Tane 35: 1 - 14 (1995)

INSECTS OF THE ALDERMEN ISLANDS

by John W. Early
Auckland Institute and Museum, Private Bag 92018, Auckland

SUMMARY

Entomological collections were made on the Aldermen Is from 5-12 December 1994 as a prelude to assessing the islands' significance for conservation of terrestrial invertebrates. A preliminary annotated list of 202 species in the orders Odonata, Blattodea, Dermaptera, Orthoptera, Neuroptera, Coleoptera, Trichoptera and Hymenoptera is given; Hemiptera and Diptera await identification, and Lepidoptera were not collected. Results indicate a restricted fauna whose affinities are mainly with the Coromandel Peninsula. There are apparently no endemic species. Despite the islands' rodent-free status, no large flightless invertebrates of conservation siginificance were found. Specimens of a species belonging to an undescribed endemic family of parasitic Hymenoptera were found; they considerably extend the northern distribution limit of this species. Middle Island, being free of large insectivorous vertebrates (tuatara and rodents) should be considered for relocation and establishment of endangered northern terrestrial invertebrates such as the Mercury Is tusked weta.

INTRODUCTION

The Aldermen Is (176° 05´E 36° 57´S) constitute a small group that lie off the Coromandel Peninsula in the western Bay of Plenty, about 20km east of Tairua. Hayward (1973) gives a good description of their topography and physical features. They have not received a great deal of scientific investigation. The University of Auckland Field Club Expedition (20-30 May 1972) investigated their geology, flora and aspects of the fauna but not terrestrial invertebrates. The results from this expedition can be found in a compilation of papers in volume 19 (1973) of this journal. Insects were collected in November of the same year when the islands were visited by members of the Entomology Division, D.S.I.R., but there are no published results of their activities and findings apart from a brief and generalised mention of the beetles by Watt (1986).

The islands are potentially interesting for invertebrate conservation because, apart from Middle I., they have remained free of introduced mammals. Recent extermination of Middle Island's kiore population means that it now shares the rodent-free status that Ruamahuaiti, Ruamahuanui and Hongiora have always

enjoyed. These relatively entomologically unexplored islands are therefore likely refugia of large flightless insects that may have once been distributed more widely in New Zealand but whose local extirpation has been caused by introduced insectivorous mammals.

With these factors in mind, a short visit to the Aldermen Is was made by JWE and Rosemary Gilbert in December 1994. The aim was to make a preliminary assessment of the islands' significance with respect to invertebrate conservation, and to conduct a survey of the terrestrial invertebrate fauna, particularly the insects. The expedition was based at Tuatara Bay on Ruamahuaiti I. from 5-12 December 1994 where most collecting was done; day trips to Hongiora, Middle and Ruamahuanui Is provided additional material. The survey was necessarily limited in scope and concentrated on insects; other groups were collected as encountered but they are not reported on here. Most groups of insects require specialist collecting techniques and it was not possible to sample some groups e.g., Lepidoptera, with the resources and time available.

The weather was hot and dry for the duration of the visit, and at night the sky was clear.

METHODS AND TECHNIQUES

A variety of collecting and trapping methods was used in an attempt to sample as many different habitats as possible so as to maximise results from a relatively short survey period. Methods used were:

- Sweep net.
- Malaise trap: a tent-like trap that passively catches actively flying insects. One trap operated in the forest on Ruamahuaiti I. from 5-11 December.
- Yellow pan traps: small shallow yellow pans are sunk into the ground and partially filled with water containing a surfactant and mild preservative. Ground dwelling insects fall in; many low-flying insects are attracted to the colour and are trapped. 43 traps operated on Ruamahuaiti I. from 5-11 December in shoreline scrub (*Pittosporum crassifolium - Myoporum laetum - Melicytus* (*Hymenanthera*) - *Coprosma repens* association) and in the forest (dry slopes without much leaf litter; litter-filled gully).
- Hand searching by day in as many habitats as possible: dead wood, under rocks and logs, plant associations (in conjunction with beating, see below), bird carcases, shoreline etc.
- Night searching by headlamp: many insects are nocturnal and can be found on tree trunks, forest floor, feeding on vegetation, etc. at night. Best results are obtained on dark cloudy nights when the humidity is high particularly following or during light rain.

- Beating vegetation: a series of rapid and abrupt blows to branches of trees and shrubs causes many insects to fall onto a white tray held beneath.
- Leaf litter: one sample was collected from each of Ruamahuaiti and Ruamahuanui Is on the day of departure. Invertebrates were collected by extraction under a hot light (Berlese extraction) at Auckland Museum immediately on return.

All specimens collected are in the Auckland Museum's entomology collections.

RESULTS

Fifty eight collections comprising approximately 2500 insect specimens were made, from which 202 insect species have been recognised so far. An annotated species list for two of the major insect orders (Coleoptera and Hymenoptera) and the smaller orders (Orthoptera, Trichoptera, Neuroptera, Dermaptera, Blattodea and Odonata) is given in Appendix 1. Because of the necessity for authoritative identification by specialists, many identifications are tentative or are only to higher levels of classification (family, subfamily, genus) rather than to species level. It is intended to refine and update the lists in due course, and to provide species lists for other major insect groups, particularly Hemiptera and Diptera, as time permits. Once complete, the lists will probably include at least 300 species. Had Lepidoptera been collected the total would be higher still. Small collections of other terrestrial invertebrates were made but they have not been identified and are not reported here.

We did not find any of the large and endangered flightless beetles (e.g., *Anagotus* weevils, *Dorcus* stag beetles) which are found on some of the other northern offshore islands that are free of mammalian predators. However, there were healthy populations of *Mimopeus elongatus* and *M. opaculus* (darkling beetles, Tenebrionidae), *Ocnodus piceus* (Scarabaeidae) and *Ctenognathus novaezealandiae* (ground beetle, Carabidae). Watt (1986) mentions that *Mimopeus* may be used as indicators of rodent presence or absence - rat infested islands carry very low populations.

Some insect species seemed more abundant and were collected more easily and in larger series on the Aldermens than on the neighbouring mainland. The parasitic wasps *Neocalosoter* sp. (a parasite of wood-boring beetle larvae) and *Spalangia* sp. (probably a parasite of blowflies) are good examples.

Significant finds

1. Parasitic wasp, undescribed family

One of the two species of an undescribed endemic New Zealand family of Hymenoptera was found. This family is the subject of current research by JWE and colleagues in Australia and Canada. The species found on the Aldermen Is is also known from two specimens on the mainland (coastal remnant bush on Banks Peninsula, and East Cape) but it is more abundant on several of the Cook Strait islands (Stephens, Chetwodes, Brothers) and Somes I. in Wellington Harbour. Aldermen Is specimens were collected in pan traps in shoreline scrub (*Coprosma repens* - *Myoporum laetum* - *Hymenanthera* association) where seabirds and tuatara abound, and this is very similar to their habitat on the Cook Strait islands. Individuals from the latter have reduced wings, but Aldermen Is specimens are fully winged. These specimens are the northernmost records and considerably extend the species' known distribution.

Although small in size (1.5-2.5mm long) it is of international significance. It represents one of New Zealand's few endemic families of insects. The family appears to be a Cretaceous relict that may have been once more widely distributed in the world but has since become extinct except here in New Zealand. It bears the same relation to insects as the tuatara does to reptiles. Its biology is unknown but it is probably parasitic on larvae and/or pupae of some fly (like its presumed closest relatives), perhaps scuttle flies (Diptera: Phoridae) which are common in its habitat.

2. *Hadracalles fuliginosus* (Curculionidae)

Few specimens of this weevil are known. A single weevil was found at the base of a flax plant; Lyal (1993) reported that other specimens have been reared from flax rhizomes. It has never been found on the New Zealand mainland apart from the original type specimen which came from Moeraki, Otago (Kuschel 1982). The only other known localities are the Three Kings, Poor Knights and Coppermine Is, so this record extends its known distribution.

3. Introduced species

Xanthopimpla rhopaloceros (a parasitic wasp, Hymenoptera: Ichneumonidae) and *Trigonospila brevifacies* (a parasitic fly, Diptera: Tachinidae) were found, the latter being abundant. They are Australian species deliberately introduced to New Zealand for biological control of leafroller caterpillars (Lepidoptera: Tortricidae) in orchards. Clearly, they have made their own way across to the Aldermen Is as has *T. brevifacies* to the Poor Knights Is. They attack a wide range of leafroller species including natives. *T. brevifacies* is particularly

polyphagous and also attacks larvae of other Lepidoptera families (Geometridae, Oecophoridae, Pterophoridae; Green (1984), Berry (1990)). Both parasitoids are doubtless having an effect on the native moths on the islands. Caterpillars and adult moths may be an important component of the diet of insectivorous birds and perhaps lizards. While these species are beneficial insects in horticultural systems, they must be regarded as pests in native ecosystems.

Absences

Some groups of species of insects that might be expected to be present appear to be absent.

1. Stag beetles (Lucanidae)

No species were found. *Ceratognathus* spp. can usually be found in dead logs on forest floor but despite much searching for them on Ruamahuaiti, none were found. Fallen logs were relatively scarce, perhaps caused by extensive modification to the vegetation by humans in the past (clearing and fire) which has effectively removed the source of large logs. The forest is only now sufficiently regenerated to contain sizeable trees which will ultimately provide large logs on their demise.

2. *Celatoblatta* spp. cockroaches

These flightless native cockroaches, which can be a food source for insectivorous birds, are usually one of the most common insects in forest throughout much of New Zealand. *C. undulivitta* is present on neighbouring Red Mercury I. (Johannesson 1972) and its absence from the Aldermens is perplexing. The only cockroach species collected was *Celeriblattina minor*.

3. Introduced vespid wasps

Vespula germanica, V. vulgaris, Polistes humilis, P. chinensis and *Ancistrocerus gazella* are absent. This is fortunate since they are predators of other insects, particularly caterpillars which are an important component of the diet of some insectivorous birds. Field parties should take precautions against accidentally introducing hibernating *Vespula* queens in field equipment, particularly if it has been stored undisturbed for a period around autumn-early winter; the risk of transporting them is highest from autumn-spring.

4. Introduced pollinators

The honey bee (*Apis mellifera*) and bumble bees (*Bombus* spp) are absent. Absence of bumble bees should make it difficult for weedy legumes like clovers, vetches and medicks to establish. *Bombus terrestris* has colonized several

offshore islands, including nearby Mayor I., without human assistance (Macfarlane & Gurr 1995) but not the Aldermen Is.

DISCUSSION

This survey, while by no means exhaustive, indicates a restricted insect fauna whose closest affinities are with the Coromandel Peninsula. There do not appear to be any endemic species.

A small fauna partially reflects lack of niche and habitat diversity. The islands are small (the largest, Ruamahuanui, has an area of just 25ha) and the highest point is only 180m above sea level. They have a limited diversity of vegetation types (see Court, Hardacre & Lynch 1973), and their flora is depauperate compared with other northern offshore islands (Court 1973). Furthermore, the vegetation has been severely modified by human influence (clearing and fire) and it is only now that mature forest is appearing on Ruamahuanui and Ruamahuaiti. It is only to be expected that this will be reflected in the insect fauna. Some insect habitats were rare or absent. In particular, there were very few large fallen logs, the usual habitat of many beetles including stag beetles (Lucanidae: *Ceratognathus* spp.), none of which were found despite much searching effort.

A second factor contributing to the low number of insects encountered was the extreme dryness of the islands at the time of visiting. They lie in a rain shadow of the Coromandel Range and annual precipitation is lower than on the adjacent mainland; there are no permanent streams or ponds and this immediately eliminates aquatic insects from the fauna. On top of this, our visit, although before the worst of summer drought, came at the end of a very dry winter and spring. The streams on Hongiora mentioned by Hayward (1973) as a probable year-round source of water were completely dried up. The soil and leaf litter were dry on all islands visited, and the soil loose, friable and dusty in places. Drought causes many insects to become quiescent, and results may have been different had the expedition followed a wet period. Night collecting was poor with very few species being found. Many insects' nocturnal activity is inhibited by moonlight and the clear nights experienced did not help. Apart from the small ground beetle *Ctenognathus novaezealandiae*, the few species found at night were not very abundant. By contrast, the forest floor of the smaller and rodent-free islands of the Chathams group (Rangatira and Mangere Is) swarms with large ground beetles, stag beetles, darkling beetles and wetas at night; it is difficult to walk without treading on them. This abundance of large flightless insects on the Chathams is not matched on the Aldermens; perhaps the presence of insectivorous tuatara on the latter is the explanation.

In the remote hopes that the Aldermen Is are also home to the rare tusked weta found on Middle I. of the neighbouring Mercury Is, the expedition was originally planned to coincide with minimal moonlight. Unfortunately, bad weather delayed the expedition for four days and, even with the new moon, the clear, bright dry nights worked against us. Should the weta be present, the chances of it emerging under the conditions experienced were remote indeed.

RECOMMENDATIONS

Collecting should be carried out slightly earlier in the season (mid-November, preferably not after a winter drought) and again towards the end of the season in early April to obtain a more thorough assessment of the insect fauna. Collecting at different times of the year will undoubtedly reveal species with different seasonal patterns of activity. Emphasis should be placed on Middle and Ruamahuanui Is.

The absence of major insectivores (tuatara and rodents) make Middle I. of the Aldermens an ideal sanctuary for endangered terrestrial invertebrates. In particular, it provides the perfect opportunity for release of Mercury Is tusked weta when a captive breeding programme is successful. Tuatara, which in contrast to the weta are numerous and abundant elsewhere, or insectivorous birds should not be released on Middle I. so as to maximise the weta's chances of establishment.

ACKNOWLEDGEMENTS

I am grateful to the Waikato Conservancy of the Department of Conservation who instigated this visit to the Aldermen Is and provided all logistical support. In particular I thank Rick Thorp for facilitating the study, and Keith Donald for his consummate boat handling skills and assistance in the field. I also thank Mrs Brenda May, Mr Andrè Larochelle and Mr Keith Wise for assistance with insect identifications.

REFERENCES

Berry, J.A. 1990: Two parasitoid complexes: *Hierodoris atychioides* (Butler) (Lepidoptera: Oecophoridae) and *Icerya purchasi* Maskell (Homoptera: Margarodidae). *New Zealand Entomologist 13:* 60-62.

Court, D.J. 1973: The floristic status of the Aldermen Islands compared with other offshore islands of the Auckland Province. *Tane 19:* 61-67.

Court, D.J., Hardacre, A.K. & Lynch, P.A. 1973: The vegetation of the Aldermen Islands: a reappraisal. *Tane 19:*41-60.

Green, O.R. 1984: New Zealand host and locality records for an introduced tortricid parasite, *Trigonospila brevifacies* (Diptera: Tachinidae). *New Zealand Entomologist 8:* 69-71.

Hayward, B.W. 1973: Auckland University Field Club scientific camp, Aldermen Islands, May 1972. *Tane 19:* xi-xv.

Johannesson, J.M. 1972: Insects of Red Mercury Island. *Tane 18:* 81-86.
Kuschel, G. 1982: Apionidae and Curculionidae (Coleoptera) from the Poor Knights Islands, New Zealand. *Journal of the Royal Society of New Zealand 12(3):* 273-282.
Lyal, C.H.C. 1993: Cryptorhynchinae (Insecta: Coleoptera: Curculionidae). *Fauna of New Zealand 29.* 307 pp.
Macfarlane, R.P., Gurr, L. 1995: Distribution of bumble bees in New Zealand. *New Zealand Entomologist 18:* 29-36.
Watt, J.C. 1986: Beetles (Coleoptera) of the offshore islands of northern New Zealand. pp 221-228 *in* Wright, A.E. & Beever, R.E. (eds) *The Offshore Islands of Northern New Zealand. New Zealand Department of Lands and Survey Information Series, No 16.*

Appendix 1: Preliminary annotated list of Aldermen Is insects

ODONATA	
Coenagrionidae	
Ischnura aurora (Brauer)	Single specimen; probably flown across from mainland.
BLATTODEA	
Blatellidae	
Celeriblattina minor Johns	Forest & scrub; dead wood at night; beaten.
DERMAPTERA	
Labiduridae	
Anisolabis littorea (White)	Mainly shoreline inhabitant but does live in bush. Preyed on by tuatara and possibly other lizards.
ORTHOPTERA	
Acrididae	
Phaulacridium marginale (Walker)	Shoreline vegetation. Widespread lowland species.
Rhaphidophoridae	
genus indet.	Forest; abundant.
Stenopelmatidae	
Hemiandrus sp.	Forest floor; holes and burrows in soil.
Hemideina thoracica (White)	The Auckland tree weta; forest; abundant.
NEUROPTERA	
Hemerobiidae	
Micromus tasmaniae (Walker)	Shoreline vegetation & bush edge. Aphid predator. Widespread in NZ and Australia.
TRICHOPTERA	
Chathamiidae	
Chathamia integripennis Riek	At light; marine species; North I.
Philanisus plebius Walker	At light; marine species; Three Kings - Stewart I, and Australia (NSW).
COLEOPTERA	
Anobiidae	
genus indet.	Dead wood.

Anthicidae	
Sapintus aucklandensis Werner & Chandler	*Coprosma repens*, swept; log at top of beach. Common North I. species, usually coastal.
Brentidae	
Neocyba metrosideros (Broun)	Forest; associated with pohutukawa.
Carabidae	
Anomotarus variegatus Moore	Coastal scrub: vagile introduced species.
Ctenognathus novaezealandiae Fairmaire	Throughout but most abundant in coastal scrub; the most abundant beetle found.
Pentagonica vittipennis Chaudoir	Forest.
Cerambycidae	
Lamiinae sp. 1	Flax leaves and seed pods.
Lamiinae sp. 2	Forest and shoreline vegetation.
Microlamia pygmaea Bates	Associated with flax.
Xylotoles sp.	Forest & coastal scrub; beaten; common.
genus indet.	*Pittosporum crassifolium.*
Cleridae	
Phymatophaea fuscitarsis? Broun	Forest & shoreline vegetation; swept, Malaise trap.
Coccinellidae	
Adalia bipunctata (Linnaeus)	Shoreline scrub; European species.
Coccinella undecimpunctata Linnaeus	Shoreline scrub and herbs; European species.
Rhyzobius - possibly 5 spp.	
Colydiidae	
Coxelus sp.	Forest & coastal scrub; dead wood, pan trap.
Enarsus bakewellii? Pascoe	Forest; dead wood, pan trap.
Cryptophagidae	
Telmatophilus nitens? (Sharp)	Shoreline shrubs and herbs (*Coprosma repens, Sarcocornia, Disphyma*); swept, beaten, pan traps.
Cucujidae	
genus indet., 1 sp.	Flax leaf bases.
Curculionidae	
Chaetoptelius mundulus (Broun)	In forest: swept, Malaise trap, pan trap.
Cryptorhynchinae sp.	On dead wood at night.
Clypeolus lachrymosus (Broun)	In dead wood.
Crisius ventralis? (Broun)	Coastal scrub; pan trap.
Entiminae sp. 1	Pohutukawa; swept.
Entiminae sp. 2	Forest; pan trap.
Entiminae sp. 3	Flax seedpods.
Hadracalles fuliginosus Broun	Associated with flax; see note in text.
Hoplocneme punctatissima Pascoe	Coastal scrub; *Myoporum laetum.*
Microcryptorhynchus floricola (Broun)	Coastal; *Disphyma, Sarcocornia, Pittosporum*
Microcryptorhynchus sp.	Coastal scrub & forest; pan trap.
Pactola variabilis Pascoe	Pohutukawa, karo, flax.
Pentarthrum zealandicum Wollaston	Forest; dead wood at night.
Phloeophagosoma dilutum Wollaston	Forest; dead wood; coastal scrub.
Phloeophagosoma pedatum Wollaston	On flax.
Psepholax sp.	Dead wood.

Sericotrogus subaenescens Wollaston	Forest, pohutukawa, shoreline vegetation.
Stephanorhynchus crassus Broun	On *Pittosporum crassifolium.*
Stephanorhynchus nigrosparsus Broun	In forest.
Strongylopterus hylobioides (White)	Dead wood at night; widespread NZ species.
Synacalles sp.	Forest; pan trap.
Tysius bicornis (F.)	In forest.
Dermestidae	
genus 1 indet.	Forest & coastal scrub; Malaise trap, pan trap, swept.
genus 2 indet.	Shoreline scrub; swept.
Elateridae	
Ctenicera sp.	In dead *Coprosma repens.*
Hydrophilidae	
Cercyon sp.	Coastal scrub; pan trap.
Lathridiidae	
genus indet.	Forest & shoreline vegetation; swept.
Leiodidae	
Mesocolon sp.	Forest & coastal scrub; Malaise trap, pan trap.
Melandryidae	
Hylobia sp.	Shoreline vegetation (herbs, grasses, scrub), forest; swept, pan traps, Malaise trap.
Hylobia usitatus? Broun	Forest; swept.
Melyridae	
Dasytes sp.	Shoreline scrub; swept, beaten; common.
Pselaphidae	
Sagola sp. 1	Forest and coastal scrub; pan trap.
Sagola sp. 2	Forest and coastal scrub; pan trap.
Sagola sp. 3	Forest; pan trap.
Sagola sp. 4	Coastal scrub, pan trap.
genus indet. sp. 1	Coastal scrub, pan trap.
genus indet. sp. 2	Coastal scrub, pan trap.
genus indet. sp. 3	Coastal scrub, pan trap.
genus indet. sp. 4	Forest and coastal scrub; pan trap.
Scarabaeidae	
Ocnodus piceus (Broun)	Coastal scrub and herbs, under *Disphyma australe*; dry friable soil; pan traps. Abundant. Likely prey of tuatara and lizards.
Staphylinidae	
genus indet. sp. 1	Coastal scrub; pan trap.
genus indet. sp. 2	Forest; pan trap.
genus indet. sp. 3	Coastal scrub; pan trap.
genus indet. sp. 4	Coastal scrub; pan trap.
genus indet. sp. 5	Forest; Malaise trap.
genus indet. sp. 6	Coastal scrub; pan trap.
genus indet. sp. 7	Forest; Malaise trap.
genus indet. sp. 8	Coastal scrub, forest; pan trap, Malaise trap.
Tenebrionidae	
Artystona rugiceps Bates	Forest; dead wood; trees at night.

Chrysopeplus expolitus (Broun)	Forest; dead wood; trees at night.
Mimopeus elongatus (Breme)	Soil and leaf litter near shore; under *Disphyma australe* mats.
Mimopeus opaculus (Bates)	Coastal scrub to forest; under rocks & dead wood
Xylochus tibialis? Broun	In dead wood.
Trogossitidae	
Leperina sp.	Tree trunks and dead wood in forest at night.
HYMENOPTERA	
Aphelinidae	
Coccophagus sp.	Forest. Probably parasite of soft scale or mealy bug.
Apidae	
Lasioglossum sp.	Shoreline on *Senecio* flowers and scrub.
Leioproctus (Nesocolletes) sp.	Shoreline on *Senecio* flowers.
Bethylidae	
genus indet.	Forest & coastal scrub; swept, pan & Malaise traps.
Braconidae	
Alysiinae sp. 1	Forest & coastal scrub; pan traps.
Alysiinae sp. 2	Forest; Malaise trap.
Alysiinae sp. 3	Coastal *Pittosporum crassifolium*
Alysiinae sp. 4	Forest & bush edge; swept.
Alysiinae sp. 5	Shoreline vegetation (*Pittosporum crassifolium, Coprosma repens, Senecio lautus,* sow thistle)
Alysiinae sp. 6	Forest; Malaise trap.
Aphidiinae spp. indet.	Aphid parasites.
Ascogaster iti Walker & Huddleston	Forest; Malaise trap.
Ascogaster parrotti Walker & Huddleston	Forest; Malaise trap, swept.
Aspicolpus sp.	Forest; Malaise trap.
Doryctinae sp. 1	Forest, dead trees at night; parasite of wood-boring beetle larvae.
Doryctinae sp. 2	Forest; pan trap.
Microgastrinae sp. 1	Forest, *Myoporum laetum, Coprosma repens;* Malaise trap, swept.
Microgastrinae sp. 2	Forest & coastal scrub; Malaise & pan traps.
Microgastrinae sp. 3	Forest; Malaise trap.
Microgastrinae sp. 4	Forest & shoreline vegetation; Malaise trap.
Microgastrinae sp. 5	Shoreline scrub.
Microgastrinae sp. 6	Coastal scrub & forest; pan & Malaise traps.
Microgastrinae sp. 7	Forest & coastal bush edge.
Microgastrinae sp. 8	Shoreline vegetation; forest.
Phaenocarpa antipoda (Ashmead)	Forest & coastal scrub; parasite of blowfly larvae on carrion.
genus indet. sp. 1	Forest; swept.
genus indet. sp. 2	Forest; swept.

genus indet. sp. 3	Forest; swept.
genus indet. sp. 4	*Myoporum laetum;* swept
Ceraphronidae	
genus indet. sp. 1	Forest; Malaise trap.
genus indet. sp. 2	Forest; Malaise trap.
genus indet. sp. 3	Forest; Malaise trap.
Diapriidae	
Basalys sp.	Coastal scrub & forest. Possibly introduced European species.
Belytinae new genus	Forest & on *Myoporum laetum.* Probably parasite of fungus gnat larvae.
Belytinae sp.	Forest. Probably parasite of fungus gnat larvae.
Diphoropria sinuosa Naumann	Forest & coastal scrub. Common species throughout NZ from sea level to montane tussock/herbfield.
Entomacis sp.	Forest.
Spilomicrus sp. 1	Forest & coastal scrub. Also on Chatham Is; probably widespread in coastal habitats.
Spilomicrus sp. 2	Forest & coastal scrub. Also on Chatham Is; probably widespread in coastal habitats.
Spilomicrus sp. 3	Coastal scrub & forest; pan traps. Flightless species. Also in Northland, East Cape and probably most northern offshore islands.
Spilomicrus sp. 4	Coastal scrub & forest; pan traps. Also East Cape.
Spilomicrus sp. 5	Forest. Also East Cape area.
Spilomicrus sp. 6	Forest; Malaise trap.
Spilomicrus sp. 7	Shoreline vegetation.
Spilomicrus sp. 8	Forest.
Stylaclista sp.	Forest & coastal scrub; abundant.
Trichopria sp. 1	Coastal scrub; pan trap.
Trichopria sp. 2	Forest; Malaise trap.
Dryinidae	
genus indet.	Coastal scrub; pan trap. Single ♀, very rarely collected. Probably parasitic on plant bug nymphs.
Encyrtidae	
Adelencyrtoides sp.	Forest & shoreline vegetation.
Tetracnemoidea sp.	Forest.
genus indet. sp. 1	*Pittosporum crassifolium.*
genus indet. sp. 2	*Pittosporum crassifolium*, forest.
Eucoilidae	
Kleidotoma sp. 1	Coastal scrub & forest; pan traps. Parasitic on small fly larvae as are all Eucoilidae.
Kleidotoma? sp. 2	Shoreline bush edge.
Leptopilina sp.	Forest & coastal scrub.
Eulophidae	
genera indet., 13 spp.	

Eupelmidae

Eupelmus sp.	Coastal scrub; beaten.
Tineobius sp.	Coastal scrub; pan traps.

Figitidae

Anacharis zealandica Ashmead	Shoreline bush edge and herbs. Parasite of brown lacewing *Micromus tasmaniae*. Widespread in NZ.

Formicidae (ants)

Amblyopone australis Erichson	Forest & scrub. Also in Australia, New Guinea and Vanuatu. NZ's largest ant.
Monomorium antarcticum (F. Smith)	Shoreline, scrub & forest. NZ's commonest ant.
Monomorium antipodum Forel	Top of beach. Possibly introduced to NZ.
Monomorium smithii Forel	Forest & coastal scrub. Possibly introduced.
Ochetellus glaber (Mayr)	Shoreline vegetation, log at top of beach. Australian.
Prolasius advena (Smith)	Forest. Widespread in NZ; nests in soil & rotten wood.

Ichneumonidae

Xanthopimpla rhopaloceros Krieger	Coastal scrub; see note in text.
Netelia sp.	Coastal scrub; parasite of noctuid moth larvae.
genus indet. sp. 1	Forest; Malaise trap. Common.
genus indet. sp. 2	Forest; parasite of spider egg sacs; possibly a European species
genus indet. sp. 3	Coastal scrub.
genus indet. sp. 4	Forest; Malaise trap; in dead wood.
genus indet. sp. 5	Forest; Malaise trap.
genus indet. sp. 6	Forest; Malaise trap.
genus indet. sp. 7	Forest; Malaise trap, swept.
genus indet. sp. 8	Forest; Malaise trap.
genus indet. sp. 9	Forest; Malaise trap, swept.
genus indet. sp. 10	Forest; Malaise trap.
genus indet. sp. 11	Forest; Malaise trap.

Mymaridae

Anagroidea sp.	Forest; Malaise trap.
Ischiodasys sp.	Forest.
Steganogaster sp.	Forest.

Platygastridae

Errolium sp.	Coastal scrub; pan traps. Scale insect parasite.
Platygastrinae sp. 1	On flax.
Platygastrinae sp. 2	Forest.
Platygastrinae sp. 3	Forest & coastal scrub; pan trap, swept.
Platygastrinae sp. 4	Forest; pan & Malaise traps.
Platygastrinae sp. 5	Forest, shoreline vegetation & flax.
Platygastrinae sp. 6	Forest; swept, Malaise trap.
Sceliotrachelinae, new genus	Coastal scrub; pan traps.

Pompilidae

Priocnemis conformis Smith	Forest; pan & Malaise traps. Widespread in NZ. Spider predator.

Proctotrupidae	
Fustiserphus intrudens (Smith)	Forest. Parasite of oecophorid moth caterpillars in leaf litter. Widespread throughout NZ, lowland to subalpine..
Fustiserphus sp.	Forest & shoreliine vegetation; Malaise trap, swept.
Oxyserphus? sp.	Forest.
Oxyserphus sp.	Forest & shoreline scrub.
Pteromalidae	
Aphobetus sp.	*Pittosporum crassifolium*; parasite of coccid scale insects.
Colotrechinae sp.	Forest; swept.
Neocalosoter sp.	Forest & coastal scrub. Parasite of wood-boring beetle larvae. ♀ with reduced wings, flightless.
Parepistenia sp.	Mahoe-kawakawa-karo forest; Malaise trap.
Spalangia sp.	Forest & coastal scrub. Probably parasite of blowflies.
genus indet. sp. 1	Forest; Malaise trap.
genus indet. sp. 2	*Myoporum laetum;* swept, beaten.
genus indet. sp. 3	*Myoporum laetum;* swept, beaten.
genus indet. sp. 4	*Myoporum laetum;* swept, beaten.
genus indet. sp. 5	Coastal bush edge.
genus indet. sp. 6	Shoreline *Senecio lautus* & sowthistle.
genus indet. sp. 7	Shoreline *Senecio lautus* & sowthistle.
genus indet. sp. 8	*Disphyma & Sarcocornia.*
genus indet. sp. 9	Shoreline bush edge.
genus indet. sp. 10	*Disphyma, Sarcocornia* and shoreline bush edge.
genus indet. sp. 11	Forest.
Scelionidae	
Baeini sp.	Forest. Parasite of spider eggs.
Cremastobaeus sp.	Coastal scrub. Rarely collected in NZ.
Holoteleia sp.	Forest & coastal scrub. Probably parasite of ground weta (*Hemiandrus* sp) eggs.
Trimorus sp.	Coastal scrub; pan traps. Probably parasitizes ground beetle eggs (*Ctenognathus novaezealandiae).* Abundant.
Sphecidae	
Pison morosum Smith	Shoreline. Preys on spiders; nests in old beetle holes in wood.
Rhopalum aucklandi Leclercq	Forest. Widespread in NZ; preys on small moths; nests in old beetle holes in wood.
Rhopalum perforator Smith	Forest. Widespread in NZ; preys on flies; nests in old beetle holes in wood.
Undescribed family	
new genus	Coastal scrub; pan trap. See note in text.