

LAND MOLLUSCA OF SOME OFF-SHORE ISLANDS

By E. N. MILLIGAN

I. LAND MOLLUSCA OF MAYOR ISLAND:

Intensive collecting was carried out in the crater on a visit during November 1955 to add to the data from the previous trip (Tane, 53-54). This area of the island provided molluscs from only one habitat; the underside of rough, vesicular, moss-covered rhyolite stones which formed the floor of the inner crater and occurred in places along the valley behind Te Ananui flat. In the latter locality, as in most of the other moist valley floors, pig-rootings had severely disturbed the stone-free ground. Some leaf mould was collected from a dry locality, to the northern part of Te Ananui flat. This yielded only one species: *Ptychodon tau*. The stony ground in a gully behind Oira Bay was also investigated and a number of molluscs found.

The total number of species recorded is now 24.

Ecologically, species found can be located in three habitats:

(1) Moist, shaded conditions under moss-covered stones in the crater. Four localities investigated provided similar species: (a) The valley behind Te Ananui Flat; (b) below the saddle behind Oira Bay; (c) the crater floor; (d) two western arms of Lake Aroarotamahine and the valley at the northern arm of the Green Lake.

(2) Under stones amongst fallen nikau sheaths in gullies behind Oira and Omapu Bays. A somewhat drier habitat.

(3) Leaf mould in a gully with mixed bush and pohutukawa behind the northern end of Opo Bay and pohutukawa mould on Te Ananui Flat. This habitat was the driest of the three.

Species	Habitats
<i>Hydrocenidae:</i>	
<i>Omphalorissa purchasi</i> (494)	1
<i>Liareidae:</i>	
<i>Liarea egea</i> (572)	1
<i>Cyclophoridae:</i>	
<i>Murdochia pallidum</i> (545)	3
<i>Flammulinidae:</i>	
<i>Allodiscus dimorphus</i> (1504)	1, 2, 3
<i>Serpho kivi</i> (1526)	1, 3
<i>Therasia decidua</i> (1532)	1
<i>Therasiella tamora</i> (1534)	2
<i>Flammulina n.sp. cfchiron</i>	1, 2
<i>F. pilsburyi</i>	2
<i>Charopidae:</i>	
<i>Ptychodon tau</i> (1564)	1, 2, 3
<i>Charopa coma</i> (1588)	1, uncommon
<i>Fectola (Subfectola) caputspinulae</i> (1615)	1
<i>Mocella cogitata</i> (1618)	1, very common
<i>Laomidae:</i>	
<i>Laoma pocillosticta</i> (1635)	3
<i>Phrixynathus conella</i> (1644)	1

<i>P. fulguratus</i>	2
<i>P. glabriasulus</i>	2, 3
<i>Paralaoma lateumbilicata</i> (1680)	1
<i>Elasmatinidae:</i>	
<i>Tornatellinops novoseelandica</i> (1687)	1
<i>Paryphantidae:</i>	
<i>Delos coresia</i> (1735)	1, 2
<i>O. jeffreysiana</i> (1736)?	3?
Note: Figures in parentheses refer to numbers in Powell's checklist.	

II. LAND MOLLUSCA OF MAROTIRI ISLAND:

It was hoped that more information on the distribution of *Rhytida* could be obtained. Only two islands were visited, Marotiri Island and Whakahau Island (Middle Chicken). It appears that fires and cattle have eliminated this genus from these islands. Even the smaller species have suffered. Only a few young nikau palms are present. There are a few loose stones on the ground and much of the bush is *Leptospermum*, providing a very dry leaf mould so that suitable habitats are restricted.

On Whakahau an outcrop of chert provided some heaps of stones, a suitable habitat for some *Mocella cogitata*. For the remainder, broadleaf leaf-mould on the southern valley slopes, and a leafy moss on the main ridge of Marotiri supplied suitable conditions for a limited number of species.

1. There were 14 species in all. By far the most common was *Phrixynathus phrynia* which occurred in all localities. Some indication of habitat preference was shown by the collecting, notably the moisture loving nature of *Mocella*, *Tornatellinops* and *Otococoncha*.

Two empty shells of *Placostylus hongii* were found under pohutukawa. These were quite typical; dimensions 83 mm by 40 mm and 72 mm x 37 mm. Flax cutters have left much of Marotiri Island with only isolated patches of flax, thus further reducing suitable habitats for this species.

Localities:

1. Marotiri: moss under *Leptospermum* on the main ridge.

Therasia decidua
Phenacohelix ponsonbyi
Flammulina pilsburyi
F. chiron
Ptychodon tau

Laoma marina
Phrixynathus phrynia
P. glabriusculus
Delos coresia

2. Marotiri: Southern ridge to west of camp site—pohutukawa leaf-mould. A moist locality.

Liarea egea
Therasia decidua

Oticoncha dimidiata—s spec. under log
Mocella cogitata
Phrixgnathus phrynia
Tornatellinops novoseelandica
Placostylus hongii
Delos coresia

3. Astelia—North-east ridge, Marotiri
Athoracophorus bitentaculatus rufovenosus—2 specimens.

4 .Mid. Chick
Oticoncha dimidiata—under *Meryta* leaves—damp
Mocella cogitata—mostly under stones
Phrixgnathus phrynia—*Meryta* and broadleaf
P. glabriusculus—*Meryta* and broadleaf
Tornatellinops novoseelandica—*Meryta*

III. LAND MOLLUSCA OF GREAT BARRIER

About 25 species of land molluscs were collected from a valley under Mt Hobson running down into Fitzroy harbour. These were found in decaying nikau and ponga fronds. The list included many of the omnipresent species e.g., *Therasia decidua*, *Phenacohelix ponsonbyi*, *Suteria ide* etc.

Among the less common shells were *Murdochia cytora*, *Fectola rosevisri*, *Laoma pirongiaensis*, *Tornatellinops* and *Schizoglossa novoseelandica barrierensis*.

The finding of *Laoma pirongiaensis* is interesting as the writer recorded it from Little Barrier (1953-4). Enquiries among Auckland conchologists have revealed no records further north. Suter records it from Pirongia and Toko, Stratford. It appears then that Little Barrier has received some of its fauna, at least, from the East.

The record of *Schizoglossa* is the first other than in the type locality region, i.e. Tryphena-Onuawharo. It is possible that this slug may occur over the whole island.

IV. GENERAL DISCUSSION:

Mayor Island which has never been attached to the mainland has a molluscan fauna of at least 26 species, one at least being indigenous. In the opinion of the writer, the distance of water that lies between Mayor Island and the mainland is no permanent barrier to the migration of smaller land mollusca (in N.Z. this would include probably all mollusca excepting the large paryphantid genera, *Paryphanta*, *Rhytida*, *Wainuia* and *Schizoglossa*). Such a water barrier must of course effect a temporary barrier but the writer believes that the modification of the fauna is slight compared with environmental control. The land molluscan fauna of such islands is therefore the expression of the habitat range on the island. This is suggested by a comparison of the number of species on Little Barrier and Mayor Island. The former has a wide range of forest types and so far 33 species have been recorded (Milligan, 1953-54). Mayor Island, where collecting has been intensive, has only 26 species.

The snail population is not dependent directly on the type of forest but rather on the humidity conditions as affected by the type of leaf-mould and substratum.

It would seem that the islands are at this time still

being populated by land molluscs. Most of the islands are inhabited by the majority of the more common forms of the mainland; a few more locally distributed species are still extending their range by migration.

Powell (1954) suggests . . . 'typical [*Liarea*] *egea* . . . reached Great Barrier, Little Barrier and Chicken islands by the Coromandel route. The assumed Auckland isthmus volcanic phase allowed development in temporary isolation of a large sized counterpart of *L. egea* north of Auckland.' This idea is supported by the locality records of *Laoma pirongiaensis*, particularly those of Little and Great Barrier (see above). This writer has found *Liarea egea* on Hen Islands and Poor Knights Islands but not *Laoma pirongiaensis*. It would seem that the migration of the latter species has not yet included these islands.

It appears that the Poor Knights Islands and Hen Islands have been colonised by at least two migrations. The first resulted in the establishment of *Paryphanta* and *Rhytida* and thus involved a land connection. This connection must have been sufficiently far back in time to allow for speciation. (Te Punga [1953] deduces that *Wainuia urnula* has formed a subspecies within 11,000 years.) The ancestors of possible new species of *Flammulina* (Hen Islands) and *Allodiscus cooperi* (indigenous species on Poor Knights) may have migrated at the same time. At this migration *L. egea* could not have been geographically situated to migrate to the Poor Knights or Hen and Chickens.

Hopgood and Barron (1953-4) state their belief that the recession of sea-level preceding the Flandrian Transgression would have enabled the free passage of molluscs to outlying islands including Little Barrier. However, the lack of *Paryphanta* and *Rhytida* on Little Barrier may indicate that some barrier to migration was present between Little Barrier and the west at the time of the first migration. This idea is perhaps supported by the fact that Little Barrier has no autochthonous species (i.e. no species evolved on the island) whereas Hen Islands and Poor Knights have.

It is feasible that a large river estuary, e.g. a Pleistocene Waikato River, lying between Little Barrier and the Hen Islands formed a sufficient barrier to *Rhytida* and *Paryphanta*. At this stage, *Rhytida* and *Schizoglossa* must have been absent from the continuous land to the east.

The second migration to Poor Knights and Hen Islands was from the east via Coromandel-Great Barrier and Little Barrier. This has quite likely been partly over a discontinuous land route (due to the Flandrian Transgression) as *Liarea* and *Laoma pirongiaensis*, because of their greater migratory powers, have migrated further along this route than *Schizoglossa* and *Rhytida*.

REFERENCES

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