

NEW ZEALAND
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

BULLETIN 139 (1)

Biological Results of The Chatham Islands 1954 Expedition

PART 1

Decapoda Brachyura by R. K. DELL

Cumacea by N. S. JONES

Decapoda Natantia by J. C. YALDWYN

New Zealand Oceanographic Institute

Memoir No. 4

1960

BIOLOGICAL RESULTS OF
THE CHATHAM ISLANDS 1954 EXPEDITION

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Photo: D. Marshall

Sorting a trawl haul on the after deck

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FOREWORD

The Chatham Islands 1954 Expedition was organised and led by Prof. G. A. Knox of the Zoology Department of Canterbury University. The expedition was planned to explore the distribution of benthic and pelagic animals between the New Zealand coast and the Chatham Islands over the Chatham Rise, and to investigate the faunal affinities of the Chathams group, which lies in the Sub-tropical Convergence zone.

A substantial grant towards the cost of the expedition was made by the Council for Scientific and Industrial Research on the recommendation of the N.Z. Oceanographic Committee; further financial support was given by Canterbury University, Canterbury Museum, Dominion Museum and Canterbury and Southland Branches of the Royal Society of New Zealand. The expedition was carried out from the M.V. *Alert* under the command of her owner and master, Mr A. J. Black.

The scientific staff was drawn from the following organisations: Canterbury Museum (R. R. Forster); Canterbury University (G. A. Knox, E. W. Dawson, J. R. MacIntyre); Dominion Museum (R. K. Dell, J. M. Moreland); N.Z. Oceanographic Institute (D. M. Garner); Otago University (D. Marshall); Portobello Marine Biological Station (E. J. Batham); Victoria University of Wellington (J. C. Yaldwyn).

Prof. G. A. Knox has been responsible for organisation of the sorting and allocation of material. Type material from the expedition is deposited at Canterbury Museum. Preliminary technical editing of the resulting manuscripts has been carried out by Prof. Knox and Dr D. E. Hurley. Mr M. O'Connor (Information Bureau, D.S.I.R.) has been responsible for final editing.

Further results of the expedition will be published in this series as the examinations of other animal groups are completed.

J. W. BRODIE,
Director,
N.Z. Oceanographic Institute.

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Crabs (Decapoda, Brachyura) of the Chatham Islands 1954 Expedition

by R. K. DELL, Dominion Museum, Wellington

Abstract

The crabs collected by the Chatham Island Expedition, 1954, are listed. A revised checklist is given for the crabs of the Chatham Islands. The Australian *Carcinoplax victoriensis* Rathbun is recorded from New Zealand for the first time and a new species of *Leptomithrax* is described from deep water stations on the Chatham Rise.

INTRODUCTION

The biological material collected by the Chatham Island Expedition, 1954, comes from three distinct faunal areas. Three stations were established on the isolated Mernoo Bank, off the New Zealand coast, at depths from 40 to 100 fm; a series of deep water stations was worked from 155 to approximately 330 fm on the Chatham Rise and off the Chathams; and the Chatham Island fauna was sampled from the intertidal to the edge of the island shelf. Crabs were obtained from 29 of these stations in depths from 0 to 330 fm.

Development of knowledge of the crab fauna of the Chatham Islands has been rather sporadic. Early workers recorded occasional species but no general account was given. Chilton (1906) listed the species known to him at that date and again (1911) recorded a number of additional species,

mostly taken offshore by the *Nora Niven*. Chilton and Bennett (1929) included most of the early records in their general list of the Brachyura of New Zealand. Young (1929) recorded the results of his own collecting (mostly intertidal) and listed some previous records.

Very little is known of the deeper water crab fauna of New Zealand. *The Challenger* recorded no specimens from her few deep water stations in the New Zealand area. The deep-water material obtained by the present expedition therefore gives the first indication of the composition of the crab fauna from the edge of the continental shelf down to 328 fm.

The specimens are deposited in the Canterbury and Dominion Museums, the holotypes of the new species at Canterbury.

SPECIES OBTAINED

Acanthophrys filholi Milne-Edwards, 1876. Figs. 1, 4-6. Pl. 1.

Localities:

Sta. 14, 44°00'S., 176°21'W., Hanson Bay, Chatham Islands in 15 fm; Sta. 24, 43°36.2'S., 176°45.8'W., south of the Sisters, Chatham Islands in 38 fm, two specimens, one male, one female.

Remarks

Little has been added to our knowledge of this form since the original description. Filhol (1885) figured the species for the first time and Chilton and Bennett (1929, p. 741) added a number of locality records. It apparently occurs from the Three Kings in the north to Stewart Island in the south and can now be recorded from the Chatham Islands. It does not appear to be common in any area. Contrary to the experience of Filhol and Chilton and Bennett, the Chatham Island specimens were comparatively clean, having very little material affixed to the hairs on the carapace.

Miers (1886, p. 52) maintained a distinction between *Chlorinoides* and *Acanthophrys* based upon the shape of the merus of the external maxillipedes and the spinous meral joints of the ambulatory legs. From *Paramithrax* he distinguished it by the well-developed pre-ocular spine and the character of the basal antennal joint. Barnard (1950, p. 61) could not discuss the relationship with *Paramithrax* but stated that *Chlorinoides* was a synonym of *Acanthophrys*. As several of the crucial features required to determine the position of *filholi* have never been described or figured they have been mentioned here.

The two basal antennal points are large and spinous (fig. 1) while the second bears a fine elongate seta on the outer angle. The merus of the ambulatory legs (fig. 6) bears three flat-topped flanges though these are not truly spines. The outer maxilliped (fig. 5) is very similar in general structure to that of *Paramithrax*, the merus and ischium being both extremely flattened and plate-like.

Acanthophrys filholi certainly appears congeneric with the Australian *spatulifer* (Haswell) although Hale (1927, p. 137) lists this as *Chlorinoides*. The well-developed pre-orbital spine separates the group from *Paramithrax* and the

variously shaped, plate-like intestinal spine seems another good distinguishing feature. Part of the difficulty in determining the relationship of *Acanthophrys* and *Chlorinoides* seems to rest in the identity of the type species of the genus *Acanthophrys*, a problem that cannot be investigated here.

Leptomithrax longipes (Thomson, 1902). Fig. 2.

Locality:

Sta. 29, 43°55.5'S., 177°08'W., Petre Bay, Chatham Island in 94 fm, two specimens.

Remarks

There is a specimen in the Dominion Museum from the Chatham Islands collected by W. T. L. Travers. This species was also recorded by Young (1929, p. 150) from near Te Awapatiki.

Leptomithrax richardsoni n.sp. Fig. 3. Pl. 2.

Description

Carapace pyriform, set with comparatively long, pointed spines, sparse raised tubercles and numerous fine, curled hairs. Five outwardly directed spines form a semicircle on the margin of the branchial region, the most posterior spine being subdorsal. The second spine is the smallest, the others becoming increasingly longer from in front backwards. Hepatic region with a wide-based, bifid spine on the outer margin. Eight smaller median spines, the first two mesogastric and the largest; a pair of short spines with a longer spine behind metagastric; a single low spine urogastric; a pair of longer spines cardiac; and a pair of very low spines and one strong spine intestinal. There are several groups of tubercles on the carapace; about 20 scattered tubercles in the frontal area, and several scattered groups on the hepatic, epibranchial and mesobranchial areas.

Rostral spines very long, widely divergent, rounded in cross section, gradually tapering, slightly more than half as long as the rest of the carapace. Pre-orbital lobe wide based, bearing two spines, the more anterior the stronger and directed upwards and forwards. Supra-orbital spine small, narrowly triangular, sharp pointed, separated from the pre-orbital and post-orbital lobes by narrow gaps. Post-orbital cusp essentially a single broad based spine with a small subsidiary nodule developed posteriorly near the base.

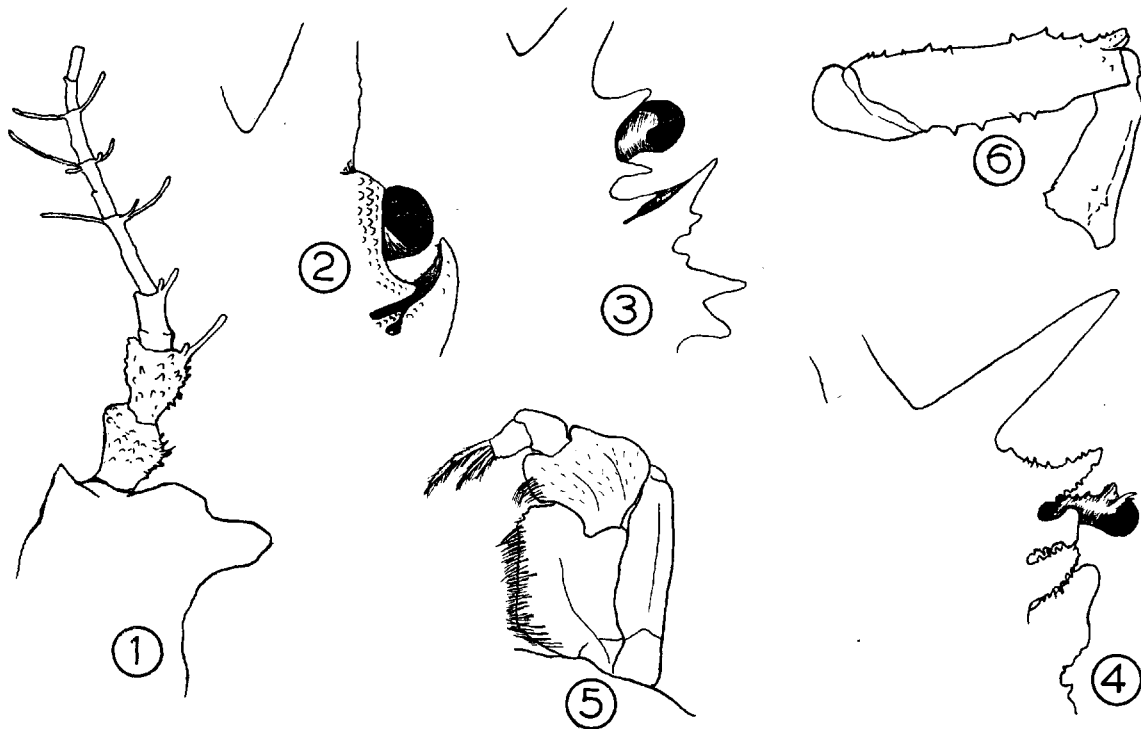


Fig. 1. Antenna of *Acanthophrys filholi* Milne-Edwards. Fig. 2. Orbital detail of *Leptomithrax longipes* (Thomson). Fig. 3. Orbital detail of *Leptomithrax richardsoni* n.sp. Fig. 4. Orbital detail of *Acanthophrys filholi* Milne-Edwards. Fig. 5. Outer Maxilliped of *Acanthophrys filholi*. Fig. 6. Merus and carpus of ambulatory leg of *Acanthophrys filholi*.

Inter-antennular spine large, directed downwards. Basal segment of antennae bearing two ridges which terminate in spines, the inner one directed downwards and forwards, the outer spine directed mainly outwards. Subhepatic region with an oblique row of three tubercles.

Sternum rather deeply excavate. Surface of sternum and abdomen pubescent.

The chelipeds are longer than the carapace without the rostrum, when extended reaching to the propodus of the first walking leg. Arm and wrist tuberculate, the larger tubercles being arranged in two irregular rows dorsally and two rows ventrally on the arms so that the cross section is subquadrangular. Legs slender, diminishing rapidly in length from in front backwards, all joints with hairs similar to those on the carapace.

Localities:

Sta. 6, 43°40'S., 179°28'E., Chatham Rise in 220 fm; Sta. 7, 43°42'S., 179°55'E., Chatham Rise in 280 fm; Sta. 41, 44°35.5'S., 176°04'W., south-east of Pitt Id., Chatham Islands in 330 fm;

Sta. 52, 44°04'S., 178°04'W., Chatham Rise in 260 fm.

Types

Holotype and paratypes in Canterbury Museum, paratypes in Dominion Museum.

	<i>Holotype</i>	<i>Paratype</i>
Length of carapace excluding rostrum and spines	24.6 mm	27.0 mm
Length of rostrum	14.3 mm	14.4 mm
Width of carapace excluding spines	19.7 mm	22.3 mm

Remarks

This species is superficially close to *L. longipes* Thomson. It differs in a number of important details, e.g., the rostral spines are much longer and are more divergent; the details of the orbit are very different (see figs. 2 and 3); the details and relative strength of the spines on the carapace are different. *L. richardsoni* has the external maxillipeds faintly pubescent but lacks the dense fur and the naked patch on the outer face as developed in *L. longipes*.

The new species was taken by the Chatham Island Expedition at four stations in depths from

220 to 330 fm. It would appear to be a fairly widely distributed form in depths beyond the island shelf.

Paramithrax latreillei Miers, 1876

Localities:

Sta. 9, Glory Bay, Pitt Id., Chatham Islands, shore collecting; Sta. 11, Owenga, Chatham Islands, shore collecting; Sta. 16, Kaingaroa, Chatham Islands, amongst algae in low tidal pools; Sta. 26, Waitangi Beach, in rock pools; Sta. 49, Port Hutt, Chatham Islands, at low tide.

Remarks

This is the commonest shore crab at the Chatham Islands as noted by Young (1929, p. 150).

Elamena producta Kirk, 1879

Localities:

Sta. 11, Owenga, Chatham Islands, on algae, intertidal; Sta. 16, Kaingaroa, Chatham Islands, intertidal; Sta. 26, Waitangi, Chatham Islands, intertidal; Sta. 49, Port Hutt, Chatham Islands, intertidal.

Remarks

This species was first recorded from the Chathams by Chilton (1906, p. 270).

Halicarcinus innominatus Richardson, 1949

Localities:

Sta. 11, Owenga, Chatham Islands, under stones in low tidal rock pools; Sta. 16, Kaingaroa, Chatham Islands; Sta. 26, Waitangi, Chatham Islands; Sta. 49, Port Hutt, Chatham Islands.

Remarks

The species of the family Hymenosomidae in New Zealand are urgently in need of revision, a fact that has been repeatedly urged by successive workers, e.g., Chilton (1906), Chilton and Bennett (1929), and Richardson (1949). Richardson has been the only local worker to attempt to evaluate the species and his key provides the only near-complete account of the New Zealand forms. It is to be hoped that a complementary full account will be forthcoming. This should be particularly useful in New Zealand where such a comparatively large number of forms belonging to this family occur. The Chatham Island forms have been separated according to Richardson's (1949) key and checked where possible against the original description and figure. It is, however, essentially Richardson's usage that is followed here. Chilton (1906)

recorded *planatus* (later, 1911, p. 293, altered to *planatus* var. *tridentatus* Jacquinet and Lucas) and *marmoratus* Chilton from the Chathams. Young (1929) allowed *planatus*, *planatus* var. *tridentatus* and *marmoratus*, though *planatus* was the only form he had collected himself. The Chatham Islands Expedition, 1954, collected two species of *Halicarcinus* comparatively commonly. One of these agrees very well with Richardson's outline drawing and key characters for *innominatus* Richardson, 1949 (= *planatus* of Richardson, 1948). The other appears to be *H. cooki* Filhol.

Halicarcinus cooki Filhol, 1885

Localities:

Sta. 11, Owenga, Chatham Islands, low tidal; Sta. 16, Kaingaroa, Chatham Islands; Sta. 26, Waitangi, Chatham Islands; Sta. 33, Te Whanga Lagoon, 1-2 fm; Sta. 49, Port Hutt, Chatham Islands.

Ebalia cheesemani (Filhol, 1885)

Localities:

Sta. 1, 42°47'9"S., 175°25'6"E., Mernoo Bank, in 100 fm; Sta. 2, 42°59'4"S., 175°30'4"E., Mernoo Bank in 60 fm; Sta. 15, 43°56'S., 176°18'5"W., Hanson Bay, Chatham Islands, in 30 fm; Sta. 20, 43°39'S., 176°34'5"W., off Cape Young, Chatham Islands in 20 fm; Sta. 28, 43°57'S., 176°47'W., Petre Bay, Chatham Islands in 50 fm; Sta. 30, 43°56'S., 176°53'W., in 70 fm; Sta. 34, 44°04'S., 175°23'5"W., east of Forty Fours, Chatham Islands in 130 fm; Sta. 60, 43°36'S., 175°31'E., Chatham Rise in 205 fm.

Remarks

All the specimens that the writer has seen from Cook Strait, Wellington Harbour and the Chathams are easily referable to *E. cheesemani*. Richardson had similarly seen nothing to substantiate the records of *laevis* Bell, *tumefacta* Mont., and *tuberculosa* Milne-Edwards.

Carcinoplax victoriensis Rathbun, 1923. Pl. 1

1923 *Carcinoplax victoriensis* Rathbun, Biol. Res. Fish. Exp. F.I.S. Endeavour 1909-14, 5: 101, pl. 19.

Localities:

Sta. 6, 43°40'S., 179°28'E., Chatham Rise in 220 fm; Sta. 41, 44°35'5"S., 176°04'W., south-east of Pitt Id., Chatham Islands in 330 fm, juveniles and adults; Sta. 58, 43°40'S., 177°59'E., Chatham Rise in 320 fm.

This is a new record for New Zealand waters. The specimens agree perfectly with Rathbun's description and figures.

Ovalipes bipustulatus (Milne-Edwards, 1861)

Localities:

Sta. 13, Owenga, Chatham Islands, in 4–5 fm on fine brown sand; Sta. 19, 43°38'2"S., 176°38' W., off Cape Young, Chatham Islands in 25 fm; Sta. 46, Kaingaroa, Chatham Islands in 2.5 fm; Sta. 48, Port Hutt, Chatham Islands, light at night.

There are also specimens in the Dominion Museum from Port Hutt, taken by light at night, F. Abernethy.

Nectocarcinus antarcticus (Jacquinot and Lucas, 1853)

Localities:

Sta. 1, 42°47'9"S., 175°25'6"E., Mernoo Bank in 100 fm; Sta. 2, 42°59'4"S., 170°30'4"E., Mernoo Bank in 60 fm; Sta. 14, 44°00'S., 176°21'W., Hanson Bay, Chatham Islands in 15 fm; Sta. 15, 43°56'S., 176°18'5"W., Hanson Bay, Chatham Islands in 30 fm; Sta. 20, 43°39'S., 176°34'5"W., off Cape Young in 20 fm; Sta. 24, 43°36'2"S., 176°48'5"W., south of the Sisters Islands in 38 fm; Sta. 28, 43°57'S., 176°47'W., Petre Bay, Chatham Islands in 50 fm; Sta. 30, 43°56'S., 176°53'W., Petre Bay in 70 fm; Sta. 38, south of Little Mangere Island, Chatham Islands in 43 fm.

Remarks

This swimming crab was collected on the Mernoo Bank at 60 and 100 fm and in numerous off shore areas at the Chathams in depths from 15 to 70 fm. It is the commonest, most generally distributed shelf species at the Chathams.

Trichopeltarion n.sp.

A new species of crab belonging to the subfamily Atelecyclinae was obtained at Sta. 41, at 44°35'5"S., 176°04'W. in 330 fm. This species, which appears to belong to the genus *Trichopeltarion*, had also been collected by Professor Richardson from the mainland. A joint description of this form will be published shortly.

Pilumnus spinosus Filhol, 1885

Localities:

Sta. 16, Kaingaroa, Chatham Islands, under stones in low tidal pools; Sta. 26, Rock shelf, Waitangi, Chatham Islands, low tidal; Sta. 49, Port Hutt, under stones.

Remarks

A number of specimens were collected in low tidal pools. Females were in "berry" in early February. The New Zealand species of this genus have never been critically revised. The Chatham Island specimens, however, agree very well with Filhol's figure of *spinosus*. This is undoubtedly the form recorded by Young (1929) as *Pilumnus vespertilio* Milne-Edwards. Chilton and Bennett (1929, p. 749) have shown that the New Zealand form previously identified as *vespertilio* by Miers and others is certainly not *vespertilio* Milne-Edwards.

Eurynolambrus australis Milne-Edwards and Lucas, 1841

Localities:

Sta. 26, Waitangi, Chatham Islands, low tidal; Sta. 49, Port Hutt, Chatham Islands.

Remarks

This species, recorded by Young from Wharekauri, was not obtained at all commonly by the Chatham Islands Expedition.

Ommatocarcinus macgillivrayi White, 1852

Localities:

Sta. 29, 43°55'5"S., 177°08'W., Petre Bay, Chatham Islands in 94 fm; Sta. 30, 43°56'S., 176°53'W., Petre Bay, Chatham Islands in 70 fm; Sta. 31, 43°56'S., 176°37'W., Petre Bay, Chatham Islands in 22 fm; Sta. 40, 44°32'S., 176°05'W., south-east of Pitt Id., Chatham Islands in 165 fm, free living in the trawl, common in ling stomachs; Sta. 41, 44°35'5"S., 176°04' W., south-east of Pitt Id., in 330 fm; Sta. 60, 43°34'S., 175°30'E., Chatham Rise in 205 fm.

Remarks

This species, which is known to the writer from depths as shallow as 9 fm on the New Zealand mainland, was collected at the Chathams in depths from 22 to 330 fm. It is thus a member of the fauna in depths beyond the island shelf as well as occurring on the shelf itself. It does not appear to have been collected from the Chathams previously.

Pinnotheres sp.

A single male was taken from a living specimen of the bivalve mollusc *Nemocardium pulchellum* Gray, from Sta. 28, 43°57'S., 176°47'W., Petre Bay in 50 fm.

CHECKLIST OF THE CRABS OF THE CHATHAM ISLANDS

- The following checklist includes not only the crabs collected by the Chatham Islands Expedition, 1954, but includes all the old records that the writer has been able to trace, and a number of new records from other sources. The list includes the shelf fauna down to a depth of 130 fm.
- Acanthophrys filholi* Milne-Edwards, 1876
Leptomithrax longipes (Thomson, 1902)
Leptomithrax australis (Jacquinot and Lucas, 1853) (a large specimen from Pitt Strait in 30 fm, collected by F. Abernethy, is in the Dominion Museum).
Paramithrax peronii Milne-Edwards, 1834 (recorded by Young).
Paramithrax latreillei Miers, 1876
Naxia huttoni Milne-Edwards, 1876 (specimens from Kaingaroa, T. Soowich, and off Chathams, F. Abernethy, are in the Dominion Museum).
- Elamena producta* Kirk, 1879
Halicarcinus innominatus Richardson, 1949
Halicarcinus cooki Filhol, 1885
Ebalia cheesemani (Filhol, 1885)
Eurynolambrus australis Milne-Edwards and Lucas, 1841.
Cancer novaezelandiae (Jacquinot and Lucas, 1853) (recorded by Young).
Heterozius rotundifrons Milne-Edwards, 1867 (recorded by Chilton but not collected by Young nor the Chatham Islands Expedition).
Ommatocarcinus macgillivrayi White, 1852
Pilumnus spinosus Filhol, 1885
Nectocarcinus antarcticus (Jacquinot and Lucas, 1853).
Ovalipes bipustulatus (Milne-Edwards, 1861)
Pinnotheres sp.

DISCUSSION

The most surprising feature of the crab fauna of the Chatham Islands is the comparative paucity of species, due very largely to the complete absence of Grapsoid crabs, which are such a marked feature on the mainland above low tide mark. Although this absence of Grapsoid crabs is obvious enough on paper, it is even more marked in the field. There are no crabs normally present above low tide mark and even at low tide mark the only common forms are *Pilumnus spinosus*, *Paramithrax latreillei*, *Halicarcinus innominatus* and *H. cooki*. The situation is rather similar to that found in the New Zealand Subantarctic Islands such as the Auckland Islands where *Leptomithrax australis* and *Halicarcinus* are the only common low tidal forms with *Cancer* and *Jacquinotia* abundant at moderate depths.

The only reasons that can be given at the moment for these absences at the Chathams are distance from the mainland and sea temperatures. Movements of oceanic surface waters from about Banks Peninsula towards the Chathams have been amply proven, so that larval migration should be mechanically possible in this direction. With such widely distributed forms as *Plagusia capense* neither distance from the mainland nor sea tem-

peratures would appear to be effective as possible barriers, and there seems no good reason why this species, for example, should not have established itself at the Chathams. With most of the other species that are lacking, too little is known of detailed geographical range and temperature tolerance on the mainland to warrant speculation in this respect, or to determine the relationships of the Chatham Island fauna in terms of latitude.

There is not a single crab species endemic to the Chathams.

Every species recorded from the Chathams to date is also known from the mainland between Cook Strait and Banks Peninsula.

The crabs collected from the Mernoo Bank, *Nectocarcinus antarcticus* and *Ebalia cheesemani*, are both widely distributed and their presence on this off-shore, shallow water area is not unexpected.

One of the most important results of the Expedition was the material obtained in depths between 140 and 330 fm, the area of sea bottom just off the shelf. Four species, *Ommatocarcinus macgillivrayi* White, *Carcinoplax victoriensis* Rathbun, *Trichopeltarion* n.sp. and *Leptomithrax richardsoni* n.sp. were obtained. *Ommatocarcinus*

evidently has a wide benthic distribution in New Zealand from at least 9 to 330 fm. *Leptomithrax* is well represented in shallow shelf waters and the occurrence of a deep water species is to be expected. The major interest in this contribution to our knowledge of the deep water fauna lies in the discovery of the species of *Carcinoplax* and

Trichopeltarion. *Carcinoplax victoriensis* has been taken in stations off the coast of Victoria in which the depth was not very accurately determined but which ranged from about 120 to 220 fm. This species has not yet been recorded from shelf waters in New Zealand but probably occurs in depths from about 220 to 330 fm.

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PLATE 1

Above: Acanthophrys filholi Milne-Edwards

(page 2)

Photo: C. Hale

Below: Carcinoplax victoriensis Rathbun

(page 4)

Photo: C. Hale