

LACEWINGS AND AQUATIC INSECTS OF NEW ZEALAND

2. Fauna of the northern offshore islands

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Abstract. Records of aquatic insects and lacewings are given in a table for each Order. Sources of records include references to previous publications and to known specimens.

Represented in the offshore islands fauna are the Neuroptera and the aquatic Ephemeroptera, Odonata, Plecoptera, Megaloptera, Trichoptera and some families of Hemiptera, Coleoptera and Diptera.

In an area of prevailing westerly winds the offshore islands are mostly east of the North I mainland and the fauna comprises North I species.

This paper, which is mainly a faunal list in tabular form, was presented in part to the Offshore Islands Research Group Symposium on "The offshore islands of northern New Zealand", at Auckland in May 1983. The islands included extend from the Three Kings Islands, *ca.* 60 km north-west of the North Island, along the east coast southwards as far as the Bay of Plenty.

Lacewings and aquatic insects are recorded in tables, Order by Order. The Orders of Insecta represented in the aquatic fauna are Ephemeroptera (mayflies), Odonata (dragonflies), Plecoptera (stoneflies), Megaloptera (dobsonflies), Trichoptera (caddis flies) and some families of Hemiptera (bugs), Coleoptera (beetles) and Diptera (flies). Neuroptera now only include the true lacewings as the Megaloptera are considered as a separate Order. Marine Trichoptera and Diptera: Tipulidae are included as aquatic records.

Information presented here results from sporadic collecting over many years. In the Tables, sources include references to publications and known specimens. "AMNZ spec.", "NMNZ spec", and "NZAC spec." indicate specimens known to the author in the Auckland Museum, National Museum and Entomology Division collections respectively. Islands and island groups are listed in a general north to south order; an island name in parenthesis after another indicates a particular island of a group. Other explanatory or informative notes are also given in parenthesis. Nomenclature and classification are mostly as in Wise (1965, 1973 and/or 1977), Winterbourn & Gregson (1981) or Towns (1983).

Further information from collecting expeditions, particularly Poor Knights Is and Little Barrier I, are still to be presented as well as individual island faunal lists when these are considered to be sufficiently known.

Ephemeroptera (Table 1)

It is noticeable that up to nine species of mayflies are recorded for Little Barrier I and few elsewhere. However, some records are from immatures and determinations require confirmation. Current work by Towns (as in Towns 1983) will enable the New Zealand fauna to become better known.

Table 1. Offshore islands Ephemeroptera.

Insecta	Islands	Sources
Family Siphonuridae		
<i>Nesameletus ornatus</i>	Little Barrier	Winterbourn 1964
<i>Ameletopsis perscitus</i>	Little Barrier	Wise 1956 Winterbourn 1964
<i>Coloburiscus humeralis</i>	Little Barrier	Winterbourn 1964
Family Leptophlebiidae		
<i>Zephlebia (Zephlebia) dentata</i>	Little Barrier	Wise 1956 Winterbourn 1964
<i>Zephlebia (Zephlebia) versicolor</i>	Little Barrier	Winterbourn 1964
<i>Zephlebia (Terama) borealis</i>	Little Barrier	Winterbourn 1964
? <i>Zephlebia</i> spp.	Cuvier	Towns 1983 AMNZ spec. Riddell 1981 AMNZ spec.
<i>Acanthophlebia cruentata</i>	Little Barrier	Winterbourn 1964 Towns 1983
<i>Deleatidium myzobranchia</i>	Great Barrier	Towns 1983
<i>Deleatidium</i> spp.	Little Barrier	Winterbourn 1964
? <i>Isothraulus abditus</i>	Little Barrier	Winterbourn 1964 Towns & Peters 1979

Odonata (Table 2)

The three known damselfly species in New Zealand are all recorded from offshore islands. During one expedition the tiny but widely distributed *Ischnura aurora aurora* (Brauer, 1865) was seen flying on islands in the Noisies group including Maria I where there is no freshwater. These damselflies may have come from Waiheke I unless the species is breeding in a small pool on Ike rock, a possibility suggested by the record of nymphs in pools on a rock in the Mercury Is group (Watson 1972).

It is interesting that records so far have proved to be for only one species of dragonfly, a species widespread in the North I but little collected in the past (Winstanley 1979).

Plecoptera (Table 3)

Stoneflies have so far only been recorded on the larger Little Barrier and Great Barrier Is which may be the only islands with suitable streams.

Table 2. Offshore islands Odonata.

Insecta	Islands	Sources
Family Coenagrionidae		
<i>Ischnura aurora aurora</i>	Poor Knights (Tawhiti Rahi)	AMNZ spec.
	Noisies (Motuhorapapa)	AMNZ spec.
	(Ike)	AMNZ spec.
	(Maria)	AMNZ spec.
	Cuvier	AMNZ spec.
	Mercury (The Stack)	Watson 1972
<i>Xanthocnemis zealandica</i>	Little Barrier	Wise 1956
	Ponui	AMNZ spec.
	Mercury (Red)	Watson 1972
	(The Stack)	Johannesson 1972 Watson 1972
Family Lestidae		
<i>Austrolestes colenisonis</i>	Great Barrier	AMNZ spec.
	Ponui	AMNZ spec.
Family Corduliidae		
<i>Antipodochlora braueri</i>	Little Barrier	Wise 1956 (as <i>Procordulia smithii</i> ?) Winterbourn 1964 (as <i>Procordulia smithii</i>) Winstanley 1979
	Great Barrier	Winstanley 1979

Table 3. Offshore islands Plecoptera.

Insecta	Islands	Sources
Family Eustheniidae		
<i>Stenoperla prasina</i>	Little Barrier	Winterbourn 1964 Zwick 1979
Family Austroperlidae		
<i>Austroperla cyrene</i>	Little Barrier	Winterbourn 1964, 1965
Family Gripopterygidae		
<i>Zelandoperla</i> n.sp.	Little Barrier	Winterbourn 1964
<i>Zelandoperla agnetis</i>	Great Barrier	Winterbourn 1965 (as <i>decorata</i>)
<i>Zelandoperla decorata</i>	Great Barrier	Winterbourn 1965 (as <i>maculata</i>)
<i>Acroperla trivacuata</i>	Little Barrier	Wise 1956 (as <i>Nesoperla trivacuata</i>) Winterbourn 1964 (as <i>Nesoperla trivacuata</i>) Winterbourn 1965 (as <i>Aucklandobius trivacuatus</i>)
	Great Barrier	Winterbourn 1965 (as <i>Aucklandobius trivacuatus</i>)
<i>Zelandobius confusus</i>	Little Barrier	Winterbourn 1964 (as <i>Zelandobius</i> n.sp.) Winterbourn 1965 (as <i>Zelandobius pallidus</i> n.sp.-type locality)
Family Notonemouridae		
<i>Spaniocerca zelandica</i>	Little Barrier	Winterbourn 1965 (as <i>minor</i>) Winterbourn 1968

Hemiptera (Table 4)

The New Zealand-wide endemic pond skaters, *Microvelia macgregori* (Kirkaldy, 1899), occur on water surfaces from Three Kings Is south except, perhaps, on volcanic White I.

The New Caledonia water measurer species, *Hydrometra risbeci* Hungerford, 1938, uncommon in New Zealand, has occurred on one island close to the mainland.

Table 4. Offshore islands Hemiptera.

Insecta	Islands	Sources
Family Veliidae <i>Microvelia macgregori</i>	Three Kings (Great)	Woodward 1954 (as <i>halei</i>) AMNZ spec.
	Poor Knights (Tawhiti Rahi)	AMNZ spec.
	Little Barrier	Wise 1956 (as <i>Microvelia</i> sp. prob. <i>macgregori</i>) Winterbourn 1964 (as <i>Microvelia</i>)
	Ponui	AMNZ spec.
	Cuvier	AMNZ spec.
	Mercury (Red)	Watson 1972 (as <i>Microvelia</i> sp.) Johannesson 1972 (as <i>Microvelia</i> sp.)
	Motuhora	AMNZ spec.
Family Hydrometridae <i>Hydrometra risbeci</i>	Ponui	AMNZ spec.

Megaloptera (Table 5)

The New Zealand dobsonfly, very common in mainland streams, has only been recorded from three offshore islands.

Table 5. Offshore islands Megaloptera.

Insecta	Islands	Sources
Family Corydalidae <i>Archichauliodes diversus</i>	Little Barrier	Wise 1956 Winterbourn 1964 AMNZ spec.
	Great Barrier	NMNZ spec.
	Cuvier	Riddell 1981

Neuroptera (Table 6)

Four species of the New Zealand lacewings have occurred, all four being taken in the Noisies Is group by the author during one expedition. Elsewhere in the offshore islands two common species, particularly *Micromus tasmaniae* (Walker, 1860), are widespread.

One specimen of the widely distributed Australo-Pacific species, *Chrysopa basalis* Walker, 1853, known previously in the New Zealand sub-region only from the Kermadec Is, has been taken on a northern offshore island.

Table 6. Offshore islands Neuroptera.

Insecta	Islands	Sources
Family Coniopterygidae		
<i>Cryptoscenea australiensis</i>	Noisies (Otata)	AMNZ spec.
Family Hemerobiidae		
<i>Drepanacra binocula</i>	Poor Knights (Tawhiti Rahi)	AMNZ spec. NZAC spec.
	Noisies (Otata)	AMNZ spec.
	Great Barrier	AMNZ spec.
	Cuvier	AMNZ spec.
	Aldermen (Ruamahuaity) (Ruamahuanui)	NZAC spec. NZAC spec.
<i>Micromus tasmaniae</i>	Cavalli (Motukawanui)	Roberts 1979 AMNZ spec.
	Hen & Chickens (Lady Alice)	AMNZ spec.
	Poor Knights (Tawhiti Rahi)	AMNZ spec. NZAC spec.
	(Aorangi)	NZAC spec.
	Little Barrier	AMNZ spec.
	Great Barrier	AMNZ spec.
	Cuvier	AMNZ spec.
	Noisies (Maria)	AMNZ spec. NZAC spec.
	(Motuhorapapa)	AMNZ spec. NZAC spec.
	(Otata)	AMNZ spec. NZAC spec.
	Rakino (On boat)	AMNZ spec.
	Waiheke	NMNZ spec.
	Oheua (Oheua)	NZAC spec.
	Aldermen (Ruamahuaity) (Ruamahuanui)	NZAC spec. NZAC spec.
	Mayor	AMNZ spec.
Family Myrmeleontidae		
<i>Weeleus acutus</i>	Little Barrier	NZAC spec.
	Noisies (Motuhorapapa)	May 1979 AMNZ spec. NZAC spec.
Family Chrysopidae		
<i>Chrysopa basalis</i>	Moturoa (Whale)	Macdonald 1977 AMNZ spec.

Coleoptera (Table 7)

Species of three aquatic beetle families have been recorded on several offshore islands.

Table 7. Offshore islands Coleoptera.

Insecta	Islands	Sources
Family Dytiscidae		
<i>Liodesus deflectus</i>	Great Barrier	Ordish 1966
<i>Antiporus strigosulus</i>	Mokohinau	Ordish 1966
<i>Copelatus australis</i>	Mokohinau	Broun 1886 (as <i>Exocelina advena</i>) Ordish 1966, 1967 AMNZ spec.
Family Scirtidae (=Helodidae)		
	Poor Knights (Tawhiti Rahi)	AMNZ spec.
	Mercury (Red)	Watson 1972 (as Helodidae) Johannesson 1972 (as Helodidae) AMNZ spec.
Family Elmidae		
	Little Barrier	Winterbourn 1964 (as Dryopidae)
	Mercury (Red)	Watson 1972 Johannesson 1972

Diptera (Table 8)

Among the many records for aquatic flies, there are a large number of Dixid and Culicid (mosquitoes) records due to the revisionary work of Belkin (1968). The coastal salt-pool mosquito, *Opifex fuscus* Hutton, 1902, occurs throughout the northern area on the islands and the mainland coast. However, the Great Barrier I record for *Opifex fuscus* is queried as Belkin's locality (1968:164, No. 17) suggests Little Barrier I where Belkin next collected; the species was re-collected at the same locality on Little Barrier I by the present author recently.

The crane-fly (Tipulidae) records include some for marine littoral species.

Table 8. Offshore islands Diptera.

Insecta	Islands	Sources
Family Dixidae		
	Cuvier	Riddell 1981
	Mercury (Red)	Watson 1972
		Johannesson 1972
<i>Nothodixa campbelli</i>	Little Barrier	Belkin 1968
	Great Barrier	Belkin 1968
<i>Paradixa neozelandica</i>	Little Barrier	Belkin 1968
	Great Barrier	Belkin 1968
<i>Paradixa fuscinervis</i>	Little Barrier	Belkin 1968
	Great Barrier	Belkin 1968
<i>Paradixa harrisi</i>	Little Barrier	Belkin 1968
	Great Barrier	Belkin 1968
<i>Paradixa</i> sp.	Little Barrier	Wise 1956
		(as <i>Dixa</i> (<i>Paradixa</i>) sp.)
		Winterbourn 1964
		(as <i>Dixa</i> (<i>Paradixa</i>) sp.)
Family Culicidae		
<i>Culex</i> (<i>Culex</i>) <i>pervigilans</i>	Poor Knights (Tawhiti Rahi)	AMNZ spec.
	Hen & Chickens (Taranga)	Belkin 1968
	Little Barrier	Belkin 1968
	Great Barrier	Belkin 1968
	Cuvier	Belkin 1968
<i>Culex</i> (<i>Culex</i>) <i>asteliae</i>	Little Barrier	Belkin 1968
	Rangitoto	Belkin 1968
		(type locality)
	Islands of Hauraki Gulf	Dumbleton 1968
		Winterbourn & Gregson 1981
<i>Culex</i> (<i>Culex</i>) <i>quinquefasciata</i>	Little Barrier	Wise 1956
		(as <i>fatigans</i>)
	Rangitoto	Belkin 1968
<i>Coquellitidia</i> (<i>Coquellitidia</i>) <i>iracunda</i>	Great Barrier	Belkin 1968
	Mayor	Belkin 1968
<i>Opifex fuscus</i>	Three Kings	Dumbleton 1968
	Three Kings (Great)	Marks 1958
		Belkin 1968
		AMNZ spec.
	Cavalli (Motukawanui)	Roberts 1979
	Poor Knights	Somerfield 1973
		Watt 1982
	(Tawhiti Rahi)	AMNZ spec.
	Hen & Chickens	Belkin 1968
	Noisies (Maria)	AMNZ spec.
	Rakino	Belkin 1968
	Waiheke	Belkin 1968
		AMNZ spec.
	Mokohinau (Burgess) (Lizard)	Belkin 1968
		Belkin 1968

	Little Barrier (Great Barrier ?)	AMNZ spec. Belkin 1968
	Cuvier	Belkin 1968
	Mercury (Red)	AMNZ spec. Johannesson 1972
	White	Wise 1970
<i>Aedes (Ochlerotatus) antipodeus</i>	Poor Knights (Tawhiti Rahi)	
	Little Barrier	AMNZ spec. Wise 1956
		Belkin 1968
<i>Aedes (Finlaya) notoscriptus</i>	Little Barrier	Belkin 1968
	Rangitoto	Belkin 1968
<i>Maorigoeldia argyropus</i>	Little Barrier	Belkin 1968
Family Ceratopogonidae		
	Mercury (Red)	Watson 1972 (also as Heleidae)
		Johannesson 1972 (as Heleidae)
	Little Barrier	Winterbourn 1964
Family Chironomidae		
	Little Barrier	Winterbourn 1964
	Cavalli	Roberts 1979
	Cuvier	Riddell 1981
		AMNZ spec.
	Mercury (Red)	Watson 1972
		Johannesson 1972
Family Simuliidae		
<i>Austrosimulium longicorne</i>	Three Kings	Crosby 1981
Family Tipulidae		
	Little Barrier	Winterbourn 1964
	Mercury (Red)	Watson 1972
	Cuvier	AMNZ spec.
<i>Limonia (Dicranomyia) wiseana</i>	Hen & Chickens	Alexander 1955
		Wise 1965
	?Little Barrier	Wise 1965
<i>Limonia (Idioglochina) fumipennis</i>	Great Barrier	Wise 1965
? <i>Limonia (Idioglochina) sp.</i>	Mercury (Red)	Johannesson 1972
Family Psychodidae		
	Mercury (Red)	Watson 1972
		Johannesson 1972
Family Syrphidae		
<i>Eristalis tenax</i>	Cuvier	AMNZ spec.
	Moturoa	MacDonald 1977
		AMNZ spec.
<i>Helophilus sp.</i>	Cuvier	AMNZ spec.
Family Stratiomyidae		
	Mercury (Red)	Watson 1972
		Johannesson 1972
Family Ephydriidae		
	Cuvier	AMNZ spec.
Family Muscidae		
	Mercury (Red)	Watson 1972
		Johannesson 1972

Trichoptera (Table 9)

Many species of caddis flies, which occur in many different aquatic habitats, are recorded.

The common marine caddis fly, *Philaniscus plebeius* Walker, 1852, is known throughout the northern offshore islands as well as on the adjacent coast. Another marine species, *Chathamia integripennis* Riek, 1977, has recently been described from Paihia in the Bay of Islands on the east coast (not west of Auckland as noted by Riek 1977). This species is now recorded on islands from the Cavalli Is to the Hauraki Gulf, and it is also known to the author in the Firth of Thames as far south as Orere Pt on the mainland. Included in a very recent collection (Oct. 1983) from Rurima Rocks, southern Bay of Plenty are male specimens of both these marine caddis fly species.

Discussion

Of the aquatic insects, ubiquitous species are marine littoral caddis flies (Trichoptera: *Philaniscus plebeius*), salt-pool mosquitoes (Diptera: *Opifex fuscus*) and the semiaquatic pond skaters (Hemiptera: *Microvelia macgregori*). These all occur throughout the northern offshore islands, on the mainland and also further south.

Of the lacewings (Neuroptera), *Micromus tasmaniae*, a common and widespread species elsewhere, is the most common species found on the islands.

The evidence concerning aquatics and lacewings so far is for few, if any, species endemic only to the offshore islands. Wind-blown adult winged individuals may account for some species records as the islands are eastward of the main North I and downwind from the prevailing westerly winds. For the same reason, it is not surprising that the established fauna comprises species present in the North Island.

Acknowledgements. Curators of collections in the National Museum, Wellington, and the Entomology Division, D.S.I.R., Auckland, have at various times made specimens available.

Table 9. Offshore islands Trichoptera.

Insecta	Islands	Sources
Family Hydropsychidae		
<i>Orthopsyche fimbriata</i>	Cuvier	Riddell 1981
	Little Barrier	Winterbourn 1964
	Great Barrier	AMNZ spec.
<i>Aoteapsyche colonica</i>		
Family Polycentropodidae		
<i>Plectrocnemia</i> sp.	Little Barrier	Winterbourn 1964
<i>Polyplectropus puerilis</i>	Cuvier	Cowley 1978
		Riddell 1981
		AMNZ spec.
	Mercury (Red)	Watson 1972
		Johannesson 1972
<i>Polyplectropus</i> sp.	Little Barrier	Wise 1956
	Mercury (Red)	Watson 1972

Family Philopotamidae

Dolophilodes (Hydrobiosella) mixta Little Barrier

Wise 1956

(as *Hydrobiosella stenocerca*)

Winterbourn 1964

(as *Hydrobiosella stenocerca*)

Cowley 1978

Cowley 1978

Family Rhyacophilidae

Mercury (Great)

Cuvier

Riddell 1981

AMNZ spec.

Psilochorema mimicum

Mercury (Red)

Johannesson 1972

Psilochorema sp.

Little Barrier

Winterbourn 1964

Mercury (Red)

Watson 1972

Johannesson 1972

Winterbourn 1964

Hydrochorema crassicaudatum

Little Barrier

Tiphobiosis plicosta

Poor Knights

(Tawhiti Rahi)

AMNZ spec.

Family Hydroptilidae

Oxyethira albiceps

Cuvier

AMNZ spec.

Family Conoesucidae

[? Conoesucidae]

Mercury (Red)

Watson 1972

(as Sericostomatid-like)

Pycnocentria funerea

Cuvier

Cowley 1978

Riddell 1981

AMNZ spec.

? *Pycnocentria* sp.

Little Barrier

Wise 1956

Pycnocentria sp.

Little Barrier

Winterbourn 1964

Olinga feredayi

Little Barrier

Wise 1956

Winterbourn 1964

Cuvier

Riddell 1981

AMNZ spec.

Family Oeconesidae

Oeconesus maori

Little Barrier

Wise 1956

Winterbourn 1964

Family Chathamidae

Chathamia integripennis

Cavalli (Hamaruru)

Roberts 1979

(as *Philanisis plebeius*)

AMNZ spec.

Urupukapuka

AMNZ spec.

(Bay of Islands)

Kawau

AMNZ spec.

Great Barrier

AMNZ spec.

Noisies (Ike)

AMNZ spec.

Rangitoto

AMNZ spec.

Motutapu

AMNZ spec.

Waiheke

AMNZ spec.

Ponui

AMNZ spec.

Motukahaua (W. coast

AMNZ spec.

Coromandel)

Rurima Rocks

AMNZ spec.

<i>Philanisus plebeius</i>	Three Kings (Great)	Wise 1958 AMNZ spec.
	Moturoa (Whale)	MacDonald 1977 AMNZ spec.
	Urupukapuka (Bay of Islands)	AMNZ spec.
	Moturoa (Bay of Islands)	AMNZ spec.
	Poor Knights (Tawhiti Rahi)	AMNZ spec.
	(Aorangi)	NZAC spec.
	Hen & Chickens	Wise 1965
	Goat	AMNZ spec.
	Little Barrier	Wise 1956, 1958 AMNZ spec.
	Great Barrier	AMNZ spec.
	Cuvier	AMNZ spec.
	Noisies (Otata)	AMNZ spec.
	(Maria)	AMNZ spec.
	Rangitoto	Cowley 1978
	Motutapu	Cowley 1978 AMNZ spec.
	Rotoroa	AMNZ spec.
	Ponui	AMNZ spec.
	Motukahaua (W. coast Coromandel)	AMNZ spec.
	Mercury (Great (Red)	AMNZ spec. Johannesson 1972
	Mayor	AMNZ spec.
	White	Wise 1970 AMNZ spec.
	Rurima Rocks	AMNZ spec.
<i>Philanisus</i> sp.	Urupukapuka (Bay of Islands)	Hayward, Grace & Brook 1981
Family Helicopsychidae		
<i>Helicopsyche zealandica</i>	Mercury (Great (Red)	Cowley 1978 Watson 1972 (as albescens) Johannesson 1972 (as albescens)
<i>Helicopsyche</i> sp.	Little Barrier	Wise 1956 Winterbourn 1964 AMNZ spec.
Family Leptoceridae		
<i>Triplectides obsoleta</i>	Cuvier	
	Little Barrier	Wise 1956 Winterbourn 1964
	Mercury (Great)	Cowley 1978

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