TRANSACTIONS

OF THE

ROYAL SOCIETY OF NEW ZEALAND

ZOOLOGY

VOL. 10 No. 26 SEPTEMBER 5, 1968.

A New Species of *Macrochiridothea* from New Zealand, with notes on the Idotheid Subfamily Chaetilinae (Crustacea Isopoda: Valvifera)

By D. E. HURLEY[1] and R. H. MURRAY[2]

[*Received by the Editor, December 4, 1967.*]

Abstract

THE isopodan genus *Macrochiridothea* (S.O. Valvifera), previously known only from South America, is recorded from New Zealand and a new species described from North Island beaches. The Subfamily Chaetilinae is outlined, and the distribution of marine isopod genera in the Southern Hemisphere briefly discussed.

INTRODUCTION

WHILE engaged in an ecological study of sandy beaches in the Auckland region, one of us (R.H.M.) collected several specimens of a particularly distinctive idotheid isopod and recognised it as being very like the North American genus *Chiridotea.* Further investigation has shown that it belongs to the genus *Macrochiridothea,* hitherto known only from South America. Although superficially very similar to the type species of this genus, *Macrochiridothea michaelseni* from Punta Arenas in Southern Chile, the New Zealand material proves to be specifically distinct.

Macrochiridothea is a further addition to a long list of littoral isopod genera known to be common to Chile and New Zealand. It belongs to a small but distinctive subfamily of idotheid isopods, the Chaetilinae. There are three genera—*Chaetilia* with two known species, *Chiriscus* with one, and *Macrochiridothea* with five, if we include the species described here. Since further investigations of New Zealand and Australian sandy beaches are likely to reveal other new species, the opportunity is taken to gather together the generic diagnoses and give keys to genera and species, and also to comment briefly on remarks on the distribution and zoogeography of Southern Hemisphere isopod genera made by Menzies (1962: 6–9).

[1] New Zealand Oceanographic Institute, D.S.I.R., P.O. Box 8009, Wellington.

[2] Zoology Department, University of Auckland, P.O. Box 2175, Auckland.

Published by the Royal Society of New Zealand, c/o Victoria University of Wellington, P.O. Box 196, Wellington.

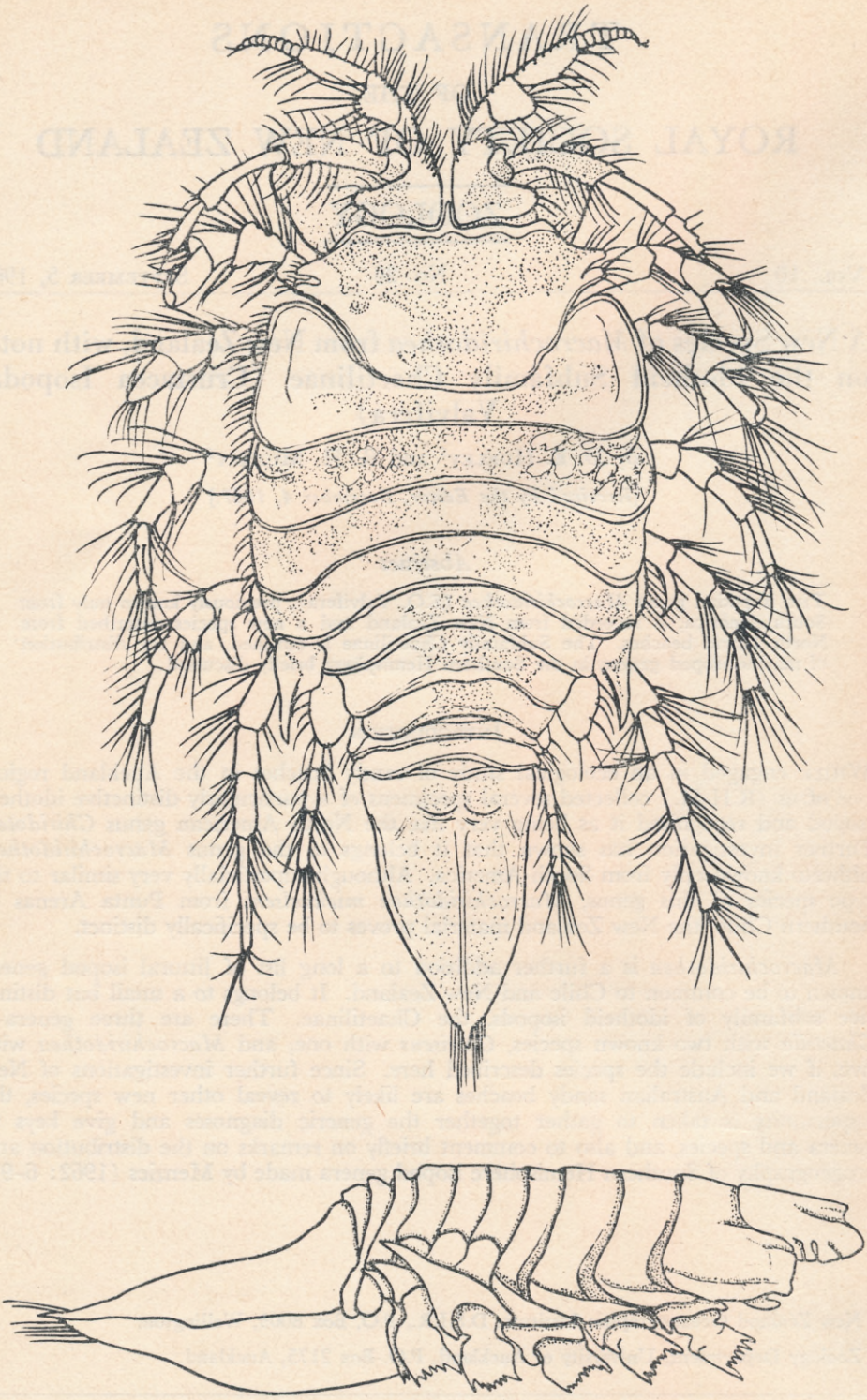

FIG. 1.—*Macrochiridothea uncinata* n.sp. Adult male, 4mm length. Dorsal and lateral views.

Family IDOTHEIDAE

Subfamily CHAETILINAE Dana, 1852

Chaetilidae Dana, 1852: 711.

Macrochiridotheinae Nordenstam, 1933: 104–105. Sheppard, 1957: 168–169.

Chaetilinae Menzies, 1962: 96.

DIAGNOSIS: "Head laterally expanded, its posterior part immersed in first pereonal somite. Eyes dorsal and small, or wanting. First antennae larger than or almost as large as second antennae, with single or two-segmented flagellum. Coxal plates marked off dorsally only on last three pereonal somites. Maxillipeds with four-segmented palp. First two, three or five pereopods subchelate or prehensile, first usually markedly so. Remaining pereopods have the dactylos absent or reduced to a very short spine. Uropods biramous."

REMARKS: This diagnosis of the Chaetilinae is essentially that of Nordenstam as modified by Menzies. However, the description of the antennae given by Menzies is slightly ambiguous, and his "First pair of peraeopods large swollen gnathopods" is not quite appropriate for either species of *Chaetilia*.

STATUS OF THE SUBFAMILY: Nordenstam (1933) considered his subfamily, *Macrochiridotheinae,* to include *Macrochiridothea* and *Chiriscus* (Richardson, 1911), and probably *Chaetilia* (Dana, 1852). Menzies (1962: 103) redefined *Chaetilia* and described a second species, *Chaetilia paucidens.* He followed Nordenstam's suggestion that, if *Chaetilia* proved to belong with the other two genera, Dana's original family name should be retained as a subfamily name.

Sheppard (1957) argued that this subfamily grouping was not a soundly based one and that *Macrochiridothea* was in fact most closely related to *Mesidotea,* but preferred to leave any re-arrangement to a revision of the whole family Idotheidae.

The present classification of the Chaetilinae is geographically satisfying since all genera are known only from the Southern Hemisphere, the northernmost record so far being that of *Chiriscus australis* from approximately 30° S, off Rio de la Plata.

KEY TO GENERA OF CHAETILINAE

1.	Lateral margins of head deeply incised	*Macrochiridothea* Ohlin, 1901
	Lateral margins of head smoothly rounded	 2
2.	Pleon with four of five somites; head, lateral margins not expanded; pereopods 1–5 prehensile	*Chaetilia* Dana, 1852
	Pleon of three somites; head, lateral margins expanded; pereopod 1 only prehensile	*Chiriscus* Richardson, 1911

Genus CHIRISCUS Richardson, 1911

Chiriscus Richardson, 1911: 169–170.

DIAGNOSIS: "Body ovate. Head large, laterally expanded; lateral margins not cleft. First antennae with peduncle of three segments, the second inserted at the outer lateral margin of the first; flagellum of two segments, the first long, the second minute. Second antennae concealed by first; peduncle of five segments, geniculate between second and third; flagellum multi-segmented. Maxilliped palp of three segments. Pereon somites 2–7 with distinct epimera. Pereonite 7 abruptly narrower than 6, not wider than pleon somites. Pleon of three somites, two short anterior ones and a long pleotelson. Pereopod 1 strongly prehensile, segment 6 large and dilated. Pereopods 2–5 and pereopod 7 have no dactyl; they are generally alike and the end segments have long setae. Pereopod 6 much longer than others, its fifth and sixth segments elongate."

REMARKS: The above diagnosis is that of Richardson, in modernised terminology. Only one species is known, *Chiriscus australis* Richardson, 1911.

Genus CHAETILIA Dana, 1852

Chaetilia **Dana, 1852: 71–72. Menzies, 1962: 103.**

DIAGNOSIS: "Chaetilinae with lateral margins of head not expanded and not incised. Eyes lateral. Pleon with four or five somites. Pereopod 6 as long as body. Pereopods 1–5 subchelate. Pereopods 6 and 7 without claws or dactyls." —After Menzies, 1962.

KEY TO SPECIES OF CHAETILIA

1. Pleon of five somites, apex of pleotelson sharply pointed; segs. 2 and 3 of antenna 1 peduncle much longer than wide	*C. ovata* Dana, 1852
Pleon of four somites, apex of pleotelson blunt; segs. 2 and 3 of antenna 1 peduncle only slightly longer than wide	*C. paucidens* Menzies, 1962

Genus MACROCHIRIDOTHEA Ohlin, 1901

Macrochiridothea **Ohlin, 1901: 286. Menzies, 1962: 98.**

DIAGNOSIS: "Chaetilinae with lateral margins of head expanded, a deep incision on either side. Eyes, when present, dorsal. Pleon with four somites. Pereopods 1–3 subchelate, the first particularly strongly developed. Pereopod 6 elongate, but not as long as body."

—After Menzies, 1962.

REMARKS: Four species of this genus have previously been recorded:

1. *M. michaelseni* Ohlin, the type species from Magellan Strait (Ohlin, 1901; Menzies, 1962).
2. *M. stebbingi* Ohlin, from Magellan Strait and from Tierra del Fuego to Chile (Ohlin, 1901; Menzies, 1962). Nordenstam (1933: 110–112, Pl. 1, fig. 7, Text-figs. 26a, 26b) described a variety of this species, var. *tuberculata,* which Sheppard (1957: 170–172) considers falls within the normal variation of *stebbingi* but Menzies (1962: 101) suggests is probably a distinct species.
3. *M. setifer* Menzies, from Southern Chile (Menzies, 1962).
4. *M. kruimeli* Nierstrasz, from the Magellan region (Nierstrasz, 1918) and the Falkland Islands (Sheppard, 1957).

KEY TO SPECIES OF *Macrochiridothea*

1.	Pereopod 5, posterior margin of seg. 3 has prominent uncinate hook	*M. uncinata* n.sp.
	Pereopod 5, posterior margin of seg. 3 without prominent uncinate hook	2
2.	Eyes and dorsal body tubercles absent	*M. michaelseni*
	Eyes present, with or without dorsal body tubercles	3
3.	With sharp dorsal body tubercles	*M. stebbingi*
	Without sharp dorsal body tubercles	4
4.	Apex of pleotelson has median spine-like projection	*M. setifer*
	Apex of pleotelson without median spine-like projection	*M. kruimeli*

Macrochiridothea uncinata n.sp.

DIAGNOSIS: "Body flattened, without tubercles. Eyes absent. Epimera of somites 5–7 produced in adult male, that of somite 5 especially distinct and sharp. Apex of telson a median spine-like tooth with setae either side. Antenna 1 flagellum of two segments. Pereopod 1 swollen, subchelate, dactyl closing against end of seg. 5. Pereopod 4 dactyl

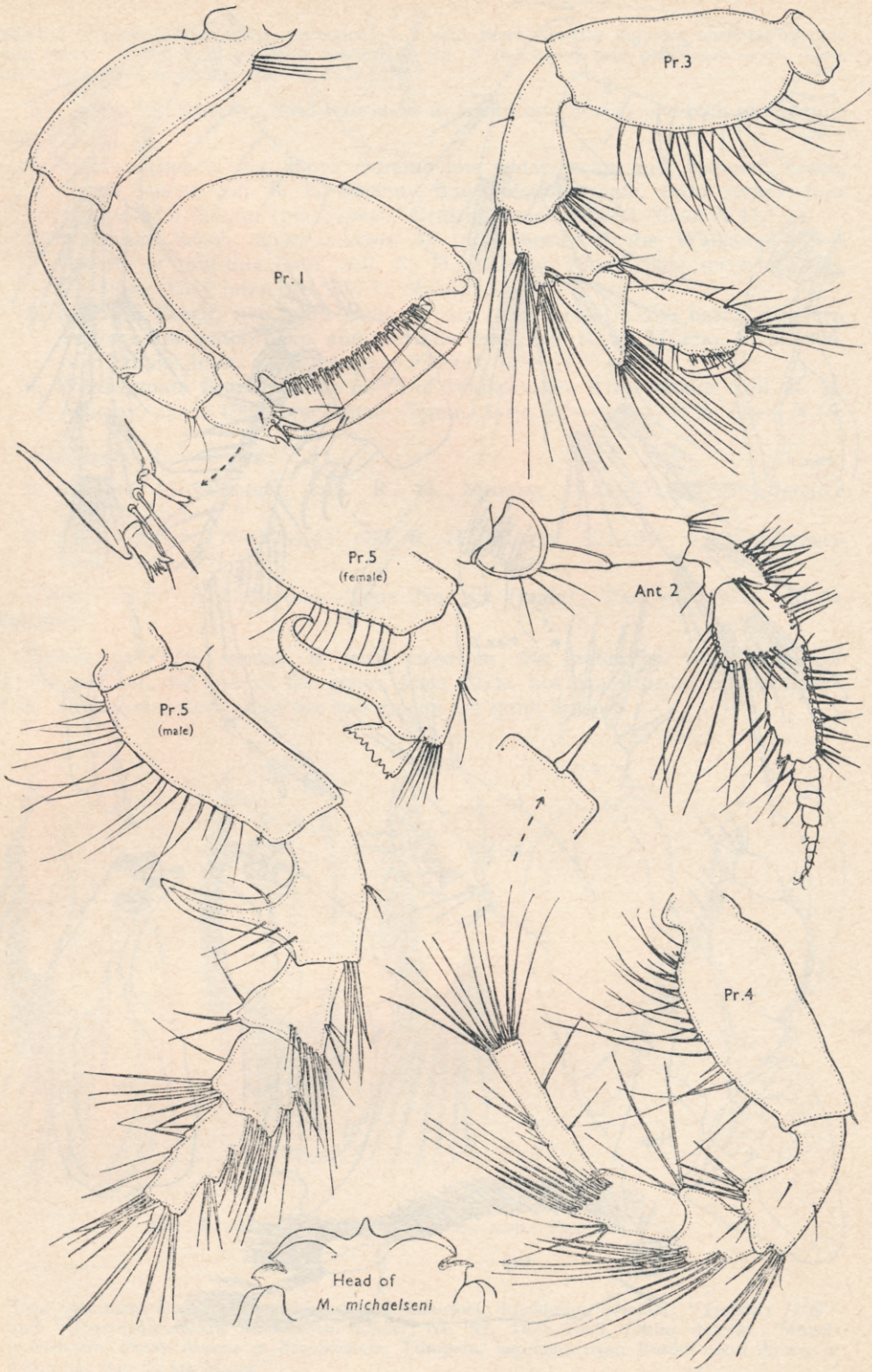

FIG. 2.—*Macrochiridothea uncinata* n.sp. Antenna 2 and pereopods. *Macrochiridothea michaelseni* Ohlin. Dorsal view of head only.

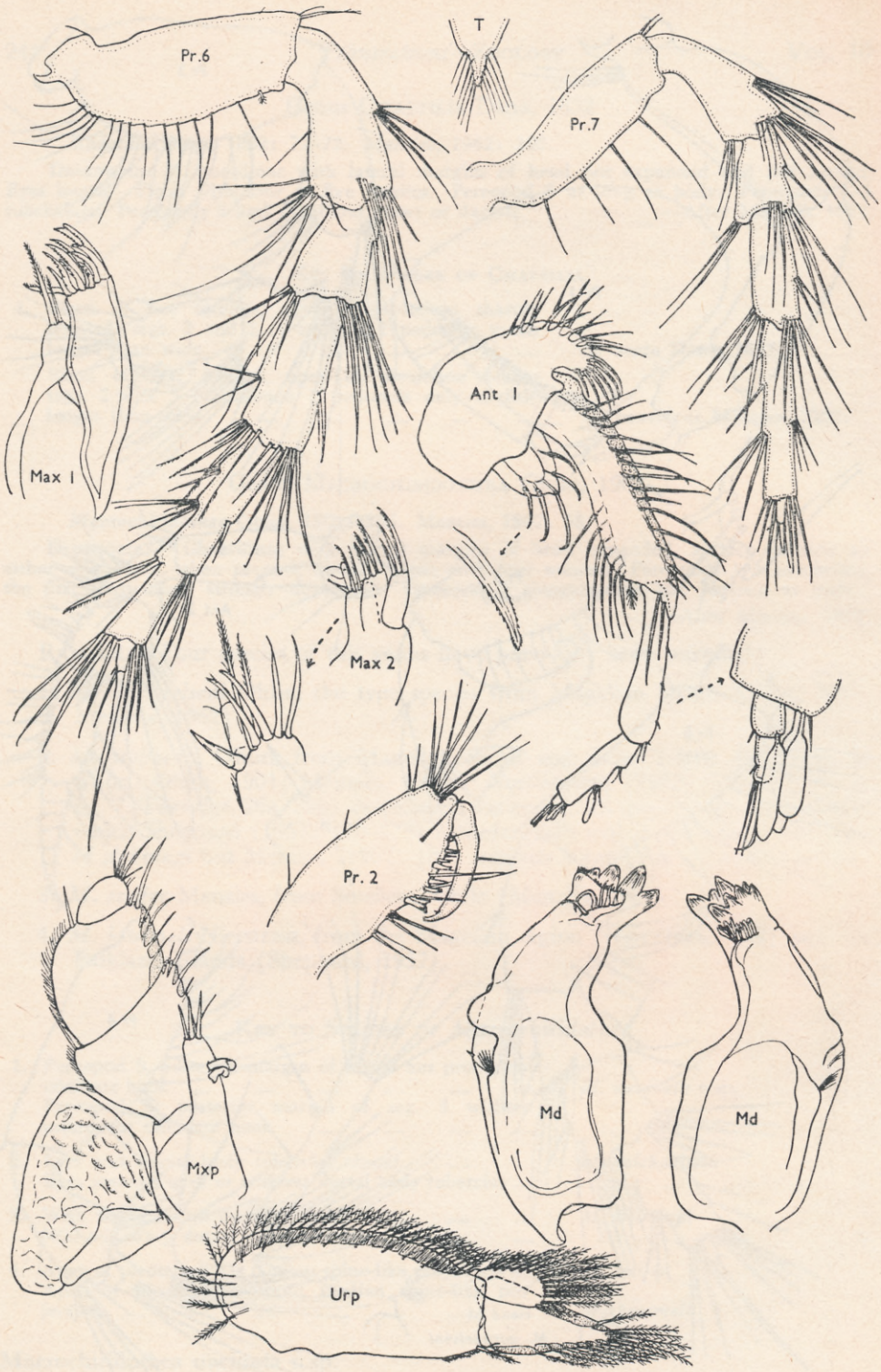

Fig. 3.—*Macrochiridothea uncinata* n.sp. Mouthparts, antenna 1, pereopods, uropod, telson.

reduced to short hidden spine; pereopods 5–7 with short dactylar segment terminating in a long spine. Pereopod 5, posterior margin of seg. 3 developed into prominent hook, more distinctly hooked in female than in male."

MATERIAL EXAMINED: (Grid references to Lands and Survey one inch to one mile map sheets.)

1. Muriwai Beach, just above extreme low water, neap, fully exposed beach, depth 3–4cm, coll. R. H. Murray, 8.iv.1966, one male, 4mm (type), four females, 3.0–3.8mm (paratypes). Grid reference 936660, Sheet N.41.
2. Waikanae Beach, approximately 3½ miles north of the Waikanae River mouth, at mid-tide level, coll. R. H. Murray, 20.viii.1966, seven females, 2–2¼mm. Grid reference 589773, Sheet N.157.
3. Muriwai Beach, two miles north of the road access to the beach, between extreme low water, neap, and mid-tide level, coll. R. H. Murray, 6.viii.1966, one female, 3mm. Grid reference 936660, Sheet N.41.
4. Whangamata Beach, ½ mile north of Waiharakeke River mouth, coll. R. H. Murray, 21.viii.1966, one female, 5½mm. Grid reference 372155, Sheet N.49.

ADDITIONAL LOCALITIES:

5. Ahipara (Northland), coll. R. H. Murray, 17.i.1967. Grid reference 663635, Sheet N.9.
6. Bayly's Beach (Northland), coll. R. H. Murray, 16.i.1967. Grid reference 269677, Sheet N.23.

TYPES: N.Z.O.I. Collection—Type No. 43 (male); Paratypes Nos. 48–51 (females).

REMARKS: This species is very close to the published illustrations of *M. michaelseni,* the type of the genus, from Chile, but examination of the types* of *M. michaelseni* shows that the two species are quite distinct.

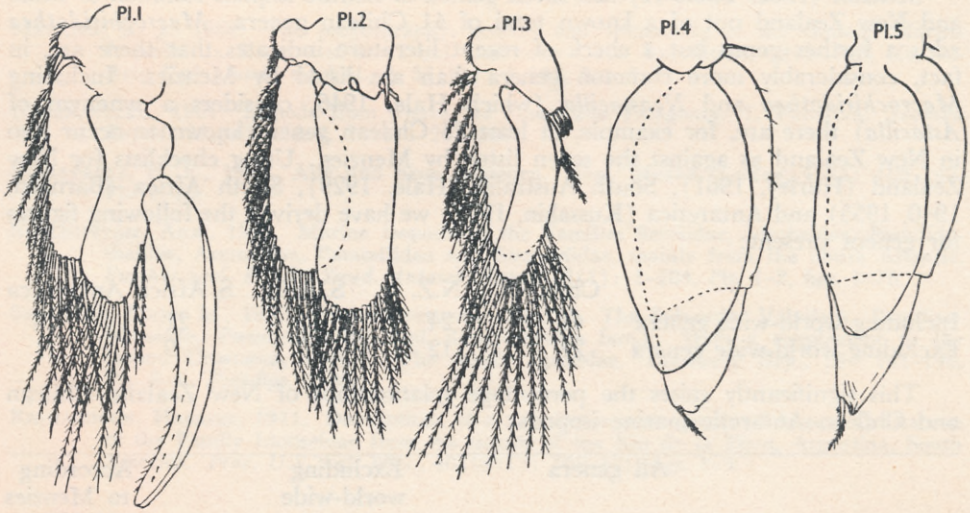

FIG. 4.—*Macrochiridothea uncinata* n.sp. Pleopods 1–5.

---

* Type specimens from the Naturhistoriska Riksmuseet, Stockholm, labelled: "Isopoda 7409" and "*Macrochiridothea michaelseni* Ohlin, Nr. 84, 16/3/1893, Ohlin determ. Magalhaenstrasse, Punta Arenas in Brackwasser, Tümpeln, lagunenartigen Resten eines Armes in Delta des Rio de las Minas".

The Chilean species is a large and quite rotund animal—a typical male is 10mm in length—with a somewhat bee-shaped body. The New Zealand animals are small, flattened, serolid-like animals with little depth through the body. However, the most striking difference is the uncinate hook on pereopod 5 which is present in both sexes of the New Zealand material but, unusually, is more prominent in the female than in the male.

Other, less obvious differences are in the shape of the "hand" of pereopod 1, the lesser development of the penial stylet which is not so strongly sabre-form, and the shape of the front margin of the head (see Figures 1, 2). Apart from these features, the two species are remarkably alike.

The New Zealand species has a grey and white mottled body.

ECOLOGY

Microchiridothea uncinata was found 2 or 3cm below the surface on exposed sandy beaches. It was particularly numerous at Muriwai where the beach is very exposed to the prevailing westerly winds off the Tasman Sea.

M. uncinata lives between mid-tide level and extreme low water, neap tide level, where the sand grade is predominantly fine, 60–70 percent of the particles being between 0.251mm and 0.124mm in diameter. This corresponds to "fine sand" on the Wentworth scale.

ZOOGEOGRAPHY

Menzies (1962, Table II) lists seven genera of marine isopods common to Chile and New Zealand out of a known total of 41 Chilean genera. *Macrochiridothea* adds a further genus but a check of recent literature indicates that there are, in fact, considerably more common genera than are listed by Menzies. Including *Macrochiridothea* and *Neastacilla* (which Hale, 1946, considers a synonym of *Astacilla*) there are, for example, at least 24 Chilean genera known to occur also in New Zealand as against the seven listed by Menzies. Using checklists for New Zealand (Hurley, 1961), South Australia (Hale, 1929), South Africa (Barnard, 1940, 1955) and Antarctica (Kussakin, 1967) we have derived the following figures for genera present:

	Chile	N.Z.	S. Aust.	S. Africa	Antarctica
Including world-wide genera	41	24	15	21	18
Excluding world-wide genera	22	12	7	9	11

This significantly raises the percentage relationships of New Zealand–Chilean and Chilean–Antarctic marine isopods:

	All genera	Excluding world-wide genera	According to Menzies (1962)
Percentages common to			
Chile–New Zealand	59%	55%	(32%)
Chile–Australia	37%	32%	—
Chile–South Africa	51%	41%	(41%)
Chile–Antarctica	44%	50%	(23%)

One would expect further work in Australia to raise the percentages to something more approaching the Chile–New Zealand or Chile–South African figures. Even as the figures stand above, it would seem that, although there may be a considerable number of endemic species in the five separate regions, the majority of the genera are widely distributed in the Southern Hemisphere.

ACKNOWLEDGMENTS

We wish to express our thanks to both the Director and Dr K. Lang of the Naturhistoriska Riksmuseet, Stockholm, for their kindness in allowing us to see the type material of *Macrochiridothea michaelseni* Ohlin.

LITERATURE CITED

BARNARD, K. H., 1940. Contributions to the Crustacean Fauna of South Africa. XII. Further additions to the Tanaidacea, Isopoda and Amphipoda, together with keys for the identification of hitherto recorded marine and freshwater species. *Ann. S. Afr. Mus.*, 32(5): 381–543, Text-figs. 1–35.

HALE, HERBERT M., 1929. "The Crustaceans of South Australia." Part II. Adelaide. Government Printer, 201–380, Text-figs. 202–364.

——— 1946. Isopoda-Valvifera. *Rep. B.A.N.Z. Antarct. Res. Exped. ser. B.(Zool. and Bot.)*, 5(3): 161–212, figs. 1–30.

DANA, J. D., 1852. Crustacea. *U.S. explor. Exped.*, 13(2): 690–1018.

HURLEY, D. E., 1961. A checklist and key to the Crustacea Isopoda of New Zealand and the Subantarctic Islands. *Trans. R. Soc. N.Z. (Zool.)*, 1(20): 259–292.

KUSSAKIN, O. G., 1967. Isopoda and Tanaidacea from the coastal zones of the Antarctic and Subantarctic. *In* Biological Results of the Soviet Antarctic Expedition (1955-1958), 3. *Issled. Fauny Morei*, 4(12): 220–380, figs. 1–64, 7 tables.

MENZIES, R. J., 1962. The zoogeography, ecology and systematics of the Chilean Marine Isopods. *In* Reports of the Lund University Chile Expedition, 1948-1949, No. 42. *Acta Univ. lund., n.f.Avd.*, 2, 57(11): 1–162, figs. 1–51.

OHLIN, AXEL., 1901. Isopoda from Tierra del Fuego and Patagonia. 1. Valvifera. *Svenska Exped. Magellansländ*, 2(11): 261–306.

NIERSTRASZ, H. F., 1918. Alte und neue Isopoden. *Zool. Meded. Leiden*, 4(2): 103–142, Pls. 9–10.

NORDENSTAM, AKE., 1933. Marine Isopoda of the Families Serolidae, Idotheidae, Pseudidotheidae, Arcturidae, Parasellidae and Stenetriidae, mainly from the South Atlantic. *Further zool. Results Swed. Antarct. Exped.*, 3(1): 1–284, Pls. 1–2, figs. 1–78.

SHEPPARD, EDITH M., 1957. Isopod Crustacea. Part II. The Sub-order Valvifera. Families: Idoteidae, Pseudidotheidae and Xenarcturidae fam.n. With a supplement to the Isopod Crustacea, Part I. The family Serolidae. *Discovery Rep.*, 29: 141–198, Pls. 8–9, Text-figs. 1–29.

RICHARDSON, HARRIET, 1911. Descriptions of a new genus and species of Isopod Crustacean of the Family Idotheidae from the mouth of the Rio de la Plata, Argentina, South America. *Proc. U.S. nat. Mus.*, 40(1811): 169–171, figs. 1–5.

DR D. E. HURLEY,
New Zealand Oceanographic Institute,
D.S.I.R., P.O. Box 8009,
Wellington, New Zealand.

R. H. MURRAY,
Zoology Department,
University of Auckland,
P.O. Box 2175,
Auckland.