



AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITIONS

# ANARE RESEARCH NOTES 11

A guide to the Decapoda of the Southern Ocean

John M. Kirkwood

ANTARCTIC DIVISION  
DEPARTMENT OF SCIENCE AND TECHNOLOGY

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A N A R E

R E S E A R C H

N O T E S

11

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Species found south of the Subtropical Convergence will be dealt with in detail. Those occurring in more northerly waters but likely to be encountered on Antarctic voyages are included in identification keys.

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A GUIDE TO THE DECAPODA OF THE SOUTHERN OCEAN

by

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ABSTRACT

A guide to the Decapoda of the Southern Ocean is presented, with emphasis on those species which have been recorded south of the Antarctic Convergence. Despite being well represented in all other oceans the decapod fauna of Antarctic waters is depauperate, with only eleven species having been reported from south of the Antarctic Convergence (Petalidium foliaceum, Notocrangon antarcticus, Pasiphaea longispina, Pasiphaea scotiae, Nematocarcinus longirostris, Nematocarcinus lanceopes, Hymenodora gracilis, Chorismus antarcticus, Lebbeus antarcticus, AcanthePHYra pelagica and Paralomis spectabilis). Species found in the subantarctic waters north of the Convergence are also included in the key as their ranges may overlap with those of the Antarctic species. A key is also provided to the larvae of decapod families which are known to have Antarctic representatives. Short descriptions, with figures and records of occurrence, are presented for each of the eleven Antarctic species to enable the reader to confirm identifications from the keys. A glossary of technical terms has also been compiled.



## 1. INTRODUCTION

The order Decapoda includes those crustaceans which are best known such as the shrimps, prawns, crabs and lobsters. The diagnostic features of the Decapoda are as follows:

1. Carapace well developed and fused with all thoracic segments.
2. Eyes stalked.
3. Peduncle of second antenna composed of two segments.
4. No thoracic brood chamber.
5. First three pairs of thoracic appendages modified as maxillipeds.
6. Remaining five pairs of thoracic appendages usually act as legs.
7. Usually with statocyst in peduncle of antennule.
8. Sides of carapace overhang to enclose gills in well developed branchial chambers.

The Decapoda consists of two suborders, the Natantia (shrimps and prawns) and the Reptantia (crayfish, lobsters, hermit crabs and crabs). The external morphology of each of these two suborders is shown in Figures 1 and 2 respectively. As the structure of the mouthparts and the thoracic legs are important in Decapod taxonomy generalised representations of these appendages are shown in Figures 3 and 4.

Despite being the largest order within the Class Crustacea, containing about one third of all known species (Barnes 1974), the Decapoda is very poorly represented in Antarctic waters. The great majority of the Decapods found off Antarctica are deep-water prawns although two of the eleven species, Notocrangon antarcticus and Chorismus antarcticus, have been recorded from inshore areas (Yaldwyn 1965). There is a single record of a deep-water anomuran crab, Paralomis spectabilis, from Antarctic waters (Birshtein and Vinogradov 1966) but true crabs (Brachyura), crayfish, lobsters and hermit crabs are completely absent from the region. Several groups absent from Antarctica are present in Arctic seas (Yaldwyn 1965) under similar environmental conditions. To date there has been no satisfactory explanation for the depauperate Decapod fauna of the Antarctic.

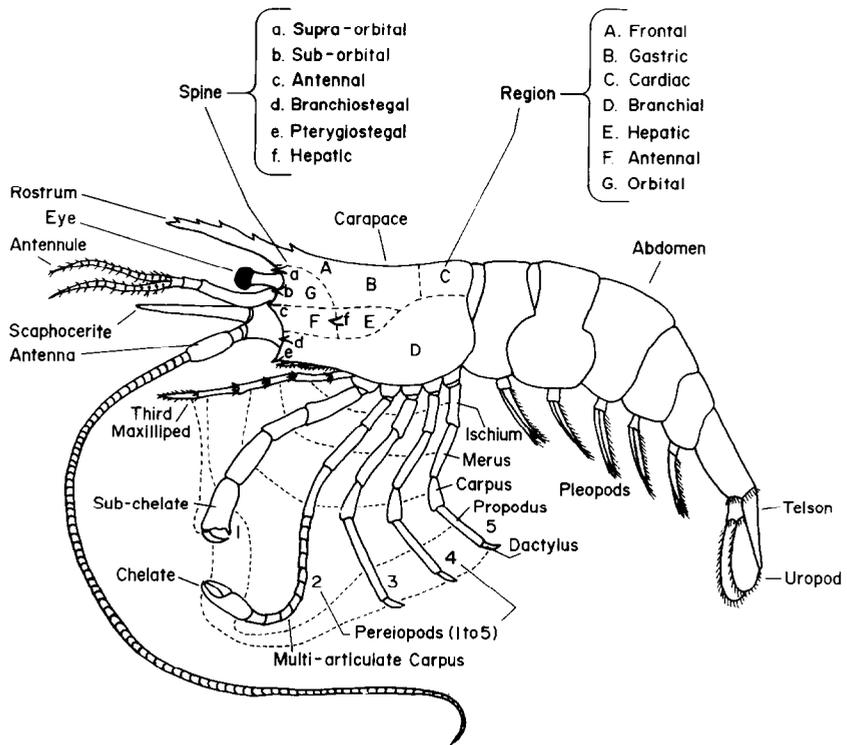


Figure 1. Generalised natant decapod (after Bate 1888; Kensley 1972 and Wadley 1978).

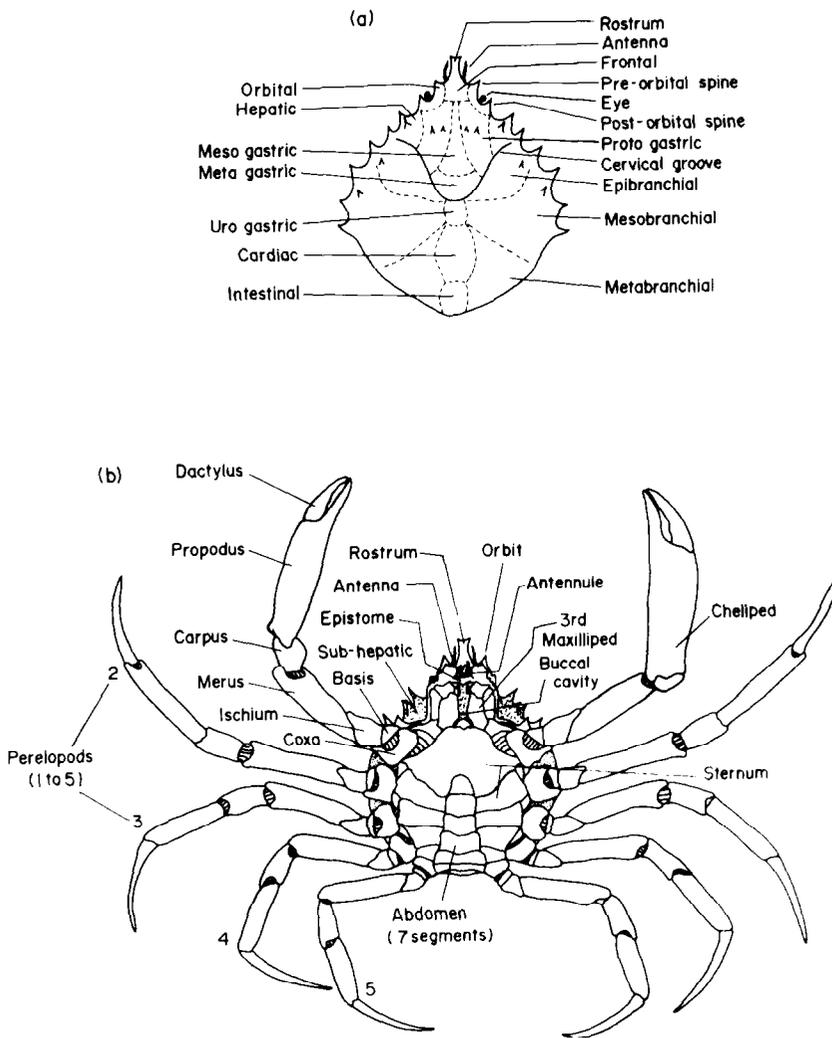


Figure 2. Generalised reptant decapod; (a) dorsal view, (b) ventral view; (after Rathbun, 1925).

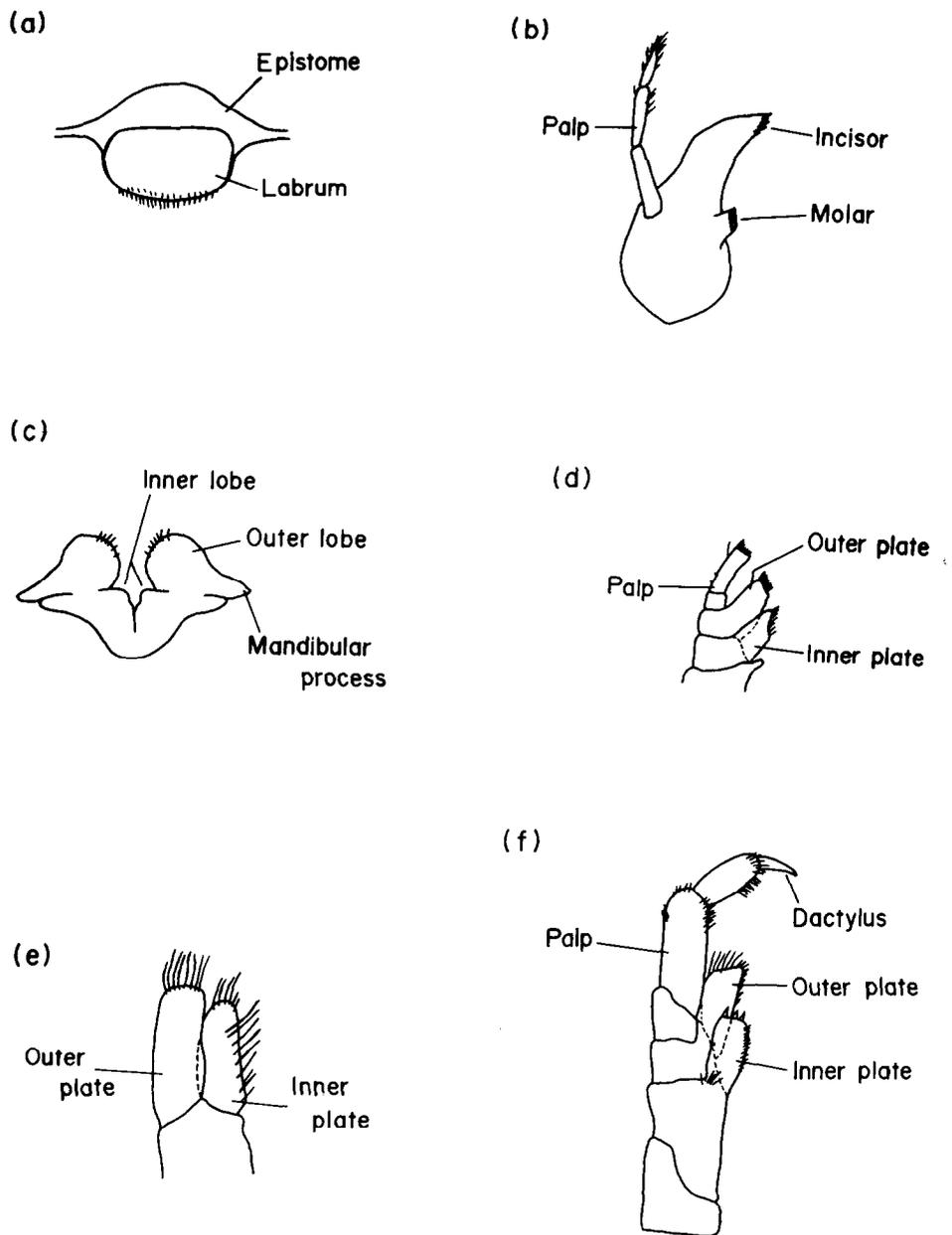


Figure 3. Generalised decapod mouthparts; (a) upper lip, (b) mandible, (c) lower lip, (d) maxilla 1, (e) maxilla 2, (f) maxilliped.

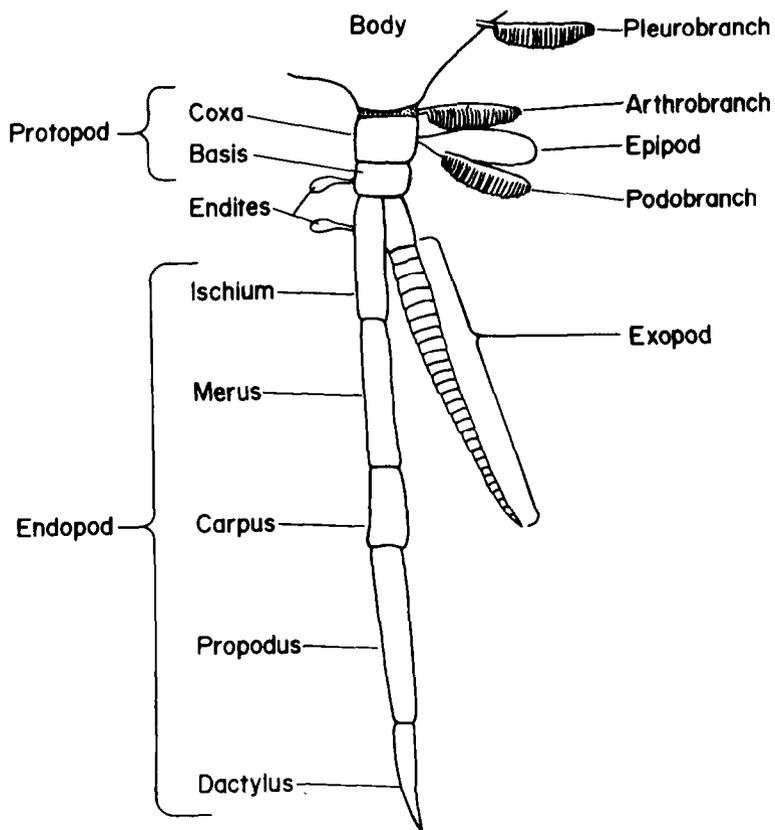


Figure 4. Generalised decapod thoracic appendage.

2. KEY TO THE SPECIES OF SOUTHERN OCEAN DECAPODS

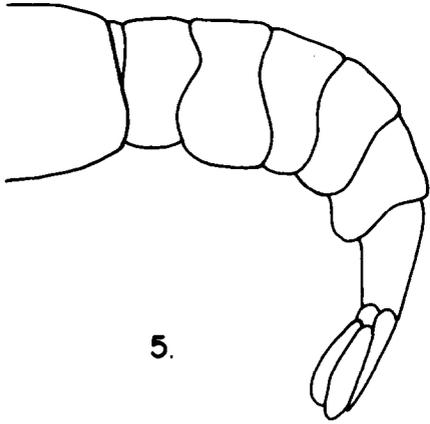
- 1a) Body laterally compressed. Well developed rostrum. Any one of the first three pereiopods may be large and chelate, others small and slender. Pleopods well developed and natatory (Figure 1) ..... Sub-order Natantia... Key A
- b) Body not laterally compressed, frequently dorso-ventrally compressed. Rostrum depressed. First pereiopod usually large and chelate, second and third pereiopods never heavier than the first. Pleopods, when present, not developed for swimming (Figure 2) ..... Sub-order Reptantia... Key B

KEY A: SUB-ORDER NATANTIA (Shrimps and Prawns)

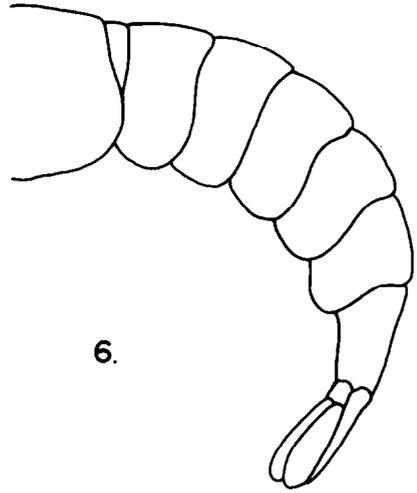
- 1a) Pleura of second abdominal segment overlapping that of the first (Figure 5). Third pereiopod never chelate .....Section Caridea... 3
- b) Pleura of second abdominal segment not overlapping that of the first (Figure 6). Third pereiopod usually chelate ...Section Penaeidea... 2
- 2a) Fourth and fifth pereiopods well developed. First pereiopod chelate ..... Family Penaeidae
- b) Fourth and fifth pereiopods reduced or absent. First pereiopod not chelate .....Family Sergestidae... Petalidium foliaceum\*
- 3a) First pereiopod sub-chelate (Figure 7) ..... Family Crangonidae... 4
- b) First pereiopod either chelate or simple (Figures 8, 9) ..... 8
- 4a) Second pereiopod much shorter than others ... Pontophilus sp. .... 5
- b) Second pereiopod sub-equal to the others ..... 7
- 5a) Rostrum acute (Figure 10) ..... Pontophilus acutirostris
- b) Rostrum broad. (Figures 11, 12) ..... 6
- 6a) Tip of rostrum wide and squarish in dorsal view (Figure 11) ..... Pontophilus yaldwyni
- b) Tip of rostrum rounded in dorsal view (Figure 12) ..... Pontophilus pilosoides
- 7a) Rostrum long and slender. Antennular peduncle slender ..... Notocrangon antarcticus\*
- b) Rostrum a short spine. Antennular peduncle reduced ..... Crangon villosus

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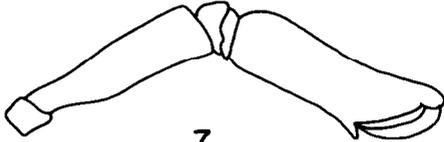
\* These species have been recorded south of the Antarctic Convergence.



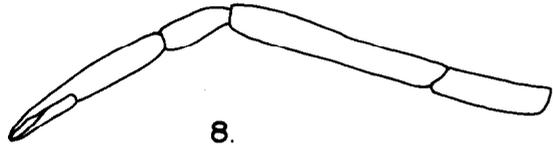
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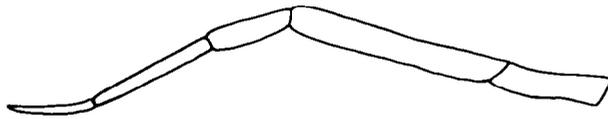
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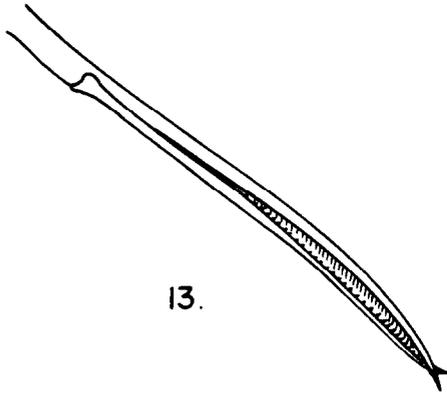


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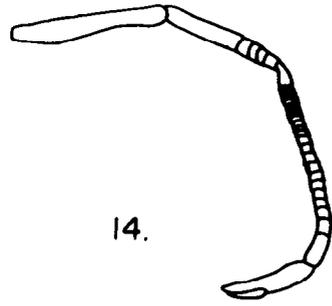
8a) Cutting edges of all chelae pectinate (Figure 13) .....Family Pasiphaeidae...	9
b) Cutting edges of all chelae are not pectinate, or chelae absent .....	12
9a) Mandible without palp. Rostrum, if present, rising from a dorsal carina on the carapace ... ..... <u>Pasiphaea</u> sp....	10
b) Mandible with palp. Rostrum normal, formed as a prolongation of the anterior end of the carapace	<u>Parapasiphaea sulcatifrons</u>
10a) Carina of carapace not produced beyond eyes ....	<u>Pasiphaea rathbunae</u>
b) Carina of carapace rises to form rostrum extend- ing beyond eyes .....	11
11a) First abdominal segment with mid-dorsal keel ...	<u>Pasiphaea longispina*</u>
b) First abdominal segment without mid-dorsal keel.	<u>Pasiphaea scotiae*</u>
12a) Carpus of second pereopod usually sub-divided into at least two segments (Figure 14). If not, then first pereopod not chelate .....	13
b) Carpus of second pereopod not segmented. First pereopod with chela .....	21
13a) At least one of the first pair of pereopods with a distinct chela .....	14
b) Chelae of first pereopods either minute or absent .....Family Pandalidae...	<u>Austropandalus grayi</u>
14a) Eyes at least partially covered by orbital hoods of carapace (Figure 15) .....	Family Alpheidae
b) Eyes free of carapace ... Family Hippolytidae ...	15
15a) Supra-orbital spine present (Figure 16) .....	16
b) Supra-orbital spine absent (Figure 17) .....	17
16a) Carpus of second pereopod seven segmented .....	<u>Lebbeus antarcticus*</u>
b) Carpus of second pereopod three segmented .....	<u>Tozeuma novae-zealandiae</u>
17a) Mandibular palp two segmented .....	<u>Eualus dozei</u>
b) Mandibular palp three segmented .....	18
18a) Sixth abdominal segment twice as long as the fifth ... <u>Chorismus</u> sp. ....	19
b) Sixth abdominal segment only slightly longer than the fifth ... <u>Nauticaris</u> sp. ....	20
19a) Carpus of second pereopod nine segmented. First segment of mandibular palp shorter than the second .....	<u>Chorismus tuberculatus</u>
b) Carpus of second pereopod eleven or twelve segmented. First segment of mandibular palp not shorter than the second .....	<u>Chorismus antarcticus*</u>

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\* These species have been recorded south of the Antarctic Convergence.



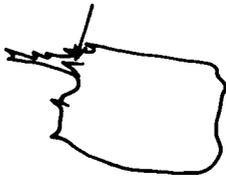
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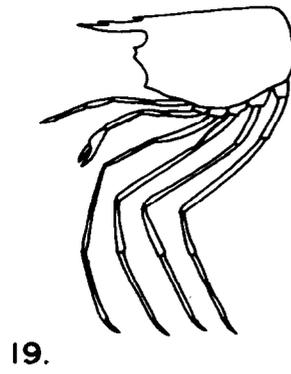
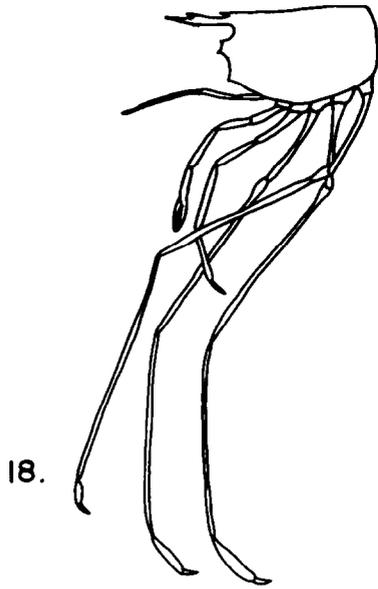


17.

20a) Third maxilliped with exopod .....	<u>Nauticaris magellanicus</u>
b) Third maxilliped without exopod .....	<u>Nauticaris marionis</u>
21a) Last three pereopods considerably longer than the first two (Figure 18) .....	Family <u>Nematocarcinidae</u> ... 22
b) Last three pereopods not longer than the first two (Figure 19) .....	23
22a) Rostrum longer than carapace, with at least 38 dorsal spines .....	<u>Nematocarcinus longirostris</u> *
b) Rostrum shorter than carapace, with 25 to 29 dorsal spines .....	<u>Nematocarcinus lanceopes</u> *
23a) All pereopods with well developed exopods ... .....	Family <u>Oplophoridae</u> ... 24
b) Pereopods without exopods .....	Family <u>Campylonotidae</u> ... 27
24a) Rostrum long and slender, reaching well beyond antennular peduncle .....	<u>Acanthephyra</u> sp.... 25
b) Rostrum short, not reaching beyond antennular peduncle .....	<u>Hymenodora gracilis</u> *
25a) Telson with four pairs of lateral spines .....	<u>Acanthephyra quadrispinosa</u>
b) Telson with seven to eleven pairs of lateral spines .....	26
26a) Rostrum almost straight, usually slightly longer than carapace, with its dorsal spines being more closely spaced posteriorly .....	<u>Acanthephyra haeckeli</u>
b) Rostrum curved upwards, equal to or slightly shorter than carapace, with its dorsal spines being similarly spaced along its length .....	<u>Acanthephyra pelagica</u> *
27a) Rostrum with four dorsal teeth. Abdomen armed dorsally with spines .....	<u>Campylonotus rathbunae</u>
b) Rostrum with at least five dorsal teeth. Abdomen dorsally unarmed .....	<u>Campylonotus capensis</u>

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\* These species have been recorded south of the Antarctic Convergence.



KEY B: SUB-ORDER REPTANTIA (Crabs and Lobsters)

- 1a) Third pereopods similar to the first. Abdomen extended and well developed, with large uropods and telson ..... Jasus lalandii
- .....Section Macrura...Family Palinuridae...
- b) Third pereopods dissimilar to the first. Abdomen usually reduced ..... 2
- 2a) Abdomen usually reduced, soft and twisted. May be flexed beneath thorax; if so then eyes medial to second antennae. Fifth pereopod reduced and turned upwards .....Section Anomura... 3
- b) Abdomen reduced and tightly flexed beneath thorax. Eyes usually lateral to second antennae. Fifth pereopods well developed ...Section Brachyura... 16
- 3a) Uropods present, well developed and natatory. Abdomen symmetrical ..... 4
- b) Uropods, if present, adapted for holding body in hollow objects, or for holding egg masses. Abdomen usually assymetrical ..... 7
- 4a) Abdomen folded upon itself .Family Galatheididae... 5
- b) Abdomen extended .....Family Callianassidae... Callianassa sp.
- 5a) Rostrum broad, dorsoventrally compressed, with lateral teeth. Abdomen dorsally unarmed ..... Galathea pusilla
- b) Rostrum long and slender, laterally compressed; unarmed, but with a well developed supra-orbital spine on either side of its base. At least one abdominal segment with spinules on its anterior margin .....Munida sp.... 6
- 6a) Carapace narrows in anterior third. Eyestalks short and directed forward ..... Munida subrugosa
- b) Carapace almost rectangular in dorsal view. Eyestalks long and directed sideways and slightly forward ..... Munida gregaria
- 7a) Abdomen flexed beneath thorax. Uropods absent. ....Family Lithodidae... 8
- b) Abdomen soft and usually twisted. Uropods, if present, adapted for holding body in hollow objects, or for holding egg masses ..... 12
- 8a) Rostrum divided into three spines. Gastric region of carapace with a large medial spine as well as several others .....Paralomis sp.... 9
- b) Rostrum long, with at least four spines. Gastric region of carapace with several large spines, but none of them medial .....Lithodes sp.... 11
- 9a) Body covered with small tubercules and a few prominent spines ..... Paralomis verrucosus
- b) Body covered with many spines of varying length, and a few small tubercules ..... 10

- 10a) Hind margin of carapace concave in dorsal view, chelae broad ..... Paralomis spectabilis\*  
 b) Hind margin of carapace convex in dorsal view, chelae slender ..... Paralomis aculeatus
- 11a) Eyestalk with distal ventral tubercule and spine partially covering the half-moon shaped cornea. Rostrum of male with mid-dorsal spine ..... Lithodes antarcticus  
 b) Eyestalk without distal ventral tubercule or spine, and with oblique cornea. Rostrum of male without mid-dorsal spine ..... Lithodes murrayi
- 12a) Gills hair-like, consisting of a central stem giving rise to two rows of flattened leaflets ... .....Family Paguridae... 13  
 b) Gills hair-like, consisting of a central stem giving rise to two collateral rows of rounded filaments .....Family Parapaguridae... Parapagurus dimorphis
- 13a) Abdomen forms a rounded sack behind cephalothorax Porcellanopagurus edwardsii  
 b) Abdomen elongate, assymetrical and more or less coiled ..... 14
- 14a) First abdominal segment of female or first two abdominal segments of male with genital appendages Sympagurus arcuatus  
 b) First two abdominal segments without genital appendages ..... 15
- 15a) Front of carapace with distinct rostrum. Right chela usually the larger ..... Eupagurus forceps  
 b) Front of carapace without distinct rostrum. Left chela usually the larger ..... Pagurus sp.
- 16a) Fifth pereopods modified for holding objects above the body .....Sub-Section Dromiacea...Family Dromiidae... 17  
 b) Fifth pereopods not modified in size or position .....Sub-Section Brachygnatha... 18
- 17a) Last two pereopods much smaller than the others. Carapace much longer than it is wide ..... Eudromia frontalis  
 b) Last two pereopods sub-equal to the others. Carapace about as wide as it is long ..... Dromidia bicornis
- 18a) Carapace narrowed anteriorly into a pseudo-rostrum, shape roughly triangular .....Infra-Section Oxyrhyncha... 19  
 b) Carapace not narrowed anteriorly, shape round, oval or squarish ..Infra-Section Brachyrhyncha... 26
- 19a) Carapace flat, integument thin. Chelae without bent fingers .....Family Hymenosomidae... Halicarcinus planatus  
 b) Carapace not flat, integument not thin. Chelae with bent fingers .....Family Majidae... 20

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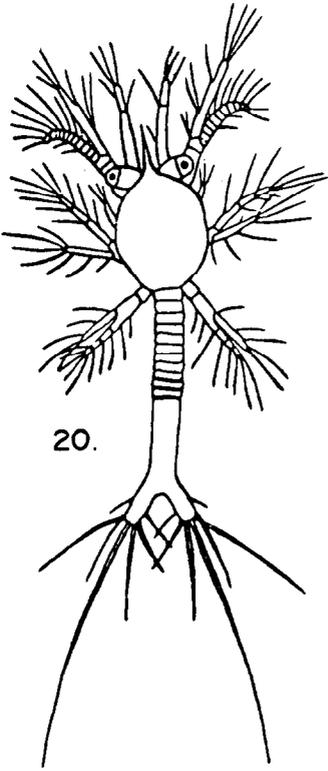
\* This species has been recorded south of the Antarctic Convergence.

20a) Eyes situated in complete orbits. Basal article of antenna very broad .....	21
b) Eyes without orbits. Basal article of antenna very slender, usually long .....	24
21a) Basal article of antenna expanded to form a floor to the orbit .....	<u>Jacquinotia edwardsii</u>
b) Basal article of antenna not specially expanded to form a floor to the orbit ... <u>Leptomithrax</u> sp.	22
22a) Third maxilliped with a prominent, rounded, naked swelling at junction of ischium and merus..	<u>Leptomithrax longipes</u>
b) Third maxilliped not swollen at junction of ischium and merus .....	23
23a) Carapace of male with numerous closely spaced tubercles; of female with a few prominent spines	<u>Leptomithrax longimanus</u>
b) Carapace of male densely covered by spines; of female with numerous closely spaced tubercles ..	<u>Leptomithrax australis</u>
24a) Abdomen of six segments; segments six and seven being completely fused. Penultimate segment of ambulatory legs long and slender .....	<u>Acheopsis</u> sp.
b) Abdomen of seven segments; segments six and seven sometimes partially fused. Penultimate segment of ambulatory legs expanded distally ....	25
25a) Rostral spines contiguous. Dactyli of ambulatory legs fold back against an oblique palm .....	<u>Eurypodius latreillei</u>
b) Rostral spines divergent. Dactyli of ambulatory legs fold back against a transverse palm .....	<u>Naxia huttoni</u>
26a) Carapace squarish, frontal margin with spines ...	27
b) Carapace round or transversely oval, frontal margins produced into spines .....	30
27a) Orbits transversely elongate, eyestalks usually very long .....	28
b) Orbits and eyestalks of moderate size .....	.....Family <u>Grapsidae</u> ...
28a) Frontal margin of carapace, between orbits, convexly rounded .....	.....Family <u>Ocypodidae</u> ... <u>Hemiplax hirtifrons</u>
b) Frontal margin of carapace either straight or slightly concave .....	.....Family <u>Goneplacidae</u> ... 29
29a) Lateral margin of carapace nearly straight but with definite teeth .....	<u>Pilumnoplax</u> sp.
b) Lateral margin of carapace strongly convex and, except in juvenile stages, without definite teeth	<u>Carcinoplax victoriensis</u>

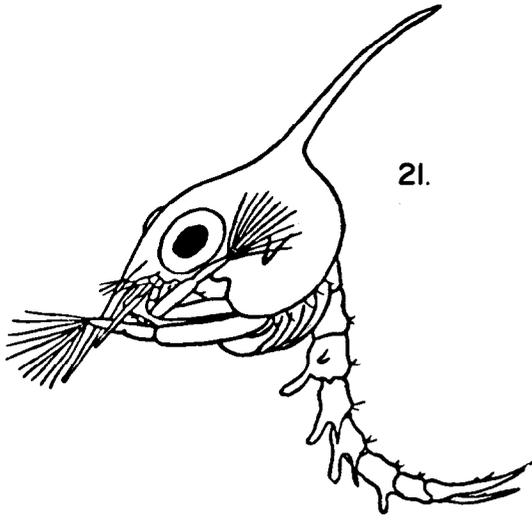
- 30a) Legs flattened and natatory. Antennules fold back transversely or obliquely ..... Family Portunidae
- b) Legs not flattened or adapted for swimming. Antennules fold back longitudinally ..... 31
  
- 31a) Carapace sub-circular. Antennal flagella long and hairy .....Family Atelecyclidae... Peltarion spinulosum
- b) Carapace transversely oval. Antennal flagella usually short, more or less hairy .....  
     .....Family Cancridae... Cancer sp.

The following references were used in the construction of these keys:

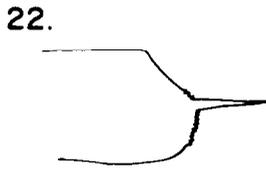
Barnard 1950  
 Barnes 1974  
 Bate 1888  
 Bennett 1964  
 Borradaile 1907  
 Garth 1957  
 Garth 1958  
 Griffin 1966  
 Hale 1927  
 Hale 1929  
 Harrison-Mathews 1932  
 Henderson 1888  
 Holthuis 1947  
 Holthuis 1952  
 Illig 1914  
 Kemp 1939  
 Kensley 1972  
 Richardson and Yaldwyn 1958  
 Schmitt 1921  
 Wadley 1978  
 Yaldwyn 1960



20.



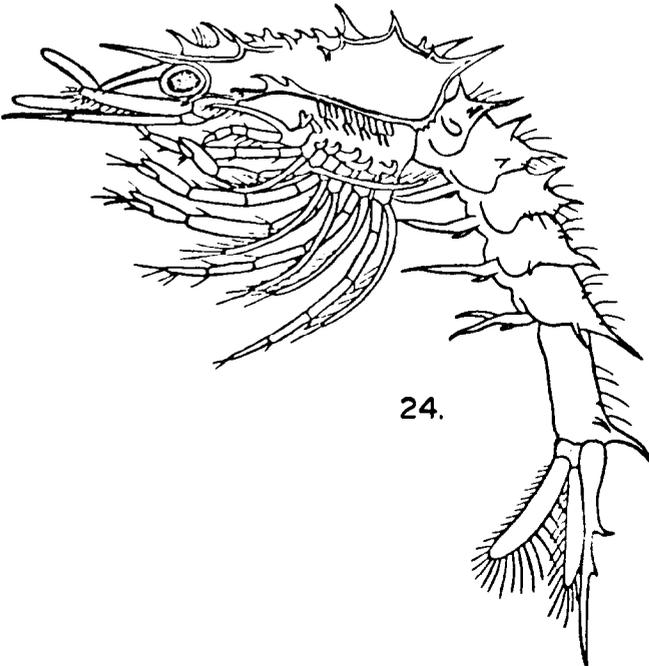
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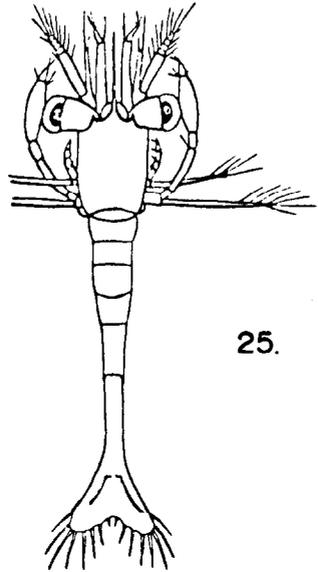
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25.

3. IDENTIFICATION OF THE LARVAE OF ANTARCTIC MARINE DECAPODS

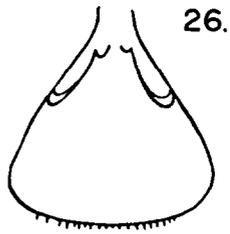
Modified after Williamson (1957)

3.1 PHASES IN THE LARVAL DEVELOPMENT OF DECAPODS

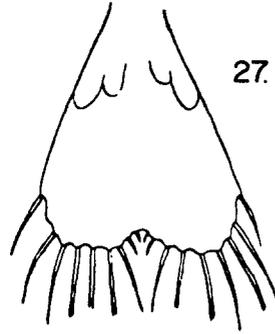
1. NAUPLIUS (including metanauplius): first three cephalic appendages well developed, setose and natatory. All other appendages absent or rudimentary.
2. ZOEAE (including protozoea, metazoea, acanthosoma, mysis and shizopod stages): thoracic appendages present, with at least some having setose exopods. Pleopods absent or rudimentary.
3. MEGALOPA (including mastigopus, glaucothoe, natant and post-larva stages): pleopods setose and natatory.

3.2 KEY TO THE ZOEAE OF FAMILIES OF DECAPODS REPRESENTED  
SOUTH OF THE ANTARCTIC CONVERGENCE

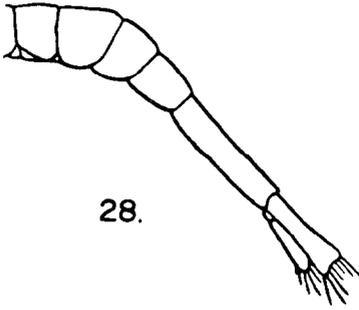
- 1a) Antennal exopod segmented throughout its length.  
Telson with two cylindrical rami (Figure 20)  
stages I-III (=protozoea) of Penaeidea ..... Family Sergestidae
- b) Antennal exopod unsegmented, or segmented near  
distal end only. Telson flat, or with tapering  
rami ..... 2
- 2a) Carapace almost spherical, usually with spines.  
Rostrum pointing ventrally or absent (Figure 21)  
.....Section Brachyura... Family Majidae
- b) Length of carapace considerably greater than its  
breadth or depth. Rostrum pointing forwards (or  
absent in stage I only) ..... 3
- 3a) Postero-lateral margin of carapace with large  
spine (Figure 22). No spines on surface of  
carapace .....Sub-section Paguridea... Family Paguridae or  
Family Lithodidae
- b) Postero-lateral margin of carapace smooth, except  
in some cases in which the surface of the  
carapace is spiny also ..... 4
- 4a) Telson terminating in two sharp prongs (Figure 23),  
or thoracic legs one to three chelate (Figure 24),  
or with both these characters .....  
.....Stage IV, last of Penaeidea... Family Sergestidae
- b) Telson not terminating in two sharp prongs,  
thoracic leg three never chelate .....  
.....Section Caridea... 5
- 5a) One or more thoracic legs expanded, oar shaped  
(Figure 25) ..... Family Hippolytidae  
(in part)
- b) No thoracic leg expanded in this way ..... 6



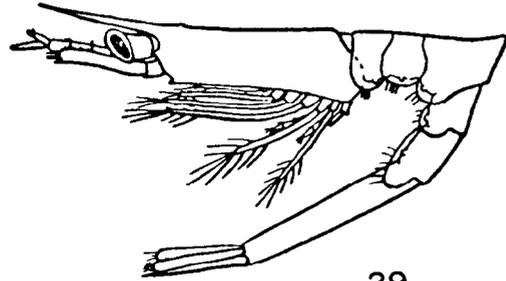
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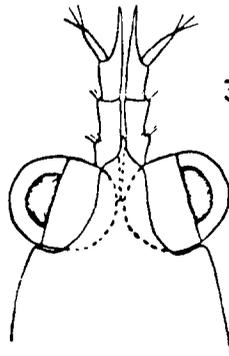
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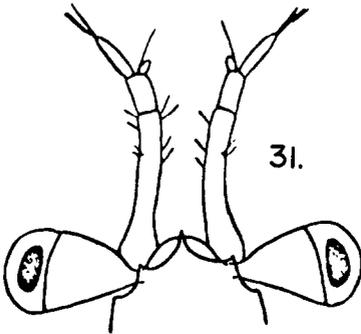
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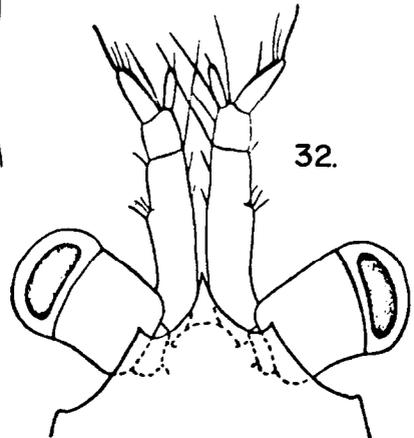
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30.



31.

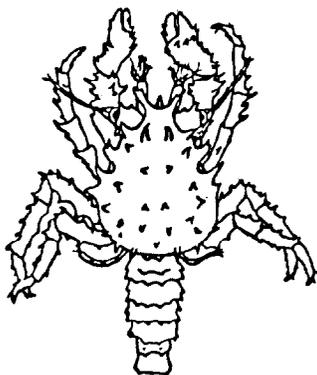


32.

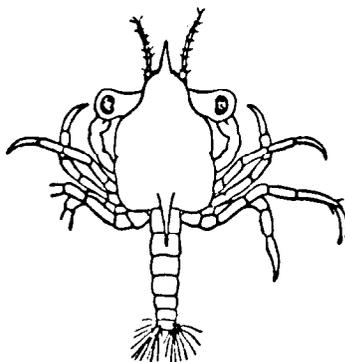
- 6a) Setose or rudimentary exopods on thoracic legs one to five (except Hymenodora stage I, in which legs four and five are uniramous). Eyes small in several species (including Hymenodora) ..... 7
- b) Thoracic leg five without exopod (except Nematocarcinus late stages, in which leg five has a minute rudimentary exopod). Eyes well developed ..... 8
- 7a) Stages I to III with very broad telson terminating in 20 or more very short spines or setae (Figure 26). Later stages with slender chelae on legs one and two. Abdominal somite three without hump (Figure 28) ..... Family Pasiphaeidae
- b) Stages I to III with not very broad telson terminating in usually no more than 16 (but up to 20 in Hymenodora) well developed spines (Figure 27). Chelae poorly developed, or absent. Abdominal somite three with hump in several species (Figure 29) ..... Family Oplophoridae
- 8a) Abdominal somite three with prominent hump (Figure 29) ..... Family Nematocarcinidae
- b) Abdominal somite three without hump (Figure 28) . 9
- 9a) Eyestalks hemispherical, almost touching in midline (Figure 30). Antennules touching at base. No supra-orbital spine. Often with very broad rostrum or very broad telson ..... Family Crangonidae
- b) Eyestalks tapering or cylindrical (except in stage I), well separated (Figures 31, 32). Antennules separated at base. Supra-orbital spine present (except in stage I). Rostrum tapering or absent, telson not very broad ..... 10
- 10a) Bases of antennules separated by more than their width, peduncles often slender and curved. Eyestalks usually tapering (Figure 31) ..... Family Pandalidae
- b) Bases of antennules separated by not more than their width, peduncles stout, almost straight. Eyestalks cylindrical (Figure 32) ..... Family Hippolytidae (in part)

3.3 KEY TO THE MAEGALOPAE OF FAMILIES OF DECAPODS REPRESENTED  
SOUTH OF THE ANTARCTIC CONVERGENCE

- 1a) Uropods lateral, forming a fan with telson ..... 2
- b) Uropods ventral, resembling pleopods ..... 4
- 2a) Thoracic legs four and five greatly reduced or  
absent ..... Family Sergestidae
- b) Thoracic legs four and five not greatly reduced.. 3
- 3a) Antennal scale large and setose ..... Section Caridea\*
- b) Antennal scale reduced or absent ..... Family Paguridae
- 4a) Carapace very spiny, fifth leg much shorter than  
preceding legs (Figure 33) ..... Family Lithodidae
- b) Carapace with few or no spines, fifth leg sub-  
equal to preceding legs (Figure 34) ..... Section Brachyura\*



33



34.

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\* Refer to key to adults for further identification.

#### 4. DESCRIPTIONS, FIGURES AND DISTRIBUTIONS OF ANTARCTIC MARINE DECAPODS

##### 4.1 Petalidium foliaceum Bate 1888 (Figure 35)

###### Description:

rostrum a small point, with no spines  
carapace smooth but for a narrow crest just behind the rostrum  
diameter of eye less than that of the eyestalk  
eyestalk uni-articulate, with median lateral spine  
mouthparts covered with dark brown hairs  
mandibular palp elongate, reaching beyond peduncle of antenna

Petalidium foliaceum is a bathypelagic species, being found in waters deeper than 1000 m on both sides of the Antarctic Convergence (Hale 1941). The maximum length recorded is about 60 mm (Bate 1888).

##### 4.2 Notocrangon antarcticus (Pfeffer 1887) (Figure 36)

Crangon antarcticus Pfeffer 1887; Ortmann 1895; Calman 1907; Lenz and Strunk, 1914

Crangon (Notocrangon) antarcticus Coutiere 1900a, 1900b, 1917; Balss 1930

Crangon (Notocrangon) antarcticus var. gracilis Calman 1907; Borradaile 1916; Bage 1938

Several workers (Calman 1907; Borradaile 1916; Bage 1938) have proposed a sub-species of Notocrangon antarcticus, which lives in the seas near South Georgia. The validity of this subspecies (N. antarcticus var. gracilis) has been questioned by Coutiere (1917) who determined that morphological distinctions upon which previous authors had based the subspecies could be linked to sexual dimorphism and age linked variation. Furthermore, Zarenkov (1968) has examined material which indicates that the traits noted by Calman (1907) and Borradaile (1916a) are so highly variable that it is impossible to distinguish the two proposed subspecies. In the absence of any conclusive evidence, N. antarcticus must therefore be considered to be a single species.

###### Description:

rostrum extends beyond anterior edge of eye, laterally compressed and acute, with no spines  
carapace with surface very uneven, covered with ridges and spines mid-dorsal  
carina terminates in an acute spine just behind rostrum  
supra-orbital, antennal and hepatic spines present  
antennular peduncle slender  
first pereopod sub-chelate

N. antarcticus is a common circumpolar species having been found north of the Antarctic Convergence on only one occasion. It is a demersal prawn which has been taken from 15 to 1320 m depth, although it is most common in the 300 to 600 m depth range (Zarenkov 1968). This species has been found in water temperatures over the range of -1.92°C to +2.92°C (Zarenkov 1968).

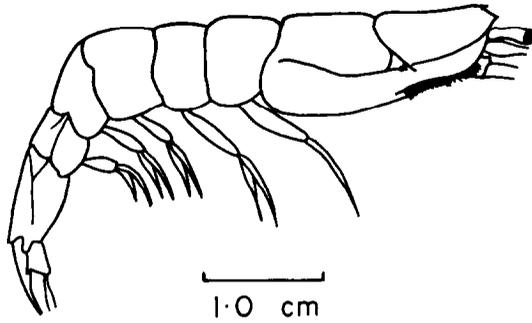
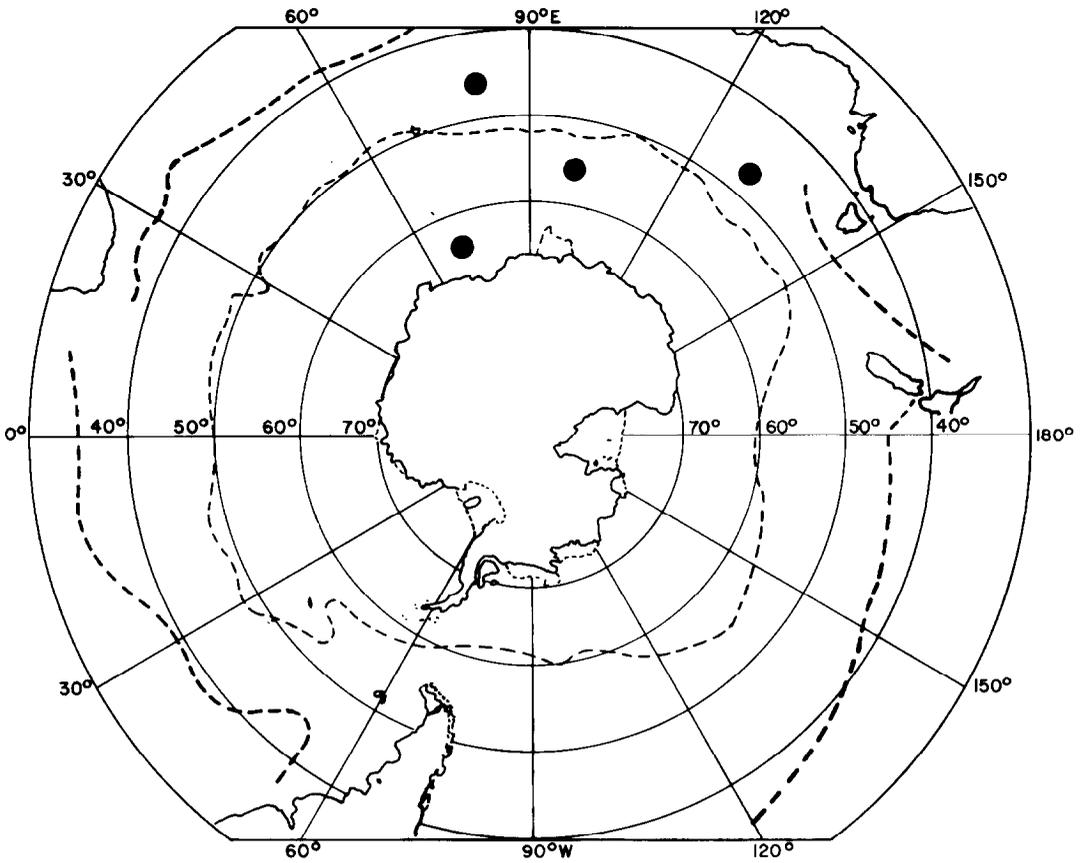


Figure 35. *Petalidium foliaceum*, lateral view (after Bate 1888; Hale 1941 and Kensley 1971). Map of distribution.



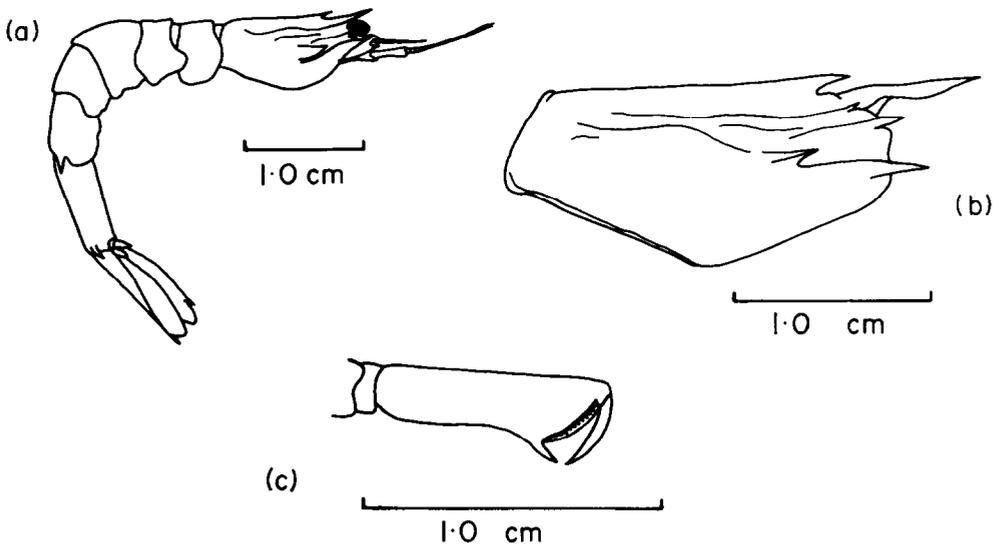
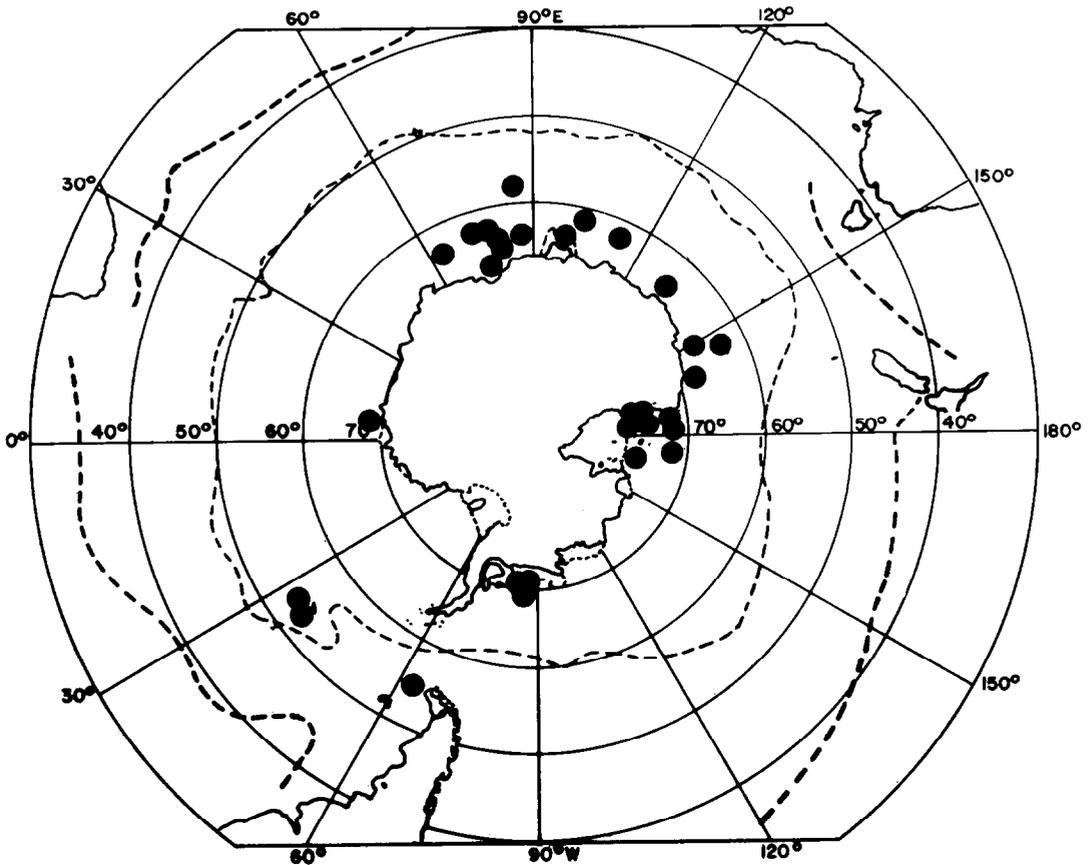
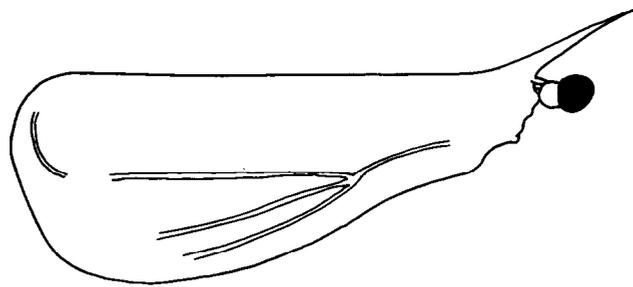


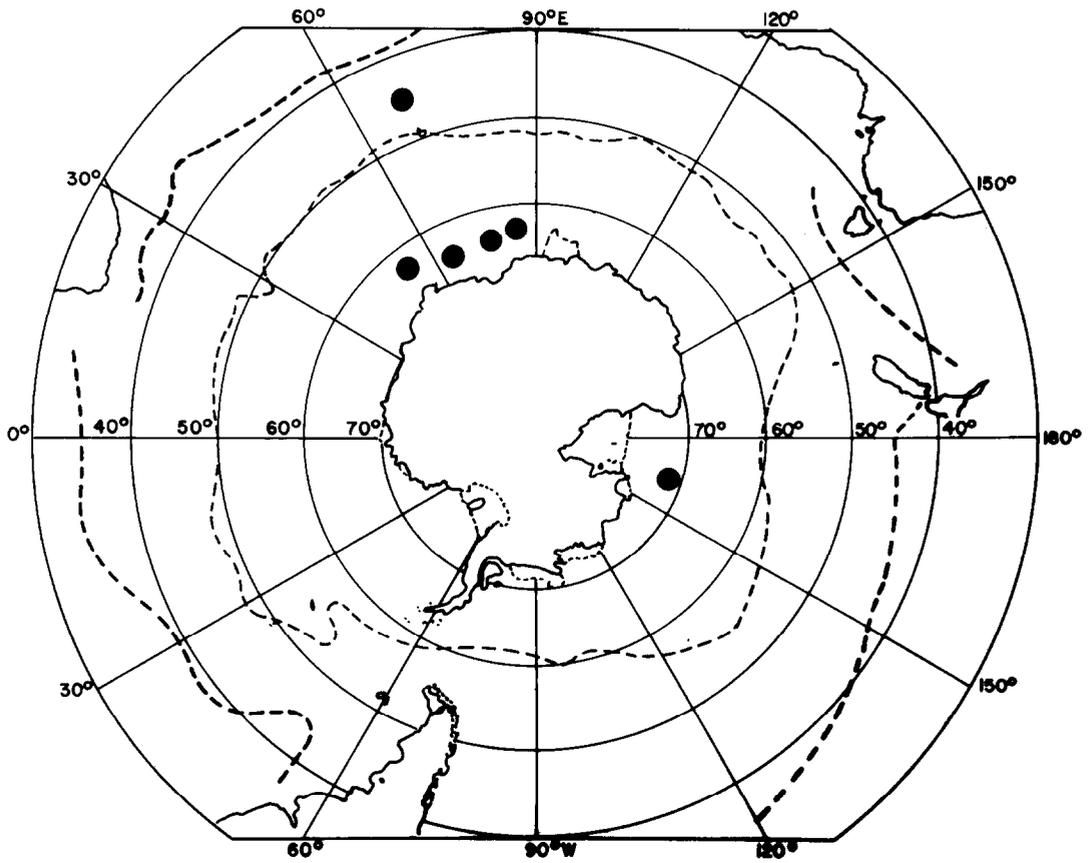
Figure 36. *Notocrangon antarcticus* (a) lateral view (after Pfeffer 1887); (b) carapace and (c) first pereopod (after Coutiere 1917). Map of distribution.





1.0 cm

Figure 37. *Pasiphaea longispina*, lateral view of carapace (after Ledoyer 1979). Map of distribution.



4.3 Pasiphaea longispina Lenz and Strunk 1914 (Figure 37)

Pasiphaea (Phye) longispina Lenz and Strunk 1914; Ledoyer 1979

Description:

rostrum extends beyond anterior edge of eye, may have downwardly hooked tip  
mid-dorsal carina extending from rostrum to 6th abdominal segment, and being particularly conspicuous on the 1st abdominal segment  
carapace with three lateral carinae converging anteriorly  
telson cleft with seven or eight spines on each side  
merus of the first pereiopod smooth, of the second with 7 spines

Pasiphaea longispina is a fairly deep-water species with a maximum length of about 100 mm (Lenz and Strunk 1914). It is thought to have a circumpolar Antarctic distribution, with only a single specimen north of the Antarctic Convergence (Ledoyer 1979).

4.4 Pasiphaea scotiae (Stebbing 1914) (Figure 38)

Phye scotiae Stebbing 1914

Note: Yaldwyn (1965) suggests that this species could be synonymous with P. longispina, but the two have never been critically compared.

Description:

rostrum extends beyond anterior edge of eye, has upturned tip  
mid-dorsal carina extends the length of the carapace, but is not present on the abdomen  
telson cleft with seven or eight spines on each side  
merus of first pereiopod smooth, of the second with 7 spines

From the above description Pasiphaea scotiae can be seen to be very similar to P. longispina. A detailed examination of type specimens is needed to establish the correct status of this species, so for present purposes it will be considered as being separate of P. longispina. Stebbing's (1914) specimens were both taken on deep hauls, so P. scotiae appears to be a bathypelagic species.

4.5 Lebbeus antarcticus (Hale 1941) (Figure 39)

Spirontocaris antarcticus Hale 1941; Yaldwyn 1965

Lebbeus antarctica Zarenkov 1968

Description:

rostrum laterally compressed, about half length of carapace, with four dorsal teeth and a single small ventral tooth  
carapace robust, with mid-dorsal carina at anterior end  
strong supra-orbital and antennal spines, small pterygostomian  
carapus of second pereiopod sub-divided into seven segments  
sixth abdominal segment three quarters as long as telson  
telson with six pairs of lateral spines

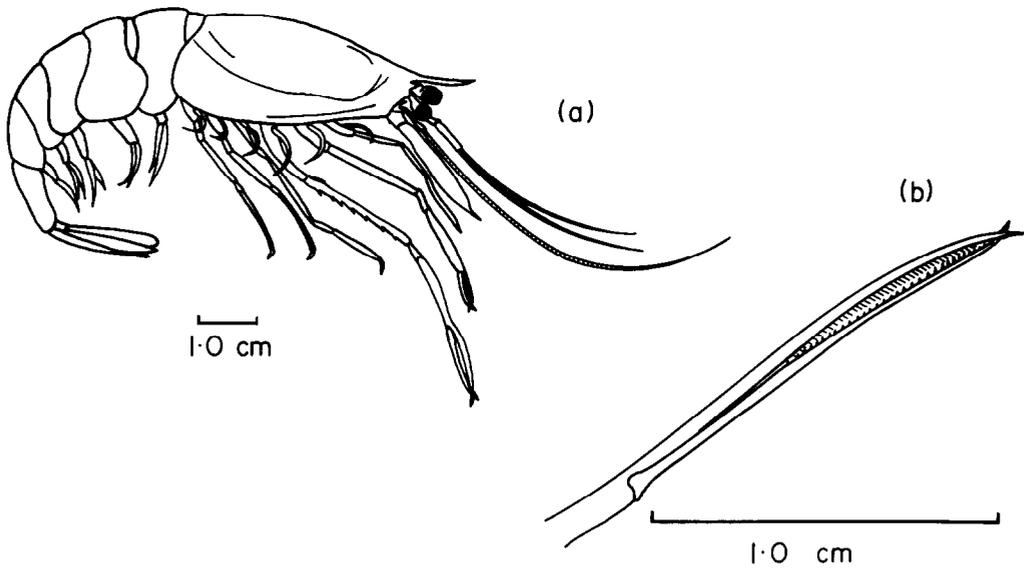
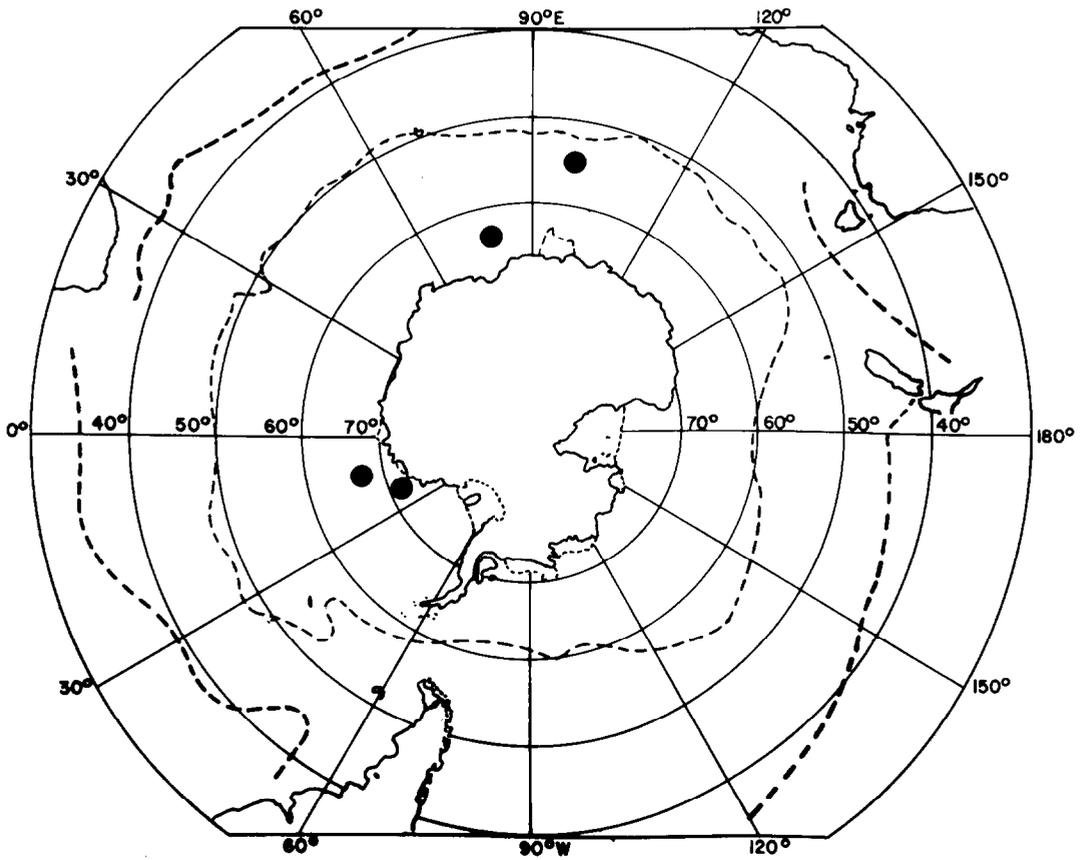
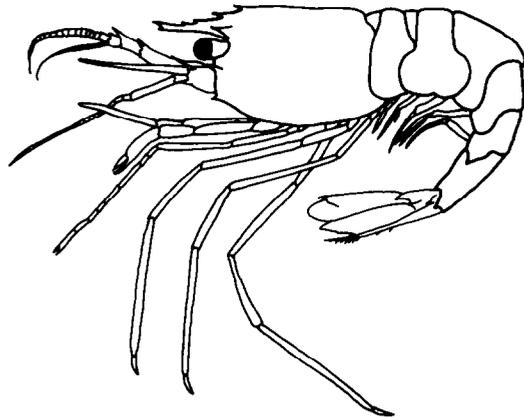


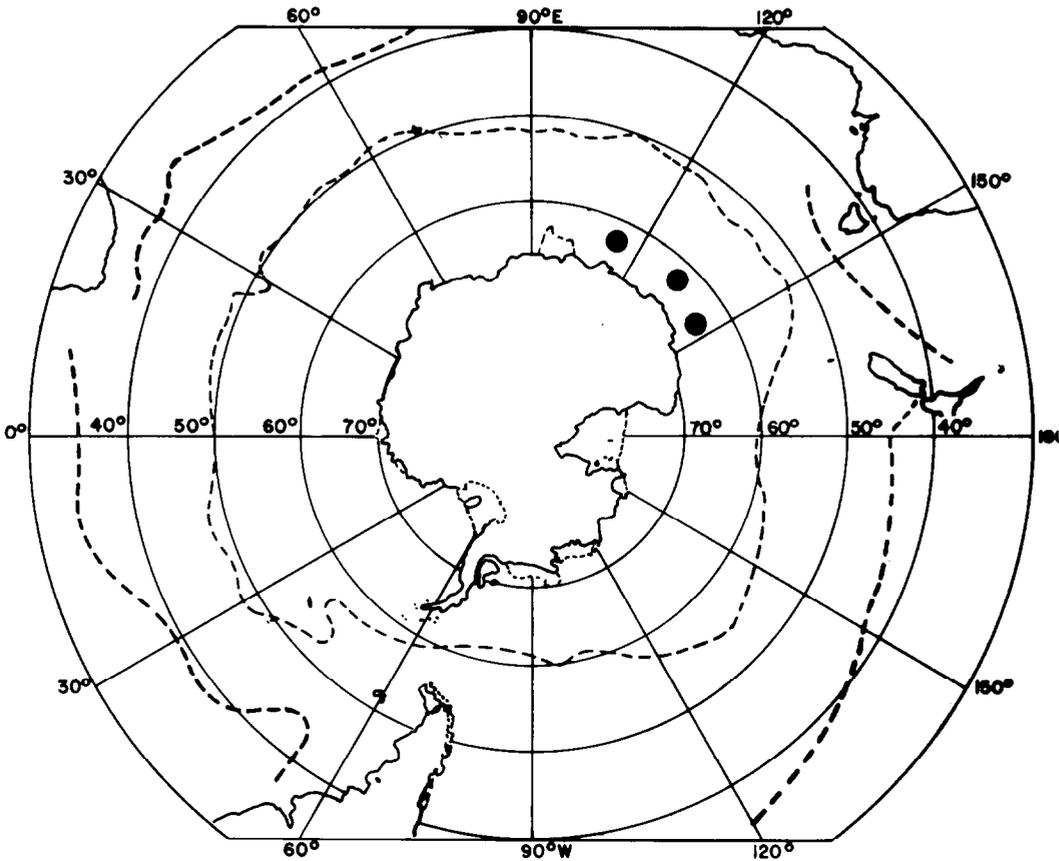
Figure 38. *Pasiphaea scotiae* (a) lateral view (b) second pereiopod (after Stebbing 1914). Map of distribution.





1.0 cm.

Figure 39. *Lebbeus antarcticus*, lateral view (after Hale 1941). Map of distribution.



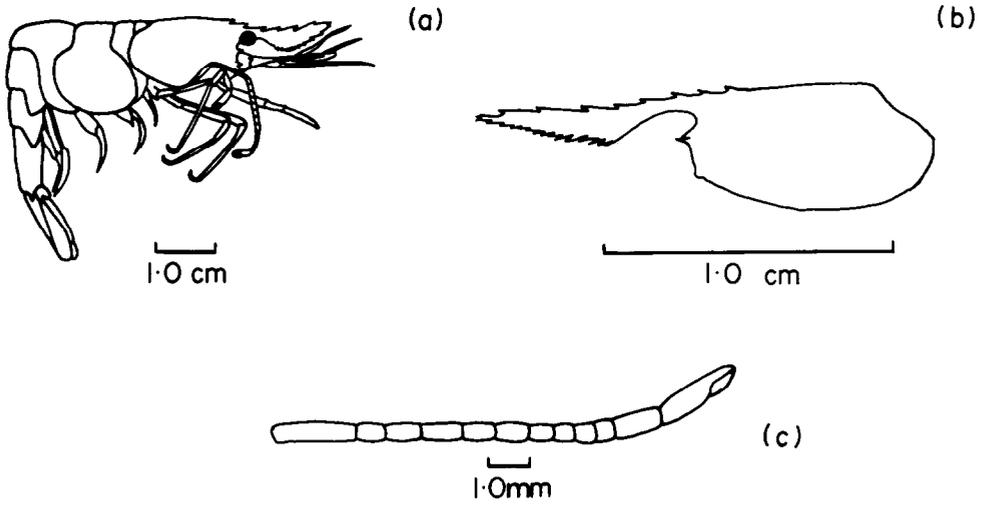
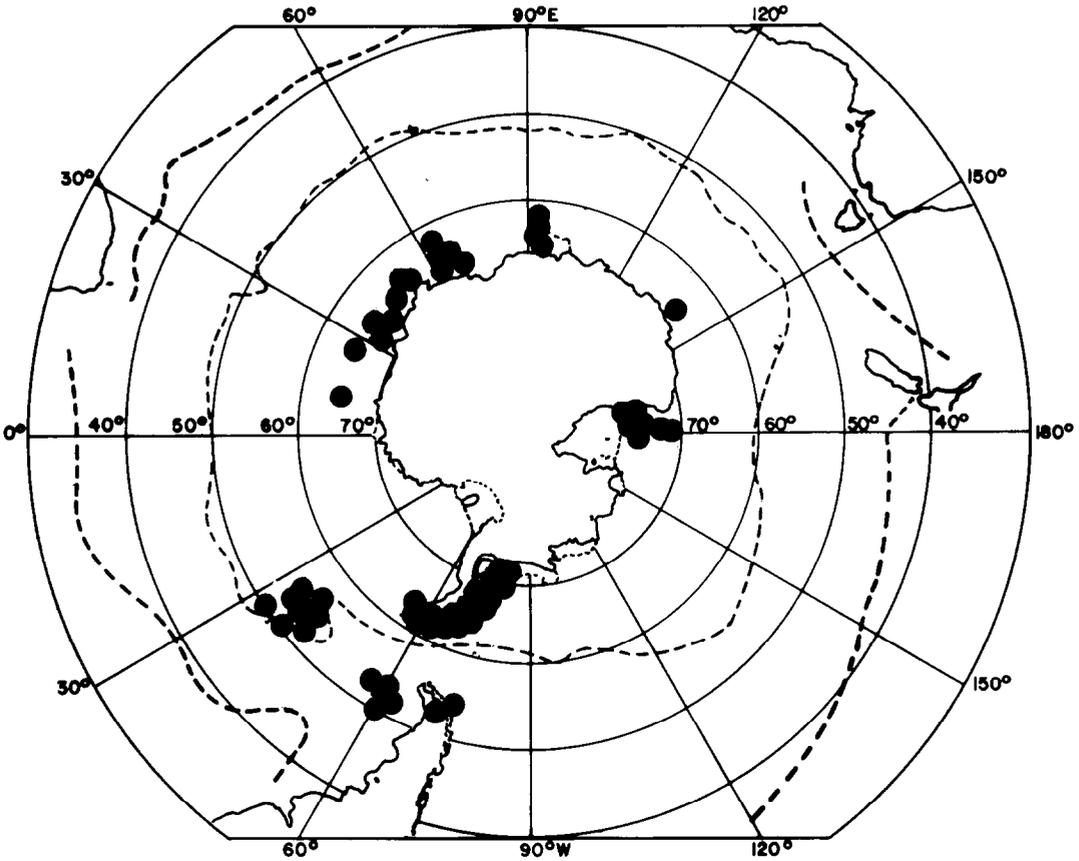


Figure 40. *Chorismus antarcticus* (a) lateral view and (c) second pereopod (after Pfeffer 1887); (b) carapace (after Zarenkov 1968). Map of distribution.



Lebbeus antarcticus is a small (maximum length recorded 28 mm, Hale 1941) benthic prawn inhabiting depths of 548 to 920 m (Zarenkov 1968). Zarenkov's (1968) specimens show a variety of rostral teeth formulae, with four to seven dorsal teeth and one or two ventral teeth. This species has only been recorded off Terre Adelie and Wilkes Land, Antarctica, at water temperatures just below 0°C (Zarenkov 1968).

4.6 Chorismus antarcticus (Pfeffer 1887) (Figure 40)

Hippolyte antarctica Pfeffer 1887, 1892

Hippolyte Romanchei A. Milne-Edwards 1891; Doflein and Balss 1910

Description:

rostrum elongate, about as long as carapace, with up to ten dorsal teeth  
supra-orbital spine absent, antennal and pterygostomial spines present  
last three pereopods without epipods  
carpus of pereopod two with eleven or twelve segments  
first segment of mandibular palp not shorter than the second

Chorismus antarcticus is the most commonly encountered circumpolar Antarctic decapod. This benthic species is commonest in inshore areas. It has also been recorded from the Falkland Islands, and the southern tip of South America (Doflein and Balss 1912). C. antarcticus is a quite large prawn (Calman 1907, recorded an ovigerous female of 101 mm). It is apparently a cold stenothermic species living at temperatures of -0.83°C to -1.90°C (Zarenkov 1968). C. antarcticus is most common in near surface waters of 15 to 300 m depth (Zarenkov 1968), but has been recorded as deep as 915 m (Calman 1907).

4.7 Nematocarcinus longirostris Bate 1888 (Figure 41)

Description:

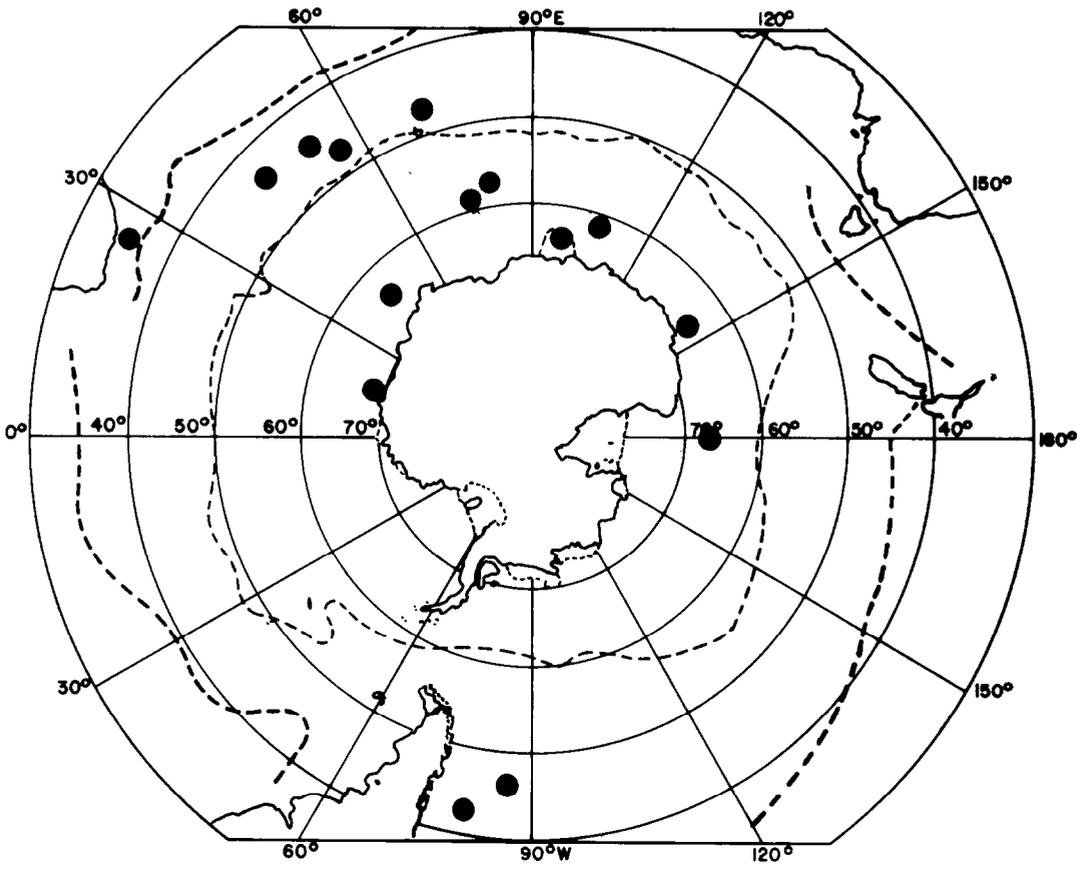
rostrum long and slender about one and a half times the carapace length  
rostrum with at least 38 dorsal spines (grading from minute closely packed, articulated spines at the proximal end, to larger, widely spaced, rigid spines at the distal end), and 5-7 ventral spines  
eyestalks large, pear-shaped, embayed in a medium sized orbital notch  
supra-orbital spine absent, antennal and pterygostomial spines present  
first two pereopods with small chelae, each with tufts of setae  
abdominal segment three with postero-dorsal hump

Nematocarcinus longirostris has only been found in the waters off Eastern Antarctica (Zarenkov 1968). It has also been recorded off Japan (Bate 1888), South Africa (Barnard 1950), Crozet Island and Kerguelen Island (Ledoyer 1979). It is either a bathypelagic or bathybenthic species (Yaldwyn 1965) recorded at depths from 842 to 3531 metres (Bate 1888, Barnard 1950, Ledoyer 1979). Zarenkov (1968) suggests that Nematocarcinus proximatus is a synonym for N. longirostris, thus greatly expanding its geographic and depth distributions. N. longirostris is a fairly large species, having been recorded at lengths up to 124 mm (Bate 1888).



1.0 cm

Figure 41. *Nematocarcinus longirostris*, lateral view of carapace (after Bate 1888). Map of distribution.



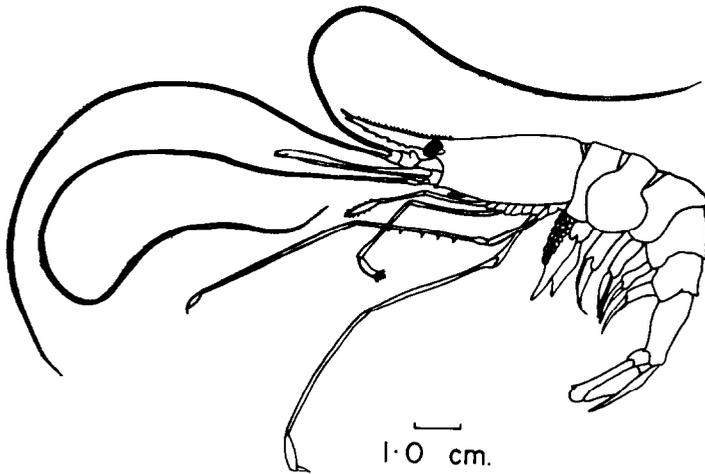
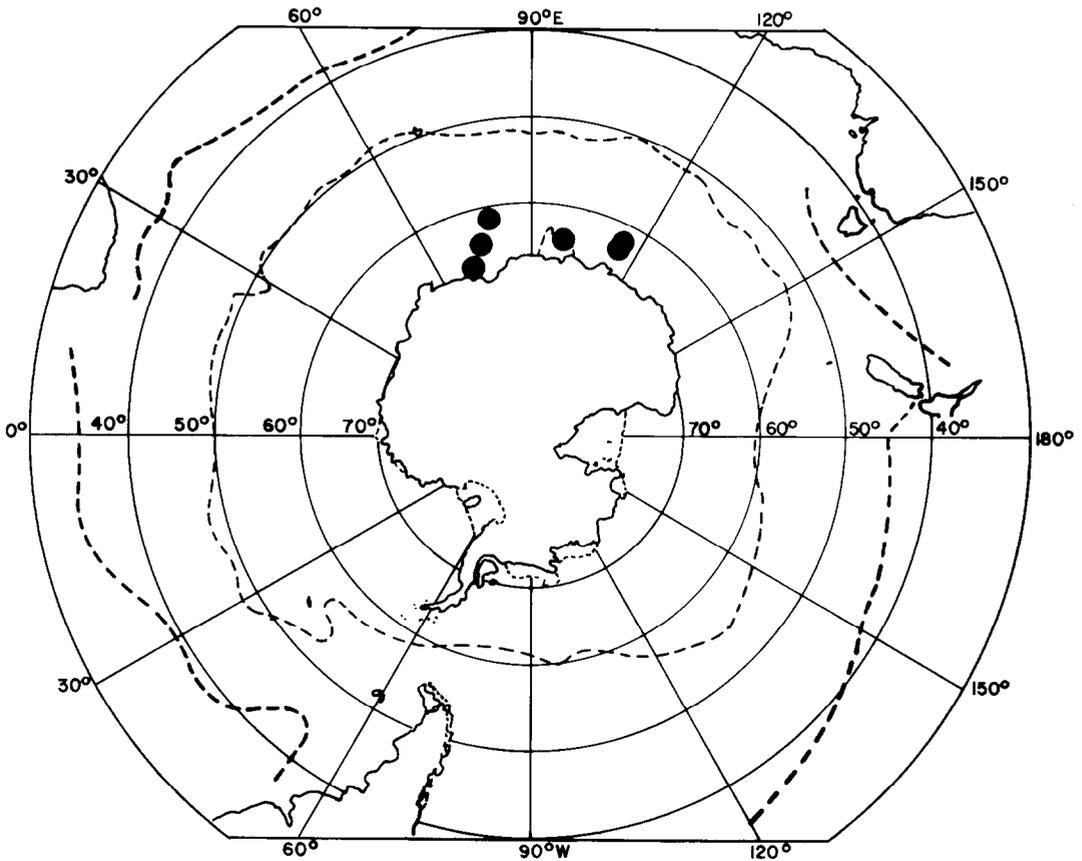
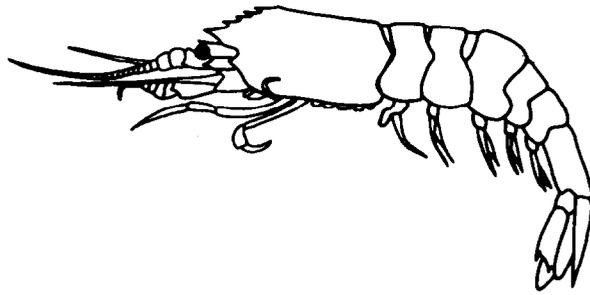


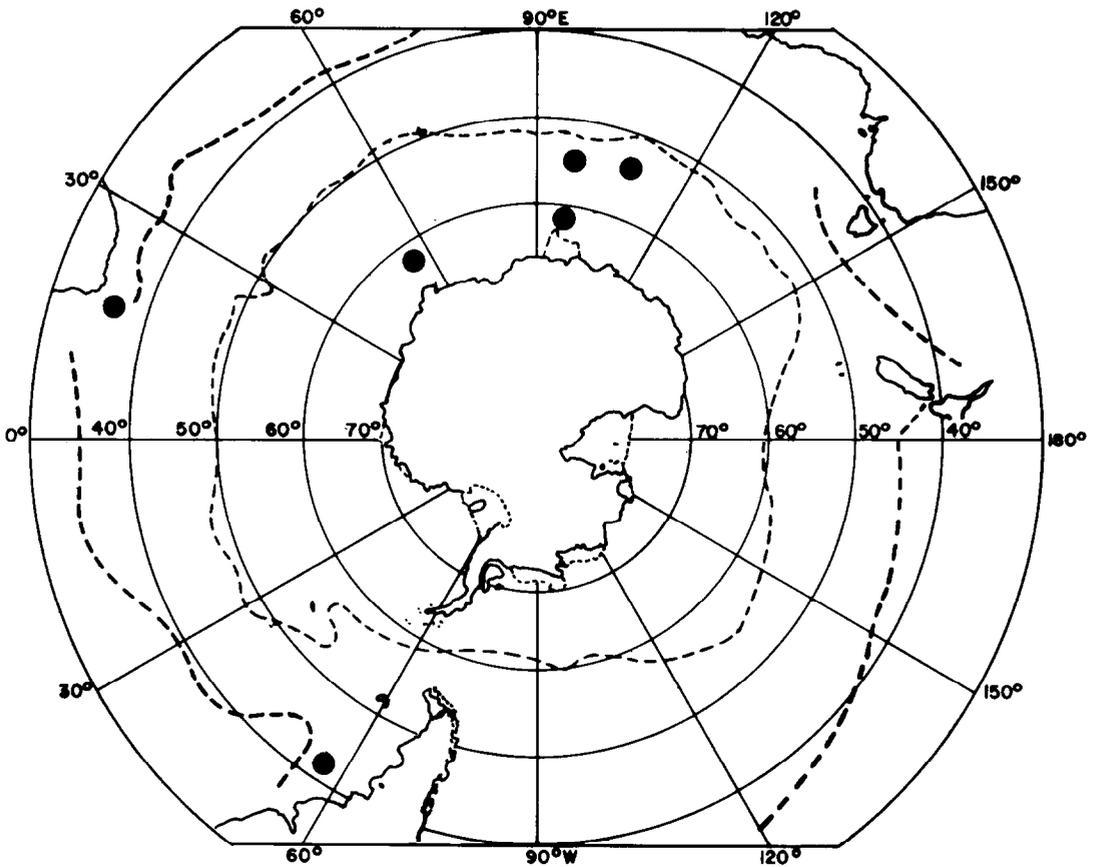
Figure 42. *Nematocarcinus lanceopes*, lateral view (after Bate 1888). Map of distribution.





1.0 cm

Figure 43. *Hymenodora gracilis*, lateral view (after Bate 1888). Map of distribution.



4.8 Nematocarcinus lanceopes Bate 1888

(Figure 42)

AcanthePHYra antarctica Bage 1938

Description:

rostrum shorter than carapace length  
rostrum with 25-29 dorsal and five to eight ventral spines  
eyestalks short, and embayed in a deep orbital notch  
supra-orbital spine absent, antennal and pterygostomian spines present  
first two pereopods with small chelae, each with tufts of setae  
abdominal segment three with postero-dorsal hump

Nematocarcinus lanceopes is a bathybenthic species, having been recorded from 1266 (Hale 1941) to 2300 m depth (Bate 1888). This large prawn (maximum length recorded 150 mm, Bage, 1938) has only been recorded off the Indian Ocean sector of Eastern Antarctica.

4.9 Hymenodora gracilis Smith 1886

(Figure 43)

Hymenodora mollicutis Bate 1888

Hymenodora glacialis Faxon 1895; Kemp 1910; Lenz and Strunk 1914

Description:

rostrum a short sharp spine, followed by about four short sharp spines on mid-dorsal elevation of carapace  
eyestalks stout and flat, with tubercular protuberance on inner side near eye  
supra-orbital and pterygostomian spines absent, blunt knob in region of antennal spine  
first two pereopods chelate

Hymenodora gracilis has a bipolar distribution, being commonly found in the north Atlantic (Stephensen 1923) and the Antarctic (Bate 1888), but it has a single record in the tropics (Lenz and Strunk 1914). Apart from the record of Lenz and Strunk (1914) at 800 m, H. gracilis has only been recorded from abyssal waters, where it is apparently quite common in the Antarctic. Hale (1941) recorded the shallowest finding of this species in the Antarctic (2000 m), but Bate (1888) found it to be most common at depths greater than 3500 m down to 4600 m. Apart from a few pelagic specimens taken by Stephensen (1923) at 4000 m in the North Atlantic, all records show this species to be benthic. The largest recorded size of H. gracilis is 70 mm (Bate 1888).

4.10 AcanthePHYra pelagica (Risso 1816)

(Figure 44)

Alpheus Pelagicus Risso 1816

Pandalus pelagicus Risso 1826

EPHYra pelagica Roux 1831

EPHYra Haeckeli von Martens 1868

Miersia pelagica Kingsley 1880

AcanthePHYra sica Bate 1888

AcanthePHYra Agassizi mediterranea Riggio 1900

AcanthePHYra pupurea multispina Coutiere 1905

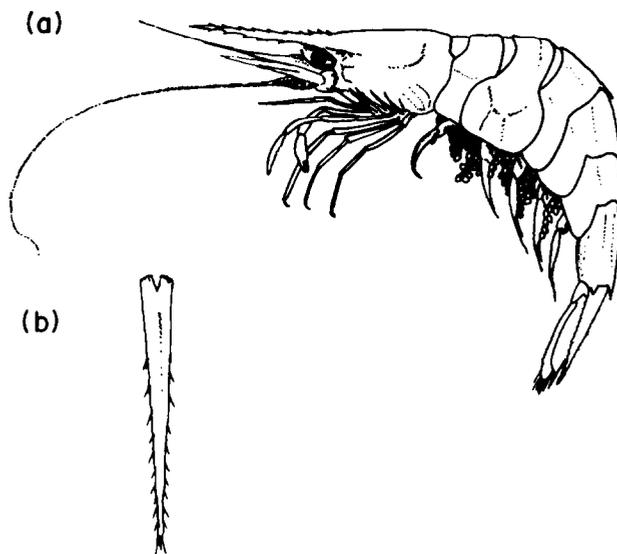
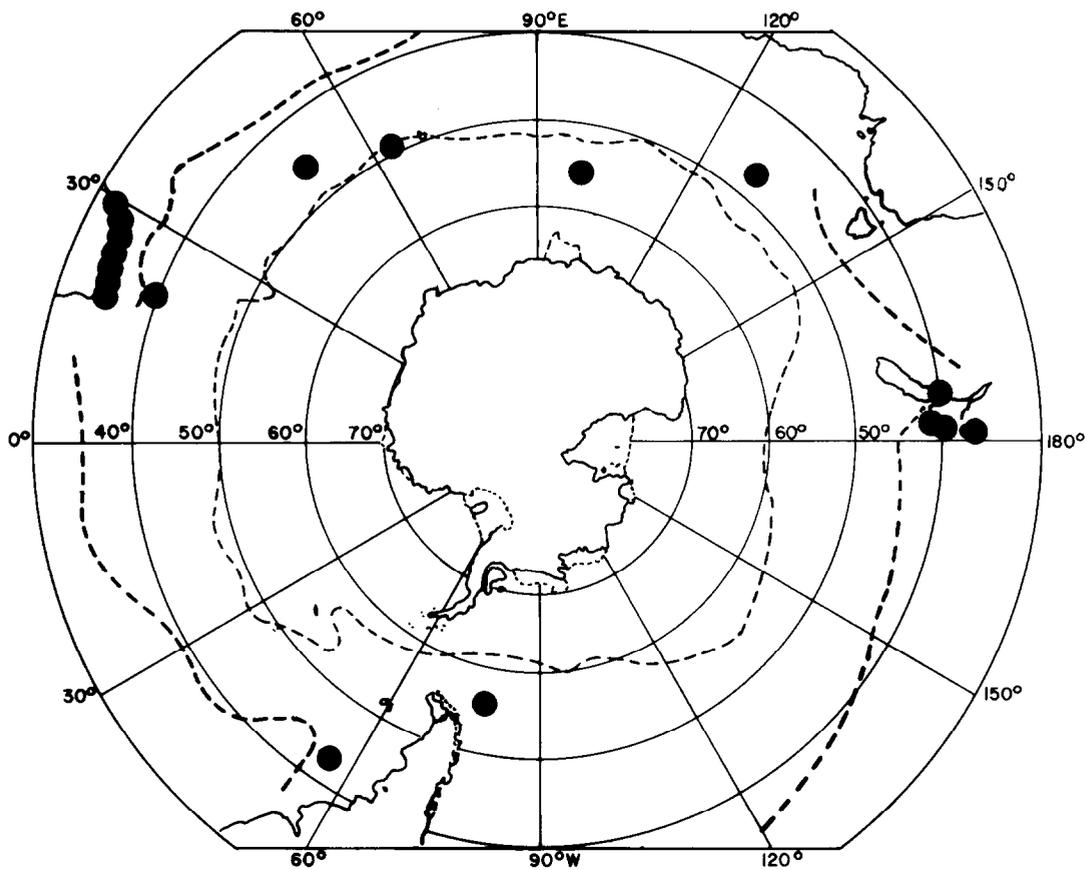


Figure 44. *Acantheephyra pelagica* (a) lateral view (b) dorsal view of telson (after Bate 1888). Map of distribution.



Acantheephyra parva multidens Coutiere 1905  
Acantheephyra multispina Murray and Hjort 1912  
Acantheephyra haeckeli Kemp 1939; Williams et al. 1983  
Acantheephyra pelagica Holthuis 1947

Description:

rostrum equal in length to carapace, with nine or ten dorsal teeth being more widely separated distally  
abdominal segments three to six with posterior mid-dorsal spines  
telson much longer than abdominal segment six, with 7-11 pairs of lateral spines  
first two pairs of pereopods chelate

Acantheephyra pelagica is a bi-polar antiboreal species, having been recorded in the North Atlantic (Kemp 1939) and North Pacific (Bate 1888) as well as in the Southern Ocean (Bate 1888; Williams et al. 1983), and off the coasts of South Africa (Kensley 1981a, 1981b) and New Zealand (Richardson and Yaldwyn 1958). It is a bathypelagic shrimp having been recorded over the wide depth range of 250 to 4900 metres (Kensley 1981a). The maximum size recorded for A. pelagica is 85 mm (Bate 1888).

4.11 Paralomis spectabilis Hansen 1908

(Figure 45)

Description:

rostrum short, tri-spinose  
scaphocerite spinulose  
carapace with seven large spines on gastric region and four on the cardiac region, both of these regions are bulbous  
eyestalks touch at base  
right cheliped larger and heavier than the left  
carapace and appendages all covered with tubercles and spines

Paralomis spectabilis was previously known from the North Atlantic only (Hansen 1908). Birshtein and Vinogradov (1966) have recorded this species from 67°S, 180°W near Scott Island (Zarenkov 1968) which makes it the first record of a reptant decapod from Antarctica. P. spectabilis is therefore a bipolar bathybenthic species with a known depth range of 500 to 1905 m (Birshtein and Vinogradov 1966; Hansen 1908). The largest specimen recorded is a female taken by Hansen with a carapace length of 54.5 mm (including rostrum). It has been recorded from temperatures in the range of 1.4°C to 3.1°C (Hansen 1908).

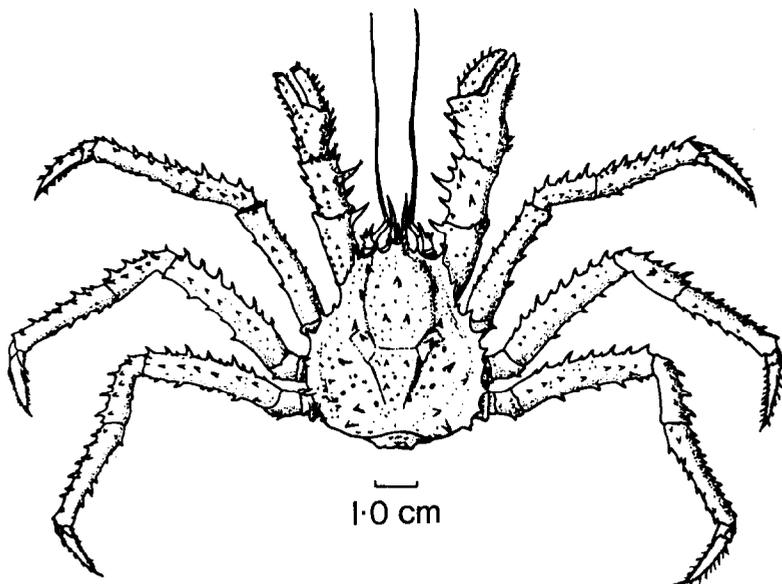
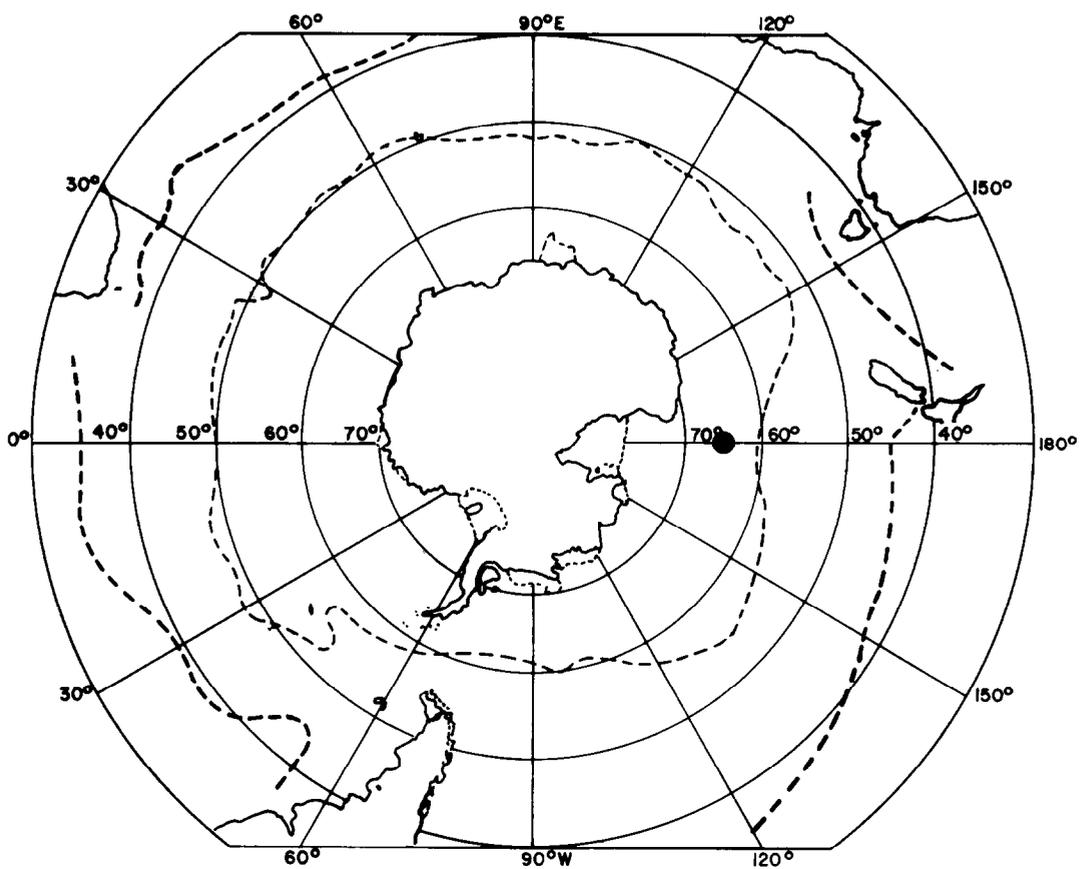


Figure 45. *Paralomis spectabilis*, dorsal view (after Hansen 1908). Map of distribution.



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## GLOSSARY

<u>Abdomen</u>	posterior part of the body, usually six segments, bearing pleopods, uropods and telson (cf. pleon)
<u>Abyssal</u>	environment of the deep oceanic basins, usually refers to waters from about 2500 to 5000 m deep (prefix: abysso-)
<u>Acicle</u>	see antennal scale
<u>Acuminate</u>	produced into a sharp point
<u>Adult</u>	sexually mature individual
<u>Ambulatory</u>	associated with, or used for, walking
<u>Antarctic Convergence</u>	the circumpolar line of convergence between the subantarctic and the Antarctic water masses, at which the Antarctic water mass flows under the subantarctic water. The exact position of this convergence is variable, depending on seasonal effects
<u>Antenna(e)</u>	(=2nd antenna), paired second head appendages, endopod usually elongate and whip-like in the Decapoda, (adj: antennal)
<u>Antennal region</u>	that region of the carapace adjacent to the peduncle of the antenna
<u>Antennal scale</u>	(=acicle or scaphocerite) exopod of antenna usually protruding forwards as a scale or lobe in the Decapoda
<u>Antennal spine</u>	spine on the antero-lateral margin of the carapace, just ventral to the orbit, in the antennal region
<u>Antennule</u>	(=1st antenna), paired first head appendages, both endopod and exopod usually elongate and whip-like in the Decapoda, (adj: antennular).
<u>Anterior</u>	in front, towards the head end, (prefix: antero-)
<u>Apex</u>	distal end, terminus or tip (adj: apical)
<u>Arthrobranch(iae)</u>	gill which is attached to the membranes joining an appendage to the body
<u>Basipod</u>	(=basis or basipodite), distal segment of the protopod of an appendage, from which the endopod and exopod arise
<u>Bathyal</u>	environment of the continental slope, usually refers to water from about 500 to 4000 m deep (prefix: bathy-)
<u>Bathypelagic</u>	refers to those organisms living in the deep oceanic waters, but not associated with the bottom, usually refers to waters deeper than 1000 m (cf. pelagic, epipelagic, mesopelagic)

<u>Benthic</u>	environment of the sea bottom, refers to organisms actually living on the bottom (cf. demersal, pelagic)
<u>Bifid</u>	(=bifurcate or biramous) consisting of two branches
<u>Branchia(e)</u>	(=gill), respiratory structure of an aquatic species
<u>Branchial region</u>	that region of the carapace which overlies the gills. May be subdivided into epimeso- and meta-branchial regions
<u>Branchiostegal spine</u>	spine on the anterior edge (usually) of the branchial region of the carapace
<u>Carapace</u>	shield of exoskeleton covering the cephalothorax; fused to all thoracic segments in the Decapoda
<u>Cardiac region</u>	that region of the carapace which overlies the heart
<u>Carina(e)</u>	(=keel), a raised ridge (adj: carinate)
<u>Carpus</u>	third segment of endopod of an appendage
<u>Cephalothorax</u>	head and thorax combined
<u>Cervical groove</u>	a more or less transverse groove on the carapace where the head joins the thorax
<u>Chela(e)</u>	pincer, formed by the dactylus articulating against a prolongation of the propodus, parallel to the long axis of an appendage (adj: chelate)
<u>Cheliped</u>	thoracic appendage which terminates in a chela
<u>Cornea</u>	that portion of the eye adapted for light reception (usually rounded and black)
<u>Coxa(e)</u>	(=coxopodite), proximal segment of protopod of an appendage
<u>Dactylus</u>	fifth (terminal) segment of endopod of an appendage
<u>Demersal</u>	living close to the sea bottom, but not actually on it (cf. benthic, pelagic)
<u>Denticle</u>	small tooth-like spine
<u>Dimorphism</u>	having two forms (e.g. sexual dimorphism)
<u>Distal</u>	furthest from point of origin or attachment (cf. proximal)
<u>Dorsal</u>	pertaining to the upper surface or back
<u>Endite</u>	setose lobe on the inner edge of the coxa, basis or ischium
<u>Endopod</u>	(=endopodite), inner branch of an appendage, arising from the basipod

<u>Epipelagic</u>	living in the near surface waters of the ocean, the upper 200 metres (cf. pelagic, bathypelagic, mesopelagic)
<u>Epipod</u>	(=epipodite), structure attached to the outer side of the coxa of an appendage
<u>Epistome</u>	small plate of exoskeleton immediately anterior to the mouthparts
<u>Eurythermic</u>	able to exist over a wide range of temperatures (cf. stenothermic)
<u>Exopod</u>	(=exopodite), outer branch of an appendage, arising from the basipod
<u>Exoskeleton</u>	(=cuticle), hard external covering or shell
<u>Filiform</u>	slender thread-like
<u>Flagellum</u>	the usually flexible whip-like part of an antenna or antennule
<u>Foregut</u>	the anterior part of the digestive tract, consisting of the oesophagus and the stomach
<u>Frontal region</u>	that region of the carapace immediately behind the rostrum, from which the rostrum arises
<u>Gastric region</u>	that region of the carapace which overlies the foregut. May be sub-divided into proto- meta- and uro-gastric regions
<u>Gill</u>	thin walled respiratory surface over which water is passed
<u>Hepatic region</u>	a small region of the carapace between the gastric and branchial regions and overlaying the hepatopancreas
<u>Hepatic spine</u>	spine on the hepatic region of the carapace, just behind its anterior edge
<u>Hepatopancreas</u>	"liver", secretes digestive enzymes into the stomach
<u>Integument</u>	outer covering of body
<u>Intermediate plate</u>	small dorsal plate between the carapace and the abdomen
<u>Intestinal region</u>	that region of the carapace of reptant Decapods which overlies the intestine. The intestine of natant Decapods passes through the abdomen
<u>Ischium</u>	first (proximal) segment of endopod of an appendage
<u>Juvenile</u>	young form, sexually immature, usually smaller than the adult but showing a general resemblance to it
<u>Labium</u>	(=lower lip), non-articulated plate on posterior margin of the mouth, may consist of several lobes

<u>Labrum</u>	(=upper lip), non-articulated plate on anterior margin of the mouth
<u>Lanceolate</u>	lance shaped, broad proximally tapering to a prolonged point distally
<u>Larva(e)</u>	immature developmental stage, morphologically distinct from the adult. Includes nauplius, zoea and megalopa stages
<u>Lateral</u>	pertaining to the side
<u>Mandible</u>	first pair of oral appendages, found between the labrum and the labium, used for biting and grinding food (adj: mandibular)
<u>Maxilla(e)</u>	(2 pairs), second and third oral appendages found immediately posterior to the lower lip and used for manipulating food
<u>Maxilliped</u>	anterior thoracic appendages (the first three in Decapods) which are modified to manipulate food, and often form a cover to the mouthparts
<u>Medial</u>	towards the mid-line
<u>Megalopa(e)</u>	(including mastigopus, glaucothoe, natant stage and post-larva), larva with setose natatory pleopods on some or all of abdominal segments one to five
<u>Merus</u>	second segment of endopod of an appendage
<u>Mesopelagic</u>	refers to those organisms living in intermediate oceanic depths, usually from about 200 to 1000 m (cf. pelagic, bathypelagic, epipelagic)
<u>Nanoplankton</u>	that part of the phytoplankton less than 20 microns in diameter
<u>Natatory</u>	associated with, or used for, swimming
<u>Nauplius</u>	(including metanauplius), larva with the first three pairs of cephalic appendages setose and natatory, other appendages absent or rudimentary
<u>Nekton</u>	organisms capable of swimming movements independent of environmental currents
<u>Neritic</u>	refers to the environment above the continental shelf, to a depth of about 200 m
<u>Oblique</u>	at an angle of less than 90° to the long axis
<u>Oceanic</u>	refers to the environment of the open oceans, not above a continental shelf
<u>Orbit</u>	cavity or notch in carapace, from which the stalked eyes of most species of Decapod protrude
<u>Orbital region</u>	that region of the carapace bordering the orbit

<u>Palp</u>	small, finger-like, exopod or endopod, usually of a mouthpart
<u>Peduncle</u>	base of an antenna or antennule
<u>Pelagic</u>	environment of the water column, away from the bottom, includes both neritic and oceanic components, and can be sub-divided into epi- meso- and bathypelagic environments (cf. benthic, demersal)
<u>Penultimate</u>	next to last
<u>Pereiopod</u>	ambulatory endopod of a thoracic appendage, does not include maxillipeds
<u>Petasma(ta)</u>	male copulatory organ present on the endopods of pleopods one and two of some Natantia
<u>Phytoplankton</u>	that portion of the plankton which is made up of microscopic plants
<u>Plankton</u>	organisms which float or drift in aquatic environments, and whose movements are controlled primarily by currents. Consists of phytoplankton (plant component) and zooplankton (animal component) (cf. nekton)
<u>Pleon</u>	that portion of the abdomen which bears pleopods
<u>Pleopod</u>	paired natatory appendages, situated on the ventral sides of the first five abdominal segments of most Natantia, may be variously modified or absent in the Reptantia
<u>Pleurobranch(iae)</u>	gill which is attached to the walls of the thorax
<u>Podobranch(iae)</u>	gill which is attached to the outer edge of the coxa of an appendage
<u>Posterior</u>	behind, towards the tail end (prefix: postero-)
<u>Prehensile</u>	adapted for grasping or holding
<u>Propodus</u>	(=propod or propopodite), two segmented base of an appendage consisting of the coxa and the basipod
<u>Protopod</u>	(=protopodite), two segmented base of an appendage consisting of the coxa and basipod
<u>Proximal</u>	nearest to point of origin or attachment (cf. distal)
<u>Pterygostomian spine</u>	spine on the ventral antero-lateral corner of the carapace
<u>Rostrum</u>	mid-dorsal projection of the anterior edge of the carapace, arising from the frontal region (adj: rostral)
<u>Scaphocerite</u>	see antennal scale

<u>Segment</u>	major portion of a body or limb, usually separated by flexible joint
<u>Seta(e)</u>	slender, flexible chitinous outgrowth, like a bristle or hair (adj: setose)
<u>Southern Ocean</u>	the ocean surrounding Antarctica and including parts of the Atlantic, Pacific and Indian Oceans. The northern limit of the Southern Ocean is undefined, but for the present purposes it will be taken as the southern coastlines of other southern hemisphere continents, and the sub-tropical convergence
<u>Spine</u>	hard, usually pointed, outgrowth
<u>Statocyst</u>	small round ciliated cavity in the integument of the coxa of the antennular peduncle of Decapods, used for orientation
<u>Stenothermic</u>	able to exist over only a small range of temperatures (cf. eurythermic)
<u>Sternum</u>	ventral surface of the thorax
<u>Stylocerite</u>	keel-like expansion of the coxa of the antennular peduncle which bears the statocyst
<u>Sub-chelate</u>	with the terminal segment of the appendage folding back on an enlarged preceding segment, to form a prehensile structure
<u>Sub-orbital spine</u>	spine situated on the ventral corner of the orbit
<u>Supra-orbital spine</u>	spine situated in the orbital region, immediately dorsal to the eyestalk
<u>Suture</u>	non-articulated line of junction between two segments
<u>Tail fan</u>	natatory paddle formed by the telson and the flattened branches of the uropods
<u>Telson</u>	terminal flap of the last segment of the abdomen
<u>Thelycum</u>	external pouch present on some female Natantia, which receives spermatophores during copulation
<u>Transverse</u>	at 90° to the long axis
<u>Uniramous</u>	consisting of a single branch or ramus
<u>Uropod</u>	appendage of the sixth abdominal segment, often broad and flattened to form a tail fan in association with the telson
<u>Ventral</u>	pertaining to the lower surface
<u>Zoea(e)</u>	(including protozoa, metazoa, acanthosoma, mysis and schizopod stages), larva with setose exopods on some or all of the thoracic appendages, pleopods absent or rudimentary
<u>Zooplankton</u>	the animal component of the plankton

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