



The Marine Fauna of New Zealand:

Pycnogonida (Sea Spiders)

C. Allan Child

COVER PHOTO: *Ammothea magniceps* (Thomson, 1884) (Ammotheidae) on bryozoans encrusting a rock wall, Kaikoura Peninsula, South Island.

Photo: Karen Gowlett-Holmes

NATIONAL INSTITUTE OF
WATER AND ATMOSPHERIC RESEARCH (NIWA)

**The Marine Fauna of New Zealand:
Pycnogonida
(Sea Spiders)**

by

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NIWA Biodiversity Memoir 109

1998

Cataloguing in publication

CHILD, C.A.

The marine fauna of New Zealand: Pycnogonida (Sea Spiders) / by
C. Allan Child – Wellington : NIWA (National Institute of Water and Atmospheric
Research), 1998

(NIWA Biodiversity Memoir, ISSN 0083-7903; 109)

ISBN 0-478-08446-3

I. Title II. Series

UDC

Series Editor: Dennis P. Gordon
Typeset by: Rose-Marie C. Thompson
National Institute of Water and Atmospheric Research Ltd (NIWA)
(incorporating N.Z. Oceanographic Institute)
Wellington

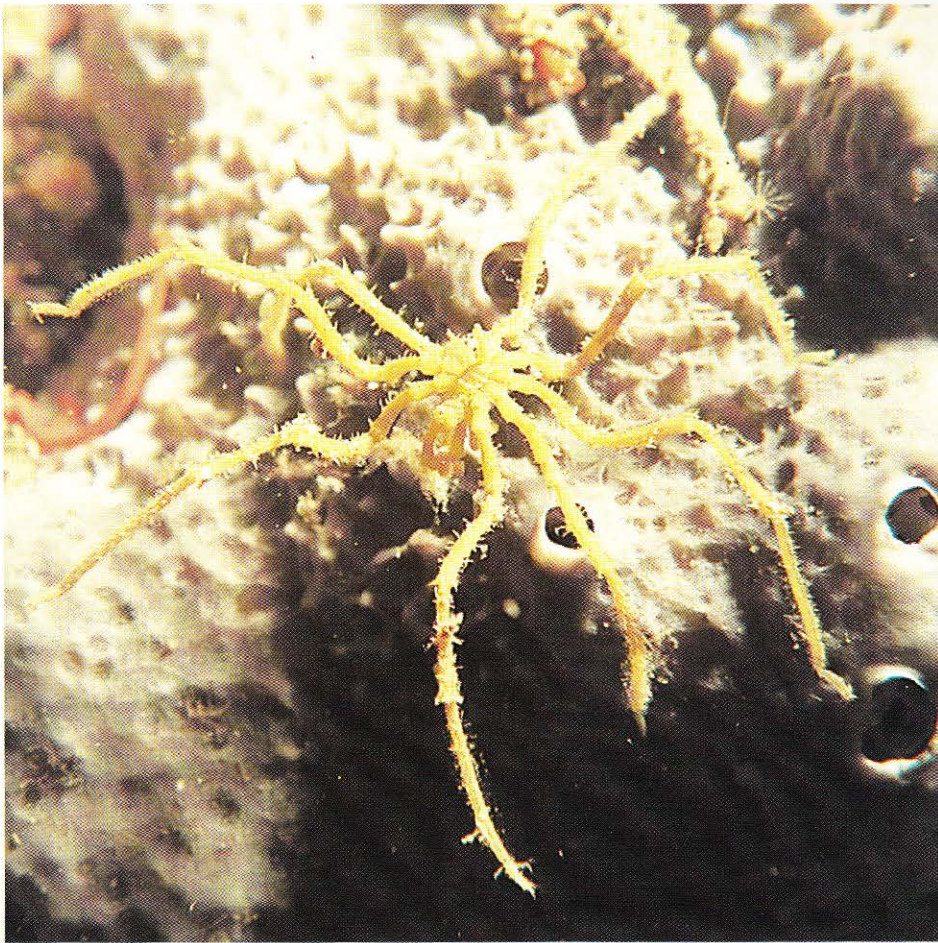
Printed and bound for NIWA by
Colorgraphic International
A Division of Wilson & Horton Print Ltd
Printers, Wellington & Auckland

Received for publication – September 1997

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Frontispiece: Top. *Achelia assimilis* (Haswell, 1885) on sponge.

Photo: Warren Farrelly

Bottom. *Pallenopsis obliqua* (Thomson, 1884) on green algae, Milford Sound, Fiordland.

Photo: Karen Gowlett-Holmes

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ABSTRACT

Ninety-four species (including subspecies) of Pycnogonida are known from the New Zealand region and described in this report. Forty of these species are described from new material, which includes six new species: *Ammothea acheliata*, *Ascorhynchus orthostomum*, *Nymphon uncatum*, *N. trispinum*, *Hedgpethia eleommata*, and *Pallenopsis (Pallenopsis) latus*. A key to pycnogonid families is given, the genera of each family represented by species found in New Zealand are diagnosed, the type species is given, and the distribution of each genus is generalised. Each species known to inhabit New Zealand waters is listed with its distribution and a brief diagnosis, and compared with similar species where practical in a remarks section. The new species are fully described, illustrated, measured, and compared with known similar species. A list of all NIWA stations known to have produced pycnogonids from New Zealand waters is enumerated. A section on zoogeography is included in which the New Zealand fauna and its affinities with nearby and more distant faunas are discussed. Previous literature and the state of current pycnogonid knowledge are elaborated.

Keywords: Pycnogonida, systematics, new species, marine fauna, New Zealand, zoogeography.

INTRODUCTION

The Class Pycnogonida represents a group of closely related genera and species of Arthropoda found exclusively in worldwide marine habitats from the shoreline to the deepest hadal depths. Pycnogonids are common to the New Zealand region but are seldom seen or collected here and elsewhere because shallow water specimens are usually very small and are cryptically coloured to blend in with whatever substrata they frequent. Deeper-water specimens are rarely captured. They may not be rare in life but only collected rarely because of the restrictions of infrequent and increasingly expensive deep-sea collecting by New Zealand and any other country engaged in such sampling.

Pycnogonids are mostly benthic organisms and some are known to be parasitic in invertebrates either as juveniles or permanently. They lack a universally accepted fossil record. Their development is direct with the male carrying cemented clutches of eggs gathered from females on special appendages until hatching and often after hatching in larval stages. A few known species are planktonic, hitching rides on medusae while parasitising them. Lacking a planktonic larva, pycnogonid dispersal is slow and spasmodic contributing to the development of many endemic species among the shallow-water forms. Deep-water pycnogonid transport is less well known and is probably assisted only by currents.

New Zealand has a rather large pycnogonid fauna mostly because of its extremely diverse shore habitats and the broad span of its island groups from the tropics to the Subantarctic. As currently known, the New Zealand fauna has about 8% of the 1150 more or less recognised pycnogonid species known from world oceans.

Previous Studies

The first records of pycnogonids from New Zealand waters came from the *Challenger*, the expedition which ignited a surge of interest in studies of marine life. Publications with new pycnogonids and other marine

fauna swelled in numbers in the late 1870s and during the 1880s. The two New Zealand *Challenger* stations (Hoek 1881) east of Auckland, produced the first three new species from that area: Stn 168, *Nymphon compactum* Hoek, and *N. longicoxa* Hoek from 2012 m; and Stn 169, the enigmatic *Oorhynchus aucklandiae* Hoek, from 1280 m, which has never been found again. These species were all deep-water inhabitants and the first two have been collected elsewhere, notably in Subantarctic and Antarctic localities. The two also appear again in this report.

The first known shallow-water pycnogonids from New Zealand were discussed in a survey by G.M. Thomson (1884) who listed Hoek's three species and described four new species from shallow localities. These are: *Achelia dohrni* (Thomson) (as *Ammothea dohrni*), *Ammothea magniceps* Thomson, *Callipallene novaezealandiae* (Thomson) (as *Pallene novaezealandiae*), and *Pallenopsis* (*P.*) *obliqua* (Thomson) (as *Phoxichilidium obliquum*).

The next species to be recognised was described by W.A. Haswell (1885) from Australia but found subsequently in New Zealand waters. Very little effort was given toward identifying New Zealand pycnogonids until well into the 20th century. Stock (1954) found 17 species in New Zealand waters, including several which were new species. He elaborated (Stock 1957) on the genus *Austrodecus* with two new species and others named to genus only from New Zealand. Many more species were found almost as a sideline while steaming to and from Antarctica from the most useful departure point for the Ross Sea, Christchurch (Gordon 1944; Fry & Hedgpeth 1969). Clark (1956) described a new *Pycnogonum* species from Banks Peninsula, two new species from Cook Strait (Clark 1958), and continued to enlarge knowledge of New Zealand pycnogonids with seven more papers to 1977, including reviews of the genera *Ammothea* (Clark 1977a) and *Tanystylum* (Clark 1977b) as found in the southern hemisphere. There are few additional listings of New Zealand species and these occur as incidental captures while going to or from Antarctic expeditions (Child 1994a, b, 1995a, b, c).

MATERIAL AND METHODS

MATERIAL

This report treats all of the 93 pycnogonid species now known to be living in the New Zealand region. The collections encompass 207 counted specimens in 95 lots and 600+ additional inexactly counted specimens in four large lots from 100 stations by NIWA (historically N.Z. Oceanographic Institute) ships or other vessels along with several shore stations. All nine pycnogonid families are represented in the collections, with 27 genera, 40 species, and two additional species unnamed for lack of adult material. These are widely spread among the 100 collecting stations. Nine described species are new to the New Zealand area, as well as six new species described herein.

The majority of the species examined (27) are from depths of 0–100 m. Nine species have a depth range of 0–500 m and four more have the greater range of from 0 to more than 1000 m.

The next largest group is 21 species found in waters deeper than 1000 m. Seven of these 21 share both deep-water habitats and slope waters of depths less than 100 m to 1000 m. Five slope (500–1000 m) species are represented, with three of these species sharing depths with shelf species (100–1000 m). The shelf species of New Zealand thus remain poorly known, undoubtedly as a result of a lack of collecting from these intermediate shelf depths. This region will probably yield several more endemic species and perhaps new species among the many forms now known when greater collecting is accomplished among the many and varied habitats. The new species recorded herein will undoubtedly have wider depth ranges than are known for just their type specimens. The six species each have ranges in one of the three depth areas: shelf, slope, or basin.

The specimens were all collected by vessels and personnel of the former New Zealand Oceanographic Institute (NZOI), a few from other vessels unrelated to NZOI, or from shore collecting. Most of the specimens are deposited within the NZOI collection of NIWA, Wellington. Several surplus specimens were deposited with the U.S. National Museum of Natural History (USNM/NMNH) in exchange for specimens not represented in the NZOI collections.

METHODS

Pycnogonid systematics is based with few exceptions

on external morphology which is fairly simple and straightforward. Pycnogonid anatomy consists of a trunk with lateral processes to which are attached usually four pairs of anterior appendages (or less) and eight legs (at least in most New Zealand species; some others have ten or twelve legs). The anterior trunk segment usually has a dorsal ocular tubercle with or without eyes, a pair of chelifores with chelae, with chelae atrophied, a chelifore stump, or lacking chelifores entirely. Ventral to the chelifores is a pair of tactile palps of varying segment numbers and between the palps, if they exist, is a suctorial proboscis. Between the fourth or posterior lateral processes is a small abdomen which contains the anus and nothing else. Directly ventral to the first pair of lateral processes in one or both sexes are usually egg-carrying appendages called ovigers. At the distal end of this is sometimes, depending on the genus and family, a strigilis with the appearance of a shepherd's crook which is often equipped with special denticulate spines and sometimes a terminal claw. The legs have eight segments and a terminal claw, sometimes flanked by a pair of auxiliary claws.

Identities of genera and families are dependent on the presence or absence of one or some of these appendages or parts of them and these higher taxonomic categories are defined in this manner. There are exceptions to every statement about morphology among the species of any genus of pycnogonids. Identification of a few species must rely in part on internal gut anatomy, but usually this can be viewed through the integument and does not require dissection. Specimens of the Class Pycnogonida display seemingly infinite variations within each of the anatomical diagnostic characters which, when recognised, bring to light the full range and wealth of about 1150 species known today. This great variation within the bounds of a simple plan can be seen in the few illustrations of new species presented in this report. The figures are drawn and arranged according to current conventions which call for presenting the trunk itself and lateral processes without legs for greater clarity, and each of the appendages separately, sometimes enlarged to provide greater detail of diagnostic characters. Illustrations of more commonly known species will be found among the references cited for each of the species.

Pycnogonid external anatomy can be examined for the most part by use of a low-power light microscope, but detailed examination of appendage parts must be

accomplished under higher magnification in order to separate many species from their congeners. For purposes of this report, some appendage parts were dissected, examined under high-power, drawn when necessary, and returned to the same specimen in alcohol. Permanent microscope slides were not necessary and all parts of specimens dissected are placed

with the main part of the specimen in alcohol. It was not found necessary to introduce any new anatomical terminology for this report, and the terminology used in current literature is sufficiently well known among systematists that figures detailing species anatomy are not thought necessary herein.

ZOOGEOGRAPHY

The bounds of the New Zealand region from which the 94 species listed in this report were taken is defined by NIWA's New Zealand regional bathymetric chart (CANZ 1997). The samples range from subtropical and temperate to subantarctic waters spanning an extremely wide range of latitude from about 25°S to 55°S that includes the Norfolk Ridge in the north to most of the Macquarie Ridge in the south. Several stations were made near Norfolk Island and one station was from the Kermadec Ridge. Many of the deep-water species came from the submarine troughs and basins surrounding New Zealand, while the largest group of species came from the Campbell Plateau, its subantarctic islands, and southern slopes. No stations made by NZOI south of Macquarie Ridge are included. Thus the geographic area encompassed by this memoir is as extremely varied as its depth range.

The statistics of species distribution and affinities reveal that pycnogonids in the New Zealand region are a somewhat neglected fauna, particularly shallow-water species. About 43% of the species (40, including the six new species) are known only from New Zealand waters. These may not necessarily all be endemic – and only the type-localities are known for the six new species listed. The distribution of many of these species will undoubtedly be expanded when more collecting is completed in adjacent waters and those further afield. New Zealand, on the other hand, is an isolated island country surrounded by many deep troughs and basins and there are very few smaller islands away from these shores except in the south. Thus a large group of the specimens presented herein, 21 of the 94 species, are from deep waters (> 1000 m). Fourteen species would qualify as slope species (100–500 m) but seven additional slope species share various depths with deep-water species (100– > 1000 m). The shallow and littoral species (< 100 m) form the largest

number with 27 listed. Nine additional species share both shelf and slope depths (0–500 m).

A surprising seven species found in the region are known only from the Macquarie Ridge and its surrounding deeps and four additional species are distributed both at Macquarie and in Antarctic localities. The greatest affinity shared with New Zealand species occurs with those known from the Antarctic. Some 22 New Zealand species are recorded from the Antarctic and in Subantarctic localities (excluding the Macquarie species counted above). Suggestions of West Wind Drift are seen in 13 New Zealand species which share patterns of either deep or shallow distributions to the east in southern Pacific and Magellanic localities. There are seven New Zealand species which also are distributed in the southern Indian Ocean, while there are only five which share their distribution with Australia, also suggesting the West Wind Drift as a method of distribution. Four of these species are from shore and shallow depths which suggests that rafting played a part in their dispersal.

Affinities with western Pacific species to the north are rather few. Species affinities are much stronger with those from southern and Antarctic localities. As far as our knowledge of faunal distribution goes, only one New Zealand species is found north in Indonesia, one in the Philippines, and two have a broader distribution which includes Japan. Four also have generalised broad distributions in several Indo-West Pacific localities. Only three of the 94 species are known to have cosmopolitan deep-water distribution. These are long-known deep-water species in two genera, *Colossendeis* and *Pallenopsis* (*Bathypallenopsis*), representatives of which could be expected to occur in New Zealand waters. More of these known deep-water species are likely to be found here.

LIST OF STATIONS

NIWA (New Zealand Oceanographic Institute) stations at which Pycnogonida were collected
and the species from each station.

Stn No.	Date	Latitude (°S)	Longitude	Depth (m)	Species
A444	5-10-58	41°14.3'	174°29.2'E	192	<i>Pallenopsis (Pallenopsis) obliqua</i>
B175	8-10-59	50°26.5'	166°37.5'E	95	<i>Pallenopsis (Pallenopsis) obliqua</i>
B493	8-6-61	45°34.4'	166°39.1'E	84	<i>Pallenopsis (Pallenopsis) obliqua</i>
C171	4-9-59	39°40'	172°52.5'E	163	<i>Cilunculus sewelli</i>
C172	4-9-59	39°40'	173°05'E	139	<i>Cilunculus sewelli</i>
C386	30-4-60	41°27'	174°28'E	128	<i>Pallenopsis (Pallenopsis) obliqua</i>
E709	21-3-67	40°28'	177°43'E	1642-1789	<i>Nymphon longicoxa</i>
E820	23-10-67	46°35'	165°58'E	159-220	<i>Cheilopallene trappa, Pallenopsis (Pallenopsis) obliqua</i>
E891	24-3-68	36°40'	173°27'E	1247-1282	<i>Nymphon immane</i>
E892	24-3-68	37°20'	173°35'E	1224-1226	<i>Nymphon immane</i>
E948	20-10-68	ca. 37°48'	174°54'E	littoral	<i>Anoplodactylus pycnosoma</i>
E962	26-10-68	ca. 39°10'	177°53'E	littoral	<i>Achelia dohrni</i>
E967	5-11-67	Eve Bay, Wellington		littoral	<i>Ammothea australiensis</i>
E973	25-1-68	45°55'	170°29'E	littoral	<i>Achelia assimilis, Ammothea australiensis</i>
E974	25-1-68	45°55'	170°29'E	littoral	<i>Achelia assimilis, Anoplodactylus pycnosoma</i>
I13	4-5-75	35°35.9'	174°50.8'E	140-149	<i>Cilunculus sewelli</i>
I75	20-7-75	28°45'	167°55.2'E	70	<i>Ammothea acheliata</i> n.sp.
I341	16-11-77	34°14.7'	172°50.8'E	89-92	<i>Pallenopsis (Pallenopsis) obliqua</i>
I666	13-3-79	47°47.5'	178°59.5'W	1165	<i>Ammothea adunca, Colossendeis colossea, C. megalonyx</i>
I672	13-3-79	48°00.3'	179°44'W	380	<i>Colossendeis megalonyx</i> ssp.
I674	14-3-79	48°00.4'	179°10.5'W	750	<i>Colossendeis arcuata, Pallenopsis (Pallenopsis) latus</i> n.sp.
I675	14-3-79	48°00'	179°00' W	1068	<i>Colossendeis megalonyx, C. tortipalpis</i>
I686	16-3-79	48°30.5'	179°45'W	710	<i>Colossendeis megalonyx</i>
I689	17-3-79	48°51.5'	178°41.5'E	608-808	<i>Colossendeis megalonyx</i>
I694	18-3-79	49°30'	178°45'E	1004-995	<i>Colossendeis longirostris, C. megalonyx</i>
I697	19-3-79	48°29.1'	178°16.6'E	915-917	<i>Colossendeis tortipalpis</i>
I721	26-3-79	44°07.4'	175°46.2'E	540	<i>Pallenopsis (Pallenopsis) latus</i> n.sp.
J485	7-12-73	50°38'	167°38'E	320-380	<i>Colossendeis megalonyx</i>
J550	17-12-73	49°04'	172°40.3'E	535	<i>Colossendeis macerrima</i>
J668	6-9-74	36°23.5'	177°39.1'E	2570-2571	<i>Colossendeis tortipalpis</i>
P5	25-1-77	32°36.4'	167°30.6'E	126	<i>Pallenopsis (Pallenopsis) kupei</i>
P18	25-1-77	29°34.6'	168°03'E	86-90	<i>Pallenopsis (Pallenopsis) obliqua</i>
P31	28-1-77	29°00.4'	168°54.9'E	4-14	<i>Achelia assimilis</i>
P46	30-1-77	28°42.3'	167°56.7'E	450-475	<i>Scipiolus plumosus</i>
P927	18-4-80	40°50.1'	168°14.8'E	1005-1009	<i>Colossendeis tortipalpis</i>
P947	1-6-80	25°13.7'	179°04.1'W	547-646	<i>Pallenopsis (Pallenopsis) latus</i> n.sp.
P969	15-6-80	37°05.5'	178°20.9'E	2250-2262	<i>Nymphon compactum</i>
P970	17-6-80	39°30'	178°50'E	3391-3390	<i>Nymphon uncatum</i> n.sp., <i>Pallenopsis (Bathypallenopsis) californica</i>
Q85	2-11-78	41°12.6'	174°27.2'E	315	<i>Pallenopsis (Pallenopsis) obliqua</i>
Q91	3-11-78	40°38.5'	174°01.0'E	215	<i>Pallenopsis (Pallenopsis) obliqua</i>
Q100	7-11-78	ca. 45°40.0'	166°43.9'E	0-21 SCUBA	<i>Pallenopsis (Pallenopsis) obliqua</i>
Q102A	8-11-78	45°38.8'	166°53.3'E	0-40 SCUBA	<i>Pallenopsis (Pallenopsis) obliqua</i>
Q644	17-11-81	39°26.3'	147°48.7'E	49	<i>Oropallene dimorpha</i>
Q77	23-7-82	46°04.5'	166°45.2'E	35 SCUBA	<i>Pallenopsis (Pallenopsis) obliqua</i>
S22	17-9-78	50°39.0'	167°39.6'E	400	<i>Pallenopsis (Pallenopsis) obliqua</i>
S45	21-9-78	54°01.5'	171°04.5'E	1262	<i>Colossendeis megalonyx</i>
S71	26-9-78	47°55.2'	178°37.6'E	365	<i>Colossendeis megalonyx</i>
S120	20-10-79	43°33.0'	175°58.8'E	365	<i>Pycnosomia asterophila</i>

Stn No.	Date	Latitude (°S)	Longitude	Depth (m)	Species
A444	5-10-58	41°14.3'	174°29.2'E	192	<i>Pallenopsis (Pallenopsis) obliqua</i>
S129	21-10-79	43°33.2'	175°58.4'E	355	<i>Cilunculus sewelli, Pycnosomia asterophila</i>
S131	21-10-79	43°35.6'	175°57.8'E	355	<i>Cilunculus sewelli</i>
S138	24-10-79	44°35.4'	174°49.6'E	785	<i>Achelia assimilis, Cilunculus sewelli, Austrodecus (Microdecus) fryi</i>
S140	24-10-79	44°33.9'	174°51.2'E	750	<i>Colossendeis megalonyx</i>
S147	25-10-79	44°30.1'	174°18.8'E	760	<i>Austrodecus (Microdecus) fryi</i>
S148	25-10-79	44°41.0'	174°20.9'E	859	<i>Austrodecus (Microdecus) fryi, Cilunculus sewelli, Nymphon sp.</i>
S150	26-10-79	45°46.0'	174°24.5'E	1640	<i>Cilunculus sewelli, Nymphon longicoxa, Pantopipetta australis, Oropallene metacaula</i>
S151	26-10-79	45°45.8'	174°30.5'E	1586	<i>Ascorhynchus orthostomum n.sp., Nymphon longicoxa, Pantopipetta australis</i>
S152	26-10-79	45°52.3'	174°04.9'E	1676	<i>Nymphon longicoxa</i>
S153	27-10-79	45°21.1'	173°35.8'E	1386	<i>Ammonothea adunca, Colossendeis megalonyx, Nymphon sp., Oropallene metacaula</i>
S154	27-10-79	45°24.2'	173°59.8'E	1373	<i>Nymphon bucuspidum, Oropallene metacaula, Colossendeis megalonyx</i>
S160	28-10-79	44°13.9'	173°39.5'E	550	<i>Colossendeis megalonyx, Pallenopsis (Pallenopsis) kupei</i>
S164	29-10-79	44°34.0'	174°06.5'E	863-910	<i>Achelia assimilis</i>
S174	30-10-79	44°06.5'	175.4.1'E	518	<i>Colossendeis megalonyx</i>
S184	31-10-79	43°22.4'	173°21.9'E	75	<i>Pallenopsis (Pallenopsis) obliqua</i>
S194	31-10-79	43°09.4'	173°47.5'E	1190	<i>Colossendeis megalonyx, Nymphon immane</i>
S202	2-11-79	42°14.7'	175°08.6'E	2476-2572	<i>Ascorhynchus cooki, Nymphon australe caecum, Nymphon typhlops, Pentanymphon antarcticum, Colossendeis megalonyx, Pallenopsis (Pallenopsis) pilosa</i>
S203	2-11-79	42°07.0'	175°08.2'E	2619-2627	<i>Nymphon australe caecum, Nymphon typhlops, Pallenopsis (Pallenopsis) pilosa</i>
S204	3-11-79	42°10.5'	175°59.4'E	2677-2602	<i>Nymphon australe caecum, Nymphon typhlops, Pallenopsis (Pallenopsis) pilosa</i>
T33	13-3-81	48°30.2'	179°43.6'W	721-725	<i>Colossendeis megalonyx</i>
T47	14-3-81	49°57.9'	177°32.6'E	1200-1400	<i>Pallenopsis (Pallenopsis) pilosa</i>
U196	24-9-82	33°03'	165°22.4'E	3118-3120	<i>Colossendeis macerrima</i>
U198	26-9-82	34°59.3'	162°11.2'E	1573	<i>Colossendeis colossea</i>
U226	16-10-82	38°37.3'	165°36'E	2417-2421	<i>Colossendeis colossea</i>
V376	14-9-89	44°20.3'	179°00.3'E	1239	<i>Colossendeis megalonyx, Nymphon bucuspidum</i>
V400	10-12-91	44°29.1'	171°13.7'E	8	<i>Achelia dohrni</i>
V402	10-12-91	44°29.8'	171°13.9'E	12	<i>Achelia dohrni</i>
V405	10-12-91	44°30.9'	171°45'E	8	<i>Achelia dohrni</i>
V408	10-12-91	44°27.5'	171°14.9'E	7	<i>Achelia dohrni</i>
V410A	18-5-92	44°29.1'	171°13.7'E	8	<i>Achelia dohrni</i>
W248	14-9-93	44°36.0'	178°55.6'E	1442-1468	<i>Hedgpethia eleommata n.sp.</i>
W249	14-9-93	44°18.9'	179°00.9'E	1200-1230	<i>Colossendeis megalonyx, Nymphon bucuspidum</i>
W274	26-9-93	42°39.2'	179°00.9'E	1844	<i>Nymphon typhlops</i>
W460	23-2-95	45°57.9'	171°45.7'E	1400-1415	<i>Ascorhynchus orthostomum n. sp., Oropallene metacaula, Nymphon bucuspidum, Nymphon trispinum n.sp., Colossendeis megalonyx, Hedgpethia eleommata n.sp.</i>
X536	14-7-94	42°46.6'	175°13.3'W	1363-1365	<i>Colossendeis colossea, C. longirostris</i>
X677	13-2-96	35°25.5'	178°39.7'E	1235-1268	<i>Colossendeis colossea</i>
R/V <i>Tangaroa</i> :					
Z8396	13-10-95	44°21.1'	179°25.6'E	1123-1134	<i>Colossendeis australis</i>
Z8670	6-10-95	44°23.5'	173°35.9'E	656-666	<i>Colossendeis megalonyx</i>
Z8671	7-10-95	44°55.9'	174°07.3'E	1009-1067	<i>Colossendeis megalonyx</i>
Z8672	10-10-95	44°06.3'	178°04.3'E	1037-1041	<i>Colossendeis longirostris</i>
Z8673	17-5-92	35°49'	174°30'E	low water	<i>Pycnogonum anovigerum</i>
(North Island, Whangarei Heads, Aubrey Island, under rocks)					
F/V <i>Peterson</i> :					
Z8481	May 1996	37°54'	179°13'E	1050-1100	<i>Colossendeis colossea</i>

Stn No.	Date	Latitude (°S)	Longitude	Depth (m)	Species
R/V <i>Ben Gunn</i> :					
Z8640	27-2-97	34°21.5'	172°47.8'E	57	<i>Achelia assimilis</i>
Z8641	27-2-97	34°23.4'	172°51.8'E	49	<i>Ammothea magniceps</i>
Z8645	27-2-97	34°22.2'	172°48.0'E	51.3	<i>Achelia assimilis</i>
Z8649	27-2-97	34°22.5'	172°47.9'E	47	<i>Achelia assimilis</i>
Z8660	27-2-97	34°21.3'	172°47.1'E	38	<i>Achelia assimilis</i>
Z8662	27-2-97	34°21.4'	172°46.2'E	54.5	<i>Achelia assimilis</i> , <i>Austrodecus frigorifugum</i>
Z8663	27-2-97	34°23.8'	172°53.3'E	37.5	<i>Achelia assimilis</i>
Z8822	5-2-97	34°21.3'	172°47.1'E	57.5	<i>Achelia assimilis</i>
Z8823	24-2-97	35°59.0'	174°36.3'E	37	<i>Rhynchothorax percivali</i>
Z8824	18-5-92	35°49'	174°30'E	sublittoral	<i>Achelia assimilis</i>

(Whangarei Heads, Smugglers Bay)

CHECKLIST OF PYCNOGONIDA KNOWN FROM THE NEW ZEALAND REGION

(* = described in this account; + = new record for the New Zealand region).

Family AMMOTHEIDAE

- * *Achelia assimilis* (Haswell, 1885)
- Achelia australiensis* Miers, 1884
- * *Achelia dohrni* (Thomson, 1884)
- Achelia transfuga* Stock, 1954
- *+*Ammothea acheliata* n.sp.
- *+*Ammothea adunca* Child, 1994
- * *Ammothea antipodensis* Clark, 1972
- Ammothea longispina* Gordon, 1932
- Ammothea magniceps* Thomson, 1884
- Ammothea makara* Clark, 1977
- Ammothea uru* Clark, 1977
- Ascorhynchus antipodus* Child, 1987
- * *Ascorhynchus cooki* Child, 1987
- Ascorhynchus insularum* Clark, 1971
- * *Ascorhynchus orthostomum* n.sp.
- Cilunculus cactoides* Fry & Hedgpeth, 1969
- * *Cilunculus sewelli* Calman, 1938
- Cilunculus spinicristus* Child, 1987
- Oorhynchus aucklandiae* Hoek, 1881
- *+*Scipiolus plumosus* Loman, 1908
- Tanystylum antipodum* Clark, 1977
- Tanystylum excuriatum* Stock, 1954
- Tanystylum neorhetum* Marcus, 1940
- Tanystylum oedinotum* Loman, 1923
- Tanystylum styliigerum* (Miers, 1875)

Family AUSTRODECIDAE

- Austrodecus (Austrodecus) breviceps* Gordon, 1938
- Austrodecus (A.) cestum* Child, 1994
- Austrodecus (A.) enzo* Clark, 1971
- Austrodecus (A.) frigorifugum* Stock, 1954
- Austrodecus (A.) glaciale* Hodgson, 1907
- Austrodecus (A.) gordonae* Stock, 1954
- Austrodecus (A.) serratum* Child, 1994
- Austrodecus (A.) sinuatum* Stock, 1957
- Austrodecus (A.) varum* Child, 1994
- Austrodecus (Microdecus) confusum* Stock, 1957

- Austrodecus (M.) fryi* Child, 1994a
- Austrodecus (M.) minutum* Clark, 1971
- Pantopipetta australis* (Hodgson, 1914)

Family PHOXICHILIDIIDAE

- Anoplodactylus lacinosus* Child, 1995
- *+ *Anoplodactylus pycnosoma* (Helfer, 1938)
- Anoplodactylus speculum* Child, 1995
- Anoplodactylus typhlops* Sars, 1888
- Anoplodactylus xenus* Stock, 1980
- Phoxichilidium pyrgodum* Child, 1995
- *+ *Pycnosomia asterophila* Stock, 1981

Family ENDEIDIDAE

- Endeis australis* (Hodgson, 1907)

Family NYPHONIDAE

- Heteronymphon exiguum* (Hodgson, 1927)
- Nymphon australe* Hodgson, 1902
- * *Nymphon australe caecum* Gordon, 1944
- * *Nymphon bucuspidum* Child, 1995
- * *Nymphon compactum* Hoek, 1881
- * *Nymphon immane* Stock, 1954
- Nymphon lomani* Gordon, 1944
- Nymphon longicollum* Hoek, 1881
- * *Nymphon longicoxa* Hoek, 1881
- Nymphon macquariensis* Child, 1995
- Nymphon maoriana* Clark, 1958
- Nymphon punctum* Child, 1995
- * *Nymphon trispinum* n.sp.
- *+*Nymphon typhlops* (Hodgson, 1915)
- *+*Nymphon uncatum* n.sp.
- *+*Pentanymphton antarcticum* Hodgson, 1904

Family CALLIPALLENIDAE

- Austropallene cristata* (Bouvier, 1911)
- Austropallene tibicina* Calman, 1915
- Callipallene novaezealandiae* (Thomson, 1884)
- * *Cheilopallene trappa* Clark, 1971

- Neopallene antipoda* Stock, 1954
 * *Oropallene dimorpha* (Hoek, 1898)
Oropallene dolichodera Child, 1995
 * *Oropallene metacaula* Child, 1995
Parapallene exigua Stock, 1954
Pallenopsis (*Bathypallenopsis*) *antipoda* Clark, 1971
 *+*Pallenopsis* (*P.*) *californica* Schimkewitsch, 1893
 * *Pallenopsis* (*Pallenopsis*) *kupei* Clark, 1971
 *+*Pallenopsis* (*P.*) *latus* n.sp.
Pallenopsis (*P.*) *mauii* Clark, 1958
 * *Pallenopsis* (*P.*) *obliqua* (Thomson, 1884)
 *+*Pallenopsis* (*P.*) *pilosa* (Hoek, 1881)
Pallenopsis (*P.*) *triregia* Clark, 1962

Family COLOSSENDEIDAE

- *+*Colossendeis arcuata* H. Milne-Edwards, 1885
Colossendeis australis Hodgson, 1907

- * *Colossendeis colosse*a Wilson, 1881
Colossendeis hoeki Gordon, 1944
 * *Colossendeis longirostris* Gordon, 1938
 * *Colossendeis macerrima* Wilson, 1881
Colossendeis media Hoek, 1881
 * *Colossendeis megalonyx* Hoek, 1881
 * *Colossendeis tortipalpis* Gordon, 1932
 * *Hedgpathia eleommata* n.sp.

Family RHYNCHOTHORACIDAE

- Rhynchothorax articulatus* Stock, 1968
Rhynchothorax australis Hodgson, 1907
Rhynchothorax percivali Clark, 1976

Family PYCNOGONIDAE

- Pycnogonum anovigerum* Clark, 1956
Pycnogonum planum Stock, 1954

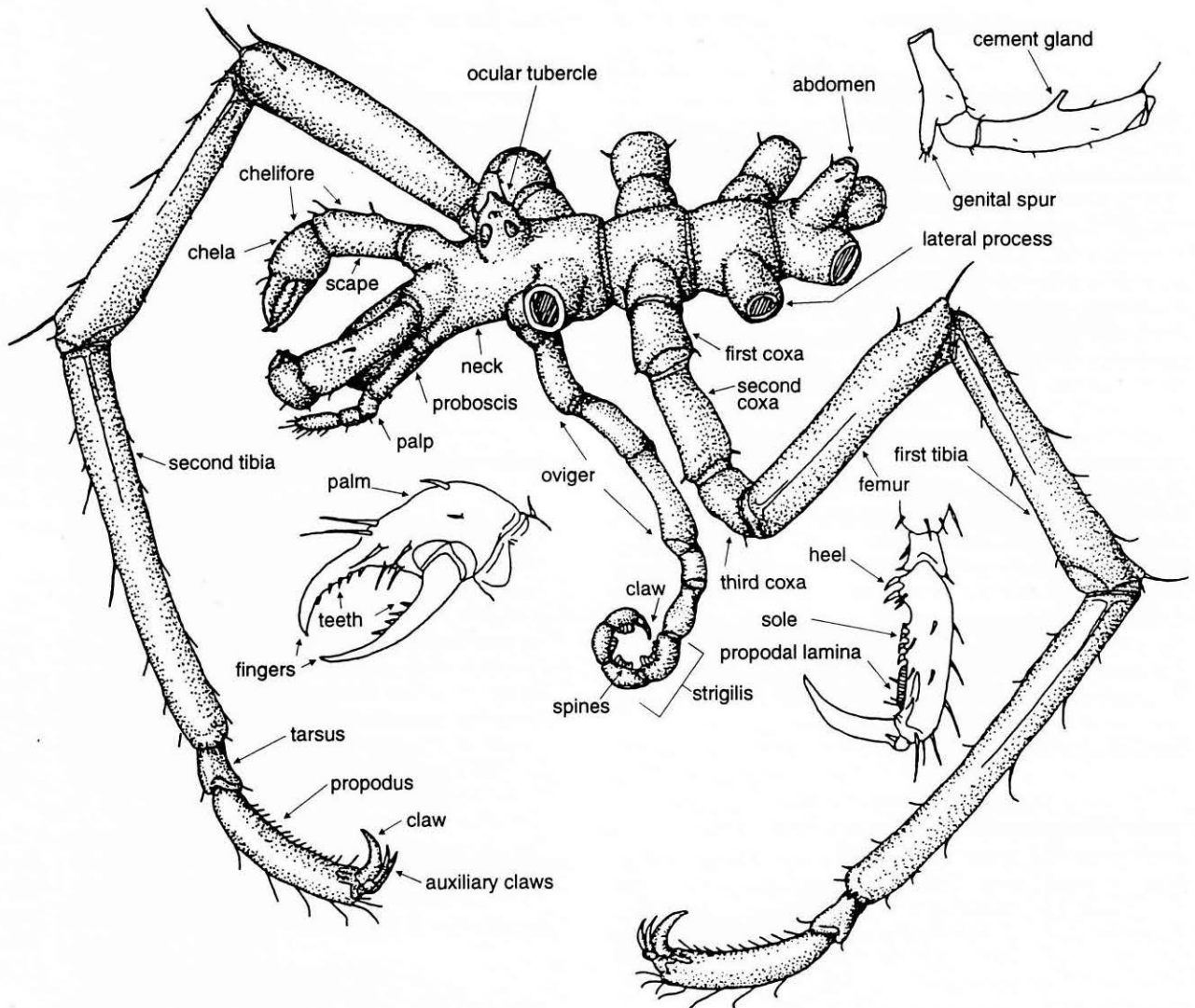


Fig. 1. Diagrammatic pycnogonid, with insets of other pycnogonid appendages, showing terms used in the descriptions.

SYSTEMATICS

KEY TO THE FAMILIES OF PYCNOGONIDA (adapted from Hedgpeth 1948, and Child 1979)

- 1 Chelifores and palps present; ovigers in both sexes 2
 Chelifores or palps, or both, lacking or greatly reduced; ovigers in both sexes, in male only or lacking 4
- 2(1) Chelifores or chelae, or both, vestigial, some achelate; palps 4- or 10-segmented, ovigers 9- or 10-segments, with or without terminal claw, with denticulate or simple spines AMMOTHEIDAE
 Chelifores and chelae well developed, functional 3
- 3(2) Palps with 5 segments; ovigers with 10, with strong strigilis, terminal claw and denticulate spines; propodus with or without auxiliary claws NYMPHONIDAE
 Palps lacking, reduced to buds, or 4-segmented; oviger with 9 or 10 segments, strigilis with simple or denticulate spines, with or without terminal claw; propodus with or without auxiliary claws CALLIPALLENIDAE
- 4(1) Chelifores present; palps absent; ovigers 5- or 6-segmented, in males only, without strigilis or terminal claw; auxiliary claws tiny or lacking PHOXICHILIDIIDAE
 Chelifores lacking; palps present or lacking; ovigers in both sexes or males only, or lacking altogether, with or without terminal claw 5
- 5(4) Size giant, appendages extremely long; palps and ovigers 10-segmented, with terminal claw and rows of denticulate spines; auxiliary claws lacking COLOSSENDEIDAE
 Size much smaller, appendages shorter; palps present or lacking 6
- 6(5) Proboscis long, pipette-like, with rings over most of its length; palps usually 6-segmented; ovigers 1- to 6-segmented, not functional, without claw, lacking in some females AUSTRODECIDAE
 Proboscis more typical size and shape; palps usually of 4 segments or lacking; ovigers of 7 to 9 segments, in both sexes, in males only, or entirely lacking in some 7
- 7(6) Size very tiny; lateral processes crowded; lips of proboscis oral surface vertical; palps 4-segmented; 8-segmented oviger, usually in both sexes RHYNCHOTHORACIDAE
 Size little larger; lateral processes crowded or separated; oral surface round; palps lacking entirely; oviger with 7 or 9 segments in males only or lacking .. 8
- 8(7) Habitus slender (*Anoplodactylus*-like); ovigers 7-segmented, in males only, strigilis weak, without claw, with setae only; multiple cement gland pores ENDEIDAE
 Habitus stout, with short robust legs; ovigers 9-segmented, lacking in males of few species, with terminal claw; usually with single lateral cement gland pore on first coxae PYCNOGONIDAE

Family AMMOTHEIDAE Dohrn, 1881

Achelia Hodge, 1864

Body circular or discoidal in dorsal view with lateral processes touching or only narrowly separated distally. Proboscis pyriform; scapes 1-segmented, usually short, chelae present but vestigial. Palps 7-, 8-, or 9-segmented; oviger 10-segmented, weak strigilis with 1-2 denticulate spines per segment, in both sexes, that of female smaller. Legs knobby or tuberculate, first and second coxae with dorsolateral tubercles. One dorsodistal femoral cement gland. Auxiliary claws usually large.

TYPE: *Achelia echinata* Hodge, 1864, by original designation.

TYPE LOCALITY: Durham coast of United Kingdom, tidal to a few fathoms.

REMARKS: The members of this genus are found worldwide but almost half their number are concentrated around the perimeter of the Pacific.

Achelia assimilis (Haswell, 1885)

Ammothea assimilis Haswell, 1885: 1026-1027, pl. 54, figs 5-9.

Achelia assimilis: Child 1994a: 5-6 [previous literature]; Stock 1994: 32-33, fig. 9.

Nymphopsis denticulata Gordon, 1932a: 123-125, figs 69-70; McCloskey 1967: 122 [key].

MATERIAL EXAMINED: NZOI Stns P31, Norfolk Island, scuba, 4–14 m, 1 male; E973, St Clair, Dunedin, algal wash in 0–1 m, 2 juveniles; E974, St Clair, Dunedin, shallow, on giant kelp, 1 juvenile; S148, SW of Mernoo Bank, 859 m, trawl, 1 male (net contamination?); Z8824, Smugglers Bay, Whangarei Heads, sublittoral, 1 female; Z8640, near North Cape, 57 m, 1 male w/eggs, 1 female; Z8645, near North Cape, 51.3 m, 1 male w/eggs; Z8649, near North Cape, 47 m, 1 female, 1 juvenile; Z8660, near North Cape, 38 m, 1 male; Z8662, near North Cape, 54.5 m, 2 females, 1 juvenile; Z8663, near North Cape, 37.5 m, 1 female; Z8822, near North Cape, 57.5 m, 3 females.

DISTRIBUTION: This southern hemisphere shallow-water species demonstrates the effects of the West Wind Drift very well. It is found from Mozambique east to southern Australia, New Zealand, and Papua New Guinea. It is also known in an increasingly common north-south corridor of basically southern hemisphere species that occur north to Malaysia, Indonesia, the Philippines, and a few as far as Japan. This species has been found in the Philippines but not as far north as Japan. It has also been found in the Society Islands at Moorea Island, and it occurs on the shores of Chile and Argentina.

DESCRIPTION: Extremely variable. Trunk suture lines complete, partial or lacking. Two or more dorso-medial tubercles on trunk with or without similar tubercles on abdomen. Lateral processes broad, more or less contiguous, with distal tubercles varying in size and number. Proboscis a slender ovoid as long as trunk. Chelifores 2-segmented, scape longer than usual, with short dorsodistal tubercles or without. Chelae tiny nubs, atrophied in adults. Palps 8-segmented. Ovigera 10-segmented, smaller in females, armed with 1–2 denticulate spines per distal 3 segments. Legs slender, with or without low to tall tubercles, mostly dorsal if present. Male femur with 1 dorsodistal cement gland pore. Propodus well curved, with 3–4 larger heel spines, 7–8 smaller sole spines, robust claw and stout auxiliaries of varying lengths.

TYPE SPECIES: *Ammothea assimilis* Haswell, 1885.

TYPE LOCALITY: Clark Island, Port Jackson (Sydney), Australia.

REMARKS: This is probably the commonest of the four *Achelia* species found in New Zealand waters. It has a wealth of variation in the many tubercles, setae, spines, or in the lack of these. Fortunately, it is one of the few *Achelia* species that can be easily separated from *A. dohrni* (Thomson, 1884), the other common New Zealand species, by the simple spines found on *A. assimilis*. *Achelia dohrni* has very unusual spines most

of which show tiny bifurcate or trifurcate tips under high magnification.

Achelia assimilis is easily separated from *A. australiensis* Stock, 1954. The latter species lacks all tubercles, spines and larger setae on its trunk and lateral processes. It can be separated with equal ease from *A. transfuga* Stock, 1954, by the very tapered and downcurved proboscis of that species. The proboscis of *A. assimilis* is typically straight.

Achelia australiensis Miers, 1884

Achelia laevis var. *australiensis* Miers, 1884: 323–324, pl. 35, fig. A.

Achelia australiensis: Stock, 1954: 105–107, fig. 49.

Achelia (Ignavogriphus) australiensis: Fry & Hedgpeth, 1969: 106 [literature], fig. 156, tables 13, 14.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Lyttleton Harbour, 2–10 m. Also Port Jackson, Australia.

Achelia dohrni (Thomson, 1884)

Ammothea dohrni Thomson, 1884: 243–245, pl. 14, figs 5–9.

Achelia dohrni: Clark, 1972b: 441–448 [previous literature], figs 6A–H, 7A–J, 8A–I, 9A–H, 10A–R; 1975: 124–126.

MATERIAL EXAMINED: NZOI Stns E962, Mahia Peninsula, beach on outer coast, among algae, lower littoral, coll. K.P. Jansen, 1 female; V400, near Timaru, 8 m, trawl, 10 males w/eggs, 5 males, 16 females, 9 juveniles; V402, near Timaru, 12 m, dredge, (USNM 5 males w/eggs, 4 females); V405, near Timaru, 8 m, dredge, 6 males w/eggs, 1 male, 9 females, 6 juveniles; V408, near Timaru, 7 m, dredge, 13 males w/eggs, 2 males, 6 females, 13 juveniles; V410A, near Timaru, 8 m, 1 male w/eggs.

DISTRIBUTION: This species has been restricted in the literature to New Zealand and its Subantarctic Islands, in 0–50 m. The Mahia Peninsula capture is the northernmost record although it is apparently quite common in the shallows of South Island and its offshore islands, and most of the above specimens support this distributional survey. It appears to be endemic.

DESCRIPTION: Trunk almost circular in dorsal outline, segmentation lines lacking or first and second segments divided by line. Most trunk and appendage spines with bifurcate tips, some trifurcate. Lateral processes almost smooth, with few tiny setae, touching for most of their lengths. Ocular tubercle short, eyes prominent. Palp distal 3 segments carried anaxially

on extended fifth segment. Ovipiger strigilis usually with few plain setae but some with tiny denticulate spines. Coxa 2 distally swollen in females, with ventrodiscal spur in males. Major leg segments with few longer dorsal and lateral spines and few short setae. Tarsus typical, very short, propodus short, well curved, with 4, 5, or 6 larger heel spines, 8-10 small sole spines, Claw and auxiliaries typical, robust.

TYPE SPECIES: *Ammothea dohrni* Thomson, 1884.

TYPE LOCALITY: Rock pools at Oamaru, Otago Harbour, and near Dunedin, New Zealand.

REMARKS: As mentioned in the remarks under *A. assimilis*, most of the spines which clothe this species are peculiar and almost unique in having split tips (bifurcate or trifurcate). Distinctive spines are often found in the allied genus *Ammothella*, but rarely in this one. This character separates it from most members of the genus, particularly in New Zealand with only four known *Achelia* species.

Achelia transfuga Stock, 1854

Achelia transfuga Stock, 1954: 109-112, figs 52, 53.
Aduncorostris transfuga: Fry & Hedgpeth, 1969: 113.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known only from Lyttleton Harbour in 2-10 m.

REMARKS: This is the only New Zealand species of *Achelia* with a distally tubular and downcurved proboscis which makes it quite easily separated from any other known ammotheid.

Ammothea Leach, 1814

Trunk fully segmented, segment posteriors flared into cowlings, with or without dorsomedian tubercles. Lateral processes well separated, spinose. Ocular tubercle well marked, with eyes. Proboscis usually inflated, straight or well curved and bottle shaped. Chelifores either lacking or usually 1- or sometimes 2-segmented, short, chelae lacking or more often atrophied bumps, some with functional chelae. Palps 6- to 9-segmented, distal segments sometimes with ventral tubercles. Ovipiger 10-segmented, in both sexes, smaller in females, with simple or denticulate spines. Legs usually robust, with single dorsodistal femoral cement gland. Anterior propodi often with different

sole spine arrangement than posterior propodi, auxiliaries large.

TYPE SPECIES: *Ammothea carolinensis* Leach, 1814, by monotypy.

TYPE LOCALITY: Off the "Carolinas", in error for a subantarctic locality, probably South Georgia Island.

REMARKS: This genus is found predominantly in Antarctic and subantarctic regions. Of the 31 known species, 19 are from southern polar (Antarctic and subantarctic) seas. Seven others are known only from the southern hemisphere with four of these non-Antarctic species found in New Zealand waters. Six of the 19 polar species are also found on or near the Campbell Plateau. Only five species are found in the northern hemisphere and three of these are known only from Japan. New Zealand has a total of seven known species with two of them having additional records herein. New Zealand has an additional species, *Ammothea acheliae*, which is new, making it the thirty-second known species of the genus. Only two species in this memoir, *Ammothea adunca* Child, 1994a, and *A. longispina* Gordon, 1932, of the seven from New Zealand, have subantarctic affinities (south of 50°S). *Ammothea adunca* was described from specimens collected in the vicinity of Heard Island, Indian Ocean, in about 52°S.

Species of this genus are relatively stable and show little variation, unlike the previous genus, *Achelia*. Temperate species almost always have less flaring trunk cowlings than the Antarctic species. In the latter group, cowlings sometimes can be quite elevated and conspicuous.

Ammothea acheliata n.sp. (Fig. 2A-F)

MATERIAL EXAMINED: NZOI Stn I75, Norfolk Island, 70 m, trawl (holotype), 1 male with eggs.

DISTRIBUTION: Known only from the type locality.

DESCRIPTION: Size tiny for the genus, leg span only about 14 mm. Trunk fully segmented, without large cowls or dorsomedian tubercles at posterior segmentation lines. Lateral processes only as long as their diameters, separated by slightly less than their diameters, armed with 1-3 short dorsodistal or dorsal spines. Ocular tubercle low, shorter than basal diameter, eyes large, prominent, darkly pigmented. Abdomen short, blunt, without distal extension or rounded tubercle, not as long as fourth lateral processes, armed with 3-4 short distal spines. Proboscis ovoid, slightly longer than

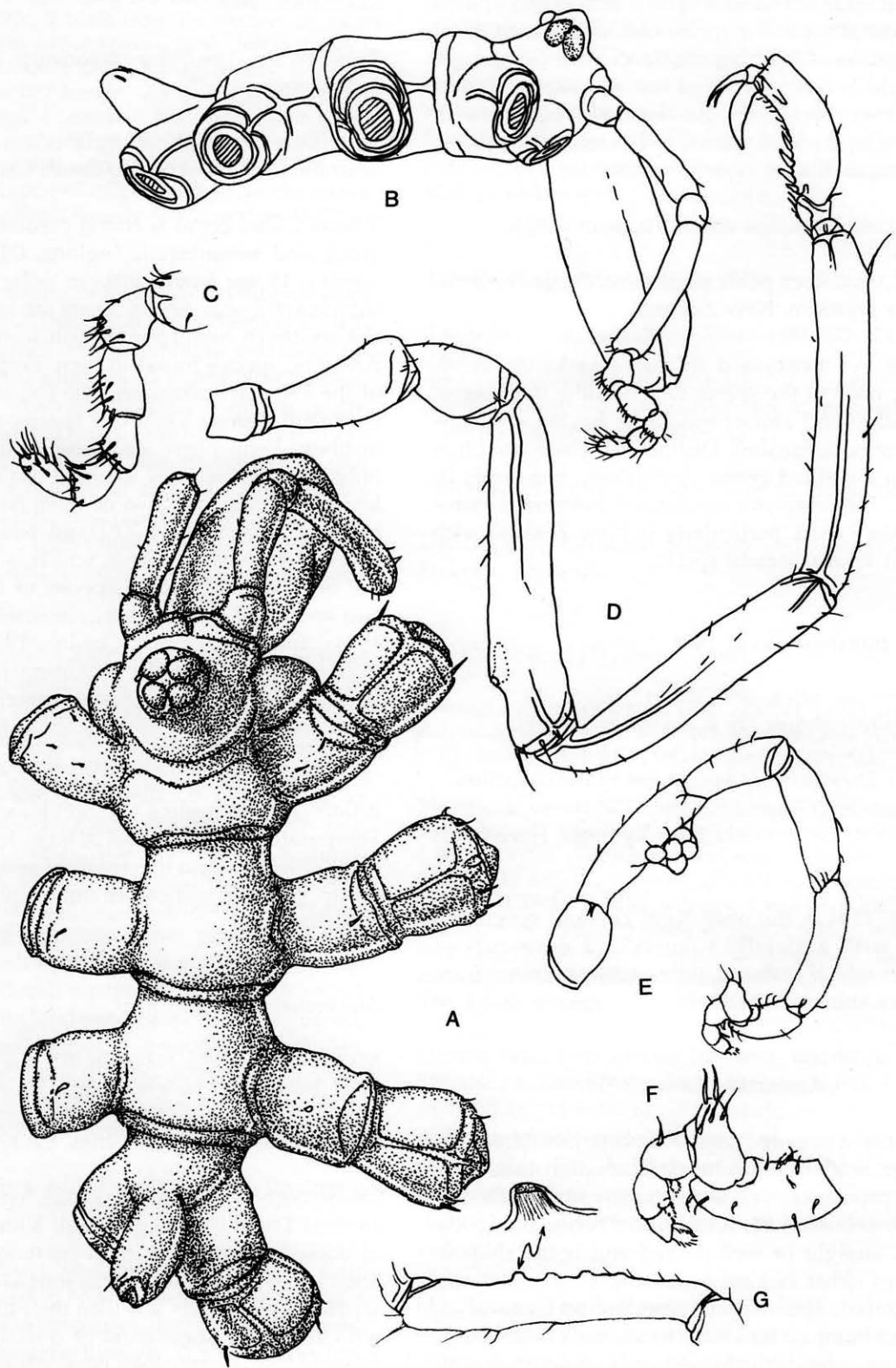


Fig. 2. *Ammothea acheliata* n.sp. Holotype male. A, trunk, dorsal view; B, trunk, lateral view; C, palp distal segments, enlarged; D, third leg; E, oviger; F, oviger distal segments, enlarged. *Nymphon immane* Stock. G, male femur with enlargement of single cement gland opening.

trunk width, about half trunk length, without constrictions.

Chelifores entirely lacking.

Palps 9-segmented, fourth segment longest, slightly longer than second, first and third short, subequal. Distal four short segments carried anaxially on curved fifth segment, hook-shaped, without ventral extensions or tubercles, moderately setose ventrally and distally. Most setae only as long as segment diameters.

Oviger 10-segmented, third segment slightly shorter than fourth or fifth which are subequal in length. Sixth segment with many short spines, seventh placed anaxially on sixth, with lateral apophysis bearing 5–6 moderately long spines. Eighth, ninth, and tenth segments each smaller than last, armed with small denticulate spines in formula 1: 1: 2, each with many lateral denticles.

Legs moderately long and slender, armed with very few short setae or spines except distal segments. Second tibiae the longest segments. Femoral cement gland small, opening a single small dorsodistal pore at about 0.75 femoral length. Tarsus very short, without major heel spines. Propodi homogeneous in anterior and posterior members, short, well curved, sole with three major heel spines, one or two slightly smaller proximal heel spines, and 6–7 small sole spines. Claw robust, short, well curved distally, auxiliary claws long, about 0.6 main claw length.

Female characters unknown.

MEASUREMENTS: Holotype in mm: Trunk length (anterior of eye tubercle to tip 4th lateral processes), 1.43; trunk width (across 2nd lateral processes), 0.71; proboscis length, 0.79; abdomen length, 0.34; third leg, coxa 1, 0.26; coxa 2, 0.68; coxa 3, 0.43; femur, 1.45; tibia 1, 1.39; tibia 2, 1.5; tarsus, 0.13; propodus, 0.61; claw, 0.24.

ETYMOLOGY: The species name *acheliata* (Latin *a*, meaning without, and *cheliata*, meaning claw or finger, diminutive) refers to the complete lack of chelifores on this unique specimen.

HOLOTYPE: Male with eggs, deposited in the NZOI collection at NIWA, Wellington, No. H-690.

TYPE LOCALITY: NZOI Stn I75, 28°45'S, 167°55.2'E, off Norfolk Island, Norfolk Ridge in 70 m.

REMARKS: This new species belongs to a small group of closely related members of the genus *Ammothea* which share a lack of chelae, distal palp segments sometimes with setose ventral extensions or tubercles, an ocular tubercle and abdomen sometimes with a small distal tubercle, and legs and ovigers which are very similar or even alike. It can be immediately separated from

any of this group by its lack of scapes and chelae in any form. The other species have chelifore scapes of various lengths but this species only has a partial suture line around the normal location for insertion of a scape. It is possible that this character is an artifact on a dam-aged specimen, but there is no indication that there ever were chelifore scapes present. They might have been lost at an early juvenile stage but there is no damage remaining to show that they existed.

The species of this group were listed as *Lecythorhynchus* until this was synonymised under *Ammothea* by Stock (1956). The species, as now recognised, are *A. hilgendorfi* Böhm, 1879 (= *L. marginatus* Cole, 1904), and *A. ovatooides* Stock, 1973. The list possibly includes *A. hedgpethi* Utinomi, 1959, which has the recurved distal palp segments but also has rudimentary chelae. Thus the group can not be clearly defined. The monotypic genus and species *Acheliiana tropicalis* Arnaud, 1971, is quite similar to this species but has very atrophied chelifores which appear only as tiny nubs. Arnaud's genus is possibly another aberrant or at least divergent member of this *Ammothea* group.

This new species is closest to *A. ovatooides* and were it not for its total lack of chelifore scapes, it would be difficult to separate from that species. The other differences between the two species are in the distal palp segment shape, presence or absence of small distal tubercles on the abdomen and ocular tubercle, and length of the major leg segments. In *A. acheliata*, the distal palp segments lack ventral swellings or tubercles while these are conspicuous in *A. ovatooides*. The small distal tubercles of the abdomen and ocular tubercle are also lacking in *A. acheliata*, while both are present in *A. ovatooides*. With major leg segments, the second tibiae are longest in the new species while the femora are longest in *A. ovatooides*. On the propodus of *A. acheliata*, there are fewer sole spines and the auxiliary claws are a good bit longer than on *A. ovatooides*. Most of these same differences are valid between *A. hilgendorfi* and this new species.

The states of chelifore development in the genus *Ammothea* are thus of four levels in adults, provided this new species is whole and undamaged. They now occur with species having no chelifores in any form, those with 1-segmented chelifore scapes only, chelifores with 2-segmented scapes with atrophied chelae, and chelifores with scapes bearing complete chelae with fingers which are presumably functional. This is the only known genus of pycnogonids with species of such diverse chelae development. Other genera in the family Ammotheidae have at least two of the above states (e.g., *Tanystylum*, *Ammothella*) but no other known genus occurs with as many as four states of chelifore development as *Ammothea* is now known to have.

Ammothea adunca Child, 1994a

Ammothea adunca Child, 1994a: 13–15, fig. 2.

MATERIAL EXAMINED: NZOI Stns I666, plateau slope SE of Bounty Is., 1165 m, 1 male, 1 juvenile; S153, Bounty Trough, S of Banks Peninsula, 1386 m, small dredge, 1 juvenile.

DISTRIBUTION: Previously known from type specimens collected in the vicinity of Heard Island, Indian Ocean, in 175–800 m. The New Zealand specimens extend its range eastward to the Campbell Plateau slopes and into considerably deeper waters.

DESCRIPTION: Size of species rather large for genus with a leg span of 163 mm. Integument sparsely covered with short scattered spines. Trunk robust, chunky, with large closely spaced lateral processes. Trunk segment cowls narrow, with dorsal extensions of rims but not produced into pointed tubercles. Proboscis longer than trunk, swollen proximally, a downcurved narrow cylinder distally. Chelifores enlarged, massive, scapes short, with fully developed chelae. Palps 9-segmented, reduced in size, almost miniature, shorter than proboscis, distal five segments without ventral tubercles. Ovipiger segments mostly curved, clothed in tiny setules, strigilis segments recurved, armed with simple setae. Legs moderately short, with few setae, second tibiae longest segments. Propodus size uniform on all legs, long, moderately curved, without differentiated heel spines but few robust larger sole spines among many smaller sole setae. Claw short, auxiliary claws half main claw length.

HOLOTYPE: Male deposited in the South Australian Museum (11736).

PARATYPES: Male with eggs/larvae, female, and 3 juveniles deposited in the South Australian Museum (11744, 11745, 11746, 11757). Paratype male and female deposited in National Museum of Natural History (USNM 234619, 234620).

TYPE LOCALITY: The Kerguelen Plateau northeast and northwest of Heard Island in 175–800 m.

REMARKS: These specimens differ little from the types. The bottle-shaped and downcurved proboscis, fully developed chelae, and very short palps of nine segments, serve to separate this species from all others known from the vicinity of New Zealand. The only other species with palps of reduced size are *A. longispina* Gordon, 1932, with eight segments, and *A. sextarticulata* Munilla, 1989, with palps of six or seven segments. Both are from the South American sector

of Antarctica and the Ross Sea.

The proboscis of *A. longispina* is tapering, styliform and distally very narrow. That of *Ammothea sextarticulata* is a cylinder with median swelling. In neither species is the proboscis downcurved, nor are the chelae developed but vestigial in adults.

Ammothea antipodensis Clark, 1972

Ammothea antipodensis Clark, 1972b: 435–438, fig. 4A–K; 1975: 124 [list]; 1977a: 174–176 [list, key], 180–181, figs 15–24.

MATERIAL EXAMINED: NZOI Stn E973, St Clair, Dunedin, algal wash, 0–1 m, coll. J.L. Barnard (JLB NZ-8), 1 female.

DISTRIBUTION: The few collections of this species are confined to the subantarctic Antipodes and Auckland Islands on the Campbell Plateau from the littoral to 24 m. With the present record, this species extends its known distribution into more temperate waters to the north at Dunedin, South Island.

DESCRIPTION: Size small, leg span of male holotype is little more than 16 mm. Trunk compact, lateral processes contiguous at their bases, spreading distally. Trunk second and third segments with tall conical tubercles, none on first or fourth segment. Ocular tubercle a cone as tall as basal diameter, eyes moderately small. Abdomen erect, slightly longer than trunk tubercles, with conical dorsodistal tubercle. Proboscis ovoid, shorter than trunk.

Chelifores 2-segmented, scapes slender, with low dorsodistal tubercles, chelae small slender knobs. Palps 9-segmented, four short distal segments with large ventral extensions bearing tiny setae. Terminal segment downcurved, resembling tubercles of previous four segments. Ovipigers conventional, strigilis with seventh segment apophysis and distal three segments placed anaxially on seventh. Legs moderately slender, with few short setae. Cement gland a small bulge and pore slightly proximal to distal femoral rim. Propodus typical, with 5–6 heel spines and several tiny sole spines. Claw long, robust, auxiliaries about 0.6 length of main claw.

TYPES: Holotype male and 2 juvenile paratypes deposited in Museum of New Zealand (NMNZ), Wellington.

TYPE LOCALITY: Reef crevice in the intertidal zone at the Antipodes Islands.

REMARKS: This species is confined to the Campbell Plateau of New Zealand and is not known to inhabit any other subantarctic localities. It shares this distinc-

tion with *A. magniceps* Thomson, 1884, both of which are probably endemic in this area. It differs by having the lateral processes contiguous (well separated in *A. magniceps*) and long ventral extensions of the distal palp segments (each expanded trumpet-like distally in *A. magniceps*). The two species otherwise have very few small differences.

Ammonothea longispina Gordon, 1932

Ammonothea longispina Gordon, 1932a: 101–103, figs 50–52; 1944: 49–50, fig. 16f; Child, 1994a: 24.
Ammonothea sp.? Gordon, 1932a: 108, fig. 58.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species was collected once in the far southern New Zealand Islands but is essentially a denizen of subantarctic and Antarctic waters from Tierra del Fuego, the Argentine basin, and South Georgia Island to the Ross Sea. It has the wide depth range of 57–1454 m.

Remarks: There are only three known species of the 32 recognised in the genus *Ammonothea* which have palps shorter than the proboscis. The others, besides this species, are *A. adunca* Child (with 9 palp segments), and *A. sextarticulata* Munilla (with 6–7 palp segments). This species also has another character, unlike the other two, of a long narrow proboscis which is severely tapered in its distal half. These distinctive features make the species easily recognised even though it is rather small.

Ammonothea magniceps Thomson, 1884

Ammonothea magniceps Thomson, 1884: 244–245, pl. 15, figs 1–5, pl. 16, fig. 3; Stock, 1956: 43–45, fig. 6; Clark, 1977a: 174–180, figs 1–14.
Ammonothea australiensis Flynn, 1919: 95–99, pl. 14, figs 4–6; Clark, 1963: 58–59.
Ammonothea (Theammonia) magniceps: Fry & Hedgpeth, 1969: 81–83, figs 120–122.

MATERIAL EXAMINED: NZOI Stn Z8641, 49 m, 2 males, 1 juvenile.

DISTRIBUTION: The species has been collected widely in southern New Zealand at Akaroa, Lyttleton, and at the Snares, Auckland, and Antipodes Islands. Also known from Port Jackson and Melbourne, Australia, it has a known shallow depth range from the shore to about 16 m. This collection increases both its known depth range and extends its geographic range to the northern end of North Island.

DESCRIPTION: Trunk without marked mediodorsal tubercles or swellings, lateral processes separated by less than their diameters, armed with pair of conspicuous laterodistal spines. Ocular tubercle short, with small apical cone, eyes prominent to indistinct, little to no pigment. Proboscis moderately short, distally rounded to small mouth. Abdomen erect, moderately long, with small but distinct dorsodistal tubercle. Palp long, segments longer than their diameters, with few to generous numbers of ventral setae. Chelae atrophied to bumps, scapes moderately short. Ovigera typical of genus. Legs with setae in rows, a few longer than others. Femoral cement gland tube well distal but not near the femur tip, tiny, with very short tube. Propodus with three large heel spines, few shorter sole spines. Main claw robust, fairly long, with auxiliary claws slightly longer than half main claw length.

REMARKS: This rather plain species is small, with 9-segmented palps much longer than its bulbous proboscis, crowded trunk segments with no protruding mediandorsal ridges, a posterior notched ocular tubercle, and short stout propodi armed with fairly short claws. It is combined with *A. australiensis* by Fry and Hedgpeth (1969: 82–83) as one species separated only by variations. I believe the two can be left separate based on presence or absence of trunk ridges or tubercles, crowded or well separated lateral processes, ocular tubercle notch, and large or small propodal heel spines. Most of these characters are relative and difficult to assess without having both species in hand.

Ammonothea makara Clark, 1977a

Ammonothea makara Clark, 1977a: 174 [list, key], 182–184, figs 25–33.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known only from Wellington in 3 m.

REMARKS: The unique holotype has a conspicuously oval trunk habitus with closely crowded lateral processes, large robust anterior and posterior spines on the leg first coxae, no mediodorsal trunk tubercles or cones, ventral lobes on the distal four palp segments excluding the terminal segment, and five short broad propodal heel spines.

Ammonothea uru Clark, 1977a

Ammonothea uru Clark, 1977a: 174 [list], 175 [key], 184–186, figs 34–46.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known from six type specimens collected along the shores of North Island (depths unrecorded).

REMARKS: Lateral processes very crowded together, trunk with broad conical mediodorsal protrusions of the second and third segments, only a low conical ocular tubercle on the first segment, and a very swollen bulbous proboscis characterise this species.

Ammothea sp. indeterminate

MATERIAL EXAMINED: NZOI Stn E967, coll. J.L. Barnard [JLB NZ 2], Eve Bay, Wellington, algal wash, 1 post-larva.

REMARKS: This specimen is too juvenile for determination.

Ascorhynchus Sars, 1877

Mostly small species but some quite large. Trunk segmentation with large posterior cowls, some with dorsal tubercles. Lateral processes usually short, some with small dorsal tubercles. Ocular tubercle usually conspicuous, with eyes, some lack tubercle and/or eyes. Proboscis large, with two or three lateral constrictions. Chelifores unusually small, scapes with one or two segments, chelae tiny, usually atrophied bumps. Palps 10-segmented, with two very short proximal segments, distal five segments usually very setose. Ovigera 10-segmented, in both sexes, male ovigera larger, often with heavily setose distal sixth segment, strigilis with several rows of denticulate spines and terminal claw. Legs slender, variously setose or without setae, tarsus often longer than propodus, without auxiliary claws. Male cement gland orifice a single dorsal pore or tube or a series of lateral pores on femur and first tibia.

TYPE SPECIES: *Ascorhynchus abyssi* Sars, 1877, deposited in Norway.

TYPE LOCALITY: North Sea W of Norway and between Iceland and the Faroe Islands, 1089–1539 fathoms (2000–2800 m).

REMARKS: The many species (68 by latest count) of *Ascorhynchus* have been conveniently divided into somewhat smaller sets based on their chelifore segment numbers and the length ratios of tarsus and propodus. The chelifore can have a 1- or 2-segmented

scape and the tarsus can either be longitarsal or brevitar-sal, that is, longer than half the propodal length or shorter than that length. There are four groups of species based on these two characters. The four known species which occur in New Zealand waters can be divided into three groups: brevitar-sal with 1-segmented scapes (*A. antipodus* Child, 1987; *A. insularum* Clark, 1971); longitarsal with 1-segmented scapes (*A. orthostomum*, n. sp. herein); and longitarsal with 2-segmented scapes (*A. cooki* Child, 1987). No members of this genus having brevitar-sal distal leg segments and 2-segmented scapes (the smallest group with nine species) have been collected in New Zealand waters.

Ascorhynchus antipodus Child, 1987

Ascorhynchus antipodus Child, 1987: 902–904, fig. 1.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known only from a female specimen collected in the Southwest Pacific basin, east of the Antipodes Islands in 5340 m.

REMARKS: This very deep-water species is atypical of the genus in that it is blind and lacks an ocular tubercle. It has an extremely slender narrow habitus with well separated lateral processes hardly longer than wide, fairly long chelifores, and a narrow proboscis with a single proximal constriction.

Ascorhynchus cooki Child, 1987

Ascorhynchus cooki Child, 1987: 904–906, fig. 2; 1994a: 29 [key], 30.

MATERIAL EXAMINED: NZOI Stn S202, E of Cook Strait in Hikurangi Trough, 2476–2542 m, 4 males, 4 females.

DISTRIBUTION: Thus far endemic to slopes of New Zealand's Campbell Plateau and the nearby Macquarie Island Ridge, this species has been collected in 1463 m and 2476–2992 m.

DESCRIPTION: Giant species, leg span almost 180 mm. Smooth trunk with conical dorsomedian tubercles on segment posteriors, well separated lateral processes with smaller blunt conical tubercles on dorsodistal tips. Almost no appendage setae or spines. Neck long, ocular tubercle only as tall as trunk tubercles, situated dorsal to ovigera bases at posterior third of neck length. Eyes small, indistinct. Proboscis typical tripartite shape with proximal and distal rings. Abdomen moderately

long, downcurved ventrally to plane of trunk.

Chelifore scapes 2-segmented, short, subequal in length, chelae vestigial, tiny knobs with minute segmentation line where finger would be. Palps and ovigers typical. Male oviger sixth segment with tuft of long and short setae next to strigilis which has 3–5 rows of narrow denticulate spines. Terminal claw short, small. Legs very long and slender, without spines or setae. Femur the longest major segment, tarsus only slightly shorter than propodus, claws very short, claws of first leg pair tiny, no longer than wide. Cement glands extend from proximal femora to distal first tibiae emptying through 40–47 tiny pores on anterolateral surface of each leg.

HOLOTYPE: Male, five paratype females, and one chelate juvenile deposited in U.S. National Museum.

TYPE LOCALITY: Southwest of Macquarie Island in 2985–2992 m, Hikurangi Trough, N of Chatham Rise in 2610–2668 m, and Hikurangi Trough, SE of Cook Strait in 2612 m.

REMARKS: This large handsome species would be difficult to confuse with any other in the Indo-West Pacific except perhaps *Ascorhynchus glaber* Hoek, 1881, or *A. levissimus* Loman, 1908 (the latter was omitted from a key to the giant species, Child 1987: 906–907). Both are similarly large robust species; Hoek's is found from the Russian Arctic to the Indian Ocean at Mozambique and South Africa at shallower but similar depths, and Loman's is known only from the confines of the Flores Sea, Indonesia, in about 600–800 m. This New Zealand species has low lateral process tubercles, lacking in Loman's species. The tubercles are larger in Hoek's species. *Ascorhynchus glaber* is blind while the eyes are present if indistinct in *A. cooki* and Loman's *A. levissimus*. *Ascorhynchus cooki* also has a shorter abdomen, and notably shorter propodal claws than Hoek's species. The two scape segments are subequal in *A. cooki* and *A. glaber* while the second scape segment is longer than the first in *A. levissimus*. The three species otherwise share many character similarities of trunk, proboscis, oviger, and legs.

Ascorhynchus insularum Clark, 1972

Ascorhynchus insularum Clark, 1972a: 335–337, fig. 2; 1977c: 176.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species is only known from littoral depths at the Snares Islands.

REMARKS: Clark's small species has crowded lateral processes touching each other, very short appendages, a very short tarsus, and a rather bulbous proboscis, all of which make it easily identified among the long appendaged species known to New Zealand waters.

Ascorhynchus orthostomum n.sp. (Fig. 3A–F)

Ascorhynchus simplex? Child, 1994a: 31.

MATERIAL EXAMINED: NZOI Stns S151, Slope SE of Dunedin, 1586 m, 1 paratype female, (reported in Child, 1994a: 31); W460, Slope off Dunedin, 1400–1415 m, from hexactinellid sponge, 1 male with eggs, holotype.

DISTRIBUTION: Known only from the type locality and at another locality slightly further east.

DESCRIPTION: Size medium for the genus, leg span about 40.6 mm. Trunk fully segmented, first three segment posteriors with grossly inflated cowlings capped by low mediodorsal cones. Lateral processes twice longer than their diameters, with low conical dorso-distal tubercles. Neck as long as its diameter, oviger bases placed halfway between first lateral processes and expansion at chelifore insertion. Ocular tubercle at anterior and dorsal to expansion which has broad, low, pointed lateral tubercles. Ocular tubercle a low cone with anterior-pointing apical extension, eyes large, of equal size, darkly pigmented. Proboscis grossly elongate, longer than trunk length, cylindrical, without divisions, with rounded oral surface. Abdomen long, slender, slightly inflated distally, extending to distal rim of fourth leg second coxae.

Chelifore scapes 1-segmented, cylindrical, curved inward, slightly longer than twice their diameters, armed with few short distal setae. Chelae atrophied bumps, carried retracted within scape tips. Palps 10-segmented, fifth segment the longest segment, inflated, distal five segments very slender, each slightly curved, with few ventral setae, some longer than segment diameters. Oviger 10-segmented, fifth segment slightly longer than fourth. Fifth and sixth segments armed with lateral rows of few short setae.

Strigilis well formed, segments increasingly short distally, armed with denticulate spines in the formula 13: 7: 6: 6, in two rows, spines with two lateral serrations per side. Terminal claw about 0.6 length of terminal segment, almost straight, without teeth.

Legs fairly long, first tibiae the longest segments, longest segments armed with dorsal, lateral, and ventral rows of very short setae. Femur with fewer short setae, cement glands paired, each with single low cribriform pore. Tarsus about 0.9 length of propo-

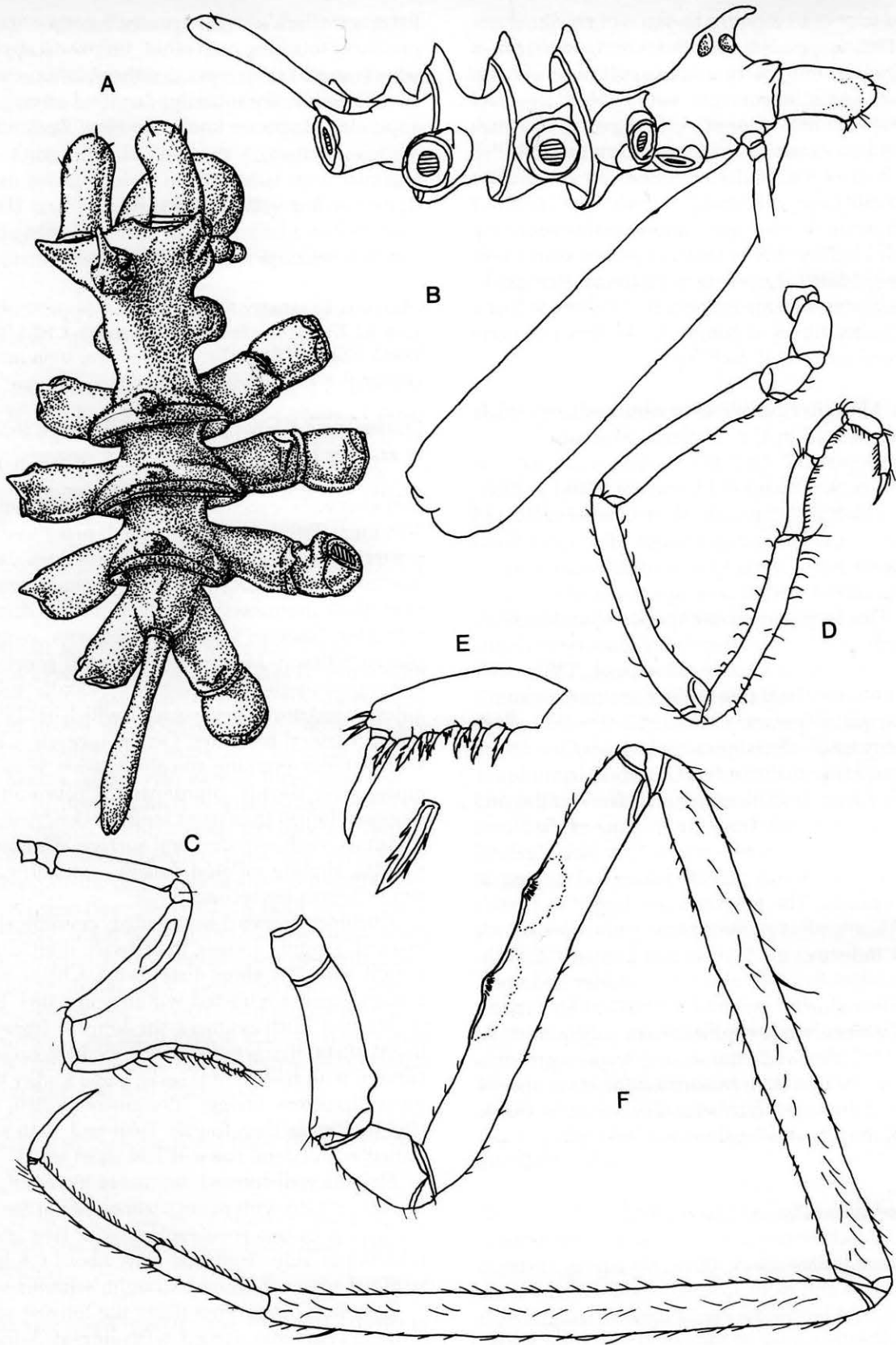


Fig. 3. *Ascorhynchus orthostomum* n.sp.: Holotype male. A, trunk, dorsal view; B, trunk, lateral view; C, palp; D, oviger; E, distal oviger segments and denticulate spine, enlarged; F, third leg.

dus, both armed with row of very short sole spines and fewer short dorsal setae. Claw slender, moderately curved, slightly more than half propodal length.

Female slightly larger in all measurements except oviger, ocular tubercle smaller, tarsus slightly longer than those of male.

MEASUREMENTS: Holotype in mm: Trunk length (chelifore insertion to tip 4th lateral processes), 3.91; trunk width, 2.28; proboscis length, 3.98; abdomen length, 1.63; third leg segment lengths, coxa 1, 0.54; coxa 2, 1.68; coxa 3, 0.98; femur, 4.08; tibia 1, 4.92; tibia 2, 3.7; tarsus, 1.15; propodus, 1.37; claw, 0.72.

ETYMOLOGY: The name (Greek *ortho*, straight, and *stomum*, a large mouth) refers to the exceptionally large straight-sided proboscis of this species.

HOLOTYPE: Male with eggs, deposited in the NZOI collections at NIWA, Wellington, H-691.

TYPE LOCALITY: NZOI Stn W460, 45°57.9'S, 171°45.7'E, Slope off Dunedin, 1400–1415 m.

REMARKS: A female of this species was an early discovery in New Zealand material and it was regarded as a specimen of the Japanese *A. simplex* Nakamura & Child, 1991, with several variations (Child, 1994a: 31). The two are quite similar, but the discovery of a male specimen in later material presented a full set of diagnostic characters. The massive proboscis was the principal difference between the two, but with male ovigers and cement glands now available, these and other major differences were sufficient to separate this new species from the Japanese form.

Cilunculus Loman, 1908

With many characters near *Ascorhynchus* and *Ammothella*, but with hooded anterior cephalic segment dorsal to chelifores. Trunk fully segmented, lateral processes well separated, both usually with dorso-distal tubercles or spines. Ocular tubercle often tall, sometimes with eyes, some blind.

Chelifore scape usually 1-segmented, sometimes 2-segmented, chelae rudimentary, atrophied. Palp *Ascorhynchus*-like, 9-segmented. Oviger 10-segmented, with strigilis having 1–3 denticulate spines per segment, without terminal claw. Legs with many setae or spines, some unusually long. Male femur with single tubular dorsodistal cement gland tube usually within conical structure, the tube and cone sometimes extending dorsodistally five or six times longer than segment diameter. Tarsus usually very short. Propo-

dus slender, without heel but with larger heel spines, few smaller sole spines, claw and auxiliaries usually long.

TYPE SPECIES: 1 male, *Cilunculus frontosus* Loman, deposited with *Siboga* Expedition material in Leiden, Netherlands.

TYPE LOCALITY: Menado, Sulawesi Island, Indonesia, in 1165–1260 m.

REMARKS: This has been an uneasy genus and several of its species have been confused with the genus *Ammothella*. It has been described as a possible deep-sea counterpart of shallow water *Ammothella*. It has some characters which are closely related to those of *Ammothella*, *Aschrhynchus* and *Ammothea*, but the single male cement gland tube is usually extremely long and the chelifores usually are placed within an anterior trunk collar or depression. These two characters serve to differentiate *Cilunculus* from the other genera mentioned. The fact that most species are deep-sea also serves in part to separate many species in this genus.

Cilunculus cactoides Fry & Hedgpeth, 1969

Cilunculus cactoides Fry & Hedgpeth, 1969: 124–126, figs 205–206; Child, 1994a: 34–35.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species has been collected on the Campbell Plateau off the Antipodes Islands and also at Macquarie Island. It is also known to be widely distributed in other subantarctic and in Antarctic localities in 38–540 m.

REMARKS: As its name implies, the species is full of long spines making it appear cactus-like, particularly since many specimens apparently curled up into a ball-shape when they were initially disturbed.

Cilunculus sewelli Calman, 1938

Cilunculus sewelli Calman, 1938: 161–163, figs 8–9; Nakamura & Child, 1991: 21 [literature]; Stock, 1994: 23, fig. 3.

MATERIAL EXAMINED: NZOI Stns C171, W of Cook Strait, 163 m, 1 female; C172, Cook Strait, 139 m, 2 males, 1 female; I13, E of North Cape, 140–149 m, dredge, 1 female; S129, SE of Mernoo Bank, 355 m, 1 female; S131, SE of Mernoo Bank, 355 m, 1 female; S138, SW of Mernoo Bank, 785 m, 1 female; S148, SW of Mernoo Bank, 859 m, trawl, 1 male, 1 female; S150, Bounty Trough, SE of Dunedin, 1640 m, 1 male.

DISTRIBUTION: This species has an Indo-West Pacific distribution from Natal, South Africa and Zanzibar, to New Zealand and Japan, in a wide depth range of 183–1789 m. Some of the above depths are in even shallower localities than any previously recorded.

DESCRIPTION: Trunk fully segmented with long neck and closely spaced lateral processes. Tall dorsomedian trunk tubercles have 2–3 long lateral setae, ocular tubercle at extreme anterior of segment is tall slender cone without eyes, with pair of long setae flanking posterior base. Anterior of cephalic segment flaring, with low tubercles each having short seta which match dorsodistal rims of lateral processes. Some short setae on anterior and posterior of each lateral process. Proboscis large, ovoid, without constrictions. Abdomen moderately long, distally swollen, bearing 2–3 short dorsal setae.

Chelifores very short, scapes 2-segmented, first segment extremely short, hidden by cephalic segment hood, both armed with several long setae. Chelae atrophied, tiny slender cones with lateral stub representing movable finger. Palps typical, 9-segmented. Ovigera *Ammothella*-like, with non-functioning strigilis having 2–3 slender denticulate spines. Terminal segment not longer than wide. Legs long, slender, with many long lateral and dorsal setae. Propodus slender, well curved, with 3 larger heel spines and many smaller sole spines. Claw quite long, strongly curved, auxiliaries very short. Male cement gland tube not within conical tubercle, situated at about 0.6 length of femur dorsum, angled distally.

HOLOTYPE: 1 male, deposited in the British Museum (Natural History), London.

TYPE LOCALITY: "Zanzibar area", Kenya, East Africa, in 1789 m.

REMARKS: Nakamura and Child (1991: 21) noted little tubercle and setae variation, but Stock (1994: 23) noted leg dimorphism in the longer fourth pair of legs. Of the three species in this genus known to New Zealand waters, this is by far the commonest. The others are *C. cactoides* Fry & Hedgpeth, 1969, which appears to reach its northernmost SW Pacific range off the Antipodes and Macquarie Islands, and *C. spinicristus* Child, 1987, known only from its type male collected N of the Antipodes Islands in about 500 m. Like many deep-water pycnogonid species and genera, many of this genus are known only from types and were never collected again.

Cilunculus spinicristus Child, 1987

Cilunculus spinicristus Child, 1987: 907–909, fig. 3; 1994a: 34 [key; listed as *S. spinicrista*].

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species is known only from a male holotype collected north of the Antipodes Islands in 476–540 m.

REMARKS: This is a blind species although it has a slender ocular tubercle slightly more than twice taller than its diameter. This suggests that it may inhabit waters deeper than that at which it was collected and where eyes are unnecessary. Its principal recognition character consists of many short spines on the trunk dorsum at the posterior rim of each segment, and most conspicuously on the lateral processes lateral and dorsal surfaces. The whole body habitus of this species is reminiscent of a typical species of the genus *Ammotheta*. Its major leg segments are more setose than most *Ammotheta* species, the cement gland protrudes in a long dorsodistal tube on each femur unlike the small pore of most species in *Ammotheta*, and it lacks tall dorsomedian tubercles on the trunk segmentation, but otherwise has many *Ammotheta* characters.

Oorhynchus Hoek, 1881

Trunk compact, *Ascorhynchus*-like, segment posteriors each with two long middorsal spines, lateral processes separated by narrow intervals, ocular tubercle tall, distally bulbous, placed at anterior of first trunk segment, eyes prominent. Proboscis short, egg-shaped. Abdomen long, carried horizontally, extending to tip of third coxae of fourth leg pair. Chelifores short, globular in shape with distal spines, chelae vestigial, sunken within distal cups. Palp 9-segmented, oviger 10-segmented, both *Achelia*-like, oviger strigilis with one or two denticulate spines per segment. Femur short, with long setae and enormous dorsodistal cement gland tube on a tall tubercle. Propodus short, slender, without larger heel spines, no auxiliary claws.

HOLOTYPE: Male, deposited at the British Museum (Natural History), London, with the *Challenger* material. Monotypic.

TYPE LOCALITY: Collected off Auckland, New Zealand, 37°34' S, 179°22' E, in 1280 m.

Oorhynchus aucklandiae Hoek, 1881

Oorhynchus aucklandiae Hoek, 1881: 59–61, pl. 7, figs 1–7.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known only from the single type specimen taken off Auckland in 1280 m.

DESCRIPTION: As with the genus.

REMARKS: This genus remains monotypic and the type specimen is unique.

Scipiolus Loman, 1908

Trunk *Anoplodactylus*-like, fully segmented, with slight forward extension of cephalic segment over proboscis. Proboscis usually small, much shorter than trunk, cylindrical. Chelifore scapes with 1 segment, chelae rudimentary, nonfunctional. Palps 9-segmented. Oviger 10-segmented, in both sexes, distal 4 segments with *Achelia*-like denticulate spines. Propodus with strong heel, larger heel spines, small sole setae, with or without tiny auxiliary claws.

TYPE SPECIES: *Scipiolus plumosus* Loman, 1908, 1 male deposited with *Siboga* Expedition material in Leiden, Netherlands.

TYPE LOCALITY: Indonesia, Kei Islands, 90 m.

REMARKS: A rare genus closely related to *Achelia* and *Ammothea*.

Scipiolus plumosus Loman, 1908

Scipiolus plumosus Loman, 1908: 58–59, pl. 15, figs 204–212; Stock, 1957: 91 [text], figs 10a, 10c, 11; 1991a: 160, fig. 26.

MATERIAL EXAMINED: NZOI Stn P46, Norfolk Ridge, 450–475 m, 1 female.

DISTRIBUTION: This genus and its three species are rare. The species have few known collecting localities; two are found in Honshu, Japan, and this one has only been collected in eastern Indonesia and off New Caledonia in the Southwest Pacific. Its known depths are 90–300 m. This single female extends its sparsely known range to the southeast of New Caledonia on the Norfolk Ridge and into slightly deeper water.

DESCRIPTION: Trunk moderately long, completely segmented, glabrous. Lateral processes well separated,

armed with 1–2 dorsodistal setae. Cephalic segment extending slightly dorsal to tiny chelifores, ocular tubercle at centre of segment, little taller than basal diameter, small eyes at midlength. Proboscis short, only about 1.5 times longer than cephalic segment, cylindrical, slightly tapered distally. Abdomen moderately short, erect.

Chelifores very slender, short, chelae atrophied, armed with few short distal setae. Palps 9-segmented, *Achelia*-like, with few ventral setae. Ovigigers 10-segmented, fourth segment longest, second segment longer than fifth, sixth segment with denticulate spine, strigilis segments with 1–2 denticulate spines each, without terminal claw. Denticulate spines with small single denticles to larger spines with many lateral denticles. Leg major segments with several short tubercles each with long feathered (with many lateral setules) seta. Propodus short, well curved, with large heel spines and smaller sole spines, Claw long, robust, tiny auxiliaries present, shorter than basal claw diameter. Male characters unknown.

TYPE LOCALITY: NZOI Stn P46, 28°42.3' S, 167°56.7' E, Norfolk Ridge, 450–475 m.

REMARKS: This is only the third record and fourth specimen in this species and the male remains unknown. A single male specimen of *S. spinosus* Utinomi, 1955, the only male known in this genus, was described from Suruga Bay, Honshu, Japan. Stock's *S. validus* (1957) was described from one female taken in Tokyo Bay, and Loman's species is known from only four females. The genus contains so few specimens that it is difficult to associate it with any close generic relations in the Ammotheidae. *Scipiolus bifidus* Stock, 1968, from South Africa, is actually a species of *Cilunculus* (Child, 1982: 11), another genus difficult to separate from this and other genera among the ammotheids.

Stock's New Caledonia specimens were found to have tiny auxiliary claws, unlike the other two species, and their oviger denticulate spines have variations in their lateral tooth numbers.

Tanystylum Miers, 1879

Species tiny, trunk compact, circular in dorsal aspect, lateral processes closely crowded, compressed, ocular tubercle usually low, proboscis short, bulbous, bottle-shaped, or styliform. Abdomen quite short. Chelifores reduced to single blunt scape segment, with tiny atrophied chelae in only one species, or chelae lacking in all others. Palps from four to six segments. Ovigigers 10-segmented, in both sexes, without distinctive strigilis but with 1–2 denticulate spines per segment. Legs short, robust, with large well-developed propodus

having large heel spines, large claw and auxiliary claws. Femoral cement gland usually a small dorso-distal tube.

TYPE SPECIES: *Nymphon styligerum* Miers, 1875.

TYPES: Two specimens deposited in the British Museum (Natural History), London.

TYPE LOCALITY: Observatory Bay, Kerguelen Islands, Indian Ocean; from bases of *Macrocystis* grappled in 5–7 fm (9–13 m).

REMARKS: Four of five species found in New Zealand are range extensions for specimens more often collected in subantarctic localities. Most species in this genus are known from more temperate shallow localities in the northern hemisphere. None of the species were represented in the collections examined herein.

Tanystylum antipodum Clark, 1977

Tanystylum antipodum Clark, 1977b: 318–321, figs 2–9, 18–19; Child, 1994a: 37–38.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Apparently endemic, and known intertidally from South and Stewart Islands, and Snares, Antipodes, and Campbell Islands.

REMARKS: This plain species looks flat in lateral view, its ocular tubercle being twice as wide as tall and its abdomen carried horizontally. It has no long spines, but many short blunt spines and looks almost glabrous on superficial examination.

Tanystylum excuriatum Stock, 1954

Tanystylum excuriatum Stock, 1954: 146–149, figs 71–72; Clark, 1977b: 323–326, figs 14–17.

MATERIAL EXAMINED: None. No specimens in the collection.

DISTRIBUTION: The species is endemic and is known from Hawke Bay and Lyttleton Harbour in 2–47 m.

REMARKS: This is another endemic species which is known from very few capture records in the literature. It is one of two or three species of *Tanystylum* having chelae in any form. They are tiny atrophied bulbs with a hint of movable finger. The lateral processes are crowded but long, the proboscis is longer than usual

for species of the genus and the oviger has longer distal segments without denticulate spines.

Tanystylum neorhetum Marcus, 1940

Tanystylum neorhetum Marcus, 1940: 95–96, 129 (for *T. pfefferi* preoccupied); Clark, 1977: 327–330, figs 31–39, 40–43; Child, 1994a: 38–39.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Clark comments (1977b: 330) on doubtful specimens which Stock (1954: 149–151, figs 73–74) identified as this species from the Auckland Islands. The accompanying figures appear to fall within the known variability of *T. neorhetum*, although this locality may be slightly north of other accepted collections. It is also known from the vicinity of Macquarie Island in the New Zealand region. This species is very widely distributed in the subantarctic shallows from the coasts of Chile and Argentina to the islands of the South Atlantic and Kerguelen Islands in the Indian Ocean in 0–115 m.

REMARKS: This is very much the typical *Tanystylum* species: trunk circular in dorsal view, ocular tubercle short but elevated on a large hump, abdomen not long but carried very erect, and variable to the extent of having palps of 6–7 segments. It has many variables including most characters listed above. Its legs are rather plain but the ocular tubercle sometimes lacks its basal hump and the abdomen is often shorter and less erect. It is the most commonly collected species of this genus south of New Zealand.

Tanystylum oedinotum Loman, 1923

Tanystylum oedinotum Loman, 1923: 29–30, fig. F; Clark, 1977b: 330–332 [literature], figs 44–50; Child, 1994a: 39.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This seldomly collected species is only found in the vicinity of Macquarie Island in the New Zealand region. It is known elsewhere from Kerguelen Islands, Marion, and Prince Edward Islands, and in several shallow localities in southern South America in 0–124 m. It is also more a denizen of subantarctic localities than temperate shallows. This and several other species in this report are assisted in their distribution by the West Wind Drift of the vast southern ocean.

REMARKS: This is the only species of *Tanystylum* from

the New Zealand area that has a conspicuous dorsal tubercle at the base of its abdomen along with a truncate conical proboscis.

Tanystylum stylicherum (Miers, 1875)

Nymphon stylicherum Miers, 1875: 76.

Tanystylum stylicherum Miers, 1879: 213, pl. 11, figs 9-9d; Clark, 1977b: 333-336 [literature], figs 51-61; Child, 1994a: 39-40.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Another species influenced by the West Wind Drift, this one is also known from Macquarie Island. Elsewhere, it has been collected at Kerguelen, Tierra del Fuego, Chile, and the Falkland Islands in 0-91 m. It is one of the few *Tanystylum* species known from the Palmer Archipelago off the Antarctic Peninsula and was collected there in almost 200 m.

REMARKS: It has a bulbous proboscis, conical chelifore stumps, and an abdomen longer than most species (past the second coxae). There are one or more strong spines at the base of the abdomen, a unique character among the known species found in New Zealand waters. Miers' species has had several names, now synonyms, and is the type species of the genus.

Family AUSTRODECIDAE Stock, 1954

This is a family with only two genera but the tiny species of both are so closely allied that specimens of either genus have become increasingly difficult to identify as more are described. The first described genus, *Austrodecus* Hodgson, 1907, has 39 species which are made slightly easier to identify by separating them into groups based on two diagnostic characters. These characters are; the number of segments in the tiny ovigers which lack a strigilis, and the presence or absence of auxiliary claws. With this separation, the species in each group can be identified by several other characters present, absent, or morphologically different in each. All species in this family have an annulate tubular proboscis of various lengths but all are very slender and pipette-shaped, used to probe into their food source which appears to be, in some instances, mats of cheilostome Bryozoa.

The other genus, *Pantopipetta* Stock, 1963, has only 14 known species, but these can be separated by the broader suite of characters of each species. The leg spans of *Pantopipetta* species are moderately large and range from about 15-30 mm, while those of *Austrodecus* are notably smaller and range from 3 to about 8 mm.

The New Zealand pycnogonid fauna has one of the most diverse groups of species in the primarily Antarctic genus *Austrodecus* while there is only one known New Zealand species of *Pantopipetta*. There exists a corridor of species, mostly endemics, carried north from Antarctica through New Zealand, New Guinea, the Philippines, and sometimes to Japan. The 12 New Zealand species (and several unnamed forms) can be placed, according to the above criteria, in four of six groups in this worldwide genus. First, the *glaciale* section which has ovigers of six segments and legs with auxiliary claws, comprises *A. cestum* Child, *A. glaciale* Hodgson, *A. serratum* Child, *A. sinuatum* Stock, and *A. varum* Child. The second group, the *breviceps* section, has 6-segmented ovigers, but no propodal auxiliaries. It comprises *A. breviceps* Gordon, and *A. enzoii* Clark. Third is the *gordonae* section, having 4-segmented ovigers and no auxiliaries, with *A. frigidifugum* Stock, and *A. gordonae* Stock. The fourth group, the subgeneric *Microdecus* section, with 1- or 2-segmented ovigers and auxiliary claws, has three known species all of which are from New Zealand waters; *A. (Microdecus) confusum* Stock, *A. (M.) fryi* Child, and *A. (M.) minutum* Clark. The other two morphogroups lack New Zealand representatives. These groups either have 4-segmented ovigers and auxiliary claws, or 0- to 3-segmented ovigers in males (ovigers larger and 4-segmented in females) and lack auxiliaries. There are three other species which cannot be placed in a group for various reasons. None of the three named species is from New Zealand. There are thus 12 known species in this genus from the waters under study although only one of these was found among the fauna collections in this report.

TYPE SPECIES: *Austrodecus glaciale* Hodgson, 1907, by original designation. From Antarctic waters.

REMARKS: The 12 species will be listed below, as they are above, under the title of their morphological group.

1. The *glaciale*-group
with 6-segmented ovigers and auxiliaries.

Austrodecus cestum Child, 1994b

Austrodecus cestum Child, 1994b: 54 [key], 59-61, fig. 3.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Its type locality is the vicinity of the Antipodes Islands in 86-103 m, and it is also known from east of Auckland Island in 165-207 m.

REMARKS: This "fat" species has extremely short lateral processes which extend very little beyond the trunk. The first coxae on each leg are also wider than long and have low dorsodistal tubercles in the sequence 1: 2: 2: 1 from anterior to posterior on each side. It has four low rounded mediodorsal trunk tubercles and a neck of intermediate length. The principal character, although difficult to see, is the mitten-shaped distal palp segment which has two fingers or lobes, usually of unequal length. Distal palp segments of most species are attached in linear sequence.

Austrodecus glaciale Hodgson, 1907

Austrodecus glaciale Hodgson, 1907: 53, pl. 8, fig. 1; Stock, 1957: 45–50, figs 19–21; Child, 1994b: 63–67 [literature], fig. 6.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This widely distributed species has one collecting record on the Campbell Plateau slope in 2010–2100 m. This is probably at the northern extreme of its more southern range. The species has a circum-polar distribution around Antarctica from the Ross Sea to the subantarctic islands of the Scotia Sea and Indian Ocean. It has among the widest depth ranges from the shallows to 2100 m.

REMARKS: This is the type species of the genus and as such has been known longer than any other. It also shares many more records than others as the most commonly collected species. Child (1994b: 65–67) lists 2300+ specimens from more than 250 stations in subantarctic and Antarctic localities.

The lateral processes of this species are almost as long as their width and are well separated laterally over their entire lengths. The ocular tubercle is long, the dorsomedian trunk tubercles are conical and slightly taller than wide, and the first coxae dorso-distal tubercles are arranged in the anterior-posterior sequence 1: 2: 2: 2. The variations among specimens of this species are better known than for most others and occur in neck and tubercle lengths or widths.

Austrodecus serratum Child, 1994b

Austrodecus serratum Child, 1994b: 71–73, fig. 9.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Only known from a male and female taken at two stations in the vicinity of Macquarie Island in 79–124 m.

REMARKS: This species has mediodorsal trunk tubercles very similar to those of *A. glaciale*, but it has a very short and blunt ocular tubercle. The short lateral processes are separated but close and it has first coxae tubercles taller than most others and arranged in an anterior-posterior sequence of 1: 2: 2: 2. It has two extremely short palp segments, one placed laterally on the other and males have a peculiar funnel-shaped cement gland tube on the ventral femur.

Austrodecus sinuatum Stock, 1957

Austrodecus sinuatum Stock, 1957: 56–57, fig. 27; Clark 1975: 124–125.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known only from Masked Island, Carnley Harbour, Auckland Islands, from a shallow but unreported depth.

REMARKS: This is another species with low conical trunk tubercles, as broad as they are tall, but the tubercles number five and include a smaller dorsodistal cone on the abdomen. Its ocular tubercle is short, broad, and blunt and is illustrated without eyes, but Stock (1957: 56) does not comment on this omission. All other known specimens appear to have eyes. The terminal oviger segment, longer than the other five, is slightly curved and constricted distally which may be an artifact of the single type specimen.

Austrodecus varum Child, 1994b

Austrodecus varum Child, 1994b: 73–75, fig. 10.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known only from the holotype which was collected off Macquarie Island in 443–549 m.

REMARKS: This is an extremely slender species with only hints of middorsal trunk tubercles. It has a very long slender ocular tubercle and the well-separated lateral processes are slightly longer than their diameters, an unusual character in this genus. The first coxae tubercles are extremely long, almost three times longer than the segment diameters, and the third coxae have similar slender tubercles but only as long as their segment diameters. The terminal palp segment is twice as long as the penultimate segment and is more slender.

2. The *breviceps*-group
with 6-segmented ovigers, without paired auxiliary
claws.

Austrodecus breviceps Gordon, 1938

Austrodecus breviceps Gordon, 1938: 25–26, figs 7–8; Clark 1972b: 449–450, figs 11A–E; Child 1994b: 75–76 [literature], fig. 11.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The species was described from specimens taken from off Macquarie Island. It was subsequently found at the Antipodes Islands on Campbell Plateau. It has also been collected in the Kerguelen Islands and has a depth range from the littoral to 140 m.

REMARKS: This is a very tuberculate little species and has a very short blunt ocular tubercle. The trunk has four long slender dorsal tubercles, one per segment, the lateral processes each have a similar middorsal tubercle, and the first coxae each have a tubercle pair with the anterior one longer than the posterior tubercle. The short lateral processes are crowded together but not touching. The distal palp segments are joined with the terminal segment placed anaxially on the base of the more proximal segment and the oviger terminal segment is clubbed and has many tiny short distal spines.

Austrodecus enzoii Clark, 1972

Austrodecus enzoii Clark, 1972a: 338–340, figs 3H–M.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: A single female type specimen was taken from off the Snares Islands in 81 m.

REMARKS: Clark remarks (1972a: 340) on the presence of dorsal trunk and first coxae tubercles but did not illustrate their lateral shape and size with a figure. There are apparently no tubercles on the first pair of coxae, two on each of the second and third pairs, and one on each of the fourth pair. The ocular tubercle is quite short and blunt and the terminal palp segment appears to be attached on the ventral side of the penultimate segment.

3. The *gordonae*-group
with 4-segmented ovigers and no auxiliaries.

Austrodecus frigorifugum Stock, 1954

Austrodecus frigorifugum Stock, 1954: 156–159, fig. 77; 1957: 72–73, fig. 40; 1968: 28–29, fig. 10a; Child 1994b: 51 [table 1], 55 [key].

MATERIAL EXAMINED: NZOI Stn Z8662, off North Cape, 54.5 m, 1 female.

DISTRIBUTION: The two type specimens came from Three Kings Islands in 119 m. A questionable juvenile was collected at the Campbell Islands under an intertidal stone. Another juvenile was collected at the Kermadec Islands in 60 m. The present specimen was collected off North Cape south and east of the type specimens but within known depths.

DESCRIPTION: A species with tall slender trunk tubercles and similar tubercles on the first coxae and to a lesser extent on the dorsodistal tip of the femora. Lateral processes without tubercles. Ocular tubercle short, carried almost horizontally, eyes at tip, prominent. Proboscis quite short, recurved back ventrally under cephalic segment. Abdomen very short, not extending to distal rim of second coxae, fourth leg pair.

Palps very short, terminal segment mounted laterally at base of shorter third segment forming subchelate structure. Oviger fourth segment longest, with constrictions suggesting additional segments beyond fourth are coalesced, armed with few distal spines. Legs moderately short, first coxae with tall slender dorsodistal tubercle equal to but more slender than median trunk tubercles. Femora with slender dorsodistal tubercle shorter than those of coxae. Tarsus short, rounded, with dense tuft of sole setae. Propodus well curved, longer than short second tibiae, with row of short sole spines, claw short, robust, auxiliaries lacking.

TYPE AND TYPE LOCALITY: Two female specimens dredged off Three Kings Islands in 119 m.

REMARKS: This species is crowded with dorsal tubercles. It has tall slender trunk tubercles, but none on the very short lateral processes, and similar tall tubercles on the first coxae and femora dorsodistal tips. It has an extremely short proboscis and palps of similar length. The many slender tubercles on this species make it cactus-like in superficial appearance.

Austrodecus gordonae Stock, 1954

Austrodecus gordonae Stock, 1954: 153–156 (part), figs 75a, b, d, e, 76a–d; 1957: 73–75, figs 41, 42.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Only known from eight type specimens taken at Three Kings Islands in 119 m.

REMARKS: This is a more conventional-appearing species than the last species listed. It has four low mediodorsal trunk tubercles, the posterior three wider at their bases than they are tall, an ocular tubercle of medium length with pigmented eyes, and small slender first coxae tubercles arranged as 1: 2: 2: 1 from anterior to posterior. The one character which sets this species off is its mitten-shaped two distal palp segments which coalesce into one bifurcate segment. The species *A. cestum* also has this character, but *A. cestum* has ovigers of six segments and has auxiliary claws unlike this species. These characters readily separate the two.

4. The subgenus *Microdecus*-group with 1- or 2-segmented ovigers and auxiliary claws.

Austrodecus (Microdecus) confusum Stock, 1957

Austrodecus gordonae Stock, 1954: 153–156 (part), fig. 75c only.
Austrodecus confusum Stock, 1957: 69–71, fig. 38.
Austrodecus (Microdecus) confusum: Child, 1994b: 80 [text].

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Only one specimen, a female, is known from Three Kings Islands in 119 m. Two other species described by Stock came from this single rich station of the Mortensen Expedition.

REMARKS: The four tall slender mediodorsal trunk tubercles are slanted to the anterior and the first coxae have similar tubercles with singles only on the anterior pair and two on all other first coxae. The ocular tubercle and abdomen are both long and slender. The oviger of the female consists of a single slender segment while the male oviger remains unknown. The distal two short palp segments are in a linear sequence.

The subspecies diagnosis is based, in part, on the presence of a cement gland tube placed laterally only on the fourth leg pair of males. This conical tube, longer than the femoral diameter, is unique to this subspecies and to all other known pycnogonids. Some species of other genera in other families have cement glands on less than all femora (the normal configuration) but their placement on only the two posterior legs and laterally suggests some unknown method for fertilising eggs. This species is only tentatively placed with this subgenus because of the lack of a male. The single oviger segment of the female suggests that this

species will probably belong to the *Microdecus* group when a male can be described.

Austrodecus (Microdecus) fryi Child, 1994b

Austrodecus (Microdecus) fryi Child, 1994b: 80–83, fig. 13.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The type specimens were taken off the Antipodes Islands in 476–540 m. Other specimens were collected east of Macquarie Island in 112–124 m, east of South Island in 760–859 m, and off Campbell Island in 91–92 m. From these limited collections, it appears to be an endemic species.

REMARKS: Besides the long conical cement gland tubercle on femora of the fourth legs only, which serves to define this subgenus, this species has very short, well-separated lateral processes. Its first coxae tubercles are arranged in the anterior-posterior sequence of 1: 2: 2: 1, and it has rather slender dorso-median trunk tubercles little longer than their width. Its ocular tubercle is slender, long, and carried almost horizontally. There are also one or two tiny dorsodistal bumps on the abdomen. The oviger 1-segmented "stubs" are tiny and difficult to discern, but males all display these stubs. Female tubercles may be shorter than on males.

Austrodecus (Microdecus) minutum Clark, 1972

Austrodecus minutum Clark, 1972a: 336–339, figs 3A–C.
Austrodecus (Microdecus) minutum: Child 1994b: 80 [text].

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: One male type specimen was collected off the Snares Islands in 132 m.

REMARKS: It is fortunate that the single type specimen is a male. Having at least one male removes all doubt that this species has the cement gland character called for in this subgenus. It also has a single tiny oviger segment which appears to be dominated by four large spines as long as the segment. The species is otherwise quite conventional with short closely crowded lateral processes, ocular tubercle of moderate length, the usual first coxae tubercles, and regular distal palp segments.

It appears to be the only species known in New Zealand waters which has a single trunk tubercle on the fourth segment and none on the other three

anterior segments. All other known New Zealand species have at least three trunk tubercles of various sizes. Clark (1971a: 338) questioned whether or not this is an adult specimen, based on its very reduced ovigers. In most instances among pycnogonids, the ovigers and cement glands are not fully developed until a specimen has reached full adult growth, but Clark had no way of knowing at the time that there are *Austrodecus* species which normally have only one oviger segment in adults.

Pantopipetta Stock, 1963

Species of this genus are among the most attenuate and slender of all pycnogonids. They are larger than species of *Austrodecus* but their legs are so slender that they become entangled and break in many collections. This genus is commonly described as the deep-water counterpart of the shallower *Austrodecus*, but some species of the latter genus reach depths as deep or even deeper than those of some *Pantopipetta*.

Pantopipetta australis (Hodgson, 1914)

Pipetta australis Hodgson, 1914: 159; 1915: 141–142; 1927: 314–315, fig. 2; Turpaeva 1955: 327.

Pantopipetta australis: Hedgpeth & McCain 1971: 223, figs 1–2, tables 1, 2; Child 1995b: 83–84, fig. 14.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species, like most of the described species in this genus, has had very few published records attributed to it. The New Zealand records (Child 1994b: 83) are from the Bounty Basin east of Dunedin in 1586 and 1640 m. These captures mark the furthest north and shallowest records for the species. A few other specimens have been taken in the Scotia Sea and the Ross Sea in 2450–5340 m.

REMARKS: The trunk, lateral processes, and first coxae lack dorsal swellings or tubercles, and the lateral processes are extremely short for a species of this genus. The tarsus is notably short, being only slightly longer than wide. The terminal oviger segment tapers over its entire length instead of only distally and has a tiny terminal claw, and the abdomen is long and extends well beyond the first coxae.

Family PHOXICHILIDIIDAE Sars, 1891

Anoplodactylus Wilson, 1878a

Trunk with anterior extension of cephalic segment carrying small functional chelifores dorsal to short proboscis. Without palps and rarely with small palp buds. Ovigers 5- or 6-segmented, in males only, without functional strigilis. Propodus usually with tiny cutting lamina on distal sole, tiny auxiliary claws proximolateral on main claw, or auxiliary claws lacking. Male femoral cement gland usually single, mediodorsal or more distal, with outlet tube or pore on swelling, sometimes from multiple pores. Sexual pores often on ventrodorsal extension of second coxa segment of posterior four legs.

TYPE SPECIES: *Anoplodactylus lentus* Wilson, 1878a, by original designation.

REMARKS: Females of this genus, lacking ovigers and cement glands, are difficult if not impossible to identify as isolated specimens. Sometimes species will have characters which are separable from all others to allow identification of females, but this is rare among the approximately 120 known species. Identifications in this genus are difficult because of many look-alike species in which the differences are minor and must be searched out to find the correct species. The family has an almost unique character — a propodal lamina of tiny joined setules forming a possible cutting instrument in the plane of the propodal sole. Sometimes this lamina extends the entire length of the sole but its use is only conjectural.

DISTRIBUTION: Worldwide in mostly shallow waters of temperate and tropical seas, but a few species are known from the Antarctic and subantarctic and several species have been taken from depths greater than 1000 m.

Anoplodactylus lacinosus Child, 1995c

Anoplodactylus lacinosus Child, 1995c: 124–126, fig. 2.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The species is known only from a male type taken from off the Antipodes Islands in 476–540 m.

REMARKS: This tiny species has a leg span of about 14 mm. Its lateral processes are crowded together and are increasingly shorter from anterior to posterior. The conical ocular tubercle and abdomen are approximately the same short length and the short proboscis has protruding ventral corners. The first coxae have low laterodistal bumps and the male femoral cement

glands consist of a row of 12–14 tiny pores on the proximal half of the segment. The sixth or terminal oviger segment is as long as the fifth. The sixth is almost always shorter than the fifth in almost all species of this genus except for a few species and the few others having only five oviger segments.

Anoplodactylus pycnosoma (Helfer, 1938)

Peritrachia pycnosoma Helfer, 1938: 176–177, fig. 7.

Anoplodactylus pycnosoma: Stock 1953: 41, fig. 5; Nakamura & Child 1991: 30 [literature]; Stock 1994: 65, 67; Child 1996: 552–553.

MATERIAL EXAMINED: NZOI Stns E948, Whale Bay, Raglan, intertidal, 1 male w/eggs; Stn E974, coll. J.L. Barnard (JLB NZ-9), St Clair, Dunedin, 1 male juvenile, 1 female.

DISTRIBUTION: This species has an Indo-West Pacific distribution. It has been collected on the east coast of Africa, in several places between there and Australia, the Philippines and Japan in shallow and littoral depths. The above stations mark the first time it has been collected in New Zealand waters and both stations were made along the shore. Its depth range is mostly shallow.

DESCRIPTION: Size small, trunk first and second segmentation lines complete, line between third and fourth segments lacking. Lateral processes short, almost touching at bases, glabrous. Neck extension over proboscis very short, ocular tubercle short, eyes well defined. Proboscis robust, short, with prominent ventrolateral tubercles. Abdomen very short, a truncate cone.

Chelifores slender as long as proboscis, functional chelae hanging anterior to proboscis mouth, chelae fingers with 4–5 tiny teeth. Palps entirely lacking. Ovigera 6-segmented, third segment longest, without evidence of proximal segmentation, sixth segment a conical bud, no segment with strong setae or spines. Legs short, robust, with very few setae. Tarsus very short, propodus short, robust, well curved, with 3 heel spines, several tiny sole spines, a very long claw, and extremely tiny auxiliaries. Male femoral cement gland openings as 7–8 dorsolateral slits proximal to just past median point of segment.

TYPE SPECIES: Holotype, female specimen deposited at the Berlin Museum (Stock 1953: 41, fig. 5).

TYPE LOCALITY: Kobe, Japan, depth not given.

REMARKS: This is a very common species in littoral and shallow depths. It appears in many reports treating

collections from the Indo-West Pacific. It has not been collected as yet in the western hemisphere or the west coast of Africa.

Anoplodactylus speculus Child, 1995c

Anoplodactylus pelagicus: Stock 1963: 340; 1981: 463–464, fig. 6. non *A. pelagicus* Flynn, 1928: 25–27, fig. 14; Barnard 1954: 128, fig. 19.

Anoplodactylus speculus Child, 1995c: 126–128, fig. 3.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species, provided all of the synonymy above is correct, is known from two slope stations east of Dunedin in 1586–1640 m. It is also known (previously as *A. pelagicus* Stock) from localities off the South African coast in 3550 m, among the deepest depths known for any member of this genus.

REMARKS: This is almost the opposite of the previous species; long and slender, with the long well-separated lateral processes, a tall tapered and sometimes blind ocular tubercle, very long ovigera, and relatively long legs having one major heel spine on each propodus. The male single cement gland is situated on a swollen bump in the distal half of the femora and is a very short tube.

Anoplodactylus typhlops Sars, 1888

Anoplodactylus typhlops Sars, 1888: 341–342; 1891: 29, pl. 2, fig. 3a–e; Hedgpeth 1948: 228–229 [early literature], fig. 29a–c; Arnaud & Child, 1988: 130–131.

Anoplodactylus neglectus Hoek 1898: 293–295, figs 7–10.

Anoplodactylus pelagicus Flynn 1928: 25–27, fig. 14a–b; Barnard 1954: 128, fig. 19a–g.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This well known species has been recorded many times from world oceans at great depths. It is known in New Zealand waters east of Dunedin on the plateau slope in 1586 and 1640 m, in the same trawls which collected *A. speculus*. Elsewhere, it has been collected in so many scattered localities below 1000 m that it is possibly panoceanic. It has been taken from the vicinity of the South Shetland Islands to as far north as Norway and in depths as great as 3600 m, making it the deepest known member of this genus.

REMARKS: This is another attenuated species with long slender segments. The main difference from the above

species, *A. speculus*, is that *A. typhlops* has no ocular tubercle nor any swelling to show where an ocular tubercle might have been. It is even more slender, and has three major heel spines instead of one.

Phoxichilidium Milne Edwards, 1840

This genus encompasses a small group of species which often have been confused with the much more numerous genus *Anoplodactylus*. *Phoxichilidium* species have only one major character difference from the first species. This has to do with the auxiliary claws which in this genus occur on top of the main claw and are longer than the main claw diameter. The auxiliaries of *Anoplodactylus* originate on the sides of the main claw and are tiny and shorter than the main claw diameter. They do not exist on the claws of many *Anoplodactylus* species. Species of *Phoxichilidium* are invariably compact with short crowded lateral processes, short appendages, and have low ocular tubercles and abdomina. The male femoral cement gland pores are almost always in multiples and appear on the surface as tiny cups with or without a tubular extension or protruding rim. When they have a single opening, they can be a single pore or, as in the only species from New Zealand waters, a cribriform slit.

TYPE SPECIES: *Phoxichilidium femoratum* (Rathke, 1799), by original designation.

REMARKS: Stock (1991: 202) reduced the numbers of species in this genus to seven based on the auxiliary claws appearing laterally or dorsally in relation to the main claw. Since then, two more species have been added to this list, including the species below. Most species do not have the propodal lamina.

Phoxichilidium pyrgodum Child, 1995c

Phoxichilidium pyrgodum Child, 1995c: 129-131, fig. 4.

MATERIAL EXAMINED: No species in the collection.

DISTRIBUTION: This species is known from 10 type specimens taken at two stations off Macquarie Island in 79-93 m and 112-124 m.

REMARKS: The species is more slender and graceful than the usual appearance of closely crowded appendages in most species of the genus. Its lateral processes are increasingly shorter from anterior to posterior but its short conical ocular tubercle and abdomen are typical of the genus. The first coxae each bear a short conical

tubercle on the posterodorsal side at the distal rim of the segment. The auxiliary claws are dorsal to the main claw and the cement gland orifice is a cribriform slit proximal to the midline of each femur.

Pycnosomia Losina-Losinsky, 1961

Anoplodactylus-like, but chelifores shorter than the long, slender, bottle-shaped, sometimes styliform proboscis. Chelae very small, possibly functional. Palps entirely lacking. Ovigera 6-segmented, without strigilis, in male only. Legs conventional, propodus with single conical heel spine, few tiny sole setae or spatulate spines on both heel and sole. Auxiliary claws entirely lacking. Femoral cement gland (where known) with multiple small dorsodistal pores without swellings. Sex pores of females usually on large ventral swelling of second coxae, lacking in males.

TYPE SPECIES: *Pycnosomia strongylocentroti* Losina-Losinsky, 1933, by original designation [*Pycnosomia* Losina-Losinsky, 1933, preoccupied].

TYPE LOCALITY: Tatar Strait, northern Sea of Japan, 70 m.

REMARKS: Three of the four species known have been collected in association with echinoderms and are apparently commensal or parasitic on these host specimens. The fact that they are not free living has perhaps limited their discovery and is possibly the reason for so few collections because they were not noticed during routine sorting of large host specimens. There are a few other species in the genus *Anoplodactylus*, within this family, that are known to be commensal on ophiuroid echinoderms (e.g., *A. ophiurophilus* Stock, 1979). These species apparently feed on food bits being passed along ambulacral grooves to the host's mouth.

DISTRIBUTION: This is a rare Indo-West Pacific genus with only four known species. Three of these four are only known from their type specimens. These species follow a known distributional corridor of several other genera and species which have a north-south range along the western rim of the Pacific. The first two species known, *Pycnosomia strongylocentroti* Losina-Losinsky, 1933, and *P. tuberculata* Losina-Losinsky, 1961, were collected in boreal-arctic waters of the Russian Far East. The other two, more recently described; *P. asterophila* Stock, 1981, and *P. coxata* Stock, 1991, are known only from the Philippines. All were collected in shallow to moderate depths of 17-591 m.

Pycnosomia asterophila Stock, 1981a: 309–312, figs 1–8.

Endeis Philippi, 1843

MATERIAL EXAMINED: NZOI Stns S120, Chatham Rise, SE of Mernoo Bank, 365 m, on large starfish, 3 males w/eggs, 1 male, 1 female, (NMNH 2 males w/eggs); S129, Chatham Rise, SE of Mernoo Bank, 355 m, trawl, 1 juvenile.

DISTRIBUTION: Known only from the Philippines, these two stations extend the species distribution (and that of the genus) into the southern hemisphere to the Campbell Plateau and into slightly shallower water than the type.

DESCRIPTION: Moderately small, leg span about 15 mm. Trunk segmentation varies, lateral processes separated by 0.3–0.7 of their width, little longer than their width, armed dorsally and distally with 4–8 short spines. Neck extending very little anterior to proboscis insertion, ocular tubercle low, at extreme anterior of neck, eyes well defined. Proboscis long, slender, about length of first two trunk segments, bottle-shaped, with long distal bottle neck, tapering at mouth. Abdomen moderately long, extending just beyond first coxae of fourth leg pair.

Chelifores slender, short, only about half proboscis length, chelae tiny, with functional fingers. Palps lacking. Ovigera of 6 segments, *Anoplodactylus*-like, with few short setae. Legs of moderate length, with few short setae. Male femoral cement gland with row of minute pores along dorsal surface. Tarsus very short, propodus robust, with one conspicuous heel spine, few tiny sole spines, robust claw very curved distally, auxiliaries lacking.

Female sex pore on prominent ventrodorsal tubercle of all second coxae.

TYPES: Males, females, juveniles, 20 of which are deposited in the Paris Museum and 5 in the Amsterdam Museum.

TYPE LOCALITY: Philippines: 13°55.1' N, 120°28.6' E, 379–407 m, on the oral surface of *Calliaster corynetes* Fisher.

REMARKS: These specimens are very much like and difficult to separate from *Pycnosomia coxata* Stock. Indeed, they were thought to be that species on first superficial examination. The differences are subtle and mostly involve the proboscis and chelifores. Stock's *P. coxata* has a narrower, shorter, and more down-curved distal tube of its proboscis. In this species it is longer, broader, and with less distal curve. The scape of *P. coxata* is longer and more curved than in this species. There are other minor differences in leg spines between the two species.

A small group of species with many characters similar to the larger genus *Anoplodactylus*. *Endeis* species have 7-segmented ovigera carried only by males and lack any form of chelifores and palps. Their lateral processes are well separated, like most species of *Anoplodactylus*, and their legs are usually long with well-developed propodi bearing auxiliary claws. Male femoral cement gland openings consist of one or two rows of very tiny pores on the dorsal surface. There is only one known species in New Zealand waters.

TYPE SPECIES: *Endeis spinosa* (Montagu, 1808)

REMARKS: Species of *Endeis* are found in few numbers around the world oceans and are never very common except for the genotype which is a resident of floating *Sargassum* weed and is carried vast distances throughout the Atlantic Ocean and Mediterranean Sea. Others may be transported in this same fashion as several are known to be widely distributed.

Endeis australis (Hodgson, 1907)

Phoxichilus australis Hodgson, 1907: 5, pl. 1, fig. 1.

Endeis australis: Fry & Hedgpeth 1969: 64–66 [literature], figs; 96–98; Child 1995c: 131.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species has one record from off Macquarie Island. It is otherwise known from scattered subantarctic and Antarctic records in depths of 10–550 m. It has probably reached its northern range limit at Macquarie Island.

REMARKS: Species of this genus are easily recognised if difficult to separate from each other. The lack of chelifores and palps is conspicuous and 7-segmented ovigera without a functional strigilis are another easy character for generic separation.

Family NYMPHONIDAE Wilson, 1878

Heteronymphon Gordon, 1932

The eight species known in this genus are all rare except for the type species. They are found for the most part in very deep water, with exceptions, and are all slender and rather small species. Unlike species of the great genus *Nymphon*, species in this genus have

low eye tubercles placed very anterior on the cephalic segment or at least anterior sensory papillae over a blind area where eyes would be if they were not missing. The ocular tubercle in *Nymphon* is always well posterior to the cephalic segment anterior rim and not touching it as in *Heteronymphon* species. Other consistent characters are a fifth or terminal palp segment longer than the fourth, lack of auxiliary claws, and poor chelae tooth development, none of which is unique to this genus or family.

TYPE SPECIES: *Nymphon exiguum* Hodgson, 1927

REMARKS: Species in this genus are usually small to tiny and are not as large as the majority of *Nymphon* species. This character cannot be used alone and probably should not be used at all to diagnose *Heteronymphon* species, but gives some idea of size within the genus. The forward placement of an ocular tubercle, if present, is the best diagnosis of any *Heteronymphon* and will serve even with known blind species which have lateral sensory papillae where an ocular tubercle would occur.

Heteronymphon exiguum (Hodgson, 1927)

Nymphon exiguum Hodgson, 1927: 321–322, fig. 4.
Heteronymphon kemp Gordon, 1932: 80–82, figs 38–39.
Heteronymphon exiguum: Stock 1953: 37–38 [literature], fig. 2; Nakamura 1985: 33 [key]; Child 1995a: 4–5.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species was collected on the Campbell Plateau slope west of the Auckland Islands in 415 m. It also is the only *Heteronymphon* species known in Antarctic and subantarctic seas although it has many capture records from these localities. It has a depth range of about 50–400 m.

REMARKS: The characters of its genus serve to separate this species from any others in this large family.

Nymphon J.C. Fabricius, 1794

Trunk almost always fully segmented, usually elongate. Lateral processes usually well separated. Ocular tubercle placed at posterior end of cephalic segment. Abdomen usually short, never very long. Proboscis cylindrical, with variable inflation and constrictions. Chelifores robust, scape 1-segmented, chelae fully formed, functional, often large, fingers with variously shaped teeth. Palps 5-segmented, longer than proboscis, first segment always short, second usually

longest. Ovigera 10-segmented, in both sexes, with fully formed strigilis having denticulate spines and a terminal claw usually with teeth. Tarsus usually short, sometimes longer than propodus in deep-sea specimens. Propodus without heel, claw usually with auxiliary claws. Male cement glands (where known) with opening(s) on ventral femur.

TYPE SPECIES: *Nymphon grossipes* (O. Fabricius, 1780)

REMARKS: Hedgpeth (1948: 181) remarked that "there seems to be no end to the variations of trivial characters on which the [new *Nymphon*] species are based." Indeed, this splitting habit by taxonomists continues today without apology as more species are published from the world oceans, including those new species of this report. Since the time Hedgpeth wrote that line, the number of more or less recognised *Nymphon* species has more than doubled to greater than 250. The only method by which this unwieldy mass of species can be separated appears to be by the recent trend to segregate many of them into species "groups" or sets based on a discrete set of characters which seem to be uniquely shared by those few in each set.

DISTRIBUTION: Worldwide in all oceans and all depths, but with increased numbers and more species occurring in Arctic and Antarctic localities followed closely by those of temperate and tropical habitats.

Nymphon australe Hodgson, 1902

Nymphon australe Hodgson, 1902: 257, pl. 11; Child 1995a: 7 [key], 9–10 [literature].

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This prolific species has been collected as far north as Cook Strait in New Zealand. It is by far the most commonly collected species of *Nymphon* from southern Chile and Argentina, in Antarctic and subantarctic waters, and perhaps is the commonest species in any waters. Child (1995a: 10) listed more than 6000 specimens of this circumpolar pycnogonid in all depths from intertidal to more than 1000 m. It has been collected in deeper waters, though rarely.

REMARKS: This species has a leg span of about 2–3 cm, a tall ocular tubercle with prominent eyes, and closely crowded lateral processes which usually, along with the trunk, have long dorsal spines. Spines are also carried on the chelifore scapes and in rows along the legs. It has a short neck crowded with a bulbous oviger base on each side. The male ovigera have distally

inflated fifth and sixth segments which are often collapsed. The tarsus, with strong distal spines, is usually as long or longer than the propodus which has a short main claw and vestigial or missing auxiliary claws. A wide range of variations occur among the many specimens of this species. This is attested to by its several synonyms.

This is the genotype of a group of 20 predominantly Antarctic species which belong to a discrete assemblage called the *australe* group (Child, 1995a: 5–7, with key). It shares the diagnostic characters enumerated above with the others and forms one of the groups into which this cumbersome genus must be divided if any sense is to be made of trying to separate its multitude of species.

Nymphon australe caecum Gordon, 1944

Nymphon australe var. *caecum* Gordon, 1944: 25–27, fig. 5a–d; Turpaeva 1974: 280; Child 1995a: 6 [key], 10–11.

MATERIAL EXAMINED: NZOI Stns: S202, Hikurangi Trough, 2476–2542 m, small trawl, 250+ specimens; S203, Hikurangi Trough, 2619–2627 m, small trawl, 41 specimens; S204, Hikurangi Trough, 2602–2677 m, small trawl, 150+ specimens.

DISTRIBUTION: This subspecies undoubtedly has a circumpolar distribution in Antarctic waters. It is the deep-water counterpart of its parent species which is the most commonly collected species throughout Antarctic waters. The subspecies always occurs deeper than 1200 m according to all known records. Child (1995a: 11) included specimens from two stations on the subantarctic slope of the Campbell Plateau, and another station from south of the Plateau in deeper water. The above stations represent the furthest north the subspecies has been taken in New Zealand waters. The great numbers of specimens per above station suggest that it occurs in patches of many crowded specimens. It is common in its known depth range in southern New Zealand waters.

DESCRIPTION: Like the typical form or parent species, *Nymphon australe* Hodgson, except for the lack of an ocular tubercle and eyes in any form. Trunk and entire body robust, appendages moderately short, crowded. Lateral processes close to touching on short trunk, armed with dorsal setae and spines on both, but sometimes lacking on trunk. Neck short, crowded with large oviger bases. Proboscis moderately short, abdomen long, carried horizontally. Chelifores large, scapes with long setae, chelae finger teeth numerous, 36–65 per finger. Male ovigers with swollen thin-walled fifth and sixth segments which are sometimes

collapsed. Legs with long setae and spines usually in rows. Tarsus as long or longer than propodus. Claw short, usually lacking auxiliaries, but sometimes with tiny vestigial auxiliary claws.

TYPES: Holotype male, paratype males, young female, deposited in Adelaide, Australia with the British, Australian and New Zealand Antarctic Research Expedition material.

TYPE LOCALITY: Antarctica: BANZARE Stn 29, 66°28' S, 072°41' E, 1266 m, 25/12/1929 .

REMARKS: The total lack of an ocular tubercle of any form always serves to separate this subspecies from its look-alike parent species. The parent has a fairly tall cylindrical ocular tubercle which almost always has eyes (except for the deepest specimens) which may or may not be pigmented. Both the parent species and the subspecies belong to the *Nymphon australe* group (Child 1995a: 5, 6–7 [key]) of short, compact, setose species with vestigial auxiliary claws or lacking these and with a long tarsus.

Nymphon bucuspidum Child, 1995a

Nymphon bucuspidum Child, 1995a: 34–35, fig. 10B–G.

MATERIAL EXAMINED: NZOI Stns: S45 (type locality); S154, slope E of Dunedin, 1373 m, 1 male w/eggs, 2 males, 3 females, 1 juvenile; V376, North slope of Bounty Trough, 1239 m, 1 male w/larvae.

DISTRIBUTION: The above slope specimens extend the distribution of this recently described species only a little distance to the north and into slightly deeper water from the type locality. Thus far, it is known as a deep-water species endemic to southern New Zealand slopes.

DESCRIPTION: Size moderate for genus, leg span about 60 mm. Trunk with bulbous segments completely segmented, armed with 2–3 long dorsomedian trunk setae and 1 long dorsodistal seta on all but anterior lateral processes which are short. Neck short, crowded with large oviger implants, low ocular tubercle with large eyes at junction of trunk and anterior of first lateral processes. Proboscis short, with median and distal swelling. Abdomen moderately long, carried horizontal, glabrous.

Chelifore scapes longer than proboscis, armed with short and long dorsal setae. Chelae large, palm very short, fingers long, armed with ectal setae and 16–18 long pointed endal teeth. Palp segments short, fourth and fifth subequal, armed with many long setae.

Ovigers with very long distally swollen and setose fifth segment. Terminal claw short, with 3 endal teeth. Legs moderately short, tibiae with many long setae. Tarsus slightly longer than short propodus, each with many sole and dorsal setae. Claw slightly more than half propodal length, auxiliaries lacking.

HOLOTYPE: Male, deposited in NZOI collection, NIWA, Wellington, H-697.

PARATYPE: Female, from Stn S154, deposited in NMNH (USNM 234681).

TYPE LOCALITY: NZOI Stn S45, New Zealand slope E of Campbell Rise, off southern Campbell Plateau, 54°01.5' S, 171°04.5' E, 1262 m.

REMARKS: This species has several characters shared by the *Nymphon australe* group such as short legs with many setae and short neck crowded with oviger bases. It differs from this group of species by having a different setal arrangement on the legs, lateral processes not nearly as close together, lack of inflated fifth (which is much longer than that of group species) and sixth oviger segments, and shorter abdomen which lacks typical inflation of those in the group. The long chelae fingers with their many long sharply pointed teeth and outer setae serve to separate this species from most others in the genus and from any others found in New Zealand waters.

Nymphon compactum Hoek, 1881

Nymphon compactum Hoek, 1881: 41–43, pl. 2, figs 6–8, pl. 15, fig. 10; Hodgson 1908: 147–149, pl. 1, figs 5, 5a; Bouvier 1913: 72–73; Loman 1923: 14; Gordon 1932a: 115–117, fig. 10; 1944: 19 [key]; Stock 1965: 21–22 [list]; Turpaeva 1974: 278–280, fig. 1; Child 1995a: 6 [key], 13–14.

MATERIAL EXAMINED: NZOI Stn P969, E of Hawke Bay, 2250–2262 m, 1 female.

DISTRIBUTION: The species is known from a single record E of Auckland, North Island. It has also been collected in the South Sandwich Islands, and South Orkney Islands in depths of 731–3246 m.

DESCRIPTION: Member of the *Nymphon australe* group but with a more slender trunk, lateral processes more separated than usual, and with very few long or short setae. Ocular tubercle a low blind bump. Chelifores slender with few short setae. Chelae fingers very slender, with 40–48 closely spaced teeth on each finger. Palp distal segments longer than proximal segments. Oviger fifth and sixth segments typically inflated. Legs

only slightly setose, tarsus twice length of propodus, claw long, auxiliaries lacking.

TYPES: 2 female syntypes deposited in British Museum (Natural History) with the *Challenger* material.

TYPE LOCALITY: E of Auckland, North Island, New Zealand, in 2000+ m.

REMARKS: This species barely qualifies as a member of the *Nymphon australe* group because of its slender habitus with well-separated lateral processes, lack of groups of long setae, extra long tarsus in relation to the propodus, and the long claws on the legs. It does qualify because of the oviger similarities with those of the group, short neck and long abdomen, and a few other minor characters which agree with those of the group.

Nymphon immane Stock, 1954 (Fig. 2G)

Nymphon immane Stock, 1954: 25–28, figs 9–10; Clark 1963: 7, fig. 4.

MATERIAL EXAMINED: NZOI Stns E891, New Caledonia Trough, 1247–1282 m, 1 female, damaged; E892, New Caledonia Trough, 1224–1226 m, trawl, 1 male; S194, Hikurangi Trough, 1190 m (USNM 1 subadult male).

DISTRIBUTION: The above specimens increase geographic distribution for the species to the east and west of North Island, and more than double the previously known depth range. Clark's specimen came from New South Wales, Australia, in 540 m.

DESCRIPTION: Size small, leg span about 27 mm. Trunk moderately slender, lateral processes separated by their diameters or slightly less, with small rounded dorsodistal tubercles. Neck moderately long, with small rounded tubercle dorsal to each chelifore insertion, oviger implantations at posterior, against first lateral processes. Ocular tubercle a tall slender cone with distal eyes. Proboscis short, distally rounded. Abdomen short.

Chelifores very large, scapes divergent. Chelae palms short, fingers long, both curved ventrally, overlap at tips. Immobile fingers with about 25 slender teeth, movable fingers with more than twice as many much smaller teeth. Palps with segment 2 shorter than 3, segments 4 and 5 subequal in length, with few distal setae. Ovigers with slender long fifth segment swollen distally, with few lateral setae. Strigilis claw with 9–10 ventral lobes. Legs slender, with few setae. Propodus about twice tarsus length, both without spines on soles, with few tiny setae. Claw

moderately short, auxiliary claws very curved, about 0.6 as long as main claw. Male cement gland ventral with 7 low tubes, but mostly more, up to 11 per leg, with shortest tube proximal, longest tube distally (Fig. 1G). Distal tubes as wide as tall.

HOLOTYPE: Male with larvae, deposited in Zoological Museum, Copenhagen.

TYPE LOCALITY: Off Eden, New South Wales, Australia, in 37–46 m.

REMARKS: There are a number of small differences between these males and the type specimen. The ocular tubercle of the New Zealand specimens either lacks eyes entirely or has indistinct distal darkened areas without definite edges. The chelae teeth are not as dimorphic on opposing fingers as those of the type. These specimens have about 75–76 slender pointed teeth on the movable finger and 62–63 on the immovable finger. Those of the immovable finger are only slightly larger than their opposites while in the type, the immovable finger teeth are more than twice as large as the opposable finger teeth.

The legs of the two males above have conspicuous cement-gland tubes. In the fully adult male, there are seven ventrally on the anterior femur pair and these increase to eleven on the posterior leg pair. They are short tubes or cylinders with a distal sieve plate. These were not described nor figured for the male type which suggests that it is a subadult without fully formed cement glands. The propodal claws are slightly longer and more slender in the New Zealand specimens. These differences are probably attributable to different populations. The remaining characters of these specimens agree fairly well with the description and figures of Stock's type specimen, including the unusually long third palp segment. This segment is rarely longer than the second segment in species of the genus.

Nymphon lomani Gordon, 1944

Nymphon lomani Gordon, 1944: 21 [key], 23–24, fig. 4a–c; Child 1995a: 42–43, fig. 12g.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The species has a limited distribution based only on two sets of published records. It is known from just east of Macquarie Island in 112–124 m. Elsewhere, it has been collected from Enderby Land, Antarctica, in 180–220 m (the types), and the Scotia and Ross Seas in 659–714 m and 392 m respectively.

REMARKS: This is a rather long and slender species. It has a long neck with oviger implantations separate from the first lateral processes, and chelifores which are much longer than the slightly inflated proboscis. The slender palps have a third segment equal to or slightly shorter than the fourth and fifth segments combined. The male oviger has a very long fifth segment, distally curved, with lateral setae on outside curve and tiny papillae on inside of curve. Its legs are long and slender with a propodus half again as long as the tarsus, both with short sole spines, and auxiliaries about half the main claw length. Females with eggs almost always have grossly swollen proximal femura but where more ova are present, the swelling extends into the distal half of the segment.

Nymphon longicollum Hoek, 1881

Nymphon longicollum Hoek, 1881: 40–41, pl. 3, figs 1–3, pl. 15, fig. 11; Gordon 1944: 18 (table 2), 19 (key); Stock 1965: 22 (list, key); Child 1995a: 43.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The species has only been known from two collections, the type and the group of Antarctic specimens of Child (1995a: 43). It was taken on the Campbell Plateau slope, southeast of Christchurch in 2612 m. The types were collected in the Chilean basin in 4069 m. It has since been collected along the Scotia arc near South Georgia, South Sandwich Islands, South Shetland Islands, South Orkney Islands, and the Weddell and Ross Seas in 508–4069 m.

REMARKS: This is another long slender species with oviger implants just anterior to the first lateral processes and not touching them. The ocular tubercle is conspicuously tall, blind, and conical with a broad base. The chelifore scapes are longer than the cylindrical proboscis and the chelae have fewer than usual (16–18) teeth per finger. The oviger fifth segment is little longer than the fourth with the sixth about half as long as the fifth. The legs are slender with short setae only, and a subequal tarsus and propodus with the claw about 0.6 as long as the propodus. Auxiliary claws are vestigial or lacking and the male cement gland pores number 9–10 and are placed proximoventral on each femur.

Nymphon longicoxa Hoek, 1881

Nymphon longicoxa Hoek, 1881: 38–39, pl. 2, figs 1–5, pl. 15, figs 8–9; Gordon 1932a: 106–109, figs 7, 8a; Clark 1958: 1–2; Child 1982: 43 [literature]; Arnaud & Branch 1991: 67 [key], 70 [text], 1 fig; Child 1995a: 43–44.

MATERIAL EXAMINED: NZOI Stns E709, S of Hawke Bay, 1642–1789 m, Menzies trawl, 1 male w/eggs; S150, Bounty Trough, 1640 m, trawl, 1 female; S151, Bounty Trough, 1586 m, trawl, 1 male, 3 females, 1 juvenile; S152, Bounty Trough, 1676 m, trawl, 25+ specimens.

DISTRIBUTION: Known from many subantarctic and Antarctic locations, this species has also been taken just to the south of the Campbell Plateau. The Bounty Trough specimens mark the furthest north the species has been collected in the vicinity of New Zealand. It is also known to occur in the Argentine Basin as far north as the Rio de La Plata.

DESCRIPTION: Size moderately large, leg span about 82–92 mm. Most appendages very long, slender. Trunk and lateral processes well separated, glabrous. Neck of medium length, oviger bases implanted well anterior to first lateral processes, low ocular tubercle placed between oviger bases and first lateral processes. Proboscis rather long, slender, with slight median and distal swelling. Abdomen narrow, short.

Chelifore scapes longer than proboscis. Chelae very slender, palms short, fingers very long, overlapping at tips, armed with very many slender sharp teeth. Palps quite slender, third segment about 0.6 length of second, fourth only slightly shorter than fifth (sometimes subequal). Oviger fifth segment longest, slender, distally curved and swollen. Second coxae of legs unusually long, about 4.5 times longer than first coxae. Second tibiae longest segments. Tarsus sometimes shorter, sometimes subequal to propodal length, claw 0.7 length of propodus, sometimes longer, without auxiliaries. Sole of both distal segments with many very short spines.

TYPES: 9 males, 3 females, deposited in British Museum (Natural History) with *Challenger* material.

TYPE LOCALITY: *Challenger* Stn 168, E of Auckland, 40°28' S, 177°43' E, 2000+ m, July 8, 1874.

REMARKS: The specimens from Stn S152 are very broken up with almost all legs separated from the trunks and in pieces, making it very difficult to make an exact count of specimen numbers. The extremely long second coxae are best to use in separating this deep-sea species from other *Nymphon* species of the South-west Pacific and Antarctic.

Nymphon macquariensis Child, 1995a

Nymphon macquariensis Child, 1995a: 44–45, fig. 13.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The unique type of this species was collected east of Macquarie Island in 112–124 m.

REMARKS: This small squat species has short appendages and lateral processes separated by less than their diameters, and a short neck and proboscis. The chelae are long-fingered with few (9–11) large teeth, the palp segments are quite short as are the legs. The tarsus is only about 0.8 as long as the propodus and the robust claw is only about 0.3 of the propodal length. This species lacks auxiliary claws and is one of the very few small squat species with short appendages to lack auxiliaries. Almost all species which lack auxiliaries are slender deep-sea forms of larger size.

Nymphon maoriana Clark, 1958

Nymphon maoriana Clark, 1958: 2–3, figs 1–8.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The species is known only from the types and other collections reported on at the same time. They came from the east coast near Wellington in 37–55 m, and from Cook Strait in 73 m.

REMARKS: This very small species has few uncommon characters except for very long chelifores with scapes longer than the proboscis and chelae crossing in front of the proboscis. Its ocular tubercle is short, broader at its base than it is tall and has four darkly pigmented eyes. The chelae fingers have many small teeth (24–38) and are well curved. The distal three palp segments are very short with the combined fourth and fifth longer than the third. The tarsus is little more than half as long as the propodus and the claw is slightly longer than the tarsus. The auxiliaries are almost half the main claw length. Most of the species is rather plain, without adornment, and has a short neck.

Nymphon punctum Child, 1995a

Nymphon punctum Child, 1995a: 51, fig. 16.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The only known specimen, a female type, was collected from a remote tablemount west of the Auckland Islands in 415 m.

REMARKS: This species is superficially like *N. maoriana* Clark. It has shorter chelifores with smaller-sized teeth, an ocular tubercle taller than wide, legs with conspicuous sharp distal spines, and a tarsus only half as

long as the short propodus. The similarities reside in the plain trunk, short neck, very short palp segments and short legs with long claws.

Nymphon trispinum n.sp. (Fig. 4)

MATERIAL EXAMINED: NZOI Stn W460, slope off Dunedin, found in hexactinellid sponge, 1400–1415 m, 1 female, holotype.

DISTRIBUTION: The species is known from a single female holotype collected on the Campbell Plateau slope off Dunedin in 1400–1415 m.

DESCRIPTION: Size fairly small, leg span about 46.3 mm. Trunk fully segmented, slender, lateral processes separated by more than their diameters, glabrous. Neck of medium length, oviger implants well anterior to first lateral processes. Ocular tubercle placed just posterior to implants and at anterior of first lateral processes, low, rounded, eyes large, without pigment. Abdomen small, erect, glabrous, not extending beyond posterior lateral processes.

Chelifore scapes long, slender, with few short lateral and distal setae. Chelae palms short, rectangular, with few distal setae. Fingers longer than palm, slender, overlapping distally, with 14 sharp slender endal teeth and four ectal setae on immovable finger, 16 similar teeth and no setae on movable finger. Palps moderately short, second segment longest, combined length of fourth and fifth segments subequal to length of third. Second and third with few short lateral setae, fourth and fifth with more ventral setae, some longer than segment diameters. Ovigerae moderately short, fourth segment subequal in length to fifth, fourth with low conical bulge just proximal to mid-length. Strigilis segments each increasingly shorter than last, denticulate spines arranged in single row with the count of 9: 6: 5: 7: with terminal claw almost as long as distal segment, claw armed with 10 slender sharp teeth. Denticulate spines with three or four lateral teeth.

Legs long, slender, with few longer dorsal setae and more short ventral setae. Second tibia the longest major segment. Tarsus short, only about 0.3 as long as almost straight propodus. Tarsus armed with few short and one longer sole spines. Propodus armed with three large heel spines, seven short distal sole spines, and several dorsodistal short setae. Claw long, about 0.7 as long as propodus, auxiliary claws quite short, little longer than greatest diameter of main claw.

Male characters unknown.

MEASUREMENTS: Holotype in mm: trunk length (chelifore

insertion to tip of 4th lateral processes), 4.38; trunk width (across 2nd lateral processes), 1.96; proboscis length, 1.98; abdomen length, 0.62; second leg, coxa 1, 0.53; coxa 2, 1.66; coxa 3, 0.84; femur, 4.2; tibia 1, 4.94; tibia 2, 7.63; tarsus, 0.36; propodus, 1.24; claw, 0.79.

ETYMOLOGY: The name (Latin: *tri*, prefix for three, and *spinum*, meaning spine or spinose) refers to the three prominent heel spines.

HOLOTYPE: Female, deposited in the NZOI collections at NIWA, Wellington, H-692.

TYPE LOCALITY: Campbell Plateau slope, 45°57.9' S, 171°45.7' E, 1400–1415 m.

REMARKS: This species has very few striking characters other than its large chelae with their large widely spaced teeth, common to many *Nymphon* species, and the three large heel spines (rather uncommon). The trunk is reminiscent of several known species and is probably closest to that of *N. lomani* Gordon, and *N. longispinum* Nakamura & Child. Both of these species share the new species characters of oviger implants which are anterior to the first lateral processes, short distal palp segments, moderately short necks, and similar low ocular tubercles with large eyes. The chelae, abdomen, and auxiliary claws of *N. lomani* are all much larger than those of this new species. The chelifore palms of *N. longispinum* are much longer than those of the new species and the long distal first coxae spines, strigilis denticulate spines, and propodal heel spines and auxiliary claws are either very different or not present in the new species. The range of different characters broadens in other species having similar trunk morphology.

Nymphon typhlops (Hodgson, 1915)

Chaetonymphon typhlops Hodgson, 1915: 144; 1927: 327–329, fig. 6.

Nymphon typhlops: Gordon, 1944: 19 [key]; Stock 1965: 22 [key]; Child 1995a: 6 [key], 20–21; 1997: 137, 139.

Nymphon spicatum Child, 1982: 46–48, fig. 15.

MATERIAL EXAMINED: NZOI Stns S202, Hikurangi Trough, 2476–2542 m, small trawl, 150+ specimens; S203, Hikurangi Trough, 2619–2627 m, trawl, 2 specimens.

DISTRIBUTION: There are few Antarctic records of this apparently rare species, all from depths of 2450–2818 m. The Hikurangi Trough records place this species much to the north of previous records, but within known depths. The large number of specimens

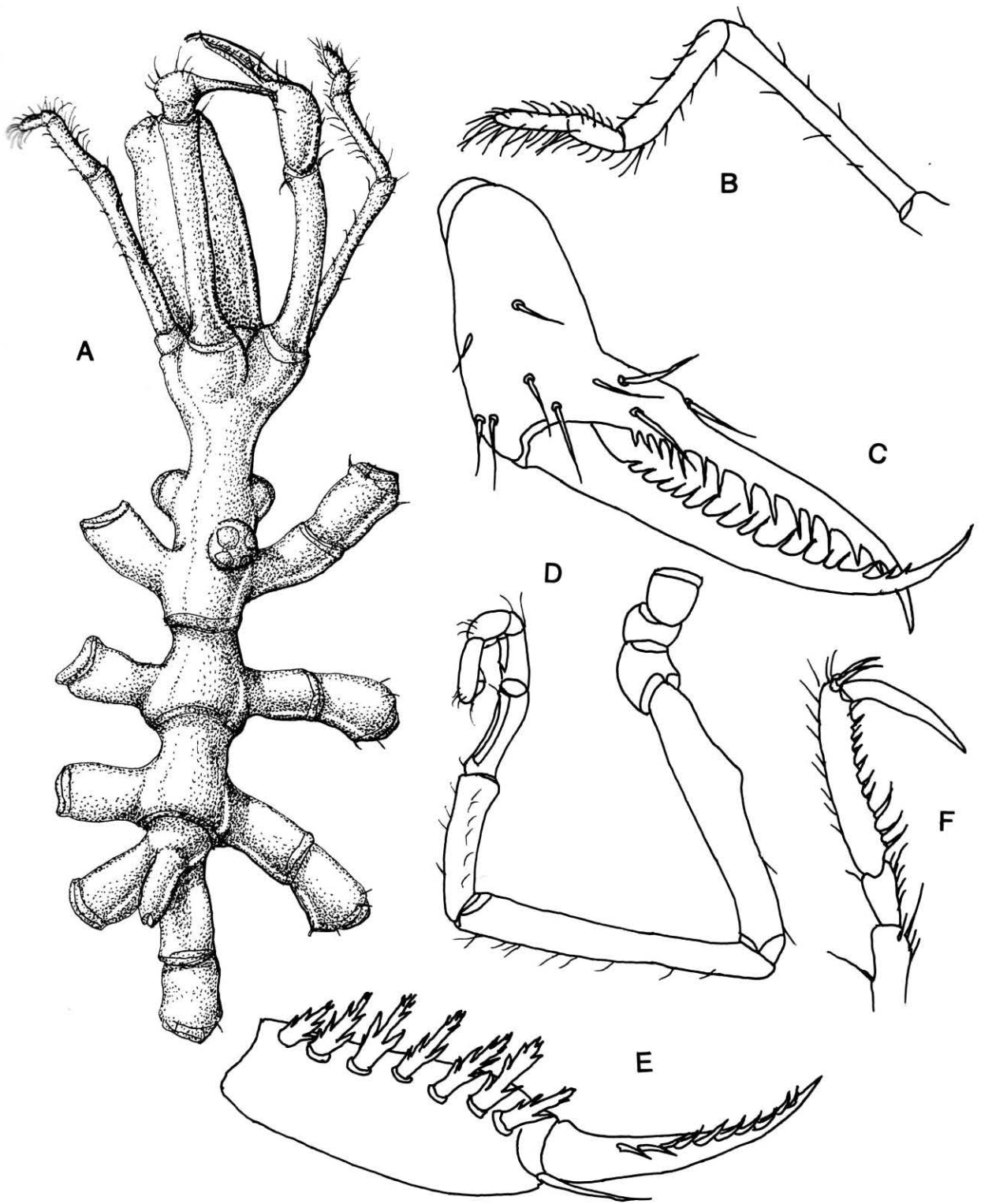


Fig. 4. *Nymphon trispinum* n.sp.: Holotype female. A, trunk, dorsal view; B, palp; C, chela; D, oviger; E, oviger terminal segment and claw, enlarged; F, leg terminal segments.

from Stn S202 suggest that this is another species like *N. australe caecum* which gathers in crowded masses. Perhaps such groups are prolific year groups of fecund parents, but this is speculative.

DESCRIPTION: Similar to *Nymphon australe*. Trunk, lateral processes and scapes with short dorsal spines on low tubercles. Trunk with first two segmentation lines, third line lacking. Lateral processes almost touching proximally, narrowly separated distally. Neck typical, very short, with large oviger bases. Ocular tubercle tall, curved, blind. Proboscis short, abdomen long, horizontal.

Chelifores large, chelae with curved teeth, more teeth in movable than immovable fingers. Palp segments 4, 5 very short. Oviger typical, fifth segment longest, curved. Legs slender, armed with rows of short spines. First tibiae the longest segments, tarsus slightly longer than propodus, claw robust, auxiliary claws vestigial. Male cement glands open through 7–8 low ventral cups.

TYPE: "A few specimens".

TYPE LOCALITY: NW of Gauss Station, Antarctica, in 1207 m.

REMARKS: This species also belongs to the *Nymphon australe* group (Child 1995a: 5–6 [key]), as do *N. australe caecum* Gordon, and *N. compactum* Hoek, discussed elsewhere in this report. This is a distinctive group of twenty or more species, almost all found in the Antarctic. The group is characterised by long dorsal setae and spines on the trunk and/or crowded lateral processes of most species, and a short neck crowded with oviger bases. The legs are usually quite spinose or setose, the tarsus is often longer than the propodus, and the auxiliary claws are usually vestigial but mostly lacking. This is one of the more conspicuously setose species which is characterised by a slender blind ocular tubercle and palps with two extremely short distal segments, making it easier to separate from others of the group.

Nymphon uncatum n.sp. (Fig. 5)

MATERIAL EXAMINED: NZOI Stn P970, Hikurangi Trough, 3390–3391 m, 3 females (types).

DISTRIBUTION: Types, which see.

DESCRIPTION: Large conspicuous species having a leg span of about 173 mm. Trunk fully segmented, lateral processes separated by their diameters or slightly

more, glabrous. Neck moderately short, large oviger implants at posterior, touching first lateral processes. Ocular tubercle a low rounded bump, without eyes, sensory papillae prominent. Proboscis long, a cylinder slightly swollen just distal to midpoint, lips flat. Abdomen short, not as long as first coxae, distally downcurved to be almost vertical at tip, glabrous.

Chelifores massive, glabrous, cylindrical scapes slightly longer than proboscis. Chelae curved inward, palms cylindrical, shorter than slender fingers. Movable finger with about 70 long and short teeth, slightly longer than immovable finger which has 63–64 teeth of uneven sizes. Palps slender, third segment only little shorter than second, fourth and fifth of subequal length, fourth armed with 1 distal seta, fifth with 3 short distal setae. Oviger fourth segment curved, with small low lateral tubercle at about 0.3 its length, fifth segment longest, straight. Strigilis segments each successively smaller, armed with denticulate spines in the formula 15: 12: 10: 9, with a straight terminal claw the same length or slightly longer than the terminal segment, armed with 13 long slender teeth. Denticulate spines long, with 4 lateral lobes on each side. Legs long, glabrous, second tibiae the longest segments. Propodus only slightly longer than tarsus, both slightly curved, unarmed. Claw straight, about 0.75 length of tarsus.

MEASUREMENTS: Holotype in mm: Trunk length (chelifore insertion to tip 4th lateral processes), 15.5; trunk width (across 2nd lateral processes), 8.7; proboscis length, 7.2; abdomen length, 2.5; third leg, coxa 1, 2.8; coxa 2, 4.9; coxa 3, 3.4; femur, 17.9; tibia 1, 16.6; tibia 2, 25.0; tarsus, 4.1; propodus, 4.6; claw, 3.1.

ETYMOLOGY: The species name (Latin: *uncatus*, meaning hooked, barbed, or with an angle) refers to the sharply downcurved abdomen, a rare character among species of this genus.

HOLOTYPE: Female, deposited in the NZOI collection, NIWA, Wellington, H-693.

PARATYPES: Female, deposited in the NZOI collection, NIWA, Wellington, P-1141; Female, deposited in NMNH, registration no. 234736.

TYPE LOCALITY: Hikurangi Trough, E of Hawke Bay, 39°30' S, 178°50' E, in 3391 m.

REMARKS: The very large size of this species compares well with only two other known southern *Nymphon* species: *N. charcoti* Bouvier, 1911, and *N. inferum* Child, 1995a. Of the two known species, it is nearest to *N. inferum*, known from the arc of islands around the

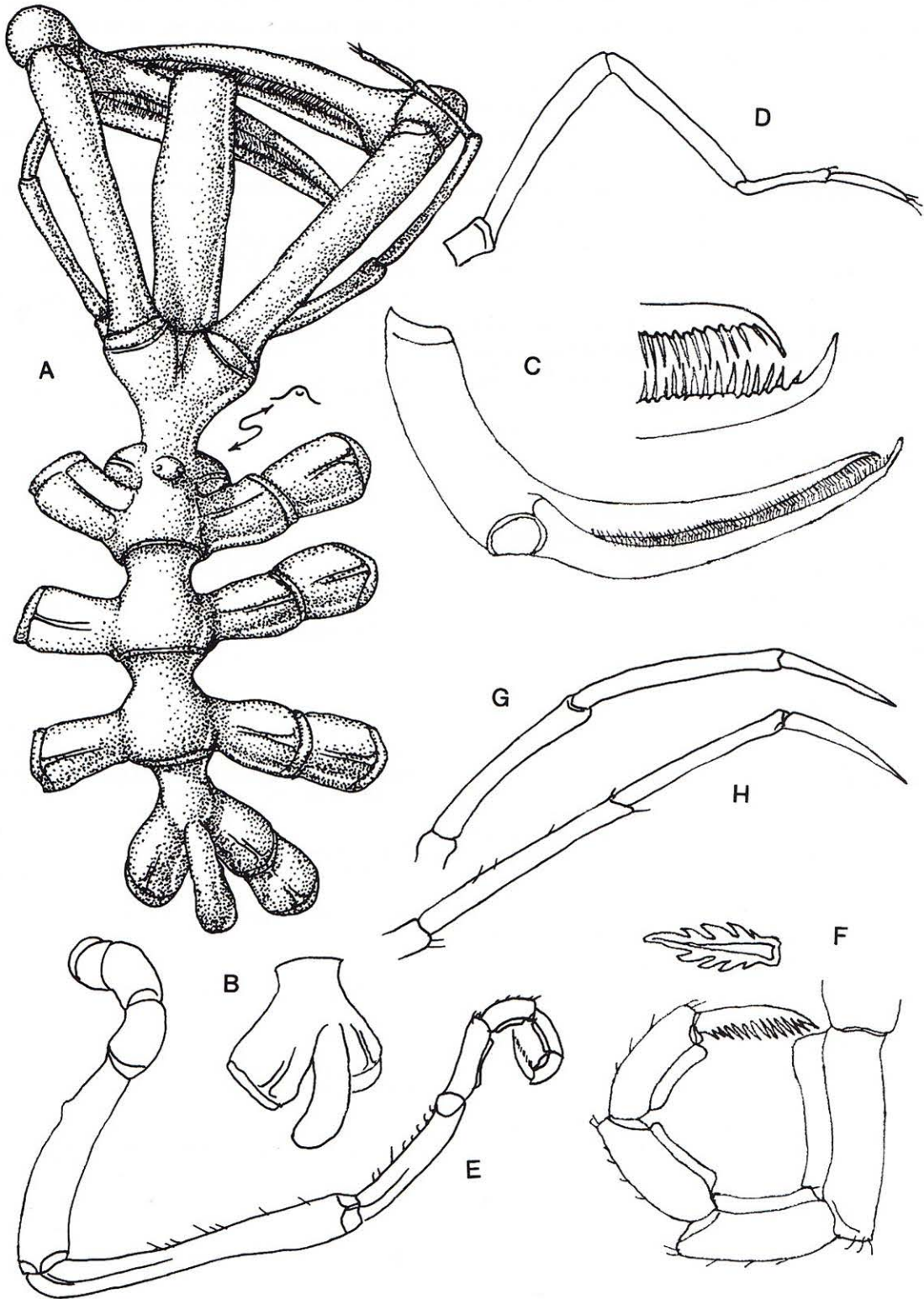


Fig. 5. *Nymphon uncatum* n.sp.: Holotype female. A, trunk, dorsal view; B, posterior trunk segment and abdomen, oblique view; C, chelifore, with enlargement of finger tips; D, palp; E, oviger; F, oviger strigilis with enlarged denticulate spine; G, distal leg segments, enlarged. *Nymphon charcoti* Bouvier: H, distal leg segments, enlarged.

Scotia Sea in comparable depths. Both *N. inferum* and *N. uncatum* have well-separated lateral processes, short necks, very large chelifores crossing in front of the proboscis, oviger bases touching the anterior of first lateral processes, and low rounded ocular tubercle bumps which lack any evidence of eyes. The differences are in *N. uncatum* having a sharply downcurved abdomen, a slightly taller ocular tubercle, a few more chelae teeth, very few setae, and a glabrous tarsus and propodus which form a curved arc. The strigilis of *N. uncatum* has a different denticulate spine count and the terminal claw is the same length or longer than the ultimate segment and has thirteen sharp teeth. The oviger claw of *N. inferum* is shorter than its terminal segment and has only eight teeth. There is little doubt that these two species are closely related and may possibly have a common ancestor.

The suite of characters in *N. charcoti* have a greater number of differences from those of *N. uncatum* and some of these are of more magnitude than those between *N. inferum* and this new species. Besides sharing many of the differences shown by *N. inferum*, the size of typical *N. charcoti* specimens is even larger than the new species (Fig. 5H). Its oviger bases are separate from the first lateral processes and are further anterior, its ocular tubercle is larger and it has eyes, and its tarsus is longer than the propodus and both are straight rather than curved.

Nymphon sp. indeterminate

MATERIAL EXAMINED: NZOI Stns S148, Chatham Rise, SW of Mernoo Bank, 859 m, trawl, 1 juvenile, 1 larva; S153, Bounty Trough, 1386 m, 1 male, damaged.

REMARKS: The tiny specimen from Stn S153 is too damaged to permit its identification, while the others are too juvenile.

Pentanympion Hodgson, 1904

Characters as with *Nymphon* but with five pairs of legs rather than four.

TYPE SPECIES: *Pentanympion antarcticum* Hodgson, 1904 (see below).

REMARKS: The character of ten legs immediately separates this species, which is small to tiny, from almost all pycnogonids except for the very few other decapodous species in the southern hemisphere. These other species are very much larger than Hodgson's species.

DISTRIBUTION: Circumpolar to the Antarctic Convergence and extending beyond to New Zealand and Magellanic areas, with a wide depth range of less than 200 m to 3227 m.

Pentanympion antarcticum Hodgson, 1904

Pentanympion antarcticum Hodgson, 1904: 458–462, pl. 14; 1907: 36–39, pl. 5; 1908: 177; Child 1995a: 54–55 [literature]. *Pentanympion minutum* Gordon, 1944: 14–16, figs 3a–f; Fage 1952: 264–265; Arnaud 1972: 149.

MATERIAL EXAMINED: NZOI Stn S202, Hikurangi Trough, E of Cook Strait, 2476–2542 m, small trawl, 1 specimen.

DISTRIBUTION: This is another common circumpolar Antarctic species with a very wide depth range of about 22–3227 m. This is its first New Zealand record, but the species is sufficiently common that it might be expected to occur in deep waters this far north.

DESCRIPTION: General habitus otherwise like *Nymphon hiemale* Hodgson, 1907 except for having five pairs of legs. Trunk and lateral processes slender, glabrous. Lateral processes well separated, ocular tubercle and oviger implantations at anterior of first lateral processes. Neck long, abdomen short.

Chelifores slender, long, chelae with many crowded teeth. Palps as in *N. hiemale*. Ovigiers very similar in both species but strigilis of this species with more denticulate spines per segment. Legs long, slender, with few short setae. Tarsus slightly shorter than propodus, both with short sole spines only, claw slender, well curved, auxiliary claws about half main claw length.

TYPE: 28 specimens, deposited in British Museum (Natural History) with *Discovery* collections, by monotypy.

TYPE LOCALITY: Ross Sea, McMurdo Sound, 12–125 fathoms (22–229 m).

REMARKS: The presence of an extra pair (or pairs) of legs is not unique to *Pentanympion antarcticum*. The first extra-legged species, *Decolopoda australis* Eights, 1835, beautifully illustrated by its author, has since been collected in many localities around the Antarctic coasts. Most other species also occur in the Antarctic except for another 10-legged species found in the Caribbean. Hedgpeth (1947: 13–16) discussed possible origins for decapodous and dodecapodous forms and included all species known up to that time.

Family CALLIPALLENIDAE Hilton, 1942

The trunk is usually fully segmented, chelifore scapes 1- or 2-segmented, with functional chelae, with variously segmented palps or palp bud or lacking palps entirely, with 9- or 10-segmented ovigers having strigilis with plain spines, with or without terminal claw. The legs with or without auxiliary claws, male cement glands on ventral femora, seldom visible.

This is a family of many diverse genera (21 or 22 recognised) with only a few having many species. The definition of several genera is rather tenuous with differences based only on presence or absence of an oviger terminal claw, auxiliary claws, and chelae fingers with serrate, crenulate, or pointed teeth or none. An artificial key to the seven genera known to have representatives in New Zealand waters is presented here to help sort them out.

Key to the known Callipallenid genera of New Zealand

- 1 With segmented palps or 1-segmented palp buds; with auxiliary claws 2
Without palps in any form; with or without auxiliary claws 4
- 2 Chelifores with short 1-segmented scapes; ovigers 10-segmented, in male only, with terminal claw, with distal apophysis on segment 5; auxiliary claws usually present but sometimes absent; palps 4-segmented or 1-segmented and protruding 3
Chelifores with long, usually 2-segmented scapes; ovigers 10-segmented in male, without 5th segment distal apophysis, rarely 9-segmented in female, without terminal claw and strigilis; palp buds rounded, not protruding. *PALLENOPSIS*
- 3 Palps with 4 segments *OROPALLENE*
Palps with 1 protruding segment *NEOPALLENE*
- 4 Ovigers with terminal claw of any shape; auxiliary claws lacking 5
Ovigers without terminal claw; chelae fingers with regular dentate or serrate teeth; auxiliary claws present, usually long *CALLIPALLENE*
- 5 Proboscis usually without protruding lips; chelae fingers smooth, without denticulations 6
Proboscis with protruding petal-shaped lips; chelae fingers with nodes imparting denticulate appearance *CHEIOPALLENE*
- 6 Proboscis styliform, without lips; lateral processes and chelifores usually with tubercles *AUSTROPALLENE*

Proboscis short, a cylinder or cone, some with protruding lips; body usually smooth, without tubercles
..... *PARAPALLENE*

Austropallene Hodgson, 1915

A subantarctic and Antarctic genus of only seven species, two of which occur in far southern New Zealand waters. They both are probably emigrants at the extreme limits of their more usual range in cold Antarctic waters.

The proboscis tapers conspicuously, the trunk dorsum may or may not have median tubercles, and the chelifores are often massive and may have a globular palm. The species are without oviger terminal claw and propodal auxiliary claws.

Austropallene cristata (Bouvier, 1911)

Pseudopallene cristata Bouvier, 1911: 1138; 1913: 102-105, figs 55-59.
Austropallene cristata Hodgson, 1927: 331-332; Gordon 1932a: 86; 1938: 15; 1944: 36 [key], 37; Krapp 1980: 6; Child 1995c: 134-135.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species was collected at its deepest known depth on the southern Campbell Plateau slope in 2010-2100 m. It is elsewhere confined to the subantarctic off South America and is known to be circumpolar in Antarctic waters in shallower depths (to 520 m).

REMARKS: This is the only species known with dorsal trunk tubercles and its large chelae and tapering proboscis serve to differentiate it from other species of the genus.

Austropallene tibicina Calman, 1915

Austropallene tibicina Calman, 1915: 39-41, figs 7-8; Gordon 1938: 15; 1944: 41-42, figs 12b-d, 14e; Hedgpeth 1950: 151; Child 1995c: 135-136.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species occurred at only one locality in New Zealand waters; from a Campbell Plateau tablemount west of the Auckland Islands in 415 m. It is otherwise known from several locations in the Ross Sea and Palmer Archipelago of Antarctica in a depth range of 50-550 m.



REMARKS: The chelae of this species are very narrow and hardly wider than the scapes, the movable finger of each chela is shorter than the immovable finger, and the proboscis is bottle-shaped and tapers to a distal pipette-like tip. It has a more elongate habitus than other species of this genus.

Callipallene Flynn, 1929

This conventional genus in a family with many unconventional genera has functional chelae on a 1-segmented scape, no trunk or lateral process decoration, no hint of palps in either sex, ordinary eye tubercles and short abdomina. It has ovigers with a fifth segment apophysis, denticulate strigilis spines, and lacks an oviger claw. The legs are usually short and have rather long auxiliary claws. The male cement gland usually has inconspicuous ventral pores which are very difficult to see, but there is sometimes a swelling where the pore or pores are situated.

The genus occurs worldwide in relatively shallow waters except for a few species which are deep-sea denizens. This is one of the few genera in this family which has more than a few species. New Zealand has only one known representative of more than 30 species in the genus. No specimens were found in the present collections.

TYPE SPECIES: *Pallene brevirostris* Johnston, 1837.

Callipallene novaezealandiae (Thomson, 1884)

Pallene novae-zealandiae Thomson, 1884: 246–247, pl. 14, figs 1–4.

Callipallene brevirostris novaezealandiae: Child 1975: 10 [literature].

Callipallene novaezealandiae: Child 1983: 708; 1996: 554–555.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Thomson described his single specimen as taken by dredge in Otago Harbour (Port Chalmers) in 9 m. This well-known species has since been collected in a wide Indo-West Pacific distribution from East Africa and Madagascar to Australia and Japan. It has a rather wide depth range for members of this genus: 2–274 m.

REMARKS: This small species has a fairly long neck between the trunk itself and the anterior expansion carrying the chelifores and proboscis, although it is shorter than its diameter. The chelifore scapes are shorter than the short proboscis and the chelae have a

conventional inflated palm with short, slightly curved fingers having tiny inner crenulations. The legs are long and slender (and often broken off). The propodus is short, carries large heel spines, small sole spines, and many short setae. The auxiliaries are long; about 0.6 as long as the main claw.

Cheilopallene Stock, 1955

Proboscis bottle-shaped, with trifurcate lips in juveniles, tubular in adults, sometimes with dense field of distal setae. Chelae fingers irregular, with endal nodes, bumps or tubercles. Without palps. Oviger usually 10-segmented, with terminal claw, sometimes 6-segmented and distally clubbed and lacking terminal claw. Propodus without auxiliary claws.

TYPE SPECIES: *Cheilopallene clavigera* Stock, 1955, by monotypy.

REMARKS: This genus was proposed to separate further the complex sets of characters which were becoming more numerous as more and more species were found and described. Other genera such as *Spasmopallene*, *Stylopallene*, and perhaps others were designated more recently for still other species with divergent sets of characters until this family has become topheavy with a complexity of genera.

DISTRIBUTION: This genus has seven recognised species most of which are known only from the Indo-West Pacific. The type species is known from the Caribbean, and one from Antarctica. The others have been described from scattered localities including Aldabra Atoll and the Maldives Islands in the Indian Ocean, Malaysia, Australia, New Zealand, Japan, and Korea. Specimens of the genus are seldom taken and there is little to indicate a distribution pattern among the seven species or with any single species.

Cheilopallene trappa Clark, 1972

Cheilopallene trappa Clark, 1972a: 331–333, fig. 1A–J; 1977c: 174, fig. 1D–F.

MATERIAL EXAMINED: NZOI Stn E820, Campbell Plateau, SW of Windsor Point, 159–220 m, on *Orthoscuticella* sp., 1 female.

DISTRIBUTION: Clark found this species in three separate stations in the Snares Islands, south of Stewart Island, from low water to 81 m. The above female is from the coast of South Island, marking it as the specimen from

furthest north among the few known and the deepest on record. Too few collecting localities are known for this species to form any pattern of distribution.

DESCRIPTION: Trunk short, compact, fully segmented, with 3–4 short dorsomedian setae. Lateral processes short, closely spaced, glabrous. Neck very short, ocular tubercle at narrowest part, dorsal to oviger implants, with large prominent eyes. Proboscis bottle-shaped, broadest at base, tapering to ovoid shape with moderately long distal tubular area. Lips narrow, flat in adults, tripartite and splayed apart in juveniles, without distal setae field. Abdomen short, not as long as tip of first coxae of fourth leg pair.

Chelifores massive, scapes short, with single median and few short distal setae. Chelae with large triangular palm, short fingers. Immobile finger with rounded endal tubercle, movable finger shorter, closing on tubercle of immobile finger, with few short ectal setae. Palps lacking. Ovigera with long fifth segment bearing a laterodistal apophysis with several short spines. Strigilis segments short, with typical spines, terminal claw shorter than terminal segment, with 3–4 short endal teeth. Legs moderately long, with rows of short spines on both tibiae, some associated with low tubercles. Tarsus short, with one stout sole spine. Propodus short, well curved, with 3 larger heel spines and 5–6 smaller sole spines. Claw robust, well curved, long in relation to propodal length. Without auxiliaries.

Female slightly larger, neck and proboscis longer than those of male. Ovigera without fifth segment apophysis, shorter.

HOLOTYPE: Damaged male deposited in Zoology Department, University of Canterbury, New Zealand.

PARATYPE: Immature female deposited in NZOI collection, NIWA Wellington, P-184.

TYPE LOCALITY: Holotype from Snares Islands, and paratype from NZOI Stn D156, 48°01.5' S, 166°35.0' E, 81 m.

REMARKS: The legs of this female, in contrast to those of the male, have two large conical tubercles on the ventral femora and greater numbers of smaller tubercles dorsally and ventrally on the tibiae, each armed with a short spine. In Clark's (1971) figure 1I, the tubercles are much less conspicuous or absent. This female retains slightly trifurcate lips which would probably have been lost in the next moult. The retention of these lips suggests that the specimen is not fully adult and that the spinose leg tubercles could also be reduced in size in the adult.

Neopallene Dohrn, 1881

Specimens in this genus look superficially very much like some of the many *Callipallene* species except for having 1-segmented, erect palps and a terminal claw on the ovigera. Both of these characters are absent from *Callipallene* morphology. *Neopallene* also has typical chelae with finger denticulations, a fifth segment apophysis of male ovigera and a strigilis with denticulate spines. The propodi have auxiliary claws. The femoral cement gland, in the type species, is a large distally pointing cone placed midventrally.

There are only three known species in this genus and they are found in extremely separated localities of the seas: *N. campanellae* Dohrn, 1881, in the Mediterranean, *N. azorensis* Arnaud, 1974, from the Azores, and *N. antipoda* Stock, 1954, from New Zealand.

TYPE SPECIES: *Neopallene campanellae* Dohrn, 1881.

TYPE LOCALITY: Gulf of Naples, Italy, on algae in 90 m.

REMARKS: The species in this genus are probably not rare but are the result of few collections made in their localities. This holds for many pycnogonid species and other fauna which inhabit places which are difficult to collect due to rocky habitats, reefs, sloping bottoms, or any of the other hazards to trawls, dredges, or human feet.

Neopallene antipoda Stock, 1954

Neopallene antipoda Stock, 1954: 34–36, figs 13–14.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species is known only from a single questionable male taken northwest of Cape Maria van Diemen in 55 m.

REMARKS: Stock's figures of this unique specimen suggest that it is probably a juvenile rather than fully grown. It has much shorter and less developed palps than the known male adults in the genus. It also lacks evidence of cement-gland outlets which, since it has the palps of a male, also suggests a juvenile. The oviger segments are rather short to be those of an adult and the fifth segment lacks the laterodistal apophysis typical of adult males.

The species characters fully conform to the above diagnosis for the genus except for the apparently juvenile characters above.

Oropallene Schimkewitsch, 1930

Ocular tubercle in posterior half of cephalic segment. Proboscis cylindrical, short, with or without ventrodistal bulges, without protruding lips. Chelifores typical, functional, scape 1-segmented, chelae fingers with normal denticulation. Male with 4-segmented short palps, absent in females. Ovigera with full strigilis, denticulate spines and smooth terminal claw, male fifth segment with distal apophysis. Propodus with auxiliary claws.

TYPE SPECIES: *Pallene dimorpha* Hoek, 1898, by subsequent designation.

TYPE LOCALITY: Christmas Harbour, Kerguelen Islands, in 82, 192, and 220 m, 29 January 1874, *Challenger* Stn 149.

REMARKS: This is another of the many genera split off from the original *Pallene* (now *Callipallene*) group as many previously unrecognised diagnostic characters were recognized for the first time. The genus can be easily separated from others, at least in the males, by the 4-segmented palps, long auxiliary claws, oviger fifth segment apophysis, and terminal oviger segment claw. Indeed, Hoek first elaborated on this dimorphism when describing the type species.

DISTRIBUTION: The majority of species are found in the Southwest Pacific and Indian Oceans; three from New Zealand waters with one (the type species) also known from Kerguelen, and one from Australia. There is also one questionable species from Hawaii, and one from a locality quite remote from all others — Point Barrow, Alaska, in the Arctic Ocean. This disjunct distribution pattern is quite common among many inadequately known pycnogonid genera and species.

Oropallene dimorpha (Hoek, 1898)

Pallene dimorpha Hoek, 1898: 290–293, pl. 2, figs 1–6.
Oropallene dimorpha: Schimkewitsch 1930: 245 [text], 291–292 [text]; Child 1987: 915–916, fig. 6; 1995c: 137 [literature].

MATERIAL EXAMINED: NZOI Stn Q644, Australia, Bass Strait, 39°26.3' S, 147°48.7' E, 49 m, trawl, 1 female.

DISTRIBUTION: This species was first taken in the vicinity of the Kerguelen Islands in the southern Indian Ocean. It has been reported from localities on the Campbell Plateau and from Macquarie Island in depths of 69–415 m. This Bass Strait capture extends its depth distribution into shallower waters and to Australia.

DESCRIPTION: Trunk fully segmented, lateral processes closely spaced, little longer than their diameters, each with a slender dorsodistal tubercle except fourth pair which has small bump. Neck moderately long, ocular tubercle and oviger implantations at neck posterior at first lateral processes. Ocular tubercle as tall as basal diameter, eyes very large. Proboscis a short cylinder rounded at tip, without distal setae. Abdomen moderately long, cylindrical, armed with several distal setae.

Chelifores large, scape as long as proboscis, with few dorsal and distal setae. Chelae with oval palm about the same length as fingers which have proximal rugosities on the movable finger and larger crenulations on the entire inner surface of the immovable finger. Palm with short distal-pointing setae. Palp short, little longer than proboscis, segments of unequal length; third longest, first little longer than second, fourth slender, subequal to first. Third and fourth segments with distal setae as long or longer than segment diameters. Oviger typical, fifth segment longest, with apophysis. Terminal segment with short curved claw. Legs moderately short, with few lateral and dorsal setae. Tarsus very short, with large sole spine. Propodus short, only slightly curved, with two heel spines and several sole spines, claw short, auxiliaries about 0.7 main claw length.

REMARKS: Females of this genus are difficult to distinguish from those of the genus *Callipallene*, lacking the small but conspicuous palps of *Oropallene* males. The only difference among females in the two genera is in the oviger which has a terminal claw in *Oropallene* and lacks this claw in species of *Callipallene*.

There are several variations in spine count, segment lengths, and claw size among known specimens in this species. Even with these variations, the species is not difficult to distinguish from other New Zealand forms. It has a shorter neck, appendages, and claws, and the chelifores are larger in relation to the trunk in this species and not the other two.

Oropallene dolichodera Child, 1995c

Oropallene dolichodera Child, 1995c: 137–139, fig. 5.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The type specimen came from the Campbell Plateau slope south of Christchurch in 2612 m. Another specimen came from east of Macquarie Island in 112–124 m, and a third specimen is from the north side of Bounty Trough in 1676 m. There appears to be no explanation for the great disparity in depths at which these specimens were collected.

REMARKS: This species and the next have very long necks while *O. dimorpha* has a short neck more typical of the genera in this diverse family. The palps of *O. dolichodera* are slender and the fourth segment is almost as long as the third which is the longest. Oviger bases are well anterior to first lateral processes and low ocular tubercle. The species has well-developed eyes. The chelae have short fingers and only the immovable finger has a row of short sharp denticles. The propodus is moderately short and curved and the auxiliary claws are fully 0.8 as long as the slender main claw.

Oropallene metacaula Child, 1995

Oropallene metacaula Child, 1995c: 139–141, fig. 6.

MATERIAL EXAMINED: NZOI Stns S150, western Bounty Trough, 1640 m, 1 male w/eggs, 1 ovigerous female (USNM, 1 male w/eggs, 1 female); S153, western Bounty Trough, 1386 m, 3 males, no legs; S154, western Bounty Trough, 1373 m, 1 female, no legs.

DISTRIBUTION: This recently described deep-water species is known only from the Bounty Trough east of South Island in 1586 m (the types) and from the same area in the depth range of 1373–1640 m.

DESCRIPTION: Trunk and neck long, slender, glabrous, lateral processes well separated, less than twice as long as their diameters. Ocular tubercle a small blind cone at extreme anterior of cephalic segment before the long neck, lateral sensory papillae prominent. Oviger bases partly hidden in dorsal view by first lateral processes. Abdomen a short cylinder rounded at tip.

Chelifores large, scapes almost as long as proboscis in ventral view, with few short setae. Chelae typical, palm very short, with many short setae, movable finger twice length of immovable finger, both with several low crenulations as teeth. Palps shorter than proboscis, first two segments short, distal two longer, subequal, with few setae, most longer than segment diameters. Oviger typical, fifth segment with small apophysis with 1–2 short setae. Strigilis with many denticulate spines, terminal claw slender, about half length of terminal segment. Legs slender, very long, with few short setae. Second tibiae the longest segments. Tarsus very short, with one major sole spine, several setae. Propodus long, straight, with three major heel spines, 10–12 smaller sole spines, and rather short claw with auxiliary claws almost as long as main claw.

HOLOTYPE: Male, deposited in NZOI collection, NIWA, Wellington, H-698.

PARATYPES: 5 female paratypes, deposited in NZOI collection, NIWA, Wellington, P-1143.

TYPE LOCALITY: NZOI Stn S151, western Bounty Trough in 1586 m.

REMARKS: This species differs very little from the other recently described species from New Zealand, *O. dolichodera* Child. It has a smaller ocular tubercle which is blind while *O. dolichodera* has a larger tubercle with pigmented eyes. It also has oviger bases which touch and are partly hidden by the first lateral processes while those of *O. dolichodera* are well anterior to the lateral processes. The only other major difference is in the legs of this species which are much longer with a very slender long propodus. Those of *O. dolichodera* are shorter, more robust, have more setae, and have a much shorter and more curved propodus. The two species are otherwise quite closely related. The new species is very different from the compact *O. dimorpha* in many characters.

Parapallene Carpenter, 1892

Another callipallenid genus with most species having long necks. It also has the suggestion of a collar at the neck posterior, and proboscis lips which are usually projecting or protruding. The scape is 1-segmented, the chelae are usually inflated and the short fingers are often smooth, without denticles. Palps are absent in both sexes, and the 10-segmented ovigers have a strigilis with denticulate spines and a simple terminal claw. Propodal auxiliary claws are usually absent but, contrary to the standard diagnosis of this genus, two species have auxiliaries.

TYPE SPECIES: *Pallene australiensis* Hoek, 1881.

TYPE LOCALITY: The syntypes came from Australia, off East Moncoeur Island, Bass Strait, in 70–73 m, and off Twofold Bay in 220 m.

DISTRIBUTION: The majority of species are concentrated around the periphery of Australia and the East and South African coast, but two are found in the Atlantic and several others in the western Pacific islands. Most are found at intertidal depths to less than 100 m, with several exceptions found in deeper waters.

REMARKS: Many of the 19 known species are elongate or extended in other ways so as to make some look bizarre and unlike other pycnogonids. One species, *P. virgosa* Child, 1996, is so extenuate that it has more the appearance of a phasmid insect than a pycnogonid.

New Zealand waters contain one known species, listed below, more conventional and compact than most.

Parapallene exigua Stock, 1954

Parapallene exigua Stock, 1954: 57–59, fig. 25.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The types consist of 21 specimens taken off Three Kings Islands in 119 m. No other specimens are recorded in the literature.

REMARKS: This species is unlike most in the genus in being compact with a short neck and having short legs. It looks more like a species of *Callipallene* except that it has an oviger claw, lacks auxiliary claws, and has two tubular cement-gland outlets based on low ventral tubercles.

Pallenopsis Wilson, 1881

Cephalic segment and anteriorly placed ocular tubercle extending dorsally over proboscis insertion. Proboscis cylindrical with swellings.

Chelifores 2- or 3-segmented, scapes closely spaced, slender, chelae small, fingers extensions of palm or placed at right angles with distal setose pad, without teeth but sometimes with crenulate grasping surfaces. Palps vestigial 1-segmented bumps. Ovigers 10-segmented in males, sometimes 9-segmented, but mostly 10-segmented in females. Strigilis with setae only, without spines or terminal claw. Legs typical, femoral cement-gland opening a narrow ventral tube of various lengths. Propodus with auxiliary claws.

Subgenus *Pallenopsis* Wilson, 1881

With the characters of the genus. Proboscis usually short, often half the length of species in *Bathypalleneopsis*. Chelae fingers shorter than palm, carried laterally, clamping together when flexed, often crenulate along cutting edges, usually with a setose distal pad. Auxiliary claws almost always present, usually longer than main claw diameter. Other characters similar to those of subgenus *Bathypalleneopsis*.

TYPE SPECIES: *Pallenopsis (Pallenopsis) fluminensis* (Krøyer, 1845), by subsequent designation (Stock 1975: 1017).

REMARKS: The species of this subgenus are more commonly collected than those of subgenus *Bathypalleneopsis* because they live mostly at shallower depths.

They are easily recognised next to species of *Bathypalleneopsis* by their short chelae fingers positioned at right angles to the palm, and usually shorter proboscis and abdomen. The subgenus *Pallenopsis* consists of a large complex group of closely-related species which are almost always difficult to separate without close, detailed examination.

DISTRIBUTION: Species of this subgenus are collected worldwide but are predominantly commoner in the southern hemisphere with a dominance of subantarctic and Antarctic forms. They are mostly collected in depths from the subtidal to 500 m, with some found down to 2000 m. Very few have been collected in the littoral.

Pallenopsis (Pallenopsis) kupei Clark, 1972

Pallenopsis mauii Clark, 1958: 4–6 [part], figs 9–10, 12–13, 15, 17.

Pallenopsis kupei Clark, 1972b: 430–433, fig. 2A–J.

Pallenopsis (Pallenopsis) kupei: Child 1995c: 142 [key], 143.

MATERIAL EXAMINED: NZOI Stns P5, Norfolk Ridge, 126 m, dredge, 1 male, 1 female; S160, SE of Banks Peninsula, 550 m, trawl, 2 females.

DISTRIBUTION: The species is known from the Campbell Plateau west of Auckland Island, off the Antipodes Islands, in Cook Strait, and off Macquarie Island. It has been taken in 146–1097 m. The Norfolk Ridge capture extends its known range well to the north and also to slightly shallower water. It has a rather rare eurythermal distribution from semitropical to subantarctic waters.

DESCRIPTION: Size large, male leg span about 80 mm (female about 130–150 mm). Trunk fully segmented, narrow, glabrous, lateral processes about 1.5 times longer than diameters, with few short dorsodistal setae. Neck wider than trunk, oviger bases against first lateral processes, conspicuous palp buds extending laterally. Ocular tubercle a curved cone with large eyes. Proboscis a moderately long cylinder, lips tapered. Abdomen medium length, upcurved, with tiny setae.

Chelifore scapes as long as proboscis, with few scattered setae. Chelae palms slender, twice as long as wide, with fringe of distal and endal setae. Fingers narrow, movable finger with setose proximal pad, longer than immovable finger. Oviger second segment almost twice length of third or first, fifth only little

longer than sixth. Strigilis segments with many short setae, none longer than segment diameters except for those of smaller terminal segment. Legs moderately long, with dorsal and ventral fringe of short setae. Tibia 2 the longest segment. Ventral cement-gland tube of varying length, from 0.2 to about 0.7 of femoral diameter. Tarsus very short, with one large ventral spine and several setae. Propodus with three major heel spines, several short sole spines and setae, and claw about half propodal length. Auxiliaries 0.5–0.7 length of main claw.

TYPES: Holotype male, allotype, and paratypes (4 females) deposited in Dominion Museum, Wellington; 6 other paratypes deposited in Portobello Marine Biological Station and NZOI collection, NIWA Wellington, P-185.

TYPE LOCALITY: Cook Strait, off Palliser Bay, 41°45' S, 174°53' E; 914–1097 m, baited trap, 24 November 1956, and Papanui Canyon, 45°51' S, 171°02' E, muddy sand, 730 m, trawl, 1967.

REMARKS: The two Norfolk Ridge specimens are only half the size of previously examined specimens but are otherwise quite close to the figures given for the type. Their smaller size suggests that size in this case is determined by their environment. The cement-gland tubes are longer than those Clark illustrated for a male type. The two females are just the opposite size; almost twice larger than Clark's type measurements. They have the same set of characters in the chelae, lateral process separations, abdomen, distal leg segments, and the rather small palp buds (round knobs in dorsal view). The eyes of all specimens examined usually have pigment but sometimes are unpigmented. The depth at which they were captured appears to be unrelated to presence or absence of pigment.

Pallenopsis (Pallenopsis) latus n.sp. (Fig. 6)

MATERIAL EXAMINED: NZOI Stns P947, Colville Ridge, NW of Kermadec Islands, 547–646 m, trawl, 1 male (holotype). I721, S of Mernoo Bank, 540 m, dredge, 1 female paratype, (USNM 1 male, paratype); I674, SE of Bounty Islands, 750 m, trawl, 1 female juvenile, paratype).

DISTRIBUTION: The new species has a broad geographic distribution from north of New Zealand to south of the Bounty Islands in temperate to subantarctic waters, but has a narrow known depth range of 540–750 m.

DESCRIPTION: Size large, leg span about 110 mm (about 122 for females). Trunk fully segmented, segments

and neck tapering anteriorly, lateral processes 1.5 times their diameters, all glabrous. Ocular tubercle at extreme anterior of neck, eyes moderately large, darkly pigmented. Ovipiger implants touching and below first lateral processes. Proboscis a cylinder, swollen distally and armed with fringe of short setae around mouth. Abdomen moderately short, glabrous.

Chelifore scapes almost as long as proboscis, both with hint of median suture, armed distally with fringe of short setae. Chelae with ovoid palms bearing inner field of short setae. Fingers short, of equal length, movable finger with small setose pad at base. Palp buds very large, bulging laterally for most of neck length. Ovipiger long, second segment long, third about 0.6 length of second, both with distal field of tiny setae. Fifth longest, about 1.2 longer than fourth. Strigilis seventh and eighth segments with groups of setae longer than segment diameters, other segments with many short setae. Legs moderately long, femora slightly curved, long cement-gland tube about 1.1 times diameter of segment. Second tibiae the longest segments. Tarsus very short, with one broad sole spine. Propodus moderately long, slightly curved, with five short broad heel spines and 9–10 very short sole spines. Claw short, less than half propodal length, auxiliary claws about 0.7 main claw length.

Female slightly larger, abdomen little longer, upcurved. Propodus with four heel spines and greater number of small sole spines. (Ovipigers missing).

MEASUREMENTS: Holotype in mm. Trunk length (chelifore insertion to tip 4th lateral processes), 7.2; trunk width (across 2nd lateral processes), 3.4; proboscis length, 4.1; abdomen length, 2.3; third leg, coxa 1, 1.5; coxa 2, 3.8; coxa 3, 1.7; femur, 12.8; tibia 1, 12.5; tibia 2, 17.8; tarsus, 0.4; propodus, 1.8; claw, 0.8.

ETYMOLOGY: The species designation (Latin: *latus*, meaning broad or wide) refers to the very broad palp buds, the size of which are unusual for species of this subgenus.

HOLOTYPE: From Stn P947, male H-694 and female paratype P-1144; and from Stn I674 juvenile female P-1145 deposited in NZOI collection, NIWA, Wellington.

PARATYPE: Male deposited in U.S. National Museum of Natural History, registered no. 234735.

TYPE LOCALITY: NZOI Stn P947, Colville Ridge NW of Kermadec Islands, 25°13.7' S, 179°04.1' W, 547–646 m.

REMARKS: This species is quite close to *P. (P.) kupei* Clark except for the following differences. The most conspicuous difference is in the very large palp buds of

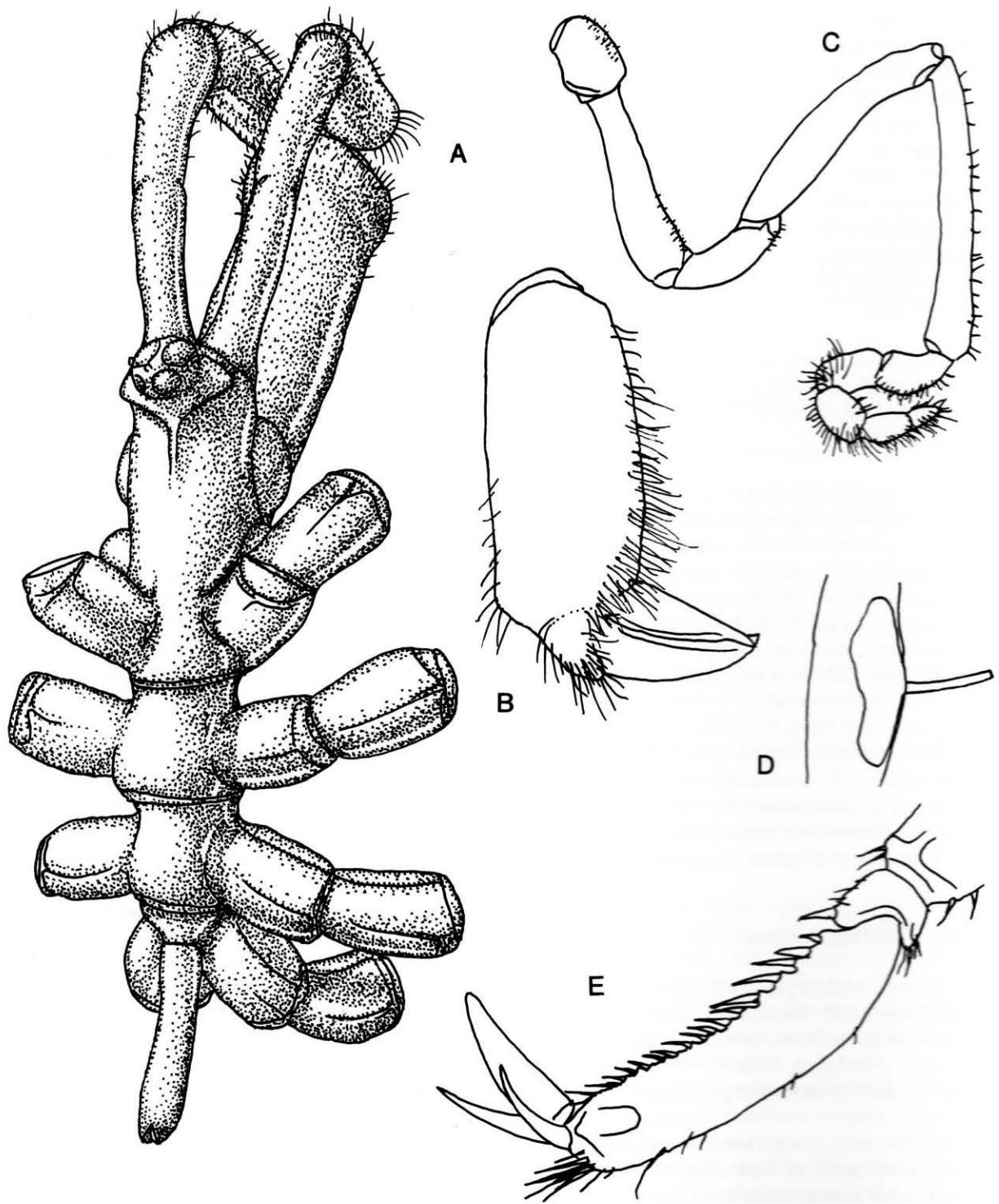


Fig. 6. *Pallenopsis (Pallenopsis) latus* n.sp.: Holotype male. A, trunk, dorsal view; B, chela, enlarged; C, ovipiger; D, femoral cement gland, tube, and adjacent femur, enlarged; E, distal leg segments, enlarged.

the new species while the buds are small but protruding in Clark's species. The proboscis shape and armament are quite different in the swollen distal rim and its crown of short setae in *P. (P.) latus*. The distal proboscis of *P. (P.) kupei* is tapered to the lips and without a swelling. The propodal sole armament differs between the two species in spine counts and the male cement-gland tube is very much longer in the new species than that of *P. (P.) kupei*.

***Pallenopsis (Pallenopsis) mauii* Clark, 1958**

Pallenopsis mauii Clark, 1958: 4–6, figs 11, 14, 16, 18, 19; 1972b: 433–435, figs 3A–G.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: Known only from the male holotype taken off Palliser Bay, Cook Strait, in 712 m.

REMARKS: Clark at first confused this with another new species (*P. P. kupei*) from which he made most of the illustrations. He later (1971) cleared up the confusion and provided figures of the male holotype.

***Pallenopsis (Pallenopsis) obliqua* (Thomson, 1884)**

Phoxichilidium obliquum Thomson, 1884: 247–248, pl. 15, fig. 6, pl. 16, figs 1, 2.

Pallenopsis obliqua: Stock 1954: 64–65, fig. 30b–f; 1972a: 330–331 [literature]; Clark 1972b: 435; 1977c: 173–174, fig. 1A–C.

Pallenopsis (Pallenopsis) obliqua: Child 1995c: 142 [key], 147.

MATERIAL EXAMINED: NZOI Stns A444, Cook Strait, 192–380 m, 3 males, 2 females; B493, off Resolution Island, 84 m, dredge, 1 female; C386, Cook Strait, 128 m, dredge, 1 male; E820, South Island, slope SW of Windsor Point, 220–159 m, 1 male; I341, vicinity of Three Kings Islands, 89–92 m, trawl, 1 male, 1 female; P18, Norfolk Ridge, just S of Philip Island, 90–86 m, dredge, 1 male; Q85, Cook Strait, 315 m, dredge, 1 male w/eggs; Q91, Cook Strait, 215 m, dredge, 1 male w/eggs; Q100, Resolution Island, 0–21 m, scuba, 2 females; Q102A, Resolution Island, 0–40 m, scuba, 1 male; Q770, South Island, off Windsor Point, 35 m, scuba, 1 male w/eggs; S184, Pegasus Bay, 75 m, dredge, (USNM 1 male).

DISTRIBUTION: This species was thought to be confined to the Campbell Plateau and North and South Islands from littoral depths to 400 m. Stn P18 on the Norfolk Ridge extends its known distribution to the north of North Island but within known depths. It is apparently rather common on the Campbell Plateau.

DESCRIPTION: There is more variation among specimens of this species than has been previously recognised.

Even with the few specimens in hand, there are differences in numbers of leg setae and spines, particularly between the sexes. Males usually have more setae, increasing in numbers distally. The abdomen sometimes lacks strong spines near its tip (broken off?), and the strong spines at midfemur length are sometimes small or even absent. The tibiae sometimes have rather dense lateral and dorsal setae but some specimens have far fewer setae on these segments.

TYPES: "... several specimens ..." (Thomson 1884: 248).

TYPE LOCALITY: Dredged in Lyttleton Harbour, South Island, at an unknown depth.

REMARKS: This species is readily separated from other known New Zealand species by its short trunk with crowded and touching lateral processes, its very large chelifores, femur with encircling fringe of moderately long spines at midlength, and its very broad neck. No other species from this area appears so compact.

***Pallenopsis (Pallenopsis) pilosa* (Hoek, 1881)**

Phoxichilidium pilosum Hoek, 1881: 90–92, pl. 13, figs 10–11.

Pallenopsis pilosa: Hoek, 1883: 9 [list].

Pallenopsis lanata Hodgson, 1908: 143–145, pl. 2, figs 4, 4a.

Pallenopsis (Pallenopsis) pilosa: Child 1995c: 142 [key], 149–150 [literature].

MATERIAL EXAMINED: NZOI Stns S202, Hikurangi Trough, 2476–2542 m, small trawl, 50+ specimens; S203, Hikurangi Trough, 2619–2627 m, trawl, 1 male w/eggs, 2 juveniles; S204, E of Stn S203, 2677–2602 m, trawl, 4 males, 6 females, 6 juveniles; T47, Campbell Plateau, slope W of Antipodes Islands, 1400–1200 m, trawl, 1 female.

DISTRIBUTION: This wide-ranging species has been taken in many Antarctic and subantarctic localities and is known as circumpolar. It has an extremely wide depth range of 254–3566 m. These are the first specimens known from the Campbell Plateau but they were taken on the subantarctic slope of the plateau and the deep Bounty Trough to the north where waters are much colder than those in shallower plateau localities.

DESCRIPTION: Size moderately small, leg spans to about 50–70 mm. Trunk, lateral processes, and legs covered variously with long and short setae and some covered with pile of short setae. The long setae rarely have tiny lateral setules as occur in some similar species. Lateral processes well separated. Neck posterior widest, tapering toward anterior. Proboscis and abdomen moderately long, without setae. Chelae fingers long, cutting (inner) edge touching when closed. Movable finger without proximal setose pad.

TYPES: Two females, one male, syntypes, deposited in the British Museum (Natural History) with *Challenger* material.

TYPE LOCALITY: *Challenger* Stn 147, Southern Indian Ocean, 46°16' S, 48°27' E, 2926 m, 30 December 1873, and Stn 157, 53°55' S, 108°35' E, 1950–3566 m, 3 March 1874.

REMARKS: This is one of the commonest species of this subgenus taken in subantarctic and Antarctic localities. It is probably the most heavily setose species to be found in New Zealand waters, the setae sometimes thick enough to disguise the segment boundaries.

Pallenopsis (Pallenopsis) triregia Clark, 1962

Pallenopsis triregia Clark, 1962: 517–520, figs 1A–H.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The species is only known from the Three Kings Islands in 82–137 m.

REMARKS: Clark had only two females and thus the male diagnostic characters remain unknown. The species is small for this genus although the leg span is about 78 mm. The very short lateral processes are separated by widths greater than their diameters. The ocular tubercle is quite tall with the posterior pair of eyes larger and more distal than the low anterior pair. In most species with eyes of unequal size it is the anterior pair which are larger than the smaller posterior pair.

The chelifore scapes are 1-segmented and very slender, while the chelae, with their short fingers placed laterally, have very setose ventral and distal surfaces. The legs are extremely long and slender but have a small propodus which is slightly curved, has two larger heel spines, a short main claw and auxiliary claws little longer than the main claw diameter.

Subgenus *Bathypallenopsis* Stock, 1975

Proboscis tapering, with slight swelling medially or distally or both, usually longer than that of other subgenus *Pallenopsis*. Abdomen often extremely long. Chela fingers slender, longer than palm, extending beyond or distal to palm rather than laterally, not closing when tips together, without distal setose pad. Propodus with long claw and vestigial or tiny auxiliaries seldom longer than claw diameter.

TYPE SPECIES: *Pallenopsis (Bathypallenopsis) paramollis* Stock, 1975, by original designation (Stock 1975: 1032).

TYPE LOCALITY: Off Japan, *Albatross* Stn 4975, in 997–1302 m, and slightly further north at Stn 5080, in 923 m.

REMARKS: The genus *Pallenopsis* has been subject to recent controversy regarding its familial affinities. It has been judged to belong to the family Phoxichiliidae or the family Callipallenidae because it has some of the characters of both. Which it is more closely related to depends on what weight the observer gives the varying sets of characters. It is not deemed fitting to try to solve this dilemma one way or another in this report, if it can be done, but only to place the group with the family which the author sees as closest to a majority of characters.

DISTRIBUTION: This subgenus is found in all oceans in depths which are usually deeper than those where species of the subgenus *Pallenopsis* are found. It is often said to be the deep-sea counterpart of the usually shallower subgenus. Most of the pelagic pycnogonid species belong to the subgenus *Bathypallenopsis*. Some live on planktonic medusae as parasites. A few others are thought to be planktonic parasites although their hosts remain unknown.

Pallenopsis (Bathypallenopsis) californica Schimkewitsch, 1893

Pallenopsis californica Schimkewitsch, 1893: 39–41, pl. 1, fig. 11, pl. 2, figs 18–23; Hilton 1942: 40.

Pallenopsis (Bathypallenopsis) californica: Stock 1975: 1036–1038, figs 33–34; 1994: 51, 53, fig. 20; Turpaeva 1991: 39; 1992: 92; Child 1994c: 3.

MATERIAL EXAMINED: NZOI Stn P970, Hikurangi Trough, 3390–3391 m, trawl, 1 male.

DISTRIBUTION: This species was described more than 100 years ago from specimens collected in Panama. Other specimens have been taken on the Pacific coast of America as far north as Oregon in 2665–3358 m. Turpaeva (1991: 39) listed a specimen from the Mozambique Channel of the Indian Ocean in 2100 m. Stock (1994) listed a male from the same locality in 1510–1600 m. It was suggested (Child 1994c: 3, before Stock's report was received) that Turpaeva's specimen might be *P. (B.) oscitans* Hoek, 1881, a species known from that Channel. With the specimen in hand and those identified by Turpaeva and Stock as this species, the probability that this species has a cosmopolitan deep-water distribution becomes increasingly likely. These scattered records do not insure the truth of this conjecture but do make it an interesting possibility. The

species is new to the Southwest Pacific, but the depths are within known ranges.

DESCRIPTION: Species very large for genus, leg span about 190 mm. Trunk and lateral processes robust. Neck widened just anterior to first lateral processes, palp buds visible in dorsal view. Ocular tubercle at anterior rim of cephalic segment; low, rounded eyes not prominent, sometimes difficult to see. Proboscis long, slightly swollen and wider at midpoint than distally. Abdomen very long, slender.

Chelifores long, scapes 2-segmented, second segment with few long setae. Chelae large, palm little longer than wide, fingers very long, at slight angle to palm, immovable finger with few short setae at base, neither with teeth. Ovipiger second, fourth and fifth segments almost equal in length, strigilis with many setae longer than their segments. Legs moderately long, major segments with many long setae longer than segment diameters, second tibiae the longest segments. Tarsus very short, with one long slender sole spine, several sole setae. Propodus very short, not curved, heel armed with single huge broad spine, one smaller distal spine, and several tiny sole spines. Claw very long, about the length of propodus, auxiliaries tiny, slightly longer than claw basal diameter. Ventral cement gland tube short, about half femoral diameter.

TYPES: 3 male syntypes, deposited in the National Museum of Natural History, Smithsonian Institution.

TYPE LOCALITY: *Albatross* Stn 3431, Gulf of California, 23°59' N, 108°40' W, 1819 m, April 20, 1891; and Stn 3392, Gulf of Panama, 07°05'30" N, 79°40' W, 2323 m, March 10, 1891.

REMARKS: It is surprising to find this distinctive species on the opposite side of the Pacific from its usual collecting localities off western north America. It can be recognised easily by a combination of distally tapering proboscis, long abdomen, and very distinctive propodal armature. The short propodus has a giant proximal heel spine and another more distal to the larger spine and half its size or smaller. It also has very tiny slender auxiliary claws on the large main claw. It is a very large species although size should never be used alone to identify pycnogonids.

This specimen was covered with flocculent material and had to be cleaned before examination. This is in keeping with many of the specimens examined from the American Oregon coast which also carried strands of flocculent bottom material.

Pallenopsis (Bathypallenopsis) antipoda Clark, 1972

Pallenopsis (Pallenopsodon) antipoda Clark, 1972b: 428–430, figs 1A–G.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species is known only from a female taken off the Antipodes Islands in 1280 m.

REMARKS: This species is smaller than *P. (B.) californica* although its leg span is slightly more than 100 mm. Its lateral processes are much more compact and closely placed than those of *P. (B.) californica*. The chelifore scapes have two distinct segments and the chelae fingers are without teeth and extend further beyond the palm than the right-angle placement of fingers in species of the subgenus *Pallenopsis*. The abdomen is extremely long and the short propodus has several large spines, those of the heel being more elongate but not as long as the heel spine of the species above. The short main claw is equipped with very short auxiliaries only about as long as its maximum diameter.

Family COLOSSENDEIDAE Hoek, 1881

Colossendeis Jarzynsky, 1870

Largest of the pycnogonids in size, leg spans sometimes wider than 50 cm, almost exclusively deep-sea and cosmopolitan. Appendages very long, slender. Proboscis a straight or curved cylinder usually longer than trunk. Palps long, 10-segmented (except 1 Antarctic species with 9), longer than proboscis. Chelifores lacking entirely in adults. Ovipigers 10-segmented, in both sexes, strigilis strong, well formed, with terminal claw and spatulate compound spines. Legs usually very slender, propodus without heel or larger spines, without auxiliary claws.

TYPE SPECIES: *Colossendeis borealis* Jarzynsky, by monotypy (= *C. proboscidea* (Sabine, 1824)).

TYPE LOCALITY: Off coast of Russian Lapland in 220–457 m.

REMARKS: This genus is composed of many species often difficult to separate into appropriate taxa (e.g., *C. megalonyx* ssp.). The accompanying descriptions should serve to separate the few known New Zealand species.

DISTRIBUTION: A cosmopolitan deep-sea genus often found in quite shallow localities in Antarctic waters.

Colossendeis arcuata A. Milne Edwards, 1885

Colossendeis arcuatus A. Milne Edwards, in Filhol, 1885: 151, fig. 48.

Colossendeis arcuata: Stock 1978: 403–405 [literature], fig. 1g–j; Bamber 1983: 71–72, fig. 5; Stock 1984: 745; 1986: 417; Child 1992:41; Bamber & Thurston, 1993: 859.

MATERIAL EXAMINED: NZOI Stn I674, Subantarctic Slope, SE of Bounty Islands, 750 m, trawl, 1 specimen.

DISTRIBUTION: During most of its published history since it was described, this species was reported only from the North Atlantic (in 1300–2100 m). It was only recently collected and reported (Child 1992: 41) in the Pacific from southern Chile (730–750 m). The above specimen greatly extends this distribution to New Zealand, although it was collected in the same depth as the Chile specimen. These far-flung collections suggest that the species is cosmopolitan but uncommon in its known depth range.

DESCRIPTION: Size intermediate among species. Proboscis longer than trunk, robust, conspicuously downcurved over its entire length (rather than only distally). Palp segments moderately short, fifth less than half length of third, seventh next-longest, followed by eighth, tenth, sixth, and ninth which is shortest (other than two very short basal segments). Palp distal two segments recurved posteriorly toward trunk. Ovipiger terminal claw only as long as terminal segment diameter. Leg distal segments quite short in relation to long legs. Tarsus slightly shorter than propodus, claw less than half propodal length.

TYPES: 1 specimen deposited in Paris Museum.

TYPE LOCALITY: W of Moroccan coast: Expedition of *Talisman*, Stn 33 (= Stn 34), 32°31' N, 09°48' W, 1350 m (or 1500 m?).

REMARKS: This species and several others found in European waters had been elusive until Stock (1978) provided descriptions and illustrations of the critical characters useful for differentiating them. This species has the conspicuous characters of a large, robust, downcurved proboscis and a shorter than usual doubly-curved palp. Most species have a fifth palp segment which is considerably longer than that of *C. arcuata*.

Colossendeis australis Hodgson, 1907

Colossendeis australis Hodgson, 1907: 59, pl. 9, fig. 1, pl. 10, figs 1–2; Fry & Hedgpeth 1969: 49–50 [literature], figs 7, 8, 10, 65–71; Turpaeva 1974: 297; Child 1995b: 73–74.

MATERIAL EXAMINED: NZOI Stn Z8396, 1123–1134 m, 1 specimen.

DISTRIBUTION: This is the first record from New Zealand waters of this previously known circumpolar Antarctic and subantarctic species.

DESCRIPTION: Trunk and proboscis large but size only intermediate with leg span of about 250 mm. Ocular tubercle quite low with small eyes. Proboscis broadly expanded from narrow base, downcurved, longer than trunk. Palp longer than proboscis, distal three segments subequal in length. Ovipiger terminal claw opposed by subchelate larger spine forming pincer-like claws. The propodus is only 0.6 as long as the tarsus and the terminal claw is short.

TYPES AND TYPE LOCALITY: Antarctica; one type taken off Cape Wadsworth, Coulman Island in 15–46 m, and another specimen taken offshore of Ross Island in 914 m.

REMARKS: This species always looks giant even though its legs are relatively short in relation to those of many *Colossendeis* species.

The proboscis is very characteristic and has a distinct downcurve beyond its midlength. Detailed investigation of the ovipiger tip will reveal the subchelate spine and opposing claw. These prominent characters should serve to separate this large species from all others in these waters.

Colossendeis colossea Wilson, 1881

Colossendeis colossea Wilson, 1881: 244–246, pl. I, fig. 1, pl. 3, figs 5–7; Fry & Hedgpeth 1969: 53–54 [literature], fig. 8; Child 1995b: 76.

MATERIAL EXAMINED: NZOI Stns I666, Campbell Plateau, SE of Bounty Islands, 1165 m, trawl, 1 specimen; U198, Lord Howe Rise, NW of Bellona Trough, 1573 m, small trawl, 4 juvenile specimens; U226, Bellona Trough, 2421 m, small trawl, 2 specimens; X677, Raukumara Plain, E of North Island, 1235–1268 m, 1 specimen.

DISTRIBUTION: A cosmopolitan deep-water species.

DESCRIPTION: One of the largest species of the genus, many specimens known with leg spans more than 50 cm. Proboscis long, very swollen medially, with smaller swelling distally, without curve of any form. Palp much longer than proboscis, fifth segment almost as long as third, seventh only slightly shorter, distal three segments subequal in length. Legs conspicuously

long and slender. Tarsus about 0.4 longer than propodus, claw about half propodal length.

TYPES: Syntypes, 10 specimens deposited in the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

TYPE LOCALITY: Five stations off North American coast from 39°43' N, 70°55.5' W, to 41°33.2' N, 65°51.3' W, 958–2169 m

REMARKS: This is the largest pycnogonid species thus far found in the New Zealand vicinity in terms of size and leg span. Juveniles can pose a problem in identification because of their size and lack of inflation in the proboscis of some specimens. The palp segments are usually very stable in length and can serve, along with distal leg segment lengths, to differentiate this species from others.

Colossendeis hoeki Gordon, 1944

Colossendeis hoeki Gordon, 1944: 8 [key], 11–13, figs 1a–1b; Fry & Hedgpeth 1969: 51, figs 7–8; Child 1995b: 72 [key], 82, fig. 5.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This relatively rare species was previously taken on the Campbell Plateau slope near Campbell Island in 1860–1940 m. It is also known from the type specimen collected in the Kerguelen Islands in 3112 m. Other specimens are recorded from the Ross Sea, Antarctica, and a questionable juvenile specimen is known from the Scotia Sea in 594–761 m, a shallow depth for the species.

REMARKS: This is a relatively small species with a small trunk and a proboscis only slightly longer than the trunk. The ocular tubercle is a conspicuously tall cone with the eyes at its base, the anterior eye pair much larger than the posterior pair. The palps are moderately short, with a long seventh segment and an eighth segment slightly shorter than the subequal ninth and tenth. The femur is conspicuously longer than the two tibiae and the tarsus is longer by 0.3 than the propodus. The claw is slightly longer than half the propodal length.

This species has a very scattered known distribution but will probably be circumpolar when more is known with the capture of more specimens.

Colossendeis longirostris Gordon, 1938

Colossendeis longirostris Gordon, 1938: 8 [key], 9–10, fig. 1; Utinomi 1959: 10–12, fig. 6; Fry & Hedgpeth 1969: 42–43, figs 7, 8, 45, 46; Child 1995b: 82.

MATERIAL EXAMINED: NZOI Stn I694, Subantarctic Slope E of Antipodes Islands, 1004–995 m, dredge, 1 specimen.

DISTRIBUTION: This species is known only from a few scattered localities, mostly in Antarctic seas. Its depth range is from as shallow as 408 m in the Ross Sea to about 3900 m south of Tasmania. It was taken once in Hikurangi Trough in 2600 m by the R/V *Eltanin* (Child 1995b: 82) and is therefore not new to New Zealand waters.

DESCRIPTION: Proboscis very narrow, long and straight. It is nearly twice the trunk diameter and has very little median swelling. Ocular tubercle a low bump, eyes indistinct. Seventh palp segment very long, slender, eighth segment semitriangular, with ventral tubercle or extension, ninth subequal to eighth, tenth twice as long, both carried recurved dorsally. Ovipiger terminal segment with enlarged distal denticulate spine forming subchela with moderately long curved terminal claw. Femora the longest major leg segments. Tarsus slightly longer than propodus, claw long, variable, sometimes longer than propodus.

TYPES: 1 female holotype deposited in Adelaide, Australia, with the Australasian Antarctic Expedition material.

TYPE LOCALITY: Antarctica: AAE Stn 5, 64°34' S, 127°08' E, 3109 m, January 6, 1914.

REMARKS: The very short eighth palp segment is almost triangular and has a distinctive ventral tubercle which has not been emphasized before except in Gordon's (1938) figure 1b which illustrates this character very well. The next distal two segments are carried recurved dorsally over the more proximal segments. A large distal spine on the ovipiger terminal segment is opposable with the claw (longer than its segment diameter). This is another rare character shared by only two other known Antarctic species – *C. tortipalpis* Gordon, 1932 and *C. scotti* Calman, 1915. Only the former species has been found in New Zealand waters. It can be separated from *C. longirostris* by its down-curved proboscis which has a much greater median inflation and an ovipiger terminal claw which is much shorter.

Colossendeis macerrima Wilson, 1881

Colossendeis macerrima Wilson, 1881: 246–247, pl. 1, fig. 2, pl. 4, figs 9–12, pl. 5, fig. 32; Hedgpeth 1948: 273 [literature], fig. 50d; Nakamura & Child 1990: 309 [recent literature]; Child 1992: 42; Stock 1994: 39; Child 1995b: 83–84.

MATERIAL EXAMINED: NZOI Stns J550, Campbell Plateau, Pukaki Rise, 535 m, trawl, 3 specimens; U196, New Caledonia Trough, 3118–3120 m, small trawl, 1 specimen.

DISTRIBUTION: A cosmopolitan deep-water species.

DESCRIPTION: Proboscis very long, swollen proximal to and including midpoint, extremely slender (pipette-like) distal to swelling, upturned toward tip. Lateral processes short, well separated. Palps moderately short, little longer than proboscis, distal three segments subequal. Legs very slender, distal segments small, tarsus longer by 1.5 times than short propodus, claw tiny.

TYPES: 1 specimen deposited in Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

TYPE LOCALITY: Blake Stn 338, North American slope, 38°18.6' N, 73°18.1' W, 1686 m.

REMARKS: There is a small amount of variation in the proboscis of this species. It can be more pipette-shaped distally with a very narrow tip or it can be wider distally without the more common taper. It always is upturned distally, a character uncommon in this genus of straight or downturned proboscides. This serves as a very good recognition point.

Colossendeis media Hoek, 1881

Colossendeis media Hoek, 1881: 71, pl. 10, figs 10–11; Child 1995b: 84 [literature], fig. 6.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The only specimen known in the New Zealand area is one taken southwest of Macquarie Island in 3386–3422 m. There are only ten specimens of this rare species known in the literature and the type came from the southeast Pacific Basin in 4069 m. Others were collected in the Argentine Basin in 4846 m, the Scotia Sea in about 5465 m and 5259 m, the Antarctic Ocean in about 4800 m, and the Southeast Pacific Basin in 3639 m. That it is rarely collected is undoubtedly due to the extreme depths of its habitats

and the fact that few expeditions collect at these depths.

REMARKS: The morphology of this deep-sea denizen is among the strangest of all *Colossendeis* species. It has an ocular segment which is about twice as broad as the rest of the trunk, and a sharp spike-like cone in the middle of this segment represents the ocular tubercle. It is blind and has no evidence of eyes. The proboscis is only slightly longer than the trunk and the lips are convoluted or swollen. There is evidence in adults of neotenic chelifores in the broken-off stubs where juvenile chelifores would normally be found. The palp, although longer than the proboscis, has short third and fifth segments and the distal two segments are carried recurved back dorsally over the seventh and eighth segments. The eighth is a small triangle with the ninth and tenth subequal in length. The oviger has a robust terminal claw longer than the segment diameter and has no terminal spine to make a chelate effect. The tarsus is subequal to slightly longer than the propodus and the very long claw is subequal in length to the tarsus. The ocular segment and tubercle alone make this species seem strange when compared with any other known *Colossendeis*.

Colossendeis megalonyx Hoek, 1881

Colossendeis megalonyx Hoek, 1881: 67, pl. 9, figs 1–3.
Colossendeis megalonyx megalonyx: Fry & Hedgpeth, 1969: 30–32 [literature], figs 7, 8, 11–16, 23; Child 1995b: 72 [key], 86–87.

MATERIAL EXAMINED: NZOI Stns I666, Bounty Plateau, 1165 m, trawl, 3 specimens; I672, Bounty Plateau, 380 m, trawl, 1 specimen; I675, Bounty Plateau, 750–800 m 2 specimens; I686, subantarctic slope E of Bounty Plateau, 710 m, trawl, 1 specimen; I689, E of Bounty Plateau, 808–608 m, trawl, 2 specimens; I694, E of Bounty Plateau, 1004–995 m, dredge, 2 specimens; J485, Campbell Plateau, E of Auckland Islands, 320–380 m, trawl, 1 specimen; S45, Campbell Plateau, S of Campbell Rise, 1262 m, trawl, 1 specimen; S71, Campbell Plateau, Bounty Plateau, 365 m, 1 specimen; S140, Campbell Plateau, S of Chatham Rise, 750 m, 1 specimen; S153, Bounty Trough, 1386 m, 2 specimens; S154, Bounty Trough, 1373 m, 4 specimens; S160, Campbell Plateau, E of Banks Peninsula, 550 m, trawl, 1 specimen; S174, Campbell Plateau E of Banks Peninsula, 518 m, trawl, 1 specimen; S194, Hikurangi Trough, 1190 m, dredge, 1 specimen; S202, Hikurangi Trough, 2476–2542 m, small trawl, 2 specimens; T33, 721–725 m, 1 specimen; V376, 1239 m, 2 specimens.

DISTRIBUTION: The range of this species is circumpolar Antarctic with northern extensions into the western Indian Ocean, western Pacific, including off the Antipodes Islands, and to the Magellanic region of

the south Atlantic. In this vast territory, it has one of the widest depth distributions of 4–5 m (questionable?) to at least 4000 m, with most captures in the 1000–3000 m range, suggesting it is probably not a single species.

DESCRIPTION: The proboscis is consistently from 1.2 to 1.6 the trunk length and always has a slight distal downcurve. It is swollen both at midpoint and distally. The palp is considerably longer than the proboscis, the seventh segment of which is half as long as the distal two segments which are subequal. The tarsus is always longer than the propodus and the terminal claw is also long.

TYPES: 7 specimens, syntypes, deposited in the British Museum (Natural History) with the *Challenger* material.

TYPE LOCALITY: Stn 149, off Christmas Harbour, Kerguelen Islands, 220 m, 29.01.1874; Stn 313, Magellanic, 52°20' S, 68°00' W, 101 m, 20.01.1876; Stn 314, 51°36' S, 65°40' W, 128 m, 21.01.1876.

REMARKS: These specimens agree very well with Hoek's original description and figures of this species. The other subspecies put together by Fry and Hedgpeth (1969: 32–35, and below) do not agree with Hoek's material and make little sense as subspecies of Hoek's species. Hoek's *C. megalonyx* is apparently an extremely variable species in a genus with many variable species. I do not believe it is sufficiently variable to encompass the many species included under the *megalonyx* "umbrella" of Fry and Hedgpeth. In spite of this opinion, there is apparently little or no suggestion of a clearcut character division between the subspecies among the wealth of Antarctic specimens reported on by Child (1995b: 86–87) and none was found by Fry and Hedgpeth among their many specimens. Only one subspecies (*C. scoresbyi* Gordon) could be withdrawn from this group and restored to full species status (Child 1995b: 90, fig. 8). It has a few consistent differences between the specimens reported on and the remaining wealth of material. None of the other specimens have any consistent differences which can be deciphered.

The above specimens display a wide variety of differences even in so small a group. The variation among these is most evident in the ocular tubercle which is variously low, slightly conical, and with white eyes without pigment, a tall cone with darkly pigmented eyes, or a rounded tubercle with a slender spike above well-pigmented eyes. The anterior eye pair is always of different size from the posterior pair. Usually the posterior eyes are smaller but they can be

of equal size with the anterior pair. Some specimens have anterior eyes twice as large as the posterior pair and in some instances, all four eyes are slightly smaller or slightly larger among the specimens.

Colossendeis tortipalpis Gordon, 1932

Colossendeis tortipalpis Gordon, 1932: 12–15, figs 2b–2e, 4a; Child 1995b: 93 [literature].

MATERIAL EXAMINED: NZOI Stns I675, Campbell Plateau, 750–800 m, trawl, 1 specimen; I697, subantarctic slope E of Antipodes Islands, 917–915 m, trawl, 1 specimen; J668, Raukumara Plain, 2571–2570 m, trawl, 1 specimen; P927, Challenger Plateau slope, 1009–1005 m, small trawl, 1 specimen.

DISTRIBUTION: The species has one of the widest geographic and depth distributions of any species known in the southern ocean. It has been taken from the southern Indian Ocean, Pacific Ocean, and Atlantic Ocean, to as far south as the Ross Sea. Some of the more southern depths are quite shallow for the genus (46, 156, 219 m) and it has some great depths recorded from further north at 3733–4026 m. It is new to the New Zealand area, with the above records.

DESCRIPTION: Proboscis half again as long as the trunk, generally inflated and slightly downcurved over most of its length. Ocular tubercle taller than its diameter, eyes small. Palp seventh segment quite long, eighth very short, not as long as wide, with ventral projection, ninth and tenth segments longer, subequal, carried elevated but not recurved. Ovipiger claw only as long as segment diameter, opposed to enlarged distal denticulate spine, forming a subchelate structure. Tarsus and propodus subequal in length, claw about 0.75 propodal length or more.

TYPES: 1 female holotype, 1 male, 1 juvenile, paratypes, deposited in British Museum (Natural History) with the *Discovery* material.

TYPE LOCALITY: Stn 170, South Shetland Islands, Clarence Island, off Cape Bowles, 61°25.5' S, 53°46' W, 342 m, dredge, 23.02.27.

REMARKS: The long proboscis of this species, 1.5 times longer than the trunk, and the large triangular eighth palp segment carrying the ninth and tenth segments elevated or recurved back toward the trunk, serve to identify specimens of *C. tortipalpis*. The terminal ovipiger spine is larger and opposed to the claw, creating a subchela. The latter is a rather rare character in the genus, being found only in *C. australis* Hodgson, *C. longirostris* Gordon, *C. scotti* Calman, and this species.

The long proboscis of this species and the oviger subchelae both serve as good recognition characters for this species in New Zealand waters.

Hedgpethia Turpaeva, 1973

Colossendeis Loman, 1908: 22–23.

Rhopalorhynchus Stock, 1958: 116.

Hedgpethia Turpaeva, 1973: 184–185.

TYPE SPECIES: *Colossendeis articulata* Loman, 1908

There are only eleven known species in this genus. Stock (1991: 26) divided them into two subgroups based on proboscis shape; whether it is spindle-shaped, distally tapering and pointed (9 species) or cylindrical and distally rounded or truncate (2 species). There is one additional named species which was never illustrated and is now an unidentifiable *species inquirenda*. All known species are fairly small and are dwarfed when compared to most specimens of *Colossendeis*.

The species are limited to few collecting sites although more than one is far-ranging in distribution. None is frequently collected and many are known only from their type locality. They have a very wide depth range among the various species and one is found as shallow as 20 m while most range to 600+ m and one is only known from 4100 m.

Hedgpethia eleommata n.sp. (Fig. 7)

MATERIAL EXAMINED: NZOI Stn W460, continental slope off Dunedin, 1400–1415 m, from hexactinellid sponge (NZOI holotype specimen, 4 paratype specimens; also USNM 3 paratype specimens).

OTHER MATERIAL: NZOI Stn W248, S Chatham Rise, 1442–1468 m, 1 damaged specimen.

DESCRIPTION: Size moderately small for the genus, leg span only 19.5 mm, trunk moderately short, fully segmented, posterior rims inflated, lateral processes shorter than their diameters, separated by less than their diameters from each other, glabrous. Ocular tubercle a tall, slender, anterior-pointing cone with distinct bulge at base for huge anterior pair of darkly pigmented eyes. Posterior pair of eyes only about 0.2 as large as anterior pair.

Proboscis only little longer than trunk, slightly swollen at median length, sharply curved proximally almost to right angle. Proboscis semicylindrical, with slight distal taper, lips flat. Abdomen very short, carried almost ventrally and hidden in dorsal view, glabrous.

Palps much longer than proboscis, slender, first two segments shorter than their diameters. Third segment longest, fifth about 0.6 length of third, with short ventrodistal setae. Five distal segments with thick short ventral setae. Sixth segment very short, seventh and ninth subequal, eighth longest of distal segments, tenth short, about 0.8 length of ninth. Ovigera typical, with very few short setae, sixth segment longest. Four strigilis segments well curved, each armed with many spatulate, distally curved spines in three and sometimes four ventral rows. Terminal claw short, little longer than adjacent spines, distally spatulate, with curved ventral fringe.

Legs slender, with few short setae increasing in numbers distally. Second and third coxae subequal, first tibiae the longer segments. The tarsus is only about 0.7 length of propodus while robust claw is 0.9 the propodal length.

MEASUREMENTS: Holotype in mm. Trunk length (from proboscis insertion to tip 4th lateral processes), 3.34; trunk width (across 2nd lateral processes), 1.72; proboscis length, 3.65; third leg, coxa 1, 0.38; coxa 2, 0.6; coxa 3, 0.65; femur, 4.26; tibia 1, 5.41; tibia 2, 4.02; tarsus, 1.12; propodus, 1.62; claw, 1.46.

ETYMOLOGY: The name (Greek: *eleos*, an owl, and *ommation*, diminutive of *ommatos*, eyes) refers to the extremely large anterior eyes suggesting the large eyes of many owls: owl-eyed.

TYPES AND TYPE LOCALITY: Holotype, H-695, from NZOI Stn W460; paratypes P-1142 from same locality.

REMARKS: The huge eyes of this species can be seen in dorsal view on either side of the slender ocular cone and more dramatically in lateral view; their dark pigment is immediately evident.

In lateral view, the proboscis of this species is fairly narrow and is reminiscent of Stock's second grouping of species with a more or less cylindrical proboscis which is distally rounded or truncate. The two other species in this group are *H. dampieri* (Child, 1975), and *H. brevitarsis* (Losina-Losinsky, 1958).

The proboscis of *H. dampieri* has a distinctive proximal bulge followed by a constriction and then a broad expanse tapering distally. It has several other characters which also differ from this species. The proboscis of *H. brevitarsis* is very similar to that of *H. eleommata* and has gradual swelling over its entire length and an abruptly rounded tip rather than one that tapers to a sharp narrow point. The greatest difference between these two species is found in the ocular tubercles. That of *H. brevitarsis* is conventional for the genus and is short, swells distally where the

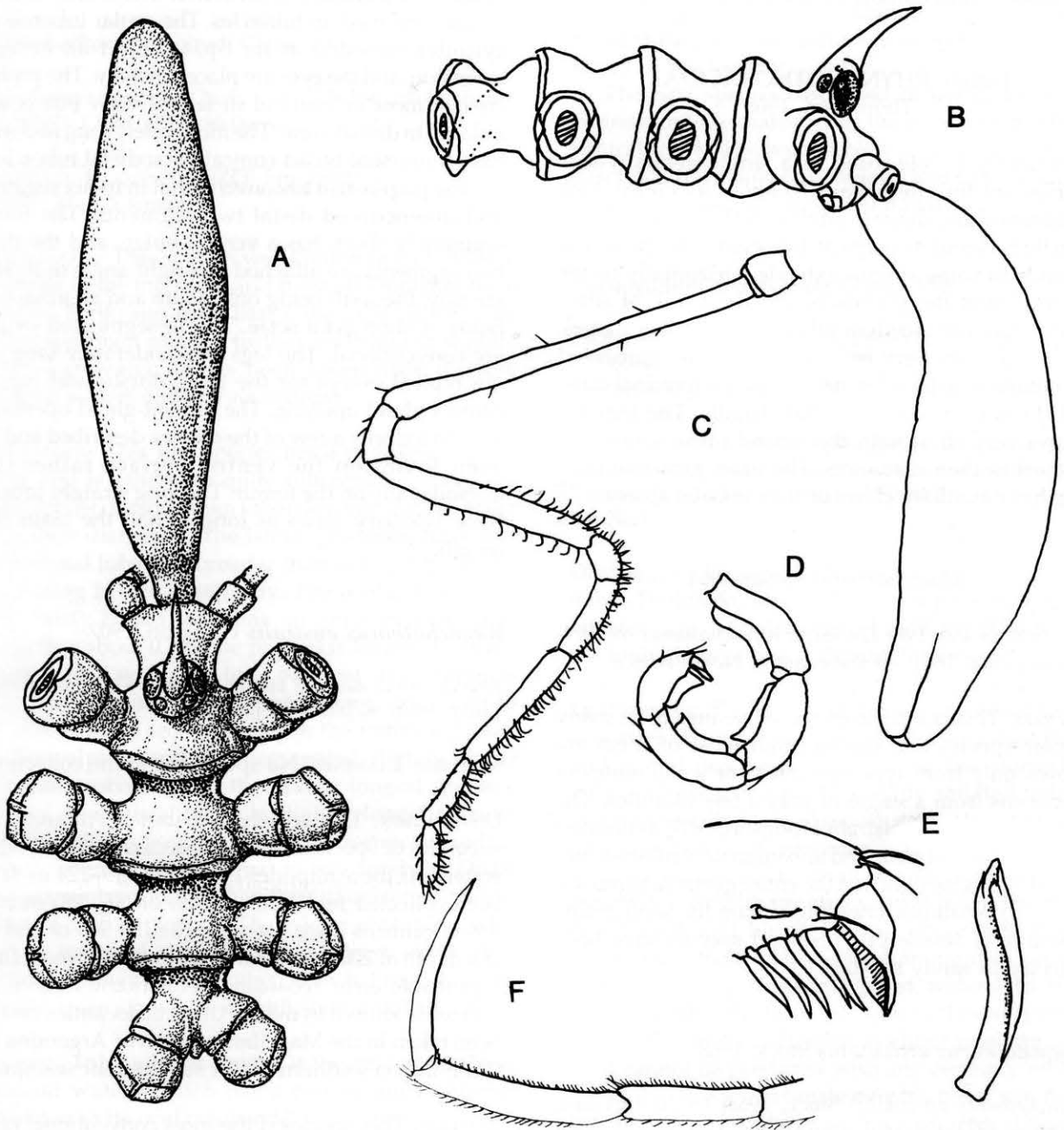


Fig. 7. *Hedgpethia eleommata* n.sp.: Holotype. A, trunk, dorsal view; B, trunk, lateral view; C, palp; D, oviger strigilis; E, oviger distal part of terminal segment and two spines, enlarged; F, distal leg segments, enlarged.

equal-sized eyes are located, and has a short apical extension or cone. The ocular tubercle of *H. eleommata* is a larger anterior-curved cone with a bulge at its base where the very large anterior pair of eyes and much smaller posterior eye pair are situated. The terminal oviger claw of *H. brevitarsis* has an opposing modified spine adjacent to it which forms a small chelate structure. The oviger claw of *H. eleommata* has no opposing claw of any shape and has only rows of spatulate spines of more or less the same size.

Family RHYNCHOTHORACIDAE
Thompson, 1908

This family is composed of a single genus whose species are tiny (leg spans of about 4–5 mm), lack chelifores of any shape in adults, and have short dorso-distally tuberculate palps of 4–6 segments. The ocular tubercle in some species extends horizontally to the anterior over the proboscis and the trunk of some species has dorsomedian tubercles of various shapes. The ovigers are very reduced in size, 10-segmented (sometimes 9 in females, have a curved terminal claw, and do not form a functional strigilis. The legs are always very short with the second tibiae sometimes as short as their diameters. The main propodal claw may have auxiliary claws or they may be absent.

Rhynchothorax Costa, 1861

TYPE SPECIES AND TYPE LOCALITY: *Rhynchothorax mediterraneus* Costa, 1861, on the coast of North Africa.

REMARKS: This is a difficult genus because of its many similar species and the fact that most of them are known only from type specimens or small suites of specimens from a single or only a few localities. The one exception is *R. australis* Hodgson, 1907, a common inhabitant of Antarctic and subantarctic shallow-water localities. It is thought that the entire genus may inhabit interstitial shallows, crawling among the sand grains in search of sessile prey. Several species have been collected in sandy habitats.

Rhynchothorax articulatus Stock, 1968

Rhynchothorax articulatus Stock, 1968: 18–20, figs 5a–f; Arnaud 1972: 408 [key]; Krapp 1973: 121, 123 [key]; Clark 1976: 287–292, 295 [key], figs 2, 3–9, 10–11.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This species was first collected and described from a male taken in Cook Strait in 146 m. It was subsequently collected off Auckland and the Otago Peninsula in 251–265 m and 500 m respectively. It is apparently endemic in New Zealand waters.

REMARKS: This species is unconventional in several characters. It has unusually long lateral processes which are closely crowded to touching and which have small, low dorsodistal tubercles. The trunk also has similar low median tubercles. The ocular tubercle is a cylinder rounded at its tip, without an anterior extension, and the eyes are placed distally. The proboscis is almost cylindrical in lateral view but is well inflated in dorsal view. The moderately long abdomen has an unusual broad conical dorsodistal tubercle.

The palp is also unconventional in its six segments and downcurved distal two segments. The fourth segment is short, has a ventral bulge, and the distal two segments are attached at a right angle to it. They are tiny, the sixth being only a nub and all three have fields of short ectal setae. The 10-segmented ovigers are conventional. The legs are moderately long and are typical except for the large dorsodistal tubular cement gland opening. The cement-gland opening is known for only a few of the species described and has been found on the ventral surface rather than dorsodistally on the femur. The long straight propodi have auxiliary claws as long as half the main claw length.

Rhynchothorax australis Hodgson, 1907

Rhynchothorax australis Hodgson, 1907: 57–58, pl. 8, fig. 3; Child 1995b: 96 [literature], fig. 9.

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: This widely distributed Antarctic and subantarctic species has been collected in New Zealand waters off the Antipodes Islands in 119–124 m. It has been collected mostly at depths of 60–450 m but a few specimens have been recorded at 900 m and one at a depth of 2000 m, which is a possible or more likely a probable error recording net contamination. The species is known in many Antarctic localities and has been taken in the Magellanic region of Argentina and Chile and on southern Pacific subantarctic seamounts.

REMARKS: This species is the most conventional of the three known in New Zealand waters. It has large dorsomedian trunk tubercles slightly taller than their width and lacks any kind of tubercles except bumps on the very short lateral processes. The ocular tubercle

Pycnogonum Brunnich, 1764

is short, broad, and points obliquely anterior, but is without an extension. The palps are 5-segmented with the longest third segment bearing a rounded dorso-distal tubercle. The fourth and fifth segments are tiny with the fifth merely a nub. The legs are moderately long and slender, the first coxae have low dorsodistal tubercles, the other segments are without tubercles, and the propodal claw has auxiliaries less than half the main claw length.

Rhynchothorax percivali Clark, 1976

Rhynchothorax percivali Clark, 1976: 292–294, 295 [key], figs 1, 12–21; Child 1995b: 96 [key], 99, fig. 10.

MATERIAL EXAMINED: NZOI Stn Z8823, off Whangarei Heads, 37 m, 1 female.

DISTRIBUTION: This species was known from Lyttleton Harbour in the intertidal and from off Dunedin, from Mernoo Bank, and from East Cape in 51–101 m. The above specimen places it further north and in slightly shallower water. It has been taken only in New Zealand waters and is thus endemic.

DESCRIPTION: This tiny species has a papillose integument and is otherwise quite tuberculate. There are three robust dorsomedian tubercles only slightly taller than their diameters. The lateral processes have low dorsodistal tubercles broader than tall and gradually decreasing in size posteriorly. The ocular tubercle is low, fairly broad, and has an anterior extension projecting about 0.3 of the proboscis length. The eyes are indistinct with very little pigment. The proboscis is typical. The abdomen is fairly long, extending to the distal rim of second coxae on the fourth leg pair.

The palps are robust, 4-segmented, slightly longer than the proboscis, and the first or longest segment bears a dorsodistal tubercle slightly longer than its diameter. Second segment slightly shorter, with a low dorsal tubercle just proximal to the distal tip. Distal two segments no longer than their diameters, terminal segment only a tiny knob. The ovigers are typical, with curved terminal claw. Legs are robust, short, first coxae with low rounded tubercle each. Propodus well curved, main claw robust, with short auxiliary claws.

REMARKS: This endemic species is the only one in New Zealand waters which has a conspicuous anterior extension to its ocular tubercle.

This genus contains a large group of species from worldwide localities which are fairly easy to differentiate from most other pycnogonids by the absence of several characters. All species of this genus lack both chelifores and palps and several species lack ovigers in both sexes while only a few species have auxiliary claws. The many known species are sometimes difficult to separate where more than one is found in one locality.

The first species discussed below lacks ovigers entirely and the male carries the eggs cemented to its ventral trunk. The second New Zealand species was described from only two females and the presence or absence of male ovigers is unknown.

Pycnogonum anovigerum Clark, 1956

Pycnogonum anovigerum Clark, 1956: 171–173, figs 1–5; Stock 1966: 402 [key].

Pycnogonum (*Nulloviger*) *anovigerum*: Stock 1968: 61.

MATERIAL EXAMINED: NZOI Stn Z8673, Whangarei Heads, Aubrey Island, under rocks at low water, 4 males w/eggs, 2 males, 4 females, 1 juvenile (USNM 2 males w/eggs, 2 females).

DISTRIBUTION: This species has been collected only from Banks Peninsula, South Island. It is possibly endemic but this cannot be determined with any finality from the limitations of two collecting localities.

DESCRIPTION: Trunk ovoid with very short lateral processes. Trunk with three low dorsomedian bulges and lateral processes with similar low dorsodistal bulges. Proboscis a plain, slightly inflated cylinder tapering distally to small mouth area. Abdomen short, laterally inflated. Ovigers entirely lacking in both sexes.

Legs very robust, coxae shorter than their diameters, femur with proximoventral bulge and dorso-distal knob and bulge. Second tibiae only slightly longer than their width. Tarsus triangular, with few sole spines. Propodus well-curved, wider at base than distally, with only distal sole spines, claw very robust, about 0.6 of propodal length. Without auxiliary claws.

It cannot be predicted with any certainty whether or not this species has male ovigers, but if not, it joins the other species above in this character. There are few species in this genus which have auxiliary claws, however small, and these must serve to separate these two otherwise similar members of the New Zealand fauna.

TYPES: Holotype, female, and 2 male paratypes deposited in the Canterbury Museum, Christchurch.

TYPE LOCALITY: Collected from beneath boulder in rock pool at East Point, Menzies Bay, Banks Peninsula, by W. C. Clark, 14 May 1952.

REMARKS: This species is easily recognised by its lack of ovigers in the males and lack of auxiliary claws in any specimen.

Pycnogonum planum Stock, 1954

Pycnogonum planum Stock, 1954: 165–168, fig. 81; 1966: 399 [text], 400 [key].

MATERIAL EXAMINED: No specimens in the collection.

DISTRIBUTION: The species is only known from two females taken at Kaipara along the shore.

REMARKS: This is another species with low dorsomedian bumps or swellings on the trunk and corresponding low bumps on the lateral processes. It differs by having a longer, less robust trunk which allows the longer lateral processes to be well separated from each other with a narrow open interval between each. The proboscis is fairly short and a tapering cylinder rounded distally. The abdomen is long, inflated only distally, and extends to the distal rim of the fourth leg second coxae. The coxae are wider than long but the three main leg segments are longer than in *P. anovigerum*, particularly the second tibiae which are at least 1.5 times longer than wide. The tarsus is large, angular, and armed with many short sole spines. The propodus is broadest proximally, slightly curved, armed with few sole spines increasing in numbers distally, and has a robust, well-curved claw which has very tiny auxiliary claws.

ACKNOWLEDGMENTS

I am very much indebted to Joel W. Hedgpeth and the late William G. Fry for beginning the current study of New Zealand and particularly Antarctic Pycnogonida. They paved the way for further modern reports on these animals. The inclusion of some New Zealand fauna in Antarctic reports is the inevitable outcome of using these Islands as a staging area and jumping-off base for expeditions to Antarctica. This report is among the few longer reports on the pycnogonids of New Zealand exclusively and would

not have been possible without the repeated generosity in the loan of specimens and continued help of the New Zealand Oceanographic Institute (NZOI), now the National Institute of Water and Atmospheric Research (NIWA). I wish to thank those people who made a number of earlier loans of material to Joel Hedgpeth. Thanks go to Dennis P. Gordon and Steve O'Shea of NIWA for their generous assistance in many ways which made this compilation and report easier.

REFERENCES

- ARNAUD, F. 1971: *Acheliana tropicalis* n. gen., n. sp., Pycnogonides des récifs coralliens du Sud-Ouest de Madagascar. *Beaufortia* 18(241) : 199–204.
- ARNAUD, F. 1972: Pycnogonides. Invertébrés marins. XIIème et XVème Expéditions antarctiques françaises en Terre Adélie. *Téthys* 4, suppl. 4 : 135–156.
- ARNAUD, F. 1974: Pycnogonides récoltés aux Açores par les campagnes 1969 et Biazores 1971. *Bulletin Zoölogisch Museum, Universiteit van Amsterdam* 3(21) : 169–187.
- ARNAUD, F.; BRANCH, M.L. 1991: The Pycnogonida of subantarctic Marion and Prince Edward Islands: Illustrated keys to the species. *South African Journal of Antarctic Research* 21 : 65–71.
- ARNAUD, F.; CHILD, C.A. 1988: The South African Museum's Meiring Naude Cruises, Part 17: Pycnogonida. *Annals of the South African Museum* 98 : 121–187.
- BAMBER, R.N. 1983: Some deep water pycnogonids from the north-east Atlantic. *Zoological Journal of the Linnean Society* 77 : 65–74.

- BAMBER, R.N.; THURSTON, M.H. 1993: Deep water pycnogonids of the Cape Verde slope. *Journal of the Marine Biological Association of the United Kingdom* 73 : 837-861.
- BARNARD, K.H. 1954: South African Pycnogonida. *Annals of the South African Museum* 41 : 81-158.
- BÖHM, R. 1879: Ueber die Pycnogoniden des Kg. Zoolog. Museums zu Berlin, insbesondere über die von S.M.S. Gazelle mitgebrachte Arten. *Monatsberichte der Koniglichen Preussischen Akademie der Wissenschaften zu Berlin*, 1879 : 170-195, 2 pls.
- BOUVIER, E.L. 1911: Les Pycnogonides des *Pourquoi Pas?* *Comptes Rendus des Séances Hebdomadaires de l'Académie des Sciences, Paris* 152 : 1136-1142.
- BOUVIER, E.L. 1913: Pycnogonides du *Pourquoi Pas?* *Deuxième Expédition antarctique française (1908-1910)* 6 : 1-169.
- BRÜNNICH, M.T. 1764: *Entomologia sistens Insectorum Tabulas Systematicas, cum Introductione et Iconibus, etc. Hafniae*. 87 p., 1 pl.
- CALMAN, W.T. 1915: Pycnogonida. *British Antarctic (Terra Nova) Expedition 1910, Zoology* 3(1) : 1-74.
- CALMAN, W.T. 1938: Pycnogonida. *Scientific Reports of the John Murray Expedition 1933-34*, 5(6) : 147-166.
- CANZ, 1997: New Zealand Region Bathymetry, 3rd edition, 1:4,000,000. NIWA *Miscellaneous Chart* 73.
- CARPENTER, G.H. 1892: Pycnogonida. Reports on the zoological collections made in Torres Straits by Prof. A. C. Haddon, 1888-89. *Scientific Proceedings of the Royal Dublin Society* 7(5) (40) : 552-558, 1 pl.
- CHILD, C.A. 1975: Pycnogonida of Western Australia. *Smithsonian Contributions to Zoology* 190 : 1-28.
- CHILD, C.A. 1982: Deep-sea Pycnogonida from the North and South Atlantic Basins. *Smithsonian Contributions to Zoology* 349 : 1-54.
- CHILD, C.A. 1983: Pycnogonida of the western Pacific Islands, II. Guam and the Palau Islands. *Proceedings of the Biological Society of Washington* 96 : 698-714.
- CHILD, C.A. 1987: New and little known Pycnogonida from Antarctic and subantarctic waters. *Proceedings of the Biological Society of Washington* 100 : 902-916.
- CHILD, C.A. 1992: Pycnogonida of the Southeast Pacific Biological Oceanographic Project (SEPBOP). *Smithsonian Contributions to Zoology* 526 : 1-43.
- CHILD, C.A. 1994a: Antarctic and subantarctic Pycnogonida. I. The family Ammotheidae. *Antarctic Research Series* 63, *Biology of the Antarctic Seas* 23 : 1-48.
- CHILD, C.A. 1994b: Antarctic and subantarctic Pycnogonida. II. The family Austrodecidae. *Antarctic Research Series* 63, *Biology of the Antarctic Seas* 23 : 49-99.
- CHILD, C.A. 1995a: Antarctic and subantarctic Pycnogonida. III. The family Nymphonidae. *Antarctic Research Series* 69, *Biology of the Antarctic Seas* 24 : 1-68.
- CHILD, C.A. 1995b: Antarctic and subantarctic Pycnogonida. IV. The families Colossendeidae and Rhynchothoraxidae. *Antarctic Research Series* 69, *Biology of the Antarctic Seas* 24 : 69-111.
- CHILD, C.A. 1995c: Antarctic and subantarctic Pycnogonida. V. The families Pycnogonidae, Phoxichilidiidae, Endeididae, and Callipallenidae, including the genus *Pallenopsis*. *Antarctic Research Series* 69, *Biology of the Antarctic Seas* 24 : 112-165.
- CHILD, C.A. 1996: Pycnogonida of the western Pacific islands. XIII. Collections from Indonesia, Melanesia, and Micronesia. *Proceedings of the Biological Society of Washington* 109 : 540-559.
- CHILD, C.A. 1997: Some deep-sea Pycnogonida from the Argentine slope and basin. *Proceedings of the Biological Society of Washington* 110 : 128-142.
- CLARK, W.C. 1956: A new species of *Pycnogonum* from Banks Peninsula, New Zealand. *Records of the Canterbury Museum* 7 : 171-173.
- CLARK, W. C. 1958: Some Pycnogonida from Cook Strait, New Zealand, with descriptions of two new species. *Zoological Publications from Victoria University of Wellington* 23 : 1-7.
- CLARK, W.C. 1962: *Pallenopsis triregia*, a new species of Pycnogonida from near Three Kings Islands, New Zealand. *N.Z. Journal of Science* 5 : 517-520.
- CLARK, W.C. 1963: Australian Pycnogonida. *Records of the Australian Museum* 26 : 1-81.
- CLARK, W.C. 1972a [1971]: Pycnogonida of the Snares Islands. *N.Z. Journal of Marine and Freshwater Research* 5 : 329-341.
- CLARK, W. C. 1972b [1971]: Pycnogonida of the Antipodes Islands. *N.Z. Journal of Marine and Freshwater Research* 5 : 427-452.
- CLARK, W.C. 1975: Pycnogonida. Pp 122-126 in *Preliminary Results of the Auckland Islands Expedition 1972-1973*. Department of Lands and Survey, Wellington, New Zealand. 447 p.
- CLARK, W.C. 1976: The genus *Rhynchothorax* Costa (Pycnogonida) in New Zealand waters. *Journal of the Royal Society of New Zealand* 6 : 287-296.

- CLARK, W.C. 1977a: The genus *Ammothea* Leach (Pycnogonida) in New Zealand waters: New species and a review. *Journal of the Royal Society of New Zealand* 7 : 171–187.
- CLARK, W.C. 1977b: The genus *Tanystylum* Miers, 1879 (Pycnogonida) in the Southern Oceans. *Journal of the Royal Society of New Zealand* 7 : 313–338.
- CLARK, W. C. 1977c: Pycnogonida from the Snares Islands. [Note.] *N.Z. Journal of Marine and Freshwater Research* 11 : 173–177.
- COLE, L.J. 1904: Pycnogonida of the west coast of North America. *Harriman Alaska Expedition* 10 : 249–330, pls 11–26.
- COSTA, O.G. 1861: *Microdoride mediterranea, o descrizione di poco ben conosciuti od affatto ignoti viventi minuti e microscopici del Mediterraneo, etc.* 1 : i–xviii + 1–80, pls 1–12.
- DOHRN, A. 1881: Die Pantopoden des Golfes von Neapel und der angrenzenden Meeresabschnitte. *Monographie der Fauna und Flora des Golfes von Neapel* 3 : 1–252, 18 pls.
- EIGHTS, J. 1835: Description of a new animal belonging to the Arachnides of Latreille; discovered in the sea along the shores of the New South Shetland Islands. *Boston Journal of Natural History* 1 : 203–206, pl. 7.
- FABRICIUS, J. C. 1794: *Entomologia Systematica Emendata et aucta* 4 : 416–417. Copenhagen.
- FAGE, L. 1952: Pycnogonides de la Terre Adélie. *Bulletin du Muséum National d'Histoire Naturelle, sér. 2*, 24 : 263–273.
- FLYNN, T.T. 1919: Two new Australian Pycnogonida. *Papers and Proceedings of the Royal Society of Tasmania*, 1918 : 91–100, 2 pls.
- FLYNN, T. T. 1928: The Pycnogonida of the Marine Survey of South Africa. *Reports of the Fisheries and Marine Biological Survey of the Union of South Africa* 6 (Special Reports, 1 : 3–36.
- FLYNN, T. T. 1929: Pycnogonida from the Queensland coast. *Memoirs of the Queensland Museum* 9 : 252–260.
- FRY, W.G.; HEDGPETH, J.W. 1969: Pycnogonida, 1. Colossendeidae, Pycnogonidae, Endeidae, Ammotheidae. Fauna of the Ross Sea, 7. *Memoir. New Zealand Oceanographic Institute* 49 : 1–139, 1 pl.
- GORDON, I. 1932a: Pycnogonida. *Discovery Reports* 6 : 1–138.
- GORDON, I. 1932b: Redescription of some type-specimens of Pycnogonida of the genus *Nymphon*. *Annals and Magazine of Natural History* (10) 9 : 97–120.
- GORDON, I. 1938: Pycnogonida. *Scientific Reports of the Australasian Antarctic Expedition (C), (Zoology and Botany)* 2(8) : 1–40.
- GORDON, I. 1944: Pycnogonida. *Reports of the British, Australian and New Zealand Antarctic Research Expedition (B)* 5(1) : 1–72.
- HASWELL, W.A. 1885: Pycnogonida of the Australian coast with descriptions of new species. *Proceedings of the Linnean Society of New South Wales* 9 : 1021–1033, 4 pls.
- HEDGPETH, J.W. 1947: On the evolutionary significance of the Pycnogonida. *Smithsonian Miscellaneous Collections* 106(18) : 1–54, 1 pl.
- HEDGPETH, J.W. 1948: The Pycnogonida of the western North Atlantic and the Caribbean. *Proceedings of the United States National Museum*, 97(3216) : 157–342.
- HEDGPETH, J.W. 1950: Pycnogonida of the United States Navy Expedition, 1947–48. *Proceedings of the United States National Museum* 100(3260) : 147–160.
- HEDGPETH, J.W.; McCAIN, J.C. 1971: A review of the pycnogonid genus *Pantopipetta* (family Austrodecidae, emend.) with the description of a new species. In Llano, G.; Wallen, I.E. (eds) *Biology of the Antarctic Seas 4, Antarctic Research Series* 17 : 217–229.
- HELPER, H. 1938: Einige neue Pantopoden aus der Sammlung des Zoologischen Museums in Berlin. *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin* 1937 : 162–185.
- HILTON, W.A. 1942: Pantopoda (continued). II. Family Callipallenidae. *Journal of Entomology and Zoology of Pomona College* 34 : 38–41.
- HODGE, G. 1864: List of the British Pycnogonidea, with descriptions of several new species. *Annals and Magazine of Natural History* (3) 13 : 113–117, 2 pls.
- HODGSON, T.V. 1902: Crustacea (Pycnogonida). In : *Report on the Collections of Natural History made in the Antarctic Regions during the Voyage of the Southern Cross* : 256–258, pl. 40.
- HODGSON, T.V. 1904: On a new pycnogonid from the South Polar regions. *Annals and Magazine of Natural History* (7) 14 : 458–462, pl. 14.
- HODGSON, T.V. 1907: Pycnogonida. *Reports of the National Antarctic Expedition of 1901–1904, Natural History* 3 : 1–72, 10 pls.
- HODGSON, T.V. 1908: The Pycnogonida of the Scottish National Antarctic Expedition. *Transactions of the Royal Society of Edinburgh* 46 : 159–188, 3 pls.
- HODGSON, T.V. 1914: Preliminary report on the Pycnogonida of the German Southpolar Expedition, 1901–1903. *Zoologische Anzeiger* 45 : 158–165.

- HODGSON, T.V. 1915: The Pycnogonida collected by the *Gauss* in the Antarctic regions, 1901-03: Preliminary report. *Annals and Magazine of Natural History* (8) 15 : 141-149.
- HODGSON, T.V. 1927: Die Pycnogoniden der Deutschen Südpolar-Expedition 1901-03. *Deutsch Südpolar-Expedition, ser. 11, Zoologie* 19 : 303-358.
- HOEK, P.P.C. 1881: Report on the Pycnogonida dredged by HMS *Challenger* 1873-76. *Reports of the Scientific Results of the Exploring Voyage of HMS Challenger* 3(10) : 1-167, 21 pls.
- HOEK, P.P.C. 1883: The Pycnogonida dredged in the Faroe Channel during the cruise of HMS *Triton* during August 1882. *Transactions of the Royal Society of Edinburgh* 32 : 1-10, 1 pl.
- HOEK, P.P.C. 1898: On four pycnogonids dredged during the cruise of the *Challenger* (investigated and described after the completion of the report). With an appendix. *Tidschrift der Nederlandsche Dierkundige Vereeniging* (2) 5 : 290-301, pls 2-3.
- JARZYNSKY, T. 1870: Praemissus catalogus Pycnogonidarum, inventarum in mari Glaciali, ad oras Lapponiae rossicae et in mari Albo, anno 1869 et 1870. *Annales de la Société des Naturalistes de St.-Petersbourg* 1 : 319-320.
- JOHNSTON, G. 1837: Miscellanea Zoologica, I. An attempt to ascertain the British Pycnogonida. *Magazine of Zoology and Botany* 1 : 371-382, 1 pl.
- KRAPP, F. 1973: A fourth Mediterranean *Rhynchothorax* and remarks on the genus (Pycnogonida). *Bulletin Zoologisch Museum, Universiteit van Amsterdam* 3 : 119-124.
- KRAPP, F. 1980: Neue Pantopodenfunde (Pycnogonida, Arthropoda) nahe der belgischen Antarktis Station. *Bulletin de l'Institut Royal des Sciences Naturelles Belgique, Bruxelles, Biologie* 52(18) : 1-8.
- KRØYER, H. 1844: Om de Nordiske Pycnogonider. *Oversigt over det. K. Danske Videnskabernes selskabs Forhandlinger* 1844 : 5-6.
- KRØYER, H. 1845: Bidrag til Kundskab om Pycnogoniderne eller Søspindlerne. *Naturhistorisk Tidsskrift, Kjøbenhavn*, (2) 1: 90-139, 1 pl.
- LEACH, W.E. 1814: *The Zoology Miscellany* 1 : 33-34, 43-45, pls 13, 14. London.
- LOMAN, J.C.C. 1908: Die Pantopoden der Siboga-Expedition. *Siboga-Expeditie* 40 : 1-88, pls 1-14.
- LOMAN, J.C.C. 1923: The Pycnogonida. *Further Zoological Results of the Swedish Antarctic Expedition* 1 : 1-41.
- LOSINA-LOSINSKY, L.K. 1933: Die Pantopoden der östlichen Meere der U.S.S.R. *Issledovaniya Morei S.S.S.R., Leningrad* 17 : 43-80. [In Russian, German summary]
- LOSINA-LOSINSKY, L.K. 1958: (In Losina-Losinky and Turpaeva, 1958). The genus *Colossendeis* (Pantopoda) in the northern part of the Pacific Ocean. *Byulleten' Moskovskovo Obshchestva Ispytatelei Prirody* 63 : 23-33. [In Russian, English summary.]
- LOSINA-LOSINSKY, L.K. 1961: [Pantopoda of the far-eastern seas of the U.S.S.R.] *Issledovaniya Dalnyevostochnykh Morei S.S.S.R. Leningrad* 7 : 47-117. [In Russian.]
- MARCUS, E. 1940: Os Pantopoda brasileiros e os demais sul-americanos. *Boletim da Faculdade de Filosofia, Ciências e Letras da Universidade de São Paulo* 19 (Zoologia 4) : 3-179, 17 pls.
- MCCLOSKEY, L.R. 1967: New and little known benthic pycnogonids from North Carolina. *Journal of Natural History* 1 : 129-134.
- MIERS, E.J. 1875: Descriptions of new species of Crustacea collected at Kerguelen's Island by the Rev. A.E. Eaton. *Annals and Magazine of Natural History* (4) 16 : 73-76.
- MIERS, E. J. 1879: Crustacea (and Pycnogonida) of the Transit of Venus Expedition, Kerguelen Island. *Philosophical Transactions of the Royal Society of London* 168 : 200-214, pl. 11.
- MIERS, E.J. 1884: Pycnogonida. In : *Report on the Zoological Collections made in the Indo-Pacific during the Voyage of HMS Alert 1881-82* : 323-326, pl. 35.
- MILNE EDWARDS, H. 1840: *Histoire Naturelle des Crustacés etc.* 3. Ordre des Araneiformes ou Pycnogonides : 530-537, pl. 41.
- MILNE-EDWARDS, A. In Filhol, H. 1885: Pycnogonides. In : *La vie au fond des mers. Les explorations sous-marines et les voyages du Travailleur et du Talisman* : 150-154.
- MONTAGU, G. 1808: Description of several marine animals found on the south coast of Devonshire. *Transactions of the Linnean Society of London* 9 : 81-113, pl. 5.
- MUNILLA, T.L. 1989: Dos nuevas especies de Pycnogonidos antárticos. *Actas del Tercer Simposium Español de Estudios Antárticos*, Gredos, 3 al 5 de octubre de 1989. Comision Interministerial de Ciencia y Tecnología [Spain] : 74-79.
- NAKAMURA, K. 1985: A new species of pycnogonid, *Heteronymphon horikoshii*, from waters adjacent to Honshu, Japan. *Bulletin of the Biogeographical Society of Japan* 40(4) : 31-34.
- NAKAMURA, K.; CHILD, C.A. 1990: Pycnogonida of the Western Pacific Islands. VII. Some rare species from the Flores Sea, Indonesia. *Proceedings of the Biological Society of Washington* 103 : 304-310.

- NAKAMURA, K.; CHILD, C.A. 1991: Pycnogonida of waters adjacent to Japan. *Smithsonian Contributions to Zoology* 512 : 1-74.
- NORMAN, A.M. 1908: The Podosomata (= Pycnogonida) of the temperate Atlantic and Arctic Ocean. *Journal of the Linnean Society of London (Zoology)* 30 : 198-238, 2 pls.
- PHILIPPI, A. 1843: Über die neapolitanischen Pycnogoniden. *Archiv für Naturgeschichte* (1) 9 : 175-182, 1 pl.
- RATHKE, J. 1799: Entomologische Jagttagelser. *Skrifter af Naturhistorie-Selskabet, Kjøbenhavn* 5(1) (4) : 191-207, pl. 5.
- SABINE, E. 1824: Marine Invertebrate Animals. Pp 219-240 in Supplement to the Appendix of Captain Perry's voyage for the discovery of a North-West passage in the years 1819-20. London.
- SARS, G.O. 1877: Prodromus descriptionis Crustaceorum et Pycnogonidarum, quae in expeditione norvegia anno 1876 observavit. *Archiv for Mathematik og Naturvidenskab, Kristiania* 2 : 237-271.
- SARS, G.O. 1888: Pycnogonida borealia et arctica enumerat Prodromus descriptionis). *Archiv for Mathematic og Naturvidenskab, Oslo* 12 : 339-356.
- SARS, G.O. 1891: Pycnogonidea. *Norwegian North-Atlantic Expedition 1876-1878*, 6 (*Zoology* 20) : 1-163, pls 1-15, 1 map.
- SCHIMKEWITSCH, W. 1893: Report on the dredging operations off the West Coast of Central America to the Galapagos, to the West Coast of Mexico, and in the Gulf of California, in charge of Alexander Agassiz, carried on by the U.S. Fish Commission Steamer *Albatross*, during 1891, Lieut. Commander Z.L. Tanner, U.S.N., commanding. *Compte rendu sur les Pantopodes recueillis pendant les Explorations de l'Albatross en 1891. Bulletin of the Museum of Comparative Zoology, Harvard* 25 : 27-43, 1 pl.
- SCHIMKEWITSCH, W. 1930: [Pycnogonida (Pantopoda).] *Fauna S.S.S.R. Izvestiya Akademii Nauk SSSR, Part 2* : 225-555, pls 5-10. [In Russian and Latin.]
- STOCK, J.H. 1953: Redescription of some of Helfer's pycnogonid type-specimens. *Beaufortia* 4(35) : 33-45.
- STOCK, J.H. 1954: Pycnogonida from Indo-West Pacific, Australian, and New Zealand Waters. Papers from Dr. Th. Mortensen's Pacific Expedition 1914-1916. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn* 116 : 1-168.
- STOCK, J.H. 1955: Pycnogonida from the West Indies, Central America and the Pacific Coast of North America. Papers from Dr. Th. Mortensen's Pacific Expedition 1914-1916. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn* 117 : 20-266.
- STOCK, J.H. 1956a: Tropical and subtropical Pycnogonida, chiefly from South Africa. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn* 118 : 71-113.
- STOCK, J.H. 1956b: Pantopoden aus dem Zoologischen Museum Hamburg, 1 (= IV-VI). *Mitteilungen aus dem Zoologischen Museum in Hamburg* 55 : 81-106.
- STOCK, J.H. 1957: The pycnogonid family Austrodecidae. *Beaufortia* 6(68) : 1-81.
- STOCK, J. H. 1958: The pycnogonid genus *Rhopalorhynchus* Wood-Mason, 1873. *Tijdschrift voor Entomologie* 101 : 113-137.
- STOCK, J.H. 1963: South African deep-sea Pycnogonida, with descriptions of five new species. *Annals of the South African Museum* 46(12) : 321-340.
- STOCK, J.H. 1965: Pycnogonida from the southwestern Indian Ocean. *Beaufortia* 13(151) : 13-33.
- STOCK, J.H. 1966: Pycnogonida. Campagne de la *Calypso* au large des côtes atlantiques de l'Amérique du sud (1961-62). *Résultats scientifiques de la Campagne de la Calypso* 7. In : *Annales de l'Institut Océanographique, Monaco* 44 : 385-406.
- STOCK, J.H. 1968: Pycnogonida collected by the *Galathea* and *Anton Bruun* in the Indian and Pacific Oceans. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn* 131 : 7-65.
- STOCK, J.H. 1973: Pycnogonida from south-eastern Australia. *Beaufortia* 20(266) : 99-127.
- STOCK, J.H. 1975: Pycnogonida from the continental shelf, slope, and deep sea of the tropical Atlantic and East Pacific. Biological results of the University of Miami deep-sea expeditions, 108. *Bulletin of Marine Science* 24 : 957-1092.
- STOCK, J.H. 1978: Abyssal Pycnogonida from the North-eastern Atlantic Basin, Part II. *Cahiers de Biologie marine* 19 : 397-413.
- STOCK, J.H. 1979: *Anoplodactylus ophiurophilus* n. sp., a sea spider associated with brittlestars in the Seychelles. *Bijdragen tot de Dierkunde [Contributions to Zoology, Amsterdam]* 48 : 156-160.
- STOCK, J.H. 1981a: 13. Pycnogonides, I: *Pycnosomia astrophila*, a sea spider associated with the starfish *Calliaster* from the Philippines. In : *Résultats des Campagnes Musorstom 1. Mémoires ORSTOM, Paris*, 91 : 309-312.
- STOCK, J.H. 1981b: Abyssal Pycnogonida from the Walvis Basin, Southern Atlantic. *Cahiers de Biologie marine* 22 : 453-474.

- STOCK, J.H. 1984: Deep-water Pycnogonida of the INCAL, BIOGAS, GEOMANCHE and SAFARI Cruises. *Journal of the Marine Biological Association of the United Kingdom* 64 : 743-749.
- STOCK, J.H. 1986: Pycnogonida from the Caribbean and the Straits of Florida. Biological Results of the University of Miami Deep-sea Expeditions. *Bulletin of Marine Science* 38 : 399-441.
- STOCK, J.H. 1991a: Deep-water Pycnogonida from the surroundings of New Caledonia. In Crosnier, A. (ed.) *Résultats des Campagnes MUSORSTOM, 8. Mémoires du Muséum national d'Histoire Naturelle* 151 : 125-212.
- STOCK, J.H. 1991b: Pycnogonida of the MUSORSTOM campaigns to the Philippines. In Crosnier, A. (ed.) *Résultats des Campagnes MUSORSTOM, 8. Mémoires du Muséum national d'Histoire Naturelle* 151 : 213-228.
- STOCK, J.H. 1994: Indo-West Pacific Pycnogonida collected by some major oceanographic expeditions. *Beaufortia* 44 : 17-77.
- THOMPSON, W.D. 1909: Pycnogonida. Pp 501-542 in Harmer, S.F.; Shipley, B.E. (eds) *The Cambridge Natural History*. Macmillan, London.
- THOMSON, G.M. 1884: On the New Zealand Pycnogonida, with descriptions of new species. *Transactions and Proceedings of the New Zealand Institute* 16 : 242-248, pls 14-16.
- TURPAEVA, E.P. 1955: [New species of sea spiders (Pantopoda) from the Kurile-Kamchatka trench.] *Trudy Instituta Okeanologii P.P. Shirshov, Akademiya Nauk SSSR* 12 : 323-327. [In Russian]
- TURPAEVA, E.P. 1973: [Pantopoda from the Northeast Pacific Ocean.] *Trudy Instituta Okeanologii P.P. Shirshov, Akademiya Nauk SSSR* 91 : 178-191. [In Russian]
- TURPAEVA, E.P. 1974: [The pycnogonida of the Scotia Sea and surrounding waters.] *Trudy Instituta Okeanologii P.P. Shirshov Akademiya Nauk SSSR* 98 : 227-305. [In Russian]
- TURPAEVA, E.P. 1991: Pantopods (Pycnogonida) from the shelf of south-eastern Africa and surrounding waters. *Zoologicheskii Zhurnal* 70 : 33-43.
- TURPAEVA, E.P. 1992: Pantopods (Pycnogonida) collected off the southeast African Shelf and surrounding waters. *Hydrobiological Journal* 3 : 84-96.
- UTINOMI, H. 1959: Pycnogonida of the Japanese Antarctic Research Expeditions 1956-1958. Biological Results of the Japanese Antarctic Research Expeditions, 8. *Special Publications from the Seto Marine Biological Laboratory* : 1-12.
- WILSON, E.B. 1878a: Descriptions of two new genera of Pycnogonida. *American Journal of Science and Arts* 15(87) : 200-203.
- WILSON, E.B. 1878b: Synopsis of the Pycnogonida of New England. *Transactions of the Connecticut Academy of Arts and Sciences* 5 : 1-26.
- WILSON, E.B. 1881: Report on the Pycnogonida. Reports on the results of dredging ... *Blake. Bulletin of the Museum of Comparative Zoology, Harvard* 8 : 239-256, pls 1-4.

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