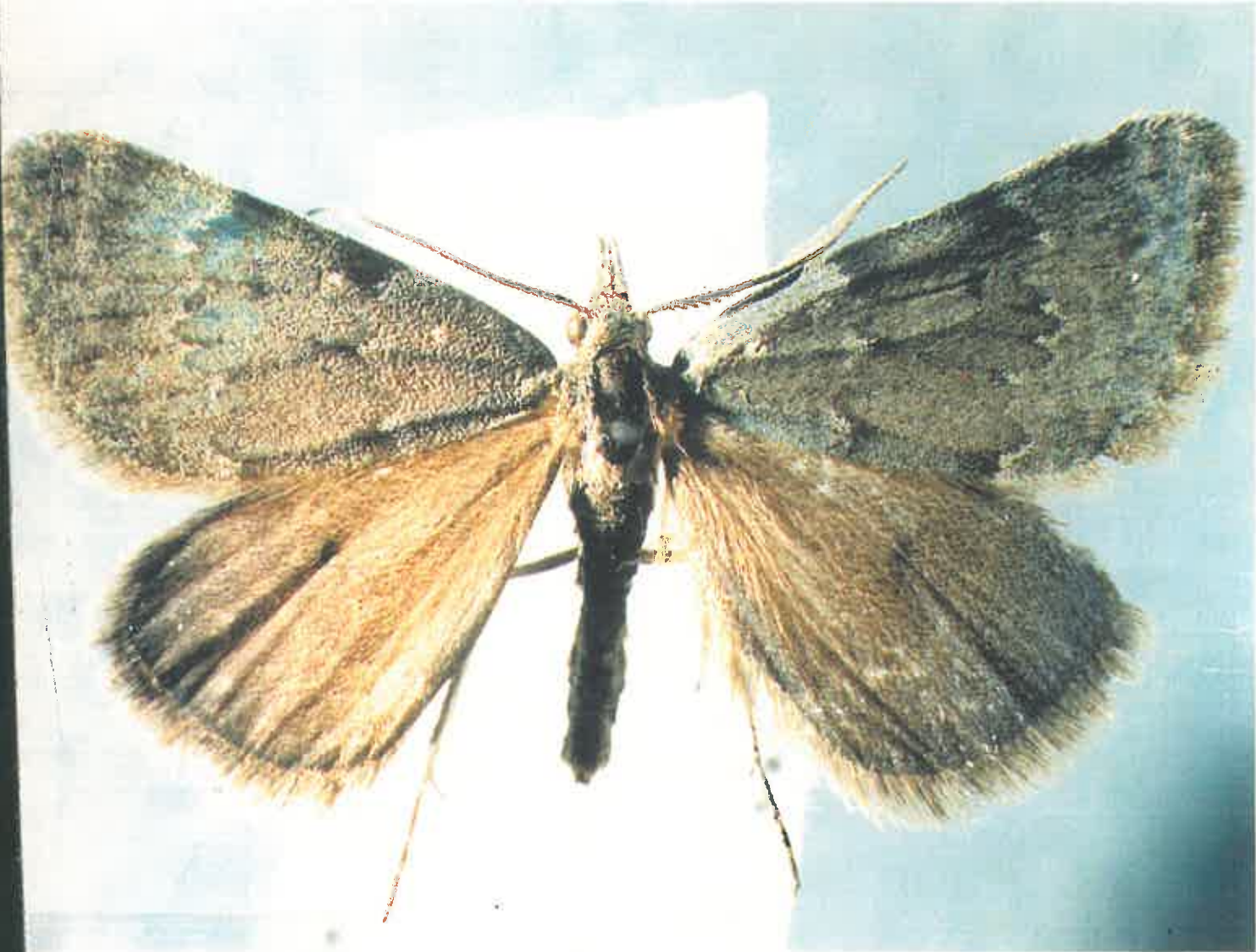




# Cloudy Bay Coastal Habitats

Entomological Values of the Foreshore  
and Associated Inland Habitats

Nelson August 2001



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Cover photo : *Dicbromodes* sp. A new species of moth  
from Cloudy Bay foreshore, found during this survey.

All photographs I Millar

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# Cloudy Bay Coastal Habitats

Entomological Values of the Foreshore and Associated Inland Habitats

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(Research Associate, Manaaki Whenua - Landcare Research NZ Ltd)

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# Summary

From October 1998 to March 1999, three areas were surveyed along Cloudy Bay: the Rarangi Foreshore (the immediate coastal strip with the inner and outer off-road vehicle tracks), Area A, a lens of low forest over a bog in an inter-ridge hollow about 150m west of Trig KK, and Area B, in a much longer and wetter hollow stretching for nearly 2km from the Wairau diversion in the direction of the east-west portion of Rarangi road. Beating and sweeping visits were made to the tauhinu community on Wairau Bar. A malaise trap (to catch flying insects) was set up in shrubby forest at area B, along with lizard-proof pitfall traps (for ground-dwelling insects). At area A, light-trapping was done at each monthly visit by JSD and IRM; on one occasion the landowner also visited. Beating, sweeping and hand-collecting were done at all areas and pitfall traps were also installed at the Rarangi foreshore site.

A total of 167 Lepidoptera species were found, 36 of which were found on the foreshore. Seven of these (listed below) are either endemic to Cloudy Bay or not previously known from there. These seven species were found only on the foreshore, and are highly specific either to a site (habitat) or a specific foodplant. They are (endemics marked with an asterisk):

- boulder copper (*Antipodalycaena boldenarum*), with larvae feeding on the shore *Muehlenbeckia*, *M. ephedroides* [new locality record, new host record];
- \*stone moth *Dichromodes* sp. nr *sphaeriata* [new species, new locality, new habitat niche];
- pimelea leafroller, *Ericodesma* sp. cf *aerodana* [new locality, probably new species, also known from Birdlings Flat];
- open-country moss moth, *Gadira leucophthalma* [extension of range, at Cloudy Bay only seen on foreshore];
- \*Cloudy Bay mat daisy jumper, *Kiwaia* sp. cf. *jeanae* [new species, taking on the role of the Birdlings Flat mat daisy jumper; but morphologically distinct];
- pimelea looper, *Notoreas* sp., cf "Cape Campbell" population [new record, new population, undescribed; differs from Birdlings Flat population]
- hard/sand tussock grassmoth *Orocrambus callirrhous* [new locality record; host sand tussock *Austrofestuca littoralis* threatened].

The most important at-risk species are the two that are endemic to Cloudy Bay:

1. The Cloudy Bay mat daisy jumper, which so far is only known from disturbed *Raoulia* pads between the outer (seaward) off-road vehicle track and HWS (highwater spring). A delicate balance will need to be kept between usage and abuse; monitoring adult populations is necessary to see effects of each year's vehicle use.
2. The stone moth, which differs from all other New Zealand species in the genus in its association with lichen encrusted shingle beds. Such shingle beds are likely to be at risk of being "mined" for roading or other uses.

# Introduction

The coastal area of the Wairau Plains is an area of possible contention between conservation and development interests. There are conflicting views regarding land-use, and coastal reserve "amelioration". This rather featureless, bleak landscape, while overpoweringly, if sparsely, clad in exotic plants from herbs to trees, has communities of indigenous plants, most of which are known to support specialist groups of insects elsewhere. In an attempt to refine information on some of the conservation values, the Department of Conservation contracted me to survey for entomological values, particularly, because of my background, those relating to Lepidoptera.

The immediate purpose of this report is to interpret the fauna of Lepidoptera, and some other insects, that were found during this survey, and to suggest any courses of action that might serve to either protect or enhance populations considered to be at risk. It has to be kept in mind that Cloudy Bay (including Wairau Bar) has been modified by man since the advent of the moa-hunters.

There are many features of the Cloudy Bay coastline that superficially resemble Kaitorete Spit (Birdlings Flat) immediately south of Banks Peninsula. Similarly exposed to the east, similarly with a steeply dipping pebbly storm beach and with similar vegetation growth forms arranged in parallel strips marking successive shorelines (Patrick 1994), it would be interesting to compare the Lepidoptera fauna of each. Such a comparison will be reported on later.

The survey extended from October 1998 to March 1999, and involved monthly visits by myself and Ian R. Millar (DOC, Nelson), and fortnightly (roughly) servicing of pit traps in two areas and a malaise trap at one site. Trap servicing was organised by Jan Clayton-Greene, and done by Messrs John Baxter and Bill Warner (DOC Renwick), to all of whom Ian Millar and I are most grateful. Land-owner consent for work at Areas A and B, and in one instance, participation, at Area A, in night collecting, was smoothly organised by Jan Clayton-Greene.

## Description of Sites

The Cloudy Bay area is the coastal strip from Rarangi settlement at the north to the mouth of the Wairau River at Wairau Bar (Fig. 1). It can be thought of as a series of parallel strips. From the sea, there is a strip of storm beach; beyond spring highwater (HWS), there is a rather disturbed area (storms) which (north of the Wairau diversion) is bounded inland by an off-road vehicle track. Inland of this is a relatively flat and undisturbed (but weedy) strip bounded by an "inland" vehicle track and by the boundary fence which largely follows the first major old shoreline. Collectively, we called this the "Rarangi Foreshore"

It includes two beach lines, the youngest (current) beach, and the next youngest at about the boundary fence. It excludes the older beach lines west of the fence line, which are all now in private ownership. These successively older beach fronts are distinguished as parallel ridges of coarse shingle, supporting a distinctive, linear community of deep-rooted endemic shrubs (*Coprosma*, *Discaria*, *Melicytus* [*Hymenanthera*]), and the scrambling liane, *Muehlenbeckia complexa*. There are also lenses of exposed coarse shingle, most of which are coated with crustose lichens. Between the third and fourth parallel ridge, and about 150m W of Trig KK (grid reference: P28 963 759) there is a strip bog/wetland with a low forest of cabbage trees, manuka and tall *Coprosma* on it, which supports a flourishing community of mistletoe. A very long and extensive wet shrubland is present between the fifth and sixth parallel ridges, with permanent water, extensive flax fields and currently dominated by barberry and willow. There are vigorous borders of cabbage trees, *Coprosma*, *Pittosporum*, *Muehlenbeckia* (two species) but mistletoes are absent. On the sixth parallel ridge there is a vigorous shrubbery of *Discaria*, *Coprosma*, *Leptospermum*, *Melicytus*, and *Muehlenbeckia complexa*.

**Area A** (Figs 1, 2): Immediately W of Trig KK, this is a N-S line of tall shrubland enclosing a wetland. The interior is dark and the floor is largely unvegetated under the tallest/densest trees. The trees are cabbage tree, manuka and some kanuka, *Pittosporum tenuifolium*, with *Coprosma crassifolium* forming a relatively hedged margin, supporting a large community of the mistletoe *Ileostylus micranthus* and the climber *Muehlenbeckia complexa* (Fig. 2A). In the wetter areas that have been opened up, there are *Carex* spp., *Juncus* spp., and occasional patches of a large-leaved *Hydrocotyle* (Apiaceae). There is little barberry. To the east, the ground is covered in introduced pasture grasses and weeds, with scattered prostrate wild irishman (*Discaria toumatou* var. "prostrate") and *Melicytus* (*Hymenanthera*) *alpinus* s.s.). To the west, a shingle ridge some 50m away from the forested belt, across poor adventive pasture and *Racomitrium* moss, has bare shingle with lichens, *Coprosma crassifolium*, *Melicytus alpinus* s.s., *Muehlenbeckia complexa* and occasional briar rose (Fig. 2B). Some of this area was burnt on 13-14 February, 1999. Only limited sampling was undertaken on the shingle ridge. The major feature of Area A is the presence of extremely vigorous and abundant mistletoe (*Ileostylus macranthus*). No native nettle was seen (cf. Area B).

Site of light trap collecting, and daytime sweeping and larval collections. Grid reference: P28 961 759.

**Area B** (Figs. 1, 3): The longer and wider wetland forest line, and more specifically the wetland forest/shrubland N of the newly created road/causeway that bisects the original belt. This area encloses a deep flax (*Phormium*) swamp, fringed by cabbage trees, *Pittosporum*, *Muehlenbeckia* and adventive barberry, willow (abundant) and scattered large *Pinus radiata*. The exotic liane, old man's beard, is extremely common. Around the malaise trap/pitfall trap site on the western side of this belt, and about 200m N of the new roadway, there are cabbage trees, willows, tall manuka, a large old man's beard vine, and hedged *Pittosporum*, *Coprosma crassifolia* and *Muehlenbeckia complexa*, with, in Spring, a luxuriant stand of the rare swamp nettle, *Urtica linearifolia*. The whole site is in a moist hollow, bordered by a shrubland emergent from introduced grasses, of *Melicytus alpinus* s.s., erect *Discaria toumatou*, *Coprosma crassifolia*, briar rose, bramble, and the occasional barberry, marking one of the parallel shingle ridges. The path to the site traverses four more or less bare shingle areas. In Spring, the grassland area is covered in "wildflower" flowers.



FIG. 3: AREA B



Fig. 3A: Ridge and hollow vegetation at Area B, adjacent to wetland.



Fig. 3B: Willow-dominated wetland, south of Area B. The causeway through this wetland was made of shingle recovered from quarrying on adjacent shingle ridge.



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### FIG. 4: RARANGI FORESHORE



Fig. 4A: View of foreshore area looking north. Rarangi beach settlement in distance.

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Fig. 4B: *Pimelea urvilleana*, host plant for *Ericodesma* sp. of *aerodana* and *Notoreas* sp. "Cape Campbell". The stones, with light lichen encrustation, provide habitat for the stone moth *Dichromodes* sp.

Fig. 4C: Mat daisy pads of an undescribed species of *Raoulia*. These appear to be the major habitat for the Clódy Bay mat daisy jumper, *Kiwata* sp.



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# Results

## 1. LOCAL ENDEMIC SPECIES OR POPULATIONS

All species thought to be endemic, or with populations different in structure or colour pattern from others, are found only on the foreshore. They are:

### 1.1 *Antipodalycaena*\* *boldenarum* (White), Lepidoptera: Lycaenidae. [Boulder Copper, Boulder Butterfly] (Figs 5A, 5B)

[\*This name may supersede *Boldenia* (B.H. & H. Patrick, *in litt.*)]

The Boulder Copper is generally associated with inland and upland riverbeds and shingle or rubble areas where its major host, *Muehlenbeckia axillaris* grows. Gibbs (1980: 155- 160) gives a most useful account of its biology and distribution (as '*Lycaena*' *boldenarum*), and notes that another host is *Rumex flexuosus*, and that in captivity the caterpillar "can be induced to feed on the other" [unspecified] "species of *Muehlenbeckia*." (Gibbs 1980:159). While its South Island distribution is less restricted than in the North (Gibbs 1980:155, fig. 53), it has not been reported coastally in Cloudy Bay before. At Kaitorete Spit, Patrick (1994: 56) records the Boulder Copper as "very common", and under "Ecology, Biology" he states: "widespread, larvae on *Muehlenbeckia axillaris*". There is no *M. axillaris* on the foreshore of Cloudy Bay (and probably not at Kaitorete Spit), but at both localities there are extensive communities of *M. ephedroides* with which the adult butterflies are now known (at Cloudy Bay) to be associated. Referring to populations on *M. axillaris*, Gibbs (1980:157) states that the butterfly does not fly far from the larval foodplant, "usually no more than about 10 metres"; this was found to be the case also at Cloudy Bay.

The Cloudy Bay population, and probably that at Kaitorete Spit as well, is associated with the extensive communities of *M. ephedroides*, in the absence of *M. axillaris*. A collection in October yielded at least one caterpillar and one hatched egg., and last instar larvae were found on November 12 at the Wairau Bar, about 2km S of the Wairau Diversion (GR P28 960722). In the laboratory, one larva pupated just under the surface of the deep layer of grit in the bottom of the container. Larval and pupal colour patterns agree well with the illustrations in Gibbs (1980). While many adults were seen over October 13/14, few were seen in November, December and January; none were seen in February.

It should be noted that Brian Patrick considers this population to represent a distinctive entity within the genus *Antipodalycaena*, at present being revised by Brian and Dr Robin Crow, Otago Museum.

### 1.2 *Dichromodes* sp. cf. *sphaeriata* Felder & Rogenhofer, Lepidoptera: Geometridae [Stone Moth] (Fig. 5C)

This entity was totally unexpected as members of *Dichromodes* in New Zealand are only known to be associated with rock faces, bluffs, tors and rock fields where the larvae browse crustose lichens. Until the discovery of the Cloudy Bay population, stable, lichen-encrusted shingle fields were not considered as a possible *Dichromodes* habitat by collectors. One adult was collected in a pit trap in December, but most adults were collected in late February. Only three females were collected, all fully winged.

Only two individuals were collected in the daytime, with all other specimens attracted to UV light.

The Cloudy Bay population differs from all known *D. sphaeriata* populations (the only other entity with elongated labial palpi) in its peppering of whitish scales on the dark stone-grey forewings, and consistently smaller size; all others have these scales yellow. At present because of these differences, and the "unusual" habitat, this population is regarded as a Cloudy Bay endemic.

1.3 *Ericodesma* sp. cf. *aerodana* (Meyrick), Lepidoptera:  
Tortricidae [*Pimelea leafroller*] (Fig. 5D)

This small grey moth is a member of a group that are specialists on [restricted to] *Pimelea* species in coastal, lowland to upland open [non-forest] situations in the North Island, and coastal *Pimelea* communities in the South Island. All species and species groups in this genus are specialists on certain plants, with species restricted to *Gleichenia dicarpa* (2), *Dracophyllum* spp. (3), *Leucopogon fasciculatus* (1), *Corokia cotoneaster* (1), and *Pimelea* spp. (1). The taxonomic status of the Cloudy Bay and Kaitorete spit foreshore populations vis-a-vis those in North Island coastal and inland (frostflat) sites is uncertain but they can be distinguished from the North island species by their lack, on the forewing, of the orange scales that characterize *E. aerodana*.

In the South Island this species is known from Kaitorete Spit (Birdlings Flat), Canterbury Conservancy (as *Ericodesma aerodana* (Meyrick), Patrick 1994: 55). Its presence on *Pimelea* communities at Farewell Spit is unknown; larvae collected at Punakaiki off *Pimelea prostrata* growing on coastal cliffs yielded only the distantly related *Merophyas leucaniana* (Walker).

It is absent from the Chatham Islands, despite the presence there of large communities of *Pimelea arenaria*, and of two other *Ericodesma* species on the bog-fern *Gleichenia dicarpa* and *Dracophyllum arboreum*, respectively.

Larvae web two shoots together, or web a series of leaves on a stem. Damage is easily seen in September, when middle-to-fully grown larvae, pupae and some adults can be found. Adults disturbed from the *Pimelea* mat will struggle back to the plant against the wind.

The fortunes of the population on Cloudy Bay foreshore are ineluctably fused with those of its hostplant, *Pimelea urvilleana*. Existence of other populations of herbivore and host on shingle beaches in Marlborough south of Cloudy Bay cannot be discounted.

1.4 *Gadira leucophthalma* (Meyrick), Lepidoptera: Crambidae  
[Beaked moss moth] (Fig. 6A)

This little-known species with very long labial palpi is highly variable for colour pattern and size in both sexes at Cloudy Bay. Adults were most abundantly encountered in the areas of bristle-grass plus moss carpet, inland of the coastal vehicle track. Females were variable for relative wing length, with some showing slight brachyptery. This species appears confined to the current beach terrace, as it was not encountered at the more inland sites, Areas A and B. A few individuals were collected to UV light, but most were seen readily flying by day. Larvae are thought to be moss feeders; areas where we encountered this species had extensive moss carpets or these were nearby.

*dalycaena*  
the boulder



Engenhofer,  
scale in mm).





FIG. 6: SOME LEPIDOPTERA OF THE  
FORESHORE



Fig. 6A: *Gadira leucophthalma*, the beaked moss moth.



Fig. 6C (above): Caterpillar of *Notoreas* sp.



Fig. 6B (right): *Kiwata* sp., the mat daisy jumper. Body length c. 5mm. Note the short, fringed hind wings, still folded on the abdomen.



Fig. 6D: *Notoreas* sp. "Cape Campbell", the pimalea looper. Male (top left) and 2 females (scale in mm).

FIG. 7: SOME MOTHS AND A STILETTO FLY



Fig. 7A: *Orocrambus callirrhous* (Meyrick), the hard tussock and sand tussock grass moth (scale in mm).



Fig. 7B: *Morova subfasciata* Walker, a stem-galler, here on *Muehlenbeckia complexa*.



Fig. 7C: *Anabarhynchus arenarius* Lyneborg, a stiletto fly.

2.3 *Mecodema oblongum* (Broun), and *Megadromus compressus* Broun, Coleoptera: Carabidae. Predatory groundbeetles (Figs 8A, 8B)

One specimen each of these large (>15mm body length) species, otherwise known from forested areas in the hills around Picton, were collected, *M. oblongum* in a pitfall trap on the Rarangi foreshore, 4km (at least) south from any forested or hilly area, and *M. compressus* at Area B. For *M. oblongum*, presence of this species is regarded as an unusual event, but for *M. compressus*, presence may be relictual. We are indebted to J.I. Townsend for confirming the identities.

2.4 *Mimopeus* sp., cf *clarkei* Watt, *M. neglectus* Watt, Coleoptera: Tenebrionidae. Darkling beetles (Fig. 8C)

While a small coastal species of *Mimopeus* on the foreshore (*M. neglectus* Watt, 1989) was expected, the presence of a large species in the wet shrublands was a surprise. Three specimens were caught in pitfall traps in Area B. The identity of this large (17mm body length), somewhat rugose dark grey darkling beetle has not yet been established, but it resembles *M. clarkei* in Watt's (1992) key and specimens in the New Zealand Arthropod Collection, Mt Albert, Auckland. The genus *Mimopeus* is flightless, and the presence of this large species at Area B indicates that at least tall shrubland has been there for a considerable time. Unlike the majority of the shrubs or trees, it could not have been spread by birds, but could have been deposited nearby by floods that would bring debris and beetles from Boundary Stream, the only Wairau Valley locality it was known from (Watt 1989). Its distribution northwards to the more extensive wet shrubland and the forest at the foot of the hills is unknown.

## Discussion

Brian Patrick (*in litt.*) noted that the Cloudy Bay area was rather rich, as he and his son had collected 34 species of Lepidoptera. In all the whole survey yielded 167 Lepidoptera species, representing 18 families. This compares with Kaitorete Spit, which yielded 130 species, with a much larger representation of Oecophoridae and Psychidae in the shrubland at Kaitorete, as well as presence of species restricted to *Carmichaelia* (absent from Cloudy Bay). Of the 167, two are vagrants, 20 are adventive or introduced species, and 145 are endemic (133) or indigenous (12) to New Zealand, with two local endemic species. Kaitorete Spit is comparable (130 total, two vagrant, three adventive, 126 indigenous/endemic to New Zealand including six local endemic species; Patrick, 1994). The larger number of local endemics at Kaitorete Spit is in part influenced by either hostplants absent from Cloudy Bay or more extensive shrublands with more complex niches for such groups as Oecophoridae and Psychidae, two families prone to local endemism.



FIG. 8: SOME BEETLES FROM THE STUDY



Fig. 8A: *Mecedema oblongum* (Brown).



Fig. 8B: *Megadromus compressus* (Brown).



Fig. 8C: *Mimopeus* sp. cf. *clarkei* Watt.

Note:

All scales in mm.

Extrusion of organs from the posterior end is an artefact of collection in Galts preservative.

# Appendix

## LIST OF LEPIDOPTERA SPP, CLOUDY BAY, OCT 1998 - MARCH 1999

### Arctiidae (1):

*Nyctemera annulata* (Boisduval). Adventive/indigenous  
Senecioinae (Asteraceae). Foreshore

### Batrachedridae (2):

*Batrachedra agaura* Meyrick. Scale insect predator. Shrubland B.

*Batrachedra litterata* Philpott. Probably dying plant parts. Foreshore

### Carposinidae (2):

*Heterocrossa rubophaga* Dugdale. Blackberry, lawyer. Shrubland A,B

*Heterocrossa sp.?* Shrubland B

### Choreutidae (1):

*Tebenna micalis* (Mann). *Raoulia* and adventive Asteraceae. Foreshore

### Cosmopterigidae (1):

*Pyroderces apparitella* (Walker). Dead branches/twigs. Shrubland A, B

### Crambidae (28):

*Achyra affinitalis* (Lederer). Field Fabaceae; (also reported elsewhere on thistles). All sites

*Deana hybreasalis* (Walker). Ranunculaceae; here *Clematis vitalba*. Shrubland B

*Eudonia chalara* (Meyrick). ?Mosses. BHP

*Eudonia cymatias* (Meyrick). Mosses. All sites

*Eudonia dinodes* (Meyrick). Mosses, on ?trunks. Shrubland A, B

*Eudonia leptalaea* (Meyrick). Mosses, low tussocks. All sites

*Eudonia octophora* (Meyrick). Swards; here, in rush areas. BHP Foreshore

*Eudonia philerga* (Meyrick). Mosses. Shrublands A, B

*Eudonia sabulosella* (Walker). Pasture sward. All sites

*Eudonia sp. cf. submarginalis* (Walker). ?Swards Shrubland A

*Eudonia submarginalis* (Walker). Swards. All sites

*Eudonia steropaea* (Meyrick). Mosses in dry open sites. Shrubland B

*Gadira acerella* Walker ?Mosses. Shrubland A, B

*Gadira leucophthalma* (Meyrick). ?Mosses, open sites. Foreshore

*Hygraula nitens* (Butler). Aquatic Shrubland B

ore	<i>Declana leptomera</i> (Walker). Polyphagous, shrubs, trees.	Shrubland A, B
ands A, B	<i>Dichromodes sp cf. sphaeriata</i> (F&R). Crustose lichens	Foreshore
ore	<i>Epicyme rubropunctaria</i> (Doubleday). <i>Geranium, Haloragis.</i>	Shrubland A
s	<i>Epiphryne verriculata</i> (F&R). <i>Cordyline australis.</i>	Shrubland A, B
and B	<i>Epyaxa lucidata</i> (Walker). Polyphagous, herbs.	Shrubland A
hore	<i>Epyaxa rosearia</i> (Doubleday). Polyphagous, herbs.	All sites
and A, B	<i>Epyaxa venipunctata</i> (Walker). Polyphagous, herbs.	All sites
hore	<i>Gellonia dejectaria</i> (Walker). Polyphagous, trees, shrubs.	Shrubland B
ands A, B	<i>Helastia cinerearia</i> (Doubleday). ?Mosses.	Shrubland B
and A, B	<i>Helastia corcularia</i> (Guenée) ?Moss.	Shrubland A
ore	<i>Homodotis megaspilata</i> (Walker). Litter in forest.	Shrubland A,B
and A, B	<i>Notoreas sp.</i> "Cape Campbell". <i>Pimelea</i> foliage, flowers	Foreshore
ore	<i>Pasiphila sandycias</i> (Meyrick). <i>Coprosma</i> flowers	Shrubland A, B
	<i>Phrissogonus laticostatus</i> (Walker). Flowers.	All sites
and B	<i>Poecilasthena schistaria</i> (Walker) ?Kanuka.	Shrubland A, B
	<i>Poecilasthena subpurpureata</i> (Walker). Manuka, kanuka.	Shrubland A, B
and B	<i>Pseudocoremia indistincta</i> Butler. <i>Muehlenbeckia complexa</i> foliage.	Shrubland A,B
and A, B	<i>Pseudocoremia leucelaea</i> (Meyrick). Conifer foliage.	Shrubland B
ore	<i>Pseudocoremia lupinata</i> (F&R). Kanuka.	Shrubland B
	<i>Pseudocoremia productata</i> (Walker). Polyphagous, trees, shrubs.	Shrubland A
and B	<i>Pseudocoremia suavis</i> Butler. Polyphagous, trees/shrubs.	Shrubland A, B
and A	<i>Scopula rubraria</i> (Doubleday). Plantains.	All sites
ore	<i>Xyridacma ustaria</i> (Walker). <i>Pittosporum.</i>	Shrubland B
es	<i>Zermizinga indocilisaria</i> Walker. Polyphagous ( <i>Discaria, Lupinus, Pimelea, Ozothamnus</i> )	Foreshore
	<b>Glyphipterigidae (2):</b>	
ore	<i>Glyphipterix scintellella</i> Walker. Miner in sedge tillers.	Shrubland B
and A, B	<i>Glyphipterix tungella</i> F&R. Miner in small sedges.	Shrubland A,B
ore	<b>Gracillaridae (1):</b>	
ands A, B	<i>Dialectica scalariella</i> Zeller. Echium miner.	All sites
ands A, B	<b>Hepialidae (2):</b>	
es	<i>Wiseana copularis</i> (Meyrick). Damp soil porina.	Shrubland A, B
land A, B	<i>Wiseana signata</i> (Walker). Sandy soil porina.	Shrubland A
land A, B	<b>Lecithoceridae (1):</b>	
land A, B	<i>Lecithocera micromela</i> Lower. Pasture litter.	Shrubland A, B

Shrubland A, B	<i>Gymnobathra sarcoxantha</i> Meyrick. Litter, case-bearer.	Shrubland B
	<i>Gymnobathra tholodella</i> Meyrick. Litter, case-bearer.	Shrubland A, B
	<i>Izatha picarella</i> (Walker). Dead wood.	Shrubland A, B
	<i>Izatha convulsella</i> (Walker). Dead wood.	Shrubland A, B
	<i>Leptocroca</i> "grey". Litter.	Shrubland A, B
	<i>Leptocroca</i> "big". Litter.	Shrubland A, B
	<i>Leptocroca</i> "pink" Litter.	Shrubland B
	<i>Phaeosaces apocrypta</i> Meyrick. Lichen feeder.	Shrubland A, B
	<i>Phaeosaces coarctatella</i> (Walker). Lichen feeder.	Shrubland A, B
	<i>Stathmopoda coracodes</i> Meyrick. Scale insect predator.	Shrubland A, B
	<i>Stathmopoda skelloni</i> (Butler). Dying plant parts, arboreal.	Shrubland A, B
	<i>Tingena actinias</i> (Meyrick). Litter.	Shrubland A, B
	<i>Tingena</i> "basella group". Litter.	Shrubland B
	<i>Tingena chloradelpha</i> (Meyrick). Litter.	Shrubland A, B
	<i>Tingena melanamma</i> (Meyrick). Litter.	All sites
	<i>Trachypepla conspicuella</i> (Walker) ?Litter.	Shrubland A, B
	<i>Trachypepla euryleucota</i> Meyrick; ?Litter. BHP record.	Shrublands
	<b>Psychidae (1):</b>	
	<i>Scoriodyta</i> sp. Micro-bagmoth on algae on tree trunks.	Shrubland A, B
	<b>Pieridae (1):</b>	
	<i>Pieris rapae</i> (Linnaeus). Adventive. Brassicaceae.	All sites
	<b>Plutellidae (1):</b>	
	<i>Plutella xylostella</i> (Linnaeus). Possibly indigenous. Brassicaceae	All sites
	<b>Pterophoridae (2):</b>	
	<i>Pterophorus furcatalis</i> (Walker). <i>Pittosporum</i> foliage.	Shrubland A, B
	<i>Pterophorus innotatalis</i> Walker. Convolvulaceae.	Foreshore
	<b>Pyralidae (3):</b>	
	<i>Crocydopora cinigerella</i> (Walker). Possibly indigenous.	
	Open sites.	Foreshore
	? <i>Cryptoblabe</i> sp. Adventive; possibly domestic. Only one recorded.	Shrubland A
	<i>Patagoniodes farinaria</i> (Turner). Adventive. Stem-borer, weed Asteraceae.	Foreshore
	<b>Thyrididae (1):</b>	
	<i>Morova subfasciata</i> Walker. Stem-galler, <i>Muehlenbeckia complexa</i> here.	Shrubland A, B

<i>alguritella</i> (Walker). Dead wood.	Shrubland A, B
<i>hasmatias</i> Meyrick. Dead branches.	Shrubland A, B
<i>lella</i> (Newman). Adventive, fur, wool.	All sites
<i>vicapitella</i> (Clemens). Adventive, feathers and	Shrubland A, B
<i>mpitella</i> (Walker). Adventive, dead wood.	Shrubland A, B
<i>toscopa</i> (Meyrick). Adventive, damp litter and wood.	Shrubland A, B
(20):	
<i>aula</i> Walsingham. Stem/tiller borer in Cyperaceae.	Shrubland A, B
<i>ctana</i> (Walker). Adventive, leafyer in perched litter.	All sites
<i>niferana</i> (Walker). Leafyer in litter.	All sites
<i>otinana</i> (Meyrick). Leafminer/tyer on cabbage tree.	Shrubland A, B
<i>jactatana</i> " (Walker). Polyphagous leafyer.	Shrubland A, B
<i>a plebejana</i> Zeller. Adventive, shoot and bud borer,	Foreshore.
<i>is herana</i> (F&R). Polyphagous leafyer.	
<i>stvitana</i> (Walker). Adventive; polyphagous leafyer.	All sites
<i>sp. cf. aerodana</i> (Meyrick). Leafyer on <i>Pimelea</i> .	Foreshore
<i>amplexana</i> (Zeller). Leafyer on shrubs.	Shrubland A, B
"hymenantha". Undescribed leafyer on small-leaved	Shrubland A, B
<i>oblongana</i> (Walker). Leafyer on small-leaved shrubs,	Shrubland A, B
<i>scolia</i> (Meyrick). Leafyer on <i>Muehlenbeckia</i> ,	Shrubland A
<i>sisyrana</i> Meyrick. Leafyer on tauhinu.	Foreshore
<i>pherana</i> (Meyrick). Leafyer on kanuka.	Shrubland A, B
<i>divulsana</i> (Walker). Leafyer on Fabaceae herbs.	Foreshore
<i>leucaniana</i> (Walker). Leafyer on herbs, mat plants.	Foreshore
<i>x notophaea</i> (Turner). Leafyer on hard, narrow- s, shrubs.	Shrubland A, B
<i>x octo</i> Dugdale. Leafyer on broadleaved trees, shrubs.	Shrubland A, B
<i>es ejectana</i> (Walker). Leafyer on Myrtaceae.	Shrubland A, B
idae (1):	
<i>tenota</i> (Meyrick). Leaf-miner/tyer on mistletoes.	Shrubland A