus (Sharp, 1874) E
Hamotulus robustus Broun, 1915 E
Hamotulus spinipes (Broun, 1893) E
Hamotulus sternalis (Broun, 1893) E
Phormiobius halli Broun, 1917 E
Plesiotyrus crassipes (Broun, 1893) E
Tyrogetus optandus Broun, 1893 E
Tyrogetus palpalis Broun, 1910 E
Zeatyrus lawsoni Sharp, 1881 E
PSEUDOPSINAE
Pseudopsis arrowi Bernhauer, 1939 E
Pseudopsis n. sp. E
SCAPHIDIINAE
CYPARIINI
Cyparium earlyi Löbl & Leschen, 2003 E
Cyparium thorpei Löbl & Leschen, 2003 E
SCAPHISOMATINI
Baeocera abrupta Löbl & Leschen, 2003 E
Baeocera actuosa (Broun, 1881) E
Baeocera benolivia Löbl & Leschen, 2003 E
Baeocera elenae Löbl & Leschen, 2003 E
Baeocera epipleuralis Löbl & Leschen, 2003 E
Baeocera hillaryi Löbl & Leschen, 2003 E
Baeocera karamea Löbl & Leschen, 2003 E
Baeocera punctatissima Löbl & Leschen, 2003 E
Baeocera sternalis Broun, 1914 E
Baeocera tekootii Löbl & Leschen, 2003 E
Baeocera tensingi Löbl & Leschen, 2003 E
Baeocera tenuis Löbl & Leschen, 2003 E
Brachynopus latus Broun, 1881 E
Brachynopus scutellaris (Redtenbacher, 1867) E
Notonewtonia thayerae Löbl & Leschen, 2003 E
Notonewtonia watti Löbl & Leschen, 2003 E
Scaphisoma corcyricum Löbl, 1964 A Do
Scaphisoma funereum Löbl, 1977 A
Scaphisoma hanseni Löbl & Leschen, 2003 E
Spinoscapha rufa (Broun, 1881) E
Vickibella apicella (Broun, 1880) E
SCYDMAENINAE
SCYDMAENITAE
CYRTOSCYDMINI
Chathamaenus chathamensis Franz, 1980 E Ch
Euconnus (*Tetramelus*) *castawayensis* Franz, 1975 E TK
Euconnus (*T.*) *curvicrus* Franz, 1975 E TK
Euconnus (*T.*) *northlandensis* Franz, 1975 E
Euconnus (*T.*) *ohenae* Franz, 1980 E
Euconnus (*T.*) *picicollis* (Broun, 1880) E
Euconnus (*T.*) *pseudoramsayi* Franz, 1975 E TK
Euconnus (*T.*) *ramsayi* Franz, 1975 E TK
Euconnus (*T.*) *stewartensis* Franz, 1980 E

Euconnus (*T.*) *threekingensis* Franz, 1975 E TK
Euconnus (*T.*) *wairauensis* Franz, 1986 E
Euconnus arthuris Franz, 1975 E
Euconnus brouni Franz, 1975 E
Euconnus calvus (Broun, 1880) E
Euconnus clarkei Franz, 1975 E
Euconnus horridus Franz, 1975 E
Euconnus impressipennis Franz, 1975 E
Euconnus kaimanawae Franz, 1986 E
Euconnus microcilipes Franz, 1986 E
Euconnus paracilipes Franz, 1986 E
Euconnus russatus (Broun, 1893) E
Euconnus setosus (Sharp, 1874) E
Euconnus n. sp. E
Maorinus alacer (Broun, 1915) E
Maorinus angulatus (Broun, 1893) E
Maorinus 'australis (Franz, 1975)', non (Franz, 1867) [preoccupied name] E
Maorinus brookesi (Franz, 1975) E
Maorinus bullockensis (Franz, 1986) E
Maorinus cilipes (Broun, 1893) E
Maorinus codfishensis (Franz, 1975) E
Maorinus divaricatus (Franz, 1980) E
Maorinus dunensis (Franz, 1975) E
Maorinus dunsdalensis (Franz, 1975) E
Maorinus egmontiensis (Franz, 1975) E
Maorinus eruensis (Franz, 1975) E
Maorinus erythronotus (Broun, 1893) E
Maorinus fabiani (Franz, 1975) E
Maorinus fugax (Franz, 1980) E
Maorinus hawkesi (Franz, 1975) E
Maorinus helmsi (Franz, 1975) E
Maorinus hollyfordensis (Franz, 1975) E
Maorinus hunuae (Franz, 1980) E
Maorinus hunuaeformis (Franz, 1986) E
Maorinus inangahuae (Franz, 1975) E
Maorinus kuscheli (Franz, 1975) E
Maorinus maketuensis (Franz, 1980) E
Maorinus marionensis (Franz, 1975) E
Maorinus milfordensis (Franz, 1975) E
Maorinus monilifer (Broun, 1893) E
Maorinus pandorae (Franz, 1975) E
Maorinus pelorianus (Franz, 1975) E
Maorinus pelorii (Franz, 1975) E
Maorinus pseudoalacer (Franz, 1975) E
Maorinus pseudoangulatus (Franz, 1975) E
Maorinus sanguineus (Broun, 1893) E
Maorinus tangihuae (Franz, 1980) E
Maorinus toronouii (Franz, 1986) E
Maorinus tunakinoi (Franz, 1975) E
Maorinus turangii (Franz, 1986) E
Maorinus turrethi (Franz, 1975) E
Maorinus wakamarinae (Franz, 1975) E
Maorinus walkerianus (Franz, 1975) E
Maorinus wellingtonensis (Franz, 1975) E
Microscydmus (*Microscydmus*) *lynfieldi* Franz, 1977 E
Microscydmus (*M.*) *perpusillus* Franz, 1980 E
Microscydmus (*M.*) n. spp. (3) 3E
Phaganophana (?) *palpalis* Broun, 1915 E
Sciacharis (*Magellanoconnus*) *brevivestis* (Franz, 1980) E
Sciacharis (*M.*) *catharactae* Franz, 1980 E
Sciacharis (*M.*) *galerus* (Broun, 1885) E
Sciacharis (*M.*) *kuscheli* (Franz, 1977) E
Sciacharis (*M.*) *maruiensis* (Franz, 1975) [corrected spelling] E
Sciacharis (*M.*) *remissus* (Franz, 1980) E
Sciacharis (*M.*) *sericeus* (Franz, 1980) E
Sciacharis (*M.*) n. spp. (3) 3E
Sciacharis (*Sciacharis*) *alackensis* (Franz, 1975) E
Sciacharis (*S.*) *ambigua* (Broun, 1880) E
Sciacharis (*S.*) *angustata* (Broun, 1885) E
Sciacharis (*S.*) *antennalis* (Broun, 1893) E
Sciacharis (*S.*) *arohana* (Franz, 1975) E
Sciacharis (*S.*) *arthurensis* Franz, 1986 E
Sciacharis (*S.*) *aurifascis* Franz, 1980 E
Sciacharis (*S.*) *bluffensis* (Franz, 1975) E
Sciacharis (*S.*) *brachycera* (Broun, 1893) E
Sciacharis (*S.*) *calcaritibia* (Franz, 1975) E TK
Sciacharis (*S.*) *cedia* (Broun, 1893) E
Sciacharis (*S.*) *collega* Franz, 1980 E
Sciacharis (*S.*) *dobsoni* (Franz, 1975) E
Sciacharis (*S.*) *dublinensis* (Franz, 1975) E
Sciacharis (*S.*) *dugdalei* Franz, 1980 E
Sciacharis (*S.*) *dunedinensis* Franz, 1980 E
Sciacharis (*S.*) *dunicola* (Franz, 1975) E
Sciacharis (*S.*) *durvillei* (Franz, 1975) E
Sciacharis (*S.*) *eruana* (Franz, 1975) E
Sciacharis (*S.*) *fiordlandensis* (Franz, 1975) E
Sciacharis (*S.*) *fletcheri* Franz, 1980 E
Sciacharis (*S.*) *florana* Franz, 1986 E
Sciacharis (*S.*) *fragilis* (Broun, 1915) E
Sciacharis (*S.*) *fulva* Broun, 1893 E
Sciacharis (*S.*) *glacialis* Franz, 1980 E
Sciacharis (*S.*) *gunnensis* (Franz, 1975) E
Sciacharis (*S.*) *hakatarameana* (Franz, 1975) E
Sciacharis (*S.*) *halli* (Broun, 1915) E
Sciacharis (*S.*) *haurokana* (Franz, 1975) E
Sciacharis (*S.*) *heterartha* (Broun, 1893) E
Sciacharis (*S.*) *hokianoae* (Franz, 1975) E
Sciacharis (*S.*) *hopeana* (Franz, 1975) E
Sciacharis (*S.*) *humpensis* Franz, 1980 E
Sciacharis (*S.*) *hutti* (Franz, 1975) E
Sciacharis (*S.*) *kaimanawana* Franz, 1986 E
Sciacharis (*S.*) *kuscheliana* (Franz, 1975) E
Sciacharis (*S.*) *labiata* (Franz, 1975) E
Sciacharis (*S.*) *lanosa* (Broun, 1885) E
Sciacharis (*S.*) *lanosiformis* Franz, 1986 E
Sciacharis (*S.*) *lewisi* Franz, 1986 E
Sciacharis (*S.*) *macburneyi* Franz, 1980 E
Sciacharis (*S.*) *marlboroughensis* (Franz, 1975) E
Sciacharis (*S.*) *maruiae* (Franz, 1975) E
Sciacharis (*S.*) *moerakensis* Franz, 1986 E
Sciacharis (*S.*) *montana* Franz, 1980 E
Sciacharis (*S.*) *ohakunei* (Franz, 1975) E
Sciacharis (*S.*) *oreas* (Broun, 1885) E
Sciacharis (*S.*) *orrhillensis* (Franz, 1975) E
Sciacharis (*S.*) *ovipennis* (Broun, 1893) stat. rev. E
Sciacharis (*S.*) *oweni* (Franz, 1975) E
Sciacharis (*S.*) *paralatuliceps* (Franz, 1975) E
Sciacharis (*S.*) *paraoveni* Franz, 1986 E
Sciacharis (*S.*) *parawhangamoana* (Franz, 1975) E TK
Sciacharis (*S.*) *peckiana* Franz, 1986 E
Sciacharis (*S.*) *perspicax* Franz, 1980 E
Sciacharis (*S.*) *pictonensis* (Franz, 1975) E
Sciacharis (*S.*) *pontis* Franz, 1986 E
Sciacharis (*S.*) *portae* Franz, 1980 E
Sciacharis (*S.*) *pseudowhangamoana* (Franz, 1975) E
Sciacharis (*S.*) *puncticollis* (Broun, 1880) E
Sciacharis (*S.*) *relata* (Broun, 1893) E
Sciacharis (*S.*) *restinga* (Franz, 1975) E
Sciacharis (*S.*) *sannio* (Franz, 1977) E
Sciacharis (*S.*) *sinuata* (Broun, 1915) E
Sciacharis (*S.*) *stenocera* (Broun, 1893) E
Sciacharis (*S.*) *sulcifera* (Broun, 1915) E
Sciacharis (*S.*) *takakae* (Franz, 1975) E
Sciacharis (*S.*) *tapapana* Franz, 1986 E
Sciacharis (*S.*) *taranakii* Franz, 1980 E
Sciacharis (*S.*) *taupoensis* Franz, 1986 E
Sciacharis (*S.*) *tautukuensis* Franz, 1986 E
Sciacharis (*S.*) *tennysoni* Franz, 1986 E
Sciacharis (*S.*) *tennysoniana* Franz, 1986 E
Sciacharis (*S.*) *townsendiana* (Franz, 1975) E
Sciacharis (*S.*) *waikawensis* (Franz, 1975) E
Sciacharis (*S.*) *waiporiensis* (Franz, 1975) E
Sciacharis (*S.*) *waipouana* (Franz, 1975) E
Sciacharis (*S.*) *waipouensis* (Franz, 1975) E
Sciacharis (*S.*) *wairauensis* Franz, 1980 E
Sciacharis (*S.*) *whakatanensis* (Franz, 1975) E
Sciacharis (*S.*) *whangamoana* (Franz, 1975) E
Sciacharis (*S.*) *wilmotensis* Franz, 1980 E
Sciacharis (*S.*) *xanthopa* (Broun, 1893) E
Sciacharis (*S.*) *yakasensis* Franz, 1986 E
Stenichnaphes newtoni Franz, 1986 E
Stenichnaphes urbanus Franz, 1980 E
Stenichnaphes n. sp. E
Stenichnus (*Austrostenichnus*) *insignis* (Broun, 1893) E
Stenichnus (*A.*) *kuschelianus* Franz, 1977 E
Stenichnus (*A.*) n. sp. E
EUTHEIINI
Eutheia schaumi Kiesenwetter, 1858 A Do
SCYDMAENINI
Adrastia angulifrons (Broun, 1915) E
Adrastia angustissima (Franz, 1975) E
Adrastia anophthalma (Franz, 1977) E
Adrastia anthicoides (Franz, 1980) E
Adrastia brookesi (Franz, 1975) E
Adrastia brouni (Franz, 1975) E
Adrastia clarkei (Franz, 1975) E
Adrastia clavatella Broun, 1915 E
Adrastia curticornis (Franz, 1975) E
Adrastia decipiens (Franz, 1975) E
Adrastia dentipes (Franz, 1975) E
Adrastia edwardsi (Sharp, 1874) E
Adrastia gourlayi (Franz, 1975) E
Adrastia greymouthi (Franz, 1975) E
Adrastia haastensis (Franz, 1980) E
Adrastia laetans Broun, 1881 E
Adrastia nelsoni (Franz, 1975) E
Adrastia novaezeelandiae (Franz, 1975) E
Adrastia paravillosipennis (Franz, 1975) E
Adrastia peckorum (Franz, 1986) E
Adrastia stokesi (Franz, 1975) E
Adrastia subinermis (Franz, 1980) E
Adrastia townsendi (Franz, 1977) E
Adrastia vilosipennis (Franz, 1975) E
Adrastia wilmotensis (Franz, 1977) E
Scydmaenus elongellus Broun, 1893 E SI
STAPHYLININAE
MAOROTHIINI
Maorothius adustus (Broun, 1880) E
Maorothius brevispinosus Assing, 2000 E
Maorothius brookesi (Cameron, 1952) E
Maorothius brouni (Steel, 1949) E
Maorothius coalitus Assing, 2000 E
Maorothius dispar Assing, 2000 E
Maorothius effeminatus Assing, 2000 E
Maorothius hamifer Assing, 2000 E
Maorothius hammondi Assing, 2000 E
Maorothius insulanus Assing, 2000 E
Maorothius longispinosus Assing, 2000 E
Maorothius pectinatus Assing, 2000 E
Maorothius pubescens Assing, 2000 E
Maorothius puncticeps (Broun, 1894) E
Maorothius setiger Assing, 2000 E
Maorothius solus Assing, 2000 E
Maorothius tonsor Assing, 2000 E
Maorothius torquatus Assing, 2000 E
Maorothius tridens Assing, 2000 E
Maorothius volans Assing, 2000 E
STAPHYLININI
S. PHILONTHINA
Bisnius parcus (Sharp, 1874) A
Bisnius sordidus (Gravenhorst, 1802) A
Cafius algophilus Broun, 1894 E
Cafius litoreus (Broun, 1880) E
Cafius maritimus (Broun, 1880) E
Cafius puncticeps (White, 1846) E
Cafius quadriimpressus (White, 1846) E
Cafius zealandicus Cameron, 1947 E
Gabrius nigritulus (Gravenhorst, 1802) A
Gabronthus sulcifrons (Sharp, 1889) A
Neobisnius n. sp. A?
Philonthus burrowsi (Broun, 1915) E
Philonthus discoideus (Gravenhorst, 1802) A

Philonthus hepaticus Erichson, 1840 A
Philonthus insularis Bernhauer & Schubert, 1916 E
Philonthus longicornis Stephens, 1832 A
Philonthus novaezeelandiae Duvivier, 1883 E
Philonthus ohianensis (Broun, 1923) E
Philonthus politus (Linnaeus, 1758) A
Philonthus pyropterus Kraatz, 1859 A
Philonthus rectangulus Sharp, 1874 A
Philonthus umbratilis (Gravenhorst, 1802) A
Philonthus ventralis (Gravenhorst, 1802) A
Thinocafius insularis Steel, 1949 E Ch
S. QUEDIINA
Cafioquedius gularis Sharp, 1886 E
Cafioquedius n. sp. E
Heterothops minutus Wollaston, 1860 A
Quediocafius insolitus (Sharp, 1886) E
Quediocafius taieriensis (Broun, 1894) E
Quediomimus brookesi Cameron, 1948 E
Quediomimus hybridus (Erichson, 1840) A Do
Quedius aeneiventris Broun, 1910 E
Quedius aeneoceps (Broun, 1880) E
Quedius agathis Broun, 1893 E
Quedius aliiceps Cameron, 1948 E Su
Quedius ambiguus Broun, 1894 E
Quedius antarcticus Bernhauer & Schubert, 1916 E
Quedius antipodum Sharp, 1886 E
Quedius arctifrons (Broun, 1880) E
Quedius arrowi Bernhauer, 1941 E
Quedius aucklandicus Cameron, 1947 E
Quedius badius Broun, 1923 E
Quedius brookesi Cameron, 1947 E
Quedius brouni Cameron, 1947 E
Quedius brunneorufus Bernhauer, 1941 E
Quedius bryocharis Broun, 1923 E
Quedius cavelli Broun, 1893 E
Quedius collinus Broun, 1893 E
Quedius conspicuellus Broun, 1894 E
Quedius discrepans Broun, 1893 E
Quedius diversicollis Cameron, 1945 E
Quedius edwardsi Sharp, 1886 E
Quedius enodis (Broun, 1880) E
Quedius eruensis Broun, 1912 E
Quedius fulgidus (Fabricius, 1792), non (Fabricius, 1787) A
Quedius fultoni Cameron, 1945 E
Quedius fuscatus Broun, 1893 E
Quedius hallianus Broun, 1917 E
Quedius hilaris Broun, 1909 E
Quedius hirtipennis Broun, 1915, non Stephens, 1832 E
Quedius iridescens Broun, 1921 E
Quedius latifrons Sharp, 1886 E
Quedius latimanus Broun, 1893 E
Quedius longiceps Broun, 1910 E
Quedius mannaiaensis Cameron, 1945 E
Quedius maorinus Broun, 1923 E
Quedius megophthalmus Broun, 1917 E
Quedius mesomelinus (Marsham, 1802) A
Quedius ophthalmicus Cameron, 1945 E
Quedius quadripunctus Bernhauer, 1941 E
Quedius recticeps Broun, 1917 E
Quedius sciticollis Broun, 1894 E
Quedius secretus Cameron, 1948 E Su
Quedius sericeicollis Bernhauer, 1941 E
Quedius slipsensis Broun, 1923 E
Quedius subapterus Cameron, 1950 E TK
Quedius tinctellus Broun, 1910 E
Quedius tripunctatus Bernhauer, 1941 E
Quedius urbanus Broun, 1921 E
Quedius variegatus Bernhauer, 1941 E
Quedius veteratorius (Broun, 1880) E
Quedius vividus (Broun, 1880) E
Quedius wakefieldi Bernhauer, 1941 E
Quedius xenophaenus Broun, 1912 E
Sphingoquedius strandi Bernhauer, 1941 E
S. STAPHYLININA
Creophilus huttoni (Broun, 1880) E
Creophilus oculatus (Fabricius, 1775)
Hadrotes wakefieldi Cameron, 1945 E
Tasgius ater (Gravenhorst, 1802) A
XANTHOLININI
Gyrohypnus fracticornis (Müller, 1776) A
Leptacinus pusillus (Stephens, 1833) A
Neohypnus andinus (Fauvel, 1866) A
Neoxantholinus brouni (Sharp, 1876) E
Neoxantholinus chathamicus Bordoni, 2005 E Ch
Neoxantholinus pseudorufulus Bordoni, 2005 E
Neoxantholinus rufulus (Broun, 1880)
Notolinus socius (Fauvel, 1877)
Otagonia chathamensis Bordoni, 2005 E
Otagonia labralis (Broun, 1880) E
Otagonia nunni Bordoni, 2010 E
Paracorynus arecae (Broun, 1880) E
Pseudocorynus archaicus Bordoni, 2005 E
Pseudocorynus cultus (Broun, 1880) E
Pseudocorynus mediocris (Broun, 1880) E
Pseudocorynus nelsonianus Bordoni, 2005 E
Pseudocorynus neozelandicus Bordoni, 2005 E
Pseudoxantholinus sharpi (Broun, 1880) E
Thyreocephalus chalcopterus (Erichson, 1839) A?
Thyreocephalus chloropterus (Erichson, 1839) A
Thyreocephalus orthodoxus (Olliff, 1887) A
Thyreocephalus taitensis (Boheman, 1858) A
Waitatia bellicosa Bordoni, 2005 E
Waitatia maoriana Bordoni, 2005 E
Whangareiella fulvipes (Broun, 1880) E
Xantholinus linearis (Olivier, 1795) A
TACHYPORINAE
TACHYPORINI
'*Coproporus*' n. sp. A?
Sepedophilus acerbus (Broun, 1880) E
Sepedophilus antennalis (Broun, 1923) E
Sepedophilus asperellus (Broun, 1914) E
Sepedophilus atricapillus (Broun, 1880) E
Sepedophilus auricomus (Broun, 1880) E
Sepedophilus austerus (Broun, 1880) E
Sepedophilus badius (Broun, 1880) E
Sepedophilus basipennis (Bernhauer, 1941) E
Sepedophilus brevicornis (Broun, 1893) E
Sepedophilus convexus (Bernhauer, 1941) E
Sepedophilus flavithorax (Broun, 1880) E
Sepedophilus helmsi (Bernhauer, 1941) E
Sepedophilus hudsoni (Cameron, 1945) E
Sepedophilus laetulus (Broun, 1914) E
Sepedophilus largulus (Broun, 1880) E
Sepedophilus maculosus (Broun, 1880) E
Sepedophilus maorinus (Broun, 1893) E
Sepedophilus morosus (Broun, 1923) E
Sepedophilus niticollis (Broun, 1893) E
Sepedophilus nubilus (Broun, 1880) E
Sepedophilus phoxus (Olliff, 1886) A
Sepedophilus seminudus (Broun, 1923) E
Sepedophilus suavis (Fauvel, 1895) A?
Sepedophilus subruber (Broun, 1880) E
Sepedophilus zealandicus (Bernhauer, 1941) E
Sepedophilus n. spp. (3) 3E
Tachyporus nitidulus (Fabricius, 1781) A
SCARABAEOIDEA
LUCANIDAE
AESALINAE
Holloceratognathus cylindricus (Broun, 1895) E
Holloceratognathus helotoides (Thomson, 1862) E
Holloceratognathus passaliformis (Holloway, 1962) E
Mitophyllus alboguttatus (Bates, 1867) E
Mitophyllus angusticeps Broun, 1895 E
Mitophyllus arcuatus Holloway, 2007 E
Mitophyllus dispar (Sharp, 1882) E
Mitophyllus falcatus Holloway, 2007 E
Mitophyllus foveolatus (Broun, 1880) E
Mitophyllus fusculus (Broun, 1886) E
Mitophyllus gibbosus (Broun, 1885) E
Mitophyllus insignis Broun, 1923 E
Mitophyllus irroratus Parry, 1843 E
Mitophyllus macrocerus (Broun, 1886) E
Mitophyllus parrianus Westwood, 1863 E
Mitophyllus reflexus Broun, 1909 E Ch
Mitophyllus solox Holloway, 2007 E
LAMPRIMINAE
Dendroblax earlii White, 1846 E
SYNDESINAE A
Syndesus cornutus (Fabricius, 1801) A
LUCANINAE
Geodorcus alsobius Holloway, 2007 E
Geodorcus auriculatus (Broun, 1903) E
Geodorcus capito (Deyrolle, 1873) E Ch
Geodorcus helmsi (Sharp, 1881) E
Geodorcus ithaginis (Broun, 1893) E
Geodorcus montivagus Holloway, 2007 E
Geodorcus novaezealandiae (Hope, 1845) E
Geodorcus philpotti (Broun, 1914) E
Geodorcus servandus Holloway, 2007 E
Geodorcus sororum Holloway, 2007 E Ch
Paralissotes mangonuiensis (Brookes, 1927) E
Paralissotes oconnori (Holloway, 1961) E
Paralissotes planus (Broun, 1880) E
Paralissotes reticulatus (Westwood, 1844) E
Paralissotes rufipes (Sharp, 1886) E
Paralissotes stewarti (Broun, 1881) E
Paralissotes triregius (Holloway, 1963) E TK
Ryssonotus nebulosus (Kirby, 1818) A
TROGIDAE A
Trox (*Trox*) *scaber* (Linnaeus, 1767) A
SCARABAEIDAE
MELOLONTHINAE
LIPARETRINI
Costelytra austrobrunnea Given, 1952 E
Costelytra brookesi Given, 1966 E
Costelytra brunnea (Broun, 1880) E
Costelytra distincta Given, 1966 E
Costelytra diurna Given, 1960 E
Costelytra gregoryi Given, 1966 E
Costelytra macrobrunnea Given, 1952 E
Costelytra piceobrunnea Given, 1952 E
Costelytra pseudobrunnea Given, 1952 E
Costelytra symmetrica Given, 1966 E
Costelytra zealandica (White, 1846) E
Odontria albonotata Broun, 1893 E
Odontria aurantia Given, 1952 E
Odontria aureopilosa Given, 1952 E
Odontria australis Given, 1952 E
Odontria autumnalis Given, 1952 E
Odontria borealis Given, 1960 E
Odontria carinata Given, 1954 E
Odontria cassiniae Given, 1952 E
Odontria cinnamomea White, 1846 E
Odontria communis Given, 1952 E
Odontria convexa Given, 1952 E
Odontria decepta Given, 1952 E
Odontria fusca Broun, 1893 E
Odontria giveni Watt, 1984 E
Odontria halli Broun, 1921 E
Odontria inconspicua Given, 1952 E
Odontria macrothoracica Given, 1952 E
Odontria magna Given, 1952 E
Odontria marmorata Broun, 1893 E
Odontria monticola Broun, 1912 E
Odontria nesobia Broun, 1921 E
Odontria nitidula Broun, 1912 E
Odontria obscura Broun, 1895 E
Odontria obsoleta Broun, 1917 E
Odontria occiputale Broun, 1893 E
Odontria regalis Given, 1952 E
Odontria rufescens Given, 1952 E
Odontria sandageri Broun, 1881 E
Odontria smithii Broun, 1893 E

Odontria striata White, 1846 E
Odontria suavis Broun, 1880 E
Odontria subnitida Given, 1952 E
Odontria sylvatica Broun, 1880 E
Odontria varicolorata Given, 1952 E
Odontria variegata Given, 1952 E
Odontria velutina Given, 1952 E
Odontria xanthosticta White, 1846 E
Odontria n. spp. (12) 12 E
Prodontria capito (Broun, 1909) E
Prodontria grandis Given, 1964 E
Prodontria jenniferae Emerson, 1997 E
Prodontria lewisi Broun, 1904 E
Prodontria longitarsis (Broun, 1909) E Su
Prodontria matagouriae Emerson, 1997 E
Prodontria minuta Emerson, 1997 E
Prodontria modesta (Broun, 1909) E
Prodontria montis Emerson, 1997 E
Prodontria patricki Emerson, 1997 E
Prodontria pinguis Given, 1952 E
Prodontria praelatella (Broun, 1909) E
Prodontria rakiurensis Emerson, 1997 E
Prodontria regalis Emerson, 1997 E
Prodontria setosa Given, 1952 E
Prodontria truncata Given, 1960 E
Scythrodes squalidus Broun, 1886 E
Sericospilus advena Sharp, 1882 E
Sericospilus aenealis (Broun, 1909) E
Sericospilus brevis Given, 1952 E
Sericospilus costellus (Broun, 1880) E
Sericospilus cumberi Given, 1953 E
Sericospilus eximius (Broun, 1917) E
Sericospilus glabratus (Broun, 1893) E
Sericospilus intermediatus Given, 1952 E
Sericospilus minor Given, 1952 E
Sericospilus obscurus Given, 1952 E
Sericospilus ornatus Given, 1960 E
Sericospilus piliventris (Broun, 1921) E
Sericospilus rossii (White, 1846) E
Sericospilus truncatus Given, 1952 E
Sericospilus watti Given, 1960 E
SCITALINI
Gnaphalopoda brookesi (Broun, 1921) E
Gnaphalopoda picea (Broun, 1886) E
XYLONYCHINI
Mycernus elegans Broun, 1904 E
Mycernus intermediatus Given, 1952 E
Psilodontria viridescens Broun, 1895 E
Pyronota edwardsi Sharp, 1876 E
Pyronota festiva (Fabricius, 1775) E
Pyronota inconstans Brookes, 1926 E
Pyronota lugubris Sharp, 1886 E
Pyronota minor Given, 1952 E
Pyronota munda Sharp, 1876 E
Pyronota pallida Broun, 1893 E
Pyronota punctata Given, 1952 E
Pyronota rubra Given, 1952 E
Pyronota setosa Given, 1952 E
Pyronota sobrina Sharp, 1876 E
Pyronota splendens Given, 1952 E
Stethaspis convexa (Given, 1952) E
Stethaspis discoidea (Broun, 1893) E
Stethaspis intermediata (Given, 1952) E
Stethaspis lineata (Arrow, 1924) E
Stethaspis longicornis (Arrow, 1924) E
Stethaspis prasina (Broun, 1893) E
Stethaspis pulchra (Broun, 1895) E
Stethaspis simmondsi (Broun, 1893) E
Stethaspis suturalis (Fabricius, 1775) E
SERICINI
S. PHYLLOTOCINA
Phyllotocus macleayi macleayi Fischer, 1823 A Do
SCARABAEINAE
COPRINI
Copris incertus Say, 1835 A BC
CANTHONINI
Epirinus aeneus (Wiedemann, 1823) A BC
Saphobiamorpha maoriana Brookes, 1944 E
Saphobius brouni Paulian, 1935 E
Saphobius curvipes Broun, 1893 E
Saphobius edwardsi Sharp, 1873 E
Saphobius fulvipes Broun, 1893 E
Saphobius fuscus Broun, 1893 E
Saphobius inflatipes Broun, 1893 E
Saphobius laticollis Broun, 1914 E
Saphobius lepidus Broun, 1912 E
Saphobius lesnei Paulian, 1935 E
Saphobius nitidulus Broun, 1880 E
Saphobius setosus Sharp, 1886 E
Saphobius squamulosus Broun, 1886 E
Saphobius tibialis Broun, 1895 E
Saphobius wakefieldi Sharp, 1877 E
ONTHOPHAGINI
Onthophagus granulatus Boheman, 1858 A BC
Onthophagus posticus Erichson, 1842 A BC
DYNASTINAE
PENTODONTINI
Adoryphorus couloni (Burmeister, 1847) A
Dasygnathus dejeani MacLeay, 1819 A
Heteronychus arator (Fabricius, 1775) A
Pericoptus frontalis Broun, 1904 E
Pericoptus nitidulus Broun, 1880 E
Pericoptus punctatus (White, 1846) E
Pericoptus stupidus Sharp, 1876 E
Pericoptus truncatus Fabricius, 1775 E
APHODIINAE
APHODIINI
Aphodius (*Calamosternus*) *granarius* (Linnaeus, 1767) A
Aphodius (*Nialus*) *lividus* (Olivier, 1789) A
Acrossidius tasmaniae (Hope, 1847) A
Phycocus graniceps Broun, 1883 E
Tesarius sulcipennis (Lea, 1904) A Ch
PROCTOPHANINI
Proctophanes sculptus (Hope, 1846) A
Australaphodius frenchi (Blackburn, 1892) A
EUPARIINI
Parataenius simulator (Harold, 1868) A
Ataenius brouni (Sharp, 1876) A
Ataenius picinus Harold, 1867 A
Saprosites communis (Broun, 1880) E
Saprosites distans (Sharp, 1876) E
Saprosites exsculptus (White, 1846) E
Saprosites fortipes (Broun, 1881) E
Saprosites kaimai Stebnicka, 2005 E
Saprosites kingsensis Stebnicka, 2001 E TK
Saprosites mendax (Blackburn, 1892) A?
Saprosites raoulensis (Broun, 1910) E K
Saprosites sulcatissimus (Broun, 1911) E Ch
Saprosites watti Stebnicka, 2001 E
ELATERIFORMIA
SCIRTOIDEA
SCIRTIDAE
SCIRTINAE
Amplectopus fuscus Broun, 1893 E
Amplectopus latulus Broun, 1893 E
Amplectopus ovalis Sharp, 1886 E
Amplectopus pallicornis Broun, 1893 E
Atopida basalis Broun, 1912 E
Atopida brouni Sharp, 1878 E
Atopida castanea White, 1846 E
Atopida dorsale Broun, 1893 E
Atopida grahami Broun, 1910 E
Atopida hirta Broun, 1880 E
Atopida impressa Broun, 1914 E
Atopida lawsoni Sharp, 1878 E
Atopida montana Broun, 1921 E
Atopida pallidula Broun, 1921 E
Atopida proba Sharp, 1878 E
Atopida sinuata Broun, 1893 E
Atopida suffusa Broun, 1910 E
Atopida suturalis White, 1846 E
Atopida testacea Broun, 1880 E
Atopida villosa Broun, 1921 E
Brounicyphon sericeum Pic, 1947 E
Byrrhopsis gravidus (Sharp, 1878) E
Cyphanodes vestitus Broun, 1893 E
Cyphanus capax Broun, 1880 E
Cyphanus debilis Sharp, 1878 E
Cyphanus dubius Broun, 1893 E
Cyphanus granulatus Broun, 1880 E
Cyphanus granulosus Broun, 1910 E
Cyphanus laticeps Sharp, 1878 E
Cyphanus maculifer Broun, 1910 E
Cyphanus mandibularis Broun, 1883 E
Cyphanus medius Broun, 1880 E
Cyphanus mollis Sharp, 1878 E
Cyphanus ocularius Broun, 1910 E
Cyphanus punctatus Sharp, 1878 E
Cyphanus scaber Broun, 1893 E
Cyphon acerbus Broun, 1883 E
Cyphon aequalis Sharp, 1878 E
Cyphon aethiops Broun, 1886 E
Cyphon albidosparsus Nyholm, 2000 E
Cyphon arduus Sharp, 1878 E
Cyphon brouni Pic, 1913 E
Cyphon burrowsi Broun, 1915 E
Cyphon decussatus Nyholm, 2000 E
Cyphon deterius Broun, 1914 E
Cyphon dilutus Broun, 1883 E
Cyphon discedens Broun, 1893 E
Cyphon genalis Sharp, 1878 E
Cyphon graniger Sharp, 1878 E
Cyphon huttoni Sharp, 1878 E
Cyphon ignoratus Nyholm, 2000 E
Cyphon lateralis Broun, 1883 E
Cyphon laticeps Sharp, 1878 E
Cyphon laticollis Broun, 1883 E
Cyphon nigritulus Broun, 1893 E
Cyphon nigropictus Broun, 1883 E
Cyphon ornatus Broun, 1893 E
Cyphon oscillans Sharp, 1878 E
Cyphon parviceps Sharp, 1878 E
Cyphon pauper Broun, 1893 E
Cyphon pictulus Sharp, 1878 E
Cyphon poecilopterus Nyholm, 2000 E
Cyphon princeps Nyholm, 2000 E
Cyphon pumilio Sharp, 1878 E
Cyphon pusillus Nyholm, 2000 E
Cyphon rectalis Broun, 1886 E
Cyphon rectangulus Broun, 1883 E
Cyphon remotus Broun, 1883 E
Cyphon subvariegatus Nyholm, 2000 E
Cyphon suffusus Sharp, 1878 E
Cyphon thomasi Pic, 1914 E
Cyphon trivialis Broun, 1886 E
Cyphon umbricolor Nyholm, 2000 E
Cyphon variegatus Sharp, 1882 E
Cyphon viridipennis Broun, 1880 E
Cyphon waikatoensis Broun, 1886 E
Cyphon zealandicus Sharp, 1878 E
Gen. nr *Cyphon* Paykull, 1799, sensu Nyholm, 2000, *amplus* Broun, 1880 E
Gen. nr *Cyphon cincticollis* Broun, 1915 E
Gen. nr *Cyphon fuscifrons* Broun, 1893 E
Gen. nr *Cyphon granulicollis* Broun, 1915 E
Gen. nr *Cyphon mackerrowi* Broun, 1895 E
Gen. nr *Cyphon pachymerus* Broun, 1912 E
Gen. nr *Cyphon plagiatus* Broun, 1883 E
Gen. nr *Cyphon plumatellus* Broun, 1915 E
Gen. nr *Cyphon propinquus* Broun, 1883 E
Gen. nr *Cyphon* n. spp. (8) 8E
Cyphotelus angustifrons Sharp, 1878 E
Cyprobius nitidus Sharp, 1878 E
Cyprobius terrenus Broun, 1895 E

Cyprobius undulatus Broun, 1883 E
Mesocyphon bifoveatus Broun, 1914 E
Mesocyphon capito Broun, 1914 E
Mesocyphon divergens Sharp, 1878 E
Mesocyphon granulatus Broun, 1886 E
Mesocyphon lateralis Broun, 1914 E
Mesocyphon laticeps Broun, 1893 E
Mesocyphon longicornis Broun, 1914 E
Mesocyphon mandibularis Broun, 1912 E
Mesocyphon marmoratus Sharp, 1878 E
Mesocyphon monticola Broun, 1886 E
Mesocyphon pallidus Broun, 1893 E
Mesocyphon setiger Sharp, 1878 E
Mesocyphon tristis Broun, 1910 E
Mesocyphon vestitus Broun, 1914 E
Mesocyphon wakefieldi Sharp, 1878 E
Veronatus amplus Broun, 1895 E
Veronatus antennalis Broun, 1883 E
Veronatus apterus Broun, 1921 E
Veronatus brevicollis Broun, 1921 E
Veronatus capito Broun, 1880 E
Veronatus frontalis Broun, 1880 E
Veronatus fulgidulus Broun, 1915 E
Veronatus granicollis Broun, 1910 E
Veronatus longicornis Sharp, 1878 E
Veronatus nubilus Broun, 1893 E
Veronatus punctipennis Broun, 1914 E
Veronatus reversus Broun, 1921 E
Veronatus scabiosus Broun, 1880 E
Veronatus sharpi Broun, 1880 E
Veronatus sternalis Broun, 1921 E
Veronatus tarsalis Broun, 1915 E
Veronatus tricostellus (White, 1846) E
Veronatus versicolor Broun, 1921 E
Veronatus vestitus Broun, 1921 E
Gen. et sp(p.) indet. (2) 2E
EUCINETIDAE
Eucinetus stewarti (Broun, 1881) E
Noteucinetus nunni Bullians & Leschen, 2005 E
CLAMBIDAE
Clambinae
Clambus bulla bulla Endrödy-Younga, 1974 E
Clambus b. elongatus Endrödy-Younga, 1990 E
Clambus b. marmoratus Endrödy-Younga, 1990 E
Clambus domesticus Broun, 1886 E
Clambus jupiter Endrödy-Younga, 1999 E
Clambus neptunus Endrödy-Younga, 1990 E
Clambus pluto Endrödy-Younga, 1990 E
Clambus saturnus annulus Endrödy-Younga, 1990 E
Clambus s. saturnus Endrödy-Younga, 1990 E
Clambus uranus Endrödy-Younga, 1999 E
Clambus venus Endrödy-Younga, 1990 E
Clambus n. sp. E
Sphaerothorax brevisternalis Endrödy-Younga, 1990 E
Sphaerothorax kuscheli Endrödy-Younga, 1990 E
Sphaerothorax suffusus (Broun, 1886) E
Sphaerothorax tierensis (Blackburn, 1902) A
Sphaerothorax zealandicus Endrödy-Younga, 1990 E
BUPRESTOIDEA
BUPRESTIDAE
Buprestinae
Maoraxia eremita (White, 1846) E
Nascioides enysi (Sharp, 1877) E
BYRRHOIDEA
BYRRHIDAE
Byrrhinae
Chlorobyrrhulus coruscus (Pascoe, 1875) E
Curimus squamifer Broun, 1893 E
Curimus striatus Broun, 1880 E
Curimus vestitus Broun, 1904 E
Curimus zeelandicus Redtenbacher, 1868 E
Cytilissus claviger Broun, 1893 E
Epichorius aucklandiae Kiesenwetter & Kirsch, 1877 E Su
Epichorius longulus (Broun, 1909) E Su
Epichorius sorenseni (Brookes, 1951) E Su
Epichorius tumidellus (Broun, 1909) E Su
Liochoria huttoni Pascoe, 1875 E
Liochoria insueta (Broun, 1886) E
Liochoria mixta (Broun, 1886) E
Liochoria nigralis (Broun, 1893) E
Liochoria nigricans (Broun, 1881) E
Liochoria orbicularis (Broun, 1880) E
Liochoria sternalis Broun, 1893 E
Pedilophorus aemulator Broun, 1914 E
Pedilophorus bryobius Broun, 1910 E
Pedilophorus cognatus Broun, 1910 E
Pedilophorus creperus Broun, 1893 E
Pedilophorus foveigerus Broun, 1910 E
Pedilophorus gemmeus (Broun, 1883) E
Pedilophorus helmsi (Reitter, 1880) E
Pedilophorus humeralis Broun, 1914 E
Pedilophorus laetus (Broun, 1893) E
Pedilophorus laevipennis Broun, 1893 E
Pedilophorus lewisi Broun, 1907 E
Pedilophorus nigrescens Broun, 1915 E
Pedilophorus opaculus Broun, 1912 E
Pedilophorus ornatus Broun, 1914 E
Pedilophorus picipes Broun, 1893 E
Pedilophorus probus Broun, 1893 E
Pedilophorus pulcherrimus Broun, 1909 E
Pedilophorus puncticeps Broun, 1893 E
Pedilophorus sculpturatus Broun, 1910 E
Pedilophorus tibialis Broun, 1893 E
Synorthus anomalus (Broun, 1880) E
Synorthus granulatus (Broun, 1893) E
Synorthus insularis Watt, 1971 E Su
Synorthus laevigatus Broun, 1910 E
Synorthus mandibularis Broun, 1910 E
Synorthus pygmaeus Broun, 1910 E
Synorthus rectifrons Broun, 1915 E
Synorthus rotundus (Broun, 1881) E
Synorthus setarius (Broun, 1880) E
Synorthus substriatus Broun, 1914 E
Synorthus versipilus Broun, 1914 E
Synorthus villosus (Broun, 1886) E
Synorthus n. sp. E Su
Syncalyptinae
Microchaetes n. sp. E Ch
DRYOPIDAE
Parnida agrestis Broun, 1880 E
Parnida longulus (Sharp, 1886) E
Parnida scutellaris (Broun, 1910) E
Parnida vestitus (Sharp, 1883) E
ELMIDAE
Larainae
Hydora angusticollis (Pascoe, 1877) E F
Hydora lanigera Broun, 1914 E F
Hydora nitida Broun, 1885 E F
Hydora obsoleta Broun, 1885 E F
Hydora picea (Broun, 1881) E F
Hydora subaenea Broun, 1914 E F
Hydora n. sp. E F
Elmidae gen. et spp. indet. (15) 15E F
LIMNICHIDAE
Hyphalinae
Hyphalus kuscheli Britton, 1977 E M
Hyphalus prolixus Britton, 1977 E M
Hyphalus ultimus Britton, 1977 E M
Hyphalus wisei Britton, 1973 E M
Limnichinae
LIMNICHINI
Limnichus decorus Broun, 1880 E
Limnichus nigripes Broun, 1893 E
Limnichus picinus Broun, 1881 E
Limnichus simplex Broun, 1910 E
HETEROCERIDAE
Heterocerinae
HETEROCERINI
Heterocerus novaeselandiae Charpentier, 1968 E F
PTILODACTYLIDAE
Anchytarsinae
Byrrocryptus urquharti (Broun, 1893) E
Byrrocryptus n. spp. (4–7) 4–7 E
Ptilodactylidae gen. et. sp. indet. E
CHELONARIIDAE
Chelonariinae
Brounia thoracica Sharp, 1878 E
ELATEROIDEA
EUCNEMIDAE
Melasinae
XYLOBIINI
Agalba cylindrata (Broun, 1883) E
Agalba nigrescens Broun, 1893 E
Agalba ruficornis Broun, 1893 E
NEOCHARINI
Neocharis concolor Sharp, 1877 E
Neocharis lobitarsis Broun, 1910 E
Neocharis osculans Broun, 1881 E
Neocharis pubescens Sharp, 1877 E
Neocharis simplex Sharp, 1877 E
Neocharis varia Sharp, 1877 E
DIRHAGINI
Balistica foveata (Broun, 1881) E
Talerax capax Broun, 1881 E
Talerax distans Sharp, 1877 E
Talerax dorsalis Broun, 1912 E
Talerax micans Broun, 1893 E
Talerax niger Broun, 1881 E
Talerax rusticus Broun, 1881 E
Talerax spinitarsis Broun, 1910 E
Talerax tenuis Broun, 1883 E
Macraulacinae
MACRAULACINI
Dromaeolus australasiae Bonvouloir, 1871 A Do
Dromaeolus nigellus (White, 1846) E
Nematodes major Bonvouloir, 1872 A
ELATERIDAE
Agrypninae A
AGRYPNINI
Agrypnus variabilis (Candèze, 1857) A
CONODERINI
Conoderus exsul (Sharp, 1877) E
Conoderus maritimus (Broun, 1893) E
Conoderus planatus Schwarz, 1906 E
Conoderus posticus (Eschscholtz, 1822) A
Conoderus submarmoratus Macleay, 1872 A
Conoderus subrufus (Broun, 1880) E
Silene brunnea Broun, 1893 E SI
HEMIRHIPINI
Thoramus angustus Broun, 1881 E
Thoramus cervinus Broun, 1881 E
Thoramus feredayi Sharp, 1877 E
Thoramus foveolatus Broun, 1880 E
Thoramus huttoni Sharp, 1886 E
Thoramus laevithorax (White, 1846) E Ch
Thoramus parryi (Candèze, 1863) E
Thoramus parvulus Broun, 1881E
Thoramus perblandus Broun, 1880 E
Thoramus rugipennis Broun, 1880 E
Thoramus wakefieldi Sharp, 1877 E
Cardiophorinae
CARDIOPHORINI
Exoeolus brouni Douglas, 2005 E
Exoeolus rufescens Broun, 1893 E
Prosterninae
PITYOBIINI
Metablax acutipennis (White, 1846) E
Metablax approximans (White, 1846) E
Metablax brouni Sharp, 1877 E
Metablax cinctiger (White, 1846) E
Metablax gourlayi Calder, 1976 E TK
Denticollinae
Acritelater barbatus (Candèze, 1865) E
Acritelater elongatus (Sharp, 1877) E

Acritelater reversus (Sharp, 1877) E
Acritelater setiger (Broun, 1881) E
Amphiplatys lawsoni Sharp, 1877 E
Amychus candezei Pascoe, 1876 E
Amychus granulatus (Broun, 1883) E
Amychus manawatawhi Marris & Johnson, 2010 E TK
Asymphus insidiosus Sharp, 1886 E
Elatichrosis aeneola (Candèze, 1865) E
Elatichrosis castanea (Broun, 1881) E
Elatichrosis certa (Broun, 1881) E
Elatichrosis fulvipes (Broun, 1881) E
Elatichrosis polita (Sharp, 1877) E
Elatichrosis violacea (Sharp, 1877) E
Hapatesus (*Hapatesus*) *electus* Neboiss, 1957 A
Oxylasma basale Broun, 1886 E
Oxylasma carinale Broun, 1893 E
Oxylasma pannosum Broun, 1881 E
Oxylasma tectum Broun, 1881 E
Oxylasma vittiger Broun, 1883 E
Parinus villosus Sharp, 1877 E
Poemnites (*Poemnites*) *agriotoides* (Sharp, 1877) E
Poemnites (*P.*) *antipodus* (Candèze, 1863) E
Poemnites (*P.*) *approximans* (Broun, 1912) E
Poemnites (*P.*) *canaliculatus* (Broun, 1893) E
Poemnites (*P.*) *dubius* (Sharp, 1877) E
Poemnites (*P.*) *fulvescens* (Broun, 1912) E
Poemnites (*P.*) *irregularis* (Sharp, 1886) E
Poemnites (*P.*) *megops* (White, 1846) E
Poemnites (*P.*) *mundus* (Sharp, 1886) E
Poemnites (*P.*) *munroi* (Broun, 1893) E
Poemnites (*P.*) *olivascens* (White, 1846) E
Poemnites (*P.*) *sternalis* (Broun, 1912) E
Poemnites (*P.*) *strangulatus* (White, 1846) E
Poemnites (*P.*) *vitticollis* (Broun, 1912) E
Zeaglophus pilicornis Broun, 1895 E
Hypnoidinae
HYPNOIDINI
Hypnoidus meinertzhageni (Broun, 1881) E
PRISAHYPNINI
Australeeus humilis (Sharp, 1877) E
Australeeus powelli (Sharp, 1877) E
Insulahypnus kuscheli Stibick, 1981 E
Insulahypnus lancea Stibick, 1981 E
Insulahypnus longicornis (Sharp, 1877) E
Insulahypnus mayae Stibick, 1981 E
Insulahypnus wisei Stibick, 1981 E
Prisahypnus attenuatus (Broun, 1893) E
Prisahypnus frontalis (Sharp, 1877) E
Lissominae
PROTELATERINI
Protelater atriceps Broun, 1886 E
Protelater costiceps Broun, 1893 E
Protelater diversus Broun, 1912 E
Protelater elongatus Sharp, 1877 E
Protelater guttatus Sharp, 1877 E
Protelater huttoni Sharp, 1877 E
Protelater nigricans Sharp, 1881 E
Protelater opacus Sharp, 1877 E
Protelater picticornis Sharp, 1877 E
Protelater pubescens Broun, 1893 E
Protelater urquharti Broun, 1893 E
Protelater vitticollis Broun, 1886 E
Sphaenelater collaris (Pascoe, 1877) E
Sphaenelater lineicollis (White, 1846) E
Sphaenelater nitidofuscus (Blanchard, 1853) E Su
Elaterinae
AMPEDINI
Aglophus modestus Sharp, 1877 E
Lomemus collaris Sharp, 1877 E
Lomemus elegans Sharp, 1877 E
Lomemus flavipes Sharp, 1877 E
Lomemus frontalis Broun, 1893 E
Lomemus fulvipennis Broun, 1893 E
Lomemus fuscicornis Broun, 1893 E
Lomemus fuscipes Broun, 1893 E
Lomemus maurus Broun, 1893 E
Lomemus obscuripes Sharp, 1877 E
Lomemus pictus Sharp, 1877 E
Lomemus pilicornis Sharp, 1877 E
Lomemus puncticollis Broun, 1895 E
Lomemus rectus Broun, 1883 E
Lomemus sculpturatus Broun, 1893 E
Lomemus similis Sharp, 1877 E
Lomemus suffusus Sharp, 1877 E
Lomemus vittatus Broun, 1883 E
Lomemus vittipennis Broun, 1910 E
Mecastrus convexus Sharp, 1877 E
Mecastrus discedens Sharp, 1877 E
Mecastrus intermedius Broun, 1893 E
Mecastrus lateristrigatus (White, 1846) E
Mecastrus vicinus Sharp, 1877 E
Ochosternus zealandicus (White, 1864) E K
MEGAPENTHINI
Megapenthes kieneri Schimmel, 1997 E
POMACHILINI
Betarmonides flavipilus (Broun, 1893) E
Betarmonides frontalis (Sharp, 1877) E
Betarmonides gracilipes (Sharp, 1877) E
Betarmonides laetus (Sharp, 1877) E
Betarmonides obscurus (Sharp, 1877) E
Betarmonides sharpi (Candèze, 1882) E
Panspoeus guttatus Sharp, 1877 E
LYCIDAE
Metriorrhynchinae A
Porrostoma (*Porrostoma*) *rufipennis* (Fabricius, 1801) A
CANTHARIDAE
Dysmorphocerinae
Asilis (*Asilis*) *alticola* Wittmer, 1979 E
Asilis (*A.*) *annulicornis* Wittmer, 1979 E
Asilis (*A.*) *apicalis* Broun, 1909 E
Asilis (*A.*) *arcuata* Wittmer, 1979 E
Asilis (*A.*) *brevicornis* Broun, 1910 E
Asilis (*A.*) *calleryensis* Wittmer, 1979 E
Asilis (*A.*) *collaris* Broun, 1910 E
Asilis (*A.*) *cornuta* Wittmer, 1979 E
Asilis (*A.*) *dentata* Wittmer, 1979 E
Asilis (*A.*) *dugdalei* Wittmer, 1979 E
Asilis (*A.*) *dunensis* Wittmer, 1979 E
Asilis (*A.*) *fiordensis* Wittmer, 1979 E
Asilis (*A.*) *forcipifera* Wittmer, 1979 E
Asilis (*A.*) *fulvithorax* (Broun, 1880) E
Asilis (*A.*) *grossepunctata* Wittmer, 1979 E
Asilis (*A.*) *homerica* Wittmer, 1979 E
Asilis (*A.*) *kuscheli* Wittmer, 1979 E
Asilis (*A.*) *laevigata* (Broun, 1886) E
Asilis (*A.*) *laeviuscula* Wittmer, 1979 E
Asilis (*A.*) *lyriformis* Wittmer, 1979 E
Asilis (*A.*) *maori* Wittmer, 1979 E
Asilis (*A.*) *nelsonensis* Wittmer, 1979 E
Asilis (*A.*) *paralella* Broun, 1910 E
Asilis (*A.*) *pilicornis* Broun, 1909 E
Asilis (*A.*) *piliventer* (Broun, 1881) E
Asilis (*A.*) *planata* Wittmer, 1979 E
Asilis (*A.*) *platygona* Wittmer, 1979 E
Asilis (*A.*) *pugiunculus* Wittmer, 1979 E
Asilis (*A.*) *ramosa* Wittmer, 1979 E
Asilis (*A.*) *reflexa* Wittmer, 1979 E
Asilis (*A.*) *reflexodentata* Wittmer, 1979 E
Asilis (*A.*) *sinuella* Broun, 1909 E
Asilis (*A.*) *tenuicula* (Broun, 1880) E
Asilis (*A.*) *waipouana* Wittmer, 1979 E
Asilis (*Heterasilis*) *flavipennis* Broun, 1914 E
Asilis (*H.*) *intermixta* Wittmer, 1979 E
Asilis (*H.*) *nigricans* (Broun, 1880) E
Asilis (*H.*) *subnuda* (Broun, 1880) E
Asilis (*H.*) *tumida aptera* Wittmer, 1979 E
Asilis (*H.*) *t. tumida* (Broun, 1881) E
Neoontelus bifurcatus Wittmer, 1979 E
Neoontelus elongatus Wittmer, 1979 E
Neoontelus punctipennis (Broun, 1910) E
Neoontelus striatus (Broun, 1880) E
Malthininae A
MALTHODINI
Malthodes pumilus (Brébisson, 1835) A
BOSTRICHIFORMIA
DERODONTOIDEA
DERODONTIDAE
Laricobiinae
Nothoderodontus gourlayi Crowson, 1959 E
Nothoderodontus watti Lawrence, 1985 E
BOSTRICHOIDEA
JACOBSONIIDAE
Derolathrus n. spp. (3) 3E
Saphophagus minutus Sharp, 1886 E
Saphophagus n. sp. E
NOSODENDRIDAE
Nosodendron (*Nosodendron*) *ovatum* Broun, 1880 E
Nosodendron (*N.*) *zealandicum* Sharp, 1882 E
DERMESTIDAE
Dermestinae A
DERMESTINI
Dermestes (*Dermestes*) *ater* De Geer, 1774 A
Dermestes (*D.*) *haemorrhoidalis* Küster, 1852 A
Dermestes (*D.*) *lardarius* Linnaeus, 1758 A
Dermestes (*D.*) *peruvianus* Laporte de Castelnau, 1840 A
Dermestes (*Dermestinus*) *carnivorus* Fabricius, 1775 A Do
Dermestes (*D.*) *maculatus* De Geer, 1774 A
Trinodinae
THYLODRINI
Hexanodes vulgata (Broun, 1880) E
Attageninae A
ATTAGENINI
Attagenus pellio (Linnaeus, 1758) A Do
Megatominae
MEGATOMINI
Anthrenocerus australis (Hope, 1843) A
Reesa vespulae (Milliron, 1939) A
Trogoderma antennale Broun, 1893 E
Trogoderma carteri Armstrong, 1942 A Do
Trogoderma granulatum Broun, 1886 E
Trogoderma grassmani Beal, 1954 A Do
Trogoderma inclusum LeConte, 1854 A Do
Trogoderma maestum Broun, 1880 E
Trogoderma ornatum Say, 1825 A Do
Trogoderma pictulum Broun, 1911 E Ch
Trogoderma punctatum Broun, 1886 E
Trogoderma puncticolle Broun, 1914 E
Trogoderma quadrifasciatum Broun, 1893 E
Trogoderma serrigerum Sharp, 1877 E
Trogoderma signatum Sharp, 1877 E
Trogoderma suffusum Broun, 1886 E
Trogoderma variabile Ballion, 1878 A
ANTHRENINI
Anthrenus (*Florilinus*) *museorum* (Linnaeus, 1761) A
Anthrenus (*Nathrenus*) *verbasci* (Linnaeus, 1767) A
BOSTRICHIDAE
Dinoderinae A
Dinoderus minutus (Fabricius, 1775) A
Rhyzopertha dominica (Fabricius, 1792) A
Dinoderinae sp. indet. A?
Lyctinae A
LYCTINI
Lyctus brunneus (Stephens, 1830) A
Lyctus linearis (Goeze, 1777) A Do
Lyctus planicollis LeConte, 1858 A Do
Lyctinae sp. indet. A?
Euderinae
Euderia squamosa Broun, 1880 E
ANOBIIDAE
Anobiinae
Anobium punctatum De Geer, 1774 A
Australanobium inaequale inaequale (Broun, 1912) E
Australanobium i. trapezicolle Español, 1976 E

Hadrobregmus (*Megabregmus*) *australiensis* Pic, 1901 E
Hadrobregmus (*M.*) *crowsoni* Español, 1976 E
Hadrobregmus (*M.*) *magnus* (Dumbleton, 1941) E
Macranobium truncatum Broun, 1886 E
Stegobium paniceum (Linnaeus, 1758) A
Xenocera ambigua Broun, 1881 E
Xenocera furca Broun, 1881 E
Xenocera granulata (Broun, 1880) E
Xenocera notata (Broun, 1880) E
Xenocera obscura (Sharp, 1886) E
Xenocera plagiata Broun, 1881 E
Xenocera pulla Broun, 1881 E
Xenocera sericea (Broun, 1880) E
Xenocera versuta Broun, 1881 E
DORCATOMINAE
CRYPTORAMORPHINI
Dorcatomiella ornata Español, 1977 E K
Mirosternomorphus crowsoni (Español, 1970) E
Mirosternomorphus oblongus (Broun, 1880) E
Mirosternomorphus n. sp. E TK
Serianotus (*Serianotus*) *punctilatera kermadecensis* Español, 1979 E K
DORCATOMINI
Cyphanobium illustre (Broun, 1880) E
Dorcatoma lauta Broun, 1881 E
Dorcatoma pilosella Hinton, 1941 E
PROTHECINI
Methemus griseipilus (Broun, 1881) E
DRYOPHILINAE
Sphinditeles atriventris Broun, 1881 E
Sphinditeles debilis (Sharp, 1882) E
Sphinditeles dorsalis Broun, 1893 E
Sphinditeles nigricornis Broun, 1893 E
Sphinditeles niticollis (Broun, 1912) E
Sphinditeles rufescens Broun, 1893 E
Sphinditeles ruficornis Broun, 1893 E
ERNOBIINAE A
Ernobius mollis (Linnaeus, 1758) A
MESOCOELOPODINAE
TRICORYNI
Tricorynus herbarium (Gorham, 1883) A
XYLETININAE
Deroptilinus granicollis Lea, 1924 A
Lasioderma serricorne (Fabricius, 1792) A
Leanobium flavomaculatum Español, 1979 E K
Leanobium marmoratum (Lea, 1924) E K
Leanobium undulatum (Broun, 1881) E
Xyletobius (*Holcobius*) *watti* (Español, 1982) E
Xyletobius (*Xyletobius*) *kuscheli* Español, 1982 E
PTINIDAE
GIBBIINAE
Mezium affine Boieldieu, 1856 A
Mezium americanum (Laporte de Castelnau, 1840) A
PTINIINAE
Niptus hololeucus (Faldermann, 1836) A
Ptinus clavipes Panzer, 1792 A
Ptinus fur (Linnaeus, 1758) A Do
Ptinus littoralis Broun, 1893 E
Ptinus maorianus Brookes, 1926 E
Ptinus murinus White, 1846 E
Ptinus plagiatus Broun, 1914 E
Ptinus sexpunctatus Panzer, 1792 A Do
Ptinus speciosus Broun, 1880 E
Ptinus suturalis White, 1846 E
Ptinus tectus Boieldieu, 1856 A
Sphaericus (*Sphaericus*) *gibboides* (Boieldieu, 1854) A
Trigonogenius globulus Solier, 1849 A
CUCUJIFORMIA
CLEROIDEA
TROGOSSITIDAE
LOPHOCATERINAE
ANCYRONINI
Grynoma albosparsa Broun, 1909 E
Grynoma clavalis Broun, 1917 E
Grynoma diluta Sharp, 1877 E
Grynoma fusca Sharp, 1877 E
Grynoma pallidula Broun, 1917 E
Grynoma proxima Broun, 1917 E
Grynoma regularis Sharp, 1882 E
Grynoma rugosa Broun, 1893 E
Grynoma setigera Broun, 1917 E
Grynoma varians Broun, 1893 E
Neaspis variegata (MacLeay, 1871) A
LOPHOCATERINI
Promanus auripilus Broun, 1893 E
Promanus depressus Sharp, 1877 E
Promanus subcostatus Broun, 1909 E
PELTINAE
THYMALINI
Australiodes vestitus (Broun, 1883) E
Parentonium magnum (Crowson, 1966) E
Protopeltis pulchella (Broun, 1915) E SI
Protopeltis viridescens (Broun, 1886) E
Rentonellum apterum Crowson, 1966 E
Rentonellum n. sp. (3) 3E
Rentonidium costiventris Crowson, 1966 E
Rentonium daldiniae Crowson, 1966 E
Rentonium n. sp. (2) 2E
'Peltidae' indet. spp. (2) 2E
TROGOSSITINAE
GYMNOCHILINI
Lepidopteryx ambigua (Broun, 1880) E
Lepidopteryx brounii (Pascoe, 1876) E
Lepidopteryx farinosa (Sharp, 1877) E
Lepidopteryx interrupta Brookes, 1932 E
Lepidopteryx nigrosparsa (White, 1846) E
Lepidopteryx shandi (Broun, 1910) E Ch
Lepidopteryx sobrina (White, 1846) E
Lepidopteryx wakefieldi (Sharp, 1877) E
Tenebroides affinis (White, 1846) E
Tenebroides mauritanicus (Linnaeus, 1758) A
CHAETOSOMATIDAE sensu Crowson 1952
Chaetosoma colossa Opitz, 2010
Chaetosoma scaritides Westwood, 1851 E
Chaetosoma n. sp. E
Chaetosomodes halli Broun, 1921 E
CLERIDAE
CLERINAE
Balcus signatus Broun, 1880 E
Balcus violacea (Fabricius, 1787) E
Thanasimus formicarius (Linnaeus, 1758) A
ENOPLIINAE
Phymatophaea aeraria (Pascoe, 1876) E
Phymatophaea aquila Opitz, 2009 E
Phymatophaea atrata Broun, 1881 E
Phymatophaea auripila Opitz, 2009 E
Phymatophaea breviclava Broun, 1914 E
Phymatophaea deirolinea Opitz, 2009 E TK
Phymatophaea earlyi Opitz, 2009 E Ch
Phymatophaea enodis Opitz, 2009 E TK
Phymatophaea fuscitarsis Broun, 1914 E
Phymatophaea guttigera (Waterhouse, 1877) E
Phymatophaea hudsoni Broun, 1923 E
Phymatophaea insula Opitz, 2009 E
Phymatophaea longula Sharp, 1877 E
Phymatophaea lugubris Broun, 1909 E
Phymatophaea maorias Opitz, 2009 E
Phymatophaea oconnori Broun, 1914 E
Phymatophaea opacula Broun, 1893 E
Phymatophaea opiloides (Pascoe, 1876) E
Phymatophaea pantomelas (Boisduval, 1835) E
Phymatophaea pustulifera (Westwood, 1852) E
Phymatophaea testacea Broun, 1881 E
Phymatophaea trachelogloba Opitz, 2009 E
Phymatophaea watti Opitz, 2009 E
KORYNETINAE A
Necrobia ruficollis (Fabricius, 1775) A
Necrobia rufipes (De Geer, 1775) A
HYDNOCERINAE
Lemidia aptera (Sharp, 1877) E
Lemidia debilis (Sharp, 1877) E
Lemidia longipes (Sharp, 1877) E
Lemidia rugosa (Broun, 1893) E
Lemidia violacea (Broun, 1912) E
TARSOSTENINAE A
Paratillus carus (Newman, 1840) A
METAXINIDAE E
Metaxinida ornata Broun, 1909 E
PHYCOSECIDAE
Phycosecis limbatus (Fabricius, 1781) E
MELYRIDAE
DASYTINAE
'Arthracanthus' atriceps Broun, 1914 E
'Arthracanthus' fossicollis Broun, 1914 E
'Arthracanthus' foveicollis Broun, 1912 E
'Arthracanthus' fulvipes Broun, 1914 E
Dasytes aethiops Broun, 1893 E
Dasytes anacharis Broun, 1909 E
Dasytes aurisetifer Broun, 1909 E
Dasytes cheesemani Broun, 1886 E
Dasytes cinereohirtus Broun, 1880 E
Dasytes clavatus Broun, 1921 E
Dasytes constrictus Broun, 1883 E
Dasytes fuscitarsis Broun, 1914 E
Dasytes helmsi Sharp, 1882 E
Dasytes laevulifrons Broun, 1914 E
Dasytes laticeps Broun, 1880 E
Dasytes littoralis Broun, 1893 E
Dasytes minutus (Fabricius, 1781) E
Dasytes obscuricollis Broun, 1880 E
Dasytes occiputalis Broun, 1883 E
Dasytes opaculus Broun, 1886 E
Dasytes oreocharis Broun, 1893 E
Dasytes philpotti Broun, 1915 E
Dasytes pittensis Broun, 1911 E Ch
Dasytes planifrons (Broun, 1883) E
Dasytes stewarti Broun, 1881 E
Dasytes veronicae Broun, 1910 E
Dasytes violascens Broun, 1921 E
Dasytes wakefieldi Sharp, 1877 E
Dasytes n. spp. (2) 2E
Halyles brevicornis Broun 1883 E
Halyles nigrescens Broun, 1883 E
Halyles semidilutus Broun, 1883 E
MALACHIINAE
CARPHURINI
Carphurus venustus Kirsch, 1877 E Su
CUCUJOIDEA
NITIDULIDAE
EPURAEINAE
EPURAEINI
Epuraea antarctica (White, 1846) E
Epuraea imperialis Reitter, 1877 A
Epuraea scutellaris (Broun, 1880), non *scutellaris* Kraatz, 1895 E
Epuraea signata Broun, 1880 E
Epuraea zelandica Sharp, 1878 E
CARPOPHILINAE A
Carpophilus davidsoni Dobson, 1952 A
Carpophilus dimidiatus (Fabricius, 1792) A
Carpophilus gaveni Dobson, 1964 A
Carpophilus hemipterus (Linnaeus, 1758) A
Carpophilus ligneus Murray, 1864 A
Carpophilus maculatus Murray, 1864 A Do
Carpophilus marginellus Motschulsky, 1858 A
Carpophilus mutilatus Erichson, 1843 A Do [not established]
Carpophilus oculatus gilloglyi Dobson, 1993 A Do
Carpophilus o. oculatus Murray, 1864 A
Urophorus humeralis (Fabricius, 1798) A
NITIDULINAE
NITIDULINI
Nitidula carnaria (Schaller, 1783) A
Omosita (*Saprobia*) *colon* (Linnaeus, 1758) A

Omosita (*Saprobia*) *discoidea* (Fabricius, 1775) A
Omosita (*Saprobia*) *spinipes* Broun, 1880 E
Soronia asperella (Broun, 1893) E
Soronia micans Broun, 1893 E
Soronia morosa Broun, 1893 E
Soronia oculata Reitter, 1880 E
Soronia optata Sharp, 1878 E
Hisparonia hystrix (Sharp, 1876) E
Neopocadius (*Brounthina*) *aequalis* (Kirejtschuk, 1997) E
Aethina (*Idaethina*) *concolor* (MacLeay, 1872) A
Thalycrodes australis (Germar, 1848) A
CYLLODINI
Cerylollodes dacnoides Kirejtschuk, 2006 E
CILLAEINAE
Brachypeplus brevicornis Sharp, 1878 E
CRYPTARCHINAE
Cryptarcha nitidisssima Reitter, 1873 A
Crytptarcha optanda (Broun, 1881) E
Homepuraea amoena (Broun, 1880) E
Homepuraea halli (Broun, 1921) E
MONOTOMIDAE
LENACINAE
LENACINI
Lenax mirandus Sharp, 1877 E
MONOTOMINAE A
Monotoma (*Monotoma*) *bicolor* Villa & Villa, 1835 A
Monotoma (*M.*) *longicollis* (Gyllenhal, 1827) A
Monotoma (*M.*) *picipes* Herbst, 1793 A
Monotoma (*M.*) *spinicollis* Aubé, 1838 A
Monotoma (*M.*) *testacea* Motschulsky, 1845 A
AGAPYTHIDAE E
Agapytho foveicollis Broun, 1921 E
PRIASILPHIDAE
Priasilpha angulata Leschen, Lawrence & Ślipiński, 2005 E
Priasilpha aucklandica Leschen, Lawrence & Ślipiński, 2005 E
Priasilpha bufonia Leschen, Lawrence & Ślipiński, 2005 E
Priasilpha carinata Leschen, Lawrence & Ślipiński, 2005 E
Priasilpha earlyi Leschen, Lawrence & Ślipiński, 2005 E
Priasilpha embersoni Leschen, Lawrence & Ślipiński, 2005 E
Priasilpha obscura Broun, 1893 E
SILVANIDAE
BRONTINAE
BRONTINI
Brontopriscus pleuralis (Sharp, 1877) E
Brontopriscus sinuatus Sharp, 1886 E
Dendrophagella capito (Pascoe, 1876) E
Protodendrophagus antipodes Thomas, 2004 E
SILVANINAE
CRYPTAMORPHINI
Cryptamorpha brevicornis (White, 1846) E
Cryptamorpha curvipes Broun, 1880 E
Cryptamorpha desjardinsi (Guérin-Méneville, 1829) A
Cryptamorpha picturata (Reitter, 1880) E
Cryptamorpha rugicollis (Broun, 1910) E
Cryptamorpha n. sp. E TK
SILVANINI
Ahasverus advena (Waltl, 1832) A
Nausibius clavicornis (Kugelann in Schneider, 1794) A
Oryzaephilus mercator (Fauvel, 1889) A
Oryzaephilus surinamensis (Linnaeus, 1758) A
Silvanus bidentatus (Fabricius, 1792) A Do
Silvanus lateritius (Broun, 1880) E
Silvanus unidentatus (Olivier, 1790) A Do
CUCUJIDAE
Platisus zelandicus Marris & Klimaszewski, 2001 E TK
LAEMOPHLOEIDAE
Cryptolestes capensis (Waltl, 1834) A
Cryptolestes ferrugineus (Stephens, 1831) A Do
Cryptolestes pusilloides (Steel & Howe, 1952) A
Cryptolestes pusillus (Schönherr, 1817) A Do
Microbrontes lineatus (Broun, 1893) E
Microbrontes n. sp. E
Notolaemus n. sp. A
PHALACRIDAE A
PHALACRINAE
Phalacrus uniformis frigoricola Thompson & Marshall, 1980 A
Phalacrus sp. indet. A
CYCLAXYRIDAE E
Cyclaxyra jelineki Gimmel, Leschen & Ślipiński, 2009 E
Cyclaxyra politula (Broun, 1881) E
CAVOGNATHIDAE
Taphropiestes chathamensis (Watt, 1980) E Ch
Taphropiestes dumbletoni (Crowson, 1973) E
Taphropiestes electa (Broun, 1921) E
Taphropiestes watti Ślipiński & Tomaszewska, 2010 E
CRYPTOPHAGIDAE
CRYPTOPHAGINAE
CRYPTOPHAGINI
Cryptophagus pilosus Gyllenhal, 1828 A
Henoticus californicus (Mannerheim, 1843) A Do
CRYPTOSOMATULINI
Antarcticotectus aucklandicus Brookes, 1951 E Su
Brounina distincta (Broun, 1893) E
Micrambina amoena (Broun, 1912) E
Micrambina angulifera (Broun, 1880) E
Micrambina australis (Redtenbacher, 1867) E
Micrambina discoidea (Broun, 1893) E
Micrambina helmsi Reitter, 1880 E
Micrambina hispidula (Broun, 1880) E
Micrambina insignis Reitter, 1880 E
Micrambina obscura (Broun, 1893) E
Micrambina rufescens (Blanchard, 1853) E
Micrambina rutila (Broun, 1880) E
'Micrambina' silvana (Broun, 1880) E
'Micrambina' tumida (Broun, 1893) E
Ostreacryptus clarkae Leschen, 2001 E
Picrotus thoracicus Sharp, 1886 E
Thortus ovalis Broun 1893 E
ATOMARIINAE
ATOMARIINI
Atomaria lewisi Reitter, 1877 A
Ephistemus globulus (Paykull, 1798) A
Paratomaria crowsoni Leschen, 1996 E
Salltius ruficeps (Broun, 1880) E
Gen. et sp. indet. E
EROTYLIDAE
CRYPTOPHILINAE
CRYPTOPHILINI
Cathartocryptus maculosus (Broun, 1881) E
Cryptophilus integer (Heer, 1841) A
EROTYLINAE A
DACNINI
Cryptodacne brounii (Pascoe, 1876) E
Cryptodacne ferrugata Reitter, 1880 E
Cryptodacne lenis Broun, 1880 E
Cryptodacne nui Skelley & Leschen, 2007 E
Cryptodacne pubescens Broun, 1893 E
Cryptodacne rangiauria Skelley & Leschen, 2007 E
Cryptodacne synthetica Sharp, 1878 E
Kuschelengis politus (White, 1846) E
LANGURIINAE
HAPALIPINI
Hapalips prolixus (Sharp, 1876) E
LOBERINAE
Loberus anthracinus (Broun, 1893) E
Loberus borealis Leschen, 2003 E
Loberus depressus (Sharp, 1876) E
Loberus nitens (Sharp, 1876) E
Loberus watti Leschen, 2003 E TK
XENOSCELINAE
Loberonotha olivascens (Broun, 1893) E
BOTHRIDERIDAE
ANOMMATINAE A
Anommatus duodecimstriatus (Müller, 1821) A
BOTHRIDERINAE
Ascetoderes cognatus (Sharp, 1886) E
Ascetoderes diversus (Broun, 1912) E
Ascetoderes moestus (Sharp, 1877) E
Ascetoderes obsoletus (Broun, 1895) E
Ascetoderes paynteri (Broun, 1911) E Ch
Ascetoderes picipes (Broun, 1903) E
CERYLONIDAE
EUXESTINAE
Hypodacnella rubripes (Reitter, 1880) E
CERYLONINAE
Philothermus bicavus Reitter, 1880 E
Philothermus nitidus Sharp, 1876 E
Philothermus notabilis Broun, 1880 E
Philothermus sanguineus Broun, 1880 E
ENDOMYCHIDAE
MYCETAEINAE A
Mycetaea subterranea (Fabricius, 1801) A
MEROPHYSIINAE
Holoparamecus castaneus Broun, 1893 E
Holoparamecus tenuis Reitter, 1880 E
Holoparamecus n. sp. E
Gen. et spp. indet. (3) 3E
COCCINELLIDAE
COCCINELLINAE
CHILOCORINI
Halmus chalybeus (Boisduval, 1835) A BC
COCCIDULINI
Adoxellus flavihirtus (Broun, 1880) E
Adoxellus picinus (Broun, 1880) E
Apolinus lividigaster (Mulsant, 1853) A
Cryptolaemus montrouzieri Mulsant, 1853 A
Hoangus venustus (Pascoe, 1875) E
Rhyzobius acceptus (Broun, 1880) E
Rhyzobius consors (Broun, 1880) E
Rhyzobius eximius (Broun, 1880) E
Rhyzobius fagus (Broun, 1880) E
Rhyzobius forestieri (Mulsant, 1853) E
Rhyzobius minutulus (Broun, 1880) E
Rhyzobius nigritulus (Broun, 1914) E
Rhyzobius pallidiceps (Broun, 1880) E
Rhyzobius prolongatus (Broun, 1914) E
Rhyzobius rarus (Broun, 1880) E
Rhyzobius sedatus (Broun, 1886) E
Rhyzobius suffusus (Broun, 1880) E
Rhyzobius terrenus (Broun, 1880) E
Rhyzobius tristis (Broun, 1880) E
Rhyzobius ventralis (Erichson, 1843) A
Rhyzobius villosus (Broun, 1886) E
Rhyzobius n. spp. (3) 3E
Rodolia cardinalis (Mulsant, 1850) A BC
Rodolia koebelei Coquillett, 1893 A
Scymnus loewii Mulsant, 1850 A
Scymnus pygmaeus (Blackburn, 1892), non *pygmaeus* (Fourcroy, 1785), nec *pygmaea* Brullé, 1832 A
Stethorus bifidus Kapur, 1948 A
Stethorus griseus Chazeau, 1979 E
Stethorus (*Parastethorus*) *histrio* Chazeau 1974 E
Veronicobius aucklandiae Kirsch, 1877 E Su
Veronicobius hirtus Broun, 1893 E
Veronicobius macrostictus (Broun, 1911) E
Veronicobius n. spp. (2) E Ch
DIOMINI
Diomus notescens (Blackburn, 1889) A
Diomus subclarus (Blackburn, 1895) A
COCCINELLINI
Adalia (*Adalia*) *bipunctata bipunctata* (Linnaeus, 1758) A BC
Cleobora mellyi (Mulsant, 1850) A BC
Coccinella leonina Fabricius, 1775 E

Coccinella undecimpunctata Linnaeus, 1758 A BC
Coelophora inaequalis (Fabricius, 1775) A BC
Harmonia antipoda (Mulsant, 1848) E
Harmonia conformis (Boisduval, 1835) A BC
Illeis galbula (Mulsant, 1850) A
EPILACHNINI
Epilachna vigintioctopunctata (Fabricius, 1775) A
MICROWEISEINAE A
SERANGIINI
Serangium maculigerum Blackburn, 1892 A
CORYLOPHIDAE
CORYLOPHINAE
AENIGMATICINI
Stanus bowesteadi Ślipiński, Tomaszewska & Lawrence, 2009 E
CORYLOPHINI
Corylophus n. sp. E?
PELTINODINI
Holopsis lawsoni Broun, 1883 E
Holopsis nigella Broun, 1883 E
Holopsis oblonga Endrödy-Younga, 1964 E
Holopsis pallida Broun, 1883 E
Holopsis pictula Broun, 1893 E
Holopsis rotundata Broun, 1893 E
Holopsis n. spp. (4) 4E
SERICODERINI
Sericoderus apicalis Lea, 1895 A
Sericoderus ater (Matthews, 1886) E
Sericoderus brevicornis Matthews, 1890 A
Sericoderus brouni Csiki, 1910 E
Sericoderus seelandicus Csiki, 1910 E
Sericoderus sharpi (Matthews, 1886) E
Sericoderus thoracicus (Erichson, 1842), non Stephens, 1829 A
Sericoderus sp. indet. A
ORTHOPERINAE A
Orthoperus aequalis Sharp, 1885 A
Orthoperus atomarius (Heer, 1841) A
Orthoperus sp. indet. A
PARMULINAE
Arthrolips curtula (Broun, 1914) E
Arthrolips laetans (Broun, 1914) E
Arthrolips oblonga Broun, 1893 E
Clypastraea pulchella (Lea, 1895) A
Gen. et spp. indet. (2) E?
LATRIDIIDAE
LATRIDIINAE
Adistemia watsoni (Wollaston, 1871) A Do
Cartodere (*Aridius*) *bifasciatus* (Reitter, 1877) A
Cartodere (*A.*) *costatus* (Erichson, 1842) A
Cartodere (*A.*) *nodifer* (Westwood, 1839) A
Cartodere (*Cartodere*) *constricta* (Gyllenhal, 1827) A
Dienerella (*Cartoderema*) *ruficollis* (Marsham, 1802) A
Dienerella (*Dienerella*) *filiformis* (Gyllenhal, 1827) A
Dienerella (*D.*) *filum* (Aubé, 1850) A
Enicmus bifoveatus (Broun, 1886) E
Enicmus caviceps (Broun, 1893) E
Enicmus floridus (Broun, 1880) E
Enicmus foveatus Belon, 1884 E
Enicmus priopterus (Broun, 1886) E
Enicmus puncticeps (Broun, 1886) E
Enicmus rufifrons (Broun, 1914) E
Enicmus sharpi Belon, 1884 E
Latridius minutus (Linnaeus, 1767) A
Lithostygnus serripennis Broun, 1914 E
Lithostygnus sinuosus (Belon, 1884) E
Metophthalmus minor (Broun, 1893) E
Metophthalmus n. spp. (3) 3E
CORTICARIINAE
Bicava alacris (Broun, 1880) E
Bicava angusticollis (Broun, 1880) E
Bicava castanea (Broun, 1914) E
Bicava discoidea (Broun, 1880) E
Bicava diversicollis (Belon, 1884) E
Bicava erythrocephala (Broun, 1886) E
Bicava fuscicollis (Broun, 1912) E
Bicava gilvipes (Broun, 1886) E
Bicava globipennis (Reitter, 1881) E Su
Bicava illustris (Reitter, 1880) E
Bicava obesa (Broun, 1880) E
Bicava platyptera (Broun, 1886) E
Bicava pubera (Broun, 1880) E
Bicava pudibunda (Broun, 1880 E
Bicava semirufa (Broun, 1886) E
Bicava unicolor (Broun, 1914) E
Bicava variegata (Broun, 1880) E
Bicava zelandica (Belon, 1884) E
Corticaria clavatula Broun, 1914 E
Corticaria elongata (Gyllenhal, 1827) A
Corticaria ferruginea Marsham, 1802 A
Corticaria latulipennis Broun, 1914 E
Corticaria picicornis Broun, 1914 E
Corticaria pubescens (Gyllenhal, 1827) A
Corticaria serrata (Paykull, 1798) A
Corticarina clarula Broun, 1895 E
Corticarina pacata (Broun, 1886) E
Cortinicara hirtalis (Broun, 1880) A
Cortinicara meridiana Johnson, 1975 A
Cortinicara vagepunctata (Broun, 1914) E
Diarthrocera formicaephila Broun, 1893 E
'Melanophthalma' n. spp. (5) 5E
Rethusus fulvescens Broun, 1921 E
Rethusus lachrymosus Broun, 1886 E
Rethusus pustulosus (Belon, 1884) E
Gen. et sp. indet. (1) A
TENEBRIONOIDEA
HETEROMERA
MYCETOPHAGIDAE
MYCETOPHAGINAE
MYCETOPHAGINI
Litargus (*Alitargus*) *balteatus* LeConte, 1856 A
Litargus (*Litargus*) *vestitus* Sharp, 1879 A
Triphyllus aciculatus (Broun, 1880) E
Triphyllus adspersus (Broun, 1880) E
Triphyllus concolor Sharp, 1886 E
Triphyllus confertus Sharp, 1886 E
Triphyllus constans Broun, 1914 E
Triphyllus fuliginosus (Broun, 1880) E
Triphyllus hispidellus (Broun, 1880) E
Triphyllus huttoni Sharp, 1886 E
Triphyllus integritus Broun, 1893 E
Triphyllus maculosus Sharp, 1886 E
Triphyllus pubescens Broun, 1909 E
Triphyllus punctulatus (Broun, 1880) E
Triphyllus rubicundus Sharp, 1886 E
Triphyllus serratus (Broun, 1880) E
Triphyllus substriatus (Broun, 1880) E
Triphyllus zealandicus Sharp, 1886 E
Triphyllus n. spp. (2) 2E Ch
TYPHAEINI
Typhaea stercorea (Linnaeus, 1758) A
Mycetophagidae gen. et sp. indet. E
ARCHEOCRYPTICIDAE A
Archeocrypticus topali Kaszab, 1964 A
CIIDAE
CIINAE
CIINI
Cis anthracinus Broun, 1880 E
Cis asperrimus Broun, 1880 E
Cis bilamellatus Wood, 1884 A
Cis boettgeri (Reitter, 1880) E
Cis cornuticeps Broun, 1880 E
Cis flavitarsis Broun, 1880 E
Cis fulgens Broun, 1895 E
Cis fultoni Broun, 1886 E
Cis fuscipes Mellié, 1848 A
Cis illustris Broun, 1880 E
Cis lineicollis Broun, 1880 E
Cis lobipes Broun, 1895 E
Cis minutus Bayford, 1931 E
Cis obesulus Broun, 1886 E
Cis obsoletus (Reitter, 1880) E
Cis perpinguis Broun, 1880 E
Cis piciceps Broun, 1886 E
Cis picicollis Broun, 1883 E
Cis picturatus Broun, 1886 E
Cis recurvatus Broun, 1883 E
Cis rufulus Broun, 1880 E
Cis viridiflorus Broun, 1883 E
Cis zeelandicus Reitter, 1880 E
Cis n. spp. (5) 5E
Ennearthron n. sp. E
Orthocis assimilis (Broun, 1880) E
Orthocis undulatus (Broun, 1880) E
OROPHILINI
Octotemnus dilutipes (Blackburn, 1891) A
XYLOGRAPHELLINI
XYLOGRAPHELLINA
Scolytocis novaezelandiae Lopes-Andrade, 2008 E
Scolytocis n. sp. 1 E
MELANDRYIDAE
MELANDRYINAE
HYPULINI
Doxozilora punctata Broun, 1909 E
ORCHESIINI
Allorchesia guinnessi (Broun, 1912) E
Allorchesia validipes Broun, 1914 E
Hylobia acuminata Broun, 1915 E
Hylobia arboricola Broun, 1915 E
Hylobia bifasciata Broun, 1880 E
Hylobia calida Broun, 1880 E
Hylobia cylindrata Broun, 1880 E
Hylobia minor Broun, 1880 E
Hylobia nigricornis Broun, 1880 E
Hylobia nubeculosa Broun, 1880 E
Hylobia plagiata Broun, 1912 E
Hylobia pulla Broun, 1880 E
Hylobia sexnotata Broun, 1915 E
Hylobia undulata Broun, 1880 E
Hylobia velox Broun, 1880 E
Hylobia n. sp. E
Lyperocharis agilis Broun, 1914 E
Lyperocharis n. sp. E
Neorchesia divergens Broun, 1914 E
Neorchesia terricola Broun, 1914 E
Orchesia rennelli Gressitt & Samuelson, 1964 E Su
SERROPALPINI
Allopterus cavelli Broun, 1893 E
Allopterus instabilis Broun, 1886 E
Allopterus ornatus (Broun, 1880) E
Allopterus reticulatus Broun, 1883 E
Allopterus simulans Broun, 1910 E
Axylita sericophora Broun, 1914 E
Ctenoplectron coloratum Broun, 1886 E
Ctenoplectron costatum Broun, 1881 E
Ctenoplectron dignum Broun, 1886 E
Ctenoplectron fasciatum Redtenbacher, 1867 E
Ctenoplectron fuliginosum Broun, 1880 E
Ctenoplectron maculatum Broun, 1881 E
Ctenoplectron vittatum Broun, 1886 E
Mecorchesia brevicornis Broun, 1914 E
Mecorchesia spectabilis Broun, 1914 E
Melandryidae gen. et sp. indet. E
MORDELLIDAE
MORDELLINAE
MORDELLINI
Hoshihananomia antarctica (White, 1846)
Mordella jucunda (Broun, 1880) E
Mordella promiscua Erichson, 1842 A
Stenomordellaria neglecta (Broun, 1880) E
Zeamordella monacha Broun, 1886 E
MORDELLISTENINI
Tolidopalpus nitidocoma (Lea, 1929) A
RIPIPHORIDAE
PELECATOMINAE

Allocinops brookesi Broun, 1921 E
Rhipistena cryptarthra Broun, 1904 E
Rhipistena lugubris Sharp, 1878 E
Rhipistena sulciceps Broun, 1904 E
Sharpides hirtella (Broun, 1880) E
ZOPHERIDAE
COLYDIINAE
SYNCHITINI
Ablabus brevis Broun, 1886 E
Ablabus crassulus (Broun, 1914) E
Ablabus crassus Broun, 1881 E
Ablabus demissus (Broun, 1912) E
Ablabus discors (Broun, 1921) E
Ablabus facetus (Broun, 1893) E
Ablabus fervidulus Broun, 1880 E
Ablabus libentus (Broun, 1886) E
Ablabus lobiferus (Broun, 1909) E
Ablabus longipes (Broun, 1914) E
Ablabus nodosus Broun, 1886 E
Ablabus ornatus Broun, 1880 E
Ablabus pallidipictus Broun, 1880 E
Ablabus punctipennis Broun, 1880 E
Ablabus scabrus Broun, 1880 E
Ablabus sellatus (Sharp, 1886) E
Ablabus sparsus (Broun, 1886) E
Ablabus truncatus (Broun, 1914) E
Ablabus varicornis (Broun, 1910) E
Allobitoma halli Broun, 1921 E
Bitoma auriculata Sharp, 1886 E
Bitoma brouni Hetschko, 1928 E
Bitoma costicollis Reitter, 1880 E
Bitoma discoidea Broun, 1880 E
Bitoma distans Sharp, 1876 E
Bitoma distincta Broun, 1880 E
Bitoma guttata Broun, 1886 E
Bitoma insularis White, 1846 E
Bitoma lobata Broun, 1886 E
Bitoma morosa Broun, 1921 E
Bitoma mundula Sharp, 1886 E
Bitoma nana Sharp, 1876 E
Bitoma novella Hetschko, 1929 E
Bitoma picicornis Broun, 1909 E
Bitoma rugosa Sharp, 1876 E
Bitoma scita Broun, 1886 E
Bitoma serraticula Sharp, 1886 E
Bitoma vicina Sharp, 1876 E
Chorasus costatus (Broun, 1893) E
Chorasus costicollis (Broun, 1893) E
Chorasus incertus (Broun, 1895) E
Chorasus lateralis (Broun, 1921) E
Chorasus posticalis (Broun, 1921) E
Chorasus purus (Broun, 1921) E
Chorasus setarius (Broun, 1921) E
Chorasus subcaecus Sharp 1882 E
Chorasus suturalis (Broun, 1921) E
Ciconissus granifer Broun, 1893 E
Coxelus bicavus Broun, 1909 E
Coxelus chalmeri Broun, 1886 E
Coxelus clarus Broun, 1882 E
Coxelus dubius Sharp, 1876 E
Coxelus elongatus Broun, 1909 E
Coxelus graniceps Broun, 1893 E
Coxelus grossanus Broun, 1886 E
Coxelus instabilis Broun, 1914 E
Coxelus longulus Broun, 1893 E
Coxelus mucronatus Broun, 1911 E
Coxelus oculator Broun, 1893 E
Coxelus ovicollis Broun, 1893 E
Coxelus picicornis Broun, 1893 E
Coxelus posticalis Broun, 1893 E
Coxelus punctatus Broun, 1910 E K
Coxelus regularis Broun, 1893 E
Coxelus robustus Broun, 1880 E
Coxelus rufus Broun, 1893 E
Coxelus similis Sharp, 1876 E
Coxelus thoracicus Broun, 1895 E
Coxelus variegatus Broun, 1909 E
Coxelus xanthonyx Broun, 1910 E K
Epistranus fulvus Reitter, 1880 E
Epistranus hirtalis Broun, 1893 E
Epistranus humeralis Broun, 1880 E
Epistranus lawsoni (Sharp, 1876) E
Epistranus optabilis Broun, 1893 E
Epistranus parvus Broun, 1886 E
Epistranus sharpi Reitter, 1880 E
Epistranus valens Broun, 1881 E
Glenentela costata Broun, 1921 E
Glenentela serrata Broun, 1893 E
Heterargus angulifer (Broun, 1914) E
Heterargus decorus (Broun, 1914) E
Heterargus fuscus (Broun, 1923) E
Heterargus indentatus (Broun, 1893) E
Heterargus interruptus (Broun, 1923) E
Heterargus nodosus (Broun, 1893) E
Heterargus obliquecostatus (Broun, 1909) E
Heterargus pallens (Broun, 1914) E
Heterargus parallelus Broun, 1914 E
Heterargus posticalis (Broun, 1909) E
Heterargus rudis Sharp, 1886 E
Heterargus ruficornis (Broun, 1893) E
Heterargus serricollis Broun, 1893 E
Heterargus subaequus Broun, 1914 E
Heterargus tricavus (Broun, 1909) E
Lasconotus gracilis (Sharp, 1876) E
Namunaria sp. indet. A
Norix crassus Broun, 1893 E
Notocoxelus helmsi (Reitter, 1880) E
Pristoderus aberrans (Broun, 1880) E
Pristoderus acuminatus (Broun, 1880) E
Pristoderus aemulus (Broun, 1923) E
Pristoderus affinis (Broun, 1923) E
Pristoderus antarcticus (White, 1846) E
Pristoderus asper (Sharp, 1876) E
Pristoderus atratus (Broun, 1880) E
Pristoderus bakewelli (Pascoe, 1866) E
Pristoderus brouni (Sharp, 1876) E
Pristoderus carus (Broun, 1886) E
Pristoderus cinereus (Broun, 1886) E
Pristoderus contractifrons (Broun, 1880) E
Pristoderus cucullatus (Sharp, 1886) E
Pristoderus discalis (Broun, 1921) E
Pristoderus discedens (Sharp, 1877) E
Pristoderus dissimilis (Sharp, 1886) E
Pristoderus dorsalis (Broun, 1882) E
Pristoderus exiguus (Broun, 1882) E
Pristoderus fulvus (Broun, 1893) E
Pristoderus fuscatus (Broun, 1886) E
Pristoderus insignis (Broun, 1880) E
Pristoderus integratus (Broun, 1886) E
Pristoderus isostictus (Broun, 1886) E
Pristoderus lawsoni (Wollaston, 1873) E
Pristoderus philpotti (Broun, 1914) E
Pristoderus plagiatus (Broun, 1911) E
Pristoderus planiceps (Broun, 1915) E
Pristoderus probus (Broun, 1893) E
Pristoderus proprius (Broun, 1914) E
Pristoderus punctatus (Broun, 1886) E
Pristoderus reitteri (Sharp, 1882) E
Pristoderus rudis (Sharp, 1877) E
Pristoderus rufescens (Broun, 1886) E
Pristoderus salebrosus (Broun, 1880) E
Pristoderus scaber (Fabricius, 1775) E
Pristoderus tuberculatus (Broun, 1880) E
Pristoderus undosus (Broun, 1882) E
Pristoderus uropterus (Broun, 1912) E
Pristoderus viridipictus (Wollaston, 1873) E
Pristoderus wakefieldi (Sharp, 1877) E
Pristoderus wallacei (Broun, 1912) E
Rytinotus squamulosus Broun, 1880 E
Syncalus explanatus Broun, 1912 E
Syncalus granulatus (Broun, 1880) E
Syncalus hystrix Sharp, 1876 E
Syncalus munroi Broun, 1893 E
Syncalus oblongus (Broun, 1880) E
Syncalus optatus Sharp, 1876 E
Syncalus piciceps Broun, 1893 E
Syncalus politus Broun, 1880 E
Syncalus solidus Broun, 1923 E
Tarphiomimus indentatus Wollaston, 1873 E
Tarphiomimus tuberculatus Broun, 1912 E
Tarphiomimus wollastoni Sharp, 1882 E
PYCNOMERINAE
Pycnomerodes peregrinus Broun, 1886 E
Pycnomerus acutangulus Reitter, 1878 E
Pycnomerus aequicollis Reitter, 1878 E
Pycnomerus angulatus Broun, 1893 E
Pycnomerus arboreus Broun, 1886 E
Pycnomerus arcuatus Broun, 1914 E
Pycnomerus basalis Broun, 1882 E
Pycnomerus caecus Broun, 1886 E
Pycnomerus candidus Broun, 1912 E
Pycnomerus carinellus Broun, 1886 E
Pycnomerus cognatus Broun, 1886 E
Pycnomerus depressiusculus (White, 1846) E
Pycnomerus ellipticus Broun, 1880 E
Pycnomerus elongellus Broun, 1893 E
Pycnomerus frontalis Broun, 1893 E
Pycnomerus helmsi Sharp, 1886 E
Pycnomerus hirtus Broun, 1886 E
Pycnomerus impressus Broun, 1893 E
Pycnomerus lateralis Broun, 1886 E
Pycnomerus latitans Sharp, 1886 E
Pycnomerus longipes Broun, 1893 E
Pycnomerus longulus Sharp, 1886 E
Pycnomerus marginalis Broun, 1893 E
Pycnomerus mediocris Broun, 1911 E
Pycnomerus minor Sharp, 1876 E
Pycnomerus nitidiventris Broun, 1903 E
Pycnomerus ocularius Broun, 1914 E
Pycnomerus parvulus Broun, 1921 E
Pycnomerus reversus Broun, 1912 E
Pycnomerus rufescens Broun, 1882 E
Pycnomerus ruficollis Broun, 1909 E
Pycnomerus simplex Broun, 1880 E
Pycnomerus simulans Sharp, 1876 E
Pycnomerus sinuatus Broun, 1893 E
Pycnomerus sophorae Sharp, 1876 E
Pycnomerus sulcatissimus Reitter, 1880 E
Pycnomerus suteri Broun, 1909 E
Pycnomerus tenuiculus Broun, 1914 E
ULODIDAE
Arthopus brouni Sharp, 1876 E
Brouniphylax binodosus (Broun, 1895) E
Brouniphylax exiguus (Broun, 1914) E
Brouniphylax squamiger (Broun, 1880) E
Brouniphylax sternalis (Broun, 1904) E
Brouniphylax varius (Broun, 1880) E
Exohadrus volutithorax (Broun, 1880) E
Syrphetodes bullatus Sharp, 1886 E
Syrphetodes cordipennis Broun, 1893 E
Syrphetodes crenatus Broun, 1880 E
Syrphetodes decoratus Broun, 1880 E
Syrphetodes dorsalis Broun, 1893 E
Syrphetodes marginatus Pascoe, 1875 E
Syrphetodes nodosalis Broun, 1904 E
Syrphetodes pensus Broun, 1921 E
Syrphetodes punctatus Broun, 1893 E
Syrphetodes simplex Broun, 1903 E
Syrphetodes sylvius Broun, 1893 E
Syrphetodes thoracicus Broun, 1921 E
Syrphetodes truncatus Broun, 1912 E
Syrphetodes variegatus Broun, 1917 E
Syrphetodes n. spp. (2) 2E
CHALCODRYIDAE E
Chalcodrya hilaris Watt, 1974 E

Chalcodrya variegata Redtenbacher, 1868 E
Onysius anomalus Broun, 1886 E
Philpottia levinotis Watt, 1974 E
Philpottia mollis (Broun, 1886) E
TENEBRIONIDAE
ALLECULINAE
Omedes nitidus Broun, 1893 E
Omedes substriatus (Broun, 1880) E
Tanychilus metallicus White, 1846 E
Tanychilus sophorae Broun, 1880 E
Xylochus dentipes Broun, 1883 E
Xylochus spinifer Broun, 1893 E
Xylochus tibialis Broun, 1880 E
Xylochus triregius Watt, 1992 E TK
Zomedes borealis Watt, 1992 E TK
COELOMETOPINAE
COELOMETOPINI
Chrysopeplus expolitus (Broun, 1880) E
Chrysopeplus triregius Watt, 1992 E TK
DIAPERINAE A
DIAPERINI
Gnatocerus cornutus (Fabricius, 1798) A
GNATHIDIINI
Menimus batesi Sharp, 1876 E
Menimus borealis Watt, 1992 E
Menimus brouni Watt, 1992 E
Menimus caecus Sharp, 1876 E
Menimus crassus Sharp, 1876 E
Menimus crinalis Broun, 1880 E
Menimus crosbyi Watt, 1993 E
Menimus curtulus Broun, 1883 E
Menimus dubius Broun, 1880 E
Menimus elongatus Watt, 1992 E
Menimus helmorei Watt, 1992 E
Menimus laevicollis Broun, 1895 E
Menimus moehauensis Watt, 1992 E
Menimus oblongus Broun, 1880 E
Menimus obscurus Broun, 1880 E
Menimus pubiceps Broun, 1921 E
Menimus puncticeps Broun, 1880 E
Menimus sinuatus Broun, 1886 E
Menimus thoracicus Broun, 1880 E
PLATYDEMINI
Platydema sp. indet. A
LAGRIINAE
ADELIINI
Adelium brevicolle Blessig, 1861 A
Exadelium rufilabrum (Broun, 1886) E
Kaszabadelium aucklandicum (Broun, 1880) E
Mesopatrum granulosum Broun, 1893 E
Mitua triangularis Watt, 1992 E
Mitua tuberculicostata (White, 1846) E
Periatrum carinatum Watt, 1992 E
Periatrum edentatum Watt, 1992 E
Periatrum helmsi Sharp, 1886 E
Periatrum manapouricum Watt, 1992 E
Periatrum rotundatum Watt, 1992 E
Periatrum tumipes Broun, 1893 E
Pheloneis amaroides (Lacordaire, 1859) E
Pheloneis simulans (Redtenbacher, 1868) E
Pheloneis triregius Watt, 1992 E TK
Stenadelium striatum Watt, 1992 E
Wattadelium alienum (Broun, 1880) E
Wattadelium curtulum (Watt, 1992) E
Wattadelium pleurale Broun, 1893) E
Zeadelium aeratum (Broun, 1880) E
Zeadelium arthurense Watt, 1992 E
Zeadelium australe Watt, 1992 E
Zeadelium bullatum (Pascoe, 1876) E
Zeadelium chalmeri (Broun, 1883) E
Zeadelium complicatum (Broun, 1912) E
Zeadelium femorale (Broun, 1910) E
Zeadelium gratiosum (Broun, 1893) E
Zeadelium hanseni (Broun, 1885) E
Zeadelium hudsoni (Broun, 1908) E
Zeadelium indigator (Broun, 1886) E
Zeadelium intermedium (Sharp, 1886) E
Zeadelium intricatum (Broun, 1880) E
Zeadelium lentum (Broun, 1880) E
Zeadelium nigritulum (Broun, 1885) E
Zeadelium parvum Watt, 1992 E
Zeadelium senile Watt, 1992 E
Zeadelium simplex (Sharp, 1886) E
Zeadelium thoracicum (Broun, 1880) E
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CHAERODINI
Chaerodes laetus Broun, 1880 E
Chaerodes trachyscelides White, 1846 E
LUPROPINI
Lorelus crassicornis Broun, 1880 E
Lorelus kaszabi Watt, 1992 E
Lorelus laticornis Watt, 1992 E
Lorelus latulus Broun, 1910 E
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Lorelus obtusus Watt, 1992 E
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Lorelus politus Watt, 1992 E
Lorelus priscus Sharp, 1876 E
Lorelus pubescens Broun,1880 E
Lorelus punctatus Watt, 1992 E
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PHRENAPATINAE
Archaeoglenes costipennis Broun, 1893 E
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CNEMEPLATIINI
Actizeta albata Pascoe, 1875 E
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Hypaulax crenata (Boisduval, 1835) A Do
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ALPHITOBIINI
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Amarygmus watti Bremer, 2005 A
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Mimopeus buchanani (Broun, 1880) E
Mimopeus clarkei Watt, 1988 E
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Mimopeus elongatus (Brême, 1842) E
Mimopeus granulosus (Brême, 1842) E
Mimopeus humeralis (Bates, 1873) E
Mimopeus impressifrons (Bates, 1873) E
Mimopeus insularis Watt, 1988 E
Mimopeus johnsi Watt, 1988 E
Mimopeus lateralis (Broun, 1908) E
Mimopeus lewisianus (Sharp, 1903) E
Mimopeus neglectus Watt, 1988 E
Mimopeus opaculus (Bates, 1873) E
Mimopeus parallelus Watt, 1988 E
Mimopeus parvus Watt, 1988 E
Mimopeus pascoei (Bates, 1873) E Ch
Mimopeus rugosus (Bates, 1873) E
Mimopeus subcostatus (Sharp, 1903) E Ch
Mimopeus thoracicus (Bates, 1873) E
Mimopeus tibialis (Bates, 1873) E
Mimopeus turbotti Watt, 1988 E TK
Mimopeus vallis Watt, 1988 E
OPATRINI
Gonocephalum elderi (Blackburn, 1892) A
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Tenebrio molitor Linnaeus, 1758 A
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Artystona erichsoni (White, 1846) E
Artystona lata Watt, 1992 E
Artystona obscura Sharp, 1886 E
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Cerodolus arthurensis Watt, 1992 E
Cerodolus chrysomeloides Sharp, 1886 E
Cerodolus curvellus Broun, 1912 E
Cerodolus genialis Broun, 1893 E
Cerodolus manepouricus Watt, 1992 E
Cerodolus sinuatus Watt, 1992 E
Cerodolus tuberculatus Broun, 1917 E
Partystona metallica Watt, 1992 E TK
Pseudhelops antipodensis Watt, 1971 E Su
Pseudhelops capitalis (Broun, 1917) E
Pseudhelops chathamensis Watt, 1992 E Ch
Pseudhelops clandestinus Watt, 1971 E Su
Pseudhelops liberalis Watt, 1971 E Su
Pseudhelops posticalis Broun, 1909 E Su
Pseudhelops quadricollis Broun, 1909 E Su
Pseudhelops tuberculatus Guérin-Méneville, 1841 E Su
TRIBOLIINI
Tribolium castaneum (Herbst, 1797) A
Tribolium confusum Jacquelin du Val, 1868 A
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Aphtora rufipes Bates, 1872 E
Uloma sanguinipes (Fabricius, 1775) A Do
Uloma tenebrionoides (White, 1846) E
Ulomotypus laevigatus Broun, 1886 E
INCERTAE SEDIS (Tenebrioninae)
Demtrius carinulatus Broun, 1895 E
ZOLODININAE
Zolodinus zelandicus Blanchard, 1853 E
PROSTOMIDAE
Dryocora howitti Pascoe, 1868 E
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NACERDINI
Nacerdes melanura (Linnaeus, 1758) A
OEDEMERINAE
Baculipalpus clarencensis Hudson, 1975 E
Baculipalpus mollis (Broun, 1886) E
Baculipalpus oconnori Hudson, 1975 E
Baculipalpus prolatus Hudson, 1975 E
Baculipalpus rarus Broun, 1880 E
Baculipalpus strigipennis (White, 1846) E
Parisopalpus macleayi (Champion, 1895) A
Parisopalpus nigronotatus (Boheman, 1858) A
Parisopalpus thoracicus (Broun, 1893) E
Koniaphassa obscura (Broun, 1880) E
Selenopalpus aciphyllae Broun, 1886 E
Selenopalpus cyaneus (Fabricius, 1775) E
Selenopalpus rectipes Broun, 1909 E
Thelyphassa brouni Hudson, 1975 E
Thelyphassa chrysophana Hudson, 1975 E
Thelyphassa diaphana Pascoe, 1876 E
Thelyphassa latiuscula (Broun, 1880) E
Thelyphassa lineata (Fabricius, 1775) E
Thelyphassa nemoralis Broun, 1886 E
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Exocalopus pectinatus Broun, 1893 E
Techmessa concolor Bates, 1874 E
Techmessa longicollis Broun, 1903 E
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Techmessodes picticornis (Broun, 1880) E
Techmessodes versicolor Broun, 1893 E
Pyrochroidae gen. et spp. indet. (3) 3E
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AEGIALITINAE
Antarcticodomus fallai Brookes, 1951 E Su
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Diagrypnodes wakefieldi Waterhouse, 1876 E
SALPINGINAE
Salpingus angusticollis Broun, 1880 E

Salpingus aterrimus Broun, 1921 E
Salpingus atrellus Broun, 1914 E
Salpingus bilunatus Pascoe, 1876 E
Salpingus cognatus Broun, 1910 E
Salpingus denticollis Broun, 1914 E
Salpingus fossulatus Broun, 1893 E
Salpingus hirtus Broun, 1883 E
Salpingus hudsoni Blair, 1925 E
Salpingus laticollis Blair, 1925 E
Salpingus lautus Broun, 1880 E
Salpingus lepidulus Broun, 1910 E
Salpingus nigricans Broun, 1921 E
Salpingus ornatus Broun, 1895 E
Salpingus pallidipes Blair, 1925 E
Salpingus perpunctatus Broun, 1880 E
Salpingus quisquilius Broun, 1883 E
Salpingus rugulosus Broun, 1910 E
Salpingus semilaevis Broun, 1914 E
Salpingus simplex Broun, 1883 E
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Salpingus tarsalis Broun, 1910 E
Salpingus testaceus Blair, 1925 E
Salpingus unguiculus Broun, 1880 E
Salpingus sp. n. E
Vincenzellus (= *Trichoocolposinus*) sp. indet. E?
ANTHICIDAE
ANTHICINAE
ANTHICINI
Anthicus (*Anthicus*) *hesperi* King, 1869 A
Anthicus (*A.*) *kreusleri* King, 1869 A
Floydwernerius gushi (Werner & Chandler, 1995) A
Floydwernerius troilus (Hinton, 1945) A
Omonadus floralis (Linnaeus, 1758) A
Omonadus formicarius (Goeze, 1777) A
Pseudocyclodinus glaber (King, 1869) A
Pseudocyclodinus minor (Broun, 1886) E
Pseudocyclodinus otagensis (Werner & Chandler, 1995) E
Sapintus argenteofasciatus Telnov, 2003 A
Sapintus aucklandensis Werner & Chandler, 1995 E
Sapintus deitzi Werner & Chandler, 1995 E
Sapintus obscuricornis (Broun, 1880) E
Sapintus pellucidipes (Broun, 1880) E
Stricticollis tobias (Marseul, 1879) A
LEMODINAE
Cotes bullata Broun, 1923 E
Cotes crispi (Broun, 1880) E
Cotes gourlayi Werner & Chandler, 1995 E
Cotes halliana Broun, 1923 E
Cotes optima Broun, 1893 E
Cotes proba Broun, 1881 E
Cotes rufa Broun, 1893 E
Cotes vestita Sharp, 1877 E
Trichananca fulgida Werner & Chandler, 1995 A?
Trichananca spp. indet. (2) 2A
Zealanthicus sulcatus Werner & Chandler, 1995 E
MACRATRIINAE
Macratria aotearoa Werner & Chandler, 1995 E
Macratria exilis Pascoe, 1877 E
ADERIDAE
Scraptogetus anthracinus Broun, 1893 E
Scraptogetus arboreus (Broun, 1914) E
Xylophilus antennalis Broun, 1893 E
Xylophilus brouni (Pic, 1901) E
Xylophilus coloratus Broun, 1893 E
Xylophilus luniger Champion, 1916 E
Xylophilus nitidus Broun, 1893 E
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Xylophilus xenarthrus Broun, 1910 E
Xylophilus n. spp. (4) 4E
SCRAPTIIDAE
SCRAPTIINAE
SCRAPTIINI
Nothotelus nigellus (Broun, 1880) E
Nothotelus ocularius Broun, 1914 E
Nothotelus usitatus (Broun, 1880) E
Nothotelus n. sp. E
Phytilea propera Broun, 1893 E
Phytilea n. sp. E
Scraptia sp. indet. A
TENEBRIONOIDEA
LAGRIOIDINAE (INCERTAE SEDIS)
Lagrioida brouni Pascoe, 1876 E
INCERTAE SEDIS
Rhizonium antiquum Sharp, 1876 E
CHRYSOMELOIDEA
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CERAMBYCINAE
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Gnomodes piceus Broun, 1893 E
Zorion angustifasciatum Schnitzler, 2005 E
Zorion australe Schnitzler, 2005 E
Zorion batesi Sharp, 1875 E
Zorion dugdalei Schnitzler, 2005 E
Zorion guttigerum (Westwood, 1845) E
Zorion kaikouraiensis Schnitzler, 2005 E
Zorion minutum (Fabricius, 1775) E
Zorion nonmaculatum Schnitzler, 2005 E
Zorion opacum Sharp, 1903 E
Zorion taranakiensis Schnitzler, 2005 E
CALLIDIOPINI
Bethelium signiferum (Newman, 1840) A
Callidiopis scutellaris (Fabricius, 1801) A
Didymocantha flavopicta Mckeown, 1948 E
Didymocantha obliqua Newman, 1840 A
Didymocantha quadriguttata Sharp, 1886 E
Didymocantha sublineata White, 1846 E
Oemona hirta (Fabricius, 1775) E
Oemona plicicollis Sharp, 1886 E
Oemona separata (Broun, 1921) E
Oemona simplicicollis (Broun, 1880) E
COPTOMMATINI
Coptomma lineatum (Fabricius, 1775) E
Coptomma marrisi Song & Wang, 2003 E
Coptomma sticticum (Broun, 1893) E
Coptomma sulcatum (Fabricius, 1775) E
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ELAPHIDIINI
Coptocercus rubripes (Boisduval, 1835) A
Epithora dorsalis (MacLeay, 1827) A
Liogramma zelandica (Blanchard, 1853) E
HESPEROPHANINI
Xuthodes batesi Sharp, 1877 E
Xuthodes punctipennis Pascoe, 1875 E
HETEROPSINI
Aridaeus thoracicus (Donovan, 1805) A
MOLORCHINI
Anencyrus discedens Sharp, 1886 E
Gastrosarus lautus Broun, 1893 E
Gastrosarus nigricollis Bates, 1874 E
Gastrosarus picticornis Broun, 1893 E
Gastrosarus urbanus Broun, 1893 E
Gastrosarus n. sp. E
PHLYCTAENODINI
Agapanthida morosa (Sharp, 1886) E
Agapanthida pulchella White, 1846 E
Ambeodontus tristis (Fabricius, 1775) E
Astetholea aubreyi Broun, 1880 E
Astetholea lepturoides Bates, 1876 E
Astetholea pauper Bates, 1874 E
Astetholida lucida Broun, 1880 E
Ophryops aegrotus (Bates, 1876) E
Ophryops dispar Sharp, 1886 E
Ophryops fuscicollis (Broun, 1913) E
Ophryops medius (Broun, 1913) E
Ophryops pallidus White, 1846 E
Ophryops pseudofuscicollis Lu & Wang, 2005 E
Pseudosemnus retifer (Lacordaire, 1869) E
Votum mundum Broun, 1880 E
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Phoracantha semipunctata (Fabricius, 1775) A
PYTHEINI
Brounopsis hudsoni Blair, 1937 E
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Cacodrotus bifasciatus Broun, 1893 E
Calliprason costifer (Broun, 1886) E
Calliprason elegans (Sharp, 1877) E
Calliprason marginatum White, 1846 E
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Calliprason sinclairii White, 1843 E
Drototelus elegans (Brookes, 1927) E
Drototelus politus Broun, 1903 E
Drototelus rarus Wang and Lu, 2004 E
Eburilla sericea (White, 1855) E
TESSAROMMATINI
Tessaromma undatum Newman, 1840 A
TRIBUS INCERTAE SEDIS
Leptachrous strigipennis (Westwood, 1845) E
Nesoptychias simpliceps (Broun, 1880) E
Ochrocydus huttoni Pascoe, 1876 E
LAMIINAE
ACANTHOCINI
Mesolamia aerata Broun, 1893 E
Mesolamia marmorata Sharp, 1882 E
Metalamia cuprea Breuning, 1940 E
Metalamia obtusipennis (Bates, 1876) E
Microlamia elongata Breuning, 1940 E
Microlamia pygmaea Bates, 1874 E
Polyacanthia flavipes (White, 1846) E
Psilocnaeia aegrota (Bates, 1874) E
Psilocnaeia asteliae Kuschel, 1990 E
Psilocnaeia brouni Bates, 1876 E
Psilocnaeia bullata (Bates, 1876) E
Psilocnaeia linearis Bates, 1874 E
Psilocnaeia nana (Bates, 1874) E
Psilocnaeia parvula (White, 1846) E
Spilotrogia elongata (Broun, 1883) E
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Spilotrogia hilarula Broun, 1880 E
Spilotrogia maculata Bates, 1874 E
Spilotrogia pictula (Bates, 1876) E
Spilotrogia pulchella (Bates, 1874) E
Stenellipsis bimaculata (White, 1846) E
Stenellipsis cuneata Sharp, 1886 E
Stenellipsis gracilis (White, 1846) E
Stenellipsis grata (Broun, 1880) E
Stenellipsis latipennis Bates, 1874 E
Stenellipsis longula Breuning, 1940 E
Stenellipsis sculpturata (Broun, 1915) E
Tetrorea cilipes White, 1846 E
Tetrorea discedens Sharp, 1882 E
Tetrorea longipennis Sharp, 1886 E
Tetrorea sellata Sharp, 1882 E
Tetrorea variegata (Broun, 1880) E
PARMENINI
Adriopea pallidata Broun, 1910 E
Hexatricha pulverulenta (Westwood, 1845) E
Nodulosoma angustum (Broun, 1880) E
Nodulosoma flavidorsis (Broun, 1914) E
Nodulosoma halli (Broun, 1914) E
Nodulosoma helmsi (Sharp, 1882) E
Nodulosoma laevinotatum (Broun, 1914) E
Nodulosoma laevior (Broun, 1893) E
Nodulosoma laevithorax (Breuning, 1940) E
Nodulosoma maculatum (Broun, 1921) E
Nodulosoma picticornis (Broun, 1895) E
Nodulosoma pinguis (Broun, 1913) E
Nodulosoma posticalis (Broun, 1913) E
Nodulosoma rufescens (Breuning, 1940) E
Nodulosoma spectabilis (Broun, 1914) E
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Nodulosoma testaceum (Broun, 1909) E
Ptinosoma ampliatum (Breuning, 1940) E
Ptinosoma convexum (Broun, 1893) E
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Ptinosoma lineiferum (Broun, 1909) E
Ptinosoma ptinoides (Bates, 1874) E
Ptinosoma spinicollis (Broun, 1893) E
Ptinosoma waitei (Broun, 1911) E
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Somatidia antarctica (White, 1846) E
Somatidia grandis Broun, 1893 E
Somatidia longipes Sharp, 1878 E
Somatidia simplex Broun, 1893 E
Tenebrosoma albicoma (Broun, 1893) E
Tenebrosoma corticola (Broun, 1913) E
Tenebrosoma crassipes (Broun, 1883) E
Tenebrosoma diversa (Broun, 1880) E
Tenebrosoma nitida (Broun, 1880) E
Tenebrosoma parvula (Broun, 1914) E
Tenebrosoma pictipes (Broun, 1880) E
Tenebrosoma tenebrica (Broun, 1893) E
Tenebrosoma terrestre (Broun, 1880) E
Tenebrosoma testudo (Broun, 1904) E
Xylotoles (*Trichoxylotoles*) *apicalis* (Broun, 1923) E
Xylotoles (*T.*) *phormiobius* Broun, 1893 E
Xylotoles (*Xylotoles*) *costatus* Pascoe, 1875 E
Xylotoles (*X.*) *costipennis* (Breuning, 1982) E
Xylotoles (*X.*) *griseus* (Fabricius, 1775) E
Xylotoles (*X.*) *humeratus* Bates, 1874 E
Xylotoles (*X.*) *inornatus* Broun, 1880 E
Xylotoles (*X.*) *laetus* White, 1846 E
Xylotoles (*X.*) *lynceus* (Fabricius, 1775) E
Xylotoles (*X.*) *nanus* Bates, 1874 E
Xylotoles (*X.*) *nudus* Bates, 1874 E
Xylotoles (*X.*) *rugicollis* Bates, 1874 E
Xylotoles (*X.*) *sandageri* Broun, 1886 E
Xylotoles (*X.*) *scissicauda* Bates, 1874 E
Xylotoles (*X.*) *traversii* Pascoe, 1876 E Ch
Xylotoloides huttoni (Sharp, 1882) E
POGONOCHERINI
Hybolasiopsis trigonellaris (Hutton, 1898) E
Hybolasius castaneus Broun, 1893 E
Hybolasius cristatellus Bates, 1876 E
Hybolasius cristus (Fabricius, 1775) E
Hybolasius dubius Broun, 1893 E
Hybolasius femoralis Broun, 1893 E
Hybolasius lanipes Sharp, 1877 E
Hybolasius modestus Broun, 1880 E
Hybolasius optatus Broun, 1893 E
Hybolasius parvus Broun, 1880 E
Hybolasius pedator Bates, 1876 E
Hybolasius picitarsis Broun, 1883 E
Hybolasius postfasciatus Breuning, 1940 E
Hybolasius promissus Broun, 1880 E
Hybolasius pumilus Pascoe, 1876 E
Hybolasius vegetus Broun, 1881 E
Hybolasius viridescens Bates, 1874 E
Hybolasius wakefieldi Bates, 1876 E
Hybolasius n. sp. E Ch
Poecilippe femoralis Sharp, 1886 E
Poecilippe medialis Sharp, 1886 E
Poecilippe simplex Bates, 1874 E
Poecilippe stictica Bates, 1874 E
Sphinohybolasius spinicollis Breuning, 1959 E
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LEPTURINI
Blosyropus spinosus Redtenbacher, 1868 E
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Prionoplus reticularis White, 1843 E
SPHONDYLIDINAE
ASEMINI
Arhopalus ferus (Mulsant, 1839) A
CHRYSOMELIDAE
ALTICINAE
Agasicles hygrophila Selman & Vogt, 1971 A BC
Alema paradoxa Sharp, 1876 E
Alema spatiosa Broun, 1880 E
Altica carduorum (Guérin-Méneville, 1858) A BC
Chaetocnema (*Chaetocnema*) *paspalae* (Broun, 1923) E
Chaetocnema (*Tlanoma*) *aotearoa* Samuelson, 1973 E
Chaetocnema (*T.*) *graminicola* (Broun, 1893) E
Chaetocnema (*T.*) *littoralis* (Broun, 1893) E
Chaetocnema (*T.*) *moriori* Samuelson, 1973 E Ch
Chaetocnema (*T.*) *nitida* (Broun, 1880) E
Longitarsus fuliginosus (Broun, 1880) E
Longitarsus jacobaeae (Waterhouse, 1858) A BC
Phyllotreta undulata (Kutschera, 1860) A
Pleuraltica cyanea (Broun, 1880) E
Psylliodes brettinghami Baly, 1862 A
Trachytetra robusta Broun, 1923 E
Trachytetra rugulosa (Broun, 1880) E
BRUCHINAE A
ACANTHOSCELIDINI
Acanthoscelides obtectus (Say, 1931) A
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Bruchidius villosus (Fabricius, 1792) A BC
Callosobruchus maculatus (Fabricius, 1775) A Do
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Bruchus pisorum (Linnaeus, 1758) A Do
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Lema cyanella (Linnaeus, 1758) A BC
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S. LUPERINA
Adoxia aenea Broun, 1880 E
Adoxia aenescens (Sharp, 1886) E
Adoxia angularia (Broun, 1909) E
Adoxia anthracina (Broun, 1914) E
Adoxia asperella (Broun, 1909) E
Adoxia atripennis (Broun, 1913) E
Adoxia attenuata Broun, 1880 E
Adoxia aurella (Broun, 1914) E
Adoxia axyrocharis (Broun, 1909) E
Adoxia brevicollis (Broun, 1893) E
Adoxia bullata (Broun, 1914) E
Adoxia calcarata (Broun, 1893) E
Adoxia cheesemani (Broun, 1910) E
Adoxia cyanescens (Broun, 1917) E
Adoxia dilatata (Broun, 1914) E
Adoxia dilucida (Broun, 1917) E
Adoxia dilutipes (Broun, 1915) E
Adoxia discrepans (Broun, 1914) E
Adoxia diversa (Broun, 1910) E
Adoxia foveigera (Broun, 1913) E
Adoxia fuscata (Broun, 1893) E
Adoxia fuscifrons (Broun, 1910) E
Adoxia gracilipes (Broun, 1917) E
Adoxia halli (Broun, 1917) E
Adoxia insolita (Broun, 1914) E
Adoxia iridescens (Broun, 1914) E
Adoxia lewisi (Broun, 1909) E
Adoxia mediocris (Broun, 1917) E
Adoxia minor (Broun, 1917) E
Adoxia mollis (Broun, 1893) E
Adoxia monticola (Broun, 1893) E
Adoxia nigricans Broun, 1880 E
Adoxia nigricornis (Sharp, 1886) E
Adoxia nitidicollis Broun, 1880 E
Adoxia nodicollis (Broun, 1915) E
Adoxia obscura (Broun, 1910) E
Adoxia oconnori (Broun, 1913) E
Adoxia oleareae (Broun, 1893) E
Adoxia palialis (Broun, 1909) E
Adoxia perplexa (Broun, 1917) E
Adoxia princeps (Broun, 1893) E
Adoxia proletaria (Weise, 1924) E
Adoxia pubicollis (Broun, 1915) E
Adoxia puncticollis (Sharp, 1886) E
Adoxia quadricollis (Broun, 1917) E
Adoxia rectipes (Broun, 1893) E
Adoxia rugicollis (Broun, 1893) E
Adoxia scutellaris (Broun, 1909) E
Adoxia simmondsi (Broun, 1913) E
Adoxia sordidula (Weise, 1924) E
Adoxia sulcifera (Broun, 1893) E
Adoxia truncata (Broun, 1893) E
Adoxia vestitus (Weise, 1924) E
Adoxia vilis (Weise, 1924) E
Adoxia viridis Broun, 1880 E
Adoxia vulgaris Broun, 1880 E
Adoxia xenoscelis (Broun, 1917) E
Allastena eminens Broun, 1917 E
Allastena nitida Broun, 1893 E
Allastena piliventris Broun, 1915 E
Allastena quadrata Broun, 1893 E
Bryobates aeratus Broun, 1914 E
Bryobates coniformis Broun, 1886 E
Bryobates nigricans Broun, 1914 E
Bryobates rugidorsis Broun, 1917 E
Lochmaea suturalis Thomson, 1866 A BC
CRYPTOCEPHALINAE
CRYPTOCEPHALINI
Aporocera melanocephala Saunders, 1843 A
Diachus auratus (Fabricius, 1801) A
Ditropidus compactus (Sharp, 1881) E?
STYLOSOMINI
Arnomus brouni Sharp, 1876 E
Arnomus curtipes Broun, 1893 E
Arnomus fulvus Broun, 1915 E
Arnomus marginalis Broun, 1893 E
Arnomus signatus Broun, 1909 E
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Arnomus viridicollis Broun, 1909 E
EUMOLPINAE
Atrichatus aeneicollis Broun, 1895 E
Atrichatus ochraceus (Broun, 1880) E
Eucolaspis antennata Shaw, 1957 E
Eucolaspis brunnea (Fabricius, 1792) E
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Eucolaspis jucunda (Broun, 1880) E
Eucolaspis pallidipennis (White, 1846) E
Eucolaspis picticornis Broun, 1893 E
Peniticus antiquus Sharp, 1876 E
Peniticus plicatus Broun, 1921 E
Peniticus robustus Broun, 1880 E
Peniticus suffusus Sharp, 1876 E
Peniticus wallacei Broun, 1910 E
Pilacolaspis angulatus Broun, 1913 E
Pilacolaspis huttoni (Broun, 1880) E
Pilacolaspis latipennis Broun, 1913 E
Pilacolaspis rugiventris Broun, 1914 E
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CHRYSOMELINAE
CHRYSOMELINI
S. CHRYSOLININA
Chrysolina hyperici (Förster, 1771) A BC
Chrysolina quadrigemina (Suffrian, 1851) A BC
S. DICRANOSTERNINA
Dicranosterna semipunctata (Chapuis, 1877) A
S. GONIOCTENINA
Gonioctena (*Spartophila*) *olivacea* (Förster, 1771) A BC
S. PAROPSINA
Paropsis charybdis Stål, 1860 A
Peltoschema suturalis Germar, 1848 A Do [eradicated]
Trachymela catenata (Chapuis, 1877) A
Trachymela sloanei (Blackburn, 1896) A
S. PHYLLOCHARINA
Allocharis fuscipes Broun, 1917 E
Allocharis limbata Broun, 1893 E
Allocharis marginata Sharp, 1882 E
Allocharis media Broun, 1917 E
Allocharis morosa Broun, 1893 E
Allocharis nigricollis Broun, 1917 E
Allocharis picticornis Broun, 1917 E
Allocharis praestans Broun, 1917 E

Allocharis robusta Broun, 1917 E
Allocharis subsulcata Broun, 1917 E
Aphilon convexum Broun, 1893 E
Aphilon enigma Sharp, 1876 E
Aphilon impressum Broun, 1914 E
Aphilon laticolle Broun, 1893 E
Aphilon latulum Broun, 1893 E
Aphilon minutum Broun, 1880 E
Aphilon monstrosum Broun,1886 E
Aphilon praestans Broun, 1893 E
Aphilon pretiosum Broun, 1880 E
Aphilon punctatum Broun, 1880 E
Aphilon scutellare Broun, 1893 E
Aphilon sobrinum Broun,1886 E
Aphilon sternale Broun, 1921 E
Aphilon n. sp. E
Caccomolpus amplus Broun, 1921 E
Caccomolpus cinctiger Broun, 1921 E
Caccomolpus flectipes Broun, 1914 E
Caccomolpus fuscicornis Broun, 1917 E
Caccomolpus globosus Sharp, 1886 E
Caccomolpus hallianus Broun, 1917 E
Caccomolpus maculatus Broun, 1893 E
Caccomolpus montanus Broun, 1921 E
Caccomolpus nigristernis Broun, 1917 E
Caccomolpus ornatus Broun, 1910 E
Caccomolpus plagiatus Sharp, 1886 E
Caccomolpus pullatus Broun, 1893 E
Caccomolpus subcupreus Broun, 1921 E
Caccomolpus substriatus Broun, 1917 E
Caccomolpus tibialis Broun, 1917 E
Caccomolpus viridescens Broun, 1917 E
Chalcolampra (*Eualema*) *speculifera* Sharp, 1882 E
Cyrtonogetus crassus Broun, 1915 E
CASSIDINAE
CASSIDINI
S. CASSIDINA
Cassida rubiginosa Müller, 1776 A BC
CURCULIONOIDEA
RHYNCHOPHORA
NEMONYCHIDAE
RHINORHYNCHINAE
Rhinorhynchus halli Kuschel, 2003 E
Rhinorhynchus halocarpi Kuschel, 2003 E
Rhinorhynchus phyllocladi Kuschel, 2003 E
Rhinorhynchus rufulus (Broun, 1880) E
ANTHRIBIDAE
ANTHRIBINAE
CORRHECERINI
Cacephatus aucklandicus (Brookes, 1951) E Su
Cacephatus huttoni (Sharp, 1876) E
Cacephatus incertus (White, 1846) E
Cacephatus inornatus (Sharp, 1886) E
Cacephatus propinquus (Broun, 1911) E Ch
Cacephatus vates (Sharp, 1876) E
Etnalis obtusus (Sharp, 1886) E
Etnalis spinicollis Sharp, 1873 E
PLATYSTOMINI
Arecopais spectabilis (Broun, 1880) E
Euciodes suturalis Pascoe, 1866 A
Lawsonia variabilis Sharp, 1873 E
STENOCERINI
Helmoreus sharpi (Broun, 1880) E
TRIBUS INCERTAE SEDIS
Androporus discedens (Sharp, 1876) E
Caliobius littoralis Holloway, 1982 E
Cerius otagensis Holloway, 1982 E
Cerius triregius Holloway, 1982 E TK
Dasyanthribus purpureus (Broun, 1880) E
Eugonissus conulus (Broun, 1880) E
Garyus altus (Sharp, 1876) E
Gynarchaeus ornatus (Sharp, 1876) E
Hoherius meinertzhageni (Broun, 1880) E
Hoplorhaphus nodifer Holloway, 1982 E
Hoplorhaphus spinifer (Sharp, 1876) E
Isanthribus dracophylli Holloway, 1982 E
Isanthribus phormii Holloway, 1982 E
Isanthribus proximus (Broun, 1880) E
Lichenobius littoralis Holloway, 1970 E
Lichenobius maritimus Holloway, 1982 E Su
Lichenobius silvicola Holloway, 1970 E Ch
Lophus cristatellus (Broun, 1911) E Ch
Lophus lewisi (Broun, 1909) E
Lophus rudis (Sharp, 1876) E
Phymatus cucullatus (Sharp, 1886) E
Phymatus hetaera (Sharp, 1876) E
Phymatus phymatodes (Redtenbacher, 1868) E
Pleosporius bullatus (Sharp, 1876) E
Sharpius brouni (Sharp, 1876) E
Sharpius chathamensis Holloway, 1982 E Ch
Sharpius imitarius (Broun, 1914) E
Sharpius sandageri (Broun, 1893) E
Sharpius venustus (Broun, 1914) E
Tribasileus noctivagus Holloway, 1982 E
Xenanthribus hirsutus Broun 1893 E
CHORAGINAE A
ARAECERINI
Araecerus fasciculatus (De Geer, 1775) A
Araecerus palmaris (Pascoe, 1882) A
Araeocerodes sp. A
Xanthoderopygus sp. A
TRIBUS INCERTAE SEDIS
Dysnocryptus balthasar Holloway, 1982 E TK
Dysnocryptus dignus (Broun, 1880) E
Dysnocryptus gaspar Holloway, 1982 E TK
Dysnocryptus inflatus (Sharp, 1876) E
Dysnocryptus maculifer Broun, 1893 E
Dysnocryptus melchior Holloway, 1982 E TK
Dysnocryptus pallidus Broun, 1893 E
Dysnocryptus pilicornis (Broun, 1911) E Ch
Dysnocryptus rugosus (Sharp, 1876) E
Liromus pardalis (Pascoe, 1876) E
Micranthribus atomus (Sharp, 1876) E
Notochoragus chathamensis Holloway, 1982 E Ch
Notochoragus crassus (Sharp, 1876) E
Notochoragus fungicola (Broun, 1893) E
Notochoragus nanus (Sharp, 1876) E
Notochoragus thoracicus (Broun, 1893) E
BELIDAE
PACHYURINAE
AGNESIOTIDINI
Agathinus tridens (Fabricius, 1787) E
PACHYURINI
Pachyurinus sticticus (Broun, 1893) E
Rhicnobelus aenescens (Broun, 1915) E
Rhicnobelus metallicus (Pascoe, 1877) E
Rhicnobelus rubicundus (Broun, 1880) E
OXYCORYNIDAE
AGLYCYDERINAE
Aralius wollastoni (Sharp, 1876) E
BRENTIDAE
TRACHELIZINAE
ITHYSTENINI
Lasiorhynchus barbicornis (Fabricius, 1775) E
APIONIDAE
APIONINAE
EXAPIINI
Exapion (*Ulapion*) *ulicis* (Forster, 1771) A BC
RHADINOCYBINI
Cecidophyus nothofagi Kuschel, 2003 E
Neocyba metrosideros (Broun, 1880) E
Neocyba regalis Kuschel, 2003 E TK
Strobilobius libocedri Kuschel, 2003 E
Zelapterus terricola (Broun, 1923) E
DRYOPHTHORIDAE A
DRYOPHTHORINAE A
Dryophthorus sp. indet. A
RHYNCHOPHORINAE A
LITOSOMINI
Sitophilus granarius (Linnaeus, 1758) A
Sitophilus oryzae (Linnaeus, 1763) A
Sitophilus zeamais Motschulsky, 1855 A
SPHENOPHORINI
Sphenophorus brunnipennis (Germar, 1824) A
ERIRHINIDAE
ERIRHININAE
ERIRHININI
Colabotelus dealbatus Broun, 1914 E
Praolepra albopicta Broun, 1881 E
Praolepra asperirostris Broun, 1881 E
Praolepra fultoni Broun, 1886 E
Praolepra infusca Broun, 1880 E
Praolepra pallida Broun, 1881 E
Praolepra rufescens Broun, 1881 E
Praolepra squamosa Broun, 1880 E
Praolepra uniformis Marshall, 1938 E
Praolepra varia Broun, 1881 E
STENOPELMINI
Athor arcifera Broun, 1909 E
Baeosomus alternans (Broun, 1914) E
Baeosomus amplus (Broun, 1915) E
Baeosomus angustus (Broun, 1923) E
Baeosomus burrowsi (Broun, 1915) E
Baeosomus crassipes (Broun, 1923) E
Baeosomus crassirostris (Broun, 1921) E
Baeosomus diversus (Broun, 1923) E
Baeosomus elegans (Broun, 1921) E
Baeosomus fordi (Broun, 1923) E
Baeosomus humeratus (Broun, 1921) E
Baeosomus iridescens (Broun, 1921) E
Baeosomus jugosus (Broun, 1914) E
Baeosomus lugubris (Broun, 1921) E
Baeosomus nigrirostris (Broun, 1914) E
Baeosomus niticollis (Broun, 1921) E
Baeosomus nodicollis (Broun, 1914) E
Baeosomus ovipennis (Broun, 1923) E
Baeosomus plicatus (Broun, 1923) E
Baeosomus polytrichi (Kuschel, 1990) E
Baeosomus quadricollis (Broun, 1921) E
Baeosomus rubidus (Broun, 1921) E
Baeosomus rugosus (Broun, 1921) E
Baeosomus scapularis (Marshall, 1937) E
Baeosomus serripes Kuschel, 1964 E Su
Baeosomus tacitus Broun, 1904 E
Baeosomus thoracicus (Broun, 1923) E
TRIBUS INCERTAE SEDIS
Aganeuma rufula Broun, 1893 E
Euprocas scitulus Broun, 1893 E
Philacta maculifera Broun, 1904 E
Philacta testacea Broun, 1880 E
Stilbopsis polita Broun, 1893 E
RAYMONDIONYMIDAE
MYRTONYMINAE
MYRTONYMINI
Myrtonymus zelandicus Kuschel, 1990 E
CURCULIONIDAE
BARIDINAE A
MADOPTERINI
S. ZYGOBARIDINA
Linogeraeus urbanus (Boheman, 1859) A
CEUTORHYNCHINAE A
CEUTORHYNCHINI
Trichosirocalus mortadelo Alonso-Zarazaga & Sánchez-Ruiz, 2002 A
HYPURINI
Hypurus bertrandi (Perris, 1852) A BC
PHYTOBIINI
Rhinoncus australis Oke, 1931 A BC
COSSONINAE
ARAUCARIINI
Inosomus rufopiceus (Broun, 1881) E
Xenocnema spinipes Wollaston, 1873 E
COSSONINI
Exomesites optimus Broun, 1886 E
Exomesites n. sp. E

Mesites pallidipennis Boheman, 1838 A
Phloeophagosoma (*Amorphorhynchus*) *brouni* Kuschel, 1982 E
Phloeophagosoma (*A.*) *corvinum* Wollaston, 1873 E
Phloeophagosoma (*Phloeophagosoma*) *abdominale* Broun, 1881 E
Phloeophagosoma (*P.*) *dilutum* Wollaston, 1874 E
Phloeophagosoma (*P.*) *pedatum* Wollaston, 1874 E
Phloeophagosoma (*P.*) *rugipenne* Broun, 1881 E
Phloeophagosoma (*P.*) *thoracicum* Wollaston, 1874 E
Stenotrupis debilis (Sharp, 1878) E
Stenotrupis wollastonianum (Sharp, 1878) E
DRYOTRIBINI
Allaorus carinifer Broun, 1921 E
Allaorus impressus Broun, 1917 E
Allaorus ovatus Broun, 1893 E
Allaorus pedatus Broun, 1893 E
Allaorus piciclavus Broun, 1909 E
Allaorus pyriformis (Broun, 1893) E
Allaorus rugosus (Broun, 1893) E
Allaorus scutellaris Broun, 1914 E
Allaorus sternalis Broun, 1893 E
Allaorus urquharti Broun, 1893 E
Allaorus versutus (Broun, 1880) E
Catolethrobius silvestris (Kolbe, 1910) A
Eiratus costatus Broun, 1886 E
Eiratus nitirostris Broun, 1910 E
Eiratus ornatus Broun, 1886 E
Eiratus parvulus Pascoe, 1877 E
Eiratus setulifer (Marshall, 1953) E
Eiratus suavis Broun, 1886 E
Eiratus tetricus Broun, 1880 E
Microtribus brouni (Wollaston, 1874) E
Microtribus huttoni Wollaston, 1873 E
Microtribus sculpturatus Broun, 1910 E
Microtribus sp. n. E
Stilbocara constricticollis (Broun, 1880) E
Stilbocara nitida Broun, 1893 E
Stilbocara serena Broun, 1893 E
Stilboderma impressipennis Broun, 1909 E
ONYCHOLIPINI
Pselactus ferrugineus Broun, 1909 E
Pselactus spadix (Herbst, 1795) A
Stenoscelis hylastoides Wollaston, 1861 A
PENTARTHRINI
Adel crenatum (Broun, 1883) E
Agastegnus aeneopiceus (Broun, 1880) E
Agastegnus coloratus Broun, 1886 E
Agastegnus concinnus Broun, 1914 E
Agastegnus distinctus Broun, 1893 E
Agastegnus femoralis Broun, 1886 E
Agastegnus ornatus Broun, 1911 E
Agastegnus rarus (Broun, 1886) E
Agastegnus rufescens Broun, 1907 E
Agastegnus rugipennis Broun, 1914 E
Agastegnus simulans (Sharp, 1878) E
Agastegnus thoracicus Broun, 1914 E
Agrilochilus prolixus Broun, 1880 E
Arecocryptus bellus (Broun, 1880) E
Camptoscapus planiusculus (Broun, 1880) E
Entium aberrans Sharp, 1878 E
Eucossonus antennalis Broun, 1910 E
Eucossonus comptus Broun, 1886 E
Eucossonus constrictus Broun, 1921 E
Eucossonus discalis Broun, 1910 E
Eucossonus disparilis Broun, 1921 E
Eucossonus elegans Broun, 1893 E
Eucossonus gracilis Broun, 1893 E
Eucossonus nasalis Broun, 1921 E
Eucossonus orneobius Broun, 1921 E
Eucossonus rostralis Broun, 1909 E
Eucossonus setiger (Sharp, 1878) E
Eucossonus sulcicollis Broun, 1921 E
Euophryum confine (Broun, 1881) E
Euophryum rufum (Broun, 1880) E
Macroscytalus cheesemani (Broun, 1893) E
Macroscytalus confertus (Sharp, 1886) E
Macroscytalus constrictus (Sharp, 1886) E
Macroscytalus elongatus (Broun, 1909) E
Macroscytalus fusiformis (Broun, 1914) E
Macroscytalus glabrus (Broun, 1881) E
Macroscytalus gracilis (Broun, 1909) E
Macroscytalus halli (Broun, 1914) E
Macroscytalus lewisi (Broun, 1909) E
Macroscytalus parvicornis (Sharp, 1878) E
Macroscytalus remotus (Sharp, 1878) E
Macroscytalus sagax Broun, 1886 E
Morronella latirostris (Marshall, 1926) E
Morronella lawsoni (Wollaston, 1873) E
Morronella n. sp. 1 E
Novitas dispar Broun, 1893 E
Novitas nigrans Broun, 1880 E
Novitas rufus Broun, 1880 E
Pentarthrum amicum Broun, 1893 E
Pentarthrum assimilatum Broun, 1880 E
Pentarthrum auricomus Broun, 1881 E
Pentarthrum auripilum Broun, 1911 E Ch
Pentarthrum brevicorne Broun, 1915 E
Pentarthrum brunneum Broun, 1880 E
Pentarthrum carmichaeli Waterhouse, 1884 A
Pentarthrum castum Broun, 1881 E
Pentarthrum dissimile Broun, 1911 E Ch
Pentarthrum ferrugineum Broun, 1883 E
Pentarthrum fultoni Broun, 1893 E
Pentarthrum gracilicorne Broun, 1910 E
Pentarthrum impressum Broun, 1913 E
Pentarthrum melanosternum Broun, 1886 E
Pentarthrum nubilum Broun, 1893 E
Pentarthrum philpotti Broun, 1895 E
Pentarthrum planicolle Broun, 1909 E
Pentarthrum proximum Broun, 1886 E
Pentarthrum punctirostre Broun, 1881 E
Pentarthrum reductum Broun, 1881 E
Pentarthrum ruficorne Broun, 1881 E
Pentarthrum rugirostre Broun, 1881 E
Pentarthrum subsericatum Wollaston, 1873 E
Pentarthrum tenebrosum Broun, 1913 E
Pentarthrum triste Broun, 1909 E
Pentarthrum vestitum Broun, 1880 E
Pentarthrum zealandicum Wollaston, 1873 E
Proconus asperirostris (Broun, 1880) E
Proconus crassipes Broun, 1884 E
Sericotrogus ovicollis Broun, 1909 E
Sericotrogus plexus Broun, 1913 E
Sericotrogus stramineus Broun, 1909 E
Sericotrogus subaenescens Wollaston, 1873 E
Stenotoura exilis (Broun, 1893) E
Stenotoura lateritia (Broun, 1880) E
Tanysoma aciphyllae Broun, 1913 E
Tanysoma angustum (Broun, 1886) E
Tanysoma comata (Broun, 1886) E
Tanysoma fuscicollis Broun, 1909 E
Tanysoma impressella Broun, 1913 E
Torostoma apicale Broun, 1880 E
Toura fulva (Broun, 1893) E
Toura helmsianum (Sharp, 1882) E
Toura longirostre (Wollaston, 1873) E
Toura morosa (Broun, 1886) E
Toura sharpiana (Wollaston, 1874) E
Touropsis brevirostris (Sharp, 1878) E
Touropsis n. sp. E
Unas conirostris Marshall, 1953 E
Unas piceus (Broun, 1880) E
Unas pictonensis (Sharp, 1886) E
Zenoteratus cephalotes (Sharp, 1886) E
Zenoteratus diversus Broun, 1909 E
Zenoteratus macrocephalus (Broun, 1886) E
Zenoteratus servulus (Broun, 1886) E
PROECINI
Conarthrus cylindricus (Broun, 1893) E
Conarthrus parvulus (Broun, 1893) E
Eutornopsis picea Broun, 1910 E
RHYNCOLINI
S. RHYNCOLINA
Macrorhyncolus littoralis (Broun, 1880) E
Pachyops dubius (Wollaston, 1873) E
CRYPTORHYNCHINAE
CRYPTORHYNCHINI
S. CRYPTORHYCHINA
Allanalcis altostethus (Broun, 1893) E
Allanalcis aulacus (Broun, 1893) E
Allanalcis eruensis (Broun. 1913) E
Allanalcis laticollis Broun, 1914 E
Allanalcis melastictus Broun, 1921 E
Allanalcis n. sp. E
Baeorhynchodes cristatus Broun, 1909 E
Indecentia nubila Broun, 1880 E
Mitrastethus baridioides Redtenbacher, 1868 E
Rhynchodes ursus White, 1846 E
S. MECISTOSTYLINA
Mecistostylus douei Lacordaire, 1866 E
S. TYLODINA
Adstantes arctus (Broun, 1881) E
Adstantes rudis (Broun, 1881) E
Adstantes n. sp. E Ch
Agacalles comptus (Broun, 1893) E
Agacalles formosus Broun, 1886 E
Agacalles gracilis (Broun, 1913) E
Agacalles integer (Broun, 1893) E
Agacalles tortipes (Broun, 1880) E
Ampagia rudis (Pascoe, 1877) E
Anaballus amplicollis (Fairmaire, 1849) A Do
Andracalles canescens (Broun, 1881) E
Andracalles diversus (Broun, 1883) E
Andracalles horridus (Broun, 1881) E
Andracalles pani Lyal, 1993 E TK
Andracalles spurcus (Broun, 1881) E
Andracalles vividus (Broun, 1880) E
Andracalles n. spp. (2) 2E
Clypeolus binodes (Broun, 1921) E
Clypeolus brookesi (Broun, 1923) E
Clypeolus cilicollis (Broun, 1921) E
Clypeolus cineraceus Broun, 1909 E
Clypeolus complexus (Broun, 1921) E
Clypeolus dux (Broun, 1893) E
Clypeolus fuscidorsis (Broun, 1909) E
Clypeolus lachrymosus (Broun, 1881) E
Clypeolus maritimus (Broun, 1893) E
Clypeolus notoporhinus (Broun, 1914) E
Clypeolus pascoei (Broun, 1880) E
Clypeolus robustus (Broun, 1909) E
Clypeolus signatus (Broun, 1880) E
Clypeolus simulans (Broun, 1921) E
Clypeolus squamosus (Broun, 1914) E
Clypeolus sympedioides (Broun, 1893) E
Clypeolus terricola (Broun, 1921) E
Clypeolus veratrus (Broun. 1893) E
Crisius anceps (Broun, 1921) E
Crisius baccatellus (Broun, 1917) E
Crisius bicinctus (Broun, 1915) E
Crisius bicristaticeps (Broun, 1914) E
Crisius binotatus Pascoe, 1876 E
Crisius brouni Lyal, 1993 E
Crisius cinereus (Broun, 1883) E
Crisius confusus (Broun, 1914) E
Crisius contiguus Broun, 1921 E
Crisius curtus (Broun, 1881) E
Crisius decorus Broun, 1913 E
Crisius dives Broun, 1921 E
Crisius dorsalis Broun, 1904 E
Crisius eucoelius (Broun, 1921) E
Crisius eximius Broun, 1921 E
Crisius fasciatus (Broun, 1914) E
Crisius fasciculatus Broun, 1893 E
Crisius flavisetosus (Broun, 1909) E

Crisius fulvicornis (Broun, 1914) E
Crisius fuscatus (Broun, 1907) E
Crisius grisealis (Broun, 1921) E
Crisius griseicollis (Broun, 1909) E
Crisius hopensis (Broun, 1921) E
Crisius humeralis Broun, 1913 E
Crisius humeratus (Broun, 1893) E
Crisius latirostris Broun, 1914 E
Crisius lineirostris (Broun, 1911) E
Crisius longulus Broun, 1921 E
Crisius lunalis (Broun, 1917) E
Crisius minor (Broun, 1893) E
Crisius nodigerus (Broun, 1917) E
Crisius obesulus Sharp, 1886 E
Crisius oblongus (Broun, 1914) E
Crisius obscurus (Broun, 1921) E
Crisius ornatus Broun, 1893 E
Crisius picicollis Broun, 1893 E
Crisius posticalis (Broun, 1914) E
Crisius postpuncta Lyal, 1993 E
Crisius rostralis (Broun, 1893) E
Crisius scutellaris Broun, 1880 E
Crisius semifuscus Broun, 1913 E
Crisius signatus Broun, 1893 E
Crisius sparsus (Broun, 1914) E
Crisius sternalis (Broun, 1917) E
Crisius subcarinatus (Broun, 1911) E
Crisius variegatus Broun, 1880 E
Crisius variellus (Broun, 1914) E
Crisius ventralis (Broun, 1885) E
Crisius zenomorphus (Broun, 1917) E
Crooktacalles abruptus (Marshall, 1937) E
Crooktacalles certus (Broun, 1880) E
Dermothrius asaphus (Broun, 1921) E
Dermothrius brevipennis (Broun, 1921) E
Dermothrius farinosus (Broun, 1893) E
Dermothrius porcatus (Broun, 1893) E
Dermothrius puncticollis (Broun, 1893) E
Dermothrius ruficollis (Broun, 1893) E
Dermothrius sanguineus (Broun, 1881) E
Didymus bicostatus (Broun, 1921) E
Didymus erroneus (Pascoe, 1876) E
Didymus impexus (Pascoe, 1877) E
Didymus intutus (Pascoe, 1876) E
Didymus metrosideri (Broun, 1910) E K
Didymus n. spp. (2) 2E TK
Ectopsis ferrugalis Broun, 1881 E
Ectopsis foveigera Broun, 1917 E
Ectopsis simplex Broun, 1893 E
Hadracalles fuliginosus Broun, 1893 E
Hiiracalles dolosus (Broun, 1893) E
Hiiracalles scitus (Broun, 1880) E
Maneneacalles concinnus (Broun, 1893) E
Metacalles aspersus Broun, 1893 E
Metacalles aterrimus (Broun, 1909) E
Metacalles cordipennis (Broun, 1881) E
Metacalles crinitulus Hustache, 1936 E
Metacalles crinitus (Broun, 1881) E
Metacalles exiguus (Broun, 1881) E
Metacalles irregularis (Broun, 1913) E
Metacalles lanosus Broun, 1913 E
Metacalles latisulcatus (Broun, 1909) E
Metacalles latus (Broun, 1881) E
Metacalles ornatus (Broun, 1909) E
Metacalles picatus Broun, 1914 E
Metacalles rugicollis Broun, 1893 E
Metacalles sentus (Broun, 1883) E
Metacalles sticticus (Broun, 1921) E
Microcryptorhynchus (*Microcryptorhynchus*) *albistrigalis* (Broun, 1909) E
Microcryptorhynchus (*M.*) *contractus* (Broun, 1913) E
Microcryptorhynchus (*M.*) *ferrugo* (Kuschel, 1971) E
Microcryptorhynchus (*M.*) *kronei* (Kirsch, 1877) E
Microcryptorhynchus (*M.*) *latitarsis* (Kuschel, 1964) E
Microcryptorhynchus (*M.*) *linagri* Kuschel, 1997 E
Microcryptorhynchus (*M.*) *mayae* Kuschel, 1997 E
Microcryptorhynchus (*M.*) *multisetosus* (Broun, 1907) E
Microcryptorhynchus (*M.*) *perpusillus* (Pascoe, 1877) E
Microcryptorhynchus (*M.*) *praesetosus* (Broun, 1909) E
Microcryptorhynchus (*M.*) *quietus* (Broun, 1893) E
Microcryptorhynchus (*M.*) *setifer* (Broun, 1886) E
Microcryptorhynchus (*M.*) *suillus* (Kuschel, 1964) E
Microcryptorhynchus (*M.*) *vafer* (Broun, 1881) E
Microcryptorhynchus (*M.*) n. spp. (4) 4E
Microcryptorhynchus (*Notacalles*) *floricola* (Broun, 1886) E
Microcryptorhynchus (*N.*) *leviculus* (Broun, 1881) E
Microcryptorhynchus (*N.*) *piciventris* (Broun, 1909) E
Microcryptorhynchus (*N.*) *planidorsis* (Kirsch, 1877) E
Microcryptorhynchus (*N.*) n. spp. (4) 4E
Omoeacalles crisioides (Broun, 1880) E
Omoeacalles ovatellus (Broun, 1881) E
Omoeacalles perspicuus Broun, 1909 E
Pachyderris nigricans (Broun, 1917) E
Pachyderris nodifer (Broun, 1914) E
Pachyderris punctiventris Broun, 1909 E
Pachyderris squamiventris (Broun, 1911) E
Pachyderris triangulatus (Broun, 1883) E
Pachyderris n. sp. TK
Paromalia nigricollis (Broun, 1895) E
Paromalia setiger Broun, 1880 E
Paromalia vestita Broun, 1880 E
Patellitergum rectirostre Lyal, 1993 E Ch
Postacalles rangirua Lyal, 1993 E
Rainacalles volens (Broun, 1881) E
Sceledolichus altulus Broun, 1886 E
Sceledolichus celsus (Broun, 1880) E
Sceledolichus decorus Broun, 1923 E
Sceledolichus denotans (Broun, 1881) E
Sceledolichus flectipes Broun, 1914 E
Sceledolichus hilaris Broun, 1893 E
Sceledolichus juncobius Broun, 1893 E
Sceledolichus lineithorax (Broun, 1880) E
Sceledolichus politus Broun, 1895 E
Sceledolichus pyriformis Broun, 1923 E
Sceledolichus setosus (Broun, 1881) E
Sceledolichus squamosus Broun, 1895 E
Sceledolichus villosus (Broun, 1881) E
Sympedius bufo (Sharp, 1883) E
Sympedius costatus (Broun, 1913) E
Sympedius densus (Broun, 1880) E
Sympedius ferrrugatus (Pascoe, 1876) E
Synacalles hystriculus (Pascoe, 1876) E
Sympedius lepidus Broun, 1885 E
Sympedius minor Broun, 1921 E
Sympedius rectirostris Broun, 1909 E
Sympedius testudo Pascoe, 1876 E
Synacalles cingulatus (Broun, 1883) E
Synacalles dorsalis (Broun, 1881) E
Synacalles mundus (Broun, 1881) E
Synacalles peelensis (Broun, 1913) E
Synacalles posticalis (Broun, 1886) E
Synacalles trinotatus (Broun, 1880) E
Synacalles n. sp. 1 E
Trinodicalles adamsi (Broun, 1893) E
Trinodicalles altus (Broun, 1909) E
Trinodicalles conicollis (Broun, 1913) E
Trinodicalles cristatus (Broun, 1881) E
Trinodicalles decemcristatus (Broun, 1883) E
Trinodicalles latirostris (Broun, 1883) E
Trinodicalles lepirhinus (Broun, 1893) E
Trinodicalles mimus (Broun, 1893) E
Trinodicalles terricola (Broun, 1885) E
Tychanopais dealbatus Broun, 1921 E
Tychanopais flavisparsus Broun, 1913 E
Tychanopais fougeri (Hutton, 1898) E
Tychanopais hudsoni (Marshall, 1926) E
Tychanopais pictulus Broun, 1893 E
Tychanopais tuberosus (Broun, 1923) E
Tychanus gibbus Pascoe, 1876 E
Tychanus verrucosus Pascoe, 1876 E
Tychanus vexatus (Pascoe, 1876) E
Whitiacalles ignotus (Broun, 1914) E
Zeacalles aeratus Broun, 1921 E
Zeacalles albipictus (Broun, 1921) E
Zeacalles alpestris (Broun, 1893) E
Zeacalles binodosus Broun, 1910 E
Zeacalles bisulcatus Broun, 1921 E
Zeacalles blanditus (Broun, 1921) E
Zeacalles brookesi Marshall, 1937 E
Zeacalles carinellus Broun, 1914 E
Zeacalles coarctalis Broun, 1921 E
Zeacalles cordipennis Broun, 1921 E
Zeacalles dilatatus (Broun, 1913) E
Zeacalles estriatus Broun, 1914 E
Zeacalles femoralis Broun, 1913 E
Zeacalles finitimus Broun, 1921 E
Zeacalles flavescens Broun, 1893 E
Zeacalles formosus (Broun, 1893) E
Zeacalles ignealis (Broun, 1913) E
Zeacalles igneus (Broun, 1909) E
Zeacalles incultus (Broun, 1893) E
Zeacalles inornatus Broun, 1921 E
Zeacalles latulus Broun, 1921 E
Zeacalles lepidulus Broun, 1909 E
Zeacalles oculatus (Broun, 1913) E
Zeacalles parvus Broun, 1921 E
Zeacalles picatus (Broun, 1893) E
Zeacalles pictus Broun, 1913 E
Zeacalles scaber Broun, 1915 E
Zeacalles scruposus Broun, 1921 E
Zeacalles seticollis (Broun, 1921) E
Zeacalles sparsus Broun, 1915 E
Zeacalles speciosus Broun, 1917 E
Zeacalles variatus (Broun, 1921) E
Zeacalles varius Broun, 1893 E

GASTEROCERCINI

Eutyrhinus squamiger White, 1846 E

PSEPHOLACINI

Homoreda flavisetosa (Broun, 1911) E
Homoreda murina (Broun, 1880) E
Mesoreda brevis (Pascoe, 1876) E
Mesoreda orthorhina (Broun, 1886) E
Mesoreda sulcifrons Broun, 1909 E
Nothaldonus peacei (Broun, 1880) E
Oreda notata White, 1846 E
Psepholax acanthomerus Broun, 1913 E
Psepholax coronatus White, 1846 E
Psepholax crassicornis Broun, 1895 E
Psepholax femoratus Broun, 1880 E
Psepholax macleayi (Schönherr, 1847) E
Psepholax mediocris Broun, 1886 E
Psepholax mystacinus Broun, 1886 E
Psepholax simplex Pascoe, 1876 E
Psepholax sulcatus White, 1843 E
Psepholax tibialis (Broun, 1880) E
Psepholax n. spp. (3) 3E
Strongylopterus chathamensis (Sharp, 1903) E Ch
Strongylopterus hylobioides (White, 1846) E

CURCULIONINAE

CIONINI

Cleopus japonicus Wingelmüller, 1914 A BC

EUGNOMINI

S. EUGNOMINA

Amylopterus pilosus (Broun, 1880) E
Amylopterus prasinus (Broun, 1883) E
Ancistropterus brouni Sharp, 1876 E
Ancistropterus helmsi Sharp, 1886 E
Ancistropterus mundus Sharp, 1876 E
Ancistropterus quadrispinosus White, 1846 E
Eugnomus aenescens Broun, 1893 E
Eugnomus albisetosus Broun, 1921 E
Eugnomus alternans Broun, 1917 E
Eugnomus antennalis Broun, 1909 E

Eugnomus argutus Sharp, 1883 E
Eugnomus aspersus Broun, 1893 E
Eugnomus atratus Broun, 1921 E
Eugnomus calvulus Broun, 1913 E
Eugnomus carbonarius (Broun, 1921) E
Eugnomus dennanensis Broun, 1913 E
Eugnomus dispar (Broun, 1886) E
Eugnomus durvillei Schönherr, 1847 E
Eugnomus elegans Pascoe, 1876 E
Eugnomus fasciatus Broun, 1881 E
Eugnomus femoralis Broun, 1909 E
Eugnomus fervidus Pascoe, 1876 E
Eugnomus flavipilus (Broun, 1883) E
Eugnomus fucosus Pascoe, 1877 E
Eugnomus interstitialis Broun, 1880 E
Eugnomus lituratus Broun, 1893 E
Eugnomus luctuosus Broun, 1886 E
Eugnomus maculosus Broun, 1881 E
Eugnomus maurus Broun, 1893 E
Eugnomus monachus Broun, 1886 E
Eugnomus nobilis Broun, 1893 E
Eugnomus nubilans Broun, 1881 E
Eugnomus picipennis Pascoe, 1876 E
Eugnomus robustus Marshall, 1926 E
Eugnomus squamifer Broun, 1893 E
Eugnomus tristis Broun, 1917 E
Eugnomus wakefieldi Pascoe, 1877 E
Goneumus bryobius (Broun, 1917) E
Gonoropterus spinicollis Broun, 1904 E
Hoplocneme cyanea Broun, 1893 E
Hoplocneme forcipata Marshall, 1938 E
Hoplocneme hookeri White, 1846 E
Hoplocneme inaequale Broun, 1893 E
Hoplocneme propinqua Broun, 1914 E
Hoplocneme punctatissima Pascoe, 1876 E
Hoplocneme squamosa Broun, 1880 E
Hoplocneme vicina Broun, 1913 E
Icmalius abnormis (Broun, 1886) E
Nyxetes bidens (Fabricius, 1792) E
Oreocalus albosparsa (Broun, 1913) E
Oreocalus carinulata (Broun, 1914) E
Oreocalus castanea (Broun, 1913) E
Oreocalus cinnamomea (White, 1846) E
Oreocalus congruens (Broun, 1917) E
Oreocalus dealbata (Broun, 1893) E
Oreocalus fasciata (Broun, 1917) E
Oreocalus hebe (Marshall, 1938) E
Oreocalus latipennis (Broun, 1914) E
Oreocalus lineirostris (Broun, 1914) E
Oreocalus nigrescens (Broun, 1886) E
Oreocalus nigriceps (Broun, 1886) E
Oreocalus picigularis (Broun, 1886) E
Oreocalus pleuralis (Broun, 1915) E
Oreocalus pullata (Broun, 1904) E
Oreocalus uniformis (Broun, 1913) E
Oreocalus veronicae (Broun, 1913) E
Oreocalus vittata (Broun, 1893) E
Oropterus coniger White, 1846 E
Pactola fuscicornis Broun, 1913 E
Pactola demissa Pascoe, 1876 E
Pactola fairburni Marshall, 1938 E
Pactola hudsoni Marshall, 1938 E
Pactola nigra (Hudson, 1950) E
Pactola posticalis Marshall, 1938 E
Pactola variabilis Pascoe, 1876 E
Pactolotypus depressirostris (Kirsch, 1877) E Su
Pactolotypus humeralis (Broun, 1895) E
Pactolotypus prolixus (Broun, 1914) E
Pactolotypus striatus (Broun, 1909) E
Pactolotypus subantarcticus Kuschel, 1964) E Su
Pactolotypus n. sp. E Ch
Rhopalomerus tenuirostris Blanchard, 1851 E
Scolopterus aequus Broun, 1880 E
Scolopterus penicillatus White, 1846 E
Scolopterus tetracanthus White, 1846 E
Stephanorhynchus aper Sharp, 1886 E
Stephanorhynchus attelaboides (Fabricius, 1775) E
Stephanorhynchus brevipennis Pascoe, 1876 E
Stephanorhynchus costifer Broun, 1893 E
Stephanorhynchus crassus Broun, 1880 E
Stephanorhynchus curvipes White, 1846 E
Stephanorhynchus griseipictus Broun, 1886 E
Stephanorhynchus halli Broun, 1914 E
Stephanorhynchus insolitus Broun, 1893 E
Stephanorhynchus lawsoni Sharp, 1876 E
Stephanorhynchus nigrosparsus Broun, 1893 E
Stephanorhynchus purus Pascoe, 1876 E
Stephanorhynchus pygmaeus Broun, 1903 E
Stephanorhynchus tuberosus Broun, 1881 E
Tysius bicornis (Fabricius, 1781) E
S. MERIPHINA
Geochus apicalis Broun, 1921 E
Geochus certus Broun, 1921 E
Geochus convexus Broun, 1921 E
Geochus distinguens Broun, 1914 E
Geochus frontalis Broun, 1893 E
Geochus inaequalis (Broun, 1880) E
Geochus lateralis Broun, 1914 E
Geochus marginatus Broun, 1893 E
Geochus morosus Broun, 1914 E
Geochus nigripes Broun, 1893 E
Geochus nodosus Broun, 1893 E
Geochus pictulus Broun, 1921 E
Geochus plagiatus Broun, 1893 E
Geochus politus Broun, 1881 E
Geochus posticalis Broun, 1913 E
Geochus puncticollis Broun, 1893 E
Geochus pyriformis Broun, 1914 E
Geochus rufipictus Broun, 1923 E
Geochus rugulosus Broun, 1885 E
Geochus setiger Broun, 1893 E
Geochus similis Broun, 1893 E
Geochus squamosus Broun, 1893 E
Geochus suffusus Broun, 1914 E
Geochus sulcatus Broun, 1914 E
Geochus tibialis Broun, 1893 E
Geochus variegatus Broun, 1914 E
Geochus n. sp. E
GONIPTERINI
Gonipterus scutellatus Gyllenhal, 1833 A
MECININI
Mecinus pascuorum (Gyllenhal, 1813) A
RHADINOSOMINI
Rhadinosomus acuminatus (Fabricius, 1775) E?
STOREINI
Abantiadinus gratulus (Broun, 1917) E
Abantiadinus nodipennis (Broun, 1914) E
Abantiadinus pusillus (Broun, 1914) E
Aneuma compta Broun, 1885 E
Aneuma conspersa Broun, 1921 E
Aneuma erubescens Broun, 1910 E
Aneuma fasciata (Broun, 1880) E
Aneuma ferruginea Broun, 1886 E
Aneuma fulvipes Pascoe, 1876 E
Aneuma oblonga Broun, 1921 E
Aneuma rostralis Broun, 1921 E
Aneuma rubricale (Broun, 1880) E
Aneuma rufa Broun, 1921 E
Aneuma spinifera Broun, 1913 E
Aneuma stramineipes (Broun, 1886) E
Emplesis bifoveata Lea, 1927 A
Gerynassa sp. A
Phorostichus linearis (Broun, 1881) E
Storeus albosignatus Blackburn, 1890 A
TYCHIINI
S. TYCHIINA
Tychius schneideri (Herbst, 1795) A
S. INCERTAE SEDIS
Notinus aucklandicus Kuschel, 1964 E Su
Peristoreus acalyptoides (Pascoe, 1876) E
Peristoreus acceptus (Broun, 1881) E
Peristoreus aciphyllae (Broun, 1886) E
Peristoreus aericomus (Broun, 1883) E
Peristoreus albisetosus (Broun, 1914) E
Peristoreus altivagans (Broun, 1921) E
Peristoreus anchoralis (Broun, 1881) E
Peristoreus anxius (Broun, 1893) E
Peristoreus australis (Broun, 1921) E
Peristoreus bicavus (Broun, 1886) E
Peristoreus castigatus (Broun, 1909) E
Peristoreus celmisiae (Broun, 1917) E
Peristoreus cheesemani (Broun, 1886) E
Peristoreus confusus (Broun, 1886) E
Peristoreus consonus (Broun, 1913) E
Peristoreus cordipennis (Broun, 1915) E
Peristoreus crucigerus (Broun, 1881) E
Peristoreus decussatus (Marshall, 1926) E
Peristoreus difformipes (Broun, 1886) E
Peristoreus dilucidus (Broun, 1921) E
Peristoreus discoideus (Broun, 1880) E
Peristoreus dolosus (Broun, 1881) E
Peristoreus durus (Broun, 1886) E
Peristoreus elegans (Sharp, 1883) E
Peristoreus eustictus (Broun, 1886) E
Peristoreus exilis (Broun, 1913) E
Peristoreus fascialis (Broun, 1881) E
Peristoreus femoralis (Broun, 1881) E
Peristoreus flavitarsis (Broun, 1880) E
Peristoreus floricola (Broun, 1914) E
Peristoreus fulvescens (Broun, 1914) E
Peristoreus fulvus (Broun, 1886) E
Peristoreus fuscipes (Broun, 1893) E
Peristoreus fusconotatus (Broun, 1880) E
Peristoreus fuscoventris (Broun, 1886) E
Peristoreus glottis (Pascoe, 1877) E
Peristoreus gracilirostris (Broun, 1881) E
Peristoreus grossus (Broun, 1893) E
Peristoreus innocens Kirsch, 1877 E Su
Peristoreus insignis (Broun, 1909) E
Peristoreus insolitus (Broun, 1909) E
Peristoreus lateralis (Broun, 1881) E
Peristoreus leucocomus (Broun, 1921) E
Peristoreus limbatus (Pascoe, 1877) E
Peristoreus maorinus (Broun, 1913) E
Peristoreus melastictus (Broun, 1914) E
Peristoreus melastomus (Broun, 1886) E
Peristoreus methvenensis (Broun, 1915) E
Peristoreus nesobius (Broun, 1886) E
Peristoreus nocens (Broun, 1881) E
Peristoreus obscurus (Broun, 1921) E
Peristoreus ochraceus (Broun, 1881) E
Peristoreus oleariae (Broun, 1913) E
Peristoreus pardalis (Marshall, 1926) E
Peristoreus pectoralis (Broun, 1914) E
Peristoreus poecilus (Broun, 1921) E
Peristoreus rufirostris (Broun, 1880) E
Peristoreus sexmaculatus (Broun, 1881) E
Peristoreus spadiceus (Broun, 1909) E
Peristoreus stramineus (Broun, 1881) E
Peristoreus subconicollis (Broun, 1923) E
Peristoreus sudus (Broun, 1881) E
Peristoreus sylvaticus (Broun, 1914) E
Peristoreus terrestris (Broun, 1914) E
Peristoreus thomsoni (Broun, 1886) E
Peristoreus titahensis (Broun, 1913) E
Peristoreus trilobus (Pascoe, 1877) E
Peristoreus veronicae (Broun, 1886) E
Peristoreus viridipennis (Broun, 1880) E
Peristoreus vittatus (Broun, 1921) E
Peristoreus xenorhinus (Broun, 1886) E
Peristoreus n. spp. (3) 3E
CURCULIONINAE INCERTAE SEDIS
Alloprocas muticus Broun, 1914 E
Alloprocas niger Broun, 1893 E
Alloprocas rufus Broun, 1893 E

Celetotelus fulvus Broun, 1893 E
Hypotagea castanea (Broun, 1881) E
Hypotagea concolor (Broun, 1881) E
Hypotagea creperus (Broun, 1881) E
Hypotagea dissona Broun, 1886 E
Hypotagea lewisi Broun, 1913 E
Hypotagea rubida Pascoe, 1876 E
Hypotagea simulans (Broun, 1881) E
Hypotagea testaceipennis Broun, 1880 E
Hypotagea tibialis Broun, 1893, non Broun, 1921 E
Hypotagea 'tibialis Broun, 1921', non Broun, 1893 E
Hypotagea variegata Broun, 1880 E
Hypotagea vestita (Broun, 1881) E
Neomycta pulicaris Pascoe, 1877 E
Neomycta rubida Broun, 1880 E
Neomycta seticeps Broun, 1914 E
Simachus cuneipennis Broun, 1914 E
Simachus montanus Broun, 1886 E
Simachus placens Broun, 1921 E
CYCLOMINAE
ATERPINI
S. ATERPINA
Anagotus aterrimus (Broun, 1913) E
Anagotus carinirostris Marshall, 1953 E
Anagotus costipennis (Broun, 1915) E
Anagotus fairburni (Brookes, 1932) E
Anagotus gourlayi (Brookes, 1932) E
Anagotus graniger (Broun, 1886) E
Anagotus halli (Broun, 1915) E
Anagotus hamiltoni (Broun, 1913) E
Anagotus helmsi Sharp, 1882 E
Anagotus laevicostataus(Broun, 1914) E
Anagotus latirostris (Broun, 1904) E
Anagotus lewisi (Broun, 1904) E
Anagotus oconnori (Broun, 1910) E
Anagotus pascoi (Broun, 1917) E
Anagotus peelensis (Marshall, 1937) E
Anagotus rugosus (Broun, 1883) E
Anagotus stephenensis Kuschel, 1982 E
Anagotus turbotti (Spiller, 1942) E
Anagotus n. spp. (2) 2E
Heterotyles argentatus Broun, 1883 E
Lyperopais alternans Broun, 1914 E
Lyperopais mirus Broun, 1893 E
Lyperopais stellae Marshall, 1937 E
LISTRODERINI
Gromilus anthracinus (Broun, 1921) E
Gromilus aucklandicus Kuschel, 1971 E Su
Gromilus bicarinatus (Broun, 1921) E
Gromilus bifoveatus (Broun, 1923) E
Gromilus brevicornis (Broun, 1893) E
Gromilus calvulus (Broun, 1913) E
Gromilus caudatus (Broun, 1913) E
Gromilus clarulus (Broun, 1917) E
Gromilus cockaynei (Broun, 1905) E Su
Gromilus cordipennis (Broun, 1893) E
Gromilus cristatus (Broun, 1893) E
Gromilus dorsalis (Broun, 1921) E
Gromilus exiguus (Brookes, 1951) E Su
Gromilus fallai (Brookes, 1951) E Su
Gromilus foveirostris (Broun, 1913) E
Gromilus furvus (Broun, 1921) E
Gromilus gracilipes (Sharp, 1883) E
Gromilus granissimus (Broun, 1917) E
Gromilus halli (Broun, 1917) E
Gromilus impressus (Broun, 1893) E
Gromilus inophloeoides (Broun, 1904) E
Gromilus insularis antipodarum Kuschel, 1964 E Su
Gromilus i. insularis Blanchard, 1853 E Su
Gromilus i. robustus (Brookes, 1951) E Su
Gromilus laqueorum Kuschel, 1964 E Su
Gromilus majusculus (Broun, 1915) E
Gromilus merus (Broun, 1917) E
Gromilus narinosus Kuschel, 1971 E Su
Gromilus nitidellus (Broun, 1917) E
Gromilus nitidulus (Broun, 1915) E
Gromilus nodiceps (Broun, 1914) E
Gromilus philpotti (Broun, 1917) E
Gromilus setosus (Broun, 1893), non (Broun, 1917) E
Gromilus 'setosus (Broun, 1917)', non (Broun, 1893) E
Gromilus sparsus (Broun, 1921) E
Gromilus striatus (Broun, 1915), non (Broun, 1921) E
Gromilus 'striatus (Broun, 1921)', non (Broun, 1915) E
Gromilus sulcicollis (Broun, 1913) E
Gromilus sulcipennis (Broun, 1917) E
Gromilus tenuiculus (Broun, 1921) E
Gromilus thoracicus (Broun, 1893) E
Gromilus variegatus (Broun, 1893) E
Gromilus veneris setarius (Broun, 1909) E Su
Gromilus v. veneris (Kirsch, 1877) E Su
Liparogetus sulcatissimus Broun, 1915 E
Listroderes delaiguei Germain 1895 A
Listroderes difficilis Germain, 1895 A
Listroderes foveatus (Lea, 1928) A
Listronotus bonariensis (Kuschel, 1955) A
Nestrius bifurcus Kuschel, 1964 E Su
Nestrius cilipes Broun, 1909 E
Nestrius crassicornis Broun, 1915 E
Nestrius foveatus (Broun, 1893) E
Nestrius hudsoni Marshall, 1953 E
Nestrius irregularis (Broun, 1910) E
Nestrius laqueorum Kuschel, 1964 E Su
Nestrius ovithorax (Broun, 1893) E
Nestrius prolixus Broun, 1917 E
Nestrius rubidus (Broun, 1904) E
Nestrius sculpturatus (Broun, 1909) E
Nestrius serripes Broun, 1893 E
Nestrius simmondsi Broun, 1921 E
Nestrius sulcirostris Broun, 1917 E
Nestrius zenoscelis Broun, 1921 E
Steriphus ascitus (Pascoe, 1876) E
Steriphus diversipes lineatus (Pascoe, 1873) A
Steriphus pullus (Broun, 1910) E
Steriphus variabilis (Broun, 1885) E
NOTIOMIMETINI
Aphela algarum Pascoe, 1870 A
Neosyagrius cordipennis Lea, 1904 A Do
ENTIMINAE
CELEUTHETINI
Platysimus planidorsis (Broun, 1910) E K
GEONEMINI
Lyperobates ardens Broun, 1910 E
Lyperobates asper Broun, 1893 E
Lyperobates carinifer Broun, 1910 E
Lyperobates elegantulus Broun, 1913 E
Lyperobates guinnessi Broun, 1913 E
Lyperobates punctatus Broun, 1913 E
Lyperobates rostralis Broun, 1913 E
Lyperobates virilis Broun, 1910 E
Lyperobates waterworthi Broun, 1910 E
NAUPACTINI
Asynonychus cervinus (Boheman, 1840 A
Atrichonotus sordidus (Hustache, 1939) A
Atrichonotus taeniatulus (Berg, 1881) A
Naupactus leucoloma Boheman, 1840 A
OOSOMINI
Phlyctinus callosus Boheman, 1834 A
OTIORHYNCHINI
Epitimetes bicolor Broun, 1921 E
Epitimetes cupreus Broun, 1917 E
Epitimetes densus Broun, 1921 E
Epitimetes foveiger Broun, 1913 E
Epitimetes griseatis Broun, 1913 E
Epitimetes lutosus Pascoe 1877 E
Epitimetes wakefieldi Sharp, 1886 E
Homodus cuprealis Broun, 1923 E
Homodus fumeus Broun, 1881 E
Homodus longicornis Broun, 1923 E
Homodus posticalis Broun, 1923 E
Hygrochus cordipennis Broun, 1910 E
Hygrochus granifer Broun, 1909 E
Hygrochus illepidus Broun, 1893 E
Hygrochus monilifer Broun, 1921 E
Hygrochus oculatus Broun, 1893 E
Hygrochus oscitans Broun, 1881 E
Hygrochus scutellaris Broun, 1914 E
Hygrochus verrucosus Broun, 1893 E
Otiorhynchus (*Cryphiphorus*) *sulcatus* (Fabricius, 1775) A
Otiorhynchus (*Pendragon*) *ovatus* (Linnaeus, 1758) A
Otiorhynchus rugostriatus Goeze, 1877 A
Phaeocharis cuprealis Broun, 1913 E
Phaeocharis punctatus Broun, 1913 E
OTTISTIRINI
Maleuterpes spinipes Blackburn, 1894 A
PHYLLOBIINI
Nonnotus albatus (Broun, 1881) E
Nonnotus albicans (Broun, 1880) E
Nonnotus eclectus Broun, 1893 E
Nonnotus griseolus Sharp, 1886 E
Nonnotus nigricans Broun, 1913 E
Nonnotus pallescens Broun, 1893 E
SCAIAPHILINI
Barypeithes pellucidus Jacquelin du Val, 1854 A
SITONINI
Sitona (*Sitona*) *discoidea* Gyllenhal, 1834 A
Sitona (*Sitona*) *lepidus* Gyllenhal, 1834 A
TRACHYPHLOEINI
Trachyphloeus sp. indet. A? SI
TROPIPHORININI
Agatholobus waterhousei Broun, 1913 E
Brachyolus albescens Broun, 1903 E
Brachyolus asperatus Broun, 1914 E
Brachyolus bagooides Sharp, 1886 E
Brachyolus bicostatus Broun, 1917 E
Brachyolus breviusculus (Broun, 1880) E
Brachyolus cervalis Broun, 1903 E
Brachyolus elegans Broun, 1893 E
Brachyolus fuscipictus Broun, 1914 E
Brachyolus huttoni Sharp, 1886 E
Brachyolus inaequalis Sharp, 1886 E
Brachyolus labeculatus Broun, 1913 E
Brachyolus longicollis Sharp, 1886 E
Brachyolus nodirostris Broun, 1921 E
Brachyolus obscurus Broun, 1921 E
Brachyolus posticalis Broun, 1893 E
Brachyolus punctatus White, 1846 E
Brachyolus sylvaticus Broun, 1910 E
Brachyolus terricola Broun, 1917 E
Brachyolus varius Broun, 1913 E
Brachyolus viridescens Broun, 1893 E
Brachyolus n. sp. E
Catodryobiolus antipodus Brookes, 1951 E Su
Catoptes acuminatus (Broun, 1913) E
Catoptes aequus (Broun, 1886) E
Catoptes agrestis (Marshall, 1938) E
Catoptes amotus (Broun, 1886) E
Catoptes amplus (Broun, 1921) E
Catoptes apicalis Broun, 1923 E
Catoptes argentalis Broun, 1914 E
Catoptes asperellus Broun, 1893 E
Catoptes asteliae (Broun, 1917) E
Catoptes attenuatus Broun, 1886 E
Catoptes aulicus (Broun, 1893) E
Catoptes bicostatus (Broun, 1886) E
Catoptes binodis (White, 1846) E
Catoptes binodulus (Sharp, 1886) E
Catoptes brevicornis Sharp, 1886, non (Broun, 1904) E
Catoptes 'b.' australis (Kuschel, 1964) E
Catoptes 'b. brevicornis' (Broun, 1904) E
Catoptes caliginosus Broun, 1893 E
Catoptes cavelli (Broun, 1893) E
Catoptes censorius (Pascoe, 1876) E
Catoptes chalmeri Broun, 1893 E
Catoptes cheesemani Broun, 1893 E

Catoptes citimus Broun, 1917 E
Catoptes constrictus Broun, 1910 E
Catoptes coronatus (Sharp, 1886) E
Catoptes cuspidatus Broun, 1881 E
Catoptes dehiscens Broun, 1917 E
Catoptes dispar (Broun, 1904) E
Catoptes dorsalis (Broun, 1917) E
Catoptes duplex Broun, 1904 E
Catoptes enysi (Broun, 1886) E
Catoptes flaviventris Broun, 1917 E
Catoptes fraudator Marshall, 1931 E
Catoptes fumosus Broun, 1914 E
Catoptes funestus (Broun, 1921) E
Catoptes furvus Broun, 1893 E
Catoptes hamiltoni (Broun, 1913) E
Catoptes humeralis Broun, 1893, non (Broun, 1910) E
Catoptes 'humeralis (Broun, 1910)', non Broun, 1893 E
Catoptes instabilis Marshall, 1931 E
Catoptes interruptus (Fabricius, 1781) E
Catoptes latipennis Broun, 1893, non (Broun, 1917) E
Catoptes 'latipennis (Broun, 1917)', non Broun, 1893 E
Catoptes limbatus Broun, 1909 E
Catoptes lobatus Broun, 1921 E
Catoptes longulus Sharp, 1886 E
Catoptes murinus (Broun, 1917) E
Catoptes nasalis (Broun, 1917) E
Catoptes nigricans Broun, 1917 E
Catoptes pallidipes Broun, 1917 E
Catoptes planus (Broun, 1881) E
Catoptes postrectus Marshall, 1931 E
Catoptes robustus (Sharp, 1886), non Broun, 1917 E
Catoptes 'robustus Broun, 1917', non (Sharp, 1886) E
Catoptes scutellaris Sharp, 1886, non (Broun, 1893) E
Catoptes 'scutellaris (Broun, 1893)', non Sharp, 1886 E
Catoptes simulator (Sharp, 1886) E
Catoptes spectabilis Broun, 1914 E
Catoptes spermophilus Broun, 1895 E
Catoptes subnitidus Broun, 1914 E
Catoptes subplicatus Broun, 1917 E
Catoptes tenebricus Broun, 1893 E
Catoptes vastator Broun, 1893 E
Catoptes versicolor (Broun, 1911) E
Catoptes vexator Broun, 1904 E
Cecyropa discors Broun, 1881 E
Cecyropa fumosa Broun, 1893 E
Cecyropa litorea Broun, 1921 E
Cecyropa modesta (Fabricius, 1781) E
Cecyropa setigera Broun, 1886 E
Cecyropa striata Broun, 1903 E
Cecyropa sulcifrons Broun, 1917 E
Cecyropa tychioides Pascoe, 1875 E
Echinopeplus dilatatus Broun, 1886 E
Echinopeplus dorsalis Broun, 1914 E
Echinopeplus insolitus (Sharp, 1886) E
Echinopeplus verrucatus Broun, 1914 E
Eurynotia enysi (Broun, 1886) E
Eurynotia hochstetteri (Redtenbacher, 1868) E
Haplolobus aethiops Broun, 1893 E
Haplolobus frontalis Broun, 1914 E
Haplolobus granulatus Broun, 1914 E
Haplolobus gregalis Broun, 1893 E
Haplolobus saevus Broun, 1893 E
Heterexis sculptipennis (Brookes, 1951) E Su
Heterexis seticostatus (Brookes, 1951) E
Inophloeus alacer Broun, 1893 E
Inophloeus albonotatus Broun, 1893 E
Inophloeus aplorhinus Broun, 1915 E
Inophloeus collinus Broun, 1917 E
Inophloeus costifer Broun, 1886 E
Inophloeus cuprellus Broun, 1921 E
Inophloeus discrepans Broun, 1904 E
Inophloeus egregius Broun, 1886 E
Inophloeus festucae Broun, 1921 E
Inophloeus fuscatus Broun, 1917 E
Inophloeus inuus Pascoe, 1875 E
Inophloeus laetificus Broun, 1909 E
Inophloeus longicornis Broun, 1904 E
Inophloeus medius Broun, 1893 E
Inophloeus nigellus Broun, 1881 E
Inophloeus nodifer Broun, 1893 E
Inophloeus obsoletus Broun, 1921 E
Inophloeus pensus Broun, 1914 E
Inophloeus praelatus Broun, 1886 E
Inophloeus punctipennis Sharp, 1886 E
Inophloeus quadricollis Broun, 1909 E
Inophloeus quadrinodosus Brookes, 1934 E
Inophloeus rhesus Pascoe, 1875 E
Inophloeus rubidus Broun, 1881 E
Inophloeus sexnodosus Broun, 1921 E
Inophloeus sternalis Broun, 1904 E
Inophloeus sulcicollis Broun, 1914 E
Inophloeus sulcifer Broun, 1886 E
Inophloeus suturalis Broun, 1893 E
Inophloeus traversii Pascoe, 1875 E
Inophloeus tricostatus Broun, 1915 E
Inophloeus turricolus Marshall, 1926 E
Inophloeus vestitus Broun, 1893 E
Inophloeus villaris Pascoe, 1875 E
Inophloeus vitiosus Pascoe, 1875 E
Irenimus aemulator (Broun, 1893) E
Irenimus aequalis (Broun, 1895) E
Irenimus albosparsus (Broun, 1917) E
Irenimus compressus (Broun, 1880) E
Irenimus curvus Barratt and Kuschel, 1996 E
Irenimus dugdalei Barratt and Kuschel, 1996 E
Irenimus egens (Broun, 1904) E
Irenimus parilis Pascoe, 1876 E
Irenimus patricki Barratt and Kuschel, 1996 E
Irenimus pilosellus Broun, 1886 E
Irenimus posticalis (Broun, 1893) E
Irenimus similis Barratt and Kuschel, 1996 E
Irenimus stolidus Broun, 1886 E
Irenimus tibialis Broun, 1886 E
Leptopius robustus Olivier, 1807 A
Mandalotus albosparsus (Broun, 1914) E
Mandalotus cecyropioides (Broun, 1886) E
Mandalotus hariolus (Broun, 1886) E
Mandalotus irritus (Pascoe, 1877) E
Mandalotus miricollis (Broun, 1917) E
Mandalotus pallidus (Broun, 1893) E
Mandalotus scapalis (Broun, 1921) E
Mandalotus n. sp.1 E
Neoevas celmisiae Broun, 1921 E
Nicaeana catoptoides Broun, 1914 E
Nicaeana cervina Broun, 1893 E
Nicaeana cinerea Broun, 1885 E
Nicaeana concinna Broun, 1886 E
Nicaeana cordipennis Broun, 1921 E
Nicaeana crassifrons Broun, 1917 E
Nicaeana gracilicornis Broun, 1914 E
Nicaeana infuscata Broun, 1909 E
Nicaeana modesta Pascoe, 1877 E
Nicaeana nesophila Broun, 1913 E
Nicaeana placida Broun, 1914 E
Nicaeana tarsalis Broun, 1893 E
Oclandius cinereus Blanchard, 1853 E Su
Oclandius laeviusculus (Broun, 1902) E Su
Oclandius vestitus (Broun, 1909) E Su
Paelocharis clarus (Broun, 1880) E
Paelocharis corpulentus (Broun, 1880) E
Paelocharis inflatus Broun, 1893 E
Paelocharis setiferus (Broun, 1893) E
Paelocharis sternalis (Broun, 1893) E
Paelocharis terricola (Broun, 1913) E
Paelocharis vestita Broun, 1893 E
Protolobus granicollis Broun, 1914 E
Protolobus nodosus Broun, 1917 E
Protolobus obscurus Sharp, 1886 E
Protolobus porculus (Pascoe, 1876) E
Sargon carinatus Broun, 1903 E
Sargon hudsoni Broun, 1909 E
Thesius inophloeoides Broun, 1909 E
Thotmus halli Broun, 1911 E Ch
Zenagraphus albinotatus Broun, 1921 E
Zenagraphus garviensis Marshall, 1938 E
Zenagraphus metallescens Broun, 1915 E

LIXINAE A

RHINOCYLLINI
Rhinocyllus conicus (Frölich, 1792) A BC

MESOPTILIINAE

LAEMOSACCINI
Neolaemosaccus narinus (Pascoe, 1872) A

MOLYTINAE

MOLYTINI
S. LEIOSOMATINA
Lyperobius australis Craw, 1999 E
Lyperobius barbarae Craw, 1999 E
Lyperobius carinatus Broun, 1881 E
Lyperobius clarkei Craw, 1999 E
Lyperobius coxalis Kuschel, 1987 E
Lyperobius cupiendus Broun, 1886 E
Lyperobius eylesi Craw, 1999 E
Lyperobius fallax Broun, 1917 E
Lyperobius glacialis Craw, 1999 E
Lyperobius hudsoni Broun, 1914 E
Lyperobius huttoni Pascoe, 1876 E
Lyperobius montanus Craw, 1999 E
Lyperobius nesidiotes Kuschel, 1987 E Su
Lyperobius patricki Craw, 1999 E
Lyperobius spedenii Broun, 1917 E
Lyperobius townsendii Craw, 1999 E
S. MOLYTINA
Hadramphus spinipennis Broun, 1911 E Ch
Hadramphus stilbocarpae Kuschel, 1971 E
Karocolens pittospori Kuschel, 1987 E
Karocolens tuberculatus (Pascoe, 1877) E
PHRYNIXINI
Abrotheus placitus Broun, 1917 E
Allaorops carinatus Broun, 1917 E
Allostyphlus jugosus Broun, 1921 E
Amphiskirra umbricola Broun, 1909 E
Araeoscapus ardens Broun, 1909 E
Araeoscapus brevicollis Broun, 1910 E
Araeoscapus estriatus Broun, 1909 E
Araeoscapus flavipes (Broun, 1893) E
Araeoscapus ocularius Broun, 1914 E
Araeoscapus ovipennis Broun, 1893 E
Araeoscapus punctipennis Broun, 1910 E
Araeoscapus subcostatus Broun, 1921 E
Astyplus brevicornis Broun, 1921 E
Astyplus conicus Broun, 1893 E
Bradypatae armiger Broun, 1893 E
Bradypatae capitalis (Broun, 1886) E
Bradypatae dilaticollis Broun, 1909 E
Bradypatae impressum Broun, 1921 E
Bradypatae interstitialis Broun, 1909 E
Bradypatae minor Broun, 1913 E
Bradypatae subnodifer Broun, 1921 E
Chamaepsephis aurisetifer Broun, 1893 E
Cuneopterus conicus Sharp, 1886 E
Dermotrichus elegantalis Broun, 1917 E
Dermotrichus multicristatus Broun, 1917 E
Dermotrichus mundulus Sharp, 1886 E
Dermotrichus vicinus Broun, 1921 E
Dolioceuthus dumetosus Broun, 1893 E
Dolioceuthus granulatus (Broun, 1880) E
Dolioceuthus vestitus Broun, 1893 E
Erymneus castaneus Broun, 1880 E
Erymneus celatus (Broun, 1880) E
Erymneus coenosus Broun, 1886 E
Erymneus crassipes Broun, 1893 E
Erymneus ferrugatus Broun, 1893 E
Erymneus firmus Broun, 1893 E
Erymneus irregularis Broun, 1893 E

Erymneus longulus Broun, 1886 E
Erymneus probus Broun, 1893 E
Erymneus scabiosus Broun, 1880 E
Erymneus sharpi Pascoe, 1877 E
Erymneus terrestris Broun, 1921 E
Halliellara antennalis Broun, 1917 E
Halliellara cuneata Broun, 1921 E
Halliellara longicollis Broun, 1917 E
Halliellara squamipes Broun, 1917 E
Lithocia acuminata Broun, 1913 E
Lithocia angustula Broun, 1914 E
Lithocia basalis Broun, 1917 E
Lithocia ciligera Broun, 1917 E
Lithocia fimbriata Broun, 1893 E
Lithocia nigricrista Broun, 1917 E
Lithocia rectisetosa Broun, 1917 E
Lithocia setirostris Broun, 1917 E
Lithocia stictica Broun, 1923 E
Megacolabus bifurcatus May, 1973 E
Megacolabus decipiens Marshall, 1938 E
Megacolabus garviensis May, 1963 E
Megacolabus harrisi (Brookes, 1926) E
Megacolabus obesus May, 1963 E
Megacolabus pteridosus May, 1963 E
Megacolabus reductus Marshall, 1938 E
Megacolabus sculpturatus Broun, 1893 E
Notonesius aucklandicus Kuschel, 1964 E Su
Pachyprypnus longiusculus (Broun, 1880) E
Pachyprypnus modicus Broun, 1904 E
Pachyprypnus pyriformis Broun, 1883 E
Phemus constrictus Broun 1913 E
Phemus curvipes Broun 1913 E
Phemus rufipes Broun, 1893 E
Phemus scabralis Broun, 1893 E
Phrynixodes scruposus Broun, 1921 E
Phrynixus amoenus Broun, 1921 E
Phrynixus asper Broun, 1911 E
Phrynixus astutus Pascoe, 1876 E
Phrynixus bicarinellus Broun, 1909 E
Phrynixus binodosus Broun, 1913 E
Phrynixus blandus Broun, 1921 E
Phrynixus brevipennis Broun, 1893 E
Phrynixus cedius Broun, 1893 E
Phrynixus conspicuus Broun, 1921 E
Phrynixus costirostris Broun, 1893 E
Phrynixus differens Broun, 1886 E
Phrynixus facetus Broun, 1881 E
Phrynixus humeralis Broun, 1893 E
Phrynixus humilis Broun, 1921 E
Phrynixus intricatus Broun, 1886 E
Phrynixus laqueorum Kuschel, 1964 E Su
Phrynixus longulus Broun, 1910 E
Phrynixus modicus Broun, 1880 E
Phrynixus rufipes Broun, 1886 E
Phrynixus rufiventris Broun, 1914 E
Phrynixus setipes Broun, 1913 E
Phrynixus simplex Broun, 1893 E
Phrynixus squamalis Broun, 1921 E
Phrynixus terreus Pascoe, 1875 E
Phrynixus thoracicus (Broun, 1893) E
Phrynixus tuberculatus Broun, 1886 E
Phrynixus ventralis Broun, 1909 E
Phrynixus n. sp. 1 E
Rachidiscodes altipennis Broun, 1917 E
Rachidiscodes glaber Broun, 1921 E
Rachidiscus granicollis Broun, 1893 E
Rachidiscus multinodosus Broun, 1913 E
Reyesiella caecus (Broun, 1893) E
Rystheus fulvosetosus Marshall, 1926 E
Rystheus hudsoni Marshall, 1926 E
Rystheus notabilis Broun, 1917 E
Rystheus ocularius Broun, 1893 E
Styphlotelus fascicularis Broun, 1893 E
Styphlotelus foveatus Broun, 1893 E
Tymbopiptus valeas Kuschel, 1987 E (subfossil)

TRYPETIDINI
Arecophaga varia Broun, 1880 E
Etheophanus pinguis Broun, 1893 E
Exeiratus laqueorum Kuschel, 1984 E Su
Exeiratus setarius Broun, 1914 E
Exeiratus turbotti Brookes, 1951 E Su
Inososgenes acerbus Broun, 1921 E
Inososgenes longiventris Broun, 1917 E
Paedaretus hispidus Pascoe, 1876 E
Paedaretus rufulus Broun, 1880 E
Phronira aspera (Broun, 1880) E
Phronira costosa (Broun, 1880) E
Phronira nodosa Broun, 1893 E
Phronira osculans (Broun, 1880) E
Phronira simplex (Broun, 1880) E
Phronira striata (Broun, 1880) E
Phronira sulcirostris (Broun, 1880) E
Pogonorhinus opacus (Broun, 1880) E
Pogonorhinus punctithorax (Broun, 1886) E
TRIBUS INCERTAE SEDIS
Bantiades cupiendus Broun, 1914 E
Bantiades cylindricus Broun, 1917 E
Bantiades fuscatus Broun, 1893 E
Bantiades morosus Broun, 1917 E
Bantiades nodosus Broun, 1914 E
Bantiades notatus Broun, 1917 E
Bantiades rectalis Broun, 1921 E
Bantiades suturalis Broun, 1914 E
Bantiades trifoveatus Broun, 1921 E
Bantiades valgus Broun, 1893 E
Memes rufirostris Broun, 1903 E
Sosgenes carinatus Broun, 1893 E
Sosgenes discalis Broun, 1917 E
Sosgenes longicollis Broun, 1914 E
Sosgenes planirostris Broun, 1913 E
PLATYPODINAE
PLATYPODINI
Crossotarsus externedentatus Fairmaire, 1850 E K
Platypus apicalis White, 1846 E
Platypus gracilis Broun, 1893 E
Treptoplatypus caviceps (Broun, 1880) E
SCOLYTINAE
HYLESININI
S. HYLASTINA
Hylastes ater (Paykull, 1800) A
S. PHLOEOSININA
Phloeosinus cupressi Hopkins, 1903 A
S. TOMICINA
Chaetoptelius mundulus (Broun, 1881) E
Chaetoptelius versicolor Wood, 1988 A
Dendrotrupes costiceps Broun, 1881 E
Dendrotrupes vestitus Broun, 1881 E
Dendrotrupes zealandicus Wood, 1992 E
Dendrotrupes n. sp. E
Hylurgus ligniperda (Fabricius, 1787) A
Pachycotes peregrinus (Chapuis, 1869) A
SCOLYTINI
S. CRYPHALINA
Cryphalus wapleri Eichhoff, 1871 A
Hypocryphalus asper (Broun, 1881) E
Hypocryphalus longipennis (Browne, 1970) E
Hypocryphalus n. spp. (7) 7E?
Hypothenemus sp. indet. E K
S. DRYOCEOTINA
Coccotrypes dactyliperda (Fabricius, 1801) A
S. SCOLYTINA
Scolytus multistriatus (Marsham, 1802) A
S. XYLEBORINA
Amasa truncata (Erichson, 1842) A
Ambrosiodmus compressus (Lea, 1894) A
Cnestus pseudosolidus (Schedl, 1936) A
Microperus eucalypticus (Schedl, 1938) A
Xyleborinus saxesenii (Ratzeburg, 1837) A
Xyleborus inurbanus (Broun, 1880) E
Scolytinae gen. et sp. indet. E

Order MECOPTERA
[Compiled by R. L. C. Pilgrim]
Suborder NANNOMECOPTERA
NANNOCHORISTIDAE
Nannochorista philpotti (Tillyard, 1917) E F

Order SIPHONAPTERA
[Compiled by R. L. C. Pilgrim]
Major hosts are shown *in* brackets after each entry; 'sea birds' includes a wide variety, but especially penguins, procellariiforms, shags, and gulls.
Further details – Smit (1979, 1984).

CERATOPHYLLIDAE A
Ceratophyllus (*Ceratophyllus*) *gallinae* (Schrank, 1803) A poultry, passerines
Nosopsyllus (*Nosopsyllus*) *fasciatus* (Bosc, 1800) A rat
Nosopsyllus (*N.*) *londiniensis londiniensis* (Rothschild, 1903) A black rat, mouse
Glaciopsyllus antarcticus Smit & Dunnet, 1962 petrels
ISCHNOPSYLLIDAE
Porribius pacificus Jordan, 1946 E long-tailed bat
LEPTOPSYLLIDAE A
Leptopsylla (*Leptopsylla*) *segnis* (Schönherr, 1811) A mouse
PULICIDAE A
Ctenocephalides canis (Curtis, 1826) A dog
Ctenocephalides felis felis (Bouché, 1835) A cat, dog
Pulex (*Pulex*) *irritans* Linnaeus, 1758 A human, pig
Xenopsylla cheopis (Rothschild, 1903) A human, rats
Xenopsylla vexabilis Jordan, 1925 A kiore (Polynesian rat)
PYGIOPSYLLIDAE
Notiopsylla corynetes Smit, 1979 E Hutton's shearwater
Notiopsylla enciari enciari Smit, 1957 seabirds, parakeets
Notiopsylla e. regula Smit, 1979 E seabirds
Notiopsylla kerguelensis kerguelensis (Taschenberg, 1800) seabirds
Notiopsylla k. tenuata Smit, 1979 E seabirds, parakeets
Notiopsylla peregrinus Smit, 1979 E seabirds
Hoogstraalia imberbis Smit, 1979 E ?landbirds
Pagipsylla galliralli (Smit, 1965) E passerines
Pygiopsylla hoplia Jordan & Rothschild, 1922 A rats, especially kiore
Pygiopsylla phiola Smit, 1979 A rats, especially kiore
RHOPALOPSYLLIDAE
Parapsyllus longicornis (Enderlein, 1901) seabirds
Parapsyllus magellanicus largificus Smit, 1984 E albatross
Parapsyllus m. magellanicus Jordan, 1938 seabirds
Parapsyllus mangarensis Smit, 1979 E seabirds
Parapsyllus struthophilus Smit, 1979 E parakeets, passerines
Parapsyllus valedictus Smit, 1979 E weka
Parapsyllus cardinis Dunnet, 1961 seabirds
Parapsyllus lynnae alynnae Smit, 1979 E Hutton's shearwater
Parapsyllus l. lynnae Smit, 1965 E seabirds
Parapsyllus l. mariae Smit, 1979 E seabirds
Parapsyllus jacksoni Smit, 1965 E seabirds
Parapsyllus nestoris antichthones Smit, 1979 E parakeets
Parapsyllus nestoris nestoris Smit, 1965 E kea

Order DIPTERA
[Compiled by R. P. Macfarlane and T. K. Crosby]
Suborder NEMATOCERA
ANISOPODIDAE [Toft]
Mycetobia sp. indet. Toft* ?E
Sylvicola festivus (Edwards, 1928) E Fo
Sylvicola neozelandicus (Schiner, 1868) A? Fo-D

Sylvicola notatus (Hutton, 1902) E Fo Ga Li
Sylvicola undulatus (Lamb, 1909) E Fo
BIBIONIDAE
Dilophus alpinus Harrison, 1990 E
Dilophus crinitus (Hardy, 1951) E
Dilophus fumipennis Harrison, 1990 E
Dilophus harrisoni (Hardy, 1953) E
Dilophus neoinsolitus Harrison, 1990 E
Dilophus segnis Hutton, 1902 E
Dilophus nigrostigma (Walker, 1848) E We
Dilophus tuthilli (Hardy, 1953) E
BLEPHARICERIDAE [McLellan]
Neocurupira campbelli Dumbleton, 1963 E Fr
Neocurupira chiltoni (Campbell, 1921) E Fr
Neocurupira hudsoni Lamb, 1913 E Fr
Neocurupira rotalapiscula Craig, 1969 E Fr
Neocurupira tonnoiri Dumbleton, 1963 E Fr
Neocurupira n. spp. (>4)* McLellan 5E
Nothohoraia micrognathia Craig, 1969 I[C] E Fr
Peritheates harrisi (Campbell, 1921) E Sa Fr
Peritheates turrifer Lamb, 1913 E Fr
CANTHYLOSCELIDIDAE
Canthyloscelis antennata Edwards, 1922 E Fo
Canthyloscelis balaena Hutson, 1977 E Fo
Canthyloscelis brevicornis Nagatomi, 1983 E Fo
Canthyloscelis claripennis Edwards, 1922 E Fo
Canthyloscelis nigricosta Edwards, 1922 E Fo
CECIDOMYIIDAE gall midges
[Martin]
Amediella involuta Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Aprionus bullerensis Jaschhof *in* Jaschhof & Jaschhof, 2003, E Ff
Aprionus mycophiloides Jaschhof *in* Jaschhof & Jaschhof, 2003, E Ff
Aprionus remotus Jaschhof *in* Jaschhof & Jaschhof, 2003, E Ff
Arthrocnodax sp. indet. A? Cm
Campylomyza flavipes Meigen, 1818* A Ff
'*Cecidomyia*' *dubiella* Gagne, 1989 E
'*Cecidomyia*' *flavella* Kieffer, 1913 E
'*Cecidomyia*' *fragilina* Gagne, 1989 E
'*Cecidomyia*' *hirta* Marshall, 1896 E
'*Cecidomyia*' *marshalli* Gagne, 1989 E
'*Cecidomyia*' *melana* Marshall, 1896 E
'*Cecidomyia*' *minuscula* Gagne, 1989 E
'*Cecidomyia*' *scoparia* Marshall, 1896 E
'*Cecidomyia*' *wanganuiensis* Marshall, 1896 E
Dasineura? alopecuri (Reuter, 1895) A Gr HS
Dasineura hebefolia Lamb, 1951 E Fo HLG
Dasineura mali (Kieffer, 1904) A Ga-Or HL
Dasineura pyri (Bouche, 1847) A Ga-Or HL
Diadiplosis koebelei (Koebele, 1893) A IPr
Dryomyia shawiae Anderson, 1935 E Fo HSG
Eucalyptodiplosis chionochloae Kolesik *in* Kolesik, Sarfati, Brockerhoff & Kelly, 2007 E Gr HS
Holoneurus aliculatus Yukawa, 1964 E Su Gr Ff
Kiefferia coprosmae Barnes & Lamb, 1954 E Fo H
Lestodiplosis sp. indet.* A? Cr IPr
Lestremia cinerea Macquart, 1826* A? Ff
Lestremia leucophaea (Meigen, 1818) A? Ff
Lestremia novaezealandiae Marshall, 1896 E
Mayetiola destructor (Say, 1817) A Gr HS
Miastor agricolae Marshall, 1896 E Ff
Miastor difficilis Marshall, 1896 E Ff
Monardia dividua Jaschhof *in* Jaschhof & Jaschhof, 2003, E Ff
Monardia fumea Jaschhof *in* Jaschhof & Jaschhof, 2003, E Ff
Monardia furcillata Jaschhof *in* Jaschhof & Jaschhof, 2003, 2003 E Ff
Monardia modica Jaschhof *in* Jaschhof & Jaschhof, 2003, E Ff
Monardia stirpium Kieffer, 1895* A Ff
Monardia sp. E Ff Fo
Mycophila fungicola Felt, 1911* A? Ff
Oligotrophus coprosmae Barnes & Lamb, 1954 E Fo
Oligotrophus oleariae (Maskell, 1889) E Fo
Peromyia carinata Jaschhof, 2001 E Ff Fo
Peromyia clandestina Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia culta Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia derupta Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia didhami Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia dissona Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia doci Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia insueta Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia intecta Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia intonsa Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia katieae Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia latebrosa Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia memoranda Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia mountalbertiensis Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia multifurcata Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia muscorum (Kieffer, 1895) A
Peromyia novaezealandiae Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia obunca Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia palustris (Kieffer, 1895) A
Peromyia perardua Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia pertrita Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia plena Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia praeclara Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia rara Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia rotoitiensis Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia sera Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia serrata Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia setosa Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia sinuosa Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia spinigera Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia squamigera Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia tecta Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Peromyia tumida Jaschhof *in* Jaschhof & Jaschhof, 2004 E Ff Fo
Polyardis illustris Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Polyardis triangula Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Porricondyla agricolae (Marshall, 1896) E Ff
Porricondyla aurea (Marshall, 1896) E Ff
Porricondyla magna (Marshall, 1896) E Ff
Porricondyla ordinaria (Marshall, 1896) E Ff
Proterodiplosis radicis Wyatt, 1963 E FoHR
Pseudomonardia australis Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia communis Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia elongata Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia glacialis Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia hutchesoni Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia invisitata Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia neurolygoides Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia pallida Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia parva Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia parvalobata Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pseudomonardia vicina Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pteridomyia bilobata Jaschhof *in* Jaschhof & Jaschhof, 2003 E Ff
Pteridomyia gressitti[NC] (Yukawa, 1964) E Su Ff
Rhopalomyia chrysanthemi Ahlberg, 1939 A Ga HG
Stenodiplosis geniculati (Reuter, 1895) A Gr HS
Stephodiplosis nothofagi Barnes, 1936 E Fo H
Trisopsis sp. indet. Crosby 1986 E or A IPr
Zeuxidiplosis giardi (Kieffer, 1896) A BC Gr HLG
Gen. indet. et n. sp. E Gr HS
Gen. indet. (gall makers) et n. spp. (130) 130E Fo HG
CERATOPOGONIDAE
Atrichopogon fitzroyi Macfie, 1932 E
Atrichopogon greyi Macfie, 1932 E
Atrichopogon hobsoni Macfie, 1932 E
Atrichopogon shortlandi Macfie, 1932 E
Atrichopogon 'vestitipennis' Kieffer, 1917 ?E Sa
Austrohelea antipodalis (Ingram & Macfie, 1931) E
Austrohelea campbellensis (Tokunaga, 1964) E Su
Austrohelea ferruginea (Macfie, 1932) E
Austrohelea tonnoiri (Macfie, 1932) E
Dasyhelea aucklandensis Sublette & Wirth, 1980 E Su ?F
Dasyhelea jucunda Macfie, 1932 E ?F
Dasyhelea oribates Macfie, 1932 E ?F Sa
Dasyhelea sp. indet. Andrew A? Fs
Dasyhelea sp. indet. Macfie 1932 E?
Forcipomyia antipodum (Hudson, 1892) E
Forcipomyia austrina Macfie, 1932 E F
Forcipomyia belkini de Meillon & Wirth, 1979 E
Forcipomyia cooki Macfie, 1932 E
Forcipomyia desurvillei Macfie, 1932 E Sa
Forcipomyia kuscheli Sublette & Wirth, 1980 E Su F
Forcipomyia parvicellula Ingram & Macfie, 1931 E Sa
Forcipomyia tapleyi Ingram & Macfie, 1931 E
Forcipomyia tasmani Macfie, 1932 E
Leptoconops myersi (Tonnoir, 1924) E Be F
Monohelea clavipes Macfie, 1932 E Sa
Monohelea nubeculosa Macfie, 1932 E
Monohelea n. spp. (2) Green, Holder, Macfarlane 2E?Gr/We
?*Neurohelea* sp. indet. Andrew
Palpomyia cantuaris Ingram & Macfie, 1931 E ?F
Palpomyia nelsoni Macfie, 1932 E ?F
Palpomyia rastellifera Macfie, 1932 E ?F
Palpomyia urpicifemoris Macfie, 1932 E ?F
Paradasyhelea egregia (Macfie, 1932) E
Paradasyhelea harrisoni Wirth, 1981 E
Stilobezzia antipodalis Ingram & Macfie, 1931 E ?WeF
Stilobezzia badia Macfie, 1932 E ?WeF
Stilobezzia ohakunei Ingram & Macfie, 1931 E ? WeF
Stilobezzia tonnoiri Macfie, 1932 E ?WeF

CHIRONOMIDAE [Boothroyd, Forsyth]
Ablabesmyia mala (Hutton, 1902) E Fr&Fs
'Anatopynia' boninensis Tokunaga, 1964 E F
'Anatopynia' elongata Tokunaga, 1964 E F
'Anatopynia' pennipes Freeman, 1961 E F
Anzacladius kiwi Cranston, 2009 E F
?*Apsectrotanypus cana* (Freeman, 1959) E F
?*Apsectrotanypus quadricincta* (Freeman, 1959) E F
Austrocladius harrisi (Freeman, 1959) E F
Austrocladius n. sp. E F
Camptocladius stercorarius (De Geer, 1776) A So D
Chironomus antipodensis Sublette & Wirth, 1980 E Su F
Chironomus analis Freeman, 1959 E F
Chironomus forsythi Martin, 1999 E F
Chironomus subantarcticus Sublette & Wirth, 1980 E Su F
Chironomus zealandicus Hudson, 1892 E Fs
Chironomus n. sp. Winterbourn & Gregson, 1989 E F/SW
Chironomus n. spp. (3) 3E F Forsyth
Chironomus n. sp. E Ch F Forsyth
Cladopelma curtivalva (Kieffer, 1917) Fs
?*Clunio* sp. Tortell 1981 E SW
Corynocera n. sp. Boothroyd E F
?*Corynoneura scutellata* Winnertz, 1846 A Gr Fs
Cricotopus aucklandicus Sublette & Wirth, 1980 E Fr
Cricotopus cingulatus (Hutton, 1902) E Fr
Cricotopus hollyfordensis Boothroyd, 2002 E Fr
Cricotopus planus Boothroyd, 1990 E Fr
Cricotopus vincenti Boothroyd, 1990 E Fr
Cricotopus zealandicus Freeman, 1959 E Fr
Cryptochironomus n. sp. Winterbourn & Gregson 1989 E Fr,Fs
Eukiefferiella brundini Boothroyd & Cranston, 1995 E Fr
?*Eukiefferiella commensalis* (Tonnoir, 1923) E F
Eukiefferiella heveli Sublette & Wirth, 1980 E Su Fr
Eukiefferiella n. spp. (3) 3E F
Gressittius antarcticus (Hudson, 1892) E F
Gressittius umbrosus (Freeman, 1959) E F
Gymnometriocnemus lobifer (Freeman, 1959) E F
Gynnidocladius pilulus Sublette & Wirth, 1980 E Su F
Harrisius pallidus Freeman, 1959 E Fo Fr
Hevelius carinatus Sublette & Wirth, 1980 E Su F
Kaniwhaniwhanus chapmani Boothroyd 1999 E Fr
Kiefferulus opalensis Forsyth, 1975 E Fs
Kuschelius dentifer Sublette & Wirth, 1980 E Su F
Larsia n. spp. (2) Boothroyd 2E F
Limnophyes vestitus (Skuse, 1889) A Fr
Lobodiamesa campbelli Pagast, 1947 E Sa Fr
Lobodiamesa n. sp. Boothroyd E Sa F
Macropelopia apicincta (Freeman, 1959) E F
Macropelopia apicinella (Freeman, 1959) E F
Macropelopia flavipes (Freeman, 1959) E F
Macropelopia quinquepunctata (Freeman, 1959) E F
Maoridiamesa glacialis Brundin, 1966 E Sa Fr
Maoridiamesa harrisi Pagast, 1947 E Sa Fr
Maoridiamesa insularis Brundin, 1966 E Su Fr
Maoridiamesa intermedia Brundin, 1966 E Sa Fr
Maoridiamesa stouti Brundin, 1966 E Sa Fr
Maryella reducta Sublette & Wirth, 1980 E Su F
Mecaorus elongatus Sublette & Wirth, 1980 E Su F
?*Microtendipes* n. sp. Winterbourn & Gregson 1989 E Fs
Nakataia cisdentifer Sublette & Wirth, 1980 E Su F
Naonella forsythi Boothroyd, 1994 E F
Naonella kimihia Boothroyd, 2005 E F
Nesiocladius gressitti Sublette & Wirth, 1980 E Su F
Ophryophorus ramiferus Freeman, 1959 E F
Orthocladius pictipennis Freeman, 1959 E F
'Orthocladius' publicus Hutton, 1902 E F
Parachironomus cylindricus (Freeman, 1959) E Fs
Parakiefferiella? sp. indet. Macfarlane
Paratanytarsus grimmii (Schneider, 1885) A Fr,Fs
Paratrichocladius pluriserialis (Freeman, 1959) Fr,Fs
Parochlus aotearoae Brundin, 1966 E Sa Fr
Parochlus brevis Sublette & Wirth, 1980 E Su F
Parochlus carinatus Brundin, 1966 E Sa Fr
Parochlus conjugens Brundin, 1966 E Sa Fr
Parochlus glacialis Brundin, 1966 E Sa Fr
Parochlus gressitti Sublette & Wirth, 1980 E Su F
Parochlus longicornis Brundin, 1966 E Sa Fr
Parochlus maorii Brundin, 1966 E Sa Fr
Parochlus novaezelandiae Brundin, 1966 E Sa Fr
Parochlus ohakunensis (Freeman, 1959) E Sa Fr
Parochlus pauperatus Brundin, 1966 E Sa Fr
Parochlus reductus Sublette & Wirth, 1980 E Su F
Parochlus rennelli Sublette & Wirth, 1980 E Su F
Parochlus spinosus Brundin, 1966 E Sa Fr
Paucispinigera approximata Freeman, 1959 E Fo Fr
Paucispinigera n. sp. Stark E F
Pirara matakiri Boothroyd & Cranston, 1995 E Fr
Podochlus cockaynei Brundin, 1966 E Sa Fr
Podochlus grandis Brundin, 1966 E Sa Fr
Podochlus knoxi Brundin, 1966 E Sa Fr
Podochlus stouti Brundin, 1966 E Sa Fr
Podonomus parochloides Brundin, 1966 E Sa Fr
Podonomus pygmaeus Brundin, 1966 E Sa Fr
Podonomus waikukupae Brundin, 1966 E Sa Fr
Podonomus n. spp. (4) Brundin 1966 4E Sa Fr
Polypedilum alternans Forsyth, 1971 E F
Polypedilum canum Freeman, 1959 E Fr
Polypedilum cumberi Freeman, 1959 E F
Polypedilum digitulum Freeman, 1959 E F
Polypedilum harrisi Freeman, 1959 E Fr
Polypedilum lentum (Hutton, 1902) E F
Polypedilum longicrus Kieffer, 1921 A F
Polypedilum luteum Forsyth, 1971 E Fr
Polypedilum opimum (Hutton, 1902) E Fr
Polypedilum pavidum (Hutton, 1902) E Fs
Polypedilum n. sp. Boothroyd E F
Pterosis wisei Sublette & Wirth, 1980 E Su F
Riethia zeylandica Freeman, 1959 F
Semiocladius kuscheli Sublette & Wirth, 1980 E Su
Semiocladius reinga (Leader, 1975) E Be SW ?MoP
Semiocladius whangaroa (Leader, 1975) E SW ?MoP
Semiocladius n. sp. Boothroyd E
Smittia verna (Hutton, 1902) E Gr ?S or Li
Stempellina n. sp. Boothroyd E F
Stictocladius lacuniferus (Freeman, 1959) E F
Stictocladius pictus (Freeman, 1959) E F
'Tanypus' debilis (Hutton, 1902) E F
'Tanypus' languidus Hutton, 1902 E F
Tanytarsus albanyensis Forsyth, 1971 E F
Tanytarsus funebris Freeman, 1959 E Fr,Fs
Tanytarsus vespertinus Hutton, 1902 E Fr,Fs
Tanytarsus n. sp. Winterbourn et al. 2000 E Hs F
Tanytarsus n. sp. Boothroyd E F
Telmatogeton antipodensis Sublette & Wirth, 1980 E Su Be SW
Telmatogeton mortoni Leader, 1975 E Be ?F
Thienimanniella n. sp. Boothroyd E
Tonnoirocladius commensalis (Tonnoir, 1923) E F
Xenochironomus canterburyensis Freeman, 1959 E Fs MoP
Zavrelimyia harrisi (Freeman, 1959) E Fr&Fs
Zelandochlus latipalpis Brundin, 1966 E Sa Fr Gl
Gen. nov. (8) et n. spp. (9) Boothroyd 9E F
CORETHRELLIDAE
Corethrella novaezealandiae Tonnoir, 1927 E F IPr ?BF
CULICIDAE [Holder]
Aedes antipodeus (Edwards, 1920) Fs
Aedes australis (Erichson, 1842) A SW
Aedes chathamicus Dumbleton, 1962 E SW
Aedes notoscriptus (Skuse, 1889) A Fo Fs BF
Aedes subalbirostris Klein & Marks, 1960 E Fs
Coquillettidia iracunda (Walker, 1848) E F LP
Coquillettidia tenuipalpis (Edwards, 1924) E F
Culex asteliae Belkin, 1968 E Fs
Culex pervigilans Bergroth, 1889 E FoGr Fs BF
Culex quinquefasciatus Say, 1823 A Fs
Culex rotoruae Belkin, 1968 E F
Culiseta novaezealandiae Pillai, 1966 E Fs
Culiseta tonnoiri (Edwards, 1925) E Fo Fs BF
Maorigoeldia argyropa (Walker, 1848) E Fs
Opifex fuscus Hutton, 1902 E RsSW BF
DITOMYIIDAE [Toft]
Australosymmerus basalis (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Australosymmerus fumipennis (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Australosymmerus nitidus (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Australosymmerus tillyardi (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Australosymmerus trivittatus Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta bicolor Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta flavoscutellata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta harrisi Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta hexachaeta Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta hudsoni (Marshall, 1896) E Fo
Nervijuncta longicauda Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta marshalli Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta nigrescens Marshall, 1896 E Fo
Nervijuncta nigricornis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta nigricoxa Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta ostensackeni Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta parvicauda Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta pilicornis Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta pulchella Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta punctata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta ruficeps Edwards *in* Tonnoir & Edwards, 1927 E Fo
Nervijuncta tridens (Hutton, 1881) E Fo
Nervijuncta wakefieldi (Edwards, 1921) E Fo
Nervijuncta n. spp. (2) Toft 2E
DIXIDAE
Dixella fuscinervis (Tonnoir, 1924) E Sa Fs
Dixella harrisi (Tonnoir, 1925) E Fo Fs
Dixella neozelandica (Tonnoir, 1924) E Fs
Dixella tonnoiri (Belkin, 1968) E Fo Fs
Neodixa minuta (Tonnoir, 1924) E F
Nothodixa campbelli (Alexander, 1922) E Fs
Nothodixa otagensis (Alexander, 1922) E F
Nothodixa philpotti (Tonnoir, 1924) E F
Nothodixa septentrionalis (Tonnoir, 1924) E F
KEROPLATIDAE mostly fungus feeders Ff [Toft]
Arachnocampa luminosa (Skuse, 1891) E Cv-Fo
Cerotelion bimaculatum Tonnoir *in* Tonnoir & Edwards, 1927 E
Cerotelion dendyi (Marshall, 1896) E
Cerotelion hudsoni (Marshall, 1896) E
Cerotelion leucoceras (Marshall, 1896) E
Cerotelion nigrum Tonnoir *in* Tonnoir & Edwards, 1927 E
Cerotelion tapleyi Edwards *in* Tonnoir & Edwards, 1927 E
Cerotelion vitripenne Tonnoir *in* Tonnoir & Edwards,

1927 E
Chiasmoneura fenestrata (Edwards *in* Tonnoir & Edwards, 1927) E Fo
Chiasmoneura milligani (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Isoneuromyia harrisi (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Isoneuromyia novaezelandiae (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Macrocera annulata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Macrocera antennatis Marshall, 1896 E Fo
Macrocera campbelli Edwards *in* Tonnoir & Edwards, 1927 E Fo
Macrocera fusca Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Macrocera glabrata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Macrocera gourlayi Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Macrocera howletti Marshall, 1896 E Fo
Macrocera hudsoni Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Macrocera ngaireae Edwards *in* Tonnoir & Edwards, 1927 E Fo
Macrocera obsoleta Edwards *in* Tonnoir & Edwards, 1927 E Fo
Macrocera pulchra Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Macrocera ruficollis Edwards *in* Tonnoir & Edwards, 1927 E Fo
Macrocera scoparia Marshall, 1896 E Fo
Macrocera tonnoiri Matile, 1989 E Fo
Macrocera unipunctata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Neoplatyura brookesi (Edwards *in* Tonnoir & Edwards, 1927) E
Neoplatyura lamellata (Tonnoir *in* Tonnoir & Edwards, 1927) E
Neoplatyura marshalli (Tonnoir *in* Tonnoir & Edwards, 1927) E
Neoplatyura proxima (Tonnoir *in* Tonnoir & Edwards, 1927) E
Orfelia nemoralis (Meigen, 1818) A Gr
Paramacrocera brevicornis Edwards *in* Tonnoir & Edwards, 1927 E
'Platyura' albovittata (Tonnoir *in* Tonnoir & Edwards, 1927) E
Pseudoplatyura truncata Tonnoir *in* Tonnoir & Edwards, 1927 E
Pyrtaula agricolae (Marshall, 1896) E
Pyrtaula campbelli (Tonnoir *in* Tonnoir & Edwards, 1927) E
Pyrtaula carbonaria (Tonnoir *in* Tonnoir & Edwards, 1927) E
Pyrtaula chiltoni (Tonnoir *in* Tonnoir & Edwards, 1927) E
Pyrtaula curtisi (Edwards *in* Tonnoir & Edwards, 1927) E
Pyrtaula maculipennis (Tonnoir *in* Tonnoir & Edwards, 1927) E
Pyrtaula ohakunensis (Edwards *in* Tonnoir & Edwards, 1927) E Fo
Pyrtaula philpotti (Tonnoir *in* Tonnoir & Edwards, 1927) E
Pyrtaula punctifusa (Edwards *in* Tonnoir & Edwards, 1927) E
Pyrtaula ruficauda (Tonnoir *in* Tonnoir & Edwards, 1927) E
Pyrtaula rufipectus (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Pyrtaula rutila (Edwards *in* Tonnoir & Edwards, 1927) E
Pyrtaula n. sp. Toft E
Rypatula brevis (Tonnoir *in* Tonnoir & Edwards, 1927) E
Rypatula subbrevis (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
MYCETOPHILIDAE ~ fungus feeders Ff
[Toft, Didham, Matile, Jaschhof]
Allocotocera anaclinoides (Marshall, 1896) E
Allocotocera cephasi Edwards *in* Tonnoir & Edwards, 1927 E
Allocotocera crassipalpis Tonnoir *in* Tonnoir & Edwards, 1927 E
Allocotocera dilatata Tonnoir *in* Tonnoir & Edwards, 1927 E
Aneura appendiculata Tonnoir *in* Tonnoir & Edwards, 1927 E
Aneura bispinosa Edwards *in* Tonnoir & Edwards, 1927 E
Aneura boletinoides Marshall, 1896 E
Aneura defecta Edwards *in* Tonnoir & Edwards, 1927 E
Aneura fagi (Marshall, 1896) E
Aneura filiformis Tonnoir *in* Tonnoir & Edwards, 1927 E
Aneura fusca Tonnoir *in* Tonnoir & Edwards, 1927 E
Aneura jaschhofi Zaitzev, 2001 E
Aneura longicauda Tonnoir *in* Tonnoir & Edwards, 1927 E
Aneura longipalpis Tonnoir *in* Tonnoir & Edwards, 1927 E
Aneura nitida Tonnoir *in* Tonnoir & Edwards, 1927 E
Aneura pallida Edwards *in* Tonnoir & Edwards, 1927 E
Aneura tonnoiri Zaitzev, 2001 E
Anomalomyia affinis Tonnoir *in* Tonnoir & Edwards, 1927 E
Anomalomyia basalis Tonnoir *in* Tonnoir & Edwards, 1927 E
Anomalomyia flavicauda Edwards *in* Tonnoir & Edwards, 1927 E
Anomalomyia guttata (Hutton, 1901) E Fo-Gr
Anomalomyia immaculata Edwards *in* Tonnoir & Edwards, 1927 E
Anomalomyia minor (Marshall, 1896) E
Anomalomyia obscura Tonnoir *in* Tonnoir & Edwards, 1927 E
Anomalomyia subobscura Tonnoir *in* Tonnoir & Edwards, 1927 E
Anomalomyia thompsoni Tonnoir *in* Tonnoir & Edwards, 1927 E
Anomalomyia viatoris Edwards *in* Tonnoir & Edwards, 1927 E
Austrosynapha apicalis (Tonnoir *in* Tonnoir & Edwards, 1927) E
Austrosynapha cawthroni (Tonnoir *in* Tonnoir & Edwards, 1927) E
Austrosynapha claripennis (Tonnoir *in* Tonnoir & Edwards, 1927) E
Austrosynapha gracilis (Tonnoir *in* Tonnoir & Edwards, 1927) E
Austrosynapha parva (Edwards *in* Tonnoir & Edwards, 1927) E
Austrosynapha pulchella (Tonnoir *in* Tonnoir & Edwards, 1927) E
Austrosynapha similis (Tonnoir *in* Tonnoir & Edwards, 1927) E
Brevicornu antennata (Harrison, 1964) E Su
Brevicornu brunnea (Harrison, 1964) E Su
Brevicornu flavum Marshall, 1896 E
Brevicornu fragile Marshall, 1896 E
Brevicornu maculatum (Tonnoir *in* Tonnoir & Edwards, 1927) E
Brevicornu marshalli Zaitzev, 2002 E
Brevicornu matilei Zaitzev, 2002 E
Brevicornu quadriseta (Edwards *in* Tonnoir & Edwards, 1927) E
Brevicornu rufithorax (Tonnoir *in* Tonnoir & Edwards, 1927) E
Brevicornu subrufithorax Zaitzev, 2002 E
Brevicornu tongariro Zaitzev, 2002 E
Cawthronia nigra Tonnoir *in* Tonnoir & Edwards, 1927 E
Cowanomyia hillaryi Jaschhof & Jaschhof, 2009 E
Cycloneura flava Marshall, 1896 E Fo
Cycloneura triangulata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Cycloneura n. spp. (6) 6E
Exechia biseta Edwards *in* Tonnoir & Edwards, 1927 E
Exechia filata Edwards *in* Tonnoir & Edwards, 1927 E
Exechia hiemalis (Marshall, 1896) E
Exechia howesi Edwards *in* Tonnoir & Edwards, 1927 E
Exechia novaezelandiae Tonnoir *in* Tonnoir & Edwards, 1927 E
Exechia thomsoni Miller, 1918 E
Exechia n. sp. Matile E
Leia arsona Hutson, 1978 A
Manota birgitae Jaschhof & Jaschhof, 2010 E Fo
Manota granvillensis Jaschhof & Jaschhof, 2010 E Fo
Manota maorica Edwards *in* Tonnoir & Edwards, 1927 E
Manota purakaunui Jaschhof & Jaschhof, 2010 E Fo
Manota regineae Jaschhof & Jaschhof, 2010 E Fo
Morganiella fusca Tonnoir *in* Tonnoir & Edwards, 1927 E
Morganiella n. sp. E
Mycetophila campbellensis Harrison, 1964 E Su
Mycetophila clara Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila colorata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila conica Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila consobrina Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila crassitarsis Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila curtisi Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila diffusa Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila dilatata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila elegans Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila elongata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila fagi Marshall, 1896 E Fo
Mycetophila filicornis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila fumosa Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila furtiva Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila grandis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila griseofusca griseofusca Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila g. nigriclava Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila grisescens Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila harrisi Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila howletti Marshall, 1896 E
Mycetophila impunctata Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila integra Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila intermedia Edwards *in* Tonnoir & Edwards, 1927 E Fo

Mycetophila latifascia Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila lomondensis Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila luteolateralis Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila marginepunctata marginepunctata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila m. ruapehensis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila m. rotundipennis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila marshalli Enderlein, 1910 E Fo
Mycetophila media Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila minima Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila nigricans Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila nigripalpis Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila nitens Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila nitidula Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila ornatissima Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila phyllura Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila pollicata Edwards *in* Tonnoir & Edwards, 1927 E
Mycetophila pseudomarshalli Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila solitaria Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila spinigera Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila submarshalli Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila subnitens Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila subspinigera Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila subtenebrosa Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila subtillis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila sylvatica Marshall, 1896 E Fo
Mycetophila tapleyi Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila tenebrosa Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila tonnoiri Matile, 1989 E Fo
Mycetophila trispinosa Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila unispinosa Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila virgata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila viridis Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila vulgaris Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycetophila n. spp. (4) Matile, Toft 4E
Mycomya flavilatera Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycomya furcata Edwards *in* Tonnoir & Edwards, 1927 E Fo
Mycomya plagiata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Mycomya n. sp. Matile E
Neoaphelomera elongata Tonnoir *in* Tonnoir & Edwards, 1927 E
Neoaphelomera forcipata Edwards *in* Tonnoir & Edwards, 1927 E
Neoaphelomera longicauda Edwards *in* Tonnoir & Edwards, 1927 E
Neoaphelomera majuscula Edwards *in* Tonnoir & Edwards, 1927 E
Neoaphelomera marshalli Edwards *in* Tonnoir & Edwards, 1927 E
Neoaphelomera opaca Tonnoir *in* Tonnoir & Edwards, 1927 E
Neoaphelomera skusei Marshall, 1896 E Sn Su
Neotrizygia obscura Tonnoir *in* Tonnoir & Edwards, 1927 E
Neotrizygia n. spp. (6) 6E
Paracycloneura apicalis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Paracycloneura inopinata Jaschhof & Kallweit, 2009 E Fo
Paracycloneura sp. Jaschhof & Kallweit 2009
Paradoxa fusca Marshall, 1896 E
Parvicellula apicalis Tonnoir *in* Tonnoir & Edwards, 1927 E
Parvicellula fuscipennis Edwards *in* Tonnoir & Edwards, 1927 E
Parvicellula gracilis Tonnoir *in* Tonnoir & Edwards, 1927 E
Parvicellula hamata Edwards *in* Tonnoir & Edwards, 1927 E
Parvicellula nigricoxa Tonnoir *in* Tonnoir & Edwards, 1927 E
Parvicellula obscura Tonnoir *in* Tonnoir & Edwards, 1927 E
Parvicellula ruficoxa Tonnoir *in* Tonnoir & Edwards, 1927 E
Parvicellula subhamata Tonnoir *in* Tonnoir & Edwards, 1927 E
Parvicellula triangula Marshall, 1896 E
Phthinia longiventris Tonnoir *in* Tonnoir & Edwards, 1927 E
Phthinia n. sp. Toft E
Platurocypta dilatata Tonnoir 1927 E Fo
Platurocypta immaculata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Sciophila parviareolata Santos Abreu, 1920 A
Sciophila ocreata Phillipi, 1865 A
Sigmoleia melanoxantha Edwards *in* Tonnoir & Edwards, 1927 E
Sigmoleia peterjohnsi Jaschhof & Kallweit, 2009 E
Sigmoleia separata Jaschhof & Kallweit, 2009 E
Sigmoleia similis Jaschhof & Kallweit, 2009 E
Taxicnemis flava Edwards *in* Tonnoir & Edwards, 1927 E
Taxicnemis marshalli Matile, 1989 E
Taxicnemis n. spp. (2) 2E
Tetragoneura exigua Matile, 1989 E
Tetragoneura flexa Edwards *in* Tonnoir & Edwards, 1927 E
Tetragoneura fusca Tonnoir *in* Tonnoir & Edwards, 1927 E
Tetragoneura minima Tonnoir *in* Tonnoir & Edwards, 1927 E
Tetragoneura nigra Marshall, 1896 E
Tetragoneura obliqua Edwards *in* Tonnoir & Edwards, 1927 E Fo
Tetragoneura obscura Tonnoir *in* Tonnoir & Edwards, 1927 E
Tetragoneura opaca Tonnoir *in* Tonnoir & Edwards, 1927 E
Tetragoneura proxima Tonnoir *in* Tonnoir & Edwards, 1927 E
Tetragoneura rufipes Tonnoir *in* Tonnoir & Edwards, 1927 E
Tetragoneura spinipes Edwards *in* Tonnoir & Edwards, 1927 E Fo
Tetragoneura tonnoiri Matile, 1989 E
Tetragoneura ultima Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Tetragoneura venusta Tonnoir *in* Tonnoir & Edwards, 1927 E
Tetragoneura n. spp. (20) 20E
Tonnwardsia aberrans (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Tonnwardsia n. spp. (6) 6E
Trichoterga monticola monticola Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Trichoterga m. incisurata Edwards *in* Tonnoir & Edwards, 1927 E Fo
Waipapamyia dentata Jaschhof & Kallweit, 2009 E
Waipapamyia elongata Jaschhof & Kallweit, 2009 E
Waipapamyia truncata Jaschhof & Kallweit, 2009 E
Zygomyia acuta Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia albinotata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia apicalis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia bifasciola Matile, 1989 E Fo
Zygomyia bivittata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia brunnea Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia costata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia crassicauda Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia crassipyga Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia diffusa Edwards *in* Tonnoir & Edwards, 1927 E
Zygomyia distincta Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia egmontensis Zaitzev, 2002 E Fo
Zygomyia eluta Edwards *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia filigera Edwards *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia flavicoxa Marshall, 1896 E Fo
Zygomyia fusca Marshall, 1896 E Fo
Zygomyia grisescens Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia guttata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia humeralis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia immaculata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia longicauda Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia marginata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia multiseta Zaitzev, 2002 E Fo
Zygomyia nigrita Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia nigriventris Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia nigrohalterata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia obsoleta Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia ovata Zaitzev, 2002 E Fo
Zygomyia penicillata Edwards *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia ruficollis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia rufithorax Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia similis Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia submarginata Harrison, 1955 E Su Fo
Zygomyia submarginata Zaitzev, 2002 E [preoccupied name]
Zygomyia taranakiensis Zaitzev, 2002 E Fo

Zygomyia trifasciata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia trispinosa Zaitzev, 2002 E Fo
Zygomyia truncata Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia unispinosa Tonnoir *in* Tonnoir & Edwards, 1927 E Fo
Zygomyia varipes Edwards *in* Tonnoir & Edwards, 1927 E Fo
Gen. nov. 1 et n. spp. (3) 3E
Gen. nov. 2 et n. spp. (2) 2E
Gen. nov. 3 et n. sp. E
Gen. nov. 4 et n. sp. E
MYCETOPHILIFORMIA INCERTAE SEDIS
Starkomyia inexpecta Jaschhof, 2004 E Fo
PSYCHODIDAE
Ancyroaspis funebris (Hutton, 1902) E We
Ancyroaspis multimaculata (Satchell, 1950) E
Brunettia novaezelandiae Satchell, 1950 E Fo
Didicrum clarkei (Satchell, 1950) E
Didicrum claviatum (Satchell, 1950) E
Didicrum drepanatum (Satchell, 1950) E
Didicrum maurum (Satchell, 1950) E
Didicrum solitarium (Satchell, 1954) E
Didicrum triuncinatum (Satchell, 1950) E
Logima surcoufi (Tonnoir, 1922) A Ga Gr Li D
Nemapalpus zelandiae Alexander, 1921 E
Psychoda acutipennis Tonnoir, 1920 E Su
Psychoda alternata Say, 1824 A Se
Psychoda parthenogenetica Tonnoir, 1940 A
Psychoda pseudoalternata Williams, 1946 A
Psychoda solivaga Duckhouse, 1971 E Su
Psychodocha brachyptera (Quate, 1964) E Su
Psychodocha campbellica (Quate, 1964) E Su
Psychodocha cinerea Banks, 1894 A
Psychodocha eremita (Quate, 1964) E Su
Psychodocha formosa (Satchell, 1954) E
Psychodocha inaequalis (Satchell, 1950) E
Psychodocha lloydi (Satchell, 1950) E
Psychodocha novaezealandica (Satchell, 1950) E
Psychodocha penicillata (Satchell, 1950) A
Psychodocha pulchrima (Satchell, 1954) E
Psychodocha setistyla (Satchell, 1950) E
Psychodocha simplex (Satchell, 1954) E
Psychodocha squamulata (Satchell, 1950) E
Psychodocha triaciculata (Satchell, 1950) E
Psychodocha tridens (Satchell, 1954) E
Psychodocha zonata (Satchell, 1950) E Li
Psychodula harrisi (Satchell, 1950) A D
Satchellomyia barbata (Satchell, 1954) E
Satchellomyia bifalcata (Satchell, 1950) E
Satchellomyia bilobata (Satchell, 1954) E
Satchellomyia diffusa (Satchell, 1954) E
Satchellomyia gourlayi (Satchell, 1950) E
Satchellomyia lobisterna (Satchell, 1950) E
Satchellomyia serratipenis (Satchell, 1950) E
Satchellomyia spiralifera (Satchell, 1950) E
Sycorax cryptella Satchell, 1950 E
Sycorax dispar Satchell, 1950 E
Sycorax impatiens Satchell, 1950 E
Sycorax milleri Satchell, 1950 E
Threticus philpotti (Satchell, 1950) E
Threticus tortuosus Duckhouse, 1971 E Su
Trichomyia fusca Satchell, 1950 E Fo
Trichomyia capsulata Duckhouse, 1980 E Fo
Trichomyia n. sp. E Fo
Gen. indet. et n. spp. (12–29) ?12–29 E Satchell 1950
RANGOMARAMIDAE
Anisotricha novaezelandiae (Tonnoir *in* Tonnoir & Edwards, 1927) E Fo
Anisotricha similis Jaschhof, 2004 E Fo
Insulatricha catrinae Jaschhof, 2004 E Fo
Insulatricha chandleri Jaschhof, 2004 E Fo
Insulatricha hippai Jaschhof, 2004 E Fo
Ohakunea australiensis Colless, 1963*
Ohakunea bicolor Edwards *in* Tonnoir & Edwards, 1927 E
Rangomarama edwardsi Jaschhof & Didham, 2002 E Fo
Rangomarama humboldti Jaschhof & Didham, 2002 E Fo
Rangomarama leopoldinae Jaschhof & Didham, 2002 E Fo
Rangomarama matilei Jaschhof & Didham, 2002 E Fo
Rangomarama tonnoiri Jaschhof & Didham, 2002 E Fo
SCATOPSIDAE [Andrew, Macfarlane]
Anapausis stapedifortmis Freeman, 1989 E Fo
Anapausis zealandica Freeman, 1989 E Fo
Coboldia fuscipes (Meigen, 1830) A Ga Li
Colobostemus n. spp. (3) Andrew & Macfarlane 3E Fo
Rhegmoclemina n. spp. (2) 2E Andrew
Scatopse notata (Linnaeus, 1758) A Ga Li
SCIARIDAE
Bradysia ?*amoena* (Winnertz, 1867) A
Bradysia ?*brunnipes* (Meigen, 1804)* A Gr Fo Hr
Bradysia campbellensis Steffan, 1964 E Gr
Bradysia difformis Frey, 1948 A GrGa HR
Bradysia rubra (Harrison, 1955) E Su Gr
Bradysia sp. indet.* GrFo (MAFNZ)
Corynoptera ancylospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera basisetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera coronospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera cowanorum Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera densisetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera densospica Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera didymistyla Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera dividospica Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera expressospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera facticia Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera filisetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera filispica Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera fuscispica Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera harrisi (Edwards *in* Tonnoir & Edwards, 1927) E
Corynoptera hemisetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera microsetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera nigrospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera nigrotegminis Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera oririclausa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera parasetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera? *philpotti* (Tonnoir *in* Tonnoir & Edwards, 1927) E
Corynoptera pentaspina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera plasiosetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera prinospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera priscospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera pronospica Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera propriospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera prosospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera psilospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera quasisetosa Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera semiaggregata Mohrig *in* Mohrig & Jaschhof, 1999 E
Corynoptera subantarctica Steffan, 1964 E Gr
Corynoptera tapleyi (Edwards *in* Tonnoir & Edwards, 1927) E Li
Corynoptera variospina Mohrig *in* Mohrig & Jaschhof, 1999 E
Cratyna zealandica Mohrig *in* Mohrig & Jaschhof, 1999 E
Ctenosciara constrictans (Edwards *in* Tonnoir & Edwards, 1927) E
Ctenosciara griseinervis (Edwards *in* Tonnoir & Edwards, 1927) E
Ctenosciara hyalipennis? (Meigen, 1804) A
Ctenosciara nigrostyla Mohrig *in* Mohrig & Jaschhof, 1999 E
Ctenosciara nudopterix Mohrig *in* Mohrig & Jaschhof, 1999 E
Ctenosciara ovalis (Edwards *in* Tonnoir & Edwards, 1927) E
Ctenosciara rufulenta (Edwards *in* Tonnoir & Edwards, 1927) E Li
Ctenosciara xanthonota (Edwards *in* Tonnoir & Edwards, 1927) E
Epidapus chaetovenosus Mohrig *in* Mohrig & Jaschhof, 1999 E
Epidapus ctenosciaroides Mohrig *in* Mohrig & Jaschhof, 1999 E
Epidapus espinosalus Mohrig *in* Mohrig & Jaschhof, 1999 E
Epidapus parvus Mohrig *in* Mohrig & Jaschhof, 1999 E
Epidapus n. sp. E
Lycoriella castanescens (Lengersdorf, 1940)* A Gr-Fo Ff Ca
Lycoriella ?*ingenua* (Dufour, 1839)* A Gr HR
Neophmyxia nelsonia Tonnoir *in* Tonnoir & Edwards, 1927 ?E
Pseudolycoriella bispina Mohrig *in* Mohrig & Jaschhof, 1999 E
Pseudolycoriella breviseta Mohrig *in* Mohrig & Jaschhof, 1999 E
Pseudolycoriella jejuna (Edwards *in* Tonnoir & Edwards, 1927) E
Pseudolycoriella macrotegmenta Mohrig *in* Mohrig & Jaschhof, 1999 E
Pseudolycoriella zealandica (Edwards *in* Tonnoir & Edwards, 1927) E
Scatopsciara unicalcarata (Edwards *in* Tonnoir & Edwards, 1927) E
'*Sciara*' *marcilla* (Hutton, 1902) A?
'*Sciara*' *neorufescens* Miller, 1950 E
'*Sciara*' *zealandica* Kieffer, 1910 E
Scythropochroa nitida Edwards *in* Tonnoir & Edwards, 1927 E Fo
Xylosciara brevipes Steffan, 1964 E Su
Zygoneura contractans (Edwards *in* Tonnoir & Edwards, 1927) E
SIMULIIDAE
Austrosimulium albovelatum Dumbleton, 1973 E Fr
Austrosimulium australense (Schiner, 1868) E Fr
Austrosimulium bicorne Dumbleton, 1973 E Fr
Austrosimulium campbellense Dumbleton, 1973 E Su Fr

Austrosimulium dumbletoni Crosby, 1976 E Fr
Austrosimulium laticorne Tonnoir, 1925 E Fr
Austrosimulium laticorne alveolatum Dumbleton, 1973 E Fr
Austrosimulium longicorne Tonnoir, 1925 E Fr
Austrosimulium multicorne Tonnoir, 1925 E Fr
Austrosimulium multicorne stewartense Dumbleton, 1973 E Fr
Austrosimulium stewartense Dumbleton, 1973 E Fr
Austrosimulium tillyardianum Dumbleton, 1973 E Fr
Austrosimulium ungulatum Tonnoir, 1925 E Fr
Austrosimulium unicorne Dumbleton, 1973 E Fr
Austrosimulium vexans (Mik, 1881) E Su Fr
TANYDERIDAE [Judd]
Mischoderus annuliferus (Hutton, 1901) E F
Mischoderus forcipatus (Osten Sacken, 1880) E F
Mischoderus marginatus (Edwards, 1923) I[C] E F
Mischoderus neptunus (Edwards, 1923) I[C] E F
Mischoderus varipes (Edwards, 1923) E F
Mischoderus n. spp. (2) 2E Judd
THAUMALEIDAE
Austrothaumalea appendiculata Tonnoir, 1927 E F
Austrothaumalea crosbyi McLellan, 1988 E F
Austrothaumalea gibbsi McLellan, 1988 E F
Austrothaumalea macfarlanei McLellan, 1988 E F
Austrothaumalea maxwelli McLellan, 1988 E F
Austrothaumalea neozelandica Tonnoir, 1927 E F
Austrothaumalea ngaire McLellan, 1988 E F
Austrothaumalea pala McLellan, 1988 E F
Austrothaumalea walkerae McLellan, 1988 E F
Austrothaumalea zwicki McLellan, 1988 E F
Oterere oliveri McLellan, 1988 E F
TIPULIDAE
Acantholimnophila bispina (Alexander, 1922) E
Acantholimnophila maorica (Alexander, 1922) E
Amphineurus bicinctus Edwards, 1923 E
Amphineurus bicorniger Alexander, 1924 E
Amphineurus blackballensis Alexander, 1953 E
Amphineurus breviclavus Alexander, 1924 E
Amphineurus cacoxenus Alexander, 1925 E
Amphineurus campbelli Alexander, 1922 E
Amphineurus cyathetanus Alexander, 1952 E
Amphineurus edentulus Alexander, 1939 E
Amphineurus fatuus (Hutton, 1902) E
Amphineurus fimbriatulus Alexander, 1925 E
Amphineurus flexuosus Alexander, 1923 E
Amphineurus gracilisentis Alexander, 1922 E
Amphineurus harrisi Alexander, 1922 E
Amphineurus hastatus Alexander, 1925 E
Amphineurus horni Edwards, 1923 E
Amphineurus hudsoni Edwards, 1923 E
Amphineurus insulsus (Hutton, 1902) E
Amphineurus kingi Alexander, 1950 E
Amphineurus longi Alexander, 1950 E
Amphineurus lyriformis Alexander, 1923 E
Amphineurus meridionalis Alexander, 1924 E
Amphineurus minor Alexander, 1923 E
Amphineurus molophilinus Alexander, 1922 E
Amphineurus niveinervis Edwards, 1923 E
Amphineurus nothofagi Alexander, 1925 E
Amphineurus ochroplacus Alexander, 1925 E
Amphineurus operculatus Alexander, 1924 E
Amphineurus otagensis Alexander, 1922 E
Amphineurus patruelis Alexander, 1925 E
Amphineurus perarmatus Alexander, 1924 E
Amphineurus perdecorus Edwards, 1923 E
Amphineurus pressus Alexander, 1922 E
Amphineurus pulchripes Alexander, 1925 E
Amphineurus recurvans Alexander, 1922 E
Amphineurus senex Alexander, 1922 E
Amphineurus spinulistylus Alexander, 1925 E
Amphineurus stewartiae Alexander, 1924 E
Amphineurus subdecorus Edwards, 1924 E
Amphineurus subfatuus Alexander, 1922 E
Amphineurus subglaber Edwards, 1923 E
Amphineurus submolophilinus Alexander, 1923 E
Amphineurus tenuipollex Alexander, 1952 E
Amphineurus tortuosus Alexander, 1923 E
Amphineurus tumidus Alexander, 1923 E
Amphineurus n. sp. E
Aphrophila flavopygialis (Alexander, 1922) E
Aphrophila luteipes Alexander, 1926 E
Aphrophila monacantha Alexander, 1926 E
Aphrophila neozelandica (Edwards, 1923) E F
Aphrophila tridentata Alexander, 1926 E
Aphrophila trifida Alexander, 1926 E
Aphrophila triton (Alexander, 1922) E
Aphrophila vittipennis Alexander, 1925 E
Aphrophila n. spp. (3) 3E
Atarba connexa (Alexander, 1923) E
Atarba eluta (Edwards, 1923) E
Atarba filicornis Alexander, 1922 E
Atarba viridicolor Alexander, 1922 E
Aurotipula aperta (Edwards, 1923) E
Aurotipula atroflava (Alexander, 1922) E
Aurotipula auroatra (Edwards, 1923) E
Aurotipula bivittata (Edwards, 1923) E
Aurotipula brevitarsis (Edwards, 1923) E
Aurotipula clara (Kirby, 1884) E
Aurotipula dux (Kirby, 1884) E
Aurotipula ferruginosa (Edwards, 1923) E
Aurotipula flavidipennis (Alexander, 1923) E
Aurotipula flavoscapa (Alexander, 1922) E
Aurotipula occlusa (Edwards, 1924) E
Aurotipula orion (Hudson, 1895) E
Aurotipula ruapehuensis (Alexander, 1923) E
Aurotipula n. sp. E
Austrolimnophila agathicola Alexander, 1952 E
Austrolimnophila argus (Hutton, 1900) E
Austrolimnophila atripes (Alexander, 1922) E
Austrolimnophila chrysorrhoea (Edwards, 1923) E
Austrolimnophila crassipes (Hutton, 1900) E
Austrolimnophila cyatheti (Edwards, 1923) E
Austrolimnophila geographica (Hutton, 1900) E
Austrolimnophila lambi (Edwards, 1923) E
Austrolimnophila leucomelas (Edwards, 1923) E
Austrolimnophila marshalli (Hutton, 1900) E
Austrolimnophila nigrocincta (Edwards, 1923) E
Austrolimnophila obliquata (Alexander, 1922) E
Austrolimnophila oculata (Edwards, 1923) E
Austrolimnophila oriunda (Alexander, 1952) E
Austrolimnophila proximata (Alexander, 1926) E
Austrolimnophila stemma (Alexander, 1922) E
Austrolimnophila stewartiae (Alexander, 1924) E
Austrolimnophila strigimacula (Edwards, 1923) E
Austrolimnophila subinterventa (Edwards, 1923) E
Austrolimnophila wilfredlongi Alexander, 1952 E
Austrolimnophila n. spp. (3) 3E
Austrotipula hudsoni Hutton, 1900 E
Brevicera aenigmatica (Alexander, 1926) E
Brevicera heterogama (Hudson, 1913) E
Brevicera mesocera (Alexander, 1922) E
Brevicera waitakerensis (Alexander, 1952) E
Brevicera n. sp. E
Cerozodia hemiptera Alexander, 1922 E
Cerozodia hudsoni Edwards, 1923 E
Cerozodia laticosta (Alexander, 1930) E
Cerozodia paradisea Edwards, 1923 E
Cerozodia plumosa Osten Sacken, 1888 E
Cerozodia pulverulenta Edwards, 1923 E
Cerozodia striata Edwards, 1923 E
Cheilotrichia hamiltoni (Alexander, 1939) E
Chlorotipula albistigma (Edwards, 1923) E
Chlorotipula elongata (Edwards, 1923) E
Chlorotipula holochlora (Nowicki, 1875) E
Chlorotipula virescens (Edwards, 1923) E
Chlorotipula viridis (Walker, 1856) E
Ctenolimnophila alpina (Alexander, 1922) E
Ctenolimnophila brevitarsis (Alexander, 1926) E
Ctenolimnophila fulvipleura (Alexander, 1923) E
Ctenolimnophila fumipennis (Alexander, 1923) E
Ctenolimnophila harrisiana (Alexander, 1924) E
Ctenolimnophila pallipes (Alexander, 1926) E
Ctenolimnophila venustipennis (Alexander, 1925) E
Dicranota n. sp.* E
Discobola ampla (Hutton, 1900) E
Discobola chathamica Alexander, 1924 E
Discobola dicycla Edwards, 1923 E
Discobola dohrni (Osten-Sacken, 1894) E
Discobola gibberina (Alexander, 1948) E
Discobola haetara Johns & Jenner, 2006 E
Discobola striata chathamica Alexander, 1924 E
Discobola s. striata Edwards, 1923 E
Discobola tessellata (Osten-Sacken, 1894) E
Discobola venustula Alexander, 1929 E
Dolichopeza atropos (Hudson, 1895) E
Dolichopeza fenwicki Alexander, 1923 E
Dolichopeza howesi Alexander, 1922 E
Dolichopeza parvicauda Edwards, 1923 E
Elephantomyia ruapehuensis Alexander, 1923 E
Elephantomyia zealandica Edwards, 1923 E
Geranomyia n. sp.* E
Gonomyia banksiana Alexander, 1924 E
Gonomyia bispina Alexander, 1924 E
Gonomyia circumcincta Alexander, 1924 E
Gonomyia longispina Alexander, 1922 E
Gonomyia ludibunda Alexander, 1926 E
Gonomyia nigrohalterata Edwards, 1923 E
Gonomyia oliveri Alexander, 1924 E
Gonomyia tenuistyla Alexander, 1926 E
Gonomyia n. spp. (3) 3E
Gynoplistia aculeata Alexander, 1924 E
Gynoplistia albicincta Edwards, 1923 E
Gynoplistia ambulator Alexander, 1924 E
Gynoplistia angustipennis Edwards, 1924 E
Gynoplistia anthracina Alexander, 1920 E
Gynoplistia arthuriana Edwards, 1923 E
Gynoplistia auriantopyga Alexander, 1922 E
Gynoplistia bicornis Alexander, 1924 E
Gynoplistia bidentata Alexander, 1922 E
Gynoplistia bilobata Alexander, 1923 E
Gynoplistia bituberculata Alexander, 1923 E
Gynoplistia bona Alexander, 1920 E
Gynoplistia bucera Alexander, 1923 E
Gynoplistia campbelli Alexander, 1922 E
Gynoplistia canterburiana Edwards, 1923 E
Gynoplistia chathamica Alexander, 1924 E
Gynoplistia cladophora Alexander, 1922 E
Gynoplistia clarkeana Alexander, 1951 E
Gynoplistia clavipes Edwards, 1923 E
Gynoplistia concava Alexander, 1922 E
Gynoplistia conjuncta Edwards, 1923 E
Gynoplistia cuprea Hutton, 1900 E
Gynoplistia dactylophora Alexander, 1926 E
Gynoplistia digitifera Alexander, 1953 E
Gynoplistia dilatata Alexander, 1924 E
Gynoplistia dimidiata Alexander, 1922 E
Gynoplistia dispila Alexander, 1923 E
Gynoplistia dispiloides Alexander, 1926 E
Gynoplistia eluta Alexander, 1923 E
Gynoplistia fimbriata Alexander, 1920 E
Gynoplistia flavohalterata Alexander, 1926 E
Gynoplistia formosa Hutton, 1900 E
Gynoplistia fulgens Hutton, 1900 E
Gynoplistia fuscoplumbea Edwards, 1923 E
Gynoplistia generosa Alexander, 1926 E
Gynoplistia glauca Edwards, 1923 E
Gynoplistia hamiltoni Alexander, 1924 E
Gynoplistia harrisi Alexander, 1922 E
Gynoplistia heighwayi Alexander, 1930 E
Gynoplistia hiemalis (Alexander, 1923) E
Gynoplistia hirsuticauda Alexander, 1923 E
Gynoplistia hirtamera Alexander, 1922 E
Gynoplistia hyalinata Alexander, 1923 E
Gynoplistia incisa Edwards, 1923 E
Gynoplistia inconjuncta Alexander, 1926 E
Gynoplistia inflata Alexander, 1926 E
Gynoplistia lobulifera Alexander, 1923 E

Gynoplistia luteibasis Alexander, 1922 E
Gynoplistia luteicincta Alexander, 1924 E
Gynoplistia lyrifera Alexander, 1922 E
Gynoplistia magnifica Edwards, 1923 E
Gynoplistia moanae Alexander, 1951 E
Gynoplistia myersae Alexander, 1924 E
Gynoplistia nebulipennis Alexander, 1922 E
Gynoplistia nebulosa Edwards, 1923 E
Gynoplistia nematomera Alexander, 1926 E
Gynoplistia neonebulosa Alexander, 1923 E
Gynoplistia nigrobimbo Alexander, 1923 E
Gynoplistia nigronitida Edwards, 1923 E
Gynoplistia niveicincta Alexander, 1922 E
Gynoplistia notabilis Alexander, 1926 E
Gynoplistia notata Edwards, 1923 E
Gynoplistia ocellifera Alexander, 1923 E
Gynoplistia orophila Alexander, 1923 E
Gynoplistia otagana Alexander, 1930 E
Gynoplistia pallidistigma Alexander, 1923 E
Gynoplistia pedestris Edwards, 1923 E
Gynoplistia percara Alexander, 1926 E
Gynoplistia persimilis Alexander, 1926 E
Gynoplistia philpotti Alexander, 1939 E
Gynoplistia pleuralis Alexander, 1923 E
Gynoplistia plutonis Alexander, 1926 E
Gynoplistia polita Edwards, 1923 E
Gynoplistia princeps Alexander, 1923 E
Gynoplistia purpurea Alexander, 1922 E
Gynoplistia pygmaea Alexander, 1923 E
Gynoplistia recurvata Alexander, 1923 E
Gynoplistia resecta Edwards, 1924 E
Gynoplistia romae Alexander, 1930 E
Gynoplistia sackeni Alexander, 1920 E
Gynoplistia serrulata Alexander, 1926 E
Gynoplistia speciosa Edwards, 1923 E
Gynoplistia speighti Edwards, 1923 E
Gynoplistia spinicalcar Alexander, 1922 E
Gynoplistia spinigera Alexander, 1922 E
Gynoplistia splendens Alexander, 1922 E
Gynoplistia subclavipes Alexander, 1924 E
Gynoplistia subfasciata Walker, 1848 E
Gynoplistia subformosa Alexander, 1924 E
Gynoplistia subobsoleta Alexander, 1923 E
Gynoplistia tridactyla Edwards, 1923 E
Gynoplistia trifasciata Edwards, 1923 E
Gynoplistia trispinosa Alexander, 1922 E
Gynoplistia troglophila Alexander, 1962 E
Gynoplistia tuberculata Edwards, 1923 E
Gynoplistia unimaculata Alexander, 1922 E
Gynoplistia vexator Alexander, 1952 E
Gynoplistia violacea Edwards, 1923 E
Gynoplistia vittinervis Alexander, 1924 E
Gynoplistia waitakerensis Alexander, 1952 E
Gynoplistia wakefieldi Westwood, 1881 E
Gynoplistia n. sp. E
Harrisomyia *bicuspidata* Alexander, 1923 E
Harrisomyia terebrella Alexander, 1932 E
Helius harrisi (Alexander, 1923) E
Heterolimnophila *subtruncata* Alexander, 1923 E
Heterolimnophila truncata Alexander, 1922 E
Idioglochina fumipennis (Butler, 1875) E
Idioglochina kronei (Mik, 1881) E Su
Leptotarsus albiplagia (Alexander, 1923) E
Leptotarsus alexanderi (Edwards, 1923) E
Leptotarsus amissionis (Alexander, 1952) E
Leptotarsus angusticosta (Alexander, 1923) E
Leptotarsus atridorsum (Alexander, 1922) E
Leptotarsus binotatus (Hutton, 1900) E
Leptotarsus campbelli (Alexander, 1923)
Leptotarsus cinereus (Edwards, 1923) E
Leptotarsus cubitalis (Edwards, 1923) E
Leptotarsus decoratus (Edwards, 1923) E
Leptotarsus dichroithorax (Alexander, 1920) E
Leptotarsus fumibasis (Edwards, 1923) E
Leptotarsus fucatus (Hutton, 1900) E
Leptotarsus fuscolateratus (Alexander, 1922) E
Leptotarsus glaucocapillus (Alexander, 1952) E
Leptotarsus greyanus (Alexander, 1922) E
Leptotarsus halteratus (Alexander, 1923) E
Leptotarsus hudsonianus (Alexander, 1922) E
Leptotarsus huttoni (Edwards, 1923) E
Leptotarsus incertus (Edwards, 1923) E
Leptotarsus intermedius (Alexander, 1922) E
Leptotarsus longioricornis (Alexander, 1923) E
Leptotarsus lunatus (Hutton, 1900) E
Leptotarsus mesocerus (Alexander, 1922) E
Leptotarsus minor (Edwards, 1923) E
Leptotarsus minutissimus (Alexander, 1923) E
Leptotarsus monstratus (Alexander, 1924) E
Leptotarsus montanus (Hutton, 1900) E
Leptotarsus neali (Oosterbroek, 1989) E
Leptotarsus obliquus (Edwards, 1923) E
Leptotarsus obliteratus (Alexander, 1923) E
Leptotarsus obscuripennis (Kirby, 1884) E
Leptotarsus ohakunensis (Alexander, 1923) E
Leptotarsus pallidistigmus (Alexander, 1922) E
Leptotarsus pallidus (Hutton, 1900) E
Leptotarsus pedestris (Alexander, 1939) E
Leptotarsus rufibasis (Alexander, 1922) E
Leptotarsus rufiventris (Edwards, 1923) E
Leptotarsus sessilis (Alexander, 1924) E
Leptotarsus simillimus (Alexander, 1924) E
Leptotarsus sinclairi (Edwards, 1923) E
Leptotarsus submancus (Alexander, 1923) E
Leptotarsus submontanus (Edwards, 1923) E
Leptotarsus subobsoletus (Alexander, 1926) E
Leptotarsus subtener (Alexander, 1922) E
Leptotarsus subvittatus (Alexander, 1939) E
Leptotarsus tapleyi (Alexander, 1923) E
Leptotarsus tenuifrons (Alexander, 1926) E
Leptotarsus variegatus (Edwards, 1923) E
Leptotarsus vittatus (Edwards, 1923) E
Leptotarsus vulpinus (Hutton, 1881) E
Leptotarsus zeylandiae (Alexander, 1920) E
Leptotarsus n. sp. E Su
Limnophila bryobia Mik, 1881 E Su
Limnophila campbelliana Alexander, 1932 E
Limnophila latistyla Alexander, 1923 E
Limnophila luteicauda Alexander, 1924 E
Limnophila mira Alexander, 1926 E
Limnophila miroides Alexander, 1932 E
Limnophila nebulifera Alexander, 1923 E
Limnophila oliveri Alexander, 1923 E
Limnophila perscita Alexander, 1926 E
Limnophila platyna Alexander, 1952 E
Limnophila quaesita Alexander, 1923 E
Limnophila scitula Alexander, 1926 E
Limnophila spissigrada Alexander, 1926 E
Limnophila tonnoiri Alexander, 1926 E
Limnophila n. sp. E
Limnophilella delicatula (Hutton, 1900) E
Limnophilella serotina (Alexander, 1922) E
Limonia acanthophallus (Alexander, 1924) E
Limonia aegrotans (Edwards, 1923) E
Limonia annulifera (Alexander, 1922) E
Limonia archeyi (Alexander, 1924) E
Limonia arthuriana (Alexander, 1924) E
Limonia brookesi (Edwards, 1923) E
Limonia chlorophylloides (Alexander, 1925) E
Limonia cinerella (Alexander, 1923) E
Limonia conulifera (Edwards, 1923) E
Limonia crassispina (Alexander, 1923) E
Limonia cuneipennis (Alexander, 1923) E
Limonia diversispina (Alexander, 1923) E
Limonia fasciata (Hutton, 1900) E
Limonia fulviceps (Alexander, 1925) E
Limonia fulvinota (Alexander, 1923) E
Limonia funesta (Alexander, 1922) E
Limonia gubernatoria (Alexander, 1924) E
Limonia hemimelas (Alexander, 1922) E
Limonia heteracantha (Alexander, 1923) E
Limonia hudsoni (Edwards, 1923) E
Limonia incompta (Alexander, 1922) E
Limonia insularis (Mik, 1881) E Su
Limonia kermadecensis Alexander, 1973 E
Limonia lindsayi (Alexander, 1924) E
Limonia luteipes (Alexander, 1923) E
Limonia luteonitens (Edwards, 1923) E
Limonia maoriensis (Alexander, 1923) E
Limonia megastigmosa (Alexander, 1922) E
Limonia melina (Alexander, 1924) E
Limonia moesta (Alexander, 1923) E
Limonia monilicornis (Hutton, 1900) E
Limonia multispina (Alexander, 1922) E
Limonia nebulifera (Alexander, 1922) E
Limonia nelsoniana (Alexander, 1925) E
Limonia nephelodes (Alexander, 1922) E
Limonia nigrescens (Hutton, 1900) E
Limonia otagensis (Alexander, 1924) E
Limonia pendulifera (Alexander, 1923) E
Limonia pictithorax (Alexander, 1923) E
Limonia plurispina (Alexander, 1925) E
Limonia primaeva Alexander, 1929 E
Limonia repanda (Edwards, 1923) E
Limonia reversalis (Alexander, 1922) E
Limonia seducta (Alexander, 1923) E
Limonia semicuneata (Alexander, 1924) E
Limonia sperata (Alexander, 1922) E
Limonia sponsa (Alexander, 1922) E
Limonia subfasciata (Alexander, 1924) E
Limonia subviridis (Alexander, 1922) E
Limonia sulphuralis (Edwards, 1923) E
Limonia tapleyi (Alexander, 1924) E
Limonia tarsalba (Alexander, 1922) E
Limonia tenebrosa (Edwards, 1923) E
Limonia torrens (Alexander, 1923) E
Limonia tricuspis (Alexander, 1923) E
Limonia tristigmata (Alexander, 1925) E
Limonia veenmani Oosterbroek, 1986 E
Limonia vicarians (Schiner, 1868) E Su
Limonia waitakeriae Alexander, 1952 E
Limonia weschei (Edwards, 1923) E
Limonia wilfredi Alexander, 1952 E
Limonia wiseana Alexander, 1955 E
Limonia n. spp. (3) 3E Su
Limonia n. spp. (9) 9E
Maoritipula *hudsoni* (Alexander, 1924) E
Maoritipula maori (Alexander, 1920) E
Metalibnotes perhyalina (Alexander, 1973) E K
Metalibnotes watti (Alexander, 1973) E K
Metalimnophila *alpina* Alexander, 1926 E
Metalimnophila apicispina (Alexander, 1923) E
Metalimnophila banksiana (Alexander, 1923) E
Metalimnophila greyana Alexander, 1926 E
Metalimnophila howesi (Alexander, 1922) E
Metalimnophila integra Alexander, 1926 E
Metalimnophila longi Alexander, 1952 E
Metalimnophila mirifica (Alexander, 1922) E
Metalimnophila montivaga Alexander, 1926 E
Metalimnophila nemocera (Alexander, 1923) E
Metalimnophila nigroapicata (Alexander, 1922) E
Metalimnophila palmata Alexander, 1932 E
Metalimnophila penicillata (Alexander, 1922) E
Metalimnophila productella Alexander, 1926 E
Metalimnophila protea Alexander, 1923 E
Metalimnophila simplicis (Alexander, 1922) E
Metalimnophila unipuncta (Alexander, 1922) E
Metalimnophila yorkensis Alexander, 1926 E
Metalimnophila n. spp. (2) 2E
Molophilus abruptus Alexander, 1923 E
Molophilus acanthus Alexander, 1923 E
Molophilus aenigmaticus Alexander, 1925 E
Molophilus analis Alexander, 1923 E
Molophilus aucklandicus Alexander, 1923 E
Molophilus banksianus Alexander, 1922 E
Molophilus basispina Alexander, 1923 E
Molophilus bidens Alexander, 1923 E
Molophilus bifalcatus Alexander, 1925 E

Molophilus brevinervis Alexander, 1923 E
Molophilus campbellianus Alexander, 1924 E
Molophilus coloratus Alexander, 1923 E
Molophilus coronarius Alexander, 1952 E
Molophilus crassistylus Alexander, 1952 E
Molophilus cristiferus Alexander, 1950 E
Molophilus cruciferus Alexander, 1922 E
Molophilus curtivena Alexander, 1925 E
Molophilus curvistylus Alexander, 1925 E
Molophilus cyatheticolus Alexander, 1950 E
Molophilus denticulatus Alexander, 1923 E
Molophilus evanidus Alexander, 1923 E
Molophilus flagellifer Alexander, 1922 E
Molophilus flavidulus Alexander, 1923 E
Molophilus flavomarginalis Alexander, 1923 E
Molophilus gladiator Alexander, 1939 E
Molophilus greyensis Alexander, 1925 E
Molophilus harrisianus Alexander, 1925 E
Molophilus heteracanthus Alexander, 1925 E
Molophilus hexacanthus Alexander, 1924 E
Molophilus hilaris Alexander, 1923 E
Molophilus howesi Alexander, 1923 E
Molophilus imberbis Alexander, 1923 E
Molophilus improcerus Alexander, 1939 E
Molophilus infantulus Edwards, 1923 E
Molophilus inornatus Edwards, 1923 E
Molophilus irregularis Alexander, 1923 E
Molophilus jenseni Alexander, 1924 E
Molophilus latipennis Alexander, 1923 E
Molophilus lindsayi Alexander, 1922 E
Molophilus longiclavus Alexander, 1924 E
Molophilus luteipennis Alexander, 1923 E
Molophilus luteipygus Alexander, 1922 E
Molophilus macrocerus Alexander, 1922 E
Molophilus macrophallus Alexander, 1925 E
Molophilus morosus Alexander, 1923 E
Molophilus multicinctus Edwards, 1923 E
Molophilus multispinosus Alexander, 1923 E
Molophilus myersi Alexander, 1925 E
Molophilus niveicinctus Alexander, 1922 E
Molophilus ohakunensis Alexander, 1923 E
Molophilus oliveri Alexander, 1922 E
Molophilus oppositus Alexander, 1923 E
Molophilus pallidulus Alexander, 1925 E
Molophilus parvulus Alexander, 1922 E
Molophilus pediformis Alexander, 1925 E
Molophilus perlucidus Alexander, 1950 E
Molophilus phalacanthus Alexander, 1950 E
Molophilus philpotti Alexander, 1922 E
Molophilus pictipleura Alexander, 1922 E
Molophilus picturatus Alexander, 1923 E
Molophilus pilosulus Edwards, 1924 E
Molophilus plagiatus Alexander, 1922 E
Molophilus porrectus Alexander, 1925 E
Molophilus pugnax Alexander, 1925 E
Molophilus pulcherrimus Edwards, 1923 E
Molophilus pullatus Alexander, 1924 E
Molophilus quadrifidus Alexander, 1922 E
Molophilus quinquespinosus Alexander, 1952 E
Molophilus recisus Alexander, 1924 E
Molophilus reduncus Alexander, 1925 E
Molophilus remotus Alexander, 1923 E
Molophilus repandus Alexander, 1923 E
Molophilus satyr Alexander, 1925 E
Molophilus secundus Alexander, 1923 E
Molophilus semiermis Alexander, 1926 E
Molophilus sepositus Alexander, 1923 E
Molophilus speighti Alexander, 1939 E
Molophilus stewartensis Alexander, 1924 E
Molophilus sublateralis Alexander, 1922 E
Molophilus submorosus Alexander, 1924 E
Molophilus subscaber Alexander, 1952 E
Molophilus subuliferus Alexander, 1925 E
Molophilus sylvicolus Alexander, 1924 E
Molophilus tanypus Alexander, 1922 E
Molophilus tenuissimus Alexander, 1923 E
Molophilus tenuistylus Alexander, 1923 E
Molophilus terminans Alexander, 1922 E
Molophilus tillyardi Alexander, 1922 E
Molophilus tonnoiri Alexander, 1925 E
Molophilus uniplagiatus Alexander, 1923 E
Molophilus variegatus Edwards, 1923 E
Molophilus verecundus Alexander, 1924 E
Molophilus n. sp. E Su
Nealexandriaria conveniens (Walker, 1848) E
Notholimnophila exclusa (Alexander, 1922) E
Nothophila fuscana Alexander, 1922 E
Nothophila nebulosa Alexander, 1922 E
Paralimnophila kumarensis (Alexander, 1939) E
Paralimnophila skusei (Hutton, 1902) E
Pedicia arthuriana (Alexander, 1924) E
Pedicia furcata (Alexander, 1926) E
Pedicia novaezelandiae (Alexander, 1922) E
Pedicia n. sp. E
Rhabdomastix brunneipennis Alexander, 1926 E
Rhabdomastix callosa Alexander, 1923 E
Rhabdomastix monilicornis Alexander, 1926 E
Rhabdomastix neozelandiae Alexander, 1922 E
Rhabdomastix optata Alexander, 1923 E
Rhabdomastix otagana Alexander, 1922 E
Rhabdomastix sagana Alexander, 1925 E
Rhabdomastix tonnoirana Alexander, 1934 E
Rhabdomastix trichiata Alexander, 1923 E
Rhabdomastix trilineata Alexander, 1939 E
Rhabdomastix unilineata Alexander, 1939 E
Rhabdomastix vittithorax Alexander, 1923 E
Rhamphophila lyrifera Edwards, 1923 E
Rhamphophila sinistra (Hutton, 1900) E
Sigmatomera rufa (Hudson, 1895) E
Symplecta antipodarum (Alexander, 1953) E Su
Symplecta brachyptera (Alexander, 1955) E Su
Symplecta campbellicola (Alexander, 1964) E SU
Symplecta confluens (Alexander, 1922) E
Symplecta inconstans (Alexander, 1922)
Symplecta pilipes (Fabricius, 1787)
Symplecta n. spp. (4) 4E
Tasiocera aproducta Alexander, 1952 E
Tasiocera bituberculata Alexander, 1924 E
Tasiocera cervicula Alexander, 1925 E
Tasiocera diaphana Alexander, 1932 E
Tasiocera divaricata Alexander, 1932 E
Tasiocera gourlayi (Alexander, 1922) E
Tasiocera longiana Alexander, 1952 E
Tasiocera paulula (Alexander, 1923) E
Tasiocera semiermis Alexander, 1932 E
Tasiocera tonnoirana Alexander, 1932 E
Tasiocera tridentata Alexander, 1922 E
Tasiocera triton Alexander, 1925 E
Tinemyia margaritifera Hutton, 1900 E
Tonnoiraptera neozelandica (Tonnoir, 1926) E
Toxorhina levis (Hutton, 1900) E
Toxorhina ochraceum (Edwards, 1923) E
Zaluscodes aucklandicus Lamb, 1909 E
Zelandoglochina atrovittata (Alexander, 1922) E
Zelandoglochina canterburiana (Alexander, 1923) E
Zelandoglochina circularis (Alexander, 1924) E
Zelandoglochina circumcincta (Alexander, 1924) E
Zelandoglochina crassipes (Edwards, 1923) E
Zelandoglochina cubitalis (Edwards, 1923) E
Zelandoglochina decincta (Edwards, 1923) E
Zelandoglochina flavidipennis (Edwards, 1923) E
Zelandoglochina harrisi (Alexander, 1923) E
Zelandoglochina melanogramma (Edwards, 1923) E
Zelandoglochina myersi (Alexander, 1924) E
Zelandoglochina octava (Edwards, 1923) E
Zelandoglochina paradisea (Alexander, 1923) E
Zelandoglochina sublacteata (Edwards, 1923) E
Zelandoglochina unicornis (Alexander, 1923) E
Zelandoglochina unijuga (Alexander, 1923) E
Zelandoglochina n. spp. (4-5) 4-5E Johns
Zelandomyia angusta (Alexander, 1923) E
Zelandomyia atridorsum Alexander, 1932 E
Zelandomyia cinereipleura (Alexander, 1922) E
Zelandomyia deviata (Alexander, 1922) E
Zelandomyia otagensis (Alexander, 1923) E
Zelandomyia pallidula Alexander, 1924 E
Zelandomyia penthoptera Alexander, 1924 E
Zelandomyia pygmaea Alexander, 1923 E
Zelandomyia ruapehuensis (Alexander, 1922) E
Zelandomyia tantula Alexander, 1926 E
Zelandomyia watti (Alexander, 1922) E
Zelandotipula fulva (Hutton, 1900) E
Zelandotipula novarae (Schiner, 1868) E
Zelandotipula otagana (Alexander, 1922) E
Zelandotipula n. spp. (8) 8E
TRICHOCERIDAE
Asdura decussata (Alexander, 1924) E
Asdura lyrifera (Alexander, 1923) E
Asdura howesi (Alexander, 1923) E
Asdura obtusicornis (Alexander, 1923) E
Nothotrichocera antarctica (Edwards, 1923) E
Nothotrichocera aucklandica Johns, 1975 E
Nothotrichocera johnsi Krzeminska, 2006 E
Trichocera annulata Meigen, 1818 A Gr
Zedura antipodum (Mik, 1881) E
Zedura aperta (Alexander, 1922) E
Zedura complicata (Alexander, 1924) E
Zedura curtisi (Alexander, 1924) E
Zedura dololabella Krzeminska, 2005 E
Zedura harrisi (Alexander, 1924) E
Zedura lobifera (Alexander, 1922) E
Zedura macrotrichiata (Alexander, 1922) E
Zedura maori (Alexander, 1921) E
Zedura oparara (Krzeminska, 2001) E
Zedura tautuku (Krzeminska, 2003) E

Suborder BRACHYCERA
Division ORTHORRHAPHA
ACROCERIDAE [Schlinger]
Apsona muscaria Westwood, 1876 E Sa SP
Apsona n. sp. Schlinger E SP
Helle longirostris (Hudson, 1892) E SP
Helle rufescens Brunetti, 1926 E SP
Ogcodes argigaster Schlinger, 1960 E SP
Ogcodes brunneus (Hutton, 1881) E SP
Ogcodes consimilis Brunetti, 1926 E SP
Ogcodes leptisoma Schlinger, 1960 E SP
Ogcodes nitens (Hutton, 1901) E SP
Ogcodes paramonovi Schlinger, 1960 E SP
Ogcodes similis Schlinger, 1960 E SP
Ogcodes n. spp. (2) 2E SP (Schlinger)
Pterodontia n. sp. E SP (Schlinger)
ASILIDAE (Macfarlane)
'*Cerdistus*' *lascus* (Walker, 1849) E Gr IPr
Cerdistus meridionalis (Hutton, 1901) Gr Ipr
Cerdistus? n. sp. E Sa IPr
'*Neoitamus*' *bulbus* (Walker, 1849) E Gr-?Fo IPr
'*Neoitamus*' *melanopogon* (Schiner, 1868) E Gr IPr
'*Neoitamus*' *smithii* (Hutton, 1901) I[C] E Gr IPr
'*Neoitamus*' *walkeri* Daniels, 1989 E Gr IPr
'*Neoitamus*' n. spp. (3) 3E Gr Ipr
'*Neoitamus*' n. spp. 2E TK IPr
Saropogon antipodus Schiner, 1868 E Gr IPr
Saropogon chathamensis Hutton, 1901 I[C] E Ch Gr IPr
Sarapogon clarkii Hutton, 1901 E
Saropogon discus (Walker, 1849) E Gr IPr
Saropogon extenuatus Hutton, 1901 E Gr IPr
Saropogon fascipes Hutton, 1902 E Gr IPr
Saropogon fugiens Hutton, 1901 E Gr IPr
Saropogon hudsoni Hutton, 1901 E Gr IPr
Saropogon proximus Hutton, 1901 E Gr IPr
Saropogon viduus (Walker, 1849) E Gr IPr
Saropogon n. spp. (6) 6E Gr IPr
Zosteria novaezealandica Daniels, 1987 I[C] E Fo IPr
Gen. nov. 1 Asilini et n. sp. I[C] E Gr IPr
APSILOCEPHALIDAE
Kaurimyia thorpei Winterton & Irwin, 2008 E
BOMBYLIIDAE [Schnitzler]

Geron sp. E
Tillyardomyia gracilis Tonnoir, 1927 E Gr IP
DOLICHOPODIDAE [Bickel, Andrew, Macfarlane]
Abatetia robusta (Parent, 1933) E Be
Abatetia n. spp. (4) Andrew, Bickel 4E Be
Aphrosylopsis lineata Lamb, 1909 E Su
Apterachalcus borboroides (Oldroyd, 1955) E Su
Australachalcus chaetifemoratus Parent, 1933 E
Australachalcus luteipes Parent, 1933 E
Australachalcus medius Parent, 1933 E
Australachalcus minor Parent, 1933 E
Australachalcus minisculus Parent, 1933 E
Australachalcus minutus Parent, 1933 E
Australachalcus nigroscutatus Parent, 1933 E
Australachalcus relictus Parent, 1933 E
Australachalcus separatus Parent, 1933 E
Austrosciapus proximus (Parent, 1928) A Ga
Brevimyia pulverea (Parent, 1933) E
Chrysotimus bilineatus Parent, 1933 E
Chrysotimus lunulatus Parent, 1933 E
Chrysotimus nigrichaetus (Parent, 1933) E
Chrysotimus scutatus Parent, 1933 E
Chrysotimus n. spp. (2) 2E LCNZ
Chrysotus albisignatus Becker, 1924 E
Chrysotus bellax Parent, 1933 E
Chrysotus chaetipalpus Parent, 1933 E
Chrysotus chaetoproctus Parent, 1933 E
Chrysotus diversus Parent, 1933 E
Chrysotus neoselandensis Parent, 1933 E Ch
Chrysotus uniseriatus Parent, 1933 E
Chrysotus vicinus Parent, 1933 E
Chrysotus n. sp. W SW
Dactylonotus formosus (Parent, 1933) E
Diaphorus infumatus Parent, 1933 E
Diaphorus obscurus Parent, 1933 E
Diaphorus parapraestans Dyte, 1980 E
Diaphorus stylifer Parent, 1933 E
Diaphorus tetrachaetus Parent, 1933 E
Filatopus ciliatus (Parent, 1933) E
Filatopus mirabilis (Parent, 1933) E
Filatopus ornatus (Parent, 1933) E
Halteriphorus mirabilis Parent, 1933 E
Helichochaetus discifer Parent, 1933 E
Hercostomus argentifacies Parent, 1933 E
Hercostomus aurifacies Parent, 1933 E
Hercostomus philpotti Parent, 1933 E Ch
Hercostomus pollinifrons Parent, 1933 E
Hercostomus n. sp. Macfarlane 2007 E
Hydrophorus praecox (Lehmann, 1822) A Fs
Ischiochaetus lenis Parent, 1933 E
Ischiochaetus ornatipes Parent, 1933 E
Ischiochaetus rotundicornis Parent, 1933 E
Ischiochaetus spinosus Parent, 1933 E
?*Liancalus* n. sp. E
Micromorphus albipes (Zetterstedt, 1843) A
Micropygus bifenestratus Parent, 1933 E
Micropygus bipunctatus Parent, 1933 E
Micropygus brevicornis Parent, 1933 E
Micropygus brevithorax Parent, 1933 E
Micropygus divergens Parent, 1933 E
Micropygus inornatus Parent, 1933 E
Micropygus lacustris Parent, 1933 E
Micropygus nigripes Parent, 1933 E
Micropygus puerulus Parent, 1933 E
Micropygus pulchellus Parent, 1933 E
Micropygus ripicola Parent, 1933 E
Micropygus serratus Parent, 1933 E
Micropygus striatus Parent, 1933 E
Micropygus tarsatus Parent, 1933 E
Micropygus transiens Parent, 1933 E
Micropygus vagans Parent, 1933 E
Micropygus n. sp. E LCNZ
Naufraga hexachaeta (Parent, 1933) E
Ostenia robusta Hutton, 1901 E
Paraclius aeotearoa Bickel, 2008 E
Parentia anomalicosta Bickel, 1992 E
Parentia aotearoa Bickel, 1992 E
Parentia argentifrons Bickel, 1992 E TK
Parentia calignosa Bickel, 1992 E
Parentia chathamensis Bickel, 1992 E Ch
Parentia cilifoliata (Parent, 1933) E
Parentia defecta Bickel, 1992 E
Parentia fuscata (Hutton, 1901) E
Parentia gemmata (Walker, 1849) E
Parentia griseicollis (Becker, 1924) E
Parentia insularis Bickel, 1992 E TK
Parentia johnsi Bickel, 1992 E
Parentia lyra Bickel, 1992 E
Parentia magniseta Bickel, 1992 E
Parentia malitiosa (Hutton, 1901) E
Parentia milleri (Parent, 1933) E
Parentia mobile (Hutton, 1901) E
Parentia modesta (Parent, 1933) E
Parentia nova (Parent, 1933) E
Parentia pukakiensis Bickel, 1992 E
Parentia recticosta (Parent, 1933) E
Parentia restricta (Hutton, 1901) E
Parentia schlingeri Bickel, 1992 E
Parentia titirangi Bickel, 1992 E
Parentia tonnoiri (Parent, 1933) E
Parentia varifemorata Bickel, 1992 E
Parentia whirinaki Bickel, 1992 E
Parentia n. sp. E
Scelloides armatus Parent, 1933 E
Scelloides brunneifrons Parent, 1933 E
Scelloides conspicuus Parent, 1933 E
Scelloides fulvifrons Parent, 1933 E
Scelloides maculatus Parent, 1933 E
Scelloides ornatipes Parent, 1933 E
Scelloides parcespinosus Parent, 1933 E
Scelloides parvus Parent, 1933 E
Scelloides pollinosus Parent, 1933 E
Scelloides raptorius Parent, 1933 E
Scelloides spinosus Parent, 1933 E
Scelloides vicinus Parent, 1933 E
?'*Schoenophilus*' *campbellensis* Harrison, 1964 E Su
Scorpiurus aenescens Parent, 1932 E
Scorpiurus n. sp. E SW
Sympycnus albinotatus Parent, 1933 E
Sympycnus alchymicus[NC] (Parent, 1933) E
Sympycnus amplitarsus Parent, 1933 E
Sympycnus brevicornis Parent, 1933 E
Sympycnus campbelli Parent, 1933 E
Sympycnus contemptus Parent, 1933 E
Sympycnus distinctus Parent, 1933 E
Sympycnus edwardsi Parent, 1933 E
Sympycnus gracilipes Parent, 1933 E
Sympycnus harrisi Parent, 1933 E
Sympycnus humilis Parent, 1933 E
Sympycnus ignavus Parent, 1933 E
Sympycnus longicornis Parent, 1933 E
Sympycnus longipilus Parent, 1933 E
Sympycnus luteinotatus Parent, 1933 E
Sympycnus modestus Parent, 1933 E
Sympycnus moestus Parent, 1933 E
Sympycnus normalis Parent, 1933 E
Sympycnus ornatipes Parent, 1933 E
Sympycnus ornatus Parent, 1933 E
Sympycnus tenueciliatus Parent, 1933 E
Syntormon aotearoa Bickel, 1999 E We
Tetrachaetus bipunctatus Parent, 1933 E We
Tetrachaetus simplex Parent, 1933 E
Thinophilus milleri Parent, 1933 E
Thinophilus n. spp. (2–3) 2–3E
Thrypticus arahakiensis Bickel, 1992 E We H
EMPIDIDAE [Sinclair, Plant, Andrew, Macfarlane]
Abocciputa pilosa Plant, 1989 E Fo/F
Adipsomyia mutabilis Collin, 1928 E
Adipsomyia stigmosa (Smith, 1964) E Su
Adipsomyia n. spp. (2) 2E Sinclair
Apalocnemis fumosa (Hutton, 1901) E
Apalocnemis simulans Collin, 1928 E
Asymphyloptera n. spp. (4–5) Sinclair 1995 4–5E
Atodrapetis infrapratula Plant, 1997 E
Atrichopleura compitalis Collin, 1928 E
Atrichopleura conjuncta Malloch, 1931 E
Atrichopleura n. spp. (2) 2E
Austropeza insolita (Collin, 1928) E
Ceratomerus biseriatus Plant, 1991 E Fo
Ceratomerus brevifurcatus Plant, 1991 E
Ceratomerus crassinervis Malloch, 1931 E
Ceratomerus dorsatus Collin, 1928 E ?F
Ceratomerus earlyi Plant, 1991 E
Ceratomerus exiguus Collin, 1928 E Fo
Ceratomerus flavus Plant, 1991 E
Ceratomerus longifurcatus Collin, 1931 E
Ceratomerus melaneus Plant, 1991 E Sa
Ceratomerus prodigiosus Collin, 1928 E
Ceratomerus tarsalis Plant, 1991 E Fo
Ceratomerus virgatus Collin, 1928 E Fo
Ceratomerus vittatus Plant, 1991 E Sa
Ceratomerus n. spp. (29) Sinclair 29E
Chelifera apicata Collin, 1928 E
Chelifera fontinalis (Miller, 1923) E ?Fr
Chelifera tacita Collin, 1928 E
Chelifera tantula Collin, 1928 E
Chelipoda abdita Collin, 1928 E
Chelipoda abjecta Collin, 1928 E
Chelipoda aritarita Plant, 2007 E
Chelipoda atrocitax Plant, 2007 E
Chelipoda australpina Plant, 2007 E
Chelipoda brevipennis Plant, 2007 E
Chelipoda consignata Collin, 1928 E
Chelipoda cornigera Plant, 2007 E
Chelipoda cycloseta Plant, 2007 E
Chelipoda delecta Collin, 1928 E
Chelipoda didhami Plant, 2007 E
Chelipoda digressa Collin, 1928 E
Chelipoda dominatrix Plant, 2007 E
Chelipoda ferocitrix Plant, 2007 E
Chelipoda fuscoptera Plant, 2007 E
Chelipoda gracilis Plant, 2007 E
Chelipoda inconspicua Collin, 1928 E
Chelipoda interposita Collin, 1928 E
Chelipoda lateralis Plant, 2007 E
Chelipoda longicornis Collin, 1928 E
Chelipoda macrostigma Plant, 2007 E
Chelipoda mediolinea Plant, 2007 E
Chelipoda mirabilis Collin, 1928 E
Chelipoda moderata Collin, 1928 E
Chelipoda modica Collin, 1928 E
Chelipoda monorhabdos Plant, 2007 E
Chelipoda oblata Collin, 1928 E
Chelipoda oblinata Collin, 1928 E
Chelipoda otiraensis (Miller, 1923) E
Chelipoda puhihuroa Plant, 2007 E
Chelipoda rakiuraensis Plant, 2007 E
Chelipoda rangopango Plant, 2007 E
Chelipoda secreta Collin, 1928 E
Chelipoda tainuia Plant, 2007 E
Chelipoda tangerina Plant, 2007 E
Chelipoda trepida Collin, 1928 E
Chelipoda ultraferox Plant, 2007 E
Chelipoda venatrix Plant, 2007 E
Chersodromia zelandica Rogers, 1982 E
Chimerothalassius ismayi Shamshev & Grootaert, 2002 E Be
Cladodromia futilis Collin, 1928 E
Cladodromia insignita Collin, 1928 E
Cladodromia inturbida (Collin, 1928) E
Cladodromia negata Collin, 1928 E
Cladodromia soleata Collin, 1928 E
Cladodromia n. sp. Andrew E ?Fr
Clinocera gressitti Smith, 1964 E Su ?F
?*Clinorhampha politella* (Malloch, 1931) E
?*Clinorhampha* n. sp. Andrew E
Doliodromia avita Collin, 1928 E
Empidadelpha propria Collin, 1928 E

Empidadelpha torrentalis (Miller, 1923) E
Empidadelpha n. sp. CMNZ E Su
'*Empis*' *probata* Collin, 1928 E
Glyphidopeza fluviatilis Sinclair, 1997 E F
Glyphidopeza longicornis Sinclair, 1997 E F
Gynatoma atra Malloch, 1931 E
Gynatoma continens Collin, 1928 E
Gynatoma evanescens Collin, 1928 E
Gynatoma pygmaea Collin, 1928 E
Gynatoma quadrilineata Collin, 1928 E
Gynatoma subfulva Collin, 1928 E
Gynatoma n. sp. Andrew E
Hemerodromia radialis Collin, 1928 E
Heterophlebus maculipennis (Collin, 1928) E F [as genus *Oreogeton in* A/O Catalogue]
Heterophlebus rostratus (Collin, 1928) E F
Heterophlebus undulatus (Collin, 1928) E F
Heterophlebus n. spp. (3) 3E Macfarlane
Hilara anisonychia Collin, 1928 E
Hilara consanguinea Collin, 1928 E
Hilara dracophylli Miller, 1923 E
Hilara flavinceris Miller, 1923 E
Hilara fossalis Miller, 1923 E
Hilara hudsoni (Hutton, 1901) E
Hilara intuta Collin, 1928 E
Hilara littoralis Miller, 1923 E
Hilara macrura Collin, 1928 E
Hilara philpotti Miller, 1923 E
Hilara retecta Collin, 1928 E
Hilara spinulenta Collin, 1928 E
Hilara urophora Collin, 1928 E
Hilara urophylla Collin, 1928 E
Hilara vector Miller, 1923 E
Hilara n. spp. (50) Andrew 50E
Hilarempis argentella Collin, 1928 E
Hilarempis benhami (Miller, 1913) E
Hilarempis brevistyla Collin, 1928 E
Hilarempis cineracea Collin, 1928 E
Hilarempis dichropleura Collin, 1928 E
Hilarempis diversimana Collin, 1928 E
Hilarempis huttoni Bezzi, 1904 E
Hilarempis immota Collin, 1928 E
Hilarempis kaiteriensis (Miller, 1913) E
Hilarempis longistyla Collin, 1928 E
Hilarempis minthaphila Collin, 1928 E
Hilarempis nigra Miller, 1923 E
Hilarempis ochrozona Collin, 1928 E Fo Li
Hilarempis simillima Collin, 1928 E
Hilarempis smithii (Hutton, 1901) E
Hilarempis subdita[1] Collin, 1928 E
Hilarempis trichopleura Collin, 1928 E
Hilarempis uniseta Collin, 1928 E
Hilarempis n. spp. (5) Andrew 5E
Homalocnemis adelensis (Miller, 1913) E
Homalocnemis inexpleta Collin, 1928 E
Homalocnemis maculipennis Malloch, 1932 E
Homalocnemis perspicua (Hutton, 1901) E
Hybomyia oliveri Plant, 1995 E
Hydropeza agnetis Sinclair & McLellan, 2004 E F
Hydropeza akatarawa Sinclair & McLellan, 2004 E F
Hydropeza clarae Sinclair & McLellan, 2004 E F
Hydropeza daviesi Sinclair & McLellan, 2004 E F
Hydropeza longipennae (Miller, 1923) E F
Hydropeza milleri Sinclair & McLellan, 2004 E F
Hydropeza paniculata Sinclair & McLellan, 2004 E F
Hydropeza tutoko Sinclair & McLellan, 2004 E F
Hydropeza vockerothi Sinclair & McLellan, 2004 E F
Hydropeza wardi Sinclair & McLellan, 2004 E F
Icasma aequabilis Plant, 1990 E
Icasma fascipennis Sinclair, 1997 E
Icasma longicauda Sinclair, 1997 E
Icasma masneri Sinclair, 1997 E
Icasma setosa Sinclair, 1997 E
Icasma singularis Collin, 1928 E
Icasma tararua Sinclair, 1997 E
Isodrapetis excava Plant, 1999 E
Isodrapetis hyalina Plant, 1999 E
Isodrapetis nitidula Collin, 1928 E
Isodrapetis nitidiuscula Plant, 1999 E
Isodrapetis rauparaha Plant, 1999 E
Isodrapetis spinositibia Plant, 1999 E
Isodrapetis subpollinosa Collin, 1928 E
Isodrapetis suda Collin, 1928 E
Monodromia fragilis Collin, 1928 E
Neoplasta n. sp. Plant E
Ngaheremyia fuscipennis Plant & Didham, 2006 E
Oropezella antennata Collin, 1928 E
Oropezella bifurcata Collin, 1928 E Fo
Oropezella diminuloruma Plant, 1989 E Fo
Oropezella loripes Plant, 1989 E Fo
Oropezella trucispicata Plant, 1989 E Fo
Oropezella nigra (Miller, 1923) E
Oropezella tanycera Collin, 1928 E
Phyllodromia falcata Plant, 2005 E
Phyllodromia flexura Plant, 2005 E
Phyllodromia floridula Plant, 2005 E
Phyllodromia nigricoxa Plant, 2005 E
Phyllodromia proiecta Plant, 2005 E
Phyllodromia scopulifera Collin, 1928 E
Phyllodromia striata Collin, 1928 E
Platypalpus ementitus (Collin, 1928) E
Platypalpus scambus (Collin, 1928) E
Platypalpus spatiosus (Collin, 1928) E
Pseudoscelolabes fulvescens (Miller, 1923) E Fo Li
Pseudoscelolabes n. sp. Macfarlane E
Sematopoda elata Collin, 1928 E
Thinempis brouni [NC] (Hutton, 1901) E Be Andrew
Thinempis otakouensis (Miller, 1910) E ?SW/Be
Thinempis takaka Bickel, 1996 E Be
Gen. nov. 1 Hemerodromiinae n. sp. E
Gen. nov. 2 Hilarini nr *Hilarempis* et n. spp. (2) 2E
Gen. nov. 3 nr Oreogetoninae et n. sp. E
PELECORHYNCHIDAE
Pelecorhynchus sp. indet.* Winterbourn F
RHAGIONIDAE
Chrysopilus nitidiventris Tonnoir, 1927 E Fo
Chrysopilus n. spp. (2) LCNZ, CMNZ 2E Gr
STRATIOMYIDAE [Woodley, Andrew]
Australoberis amoena Lindner, 1958 E
Australoberis refugians (Miller, 1917) E
Australoberis n. spp. (2) Woodley 2E
Benhamyia alpina (Hutton, 1901) E
Benhamyia apicalis (Walker, 1849) E IPr
Benhamyia hoheria (Miller, 1917) E
Benhamyia smaragdina Lindner, 1958 E
Benhamyia straznitzkii (Nowicki, 1875) E Fo
Benhamyia n. spp. (4) Woodley 4E
Berisina caliginosa (Miller, 1917) E
Berisina maculipennis Malloch, 1928 E
Berisina saltusans (Miller, 1917) E
Berisina n. spp. (2) Woodley 2E
Boreoides tasmaniensis Bezzi, 1922 A Ga
Dysbiota parvula Lindner, 1958 E
Dysbiota peregrina (Hutton, 1901) E Fo
Exaireta spinigera (Wiedemann, 1830) A Ga Li
Hermetia illucens (Linnaeus, 1758) A Ga-We
Inopus rubriceps (Macquart, 1847) A Gr
Neactina opposita (Walker, 1854) E Fo
Neactina ostensackeni (Lindner, 1958) E Fo
Neactina simmondsii (Miller, 1917) E Fo
Neactina n. spp. (3) Woodley 2E
Odontomyia angusta Walker, 1854 E F
Odontomyia australensis Schiner, 1868 E F
Odontomyia atrovirens Bigot, 1879 E F
Odontomyia chathamensis Hutton, 1901 E Ch F
Odontomyia chloris (Walker, 1854) E F
Odontomyia collina Hutton, 1901 E F
Odontomyia fulviceps (Walker, 1854) E F
Odontomyia neodorsalis (Miller, 1950) E F
Odontomyia n. spp. (10) Andrew 10E F
Tytthoberis cuprea (Hutton, 1901) E
Zealandoberis lacuans (Miller, 1917) E
Zealandoberis micans (Hutton, 1901) E
Zealandoberis substituta (Walker, 1854) E
Zealandoberis violacea (Hutton, 1901) E
Zealandoberis n. spp. (3) 3E Woodley
Gen. indet. Chiromyzinae et n. spp. (3)* 3E Andrew
TABANIDAE [Macfarlane]
Dasybasis bratrankii (Nowicki, 1875) E ?F
Dasybasis difficilis (Krober, 1931) E ?F
Dasybasis loewi (Enderlein, 1925) E ?F
Dasybasis nigripes (Krober, 1931) E ?F
Dasybasis opla (Walker, 1850) E ?F
Dasybasis sarpa (Walker, 1850) E ?F
Dasybasis thereviformis Mackerras, 1957 E ?F
Dasybasis transversa (Walker 1854) E ?F
Dasybasis truncata (Walker, 1850) E ?F
Dasybasis viridis (Hudson, 1892) E ?F
Dasybasis n. spp. (2) Hayakawa 2E ?F
Ectenopsis lutulenta (Hutton, 1901) E ?F
Ectenopsis n. sp. Hayakawa E ?F
Scaptia adrel (Walker, 1850) E ?F
Scaptia brevipalpis Krober, 1931 E ?F
Scaptia lerda (Walker, 1850) E ?F
Scaptia milleri Mackerras, 1957 E ?F
Scaptia montana (Hutton, 1901) E ?F
Scaptia ricardoae (Hutton, 1901) E ?F
THEREVIDAE
Anabarhynchus acuminatus Lyneborg, 1992 E So IPr
Anabarhynchus albipennis Lyneborg, 1992 I[C] E So IPr
Anabarhynchus arenarius Lyneborg, 1992 E Be So IPr
Anabarhynchus atratus Lyneborg, 1992 I[C] E So IPr
Anabarhynchus atripes Lyneborg, 1992 E So IPr
Anabarhynchus aureosericeus Krober, 1932 E So IPr
Anabarhynchus brevicornis Lyneborg, 1992 E So IPr
Anabarhynchus brunninervis Krober, 1932 E So IPr
Anabarhynchus caesius Krober, 1912 E So IPr
Anabarhynchus completus Lyneborg, 1992 E Be So IPr
Anabarhynchus curvistylus Lyneborg, 1992 E Be So IPr
Anabarhynchus diversicolor Lyneborg, 1992 E So IPr
Anabarhynchus dugdalei Lyneborg, 1992 E So IPr
Anabarhynchus dysmachiiformis Krober, 1932 E So IPr
Anabarhynchus embersoni Lyneborg, 1992 I[C] E So IPr
Anabarhynchus exiguus Hutton, 1901 E So IPr
Anabarhynchus farinosus Lyneborg, 1992 E Be So IPr
Anabarhynchus femoralis Krober, 1932 E So IPr
Anabarhynchus fenwicki Lyneborg, 1992 E So IPr
Anabarhynchus flaviventris Lyneborg, 1992 I[C] E So IPr
Anabarhynchus fluviatilis Lyneborg, 1992 I[C] E So IPr
Anabarhynchus fuscofemoratus Lyneborg, 1992 I[C] E So IPr
Anabarhynchus gibbsi Lyneborg, 1992 E Be So IPr
Anabarhynchus grossus Lyneborg, 1992 E So IPr
Anabarhynchus harrisi Lyneborg, 1992 E So IPr
Anabarhynchus hayakawai Lyneborg, 1992 E So IPr
Anabarhynchus hudsoni Lyneborg, 1992 I[C] E So IPr
Anabarhynchus huttoni Lyneborg, 1992 E Be So IPr
Anabarhynchus indistinctus Lyneborg, 1992 I[C] E So IPr
Anabarhynchus innotatus (Walker, 1856) E Be-We So IPr
Anabarhynchus lacustris Lyneborg, 1992 E So IPr
Anabarhynchus lateripilosus Lyneborg, 1992 E Be So IPr
Anabarhynchus latus Lyneborg, 1992 E So IPr
Anabarhynchus limbatinervis Krober, 1932 E So IPr
Anabarhynchus longepilosus Lyneborg, 1992 E So IPr
Anabarhynchus longipennis Krober, 1932 E So IPr
Anabarhynchus macfarlanei Lyneborg, 1992 E So IPr
Anabarhynchus major Lyneborg, 1992 E So IPr
Anabarhynchus maori Hutton, 1901 E So IPr
Anabarhynchus megalopyge Lyneborg, 1992 E So IPr

Anabarhynchus microphallus Lyneborg, 1992 E Be/So IPr
Anabarhynchus monticola Lyneborg, 1992 E Sa So IPr
Anabarhynchus nebulosus Hutton, 1901 E Be So IPr
Anabarhynchus neglectus Krober, 1932 E Sa So IPr
Anabarhynchus nigrofemoratus Krober, 1932 E Be-Gr So IPr
Anabarhynchus olivaceus Lyneborg, 1992 I[C] E Gr So IPr
Anabarhynchus ostentatus Lyneborg, 1992 E Sa So IPr
Anabarhynchus postocularis Lyneborg, 1992 E Gr So IPr
Anabarhynchus robustus Lyneborg, 1992 E Gr So IPr
Anabarhynchus ruficoxa Lyneborg, 1992 E Be-Gr So IPr
Anabarhynchus rufobasalis Lyneborg, 1992 E Sa So IPr
Anabarhynchus schlingeri Lyneborg, 1992 E Be So IPr
Anabarhynchus similis Lyneborg, 1992 E Sa So IPr
Anabarhynchus simplex Lyneborg, 1992 E Gr So IPr
Anabarhynchus spiniger Lyneborg, 1992 E Gr So IPr
Anabarhynchus spitzeri Lyneborg, 1992 E Gr-Sa So IPr
Anabarhynchus triangularis Lyneborg, 1992 E Gr So IPr
Anabarhynchus tricoloratus Lyneborg, 1992 E Be So IPr
Anabarhynchus waitarerensis Lyneborg, 1992 I[C] E Be So IPr
Anabarhynchus westlandensis Lyneborg, 1992 E Be So IPr
Anabarhynchus wisei Lyneborg, 1992 I[C] E So IPr
Anabarhynchus n. spp. (3) 3E
Ectinorhynchus castaneus (Hutton, 1901) E Fo-Sa
Ectinorhynchus cupreus (Hutton, 1901) E Ga-Gr
Ectinorhynchus furcatus Lyneborg, 1992 I[C] E Sa
Ectinorhynchus micans (Hutton, 1901) E
Megathereva albopilosa Lyneborg, 1992 E Be
Megathereva atritibia Lyneborg, 1992 E Be So IPr
Megathereva bilineata (Fabricius, 1775) E Be

Division CYCLORRHAPHA
Section ASCHIZA
LONCHOPTERIDAE A
Lonchoptera bifurcata (Fallen, 1810) A Gr
PHORIDAE [Oliver]
Antipodiphora austrophila (Schmitz, 1939) E
Antipodiphora brevicornis (Schmitz, 1939) E
Antipodiphora nana (Schmitz, 1939) E
Antipodiphora similicornis (Schmitz, 1939) E
Antipodiphora subarcuata (Schmitz, 1939) E
Antipodiphora tonnoiri (Schmitz, 1939) E
Aphiura breviceps Schmitz, 1939 E D
Beckerina polysticha Schmitz, 1939 E
Bothroprosopa mirifica Schmitz, 1939 E
Ceratoplatus fullerae Schmitz, 1939 E
Diplonevra caudata Schmitz, 1939 E
Diplonevra n. spp (2) Oliver 2E
Distichophora crassimana Schmitz, 1939 E
Dohrniphora cornuta (Bigot, 1857) A Gr-Ga ScCa IPr
Kierania grata Schmitz, 1939 E
Kierania n. sp. Oliver E
Macroselia longiseta Schmitz, 1939 E
Megaselia castanea Bridarolli, 1937 E
Megaselia comparabilis Schmitz, 1929 E
Megaselia curtineura (Brues, 1909) A Ca
Megaselia dolichoptera Bridarolli, 1937 E
Megaselia dupliciseta Bridarolli, 1937 E
Megaselia halterata (Wood, 1910) A GrGa Ff
Megaselia impariseta Bridarolli, 1937 A?
Megaselia longinqua Bridarolli, 1937 E
Megaselia lucida Bridarolli, 1937 E
Megaselia rufipes (Meigen, 1804) A Gr-Ga Sc-IPr
Megaselia scalaris (Loew, 1866) A Gr-Ga Sc-IPr
Megaselia spiracularis Schmitz, 1938 A
Megaselia n. spp. (2) Oliver 2E
Metopina australiana Borgmeier, 1963 Ga I/A
Metopina climieorum Disney, 1994 Ga
Metopina n. sp. Oliver E
Minicosta mollyae Brown & Oliver, 2008 E
Palpocrates obscurior Schmitz, 1939 E
Palpocrates rufipalpis Schmitz, 1939 E
Spiniphora bergistammi (Mik, 1864) A Ca
Tarsocrates niger Schmitz, 1939 E
'Triphleba' atripalpis Schmitz, 1939 E
'Triphleba' fuscithorax Schmitz, 1939 E
'Triphleba' rufithorax Schmitz, 1939 E
Wharia willcocksorum Brown & Oliver, 2008 E
PIPUNCULIDAE [Skevington]
Cephalops libidinosus De Meyer, 1991 E IP
Dasydorylas arthurianus[NC] (Tonnoir, 1925) E Gr IP
Dasydorylas deansi[NC] (Tonnoir, 1925) E Fo IP
Dasydorylas harrisi[NC] (Tonnoir, 1925) E Gr IP
Dasydorylas n. spp. (9) 9E IP
Tomosvaryella novaezealandiae (Tonnoir, 1925) E Gr IP
PLATYPEZIDAE
Microsania tonnoiri Collart, 1934 E
Callomyiinae n. sp. Chandler 1994 E
SCIADOCERIDAE A
Sciadocera rufomaculata White, 1916 A Fo
SYRPHIDAE (Thompson)
Allograpta atkinsoni (Miller, 1921) E IPr
Allograpta dorsalis (Miller, 1924) E IPr
Allograpta flavofaciens (Miller, 1921) E IPr
Allograpta hirsutifera (Hull, 1949) E IPr
Allograpta hudsoni (Miller, 1921) E IPr
Allograpta pseudoropala (Miller, 1921) E IPr
Allograpta ropala (Walker, 1849) E IPr
Allograpta ventralis (Miller, 1921) E IPr
Allograpta n. spp. (25) Thompson 25E
Anu una Thompson, 2008 E
Eristalinus aeneus (Scopali, 1763)* A
Eristalis tenax (Linnaeus, 1758) A Ga-We-Se
Eumerus strigatus (Fallen, 1817) A GaHb
Eumerus tuberculatus Rondani, 1857 A Ga Hb
Helophilus antipodus Schiner, 1868 E
Helophilus campbelli (Miller, 1921) E
Helophilus campbellicus Hutton, 1902 E
Helophilus cargilli Miller, 1911 E
Helophilus chathamensis Hutton, 1901 E Ch
Helophilus cingulatus (Fabricius, 1775) E
Helophilus hectori Miller, 1924 E
Helophilus hochstetteri Nowicki, 1875 E F
Helophilus ineptus Walker, 1849 E
Helophilus montanus (Miller, 1921) E
Helophilus seelandicus (Gmelin, 1790) E
Helophilus taruensis (Miller, 1924) E
Helophilus n. spp. (8) Thompson 8E
Melangyna novaezealandiae (Macquart, 1855) E Gr Ga IPr
Melanostoma fasciatum (Macquart, 1850) E Cr Gr Ga IPr
Merodon equestris (Fabricius, 1794) A Ga Hb
Orthoprosopa bilineata (Walker, 1849) E
Platycheirus antipodus (Hull, 1949) E IPr
Platycheirus captalis (Miller, 1924) E IPr
Platycheirus clarkei Miller 1921 E IPr
Platycheirus cunninghami (Miller, 1921) E IPr
Platycheirus fulvipes (Miller, 1924) E IPr
Platycheirus harrisi (Miller, 1921) E IPr
Platycheirus howesii (Miller, 1921) E IPr
Platycheirus huttoni Thompson, 1989 E IPr Ns
Platycheirus leptospermi (Miller, 1921) E IPr
Platycheirus lignudus Miller, 1921 E IPr
Platycheirus myersii (Miller, 1924) E IPr
Platycheirus notatus (Bigot, 1884) E IPr
Platycheirus ronanus (Miller, 1921) E IPr
Platycheirus n. spp. (13) Thompson 13E IPr
Psilota decessa (Hutton, 1901) E
Simosyrphus grandicornis (Macquart, 1842) A K IPr

Section SCHIZOPHORA
ACALYPTRATAE
AGROMYZIDAE
Cerodontha angustipennis Harrison, 1959 E Gr HLM
Cerodontha australis Malloch, 1925 A Gr HLM
Cerodontha sylvesterensis Spencer, 1976 E Sa H
Cerodontha triplicata (Spencer, 1963) A
Chromatomyia syngenesiae Hardy, 1849 A Ga-Gr HLM
Hexomyza coprosmae Spencer, 1976 E Sh HG
Liriomyza antipoda Harrison, 1976 E Su Cr-Gr HLM
Liriomyza brassicae (Riley, 1885) A Ga HLM
Liriomyza chenopodii (Watt, 1924) A Gr HLM
Liriomyza citreifemorata (Watt, 1923) E Fo HLM
Liriomyza clianthi (Watt, 1923) E Ga HLM
Liriomyza craspediae Spencer, 1976 E H
Liriomyza flavocentralis (Watt, 1923) E HLM
Liriomyza flavolateralis (Watt, 1923) E H
Liriomyza hebae Spencer, 1976 E Sh HLM
Liriomyza homeri Spencer, 1976 E Sa H
Liriomyza lepidii Harrison, 1976 E Gr HLM
Liriomyza oleariae Spencer, 1976 E Fo HLM
Liriomyza penita Spencer, 1976 E Sa H
Liriomyza plantaginella Spencer, 1976 E Gr HLM
Liriomyza umbrina (Watt, 1923) E FoSh H
Liriomyza umbrinella (Watt, 1923) E FoSh HLM
Liriomyza umbrosa (Watt, 1923) E FoSh H
Liriomyza urticae (Watt, 1924) E Fo HLM
Liriomyza vicina Spencer, 1976 E Gr H
Liriomyza wahlenbergiae Spencer, 1976 E Gr HLM
Liriomyza watti Spencer, 1976 E HLM
Melanagromyza senecionella Spencer, 1976 E Gr HS
Phytoliriomyza bicolorata Spencer, 1976 E Sa H
Phytoliriomyza convoluta Spencer, 1976 E Fo H
Phytoliriomyza cyatheae Spencer, 1976 E Fo HLM
Phytoliriomyza flavopleura (Watt, 1923) E Fo HLM
Phytoliriomyza huttensis Spencer, 1976 E Sa H
Phytoliriomyza tearohensis Spencer, 1976 E Fo H
Phytoliriomyza sp. indet. Spencer 1976 A
Phytomyza clematadi Watt, 1923 E BC Fo HLM
Phytomyza costata Harrison, 1959 E Sa HLS
Phytomyza improvisa Spencer, 1976 E Gr H
Phytomyza lyalli Spencer, 1976 E Sa H
Phytomyza plantaginis Goreau, 1851 A Gr-Sa H
Phytomyza vitalbae Kaltenberg, 1872 A Fo HG
ANTHOMYZIDAE
Zealanthus thorpei Rohácek, 2007 E H
ASTEIIDAE
Asteia crassinervis Malloch, 1930 E Fo Ff
Asteia levis Hutton, 1902 E Fo Ff
Asteia tonnoiri Malloch, 1930 E Fo Ff
AUSTRALIMYZIDAE
Australimyza anisotomae Harrison, 1953 E Su Gr
Australimyza australensis (Mik, 1881) E Su
Australimyza kaikoura Brake & Mathis, 2007 E
Australimyza longiseta Harrison, 1959 E
Australimyza salicorniae Harrison, 1959 E Be
Australimyza setigera Harrison, 1959 E Ca
CANACIDAE
Apetaenus australis (Hutton, 1902) E Su
Apetaenus littoreus (Hutton, 1902) E Su
Isocanace crosbyi Mathis, 1999 E Be
Tethinosoma fulvifrons (Hutton, 1901) E
Zalea horningi (Harrison, 1976) E Su
Zalea earlyi McAlpine, 2007 E Rs
Zalea johnsi McAlpine, 2007 E Rs
Zalea lithax McAlpine, 2007 E Rs
Zalea mathisi McAlpine, 2007 E Rs
Zalea ohauorae McAlpine, 2007 E Rs
Zalea uda McAlpine, 2007 E Rs
Zalea wisei McAlpine, 2007 E Rs
Zalea n. spp. (2) 2E
CHAMAEMYIIDAE A

Chamaemyia polystigma (Meigen, 1830) A Gr IPr
Leucopis tapiae Blanchard, 1964 A BC Fo IPr
Pseudoleucopis benefica? Malloch, 1930 A IPr
CHLOROPIDAE
Aphanotrigonum huttoni (Malloch, 1931) E Fo-Sa
Apotropina quadriseta (Harrison, 1959) E
Apotropina shewelliana (Spencer, 1977) E
Apotropina sulae (Spencer, 1977) E Nb Sc
Apotropina tonnoiri (Sabrosky, 1955) E Be
Apotropina wisei (Harrison, 1959) E
Chlorops multisulcatus Malloch, 1931 E Fo
Chlorops occipitalis Malloch, 1931 E Fo
Conioscinella apterina Spencer, 1977 E Ch
Conioscinella badia (Hutton, 1901) E Fo-Gr
Conioscinella chathamensis Spencer, 1977 E Ch Fo
Conioscinella fulvithorax Spencer, 1977 E Fo
Conioscinella grandis Spencer, 1977 E Fo
Conioscinella speighti (Malloch, 1931) E
Conioscinella spenceri Nartshuk 1993 E
Dicraeus tibialis (Macquart, 1835) A Gr HS
Diplotoxa anorbitalis Malloch, 1931 E
Diplotoxa gemina Spencer, 1977 E We
Diplotoxa harrisoni Spencer, 1977 E
Diplotoxa knighti Spencer, 1977 E Fo
Diplotoxa lineata Malloch, 1931 E We Sa
Diplotoxa moorei (Salmon, 1939) E Gr HS
Diplotoxa neozelandica Harrison, 1959 E
Diplotoxa orbitalis Malloch, 1931 E
Diplotoxa similis Spencer, 1977 E Gr Sa HS
Diplotoxa stepheni Spencer, 1977 E
Gaurax flavoapicalis (Malloch, 1931) Ga-Gr Ca
Gaurax mesopleuralis (Becker, 1911) A Gr-Ga
Gaurax neozealandicus (Malloch, 1931) E Fo
Gaurax solidus Becker, 1910 A We
Hippelates insignificans (Malloch, 1931) E GrD
Lieparella zentae Spencer, 1986 A
Melanum neozelandicum Malloch, 1931 E Gr
Siphunculina breviseta Malloch, 1924 Ga
Siphunculina montana Spencer, 1977 E Sa
Tricimba anglemensis Spencer, 1977 E Sa
Tricimba deansi (Malloch, 1931) E Fo-S
Tricimba dugdalei Spencer, 1977 E
Tricimba flaviseta Malloch, 1931 E Fo
Tricimba fuscipes Malloch, 1931 E Fo
Tricimba kuscheli (Spencer, 1977) E
Tricimba tinctipennis (Malloch, 1931) E Fo
Tricimba walkerae (Spencer, 1977) E
Tricimba watti Spencer, 1977 E Fo
Tricimba n. sp. Macfarlane E Fo
COELOPIDAE
Baeopterus philpotti (Malloch, 1933) E Rs/Be
Baeopterus robustus Lamb, 1909 E Su Be
Chaetocoelopa littoralis (Hutton, 1881) E Be
Chaetocoelopa huttoni Harrison, 1959 E
Coelopella curvipes (Hutton, 1902) E Rs/Be
Icaridion debile (Lamb, 1909) E Rs/Be
Icaridion nasutum Lamb, 1909 E Su Rs/Be
Icaridion nigrifrons (Lamb, 1909) E Rs/Be
CRYPTOCHETIDAE A
Cryptochetum iceryae (Williston, 1888) A BC Ga-Or IP
DROSOPHILIDAE [Hodge, Martin]
Drosophila busckii Coquillett, 1901 A Ga Ff
Drosophila funebris (Fabricius, 1787) A Ga Li Ff D
Drosophila hydei Sturtevant, 1921 A Ga Li
Drosophila immigrans Sturtevant, 1921 A Ga Li Ff
Drosophila melanogaster Meigen, 1830 A Ga Li
Drosophila pseudoobscura Frolova *in* Frolova & Astaurov, 1929 A Ga
Drosophila repleta Woolaston, 1858 A
Drosophila simulans Sturtevant, 1919 A Ga Li
Drosophila n. sp. E
Scaptodrosophila enigma Malloch, 1927 A
Scaptodrosophila kirki (Harrison, 1959) E
Scaptodrosophila neozelandica (Harrison, 1959) E Ff?
Scaptodrosophila n. sp. McEvery E
Scaptomyza elmoi Takada, 1970 A
Scaptomyza flava Fallen, 1823 A Gr HL
Scaptomyza flavella Harrison, 1959 E
Scaptomyza fuscitarsis Harrison, 1959 E Gr
Scaptomyza n. spp. (2) Martin 2E
EPHYDRIDAE [Mathis]
Atissa suturalis Cresson, 1929 A
Brachydeutera sydneyensis Malloch, 1924 A Fs
Ditrichophora flavitarsis (Tonnoir & Malloch, 1926) A
Ditrichophora n. spp. (2) 2E
Eleleides chloris Cresson 1948* A We
Ephydrella aquaria (Hutton, 1901) E F
Ephydrella assimilis (Tonnoir & Malloch, 1926) E F
Ephydrella novaezealandiae (Tonnoir & Malloch, 1926) E F
Ephydrella spathulata Cresson, 1935 E F
Ephydrella thermara Dumbleton, 1969 E F Hs
Ephydrella n. sp. E Ch F
Haloscatella balioptera Mathis, Zatwarnicki & Marris, 2004 E Ch
Haloscatella karekare Mathis, Zatwarnicki & Marris, 2004 E Su
Haloscatella harrisoni Mathis, Zatwarnicki & Marris, 2004 E
Hecamede granifera Thomson, 1869 A Be
Hecamedoides affinis (Tonnoir & Malloch, 1926) E
Hecamedoides n. sp. E
Hyadina irrorata Tonnoir & Malloch, 1926 E We
Hyadina obscurifrons Tonnoir & Malloch, 1926 E
Hyadina n. sp. E
Hydrellia acutipennis Harrison, 1959 E
Hydrellia enderbii (Hutton, 1902) A? Gr
Hydrellia mareeba Bock 1991 A
Hydrellia novaezealandiae Harrison, 1959 E
Hydrellia tritici Coquillett, 1903 A Gr H
Hydrellia velutinifrons Tonnoir & Malloch, 1926 E
Hydrellia williamsi Cresson, 1936 A
Hydrellia n. spp. (3) 3E
Hydrellia n. sp. E Ch
Leptopsilopa n. sp. E
Limnellia abbreviata (Harrison, 1976) E Sn
Limnellia maculipennis Malloch, 1925 A
Nostima duoseta Cresson, 1943
Nostima kiwistriata Edmiston & Mathis, 2007 E
Nostima negramaculata Edmiston & Mathis, 2007 E
Parahyadina lacustris Tonnoir & Malloch, 1926 E
Parahyadina n. spp. (7) 7E Ch
Parydra neozelandica Tonnoir & Malloch, 1926 E
Psilopa metallica (Hutton, 1901) E Gr Li Ff
Scatella acutipennis Harrison, 1964 E Su
Scatella brevis Harrison, 1964 E Su
Scatella nelsoni Tonnoir & Malloch, 1926 E
Scatella nitidithorax Malloch, 1925 A?
Scatella nubeculosa Tonnoir & Malloch, 1926 E We
Scatella subvittata Tonnoir & Malloch, 1926 E We
Scatella tonnoiri Hendel, 1931 E
Scatella unguiculata Tonnoir & Malloch, 1926 E
Scatella vittithorax Malloch, 1925 A? Fs
Scatella n. spp. (5) 5E
Scatella n. spp. (2) 2E Ch
Subpelignus n. sp. E
Zeros invenatus (Lamb, 1912) A
FERGUSONINIDAE [Martin]
Fergusonina metrosiderosi Taylor *in* Taylor, Davies, Martin & Crosby, 2007 E HG
HELCOMYZIDAE
Maorimyia bipunctata (Hutton, 1901) E Be ?Li
HELEOMYZIDAE
Allophylina albitarsis Tonnoir & Malloch, 1927 E
Allophylopsis bivittata Harrison, 1959 E Li
Allophylopsis chathamensis Tonnoir & Malloch, 1927 E Ch
Allophylopsis distincta Tonnoir & Malloch, 1927 E
Allophylopsis fulva (Hutton, 1901) E
Allophylopsis fuscipennis Tonnoir & Malloch, 1927 E
Allophylopsis hudsoni (Hutton, 1901) E
Allophylopsis inconspicua Tonnoir & Malloch, 1927 E
Allophylopsis laquei (Hutton, 1902) E Su
Allophylopsis lineata Tonnoir & Malloch, 1927 E
Allophylopsis minuta Tonnoir & Malloch, 1927 E
Allophylopsis obscura Tonnoir & Malloch, 1927 E
Allophylopsis philpotti Tonnoir & Malloch, 1927 E
Allophylopsis rufithorax Tonnoir & Malloch, 1927 E
Allophylopsis scutellata (Hutton, 1901) E
Allophylopsis subscutellata Tonnoir & Malloch, 1927 E
Allophylopsis sp. indet.* Sa Andrew
Aneuria angusta Harrison, 1959 E
Aneuria bipunctata Malloch, 1930 E
Aneuria imitatrix Malloch, 1930 E
Aneuria sexpunctata Malloch, 1930 E
Aneuria tripunctata Malloch, 1930 E
Fenwickia affinis Harrison, 1959 E
Fenwickia caudata Harrison, 1959 E
Fenwickia claripennis Malloch, 1930 E
Fenwickia hirsuta Malloch, 1930 E
Fenwickia nuda Malloch, 1930 E
Fenwickia similis Malloch, 1930 E
Oecothea fenestralis (Fallen, 1820) A Ga
Prosopantrum flavifrons (Tonnoir & Malloch, 1927) A Gr
Tephrochlamys rufiventris (Meigen, 1830) A Ga
Xeneura picata (Hutton, 1902) E
HELOSCIOMYZIDAE
Dasysciomyza pseudosetuligera (Tonnoir & Malloch, 1928) E
Dasysciomyza setuligera (Malloch, 1922) E
Helosciomyza subalpina Tonnoir & Malloch, 1928 E IP
Napaeosciomyza rara (Hutton, 1901) E
Napaeosciomyza spinicosta (Malloch, 1922) E
Napaeosciomyza subspinicosta (Tonnoir & Malloch, 1928) E
Polytocus costatus Harrison, 1976 E Su
Polytocus spinicosta Lamb, 1909 E Su
Scordalus femoratus (Tonnoir & Malloch, 1928) E
Xenosciomyza prima Tonnoir & Malloch, 1928 E
Xenosciomyza turbotti Harrison, 1955 E Su
HUTTONINIDAE E
Huttonina (Huttonina) abrupta Tonnoir & Malloch, 1928 E
Huttonina (*H.*) *brevis* Malloch, 1930 E
Huttonina (*H.*) *elegans* Tonnoir & Malloch, 1928 E
Huttonina (*H.*) *furcata* Tonnoir & Malloch, 1928 E
Huttonina (*H.*) *glabra* Tonnoir & Malloch, 1928 E
Huttonina (*H.*) *scutellaris* Tonnoir & Malloch, 1928 E
Huttonina (*Huttoninella) angustipennis* Tonnoir & Malloch, 1928 E
Huttonina (*H.*) *claripennis* Harrison, 1959 E
Prosochaeta prima Malloch, 1935 E
LAUXANIIDAE
Poecilohetaerella antennata Harrison, 1959 E
Poecilohetaerella bilineata (Hutton, 1901) E Gr
Poecilohetaerella dubiosa Tonnoir & Malloch, 1926 E
Poecilohetaerella minuta (Tonnoir & Malloch, 1926) E
Poecilohetaerella punctatifrons (Tonnoir & Malloch, 1926) E
Poecilohetaerella punctatifrons obscura (Tonnoir & Malloch, 1926) E
Poecilohetaerella scutellata Harrison, 1959 E
Poecilohetaerella watti Tonnoir & Malloch, 1926 E
Poecilohetaerus punctatifacies Tonnoir & Malloch, 1926 E
Sapromyza arenaria Tonnoir & Malloch, 1926 E
Sapromyza dichromata Walker, 1849 E
Sapromyza neozelandica Tonnoir & Malloch, 1926 E Li
Sapromyza persimillima Harrison, 1959 E
Sapromyza simillima Tonnoir & Malloch, 1926 E
Trypetisoma guttatum (Tonnoir & Malloch, 1926) E

Trypetisoma costatum (Harrison, 1959) E
Trypetisoma tenuipenne (Malloch, 1930) E
MILICHIIDAE [Andrew, Thorpe]
Desmonetopa sp. indet. Thorpe
?*Milichillia* sp. indet. Thorpe
Paramyia sp. indet. Andrew
Stomosis sp. indet. Andrew
PALLOPTERIDAE
Maorina apicalis (Walker, 1849) E Fo
Maorina aristata Malloch, 1930 E
Maorina bimacula Malloch, 1930 E
Maorina gourlayi (Harrison, 1959) E
Maorina lamellata (Harrison, 1959) E
Maorina macronycha Malloch, 1930 E
Maorina palpalis Malloch, 1930 E
Maorina pseudoapicalis (Harrison, 1959) E
Maorina scutellata Malloch, 1930 E
Maorina n. sp. Macfarlane, CMNZ E Ch
PERISCELIDIDAE [Andrew]
Cyamops sp. indet.* Khoo 1985 ?E
PIOPHILIDAE A
Piophila australis (Harrison, 1959) A
Piophila casei (Linnaeus, 1758) A St
PLATYSTOMATIDAE
Zealandortalis interrupta Malloch, 1930 E
Zealandortalis philpotti Harrison, 1959 E
PSEUDOPOMYZIDAE
Pseudopomyza antipoda (Harrison, 1955) E Su Gr
Pseudopomyza aristata (Harrison, 1959) E Fo
Pseudopomyza brevicaudata (Harrison, 1964) E Su
Pseudopomyza brevis (Harrison, 1976) E Su
Pseudopomyza flavitarsis (Harrison, 1959) E Fo
Pseudopomyza neozelandica (Malloch, 1933) E
PSILIDAE A
Chamaepsila rosae (Fabricius, 1794) A Ga-Cr H
SCIOMYZIDAE
Eulimnia milleri Tonnoir & Malloch, 1928 E
Eulimnia philpotti Tonnoir & Malloch, 1928 E MoP F
'Limnia' transmarina? Schiner, 1868 E
Neolimnia castanea (Hutton, 1904) E
Neolimnia diversa Tonnoir & Malloch, 1928 E
Neolimnia irrorata Tonnoir & Malloch, 1928 E
Neolimnia minuta Tonnoir & Malloch, 1928 E
Neolimnia nitidiventris Tonnoir & Malloch, 1928 E
Neolimnia obscura (Hutton, 1901) E
Neolimnia pepikeiti Barnes, 1979 E
Neolimnia raiti Barnes, 1979 E
Neolimnia repo Barnes, 1979 E
Neolimnia sigma (Walker, 1849) E MoP F
Neolimnia striata (Hutton, 1904) E
Neolimnia striata brunneifrons Tonnoir & Malloch, 1928 E
Neolimnia tranquilla (Hutton, 1901) E
Neolimnia ura Barnes, 1979 E
Neolimnia vittata Harrison, 1959 E
SEPSIDAE A
Lasionemopoda hirsuta (de Meijere, 1906) A Gr D
SPHAEROCERIDAE (Marshall)
Biroina myersi (Richards, 1973) E
Biroina n. spp. (3) Marshall 3E
Coproica ferruginata (Stenhammar, 1855) A
Coproica hirtula (Rondani, 1880) A Li
Coproica hirticula Collin 1956* A
Howickia trilineata (Hutton, 1901) E Li
Howickia n. sp. Marshall E
Ischiolepta pusilla (Fallen, 1820) A D-Ca Li
Leptocera caenosa (Rondani, 1880) A
Leptocera n. sp. E Sa
*Minilimosina knightae (*Harrison, 1959) E
Minilimosina sp. indet. E Marshall
Minilimosina n. sp. E Marshall
Norrbomia sordida (Zetterstedt, 1847)* A D
Opacifrons maculifrons (Becker, 1907) A We
Opalimosina mirabilis (Collin, 1902) A Li
Phthitia emarginata Marshall in Marshall, Hall & Hodge, 2009 E Ff
Phthitia empirica (Hutton, 1901) A Ca-Nb
Phthitia lobocercus Marshall *in* Marshall & Smith, 1992 E
Phthitia notthomasi Marshall *in* Marshall & Smith, 1992 E
Phthitia plesiocerus Marshall in Marshall, Hall & Hodge, 2009 E Fs
Phthitia rennelli (Harrison, 1964) E Su Ca
Phthitia thomasi (Harrison, 1959) A Ca
Pullimosina heteroneura (Haliday, 1836) A
Pullimosina pullula (Zetterstedt, 1847) * A
Rachispoda fuscipennis (Haliday, 1833) A
Rachispoda sp. indet.* Marshall
Spelobia bifrons (Stenhammar, 1855) A Li
Spelobia luteilabris (Rondani, 1880) A
Spelobia pseudosetaria (Duda, 1918) * A
Sphaerocera curvipes Latreille, 1805 A D
Telomerina flavipes (Meigen, 1830) A
Thoracochaeta alia Marshall & Rohácek, 2000 E Be Li
Thoracochaeta ancudensis (Richards, 1931) Be Li
Thoracochaeta conglobata Marshall & Rohacek, 2000 E Be Li
Thoracochaeta harrisoni Marshall & Rohacek, 2000 E Be Li Ch
Thoracochaeta imitatrix Marshall & Rohacek, 2000 E Be Li
Thoracochaeta mucronata Marshall & Rohacek, 2000 E Be Li
Thoracochaeta zealandica (Harrison, 1959) E Be Li
Trachyopella lineafrons Spuler, 1925* A Li Marshall
Gen. nov. *mediospinosa* (Duda, 1925) A Li
TEPHRITIDAE [Macfarlane]
Austrotephritis cassiniae (Malloch, 1931) E
Austrotephritis marginata (Malloch, 1931) E
Austrotephritis plebeia (Malloch, 1931) E
Austrotephritis thoracica (Malloch, 1931) E
Procecidochares alani Steyskal, 1974 A BC HG
Procecidochares utilis Stone, 1947 A BC HG
Sphenella fascigera (Malloch, 1931) E
Trupanea alboapicata Malloch, 1931 E
Trupanea centralis Malloch, 1931 E
Trupanea completa Malloch, 1931 E
Trupanea dubia Malloch, 1931 E
Trupanea extensa Malloch, 1931 E
Trupanea fenwicki Malloch, 1931 E
Trupanea vitiosa Foote, 1989 E
Trupanea vittigera Malloch, 1931 E
Trupanea watti Malloch, 1931 E
Trupanea n. sp. E
Urophora cardui? (Linnaeus, 1758) A BC Gr HSG
Urophora solstitialis (Linnaeus, 1758) A BC Gr H
Urophora stylata (Fabricius, 1775) A BC Gr HG
TERATOMYZIDAE
Teratomyza neozelandica Malloch, 1933 E
Teratomyza n. sp. McAlpine E

CALYPTRATAE
ANTHOMYIIDAE A? [Andrew]
Anthomyia punctipennis Wiedemann, 1830 A Gr
Botanophila jacobaeae (Hardy, 1872) A BC Gr HS
Delia platura (Meigen, 1826) A Gr HL
Delia ?*urbana* (Malloch, 1924)* A Andrew
Fucellia spp. indet. (2)* 2A? Be Andrew
CALLIPHORIDAE
Calliphora hilli Patton, 1925 A Fo-Gr Ca
Calliphora h. kermadecensis Kurahashi, 1971 E K Fo-Gr Ca
Calliphora quadrimaculata (Swederus, 1787) E Fo-Gr Ca
Calliphora stygia (Fabricius, 1782) A Gr Ca-LP
Calliphora vicina Robineau-Desvoidy, 1830 A Gr Ca
Chrysomya megacephala (Fabricius, 1794) A Ca
Chrysomya rufifacies (Macquart, 1843) A Ca
Hemipyrellia ligurriens? (Wiedemann, 1830) A Ca-Li
Lucilia cuprina (Wiedemann, 1830) A Gr Ca-LP
Lucilia sericata (Meigen, 1826) A Gr-Be Ca-LP
Mystacinobia zelandica Holloway, 1976 I^{C} E Fo D
Pollenia advena Dear, 1986 E Fo-Ga
Pollenia aerosa Dear, 1986 E
Pollenia antipodea Dear, 1986 E Gr
Pollenia astrictifrons Dear, 1986 E Sa
Pollenia atricoma Dear, 1986 E ?Gr-Sa
Pollenia atrifemur? Malloch, 1930 E
Pollenia commensurata Dear, 1986 E
Pollenia consanguinea Dear, 1986 E GrSa
Pollenia consectata Dear, 1986 E Ga
Pollenia cuprea? Malloch, 1930 E
Pollenia demissa (Hutton, 1901) E
Pollenia dysaethria Dear, 1986 E ?Gr
Pollenia dyscheres Dear, 1986 E GrSa
Pollenia enetera Dear, 1986 E
Pollenia eurybregma Dear, 1986 E GrSa
Pollenia fulviantenna Dear, 1986 E Gr
Pollenia fumosa (Hutton, 1901) E GrSa
Pollenia hispida Dear, 1986 E GrSa
Pollenia immanis Dear, 1986 E GrSa
Pollenia insularis Dear, 1986 E
Pollenia lativertex Dear, 1986 E GrSa
Pollenia limpida Dear, 1986 E GrSa
Pollenia nigripalpis Dear, 1986 E TK Fo
Pollenia nigripes Malloch, 1930 E
Pollenia nigrisquama Malloch, 1930 E Fo-Gr
Pollenia notialis Dear, 1986 E GrSa
Pollenia opalina Dear, 1986 E ?GrSa
Pollenia oreia Dear, 1986 E GrSa
Pollenia pernix (Hutton, 1901) E Gr-Sa
Pollenia primaeva Dear, 1986 E
Pollenia pseudorudis Rognes, 1985 A Gr EP
Pollenia pulverea Dear, 1986 E FoWe
Pollenia sandaraca Dear, 1986 E
Pollenia scalena Dear, 1986 E Su Gr
Pollenia uniseta Dear, 1986 E GrSa
Ptilonesia auronotata (Macquart, 1855) A? Be-Gr Ca
Xenocalliphora antipodea (Hutton, 1902) E Su Ca
Xenocalliphora clara Dear, 1986 E Ca
Xenocalliphora divaricata Dear, 1986 E Ca
Xenocalliphora eudypti (Hutton, 1902) E Su Ca
Xenocalliphora flavipes (Lamb, 1909) E Su Ca
Xenocalliphora hortona (Walker, 1849) E Gr-Be Ca
Xenocalliphora neohortona (Miller, 1939) E Ca
Xenocalliphora neozealandica (Murray, 1954) E Ca
Xenocalliphora solitaria Dear, 1986 E Ch Ca
Xenocalliphora vetusta Dear, 1986 E TK Ca
Xenocalliphora viridiventris Malloch, 1930 E Su
FANNIIDAE
Euryomma perigrinum (Meigen, 1826) A
Fannia albitarsis Stein, 1911 A
Fannia canicularis (Linnaeus, 1761) A Ga Li
?*Fannia scalaris* (Fabricius, 1794) A
Fannia n. sp. (larva described) A
Fannia n. spp. (2) (larva described) 2E Be Nb
Fannia n. sp. (larva described) E Ch Be Nb
HIPPOBOSCIDAE [Sinclair]
Melophagus ovinus (Linnaeus, 1758) A Gr LP
Ornithoica ?exilis (Walker, 1861) A? Fo BP
Ornithoica stipituri (Schiner, 1868) A Gr-Ga BP
Ornithomya nigricornis Erichson, 1842 Gr BP
Ornithomya variegata Bigot, 1885 A? FoGa BP
MUSCIDAE [Harrison]
Calliphoroides antennatis (Hutton, 1881) E
'Coenosia' algivora Hutton, 1901 E
'Coenosia' rubriceps Hutton, 1901 E
Exsul singularis Hutton, 1901 I^{C} E Sa IPr
Exsul tenuis Malloch, 1923 E
Exsul n. spp. (2) 2E
Helina sexmaculata (Preyssler, 1791) A
Hydrotaea rostrata (Robineau-Desvoidy, 1830) A

Gr Ca
Idiohelina nubeculosa Malloch, 1921 E
Idiohelina nelsoni Malloch 1929 }
Idiohelina setifemur Malloch, 1929
Limnohelina bivittata Malloch, 1930 E F
Limnohelina debilis (Hutton, 1901) E
Limnohelina dorsovittata Malloch, 1930 E
Limnohelina grisea Malloch, 1930 E F
Limnohelina huttoni Malloch, 1930 E
Limnohelina nelsoni Malloch, 1930 E
Limnohelina nigripes Malloch, 1930 E
Limnohelina smithii (Hutton, 1901) E F
Limnohelina spinipes (Walker, 1849) E F
Limnohelina uniformis Malloch, 1930 E
Macrorchis meditata (Fallen, 1825) A?
Millerina hudsoni Malloch, 1925 E
Millerina nigrifemur Malloch, 1925 E
Millerina pennata Malloch, 1925 E
Millerina rapax (Hutton, 1901) E
Muscina stabulans (Fallen, 1817) A Li Ca D
Musca domestica Linnaeus, 1758 A Ga Li-D
Paracoenosia tonnoiri Malloch, 1938 E
Paralimnophora depressa Lamb, 1909 E Su
Paralimnophora filipennis [NC] (Lamb, 1909) E Su
Paralimnophora fumipennis [NC] (Lamb, 1909) E Su
Paralimnophora purgatoria[NC] (Hutton, 1901) E
Paralimnophora n. spp. (7) Harrison 7E
Pygophora apicalis Schiner, 1868 A
'Spilogona' albifrons Malloch, 1931 E
'Spilogona' argentifrons Malloch, 1931 E
'Spilogona' aucklandica (Hutton, 1902) E Su We
'Spilogona' aureifacies Malloch, 1931 E
'Spilogona' badia (Hutton, 1901) E
'Spilogona' brunneinota (Harrison, 1955) E Su
'Spilogona' brunneivittata (Harrison, 1955) E Su
'Spilogona' carbonaria (Hutton, 1901) E
'Spilogona' curvipes (Lamb, 1909) E Su
'Spilogona' dolosa (Hutton, 1901) E
'Spilogona' flaviventris Malloch, 1931 E
'Spilogona' fuliginosa (Hutton, 1901) E Su
'Spilogona' fulvescens (Hutton, 1901) E
'Spilogona' fumicosta Malloch, 1931 E
'Spilogona' insularis (Lamb, 1909) E Su
'Spilogona' lasiophthalma (Lamb, 1909) E Su
'Spilogona' latimana Malloch, 1931 E
'Spilogona' maculipennis (Hutton, 1901) E
'Spilogona' melas (Schiner 1868) E
'Spilogona' minuta (Harrison, 1955) E Su
'Spilogona' ordinata (Hutton, 1901) E
'Spilogona' sorenseni (Harrison, 1955) E Su
'Spilogona' tenuicornis (Malloch, 1923) E
'Spilogona' villosa (Hutton, 1902) E
'Spilogona' n. spp. (57) 57E
Stomoxys calcitrans (Linnaeus, 1758) A D-Li BF
Gen. nov. 1 *limpida* (Hutton, 1901) E
Gen. nov. 1 n. spp. (20) 20E
OESTRIDAE A
Gasterophilus haemorrhoidalis (Linnaeus, 1758) A Gr LP
Gasterophilus nasalis (Linnaeus, 1758) A Gr LP
Hypoderma bovis (Linnaeus, 1758) A Gr LP
Oestrus ovis Linnaeus, 1758 A Gr LP
SARCOPHAGIDAE [Andrew]
Oxysarcodexia varia (Walker, 1836) A Gr D
Sarcophaga bifrons Walker, 1853 A
Sarcophaga crassipalpis Macquart, 1939 A Ga Li
Sarcophaga peregrina (Robineau-Desvoidy, 1830) A
Tricharaea brevicornis Wiedemann, 1830* A?
Miltogramminae gen. et sp. indet.* Pape
TACHINIDAE [Dugdale]
Altaia geniculata Malloch, 1938 E IP
Asetulia nigropolita Malloch, 1938 E IP
Asetulia n. sp. NZAC E IP
Austromacquartia claripennis (Malloch, 1932) E IP
Avibrissia longirostris Malloch, 1932 E IP
Avibrissia n. sp. NZAC E IP
Avibrissina brevipalpis Malloch, 1932 E Gr So IP
Avibrissina laticornis Malloch, 1938 E IP
Avibrissina n. spp. (2) NZAC 2E IP
Bothrophora lupina (Swederus, 1787) E IP
Calcager apertum Hutton, 1901 E IP
Calcager dubius Malloch, 1938 E IP
Calcager n. sp. NZAC E IP
Calcageria incidens Curran, 1927 E IP
Calcageria varians Malloch, 1938 E IP
Calosia binigra (Malloch, 1938) E IP
Calosia n. spp. (3) NZAC 3E IP
Calotachina tricolor Malloch, 1938 E IP
Campbellia campbelli Miller, 1928 E IP
Campbellia cockaynei Miller, 1928 E IP
Campbellia lancifer (Malloch, 1930) E IP
Campylia nudara Malloch, 1938 E IP
Campylia temerarium (Hutton, 1901) E IP
Campylia n. sp. NZAC E IP
Chaetophthalmus bicolor (Macquart, 1848) A GrGa IP
Chaetopletha centralis Malloch, 1938 E IP
Erythronychia aliena Malloch, 1932 E IP
Erythronychia aperta Malloch, 1932 E IP
Erythronychia australiensis (Schiner, 1868) E IP
Erythronychia defecta Malloch, 1932 E IP
Erythronychia grisea Malloch, 1932 E IP
Erythronychia hirticeps Malloch, 1932 E IP
Erythronychia minor Malloch, 1932 E IP
Erythronychia princeps (Curran, 1927) E IP
Erythronychia velutina Malloch, 1932 E IP
'Evibrissa' huttoni Malloch, 1931 E IP
Genotrichia minor Malloch, 1938 E IP
Genotrichia tonnoiri Malloch, 1938 E IP
Gracilicera monticola (Malloch, 1938) E IP
Gracilicera pallipes (Malloch, 1938) E IP
Gracilicera politiventris (Malloch, 1938) E IP
Graphotachina sinuata Malloch, 1938 E IP
Heteria appendiculata Malloch, 1930 E IP
Heteria atripes Malloch, 1930 E IP
Heteria extensa Malloch, 1930 E IP
Heteria flavibasis Malloch, 1930 E IP
Heteria plebeia Malloch, 1930 E IP
Heteria punctigera Malloch, 1930 E IP
Heteria n. spp. (2) NZAC 2E IP
Huttonobesseria verecunda (Hutton, 1901) E We IP
Mallochomacquartia flavohirta (Malloch, 1938) E IP
Mallochomacquartia nigrihirta (Malloch, 1938) E IP
Mallochomacquartia vexata (Hutton, 1901) E IP
Medinella albifrons Malloch, 1938 E IP
Medinella flavofemorata Malloch, 1938 E IP
Medinella nigrifemorata Malloch, 1938 E IP
Medinella varipes Malloch, 1938 E IP
Medinella n. spp. (2) NZAC 2E IP
Microhystricia gourlayi Malloch, 1938 E IP
Montanarturia dimorpha (Malloch, 1938) E IP
Neoerythronychia hirta Malloch, 1932 E IP
Neotachina angusticornis Malloch, 1938 E IP
Neotachina depressa Malloch, 1938 E Gr-Sh So IP
Neotachina laticornis Malloch, 1938 E IP
Neotachina obtusa Malloch, 1938 E IP
Neotachina n. spp. (2) NZAC 2E IP
Neotryphera atra Malloch, 1938 E IP
Occisor atratus Malloch, 1938 E IP
Occisor inscitus Hutton, 1901 E IP
Occisor versutus Hutton, 1901 E Gr IP
Occisor n. spp. (2) NZAC 2E IP
Pales atrox (Hutton, 1901) E IP
Pales aurea (Hutton, 1901) E IP
Pales brouni (Hutton, 1901) E IP
Pales casta (Hutton, 1904) E IP
Pales clathrata[1] (Nowicki, 1875) E IP
Pales efferata (Hutton, 1901) E GaGr IP
Pales exitiosa (Hutton, 1901) E IP
Pales feredayi (Hutton, 1901) E GaCr IP
Pales funesta (Hutton, 1901) E GaOr Fo IP
Pales inconspicua (Hutton, 1901) E IP
Pales marginata (Hutton, 1901) E IP
Pales nefaria (Hutton, 1901) E IP
Pales nyctemeriana (Hudson, 1883) E GrCr IP
Pales orasus[1] (Walker, 1849) E IP
Pales perniciosa (Hutton, 1901) E IP
Pales tecta (Hutton, 1901) E IP
Pales usitata[1] (Hutton, 1901) E Gr IP
Pales n. spp. (10) NZAC 10E IP
Peremptor egmonti (Hutton, 1901) E IP
Peremptor kumaraensis (Miller, 1913) E IP
Peremptor modicus Hutton, 1901 E IP
Peremptor n. sp. NZAC E IP
Perrissina albiceps Malloch, 1938 E IP
Perrissina brunniceps Malloch, 1938 E IP
Perrissina crocea Malloch, 1938 E Fo IP
Perrissina variceps Malloch, 1938 E IP
Perrissina xanthopyga Malloch, 1938 E IP
Perrissinoides cerambycivorae Dugdale, 1962 E Fo IP
Phaoniella bifida Malloch, 1938 E IP
Plagiomyia achaeta Malloch, 1938 E IP
Plagiomyia alticeps Malloch, 1938 E IP
Plagiomyia longicornis Malloch, 1938 E GaGr IP
Plagiomyia longipes Malloch, 1938 E IP
Plagiomyia turbida (Hutton, 1901) E IP
Platytachina angustifrons Malloch, 1938 E IP
Platytachina atricornis Malloch, 1938 E IP
Platytachina difficilis Malloch, 1938 E IP
Platytachina latifrons Malloch, 1938 E IP
Platytachina major Malloch, 1938 E IP
Plethochaetigera fenwicki Malloch, 1938 E IP
Plethochaetigera isolata Malloch, 1938 E IP
Plethochaetigera setiventris Malloch, 1938 E IP
Plethochaetigera n. spp. (4) NZAC 4E IP
Procissio albiceps Malloch, 1938 E IP
Procissio cana Hutton, 1901 E Gr So IP
Procissio lateralis Malloch, 1938 E IP
Procissio milleri Malloch, 1938 E Gr So IP
Procissio montana Hutton, 1901 E IP
Procissio n. sp.'clear wing' NZAC E IP
Prosenosoma greyi Malloch, 1938 E IP
Protohystricia alcis (Walker, 1849) E Gr IP
Protohystricia gourlayi (Tonnoir, 1935) E IP
Protohystricia huttoni Malloch, 1930 E IP
Protohystricia orientalis (Schiner, 1868) E IP
Pygocalcager humeratum (Hutton, 1901) E IP
Pygocalcager n. spp. (2) NZAC 2E IP
Senostoma rubricarinatum?[7] (Macquart, 1846) IP
'Tachina' mestor?[22] Walker, 1849 E IP
'Tachina' sosilus?[22] Walker, 1849 E IP
Tachineo clarkii Hutton, 1901 E IP
Triarthria setipennis? (Fallen, 1810) A Gr-Ga IP
Trigonospila brevifacies (Hardy, 1934) A BC GaOr Fo IP
Truphia grisea Malloch, 1930 E IP
Truphia n. sp. NZAC E IP
Trypherina grisea Malloch, 1938 E IP
Trypherina n. spp. (2) NZAC 2E IP
Uclesiella irregularis Malloch, 1938 E IP
Uclesiella n. spp. (2) 2E IP
Veluta albicincta Malloch, 1938 E IP
Wattia ferruginea Malloch, 1938 E IP
Wattia petiolata Malloch, 1938 E IP
Wattia sessilis Malloch, 1938 E IP
Xenorhynchia peeli Malloch, 1938 E IP
Xenorhynchia n. spp. (3) NZAC 3E IP
Zealandotachina infuscata Malloch, 1938 E IP
Zealandotachina lamellata Malloch, 1938 E IP
Zealandotachina latifrons Malloch, 1938 E IP
Zealandotachina nigrifemorata Malloch, 1938 E IP
Zealandotachina quadriseta Malloch 1938 E IP
Zealandotachina quadrivittata Malloch, 1938 E IP
Zealandotachina setigera Malloch, 1938 E IP
Zealandotachina subtilis (Hutton, 1901) E IP
Zealandotachina tenuis Malloch, 1938 E IP
Zealandotachina varipes Malloch, 1938 E IP
Gen. nov. 1 et n. spp. (2) NZAC 2E IP
Gen. nov. 2 et n. spp. (2) NZAC 2E IP

Gen. nov. 3 et n. sp. NZAC E IP
Gen. nov. 4 et n. sp. NZAC E IP
Gen. nov. 5 et n. sp. NZAC E IP
Gen. nov. 6 et n. sp. NZAC E IP
Gen. nov. 7 et n. sp. NZAC E IP
Gen. nov. 8 Voriinae et n. sp. NZAC E IP

Order STREPSIPTERA
[Compiled by R. P. Macfarlane]
ELENCHIDAE
Elenchus maoricus Gourlay, 1953 E Gr IP
HALICTOPHAGIDAE
Coriophagus casui Cowley 1984 E Fo IP
Coriophaginae n. spp. (2) 2E IP

Order HYMENOPTERA
[Compiled by J. A Berry]
Suprafamilial classification generally follows that used by LaSalle and Gauld (1993), with some updates, which are noted. Families and genera are arranged alphabetically. (?) indicates the record of the species *in* New Zealand is doubtful. 'n.sp.' indicates known undescribed species; 'sp.' indicates indeterminate status.

For generic records where no species are reported from New Zealand, the origin of the generic record is indicated in square brackets [...]. In some cases this is a publication, in others the record is based on expert opinion. Authorities thus cited are: ADA – Andrew D. Austin; AH – Allen Heath; SB – Sergey Belokobylskij; JAB – Jocelyn A. Berry; ZB – Z. Boucek; PD – Paul Dessart; BJD – Barry J. Donovan; JWE – John W. Early; NDMF – N.D.M. Fergusson; IDG – Ian D. Gauld; GAPG – Gary Gibson; EEG – Eric E. Grissell; JH – John Heraty; JL – John LaSalle; JBM – J. B. Munro; MM – Manfred Mackauer; TM – T. Megyaszai; IDN – Ian D. Naumann; JSN – John S. Noyes; SRS – Scott R. Shaw; SET – Stephen Thorpe; ST – Serguei Triapitsyn; DBW – David B. Wahl.

Suborder SYMPHYTA
TENTHREDINOIDEA
PERGIDAE A
Phylacteophaga froggatti Riek, 1955 A
TENTHREDINIDAE A
Caliroa cerasi (Linnaeus, 1758) A
Nematus oligospilus Förster, 1854 A
Pontania proxima (Lepeletier, 1823) A
Priophorus morio (Lepeletier, 1823) A
SIRICOIDEA A
SIRICIDAE A
Sirex noctilio Fabricius, 1793 A
XIPHYDRIOIDEA
XIPHYDRIIDAE
Moaxiphia deceptus (Smith, 1876) E
Moaxiphia duniana (Gourlay, 1927) E
ORUSSOIDEA
ORUSSIDAE
Guiglia schauinslandi (Ashmead, 1903) E

Suborder APOCRITA
APOCRITA-PARASITICA
EVANIOIDEA
GASTERUPTIIDAE
Gasteruption expectatum Pasteels, 1957 E
Gasteruption flavicuspis Kieffer, 1911 E
Gasteruption scintillans Pasteels, 1957 E
Pseudofoenus crassipes (Smith, 1876) E
Pseudofoenus nocticolor Kieffer, 1911 E
Pseudofoenus pedunculatus (Schletterer, 1889) E
Pseudofoenus unguiculatus (Westwood, 1841) E
CERAPHRONOIDEA
CERAPHRONIDAE
Aphanogmus sp. [PD]
Ceraphron sp. [PD]
MEGASPILIDAE
Conostigmus variipilosus Dessart, 1997 E
Dendrocerus aphidum (Rondani, 1877) A
Dendrocerus carpenteri (Curtis, 1829) A
Dendrocerus laticeps (Hedicke, 1929) A
Lagynodes coxivillosus coxivillosus Dessart, 1987 E
Lagynodes gastroleius Dessart, 1987 E
Lagynodes hecaterapterus Dessart, 1981 E
Lagynodes velutinus Dessart & Masner *in* Dessart, 1977 E
Trichosteresis glaber (Boheman, 1832) A
PROCTOTRUPOIDEA
PROCTOTRUPIDAE
Exallonyx trifoveatus Kieffer, 1908 A
Fustiserphus intrudens (Smith, 1878) E
Fustiserphus longiceps Townes *in* Townes & Townes, 1981 E
Fustiserphus spp. (2-3) [Early & Dugdale 1994]
Oxyserphus baini Townes *in* Townes & Townes, 1981 E
Oxyserphus maculipennis (Cameron, 1888) E
Oxyserphus pediculatus Townes *in* Townes & Townes, 1981 E
DIAPRIOIDEA *sensu* Sharkey (2007)
DIAPRIIDAE
AMBOSITRINAE
Archaeopria eriodes Naumann, 1988 E
Archaeopria pelor Naumann, 1988 E
Archaeopria pristina Naumann, 1988 E
Betyla auriger Naumann, 1988 E
Betyla eupepla Naumann, 1988 E
Betyla fulva Cameron, 1889 E
Betyla karamea Naumann, 1988 E
Betyla midas Naumann, 1988 E
Betyla paparoa Naumann, 1988 E
Betyla prosedera Naumann, 1988 E
Betyla rangatira Naumann, 1988 E
Betyla thegalea Naumann, 1988 E
Betyla tuatara Naumann, 1988 E
Betyla wahine Naumann, 1988 E
Diphoropria sinuosa Naumann, 1988 E
Diphoropria kuscheli Naumann, 1988 E
Maoripria annettae Naumann, 1988 E
Maoripria earlyi Naumann, 1988 E
Maoripria masneri Naumann, 1988 E
Maoripria verticillata Naumann, 1988 E
Pantolytomyia flocculosa Naumann, 1988 E
Pantolytomyia insularis Naumann, 1988 E
Pantolytomyia polita Naumann, 1988 E
Pantolytomyia takere Naumann, 1988 E
Pantolytomyia taurangi Naumann, 1988 E
Pantolytomyia tungane Naumann, 1988 E
Pantolytomyia wairua Naumann, 1988 E
Parabetyla nauhea Naumann, 1988 E
Parabetyla ngarara Naumann, 1988 E
Parabetyla pipira Naumann, 1988 E
Parabetyla pokorua Naumann, 1988 E
Parabetyla spinosa Brues, 1922 E
Parabetyla tahi Naumann, 1988 E
Parabetyla tika Naumann, 1988 E
Zealaptera chambersi Naumann, 1988 E
BELYTINAE
Gladicauda aucklandica Early, 1980 E
Gladicauda spp. (~10) [JWE] E
Stylaclista quasimodo Early, 1980 E
Stylaclista spp. (~9) [TM]
Synacra sp. [JWE]
Gen. nov. et n. spp. (~10) [JWE] E
DIAPRIINAE
Antarctopria campbellana Yoshimoto, 1964 E
Antarctopria coelopae Early, 1978 E
Antarctopria diomedeae Early, 1978 E
Antarctopria latigaster Brues, 1920 E
Antarctopria rekohua Early, 1978 E
Basalys spp. (> 3) [JWE]
Cardiopria sp. [JWE]
Diapria sp. [JWE]
Entomacis subaptera Early, 1980 E
Entomacis spp. (3-19) [JWE]
Hemilexomyia spinosa Early, 1980 E
Hemilexomyia sp. [JWE]
Idiotypa spp. (7-35) [JWE]
Malvina helosciomyzae Early & Horning, 1978 E
Malvina insulae Early, 1980 E
Malvina punctata Cameron, 1889 E
Malvina quadriceps (Smith, 1878) E
Malvina spp. (~8) [JWE] E
Neurogalesus spp. (~2) [JWE]
Paramesius spp. (6-30) [JWE]
Pentapria sp. [JWE]
Probetyla subaptera Brues, 1922 E
Spilomicrus barnesi Early & Horning, 1978 E
Spilomicrus carolae Early, 1980 E
Spilomicrus pilgrimi Early, 1978 E
Spilomicrus spp. (54-100) [JWE]
Trichopria spp. (5) [JWE]
Gen. nov. et n. spp. (5) [JWE] E
Gen. nov. et n. sp. [JWE] E
Gen. nov. et n. spp. (2) [JWE.] E
Gen. nov. et n. sp. [JWE]
MAAMINGIDAE E
Maaminga marrisi Early, Masner, Naumann & Austin, 2001 E
Maaminga rangi Early, Masner, Naumann & Austin, 2001 E
PLATYGASTROIDEA *sensu* Sharkey (2007)
PLATYGASTRIDAE [Includes former Scelionidae (Sharkey 2007)]
PLATYGASTRINAE
Allostemma sp. [Masner & Huggert 1989]
Annettella gracilis Masner & Huggert, 1989 E
Inostemma boscii (Jurine, 1807) A BC
Iphitrachelus sp. [Masner & Huggert 1989]
Orseta sp. [Masner & Huggert 1989]
Platygaster hiemalis Forbes, 1888 A BC
Platygaster demades Walker, 1835 A BC
Zelostemma oleariae (Maskell, 1888) E
Zelostemma chionochloae Buhl *in* Buhl, Sarfati, Brockerhoff & Kelly, 2008 E
Zelostemma spp. (~4) [Masner & Huggert 1989] E
SCELIONINAE
Archaeoteleia chambersi Early, 2007 E
Archaeoteleia gilbertae Early, 2007 E
Archaeoteleia karere Early, 2007 E
Archaeoteleia novaezealandiae Masner, 1968 E
Archaeoteleia onamata Early, 2007 E
Archaeoteleia waipoua Early, 2007 E
Baeus seminulum Haliday, 1883 (?)
Baeus leai Dodd, 1914
Baeus saliens (Hickman, 1967)
Baeus n. spp. (3) [Stevens & Austin 2007] E
Calliscelio teleogrylli Hill, 1983 E
Ceratobaeus turneri Dodd, 1920
Ceratobaeus mussiae Iqbal & Austin, 2000 E
Cremastobaeus spp. (1-2) [Masner 1976]
Duta spp. (1-2) [ADA]
Gryon spp. (1-2) [ADA]
Hickmanella n. sp. [Austin 1988]
Idris n. spp. (4) [Austin 1988] E
Mirobaeus n. spp. (2) [Austin 1988] E
Mirotelenomus spp. (1-2) [ADA]
Neobaeus novazealandensis Austin, 1988 E
Odontacolus n. spp. (2) [Austin 1988] E
Opisthacantha spp. (1-2) [Masner 1976]
Probaryconus dubius (Nixon, 1931) A
Scelio spp. (1-2) [ADA]
Triteleia sp(p). [ADA]
SCELIOTRACHELINAE
Aphanomerus pusillus Perkins, 1905 A
Errolium piceum Masner & Huggert, 1989 E
Errolium spp. (~6) [Masner & Huggert 1989] E
Fidiobia sp. [Masner & Huggert 1989]

Fidiobia ?*citri* (Nixon, 1969) A
Zelamerus amicorum Masner & Huggert, 1989 E
Zelamerus spp. (~4) [Masner & Huggert 1989] E
Zelandonota kiwi Masner & Huggert, 1989 E
Zelandonota spp. (~12) [Masner & Huggert 1989] E
TELEASINAE
Trimorus castaneus (Brues, 1922) E
Trimorus spp. (~10) [SET]
Trimorus novaezealandiae Brues, 1922 E
TELENOMINAE
Eumicrosoma spp. (1-2) [ADA]
Telenomus spp. (1-2) [ADA]
Telenomus crinisacri Quail, 1901 E
Trissolcus basalis (Wollaston, 1858) A BC
Trissolcus maori Johnson, 1991 E
Trissolcus oenone (Dodd, 1913)
Trissolcus sp. [JAB]
CYNIPOIDEA
CYNIPIDAE A
Aulacidea subterminalis Niblett, 1946 A BC
Phanacis hypochoeridis (Kieffer, 1887) A
FIGITIDAE [Includes former Eucoilidae and Charapidae (Ronquist 1999)]
Alloxysta victrix Westwood, 1833 A
Alloxysta sp. [Valentine 1975]
Anacharis zealandica Ashmead, 1900
Hexacola sp. [JAB]
Kleidotoma (*Pentakleidota*) *subantarcticana* Yoshimoto, 1964 E
Leptopilina heterotoma (Thomson, 1862) A
Phaenoglyphis villosa (Hartig, 1841) A
?*Trybliographa* sp. [NDMF]
IBALIIDAE A
Ibalia leucospoides (Hockenwarth, 1785) A BC
CHALCIDOIDEA
AGAONIDAE A
Herodotia subatriventris (Girault, 1923) A
Odontofroggatia galili Wiebes, 1980 A
Pleistodontes froggatti Mayr, 1906 A
Pleistodontes imperialis Saunders, 1883 A
Pseudidarnes minerva Girault, 1927 A
Sycoscapter australis (Froggatt, 1900) A
APHELINIDAE
Ablerus spp. (2) [JBM]
Aphelinus abdominalis (Dalman, 1820) A
Aphelinus asychis Walker, 1839 A
Aphelinus gossypii Timberlake, 1924 A
Aphelinus humilis Mercet, 1928 A
Aphelinus mali (Haldeman, 1851) A BC
Aphelinus subflavescens (Westwood, 1837) A BC
Aphelinus sp. [Noyes & Valentine 1989b]
Aphytis chilensis Howard, 1900 A
Aphytis chrysomphali (Mercet, 1912) A
Aphytis diaspidis (Howard, 1881) A BC
Aphytis ignotus Compere, 1955
Aphytis mytilaspidis (LeBaron, 1870) A
Aphytis spp. [Noyes & Valentine 1989b]
Cales n. sp. [JH]
Centrodora scolypopae Valentine, 1966
Centrodora xiphidii (Perkins, 1906) A
Centrodora spp. (2) [Noyes & Valentine 1989b]
Coccophagoides sp. [Noyes & Valentine 1989b]
Coccophagus gurneyi Compere, 1929 A BC
Coccophagus ochraceus Howard, 1895 A
Coccophagus philippiae (Silvestri, 1915) A
Coccophagus scutellaris (Dalman, 1825) A
Coccophagus spp. (~7) [Noyes & Valentine 1989b]
Encarsia citrina (Craw, 1891) A
Encarsia formosa Gahan, 1924 A BC
Encarsia inaron (Walker, 1839) A
Encarsia koebelei (Howard, 1908) A
Encarsia pergandiella Howard, 1907 A
Encarsia perniciosi (Tower, 1913) A
Encarsia spp. (~5) [Noyes & Valentine 1989b]
Eretmocerus eremicus Rose & Zolnerowich, 1997
Euryischia sp. [Berry 1990b]
Eutrichosomella sp. [Noyes & Valentine 1989b]
Pteroptrix spp. (~25) [Noyes & Valentine 1989b] (most E)
CHALCIDIDAE
Antrocephalus sp. [Noyes & Valentine 1989b]
Brachymeria phya (Walker, 1838) (?) A BC
Brachymeria rubrifemur (Girault, 1913)
Brachymeria teuta (Walker, 1841) (?) A BC
Brachymeria sp. (1-2) [Noyes & Valentine 1989b]
Proconura sp. [Noyes & Valentine 1989b]
ENCYRTIDAE
Adelencyrtoides acutus Noyes, 1988 E
Adelencyrtoides blastothrichus Noyes, 1988 E
Adelencyrtoides inconstans Noyes, 1988 E
Adelencyrtoides mucro Noyes, 1988 E
Adelencyrtoides novaezealandiae Tachikawa & Valentine, 1969 E
Adelencyrtoides otago Noyes, 1988 E
Adelencyrtoides palustris Noyes, 1988 E
Adelencyrtoides pilosus Noyes, 1988 E
Adelencyrtoides proximus Noyes, 1988 E
Adelencyrtoides similis Noyes, 1988 E
Adelencyrtoides suavis Noyes, 1988 E
Adelencyrtoides tridens Noyes, 1988 E
Adelencyrtoides unicolor Noyes, 1988 E
Adelencyrtoides variabilis Noyes, 1988 E
Adelencyrtoides spp. (~3) [Noyes 1988]
Adelencyrtus aulacaspidis (Brethes, 1914) A
Alamella mira Noyes, 1988
Anagyrus costalis (Noyes, 1988) E
Anagyrus cyrenis (Noyes, 1988) E
Anagyrus fusciventris (Girault, 1915) A
Anagyrus regis (Noyes, 1988) E
Arrhenophagoidea coloripes Girault, 1915
Arrhenophagus chionaspidis Aurivillius, 1888 A
Austrochoreia antipodis Noyes, 1988 E
Baeoanusia sp. [JAB]
Cheiloneurus antipodis Noyes, 1988
Cheiloneurus gonatopodis Perkins, 1906 A
Coccidoctonus dubius (Girault, 1915) A BC
Coccidoctonus psyllae (Riek, 1962)
Coelopencyrtus australis Noyes, 1988 E
Coelopencyrtus maori Noyes, 1988 E
Copidosoma exvallis Noyes, 1988 E
Copidosoma floridanum (Ashmead, 1900) A BC
Cryptanusia sp. [JSN] A
Encyrtus aurantii (Geoffroy, 1785) A
Encyrtus infelix (Embleton, 1902) A
Epiblatticida minutissimus (Girault, 1923)
Epitetracnemus intersectus (Fonscolombe, 1832) A
Eusemion cornigerum (Walker, 1838) A
Gyranusoidea advena Beardsley, 1969 A
Habrolepis dalmanni (Westwood, 1837) A BC
Ixodiphagus n. sp. [AH] E
Lamennaisia ambigua (Nees, 1834) A
Metanotalia maderensis (Walker, 1872) A
Metaphycus anneckei Guerrieri & Noyes, 2000 A
Metaphycus aurantiacus Annecke & Mynhardt, 1981
Metaphycus claviger (Timberlake, 1916)
Metaphycus lounsburyi (Howard, 1898) A BC
Metaphycus maculipennis (Timberlake, 1916) A
Metaphycus reductor Noyes, 1988 E
Microterys nietneri (Motschulsky, 1859) A BC
Notodusmetia coroneti Noyes, 1988 E
Odiaglyptus biformis Noyes, 1988 E
Parectromoides varipes (Girault, 1915)
Protyndarichoides cinctiventris (Girault, 1934)
Pseudaphycus maculipennis Mercet, 1923 A BC
Pseudococcobius annulipes Noyes, 1988 E
Psyllaephagus acaciae Noyes, 1988 A
Psyllaephagus bliteus Riek, 1962 A
Psyllaephagus breviramus Berry, 2007 A
Psyllaephagus cornwallensis Berry, 2007 A
Psyllaephagus gemitus Riek, 1962 A
Psyllaephagus pilosus Noyes, 1988 A
Psyllaephagus richardhenryi Berry, 2007 A
Rhopus anceps Noyes, 1988 E
Rhopus garibaldia (Girault, 1933) (?) A
Rhopus spp. (1-2) [Noyes 1988]
Subprionomitus ferus (Girault, 1922)
Syrphophagus aphidivorus (Mayr, 1876)
Tachinaephagus australiensis (Girault, 1914) (?)
Tachinaephagus zealandicus Ashmead, 1904 A
Tetracnemoidea bicolor (Girault, 1915)
Tetracnemoidea brevicornis (Girault, 1915) A BC
Tetracnemoidea brounii (Timberlake, 1929) E
Tetracnemoidea peregrina (Compere, 1939) A
Tetracnemoidea sydneyensis (Timberlake, 1929) A
Tetracnemoidea zelandica Noyes, 1988 E
Zaomma lambinus (Walker, 1838) A
Zelaphycus aspidioti (Tachikawa & Valentine, 1969) E
Zelencyrtus latifrons Noyes, 1988 E
Gen. nov. et n. sp. [Noyes 1988] ?E
EULOPHIDAE [Includes former Elasmidae (Gauthier et al. 2000)]
Achrysocharoides latreillii (Curtis, 1826) A
Achrysocharoides sp. [Boucek 1988]
Apleurotropis sp. [JAB]
Aprostocetus zosimus (Walker, 1839) A
Aprostocetus (*Ootetrastichus*) sp. [ZB]
Arachnoobius austini Boucek, 1988
Asecodes spp. (2) [Boucek 1988 as *Teleopterus*]
Astichus spp. (2) [Boucek 1988]
Australsecodes sp. [Boucek 1988]
Baryscapus bruchophagi (Gahan, 1913) A
Baryscapus galactopus (Ratzeburg, 1844) A
Ceranisus menes (Walker, 1839) A
Ceranisus sp. [Boucek 1988]
Chrysocharis gemma (Walker, 1839) A
Chrysocharis pubicornis (Zetterstedt, 1838) A
Chrysonotomyia spp. (5) [Boucek 1988]
Cirrospilus variegatus (Masi, 1907)
Cirrospilus vittatus Walker, 1838
Cirrospilus sp. [Boucek 1988]
Closterocerus cruy (Girault, 1918) A
Closterocerus formosus Westwood, 1833 A BC
Deutereulophus n. sp. [Boucek 1988 as *Entedonomorpha*]
Diaulomorpha spp. (2) [Boucek 1988]
Diglyphus isaea (Walker, 1838) A BC
Elachertus sp. (?) [Thompson 1954]
Elasmus spp. (2) [Noyes & Valentine 1989b]
Entedon methion Walker, 1839 A
Entedonastichus dei (Girault, 1922)
Euderus spp. (2) [Boucek 1988]
Eulophus spp. (?) (1-2) [Thompson 1954]
Euplectrus agaristae Crawford, 1911
Euplectrus flavipes (Fonscolombe, 1832)
Eupronotius scaposus Boucek, 1988 E
Eupronotius n. sp. [Boucek 1988]
Hadranellus anomalus LaSalle & Boler, 1994 E
Hemiptarsenus varicornis (Girault, 1913) A BC
Hemiptarsenus spp. [Boucek 1988]
Hyssopus spp. (~2) [Boucek 1988]
Makarora obesa Boucek, 1988 E
Melittobia acasta (Walker, 1839) A
Melittobia australica Girault, 1912 A
Melittobia hawaiiensis Perkins, 1907 A
Neotrichoporoides viridimaculatus (Fullaway, 1955) A
Nesympiesis venosa Boucek, 1988 E
Noyesius metallicus Boucek, 1988 E
Noyesius testaceus Boucek, 1988 E
Noyesius n. sp. [Boucek 1988]
Omphale spp. (2) [Boucek 1988]
Oomyzus scaposus (Thompson, 1878) (?) A
Ophelimus eucalypti (Gahan, 1922) A
Ophelimus maskelli (Ashmead, 1900) A
Parasecodella n. sp. [Boucek 1988]
Pediobius bruchicida (Rondani, 1872) A
Pediobius epigonus (Walker, 1839) A BC
Pediobius metallicus (Nees, 1834) A
Pnigalio pectinicornis (Linnaeus, 1758) (?) A

Pnigalio soemius (Walker, 1839) A
Proacrias sp. [JAB]
Quadrastichodella aena Girault, 1913 (?)
Quadrastichodella pilosa Ikeda, 1999
Stenomesius n. spp. (~2) [Boucek 1988] E
Sympiesis campbellensis (Kerrich & Yoshimoto, 1964) E
Sympiesis sericeicornis (Nees, 1834)
Sympiesis spp. (~2) [JAB]
Tamarixia sp. [JL]
Tetrastichus spp. (2) [Boucek 1988]
Thripobius javae (Girault, 1917) A BC
Trielacher forticornis Boucek, 1988 E
Trielacher n. spp. (2) [Boucek 1988] E
Zasympiesis pilosa Boucek, 1988 E
Zasympiesis n. spp. (3) [Boucek 1988] E
Zealachertus abbreviatus Berry, 1999 E
Zealachertus aspirensis Berry, 1999 E
Zealachertus bildiri Berry, 1999 E
Zealachertus binarius Berry, 1999 E
Zealachertus conjunctus Berry, 1999 E
Zealachertus holderi Berry, 1999 E
Zealachertus longus Berry, 1999 E
Zealachertus nephelion Berry, 1999 E
Zealachertus nothofagi Boucek, 1978 E
Zealachertus pilifer Berry, 1999 E
Zealachertus planus Berry, 1999 E
Zealachertus tortriciphaga Berry, 1999 E
Zeastichus asper Boucek, 1988 E
Zeastichus n. sp. [Boucek 1988] E
EUPELMIDAE
Eupelmus antipoda Ashmead, 1900
Eupelmus cyaneus (Gourlay, 1928) E
Eupelmus vesicularis (Retzius, 1783) A
Eusandalum barteli (Gourlay, 1928) E
Tineobius sp. [Noyes & Valentine 1989b]
EURYTOMIDAE
Axanthosoma ?io Girault, 1915
Bruchophagus acaciae (Cameron, 1910)
Bruchophagus gibbus (Boheman, 1836) A
Bruchophagus roddi (Gussakovsky, 1933) A
Systole foeniculi Otten, 1941 A
Tetramesa linearis (Walker, 1832) A
Tetramesa spp. (~2) [Noyes & Valentine 1989b]
MYMARIDAE
Acmotemnus luteiclava Noyes & Valentine, 1989a E
Alaptus spp. (~5) [Noyes & Valentine 1989a]
Allanagrus magniclava Noyes & Valentine, 1989 E
Allarescon ochroceras Noyes & Valentine, 1989 E
Allarescon sp. [Noyes & Valentine 1989a]
Anagroidea n. spp. (~4) [Noyes & Valentine 1989a] E
Anagrus atomus (Linnaeus, 1767) A
Anagrus avalae Soyka, 1955 A
Anagrus frequens Perkins, 1905 A
Anagrus incarnatus Haliday, 1833 A
Anagrus optabilis (Perkins, 1905) A
Anagrus ustulatus Haliday, 1833 A
Anaphes nitens (Girault, 1928) A BC
Anaphes spp. (~17) [Noyes & Valentine 1989a]
Apoxypteron grandiscapus Noyes & Valetine, 1989 E
Arescon spp. (2) [Noyes & Valentine 1989a]
Australomymar n. spp. (18) [Noyes & Valentine 1989a] E
Boccacciomymar (*Prosto*) *pobeda* Triapitsyn & Berezovskiy, 2007 E
Boccacciomymar (*Prosto*) *tak* Triapitsyn & Berezovskiy, 2007 E
Camptoptera spp. (~15) [Noyes & Valentine 1989a]
Camptopteroides verrucosa (Noyes & Valentine, 1989) E
Ceratanaphes mandibularis (Noyes & Valentine, 1989) E
Ceratanaphes monticola Noyes & Valentine, 1989 E
Cleruchus n. spp. (~11) [Noyes & Valentine 1989a] E
Cybomymar fasciifrons Noyes & Valentine, 1989 E
Dicopomorpha n. sp. [Noyes & Valentine 1989] E
Dicopus spp. (2) [Noyes & Valentine 1989a]
Dorya pilosa Noyes & Valentine, 1989 E
Dorya n. sp. [Noyes & Valentine 1989a] E
Gonatocerus spp. [Noyes & Valentine 1989a]
Ischiodasys occulta Noyes & Valentine, 1989 E
Ischiodasys n. spp. (~14) [Noyes & Valentine 1989] E
Mimalaptus obscurus Noyes & Valentine, 1989 E
Mimalaptus n. spp. (1-3) [Noyes & Valentine 1989] E
Mymar schwanni Girault, 1912 A
Mymar taprobanicum Ward, 1875 A
Neserythmelus zelandicus Noyes & Valentine, 1989 E
Nesomymar magniclave Valentine, 1971 E
Nesomymar n. sp. [Noyes & Valentine 1989] E
Nesopatasson flavidus Valentine, 1971 E
Ooctonus vulgatus Haliday, 1833 [S.Triapitsyn]
Paracmotemnus potanus Noyes & Valentine, 1989 E
Paracmotemnus spp. (~5) [Noyes & Valentine 1989a]
Paranaphoidea (*Idiocentrus*) *mirus* (Gahan, 1927) E
Paranaphoidea sp. [Noyes & Valentine 1989a]
Polynema spp. (11) [Noyes & Valentine 1989a]
Prionaphes depressus Hincks, 1961 E
Prionaphes n. spp. (2) [Noyes & Valentine 1989] E
Pseudanaphes hirtus Noyes &Valentine, 1989 E
Richteria lamennaisi Girault, 1920
Scleromymar breve Noyes & Valentine, 1989 E
Scleromymar n. spp. (~4) [Noyes & Valentine 1989] E
Steganogaster silvicola Noyes & Valentine, 1989 E
Steganogaster n. spp. (~4) [Noyes & Valentine 1989a] E
Stephanodes reduvioli (Perkins, 1905) A
Stethynium spp. (~2) [Noyes & Valentine 1989a]
Zelanaphes lamprogonius Noyes & Valentine, 1989 E
Gen. nov. et n. sp. [Noyes & Valentine 1989a] E
Gen. nov. et n. sp. [Noyes & Valentine 1989a] E
Gen. nov. et n. sp. [Noyes & Valentine 1989a] E
PERILAMPIDAE
Austrotoxeuma kuscheli Boucek, 1988 E
Austrotoxeuma n. spp. (2) [Noyes & Valentine 1989b] E
PTEROMALIDAE
Acoelocyba n. sp. [Boucek 1988]
Acroclisoides sp. [IDN] A
Amerostenus sp. [Boucek 1988]
Anisopteromalus calandrae (Howard, 1881) A
Aphobetus cultratus Berry, 1995 E
Aphobetus cyanea (Boucek, 1988) E
Aphobetus erroli Berry, 1995 E
Aphobetus maskelli Howard, 1896 E
Aphobetus nana (Boucek, 1988) E
Aphobetus paucisetosus Berry, 1995 E
Asaphes vulgaris Walker, 1834 A
Callitula viridicoxa (Girault, 1913)
Cleonymus sp. [Boucek 1988]
Dibrachys sp. [JAB]
Diparea spp. (~3) [Boucek 1988]
Enoggera nassaui Girault, 1915 A BC
Errolia cyanea Boucek, 1988 E
Errolia n. spp. (3) [Boucek 1988] E
Epanogmus sp. [Boucek 1988]
Fusiterga gallarum Boucek, 1988 E
Fusiterga lativentris Boucek, 1988 E
Gastrancistrus spp. (1-2) [Boucek 1988]
Homoporus nypsius Walker, 1839 A
Inkaka quadridentata Girault, 1939
Lariophagus distinguendus (Förster, 1840) A
Macromesus sp. [Boucek 1988]
Maorita reticulata Boucek, 1988 E
Mesopolobus incultus (Walker, 1834) A
Mesopolobus nobilis (Walker, 1834) A
Mesopolobus sp. [Boucek 1988]
Moranila aotearoae Berry, 1995 E
Moranila californica (Howard, 1881) A
Moranila comperei (Ashmead, 1904)
Moranila strigaster Berry, 1995 E
Muscidifurax raptor Girault & Sanders, 1910 A BC
Nambouria xanthops Berry & Withers, 2002 A
Nasonia vitripennis (Walker, 1836) A BC
Neocalosoter n. spp. (2) [Boucek 1988] E
Neopolycystus insectifurax Girault, 1915 A
Notoglyptus scutellaris (Dodd & Girault, 1915) A
Ophelosia australis Berry, 1995 E
Ophelosia bifasciata Girault, 1916
Ophelosia charlesi Berry, 1995
Ophelosia crawfordi Riley, 1890
Ophelosia keatsi Girault, 1927
Ophelosia mcglashani Berry, 1995 E
Ophelosia stenopteryx Berry, 1995 E
Omphalodipara sp. [Boucek 1988]
Pachyneuron aphidis (Bouché, 1834) A
Proshizonotus resplendens (Gourlay, 1928) E
Proshizonotus spp. (3-4) [GAPG]
Pseudanogmus silanus (Walker, 1843)
Pseudoceraphron sp. [IDN]
Pteromalus puparum (Linnaeus, 1758) A BC
Pteromalus semotus (Walker, 1834) (?) A BC
Pteromalus sequester Walker, 1835 A
Pteromalus sp. [JAB]
Rhaphitelus maculatus Walker, 1834 A
Spalangia cameroni Perkins, 1910 A
Spalangia endius Walker, 1839 A
Spalangia nigra Latreille, 1805 (?) A
Spalangia nigroaenea Curtis, 1839
Spalangia spp. (2) [Boucek 1988]
Stinoplus etearchus (Walker, 1848) A
Systasis lelex (Walker, 1839) E
Theocolax formiciformis Westwood, 1832 A
Theocolax sp. [Boucek 1988]
Trichomalopsis hemiptera Walker, 1935 A
Trichomalopsis iambe (Walker, 1839) E
Trichomalopsis spp. (~8) [Boucek 1988]
Trigonogastrella spp. (1-2) [Boucek 1988]
Zeala walkerae Boucek, 1988 E
ROTOITIDAE
Rotoita basalis Boucek & Noyes, 1987 E
Rotoita n. spp. (2) [Noyes & Valentine 1989b] E
SIGNIPHORIDAE
Chartocerus sp. [Noyes & Valentine 1989b]
Signiphora flavella Girault, 1913 A
Signiphora flavopalliata Ashmead, 1880 (?) A
Signiphora merceti Malenotti, 1916 A
TORYMIDAE
Idiomacromerus terebrator Masi, 1916 A
Megastigmus aculeatus (Swederus, 1795) A
Megastigmus spermotrophus Wachtl, 1893 A
Megastigmus sp. [ex *Procecidochares*, Noyes & Valentine 1989b]
Megastigmus sp. [ex *Ficus*, Early 2000]
Megastigmus sp. [ex *Ophelimus*, EEG]
Palmon sp. [Noyes & Valentine 1989b]
Podagrion sp. [Noyes & Valentine 1989b]
Torymoides antipoda (Kirby, 1883) E
Torymoides spp. (~4) [Noyes & Valentine 1989b]
Torymus varians (Walker, 1833) A
TRICHOGRAMMATIDAE
Aphelinoidea spp. (5) [Noyes & Valentine 1989b]
Brachyia n. sp. [Noyes & Valentine 1989b]
Lathromeris spp. (2) [Noyes & Valentine 1989b]
Megaphragma n. spp. (2) [Noyes & Valentine 1989b]
Oligosita spp. (3) [Noyes & Valentine 1989b]
Pseudogrammina n. spp. (3) [Noyes & Valentine 1989b]
Trichogramma falx Pinto & Oatman, 1996 E
Trichogramma (*Trichogrammanza*) *funiculatum* Carver, 1978
Trichogramma maori Pinto & Oatman, 1996 E
Trichogramma minutum Riley, 1871 (?)
Trichogramma valentinei Pinto & Oatman, 1996 E
Trichogramma spp. (~4) [Pinto & Oatman 1996]
Trichogrammatoidea bactrae Nagaraja, 1978 A
Trichogrammatoidea sp. [Noyes & Valentine 1989b]
Trichogrammatomyia sp.[Noyes & Valentine 1989b]
Ufens spp. (2) [Noyes & Valentine 1989b]

Zelogramma maculatum Noyes & Valentine, 1989 E
MYMAROMMATOIDEA
MYMAROMMATIDAE
Zealaromma insulare (Valentine, 1971) E
Zealaromma valentinei Gibson, Read & Huber 2007 E
Mymaromma sp. [Gibson, Read & Huber 2007]
ICHNEUMONOIDEA
BRACONIDAE
AGATHADINAE
Gen. et sp. indet. [AKW]
ALYSIINAE
Alysia manducator (Panzer, 1799) A BC
Aphaereta aotea Hughes & Woolcock, 1976 E
Aphaereta pallipes (Say, 1829) A
Asobara ajbelli Berry, 2007 E
Asobara albiclava Berry, 2007 E
Asobara antipoda Ashmead, 1900 E
Asobara persimilis (Papp, 1977)
Asobara tabida (Nees von Esenbeck, 1834) A
Aspilota andyaustini Wharton, 2002
Aspilota albertica Berry, 2007 E
Aspilota angusta Berry, 2007 E
Aspilota parecur Berry, 2007 E
Aspilota villosa Berry, 2007 E
Chaenusa helmorei Berry, 2007 E
Chorebus paranigricapitis Berry, 2007 E
Chorebus rodericki Berry, 2007 E
Chorebus thorpei Berry, 2007 E
Dacnusa areolaris (Nees, 1812) A
Dinotrema barrattae Berry, 2007 E
Dinotrema longworthi Berry, 2007 E
Dinotrema philipi Berry, 2007 E
APHIDIINAE
Aphidius colemani Viereck, 1912 A
Aphidius eadyi Stary, Gonzales & Hall, 1980 A BC
Aphidius ervi Haliday, 1834 A BC
Aphidius pelargonii Stary & Carver, 1979
Aphidius rhopalosiphi De Stefani Perez, 1902 A BC
Aphidius salicis Haliday, 1834 A
Aphidius similis Stary & Carver, 1979
Aphidius sonchi Marshall, 1896 A
Diaeretiella rapae (M'Intosh, 1855) A
Ephedrus plagiator (Nees ab Esenbeck, 1811) A BC
Lysiphlebus testaceipes (Cresson, 1880) A
Trioxys complanatus Quilis, 1931 A BC
Gen. nov. et n. sp. [MM] E
BETYOBRACONINAE
Gen. et sp. indet. [SB]
BLACINAE
Gen. et sp. indet. [JAB]
BRACONINAE A
Bracon phylacteophagus Austin, 1989 A BC
Bracon variegator Spinola, 1808 A BC
Habrobracon hebetor Say, 1836 A
CHELONINAE
Ascogaster bicolorata Walker & Huddleston, 1987 E
Ascogaster crenulata Cameron, 1898 E
Ascogaster elongata Lyle, 1923 E
Ascogaster erroli Walker & Huddleston, 1987 E
Ascogaster gourlayi Walker & Huddleston, 1987 E
Ascogaster iti Walker & Huddleston, 1987 E
Ascogaster mayae Walker & Huddleston, 1987 E
Ascogaster parrotti Walker & Huddleston, 1987 E
Ascogaster quadridentata Wesmael, 1835 A BC
Ascogaster strigosa Walker & Huddleston, 1987 E
Ascogaster tekapoense Walker & Huddleston, 1987 E
Ascogaster vexator Walker & Huddleston, 1987 E
DORYCTINAE
Caenophanes spp. (~2) [Belokobylskij et al. 2004]
Doryctopsis neozealandicus (Belokobylskij et al., 2004) E
Monolexis fuscicornis Förster, 1862 A
Ontsira antica (Wollaston, 1858) A
Parallorhogas pallidiceps (Perkins, 1910)
Pseudosyngaster pallidus (Gourlay, 1928) E
Spathius exarator (Linnaeus, 1758)
EUPHORINAE
Aridelus sp. [SET, SRS]
Cryptoxilos thorpei Shaw & Berry, 2005 E
Dinocampus coccinellae (Schrank, 1802) A
Leiophron sp. [SRS]
Meteorus annettae Huddleston, 1986 E
Meteorus cespitator (Thunberg, 1822) A
Meteorus cinctellus (Spinola, 1808) A
Meteorus cobbus Huddleston, 1986 E
Meteorus luteus (Cameron, 1911)
Meteorus novazealandicus Cameron, 1898 E
Meteorus pulchricornis (Wesmael, 1835) A
Meteorus quinlani Huddleston, 1986 E
Meteorus n. sp. [brachypterous female; SRS, JAB] E
Microctonus aethiopoides Loan, 1975 A BC
Microctonus alpinus Shaw, 1993 E
Microctonus falcatus Shaw, 1993 E
Microctonus hyperodae Loan *in* Loan & Lloyd, 1974 A BC
Microctonus zealandicus Shaw, 1993 E
Syntretus sp. [SRS]
HELCONINAE
Aspicolpus hudsoni Turner, 1922 E
Aspicolpus penetrator (Smith, 1878) E
Diospilus antipodum Turner, 1922 E
Schauinslandia alfkenii Ashmead, 1900 E
Schauinslandia femorata Ashmead 1900 E
Schauinslandia pallidipes Ashmead, 1900 E
HORMIINAE
Austrohormius punctatus van Achterberg, 1995 E
Chremylus elaphus Haliday, 1833 A
Neptihormius stigmellae van Achterberg & Berry, 2004 E
Neptihormius sp. (ex cecidomyid; CvA, JAB) E
MACROCENTRINAE
Macrocentrus rubromaculatus (Cameron, 1901)
METEORIDEINAE
Pronkia antefurcalis van Achterberg, 1990 E
MICROGASTRINAE
Apanteles carpatus (Say, 1836) A
Apanteles galleriae Wilkinson, 1932 A
Apanteles subandinus Blanchard, 1947 A BC
Choeras helespas Walker, 1996 E
Cotesia glomerata (Linnaeus, 1758) A BC
Cotesia kazak (Telenga, 1949) A BC
Cotesia rubecula (Marshall, 1885) A BC
Cotesia ruficrus (Haliday, 1834) A BC
Diolcogaster perniciosus (Wilkinson, 1929)
Dolichogenidea carposinae (Wilkinson, 1938) E
Dolichogenidea tasmanica (Cameron, 1912) A BC
Dolichogenidea spp. (~4) [JAB]
Glyptapanteles aucklandensis (Cameron, 1909) E
Glyptapanteles demeter (Wilkinson, 1934) E
Microplitis croceipes (Cresson, 1872) A BC
Pholetesor arisba Nixon, 1973 A
Pholetesor bicolor (Nees, 1834) A
Sathon spp. (1-2) [JAB]
OPIINAE
Opius carpocapsae (Ashmead, 1900) E
Opius cinerariae Fischer, 1963
Opius spp. (~5) [JAB]
Xynobius (*Paraxynobius*) *albobasalis* van Achterberg, 2004 E
Xynobius (*Paraxynobius*) *granulatus* van Achterberg, 2004 E
RHYSSALINAE
Doryctomorpha antipoda Ashmead, 1900 E
Metaspathius apterus Brues, 1922 E
Rhyssaloides ambeodonti (Muesebeck, 1941) E
Rhyssaloides antipoda Belokobylskij, 1999 E
ROGADINAE
Aleiodes declanae van Achterberg *in* van Achterberg et al., 2005 E
Aleiodes gressitti (Muesebeck, 1964) E
Rhinoprotoma masneri van Achterberg, 1995 E
ICHNEUMONIDAE
ANOMALONINAE
Aphanistes kayi Gauld, 1980 E
Habronyx n. spp. (3) [IDG]
Spolas spp. (~4) [Gauld 1980]
Gen. nov. et n. sp. [IDG]
BANCHIINAE
Lissonota albopicta Smith, 1878 E
Lissonota aspera Bain, 1970 E
Lissonota atra Bain, 1970 E
Lissonota comparata Cameron 1898
Lissonota flavopicta Smith, 1878 E
Lissonota fulva Bain, 1970 E
Lissonota multicolor Colenso, 1885 E
CAMPOPLEGINAE
Campoletis obstructor (Smith, 1878) E
Campoletis sp. [IDG].
Campoplex disjunctus Townes, 1964 E
Campoplex hudsoni (Cameron, 1901) E
Campoplex spp. (>20) [IDG]
Casinaria spp. (~3) [IDG]
Diadegma agens Townes, 1964 E
Diadegma muelleri (White, 1874) E
Diadegma novaezealandiae Azidah, Fitton & Quicke, 2000 E
Diadegma semiclausum (Hellén, 1949) A BC
Diadegma n. spp. (~50) [IDG] E
Dusona destructor Wahl, 1991
Dusona stramineipes Cameron, 1901 E
Venturia canescens (Gravenhorst, 1829) A
Venturia intrudens (Smith, 1878) E
CREMASTINAE
Temelucha sp. [IDG]
Trathala (*Trathala*) *agnina* (Kerrich, 1959) E
CRYPTINAE
Aclastus spp. (5) [IDG]
Aclosmation spp. (~30) [IDG]
Amblyaclastus sp. [IDG]
Anacis sp. [IDG]
'Gelis' campbellensis Townes, 1964 E
'Gelis' cinctus (Linnaeus, 1758)
'Gelis' philpottii (Brues, 1922) E
Gelis tenellus (Say, 1836) A
Glabridorsum stokesii (Cameron, 1912) A BC
Sphecophaga vesparum vesparum (Curtis, 1828) A BC
Xanthocryptus novozealandicus (Dalla Torre, 1902)
Xenolytus bitinctus (Gmelin, 1790) A
Gen. nov. et n. sp. [IDG] E
Gen. nov. et n. sp. [IDG] E
Gen. nov. et n. sp. [IDG] E
Gen. nov. et n. sp. [IDG] E
CTENOPELMATINAE A
Lathrolestes luteolator (Gravenhorst, 1829) A BC
DIPLAZONTINAE
Diplazon laetatorius (Fabricius, 1781) A
Woldstedtius spp. (3) [IDG]
EUCEROTINAE
Euceros coxalis Barron, 1978 E
Euceros sp. [IDG]
ICHNEUMONINAE
Aucklandella conspirata (Smith, 1876) E
Aucklandella flavomaculata Cameron, 1909 E
Aucklandella geiri (Dalla Torre, 1902) E
Aucklandella hudsoni (Cameron, 1901) E
Aucklandella machimia (Cameron, 1898) E
Aucklandella minuta (Ashmead, 1890) E
Aucklandella novazealandica (Cameron, 1898) E
Aucklandella pyrastis (Cameron, 1901) E
Aucklandella thyellma (Cameron, 1898) E
Aucklandella ursula (Cameron, 1898) E
Aucklandella utetes (Cameron, 1898) E
Aucklandella wellingtoni (Cameron, 1901) E
Aucklandella n. spp. (~50) [IDG] E
Ctenochares bicolorus (Linnaeus, 1767) A
Degithina actista (Cameron, 1898) E
Degithina apicalis (Ashmead, 1890) E

Degithina davidi Cameron, 1901 E
Degithina decepta (Smith, 1876) E
Degithina exhilarata (Smith, 1876) E
Degithina hersilia (Cameron, 1898) E
Degithina huttonii (Kirby, 1881) E
Degithina melanopus (Cameron, 1901) E
Degithina sollicitoria (Fabricius, 1775) E
Degithina n. spp. (~24) [IDG] E
Diadromus collaris (Gravenhorst, 1829) A BC
Eutanyacra licitatoria (Erichson, 1842)
Ichneumon lotatorius Fabricius, 1775 E
Ichneumon promissorius Erichson, 1842
Levansa decoratoria (Fabricius, 1775) E
Levansa leodacus (Cameron, 1898) E
Levansa spp. (2) [IDG]
Lusius sp. [IDG] E
?*Pterocormus cinctus* (Ashmead, 1890) E
LABENINAE
Certonotus fractinervis (Vollenhoven, 1873) E
Poecilocryptus n. sp. [IDG] E
MESOCHORINAE
Mesochorus sp. [IDG]
METOPIINAE
Carria fortipes (Cameron, 1898) E
Hypsicera femoralis (Geoffroy, 1785) A
Hypsicera nelsonensis Berry, 1990a E
Sciron enolae Berry, 1990a E
Sciron glaber Berry, 1990a E
OPHIONINAE
Enicospilus insularis (Kirby, 1881)
Enicospilus skeltonii (Kirby, 1881)
Ophion inutilis Smith, 1876 E
Ophion oculatus Parrott, 1954 E
Ophion peregrinus Smith, 1876a E
Ophion punctatus Cameron, 1898 E
ORTHOCENTRINAE
Helictes n. spp. (3) [IDG] E
Megastylus n. spp. (~10) [IDG] E
Stenomacrus sp. [IDG] (?)
Gen. nov. et n. spp. (2) [IDG] E
PIMPLINAE
Camptotypus sp. [IDG]
Echthromorpha intricatoria (Fabricius, 1804)
Liotryphon caudatus (Ratzeburg, 1848) A BC
Lissopimpla excelsa (Costa, 1864)
Megarhyssa nortoni (Cresson, 1864) A BC
Rhyssa lineolata (Kirby, 1837) A
Rhyssa persuasoria (Linnaeus, 1758) A BC
Xanthopimpla rhopaloceros Krieger, 1914 A BC
TERSILOCHINAE
Allophroides sp. [IDG]
Diaparsis sp. [IDG]
Zealochus gauldi Khalaim, 2006
Zealochus postfurcalis Khalaim, 2006
Zealochus supergranulatus Khalaim, 2004
Gen. nov. et n. spp. (~8) [NZAC-IDG] E
Gen. nov. et n. spp. (~6) [NZAC-IDG] E
Gen. nov. et n. spp. (2) [NZAC-IDG] E
Gen. nov. et n. spp. (~4) [NZAC-IDG] E
Gen. nov. et n. spp. (~10) [NZAC-IDG] E
TRYPHONINAE
Netelia (*Netelia*) *ephippiata* (Smith, 1876) E
Netelia (*Netelia*) *producta* (Brullé, 1846)
Phytodietus (*Euctenopus*) *zealandicus* (Ashmead, 1900) E
INCERTAE SEDIS
Gen. et sp. indet. [IDG]

APOCRITA-ACULEATA
CHRYSIDOIDEA
BETHYLIDAE
Chilepyris platythelys Sorg & Walker, 1988
Eupsenella insulana Gordh & Harris, 1996 E
Goniozus jacintae Farrugia, 1971 A BC
Goniozus sp. [Berry 1998]
Rhabdepyris sp. [Berry 1998]
Sierola spp. (2) [Berry 1998]
DRYINIDAE
Anteon bribianum Olmi, 1987
Anteon caledonianum Olmi, 1984
Bocchus thorpei Olmi, 2007
Dryinus koebelei (Perkins, 1905)
Gonatopus alpinus (Gourlay, 1953) E
Gonatopus zealandicus Olmi, 1984 E
EMBOLEMIDAE
Embolemus zealandicus Olmi, 1996 E
SCOLEBYTHIDAE
Ycaploca sp. [SET]
VESPOIDEA
FORMICIDAE
Amblyopone australis Erichson, 1842 A
Amblyopone saundersi Forel, 1892 E
Cardiocondyla minutior Forel, 1899 A
Discothyrea antarctica Emery, 1895 E
Doleromyrma darwiniana (Forel, 1907) A
Heteroponera brouni (Forel, 1892) E
Huberia brounii Forel, 1895 E
Huberia striata (Smith, 1876) E
Hypoponera confinis (Roger 1860) A
Hypoponera eduardi (Forel, 1894) A
Hypoponera punctatissima (Roger, 1859) A
Iridomyrmex spp. (not *anceps*) A
Linepithema humile (Mayr, 1868) A
Mayriella abstinens Forel, 1902 A
Monomorium antarcticum (F. Smith, 1858) E
Monomorium fieldi Forel, 1910 SI
Monomorium pharaonis (Linnaeus, 1758) A
Monomorium smithii Forel, 1892 E
Monomorium sydneyense Forel, 1902 A
Nylanderia tasmaniensis (Forel, 1913) A
Nylanderia sp(p). A
Ochetellus glaber (Mayr, 1862) A
Orectognathus antennatus Smith, 1853
Pachycondyla castanea (Mayr, 1865) E
Pachycondyla castaneicolor (Dalla Torre, 1893) ?E
Pheidole megacephala (Fabricius, 1793) A
Pheidole proxima Mayr, 1876
Pheidole rugosula Forel, 1902 A
Pheidole vigilans (Smith, 1858) A
Ponera leae Forel, 1913 A
Prolasius advenus (Smith, 1862) E
Rhytidoponera chalybaea Emery, 1901 A
Rhytidoponera metallica (Smith, 1858) A
Solenopsis sp. (cryptic Australian species) A
Strumigenys perplexa (Smith, 1876)
Strumigenys xenos Brown, 1955
Technomyrmex jocosus Forel 1910 A
Tetramorium bicarinatum (Nylander, 1846) A
Tetramorium grassii Emery, 1895 A
MUTILLIDAE A
Ephutomorpha bivulnerata (André, 1901) A
POMPILIDAE
Epipompilus insularis Kohl, 1884 E
Cryptocheilus australis (Guérin, 1830) A
Priocnemis (Trichocurgus) carbonarius (Smith, 1855) E
Priocnemis (Trichocurgus) conformis Smith, 1876 E
Priocnemis (Trichocurgus) crawi Harris, 1987 E
Priocnemis (Trichocurgus) monachus (Smith, 1855) E
Priocnemis (Trichocurgus) nitidiventris Smith, 878 E
Priocnemis (Trichocurgus) ordishi Harris, 1987 E
Sphictostethus calvus Harris, 1987 E
Sphictostethus fugax (Fabricius, 1775) E
Sphictostethus nitidus (Fabricius, 1775) E
SCOLIIDAE A
Radumeris tasmaniensis (Saussure, 1855) A
VESPIDAE A
Ancistrocerus gazella (Panzer, 1798) A
Polistes (*Polistes*) *chinensis* (Fabricius, 1793) A
Polistes (*Polistela*) *humilis* (Fabricius, 1781) A
Vespula (*Vespula*) *germanica* (Fabricius, 1793) A
Vespula (*V.*) *vulgaris* (Linnaeus, 1758) A
APOIDEA
APIDAE A
Apis mellifera Linnaeus, 1758
Bombus (*Bombus*) *terrestris* (Linnaeus, 1758)
Bombus (*Megabombus*) *hortorum* (Linnaeus, 1761)
Bombus (*M.*) *ruderatus* (Fabricius, 1775)
Bombus (*Subterraneobombus*) *subterraneus* (Linnaeus, 1758)
COLLETIDAE
Euryglossina (*Euryglossina*) *hypochroma* Cockerell, 1916 (?) A
Euryglossina (*E.*) *proctotrypoides* Cockerell, 1913 A
Hylaeus (*Prosopisteron*) *agilis* (Smith, 1876) E
Hylaeus (*P.*) *asperithorax* (Rayment, 1927) A
Hylaeus (*P.*) *capitosus* Smith, 1876 E
Hylaeus (*P.*) *kermadecensis* Donovan, 2007 E
Hylaeus (*P.*) *matamoko* Donovan, 2007 E
Hylaeus (*P.*) *murihiku* Donovan, 2007 E
Hylaeus (*P.*) *perhumilis* (Cockerell, 1914) A
Hylaeus (*P.*) *relegatus* (Smith, 1876) E
Hyleoides concinna (Fabricius, 1775) A
Leioproctus (*Leioproctus*) *boltoni* Cockerell, 1904 E
Leioproctus (*L.*) *huakiwi* Donovan, 2007 E
Leioproctus (*L.*) *imitatus* Smith, 1853 E
Leioproctus (*L.*) *kanapuu* Donovan, 2007 E
Leioproctus (*L.*) *keehua* Donovan, 2007 E
Leioproctus (*L.*) *launcestonensis* (Cockerell, 1914) [?not established; BJD]
Leioproctus (*L.*) *metallicus* (Smith, 1853) E
Leioproctus (*L.*) *pango* Donovan, 2007 E
Leioproctus (*L.*) *purpureus* (Smith, 1853) E
Leioproctus (*L.*) *vestitus* (Smith, 1876) E
Leioproctus (*L.*) *waipounamu* Donovan, 2007 E
Leioproctus (*Nesocolletes*) *fulvescens* (Smith, 1876) E
Leioproctus (*N.*) *hudsoni* (Cockerell, 1925) E
Leioproctus (*N.*) *maritimus* (Cockerell, 1936) E
Leioproctus (*N.*) *monticola* (Cockerell, 1925) E
Leioproctus (*N.*) *nunui* Donovan, 2007 E
Leioproctus (*N.*) *paahaumaa* Donovan, 2007 E
Leioproctus (*N.*) *pekanui* Donovan, 2007 E
CRABRONIDAE
Argogorytes (*Argogorytes*) *carbonarius* (Smith, 1856) E
Pison morosum Smith, 1856 E
Pison spinolae Shuckard, 1837
Pison ?*ruficorne* Smith, 1856 [JAB]
Podagritus (*Parechuca*) *albipes* (Smith, 1878) E
Podagritus (*P.*) *carbonicolor* (Dalla Torre, 1897) E
Podagritus (*P.*) *chambersi* Harris, 1994a E
Podagritus (*P.*) *cora* (Cameron, 1888) E
Podagritus (*P.*) *digyalos* Harris, 1994a E
Podagritus (*P.*) *parrotti* (Leclercq, 1955) E
Rhopalum (*Zelorhopalum*) *aucklandi* Leclercq, 1955 E
Rhopalum (*Aporhopalum*) *perforator* Smith, 1876 E
Rhopalum (*Zelorhopalum*) *zelandum* Leclerq, 1955 E
Spilomena earlyi Harris, 1994a E
Spilomena elegantula Turner, 1916
Spilomena emarginata Vardy, 1987 E
Spilomena nozela Vardy, 1987
Tachysphex nigerrimus (Smith, 1856) ?E
HALICTIDAE
Lasioglossum (*Chilalictus*) *cognatum* (Smith, 1853) A
Lasioglossum (*Austrevylaeus*) *mataroa* Donovan, 2007 E
Lasioglossum (*A.*) *maunga* Donovan, 2007 E
Lasioglossum (*A.*) *sordidum* (Smith, 1853) E
Nomia (*Acunomia*) *melanderi* Cockerell, 1906 P
MEGACHILIDAE A
Anthidium (*Anthidium*) *manicatum* (Linnaeus, 1758) A
Megachile (*Eutricharaea*) *rotundata* (Fabricius, 1787) P
Osmia (*Helicosmia*) *coerulescens* (Latreille, 1758) P
SPHECIDAE
Podalonia tydei suspiciosa (Smith, 1856) E

Order TRICHOPTERA
[Compiled by J. B. Ward]

Suborder ANNULIPALPIA
ECNOMIDAE
Ecnomina zealandica Wise, 1958 E
HYDROPSYCHIDAE
Aoteapsyche catherinae (McFarlane, 1960) E
Aoteapsyche colonica (McLachlan, 1871) E
Aoteapsyche philpotti (Tillyard, 1924) E
Aoteapsyche rarururu (McFarlane, 1973) E
Aoteapsyche tepoka (Mosely, 1953) E
Aoteapsyche tipua (McFarlane, 1964) E
Aoteapsyche winterbourni Smith, 2008 E
Aoteapsyche n. sp. E
Diplectrona bulla Wise, 1958 E
Diplectrona zealandensis Mosely, 1953 E
Hydropsyche auricoma Hare, 1910 E SI
Hydropsyche occulta (Hare, 1910) E SI
Orthopsyche fimbriata (McLachlan, 1862) E
Orthopsyche thomasi (Wise, 1962) E
PHILOPOTAMIDAE
Cryptobiosella furcata Henderson, 1983 E
Cryptobiosella hastata Henderson, 1983 E
Cryptobiosella spinosa Henderson, 1983 E
Cryptobiosella tridens Henderson, 1983 E
Hydrobiosella aorere Henderson, 1983 E
Hydrobiosella mixta (Cowley, 1976) E
Hydrobiosella stenocerca Tillyard, 1924 E
Hydrobiosella tonela (Mosely, 1953) E
Neobiosella irrorata Wise, 1958 E
Xenobiosella motueka Henderson, 1983 E
POLYCENTROPODIDAE
Plectrocnemia maclachlani Mosely, 1953 E
Plectrocnemia tuhuae Ward, 1995 E
Polyplectropus altera McFarlane, 1981 E
Polyplectropus aurifusca McFarlane, 1956 E
Polyplectropus impluvii Wise, 1962 E
Polyplectropus puerilis (McLachlan, 1868) E
PSYCHOMYIIDAE
Zelandoptila moselyi Tillyard, 1924 E

Suborder SPICIPALPIA
HYDROBIOSIDAE
Atrachorema macfarlanei Ward, 1991 E
Atrachorema mangu McFarlane, 1964 E
Atrachorema tuarua McFarlane, 1966 E
Costachorema brachypterum McFarlane, 1939 E
Costachorema callistum McFarlane, 1939 E
Costachorema hebdomon McFarlane, 1981 E
Costachorema hecton McFarlane, 1981 E
Costachorema notopterum Wise, 1972 E
Costachorema peninsulae Ward, 1995 E
Costachorema psaropterum McFarlane, 1939 E
Costachorema xanthopterum McFarlane, 1939 E
Edpercivalia banksiensis (McFarlane, 1939) E
Edpercivalia borealis (McFarlane, 1951b) E
Edpercivalia cassicola (McFarlane, 1939) E
Edpercivalia dugdalei Ward, 1998 E
Edpercivalia flintorum Ward, 2005 E
Edpercivalia fusca (McFarlane, 1939) E
Edpercivalia harrisoni Wise, 1982 E
Edpercivalia maxima (McFarlane, 1939) E
Edpercivalia morrisi Ward, 1998 E
Edpercivalia oriens Ward, 1997 E
Edpercivalia shandi (McFarlane, 1951b) E
Edpercivalia schistaria Ward, 2005 E
Edpercivalia smithi Ward, 2005 E
Edpercivalia spaini McFarlane, 1973 E
Edpercivalia tahatika Ward, 2005 E
Edpercivalia thomasoni (McFarlane, 1960) E
Erichorema basale Ward, Leschen, Smith & Dean, 2004 E
Hydrobiosis budgei McFarlane, 1960 E
Hydrobiosis centralis Ward, 1997 E
Hydrobiosis chalcodes McFarlane, 1981 E
Hydrobiosis charadraea McFarlane, 1951b E
Hydrobiosis clavigera McFarlane, 1951b E
Hydrobiosis copis McFarlane, 1960 E
Hydrobiosis falcis Wise, 1958 E
Hydrobiosis frater McLachlan, 1868 E
Hydrobiosis gollanis Mosely, 1953 E
Hydrobiosis harpidiosa McFarlane, 1951b E
Hydrobiosis ingenua Hare, 1910 E SI
Hydrobiosis johnsi McFarlane, 1981 E
Hydrobiosis kiddi McFarlane, 1951b E
Hydrobiosis lindsayi Tillyard, 1925 E
Hydrobiosis neadelphus Ward, 1997 E
Hydrobiosis parumbripennis McFarlane, 1951b E
Hydrobiosis sherleyi Ward, 1998 E
Hydrobiosis silvicola McFarlane, 1951b E
Hydrobiosis soror Mosely, 1953 E
Hydrobiosis spatulata McFarlane, 1951b E
Hydrobiosis styracine McFarlane, 1960 E
Hydrobiosis styx McFarlane, 1951b E
Hydrobiosis taumata Ward, 1997 E
Hydrobiosis torrentis Ward, 1995 E
Hydrobiosis umbripennis McLachlan, 1868 E
Hydrobiosis n. sp. E
Hydrochorema crassicaudatum Tillyard, 1924 E
Hydrochorema lyfordi Ward, 1997 E
Hydrochorema tenuicaudatum Tillyard, 1924 E
Hydrochorema n. spp. (3) 3E
Neurochorema armstrongi McFarlane, 1951a E
Neurochorema confusum (McLachlan, 1868) E
Neurochorema forsteri McFarlane, 1964 E
Neurochorema pilosum McFarlane, 1964 E
Neurochorema n. sp. E
Psilochorema acheir McFarlane, 1981 E
Psilochorema bidens McFarlane, 1951b E
Psilochorema cheirodes McFarlane, 1981 E
Psilochorema donaldsoni McFarlane, 1960 E
Psilochorema embersoni Wise, 1982 E
Psilochorema folioharpax McFarlane, 1956 E
Psilochorema leptoharpax McFarlane, 1951b E
Psilochorema macroharpax McFarlane, 1951b E
Psilochorema mataura McFarlane, 1956 E
Psilochorema mimicum McLachlan, 1866 E
Psilochorema nemorale McFarlane, 1951b E
Psilochorema spiniharpax Ward, 1995 E
Psilochorema tautoru McFarlane, 1964 E
Psilochorema vomerharpax McFarlane, 1964 E
Synchorema tillyardi McFarlane, 1964 E
Synchorema zygoneurum Tillyard, 1924 E
Tiphobiosis cataractae Ward, 1995 E
Tiphobiosis childella Ward, 1995 E
Tiphobiosis childi McFarlane, 1981 E
Tiphobiosis cowiei Ward, 1991 E
Tiphobiosis fulva Tillyard, 1924 E
Tiphobiosis hinewai Ward, 1995 E
Tiphobiosis intermedia Mosely, 1953 E
Tiphobiosis kleinpastei Ward, 1998 E
Tiphobiosis kuscheli Wise, 1972 E
Tiphobiosis montana Tillyard, 1924 E
Tiphobiosis plicosta McFarlane, 1960 E
Tiphobiosis quadrifurca Ward, 1997 E
Tiphobiosis salmoni McFarlane, 1981 E
Tiphobiosis schmidi Ward, 1998 E
Tiphobiosis trifurca McFarlane, 1981 E
Tiphobiosis veniflex McFarlane, 1960 E
Tiphobiosis n. spp. (7) 7E
Traillochorema rakiura McFarlane, 1981 E
Traillochorema wardorum Henderson, 2008 E
HYDROPTILIDAE
Oxyethira (*Trichoglene*) *ahipara* Wise, 1998 E
Oxyethira (*Trichoglene*) *albiceps* (McLachlan, 1862) E
Oxyethira (*Trichoglene*) *kirikiriroa* Smith, 2008 E
Oxyethira (*Trichoglene*) *waipoua* Wise, 1998 E
Paroxyethira auldorum Ward & Henderson, 2004 E
Paroxyethira dundensis Ward & Henderson, 2004 E
Paroxyethira eatoni Mosely, 1924 E
Paroxyethira hendersoni Mosely, 1924 E
Paroxyethira hintoni Leader, 1972 E
Paroxyethira hughwilsoni Ward & Henderson, 2004 E
Paroxyethira kimminsi Leader, 1972 E
Paroxyethira manapouri Ward & Henderson, 2004 E
Paroxyethira pounamu Ward & Henderson, 2004 E
Paroxyethira ramifera Ward & Henderson, 2004 E
Paroxyethira sarae Ward & Henderson, 2004 E
Paroxyethira takitimu Ward & Henderson, 2004 E
Paroxyethira teika Ward & Henderson, 2004 E
Paroxyethira tillyardi Mosely, 1924 E
Paroxyethira zoae Ward & Henderson, 2004 E
Paroxyethira n. sp. E
Xuthotrichia aotea Ward & Henderson, 2004 E

Suborder INTEGRIPALPIA
Infraorder PLENITENTORIA
KOKIRIIDAE
Kokiria miharo McFarlane, 1964 E
OECONESIDAE
Oeconesus angustus Ward, 1997 E
Oeconesus incisus Mosely, 1953 E
Oeconesus maori McLachlan, 1862 E
Oeconesus similis Mosely, 1953 E
Pseudoeconesus bistirpis Wise, 1958 E
Pseudoeconesus geraldinae Ward, 1997 E
Pseudoeconesus haasti Ward, 1997 E
Pseudoeconesus hendersoni Ward, 1997 E
Pseudoeconesus hudsoni Mosely, 1953 E
Pseudoeconesus mimus McLachlan, 1894 E
Pseudoeconesus paludis Ward, 1997 E
Pseudoeconesus squamosus Mosely, 1953 E
Pseudoeconesus stramineus McLachlan, 1894 E
Pseudoeconesus n. spp. (6) 6E
Tarapsyche olis McFarlane, 1960 E
Zelandopsyche ingens Tillyard, 1921 E
Zelandopsyche maclellani McFarlane, 1981 E
Zepsyche acinaces McFarlane, 1960 E

Infraorder BREVITENTORIA
CALOCIDAE
Pycnocentrella eruensis Mosely, 1953 E
CHATHAMIIDAE
Chathamia brevipennis Tillyard, 1925 E
Chathamia integripennis Riek, 1976 E
Philanisus fasciatus Riek, 1976 E
Philanisus mataua Ward, 1995 E
Philanisus plebeius Walker, 1852 SW
CONOESUCIDAE
Beraeoptera roria Mosely, 1953 E
Confluens hamiltoni (Tillyard, 1924) E
Confluens olingoides (Tillyard, 1924) E
Confluens n. sp. E
Olinga christinae Ward & McKenzie, 1998 E
Olinga feredayi (McLachlan, 1868) E
Olinga fumosa Wise, 1958 E
Olinga jeanae McFarlane, 1966 E
Periwinkla childi McFarlane, 1973 E
Pycnocentria evecta McLachlan, 1868 E
Pycnocentria forcipata Mosely, 1953 E
Pycnocentria funerea McLachlan, 1866 E
Pycnocentria gunni (McFarlane, 1956) E
Pycnocentria hawdonia McFarlane, 1956 E
Pycnocentria mordax Ward, 1997 E
Pycnocentria patricki Ward, 1995 E
Pycnocentria sylvestris McFarlane, 1973 E
Pycnocentria n. spp. (4) 4E
Pycnocentrodes aeris Wise, 1958 E
Pycnocentrodes aureolus (McLachlan, 1868) E
Pycnocentrodes modestus Cowley, 1976 E
HELICOPHIDAE
Alloecentrella cirratus Henderson & Ward, 2007 E
Alloecentrella incisus Henderson & Ward, 2007 E
Alloecentrella linearis Henderson & Ward, 207 E
Alloecentrella magnicornis Wise, 1958 E
Zelolessica cheira McFarlane, 1956 E
Zelolessica meizon McFarlane, 1981 E
HELICOPSYCHIDAE
Helicopsyche (*Saetotricha*) *albescens* Tillyard, 1924 E
Helicopsyche (*S.*) *cuvieri* Johanson, 1999 E

Helicopsyche (*S.*) *haurapango* Johanson, 1999 E
Helicopsyche (*S.*) *howesi* Tillyard, 1924 E
Helicopsyche (*S.*) *poutini* McFarlane, 1964 E
Helicopsyche (*S.*) *torino* Johanson, 1999 E
Helicopsyche (*S.*) *zealandica* Hudson, 1904 E
Rakiura vernale McFarlane, 1973 E
LEPTOCERIDAE
Hudsonema alienum (McLachlan, 1868) E
Hudsonema amabile (McLachlan, 1868) E
Hudsonema n. sp. E
Oecetis chathamensis Tillyard, 1925 E
Oecetis iti McFarlane, 1964 E
Oecetis unicolor (McLachlan, 1868) E
Triplectides cephalotes (Walker, 1852) E
Triplectides dolichos McFarlane, 1981 E
Triplectides obsoletus (McLachlan, 1862) E
Triplectidina moselyi McFarlane & Ward, 1990 E
Triplectidina oreolimnetes (Tillyard, 1924) E
PHILORHEITHRIDAE
Philorheithrus agilis (Hudson, 1904) E
Philorheithrus aliciae Henderson & Ward, 2006 E
Philorheithrus harunae Henderson & Ward, 2006 E
Philorheithrus lacustris Tillyard, 1924 E
Philorheithrus latentis Henderson & Ward, 2006 E
Philorheithrus litoralis Henderson & Ward, 2006 E

Order LEPIDOPTERA
[Compiled by R. J. B. Hoare]
ARCTIIDAE
Metacrias erichrysa Meyrick, 1886e E
Metacrias huttoni (Butler, 1879a) E
Metacrias strategica (Hudson, 1889) E
Nyctemera amica (White, 1841) V
Nyctemera annulata (Boisduval, 1832) E
Tyria jacobaeae (Linnaeus, 1758) A BC
Utetheisa lotrix (Cramer, 1777) V
Utetheisa pulchelloides Hampson, 1907 V
AUTOSTICHIDAE A
Oegoconia caradjai Popescu-Gorj & Capuse, 1965 A
BATRACHEDRIDAE
Batrachedra agaura Meyrick, 1901 E
Batrachedra arenosella (Walker, 1864b)
Batrachedra astricta Philpott, 1930b E
Batrachedra eucola Meyrick, 1889b E
Batrachedra filicicola Meyrick, 1917a E
Batrachedra litterata Philpott, 1928a E
Batrachedra psithyra Meyrick, 1889b E
Batrachedra tristicta Meyrick, 1901 E
Houdinia flexilissima Hoare, Dugdale & Watts, 2006 E
BEDELLIIDAE
Bedellia psamminella Meyrick, 1889b
Bedellia somnulentella (Zeller, 1847)
BLASTOBASIDAE A
Blastobasis sp. nr *tarda* Meyrick, 1902d A
BLASTODACNIDAE
Circoxena ditrocha Meyrick, 1916b E
Microcolona limodes Meyrick, 1897a E
BOMBYCIDAE A
Bombyx mori (Linnaeus, 1758) A
CARPOSINIDAE
Campbellana attenuata Salmon & Bradley, 1956 E Su
Coscinoptycha improbana Meyrick, 1881 A
Ctenarchis cramboides Dugdale, 1995 E
Glaphyrarcha euthrepta Meyrick, 1938 E
Heterocrossa adreptella (Walker, 1864a) E
Heterocrossa canescens (Philpott, 1930c) E
Heterocrossa contactella (Walker, 1866b) E
Heterocrossa cryodana Meyrick, 1885b E
Heterocrossa epomiana Meyrick, 1885b E
Heterocrossa eriphylla Meyrick, 1888d E
Heterocrossa exochana Meyrick, 1888d E
Heterocrossa gonosemana Meyrick, 1882b E
Heterocrossa hudsoni Dugdale, 1988 E
Heterocrossa ignobilis (Philpott, 1930c) E
Heterocrossa iophaea Meyrick, 1907c E
Heterocrossa literata (Philpott, 1930b) E
Heterocrossa maculosa (Philpott, 1927a) E
Heterocrossa morbida (Meyrick, 1912c) E
Heterocrossa philpotti hudsoni Dugdale, 1988 E
Heterocrossa p. philpotti (Dugdale, 1971) E Su
Heterocrossa rubophaga Dugdale, 1988 E
Heterocrossa sanctimonea (Clarke, 1926) E
Heterocrossa sarcanthes (Meyrick, 1918) E
Paramorpha marginata (Philpott, 1931) E
CECIDOSIDAE
Xanadoses nielseni Hoare & Dugdale, 2003 E
CHOREUTIDAE
Asterivora albifasciata (Philpott, 1924a) E
Asterivora analoga (Meyrick, 1912c) E
Asterivora antigrapha (Meyrick, 1911b) E
Asterivora barbigera (Meyrick, 1915a) E
Asterivora chatuidea (Clarke, 1926) E
Asterivora colpota (Meyrick, 1911b) E
Asterivora combinatana (Walker, 1863c) E
Asterivora exocha (Meyrick, 1907c) E
Asterivora fasciata (Philpott, 1930b) E
Asterivora inspoliata (Philpott, 1930b) E
Asterivora iochondra (Meyrick, 1911b) E
Asterivora marmarea (Meyrick, 1888e) E
Asterivora microlitha (Meyrick, 1888e) E
Asterivora ministra (Meyrick, 1912c) E
Asterivora nivescens (Philpott, 1926a) E
Asterivora oleariae Dugdale, 1979 E Sn
Asterivora symbolaea (Meyrick, 1888e) E
Asterivora tillyardi (Philpott, 1924c) E
Asterivora tristis (Philpott, 1930b) E
Asterivora urbana (Clarke, 1926) E
Tebenna micalis (Mann, 1857)
COLEOPHORIDAE A
Coleophora alcyonipennella (Kollar, 1832) A
Coleophora mayrella (Huebner, [1813]) A
Coleophora striatipennella Tengstrom, 1848 A
Coleophora versurella Zeller, 1849 A
COPROMORPHIDAE
Isonomeutis amauropa Meyrick, 1888d E
Isonomeutis restincta Meyrick, 1923 E
Phycomorpha metachrysa Meyrick, 1914a E
COSMOPTERIGIDAE
Cosmopterix attenuatella (Walker, 1864)
Labdia anarithma (Meyrick, 1889b)
Limnaecia phragmitella Stainton, 1851
Pyroderces aellotricha (Meyrick, 1889b)
Pyroderces apparitella (Walker, 1864b) E
Pyroderces deamatella (Walker, 1864a) E
COSSIDAE A
Endoxyla cinereus (Tepper, 1890) A
CRAMBIDAE
Crambinae
Bleszynskia malacelloides (Bleszynski, 1955) A
Culladia cuneiferellus (Walker, 1863) A
Gadira acerella Walker, 1866b E
Gadira leucophthalma (Meyrick, 1882a) E
Gadira petraula (Meyrick, 1882a) E
Glaucocharis auriscriptella (Walker, 1864b) E
Glaucocharis bipunctella (Walker, 1866b) E
Glaucocharis chrysochyta (Meyrick, 1882a) E
Glaucocharis elaina (Meyrick, 1882a) E
Glaucocharis epiphaea (Meyrick, 1885a) E
Glaucocharis harmonica (Meyrick, 1888c) E
Glaucocharis helioctypa (Meyrick, 1882a) E
Glaucocharis holanthes (Meyrick, 1885a) E
Glaucocharis interrupta (Felder & Rogenhofer, 1875) E
Glaucocharis lepidella (Walker, 1866b) E
Glaucocharis leucoxantha (Meyrick, 1882a) E
Glaucocharis metallifera (Butler, 1877) E
Glaucocharis microdora (Meyrick, 1905) E
Glaucocharis parorma (Meyrick, 1924a) E
Glaucocharis planetopa (Meyrick, 1923) E
Glaucocharis pyrsophanes (Meyrick, 1882a) E
Glaucocharis selenaea (Meyrick, 1885a) E
Glaucocharis stella (Meyrick, 1938) E
Kupea electilis Philpott, 1930a E
Maoricrambus oncobolus (Meyrick, 1885a) E
Orocrambus abditus (Philpott, 1924a) E
Orocrambus aethonellus (Meyrick, 1882a) E
Orocrambus angustipennis (Zeller, 1877) E
Orocrambus apicellus (Zeller, 1863) E
Orocrambus callirrhous (Meyrick, 1882a) E
Orocrambus catacaustus (Meyrick, 1885a) E
Orocrambus clarkei Philpott, 1930b E
Orocrambus corruptus (Butler, 1877) E
Orocrambus crenaeus (Meyrick, 1885a) E
Orocrambus cultus Philpott, 1917b E
Orocrambus cyclopicus (Meyrick, 1882a) E
Orocrambus dicrenellus (Meyrick, 1883b) E
Orocrambus enchophorus (Meyrick, 1885a) E
Orocrambus ephorus (Meyrick, 1885a) E
Orocrambus eximia (Salmon, 1946) E
Orocrambus flexuosellus (Doubleday *in* White & Doubleday, 1843) E
Orocrambus fugitivellus (Hudson, 1950) E
Orocrambus geminus Patrick, 1991 E
Orocrambus haplotomus (Meyrick, 1882a) E
Orocrambus harpophorus (Meyrick, 1882a) E
Orocrambus heliotes (Meyrick, 1888c) E
Orocrambus heteraulus (Meyrick, 1905) E
Orocrambus horistes (Meyrick, 1902c) E
Orocrambus isochytus (Meyrick, 1888c) E
Orocrambus jansoni Gaskin, 1975 E
Orocrambus lectus (Philpott, 1929a) E
Orocrambus lewisi Gaskin, 1975 E
Orocrambus machaeristes Meyrick, 1905 E
Orocrambus melampetrus Purdie, 1884 E
Orocrambus melitastes (Meyrick, 1909a) E
Orocrambus mylites Meyrick, 1888c E
Orocrambus oppositus (Philpott, 1915) E
Orocrambus ordishi Gaskin, 1975 E
Orocrambus ornatus (Philpott, 1927d) E
Orocrambus paraxenus (Meyrick, 1885a) E
Orocrambus philpotti Gaskin, 1975 E
Orocrambus punctellus (Hudson, 1950) E
Orocrambus ramosellus (Doubleday *in* White & Doubleday, 1843) E
Orocrambus scoparioides Philpott, 1914 E
Orocrambus scutatus (Philpott, 1917b) E
Orocrambus simplex (Butler, 1877) E
Orocrambus siriellus (Meyrick, 1882a) E
Orocrambus sophistes Meyrick, 1905 E
Orocrambus sophronellus (Meyrick, 1885a) E
Orocrambus thymiastes Meyrick, 1901 E
Orocrambus tritonellus (Meyrick, 1885a) E
Orocrambus tuhualis (Felder & Rogenhofer, 1875) E
Orocrambus ventosus Meyrick, 1920a E
Orocrambus vittellus (Doubleday *in* White & Doubleday, 1843) E
Orocrambus vulgaris (Butler, 1877) E
Orocrambus xanthogrammus (Meyrick, 1882a) E
Tauroscopa gorgopis Meyrick, 1888c E
Tauroscopa notabilis Philpott, 1923 E
Tauroscopa trapezitis Meyrick, 1905 E
Tawhitia glaucophanes (Meyrick, 1907c) E
Tawhitia pentadactyla (Zeller, 1863)
Cybalomiinae A
Trichophysetis sp. 1 A
Glaphyriinae
Hellula hydralis Guenée, 1854 V
Musotiminae
Musotima aduncalis (Felder & Rogenhofer, 1875) E
Musotima nitidalis (Walker, 1866a)
Musotima ochropteralis (Guenée, 1854) * A
Nymphulinae
Dracaenura aegialitis Meyrick, 1910b K
Eranistis pandora Meyrick, 1910b K
Hygraula nitens (Butler, 1880) F
Pyraustinae
Achyra affinitalis (Lederer, 1863) A

Botys (s.l.) sp. Dugdale 1988 K
Deana hybreasalis (Walker, 1859b) E
Diasemia grammalis Doubleday *in* White & Doubleday, 1843
Diasemiopsis ramburialis (Duponchel, [1834]) K
Glyphodes onychinalis (Guenée, 1854) A
Herpetogramma licarsisalis (Walker, 1859) A
Proternia philocapna Meyrick, 1884e E
Proteroeca comastis Meyrick, 1884e E
Sceliodes cordalis (Doubleday *in* White & Doubleday, 1843)
Spoladea recurvalis (Fabricius, 1775) A
Udea adversa (Philpott, 1917b) E
Udea antipodea (Salmon *in* Salmon & Bradley, 1956) E Su
Udea daiclesalis (Walker, 1859c) E
Udea flavidalis (Doubleday *in* White & Doubleday, 1843) E
Udea marmarina Meyrick, 1884e E
Udea notata (Butler, 1879a) E
Udea pantheropa (Meyrick, 1902c) E Ch
Uresiphita polygonalis maorialis (Felder & Rogenhofer, 1875) E
Uresiphita p. ornithopteralis (Guenée, 1854) A*
SCOPARIINAE
Antiscopa acompa (Meyrick, 1884d) E
Antiscopa elaphra (Meyrick, 1884d) E
Antiscopa epicomia (Meyrick, 1884d) E
Eudonia alopecias (Meyrick, 1901) E
Eudonia aspidota (Meyrick, 1884d) E
Eudonia asterisca (Meyrick, 1884d) E
Eudonia atmogramma (Meyrick, 1915a) E
Eudonia axena (Meyrick, 1884d) E
Eudonia bisinualis (Hudson, 1928) E
Eudonia campbellensis (Munroe, 1964) E Su
Eudonia cataxesta (Meyrick, 1884d) E
Eudonia chalara (Meyrick, 1901) E
Eudonia characta (Meyrick, 1884d) E
Eudonia chlamydota (Meyrick, 1884d) E
Eudonia choristis (Meyrick, 1907c) E
Eudonia colpota (Meyrick, 1888c) E
Eudonia critica (Meyrick, 1884d) E
Eudonia crypsinoa (Meyrick, 1884d) E
Eudonia cymatias (Meyrick, 1884d) E
Eudonia cyptastis (Meyrick, 1909a) E
Eudonia deltophora (Meyrick, 1884d) E
Eudonia dinodes (Meyrick, 1884d) E
Eudonia dochmia (Meyrick, 1905) E
Eudonia epicremna (Meyrick, 1884d) E
Eudonia feredayi (Knaggs, 1867) E
Eudonia gressitti (Munroe, 1964) E Su
Eudonia gyrotoma (Meyrick, 1909a) E
Eudonia hemicycla (Meyrick, 1884d) E
Eudonia hemiplaca (Meyrick, 1889b) E
Eudonia legnota (Meyrick, 1884d) E
Eudonia leptalaea (Meyrick, 1884d) E
Eudonia leucogramma (Meyrick, 1884d) E
Eudonia linealis (Walker, 1866a) E
Eudonia locularis (Meyrick, 1912c) E
Eudonia luminatrix (Meyrick, 1909a) E
Eudonia manganeutis (Meyrick, 1884d) E
Eudonia melanaegis (Meyrick, 1884d) E
Eudonia meliturga (Meyrick, 1905) E
Eudonia microphthalma (Meyrick, 1884d) E
Eudonia minualis (Walker, 1866a) E
Eudonia octophora (Meyrick, 1884d) E
Eudonia oculata (Philpott, 1927d) E
Eudonia oreas (Meyrick, 1884d) E
Eudonia organaea (Meyrick, 1901) E
Eudonia pachyerga (Meyrick, 1927a) E
Eudonia paltomacha (Meyrick, 1884d) E
Eudonia periphanes (Meyrick, 1884d) E
Eudonia philerga (Meyrick, 1884d) E
Eudonia philetaera (Meyrick, 1884d) E
Eudonia pongalis (Felder & Rogenhofer, 1875) E
Eudonia psammitis (Meyrick, 1884d) E
Eudonia quaestoria (Meyrick, 1929) E
Eudonia rakaiaensis (Knaggs, 1867) E
Eudonia sabulosella (Walker, 1863b) E
Eudonia steropaea (Meyrick, 1884d) E
Eudonia subditella (Walker, 1866b) E
Eudonia submarginalis (Walker, 1863b) E
Eudonia thyridias (Meyrick, 1905) E
Eudonia torodes (Meyrick, 1901) E
Eudonia triclera (Meyrick, 1905) E
Eudonia trivirgata (Felder & Rogenhofer, 1875) E
Eudonia ustiramis (Meyrick, 1931a) E
Eudonia xysmatias (Meyrick, 1907c) E
Eudonia zophochlaena (Meyrick, 1923) E
Exsilirarcha graminea Salmon & Bradley, 1956 E Su
Heliothela atra (Butler, 1877) E
Protyparcha scaphodes Meyrick, 1909b E Su
Scoparia acharis Meyrick, 1884d E
Scoparia apheles (Meyrick, 1884d) E
Scoparia augastis Meyrick, 1907c E
Scoparia autochroa Meyrick, 1907c E
Scoparia chalicodes Meyrick, 1884d E
Scoparia cyameuta (Meyrick, 1884d) E
Scoparia dryphactis Meyrick, 1911b E
Scoparia ejuncida Knaggs, 1867 E
Scoparia encapna Meyrick, 1888c E
Scoparia fragosa Meyrick, 1910b E K
Scoparia halopis Meyrick, 1909b E
Scoparia harpalaea (Meyrick, 1884d) E
Scoparia nomeutis (Meyrick, 1884d) E
Scoparia parachalca Meyrick, 1901 E
Scoparia parmifera Meyrick, 1909b E
Scoparia petrina (Meyrick, 1884d) E
Scoparia rotuella (Felder & Rogenhofer, 1875) E
Scoparia sideraspis Meyrick, 1905 E
Scoparia triscelis Meyrick, 1909b E
Scoparia ustimacula Felder & Rogenhofer, 1875 E
Scoparia (s.l.) *albafascicula* Salmon *in* Salmon & Bradley, 1956 E Su
Scoparia (s.l.) *animosa* Meyrick, 1914a E
Scoparia (s.l.) *asaleuta* Meyrick, 1907c E
Scoparia (s.l.) *astragalota* (Meyrick, 1884d) E
Scoparia (s.l.) *autumna* Philpott, 1927d E
Scoparia (s.l.) *caesia* (Philpott, 1926a) E
Scoparia (s.l.) *caliginosa* Philpott, 1918 E
Scoparia (s.l.) *cinefacta* Philpott, 1926a E
Scoparia (s.l.) *claranota* Howes, 1946 E
Scoparia (s.l.) *clavata* Philpott, 1912 E
Scoparia (s.l.) *contexta* Philpott, 1931 E
Scoparia (s.l.) *crepuscula* Salmon, 1946 E
Scoparia (s.l.) *declivis* Philpott, 1918 E
Scoparia (s.l.) *diphtheralis* Walker, 1866a E
Scoparia (s.l.) *ergatis* Meyrick, 1884d E
Scoparia (s.l.) *exilis* Knaggs, 1867 E
Scoparia (s.l.) *falsa* Philpott, 1924a E
Scoparia (s.l.) *famularis* Philpott, 1930b E
Scoparia (s.l.) *fimbriata* Philpott, 1917b E
Scoparia (s.l.) *fumata* Philpott, 1915 E
Scoparia (s.l.) *gracilis* Philpott, 1924a E
Scoparia (s.l.) *humilialis* Hudson, 1950 E
Scoparia (s.l.) *illota* Philpott, 1919 E
Scoparia (s.l.) *indistinctalis* (Walker, 1863b) E
Scoparia (s.l.) *limatula* Philpott, 1930c E
Scoparia (s.l.) *lychnophanes* Meyrick, 1927a E
Scoparia (s.l.) *minusculalis* Walker, 1866a E
Scoparia (s.l.) *molifera* Meyrick, 1926b E
Scoparia (s.l.) *monochroma* Salmon, 1946 E
Scoparia (s.l.) *niphospora* (Meyrick, 1884d) E
Scoparia (s.l.) *pallidula* Philpott, 1928a E
Scoparia (s.l.) *panopla* Meyrick, 1884d E
Scoparia (s.l.) *parca* Philpott, 1928a E
Scoparia (s.l.) *pascoella* Philpott, 1920 E
Scoparia (s.l.) *phalerias* Meyrick, 1905 E
Scoparia (s.l.) *pura* Philpott, 1924a E
Scoparia (s.l.) *scripta* Philpott, 1918 E
Scoparia (s.l.) *sinuata* Philpott, 1930c E
Scoparia (s.l.) *subita* (Philpott, 1912) E
Scoparia (s.l.) *sylvestris* Clarke, 1926 E
Scoparia (s.l.) *tetracycla* Meyrick, 1884d E
Scoparia (s.l.) *trapezophora* Meyrick, 1884d E
Scoparia (s.l.) *tuicana* Clarke, 1926 E
Scoparia (s.l.) *turneri* Philpott, 1928a E
Scoparia (s.l.) *valenternota* Howes, 1946 E
Scoparia (s.l.) *vulpecula* Meyrick, 1927a E
INCERTAE SEDIS
Argyria s.l. *strophaea* Meyrick, 1905 E
Clepsicosma iridia Meyrick, 1888c E
CTENUCHIDAE A
Antichloris viridis Druce, 1884 A
ELACHISTIDAE s.l.
Agonopterix alstromeriana (Clerck, 1759) A
Agonopterix assimilella (Treitschke, 1832) * A BC
Agonopterix umbellana (Fabricius, 1794) A BC
Agriophara colligatella (Walker, 1864a) E
Cryptolechia (s.l.) *rhodobapta* Meyrick, 1923 E
Cryptolechia (s.l.) *semnodes* Meyrick, 1911b E
Donacostola notabilis (Philpott, 1928a) E
Eutorna caryochroa Meyrick, 1889b E
Eutorna inornata Philpott, 1927d E
Eutorna phaulocosma Meyrick, 1906 A
Eutorna symmorpha Meyrick, 1889b E
Heliostibes (s.l.) *vibratrix* Meyrick, 1927a E
Nymphostola galactina (Felder & Rogenhofer, 1875) E
Proteodes carnifex (Butler, 1877) E
Proteodes clarkei Philpott, 1926a E
Proteodes melographa Meyrick, 1927a E
Proteodes profunda Meyrick, 1905 E
Proteodes smithi Howes, 1946 E
ELACHISTIDAE s.s.
Elachista antipodensis (Dugdale, 1971b) E Su
Elachista archaeonoma (Meyrick, 1889b) E
Elachista eurychora (Meyrick, 1919) E
Elachista exaula (Meyrick, 1889b) E
Elachista galatheae (Viette, 1954) E Su
Elachista gerasmia Meyrick, 1889b E
Elachista helonoma (Meyrick, 1889b) E
Elachista hookeri (Dugdale, 1971b) E Su
Elachista laquaeorum (Dugdale, 1971b) E Sn
Elachista melanura Meyrick, 1889b E
Elachista napaea Philpott, 1930c E
Elachista ochroleuca (Meyrick, 1923) E
Elachista ombrodoca (Meyrick, 1889b) E
Elachista plagiaula (Meyrick, 1938) E
Elachista pumila (Dugdale, 1971b) E Su
Elachista sagittifera Philpott, 1927d E
Elachista thallophora Meyrick, 1889b E
Elachista watti (Philpott, 1924a) E
EPERMENIIDAE
Thambotricha vates Meyrick, 1922b E
GELECHIIDAE
Anarsia dryinopa Lower, 1897 A
Anisoplaca achyrota (Meyrick, 1885) E
Anisoplaca acrodactyla (Meyrick, 1907c) E
Anisoplaca cosmia Bradley, 1956b A
Anisoplaca fraxinea Philpott, 1928a E
Anisoplaca ptyoptera Meyrick, 1885 E
Aristotelia paradesma (Meyrick, 1885) E
Athrips (s.l.) *zophochalca* (Meyrick, 1918) E
Bilobata subsecivella (Zeller, 1852) A
Chrysoesthia drurella (Fabricius, 1775) A
Epiphthora melanombra Meyrick, 1888e E
Epiphthora nivea (Philpott, 1930b) E
Helcystogramma sp. nr *phryganitis* (Meyrick, 1911e) A
Hierodoris (s.l.) *insignis* Philpott, 1926a E
Kiwaia aerobatis (Meyrick, 1924a) E
Kiwaia brontophora (Meyrick, 1885i) E
Kiwaia caerulaea (Hudson, 1925) E
Kiwaia calaspidea (Clarke, 1934) E
Kiwaia cheradias (Meyrick, 1909a) E
Kiwaia contraria (Philpott, 1930b) E
Kiwaia dividua (Philpott, 1921) E
Kiwaia eurybathra (Meyrick, 1931b) E

Kiwaia glaucoterma (Meyrick, 1911b) E
Kiwaia heterospora (Meyrick, 1924a) E
Kiwaia hippeis (Meyrick, 1901) E
Kiwaia jeanae Philpott, 1930a E
Kiwaia lapillosa (Meyrick, 1924a) E
Kiwaia lenis (Philpott, 1929a) E
Kiwaia lithodes (Meyrick, 1885i) E
Kiwaia matermea (Povolny, 1974) E
Kiwaia monophragma (Meyrick, 1885i) E
Kiwaia neglecta (Philpott, 1924c) E
Kiwaia parapleura (Meyrick, 1885i) E
Kiwaia parvula (Philpott, 1930b) E
Kiwaia pharetria (Meyrick, 1885i) E
Kiwaia plemochoa (Meyrick, 1916b) E
Kiwaia pumila (Philpott, 1928c) E
Kiwaia schematica (Meyrick, 1885i) E
Kiwaia thyraula (Meyrick, 1885i) E
Megacraspedus calamogonus Meyrick, 1885i E
Monochroa leptocrossa (Meyrick, 1926) A
Phthorimaea operculella (Zeller, 1873) A
Scrobipalpa obsoletella (Fischer von Roeslerstamm, 1841) A
Sitotroga cerealella (Olivier, 1789) A
Symmetrischema tangolias (Gyen, 1913) A
Thiotricha lindsayi Philpott, 1927d E
Thiotricha oleariae Hudson, 1928 E
Thiotricha tetraphala (Meyrick, 1885i) E
Thiotricha thorybodes (Meyrick, 1885i) E

GEOMETRIDAE

ENNOMINAE

Chalastra aristarcha (Meyrick, 1892) E
Chalastra ochrea (Howes, 1911) E
Chalastra pellurgata Walker, 1862b E
Cleora scriptaria (Walker, 1860b) E
Declana atronivea (Walker, 1865a) E
Declana egregia (Felder & Rogenhofer, 1875) E
Declana feredayi Butler, 1877 E
Declana floccosa Walker, 1858c E
Declana glacialis Hudson, 1903 E
Declana griseata Hudson, 1898 E
Declana hermione Hudson, 1898 E
Declana junctilinea (Walker, 1865a) E
Declana leptomera (Walker, 1858c) E
Declana niveata Butler, 1879a E
Declana toreuta Meyrick, 1929 E
Gellonia dejectaria (Walker, 1860b) E
Gellonia pannularia (Guenée, 1868) E
Ischalis dugdalei Weintraub & Scoble, 2004 E
Ischalis fortinata (Guenée, 1868) E
Ischalis gallaria (Walker, 1860a) E
Ischalis nelsonaria (Felder & Rogenhofer, 1875) E
Ischalis variabilis (Warren, 1895) E
Pseudocoremia albafasciata (Philpott, 1915) E
Pseudocoremia amaculata Stephens & Gibbs, 2003 E
Pseudocoremia berylia (Howes, 1943) E
Pseudocoremia campbelli (Philpott, 1927a) E
Pseudocoremia colpogramma (Meyrick, 1936) E
Pseudocoremia dugdalei Stephens & Gibbs, 2003 E
Pseudocoremia fascialata (Philpott, 1903) E
Pseudocoremia fenerata (Felder & Rogenhofer, 1875) E
Pseudocoremia flava Warren, 1896b E
Pseudocoremia fluminea (Philpott, 1926a) E
Pseudocoremia foxi Stephens, Gibbs & Patrick, 2007 E
Pseudocoremia hollyae Stephens, Gibbs & Patrick, 2007 E
Pseudocoremia hudsoni Stephens, Gibbs & Patrick, 2007 E
Pseudocoremia indistincta Butler, 1877 E
Pseudocoremia insignita (Philpott, 1930b) E
Pseudocoremia lactiflua (Meyrick, 1912c) E
Pseudocoremia leucelaea (Meyrick, 1909a) E
Pseudocoremia lupinata (Felder & Rogenhofer, 1875) E
Pseudocoremia lutea (Philpott, 1914) E
Pseudocoremia melinata (Felder & Rogenhofer, 1875) E
Pseudocoremia modica (Philpott, 1921) E
Pseudocoremia monacha (Hudson, 1903) E
Pseudocoremia ombrodes (Meyrick, 1902c) E Ch
Pseudocoremia pergrata (Philpott, 1930b) E
Pseudocoremia productata (Walker, 1862a) E
Pseudocoremia rudisata ampla (Hudson, 1923b) E
Pseudocoremia r. rudisata (Walker, 1862b) E
Pseudocoremia suavis Butler, 1879a E
Pseudocoremia terrena (Philpott, 1915) E
Pseudocoremia (s.l.) *cineracia* (Howes, 1942) E
Sarisa muriferata (Walker, 1863a) E
Sestra flexata (Walker, 1862b) E
Sestra humeraria (Walker, 1861) E
Zermizinga indocilisaria Walker, 1863a[a] A?

LARENTIINAE

Anachloris subochraria (Doubleday *in* White & Doubleday, 1843)
Aponotoreas anthracias (Meyrick, 1883d) E
Aponotoreas dissimilis (Philpott, 1914) E
Aponotoreas incompta Philpott, 1918 E
Aponotoreas insignis (Butler, 1877) E
Aponotoreas orphnaea (Meyrick, 1883d) E
Aponotoreas synclinalis Hudson, 1903 E
Aponotoreas villosa Philpott, 1917b E
Arctesthes catapyrrha (Butler, 1877) E
Arctesthes siris (Hudson, 1908) E
Asaphodes abrogata (Walker, 1862a) E
Asaphodes adonis (Hudson, 1898) E
Asaphodes aegrota (Butler, 1879a) E
Asaphodes albalineata (Philpott, 1915) E
Asaphodes aphelias (Prout, 1939) E
Asaphodes beata (Butler, 1877) E
Asaphodes camelias (Meyrick, 1888b) E
Asaphodes campbellensis (Dugdale, 1964) E Su
Asaphodes cataphracta (Meyrick, 1883d) E
Asaphodes chionogramma (Meyrick, 1883d) E
Asaphodes chlamydota (Meyrick, 1883d) E
Asaphodes chlorocapna (Meyrick, 1925a) E Ch
Asaphodes cinnabari (Howes, 1912) E
Asaphodes citroena (Clarke, 1934) E
Asaphodes clarata (Walker, 1862a) E
Asaphodes cosmodora (Meyrick, 1888b) E
Asaphodes declarata (Prout, 1914) E
Asaphodes dionysias (Meyrick, 1907c) E
Asaphodes exoriens (Prout, 1912) E
Asaphodes frivola (Meyrick, 1913a) E
Asaphodes glaciata (Hudson, 1925) E
Asaphodes helias (Meyrick, 1883d) E
Asaphodes ida (Clarke, 1926) E
Asaphodes imperfecta (Philpott, 1905) E
Asaphodes limonodes (Meyrick, 1888b) E
Asaphodes mnesichola (Meyrick, 1888b) E
Asaphodes nephelias (Meyrick, 1883d) E
Asaphodes obarata (Felder & Rogenhofer, 1875) E
Asaphodes omichlias (Meyrick, 1883d) E
Asaphodes oraria (Philpott, 1903) E
Asaphodes oxyptera (Hudson, 1909) E Su
Asaphodes periphaea (Meyrick, 1905) E
Asaphodes philpotti (Prout, 1927) E
Asaphodes prasinias (Meyrick, 1883d) E
Asaphodes prymnaea (Meyrick, 1911b) E
Asaphodes recta (Philpott, 1905) E
Asaphodes sericodes (Meyrick, 1915a) E
Asaphodes stephanitis Meyrick, 1907c E
Asaphodes stinaria (Guenée, 1868) E
Austrocidaria anguligera (Butler, 1879a) E
Austrocidaria arenosa (Howes, 1911) E
Austrocidaria bipartita (Prout, 1958) E
Austrocidaria callichlora (Butler, 1879a) E
Austrocidaria cedrinodes (Meyrick, 1911b) E
Austrocidaria gobiata (Felder & Rogenhofer, 1875) E
Austrocidaria haemophaea (Meyrick, 1925a) E
Austrocidaria lithurga (Meyrick, 1911b) E
Austrocidaria parora (Meyrick, 1884c) E
Austrocidaria praerupta (Philpott, 1918) E
Austrocidaria prionota (Meyrick, 1883d) E
Austrocidaria similata (Walker, 1862b) E
Austrocidaria stricta (Philpott, 1915) E
Austrocidaria umbrosa (Philpott, 1917b) E
Austrocidaria venustatis (Salmon, 1946) E
Cephalissa siria Meyrick, 1883d E
Chloroclystis (s.l.) *filata* (Guenée, 1857b) A
Chloroclystis (s.l.) *impudicis* Dugdale, 1964 E Su
Chloroclystis (s.l.) *inductata* (Walker, 1862b) E
Chloroclystis (s.l.) *lichenodes* (Purdie, 1887) E
Chloroclystis (s.l.) *nereis* (Meyrick, 1888b) E
Chloroclystis (s.l.) *sphragitis* (Meyrick, 1888b) E
Chrysolarentia subrectaria (Guenée, 1858)
Dasyuris anceps (Butler, 1877) E
Dasyuris austrina Philpott, 1928a E
Dasyuris callicrena (Meyrick, 1883d) E
Dasyuris catadees Prout, 1939 E
Dasyuris enysii (Butler, 1877) E
Dasyuris fulminea Philpott, 1915 E
Dasyuris grisescens Prout, 1939 E
Dasyuris hectori (Butler, 1877) E
Dasyuris leucobathra Meyrick, 1911b E
Dasyuris micropolis Meyrick, 1929 E
Dasyuris octans Hudson, 1923c E
Dasyuris partheniata Guenée, 1868 E
Dasyuris pluviata Hudson, 1928 E
Dasyuris strategica (Meyrick, 1883d) E
Dasyuris transaurea Howes, 1912 E
Elvia glaucata Walker, 1862b E
Epicyme rubropunctaria (Doubleday *in* White & Doubleday, 1843)
Epiphryne charidema autocharis (Meyrick, 1924a) E
Epiphryne c. charidema (Meyrick, 1909b) E
Epiphryne undosata (Felder & Rogenhofer, 1875) E
Epiphryne verriculata (Felder & Rogenhofer, 1875) E
Epiphryne xanthaspis (Meyrick, 1883d) E
Epyaxa lucidata (Walker, 1862a) E
Epyaxa rosearia (Doubleday *in* White & Doubleday, 1843) E
Epyaxa venipunctata (Walker, 1863a) E
Gingidiobora nebulosa (Philpott, 1917b) E
Gingidiobora subobscurata (Walker, 1862b) E
Helastia alba Craw, 1987 E
Helastia angusta Craw, 1987 E
Helastia christinae Craw, 1987 E
Helastia cinerearia (Doubleday *in* White & Doubleday, 1843) E
Helastia clandestina (Philpott, 1921) E
Helastia corcularia (Guenée, 1868) E
Helastia cryptica Craw, 1987 E
Helastia cymozeucta (Meyrick, 1913a) E
Helastia expolita (Philpott, 1917b) E
Helastia farinata (Warren, 1896b) E
Helastia mutabilis Craw, 1987 E
Helastia ohauensis Craw, 1987 E
Helastia plumbea (Philpott, 1915) E
Helastia salmoni Craw, 1987 E
Helastia scissa Craw, 1987 E
Helastia semisignata (Walker, 1862a) E
Helastia siris (Hawthorne, 1897) E
Helastia triphragma (Meyrick, 1883d) E
Homodotis amblyterma (Meyrick, 1931a) E
Homodotis falcata (Butler, 1879a) E
Homodotis megaspilata (Walker, 1862a) E
Horisme (s.l.) *suppressaria* (Walker, 1863a) E
Hydriomena (s.l.) *arida* (Butler, 1879a) E
Hydriomena (s.l.) *canescens* Philpott, 1918 E
Hydriomena (s.l.) *clarkei* (Howes, 1917) E
Hydriomena (s.l.) *deltoidata* (Walker, 1862b) E
Hydriomena (s.l.) *hemizona* Meyrick, 1897b E
Hydriomena (s.l.) *purpurifera* (Fereday, 1884) E
Hydriomena (s.l.) *rixata* (Felder & Rogenhofer, 1875) E
Microdes epicryptis Meyrick, 1897b E
Microdes quadristrigata Walker, 1862a E
Notoreas arcuata Philpott, 1921 E

Notoreas atmogramma Meyrick, 1911b E
Notoreas blax Prout, 1939 E
Notoreas chioneres Prout, 1939 E
Notoreas chrysopeda (Meyrick, 1888b) E
Notoreas galaxias Hudson, 1928 E
Notoreas hexaleuca (Meyrick, 1914a) E
Notoreas ischnocyma Meyrick, 1905 E
Notoreas isoleuca Meyrick, 1897b E
Notoreas isomoera Prout, 1939 E
Notoreas mechanitis (Meyrick, 1883d) E
Notoreas niphocrena (Meyrick, 1883d) E
Notoreas ortholeuca Hudson, 1923b E
Notoreas paradelpha (Meyrick, 1883d) E
Notoreas perornata (Walker, 1863a) E
Notoreas regilla (Philpott, 1928a) E
Notoreas simplex Hudson, 1898 E
Orthoclydon chlorias (Meyrick, 1883d) E
Orthoclydon praefectata (Walker, 1861) E
Orthoclydon pseudostinaria (Hudson, 1918) E
Paradetis porphyrias (Meyrick, 1883d) E
Paranotoreas brephosata (Walker, 1862a) E
Paranotoreas ferox (Butler, 1877) E
Paranotoreas fulva (Hudson, 1905a) E
Paranotoreas opipara Philpott, 1915 E
Paranotoreas zopyra (Meyrick, 1883d) E
Pasiphila acompsa (Prout, 1927) E
Pasiphila aristias (Meyrick, 1897b) E
Pasiphila bilineolata (Walker, 1862a) E
Pasiphila charybdis (Butler, 1879a) E
Pasiphila cotinaea (Meyrick, 1913a) E
Pasiphila dryas Meyrick, 1891 E
Pasiphila erratica (Philpott, 1916) E
Pasiphila fumipalpata (Felder & Rogenhofer, 1875) E
Pasiphila furva (Philpott, 1917b) E
Pasiphila halianthes (Meyrick, 1907c) E
Pasiphila heighwayi (Philpott, 1927a) E
Pasiphila humilis (Philpott, 1917b) E
Pasiphila lunata (Philpott, 1912) E
Pasiphila magnimaculata (Philpott, 1915) E
Pasiphila malachita (Meyrick, 1913a) E
Pasiphila melochlora (Meyrick, 1911b) E
Pasiphila muscosata (Walker, 1862a) E
Pasiphila nebulosa Dugdale, 1971b E Su
Pasiphila plinthina Meyrick, 1888b E
Pasiphila punicea (Philpott, 1923) E
Pasiphila rivalis (Philpott, 1916) E
Pasiphila rubella (Philpott, 1915) E
Pasiphila sandycias (Meyrick, 1905) E
Pasiphila semochlora (Meyrick, 1919) E
Pasiphila suffusa (Hudson, 1928) E
Pasiphila testulata (Guenée, 1857b)
Pasiphila urticae (Hudson, 1939) E
Pasiphila vieta (Hudson, 1950) E
Phrissogonus laticostatus (Walker, 1862a) A
Poecilasthena pulchraria (Doubleday *in* White & Doubleday, 1843)
Poecilasthena schistaria (Walker, 1861) E
Poecilasthena subpurpureata (Walker, 1863a) E
Tatosoma agrionata (Walker, 1862b) E
Tatosoma alta Philpott, 1913 E
Tatosoma apicipallida Prout, 1914 E
Tatosoma fasciata Philpott, 1914 E
Tatosoma lestevata (Walker, 1862b) E
Tatosoma monoviridisata Clarke, 1920 E
Tatosoma tipulata (Walker, 1862b) E
Tatosoma topea Philpott, 1903 E
Tatosoma transitaria (Walker, 1862b) E
Xanthorhoe bulbulata (Guenée, 1868) E
Xanthorhoe frigida Howes, 1946 E
Xanthorhoe lophogramma Meyrick, 1897b E
Xanthorhoe occulta Philpott, 1903 E
Xanthorhoe orophyla (Meyrick, 1883d) E
Xanthorhoe orophylloides Hudson, 1909 E Su
Xanthorhoe semifissata (Walker, 1862b) E
OENOCHROMINAE s.l.
Adeixis griseata (Hudson, 1903) E
Dichromodes cynica Meyrick, 1911b E
Dichromodes gypsotis Meyrick, 1888b E
Dichromodes ida Hudson, 1905a E
Dichromodes niger (Butler, 1877) E
Dichromodes simulans Hudson, 1905a E
Dichromodes sphaeriata (Felder & Rogenhofer, 1875) E
Samana acutata Butler, 1877 E
Samana falcatella Walker, 1863b E
Theoxena scissaria (Guenée, 1868) E
Xyridacma alectoraria (Walker, 1860a) E
Xyridacma ustaria (Walker, 1863a) E
Xyridacma veronicae Prout, 1934 E
STERRHINAE
Scopula rubraria (Doubleday *in* White & Doubleday, 1843)
NOMEN DUBIUM
Hydriomena (s.l.) *iolanthe* Hudson, 1939 [Based on a single specimen, now lost. Hudson's figure has not been convincingly matched with any known species, endemic or adventive. Omitted from Dugdale (1988).]
GLYPHIPTERIGIDAE
Glyphipterix achlyoessa (Meyrick, 1880b) E
Glyphipterix acronoma Meyrick, 1888e E
Glyphipterix acrothecta Meyrick, 1880b E
Glyphipterix aenea Philpott, 1917b E
Glyphipterix aerifera Meyrick, 1912d E
Glyphipterix astrapaea Meyrick, 1880b E
Glyphipterix ataracta (Meyrick, 1888e) E
Glyphipterix aulogramma Meyrick, 1907c E
Glyphipterix bactrias Meyrick, 1911b E
Glyphipterix barbata Philpott, 1918 E
Glyphipterix brachydelta Meyrick, 1916b E
Glyphipterix calliactis Meyrick, 1914a E
Glyphipterix cionophora (Meyrick, 1888e) E
Glyphipterix codonias Meyrick, 1909a E
Glyphipterix dichorda Meyrick, 1911b E
Glyphipterix erastis Meyrick, 1911b E
Glyphipterix euastera Meyrick, 1880b E
Glyphipterix iocheaera Meyrick, 1880b E
Glyphipterix leptosema Meyrick, 1888e E
Glyphipterix metasticta Meyrick, 1907c E
Glyphipterix morangella Felder & Rogenhofer, 1875 E
Glyphipterix necopina Philpott, 1927d E
Glyphipterix nephoptera Meyrick, 1888e E
Glyphipterix octonaria Philpott, 1924a E
Glyphipterix oxymachaera (Meyrick, 1880b) E
Glyphipterix rugata Meyrick, 1915a E
Glyphipterix scintelella Walker, 1864b E
Glyphipterix scintilla Clarke, 1926 E
Glyphipterix scolias Meyrick, 1910b KE
Glyphipterix similis Philpott, 1928a E
Glyphipterix triselena Meyrick, 1880b E
Glyphipterix tungella Felder and Rogenhofer, 1875 E
Glyphipterix xestobela (Meyrick, 1888e) E
Glyphipterix zelota Meyrick, 1888e E
Pantosperma holochalca Meyrick, 1888e E
GRACILLARIIDAE
GRACILLARIINAE
Acrocercops (s.l.) *alysidota* (Meyrick, 1880a) A
Acrocercops (s.l.) *laciniella* (Meyrick, 1880) A
Acrocercops (s.l.) *leucocyma* (Meyrick, 1889b) E
Caloptilia azaleella (Brants, 1913) A
Caloptilia chalcodelta (Meyrick, 1889b) E
Caloptilia chrysitis (Felder & Rogenhofer, 1875) E
Caloptilia elaeas (Meyrick, 1911b) E
Caloptilia linearis (Butler, 1877) E
Caloptilia octopunctata (Turner, 1894) K
Caloptilia selenitis (Meyrick, 1909a) E
Conopomorpha cyanospila Meyrick, 1885i E
Dialectica scalariella (Zeller, 1850) A
Macarostola miniella (Felder & Rogenhofer, 1875) E
Polysoma eumetalla (Meyrick, 1880a) A
LITHOCOLLETINAE A
Phyllonorycter hardenbergiella (Wise, 1957) A
Phyllonorycter messaniella (Zeller, 1846) A
PHYLLOCNISTINAE
Acrocercops (s.l.) *aellomacha* (Meyrick, 1880a) E
Acrocercops (s.l.) *aethalota* (Meyrick, 1880a) E
Acrocercops (s.l.) *panacicorticis* (Watt, 1920) E
Acrocercops (s.l.) *panacifinens* (Watt, 1920) E
Acrocercops (s.l.) *panacitorsens* (Watt, 1920) E
Acrocercops (s.l.) *panacivagans* (Watt, 1920) E
Acrocercops (s.l.) *panacivermiforma* (Watt, 1920) E
Acrocercops (s.l.) *zorionella* (Hudson, 1918) E
HELIOZELIDAE A
Heliozela cf. *catoptrias* Meyrick, 1897 A
HEPIALIDAE
Aenetus virescens (Doubleday *in* White & Doubleday, 1843) E
Aoraia aspina Dugdale, 1994 E
Aoraia aurimaculata (Philpott, 1914) E
Aoraia dinodes (Meyrick, 1890) E
Aoraia enysii (Butler, 1877) E
Aoraia flavida Dugdale, 1994 E
Aoraia hespera Dugdale, 1994 E
Aoraia insularis Dugdale, 1994 E
Aoraia lenis Dugdale, 1994 E
Aoraia macropis Dugdale, 1994 E
Aoraia oreobolae Dugdale, 1994 E
Aoraia orientalis Dugdale, 1994 E
Aoraia rufivena Dugdale, 1994 E
Aoraia senex (Hudson, 1908) E
Cladoxycanus minos (Hudson, 1905a) E
Dioxycanus fuscus (Philpott, 1914) E
Dioxycanus oreas (Hudson, 1920) E
Dumbletonius characterifer (Walker, 1865a) E
Dumbletonius unimaculatus (Salmon, 1948) E
Heloxycanus patricki Dugdale, 1994 E
Wiseana cervinata (Walker, 1865a) E
Wiseana copularis (Meyrick, 1912c) E
Wiseana fuliginea (Butler, 1879a) E
Wiseana jocosa (Meyrick, 1912c) E
Wiseana mimica (Philpott, 1923) E
Wiseana signata (Walker, 1856a) E
Wiseana umbraculata (Guenée, 1868) E
incertae sedis
Gen. indet. *mairi* (Buller, 1873) E [*Porina mairi* was based on a single specimen, now lost. *Porina* is preoccupied (Bryozoa); Lepidoptera formerly assigned to *Porina* have been reassigned to other genera. It is not known to which *mairi* belongs.]
LECITHOCERIDAE
Compsistis bifaciella (Walker, 1864a) E
Lecithocera micromela (Lower, 1897) A
Sarisophora leucoscia Turner, 1919 A
LYCAENIDAE
Lampides boeticus (Linnaeus, 1767) A
Lycaena boldenarum boldenarum (White, 1862) E
Lycaena b. caerulaea (Salmon, 1946) E
Lycaena b. ianthina (Salmon, 1946) E
Lycaena feredayi (Bates, 1867) E
Lycaena rauparaha (Fereday, 1877b) E
Lycaena salustius (Fabricius, 1793) E
Zizina otis labradus (Godart, 1824) A?
Zizina oxleyi (Felder & Felder, 1865) E
LYMANTRIIDAE A
Orgyia antiqua (Linnaeus, 1758) A extinct
Orgyia thyellina Butler, 1881c A eradicated
Teia anartoides Walker, 1855 A eradicated
LYONETIIDAE
Cateristis eustyla Meyrick, 1889b Do
Leucoptera spartifoliella (Huebner, [1813]) A
Stegommata leptomitella Meyrick, 1880a A
Stegommata sulfuratella Meyrick, 1880 A
MICROPTERIGIDAE
Micropardalis aurella (Hudson, 1918) E
Micropardalis doroxena (Meyrick, 1888e) E
Sabatinca aemula Philpott, 1924c E
Sabatinca aenea Hudson, 1923c E
Sabatinca aurantiaca Philpott, 1924c E

Sabatinca barbarica Philpott, 1918 E
Sabatinca calliarcha Meyrick, 1912c E
Sabatinca caustica Meyrick, 1912c E
Sabatinca chalcophanes (Meyrick, 1885i) E
Sabatinca chrysargyra (Meyrick, 1885i) E
Sabatinca demissa Philpott, 1923 E
Sabatinca heighwayi Philpott, 1927d E
Sabatinca ianthina Philpott, 1921 E
Sabatinca incongruella Walker, 1863c E
Sabatinca lucilia Clarke, 1920 E
Sabatinca passalota Meyrick, 1923 E
Sabatinca quadrijuga Meyrick, 1912c E
Sabatinca rosicoma Meyrick, 1814a E
Sabatinca zonodoxa Meyrick, 1888e E
MNESARCHAEIDAE E
Mnesarchaea acuta Philpott, 1929a E
Mnesarchaea fallax Philpott, 1927a E
Mnesarchaea fusca Philpott, 1922 E
Mnesarchaea fusilella (Walker, 1864b) E
Mnesarchaea hamadelpha Meyrick, 1888e E
Mnesarchaea loxoscia Meyrick, 1888e E
Mnesarchaea paracosma Meyrick, 1885i E
MOMPHIDAE
Zapyrastra calliphana Meyrick, 1889b E
Zapyrastra stellata (Philpott, 1931) E
NEPTICULIDAE
Stigmella aigialeia Donner & Wilkinson, 1989 E
Stigmella aliena Donner & Wilkinson, 1989 E
Stigmella atrata Donner & Wilkinson, 1989 E
Stigmella cassiniae Donner & Wilkinson, 1989 E
Stigmella childi Donner & Wilkinson, 1989 E
Stigmella cypracma (Meyrick, 1916b) E
Stigmella erysibodea Donner & Wilkinson, 1989 E
Stigmella fulva (Watt, 1921a) E
Stigmella hakekeae Donner & Wilkinson, 1989 E
Stigmella hamishella Donner & Wilkinson, 1989 E
Stigmella hoheriae Donner & Wilkinson, 1989 E
Stigmella ilsea Donner & Wilkinson, 1989 E
Stigmella insignis (Philpott, 1927d) E
Stigmella kaimanua Donner & Wilkinson, 1989 E
Stigmella laquaeorum (Dugdale, 1971b) E Su
Stigmella lucida (Philpott, 1919) E
Stigmella maoriella (Walker, 1864b) E
Stigmella microtheriella (Stainton, 1854) A
Stigmella ogygia (Meyrick, 1889b) E
Stigmella oriastra (Meyrick, 1917a) E
Stigmella palaga Donner & Wilkinson, 1989 E
Stigmella platina Donner & Wilkinson, 1989 E
Stigmella progama (Meyrick, 1924b) E
Stigmella progonopis (Meyrick, 1921) E
Stigmella propalaea (Meyrick, 1889b) E
Stigmella sophorae (Hudson, 1939) E
Stigmella tricentra (Meyrick, 1889b) E
Stigmella watti Donner & Wilkinson, 1989 E
NOCTUIDAE
Achaea janata (Linnaeus, 1758) V
Agrotis infusa (Boisduval, 1832) V
Agrotis innominata Hudson, 1898 E
Agrotis ipsilon (Hufnagel, 1766) E
Agrotis munda Walker, 1857a V
Aletia (s.l.) *argentaria* Howes, 1945 E
Aletia (s.l.) *cucullina* (Guenée, 1868) E
Aletia (s.l.) *cuneata* Philpott, 1916 E
Aletia (s.l.) *cyanopetra* (Meyrick, 1927b) E
Aletia (s.l.) *dentata* Philpott, 1923 E
Aletia (s.l.) *falsidica fasidica* (Meyrick, 1911b) E
Aletia (s.l.) *f. hamiltoni* Hampson, 1913b E
Aletia (s.l.) *fibriata* Meyrick, 1913a E
Aletia (s.l.) *inconstans* (Butler, 1880) E
Aletia (s.l.) *lacustris* Meyrick, 1934 E
Aletia (s.l.) *longstaffi* (Howes, 1911) E
Aletia (s.l.) *mitis* (Butler, 1877) E
Aletia (s.l.) *moderata* (Walker, 1865a) E
Aletia (s.l.) *nobilia* Howes, 1946 E
Aletia (s.l.) *obsecrata* Meyrick, 1914a E
Aletia (s.l.) *panda* Philpott, 1920 E
Aletia (s.l.) *parmata* Philpott, 1926a E
Aletia (s.l.) *probenota* Howes, 1945 E
Aletia (s.l.) *sistens* (Guenée, 1868) E
Aletia (s.l.) *sollennis* Meyrick, 1914a E
Aletia (s.l.) *temperata* (Walker, 1858c) E
Aletia (s.l.) *virescens* (Butler, 1879a) E
Andesia pessota (Meyrick, 1887) E
Anomis flava (Fabricius, 1775) V
Anomis involuta (Walker, 1858b) V
Anticarsia irrorata (Fabricius, 1781) K
Arcte coerula (Guenée, 1852c) V
Artigisa melanephele Hampson, 1914 A
Athetis tenuis (Butler, 1886) V
Australothis volatilis Matthews & Patrick, 1998 E
Austramathes purpurea (Butler, 1879a) E
Bityla defigurata (Walker, 1865b) E
Bityla sericea Butler, 1877 E
Callopistria maillardi (Guenée, 1862) K
Chasmina sp. of Hoare, 2001 V
Chrysodeixis argentifera (Guenée, 1852b) V
Chrysodeixis eriosoma (Doubleday *in* White & Doubleday, 1843)
Condica illecta (Walker, 1865a) V
Cosmodes elegans (Donovan, 1805) A
Ctenoplusia albostriata (Bremer & Grey, 1853) A
Dasypodia cymatodes Guenée, 1852c A
Dasypodia selenophora Guenée, 1852c A
Diarsia intermixta (Guenée, 1852a)
Dipaustica epiastra (Meyrick, 1911b) E
Ectopatria aspera (Walker, 1857b)
Eudocima fullonia (Clerck, 1764) V
Eudocima materna (Linnaeus, 1767) V
Euxoa admirationis (Guenée, 1868) E
Euxoa ceropachoides (Guenée, 1868) E
Feredayia graminosa (Walker, 1857b) E
Grammodes pulcherrima T.P. Lucas, 1892 V
Graphania agorastis (Meyrick, 1887) E
Graphania averilla (Hudson, 1921) E
Graphania beata (Howes, 1906) E
Graphania bromias (Meyrick, 1902c) E
Graphania brunneosa (Fox, 1970) E
Graphania chlorodonta (Hampson, 1911) E
Graphania chryserythra (Hampson, 1905) E
Graphania disjungens (Walker, 1858c) E
Graphania erebia (Hudson, 1909) E Su
Graphania fenwicki (Philpott, 1921) E
Graphania homoscia (Meyrick, 1887) E
Graphania infensa (Walker, 1857b) E
Graphania insignis (Walker, 1865b) E
Graphania lignana (Walker, 1857b) E
Graphania lindsayi Dugdale, 1988 E
Graphania lithias (Meyrick, 1887) E
Graphania maya (Hudson, 1898) E
Graphania mollis (Howes, 1908) E
Graphania morosa (Butler, 1880) E
Graphania mutans (Walker, 1857b) E
Graphania nullifera (Walker, 1857b) E
Graphania olivea (Watt, 1916) E
Graphania oliveri (Hampson, 1911) E
Graphania omicron (Hudson, 1898) E
Graphania omoplaca (Meyrick, 1887) E
Graphania pagaia (Hudson, 1909) E Sn
Graphania paracausta (Meyrick, 1887) E
Graphania pelanodes (Meyrick, 1931a) E
Graphania petrograpta (Meyrick, 1929) E
Graphania phricias (Meyrick, 1888a) E
Graphania plena (Walker, 1865b) E
Graphania prionistis (Meyrick, 1887) E
Graphania rubescens (Butler, 1879a) E
Graphania scutata (Meyrick, 1929) E
Graphania sequens (Howes, 1912) E
Graphania sericata (Howes, 1945) E
Graphania tetrachroa (Meyrick, 1931a) E
Graphania ustistriga (Walker, 1857b) E
Helicoverpa armigera conferta (Walker, 1857b) A
Helicoverpa punctigera (Wallengren, 1860) A
Homohadena (s.l.) *fortis* (Butler, 1880) E
Hydrillodes surata Meyrick, 1910b K
Hypenodes gonospilalis (Walker, [1866]) K
Hypocala deflorata (Fabricius, 1792) V
Ichneutica cana Howes, 1914 E
Ichneutica ceraunias Meyrick, 1887 E
Ichneutica dione Hudson, 1898 E
Ichneutica empyrea (Hudson, 1918) E
Ichneutica homerica Howes, 1943 E
Ichneutica lindsayi Philpott, 1926a E
Ichneutica marmorata (Hudson, 1924) E
Ichneutica nervosa Hudson, 1922 E
Ichneutica notata Salmon, 1946 E
Leucania stenographa Lower, 1900 A
Leucocosmia nonagrica (Walker, 1864) K
Meterana alcyone (Hudson, 1898) E
Meterana asterope (Hudson, 1898) E
Meterana badia (Philpott, 1927d) E
Meterana coctilis (Meyrick, 1931a) E
Meterana coeleno (Hudson, 1898) E
Meterana decorata (Philpott, 1905) E
Meterana diatmeta (Hudson, 1898) E
Meterana dotata (Walker, 1857b) E
Meterana exquisita (Philpott, 1903) E
Meterana grandiosa (Philpott, 1903) E
Meterana inchoata (Philpott, 1920) E
Meterana levis (Philpott, 1905) E
Meterana merope (Hudson, 1898) E
Meterana meyricci (Hampson, 1911) E
Meterana ochthistis (Meyrick, 1887) E
Meterana octans (Hudson, 1898) E
Meterana pansicolor (Howes, 1912) E
Meterana pascoi (Howes, 1912) E
Meterana pauca (Philpott, 1910) E
Meterana pictula (White *in* Taylor, 1855) E
Meterana praesignis (Howes, 1911) E
Meterana stipata (Walker, 1865b) E
Meterana tartarea (Butler, 1877) E
Meterana vitiosa (Butler, 1877) E
Mocis alterna (Walker, 1858c) V
Mocis frugalis (Fabricius, 1775) K
Mocis trifasciata (Stephens, 1830) K
Mythimna separata (Walker, 1865a) A
Pantydia sparsa Guenée, 1852 * A
Persectania aversa (Walker, 1856c) E
Phalaenoides glycinae Lewin, 1805 A
Physetica caerulea (Guenée, 1868) E
Proteuxoa comma (Walker, 1856c) E
Proteuxoa sanguinipuncta (Guenée, 1852) * A
Rhapsa scotosialis Walker, 1866a E
Schrankia costaestrigalis (Stephens, 1834)
Speiredonia spectans (Guenée, 1852c) V
Spodoptera exempta (Walker, 1857a) V
Spodoptera litura (Fabricius, 1775) A
Spodoptera mauritia (Boisduval, 1833) V
Tathorhynchus exsiccata fallax Swinhoe, 1902 V
Thysanoplusia orichalcea (Fabricius, 1775) A
Tiracola plagiata (Walker, 1857) K
Tmetolophota acontistis (Meyrick, 1887) E
Tmetolophota alopa (Meyrick, 1887) E
Tmetolophota arotis (Meyrick, 1887) E
Tmetolophota atristriga (Walker, 1865b) E
Tmetolophota blenheimensis (Fereday, 1883c) E
Tmetolophota hartii (Howes, 1914) E
Tmetolophota lissoxyla (Meyrick, 1911b) E
Tmetolophota micrastra (Meyrick, 1897b) E
Tmetolophota paraxysta (Meyrick, 1929) E
Tmetolophota phaula (Meyrick, 1887) E
Tmetolophota propria (Walker, 1856c) E
Tmetolophota purdii (Fereday, 1883c) E
Tmetolophota semivittata (Walker, 1865a) E
Tmetolophota similis (Philpott, 1924a) E
Tmetolophota steropastis (Meyrick, 1887) E
Tmetolophota stulta (Philpott, 1905) E
Tmetolophota sulcana (Fereday, 1880) E
Tmetolophota toroneura (Meyrick, 1901) E

Tmetolophota unica (Walker, 1856c) E
Trigonistis anticlina (Meyrick, 1901) E
NOLIDAE
Nola parvitis (Howes, 1917) E
Pseudoips fagana (Fabricius, 1781) A [once only]
Uraba lugens Walker, 1863 A
NYMPHALIDAE
DANAINAE
Danaus petilia (Stoll, 1790) V
Danaus plexippus (Linnaeus, 1758) A
Tirumala hamata (Macleay, 1826) V
MORPHINAE A
Opsiphanes cassina Felder & Felder, 1862 A
Opsiphanes tamarindi Felder & Felder, 1861 A
NYMPHALINAE
Hypolimnas bolina (Linnaeus, 1758) V
Junonia villida (Fabricius, 1787) V
Vanessa gonerilla gonerilla (Fabricius, 1775) E
Vanessa g. ida (Alfken, 1899) E
Vanessa itea (Fabricius, 1775)
Vanessa kershawi (McCoy, 1868) V
SATYRINAE
Argyrophenga antipodum Doubleday, 1845 E
Argyrophenga harrisi Craw, 1978 E
Argyrophenga janitae Craw, 1978 E
Dodonidia helmsii Butler, 1884a E
Erebiola butleri Fereday, 1879 E
Melanitis leda (Linnaeus, 1758) V
Oreixenica lathoniella (Westwood, 1851) V
Percnodaimon merula (Hewitson, 1875) E
OECOPHORIDAE
Barea GROUP
Atalopsis n. sp. of Hoare 2001 A
Atomotricha chloronota Meyrick, 1914a E
Atomotricha exsomnis Meyrick, 1913a E
Atomotricha isogama Meyrick, 1909a E
Atomotricha lewisi Philpott, 1927d E
Atomotricha oeconoma Meyrick, 1914a E
Atomotricha ommatias Meyrick, 1883c E
Atomotricha prospiciens Meyrick, 1924b E
Atomotricha sordida (Butler, 1877) E
Atomotricha versuta Meyrick, 1914a E
Barea codrella (Felder & Rogenhofer, 1875) A
Barea confusella (Walker, 1864a) A
Barea confusella sensu Philpott 1927f A
Barea consignatella Walker, 1864a A
Barea exarcha (Meyrick, 1883e) A
Borkhausenia (s.l.) *morella* Hudson, 1939 A
Chersadaula ochrogastra Meyrick, 1923 E
Corocosma memorabilis Meyrick, 1927a E
Euchersadaula lathriopa (Meyrick, 1905) E
Euchersadaula tristis Philpott, 1926a E
Eulechria (s.l.) *zophoessa* Meyrick, 1883a E
Euthictis (s.l.) *chloratma* (Meyrick, 1916b) E
Gymnobathra (s.l.) *rufopunctella* Hudson, 1950 E
Leptocroca sanguinolenta Meyrick, 1886a A
Leptocroca (s.l.) *amenena* (Meyrick, 1888e) E
Leptocroca (s.l.) *aquilonaris* Philpott, 1931 E
Leptocroca (s.l.) *asphaltis* (Meyrick, 1911b) E
Leptocroca (s.l.) *lenita* Philpott, 1931 E
Leptocroca (s.l.) *lindsayi* Philpott, 1930a E
Leptocroca (s.l.) *porophora* (Meyrick, 1929) E
Leptocroca (s.l.) *scholaea* (Meyrick, 1883c) E
Leptocroca (s.l.) *variabilis* Philpott, 1926a E
Leptocroca (s.l.) *vinaria* (Meyrick, 1914a) E
Leptocroca (s.l.) *xyrias* Meyrick, 1931b E
Locheutis (s.l.) *fusca* Philpott, 1930b E
Locheutis (s.l.) *pulla* Philpott, 1928g E
Locheutis (s.l.) *vagata* Meyrick, 1916b E
Mermeristis ocneropis Meyrick, 1936 E
Mermeristis spodiaea Meyrick, 1915c E
Sphyrelata amotella Walker, 1864 A
Tachystola acroxantha (Meyrick, 1885c) A
Tingena actinias (Meyrick, 1901) E
Tingena affinis (Philpott, 1926a) E
Tingena afflicta (Philpott, 1926b) E
Tingena aletis (Meyrick, 1905) E
Tingena amiculata (Philpott, 1926b) E
Tingena anaema (Meyrick, 1883c) E
Tingena ancogramma (Meyrick, 1919) E
Tingena apanthes (Meyrick, 1883c) E
Tingena apertella (Walker, 1864a) E
Tingena aphrontis (Meyrick, 1883c) E
Tingena armigerella (Walker, 1864a) E
Tingena aurata (Philpott, 1931) E
Tingena basella (Walker, 1863c) E
Tingena berenice (Meyrick, 1929) E
Tingena brachyacma (Meyrick, 1909a) E
Tingena chloradelpha (Meyrick, 1905) E
Tingena chloritis (Meyrick, 1883c) E
Tingena chrysogramma (Meyrick, 1883c) E
Tingena clarkei (Philpott, 1928a) E
Tingena collitella (Walker, 1864a) E
Tingena compsogramma (Meyrick, 1920a) E
Tingena contextella (Walker, 1864a) E
Tingena crotala (Meyrick, 1915b) E
Tingena decora (Philpott, 1928a) E
Tingena enodis (Philpott, 1927d) E
Tingena epichalca (Meyrick, 1886a) E
Tingena epimylia (Meyrick, 1883c) E
Tingena eriphaea (Meyrick, 1914a) E
Tingena eumenopa (Meyrick, 1926b) E
Tingena falsiloqua (Meyrick, 1932) E
Tingena fenestrata (Philpott, 1926b) E
Tingena grata (Philpott, 1927d) E
Tingena griseata (Butler, 1877) E
Tingena hastata (Philpott, 1916) E
Tingena hemimochla (Meyrick, 1883c) E
Tingena homodoxa (Meyrick, 1883c) E
Tingena honesta (Philpott, 1929a) E
Tingena honorata (Philpott, 1918) E
Tingena hoplodesma (Meyrick, 1883c) E
Tingena horaea (Meyrick, 1883c) E
Tingena idiogama (Meyrick, 1924b) E
Tingena innotella (Walker, 1864a) E
Tingena lassa (Philpott, 1930b) E
Tingena laudata (Philpott, 1930b) E
Tingena letharga (Meyrick, 1883c) E
Tingena levicula (Philpott, 1930b) E
Tingena loxotis (Meyrick, 1905) E
Tingena macarella (Meyrick, 1883c) E
Tingena maranta (Meyrick, 1886a) E
Tingena marcida (Philpott, 1927a) E
Tingena melanamma (Meyrick, 1905) E
Tingena melinella (Felder & Rogenhofer, 1875) E
Tingena monodonta (Meyrick, 1911b) E
Tingena morosa (Philpott, 1926b) E
Tingena nycteris (Meyrick, 1890) E
Tingena ombrodella (Hudson, 1950) E
Tingena opaca (Philpott, 1926b) E
Tingena ophiodryas (Meyrick, 1936) E
Tingena oporaea (Meyrick, 1883c) E
Tingena oxyina (Meyrick, 1883c) E
Tingena pallidula (Philpott, 1924a) E
Tingena paratrimma (Meyrick, 1910a) E
Tingena paula (Philpott, 1927a) E
Tingena penthalea (Meyrick, 1905) E
Tingena perichlora (Meyrick, 1907c) E
Tingena pharmactis (Meyrick, 1905) E
Tingena phegophylla (Meyrick, 1883c) E
Tingena plagiatella (Walker, 1863c) E
Tingena pronephela (Meyrick, 1907c) E
Tingena robiginosa (Philpott, 1915) E
Tingena seclusa (Philpott, 1921) E
Tingena serena (Philpott, 1926b) E
Tingena siderodeta (Meyrick, 1883c) E
Tingena siderota (Meyrick, 1888e) E
Tingena sinuosa (Philpott, 1928g) E
Tingena tephrophanes (Meyrick, 1929) E
Tingena terrena (Philpott, 1926a) E
Tingena thalerodes (Meyrick, 1916b) E
Tingena vestita (Philpott, 1926a) E
Tingena xanthodesma (Philpott, 1923) E
Tingena xanthomicta (Meyrick, 1916b) E
Trachypepla amphileuca Meyrick, 1914a E
Trachypepla anastrella Meyrick, 1883c E
Trachypepla angularis (Philpott, 1929a) E
Trachypepla aspidephora Meyrick, 1883c E
Trachypepla conspicuella (Walker, 1864a) E
Trachypepla contritella (Walker, 1864a) E
Trachypepla cyphonias Meyrick, 1927b E
Trachypepla euryleucota Meyrick, 1883c E
Trachypepla festiva Philpott, 1930b E
Trachypepla galaxias Meyrick, 1883c E
Trachypepla hieropis Meyrick, 1892 E
Trachypepla importuna Meyrick, 1914a E
Trachypepla ingenua Meyrick, 1911b E
Trachypepla leucoplanetis Meyrick, 1883c E
Trachypepla lichenodes Meyrick, 1883c E
Trachypepla minuta Philpott, 1931 E
Trachypepla nimbosa Philpott, 1930b E
Trachypepla photinella (Meyrick, 1883a) E
Trachypepla protochlora Meyrick, 1883c E
Trachypepla roseata Philpott, 1923 E
Trachypepla semilauta Philpott, 1918 E
Trachypepla spartodeta Meyrick, 1883c E
CHELAZA GROUP
Endrosis sarcitrella (Linnaeus, 1758) A
Hofmannophila pseudospretella (Stainton, 1849) A
Prepalla austrina (Meyrick, 1914) E
HIERODORIS GROUP
Gymnobathra ambigua (Philpott, 1926a) E
Gymnobathra bryaula Meyrick, 1905 E
Gymnobathra caliginosa Philpott, 1927a E
Gymnobathra calliploca Meyrick, 1883c E
Gymnobathra callixyla (Meyrick, 1888e) E
Gymnobathra cenchrias (Meyrick, 1909a) E
Gymnobathra dinocosma (Meyrick, 1883c) E
Gymnobathra flavidella (Walker, 1864a) E
Gymnobathra hamatella (Walker, 1864a) E
Gymnobathra hyetodes Meyrick, 1883c E
Gymnobathra inaequata Philpott, 1928a E
Gymnobathra jubata (Philpott, 1918) E
Gymnobathra levigata Philpott, 1928a E
Gymnobathra omphalota Meyrick, 1888e E
Gymnobathra parca (Butler, 1877) E
Gymnobathra philadelpha Meyrick, 1883c E
Gymnobathra primaria Philpott, 1928a E
Gymnobathra sarcoxantha Meyrick, 1883c E
Gymnobathra tholodella Meyrick, 1883c E
Hierodoris atychioides (Butler, 1877) E
Hierodoris bilineata (Salmon, 1948) E
Hierodoris callispora (Meyrick, 1912d) E
Hierodoris electrica (Meyrick, 1889b) E
Hierodoris eremita Philpott, 1930c E
Hierodoris frigida Philpott, 1923 E
Hierodoris gerontion Hoare, 2005 E
Hierodoris huia Hoare, 2005 E
Hierodoris illita (Felder & Rogenhofer, 1875) E
Hierodoris iophanes Meyrick, 1912d E
Hierodoris pachystegiae Hoare, 2005 E
Hierodoris polita Hoare, 2005 E
Hierodoris s-fractum Hoare, 2005 E
Hierodoris squamea (Philpott, 1915) E
Hierodoris stella (Meyrick, 1914a) E
Hierodoris torrida Hoare, 2005 E
Hierodoris tygris Hoare, 2005 E
Izatha amorbas (Meyrick, 1910a) E
Izatha apodoxa (Meyrick, 1888e) E
Izatha attactella Walker, 1864a E
Izatha austera (Meyrick, 1883c) E
Izatha balanophora (Meyrick, 1897b) E
Izatha caustopa (Meyrick, 1892) E
Izatha churtoni Dugdale, 1988 E
Izatha convulsella (Walker, 1864a) E
Izatha copiosella (Walker, 1864b) E
Izatha epiphanes (Meyrick, 1883c) E
Izatha florida Philpott, 1927d E

Izatha heroica Philpott, 1926a E
Izatha hudsoni Dugdale, 1988 E
Izatha manubriata Meyrick, 1923 E
Izatha mesoschista Meyrick, 1931a E
Izatha metadelta (Meyrick, 1905) E
Izatha mira Philpott, 1913 E
Izatha oleariae Dugdale, 1971b E Sn
Izatha peroneanella (Walker, 1864a) E
Izatha phaeoptila (Meyrick, 1905) E
Izatha picarella (Walker, 1864a) E
Izatha plumbosa Philpott, 1927d E
Izatha prasophyta (Meyrick, 1883c) E
Izatha psychra (Meyrick, 1883c) E
Izatha rigescens Meyrick, 1929 E
Lathicrossa leucocentra Meyrick, 1883c E
Lathicrossa prophetica Meyrick, 1927a E
Phaeosaces apocrypta Meyrick, 1885i E
Phaeosaces coarctatella (Walker, 1864a) E
Phaeosaces compsotypa Meyrick, 1885i E
Phaeosaces lindsayae (Philpott, 1928c) E
Schiffermuelleria (s.l.) *orthophanes* (Meyrick, 1905) E
Scieropepla typhicola Meyrick, 1885i
Thamnosara sublitella (Walker, 1864a) E
Tinearupa sorenseni aucklandica Dugdale, 1971b E Su
Tinearupa s. sorenseni Salmon & Bradley, 1956 E
WINGIA GROUP A
Heteroteucha dichroella (Zeller, 1877) A
Trachypepla (s.l.) *indolescens* Meyrick, 1927 A
PAPILIONIDAE A
Papilio xuthus Linnaeus, 1760 A
PIERIDAE
Catopsilia pomona (Fabricius, 1775) V
Pieris rapae (Linnaeus, 1758) A
PLUTELLIDAE
Charixena iridoxa (Meyrick, 1916b) E
Chrysorthenches argentea Dugdale, 1996 E
Chrysorthenches drosochalca (Meyrick, 1905) E
Chrysorthenches glypharcha (Meyrick, 1919) E
Chrysorthenches halocarpi Dugdale, 1996 E
Chrysorthenches phyllocladi Dugdale, 1996 E
Chrysorthenches polita (Philpott, 1918) E
*Chrysorthenches porphyritis (*Meyrick, 1885i) E
Chrysorthenches virgata (Philpott, 1920) E
Doxophyrtis hydrocosma Meyrick, 1914a E
Hierodoris (s.l.) *stellata* Philpott, 1918 E
Leuroperna sera (Meyrick, 1885i) E
Orthenches chartularia Meyrick, 1924a E
Orthenches chlorocoma Meyrick, 1885i E
Orthenches dictyarcha Meyrick, 1927b E
Orthenches disparilis Philpott, 1931 E
Orthenches homerica (Salmon, 1956) E
Orthenches prasinodes Meyrick, 1885i E
Orthenches saleuta Meyrick, 1913a E
Orthenches semifasciata Philpott, 1915 E
Orthenches septentrionalis Philpott, 1930b E
Orthenches similis Philpott, 1924a E
Orthenches vinitincta Philpott, 1917b E
Phylacodes cauta Meyrick, 1905 E
Plutella antiphona Meyrick, 1901 E
Plutella xylostella (Linnaeus, 1758) A
Plutella(s.l.) *psammochroa* Meyrick, 1885i
Prays nephelomima Meyrick, 1907b A
Prays sp. 1 K
Prays sp. 2 K
Proditrix chionochloae Dugdale, 1987a E
Proditrix gahniae Dugdale, 1987a E
Proditrix megalynta (Meyrick, 1915a) E
Proditrix tetragona (Hudson, 1918) E
Protosynaema eratopis Meyrick, 1885i E
Protosynaema hymenopis Meyrick, 1935 E
Protosynaema matutina Philpott, 1928g E
Protosynaema quaestuosa Meyrick, 1924a E
Protosynaema steropucha Meyrick, 1885i E
PSYCHIDAE
Cebysa leucotelus Walker, 1854 A
Grypotheca horningae Dugdale, 1987b E Sn
Grypotheca pertinax Dugdale, 1987b E
Grypotheca triangularis (Philpott, 1930b) E
Lepidoscia heliochares (Meyrick, 1893) A*
Lepidoscia cf. *lainodes* Meyrick, 1921 A*
Lepidoscia protorna (Meyrick, 1893) A*
Liothula omnivora Fereday, 1878b E
Mallobathra abyssina (Clarke, 1934) E
Mallobathra angusta Philpott, 1928g E
Mallobathra aphrosticha Meyrick, 1912c E
Mallobathra campbellica Dugdale, 1971b E Su
Mallobathra cana Philpott, 1927d E
Mallobathra cataclysma Clarke, 1934 E
Mallobathra crataea Meyrick, 1888e E
Mallobathra fenwicki Philpott, 1924a E
Mallobathra homalopa Meyrick, 1891 E
Mallobathra lapidosa Meyrick, 1914a E
Mallobathra memotuina Clarke, 1934 E
Mallobathra metrosema Meyrick, 1888e E
Mallobathra obscura Philpott, 1928a E
Mallobathra perisseuta Meyrick, 1920a E
Mallobathra petrodoxa (Meyrick, 1923) E
Mallobathra scoriota Meyrick, 1909a E
Mallobathra strigulata Philpott, 1924a E
Mallobathra subalpina Philpott, 1930a E
Mallobathra tonnoiri Philpott, 1927d E
Orophora unicolor (Butler, 1877) E
Reductoderces araneosa (Meyrick, 1914a) E
Reductoderces aucklandica Dugdale, 1971b E Su
Reductoderces cawthronella (Philpott, 1921) E
Reductoderces fuscoflava Salmon & Bradley, 1956 E
Reductoderces illustris (Philpott, 1917b) E
Reductoderces microphanes (Meyrick, 1888e) E
Rhathamictis nocturna (Clarke, 1926) E
Rhathamictis perspersa Meyrick, 1924b E
Scoriodyta conisalia Meyrick, 1888e E
Scoriodyta dugdalei Hättenschwiler, 1989 E
Scoriodyta patricki Hättenschwiler, 1989 E
Scoriodyta rakautarensis Hättenschwiler, 1989 E
Scoriodyta sereinae Hättenschwiler, 1989 E
Scoriodyta suttonensis Hättenschwiler, 1989 E
Scoriodyta virginella Hättenschwiler, 1989 E
PTEROPHORIDAE
Amblyptilia aeolodes (Meyrick, 1902c) E
Amblyptilia deprivatalis (Walker, 1864b) E
Amblyptilia epotis (Meyrick, 1905) E
Amblyptilia falcatalis (Walker, 1864b) E
Amblyptilia heliastis (Meyrick, 1885a) E
Amblyptilia lithoxesta (Meyrick, 1885a) E
Amblyptilia repletalis Walker, 1864b E
Lantanophaga pusillidactyla (Walker, 1864b) A BC
Oxyptilus pilosellae (Zeller, 1852) A BC
Platyptilia campsiptera Meyrick, 1907c E
Platyptilia carduidactyla (Riley, 1869) A
Platyptilia celidota (Meyrick, 1885a) E
Platyptilia charadrias (Meyrick, 1885a) E
Platyptilia hokowhitalis Hudson, 1939 E
Platyptilia isodactyla (Zeller, 1852) A BC
Platyptilia isoterma Meyrick, 1909a E
Platyptilia pulverulenta Philpott, 1923 E
Pterophorus furcatalis (Walker, 1864b) E
Pterophorus innotatalis Walker, 1864b E
Pterophorus monospilalis (Walker, 1864b) E
Sphenarches anisodactylus (Walker, 1864) K
Stenoptilia orites (Meyrick, 1885a) E
Stenoptilia zophodactyla (Duponchel, [1840])
PYRALIDAE
GALLERIINAE A
Achroia grisella (Fabricius, 1794) A
Galleria mellonella (Linnaeus, 1758) A
PHYCITINAE
Arcola malloi (Pastrana, 1961) A BC
Cadra cautella (Walker, 1863b) A
Crocydopora cinigerella (Walker, 1866b)
Cryptoblabes sp. K
Delogenes limodoxa Meyrick, 1918 E
Ephestia elutella (Huebner, 1796) A
Ephestia kuehniella Zeller, 1879 A
Ephestiopsis oenobarella (Meyrick, 1879) * A
Etiella behrii (Zeller, 1848) V
Homoeosoma anaspila Meyrick, 1901 E
Homoeosoma ischnomorpha Meyrick, 1931a E
Morosaphycita oculiferella (Meyrick, 1879b) A
Patagoniodes farinaria (Turner, 1904)
Pempelia genistella (Duponchel, 1836) A BC
Plodia interpunctella (Huebner, [1813]) A
Ptyomaxia trigonogramma (Turner, 1947) *
Sporophyla oenospora (Meyrick, 1897b) E
Vinicia sp. of Horak 1997 * E
PYRALINAE
Aglossa caprealis (Huebner, [1809]) A
Diplopseustis perieresalis (Walker, 1859c)
Endotricha mesenterialis of Meyrick, 1910 K
Endotricha pyrosalis Guenée, 1854 V
Gauna aegusalis (Walker, 1859c) A
Pyralis farinalis (Linnaeus, 1758) A
ROESLERSTAMMIIDAE
Dolichernis chloroleuca Meyrick, 1891 E
ROESLERSTAMMIIDAE s.l.
Vanicela disjunctella Walker, 1864b E
SATURNIIDAE A
Actias selene (Huebner, [1819]) A extinct
Antheraea pernyi (Guerin-Meneville, 1855) A extinct
Caligula simla (Westwood, 1847) A extinct
Hyalophora cecropia (Linnaeus, 1758) A extinct
Opodiphthera eucalypti (Scott, 1864) A
Samia cynthia (Drury, 1773) A extinct
SCYTHRIDIDAE
Scythris epistrota (Meyrick, 1889b) E
Scythris grandipennis (Haworth, 1828) A BC
Scythris lacustris (Philpott, 1930a) E
Scythris nigra Philpott, 1931 E
Scythris niphozela Meyrick, 1931b E
Scythris triatma Meyrick, 1935 E
SESIIDAE A
Synanthedon tipuliformis (Clerck, 1759) A
SPHINGIDAE
Agrius convolvuli (Linnaeus, 1758)
Cizara ardeniae (Lewin, 1805) V
Daphnis placida (Walker, 1856b) V
Hippotion celerio (Linnaeus, 1758) V
STATHMOPODIDAE
Calicotis crucifera Meyrick, 1889b
Pachyrhabda antinoma Meyrick, 1910b KE
Stathmopoda albimaculata Philpott, 1931 E
Stathmopoda aposema Meyrick, 1901 E
Stathmopoda aristodoxa Meyrick, 1926b E
Stathmopoda caminora Meyrick, 1890 E
Stathmopoda campylocha Meyrick, 1889b E
Stathmopoda cephalaea Meyrick, 1897 A
Stathmopoda coracodes Meyrick, 1923 E
Stathmopoda distincta Philpott, 1923 E
Stathmopoda endotherma Meyrick, 1931b E
Stathmopoda holochra Meyrick, 1889b E
Stathmopoda horticola Dugdale, 1988 E
Stathmopoda melanochra Meyrick, 1897a A BC
Stathmopoda mysteriastis Meyrick, 1901 E
Stathmopoda plumbiflua Meyrick, 1911b E
Stathmopoda skelloni (Butler, 1880) E
Stathmopoda trimolybdias Meyrick, 1926b E
Thylacosceles acridomima Meyrick, 1889b E
Thylacosceles radians Philpott, 1918 E
THYRIDIDAE
Morova subfasciata Walker, 1865a E
THYATIRIDAE A
Thyatira batis Linnaeus, 1758 A BC extinct
TINEIDAE
Amphixystis hapsimacha Meyrick, 1901 E
Archyala culta Philpott, 1931 E
Archyala lindsayi (Philpott, 1927a) E
Archyala opulenta Philpott, 1926a E
Archyala paraglypta Meyrick, 1889b E

Archyala pentazyga Meyrick, 1915a E
Archyala terranea (Butler, 1879a) E
Astrogenes chrysograpta Meyrick, 1921 E
Astrogenes insignita Philpott, 1930b E
Bascantis sirenica Meyrick, 1914a E
Crypsitricha agriopa (Meyrick, 1888e) E
Crypsitricha generosa Philpott, 1926a E
Crypsitricha mesotypa (Meyrick, 1888e) E
Crypsitricha pharotoma (Meyrick, 1888e) E
Crypsitricha roseata (Meyrick, 1913a) E
Crypsitricha stereota (Meyrick, 1914a) E
Dryadaula castanea Philpott, 1915 E
Dryadaula myrrhina Meyrick, 1905 E
Dryadaula pactolia Meyrick, 1901 E
Dryadaula terpsichorella (Busck, 1910) K
Endophthora omogramma Meyrick, 1888e E
Endophthora pallacopis Meyrick, 1918 E
Endophthora rubiginella Hudson, 1939 E
Endophthora tylogramma Meyrick, 1924a E
Erechthias acrodina (Meyrick, 1912c) E
Erechthias charadrota Meyrick, 1880b E
Erechthias chasmatias Meyrick, 1880b E
Erechthias chionodira Meyrick, 1880b E
Erechthias crypsimima (Meyrick, 1920a) E
Erechthias decoranda (Meyrick, 1925a) E
Erechthias exospila (Meyrick, 1901) E
Erechthias externella (Walker, 1864b) E
Erechthias flavistriata (Walsingham, 1907) K
Erechthias fulguritella (Walker, 1863c) E
Erechthias hemiclistra (Meyrick, 1911b) E
Erechthias indicans Meyrick, 1923 E
Erechthias lychnopa Meyrick, 1927a E
Erechthias macrozyga Meyrick, 1916b E
Erechthias stilbella (Doubleday *in* White & Doubleday, 1843) E
Erechthias terminella (Walker, 1863c) E
Eschatotypa derogatella (Walker, 1863c) E
Eschatotypa halosparta (Meyrick, 1919) E
Eschatotypa melichrysa Meyrick, 1880b E
Eugennaea laquearia (Meyrick, 1914a) E
Habrophila compseuta Meyrick, 1889b E
Lindera tessellatella Blanchard, 1852 A
Lysiphragma epixyla Meyrick, 1888e E
Lysiphragma howesii Quail, 1901 E
Lysiphragma mixochlora Meyrick, 1888e E
Monopis argillacea (Meyrick, 1893) A
Monopis crocicapitella (Clemens, 1859) A
Monopis dimorphella Dugdale, 1971b E
Monopis ethelella (Newman, 1856) A
Monopis ornithias (Meyrick, 1888e) E
Monopis typhlopa Meyrick, 1925a E
Nemapogon granella (Linnaeus, 1758) A
Niditinea fuscella (Linnaeus, 1758) A
Oinophila v-flava (Haworth, 1828) * A
Opogona aurisquamosa (Butler, 1881) K
Opogona comptella (Walker, 1864b) A
Opogona omoscopa (Meyrick, 1893) A
Petasactis technica (Meyrick, 1888e) E
Proterodesma byrsopola Meyrick, 1909b E
Proterodesma chathamica Dugdale, 1971a E Ch
Proterodesma turbotti (Salmon & Bradley, 1956) E Su
Prothinodes grammocosma (Meyrick, 1888e) E
Prothinodes lutata Meyrick, 1914a E
Sagephora exsanguis Philpott, 1918 E
Sagephora felix Meyrick, 1914a E
Sagephora jocularis Philpott, 1926a E
Sagephora phortegella Meyrick, 1888e E
Sagephora steropastis Meyrick, 1891 E
Sagephora subcarinata Meyrick, 1931a E
Tephrosara cimmeria (Meyrick, 1914a) E
Thallostoma eurygrapha Meyrick, 1913a E
Tinea dubiella Stainton, 1859 A
Tinea pallescentella Stainton, 1851 A
Tinea pellionella (Linnaeus, 1758) A
Tinea (s.l.) *accusatrix* Meyrick, 1916b E
Tinea (s.l.) *aetherea* Clarke, 1926 E
Tinea (s.l.) *argodelta* Meyrick, 1915a E
Tinea (s.l.) *astraea* Meyrick, 1911b E
Tinea (s.l.) *atmogramma* Meyrick, 1927b E
Tinea (s.l.) *belonota* Meyrick, 1888e E
Tinea (s.l.) *conferta* Meyrick, 1914a E
Tinea (s.l.) *conspecta* Philpott, 1931 E
Tinea (s.l.) *dicharacta* sensu Meyrick, 1911b nec Meyrick, 1893 E
Tinea (s.l.) *dividua* Philpott, 1928a E
Tinea (s.l.) *fagicola* Meyrick, 1921 E
Tinea (s.l.) *furcillata* Philpott, 1930b E
Tinea (s.l.) *margaritis* Meyrick, 1914a E
Tinea (s.l.) *mochlota* Meyrick, 1888e E
Tinea (s.l.) *munita* Meyrick, 1932 E
Tinea (s.l.) *sphenocosma* Meyrick, 1919 E
Tinea (s.l.) *texta* Meyrick, 1931a E
Tineola bisselliella (Hummel, 1823) A
Trichophaga tapetzella (Linnaeus, 1758) A
Trithamnora certella (Walker, 1863c) E

TORTRICIDAE

CHLIDANOTINAE

Lopharcha insolita (Dugdale, 1966b) E

OLETHREUTINAE

Acroclita discariana Philpott, 1930a E
Argyroploce (s.l.) *chlorosaris* Meyrick, 1914a E
Bactra noteraula Walsingham, 1907 E
Bactra optanias Meyrick, 1911c E
Crocidosema plebejana Zeller, 1847
Cryptaspasma querula (Meyrick, 1912c) E
Cydia pomonella (Linnaeus, 1758) A
Cydia succedana (Denis & Schiffermueller, 1776) A BC
Grapholita molesta (Busck *in* Quaintance & Wood, 1916) A
Hendecasticha aethaliana Meyrick, 1881b E
Holocola charopa Meyrick, 1888d E
Holocola dolopaea Meyrick, 1905 E
Holocola emplasta Meyrick, 1901 E
Holocola parthenia Meyrick, 1888d E
Holocola n. sp. Hoare 2001 A
Holocola zopherana Meyrick, 1881b
Parienia mochlophorana (Meyrick, 1882c) E
Polychrosis meliscia Meyrick, 1910b K
Protithona fugitivana Meyrick, 1882c E
Protithona potamias (Meyrick, 1909a) E
Strepsicrates ejectana (Walker, 1863c)
Strepsicrates infensa (Meyrick, 1911d) A
Strepsicrates macropetana (Meyrick, 1881b) A
Strepsicrates melanotreta (Meyrick, 1910b) K
Strepsicrates (s.l.) *sideritis* (Meyrick, 1905) E
Zomariana doxasticana (Meyrick, 1881) A

TORTRICINAE

Acleris comariana Lienig &d Zeller, 1846 A
Apoctena clarkei (Philpott, 1930b) E
Apoctena conditana (Walker, 1863c) E
Apoctena laquaeorum Dugdale, 1971b E Sn
Apoctena orthocopa (Meyrick, 1924b) E
Apoctena persecta (Meyrick, 1914a) E
Apoctena spatiosa (Philpott, 1923) E
Apoctena syntona (Meyrick, 1909b) E
Apoctena taipana (Felder & Rogenhofer, 1875) E
Apoctena tigris (Philpott, 1914) E
Apoctena (s.l.) *fastigata* (Philpott, 1916) E
Apoctena (s.l.) *flavescens* (Butler, 1877) E
Apoctena (s.l.) *orthropis* (Meyrick, 1901) E
Apoctena (s.l.) *pictoriana* (Felder & Rogenhofer, 1875) E
Ascerodes prochlora Meyrick, 1905 E
Capua intractana (Walker, 1869) A
Capua (s.l.) *semiferana* (Walker, 1863c) E
Catamacta alopecana (Meyrick, 1885g) E
Catamacta gavisana (Walker, 1863c) E
Catamacta lotinana (Meyrick, 1882c) E
Catamacta rureana (Felder & Rogenhofer, 1875) E
Cnephasia (s.l.) *holorphna* Meyrick, 1911b E
Cnephasia (s.l.) *incessana* (Walker, 1863c) E
Cnephasia (s.l.) *jactatana* (Walker, 1863c) E
Cnephasia (s.l.) *latomana* (Meyrick, 1885b) E
Cnephasia (s.l.) *melanophaea* Meyrick, 1927a E
Cnephasia (s.l.) *microbathra* Meyrick, 1911b E
Cnephasia (s.l.) *ochnosema* Meyrick, 1936 E
Cnephasia (s.l.) *paterna* Philpott, 1926a E
Cochylis atricapitata (Stephens, 1852) A BC
Ctenopseustis filicis Dugdale, 1990 E
Ctenopseustis fraterna Philpott, 1930b E
Ctenopseustis herana (Felder & Rogenhofer, 1875) E
Ctenopseustis obliquana (Walker, 1863c) E
Ctenopseustis servana (Walker, 1863c) E
Dipterina imbriferana Meyrick, 1881a E
Ecclitica hemiclista (Meyrick, 1905) E
Ecclitica philpotti Dugdale, 1978 E
Ecclitica torogramma (Meyrick, 1897b) E
Ecclitica triorthota (Meyrick, 1927a) E
Epalxiphora axenana Meyrick, 1881b E
Epichorista aspistana (Meyrick, 1882c) E
Epichorista hemionana (Meyrick, 1882c) E
Epichorista (s.l.) *abdita* Philpott, 1924c E
Epichorista (s.l.) *allogama* (Meyrick, 1914a) E
Epichorista (s.l.) *crypsidora* (Meyrick, 1909a) E
Epichorista (s.l.) *elephantina* (Meyrick, 1885b) E
Epichorista (s.l.) *emphanes* (Meyrick, 1901) E
Epichorista (s.l.) *eribola* (Meyrick, 1889b) E
Epichorista (s.l.) *fraudulenta* (Philpott, 1928a) E
Epichorista (s.l.) *lindsayi* Philpott, 1928c E
Epichorista (s.l.) *mimica* Philpott, 1930b E
Epichorista (s.l.) *siriana* (Meyrick, 1881a) E
Epichorista (s.l.) *tenebrosa* Philpott, 1917b E
Epichorista (s.l.) *zatrophana* (Meyrick, 1882c) E
Epiphyas postvittana (Walker, 1863c) A
Ericodesma aerodana (Meyrick, 1881a) E
Ericodesma argentosa (Philpott, 1924a) E
Ericodesma cuneata (Clarke, 1926) E
Ericodesma melanosperma (Meyrick, 1916b) E
Ericodesma scruposa (Philpott, 1924a) E
Eurythecta robusta (Butler, 1877) E
Eurythecta zelaea Meyrick, 1905 E
Eurythecta (s.l.) *curva* Philpott, 1918 E
Eurythecta (s.l.) *eremana* (Meyrick, 1885b) E
Eurythecta (s.l.) *leucothrinca* (Meyrick, 1931b) E
Eurythecta (s.l.) *loxias* (Meyrick, 1888d) E
Eurythecta (s.l.) *phaeoxyla* Meyrick, 1938 E
Gelophaula aenea (Butler, 1877) E
Gelophaula aridella Clarke, 1934 E
Gelophaula lychnophanes (Meyrick, 1916b) E
Gelophaula palliata (Philpott, 1914) E
Gelophaula praecipitalis Meyrick, 1934 E
Gelophaula siraea (Meyrick, 1885b) E
Gelophaula tributaria (Philpott, 1913) E
Gelophaula trisulca (Meyrick, 1916b) E
Gelophaula vana Philpott, 1928g E
Harmologa amplexana (Zeller, 1875) E
Harmologa columella Meyrick, 1927a E
Harmologa festiva Philpott, 1915 E
Harmologa oblongana (Walker, 1863c) E
Harmologa petrias Meyrick, 1901 E
Harmologa pontifica Meyrick, 1911b E
Harmologa reticularis Philpott, 1915 E
Harmologa sanguinea Philpott, 1915 E
Harmologa scoliastis (Meyrick, 1907c) E
Harmologa sisyrana Meyrick, 1882c E
Harmologa speciosa (Philpott, 1927d) E
Harmologa (s.l.) *toroterma* Hudson, 1925 E
Isotenes miserana (Walker, 1863) A*
Leucotenes coprosmae (Dugdale, 1988) E
Maoritenes cyclobathra (Meyrick, 1907c) E
Maoritenes modesta (Philpott, 1930b) E
Merophyas divulsana (Walker, 1863c) A
Merophyas leucaniana (Walker, 1863c) E
Merophyas paraloxa (Meyrick, 1907c) E
Ochetarcha miraculosa (Meyrick, 1917a) E
Philocryptica polypodii (Watt, 1921b) E
Planotortrix avicenniae Dugdale, 1990 E

Planotortrix excessana (Walker, 1863c) E
Planotortrix flammea (Salmon, 1956) E
Planotortrix notophaea (Turner, 1926) E
Planotortrix octo Dugdale, 1990 E
Planotortrix octoides Dugdale, 1990 E
Planotortrix puffini Dugdale, 1990 E
Prothelymna antiquana (Walker, 1863c) E
Prothelymna niphostrota (Meyrick, 1907c) E
Pyrgotis arcuata (Philpott, 1915) E
Pyrgotis calligypsa (Meyrick, 1926b) E
Pyrgotis chrysomela (Meyrick, 1914a) E
Pyrgotis consentiens Philpott, 1916 E
Pyrgotis eudorana Meyrick, 1885b E
Pyrgotis humilis Philpott, 1930b E
Pyrgotis plagiatana (Walker, 1863c) E
Pyrgotis plinthoglypta Meyrick, 1892 E
Pyrgotis pyramidias Meyrick, 1901 E
Pyrgotis transfixa (Meyrick, 1924a) E
Pyrgotis zygiana Meyrick, 1882c E
Sorensenata agilitata Salmon & Bradley, 1956 E Su
Tortrix (s.l.) *antichroa* Meyrick, 1919 E
Tortrix (s.l.) *demiana* Meyrick, 1882c E
Tortrix (s.l.) *fervida* (Meyrick, 1901) E
Tortrix (s.l.) *incendiaria* (Meyrick, 1923) E
Tortrix (s.l.) *molybditis* Meyrick, 1907c E
Tortrix (s.l.) *sphenias* (Meyrick, 1909a) E
Tortrix (s.l.) *zestodes* Meyrick, 1924a E
Tortrix (s.l.) sp. Boneseed leafroller A BC
YPONOMEUTIDAE
Kessleria copidota (Meyrick, 1889b) E
Zelleria (s.l.) *maculata* Philpott, 1930b E
Zelleria (s.l.) *porphyraula* Meyrick, 1927b E
Zelleria (s.l.) *rorida* Philpott, 1918 E
Zelleria (s.l.) *sphenota* (Meyrick, 1889b) E
ZYGAENIDAE A
Artona martini Efetov, 1997 A
INCERTAE SEDIS
Cadmogenes literata Meyrick, 1923 E
Gymnobathra (s.l.) *origenes* Meyrick, 1936 E
Lysiphragma (s.l.) *argentaria* Salmon, 1948 E
Tanaoctena dubia Philpott, 1931 E
Thectophila acmotypa Meyrick, 1927a E
Titanomis sisyrota Meyrick, 1888 E

Checklist of New Zealand fossil and subfossil Hexapoda

All species listed are taken to be endemic. Stratigraphic occurrence: Tri, Triassic; LJur, Late Jurassic; LCre, Late Cretaceous; Eoc, Eocene; Ple, Pleistocene; Hol, Holocene (last 10,000 years or so). Quaternary records compiled from Kuschel & Worthy (1996), Leschen & Rhode (2002), Marra (2003), Marra & Leschen (2004), and Marra et al. (2006).

PHYLUM ARTHROPODA
SUBPHYLUM HEXAPODA
Class INSECTA
Subclass DICONDYLIA
Superorder NEOPTERA
Order ORTHOPTERA
Suborder ENSIFERA
PROPHALANGOPSIDAE
Notohagla mauii Johns *in* Grant-Mackie et al., 1996 LJur

Order HEMIPTERA
Suborder HETEROPTERA
Infraorder LEPTOPODOMORPHA
SALDIDAE
Saldula sp. Marra et al. 2006 Ple

Infraorder PENTATOMOMORPHA
LYGAEIDAE
Nysius huttoni White, 1878 Ple

Order COLEOPTERA
Suborder ADEPHAGA
CARABIDAE
Actenonyx bemibidioides White, 1846 Ple
Bembidion hokitikense Bates, 1878 Ple
Bembidion rotundicolle Bates, 1874 Hol
Bembidion sp. 1 Marra & Leschen 2004 Ple
Bembidion sp. 2 Marra & Leschen 2004 Hol
Bembidion sp. 3 Marra & Leschen 2004 Hol
Cicindela feredayi Bates, 1867 Ple
Euthenaris sp. 1 Marra & Leschen 2004 Hol
Haplanister crypticus Moore, 1996 Hol
Megadromus sp. 1 Marra & Leschen 2004 Hol
Notagonum feredayi (Bates, 1874) Ple
Notagonum lawsoni (Bates, 1874) Hol
Pelodiaetodes prominens Moore, 1980 Hol
Carabidae sp. 1 Marra 2003 Ple
Pterostichini sp. 1 Marra & Leschen 2004 Hol
DYTISCIDAE
Antiporus strigulosus Broun, 1880 Ple
Huxelhydrus syntheticus Sharp, 1882 Hol
Lancetes lanceolatus (Clark, 1863) Hol
Liodessus deflectus Ordish, 1966 Ple-Hol
Liodessus plicatus (Sharp, 1882) Ple
Liodessus sp. 2 Marra et al. 2006 Ple
Rhantus pulverosus (Stephens, 1828) Hol
Gen. et sp. indet. 1 Marra & Leschen 2004 Hol

Suborder POLYPHAGA
ANOBIIDAE
Hadrobregmus crowsoni (Español, 1976) Hol
Leanobium flavomaculatum Español, 1979 Ple
Ptinus littoralis Broun, 1893 Hol
Ptinus maorianus Brookes, 1926 Hol
Sphinditeles sp. indet. Marra 2003 Ple
Xenogonus sp. 1 Marra & Leschen 2004 Hol
Zenocera sp. 1 Marra 2003 Ple
ANTHICIDAE
Anthicus minor Broun, 1886 Ple
Anthicus sp. 1 Marra & Leschen 2004 Hol
Sapintus obscuricornis (Broun, 1880) Ple
ANTHRIBIDAE
Etnalis spinicollis Sharp, 1873 Ple
Isanthribis phormii Holloway, 1982 Hol
BELIDAE
Rhicnobelus metallicus (Pascoe, 1877) Ple
BYRRHIDAE
Curimus sp. Marra et al. 2006 Ple
Epichorius sp. indet. Marra 2003 Ple
CANTHARIDAE
Gen. et sp. indet. 1 Marra & Leschen 2004 Hol
CERAMBYCIDAE
Eburida quadriguttata (Broun, 1893) Hol
Hybolasius cristatellus Bates, 1876 Hol
Hybolasius lanipes Sharp, 1877 Hol
Psilocnaeia nana (Bates, 1874) Ple
Ptinosoma sp. 1 Marra & Leschen 2004 Hol
Somatidia antarctica (White, 1846) Ple
Lamiinae sp. Marra et al. 2006 Ple
CHAETOSOMATIDAE
Chaetosomodes halli Broun, 1921 Hol
CHRYSOMELIDAE
Adoxia dilutipes Broun, 1915 Ple
Eucolaspis hudsoni Shaw, 1957 Hol
Eucolaspis pallidipennis (White, 1846) Hol
Trachytetra rugulosa (Broun, 1880) Hol
Chrysomelidae sp. 1 Marra & Leschen 2004 Hol
Chrysomelidae sp. 2 Marra & Leschen 2004 Hol
Phyllocharitini n. gen. et sp. Marra et al. 2006 Ple
CHRYSOMELIDAE?
Gen. et sp. indet. (elytron) Craw & Watt 1987 LCre
CURCULIONIDAE
Anagotus rugosus (Broun, 1883) Hol
Anagotus stephenensis Kuschel, 1982 Hol
Baeosomus sp. 1 Marra 2003, Marra & Leschen 2004, Marra et al. 2006 Ple
Baeosomus sp. 2 Marra & Leschen 2004 Hol
Catoptes sp. 1 Marra Ple
Cecyropa modesta (Fabricius, 1781) Ple
Chaetoptelius mundulus Wood & Bright, 1992 Hol
Crisius sp. 1 Marra 2003, Marra & Leschen 2004 Ple-Hol
Ectopsis ferrugalis Broun, 1881 Hol
Erymneus probus Broun, 1893 Hol
Eucossonus setiger (Broun, 1909) Ple
Euophryum ?*rufum* Broun, 1880 Ple-Hol
Euthyrhinus squamiger White, 1846 Ple
Hadramphus tuberculatus (Pascoe, 1877) Hol
Hypotagea lewisi Broun, 1913 Ple
Irenimus compressus (Broun, 1880) Ple
Irenimus sp. 1 Marra & Leschen 2004 Ple
Irenimus sp. 2 Marra et al. 2006 Ple
Lyperopais sp. 1 Marra & Leschen 2004 Ple
Macroscytalus parvicornis (Sharp, 1878) Ple
Mandalotus ?*irritus* (Pascoe, 1877) Ple
Mandalotus sp. 1 Marra & Leschen 2004 Hol
Mandalotus sp. Marra et al. 2006 Ple
Mesoreda orthorhina Houstache, 1936 Hol
Microcryptorhynchus perpusillus (Pascoe, 1877) Ple
Nestrius sp. Marra 2003 Ple
Nicaeana cinerea Broun, 1885 Ple
Nicaeana sp. 1 Marra & Leschen 2004 Ple
Nicaeana sp. 2 Marra & Leschen 2004 Hol
Novitas nigrans Broun, 1880 Ple
Pentarthrum reductum Broun, 1881 Hol
Pentarthrum zealandicum (Wollaston, 1873) Ple
Peristoreus fusconotatus (Broun, 1880) Ple
Phloephagosoma pedatum Wollaston, 1874 Ple-Hol
Phrynixus terreus Pascoe, 1875 Hol
Platypus apicalis White, 1846 Hol
Psepholax coronatus White, 1846 Hol
Psepholax crassicornis Broun, 1910 Hol
Rhopalomerus tenuirostris Blanchard, 1851 Ple
Scelodolichus sp. indet. Marra 2003 Ple
Scolopterus penicillatus White, 1846 Hol
Steriphus ascitus (Pascoe, 1876) Hol
Tymbopiptus valeas Kuschel, 1987 E Hol
Toura longirostris (Wollaston, 1873) Hol
Zeacalles binodosus Broun, 1910 Hol
Zeacalles sp. Marra & Leschen 2004 Hol
Cryptorhynchini sp. 1 Marra & Leschen 2004 Hol
Cryptorhynchini sp. 2 Marra & Leschen 2004 Hol
Cryptorhynchini sp. 3 Marra & Leschen 2004 Hol

Cryptorhynchini sp. 4 Marra & Leschen 2004 Hol
Cryptorhynchini sp. 5 Marra & Leschen 2004 Hol
Gen. et sp. indet. 1 Marra 2003 Ple
Gen. et sp. indet. 2 Marra 2003 Ple
Gen. et sp. indet. 3 Marra 2003 Ple
Gen. et sp. indet. 4 Marra 2003 Ple
CYCLAXYRIDAE
Cyclaxyra politula (Broun, 1881) Hol
CYRTOPHAGIDAE
Paratomaria crowsoni Leschen, 1996 Hol
DERMESTIDAE
Trogoderma serrigerum Sharp, 1877 Hol
Trogoderma sp. 1 Marra & Leschen 2004 Hol
ELATERIDAE
Acritelater reversus (Sharp, 1877) Ple
ELMIDAE
Hydora sp. Marra et al. 2006 Ple
EROTYLIDAE
Loberus depressus (Sharp, 1876) Hol
EUCINETIDAE
Eucinetus stewarti (Broun, 1881) Hol
HISTERIDAE
Parepierus purus (Broun, 1880) Hol
HYDROPHILIDAE
Adolopus helmsi Sharp, 1884 Ple
Adolopus sp. 1 Marra & Leschen 2004 Hol
Limnoxenus zealandicus (Broun, 1880) Hol
Paracymus pygmaeus (Macleay, 1871) Ple-Hol
Rygmodus sp. 1 Marra & Leschen 2004 Hol
Gen. et sp. indet. 1 Marra & Leschen 2004 Hol
LAEMOPHLOEIDAE
Microbrontes lineatus (Broun, 1893) Ple
LATRIDIIDAE
Bicava sp. 1 Marra 2003 Ple
cf. *Enicmus foveatus* Belon, 1884 Ple
Melanophthalma sp. 1 Marra 2003 Ple
Melanophthalma sp. 2 Marra 2003 Ple
Melanophthalma sp. 3 Marra 2003 Ple
Rethusus pustulosus (Belon, 1884) Ple
LEIODIDAE
Inocatops sp. 1 Marra & Leschen 2004 Hol
Mesocolon sp. 1 Mara & Leschen 2004 Hol
LIMNICHIDAE
Limnichus decorus Broun, 1880 Ple
Limnichus simplex Broun, 1910 Ple
Gen. et sp. 1 Marra 2003, Mara & Leschen 2004 Ple-Hol
Gen. et sp. 2 Marra 2003 Ple
LUCANIDAE
Mitophyllus parrianus Westwood, 1863 Hol
MELYRIDAE
'*Dasytes*' *laticeps* Broun, 1880 Ple
MORDELLIDAE
cf. *Stenomordellaria neglecta* (Broun, 1880) Hol
NITIDULIDAE
Hisparonia hystrix (Sharp, 1876) Hol
Soronia sp. 1 Marra & Leschen 2004 Hol
PTILIIDAE
Notoptenidium sp. 1 Marra & Leschen 2004 Ple
SALPINGIDAE
Gen. et sp. indet. 1 Marra & Leschen 2004 Ple
SCARABIDAE
Saprosites communis Broun, 1880 Hol
Saprosites sp. 1 Marra & Leschen 2004 Hol
SCIRTIDAE
Cyphon sp. 1 Marra 2003 Ple
Cyphon sp. 2 Marra 2003 Ple
Cyphon sp. 3 Marra 2003 Ple
Cyphon sp. 4 Marra 2003 Ple
Scirtidae sp. 1 Marra & Leschen 2004 Hol
Scirtidae sp. 2 Marra & Leschen 2004 Hol
Scirtidae sp. 3 Marra & Leschen 2004 Hol
Scirtidae sp. 4 Marra & Leschen 2004 Hol
Scirtidae sp. 5 Marra & Leschen 2004 Hol
Scirtidae sp. 6 Marra & Leschen 2004 Hol
Scirtidae sp. 7 Marra & Leschen 2004 Ple
Scirtidae sp. 8 Marra & Leschen 2004 Ple
Cyprobius nitidius Sharp, 1878 Ple
SCYDMAENIDAE
Scydmaenidae sp. 1 Marra 2003 Ple
Scydmaenidae sp. 2 Marra 2003 Ple
STAPHYLINIDAE
Aleochara hammondi Klimszewski *in* Klimaszewski & Crosby, 1997 Ple
Bledius sp. 1 Marra 2003, Marra & Leschen 2004 Ple
Bledius sp. 2 Marra 2003, Marra & Leschen 2004 Ple-Hol
Bledius sp. 3 Marra 2003 Ple
Carpelimus zealandicus (Sharp, 1900) Ple-Hol
Carpelimus sp. 1 Marra & Leschen 2004 Ple
Carpelimus sp. 2 Marra & Leschen 2004 Ple
Carpelimus sp. 3 Marra & Leschen 2004 Hol
Carpelimus sp. 4 Marra & Leschen 2004 Hol
Eupines sp. Marra 2003 Ple
Euplectus sp. Marra 2003 Ple
cf. *Digrammus miracollis* Fauvel, 1900 Ple
Ischnoderus curtpennis Broun, 1915 Ple
Ischnoderus tectus (Broun, 1880) Ple
Ischnoderus sp. 1 Marra & Leschen 2004 Hol
Ischnoderus sp. 2 Marra & Leschen 2004 Hol
Metacorneolabium n. sp. Marra & Leschen 2004 Ple
Microsilpha sp. 1 Marra & Leschen 2004 Hol
Philonthus sp. Marra 2003 Ple
Pselaphus sp. Marra 2003 Ple
Oxytelus sp. 1 Marra & Leschen 2004 Ple
Quedius sp. 1 Marra & Leschen 2004 Hol
Quedius sp. 2 Marra & Leschen 2004 Hol
Sagola sp. Marra 2003 Ple
Stenomalium antipodum (Broun, 1893) Ple
Stenomalium planimarginatum (Broun, 1909) Ple
'*Stenomalium*' *sulcithorax* (Broun, 1880) Ple
Stenosagola sp. Marra 2003 Ple
Zelandius sp. 1 Marra 2003 Ple
Zelandius sp. 2 Marra 2003 Ple
Aleocharinae sp. 1 Marra 2003, Marra & Leschen 2004 Ple
Aleocharinae sp. 2 Marra 2003, Marra & Leschen 2004 Ple-Hol
Aleocharinae sp. 3 Marra 2003, Marra & Leschen 2004 Ple
Pselaphinae sp. 1 Marra & Leschen 2004 Ple
Pselaphinae sp. 2 Marra & Leschen 2004 Ple
Pselaphinae sp. 3 Marra & Leschen 2004 Ple
Pselaphinae sp. 4 Marra & Leschen 2004 Hol
Pselaphinae sp. 5 Marra & Leschen 2004 Hol
Pselaphinae sp. 6 Marra & Leschen 2004 Hol
Pselaphinae sp. 7 Marra & Leschen 2004 Hol
Pselaphinae sp. 8 Marra & Leschen 2004 Hol
Gen. et sp. indet. 1 Marra & Leschen 2004 Ple
TENEBRIONIDAE
Artystona rugiceps Bates, 1874 Hol
Lorelus crassicornis Broun, 1880 Ple
Mimopeus sp. 1 Marra & Leschen 2004 Hol
Zolodinus zelandicus Blanchard, 1853 Hol
Tenebrionidae sp. 1 Marra & Leschen 2004 Hol
TROGOSSITIDAE
Grynoma sp. 1 Marra & Leschen 2004 Hol
Lepidopteryx wakefieldi (Sharp, 1877) Hol
Promanus depressus Sharp, 1877 Hol
ULODIDAE
Waitomophylax worthyi (Leschen & Rhode, 2002) Hol
ZOPHERIDAE
Notocoxelus helmsi (Reitter, 1880) Hol
Notocoxelus similis (Sharp, 1876) Hol
Pycnomerus sp. 1 Marra & Leschen 2004 Hol
Pycnomerus sp. 2 Marra & Leschen 2004 Hol
Tarphiomimus wollastoni Sharp, 1882 Hol
INCERTAE SEDIS
Gen. et sp. indet. (?beetle elytron) Grant-Mackie 1958 Tri

Order DIPTERA
Suborder NEMATOCERA
BIBIONIDAE
Dilophus campbelli Harris, 1983 Eoc
CHIRONOMIDAE
Chironomus zealandicus Hudson, 1892 Ple

Order TRICHOPTERA
Suborder SPICIPALPIA
HYDROBIOSIDAE
Hydrobiosidae sp. Marra et al. 2006 Ple

Order LEPIDOPTERA
GEOMETRIDAE?
Helastia? sp. Harris & Raine 2002 LCre
HEPIALIDAE?
Gen. et sp. indet. (wing scale) Evans 1931 LEoc

Taxonomic and establishment status of selected species of Diptera (uncertain status or validity)

1. *Ctenosciara hyalipennis* Meigen, 1804 (Sciaridae) was recorded from New Zealand by Evenhuis (1989) as a senior synonym of *Sciara annulata* sensu Tonnoir & Edwards, 1927, but the latter is a species of *Bradysia*, probably *B. brunnipes* (Mohrig & Jaschof, 1999).
2. *Hemipyrellia ligurriens* Wiedemann, 1830 (Calliphoridae) may be intercepted occasionally in New Zealand, but there is no certain record of its establishment (Dear 1985).
3. *Macrorchis meditata* Rondani, 1877 (Muscidae) was mentioned in Smith (1989) as occurring in New Zealand, but has not been listed in the catalogues of New Zealand species (Miller 1950; Evenhuis 1989).
4. *Fannia scalaris* Fabricius, 1794 (Fanniidae) reportedly present in New Zealand (Miller 1984), but on limited New Zealand material from a minor collection Pont (1977) stated it was absent.
5. *Pollenia cuprea* Malloch, 1930 and *P. atrifemur* Malloch, 1930 (Calliphoridae) have types that are badly damaged and only the latter species has been tentatively retained as valid (Dear 1985).
6. *Pseudoleucopis benefica* Malloch, 1930 (Chamaemyiidae) establishment is doubtful (Cameron et al. (1989).
7. *Senostoma rubricarinatum* Malloch, 1930 (Tachinidae) is a parasite of earwigs. With no identified specimens from the field, it is assumed that no establishment has been achieved. However, insufficient investigations have been made to be sure.

Taxonomic notes (synonyms, nomia dubia, new combinations, misidentifications)

1. *Atrichopogon 'vestitipennis'* Kieffer, 1917 (Ceratopogonidae) is a probable misidentification. Macfie (1932) described New Zealand material as this species, but it probably requires a new name. This name is preoccupied by a species from Papua New Guinea (Evenhuis 1989).
2. '*Cecidomyia*' (Cecidomyiidae) – Marshall (1896) described nine species, but their generic affinity within Cecidomyiinae cannot be determined from his descriptions and the types have been lost (Miller 1950). Many of these species are probably among the undescribed species known from galls of certain plants in Canterbury (Lintott 1974; Johns 1977; Hunt 1992; Cone 1995) and considerably more from a wide range of plants (Martin unpubl.). These descriptions are *nomia dubia* especially because they can not be linked to hosts. These names might still be used when future revisionary studies designate appropriate types.
3. '*Ceonosia*'/*Paralimnophora* (Muscidae) – all the described species from New Zealand except for *C. algivora* and *C. rubriceps* Hutton were investigated by R. A. Harrison (now deceased) in a partly completed review of New Zealand Muscidae, so these species names could displace current names in these genera. Three '*Ceonosia*' species have been reassigned to *Paralimnophora* and so are new combinations. *Paralimnophora antipoda* Harrison, 1955 and *Paralimnophora indistincta* Lamb, 1909 are new synonyms for *P. depressa* Lamb, 1909.
4. *Clunio* (Chironomidae) is a probable misidentification. The genus is reputed to exist at seashores in New Zealand (Tortell 1981), but may be just a misidentified *Telmatogeton*.
5. ?*Dasineura alopecuri* (Reuter, 1895) (Cecidomyiidae) – identification doubtful (see note on *Stenodiplosis geniculati*).
6. '*Dipsomyia*' (Empididae) – an undescribed endemic genus as noted by Sinclair (1995).
7. *Drosophila* n. spp. (Drosophilidae). Hodge and MAF staff have noted an undescribed species, but it is uncertain whether one or two species are involved.
8. *Exechia* '*thomasi*' Miller, 1918, from Mt Taranaki – according to Tonnoir and Edwards (1927) it could not be distinguished from *Exechia hiemalis* on the basis of the incomplete type specimen. Eventually, an appropriate revisionary study may apply a new adequate type.
9. *Hilarempis subdita* Collin, 1928 (Empididae) appears to be a possible synonym of *Hilarempis huttoni* Bezzi, 1904.
10. *Ischiodon scutellaris* (Fabricius, 1805) was collected from Hamilton, New Zealand, in 1890 (Thompson pers. comm.), but we are unaware of any more recent specimens or its presence here, so establishment seems doubtful.
11. '*Limnia*' *transmarina* Schiner, 1868 (Sciomyzidae) – both Miller (1950) and Harrison (1959) overlooked this species and some of Schiner's types were lost in the Second World War.
12. *Lycoriella ingenua* (Dufour, 1839) is the probable correct name for the species previously known as *Sciara agraria* Felt, 1898 (Mohrig & Jaschhof 1999).
13. ?*Neurohelea* (Ceratopogonidae) – specimens that appear to belong to this genus await verification from an overseas specialist.
14. *Ornithoica exilis* Walker, 1861 (Hippoboscidae) was used by Watt (1972) for Kermadec species but listed as *O. stipituri* in Evenhuis (1989).
15. *Ornithomya avicularia* (Linnaeus, 1758) (Hippoboscidae) as used by Bishop and Heath (1988) is invalid (Evenhuis 1989. Maa (1986) considered *O. nigricornis* Erichson as valid for Australasian temperate regions rather than *O. avicularia.* They are both very similar morphologically, but *O. nigricornis* does not exist in Britain (Chandler 1998) where the introduced birds came from. Also the two species have widely disjunct distributions. We accept *O. nigricornis* as the valid name for this species.
16. *Pales orasus* (Walker, 1849) (Tachinidae) is apparently the senior synonym of both *Pales clathrata* (Nowicki, 1875), which was lost in the war, and *P. usitata* (Hutton, 1901) based on non-type material at the Canterbury Museum identified by Hutton and checked by Malloch and Macfarlane.
17. ?*Rhabdotoitamus* (Asilidae) – this genus has at least eight species in Australia (e.g. *Cerdistus caliginosus*, *C. neoclaripes*, *C. rusticanus*) and one in New Caledonia, apart from New Zealand, based on wing venation, head features, thorax hairs patterns and male genitalia. Until the holotype of the type species *R. vittipes* has been checked we are not sure that the New Zealand species are congeneric or if they belong to an undescribed genus. We have not seen the holotype of the type species of *Rhabdotoitamus.*
18. *Schoenophilus campbellensis* Harrison, 1964 (Dolichopodidae) awaits correct generic alignment (Bickel 1991).
19. *Stenodiplosis geniculati dactylidis* Barnes, 1940 (Cecidomyiidae) is included under the species *S. geniculati*. It is unclear to which genus this taxon belongs, because four gall-midge species affect cocksfoot in Great Britain (Chandler 1998). In a South American review, Gagne (1994) apparently reallocated the grass-seed-infesting *Dasineura* to *Stenodiplosis* (Chandler 1998).
20. '*Sciara*' (Sciaridae) species are not *Sciara*, but their descriptions are too imprecise to place them. '*Sciara*' *marcilla* Hutton, 1902 (Sciaridae) is possibly a synonym of *Bradysia amoena* (Winnertz, 1867) (see Mohrig & Jaschhof 1999).
21. *Scythropochroa antarctica* (Hudson, 1892) (Sciaridae) – *nomia dubia* (Evenhuis 1989). The description relies mostly on the illustration and has insufficient detail.
22. '*Tachina*' *mestor* and '*T.*' *sosilus* Walker, 1849 (Tachinidae) – Walker's descriptions are inadequate for generic attribution. When, Malloch (1938) described *Platytachina latifrons*, he found that Hutton had misidentified it as *T. mestor* (p. 211) and similarly *T. sosilus* was actually *Trypherina grisea* (p. 219).
23. *Thinempis brouni* (Hutton, 1901) Andrew n. comb. (Empididae) – previously *Empis.*
24. '*Tonnoirina*' (Phoridae) – Schmitz used this as a subgenus of *Triphleba*, but Brown (1962) noted that the genus needs revision.
25. *Zygomyia submarginata* Zaitzev 2002 is an invalid name, because it is preoccupied by *Zygomyia submarginata* Harrison 1955, so a new name is needed.

Excluded species (including a new synonym)

1. *Aedes nocturnus* (Theobold, 1903) (Culicidae), catalogued in both Miller (1950) and Evenhuis (1989), is based on a 1939 misidentification of larvae, probably of *A. notoscriptus* (Belkin 1968). It has not been found in any of the more recent mosquito surveys (Laird 1995; Holder et al. 1999).
2. *Asphondylia ulicis* Traill, 1873 (Cecidomyiidae), listed as possibly being in New Zealand (Evenhuis 1989), is treated as a failed introduction (Macfarlane & Andrew 2001).
3. *Austromaquartia isolita* (Tachinidae) – excluded from the checklist because it is almost certainly not established in New Zealand.
4. *Calliphora nothocalliphoralis* Miller, 1939 (Calliphoridae) – a very dubious species record. We do not know this species and Dear (1985) stated he did not consider it represented any existing New Zealand calliphorid.
5. ?*Coccomyza brittini* Del Guercio, 1918 (Cecidomyiidae) – a probable invalid record for New Zealand (Miller 1950).
6. *Drosophila marmoria* Hutton, 1901 (Drosophilidae) – a probable synonym of *D. hydei*. The type specimen is in too poor a condition to describe properly and is similar in many respects to *D. hydei* (Harrison, 1959) so we have allocated it as a probable synonym.
7. *Mallochomacquartia setiventris* (Tachinidae) has not been captured in New Zealand.
8. *Pseudoleria placata* (Hutton, 1901) (Heleomyzidae) – not known in New Zealand collections and should be excluded from a New Zealand distribution (McAlpine).
9. *Scatopse carbonaria* Hutton, 1902 Andrew n. syn. and *Scatopse nicarbonaria* Miller, 1950 Andrew n. syn. (Scatopsidae) – new junior synonyms of *Coboldia fuscipes* (Meigen, 1830).
10. *Sciomyza nigricornis* Macquart, 1851 (Lauxaniidae), listed from New Zealand and Tasmania (Evenhuis 1989), is the endemic Australian species *Tapeigaster nigricornis* (Heleomyzidae) (McAlpine & Kent 1982).
11. *Pseudonapomyza* sp. (Agromyzidae), recorded by Bowie et al. (2004) is based on a misidentification.
12. *Pollenia rudis* (Fabricius, 1794) – not shown to be established. The only record is the original interception (two specimens in NZAC). All other specimens similar to this species are *Pollenia pseudorudis*, which is well established.