Journal of the Royal Society of New Zealand

ISSN: 0303-6758 (Print) 1175-8899 (Online) Journal homepage: http://www.tandfonline.com/loi/tnzr20

Ecological studies of a marine terrace sequence in the Waitutu Ecological District of southern New Zealand. Part 4: Insecta: Lepidoptera and Coleoptera

B. H. Patrick

To cite this article: B. H. Patrick (1988) Ecological studies of a marine terrace sequence in the Waitutu Ecological District of southern New Zealand. Part 4: Insecta: Lepidoptera and Coleoptera, Journal of the Royal Society of New Zealand, 18:1, 85-88, DOI: 10.1080/03036758.1988.10421695

To link to this article: http://dx.doi.org/10.1080/03036758.1988.10421695

© *Journal of the Royal Society of New Zealand*
Volume 18, Number 1, 1988, pp. 85-88

Ecological studies of a marine terrace sequence in the Waitutu Ecological District of southern New Zealand. Part 4: Insecta: Lepidoptera and Coleoptera

B. H. Patrick*

The very small portion of the fauna sampled shows no indication of an ancient element. In fact most species encountered are rather widespread, except, for example, the impressive stag bettle *Dorcus philpotti*, which elsewhere is known only from southern Fiordland to the west of Hump Ridge. The low number of species in the bog areas is also notable since in the eastern South Island this habitat has a rich moth fauna. The faucity of understorey plant species palatable to deer is likely to have depleted the variety and viability of moths in forest habitats.

Keywords: Insecta, Lepidoptera, Coleoptera, marine terrace sequence, Waitutu Ecological District.

INTRODUCTION

In the course of an ecological survey the marine terrace sequence at Waitutu (Mark *et al.*, 1987), separate studies were made of two major groups of insects. During the week-long survey (12-19 May 1985) the multi-disciplinary party moved from terrace 10 at 640 metres above sea-level down to terrace 1 at sea-level (refer to map in Mark *et al.*, 1987, Fig. 1, for sampling sites). The appropriate sampling was performed by the team members at successive terraces as they were located by the team geologist. The object was to find out if an ancient element existed in these invertebrate groups that would predate the last glaciation in southern Fiordland.

METHODS

All Coleoptera specimens and most Lepidoptera were collected by hand in the day-time. Pit-fall traps were not employed, as sites were not revisited and the cool weather encountered prevented night collecting. On each terrace adjacent to the vegetation sampling sites (see Mark *et al.*, 1988, Fig. 1) the plant species present were sampled for Lepidoptera larvae by beating or careful searching for larval damage. Several of the larvae were collected and subsequently reared. All specimens collected or reared are stored in the private collections of the author and Dr Barbara Barratt, Ministry of Agriculture and Fisheries, Mosgiel.

RESULTS

The following is a brief account of the collections made on each of the terraces.

Terrace 10, 640 metres

The moths *Pseudocoremia fenerata* (Felder and Rogenhofer) with larvae on miro (*Prumnopitys ferruginea*) or matai (*P. taxifolia*), and the polyphagous *Pseudocoremia suavis* Butler, were found as adults. Both are widespread throughout New Zealand. *Orthenches porphyritis* Meyrick and an undescribed but known species of *Orthenches* were both found here. The larvae of the former feed on Hall's totara (*Podocarpus hallii*) and the latter on pink pine (*Halocarpus biformis*). On this terrace the larvae of a possibly local endemic moth were found—*Proteodes* nsp. (Fig. 1). The larvae, which bind together the leaf tips of *Cyathodes juniperina*, were recorded down to Terrace 3.

Beetles included the carabids *Neofernia procerula* (Broun) which is widespread in the

* Department of Conservation, P.O. Box 1615, Dunedin

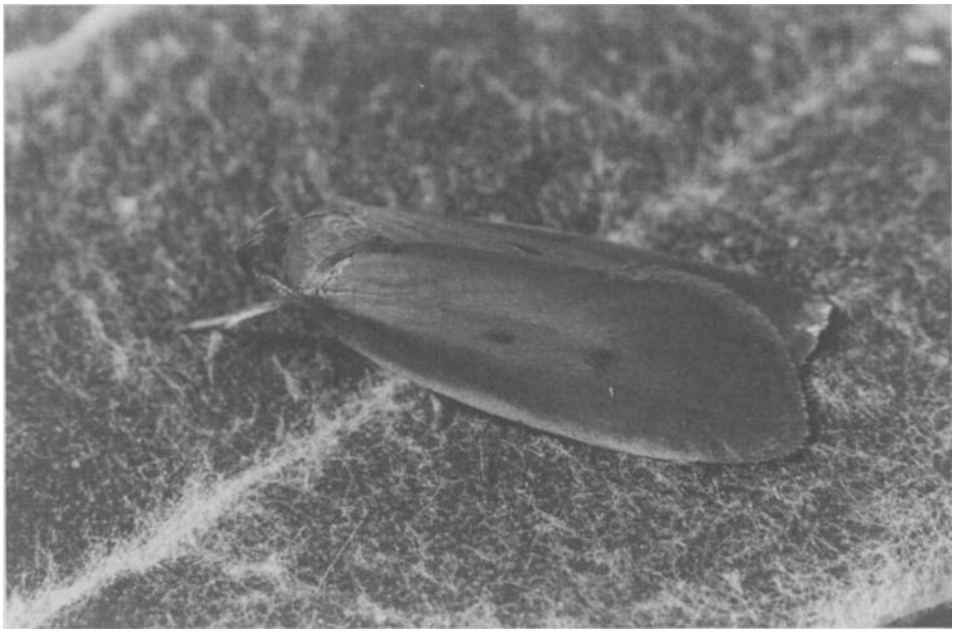

Fig. 1—An adult moth of the genus Proteodes, first discovered during the survey and apparently restricted to the Waitutu Ecological District.

southern South Island, and *Amaurotypus edwardsi* Bates, a species inhabiting moss, also known from Stewart Island.

Terrace 9, 570 metres

Both the beetles listed above also occurred here, with the tortricid moths *Strepsicrates zopherana* Meyrick on manuka (*Leptospermum scoparium*) and *Catamacta alopecana* Meyrick on celery pine (*Phyllocladus aspleniifolius* var. *alpinus*). Both species are widespread wherever their host genus is present.

Terrace 8, 460 metres

Pseudocoremia suavis larvae were found on Hall's totara. The larva of *Epichorista emphanes* Meyrick were found on Hall's totara and on mountain beech (*Nothofagus solandri* var. *cliffortioides*). *Archeria traversii* and pokaka (*Elaeocarpus hookerianus*) were being eaten by the ubiquitous tortricid *Ctenopseustis obliquana* Walker, which binds the leaves together and feeds within.

The large stag beetle *Dorcus helmsi* (Sharp), common in many different habitats throughout Fiordland, was present. Other beetles included the carabids *Neoferonia procerula* and *Amaurotypus edwardsi*, as well as *Megadromus sandageri* (Broun), which is distributed in the southern and western South Island. An undescribed species of *Pheloneis* (Tenebrionidae), known to be common throughout Fiordland, was also found here.

Terrace 7, 355 metres

The caterpillars of *Ctenopseustis obliquana* were found on southern rata (*Metrosideros umbellata*) and *Cyathodes juniperina*, in addition to the hosts listed above, while another as yet undetermined species of tortricid was feeding on miro.

A stag beetle with a southern Fiordland distribution, *Dorcus philpotti* (Broun), was an important find on this and lower terraces.

Terrace 6, 300 metres

The striking feature of this terrace was the absence of moss-bog Hepialidae moths, even though potentially suitable habitat was abundant.

The beetles *Dorcus philpotti* and *D. helmsi* were present, and so was *Pheloneis nigritulus* (Broun), a tenebrionid found on many mountain ranges of southern South Island, particularly those that have boggy areas. *Megadromus sandageri* was also present.

Terrace 4, 125 metres

The larvae of *Pseudocoremia suavis* were found on this terrace on both rimu (*Dacrydium cupressinum*) and Hall's totara, while leaves of *Cyathodes juniperina* showed damage caused by larvae of *Proteodes* n. sp. Cases of the ubiquitous bag moth *Liothula omnivora* were found on a variety of hosts including miro, Hall's totara and *Cyathodes*. *Austrocidaria* damage was also noted on various species of small-leaved *Coprosma*. The larvae of *Ctenopseustis obliquana*, and an unknown green geometrid larva, were abundant on *Archeria*.

Beetles found included a Byrrhid species not previously recorded from Fiordland (and possibly new, but the taxonomy of this group is poorly understood). *Dorcus helmsi* and *Catoptes* species (near *custpidatus*) (Broun) were also found here.

Terrace 3, 80 metres

The larvae of the new *Proteodes* species was feeding on *Cyathodes juniperina* as noted on several other terraces.

Terrace 2, 50 metres

On this terrace, and the adjoining alluvial terrace, several moth species were found, either as larvae or leaf mines. The mine of a *Stigmella* species was found on *Dracophyllum longifolium* and was widespread along with its foodplant. The larvae of *Epiphryne charidema* (Meyrick) was also common on *Dracophyllum*.

Terrace 1, sea level to 5 metres

The larva of *Pseudocoremia ampla* (Hudson) was present on *Olearia arborescens*. A significant discovery was of the larvae of *Hydriomena arida* (Butler) feeding on *Gunnera monoica*. The type locality of this moth is Dunedin where it has not been reported for at least 90 years. The identification of its host is of considerable interest; its decline is probably linked to the disappearance of this plant from many forested areas around Dunedin. Also present was an undescribed species of *Stigmella* mining the large leaves of *Brachyglottis rotundifolia*. The larvae of the herb-feeding noctuid moths *Graphania chlorodonta* (Hampson) and *Diarsia intermixta* (Guenee) were also found and bred out. The former is a rare moth in eastern areas but is widespread from Fiordland northwards. The larva of a common pest species *Agrotis ipsilon aneituma* (Walker) was found amongst coastal turf plants. Leaf mines of several species of Gracillarid moths were found on *Coprosma foetidissima, Pseudopanax simplex, P. edgerleyi* and *P. colensoi*. These moths, normally widespread on their hosts, were conspicuously absent from the higher terraces, probably because of the browse-induced scarcity of their hosts.

This terrace was also rich in beetle species, among them an undescribed species of scarabacid. *Odontria* sp., known from Homer, Eglinton Valley, Olivine Range and Manapouri, was recorded here as both larvae and adults under stones amongst a rich coastal turf community. The stage beetle *Dorcus helmsi* was present amongst coastal plants, as was the weevil *Cuneopterus conicus* Sharp, a species common from Fiordland northwards to Greymouth and also present on the Blue Mountains. Two carabids, *Megadromus sandageri* and *Holcaspis impiger* Broun, were found; the latter is widespread in southern South Island areas and has been caught previously in the Preservation Inlet area.

DISCUSSION

Given the limited collecting methods employed, the generally inhospitable weather encountered on the higher terraces, and the seasonal limitation of a week-long trip in

May, it would be impossible to document anything but a small proportion of the area's insect fauna. It is important, however, to characterize the area's fauna, and this was probably achieved by the finding of two key species, both endemic to southern Fiordland. These two species are the previously known stag beetle *Dorcus philpotti*, and a new oecophorid moth species of the genus, *Proteodes* (Lepidoptra: Oecophoridae), discovered during this survey. Its larval host, *Cyathodes juniperina*, is widespread. This distinct new species was bred out from second instar larvae found in abundance on its host. The adult moth probably emerges in the wild in November and December. The genus is interesting in that it contains both forest and alpine species, some with quite local distributions. Five species are named, two of which are restricted to particular regions of Fiordland, plus two unnamed, the present species and an alpine species that has larvae feeding on *Dracophyllum* on Mt Anglem, Stewart Island. Larval food plants in the genus, where known, are either *Nothofagus* (Fagaceae), *Cyathodes* or *Dracophyllum* (Epacridaceae).

By contrast, there was no evidence of any ancient element in the fauna, such as we could have expected to find in the open areas of Terrace 6. Moth species of the family Hepialidae with moss-bog inhabiting larvae can be reasonably taken as indicators of an ancient fauna in New Zealand, because they have generally poor dispersal ability; the females are either bracypterous or reluctant fliers. But careful searching failed to reveal any larval or adult hepialids, despite the presence of suitable habitats. Adults were recorded from many locations in Southland and eastern Otago during the time of this survey.

In fact there was no evidence of any autumn-emerging moths living in the open areas of the higher terraces. Autumn-emerging inhabitants of moss bogs, species include the above mentioned Hepialidae, and litter-feeding Tortricidae. Their absence is unexplained. Perhaps such a fauna never existed in this general area, or it has not recovered quickly enough from the climatic deterioration associated with the last glacial events.

The general lack of variety of forest understorey species, particularly those known to be palatable to deer, probably has had a marked effect on the diversity of moth species at least. Relatively few of these feed exclusively on the podocarps and other co-dominant tree species present in the area.

ACKNOWLEDGEMENTS

Financial contributions from the Otago Branch of the Royal Society of New Zealand, University of Otago Research Fund, J. S. Tennant Bequest Fund, New Zealand Forest Service and the Department of Lands and Survey are gratefully acknowledged. Field assistance was provided by Ian Thorne, Brian Rance and Brent Fagan. A special thanks to Dr Barbara Barratt for the identification of the Coleoptera.

REFERENCES

Mark, A. F., Grealish, G., Ward, C. M. and Wilson, J. B., 1988. Ecological studies of a marine terrace sequence in the Waitutu Ecological District of southern New Zealand. Part 1: The vegetation and soil patterns. *Journal of the Royal Society of N.Z.* 18: 29-58.

Received 7 April 1987; accepted 27 October 1987.