

The Pycnogonida of subantarctic Marion and Prince Edward Islands: Illustrated keys to the species

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The Pycnogonida of Marion and Prince Edward Islands were sampled over the period 1973-1989 by dredging, scuba-diving and intertidal surveys undertaken by the University of Cape Town and in 1976 deep water sampling by the French vessel Marion-Dufresne campaign MD.08. This paper comprises illustrated keys for the identification of the 17 species of Pycnogonida recorded from the area. Of these, 14 are new records for the area and one, still unidentified, a presumed new species. The bathymetric range and geographical distribution of the species are outlined.

Die Pycnogonida van Marion- en Prins Edward-eiland is gemonster gedurende die tydperk 1973-1989, deur baggerwerk, onderwaterduik en tussengetyopnames deur die Universiteit van Kaapstad en in 1976 deur diepwatermonsterneming van die Franse skip Marion-Dufresne-veldtog MD.08. Die artikel bevat geïllustreerde sleutels vir die identifikasie van 17 spesies Pycnogonida wat in die gebied opgeteken is. Van hierdie 17 is 14 nuut aangeteken vir die gebied en een nog ongeïdentifiseer, vermoedelik 'n nuwe spesie. Die batimetrie reikwydte en geografiese verspreiding van die spesies word in hooftrekke beskryf.

Introduction

Marion and Prince Edward Islands are remote islands belonging to the same subantarctic province as the Crozet archipelago. Their geographical positions are 46°54'S — 37°45'E for Marion and 46°38'S — 37°57'E for Prince Edward. Both islands are emerged summits of volcanoes originating from the mid-Atlantic ridge.

Among the expeditions that have collected pycnogonids in waters lying around the Prince Edward Islands, the oldest is the *Challenger* in 1873-1876, with Hoek's (1881) descriptions providing a basis for all subsequent work. The 1976 *Marion-Dufresne* campaign MD.08 undertook a dense benthic survey (Arnaud and Hureau, 1979). South African research began with land-based surveys of the intertidal and shallow benthos (Fuller, 1967 and de Villiers, 1976) and, in 1989, was extended subtidally by quantitative scuba-sampling at depths of five, ten and 15 meters (Beckley & Branch 1992). Extensive offshore dredging from the SA *Agulhas* over the period 1984-1989 sampled 57 stations between 32 and 775 meters, (GM Branch *et al* 1992); 27 samples yielded pycnogonids sent to one of us (FA) for identification.

The primary aims of this paper are to document the pycnogonid material and to present keys for the identification of all species thus far collected at the Prince Edward Islands.

Systematic List of Species

* = New records for the Marion and Prince Edward Islands

Phylum Pycnogonida

Depth
Range at
Prince
Edward
Is (m)

Family Ammotheidae

- * *Cilunculus kravcovi* Pushkin, 1973 360-376
- Tanystylum cavidorsum* Stock, 1957b 0-5
- * *Tanystylum neorhetum* Marcus, 1940 95-190
- * *Tanystylum oedinotum* Loman, 1923 13
- * *Tanystylum ornatum* Flynn, 1928 410-560

Family Austrodecidae

- * *Pantopipetta australis* (Hodgson, 1914) 680-715
- Austrodecus elegans* Stock, 1957a 51-606
- * *Austrodecus goughense* Stock, 1957a 42-90
- * *Austrodecus tristanense* Stock, 1957a 10-70

Family Callipallenidae

- * *Pseudopallene glutus* Pushkin, 1975 570-315

Family Pycnogonidae

- * *Pycnogonum platylophum* Loman, 1923 335-375

Family Colossendeidae

- Colossendeis megalonyx megalonyx* Hoek, 1881 220-488

Family Endeidae

- * *Endeis viridis* Pushkin, 1976 120-185

Family Rhynchothoracidae

- * *Rhynchothorax australis* Hodgson, 1907 224-232

Family Nymphonidae

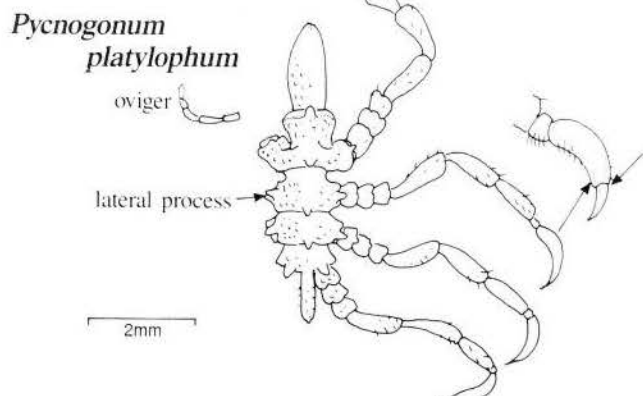
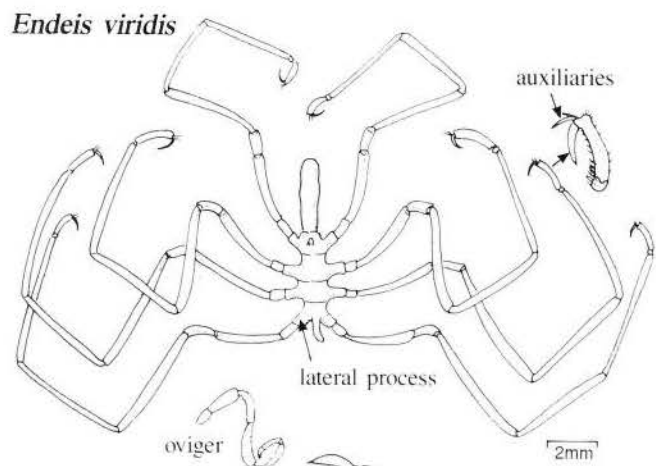
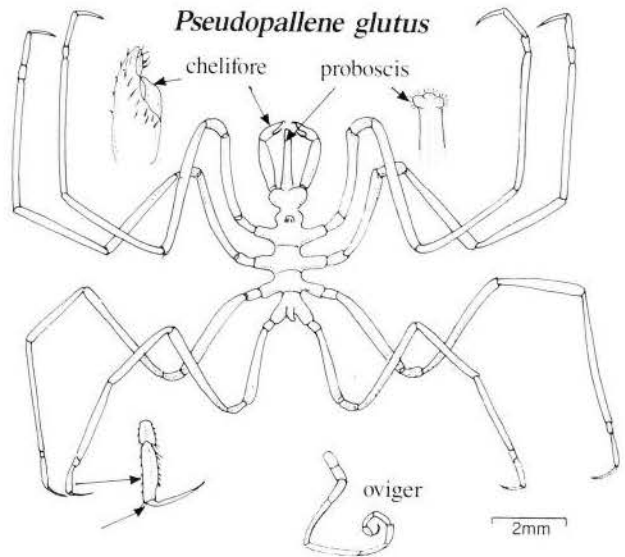
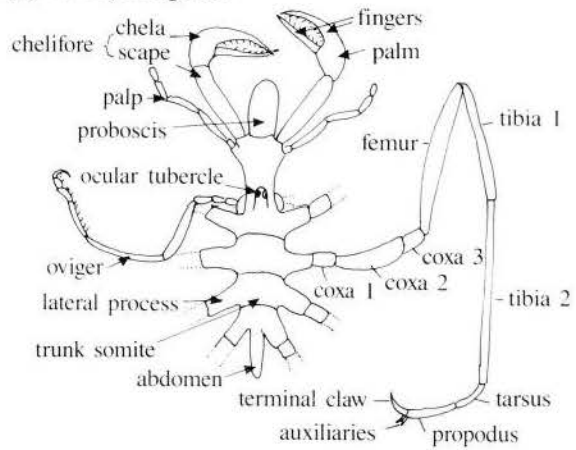
- * *Nymphon gracilipes* Miers, 1875 110-460
- * *Nymphon longicoxa* Hoek, 1881 570-315
- * *Nymphon* sp. SAM A40589 & SAM A40590 355-420

Pycnogonida of Marion and Prince Edward Islands

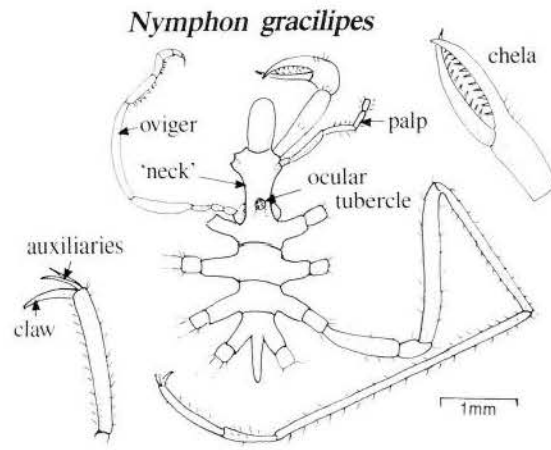
Key to the species

- 1 Palp absent. 2
- Palp present. 4
- 2 Chelifores present, functional, scape 1-jointed, fingers robust without teeth; proboscis conical with a distal fringe; legs long, without auxiliaries. *Pseudopallene glutus* Pushkin, 1975
- Chelifores absent. 3
- 3 Lateral processes of trunk segments well separated; proboscis as long as trunk, cylindrical; ocular tubercle low-rounded; legs long and with long auxiliaries. *Endeis viridis* Pushkin, 1976
- Lateral processes of trunk segments almost touching; proboscis short, conical; legs short and stout, without auxiliaries. *Pycnogonum platylophum* Loman, 1923
- 4 Chelifores present 5
- Chelifores absent 11
- 5 Chelifores strong, functional, scape 1-jointed; palp 5-segmented with second segment the longest; leg 2nd tibia the longest. 6
- Chelifores vestigial or occasionally developed. 7

Typical Pycnogonid

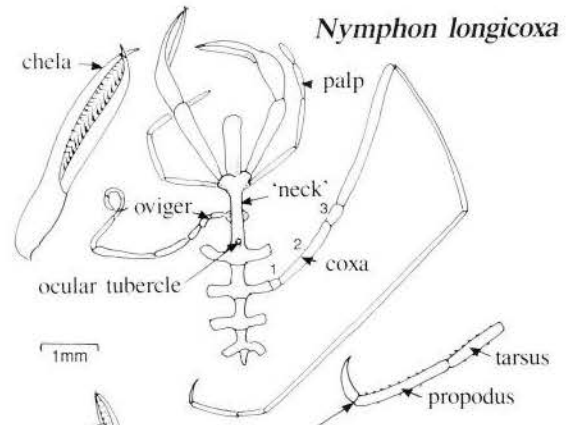


- 6 Short "neck" with ocular tubercle situated just in front of first lateral processes; oviger base inserted ventrally at level of ocular tubercle; chelifore, fingers armed with 9-22 spinules; legs hairy, auxiliaries present, longer than half claw length.
Nymphon gracilipes Miers, 1875



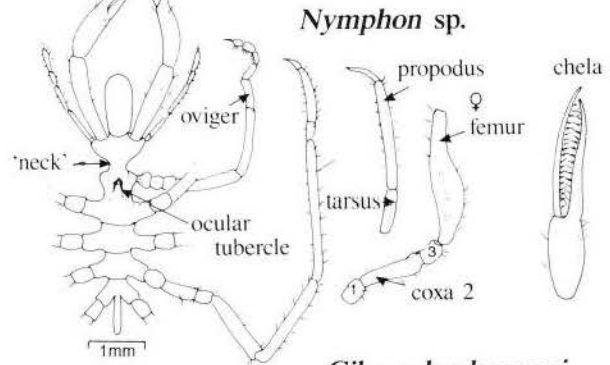
Long slender "neck" with ocular tubercle inserted just in front of first lateral processes; oviger base inserted midway between the first lateral processes and anterior cephalic lobe; fingers armed with about 100 spinules; legs long, glabrous with 2nd coxae four times as long as 1st and 3rd coxae; tarsus half propodus, short arched claw, no auxiliaries; trunk slender; abdomen shorter than fourth trunk segment.

Nymphon longicoxa Hoek, 1881



(The unidentified *Nymphon* sp. SAM A40589 and SAM A40590 had a short broad "neck" with the ocular tubercle inserted just in front of first lateral processes; oviger base inserted midway between the first lateral processes and anterior cephalic lobe; chelifore, fingers armed with about 25 spinules; legs, short, hairy, 2nd coxa less than three times as long as 1st and 3rd coxae, tarsus less than half propodus, claw short, no auxiliaries; trunk broad; abdomen longer than trunk segments.)

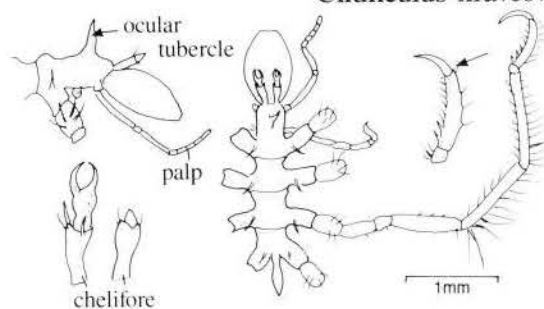
- 7 Trunk elongate, lateral processes well separated with 1 long dorsal seta near base of each process; chelifores, few developed into a small chela, others vestigial; proboscis bulbous; ocular tubercle pointed, slender, lacking eyes; legs with long hairs.
Cilunculus kravcovi Pushkin, 1973



Trunk discoid, segments coalesced; chelifores very small consisting of a single article; ocular tubercle with 4 eyes; medium-sized species.

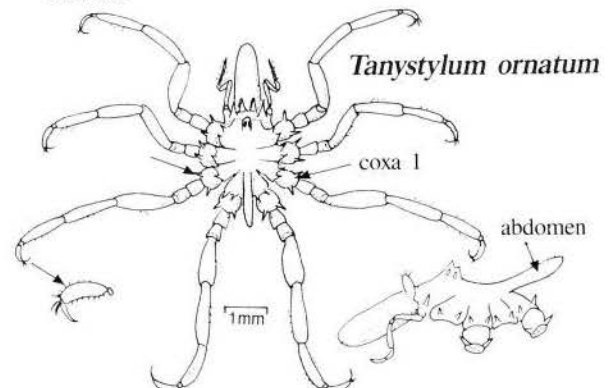
..... 8

- 8 A "horn" on anterior corners of cephalon and on the corners of all lateral processes and 1st coxae; abdomen very long, obliquely upturned.
Tanystylum ornatum Flynn, 1928

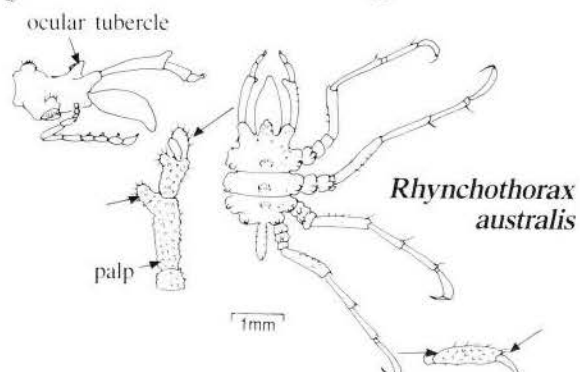
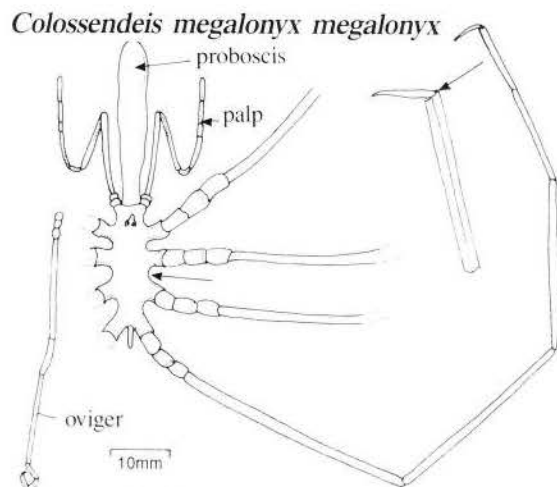
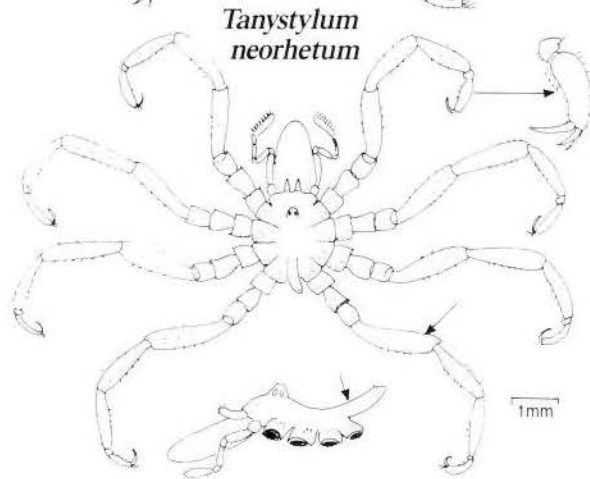
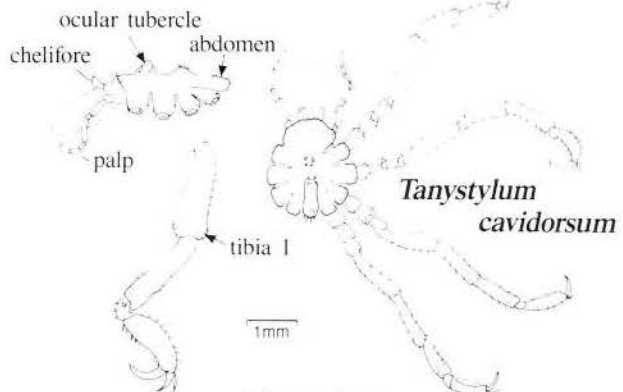
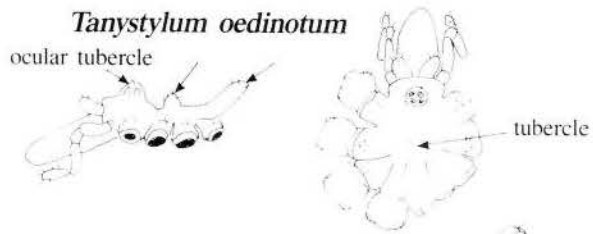


Absence of "horns" on lateral processes, which are touching.

..... 9



- 9 Trunk with a distinct mid-dorsal setiferous tubercle, equal to or higher than the ocular tubercle.
Tanystylum oedinotum Loman, 1923
- Absence of a distinct mid-dorsal tubercle.
..... 10
- 10 Abdomen horizontal, setose anteriorly and posteriorly; legs spinulose with a dorso-distal swelling on 1st tibia.
Tanystylum cavidorsum Stock, 1957b
- Abdomen erect, higher than ocular tubercle, legs robust, finely setose.
Tanystylum neorhetum Marcus, 1940
- 11 Large glabrous species; legs up to 80 mm, devoid of auxiliaries; body 20 mm long, lateral processes separated by about their diameter; palp 9-segmented; proboscis longer than trunk, with broadly rounded tip.
Colossendeis megalonyx megalonyx Hoek, 1881
- Minute species, body less than 5 mm long, poorly setose.
..... 12
- 12 Proboscis conical; trunk oval, 3-segmented with 3 columnar mid-dorsal tubercles; ocular tubercle stout, bent above the proboscis.
Rhynchothorax australis Hodgson, 1907.
- Proboscis pipette-shaped.
..... 13



- 13 Lateral processes smooth; legs, 1 ventral spine on all 1st coxae and 1 dorsal spine on all 3rd coxae; ocular tubercle verticle, sharp, conical, lacking eyes; legs with no auxiliaries.

Pantopipetta australis (Hodgson, 1914).

Ocular tubercle bent forwards, with 4 eyes at the tip.
..... 14

- 14 Ocular tubercle short, obtuse; trunk robust with 4 tall mid-dorsal spurs (often broken); legs robust with long auxiliaries (about half claw length); 1st coxa with one spur on 1st legs and 2 spurs on legs 2 to 4; in male the cement gland is a mound in the proximal part of femur.

Austrodecus tristanense Stock, 1957a
(= *A. kelpi* Pushkin, 1977 from South Georgia)

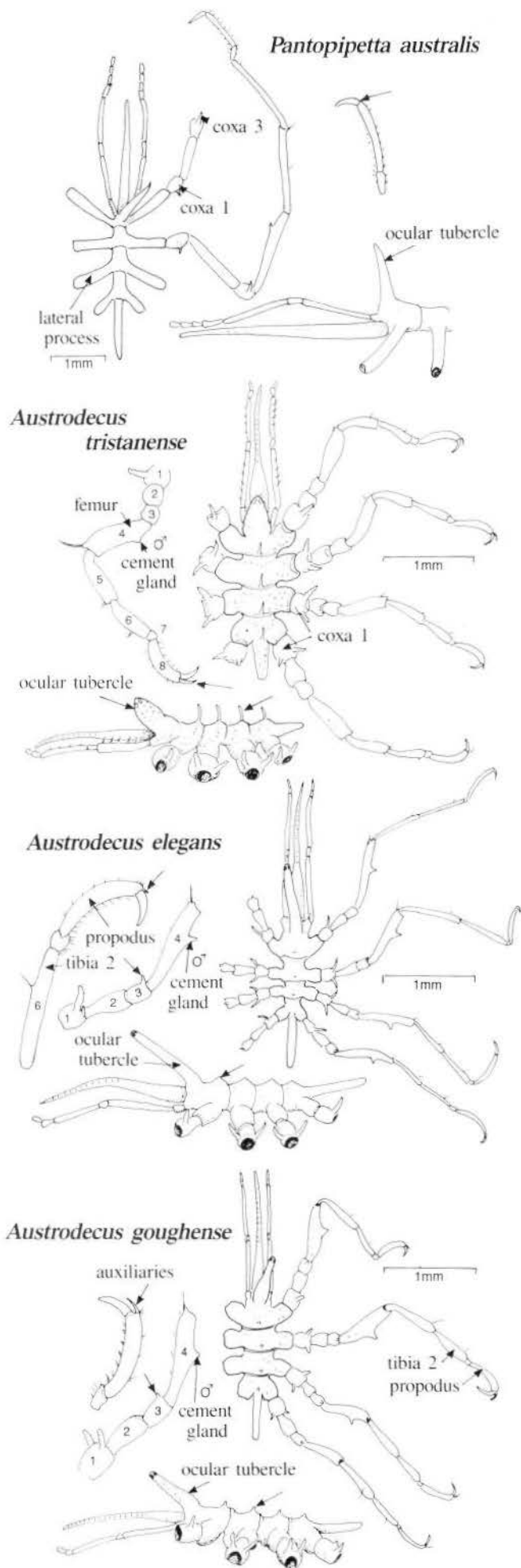
Ocular tubercle long.
..... 15

- 15 Ocular tubercle very long; trunk, no dorsal processes; abdomen slender; legs long, with second tibia longer than propodus, minute auxiliaries; high processes on first coxae (one on legs 1 and 4, two on legs 2 and 3) and one small digitation on third coxae; male, cement gland is a strong cone in the mid-ventral part of femur.

Austrodecus elegans Stock, 1957a

Ocular tubercle moderately long; trunk with feeble mid-dorsal spurs; abdomen long; high processes on first coxae (one on leg 1, two on legs 2 and 3 and a large and small process on leg 4) and a small tubercle on 3rd coxae; legs long, auxiliaries one-third claw length; male, cement gland is a strong cone on the mid-ventral part of femur.

Austrodecus goughense Stock, 1957a



Results and Discussion

The pycnogonid fauna of Marion and Prince Edward known to date is represented by 16 species plus one unnamed *Nymphon* sp. The littoral species are *Tanystylum cavadorsum* and *T. oedinotum*, while the shelf inhabitants are *T. neorhetum*, *Austrodecus goughense*, *A. tristanense*, *Endeis viridis* and *Nymphon gracilipes*. Below 200 m, the bathyal species are represented by *Cilunculus kravcovi*, *Tanystylum ornatum*, *Pantopipetta australis*, *Pseudopallene glutus*, *Pycnogonum platylophum*, *Colossendeis megalonyx megalonyx*, *Rhynchothorax australis* and *Nymphon longicoxa*. The most common species, *Austrodecus elegans*, ranged from 50-510 m. It is to be noted that none of Hoek's species of abyssal *Colossendeis* was dredged or trawled in the present collections as sampling did not exceed 880 m in depth. They are not considered to be part of the Prince Edward Islands' fauna as they were collected far from the islands, at great depths, between Marion and Crozet Islands.

The geographic distribution of these species and their depth range in the localities from which they were first recorded are summarised below. The large family Ammonotheidae is curiously only represented by two genera here, *Cilunculus* and *Tanystylum*. *Cilunculus kravcovi* was described from Crozet Islands, (255-309 m) (Pushkin 1973). *Tanystylum cavadorsum* from South Georgia (26 m) and *T. oedinotum* from Falkland Islands (22 m) are newly recorded at the Marion group as is the curious *T. ornatum* which was previously only known from South Africa (Flynn 1928). On the contrary, *T. neorhetum* is widely dispersed around Kerguelen, Macquarie, South Georgia, Tierra del Fuego, Bouvet, Gough, Tristan da Cunha and Auckland, always in littoral depths (Arnaud 1972 & Clark 1977).

The family Austrodecidae, which only has two genera, is represented by four species; *Austrodecus elegans* known from North of Marion at 99-113 m, *A. goughense* from Gough at 102-141 m, *A. tristanense* from Tristan at 0-55 m (Stock 1957a), and *Pantopipetta australis* occurs abyssally in Antarctic waters (2450-3725 m) (Hedgpeth & McCain 1971). This last species was found at the greatest depths sampled around Marion and Prince Edward occurring at 680-715 m.

The Callipallenidae is a rich family in tropical waters but is represented by one species only; *Pseudopallene glutus* was described originally from Crozet Islands, (320 m) (Pushkin 1975), with new records from Crozet at 150-187 m in the *Marion Dufresne* samples. The family Pycnogonidae has 50 species belonging to the genus *Pycnogonum*, but it is represented here by only one species, *Pycnogonum platylophum*, already known from Tierra del Fuego (78 m), East Antarctica (640 m), and Crozet (littoral), Falkland (130 m) and Macquarie (littoral to 69 m) Islands (Fry & Hedgpeth, 1969 & Arnaud 1970).

The family Colossendeidae has a large number of species in antarctic and subantarctic waters where *Colossendeis megalonyx megalonyx* has been reported from 7 to 5 000 m. It also occurs below 3 000 m at North Madagascar (Arnaud & Bamber, 1987). The family Endeidae is monogeneric and *Endeis viridis* is the only

subantarctic species recorded from Marion Island. First recorded at Kerguelen (150-377 m, 3-30 m and 59 m) (Pushkin 1976) it is also found at Crozet Islands. Three species represent the large genus *Nymphon* (family Nymphonidae) which contains many cold-adapted inhabitants, *N. gracilipes* shows a large bathymetrical range between shelf and abyssal depths down to 3 000 m, while *N. longicoxa* is reported as "cold antarctic" from 318 to 2 578 m (Child 1982). The newly recorded *Nymphon* sp. was collected south-west of Prince Edward Island in depths of 355-420 m.

The Rhynchothoracidae is a homogeneous family based on the genus *Rhynchothorax* with one species, *R. australis* dredged from 200 to 400 m in East antarctic waters, and from 138 to 275 m in the Crozet archipelago (unpublished data).

Finally, 14 of these 17 species are new to the Marion and Prince Edward group and pycnogonids are an important component of their benthic fauna. They represent a non-negligible part of the animal biomass, with values of 10 mg m⁻² (dry weight) and a maximum density of 14 *Tanystylum cavadorsum* per square meter (Arnaud & Bamber, 1987). A useful comparison could be done with the South African pycnogonid fauna proper, as updated by Arnaud & Child (1988).

The material from the 1982-1989 surveys of the University of Cape Town and representative samples of the MD.08 campaign are housed in the South African Museum, Cape Town. The MD.08 collection of the *Marion Dufresne* is housed at Station Marine d'Endoume, Marseille.

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