

Preface

During my long life as an amphipodologist I had the chance, in 1982, to ask Théodore Monod to write the preface to the first volume of "The Amphipoda of the Mediterranean". That work in a certain sense inspired the "Synopsis for the Amphipoda of the Southern Ocean" for which I am now asked to write the preface. I accept the commitment and I consider it a privilege to present a work so long awaited, since until today everybody who needed to identify Antarctic amphipods had to resort to several hundreds of specialist works in a variety of publications or in the series of reports of geographical expeditions that have punctuated the history of Antarctic researches, ever since over a century ago.

Today the amphipods of Antarctic and sub-Antarctic fauna, except the Hyperiid, totalized 815 species, a number that places these Crustaceans among the animals with the highest biodiversity for the Southern Ocean fauna. The knowledge of biodiversity at the specific level, which also allows to consider its variations due to environmental changes and thus to monitor anthropic pressure in time, has as its indispensable basis the identification of living species. This is the duty of taxonomy, which until a few years ago was considered an obsolete discipline of biology, but must be revalued and expanded, in close connection to ecology and molecular biology. The work which I am happy to present has this purpose and it is no chance that it was born in a great museum as the Institut Royal des Sciences Naturelles de Belgique. Today a work of this kind must be realised by a team, and this has already been the case for the preparation of "The Amphipods of the Mediterranean". However, an editor was needed who believed in the feat and helped the plan be born and develop, in cooperation with the 16 amphipodologists of 11 countries, chosen for its realisation. This person is my friend Claude De Broyer who, with organizational capability and great tenacity, completed the first stage of a journey which I hope will not be too long. To Claude De Broyer and all the authors are due the thanks of all of us amphipodologists.

The first volume begins with a novelty for a taxonomic work since it contains the "Catalogue of the Gammaridean and Corophiidean Amphipoda of the Southern Ocean". This is uncommon for a work that is destined to the identification of species but, I believe, is very practical because the Catalogue, over 300-pages-long, includes the citation of all the authors who have considered every species, the detailed geographic distribution, the depth range, the type-locality (with the geographic coordinates, if known) and the type specimen location. All the above allow to significantly lighten the part that is destined to the identification of taxa, to the great advantage of the users, through illustrated keys of genera and species, as electronic interactive keys up to the rank of subfamily are planned.

Amphipod systematics is conveniently represented along an alphabetical order because, due to the nearly absolute absence of paleontological proof, little or nothing can be said about an arrangement that can reflect its evolution. However, the results of the cladistic analysis are considered, which cancelled the suborder Caprellidea, instituted the suborder Corophiidean (Myers & Lowry, 2003) and considers the superfamily Talitroidea (Serejo, 2004). The question mark still remains on the superfamily Hadzioidea that hopefully can soon be reconsidered and clearly reordered. From a zoogeographic viewpoint, the total absence of the Gammaridae, which are so characteristic of the boreal hemisphere, catches the eye.

This work comes out in 2007, exactly 300 years since the birth of Carl Linnaeus. It can therefore be considered a significant tribute to the great naturalist whose system still today allows to use a conventional means, accepted unanimously, for naming living beings, through an historical and immutable language, and for ordering their units based on the progress of research. This work represents the state of the art of the knowledge on Antarctic marine amphipods, so it allows to increase with greater certainty all what we know today about a group of animals of great environmental importance.

Best wishes to the future scholars who now have the luck to have such an instrument at their disposal!

Sandro Ruffo

Foreword to the *Synopsis of the Amphipoda of the Southern Ocean*

Amphipod crustaceans are one of the most speciose animal groups in the Antarctic and sub-Antarctic waters, where they show a high diversity in terms of life styles, trophic types, habitats and size spectra. They constitute a significant trophic resource for a number of Southern Ocean fishes, invertebrates, seabirds and mammals.

Nowadays, in the "Global Change" context, polar regions experience greater rates of climate change than elsewhere in the world. Their biota is highly adapted to their extreme environment and appears vulnerable to shifts in climate. Because of the key-role of the Southern Ocean in the Earth system and the growing impact of global environmental change, it is crucial to establish comprehensive baseline information on the Antarctic marine biodiversity as a sound benchmark against which future change can reliably be assessed.

Accurate species identification is fundamental in biodiversity studies and relies on efficient identification tools, which are still lacking for some highly diverse and taxonomically difficult groups of the Southern Ocean, such as amphipods or polychaetes.

Southern Ocean amphipods have been described from the beginning of Antarctic exploration in the second half of the nineteenth century, marked by the works of Pfeffer (1888) and Stebbing (1888). At the turn of the twentieth century Antarctic exploration intensified, resulting in important taxonomic contributions mostly by Walker (1903a, 1907) and Chevreux (1906e, 1913c). The third period, between 1925 and 1938 was the most productive in the history of Antarctic amphipod taxonomy and nearly half of the present fauna was described mostly by Schellenberg (1926a, 1931a) and K.H. Barnard (1930, 1932). The increased activity in the Antarctic following the International Geophysical Year (1957-58), the establishment of permanent coastal stations and the development of many national Antarctic programmes under the coordination of SCAR resulted in a number of contributions by contemporary specialists, which substantially augmented the number of known Antarctic taxa.

However, the current knowledge of the Antarctic benthic biodiversity in general remains highly patchy in terms of coverage of geographical areas, bathymetric zones, habitats, taxonomic groups, ecofunctional groups, or size spectra. Vast areas of the High Antarctic continental shelf are still untouched and the Antarctic deep sea is hardly explored. It has been estimated that only one third of the Antarctic shelf macrobenthos species is already known (Gutt *et al.* 2003). Concerning the amphipods, new species are discovered by each exploratory cruise on the shelves around the continent or around the islands of the Scotia Arc and the first systematic investigations of the Antarctic abyssal basins by the *Polarstern* ANDEEP cruises have recently collected an impressive number of unknown taxa.

In the framework of the "Ant'Phipoda" project (De Broyer *et al.* 2001b), an international network of specialists (the «Antarctic Amphipodologist Network») was established to undertake the taxonomic revision of the Antarctic fauna of gammaridean and corophiidean amphipods (about 600 spp presently recognized), to synthesize their biogeographical and ecological traits and to elaborate the highly-needed identification guides and electronic identification keys.

The initial impetus for developing this Synopsis project came from Wolfgang Wägele (Bonn), editor of the very welcome - but now provisionally suspended - series "Synopsis of the Antarctic Benthos", who encouraged me to edit the amphipod volumes. Having in mind the nice example of the successful "Amphipoda of the Mediterranean" volumes edited by Sandro Ruffo, a number of specialists (forming the "Antarctic Amphipodologist Network") have accepted with enthusiasm to participate in the project and to contribute particular families to cover the whole Antarctic benthic fauna. I would like to thank G. Alonso de Pina (Buenos Aires), H.G. Andres (Hamburg), D. Bellan-Santini (Marseille), J. Berge (Longyearbyen), C.O. Coleman (Berlin), K. Conlan (Ottawa), C. d'Udekem d'Acoz (Bruxelles), J.M. Guerra-Garcia (Sevilla), E. Hendrycks (Ottawa), K. Jażdżewski (Lodz), T. Krapp-Schickel (Bonn), J.K. Lowry (Sydney), A. Myers (Cork), M. Rauschert (Berlin), I. Takeuchi (Matsuyama) and M.H. Thurston (Southampton) for their involvement in the project.

The Synopsis will cover all benthic amphipod taxa living in the Southern Ocean south to the Polar Front (formerly Antarctic Convergence), and, as far as possible, sub-Antarctic species living around the Subantarctic Islands and in the Magellan region of southern South America will also be taken into account.

The volumes will deal with the different family contributions as they appear ready to press. It was found preferable not to wait for the completion of the revision of the whole fauna by the various contributors. We hope that the

users of this Synopsis will understand the advantages of this presentation rather than its disadvantages. We hope to present in a second step electronic interactive keys for genera and species.

The Synopsis is designed to facilitate the identification process to non-specialists: all keys are illustrated, diagnostic characters in keys are chosen to minimize as far as possible the need for dissection.

We hope that this Synopsis will - step by step - constitute a significant contribution to the Census of Antarctic Marine Life (www.caml.aq) and the SCAR-Marine Biodiversity Information Network (www.scarmarbin.be) in the framework of the International Polar Year 2007-2008.

I wish to thank, also on behalf of the "Antarctic Amphipodologist Network":

- The Belgian Federal Science Policy for its support to the preparation of the Synopsis, through the BIANZO project (Biodiversity of the Antarctic Zoobenthos),
- The Royal Belgian Institute of Natural Sciences, and in particular Mrs C. Pisani, General Director, Dr J. Van Goethem, Head of Invertebrate Department, and Prof. K. Wouters, Editor of the Bulletin, for the publication as supplements of the "Bulletin de l'Institut Royal des Sciences Naturelles de Belgique",
- The Census of Marine Life (Albert P. Sloan Foundation, New York) for its support through the "Census of Antarctic Marine Life" (CAML) and SCAR-MarBIN.

Claude De Broyer

Editor

Institut royal des Sciences naturelles de Belgique,
Brussels, May 2007

Synopsis of the Amphipoda of the Southern Ocean

Acanthonotozomellidae, Amathillopsidae, Dikwidae, Epimeriidae, Iphimediidae, Ochlesidae and Vicmusiidae

Introduction

This is the second volume of a series of monographs on benthic amphipods of the Antarctic Ocean. The families treated herein are not a monophyletic entity. These families have in common a remarkable body shape caused by dorsal and lateral teeth and carinae. Many of these species are very colourful and it is unknown what role the strange body shapes and the colours play. In case these spiny processes are adaptive there may be two explanations: a) It could be that these spiny amphipods are less often eaten by predators such as fish as the spines prick in their mouth and digestive tract or b) the alternative could be that the strange body shapes act as a camouflage. This could be observed in *Echiniphimedia hodgsoni*, a micropredator on sponges (Coleman, 1989a), which is almost invisible on the host (see Colour plate 3f). The colour and the hedgehog like appearance of this species matches the sponge surface in all details (Coleman, unpublished) and they are easily overlooked. Apart from the body armature the mouthpart morphology in some of these families is remarkable. Especially in the Iphimediidae the mouthpart morphology is so diverse as in no other amphipod taxon. Watling and Thurson, (1989) believe that the evolution of the Iphimediidae has been driven by the mouthpart morphology. At least in some species the mouthpart morphology is clearly related to the food preference. *Gnathiphimedia mandibularis* for example has stout noncutting incisors on the mandibles. With these hammer-like mouthparts they crush bryozoans and ingest whole zooids (Coleman, 1989b). The food preference of species with calcified remains in the gut as in *Gnathiphimedia* and *Echiniphimedia* can be easily determined, but there are other species which feed on soft tissue where food preference can only be found out by way of exception: *Maxilliphimedia longipes* has large, soft food morsels in the stomach and gut that are macroscopically not identifiable. Microscopically, however, nematocysts of cnidarians can be identified and the mandibles, especially the mandibles are capable of cutting such kind of soft, mucuous cnidarian tissue (Coleman, 1989a). In *Anchiphimedia dorsalis* the maxilliped outer plates surround the mouthparts and are tapering into a short tube. With this tube this species might ingest small detrital food (Coleman, 1991). Also in the Epimeriidae there seem to be food specialists. *Epimeria oxycarinata* has been found sitting on hydrozoans and hydrozoan remains were found in the digestive canal (Coleman, 1990).

Thus for ecologists these Antarctic amphipods seem to be an interesting group. For most of the species even the fundamental data are still missing. They have many practical advantages. They are easy to find, they are in almost every catch that comes aboard. They are large noticeable animals

and, different from most amphipod groups, they are relatively easy to identify. In most cases they can be determined without any dissection by the habitus.

I hope that this publication will help and encourage the non taxonomists to work with these amphipods.

Material and Methods

The species treated herein are distributed within the Antarctic Convergence, but nevertheless some areas outside this biogeographic boundary are included: the Falkland Islands, the Magellan region and Heard Island.

Together with the illustrated keys and illustrations, short diagnoses are given. Synonyms and detailed distribution records are not included, they are treated elsewhere (De Broyer *et al.*, 2007 Volume 1).

The illustrations are based on type material and material from the collections of the Museum für Naturkunde Berlin, most of which were collected during various expeditions of RV „Polarstern“. For several species illustrations from publications were redrawn, when no material was available or the material was in a bad state. Photos on the colour plates were made by Martin Rauschert, Claude De Broyer, Gauthier Chapelle and myself in aquaria in a temperature controlled laboratory on board the RV „Polarstern“.

The material was collected with benthic trawls, mostly Agassiz trawl or fishery bottom trawls. Part of the material was fixed in 4% formalin, later washed in freshwater and then stored in 70% ethanol. Some samples were directly fixed in 70% ethanol after carefully washing the specimens in freshwater to avoid white precipitate from the reaction of seawater with the ethanol. The ethanol should not be concentrated higher than 70% as the cuticle becomes brittle in high alcohol concentrations. It may be advantageous to add 1-5 % glycerol to the samples to keep the cuticle flexible for a long period of time.

General morphology

Most amphipods are laterally compress and have rather large side plates that are derived from expanded coxal articles of the main appendages (pereopods). The body is divided in (see Fig. 1a): a) head; 7 pereon segments (pereonites); c) 3 pleon segments (pleonites with their ventral epimeral plates); d) 3 urosome segment (urosomites); e) telson. The dorsal plates of the amphipods (tergites) can be armed with pointed processes, carinae (narrow, keel-like teeth) and dorsal continuous keels. Also the coxae may be acutely produced laterally. An important taxonomic character are the shapes of the posteroventral angles of the pleonites.

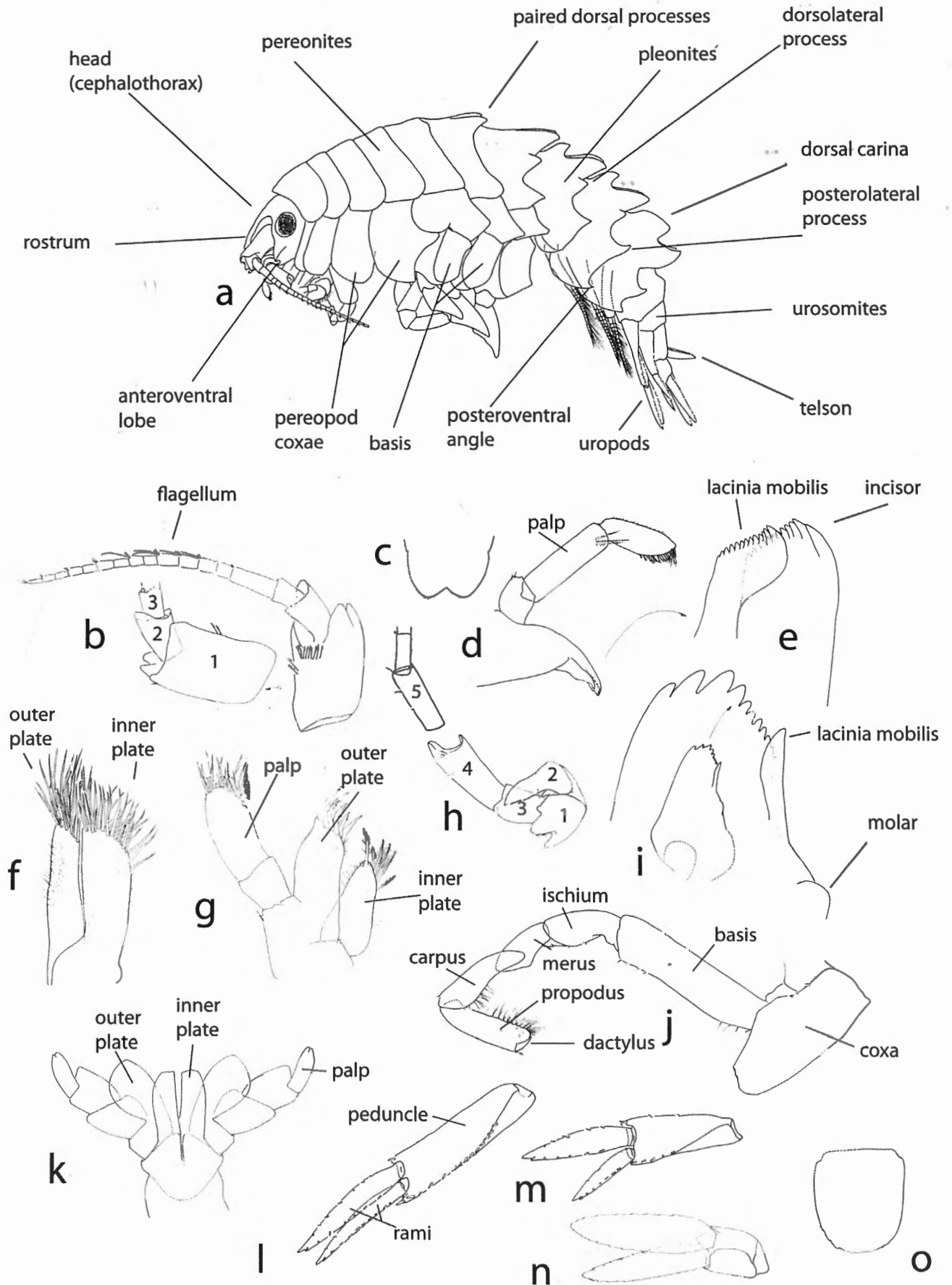


Fig. 1 a-n. Morphological structures of an amphipod crustacean. a) left aspect of body; b) antenna 1 with peduncular articles 1-3; c) upper lip (upper lip); d) mandibular body with palp; e) medial view of distal part of left mandible; f) maxilla 2; g) maxilla 1; h) antenna 2 peduncular articles 1-5; i) right mandible with lacinia mobilis and rudimentary molar; j) maxilliped, setation omitted; k) uropod 1; l) uropod 2; m) uropod 3; n) telson.

The head is in fact a cephalothorax as it comprises the head articles and additionally the first thoracopod as a maxilliped. On the head there are 2 pairs of antennae. Antenna 1 (Fig. 1b) consists of a peduncle of 3 articles and a flagellum. In many cases there is an accessory flagellum at the basis of the flagellum, that sometimes is reduced to a small, inconspicuous scale. Antenna 2 (Fig. 1h) has a 5-articulate peduncle, articles 1 and 2 are very small and sometimes partly fused. The distal margin of article 2 is drawn out into the pointed gland cone, the exit of the nephridial organ. The mouthparts are on the ventral side of the head. The anterior part is the epistome with a small plate, the upper lip or labrum (Fig. 1c). The following mouthparts are the mandibles (Fig. 1d, e, i), which act as jaws. They have a distal cutting edge (incisor), an accessory cutting blade (lacinia mobilis), and a grinding process (molar). Between lacinia mobilis and molar in most amphipod taxa there is a setal row. The mandible in most amphipods has a 3-articulate palp which is directed towards the basal articles of the antenna 2. The mandibles are followed by the lower lip (hypopharynx or labium), which is bilobed due to a median gap. Upper lip, mandibles and lower lip surround the mouth-opening. Posteriorly to this complex there are 3 more pairs of mouthparts: maxilla 1 and 2 and the fused maxilliped. Maxilla 1 (Fig. 1g) consists of an inner plate that is bordered with plumose setae, an outer plate with apical spine-like setae and a normally 2-articulate palp. Maxilla 2 (Fig. 1f) has an inner and an outer plate, bordered with setae distally and at the inner plate also medially. The maxilliped (normally in singular in amphipod literature) is fused at the proximal article and partly at the second one. There are a pair of inner and outer plates and a normally 4-articulated palp on both sides (Fig. 1k). The pereopods form 3 groups: pereopods 1-2 are called gnathopods due to their grasping capabilities involved in feeding in many species; pereopod 3-4 are in normal position in contrast to pereopods 5-7 which are strangely turned, so that the dactyli are directed anteriorly. The sequence of articles of the pereopods (Fig. 1j) follow the standard crustacean terminology (proximal to distal): coxa, basis, ischium, merus, carpus, propodus, dactylus. Gills and in females additionally oostegites (forming a brood pouch) occur as medial outgrowths of the coxae of some pereopods. The pereopods are followed by 3 pairs of pleopods that are coupled together by coupling hooks on the medial side of the proximal article. The 2 rami of each pleopod are bordered with long setulated setae that are used for swimming and ventilating the gills or eggs in the brood chamber. On the urosome there are 3 pairs of appendages that are traditionally called uropods (Fig. 1l, m, n) (in fact only the 3rd pair are uropods, uropods 1-2 are transformed pleopods). They consist of an uniarticulate peduncle and 2 rami. At the posterior end of the animal is the telson (Fig. 1o), which can be cleft or notched medially. In certain taxa reductions or transformations of these general structures may occur.

Acknowledgements

I would like to thank Prof. Dr. Wägele for his support over all these years and the crew of RV "Polarstern" for their help to collect the amphipods on several cruises. Thanks also to Dr. Martin Rauschert, Dr. Claude De Broyer and Dr. Gauthier Chapelle for providing their wonderful colour pictures. I am very grateful to Dr. Claude De Broyer for carefully editing and improving the manuscript. Special thanks to Ms Kati Wünsche for scanning the illustrations and making the distribution maps.

This is contribution n°4 to the Census of Antarctic Marine Life (CAML).

Systematics

ACANTHONOTOZOMELLIDAE Coleman & Barnard, 1991b

Diagnosis. Body compressed, with dorsal teeth. Rostrum well developed. Antennae elongate or short, flagella usually with 5+ articles; accessory flagellum absent. Mouthpart field conically produced. Epistome and upper lip narrow, long, incised. Incisor of mandible normal, toothed; setal row strong; molar reduced or absent; palp always present, 3-articulate. Lower lip without inner lobes, without distinct inner notches. Inner plate of maxilla 1 ordinary, medially setose or setation reduced; outer plate oblique, normally spinose; palp large, 2-articulate. Inner plate of maxilla 2 without facial or medial setae. Palp of maxilliped 4-articulate, article 2 often produced medially. Coxae 2-4 more or less

acuminate, ventral margins fitting normal ventral parabolic curve of anterior coxae or coxa 2 shortened; coxae 1 and 4 not shortened, coxa 1 widened in 2 genera but not significantly wider than coxa 2 (vs. Stilipedidae), subtruncate or rounded (except *Acanthonotozomoides* with concave posterior margin and ventral tooth), coxa 4 with large posteroventral process (small in *Amatiguakius*). Coxa 5 shorter than posteroventral process of coxa 4. Gnathopods feeble, subequal; gnathopods 1-2 simple or weakly parachelate, merus and carpus not produced, carpus slender. Bases 5-7 often with posterior cusps or teeth. Epimeral plate 3 often with 2 large cusps posteromarginally. Urosomites free. Uropods 1-3 biramous. Rami of uropod 3 longer than peduncle, flattened, lanceolate, 1-articulate. Telson entire or weakly incised.

List of genera. *Acanthonotozomella* Schellenberg, 1926a (= *Paracanthonotozoma* Bellan-Santini, 1972a); *Acanthonotozomoides* Schellenberg, 1931a; *Amatiguakius* Coleman & Barnard, 1991d.

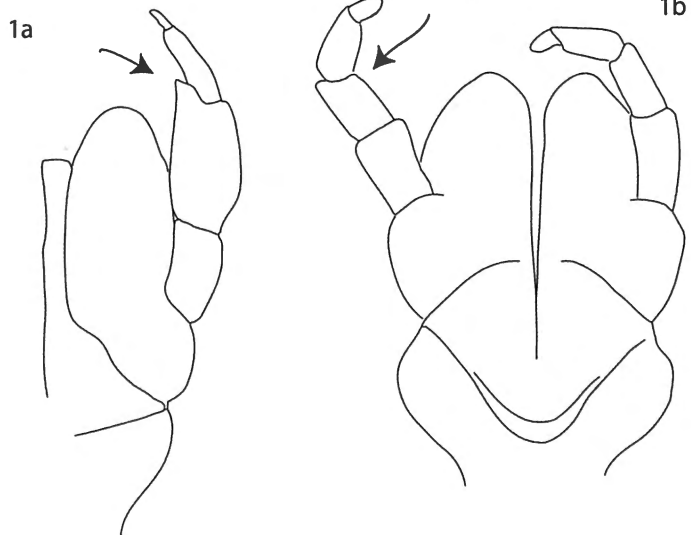
Key to the genera to Acanthonotozomellidae

1a. Article 2 of maxilliped palp medially produced.

1b. Article 2 of maxilliped palp not produced

Acanthonotozomoides

2

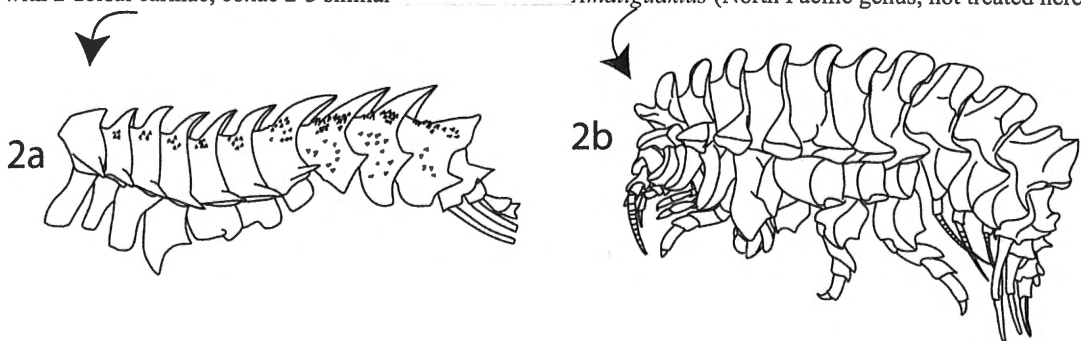


2a. Pereonite 1 with 1 dorsal dorsal carina

2b. Pereonite 1 with 2 dorsal carinae, coxae 2-3 similar

Acanthonotozomella

Amatiguakius (North Pacific genus, not treated herein)



***Acanthonotozomella* Schellenberg, 1926a**

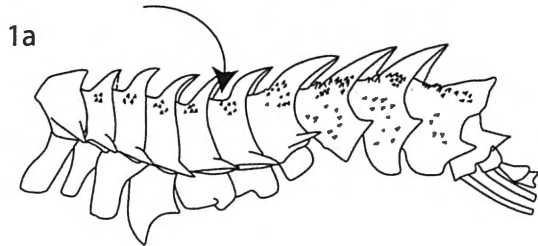
Type-species. *Acanthonotozomella alata* Schellenberg, 1926a

Diagnosis (after Barnard & Karaman, 1991). Body covered with teeth. Antenna 1 peduncular article shorter than 1. Mouthparts projecting conically. Upper lip incised, not very broad. Mandibular incisor normal, toothed; setal row long;

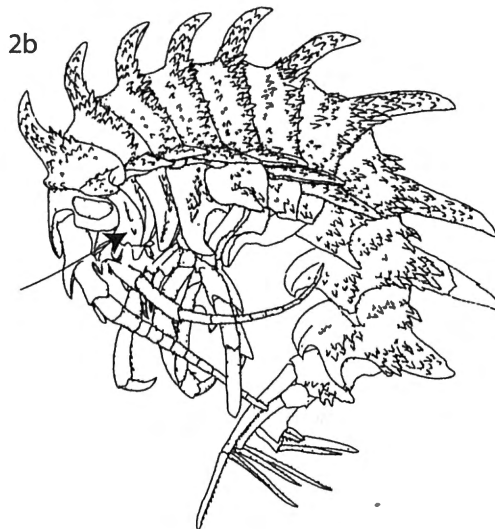
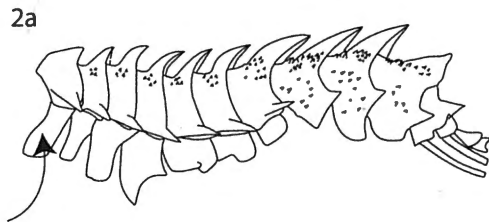
molar broad and blunt, simple. Lower lip inner lobes absent. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate without facial row of setae. Maxilliped inner plate as long but not as broad as outer plate, latter short; palp article 2 narrow and unproduced; palp article 4 well developed. Coxa 2 short; coxa 4 long, weakly bicuspidate. Gnathopods alike, propodi and dactyli elongate, narrow, both gnathopods simple. Telson broad, entire or incised.

Key to the species of *Acanthonotozomella*

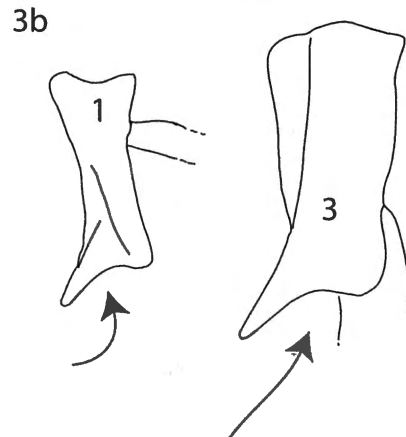
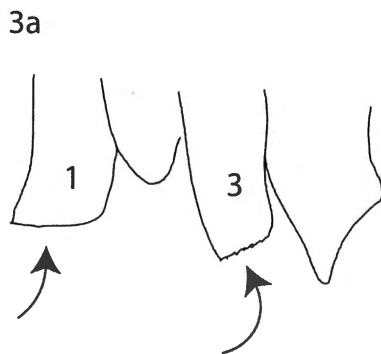
- 1a. Dorsal surface with small teeth 2
- 1b. Dorsal cuticle with carinae, but small teeth lacking 3



- 2a. Coxae smooth *A. barnardi*
- 2b. Coxae covered with small teeth *A. rauscherti*



- 3a(1). Apex of coxae 1 and 3 truncate *A. alata*
- 3b. Apex of coxae 1 and 3 excavate *A. trispinosa*



Acanthonotozomella alata Schellenberg, 1926a

(Fig. 1a-b, Map 1: rhomb)

References and synonymy. De Broyer *et al.* 2007: 21.

Diagnosis. Head, without rostrum, scarcely as long as pereonite 1; rostrum with raised lateral edges, shorter than first peduncular article of antenna 1; ocular lobe of head with blunt process; anteroventral corner roundly produced. Pereonites 1-7 and pleonites 1-2 each with broad posteriorly curved dorsal process, only that on pereonite 1 is upright, the length of the processes increases from anterior to posterior. The ventral margin of the tergite of each pereonite bears a laterally and posteriorly directed tooth, which has the same shape and length of the dorsal process in segments 2-6. Posterior margin of pleonites 1-2 concave. Pleonite 3 with 2 succeeding dorsal, apically rounded processes, the anterior one is shorter than the posterior, which is as long but not as strong as that of pleonite 1, one small tooth on both sides of the posterior process. Dorsolateral posterior margins of pleonites 1-3 with pointed process; epimera ventrally rounded, posteroventral angle not developed. Urosomite 1 with dorsal process similar shaped to that on pleonite 3, but shorter. Coxa 1 rectangular, anterodistal corner acutely drawn

out, posterodistal corner rounded, distal margin finely serrate, lateral surface with dorsoventral keel; coxa 2 subtriangular with rounded apex, shorter than preceding coxa; coxa 3 is subrectangular, slightly tapering and oblique distally, distal margin shortly serrate, anterodistal corner angular, posterodistal angle rounded; coxa 4 distally pointed, with posteromarginal rounded process; coxae 5-7 rounded, that of pereopods 5-6 with wider and shorter anterior lobe; bases 5-7 with posteromarginal rounded protrusion and distal, narrow rounded lobe that surpasses ischium. Telson wider than long, distally bluntly rounded, somewhat excavate, not reaching the distal margin of uropod 1 peduncle.

Size. Juvenile 3 mm.

Remarks. Similar to *Acanthonotozomella trispinosa*, *A. alata* has 2 dorsal processes on pleonite 3, which is different from *A. barnardi*. Bases 5-6 are straight posteromarginally in *A. barnardi*, but produced in *A. alata* and *A. trispinosa*. These two species are quite similar (see remarks in the description of *A. trispinosa*). They differ strongly in size (3 mm vs. 12 mm) so that it is possible that between these species the „differences are size-related and the two species are synonymous“ (Watling & Holman, 1980).

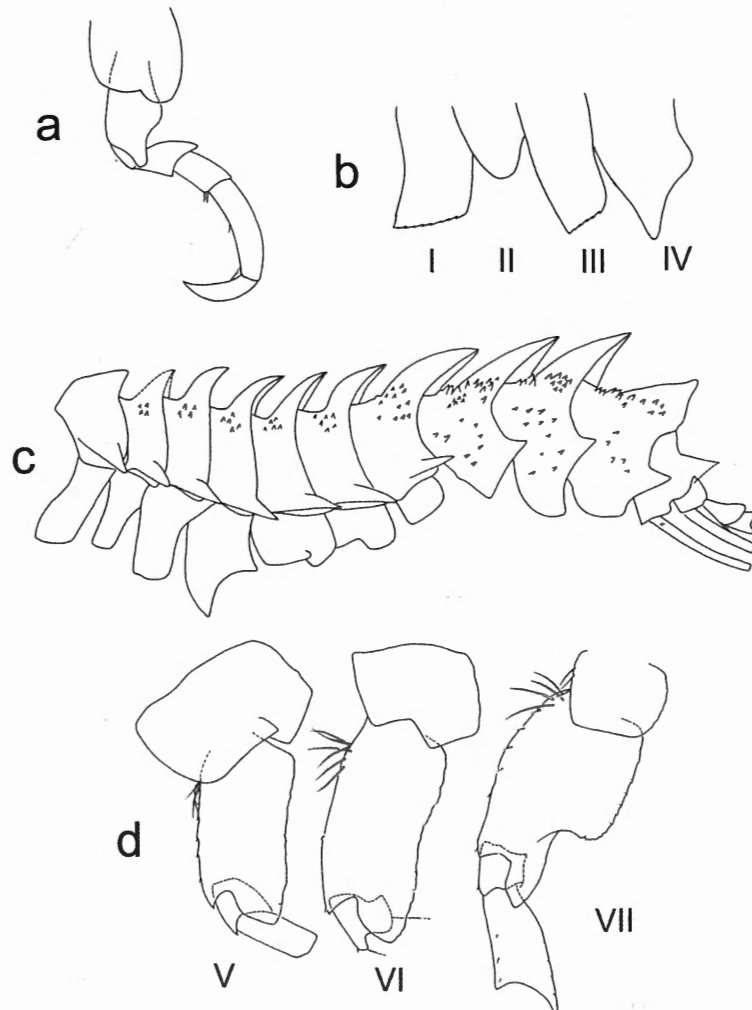
Type locality. Davis Sea: „Gauss Station“.**Distribution.** Only known from type locality.**Depth range.** 385 m.

Fig. 1a-d. Details of *Acanthonotozomella alata*, redrawn after Schellenberg, 1926a. a) pereopod 5; b) coxae 1-4. *Acanthonotozomella barnardi* redrawn after Watling & Holman, 1980. c) habitus; d) pereopods 5-7.

Acanthonotozomella barnardi Watling & Holman, 1980

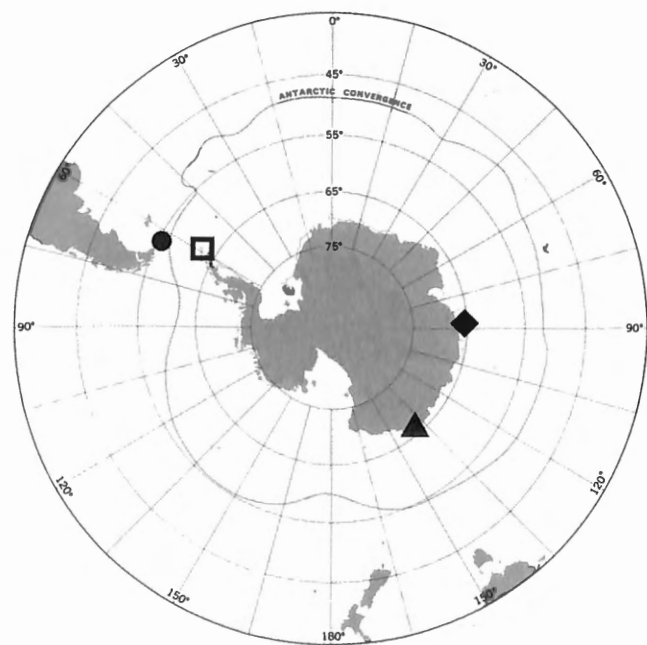
(Fig. 1c-d, Map 1: circle)

References and synonymy. De Broyer *et al.* 2007: 21.

Diagnosis. Head, measured without rostrum, shorter than pereonite 1. Rostrum with raised edges, shorter than peduncular article 1 of first antenna, ocular lobe pronounced. Integument of body covered with small cone-like papillae giving rough appearance. All pereonites and pleonites each with single dorsal carinae curved posteriorly, increasing in size with successive segment, carina on pereonite 1 consisting of a truncate keel; pereon tergites each with stout, posteriorly directing teeth laterally. Carina on pleonite 3 with single, upright process with subacute apex, not projecting beyond posterior segmental margin. Posterior lateral margin of pleonites with acute projection, epimeral plate 1 subacute ventrally, epimeral plate 2-3 rounded anteriorly, more angular posteriorly, but not produced. Urosomite 1 with dorsal tooth (?). Coxa 1 longer and wider than coxa 2, anterior margin somewhat excavate, distally truncate. Coxa 2 narrower and shorter than coxa 1 or 3. Gnathopods 1 and 2 alike, simple. Coxa 4 ventrally pointed, excavate posterodistally. Coxae 5-7 rounded posteriorly; posterior margin of basis 7 excavate, posterodistal corner extending ventrally as subacute lobe beyond distal margin of ischium. Telson probably entire.

Size. Unknown.

Remarks. *Acanthonotozomella barnardi* differs from *A. alata* and *A. trispinosa* by having a single dorsal process on pleonite 3 (vs. 2 teeth), a distally truncate coxa 2 (vs. rounded or subacute), pereopods 5 and 6 posterior margin of basis not excavate (vs. excavate).

Type locality. Magellan area: 56°06'S 66°19.30'W.**Distribution.** Only known from type locality.

Map 1. *Acanthonotozomella alata*: rhomb; *Acanthonotozomella barnardi*: circle; *Acanthonotozomella rauscheri*: open square; *Acanthonotozomella trispinosa*: triangle.

Depth range. 384-494 m.

Acanthonotozomella rauscheri Coleman & Jäger, 2001

(Fig. 2, Map 1: open square)

References and synonymy. De Broyer *et al.* 2007: 21.

Diagnosis. Head slightly longer than pereonite 1, with mid-dorsal keel; rostrum only weakly downturned; lateral margins of rostrum and of anterior head margin slightly upturned; eyes colourless in alcohol, more than 2 times higher than wide. Pereonites 1-7 with narrow dorsal slightly posteriorly curved carinae, those of pereonites 1-5 about the same length, on pereonites 6-7 longer and more directed posteriorly. Additional lateral wing-like processes on pereonites, narrow and slightly curved posteriorly. Pleonites 1-3 with dorsal carinae, those of pleonites 1-2 similar in shape and length to that of pereonite 7, rather straight and longer than on pereonites 1-6. Dorsal process on pleonite 3 shorter and wider. Epimera 1-3 with long pointed posterolateral processes, posteroventral angle of epimeral plate 1 tapering distally and rounded, that of plate 2 and 3 pointed. Urosomite 1 with short dorsal process, urosomite 2 shortest; urosomite 3 posteriorly excavate, posterodorsally angular. Pereonites, pleonites, urosomite 1 and coxae covered with irregular rows of short teeth. Antenna 1 peduncular article 1 longest, expanded, distally ending in one short and one long pointed process; article 2 running out into one long pointed process; article 3 shorter than 2. Antenna 2 article 4 about the length of articles 1-3 combined. Gnathopod 1 coxa deeply excavate anteriorly, weakly convex posteriorly, apex deeply excavate; palm lacking; dactylus with 3 pointed processes on posterior margin. Gnathopod 2 coxa excavate anteriorly, weakly convex posteriorly, apex subacutely pointed, with dentate ridge on lateral face; palm lacking; dactylus with 3 pointed processes on posterior margin. Coxa 3 of similar shape as coxa 2, but slightly longer and wider. Coxa 4 about the same width as coxa 3 proximally, anterior margin weakly sinuous, apex subacute; posteromarginal process directed ventrally. Pereopod 5 coxa wider than long, convexly rounded anteriorly, lobate posteriorly, with stout process directing posteroventrally; basis posterior margin excavate (proximal and posteroventral processes). Pereopod 6 coxa wider than long, acute anteriorly and posteriorly; apart from small teeth one stouter one. Pereopod 7 coxa subquadrate with subacute posteroventral angle; basis anteromarginally convex with long setae proximally, posterior margin sinuous, excavation on distal half, posteroventral angle subacute. Pleopod 1 length of peduncle 3 x width; coupling hooks with some lateral teeth; inner ramus shortened. Uropod 1 peduncle longer than rami, setation only on lateral margin; outer ramus slightly shorter than inner. Uropod 2 peduncle shorter than inner ramus, setation only on lateral margin; outer ramus 75% of inner. Uropod 3 peduncle shortest, outer ramus 85% of inner ramus. Telson wider than long, with a shallow depression apically.

Size. Female 11 mm.

Remarks. This species is similar to *A. barnardi* in the following characters: a single row of dorsal carinae on pereon and pleon; lateral pointed and projecting processes on pereon segments; fine teeth that cover part of the pereonites and pleonites dorsally; shape of dorsal head keel and raised lateral margins of rostrum. However, there are a number of differences between these taxa (see Table 1).

The two other species from the genus *Acanthonotozomella* can easily be distinguished from the *A. rauscherti*. *Acanthonotozomella alata* does not have any short teeth on the dorsal body cuticle and the apices of pereopod coxa 1-4 are very different: coxa 1 truncate, coxa 2 shortened considerably and rounded, coxa 3 obliquely truncate, coxa 4 only weakly excavate posteriorly.

Also *A. trispinosa* differs in many respects from *A. rauscherti*:

Table 1. Differences between *Acanthonotozomella rauscherti* and *A. barnardi*.

	<i>A. rauscherti</i>	<i>A. barnardi</i>
dorsal carinae	narrow, upright, long,	on pereonite 1 wide and short, on other segments short and strongly curved posteriorly
teeth on dorsal body surface	dense, also carinae covered with teeth laterally	sparse, not on carinae
teeth on lateral face of coxae	present	absent
peduncular articles 1-2 of antenna 1	with long distal processes	without processes
coxa 1 apex	deeply excavate	rounded
coxa 2 apex	acute	truncate
coxa 3 apex	subacute	truncate
posteroventral corner of epimeral plates 2-3	produced and pointed	angular
posterior margin of pereopod 5 basis	excavate	straight
posterior margin of pereopod 6 basis	deeply excavate, with proximal rounded lobe and posteroventral acute process	only weakly excavate, posteroventrally rounded

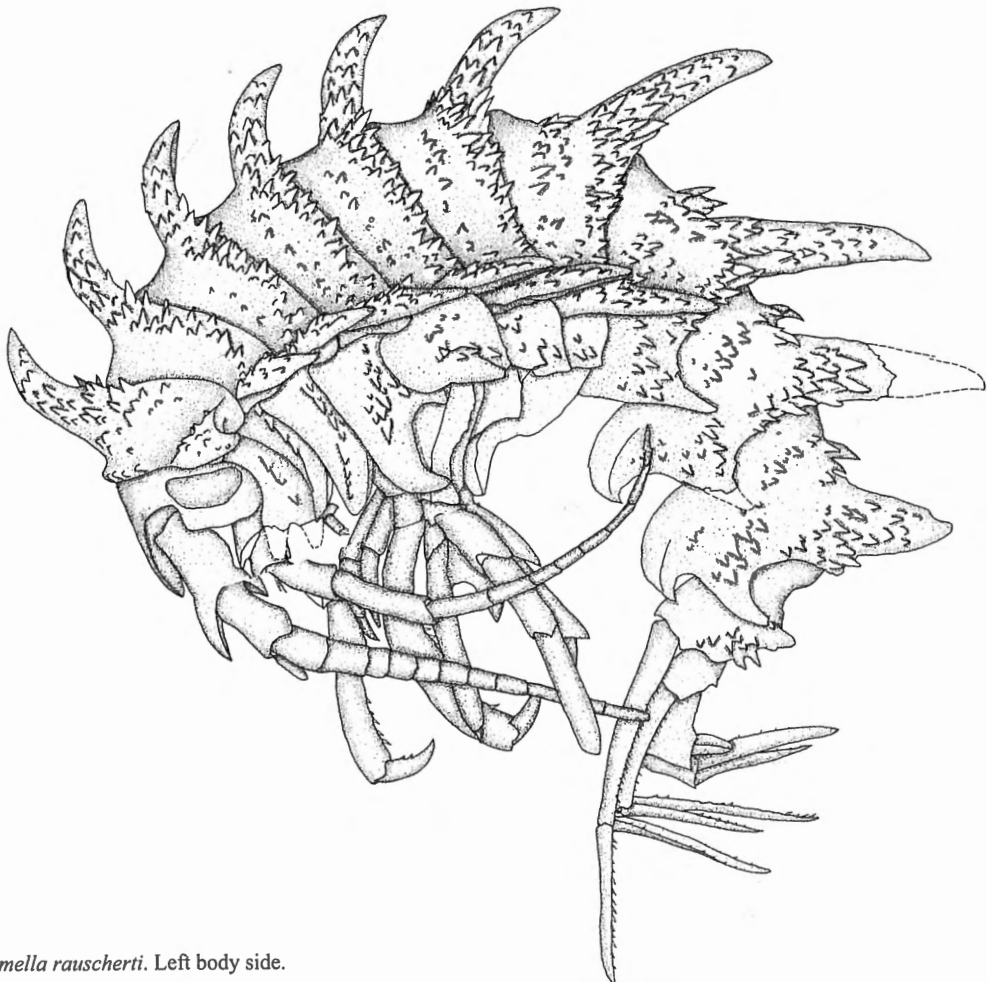


Fig 2. *Acanthonotozomella rauscherti*. Left body side.

it has no small teeth dorsally; coxa 1 is strongly expanded anterodistally and has a shallow apical depression; coxa 3 is similarly to coxa 1 anterodistally widened; basis, merus and carpus of pereopods 5-6 with acutely produced processes posteriorly.

Type locality. Drake Passage: 62°21.9'S 58°41.1'W.

Distribution. Only known from type locality.

Depth range. 1000 m.

***Acanthonotozomella trispinosa* (Bellan-Santini, 1972a)**

(Fig. 3a-j, Map 1: triangle)

References and synonymy. De Broyer *et al.* 2007: 21.

Diagnosis. Head with small flexed rostrum; ocular lobe pointed. Pereonites with mid-dorsal, posteriorly curved carinae; posterior corners of tergites drawn out to long,

pointed, posteriorly directed processes. Pleonite 1 with dorsal carina, similar to that of pereonite 7. Pleonite 2 with dorsal carina and additional process on its dorsal curvature, pleonite 3 with 2 upright, dorsal processes, the posterior one with a tooth on both sides; lateral posterior margins of pleonites produced, on pleonite 1 angular, on pleonites 2-3 acute; all epimeral plates with ridges, which flow into a weakly pointed posteroventral corner. Urosomite 1 with upright tooth. Coxa 1 distally expanded, anteroventral corner drawn out, ventral margin somewhat excavate. Coxa 2 tapering distally with subacute apex; both gnathopods alike, simple, without palm. Anteroventral corner of coxa 3 acutely drawn out, ventral margin concave. Coxa 4 tapering distally, with pointed apex and posteromarginal tooth; Coxa 5 with subacute tooth on distolateral surface. Coxa 6 subquadrate, posterodistal angle acute. Coxa 7 anteriorly excavate; pereopods 5-7 each with posteromarginal acute tooth and posterodistal pointed lobe; ischium on pereopod 5 with acute anterodistal corner; merus and carpus of pereopods 5-6 expanded distally and

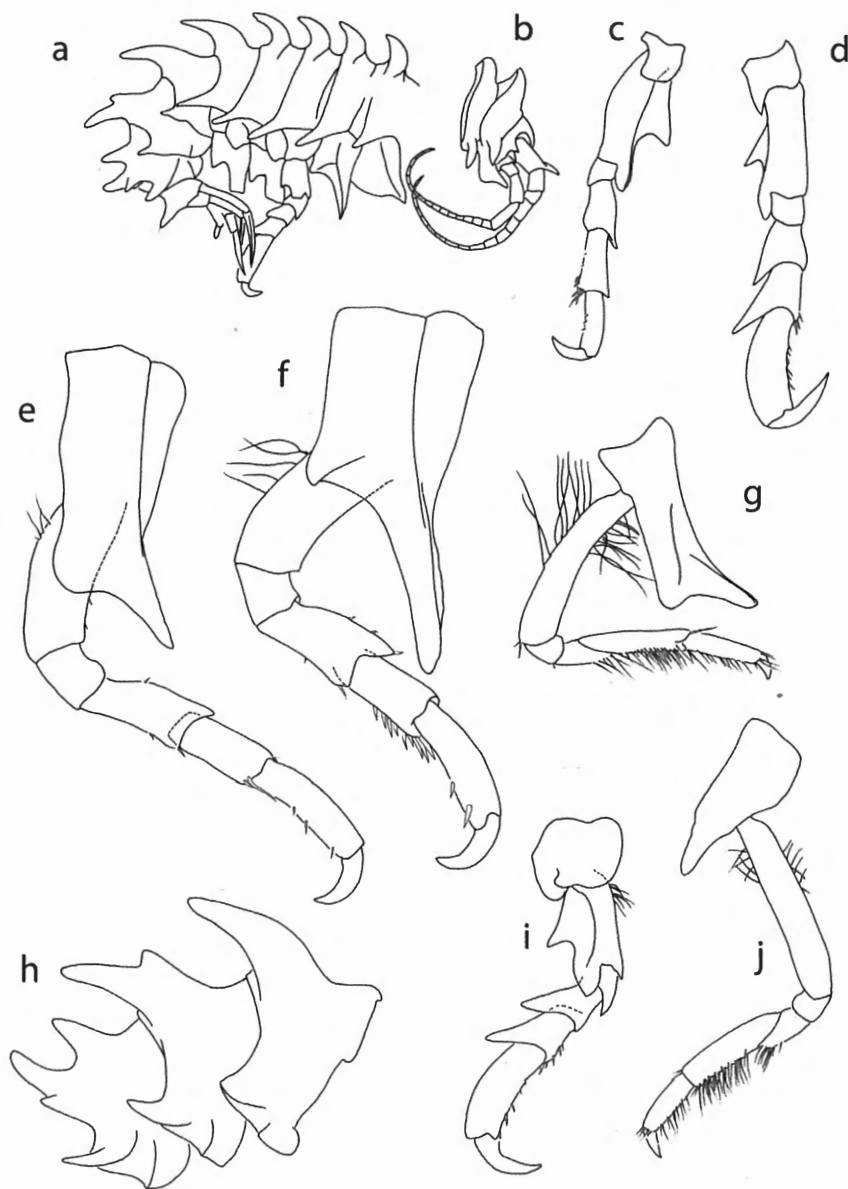


Fig. 3a-j. *Acanthonotozomella trispinosa*, redrawn after Bellan-Santini (1972a). a) right body side; b) head with pereonites 1-2; c) pereopod 7; d) pereopod 6; e) pereopod 3; f) pereopod 4; g) gnathopod 1; h) pleosome; i) pereopod 5; j) gnathopod 2.

posterodistally acutely produced, but less produced on pereopod 7. Telson entire and apically truncate.

Size. Female 12 mm.

Remarks. *Acanthonotozomella trispinosa* is similar to *A. alata*, especially in the dorsal carination. Differences between these species are: coxa 2 is distally rounded in *A. alata* (vs. subacute in *A. trispinosa*); antenna 1 peduncular article 1 with dorsal tooth in *A. trispinosa*, which is wanting in *A. alata*; posterior margin of the basis of pereopods 5-7 is rounded dorsal of excavation, but forms an acute lobe in *A. trispinosa*. Watling & Holman (1980) note: "since these species also differed strongly in size (*A. alata*, 3 mm; *A. trispinosa*, 12 mm) it is possible that the above differences are size-related and the two species are synonymous."

Type locality. Adélie Coast: Cape Géodésie, 66°40'S 139°51'E.

Distribution. Only known from type locality.

Depth range. 120-130 m.

Acanthonotozomoides Schellenberg, 1931a

Type-species. *Acanthonotozomoides sublitoralis* Schellenberg, 1931a.

Diagnosis (modified after Barnard & Karaman, 1991). Body covered with teeth or processes. Antenna 1 peduncular articles 1-2 subequal. Mouthparts projecting conically. Upper lip incised; epistome not very broad. Mandibular incisors elongate, narrow, slightly toothed; setal row present; molar absent. Lower lip inner lobes absent. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate without facial row of setae. Maxilliped inner plate as long but much narrower than outer plate, latter elongate; palp article 2 slightly produced (see Bellan-Santini, 1972a); palp article 4 small. Coxae ordinary, coxae 1-4 progressively longer; coxa 4 polycuspidate. Gnathopods alike, carpus and propodus elongate, narrow, both gnathopods simple. Telson entire.

Acanthonotozomoides oatesi (K.H. Barnard, 1930)

(Fig. 4a-b, Colour plate 1a, Map 2: rhomb)

References and synonymy. De Broyer *et al.* 2007: 21.

Diagnosis. Head with long flexed, narrow rostrum, lateral margins minutely serrate and turned up, eyes small, rounded, bulging; ocular lobe of head subacutely produced; anteroventral corner drawn out narrowly, longer than gnathopod 1 coxa. Each pereonite and pleonites with paired dorsal processes with minutely serrate margins; that on pereonite 1 broad, on segment 2 narrower with rounded apex, from pereonite 3 on pointed, curved posteriorly, increasing in size on succeeding pereonites and pleonites 1-2; each tergite of pereonites with lateral long, wing-like pointed processes, curved posteriorly, narrower on pereonites 6-7, minutely serrate anterior and lateral margins. All pleonites with long pointed, laterally

ridged process on lateral posterior margins; epimeral plates of pleonites 1-3 with ridge on lateral surface and pointed posteroventral corner; pleonite 3 different from pleonites 1-2 in having an unpaired mid-dorsal process and a pair of upright processes close to the posterior margin. Urosomite 1 with unpaired, upright, mid-dorsal process and 2 shorter dorsolateral projections on posterior margin; urosomite 3 with 2 posteromarginal acute processes, uropods with long slender rami. Coxae 1-3 tapering distally, with very narrow pointed apex, margins of distal region somewhat serrate, ridge on lateral surface. Coxa 4 excavate anteromarginally, with long, narrow, ventral and posterior process, forming a deep distal excavation, strong ridge on lateral surface, connected to posteromarginal process. Coxae 5-6 with long narrow process with serrate margins. Coxa 7 with small tip on posteroventral corner; bases 5-7 with ridge which flows into posterodistal long process, anterior margin of bases 5-7 straight, that of pereopod 7 convex; ischium of pereopod 5-7 pointed anterodistally, merus with long posterodistal process, carpus with short process. Telson longer than wide, apically entire and rounded.

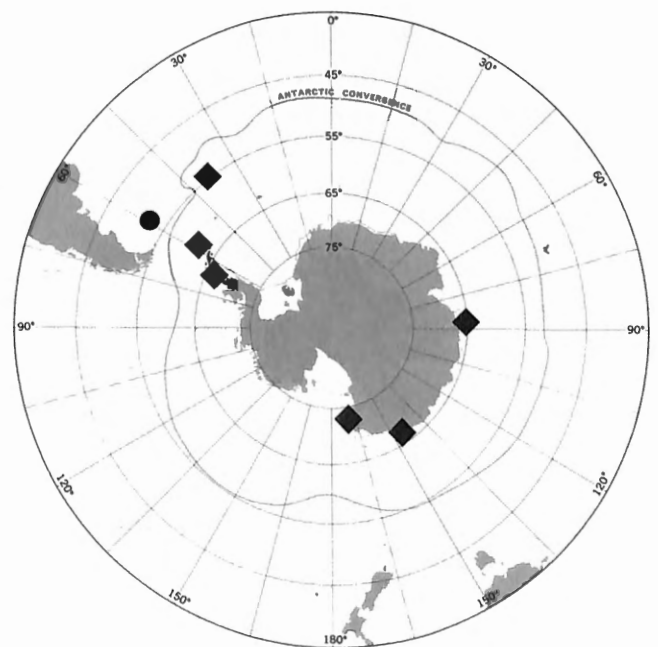
Size. Ovigerous female 7-13 mm, male 6.5-9 mm.

Remarks. *Acanthonotozomoides oatesi* differs from the closely related *A. sublitoralis* in having only 1 pair of dorsal processes on pereonite 1.

Type locality. Ross Sea: Cape Adare.

Distribution. Adélie Coast; Davis Sea; Ross Sea; South Georgia; South Shetland Islands; Palmer Archipelago.

Depth range. 68-236 m.



Map 2. *Acanthonotozomoides oatesi*: rhomb; *Acanthonotozomoides sublitoralis*: circle.

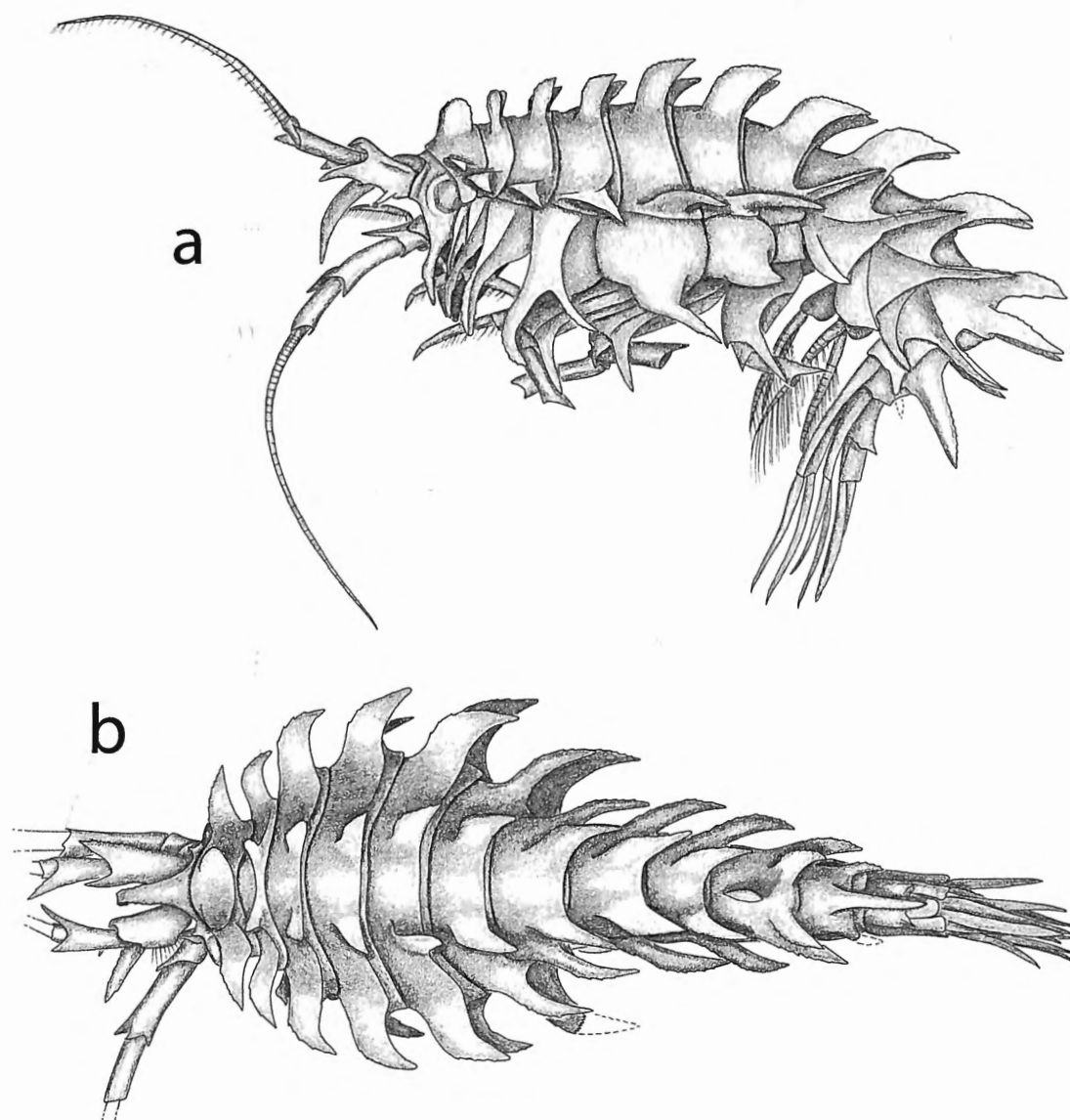


Fig. 4a-b. *Acanthonotozomoides oatesi*. a) left side of habitus; b) dorsal side of habitus

Acanthonotozomoides sublitoralis Schellenberg,
1931a

(Fig. 5, Map 2: circle)

References and synonymy. De Broyer *et al.* 2007: 22.

Diagnosis. Rostrum proximally slightly bulging dorsally, distally straight, tip slightly turned upwards, projecting as far as anteroventral corner of head, eyes large, oval, rounded and bulging; ocular lobe of head subacutely produced; anteroventral corner drawn out narrowly, longer than gnathopod 1 coxa. Each pereonite and pleonite with paired dorsal processes with minutely serrate margins, on first pereonite 2 pairs, from segment 2 on curved posteriorly, increasing in size on succeeding pereonites and pleonites 1-2; each tergite of pereonites with lateral long, wing-like pointed processes, curved posteriorly. All pleonites with long pointed, laterally ridged process on lateral posterior margins; epimeral plates of pleonites 1-3 with ridge on

lateral surface and pointed posteroventral corner; pleonite 3 different from pleonites 1-2 in having an unpaired mid-dorsal process and a pair of upright processes close to the posterior margin. Urosomite 1 with unpaired, upright, dorsal process and 2 shorter dorsolateral projections on the posterior margin; uropods with long slender rami. Coxae 1-3 tapering distally, with very narrow pointed apex, margins of distal region somewhat serrate, ridge on lateral surface; gnathopod 1 coxa with additional pointed process close to the apex; posterior margin of coxa 2 slightly excavate, anterior and posterior margin of coxa 3 concave. Pereopod 4 coxa excavate anteromarginally, with long, narrow, ventral and posterior process, forming a deep distal excavation, strong ridge on lateral surface, connected to the postermarginal process. Coxae 5-6 with long narrow process with serrate margins. Coxa 7 small tip on posteroventral corner; bases 5-7 with ridge which flow into posterodistal long process, anterior margins straight; ischium of pereopods 5-7 pointed anterodistally, merus with long posterodistal process, carpus

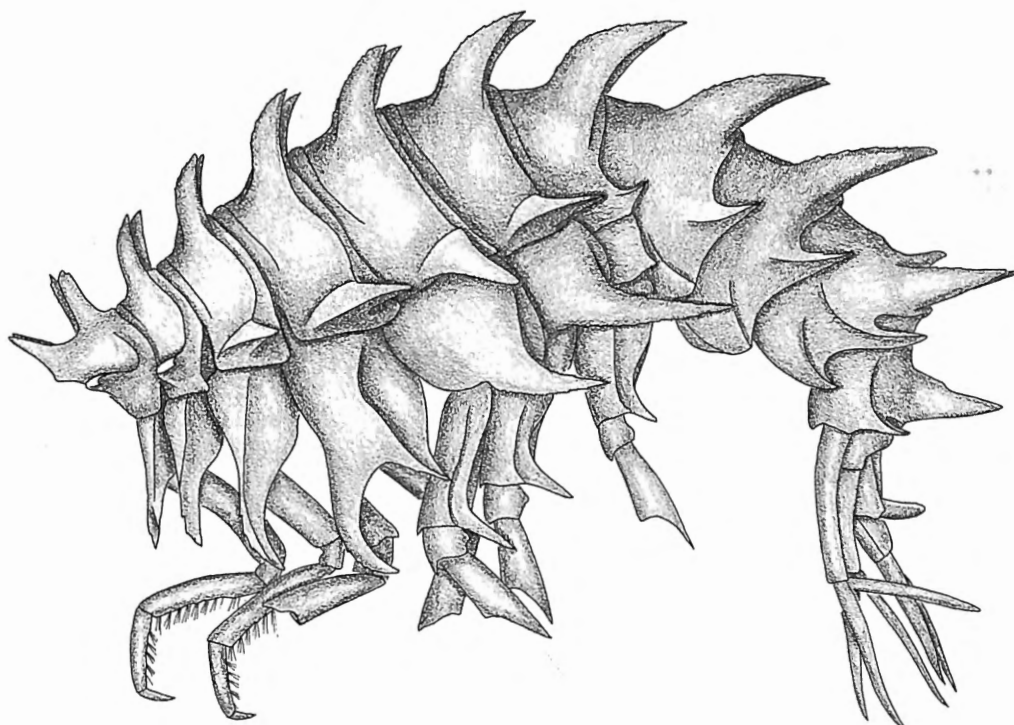


Fig. 5. *Acanthonotozomoides sublitoralis*. Left body side, head is missing.

with short process. Telson longer than wide, apically entire and rounded.

Size. Ovigerous female 9 mm.

Remarks. *Acanthonotozomoides sublitoralis* differs from the closely related *A. oatesi* in having 2 pairs of dorsal processes on pereonite 1 and a bidentate coxa 1.

Type locality. Falkland Islands: 52°29'S 60°36'W.

Distribution. Only known from type locality.

Depth range. 197 m.

AMATHILLOPSIDAE Pirlot, 1934

Diagnosis (after Coleman & Barnard, 1991). Rostrum of medium size or very small. Antennae elongate, flagella with 5+ articles; accessory flagellum 1-2 articulate. Mouthpart field quadrately developed. Epistome and upper lip broad, short, entire. Incisor of mandible ordinary, toothed; raker row strong; molar large and tritulative, palp always present, 3-articulate. Lower lip with inner lobes, without distinct inner notches. Inner plate of maxilla 1 ordinary, apically medially setose; outer plate oblique. Inner plate of maxilla 2 without facial setae. Palp of maxilliped 4-articulate, article 2 not produced medially. Coxa 1 scarcely to not acuminate, mostly truncate. Coxae 2-3 more or less acuminate; coxa 1 but not 4 shortened. Coxa 4 not strictly acuminate, with weak or posteroventral lobe. Coxa 5 at least slightly shorter than coxa 4. Gnathopods of moderate size, gnathopod 2 usually slightly longer than gnathopod 1; gnathopods 1-2 propodosubchelate, carpi lobed, propodi enlarged and almost almond-shaped. Bases of pereopods 5-7 occasionally with posterior cusps or

teeth. Epimeral plate 3 lacking 2 large cusps. Uropods 1-3 biramous. Rami of uropod 3 flattened, lanceolate, 1-articulate. Telson entire or weakly incised, generally not longer than peduncle of uropod 3.

List of genera. *Amathillopsis* Heller, 1875; *Parepimeria* Chevreux, 1912; *Cleonardopsis* K.H. Barnard, 1916.

Amathillopsis Heller, 1875

Type species. *Amathillopsis spinigera* Heller 1875

Diagnosis (modified after Barnard & Karaman, 1991). Body covered with teeth or processes. Antenna 1 peduncular articles 1-2 long, subequal; or 1 shorter than 2. Mouthparts projecting quadrately. Upper lip incised or entire, very broad, thin, elongate. Mandibular incisor ordinary, toothed; raker row present; molar broad and blunt, tritulative. Inner lobes of lower lip present, weak, or coalesced. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate without facial row of setae. Maxilliped inner plate shorter but scarcely narrower than outer plate, latter short; palp article 2 narrow and apicomediaally unproduced; palp article 4 well developed. Coxae 1-4 progressively longer; coxa 4 mono- or polycuspidate. Gnathopods slightly enlarged, alike, carpi and propodi ordinary, stout, carpi lobate, both gnathopods weakly subchelate. Uropod 1-2 apices of rami without robust setae. Telson longer than broad, entire or incised.

Amathillopsis charlottae Coleman, 1998

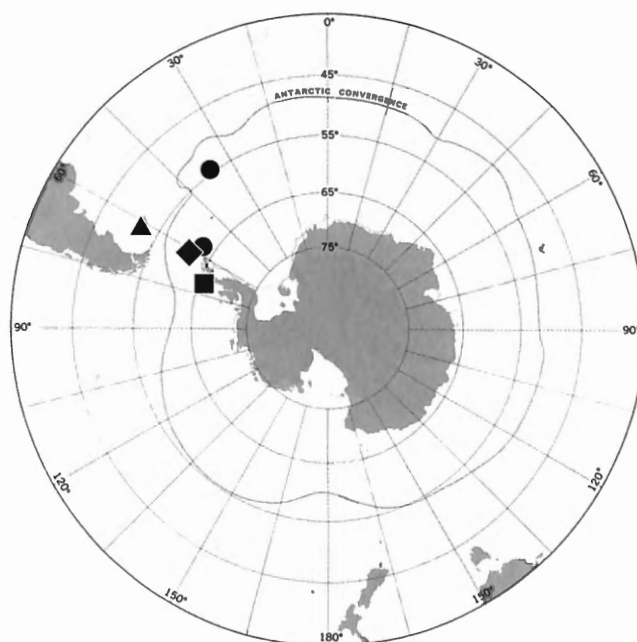
(Fig. 6, Map 3: square)

References and synonymy. De Broyer *et al.* 2007: 22.

Diagnosis. Head with short rostrum; eyes no ommatidia visible. Pereonites 2-4 indistinctly keeled dorsally; pereonite 5 with short carina and pereonites 5-6 with long pointed, weakly posteriorly curved processes. Similar but slightly longer processes on pleonites 1-2 and a shorter one on pleonite 3, about half the length of that on pleonite 2. Epimeral plate 1 ventrally truncate, obtuse posteroventrally; plate 2 posteroventrally acute, plates 1 and 2 laterally ridged; posterolateral margin of epimerial plate 3 sinuous, posteroventral angle acute. Urosomite 1 as long as segment 2 and 3 combined; urosomite 2 shortest; urosomite 3 with shallow keel, slightly overreaching posterior margin, with shallow depression in lateral view. Antenna 1 peduncular article 1 subequal in length to article 2, article 3 less than one third the length of article 2; accessory flagellum uniaarticulate; flagellum consisting of numerous, short articles, calceoli present. Antenna 2 peduncular article 4 longest, weakly tapering; article 5 slender, subequal to articles 1-3 combined; flagellum consisting of numerous, short articles, calceoli present. Upper lip wider than long with convex margin, entire. Mandible incisor with sharp teeth; lacinia mobilis wide and with similar teeth; raker row present; pars molaris weakly ridged. Lower lip small inner lobes present, outer lobes wide and distally rounded, with groups of stout setae mediolaterally. Maxilla 1 inner lobe wide distally, with plumose setae mediolaterally; outer plate with 11 slender apical setae; palp 2-articulate. Maxillipeds slender and covered with numerous setae; inner plates short with 3 nodular setae medioapically; palp articles 2-4 elongate, article 2 longest. Gnathopod 1 subchelate; coxa 2/3 the length of coxa 2-4 and narrower, with anteroventral shallow excavation; basis anterior margin straight, posterior margin convex, drawn out into a rounded lobe posterodistally; carpus distally expanded with posterior

lobe; propodus slender; dactylus long, with row of minute hair-like setae on posterior and few on anterior margin. Gnathopod 2 similar to gnathopod 1, but all articles somewhat longer and more slender. Coxa 3 longer than on preceding appendages, apex oblique with shallow depression. Coxa 4 sharply pointed with oblique rather straight apex, subequal in length to pereopod 3.

Pereopod 5 longest; coxa wider than long; basis subrectangular with proximal short rounded lobe, directed dorsally. Pereopod 6 coxa similar to that of pereopod 5, but somewhat wider. Pereopod 7 shorter than pereopods 5 and 6; coxa smallest of all pereopods; basis shorter and wider proximally compared to pereopods 5 and 6, tapering distally. All uropod peduncles and rami densely bordered with short spiniform setae, outer rami shortened. Uropod 1 peduncle equal to inner ramus. Uropod 2 peduncle shorter than rami. Uropod 3 peduncle



Map 3. *Amathillopsis charlottae*: square; *Parepimeria bidentata*: circle; *Parepimeria crenulata*: rhomb; *Parepimeria irregularis*: triangle.

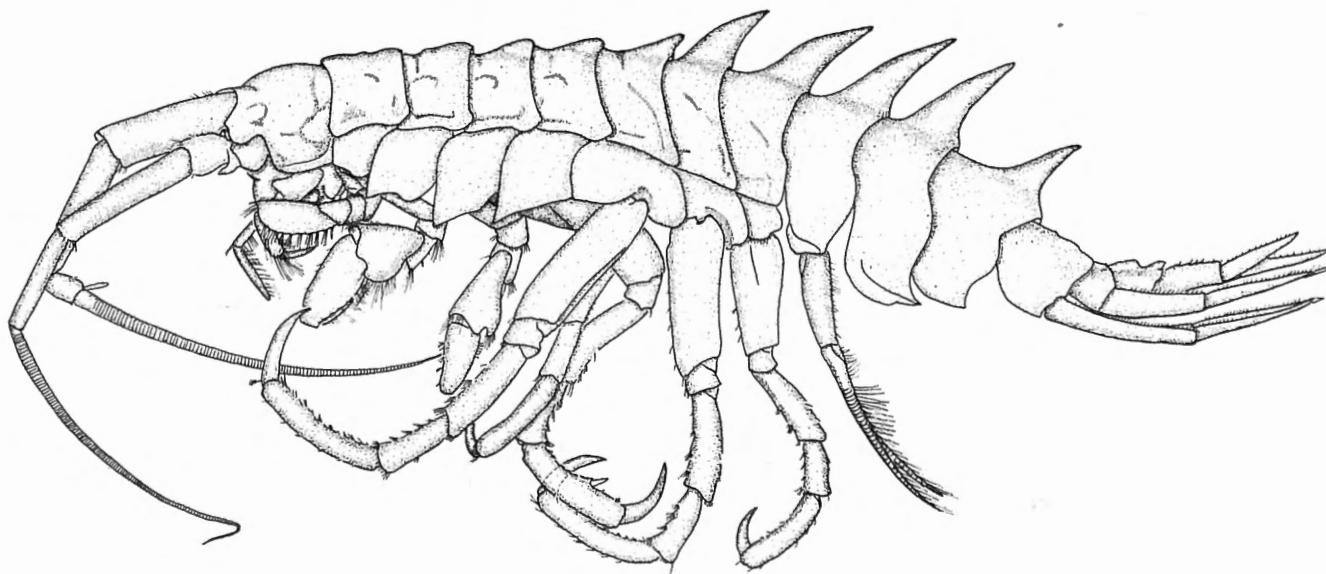


Fig. 6. *Amathillopsis charlottae*. Left body side.

wide with some stouter spines on outer margin, outer ramus shortened. Telson longer than wide, entire, convex distally, with 2 pairs of plumose setae on dorsal surface and some microtrichs.

Size. Females 23-30 mm, males 17-30 mm.

Remarks. *Amathillopsis charlottae* is the only Antarctic species of the subfamily. It is similar to *Amathillopsis australis* Stebbing, 1888, *Amathillopsis grevei* Barnard, 1961 and *Amathillopsis atlantica* Chevreux, 1908 in having a middorsal carina or tooth on pleonite 3 that is about half the length of that of pleonite 2 and urosomite 1 lacks a dorsal process, whereas all other known species from this genus have a process on pleonite 3 that is less than half the length of that of pleonite 2 or, if it is longer then urosomite 1 bears a tooth. *Amathillopsis australis*, however, differs from the *A. charlottae* in its subacute labrum (vs. rounded); in the length relationship of mandibular palp articles 2:3 = 0.65 (vs. 0.9); in the distally strongly expanded basis of gnathopod 2 and the excavated posterior margin (vs. convex); its elongate coxal plates 3 and 4; the dorsal process on pleonite 3 not being upright as in *A. charlottae*, but directed posteriorly; and the emarginate telson (vs. entire). *Amathillopsis grevei*, similar to *A. charlottae*, has short coxae 3-4 and epimeral plate 1 ventrally truncate. However, it has rather small carinae, the accessory flagellum is 2-articulate (vs. uniaarticulate), and the telson is emarginate (vs. entire). *Amathillopsis atlantica* has very narrow dorsal carinae viewed laterally, posteroventral pointed processes on epimera 2-3 are missing, and the telson tapers distally and is notched. Two other species have an additional dorsal process on urosomite 1: *Amathillopsis septemdentata* Ledoyer, 1978 has a long carina on pleonite 3,

but also a short dorsal process on urosomite 1, a much longer mandibular palp article 3 than 2 (ratio segment 2:3=0.65, vs. 0.9), and elongate and narrow dorsal carinae (vs. shorter and wider) and sinuous anterior margins of coxae 3-4 (vs. straight), so that the tips of the apices appear curved anteriorly and coxa 2 is deeply excavate distally; bases 5-7 are without the small dorsal lobes that are developed in *A. charlottae*. In *Amathillopsis spinigera* Heller, 1875 the dorsal carinae begin on pereonite 1, urosomite 1 with dorsal process, and coxae 3-4 are excavate distally.

Type locality. Antarctic Peninsula: 66°33.10'S 68°41.90'W.

Distribution. Only known from type locality.

Depth range. 607 m.

Parepimeria Chevreux, 1912

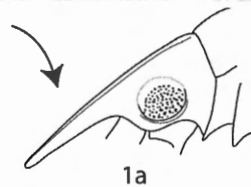
Type species. *Parepimeria crenulata*, Chevreux 1912

Diagnosis (modified after Barnard & Karaman, 1991). Body covered with teeth or processes, or weakly so (*P. irregularis*). Antenna 1 peduncular articles 1-2 long, subequal. Mouthparts projecting quadrately. Upper lip incised; epistome not very broad. Mandibular incisor narrow, toothed; raker row long; molar broad and blunt, triturative. Lower lip inner lobes weak. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2: inner plate without facial row of setae. Maxilliped plates alike, outer plate short; palp elongate, article 2 narrow and unproduced; palp article 4 well developed, unguiform. Coxae 1-4 progressively longer; coxa 4 monocuspidate. Gnathopods alike, of different sizes, carpus and propodus elongate, narrow; both gnathopods simple. Telson entire.

Key to the Antarctic species of *Parepimeria*

1a. Rostrum elongate

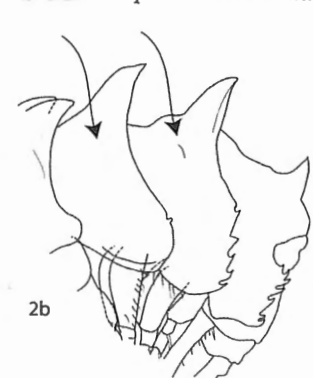
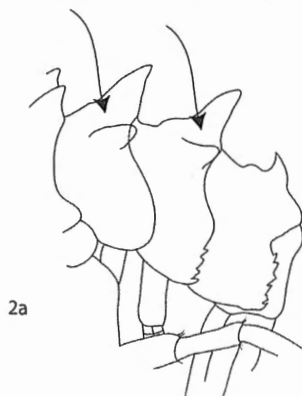
1b. Rostrum short or lacking



1
3

2a. Pleonites 1-2 with dorsolateral pointed process on both sides of carinae

2b. Pleonites 1-2 without dorsolateral pointed process on both sides of carinae



Parepimeria crenulata

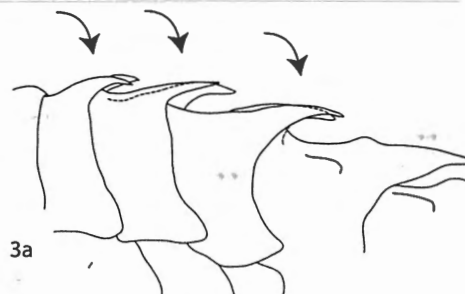
Parepimeria bidentata

3a(1). Long, slender paired processes restricted to pereonites 5-7

Parepimeria major

3b. Short paired processes on more or less pereonites

4

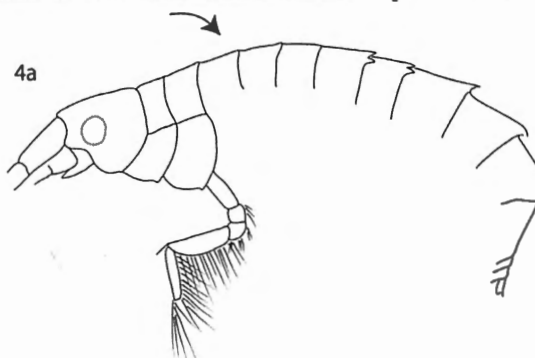


3a

4a. Paired dorsal processes on pereonites 6-7 only

Parepimeria irregularis

4b. Paired dorsal processes on pereonites 2-7

Parepimeria minor

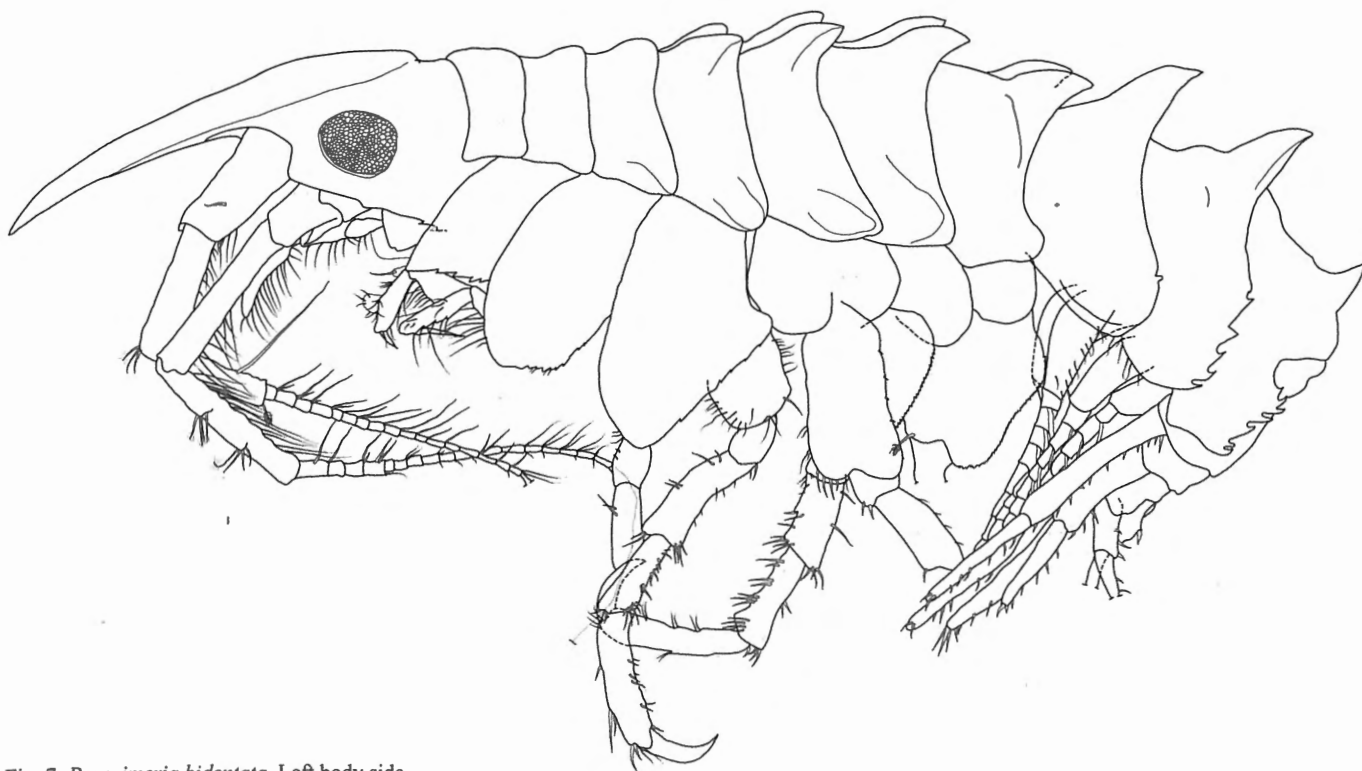
4a

***Parepimeria bidentata* Schellenberg, 1931a**

(Fig. 7, Map 3: circle)

References and synonymy. De Broyer *et al.* 2007: 22**Diagnosis.** Head including rostrum about as long as pereonites 1-5; rostrum elongate, almost reaching the distal margin of the second article of antenna 1; head dorsally straight from

lateral few, with dorsal keel; anterior head lobe angular. Eyes small, rounded. Paired dorsal processes on pereonites 3-7. Long mid-dorsal carinae on pleonites 1-2; short slightly anterior curved mid-dorsal tooth on pleonite 3. Mid-dorsal keel on pereonites 2-7 wanting. Posteroventral corner of pleonite 1 rounded with 1-3 short teeth posteromarginally; those of pleonites 2-3 serrate. Antenna 1 somewhat shorter than antenna 2. Antenna 2 article 5 slightly longer than article

Fig. 7. *Parepimeria bidentata*. Left body side.

4. Lacinia mobilis of mandible 3-4 dentate. Inner plate of maxilla 1 with 5-6 setae. Palp of maxilliped slender, twice as long as outer plate. Coxa 1 pointed and directed anteriorly; apex of coxae 2-3 subacute; coxa 4 rounded distally. Gnathopods slender, simple; carpi tapering distally; propodi half the width of carpi; dactyli slender.

Size. Ovigerous female 12-13 mm.

Remarks. *Parepimeria bidentata* is very similar to *P. crenulata*. However, the first mentioned does not have dorsolateral teeth on pleonites 1-2.

Type locality. South Georgia: Shag Rocks, 53°34'S 43°23'W.

Distribution. Antarctic Peninsula; South Georgia.

Depth range. 0-310 m.

Upper lip emarginate. Mandible palp 3-articulate, articles 2-3 elongate and setose ventromarginally. Lower lip with inner lobes, outer lobes rounded with short mandibular processes. Palp of maxilliped slender, twice as long as outer plate. Coxa 1 pointed and directed anteriorly; apex of coxa 2 pointed, that of coxae 3-4 subacute. Gnathopods slender, simple; carpi tapering distally; dactyli slender. Coxae 5-6 bilobed; coxa 7 subrectangular. Bases 5-6 subrectangular; basis 7 rounded posteromarginally. Telson entire.

Size. Female 6-13 mm, male 7-9.5 mm.

Remarks. See remarks for *P. bidentata*.

Type locality. Palmer Archipelago: Chanal de Roosen.

Distribution. South Shetland Islands.

Depth range. 23-391 m.

Parepimeria crenulata Chevreux, 1912

(Fig. 8, Colour plate 1b, Map 3: rhomb)

References and synonymy. De Broyer *et al.* 2007: 22.

Diagnosis. Head including rostrum about as long as pereonites 1-5; rostrum elongate, almost reaching the distal margin of the second article of antenna 1; head dorsally straight from lateral view, with dorsal keel; anterior head lobe rounded. Eyes of moderate size, rounded. Paired dorsal processes on pereonites 3-7. Long mid-dorsal carinae on pleonites 1-2, with dorsolateral teeth; slightly anterior curved mid-dorsal tooth on pleonite 3. Mid-dorsal keel on pereonites 2-7. Posteroventral corner of pleonite 1 rounded; those of pleonites 2-3 serrate. Antenna 1 somewhat shorter than antenna 2. Antenna 2 article 5 slightly longer than article 4.

Parepimeria irregularis (Schellenberg, 1931a)

(Fig. 9a-c, Map 3: triangle)

References and synonymy. De Broyer *et al.* 2007: 23.

Diagnosis. Head as long as pereonites 1-2, without rostrum. Anterior head lobe angular to rounded. Outlines of eyes not clearly visible. Pereonites 6-7 with small dorsal pair of teeth. Pleonites 1-2 each drawn out into mid-dorsal pointed process. Epimeral plate 1 rounded; posterior margin of plate 2 straight, posteroventral corner angular with 2-3 teeth; posteroventral angle of epimeral plate 3 serrate (5-6 dorsally curved teeth). Peduncular articles of antenna 1 subequal in length; accessory flagellum 1-articulate. Upper lip slightly incised. Lower lip with inner lobes; outer lobes small, rounded, widely separate, with short mandibular lobes. Coxa 1 anteroventral angle

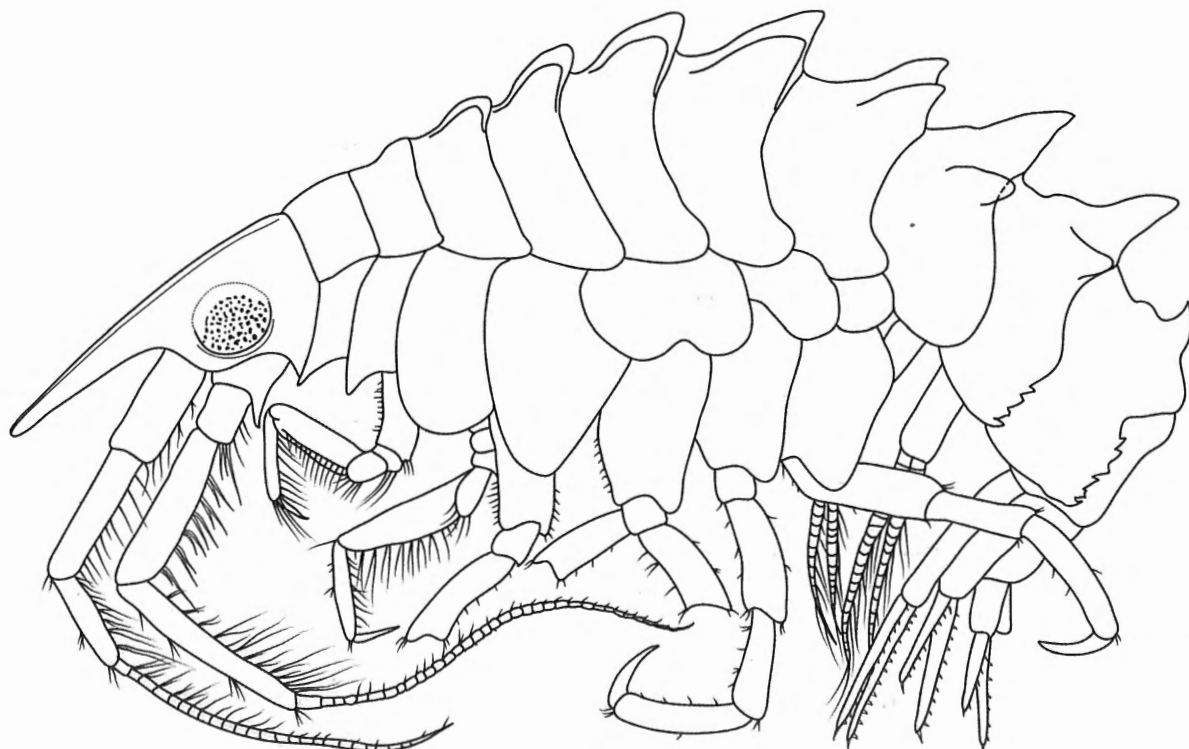


Fig. 8. *Parepimeria crenulata*. Left body side, redrawn after Chevreux (1913).

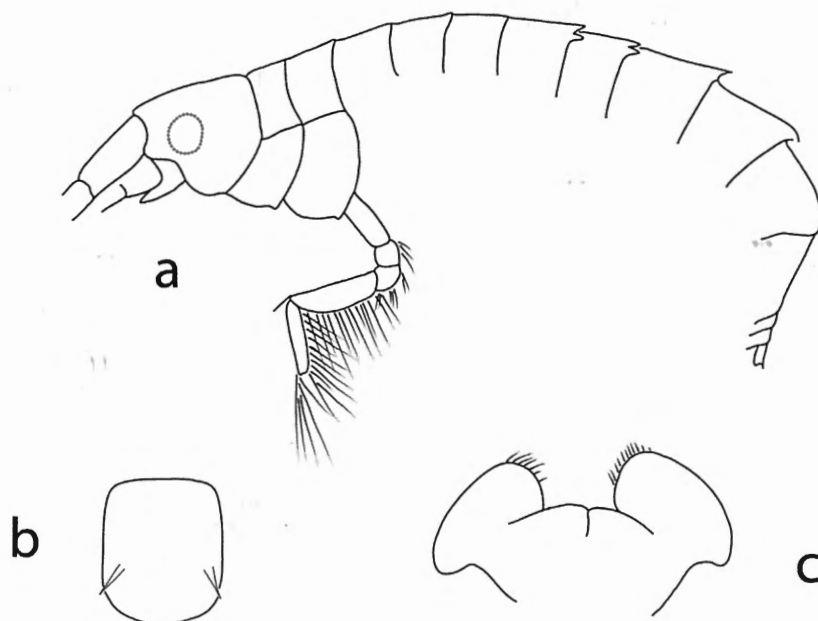


Fig. 9a-c. *Parepimeria irregularis*, redrawn after Schellenberg, 1931a. a) left body side; b) telson; c) lower lip.

pointed; coxae 1-2 truncate, posteroventral angles with short tooth. Gnathopods simple with slender distal articles; carpus largest. Bases 5-7 suboval. Uropod 1 outer ramus slightly shorter than inner, uropods 2-3 outer ramus clearly shorter than inner. Telson subquadrate, with rounded apex, with a spine-like seta on both distal corners.

Size. Ovigerous females 5-5.5 mm.

Remarks. Different from the other species of the genus: rostrum wanting; dorsal armature very short, paired dorsal processes restricted to pereonites 6-7 and carinae on pleonites 1-2.

Type locality. Southwest of Falkland Islands: 52°29'S 60°36'W.

Distribution. Only known from type locality.

Depth range. 197 m.

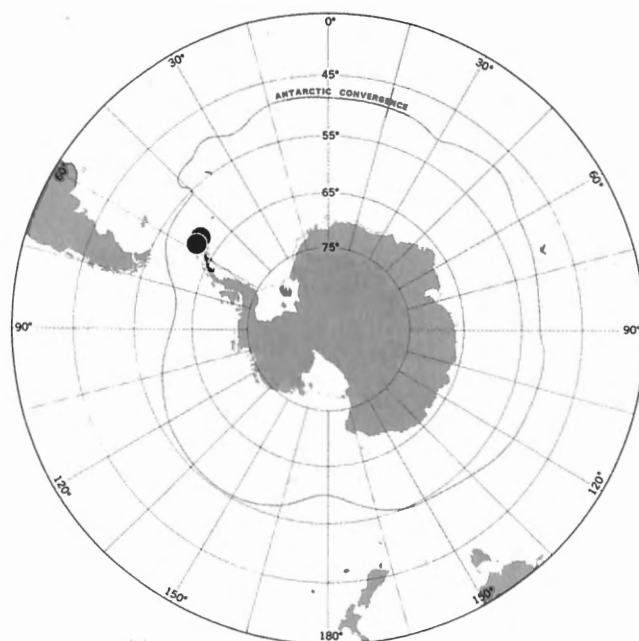
Parepimeria major K.H. Barnard, 1932

(Fig. 10, Map 4: circle)

References and synonymy. De Broyer *et al.* 2007: 23.

Diagnosis. Head as long as pereonites 1-3 combined; eyes relatively large, oval; anterior head lobe angular. Pereonites 5-7 with long slender paired dorsal teeth. Long pointed carinae on pleonites 1-2. Posterior margins of pleonites 1-3 produced, that of pleonite 3 slightly curved dorsally; posteroventral corners of epimeral plates 1-3 pointed, no trace of serration. Coxa 1 pointed and directed anteriorly. Coxae 2-4 with pointed apices; coxa 4 with acute posteromarginal lobe. Gnathopod 1 simple, with wide lobe-like expansion posteriorly, wider than propodus. Bases 5-7 tapering distally, with proximal posteromarginal lobe. Telson subquadrate, apex rounded, with a spine-like seta on both distal corners.

Size. 17 mm.



Map 4. *Parepimeria major*: circle.

Remarks. This species differs from all other species of the genus in the following: long slender paired processes restricted to pereonites 5-7; coxae 1-4 pointed; no serration on epimeral plates 1-3.

Type locality. South Shetland Islands: off Deception Island

Distribution. South Shetland Islands: off Deception Island; off Elephant Island.

Depth range. 381-1080 m.

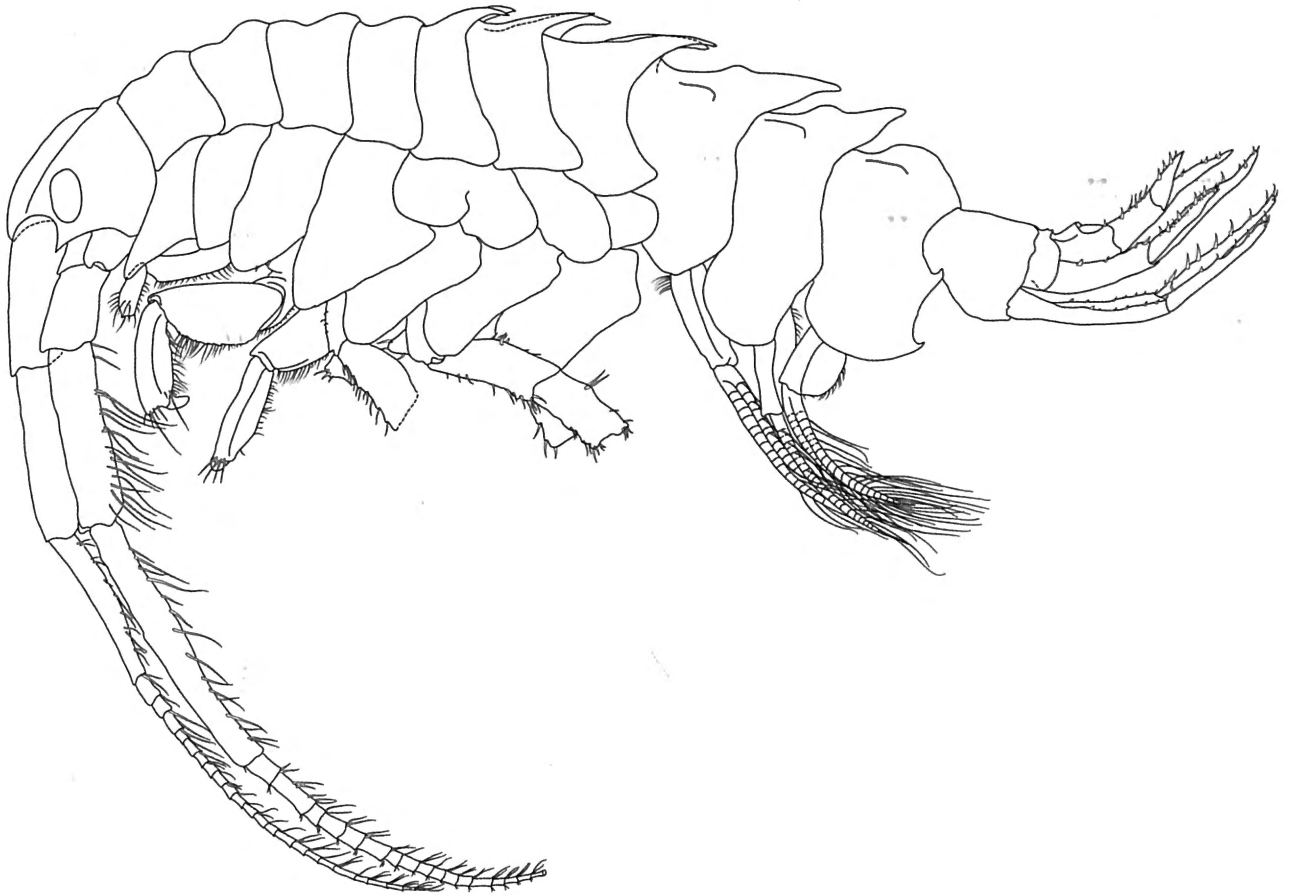


Fig. 10. *Parepimeria major*. Left body side.

***Parepimeria minor* Watling & Holman, 1980**

(Fig. 11a-e, Map 5: circle)

References and synonymy. De Broyer *et al.* 2007: 23.

Diagnosis. Head with dorsal keel; rostrum short and blunt; anterior head lobe angular; eyes very small and rounded. Low paired dorsal processes on pereonites 2-7. Mid-dorsal carinae on pleonites 1-2, pleonite 3 keeled. Epimeral plate 1 rounded, plate 2 with 2 teeth posteroventrally; plate 3 serrate posteromarginally. Mandible with multidentate incisor; lacinia mobilis of right mandible 3-dentate; molar strong and triturative; palp 3-articulate with rows of setae on ventral margins of articles 2-3. Lower lip with rounded widely separate lobes, inner lobes present. Maxilliped 4-articulate; articles 3 and 4 subequal in length. Coxa 1 pointed and drawn out anteriorly. Coxa 2 tapering distally, narrow rounded apex, small tooth posteromarginally. Gnathopods simple, similar to each other, but gnathopod 2 slightly larger than 1; carpi proximally expanded; propodi and dactyli subequal in length. Coxa 4 broadly rounded ventrally, posterior margin excavate proximally.

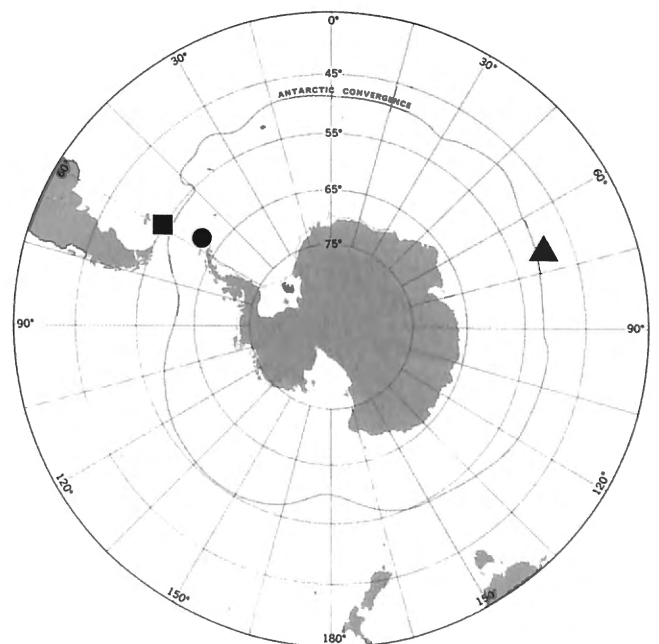
Size. 2-5 mm.

Remarks. Differing from *P. irregularis* in the presence of paired processes on pereonites 2-7 (vs. 6-7), the short rostrum (missing in *P. irregularis*) and the narrow coxae 1-2 (vs. broadly truncate)

Type locality. West of South Shetland Islands: 61°18'-20'S 56°09'-10'W.

Distribution. Only known from type locality.

Depth range. 220-240 m.



Map 5. *Parepimeria minor*: circle; *Dikwa andresi*: square; *Actinacanthus tricarinatus*: triangle.

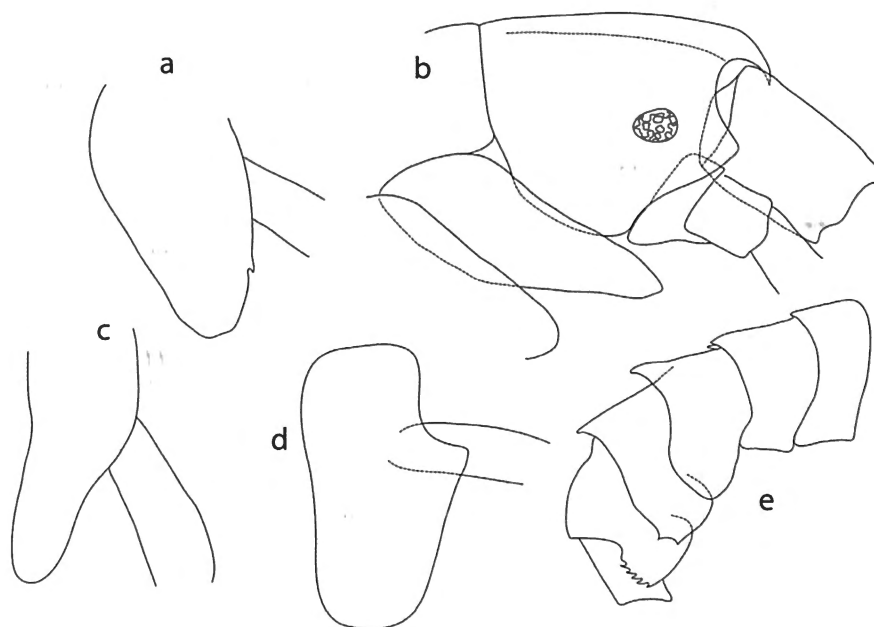


Fig. 11a-e. *Parepimeria minor*, redrawn after Watling & Holman, 1980. a) coxa 2; b) right side of head and coxa 1; c) coxa 1; d) coxa 4; e) pereonites 6-7 and pleonites 1-3 of right body side.

DIKWIDAE Coleman & J.L. Barnard, 1991b

Diagnosis (modified after Coleman & Barnard, 1991b). Body compressed, with dorsal keel or carinae on pereonites 1-5, and carinae on pereonites 6-7 and pleonites 1-3. Head poorly formed, rostrum absent. Antennae elongate, flagella with 5 + articles; accessory flagellum absent. Mouthpart part field quadrately developed. Epistome and upper lip broad, short, incised. Incisor of mandible ordinary, toothed; raker row strong; molar large and triturative; palp 3-articulate. Lower lip without inner lobes, without inner notches. Maxilla 1 palp large, 2-articulate. Palp of maxilliped 4-articulate, article 2 not produced medially. Coxae 3-4 more or less acuminate. Coxa 2 shortened and blunt below, ventral margins not fitting normal ventral parabolic curve of anterior coxae. Coxae 1 and 4 not shortened, apex of coxa 1 truncate to concave. Coxa 4 with small posteroventral lobe. Coxa 5 shorter than posteroventral lobe of coxa 4. Gnathopods feeble and with elongate propodus and dactylus on gnathopod 2, and propodus on gnathopod 1; gnathopod 2 flagellar and much longer than gnathopod 1. Gnathopod 1 propodochelate, gnathopod simple, merus and carpus not produced. Bases of pereopods 5-7 with posterior cusps or teeth. Epimeral plate 3 lacking 2 large cusps posteroventrally. Urosomites free. Uropods 1-3 biramous. Rami of uropod 3 longer than peduncle, though peduncle elongate, flattened, lanceolate, 1-articulate. Telson weakly incised, not longer than peduncle of uropod 3.

List of genera. *Dikwa* Griffiths, 1974.

Dikwa Griffiths, 1974

Type species. *Dikwa acrania* Griffiths, 1974

Diagnosis (modified after Barnard & Karaman, 1991). Body covered posteriorly with teeth or processes. Antenna 1 peduncular articles 1-2 subequal. Mouthparts projecting conically. Upper lip incised, very broad. Mandibular incisor narrow, almost needle-like; raker row long; molar broad and blunt, strong, triturative. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 ordinary. Maxilliped inner plate narrower, but as long as outer plate, latter ordinary; palp article 2 narrow and apicomedia unproduced; palp article 4 well developed but short. Gnathopods diverse, of different elongations, propodus and dactylus elongate, narrow; gnathopod 1 chelate, gnathopod 2 simple. Coxa 2 short; coxae 1, 3, 4 progressively longer; coxa 4 long, noncuspidate. Basis 7 with very long, pointed postermarginal cusp. Telson emarginate.

Diwka andresi Lörz & Coleman, 2003

(Fig. 12a-c, Map 5: square)

References and synonymy. De Broyer *et al.* 2007: 38.

Diagnosis. Cuticle covered with scale-like microtrichs. Head telescoped into the first pereonite, directed ventrally; eyes absent. Pereonites and pleonites in lateral view with wide, blunt dorsal processes, apart from pereonite 1 with weak depression. Epimeral plate 1 pointed ventrally, epimeral plate 2 posteroventrally angular and plate 3 posteroventrally rounded. Antenna 1 peduncular article 1 distal margin drawn

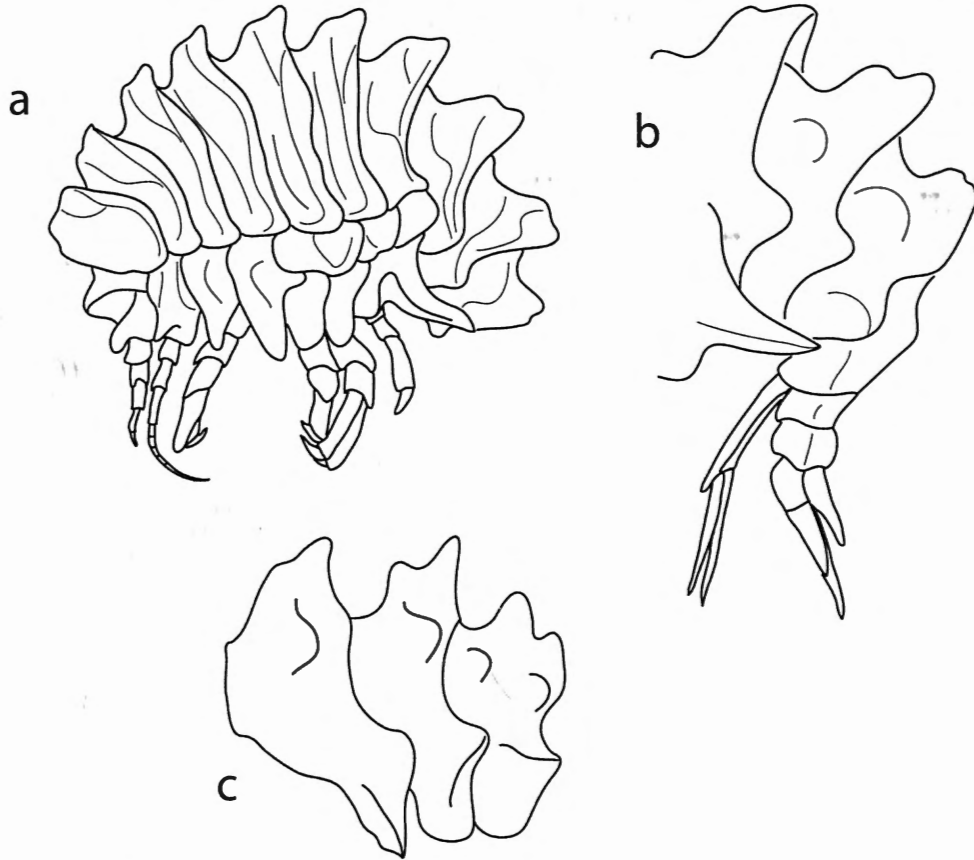


Fig. 12a-c. *Dikwa andresi*, redrawn after Lörz & Coleman, 2003. a) left body side without urosome; b) pleonites 1-3 and urosome; c) pleonites 1-3.

out into rounded projection reaching distal margin of article 2; article 3 longer than second, with scale-like accessory flagellum. Upper lip wider than long, incised. Mandible incisor strongly dentate; raker spines present; molar produced and tritulative; palp 3-articulate. Lower lip with wide lobes. Maxilla 1 palp 2-articulate, surpassing outer lobe. Maxilliped palp 4-articulate; article 1 distally slightly expanded; article 4 small. Gnathopod 1 slender; coxa twice as long as coxa 2, produced laterally, complexly sculptured, bearing two apical tips; propodus more than twice the length of carpus; chelate, dactylus longer than fixed finger. Gnathopod 2 slender, longer than gnathopod 1; simple; propodus and dactylus extremely elongated, tapering. Coxa 3 tapering distally, dorsoventrally ridged. Coxa 4 with ridges on lateral face, posteriorly concave, apex drawn out into pointed process, posteroproximomarginally with rounded lobe. Pereopod 5-6 coxae wider than long, complexly sculptured; bases anterior and posterior margins parallel, posterior margin with ventrodistally rounded lobe. Pereopod 7 basis with extremely elongate pointed lobe, curved posteriorly. Uropod 1 peduncle same length as outer ramus; rami narrow-lanceolate; subequal in length. Uropod 2 rami and peduncle subequal in length; rami narrow-lanceolate. Uropod 3 peduncle less than half the length of rami; outer ramus slightly shorter than inner. Telson longer than wide, emarginate to rounded.

Size. 5-7.3 mm.

Remarks. *Dikwa andresi* is the only species of the family in the Antarctic. It can be determined by the flagellar gnathopod 2 and the conspicuous

pointed posteromarginal lobe on basis 7.

Type locality. West of Falkland Islands: 54°30.22'S-54°29.64'S 56°8.2'W-56°8.13'W, 54°1.36'S-54°1.11'S 62°1.3'W-62°1.63'W.

Distribution. Only known from type locality.

Depth range. 272-290 m.

EPIMERIIDAE Boeck, 1871b

Diagnosis (after Coleman & Barnard, 1991b). Body compressed, with dorsal teeth sometimes confined to metasome or urosome, and sometimes weak (*Epimeriella*). Rostrum well developed. Antennae elongate, flagella with 5+ articles; accessory flagellum 0-1 articulate. Mouthpart field quadrately developed (box-like). Epistome and upper lip broad, short, incised or entire. Incisor of mandible ordinary, toothed; setal row strong; molar large and tritulative or reduced, conical and pubescent (*Epimeriella* and *Epimeria victoria* Hurley, 1957); palp always present, 3-articulate. Lower lip without inner lobes, without distinct inner notches. Inner plate maxilla 1 ordinary, medially setose (except *Uschakoviella*); outer plate oblique, normally spinose; palp large, 2-articulate. Inner plate of maxilla 2 without facial setae. Palp of maxilliped 3-4 articulate, article 2 not produced medially. Coxae 1-4 acuminate, ventral margins fitting normal ventral parabolic curve of anterior coxae; coxae 1 and 4 not shortened, coxa 4 with large posteroventral lobe, coxa

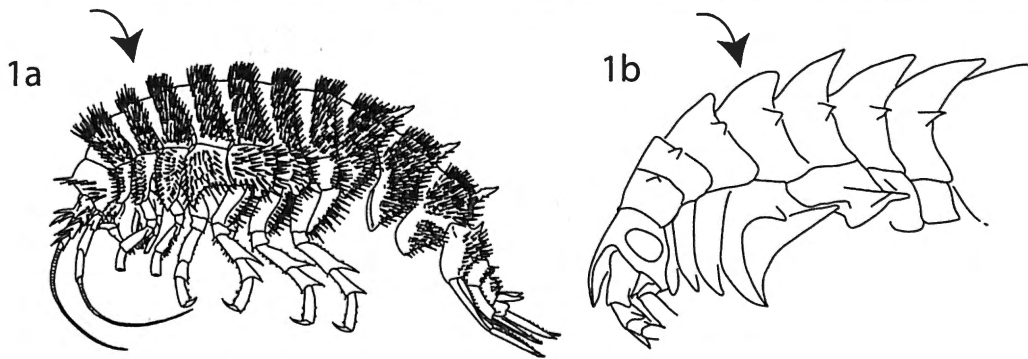
5 at least slightly shorter than 4. Gnathopods feeble and with elongate carpus and propodus, but not flagellar, gnathopod 2 usually slightly longer than gnathopod 1; both gnathopods subchelate, or simple, merus and carpus not produced. Article 2 of pereopods 5-7 often with posterior cusps or teeth. Epimeral plate 3 lacking 2 large cusps (though occasional species with very small epimeral bicuspidation), occasionally body or coxae with surficial cusps or rarely articulate spines (*Uschakoviella*). Urosomites free. Uropods 1-3 biramous.

Rami of uropod 3 longer than peduncle, flattened, lanceolate. Telson entire or weakly incised.

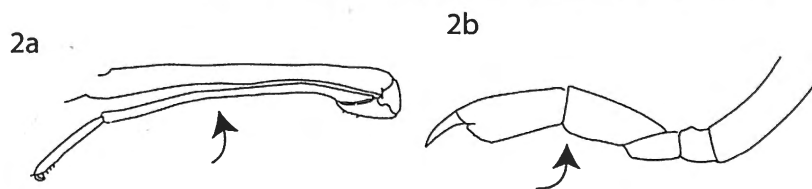
List of genera. *Paramphithoe* Bruzelius, 1859 (= *Acanthosoma* Ross, 1835, homonym, Hemiptera) (= type genus); *Actinacanthus* Stebbing, 1888; *Epimeria* Costa, 1851 (= *Pseudepimeria* Chevreux 1912a = *Subepimeria* Bellan-Santini, 1972a); *Epimeriella* Walker, 1906, 1907; *Metepimeria* Schellenberg, 1931a; *Uschakoviella* Gurjanova, 1955b.

Key to the Antarctic genera of the Epimeriidae

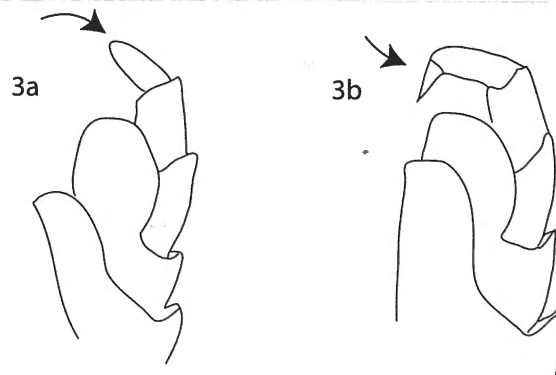
- 1a. Densely covered with articulated spines *Uschakoviella*
 1b. Body smooth or with carinae 2



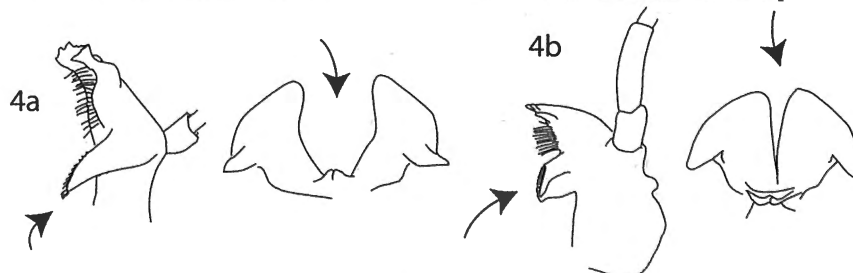
- 2a. Carpus and propodus of gnathopod 2 elongate and very slender, no palm *Actinacanthus*
 2b. Carpi and propodi of gnathopods subequal, palm present 3



- 3a. Maxilliped palp 3-articulate *Metepimeria*
 3b. Maxilliped palp 4-articulate 4



- 4a. Pars molaris drawn out, without triturative surface. Lower lip with wide hypopharyngeal gap *Epimeriella*
 4b. Pars molaris normal, triturative. Lower lip normal *Epimeria*



Actinacanthus Stebbing, 1888

Type species. *Acanthozone tricarinata* Stebbing, 1883

Diagnosis (emended after Barnard & Karaman, 1991). Body covered with teeth or processes. Antenna 1 peduncular article 1-2 subequal. Mouthparts projecting in quadrate bundle. Upper lip incised; it and epistome not very broad. Mandibular incisor ordinary; spine row present, toothed; molar broad and blunt, tritulative. Lower lip inner lobes absent, outer lobes broad. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate without facial row of setae. Maxilliped inner plate shorter and narrower than outer plate, latter elongate; palp article 2 narrow and apicomediaally unproduced; palp article 4 well developed, unguiform. Coxae 1-4 progressively longer; coxa 4 long, polycuspidate. Gnathopods alike, carpus and propodus elongate, narrow; both gnathopods scarcely subchelate. Telson entire.

Actinacanthus tricarinatus (Stebbing, 1883)

(Fig. 13, Map 5: triangle)

References and synonymy. De Broyer *et al.* 2007: 39.

Diagnosis. Head small with short rostrum. Pereon with long slender serrate dorsal carinae, that on pereonite 1 bifurcate, and additional carinae on each of the lateral tergite faces. Pleosomites with mid-dorsal carinae and small dorsolateral teeth on both sides; pleon segment 2 posteromarginally roundly produced and posteroventral corner with 2 pointed processes; pleon segment 3 additionally to the mid-dorsal

carina with 2 short teeth on the posterior margin accompanied by dorsolateral serrate tooth, posterior margin with long, serrate tooth curved dorsally, posteroventral corner roundly angular. Urosomite 1 longest, with 2 subsequent mid-dorsal serrate carinae, urosomite 2 subequal in length to segment 3, without dorsal armature; urosomite 3 with mid-dorsal carina and 2 posteromarginal teeth. Antenna 1 peduncular article 1 with 3 long slender teeth; article 2 with 2 long distal teeth, longer than article 3; article 3 shortest; flagellum article 1 elongate, as long as peduncular article 1. Antenna 2 peduncular article 2-4 with 2 distal teeth each; article 5 longest; flagellar article 1 elongate. Upper lip incised. Mandible with dentate incisor and tritulating molar; palp 3-articulate, distal article longest. Lower lip with narrow medial gap. Maxilla 1 ordinary, palp 2-articulate. Maxilla 2 without facial setae. Maxilliped palp article 2 not produced medially. Gnathopod 1 coxa pointed distally, carpus and propodus elongate and slender, subequal in length; oblique narrow palm, dactylus multipectinate. Gnathopod 2 coxa anteromarginally excavate, distally pointed; carpus extremely elongate, about 3x as long as propodus. Coxa 4 pointed distally, with serrate process strongly curved posteriorly. Coxae 5-7 subrectangular with similar process on lateral face as on pereopod 4, successively longer. Pereopods 5-7 merus and carpus acutely drawn out posterodistally. Uropods 1-2 with subequal rami. Uropod 3 with subequal, lanceolate rami. Telson slightly longer than wide, entire.

Size. 16 mm.

Remarks. Unique within the Epimeriidae.

Type locality. Heard Island: 52°04'S 71°22'E.

Distribution. Only known from type locality.

Depth range. 270 m.

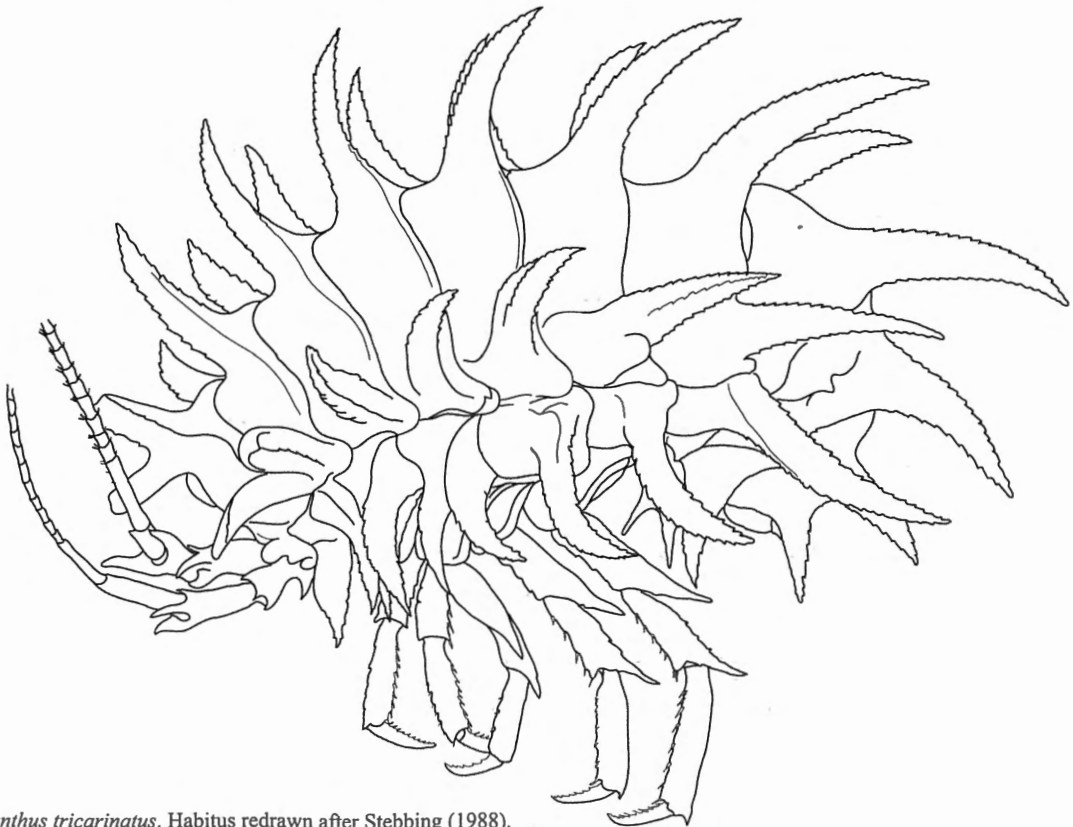


Fig. 13. *Actinacanthus tricarinatus*. Habitus redrawn after Stebbing (1988).

***Epimeria* Costa, 1851**

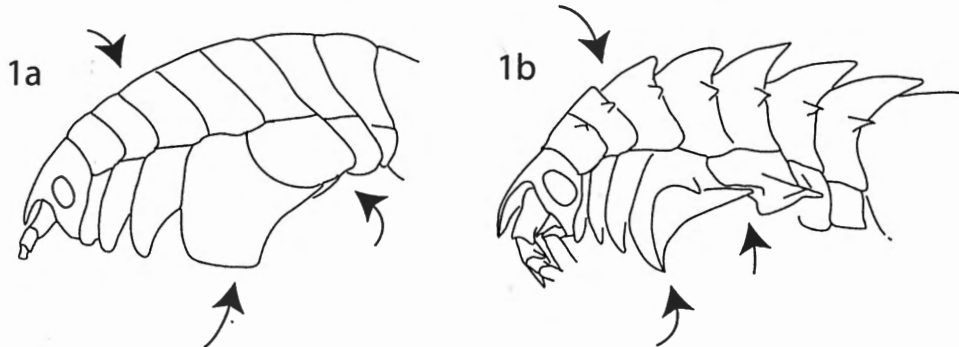
Type-species. *Epimeria tricristata* Costa, 1851 (= *Gammarus cornigera* Fabricius, 1779)

Diagnosis (after Barnard & Karaman, 1991). Body covered with teeth or processes. Antenna 1 peduncular article 2 shorter than 1. Accessory flagellum present or absent. Mouthparts projecting quadrately. Upper lip almost entire; epistome not very broad. Mandibular incisor ordinary, toothed, setal row present; molar blunt, strong, triturative. Lower lip inner

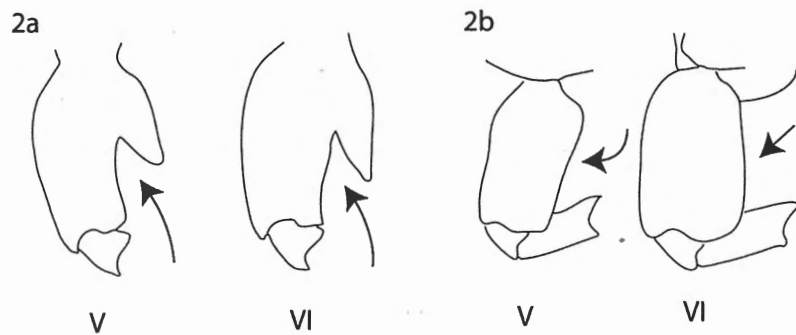
lobes absent, outer lobes relatively broad. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate without facial row of setae. Maxilliped inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomediaally unproduced; palp article 4 well developed, unguiform. Coxae 1-4 progressively longer; coxae 4-5 forming ventral arc; coxa 4 long, polycuspidate. Gnathopods alike, articles 5-6 elongate, simple or subchelate (typical). Telson incised or cleft.

Key to the Antarctic species of *Epimeria*

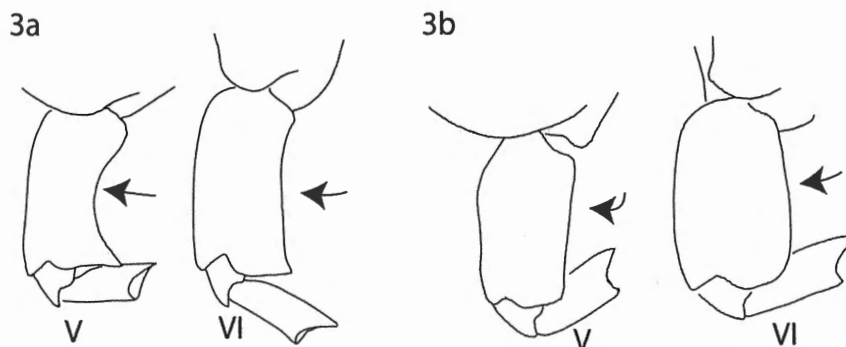
- 1a. All pereonites lacking mid-dorsal carinae. Coxa 4 ventrally broad or slightly convex. Coxa 5 not acutely produced posterodistally 2
- 1b. Some or all pereonites bearing mid-dorsal carinae. Coxa 4 ventrally broad or narrow, blunt or pointed. Coxa 5 posterodistally produced or not 6



- 2a. Bases 5 and 6 posteriorly notched *Epimeria robusta*
- 2b. Bases 5 and 6 posteriorly entire 3



- 3a. Bases 5 and 6 posteriorly concave. Mid-dorsal carinae present on pleonites 2-3 *Epimeria puncticulata*
- 3b. Bases 5 and 6 posteriorly straight or convex, not excavate. Posterodorsal projection on pleonite 3 4

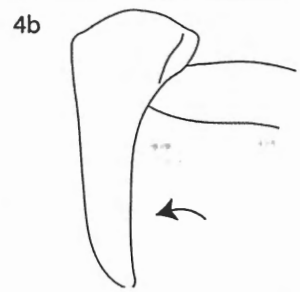
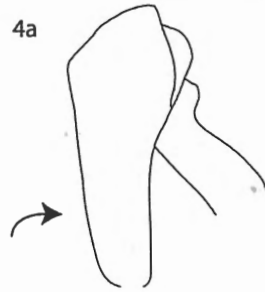


4a. Coxa 1 anterior and posterior margins of distal half parallel, apically rounded

Epimeria monodon

4b. Coxa 1 tapering distally, pointed apically

5

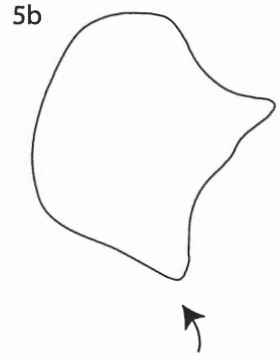
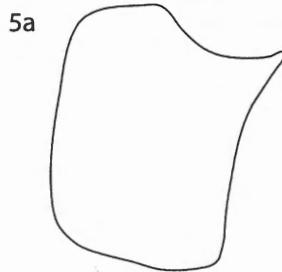


5a. Coxa 4 subquadrate

Epimeria extensa

5b. Coxa 4 posterodistal angle produced and curved medially

Epimeria annabellae

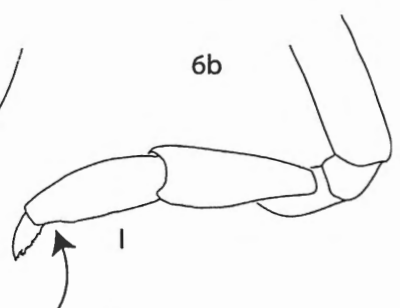
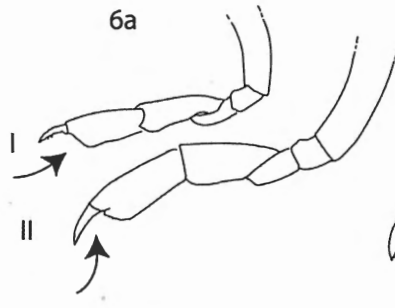


6a(1). Gnathopods 1-2 with distinct, occasionally short, palm, dactyl slender weakly pectinate

7

6b. Gnathopods 1-2 without palm, dactyl stout, sometimes strongly pectinate

16

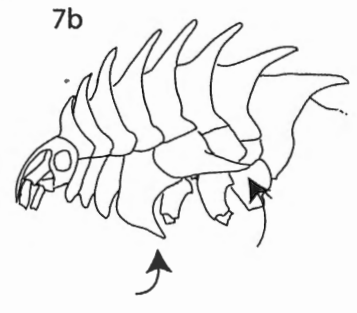
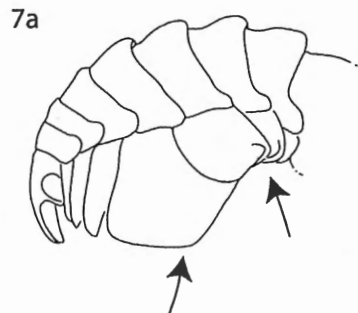


7a. Coxa 4 ventrally broadened, truncate or sometimes excavate, not forming constantly curved anterior margin..

8

7b. Coxa 4 ventrally tapering into pointed apex, forming constantly curved anterior margin

12

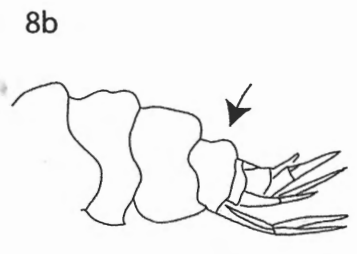
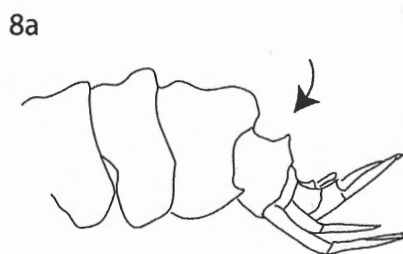


8a. Urosomite 1 with pointed tooth

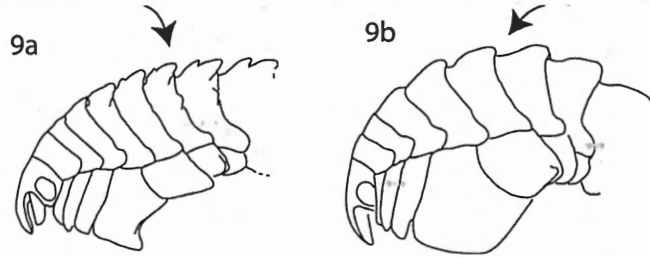
Epimeria intermedia

8b. Urosomite 1 with rounded hump

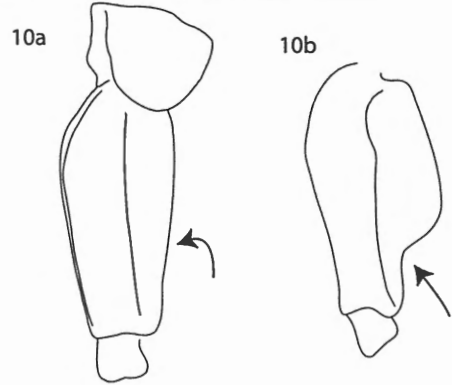
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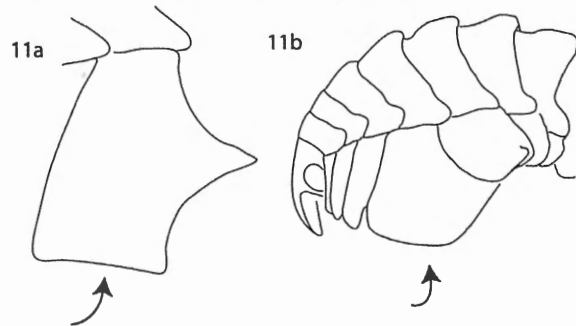
- 9a. Mid-dorsal carinae on pereonites 3-7, clearly bilobed on pereonites 5-7 *Epimeria rimicarinata* 10
 9b. Mid-dorsal carinae on pereonites blunt, not bilobed



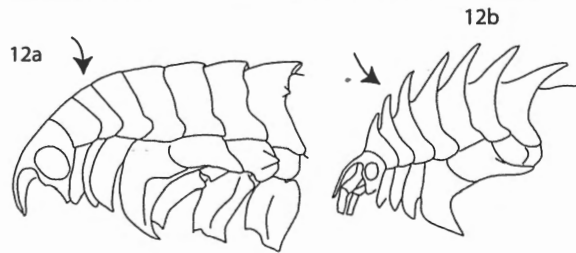
- 10a. Basis 7 slender with straight posterior margin *Epimeria heldi*
 10b. Basis 7 excavate posteriorly 11



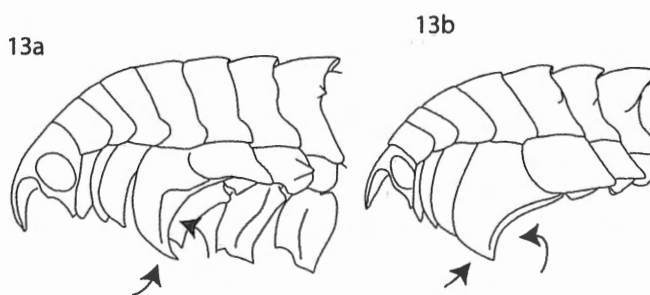
- 11a. Lateral face of coxa 4 sculptured, distal margin not curved below ventral side *Epimeria georgiana*
 11b. Lateral face of coxa 4 smooth, distal margin curved below ventral side *Epimeria inermis*



- 12a(7). Pereonites 1-4 dorsally smooth 13
 12b. Dorsal carinae starting on pereonites 1 or 2 14



- 13a. Coxa 4 apex deeply excavate posteromarginally, apex acutely pointed and curved posteriorly *Epimeria reoproii*
 13b. Coxa 4 moderately excavate posteromarginally, apex angular *Epimeria vaderi*



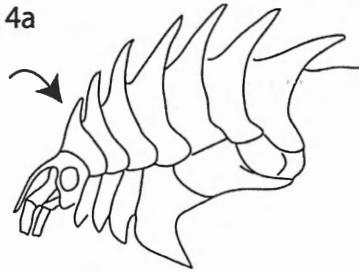
14a(12). Mid-dorsal acute dorsal processes on all pereonites

Epimeria rubriques

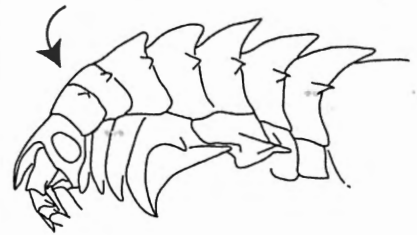
14b. Mid-dorsal processes present except for pereonites 1 or 2

15

14a



14b



15a. Mid-dorsal and midlateral teeth absent only on pereonite 2, occasionally weak on pereonite 1. Pereonite 2 shortened

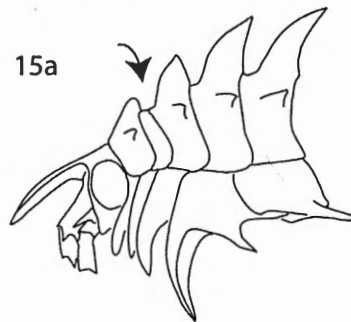
Epimeria macrodonta

15b. Mid-dorsal tooth absent on pereonite 1, weak or absent on pereonite 2.

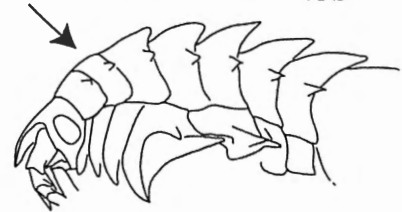
Midlateral teeth present on all pereonites, pereonite 2 normal

Epimeria similis

15a



15b



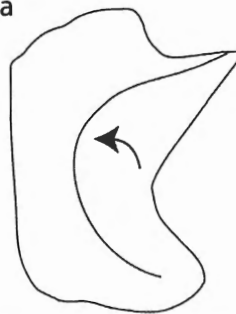
16a(6). Coxa 4 with distal margin straight, surface dorsoventral ridge not produced in tooth

Epimeria grandirostris

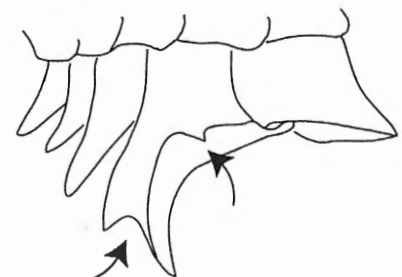
16b. Coxa 4 with distal margin deeply excavate, surface dorsoventral ridge produced in tooth

17

16a



16b



17a. Mid-dorsal carina of pereonite 1 curved forwards, three times longer than that of pereonite 2.

Lateral armature of pereonites consisting of acute teeth.

Coxa 5 posterolateral wing shorter than half the width of pereonite 5

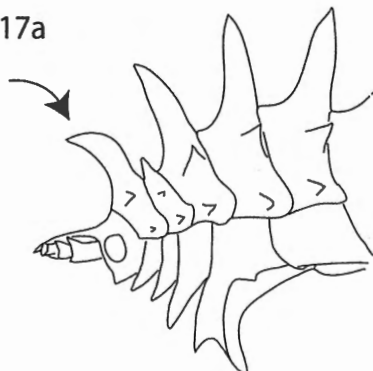
Epimeria oxycarinata

17b. Mid-dorsal carina of pereonite 1 straight, slightly longer than that of pereonite 2.

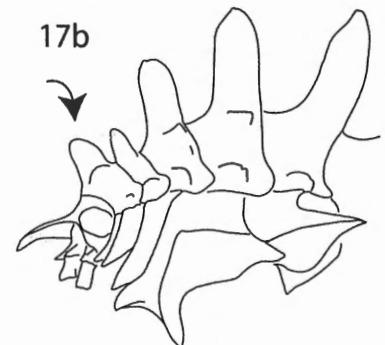
Lateral armature of pereonites consisting of tubercles. Coxa 5 very strongly protruding laterally, wing longer (1.5 times) than half the width of pereonite 5

Epimeria pulchra

17a



17b



***Epimeria annabellae* Coleman, 1994**

(Fig. 14a-b, Colour plate 1h, Map 6: rhomb)

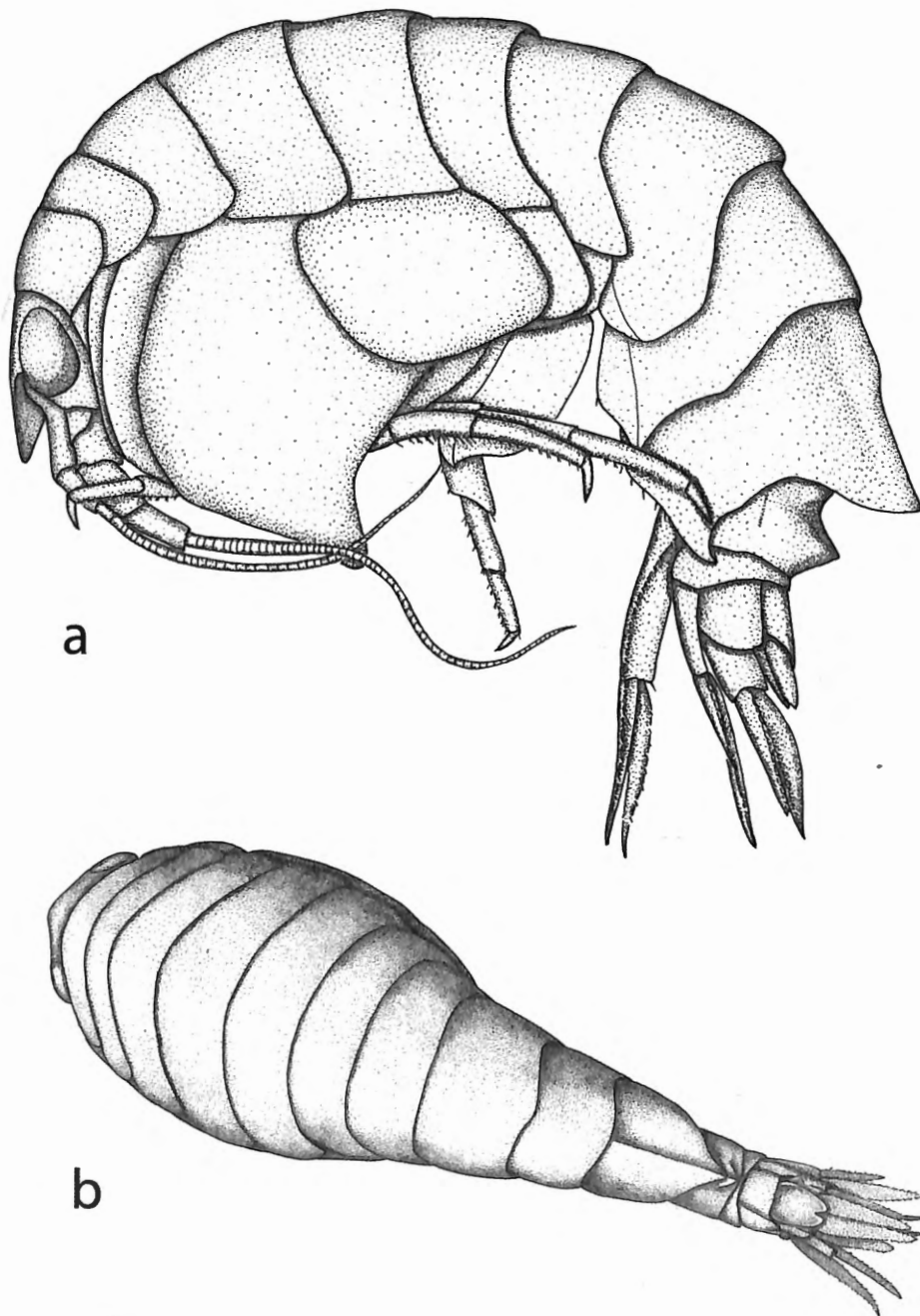
References and synonymy. De Broyer *et al.* 2007: 39.

Diagnosis. Head with large oval eyes. Pleonite 3 with mid-dorsal keel, drawn out into a posterior process. Urosomite 1 with pointed tooth. Coxa 1 slightly concave anteriorly. Gnathopods 1-2 propodus slightly expanded distally, palm oblique, serrate. Coxae 2-3 convex anteriorly and excavate posteriorly. Coxae 1-3 acuminate. Coxa 4 largest, overlapping preceding coxae, posterodistal angle strongly drawn out and directing ventrally, and curved medially below the ventral side. Basis 5 posterior margin somewhat sinuous. Basis 6

slender. Basis 7 widened with distal pointed process.

Size. Female 18-22 mm.

Remarks. *Epimeria annabellae* resembles *E. extensa* Andres, 1985, but is distinguished by the large eye (vs. normal size), anterior margin of coxa 1 somewhat excavate (vs. straight), coxa of pereopod 4 with produced posterodistal corner (vs. right-angled corner), strongly developed postero-marginal tooth and keel on pleonite 3 (vs. no keel and only small blunt hump), pointed tooth on urosomite 1 (vs. rounded hump), posterior margin of basis 5 somewhat sinuous (vs. straight) and distal margin of basis 7 pointed (vs. rounded).

Type locality. Weddell Sea: 72° 30.35'S 17° 29.88'W.**Distribution.** Weddell Sea; eastern shelf.**Depth range.** 240-264 m.Fig. 14a-b. *Epimeria annabellae*. a) left body side; b) dorsal habitus.

Epimeria extensa Andres, 1985

(Fig. 15a-f, Map 6: circle)

References and synonymy. De Broyer *et al.* 2007: 39.

Diagnosis. Rostrum longer than peduncular article of antenna 1; eye normal; lateral cephalic lobe small and pointed. Pereonites and pleonites 1-2 smooth, pleonite 3 with posterodorsal mid-dorsal blunt process. Urosomite 1 dorsally depress with rounded dorsal hump. Urosomite 3 dorsolateral ridged. Coxae 1-3 tapering distally, apically rounded, antermarginally slightly convex, postermarginally concave. Coxa 4 subquadrate, anteroventrally and posteroventrally rounded. Gnathopods 1-2 subchelate with a serrate, oblique palm. Pereopods 5-6 longer than 7. Coxa 5 rhomboid, ventrally rounded, basis straight, distally with small medial lobe. Coxa 6 wider than long and postermarginally rounded, basis 6 postermarginally slightly convex, with broader distal lobe. Pereopod 7 coxa smallest, rounded ventrally, basis with lobe longer than ischium, postermarginally convex, but posterodistal margin slightly concave. Merus of pereopods

5-7 with drawn out, pointed posterodistal corner. Epimeral plate 1 ventrally rounded, epimeral plates 2-3 posteroventral angle produced and pointed. Telson notched 1/5 to 1/4, apices smooth, not notched.

Size. Male 11 mm.

Remarks. *Epimeria extensa* is very similar to *E. monodon*, both having a posterodorsal blunt hump on pleonite 3. However, *E. monodon* has coxa 1 with parallel margins and rounded apex (vs. convex anterior and concave posterior margins and pointed tip), bases 5-7 wider, basis 7 with broad distal lobe (vs. tapering lobe, with weak posteromarginal distal excavation). The telson of *E. extensa* has smooth apices whereas that of *E. monodon* has small notches. Another species with smooth pereonites and pleonites 1-2 is *E. annabellae*. This species is easily distinguished from *E. extensa* by its dorsal keel running into an acute process on pleonite 3 and the enlarged coxa 4.

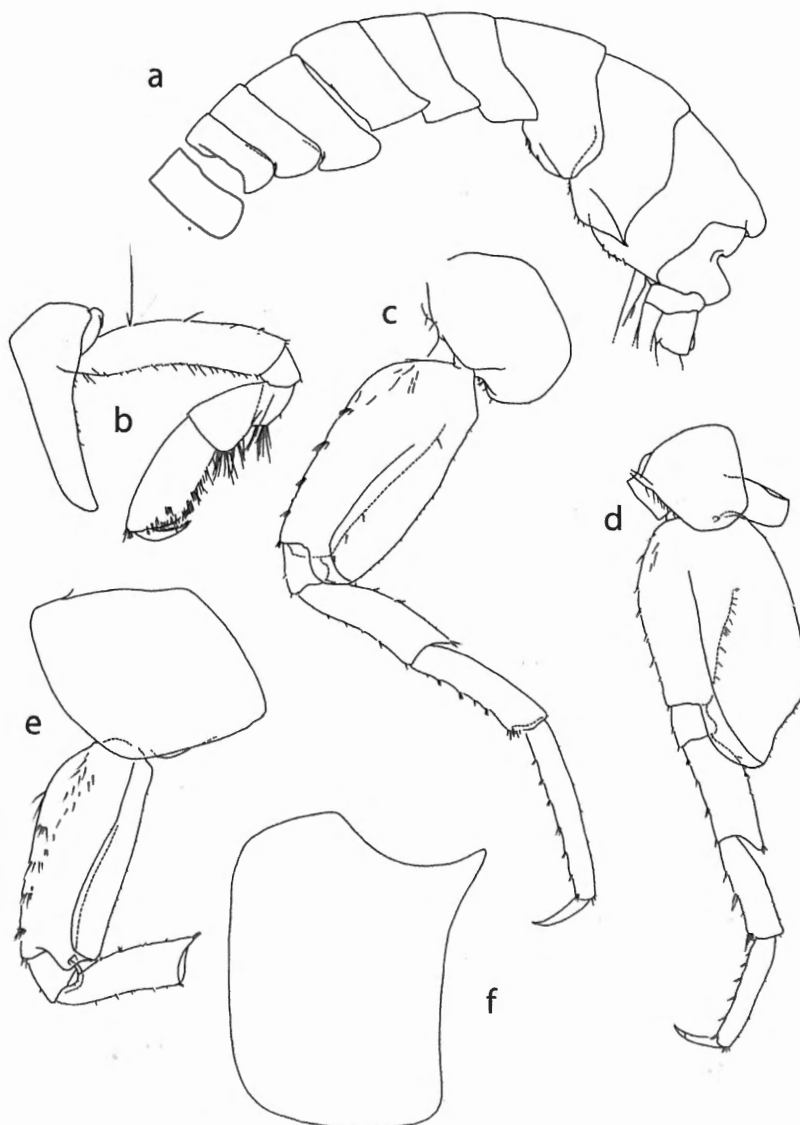
Type locality. Antarctic Peninsula: 64°06'S 55°06'W.**Distribution.** Only known from type locality.**Depth range.** 230-260 m.

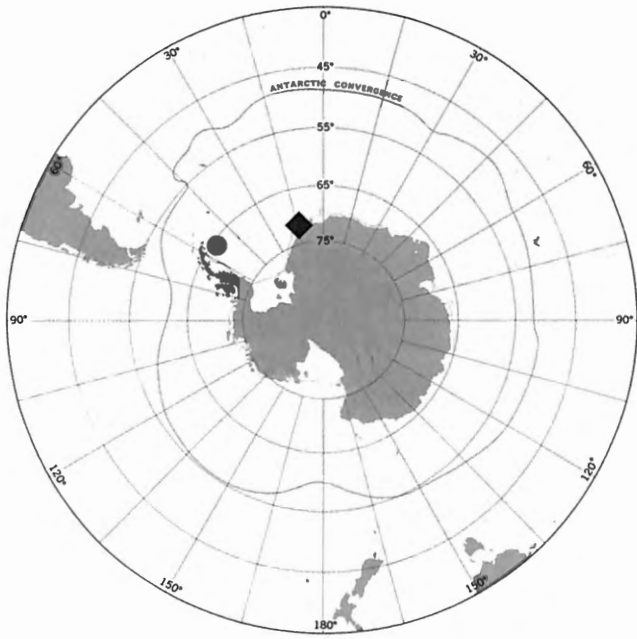
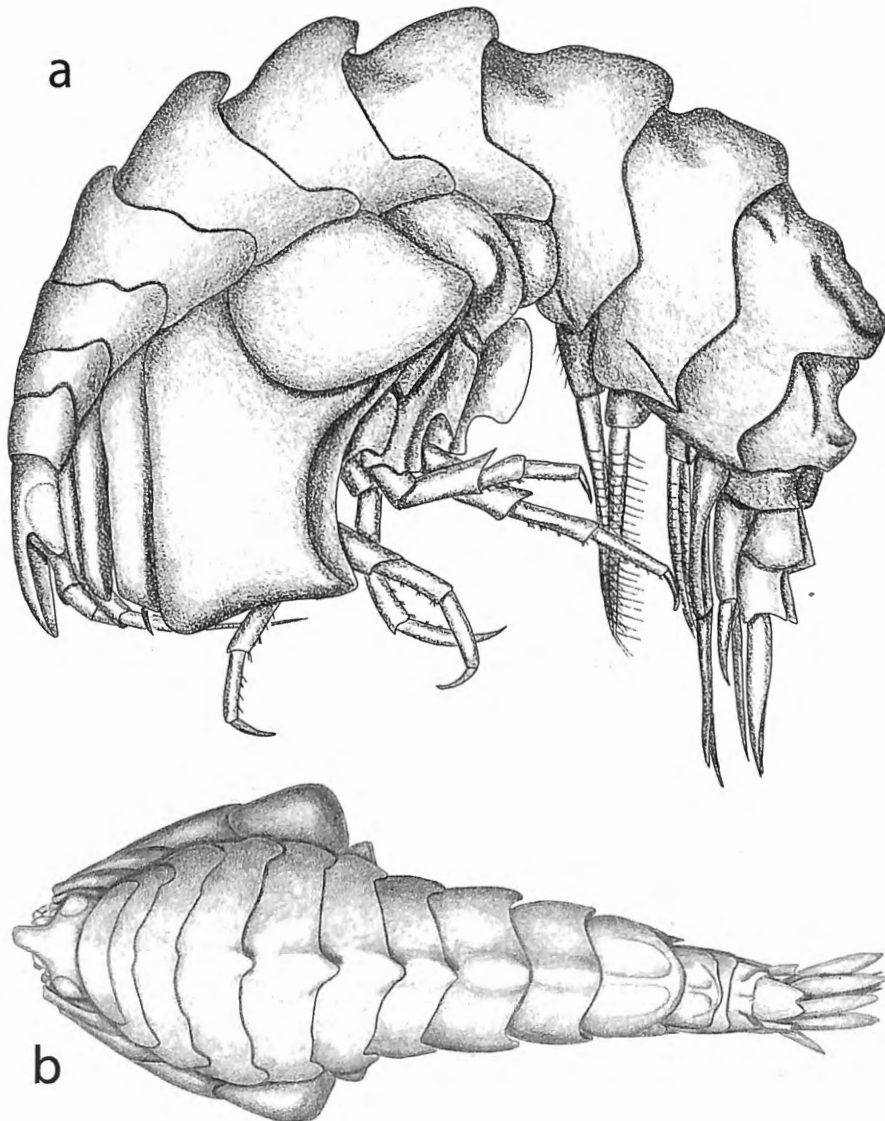
Fig. 15a-f. *Epimeria extensa*, redrawn after Andres, 1983. a) lateral view of tergites of pereon, pleon and urosome; b) gnathopod 1; c) pereopod 6; d) pereopod 2; e) pereopod 5; f) coxa 4.

Epimeria georgiana Schellenberg, 1931a

(Fig. 16a-b, Map 7: rhomb)

References and synonymy. De Broyer *et al.* 2007: 39.

Diagnosis. Body robust. Rostrum longer than first peduncular article of antenna 1, eyes large, ocular lobe rounded, lateral cephalic lobe produced and rounded. Pereonites 2-3 with short, dorsal posteromarginal protrusions, not carinate. Pereonites 4-7 with broad, blunt carinae, and less posteriorly protruding humps on pleonites 1-2, pleonite 3 and urosomite 1 sculptured by dorsolateral and medial irregular ridges and humps, pleonite 3 with 2 shallow dorsal depressions. Urosomite 1 with dorsal depression, urosomite 3 with dorsolateral ridges and a shallow dorsal keel drawn out into a small pointed posteromarginal tooth. Epimera on pleonites lateromarginally rounded, posteroventral angle produced, pointed on pleonites 2 and 3. Coxae 1-3 with ridged surface, coxa 1 apically rounded, coxa 2 with posteroapical angle, gnathopods subchelate, palm inconspicuously serrate, dactyls with short spines on inner curvature. Coxa 3 truncate. Coxa 4 largest, sculptured, apically truncate or weakly excavate,

Map 6. *Epimeria annabellae*: rhomb; *Epimeria extensa*: circle.Fig. 16a-b. *Epimeria georgiana*. a) left lateral view; b) dorsal habitus.

posterior and apical margin turned back, creating a rounded ridge, narrow pointed posteromarginal lobe, which is partly enveloped by coxa 5. Coxa 5 laterally produced. Coxa 6 rounded posteriorly with produced hump on lateral surface. Bases 5-7 ridged, with deep notches on posterior margin, creating prominent teeth.

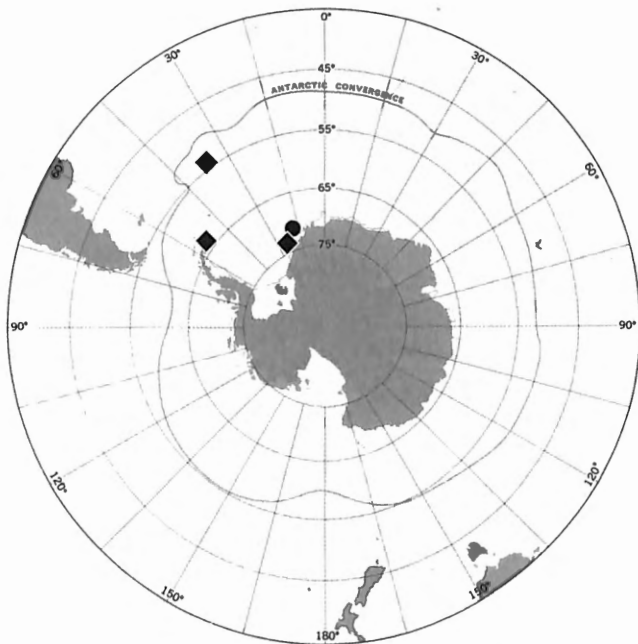
Size. Female 34-39 mm, male 10-21 mm.

Remarks. *Epimeria georgiana* is very similar to *E. rimicarinata* and *E. inermis*. *Epimeria georgiana* has the lateral face of coxa 4 sculptured, posterodistal and apical margins concave, the distal margin of coxa 4 is not curved around the ventral body side; and bases 5-7 notched posteromarginally, whereas in *E. inermis* coxa 4 is smooth, shield-like curved, with a somewhat convex ventral margin and a straight posterodistal margin, slightly curved under the ventral body side. Bases 5-7 are excavate, but not notched. *E. rimicarinata* has similarly shaped coxae as *E. georgiana*, however, the dorsal carinae are bilobed from lateral view, there are additional dorsolateral teeth on pereonites 5-7 and rounded humps on pleonites 1-3; basis 5 is not notched, basis 6 with a posteromarginal tooth, but this is directing posteriorly and not ventrally as in *E. georgiana*.

Type locality. South Georgia; Cumberland Bay: 54°11'S 36°18'W.

Distribution. South Georgia; Bransfield Strait; Palmer Archipelago; South Shetland Islands; Weddell Sea; eastern shelf.

Depth range. 75-928 m.



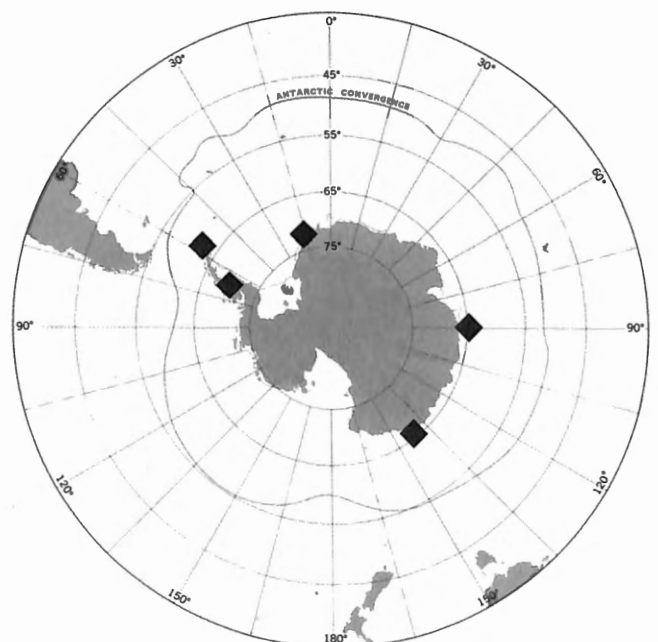
Map 7. *Epimeria georgiana*: rhomb; *Epimeria rubriques*: circle.

Epimeria grandirostris (Chevreux, 1912a)

(Fig. 17a-b, Colour plate 2b, Map 8: rhomb)

References and synonymy. De Broyer *et al.* 2007: 40.

Diagnosis. Body slender, pereon not conspicuously broadened. Head small with straight, broad elongated rostrum, anteroventral corner acute, postantennal lobe pointed, eyes oval, prominent. Pereonite 2 shortest. Pereonite 3 longer than 1 and 2 together. Pereonites 4-7 subequal. All pereonites with apically blunt mid-dorsal carinae, increasing in size on caudal segments, shortest on pereonites 1-2; dorsal carinae with lateral ridges, which are in connection with dorsolateral blunt pegs; laterally blunt tubercles. On pereonites 2-7 ridges between dorsolateral and lateral pegs. Pleonite 3 longer than 1 and 2, with mid-dorsal carinae similar to those of pereonites, dorsal carina on pleonite 3 shortest. All 3 pleonites with lateral ridges descending in posterodistal corner; both sides of dorsal carinae regularly toothed. Urosomite 1 slightly longer than urosomites 2 and 3 together, with large median and 2 lateral teeth on both sides. Urosomite 2 smallest, with 1 median and 2 lateral teeth. Urosomite 3 with 1 small median tooth, on both sides 1 lateral tooth. Coxae overlapping to a great extent. Coxae 1-3 partially hidden by coxa 4, each dorsoventrally ridged, tapering ventrally to acute process. Gnathopods 1 and 2 without palm, dactylus strongly pectinate posteromarginally. Coxa 4 broad, excavate posteriorly, with posterobasal process, ridge descending from this process to posterodistal angle. Pereopod 5 coxa with rounded process posteriorly, 2 ridges flow into this process, basis slender with 2 processes posteromarginally, dorsoventral ridge on lateral surface. Pereopod 6 coxa subrectangular with 2 acute processes directed posteriorly, basis similar to pereopod 5, but shorter and wider. Pereopod 7 coxa rounded with posteriorly directed tooth, basis broad, posterior margin convex, distal



Map 8. *Epimeria grandirostris*: rhomb.

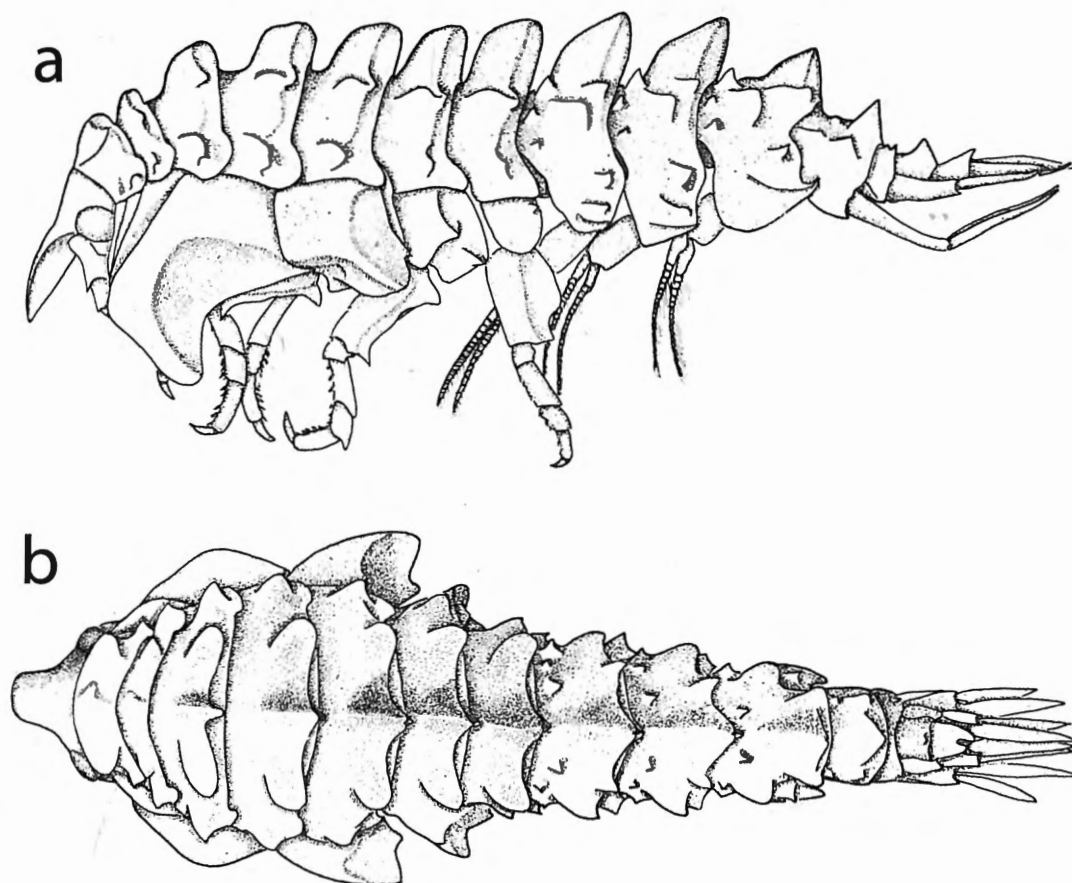


Fig. 17a-b. *Epimeria grandirostris*. a) left lateral view; b) dorsal view.

third excavate, lateral dorsoventral ridge. Telson notched nearly one half.

Size. Female 15-23 mm.

Remarks. *Epimeria grandirostris* is closely related to *E. oxycarinata* and *E. pulchra*. These species have the following in common: mid-dorsal carinae on pereonites, pleonites with lateral dorsoventral ridges, gnathopods without palm and strongly pectinate dactyli. However, *E. grandirostris* differs from these species in the shorter carinae, coxa 4 without tooth on lateral surface, weak excavation of the anterodistal margin, and less produced coxa 5.

Type locality. Marguerite Bay.

Distribution. Adélie Coast; Davis Sea; South Shetland Islands; Weddell Sea.

Depth range. 68-634 m.

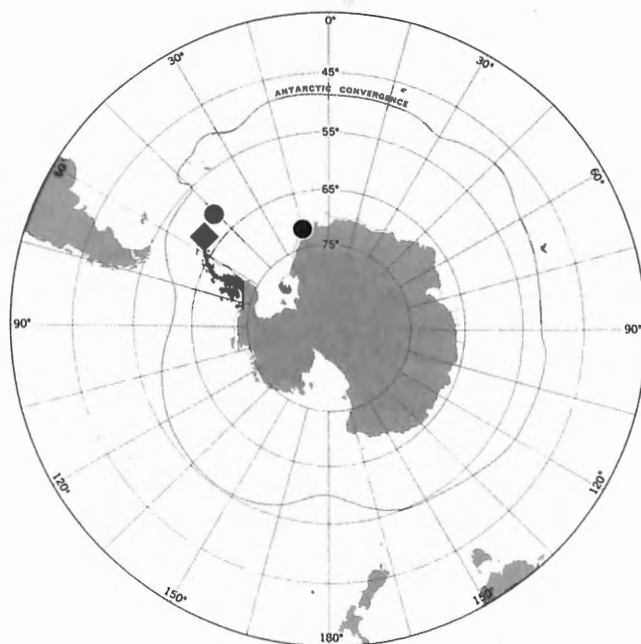
Epimeria heldi Coleman, 1998a

(Fig. 18a-b, Colour plate 1f, Map 9: rhomb)

References and synonymy. De Broyer *et al.* 2007: 40.

Diagnosis. Head with relatively long stout rostrum; eyes large, kidney-shaped; length of head (including rostrum) about that of pereonites 1-3 combined. Pereonites 4-7 increasing in length successively. A dorsal carina starts on pereonite 6 with a small hump, becomes clearly apparent on metasomal segments 1-3 with blunt, mid-dorsal processes, increasing in length to the posterior margin of the segments,

with shallow depression in lateral aspect. Epimeral plate 1 with posteromarginal rounded lobe; plate 2 with angular posteromarginal lobe; posteroventral region of epimera 1-2 not angular, but rounded, with ridges on lateral faces; epimeral plate 3 with weak lobe-like posteromarginal protrusion and pointed posteroventral angle. Urosomite 1 with a rounded



Map 9. *Epimeria heldi*: rhomb; *Epimeria pulchra*: circle.

keel-like mid-dorsal process, longer than urosomite 2-3 combined. Urosomite 3 with lateral posteriorly projecting lobes.

Antenna 1 article 1 with oblique distal margin, longer than article 2-3 combined; accessory flagellum uniaarticulate, scale-like; flagellar articles with distal setae and aesthetascs. Antenna 2 article 4 and 5 subequal; flagellar articles with short setae. Gnathopod 1 coxa weakly tapering, with rounded apex; propodus narrower than carpus, subequal in length; dactylus with row of stout setae on posterior margin; palm narrow, with fine serrate margin and some stout setae. Gnathopod 2 coxa longer than that of gnathopod 1, slightly tapering distally, apically rounded; carpus longer than propodus and carpus of gnathopod 1, only weakly expanded distally; propodus narrower than that of gnathopod 1; dactylus with row of stout setae on posterior margin; palm narrow, with fine serrate margin and some stout setae. Coxa 3 tapering and rounded distally. Coxa 4 largest, surpassing all other coxae, with complex sculpture: 1 rounded bulge on lateral face and 2 protrusions close to distal margin; an oblique distal margin with a shallow depression; posterior margin with deep excavation between rounded posterodistal angle and long posteromarginal, proximal, subacute process, that is partially covered by coxa 5; semicircular ridge on lateral face, rather indistinct in distal half. Coxa 5 wider than long, embedding posteromarginal process of coxa 4 in groove on lateral face;

anterior margin rounded, posteriorly produced, lateral face with strong ridge; ventral margin subacute; Pereopod 6 coxa about as wide as long, anterior margin straight, posterior margin rounded, lateral face produced into diagonal ridge which is situated close the proximal posterior region of coxa 5, short ventral angular lobe posteriorly; basis with rounded proximal lobe and additional edge posteromarginally, with slender setae anteromarginally, anterior margin convex, lateral face with ridge. Pereopod 7 coxa wider than long, anterior margin straight, posterior margin rounded; basis with convex anterior and straight posterior margin, tapering distally. Uropod 1 peduncle somewhat shorter than rami, with slender setae proximomediomarginally; spine-like setae only on lateral side (apart from 1 medioapical seta); outer ramus slightly longer than inner one. Uropod 2 peduncle shorter than outer ramus, which is shorter than inner one. Uropod 3 peduncle shortest; rami subequal, long, and apically rounded. Telson 1.6 x as long as wide, with rounded apical lobes and v-shaped excavation; lateral margins weakly convex.

Size. Ovigerous female 52 mm.

Remarks. This species can be distinguished very easily from other epimeriids by the following combination of characters:

(1) smooth pereon segments 1-5; posterior carinae from segment 6 on (though inconspicuous on pereonites 6-7) reaching to urosomite 1; carinae on pleonites subacute with a

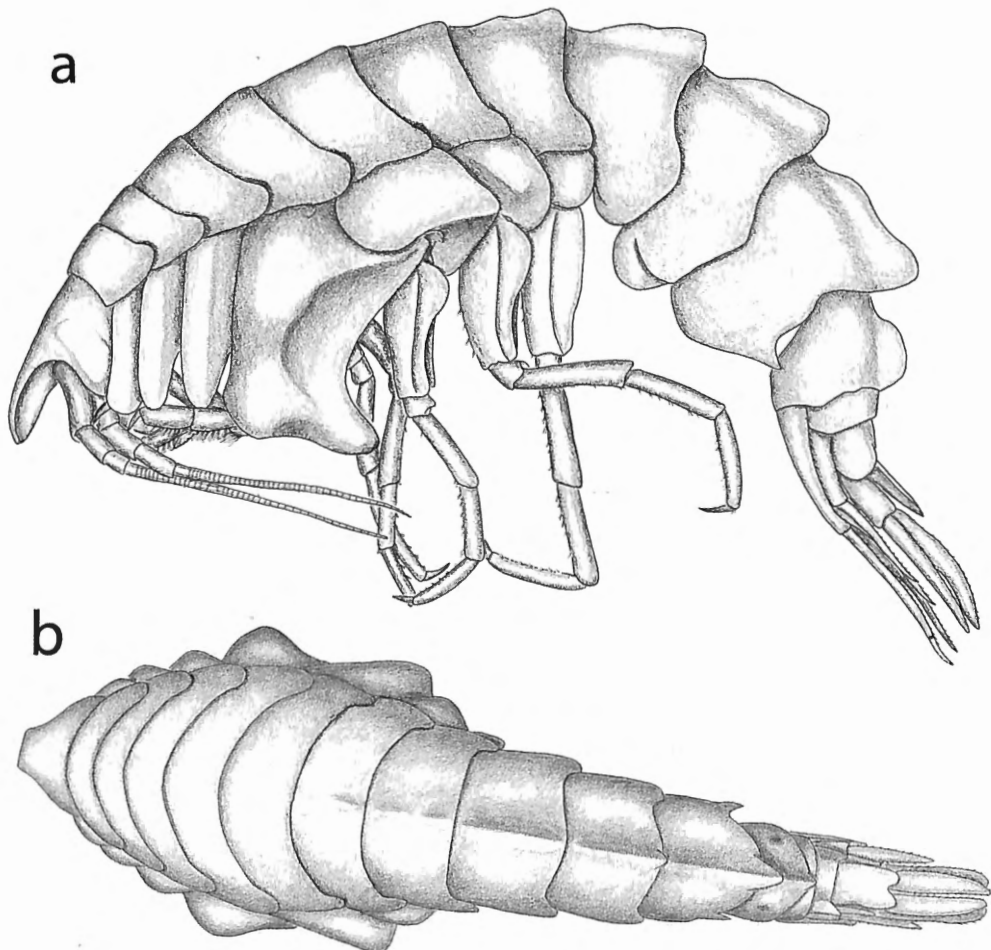


Fig. 18a-b. *Epimeria heldi*. a) left lateral view; b) dorsal view.

- shallow depression, blunt on urosomite 1,
 (2) coxae 1-3 with rounded apex,
 (3) coxa 4 sculptured, with 3 rounded bulges on the lateral face, and a ridge that runs in a semicircle on the surface and an oblique distal margin,
 (4) basis 7 narrow and posterior margin straight,
 (5) epimeral plates 1-2 rounded without posteroventral angle, and
 (6) apex of uropod 3 rami rounded.

Epimeria heldi does not belong to the genus *Metepimeria* due to its 4-articulate maxilliped palp (vs. 3-articulate), nor to *Epimeriella* having a well developed mandibular molar (vs. setose lobe) and a normal lower lip (vs. wide hypopharyngeal gap).

There are several species of *Epimeria* from many regions outside Antarctica that have smooth anterior pereonites and carinae on the pleonites without additional lateral teeth. Only *E. georgiana* Schellenberg, 1931a from the Antarctic bears a similar shaped coxa 4 as *E. heldi* (but not its characteristic sculpture) but, amongst many differences, this species can be discriminated from *E. heldi* by the wide and deeply notched posterior margins of bases 5-7. *Epimeria grandirostris* (Chevreux, 1913) also has a sculpture on the lateral face of coxa 4, but this article is much narrower and without the 3 bulges of *E. heldi*. In addition, the dorsal carinae start on

pereonite 1 and there are additional teeth on both sides of the carinae. In several other species of *Epimeria* the epimeral plate 1 is also ventrally rounded, however, a wanting posteroventral angle on epimeral plate 2 as in the *E. heldi* is unique.

Type locality. South Shetland Islands: 60°54.60'S 55°45.90'W.

Distribution. Only known from type locality.

Depth range. 235 m.

Epimeria inermis Walker, 1903a

(Fig. 19a-b, Colour plate 1c, Map 10: rhomb)

References and synonymy. De Broyer *et al.* 2007: 40.

Diagnosis. Rostrum longer than first peduncular article of antenna 1, eyes large, ocular lobe rounded, postantennal corner angled. Pereonites 2-3 with short, dorsal posteromarginal protrusions, not carinate. Pereonites 4-7 and pleonites 1-3 with broad, blunt carinae, pereonite 7 and pleonite carinae in lateral view with weak depression, pleonite 3 and urosomite 1 with dorsolateral ridges. Urosomite 1 with mid-dorsal hump, urosomite 2 shortest, urosomite 3 with dorsolateral

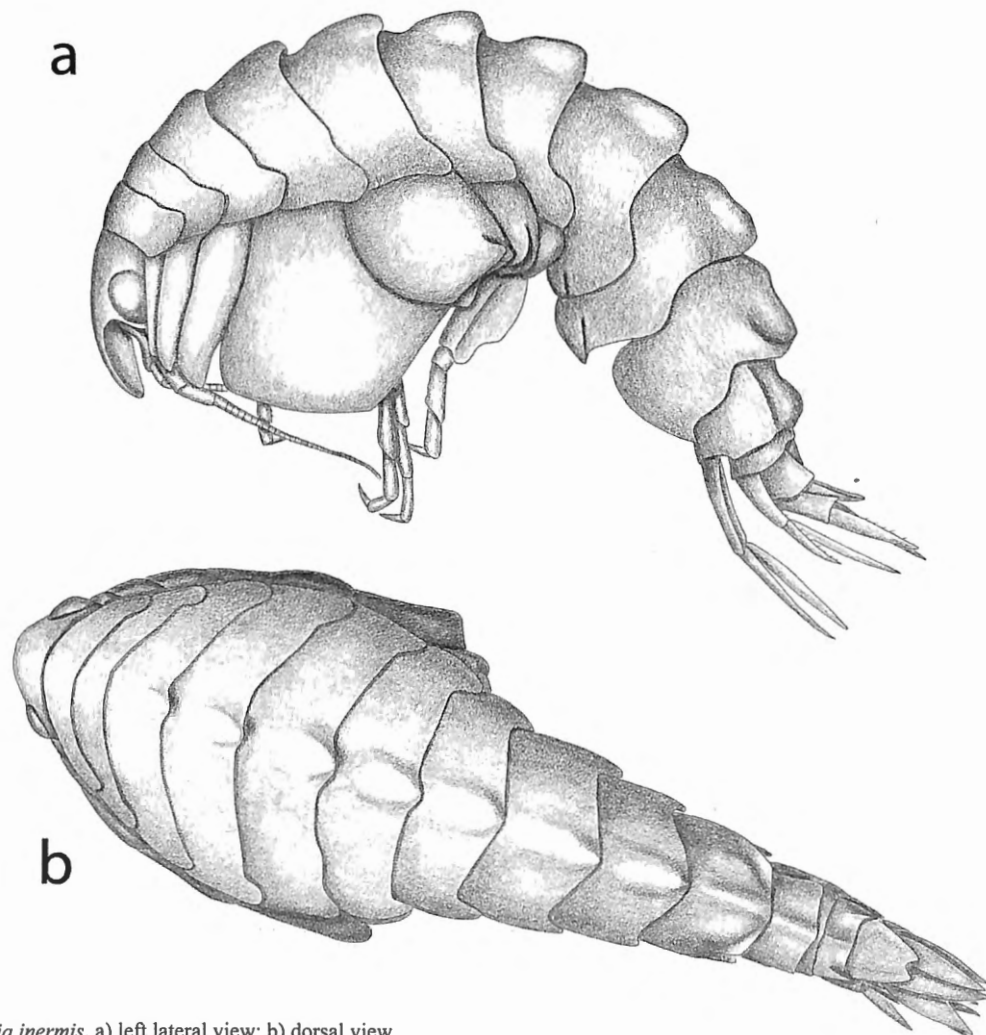


Fig. 19a-b. *Epimeria inermis*. a) left lateral view; b) dorsal view.

ridges. Epimera on pleonites lateromarginally rounded, posteroventral angle produced, pointed on pleonites 2 and 3. Coxae 1-3 with posteroapical angle. Gnathopods subchelate, palm indiscernible serrate, dactyls with short spines on inner curvature. Coxa 4 largest, smooth, shield-like and bowed ventrally, apically truncate or weakly convex, posterior distal margin straight, relative short, broad posteromarginal proximal lobe, which is hidden by a fold of coxa 5. Coxa 5 with a lateral hump. Coxa 6 rounded posteriorly with produced hump on lateral surface, bases 5-7 ridged, posterior margin excavate on basis 7 only, rather straight on bases 5-6, each with short, rounded posterobasal process directing posteriorly, but no ventrally directed teeth, created by a deep notch. Telson weakly notched.

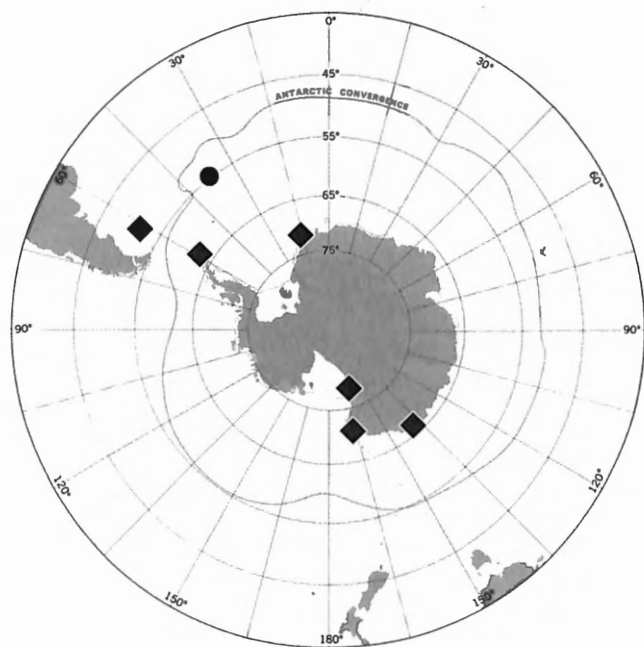
Size. Females 20-35 mm, males 13.5 mm.

Remarks. *Epimeria inermis* is very similar to *E. georgiana*, both having mid-dorsal hump-like carinae. From the latter species *E. inermis* can be differentiated by the unsculptured coxa, which has a straight or convex ventral margin and a linear posterodistal margin. The posterior margin of the basis of pereopods 5-6 is not developed to a ventrally directing tooth, as it is the case in *E. georgiana*, but these articles have posterobasal rounded lobes showing posteriorly. Similar shaped bases 5-7 are developed in *E. rimicarinata*, but in this species the posterior margin of coxa 4 is excavate, the dorsal carinae are bilobed, and there are additional dorsolateral processes on pereonites 5-7 and pleonites 1-3.

Type locality. Ross Sea: Cape Adare.

Distribution. Adélie Coast; west of Falkland Islands; Ross Sea; South Shetland Islands; Bransfield Strait; Weddell Sea.

Depth range. 15-462 m.



Map 10. *Epimeria inermis*: rhomb; *Epimeria intermedia*: circle.

Epimeria intermedia Schellenberg, 1931a

(Fig. 20a-b, Map 10: circle)

References and synonymy. De Broyer *et al.* 2007: 41.

Diagnosis. Rostrum as long as head, postantennal corner pointed. Pereonites 3-7 with shallow mid-dorsal keel, small mediolateral humps on pereonites 5-6 and pleonites. Pleonites mid-dorsal keel depressed resulting in bilobed carinae in lateral view; epimeral plate 1 posteroventral corner rounded, plate 2 with wide angle, plate 3 produced and pointed. Urosomite 1 with mid-dorsal acute tooth and dorsolateral ridges. Urosomite 2 shortest. Dorsolateral ridges on urosomite 3, drawn out into pointed processes, dorsomedial upright tooth. Coxae 1-3 tapering distally into a pointed narrow apex, anterior margin of coxae 1-2 straight. Propodus of gnathopods 1-2 elongate, not apically expanded, with narrow palm. Coxa 4 proximal anterior margin weakly concave, distal margin oblique and slightly concave, posteromarginally excavate, posterodistal corner angled. Coxa 5 rounded anteriorly, posterior margin only moderately produced, pointed process ventrally. Coxa 6 longer than wide, anterior margin straight, posteriorly rounded. Bases 5-6 ridged, posteriorly excavate, posterodistal angle somewhat produced, proximal posterior margin produced to a rounded, posteriorly directed lobe. Basis 6 with weak ridge on lateral surface, posterodistal margin excavate.

Size. Females 10-15 mm, juvenile 5.5 mm.

Remarks. There are differences between the description of Schellenberg (1931a) and K.H. Barnard (1932). In Schellenberg's material the dorsal carinae start at pereonite 3, according to Barnard's description on pereonite 1. Some of Barnard's specimens have the posterior margins of pereonites 5-7 and pleonite 1 feebly nodulose, which is not the case in the type material. Future investigations have to show, if the difference are within the variability of the species or if they indicate two separate species.

E. intermedia has a similarly shaped coxa 4 as *E. georgiana*, however, the narrow, pointed coxae 1-3, the less developed dorsal humps, the additional dorsolateral armature on the posterior pereonites and the pleonites clearly separates *E. intermedia* from *E. georgiana*. *Epimeria intermedia* resembles *Metepimeria acanthurus* in the pointed dorsal process on urosomite 1, the additional ridge-like dorsolateral armature of the pleonites, the shape of the dorsal carinae and the shape of coxae 1-4, but *M. acanthurus* has the maxilliped palp 3-articulate (vs. 4-articulate in all other epimeriids) and the bases 5-6 are not produced at the posterior proximal margin.

Type locality. South Georgia: Cumberland Bay.

Distribution. South Georgia.

Depth range. 75-273 m.

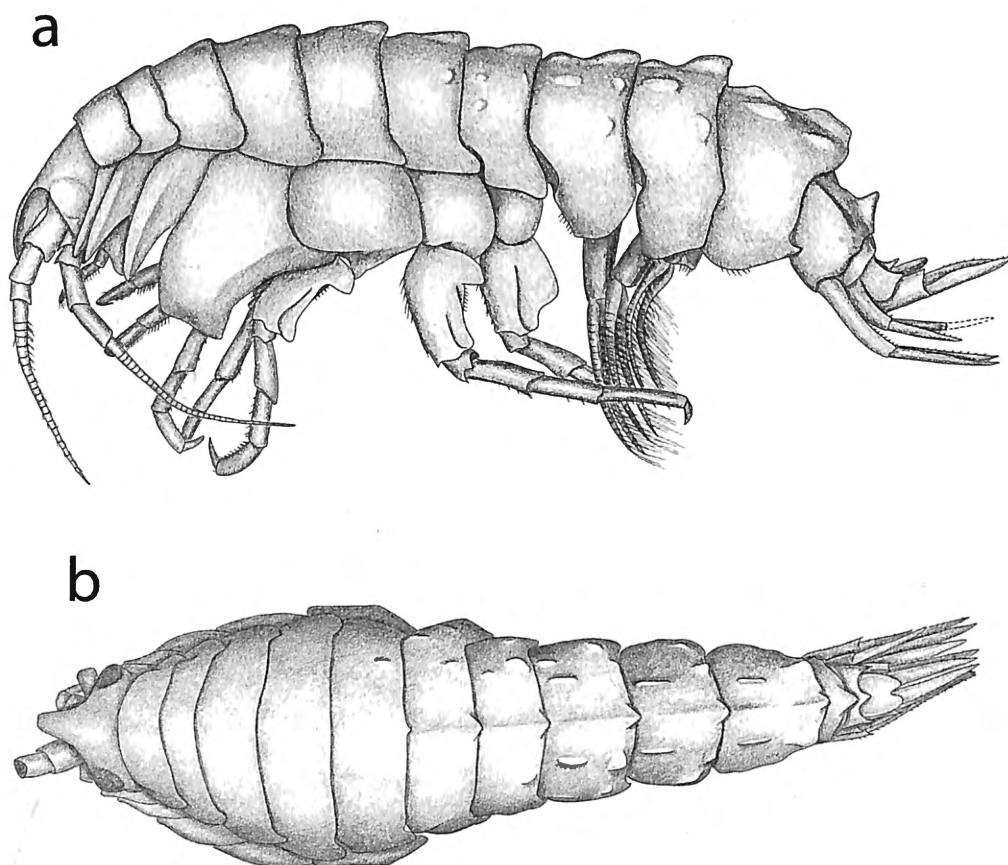


Fig. 20a-b. *Epimeria intermedia*. a) left lateral view; b) dorsal view.

Epimeria macrodonta Walker, 1906b

(Fig. 21a-b, Colour plate 1d, Map 11: rhomb)

References and synonymy. De Broyer *et al.* 2007: 41.

Diagnosis. Head with narrow, weakly flexed rostrum, about twice the length of the head, eye large and prominent, ocular lobe with short protrusion, anteroventral corner pointed. Pereonite 1 with blunt dorsal carina, and with one small dorsolateral tooth on both sides (sometimes minute). Pereonite 2 shortest, wanting a dorsal carinae or dorsolateral teeth. Dorsal carinae and dorsolateral posterior directing teeth on pereonites 3-7 and pleonites 1-3, increasing in length on each segment; the anterior edge of each carina sharp and narrow, widened posteriorly, seen from posteriorly the carinae are excavate (except for pereonite 3 and pleonite 3 carinae). Dorsal carina on pleonite 3 slightly depressed anterodistally in lateral view; posterodistal corners of all three pleonite epimera produced and pointed. Urosomite 1 longest, with mid-dorsal pointed process. Urosomite 2 shortest, with small, pointed, lateral posteromarginal processes. Urosomite 3 with inconspicuous mid-dorsal shallow keel and laterodorsal ridges which are drawn out into acute tips posteriorly. Coxae 1-4 rounded anteriorly and excavate posteriorly, pointed ventrally, lateral surface with sharp ridge. Propodus of gnathopods 1-2 slender, palm narrow and oblique, dactylus

with short spines on inner curvature. Coxa 4 with a pointed process at the dorsal region of a semicircular ridge, which flows into a pointed posteromarginal projection. Coxa 5 on lateral surface with long wing-like acute process. Coxa 6 with similar, but shorter process, rounded lobe ventrally. Posterodistal angle of coxa 7 rounded. Basis 5 with rounded posterobasal lobe and acute posterodistal process, surface with sharp ridge. Basis 6 of similar shape, but somewhat wider. Basis 7 sinuous posteromarginally with pointed posterodistal angle. Telson notched about one third.

Size. Female 34 mm, male 13-30 mm.

Remarks. *Epimeria macrodonta* resembles *E. similis* very much. From the latter species *E. macrodonta* can be differentiated by the mid-dorsal carina on pereonite 1, the lack of carina and teeth on pereonite 2, the longer process on the lateral face of coxa 4, and the rostrum that is twice as longer as the head. *Epimeria oxycarinata* and *E. pulchra* differ in the following characters: carinae each with lateral ridge, mid-dorsal carina, dorsolateral and lateral teeth present on pereonite 2, lateral teeth on each pereonite, additional small teeth on pleonites, coxae 1-3 concave anteromarginally and convex posteromarginally, gnathopodal palms wanting, dactyli strongly pectinate, coxa 4 ventrally broad and excavate, basis 7 posterior margin deeply excavate. *Epimeria rubriques* deviates in the following: slender dorsal carinae on all pereonites and pleonites, dorsolateral teeth on pereonites

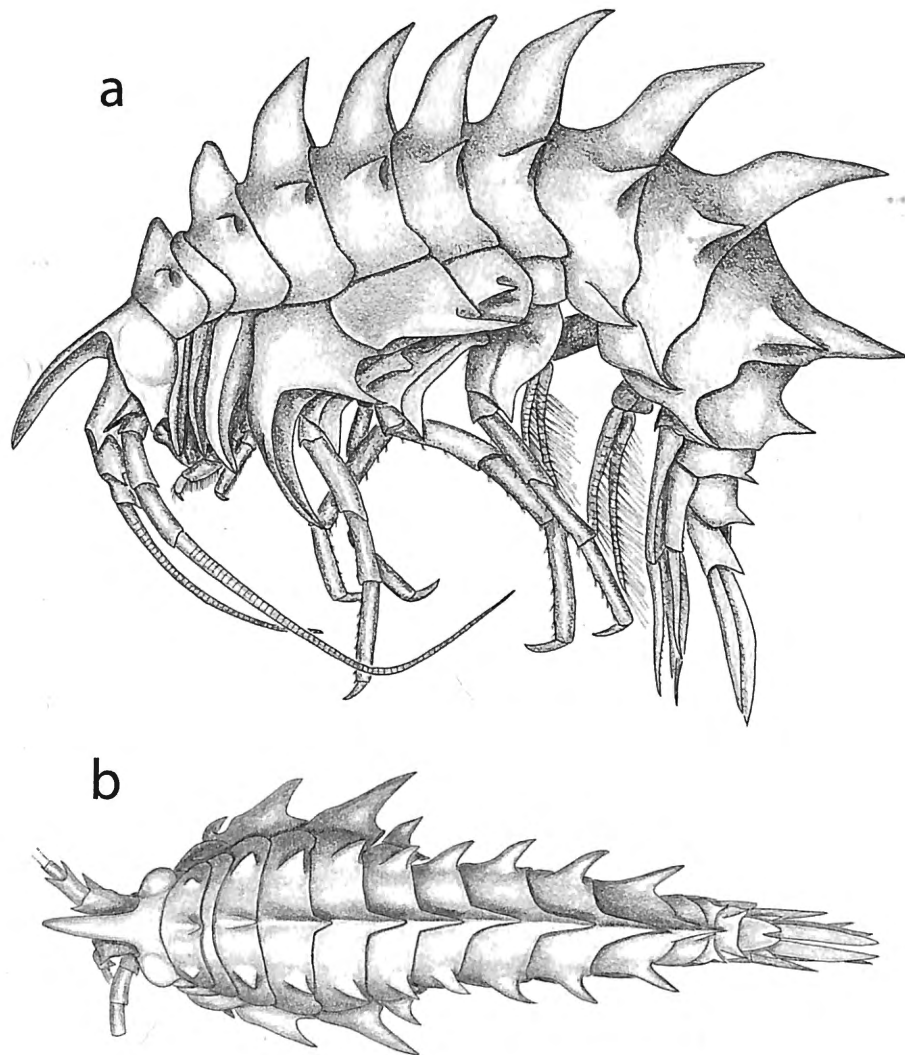
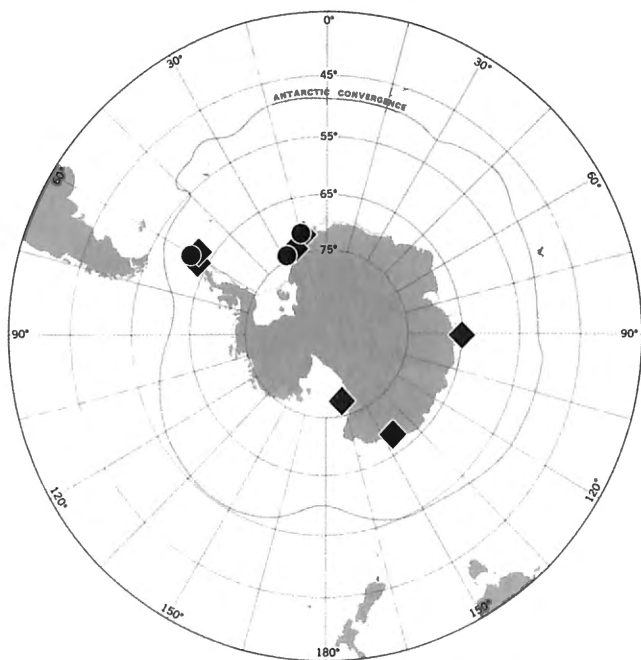


Fig. 21a-b. *Epimeria macrodonta*. a) left lateral view; b) dorsal view.



Map 11. *Epimeria macrodonta*: rhomb; *Epimeria similis*: circle. It may be that older references of locations (before 1985) may be wrong due to problems of distinction between these species.

and pleonites wanting (except for rounded protrusions), coxae 1-3 broad, gnathopods distally expanded, coxa 4 ventrally broad and without tooth on lateral surface.

Type locality. Ross Sea: McMurdo Sound.

Distribution. Adélie Coast; Bransfield Strait; Davis Sea; Marguerite Bay; Oates Coast; Palmer Archipelago; Ross Sea; South Shetland Islands; Weddell Sea.

Depth range. 30-914 m.

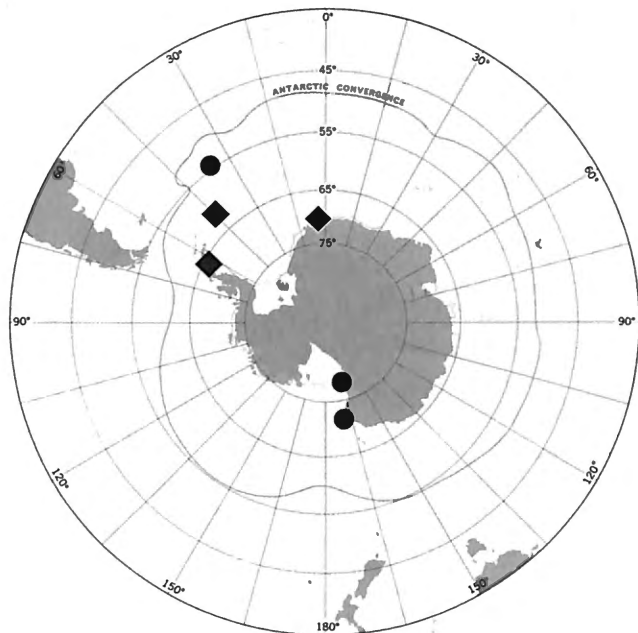
Epimeria monodon Stephensen, 1947a

(Fig. 22a-b, Colour plate 2c, Map 12: rhomb)

References and synonymy. De Broyer *et al.* 2007: 42.

Diagnosis. Eyes of normal size. Pereon smooth. Pleonite 3 with mid-dorsal keel, drawn out into a short posterior process. Urosomite 1 with rounded hump. Coxae 1-3 rounded distally. Coxa 1 anterior and posterior margins almost parallel. Propodus of gnathopods 1-2 weakly expanded distally. Coxa 4 posterodistal angle not projecting ventrally, approximating to 90°. Basis 5 subrectangular. Basis 6 somewhat widened

and lobate distally. Basis 7 roundly lobate distally.
Size. Female 29 mm, male 12-16 mm.



Map. 12. *Epimeria monodon*: rhomb; *Epimeria puncticulata*: circle.

Remarks. The illustrated specimen agrees well with the description given by Stephensen (1947a), but coxa 5 appears to be slightly wider in the present material. Basis 6 is more lobate distally in the present material compared with Stephensen's drawing. *Epimeria monodon* resembles *E. puncticulata*, but the latter has a keel and posteromarginal tooth on pleonites 2-3, whereas *E. monodon* has only the pleonite 3 keeled and strongly toothed. In this regard *E. monodon* is similar to *E. annabellae*, but the tooth of *E. annabellae* is much larger and also urosomite 1 bears a tooth (vs. a blunt protrusion in *E. monodon*). *Epimeria monodon* is very similar to *E. extensa* in having a dorsal process on pleonite 3. However, *E. monodon* has coxa 1 with parallel margins and rounded apex (vs. convex anterior and concave posterior margins and pointed tip), bases 5-7 wider, basis 7 with broad distal lobe (vs. tapering lobe, with weak posteromarginal distal excavation). The telson of *E. extensa* has smooth apices whereas that of *E. monodon* has small notches.

Type locality. Palmer Archipelago: Flandres Bay.

Distribution. Palmer Archipelago; South Orkney Islands; Signy Island; South Shetland Islands, King George Island; Weddell Sea.

Depth range. 0-254 m.

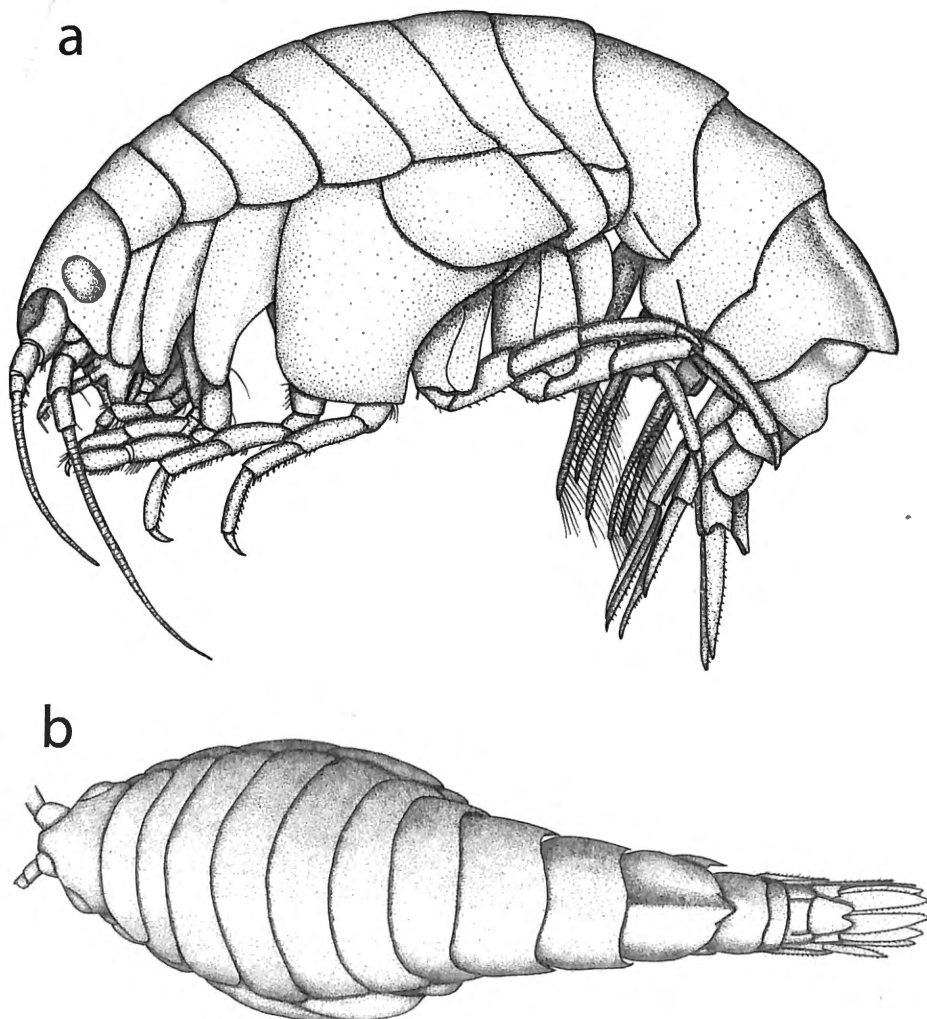


Fig. 22a-b. *Epimeria monodon*. a) left lateral view; b) dorsal view.

Epimeria oxycarinata Coleman, 1990b

(Fig. 23a-b, Colour plate 2g, Map 13: rhomb)

References and synonymy. De Broyer *et al.* 2007: 42.

Diagnosis. Head with elongate rostrum; anteroventral angle acute; eyes round, prominent. Pereonite 1 with large, anteriorly curved, mid-dorsal carina. Pereonite 2 shortest, with small, pointed, upright carina, less than half as long as that of pereonite 1. Pereonites 3-7 with long, pointed, upright carinae; all carinae laterally ridged, up to 5-6 times as long as that of pereonite 2. All pereonites with a pair of dorsolateral and lateral teeth. Pleonites 1-3 with mid-dorsal carinae, that of pleonite 3 shortest, close to the basis a pair of pointed teeth; each pleonite with dorsolateral stout teeth and several small teeth on dorsolateral surface. Epimeral plate 1 with blunt posteroventral angle, epimeral plates 2-3 with pointed posteroventral corner. All epimeral plates with ridges on lateral surfaces. Urosomite 1 longest, with large pointed, mid-dorsal tooth and 1 pair of small lateral teeth. Urosomite 2 shortest, posterodistal margin with 1 small median tooth and 2 larger lateral teeth. Coxae 1-3 pointed distally, with

ridge on lateral surface, anteromarginally slightly concave, posteromarginally convex. Gnathopodal propodi slender, without palm, dactyli strongly pectinate. Coxa 4 ventrally broad, excavate, strong ridge from posterodistal tip to posteromarginal process, with tooth on lateral surface, posteromarginally excavate. Coxa 5 with acute process directing laterally, with 2 strong ridges on lateral surface flowing into the tip of the process. Coxa 6 with prominent tooth, strongly sculptured by ridges. Coxa 7 round and small, with acute tooth at posterior margin. Basis of pereopods 5-6 posterior margin with 1 proximal process and a longer more pointed distal process. Basis 7 posterior margin deeply excavate distally. Merus and carpus of pereopods 5-7 drawn out into pointed process posterodistally. Telson notched more than one third.

Size. Female 16-26 mm.

Remarks. *Epimeria oxycarinata* is evidently closely related to *E. pulchra*. Both species possess long, laterally ridged dorsal carinae, shortened pereonite 2 bearing a shorter and narrower dorsal carina, and coxa 4 of similar shape (distal excavation and ridges which form an acute tooth projecting laterally from the body). The dorsal carina on pereonite 1 of

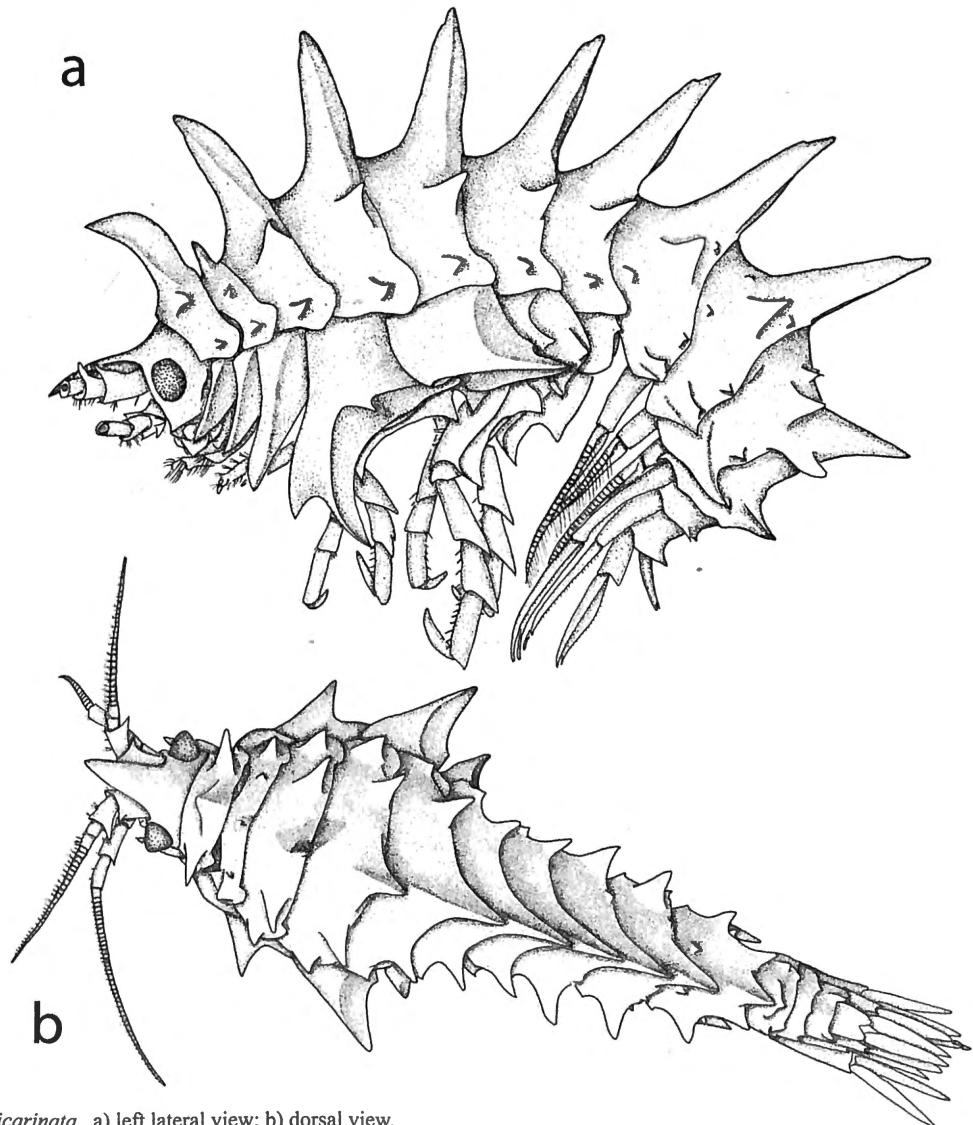
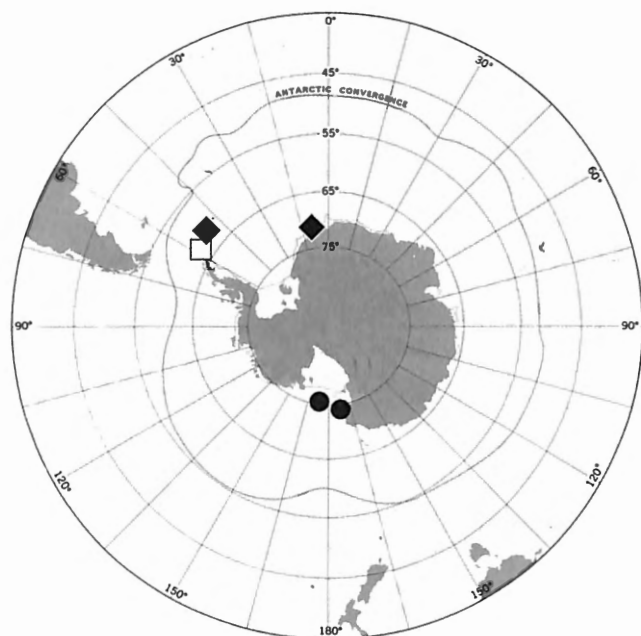


Fig. 23a-b. *Epimeria oxycarinata*. a) left lateral view; b) dorsal view.



Map. 13. *Epimeria oxycarinata*: rhomb; *Epimeria rimicarinata*: circle; *Epimeria reoproii*: open square.

E. oxycarinata is about 3 times longer than that of pereonite 2 and curved forwards. In *E. pulchra* it is only slightly longer and straight. In *E. oxycarinata* the armature of the pereonites consists of acute teeth, in *E. pulchra* of tubercles. One species bearing some superficial resemblance of *E. oxycarinata* is *Paramphithoe hystrix* (Sars, 1895), not an Antarctic species though, which has acute dorsal carinae and a forward-curving carina on pereonite 1. *Epimeria oxycarinata* can be distinguished easily from this species by its ridged coxae, long rostrum, single dorsal carina on pereonite 1 (instead of 2 carinae as in *P. hystrix*) and by the notched telson. Similar to *E. Oxycarinata*, in *E. macrodonta* pereonite 2 is shortened, but without tooth. *E. macrodonta* also lacks the additional lateral teeth on the pereonite and pleonite tergites and has coxa 4 with only 1 apical process.

Type locality. South Shetland Islands: Elephant Island, 61°10.1'S 55°57.9'W, 60°52'S 55°31.8'W.

Distribution. South Shetland Islands; Weddell Sea.

Depth range. 129-267 m.

Epimeria pulchra Coleman, 1990b

(Fig. 24a-b, Colour plate 2f, Map 9: circle)

References and synonymy. De Broyer *et al.* 2007: 42.

Diagnosis. Head with elongate rostrum, twice as long as head; eyes oval, prominent, drawn out into a small acute tip; ventral corner of head subacute; acute process between antennae 2; epistome with dorsally directed acute process. Pereonite 1 with dorsal carina and broad rounded projections dorsolaterally, small tooth close to the lateral margin. Pereonite 2 in lateral view with narrower dorsal carina, smaller in comparison with that of pereonite 1, on both sides of dorsal carina is a small

tooth and lateral protrusions with small acute tip. Pereonite 3 dorsal carina twice as long as that on pereonites 1 and 2, blunt dorsolateral protrusion, lateral process with acute small tip; pereonites 5-7 subequal to pereonite 3, but dorsal carina longer and additional tooth between dorsolateral and lateral protrusion, posteroventral corner of pereonite 7 with small tooth. Pleonites 1-3 with carinae similar to those on pereonites 4-7, all carinae laterally ridged. On all pleonites numerous small teeth on dorsolateral and lateral surface. Epimeral plate 1 rounded posteroventrally, pointed on epimera 2-3, posterolateral margin of pleonite 3 acutely produced. Urosomite 1 with small dorsal carina, on both sides with 1 tooth and 2 additional lateral teeth. Urosomite 2 with 2 lateral teeth posteromarginally and 1 small posteromarginal tooth. Urosomite 3 with posteromarginal spine-like tooth, and protruding processes on both sides. Coxae 1-3 pointed distally, with ridge on lateral surface, anteromarginally slightly concave, posteromarginally convex. Propodi of gnathopods 1-2 slender, without palm, dactyli strongly pectinate. Coxa 4 ventrally expanded, excavate distally, strong ridge from posterodistal tip to posteromarginal process and additional ridges at the anterodistal corner and the proximal lateral surface, with small protrusion at the junction of the ridges on the lateral surface, posterior coxal margin excavate. Coxa 5 with long acute process directing laterally like a wing, with 2 strong ridges on lateral surface flowing into the tip of the process. Coxa 6 with prominent tooth, strongly sculptured by ridges. Coxa 7 round and small, with acute tooth at posterior margin. Basis of pereopods 5-6 posterior margin with 1 pointed proximal process and a slightly longer, acute distal process. Basis 7 posterior margin deeply excavate distally. Merus and carpus of pereopods 5-7 drawn out into pointed process posterodistally. Telson notched one third.

Size. Ovigerous female 25-29 mm.

Remarks. *Epimeria pulchra* is most closely related to *E. oxycarinata* and *E. grandirostris*. The pereon of *E. pulchra* is broader (seen in dorsal view) than in those other species. The dorsal carinae are similar in form to those of *E. grandirostris*, but considerably longer. Both species have tubercle-like armature of the pereon, although *E. pulchra* bears a small additional tooth on pereonites 4-7. Coxa 4 is of the same form as in *E. oxycarinata*, but wider. Coxa 5 protrudes laterally from the body, like a wing. This unique character, together with the typical well-developed dorsal carinae and the pointed eyes, allows rapid identification.

Type locality. South Orkney Islands: 60°43.12'S 45°30.86'W.

Distribution. South Orkney Islands; Weddell Sea.

Depth range. 141-499 m.

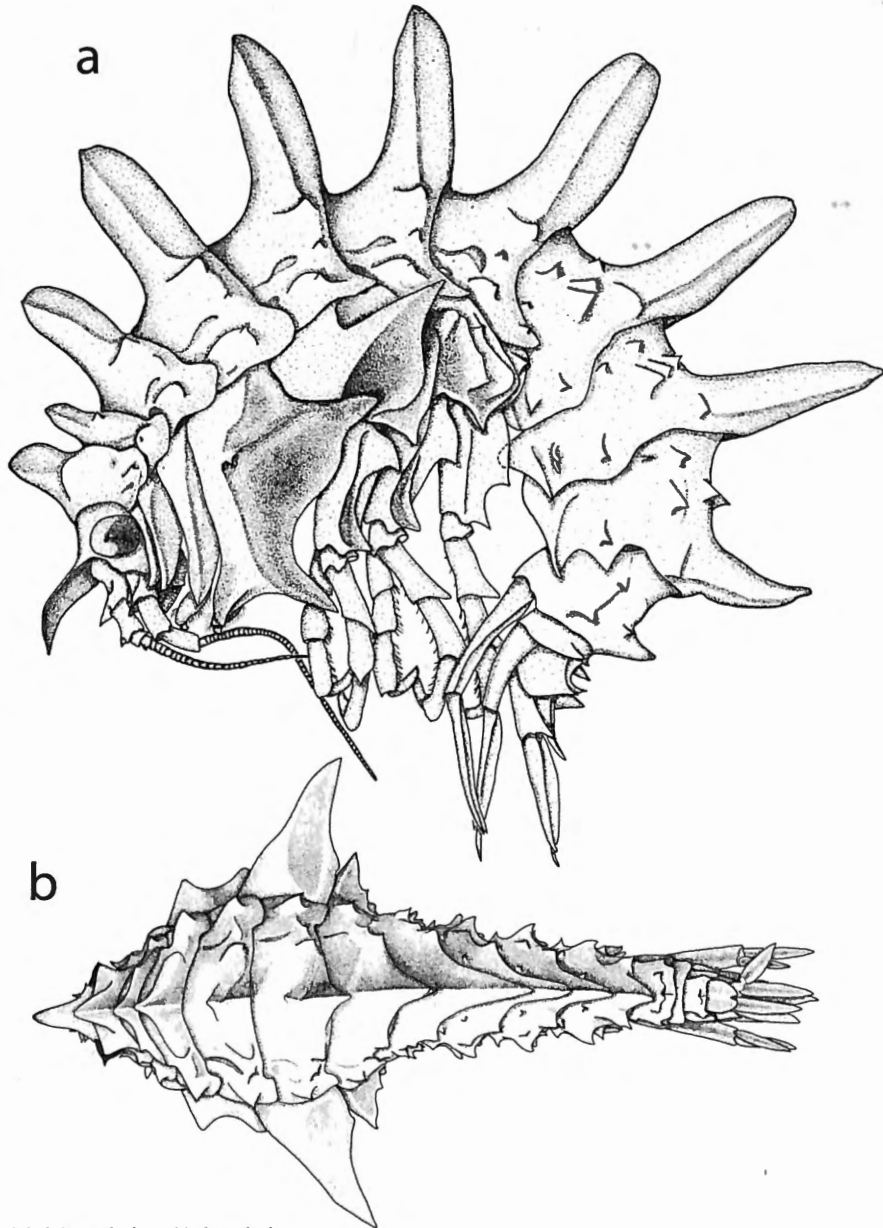


Fig. 24a-b. *Epimeria pulchra*. a) left lateral view; b) dorsal view.

***Epimeria puncticulata* K.H. Barnard, 1930**

(Fig. 25, Colour plate 2d, Map 12: circle)

References and synonymy. De Broyer *et al.* 2007: 43.

Diagnosis. Pleonites 2-3 with mid-dorsal keel, drawn out into small posterior projections, that of segment 2 is pointed whereas that of segment 3 is blunt. Urosomite 1 with a posterior hump. Coxa 1 subtriangular in shape, carpus slightly expanded distally, propodus slender without conspicuous palm. Coxa 2 convex anteriorly, posterior margin rather linear, carpus and propodus slender and elongate. Coxa 3 somewhat excavate posteriorly. Coxa 4 posterodistal angle not projecting ventrally, posteroventral margin broad. Basis 5 posterodistal angle drawn out, distal margin sinuous. Basis 6 slightly excavate posteriorly, bluntly lobate distally. Basis 7 with conspicuous round lobe distally and slight posteromarginal excavation.

Size. Females 10-17 mm, male 7-10.5 mm.

Remarks. *Epimeria puncticulata* resembles *E. monodon*, but the first has a keel and posteromarginal tooth on pleonites 2 and 3, whereas *E. monodon* has only the pleonite 3 keeled and strongly toothed. In *E. puncticulata* the posterior margins of bases 5-6 are somewhat roundly produced basally and acutely produced distally. As a result the posterior margin of these articles appears excavate whereas in *E. monodon* they are straight or convex. Similar to *E. puncticulata* is *E. robusta*, but this species has the mid-dorsal tooth on pleonite 3 upright, a broader coxa 4, posterior margin of coxa 5 produced (vs. rounded), and bases 5-6 with ventrally directed process (vs. weak excavation).

Type locality. Ross Sea: McMurdo Sound.

Distribution. Adélie Coast; Antarctic Peninsula; Ross Sea; South Georgia; South Shetland Islands; Weddell Sea.

Depth range. 60-1590 m.

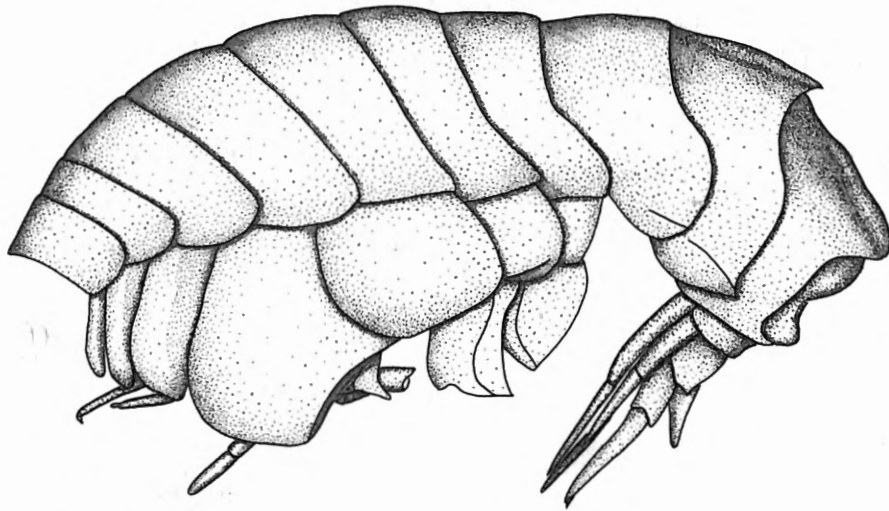


Fig. 25. *Epimeria puncticulata*. Left lateral view, head missing.

Epimeria reoproi Lörz & Coleman, 2001

(Fig. 26, Colour plate 2h, Map 13: open square)

References and synonymy. De Broyer *et al.* 2007: 43.

Diagnosis. Head with strongly flexed rostrum, reaching the distal margin of peduncular article of antenna 1; eyes large round, somewhat prominent. Pereonite 1 less than half the length of head. Pereonite 2 shortest. Pereonite 3 somewhat shorter than 1. Pereonites 4-6 subequal in length, with subacute posteroventral angles. Pereonite 7 slightly longer than 6. Pleonite 1 and 3 shorter than 2. Pereonites 1-4 dorsally smooth, pereonites 5-7 with increasing dorsal teeth; pleonites 1-3 with strongly posteriorly curved dorsal teeth. Posterolateral margin of pereonite 6 roundly produced, that of pereonite 7 with one tooth on both sides, similar but larger teeth on pleonites 1-3. Epimeral plates with posterolateral rounded protrusion and posteroventral acutely produced angles. Urosomite 1 with shallow dorsal elevation. Urosomite

2 shortest. Urosomites 2 and 3 smooth. Antenna 1 peduncular article 1 stout with many plumose setae, distal margin 3 short processes; article 2 less than half the length of article 1, distal margin with 2 short processes. Antenna 2 longer than 1; peduncular article 1 scale-like; article 2 with short nephridial cone and acute distal margin; articles 4 and 5 subequal. Gnathopod 1 coxa tapering distally, anterior margin sinuous; carpus expanded distally, wider than propodus; palm shorter than dactylus length; inner curvature of dactylus with traces of serration. Gnathopod 2 longer than gnathopod 1; coxa convex anteromarginally, concave posteromarginally, slightly tapering distally, apex rounded; carpus and propodus subequal in length and width; palm shorter than dactylus length; inner curvature of dactylus with traces of serration. Coxa 3 subequal in shape compared to that of gnathopod 2, but wider. Coxa 4 with ridge on lateral face, anteriorly strongly convex, apex drawn out into long pointed posteriorly curved process, posteroproximomarginally with rounded lobe. Pereopod 5 coxa wider than long, drawn out into long, acute process,

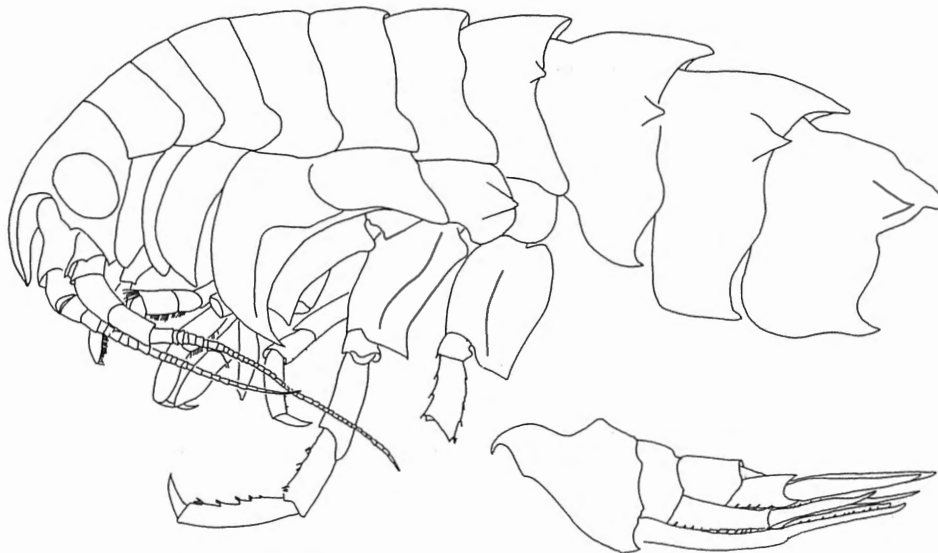


Fig. 26. *Epimeria reoproi*. Left lateral view, urosome broken off and separate.

anteriorly rounded; basis weakly convex, posterior margin with proximal rounded process and distal pointed process, distal margin sinuous. Pereopod 6 coxa truncate anteriorly, rounded posteriorly, large tooth on the face of coxa; posterior margin similar to that of pereopod 5, but less deeply excavate, anterior margin sinuous. Pereopod 7 coxa wider than long, truncate posteromarginally; basis convex anteromarginally, posterior margin weakly sinuous, posterventrally subacutely lobate. Uropod 1 peduncle subequal to outer ramus, outer ramus somewhat shorter. Uropod 2 peduncle shorter than outer ramus. Uropod 3 peduncle short with pointed process on apical margin, rami subequal in length. Telson slightly tapering distally, notched nearly $\frac{1}{4}$.

Size. 9-20 mm (no female or male characters present).

Remarks. This species bears some superficial resemblance to *Metepimeria acanthurus* Schellenberg, 1931a in the similar dorsal armature. However, compared with *E. reopoi* the maxilliped palp of *M. acanthurus* is only 3-articulate (vs. 4-articulate), coxa 4 is truncate apically (vs. acutely pointed), the rostrum is straight (vs. strongly flexed). Due to the 4-articulate maxilliped palp *E. reopoi* is classified as *Epimeria*. Within this genus several species are similarly anterodorsally smooth and carinate on the posterior pereonites and/or pleonites. *Epimeria cora* J.L. Barnard, 1971, *E. cornigera* (Fabricius, 1779), *E. tuberculata* Sars, 1895 and *E. glaucosa* Barnard, 1961 have slender bases 5-7 which are not widened apically (vs. drawn out to posterodistal process). None of these species occur in the Antarctic Ocean. *Epimeria reopoi* has to be discriminated from existing Antarctic *Epimeria* species with smooth anterior pereon: *E. annabellae* Coleman, 1994, *E. heldi* Coleman, 1998a, *E. monodon* Stephensen, 1947a, *E. puncticulata* K.H. Barnard,

1930, *E. robusta* K.H. Barnard, 1930 and *E. vaderi* Coleman, 1998b. In *E. annabellae* only pleonite 3 and urosomite 1 are carinate, coxa 4 is much wider and less pointed, coxae 5-6 are posteriorly rounded and bases 5-6 are not cuspidate. *Epimeria heldi* has a rounded coxa 3 (vs. pointed) while coxa 4 is distally truncate (vs. pointed). In opposite to *E. reopoi*, *E. heldi* bears slender bases 5-7. *Epimeria monodon* has only a carina on pleonite 3. *Epimeria puncticulata* has inconspicuous carinae on the pleosome, also additional teeth guarding the carinae on the pleon are wanting (vs. strong carina on pereonite 5 to urosomite 1 with lateral teeth on pleosome). *Epimeria puncticulata* has coxa 4 apically rounded with rather straight posterior margin (vs. strongly pointed and excavated); coxae 5-6 rounded posteriorly (vs. pointed). *Epimeria robusta* has a strongly widened coxa 4 with a convex posteroventral margin (vs. narrower, concave margin and strongly pointed apex) and the posterior margins of the bases 5-6 are both deeply notched and have a pointed ventrally directed lobe and narrow apices (vs. excavate with distal pointed process). *Epimeria vaderi* and *Epimeria* sp. Andres, 1985 resemble the new species most. The differences between these species are shown in Table 2. The result of this comparison is that *E. reopoi* and *Epimeria* sp. Andres, 1985 are most similar. It is conceivable that *Epimeria* sp. Andres, 1985 is a subadult of *E. reopoi*. Although the male sex was determined in Andres' specimen it is not possible to sex the new species that is about 3 times as long as Andres' animal.

Type locality. Bransfield Strait: 63°00.10'S 60°31.00'W.

Distribution. Only known from type locality.

Depth range. 48 m.

Table 2. Morphological differences between *E. reopoi*, *E. vaderi* and *Epimeria* sp. Andres, 1985

	<i>Epimeria reopoi</i> Lörz & Coleman, 2001	<i>Epimeria vaderi</i> Coleman, 1998b	<i>Epimeria</i> sp. Andres, 1985
rostrum	strongly flexed, reaching distal margin of 1st peduncular article of antenna 1	straight, reaching distal margin of 1st peduncular article of antenna 1	straight, surpassing distal margin of 1st peduncular article of antenna 1
dorsolateral teeth on pleonites 1-2 (on both sides of carina)	single tooth	two teeth	single tooth
posteroventral angles of epimera 1-3	pointed and strongly produced	pointed, but weakly produced	pointed, but weakly produced
coxa 1	rounded	pointed	rounded
coxa 3	wide, with pointed apex	wide with pointed apex	narrow, angular apically
coxa 4	deeply excavate, apex acutely drawn out and curved posteriorly	not deeply excavate apex moderately drawn out, angular	deeply excavate, apex acutely drawn out and curved posteriorly
posteroventral angle of bases 5-6	strongly pointed	strongly pointed	less pointed
posterior margin of bases 5-6	deeply excavate	deeply excavate	rather straight
telson	with v-shaped notch	with v-shaped notch	with U-shaped notch

***Epimeria rimicarinata* Watling & Holman, 1980**

(Fig. 27a-c, Colour plate 2e, Map 13: circle)

References and synonymy. De Broyer *et al.* 2007: 43.

Diagnosis. Rostrum long, strongly curved ventrally, extending beyond antenna 1 peduncular article 1. Pereonites 3-7, pleonites 1-3 and urosomites 1-2 with blunt, posteriorly directed, mid-dorsal carinae, those of pereonites 5-7, pleonites 1-3 and urosomite 1 distinctly cleft into anterior and posterior teeth; carinae on pereonites and pleonites 1-2 laterally excavate and sculptured (as in Fig. 27c). Pereonites 5-7, pleonites 1-3 and urosomite 1 with dorsolateral teeth. Pleonites 1-3 and urosomite 1 each bear one additional lateral protrusion anteriorly. Coxae 1-3 narrowly subrectangular with anteroventral corners rounded, posteroventral corners

angular. Propodi of both gnathopods expanded distally, with serrate palm, dactyli with short setae on inner curvature. Coxa 4 ventral margin broadly quadrate, posteroventral corner slightly produced. Coxa 5 posterior margin bluntly produced. Coxa 6 with rounded hump on lateral surface. Coxa 7 tapering posteriorly. Posterior margin of basis 5 with short rounded proximal lobe. Basis of pereopods 6-7 proximal process successively enlarged, producing incised appearance. Telson cleft one fourth.

Size. Female and male 35 mm.

Remarks. *Epimeria rimicarinata* is most similar to *E. georgiana* in having blunt mid-dorsal carinae and ventral margin of coxa 4 truncate and posteroventral corner produced. Different from *E. georgiana* the dorsal carinae are notched creating bilobed carinae in *E. rimicarinata*. The latter species also bear posterolateral teeth on pereonites 5 to urosomite

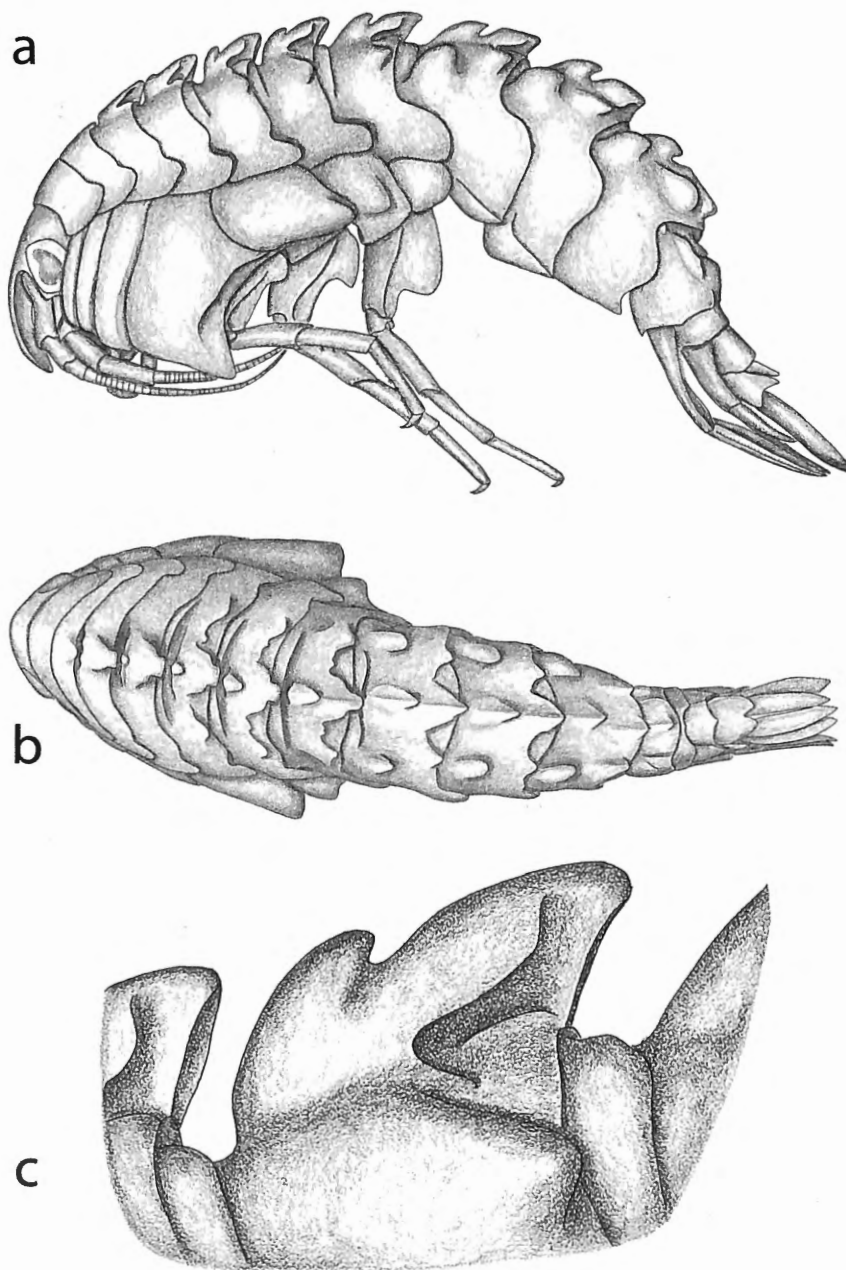


Fig. 27a-c. *Epimeria rimicarinata*. a) left lateral view; b) dorsal view; c) detail of sculptured dorsal carina of pereon segment.

1 and additional posterolateral protrusions on pleonites 1 to urosomite 1 anteriorly. The posteromarginal pointed processes of bases 5-6 are directing ventrally in *E. georgiana*, but are weakly developed on basis 5 and horizontal on basis 6 in *E. rimicarinata*.

Type locality. Ross Sea: 72°32'S 171°26-28'E.

Distribution. Ross Sea.

Depth range. 337-474 m.

without tooth, only posterodistal angle pointed.

Size. Female 19-45 mm, male 22-26 mm.

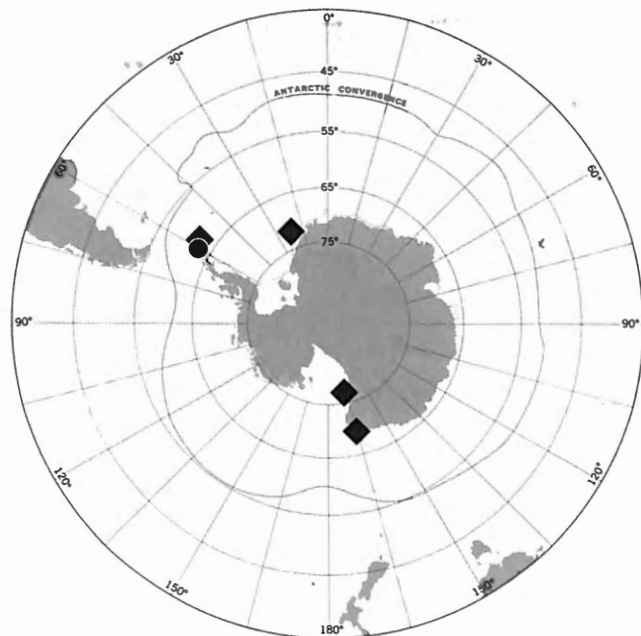
Remarks. There seems to be some variability of the dorsal armature in this species. In the type material the keel of the pleonites is only well developed on segment 3, but

Epimeria robusta K.H. Barnard, 1930

(Fig. 28a-b, Colour plate 1g, Map 14: rhomb)

References and synonymy. De Broyer *et al.* 2007: 43.

Diagnosis. Body robust. Posterior margin of pereonites 5-6 with small medial protrusion, pereonite 7 with shallow keel. Pereonite 7 and posterior margins of pleonites 1-2 in lateral view with tooth-like elevation. Pleonites 1-3 with mid-dorsal keel, pleonite 3 and urosomite 1 with pointed tooth. Urosomite 3 with shallow mid-dorsal keel. Pereopod coxa 1-3 tapering distally, apically rounded. Propodus of gnathopods 1-2 expanded distally, with well developed palm. Coxa 4 very large, with wide posteroventral angle projecting somewhat ventrally. Basis 5 with posteromarginal tooth. Basis 6 with similar tooth but larger. Basis 7 widened proximally, but



Map 14. *Epimeria robusta*: rhomb; *Epimeria vaderi*: circle.

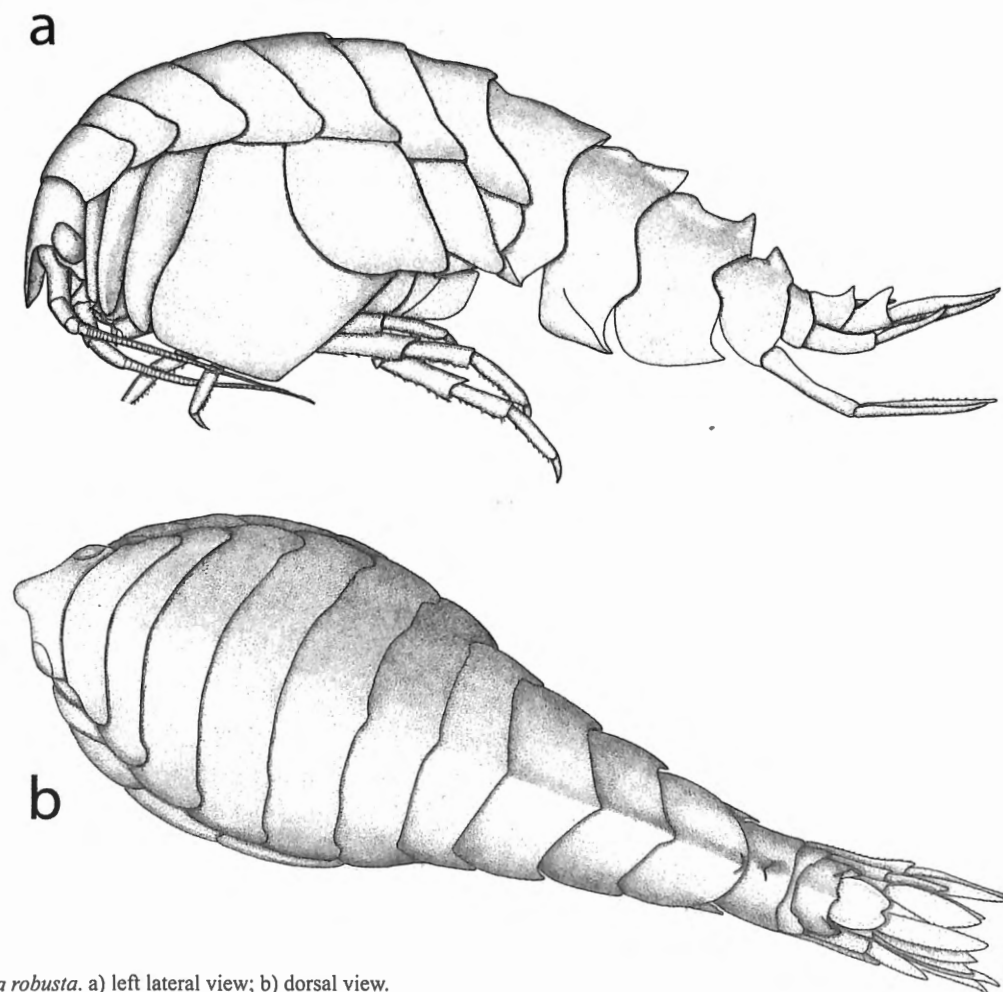


Fig. 28a-b. *Epimeria robusta*. a) left lateral view; b) dorsal view.

very weak and rounded on segments 1-2, and the posterior margin of pleonite 1 is drawn out to a tooth. Also the teeth on pleonite 3 and urosomite 1 are rather short compared with the redescribed material. A tooth is also lacking on the posterior margin of pleonite 1 of a specimen collected close to Elephant Island.

Type locality. Ross Sea: McMurdo Sound.

Distribution. Ross Sea; South Shetland Islands; Weddell Sea.

Depth range. 82-2000 m.

***Epimeria rubriques* De Broyer & Klages, 1991**

(Fig. 29a-b, Colour plate 2a, Map 7: circle)

References and synonymy. De Broyer *et al.* 2007: 44.

Diagnosis. Head with large, flexed rostrum, almost twice as long as head, reaching to the distal end of the second peduncular article of antenna 1; eyes oval; ocular lobe of head pointed or with small notch; anteroventral corner produced, subacute.

All pereonites and pleonites 1-2 with long narrow, apically blunt, mid-dorsal process, increasing in length from the first to the fifth segment. Pleonite 3 with wide triangular mid-dorsal tooth; on pleonites 1-3 the front base of the process marked with a rounded protuberance; pereonites 5-7 and pleonites 1-3 with slightly produced dorsolateral tubercle, weakly increasing in size from pereonites 5 to pleonite 3. Urosomite 1 slightly longer than urosomites 2-3 combined, with medial hump, weak lateral tubercle and dorsolateral antero-posterior blunt ridge; urosomite 2 shortest and smooth; urosomite 3 with a low mid-dorsal carina ending in a triangular posterior projection. Coxae 1-3 not acute distally, with dorsoventral ridge on lateral surface, anteroventral angle broadly rounded, posteroventral angle subacute, gnathopods with wide palm region, inner curvature of dactylus bordered with short spines. Coxa 4 ventrally broad, posteroventral angle acute, sharply ridged close to posteromarginal excavation. Coxa 5 with very long acute posterior process. Coxa 6 with strong blunt central tubercle. Coxa 7 with rounded posterior margin. Bases 5-7 with strong ridge on lateral surface. Basis 5 posterior margin with a proximal subacute lobe, and distal lobe. Basis 6 wider

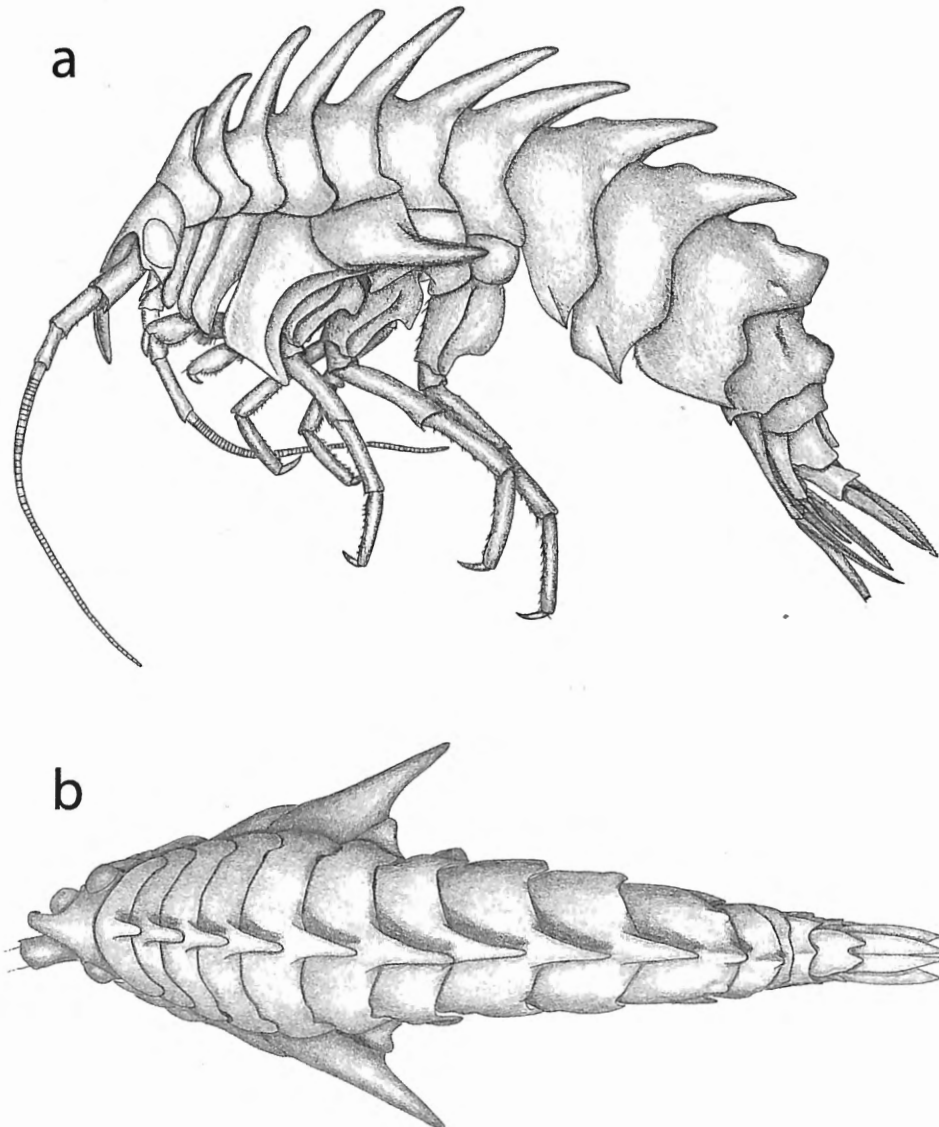


Fig. 29a-b. *Epimeria rubriques*. a) left lateral view; b) dorsal view.

than on preceding leg, posterior margin with proximal acute process. Basis 7 with distal posteromarginal excavation. Telson notched 1/5.

Size. Female 18-69 mm, male 15-51 mm.

Remarks. *E. rubriques* is similar to *E. macrodonta* and *E. similis*. From these species it can be distinguished by: the long upright processes on all pereonites (vs. wanting carinae on pereonite 1 or 2); the rounded protuberance on coxa 6 (vs. acute tooth); the strongly excavate posterior margins of bases 5-7 (vs. weak excavation); short distal teeth on peduncular articles 1-2 of antenna 1 (vs. long, strongly projecting teeth).

Type locality. Weddell Sea: 72°35'S 18°07'W.

Distribution. Weddell Sea.

Depth range. 254-1030 m.

prominent, ocular lobe with short protrusion, anteroventral corner pointed. Pereonites 1-2 without dorsal carinae, but with one small laterodorsal tooth on both sides of each segment (sometimes minute on pereonite 1); dorsal carinae begin on pereonite 3 with a small tooth, increasing in length on subsequent pereonites and pleonites 1-2, all passing well beyond each segmental posterior margin; the anterior edge of each carina sharp and narrow, widened posteriorly, seen from posteriorly the carinae are excavate; laterodorsal teeth rounded on pereonite 3, but pointed on following pereonites and pleonites; dorsal carina on pleonite 3 depressed in lateral view, not much passing beyond posterior segmental margin and not excavate posteriorly; posterodistal corners of all three pleonite epimera produced and pointed. Urosomite 1 longest, with mid-dorsal pointed process. Urosomite 2 shortest, in some specimens with small, pointed, lateral posteromarginal processes. Urosomite 3 with inconspicuous mid-dorsal shallow keel and laterodorsal ridges which are drawn out into a acute tip posteriorly. Coxae 1-4 rounded anteriorly and excavate posteriorly, pointed ventrally, lateral surface with sharp ridge. Propodus of gnathopods 1-2 slender, palm narrow and oblique, dactylus with short spines on inner curvature. Coxa 4 with a pointed (in some specimens inconspicuously rounded) process at the dorsal region of the semicircular ridge,

Epimeria similis Chevreux, 1912a

(Fig. 30a-b, Colour plate 1e, Map 11: circle)

References and synonymy. De Broyer *et al.* 2007: 44.

Diagnosis. Head with narrow, moderately flexed rostrum, about the length of the head or slightly longer, eye large and

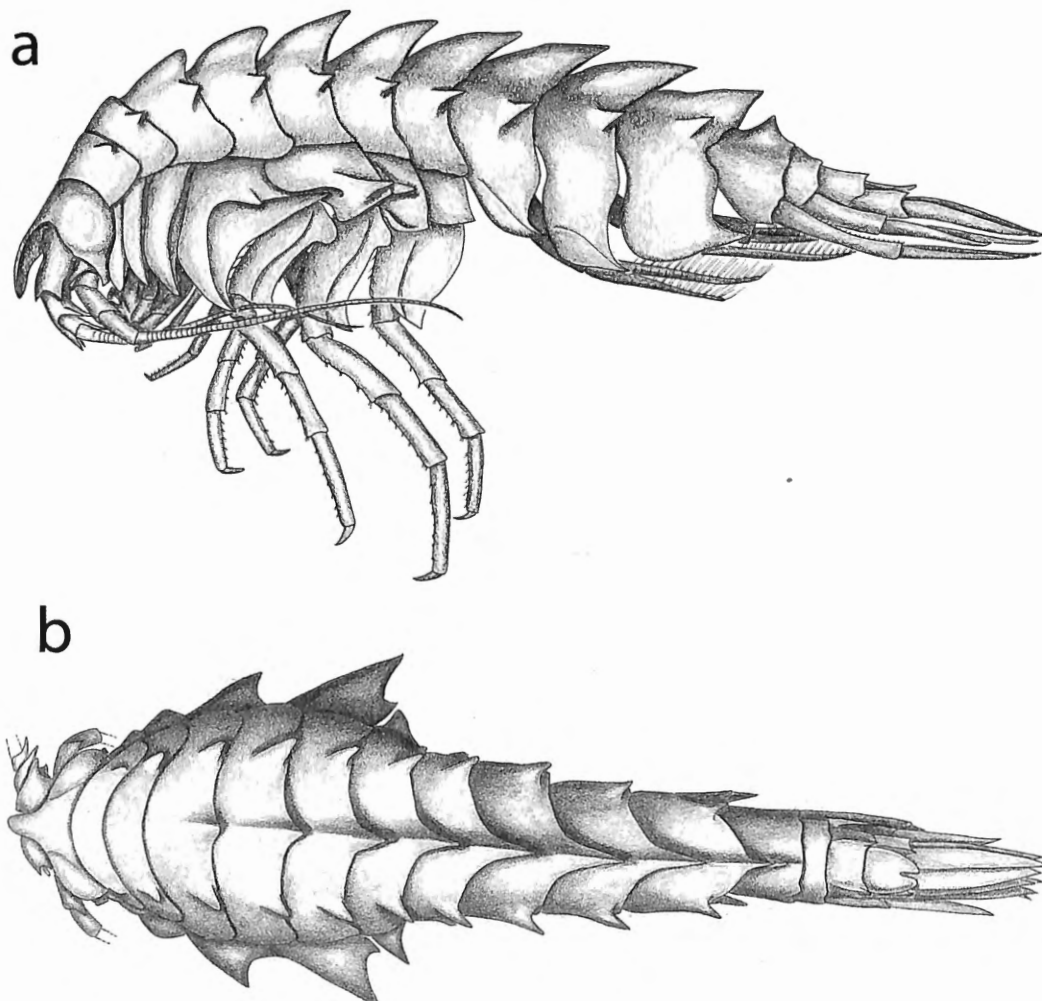


Fig. 30a-b. *Epimeria similis*. a) left lateral view; b) dorsal view.

which flows into a pointed posteromarginal projection. Coxa 5 on lateral surface with long wing-like acute process. Coxa 6 with similar, but shorter process, rounded lobe ventrally. Posterodistal angle of coxa 7 pointed. Basis 5 with rounded posterobasal lobe and acute posterodistal process, surface with sharp ridge. Basis 6 of similar shape, but somewhat wider. Basis 7 sinuous posteromarginally with pointed posterodistal angle. Telson notched 25-30%.

Size. Female 14-48 mm, male 12-22 mm.

Remarks. There seems to be some variability within this species comparing specimens from the Antarctic Peninsula and the Weddell Sea. The population from the Antarctic Peninsula has an only inconspicuously rounded process on the surface of coxa 4, whereas it is rather long and pointed in the Weddell Sea specimens; the dorsolateral processes on pereonite 1 are inconspicuous swellings in the Weddell Sea material, but rounded teeth in the specimens collected at the Antarctic Peninsula; second urosomite with 2 lateral posteromarginal teeth versus smooth at the Weddell Sea animals. In a few specimens from the Antarctic Peninsula the first pereonites were lacking any carinae and pereopod coxa 1 was not pointed but rather wide.

Epimeria similis resembles *E. macrodonta* very much. From this species *E. similis* can be differentiated by the lack of a mid-dorsal carina on pereonite 1, posterolateral teeth on pereonite 2, short process on the lateral face of pereopod 4 coxa (vs. long), and the rostrum that is not much longer than the head (vs. twice the head length). *Epimeria similis* is matching *E. loricata*, not an Antarctic species though, in the dorsal armature. However, there are not only one row of dorsolateral teeth on the pleonites 1-3 of *E. loricata*, but numerous teeth, the carinae are rounded apically, coxae 5-6 are without protrusions posteromarginally, and the rostrum surpasses peduncular article 3 of antenna 1.

Type locality. South Shetland Islands: King George Island.

Distribution. Danco Coast; Palmer Archipelago; South Shetland Islands; Bransfield Strait; Weddell Sea.

Depth range. 30-620 m.

Epimeria vaderi Coleman, 1998b

(Fig. 31a-b, Map 14: circle)

References and synonymy. De Broyer *et al.* 2007: 45.

Diagnosis. Cuticle pitted; head with long flexed rostrum and large ovoid eyes, anterior head margin sinuous, pointed anteroventrally. Pereonite 2 shortest. Pereonite 4 subequal to pereonites 1-2 combined. Dorsal carinae inconspicuously starting on pereonite 4, becoming more distinct and narrower on posterior segments, strongly curved posteriorly and overreaching the following segment, largest on pleonites 1-2, but shorter on pleonite 3. Pleonites 1-2 with 2 pairs of additional small (3rd pleonite with 1 pair) teeth laterally guarding the dorsal carina on both sides. Epimeral plates 1-2 with lateroventral ridge, epimeral plates 1-3 posterolateral margins roundly produced and with acutely produced

anteroventral angle. Urosomite 1 longest, with short, narrow upward pointed process. Urosomite 2 shortest. Urosomite 3 with dorsolateral and a medial ridge, posterior margin excavate. Antenna 1 peduncular article 1 longer than articles 2-3 combined, with 4 teeth on distal margins of articles 1-2; article 3 drawn out into long process, almost reaching end of 1st flagellar article. Antenna 2 peduncular articles 1-3 condensed to short complex; article 4 longest, with 2 processes distally; article 5 three-quarters the length of article 4. Gnathopod 1 coxa strongly tapering distally and sharply pointed with ridge on lateral face, anterior margin weakly convex, posterior margin slightly excavate; carpus 145% of propodus; propodus narrower than carpus with spiniform setae near serrate palm region; dactylus with dentate inner curvature and 2 minute setae proximal to nail. Gnathopod 2 all articles longer compared to gnathopod 1; coxa also wider, with ridge on lateral face and convex anterior margin; carpus 155% of propodus; propodus narrower than that of gnathopod 1, with spiniform setae near serrate palm region. Coxa 3 similar shaped as that of gnathopod 2, but wider and anterior margin more strongly convex, lateral face with ridge. Coxa 4 longest and widest, with strongly rounded anterior margin, posterodistal angle subacutely produced, strong lobe-like subacute posterior process, which is partially hidden under coxa 5, strong ridge close to posteroventral excavation. Pereopod 5 coxa parallelogram-shaped, wider than long, almost as wide as coxa 4, convex anteromarginally, drawn out into subacute posteroventral lobe, shallow ventral lobe; basis expanded distally, only weakly produced ventrally, with rounded proximal posteromarginal lobe and posteroventral pointed process; ridge on lateral face, setal group anteroproximally. Pereopod 6 coxa anterior margin oblique and excavate, with ventrally rounded lobe, posteriorly produced with acutely pointed process; basis of similar shape than that of pereopod 5, but slightly longer and posterior margin between proximal and distal processes somewhat produced. Pereopod 7 coxa subquadrate; basis wider than coxa and wider than those of pereopods 5-6; posterior margin rounded and produced ventrally, overreaching ischium. Uropod 1 peduncle subequal to rami, lateral margin with shorter spiniform setae, on medial margin only few setae proximally and 1 mediobasal seta; rami subequal. Uropod 2 peduncle slightly expanded distally, outer ramus shortened (approx. 60% of inner ramus). Uropod 3 peduncle with spiniform setae on medial margin, laterodistal angle pointed; outer ramus somewhat shortened. Telson tapering distally; with terminal notch (28% of total length); dorsal surface with microtrichs.

Size. Ovigerous female 19 mm.

Remarks. This species bears some superficial resemblance to *Metepimeria acanthurus* Schellenberg, 1931a in the similar dorsal armature. However, compared with *E. vaderi* the maxilliped palp of *M. acanthurus* is only 3-articulate (vs. 4-articulate), pereopod coxa 1 is shortened (vs. normal), coxa 6 is rounded posteriorly (vs. drawn out), bases 5-7 are tapering distally (vs. expanded distally) and antenna 1 peduncular articles 1-3 are smooth apically (vs. dentate). *Epimeria robusta* has differently shaped dorsal carinae, a strongly widened coxa 4 with a convex posteroventral margin

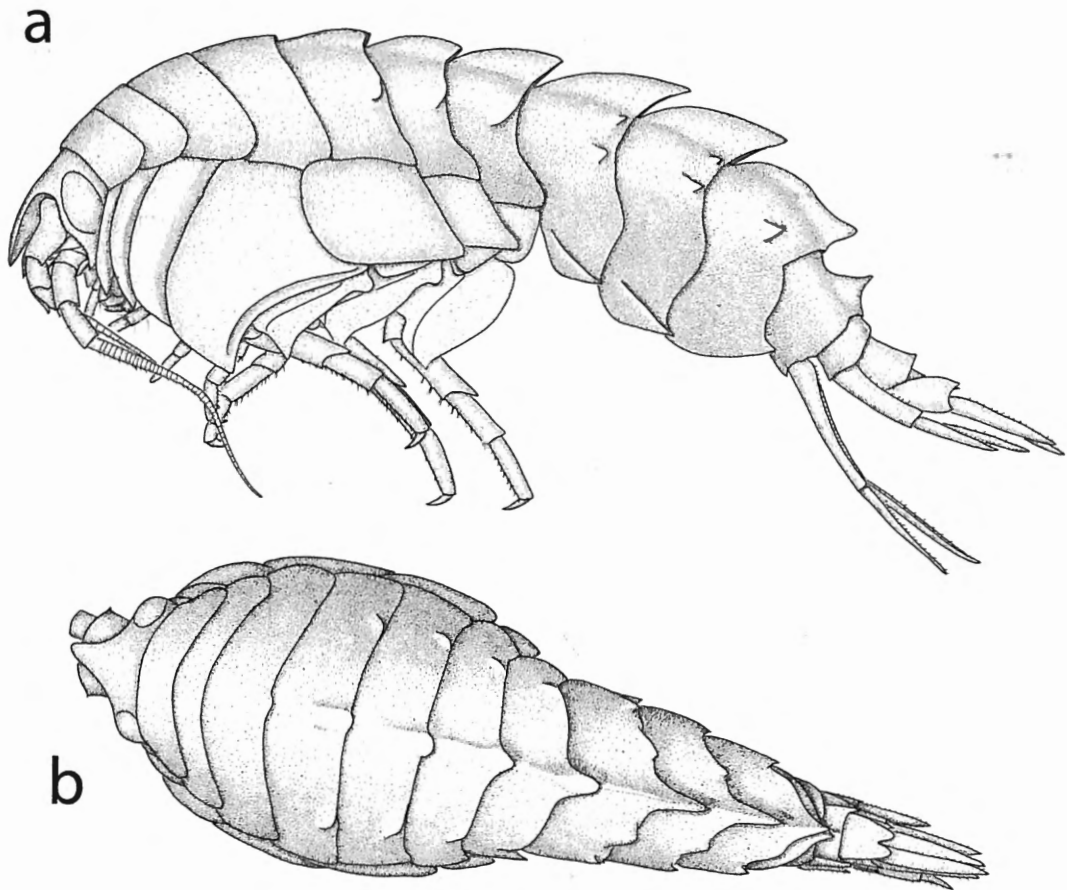


Fig. 31a-b. *Epimeria vaderi*. a) left lateral view; b) dorsal view.

(vs. narrower and concave margin) and the posterior margins of bases 5-6 are both deeply notched and have a pointed ventrally directed lobe and narrow apices (vs. excavate with distal pointed process). *Epimeria puncticulata* and *E. vaderi* appear to be closely related as, besides the pitted cuticle, they have similarly shaped coxa 4 and bases 5-7, as well as the dentated distal margin of the peduncular article 1 of the first antenna (Bellan-Santini, 1972a). *Epimeria puncticulata*, however, has inconspicuous carinae on the pleosome, also additional teeth guarding the carinae on the pleon are wanting (vs. strong carina on pereonite 5 to urosomite 1 with lateral teeth on pleosome). *Epimeria puncticulata* has coxae 1-3 apically rounded with straight posterior margins (vs. pointed and excavate); coxae 5-6 rounded posteriorly (vs. drawn out and pointed); non or weak dentation on 4th maxilliped palp article (vs. strong teeth); slender gnathopodal propodi (vs. wider with stronger palm). Compared with *E. vaderi*, in *E. annabellae* only pleonite 3 and urosomite 1 are carinate, coxa 4 is much wider, coxae 5-6 are posteriorly rounded and bases 5-6 are not cuspidate. *Epimeria monodon* only has a carina on pleonite 3, pereopod coxa 1-3 are rounded apically (vs. pointed), coxa 6 is rounded (vs. pointed) and bases 5-6 are convexly rounded (vs. excavate) posteromarginally.

Type locality. Antarctic Peninsula: 61°03.8'S 54°37.6'W.

Distribution. Only known from type locality.

Depth range. 332 m.

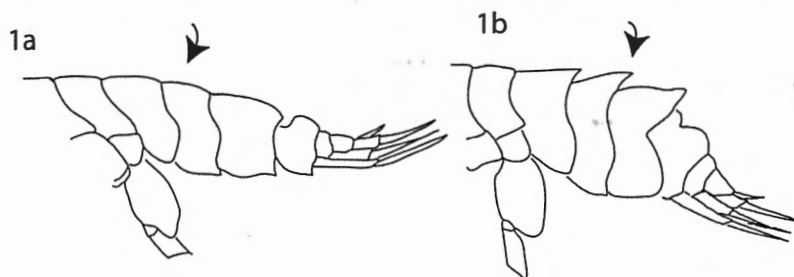
Epimeriella Walker, 1906b

Type-species. *Epimeriella macronyx* Walker, 1906b

Diagnosis (after Barnard & Karaman, 1991). Body poorly armed, almost smooth. Antenna 1 peduncular article 2 shorter than 1. Mouthparts projecting quadrately, but tending to be foliaceous as in Stilipedidae. Upper lip incised; epistome not very broad, gibbous. Mandibular incisor ordinary, or broad, toothed; setal row long, molar absent or simple, conical or laminar. Lower lip inner lobes absent, outer gaping. Maxilla 1 inner plate slightly broadened, palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate without facial row of setae and short and stout, outer plate extended, both separated at base. Maxilliped inner plate shorter and narrower than outer plate, latter elongate; palp article 2 narrow and medially unproduced; palp article 4 well developed, serrate. Coxae 1-4 progressively longer; coxa 1 either weakly acuminate or blunt and in some species becoming weakly expanded basally, coxae 4-5 forming ventral arc; coxa 4 polycuspidate. Gnathopods alike, carpus and propodus ordinary, both gnathopods weakly subchelate. Telson incised or cleft.

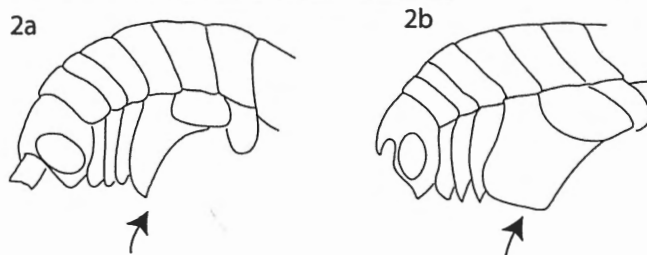
Key to the species of *Epimeriella*

- 1a. Pleonites 1-3 dorsally smooth, only shallow keel on pleonite 3 2
 1b. Pleonites 1-3 with dorsal carinae 3



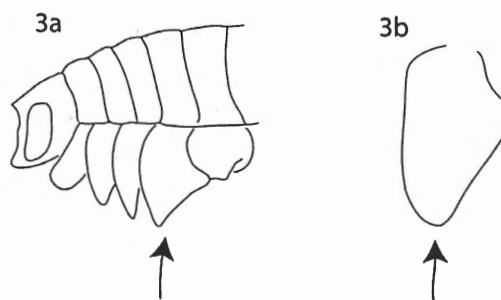
- 2a. Coxa 4 ventrally pointed
 2b. Coxa 4 ventrally broad and truncate

Epimeriella macronyx
Epimeriella walkeri



- 3a(1). Coxa 4 wide, ventrally pointed
 3b. Coxa 4 slender, ventrally rounded

Epimeriella scabrosa
Epimeriella truncata

*Epimeriella macronyx* Walker, 1906b

(Fig. 32a-b, Map 15: rhomb)

References and synonymy. De Broyer *et al.* 2007: 45.

Diagnosis. Head with minute rostrum; eyes large, produced; anteroventral corner produced rounded. Pereon smooth. Pleonites 1-2 smooth and slightly depress dorsally. Pleonite 3 with inconspicuous shallow keel (in large females produced into a tooth); posteroventral corners of epimeral plates forming a right angle or weakly pointed; epimeral plates 1-2 with inconspicuous ridge on ventrolateral surface. Urosomite 1 with mid-dorsal carina posteriorly. Urosomite 2 shortest. Urosomite 3 with a dorsolateral ridge at both sides running into pointed processes. Coxa 1 with anterior margin concave. Apex of coxae 1-3 rounded. Coxa 4 pointed ventrally, posterior margin weakly excavate, surface without ridge or tooth. Coxa 5 rounded posteromarginally, without hump or tooth, only slightly elevated, surpassing pointed proximal posteromarginal process of coxa 4. Coxa 6 posterior margin only weakly convex, angularly lobate ventrally. Coxa 7 small

and round. Basis 5 slender, lateral surface with strong ridge, posterior margin linear, proximally somewhat produced, ventral rounded lobe surpassing posterior half of ischium. Basis 7 with convex posterior margin and ridge on lateral surface, ventral lobe surpassing half of merus. Telson elongate, reaching apex of outer ramus of uropod 2, with shallow notch.

Size. Females 14-28 mm; males 16-22 mm.

Remarks. *Epimeriella macronyx* shows some resemblance to *E. walkeri*. From this species *E. macronyx* is easy to distinguish by coxa 4, which is tapering distally and pointed (vs. ventrally widened and truncate) and the normal sized carpus and propodus on pereopods 5-7 (vs. elongate). The 2 other *Epimeriella* species, *E. scabrosa* and *E. truncata*, differ from *E. macronyx* and *E. walkeri* in having carinate pleon segments 1-3.

Type locality. Ross Sea: Winter Quarters Bay.

Distribution. Antarctic Peninsula; Davis Sea; Ross Sea; South Orkney Islands; South Shetland Islands; Weddell Sea.

Depth range. 0-1200 m.

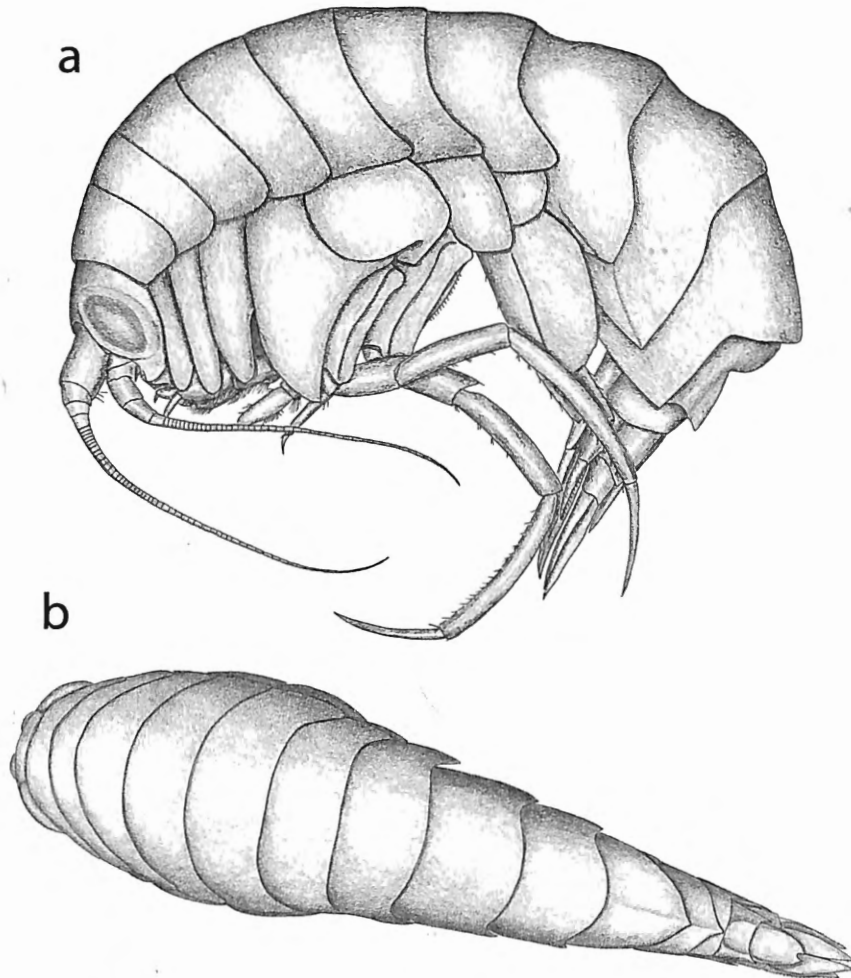


Fig. 32a-b. *Epimeriella macronyx*. a) left lateral view; b) dorsal view.

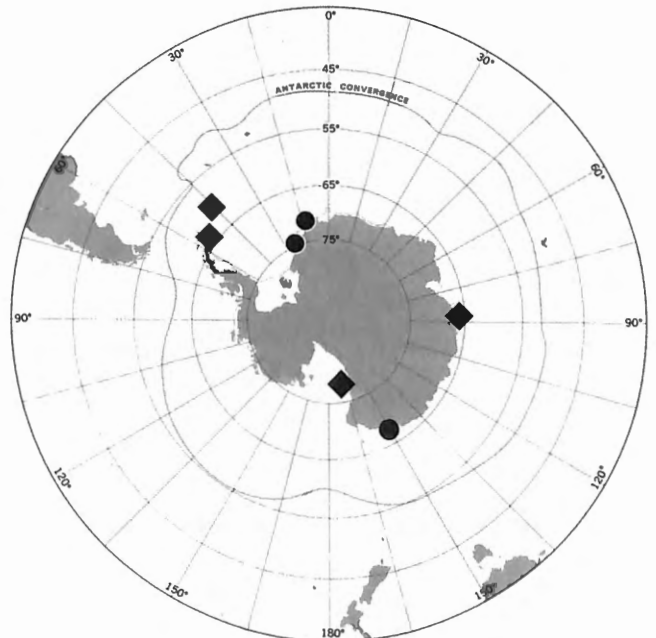
***Epimeriella scabrosa* K.H. Barnard, 1930**

(Fig. 33, Map 15: circle)

References and synonymy. De Broyer *et al.* 2007: 45.

Diagnosis. Head with minute rostrum; eyes large, reniform; anteroventral corner rounded. Pereonites without dorsal or dorsolateral armature; pereonite 2 shortest; posteroventral corner of pereonites 1-4 rounded, that of pereonites 5-7 angular. Pleonites 1-3 with dorsal carinae, that of pleonites 1-2 surpassing posterior margin. Carina of pleonite 3 excavate posteriorly seen from lateral side. Posterior margin of pleonites 1-2 sinuous, ending in pointed posteroventral corner of the epimeral plates, ridges on the lateral surface of epimeral plates 1-2 close to the ventral margin. Posterior margin of pleonite 3 forming a 90 degree angle excavation, posteroventral corner angular. Urosomite 1 longest, with a shallow rounded elevated, sharp mid-dorsal keel. Urosomite 3 with a pair of dorsolateral ridges and a shallow mid-dorsal keel. Coxa 1 distally rounded, anterior margin weakly excavate. Coxa 2 with rounded anterior margin and tapering subacute apex. Coxa 3 pointed ventrally. Coxa 4 rounded anteriorly, pointed ventrally, straight posterior margin, posterior process not closely embedded within coxa 5.

Coxa 5 wider than long, anterior margin rounded, posterior margin straight, transverse fold overlapping proximal region



Map 15. *Epimeriella macronyx*: rhomb; *Epimeriella scabrosa*: circle.

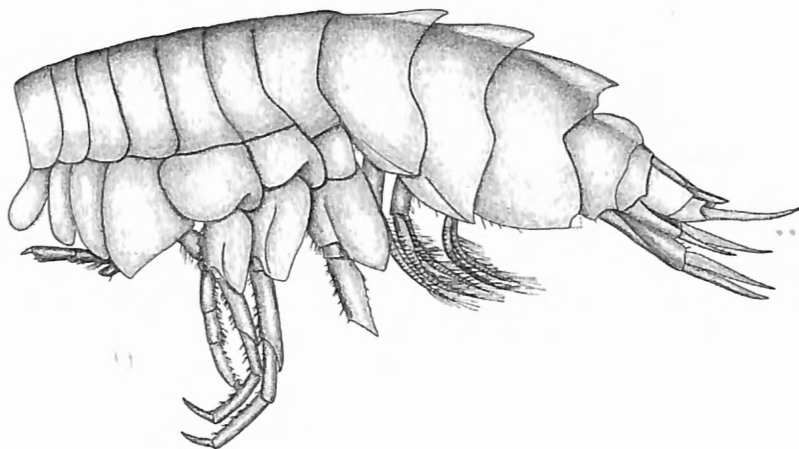


Fig. 33. *Epimeriella scabrosa*. Left lateral view, head missing.

of basis, posterior lobe not expanded ventrally. Coxa 6 with similar fold. Bases 5-6 with linear posterior margin, ridge on lateral surface, ventral lobe surpassing ischium. Basis 7 with rounded posterior margin and subacute distal lobe, surpassing ischium; merus of pereopods 5-7 acutely drawn out posteriorly. Telson, not reaching apex of the outer ramus of uropod 2, notched about one third.

Size. Ovigerous female 14 mm.

Remarks. *E. scabrosa* closely resembles *E. truncata* in the shape of the dorsal carinae on the pleonites, which are lacking in the other *Epimeriella* species. *E. scabrosa* differs in small details from *E. truncata*: the subacute apex of the coxae 3 and 4 (vs. rounded), gnathopods propodus longer than carpus (vs. equal), basis 6 straight posteromarginally (vs. convex), bases 6-7 posterodistal lobe angular (vs. regularly rounded). Future investigations must show if *E. scabrosa* and *E. truncata* are separate species.

Type locality. Oates Coast.

Distribution. Oates Coast; Weddell Sea.

Depth range. 329-366 m.

rounded. Coxa 7 ventrally rounded. Posterior margin of basis 5 linear, that of bases 6-7 convex; anterodistal angles pointed, posterodistal region lobate, rounded. Telson as long as width of basis; broadly notched, inner margin truncate distally and with small notches.

Size. Female 8 mm.

Remarks. *E. truncata* closely resembles *E. scabrosa* in the dorsal carinae on the pleonites, which are lacking in the other *Epimeriella* species. *E. truncata* differs in only small details from *E. scabrosa*: the rounded apex of the coxae 3 and 4 (vs. subacute), gnathopods propodus equal to carpus (vs. longer), basis 6 convex posteromarginally (vs. straight), bases 6-7 posterodistal lobe regularly rounded (vs. angular). Future investigations must show if *E. truncata* and *E. scabrosa* are separate species.

Type locality. 64°00'S 64°30'W.

Distribution. Only known from type locality.

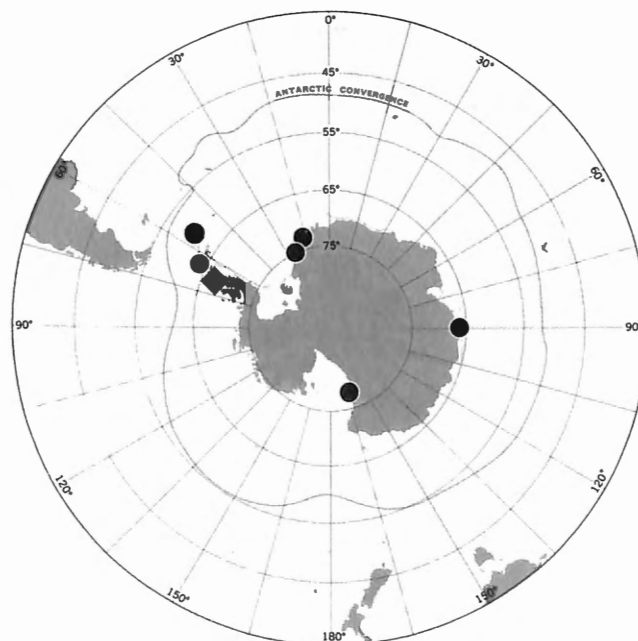
Depth range. 100-382 m.

Epimeriella truncata Andres, 1985

(Fig. 34a-g, Map 16: rhomb)

References and synonymy. De Broyer *et al.* 2007: 46.

Diagnosis. Head with short rostrum, ocular lobe small rounded, anteroventral corner somewhat produced, rounded; eyes large, oval. Pereonites without carination. Pleonites 1-3 with mid-dorsal carinae, dorsal keel on pleonites 2-3 clearer developed compared to pleonite 1. Urosomite 1 with dorsal depression and posteriorly with rounded dorsal keel. Urosomite 3 with weak shallow median keel and dorsolateral ridges that are drawn out posteriorly. Epimeral plates on pleonites 1 and 3 with angular posteroventral corner, that of pereonite 2 with small tooth. Coxa 1 weakly expanded distally with rounded apex. Coxae 2 and 3 tapering distally, gnathopods subchelate, carpus and propodus equal in length. Coxa 4 rounded distally with linear posterior margin. Coxa 5 wider than long. Posterior region of coxa 6 lobate, ventrally



Map 16. *Epimeriella truncata*: rhomb; *Epimeriella walkeri*: circle.

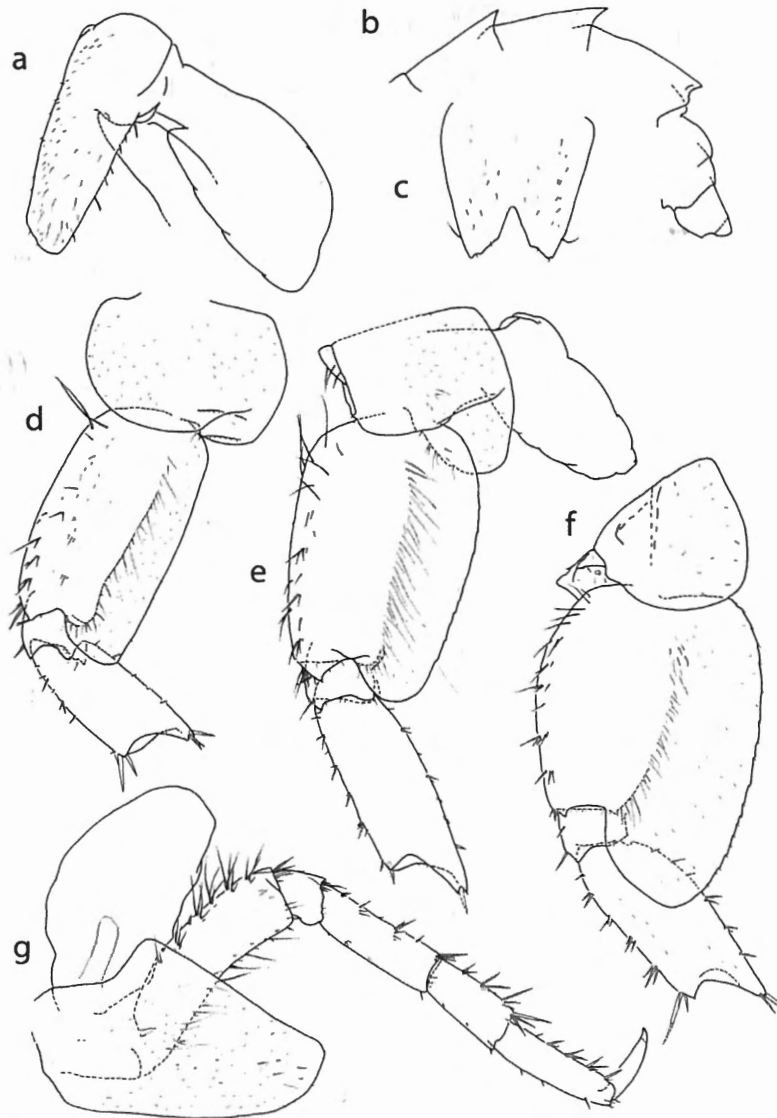


Fig. 34a-g. *Epimeriella truncata*, redrawn after Andres, 1985. a) coxa 3; b) dorsal outline of pleonites 1-3 and urosome; c) telson; d) pereopod 5; e) pereopod 6; f) pereopod 7; g) pereopod 4.

Epimeriella walkeri K.H. Barnard, 1930

(Fig. 35a-b, Colour plate 3a, Map 16: circle)

References and synonymy. De Broyer *et al.* 2007: 46.

Diagnosis. Head with short rostrum; eyes large, oval; anteroventral corner pointed. Pereonites smooth, without carinae. Pleonite 3 with shallow, rounded process posteromarginally; posteroventral corner of epimeral plates 2-3 acutely produced, that of pleonite 1 rounded; ridges on the lateral surface of pleonites 1-2. Urosomite 1 with dorsal hump. Urosomite 2 shortest, Urosomite 3 with dorsolateral ridges, each running into a pointed process posteriorly. Coxa 1 excavate anteromarginally, truncate distally, posteroventral corner pointed. Coxae 2 and 3 tapering distally, apically pointed, gnathopods with very slender propodi and very short palm, dactyli with pectinate inner curvature. Coxa 4 very broad, anteroventral region rounded, produced, covering apex of coxa 3 (sometimes coxae 1-3), ventrally truncate, posteroventral margin straight or weakly sinuous. Coxa 5

wider than long, drawn out posteriorly and rounded. Coxa 6 longer than wide, with transverse ridge on lateral surface. Coxa 7 somewhat tapering distally, rounded. Basis 5 posterior margin straight, posterodistal corner roundly produced. Basis 6 straight or weakly convex posteromarginally; bases 5-6 distally not produced to a lobe. Basis 7 broadest with posterior margin convex, distal lobe strongly produced, pointed apically. Telson moderately incised, lobes of telson rounded, distal lobes of telson not reaching apex of outer rami of uropod 2.

Size. Female 14-29 mm, male 11-14 mm.

Remarks. *Epimeriella walkeri* is unique within the genus. It has coxa 4 enlarged and apically truncate, whereas the other *Epimeriella* species have coxa 4 tapering distally ending in a pointed or rounded apex. The shape of the coxa 4 of *E. walkeri* is similar to that of *Epimeria inermis*. However, between these species are numerous differences which allow rapid identification: rostrum shortened in *E. walkeri*, vs. long in *E. inermis*; pereon and pleon without carination, vs. rounded produced hump-like carinae; coxa 1 excavate

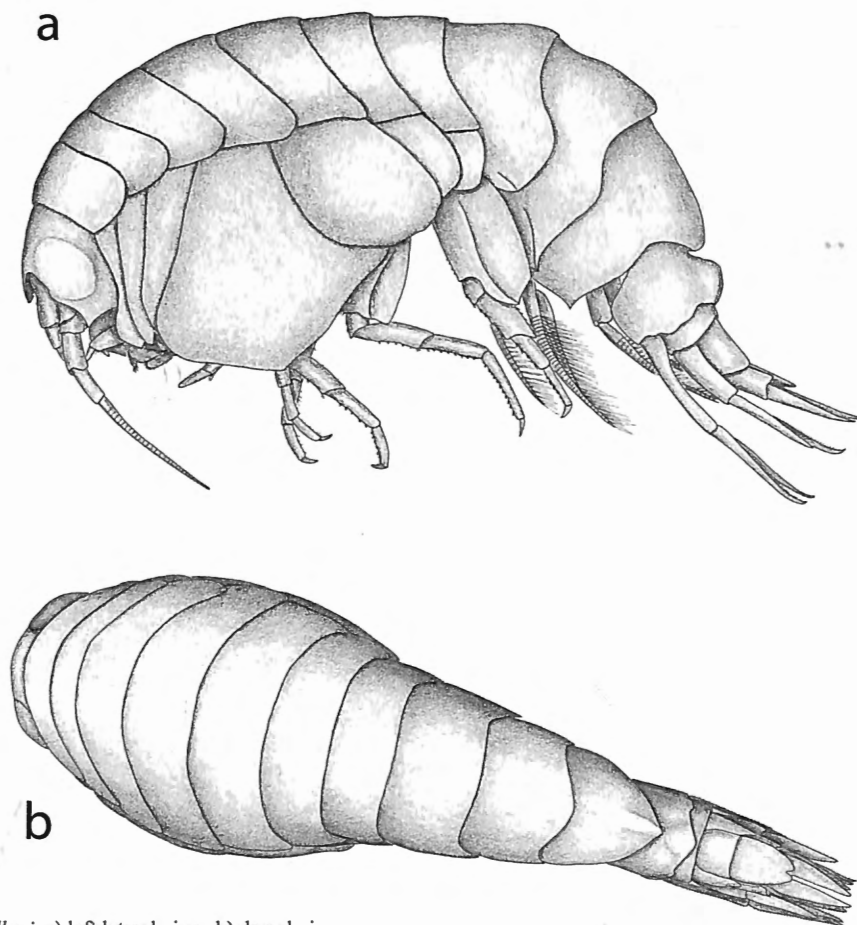


Fig. 35a-b. *Epimeriella walkeri*. a) left lateral view; b) dorsal view.

anteromarginally, vs. linear; coxae 5-6 without hump on lateral surface, vs. hump present; bases 5-6 straight, vs. excavate posteromarginally.

Type locality. Ross Sea: McMurdo Sound.

Distribution. Davis Sea; Palmer Archipelago; Ross Sea; South Shetland Islands; Weddell Sea:

Depth range. 184-928 m.

Metepimeria Schellenberg, 1931a

Type-species. *Metepimeria acanthurus* Schellenberg, 1931a

Diagnosis (after Barnard & Karaman, 1991). Body covered posteriorly with teeth or processes. Antenna 1 peduncular article 2 shorter than 1. Mouthparts projecting quadrately. Upper lip almost entire, not very broad. Mandibular incisor toothed; setal row present; molar broad and blunt, tritulative. Lower lip inner lobes absent. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate (? without facial row of setae). Maxilliped (? inner plate shorter and narrower than outer plate, latter elongate; ? palp article 2 narrow and apicomediaally unproduced); palp article 4 absent. Coxae 1-4 progressively longer; coxae 4-5 forming ventral arc; coxa 4 long, polycuspidate. Gnathopods alike, carpus and propodus elongate, narrow; both gnathopods simple. Telson incised or cleft.

Metepimeria acanthurus Schellenberg, 1931a

(Fig. 36, Map 1: rhomb)

References and synonymy. De Broyer *et al.* 2007: 46.

Diagnosis. Rostrum as long as head, weakly flexed; eyes moderately large, oval; anteroventral corner with right angle. Pereonites 1-5 without dorsal or dorsolateral armature; posteroventral corner of each pereonite rounded, pereonite 6 with weak dorsal keel posteriorly. Pereonite 7 with shallow carina, slightly depressed, seen from lateral view. Similar carinae on pleonites 1-3, that on pleonite 3 not curved posteriorly; close to posterior margin of pereonite 7 to pleonite 3 a dorsolateral tooth on both sides. Pleonites 2-3 with additional dorsolateral ridges; posteroventral angle of epimeral plate 1 rounded, that of pleonites 2-3 pointed. Lateral surface of epimeral plates of pleonites 1-2 ridged. Urosomite 1 with pointed upright dorsal tooth. Urosomite 3 with dorsolateral ridges drawn out posteriorly and shallow medial keel. Coxa 1 tapering distally with pointed apex, anterior margin slightly concave. Coxa 2 distally rounded, gnathopods with very slender propodi, without palm, dactyli spinose at inner curvature. Coxa 3 broader than coxa 2, anterodistal angle rounded, posterodistal corner angular. Coxa 4 largest, anterior margin slightly excavate, distally truncate, posterodistal margin concave, close to this margin with a ridge on the lateral surface of the coxa. Coxa 5

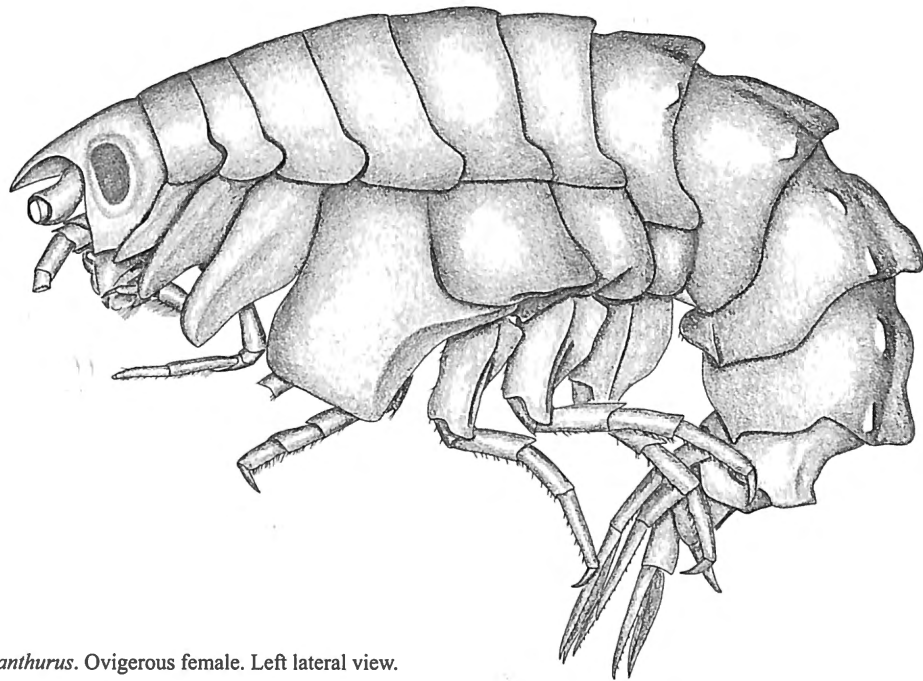


Fig. 36. *Metepimeria acanthurus*. Oviparous female. Left lateral view.

subacute posteriorly, with lateral fold that encloses posterior process of coxa 4. Coxa 6 lateral surface produced, posterior margin rounded. Coxa 7 rounded without hump. Bases 5 and 6 with 2 ridges on lateral surface, proximal posterior margin expanded, posterodistal angle lobate and angular. Basis 7 with ridge on lateral surface and rounded posterior margin, which is distally slightly excavate, distal lobe acute. Mouthparts as typical for *Epimeria* except for 3-articulate maxilliped palp. Telson broadly notched with distally rounded lobes.

Size. Female 21-22 mm.

Remarks. *Metepimeria acanthurus* is somewhat similar to *Epimeria intermedia*. Both species have shallow dorsal carinae and dorsolateral ridges on pleonites. However, the carinae start on pereonite 3 in *E. intermedia*, and on pereonite 7 in *M. acanthurus*. Coxae 1-3 are pointed in *E. intermedia*, but only coxa 1 is apically acute in *M. acanthurus*. Bases 5-7 differ in these species: *M. acanthurus* has the posterodistal corner ventrally lobate, and the bases 5-6 without proximal narrow rounded process. The examination of the mouthparts exhibit the apomorphy for *Metepimeria*, the reduced 4th article of the maxilliped palp.

Type locality. Magellan area: Puerto Condor, Harris Bay.

Distribution. Falkland Islands; Magellan area.

Depth range. 27-494 m.

Uschakoviella Gurjanova, 1955b

Type-species. *Uschakoviella echinophora* Gurjanova, 1955b

Diagnosis. Body covered with articulate spines. Antenna 1 peduncular articles 1-2 subequal. Mouthparts projecting conically. Upper lip incised, not very broad. Mandibular

incisor ordinary, toothed; setal row weak; molar broad and blunt, triturative. Lower lip inner lobes absent. Maxilla 1 palp 2-articulate, article 2 ordinary. Maxilla 2 inner plate without facial row of setae. Maxilliped inner plate narrower but as long as outer plate, latter elongate; palp article 2 narrow and apicomediaally unproduced; palp article 4 well developed. Coxae 1-4 progressively longer; coxae 4-5 forming ventral arc; coxa 4 scarcely polycuspidate. Gnathopods alike, carpus elongate, propodus shorter, both narrow; both gnathopods scarcely chelate. Telson incised or cleft.

Uschakoviella echinophora Gurjanova, 1955b

(Fig. 37, Map 17: circle)

References and synonymy. De Broyer *et al.* 2007: 47.

Diagnosis. Head with small blunt forward pointing rostrum, anteroventral corner slightly produced; row of spines running from top of head down through eye, a few spines below eye; eyes of medium size, bulging. Each pereonite densely covered with long, slender, spines, except for anterior region of pereonites 2-7. Pleonites 1-3 with the same dense spination, additionally each pleonite bearing a prominent backward-inclined dorsal spine or tooth; epimeral plates 1-2 tapering distally, with rounded or subacute ventral margin, epimeral plate 3 ventrally rounded, all epimeral plates not produced posteriorly. Urosomites 1-3 with shorter teeth compared to preceding segments; urosomite 1 with sharp dorsal tooth directed slightly forward. Coxa 1 tapering distally with pointed apex and anteriorly directed tip, posterior margin convex, teeth on anterior region of the surface, directing anteriorly. Coxa 2 of similar shape, but longer and with more spines, both pairs of gnathopods with slender, distally

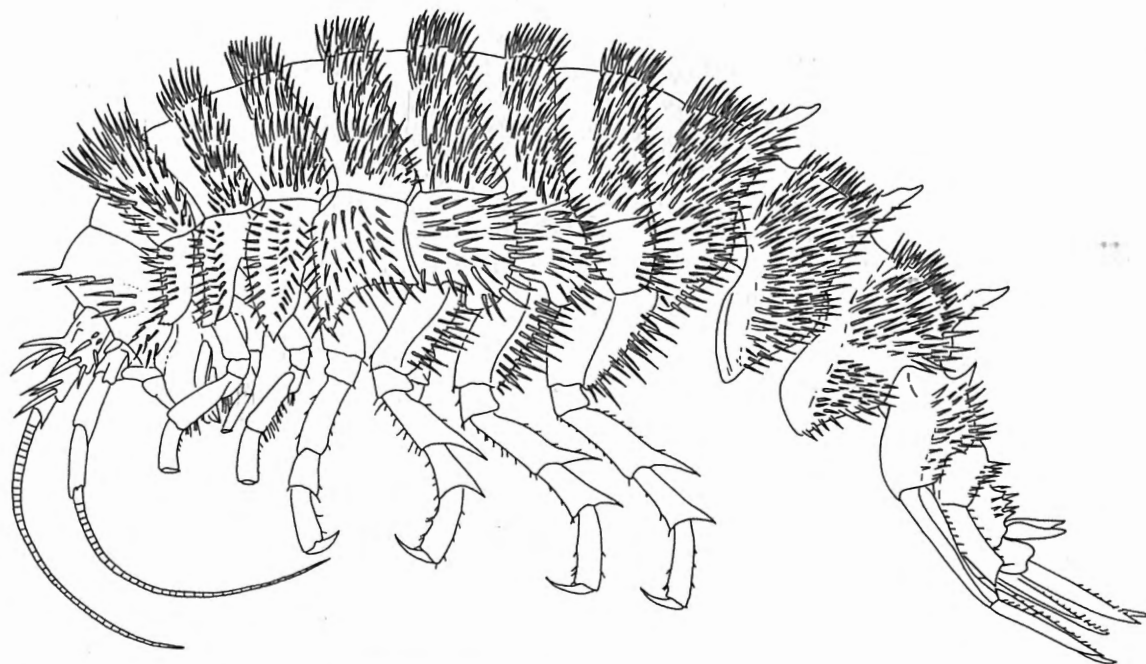


Fig. 37. *Uschakoviella echinophora*, redrawn from Barnard & Karaman, 1991. Left lateral view.

slightly expanded propodi. Coxa 3 tapering to an acute point, posterodistal margin with several sort rounded protrusions. Anterior margin of coxa 4 straight or slightly concave, posteroventral margin excavate, anterodistal corner pointed, teeth on lateral surface pointing ventrally. Coxa 5 rounded anteriorly, posterodistally lobate. Anterior margin of coxa 6 excavate, posterodistally lobate. Coxa 7 with teeth only posterior surface, anteroventral margin excavate. Bases 5-7 subrectangular with teeth close to posterior margin; merus distally expanded and acutely drawn out posteriorly, carpus distally expanded. Telson broadly notched and apically slightly expanded, sometimes with teeth on dorsal surface.

Size. Female 30 mm, male 8 mm.

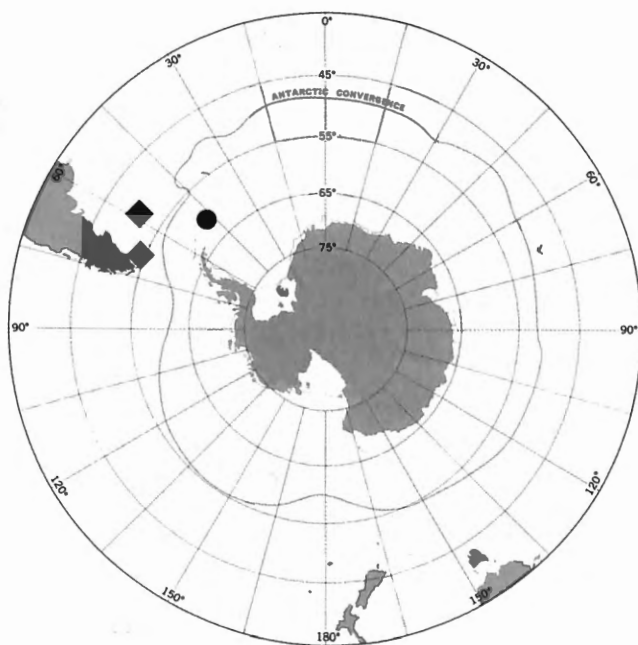
Remarks. At the first glance *U. echinophora* resembles very much the iphimeriid *Echiniphimedia hodgsoni* (Walker, 1906c). The latter species differs from *U. echinophora* in the following: teeth on body surface not articulate; anteroventral corner of head deeply notched; mandible without molar; no teeth on dorsal side of the head; no long dorsal carinae on pleonites; posterodistal corner of epimeral plates 2-3 produced and pointed, additional long process on lateral posterior margin of pleonite 3 and the typical arrangement of iphimeriid chelate gnathopods (first pair short and sparsely setose and second pair elongate and strongly setose).

The species has been recorded only once in the Antarctic by Watling & Holman (1981) and the specimen appears to be lost. So it is impossible to confirm the determination.

Type locality. North Pacific: east of Sturup Island, northernmost of Kuril Island.

Distribution. North Pacific; West Antarctic: South Orkney Islands, 59°48'S 45°06'W.

Depth range. 54-2550 m.



Map 17. *Metepimeria acanthurus*: rhomb; *Uschakoviella echinophora*: circle.

IPHIMEDIIDAE Boeck, 1871b

Diagnosis. (after Coleman & Barnard, 1991b). Body compressed, with dorsal teeth (lacking in *Iphimedia gibba* and *Pariphimedia normani*). Rostrum well developed. Antennae elongate, flagella with 5+ articles; accessory flagellum 0-2 articulate. Mouthpart field conically developed. Epistome and upper lip highly variable, broad or narrow, short or long, incised or entire. Incisor of mandible variable, broad and toothed in transition to needle shaped or blunt, untoothed, callused or hallowed out; setal row absent; molar absent or reduced (*Stegopanoploea* with conical molar); palp always present, 3-articulate. Lower lip without inner lobes, with or without inner notches. Inner plate of maxilla 1 ordinary or minute, usually medially setose; outer plate oblique, normally spinose or reduced (*Nodotergum*); palp large or small, 1-2 articulate. Inner plate of maxilla 2 rarely with facial setae. Palp of maxilliped 3-4 articulate, article 2 produced medially in several genera. Coxae 2-4 more or less acuminate, ventral margins fitting normal ventral parabolic curve of anterior coxae; coxae 1 and 4 not shortened, coxa 1 variable, broad or narrow, acuminate or not, coxa 4 with large posteroventral lobe, coxa 5 shorter than 4. Gnathopods feeble and with

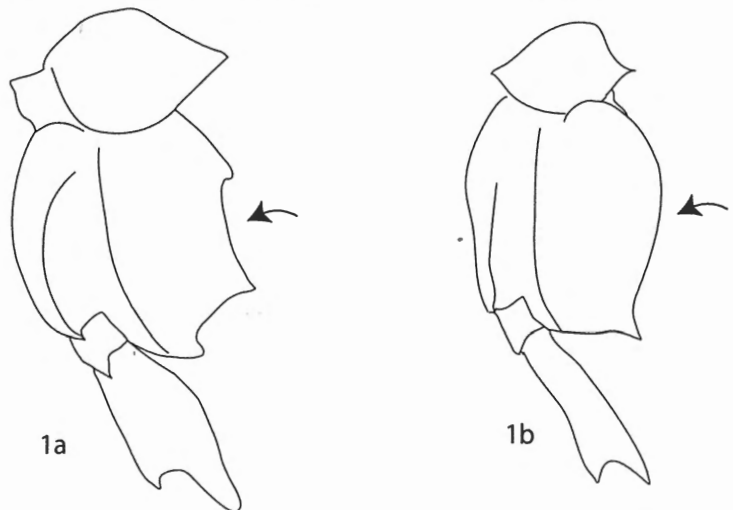
elongate merus and propodus; gnathopod 2 longer and stouter than gnathopod 1; both gnathopods propodochelate or gnathopod 1 simple in *Nodotergum*, merus and carpus not produced. Bases 5-7 often with posterior cusps or teeth. Epimeral plate 3 usually with 2 large posterior cusps. Urosomites free. Uropods 1-3 biramous. Rami of uropod 3 longer than peduncle, flattened, lanceolate, 1-articulate. Telson entire or weakly incised, generally not longer than peduncle of uropod 3.

List of genera. *Iphimedia* Rathke, 1843 (type genus) (= *Microcheles* Krøyer, 1846; = *Panoploea* Thomson, 1880; = *Iphimediopsis* Della Valle, 1893; = *Cypsiphimedia* K.H. Barnard, 1955); *Anchiphimedia* K.H. Barnard, 1930; *Anisophimedia* Karaman, 1980b; *Coboldus* Krapp-Schickel, 1974; *Echiniphimedia* K.H. Barnard, 1930; *Gnathiphimedia* K.H. Barnard, 1930; *Iphimediella* Chevreux, 1911c; *Labriphimedia* K.H. Barnard, 1931 (= *Maoriphimedia* Hurley, 1954); *Maxilliphimedia* K.H. Barnard, 1930; *Nodotergum* Bellan-Santini, 1972a; *Paranchiphimedia* Ruffo, 1949; *Parapanoploea* Nicholls, 1938; *Pariphimedia* Chevreux, 1906a; *Pseudiphimediella* Schellenberg, 1931a; *Stegopanoploea* Karaman, 1980b.

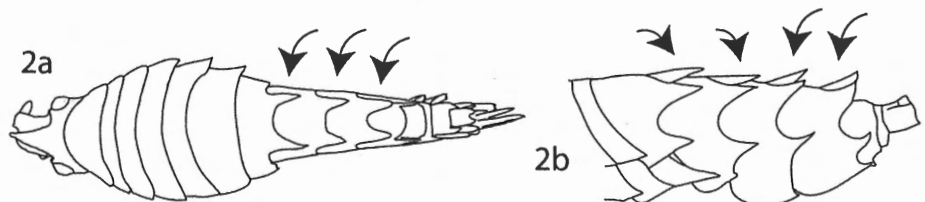
Key to the Antarctic species of Iphimediidae

Remarks. This key leads directly to the species of the family without using genera as intermediate steps. The generic concept within this family is based solely on the mouthpart morphology and requires a preparation of each specimen. The use of these mouthpart details has been avoided as far as possible.

- 1a. Pereopod 7 posterior margin of basis excavate (very weakly in *Nodotergum*!), or multicuspidate 2
 1b. Pereopod 7 posterior margin of basis straight, rounded or sinuous, (occasionally with submarginal teeth) 11



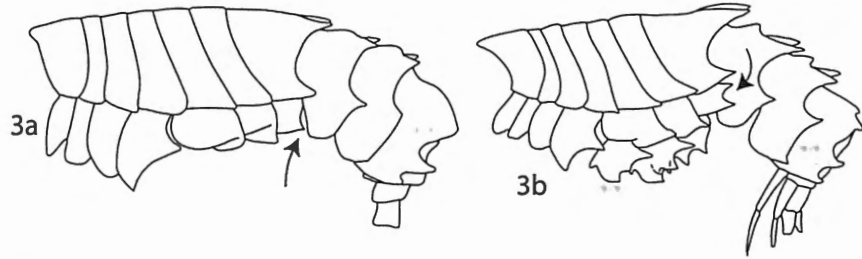
- 2a. Paired teeth on 3 pereonites and pleonites combined 3
 2b. At least 4 pairs of teeth on pereonites and pleonites 5



- 3a. Coxa 7 posterior margin with one posteroventral spine
 3b. Coxa 7 with posterior margin bicuspidate

Iphimedia magellanica

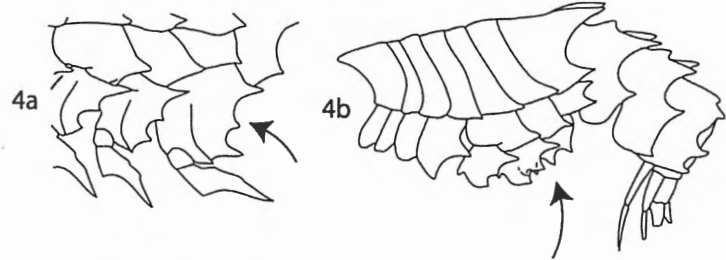
4



- 4a. Bases 6-7 with 4(-5) posteromarginal cusps
 4b. Bases 6-7 with 3 posteromarginal cusps

Iphimedia macrocystidis

Iphimedia multidentata

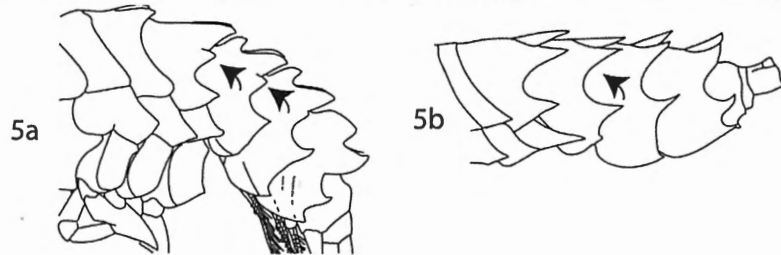


- 5a(2). With an additional tooth on pereonite 7 and pleonites 1-2 close to both sides of dorsal pair of processes (don't mix up with dorsolateral lobe)

6

- 5b. Paired teeth only, no additional dorsolateral processes close to dorsal pairs of processes

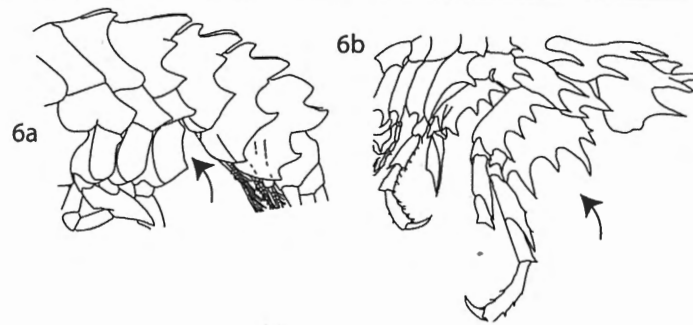
8



- 6a. Pereopod 7 posterior margin of basis regularly excavate
 6b. Pereopod 7 posterior margin of basis multicuspidate

Pseudiphimediella nodosa

7

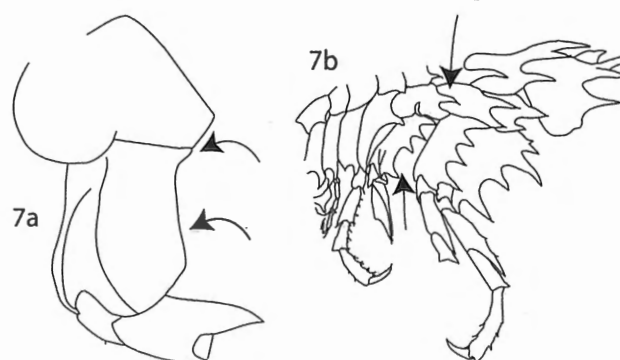


- 7a. Pereopod 5 posterior margin of basis weakly excavate, produced proximo-posteromarginal pointed tooth. Coxa 6 posteriorly pointed

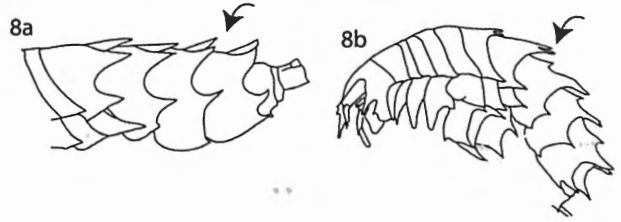
Pseudiphimediella glabra

- 7b. Pereopod 5 posterior margin of basis multicuspidate. Coxa 6 posteriorly bicuspidate

Labriphimedia pulchridentata

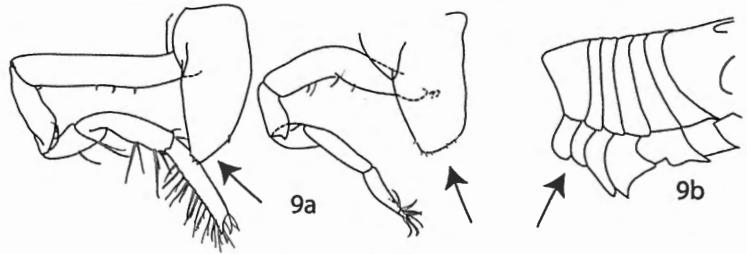


- 8a(5). Paired teeth on 4 pereonites and pleonites combined 9
- 8b. Paired teeth on 5 pereonites and pleonites combined or more 10



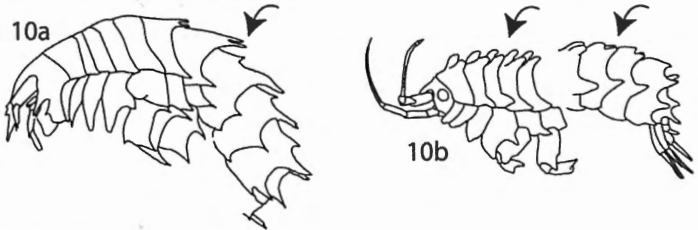
- 9a. Coxa 1 apex truncate and oblique anterodistally.
Coxa 2 pointed distally subacute
- 9b. Apex of coxae 1 and 2 rounded distally

Iphimediella paracuticoxa
Iphimediella acuticoxa

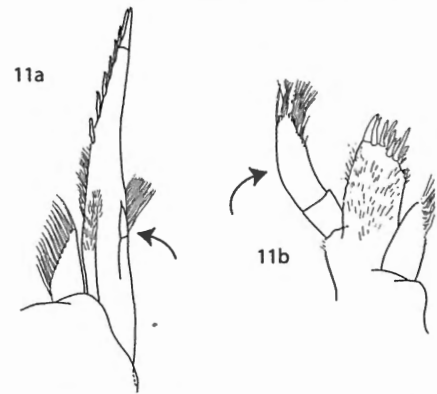


- 10(a8). Paired teeth on 5 pereonites and pleonites combined
- 10b. Paired teeth on all pereonites and pleonites

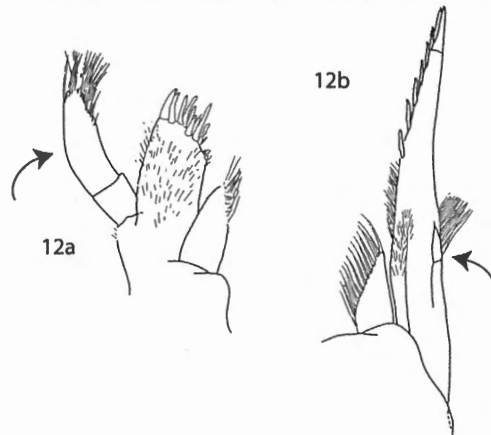
Gnathiphimedia urodentata
Nodotergum bicarinatum



- 11a(1). Maxilla 1 palp shorter than outer plate 12
- 11b Maxilla 1 palp longer than outer plate, or subequal to outer plate 17



- 12a. Maxilla 1 palp 2-articulate 13
- 12b. Maxilla 1 palp uniarticulate 15



13a. Pleon carinae drawn out into pointed teeth

Stegopanoploea joubini

13b. Pleon carinae low rounded, not acute

14



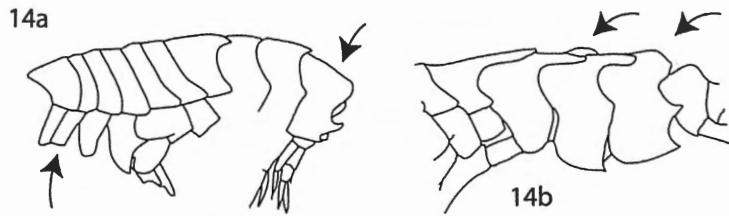
14a. Low rounded mid-dorsal carina on pleonite 3 only. Coxa 2 with truncate apex

Iphimedia imparilabia

14b. Low rounded mid-dorsal carina on pleonites 2-3.

Coxa 2 rounded anteriorly and pointed posterodistally

Anchiphimedia dorsalis



15a(12). Mid-dorsal body side smooth, without any teeth

Pariphimedia normani

15b. Mid-dorsal body side with teeth

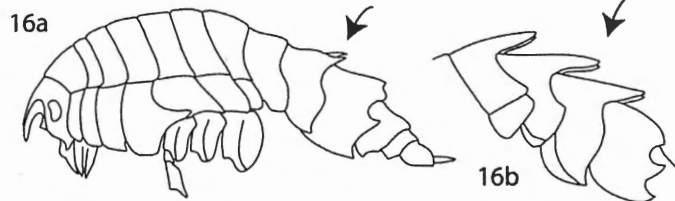
16

16a. Paired teeth on pleonite 2 only

Pariphimedia integricauda

16b. Three pairs of dorsal teeth

Paranchiphimedia monodi

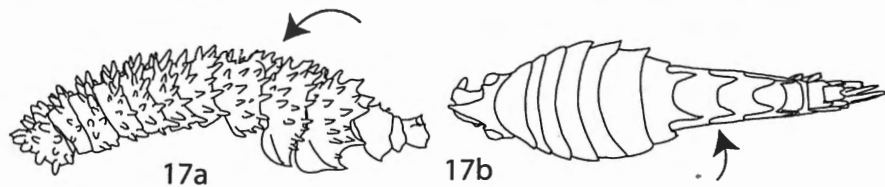


17a(11). Dorsal armature irregular covered with spines or tubercles

18

17b. Dorsal armature with paired teeth

24

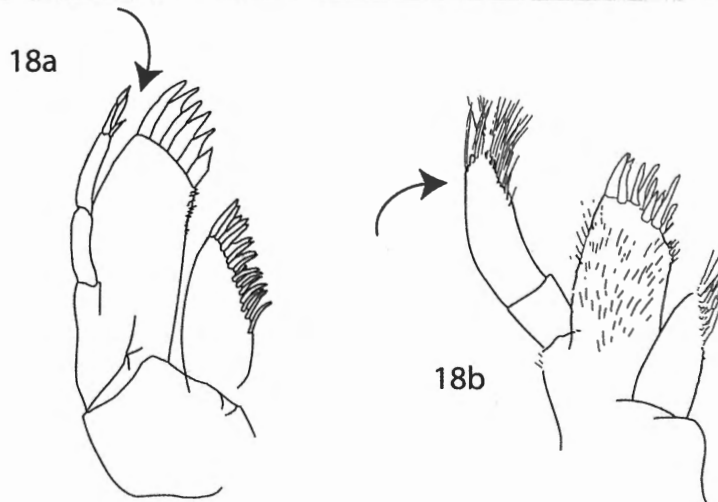


18a. Maxilla 1 palp subequal to outer plate

19

18b. Maxilla 1 palp longer than outer plate

20

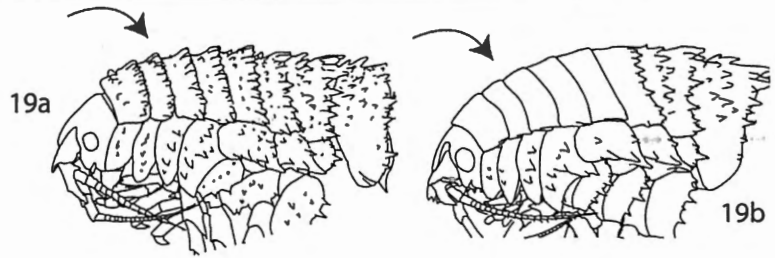


19a. Anterior pereonites dorsally with teeth and tubercles

Echiniphimedia gabrielae

19b. Anterior pereonites dorsally without teeth

Echiniphimedia waegelei

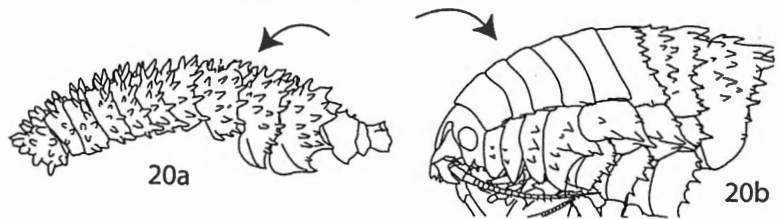


20a(18). Anterior pereonites dorsally with teeth

21

20b. Anterior pereonites dorsally without teeth

22

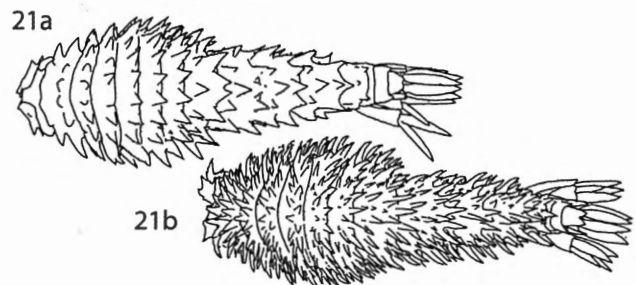


21a. Pereonites 2-7 with just 1 principal row of dorsal spines

Echiniphimedia scotti

21b. Pereonites 2-7 with 2 or 2+ rows of dorsal long slender spines

Echiniphimedia hodgsoni

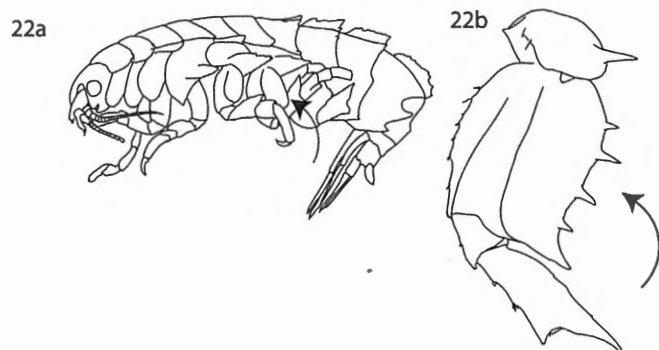


22a(20). Bases 5-7 without teeth

Echiniphimedia imparidentata

22b. Bases 5-7 with submarginal teeth

23

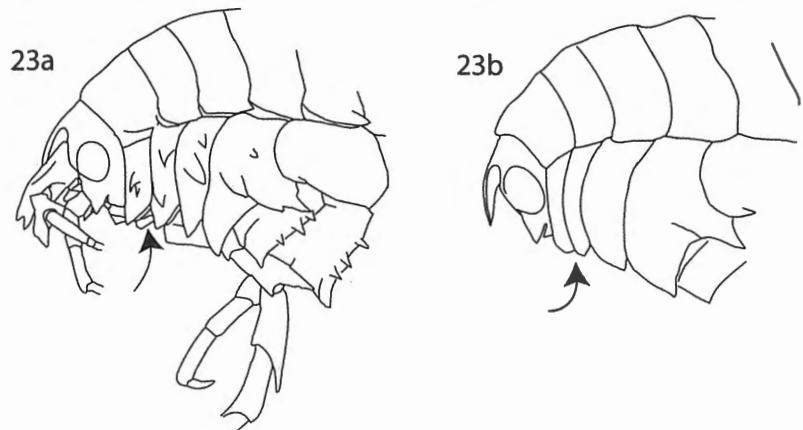


23a. Lateral teeth on coxae 1-3 present

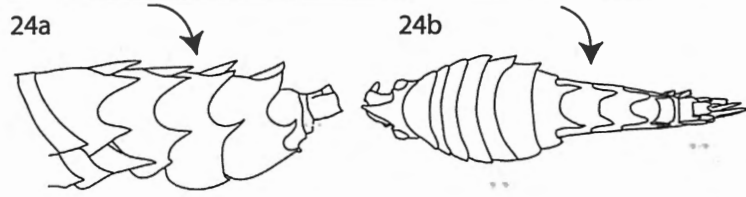
Echiniphimedia barnardi

23b. Lateral teeth on coxae 1-3 absent

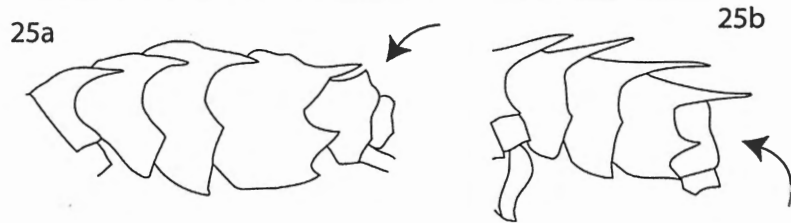
Echiniphimedia echinata



- 24a(17). Paired teeth on 4 pereonites and pleonites combined 25
 24b. Paired teeth on 3 pereonites and pleonites combined 34

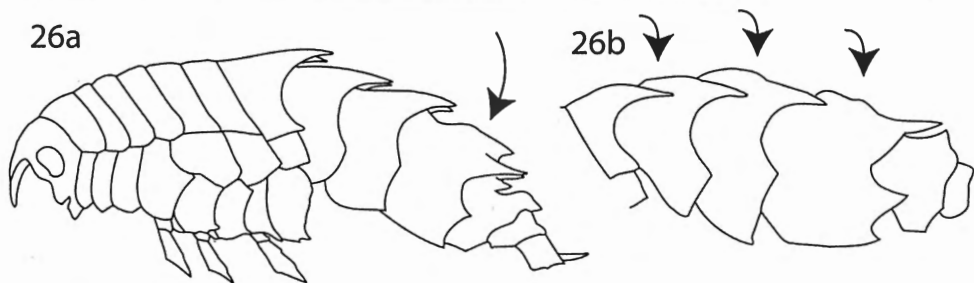


- 25a. Mid-dorsal carina on urosomite 1 present 26
 25b. Mid-dorsal carina on urosomite 1 absent 27

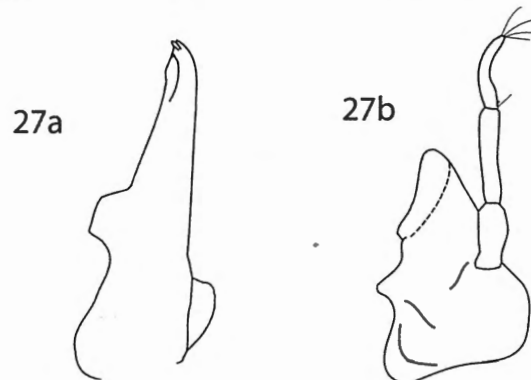


- 26a. Mid-dorsal carinae on pleonite 1-2 inconspicuous, but on pleonite 3 strongly projecting with a pointed tip posteriorly. Pereopod 5 posterior margin of basis excavate with pointed proximo-posteromarginal tooth and serrate posterior margin *Labriphimedia vespucii*

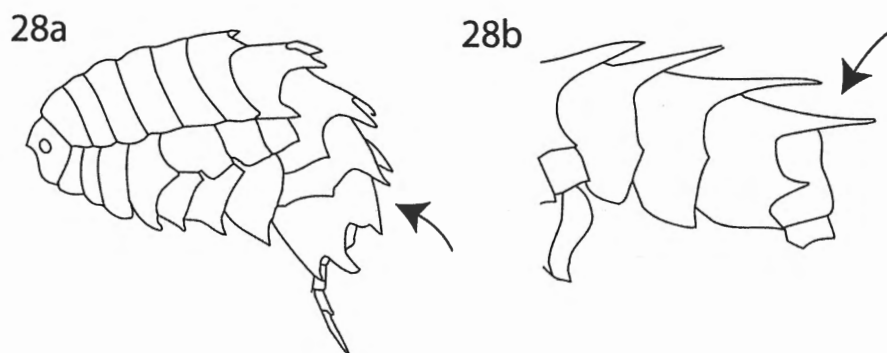
- 26b. Low mid-dorsal carinae on pleonite 1-3. Pereopod 5 posterior margin of basis weakly sinuous *Iphimediella rigida*



- 27a(25). Mandibular body elongate and strongly tapering distally 28
 27b. Mandibular body bulky 30



- 28a. Mid-dorsal carina on pleonite 3 only *Iphimediella serrata*
 28b. Mid-dorsal carinae on pleonites wanting 29

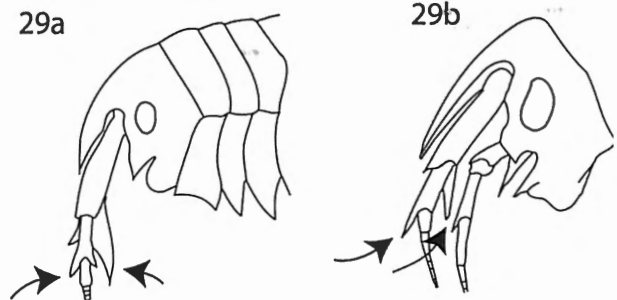


29a. Antenna 1 distal margin of first article with 2 processes; longest process of peduncular article 1 somewhat exceeding beyond distal margin of article 2; longest process of peduncular article 2 not exceeding beyond distal margin of article 3

Iphimediella cyclogena

29b. Antenna 1 distal margin of first article with 3 processes; longest process of peduncular article 1 not exceeding beyond distal margin of article 2; longest process of peduncular article 2 exceeding beyond distal margin of article 3

Iphimediella microdentata

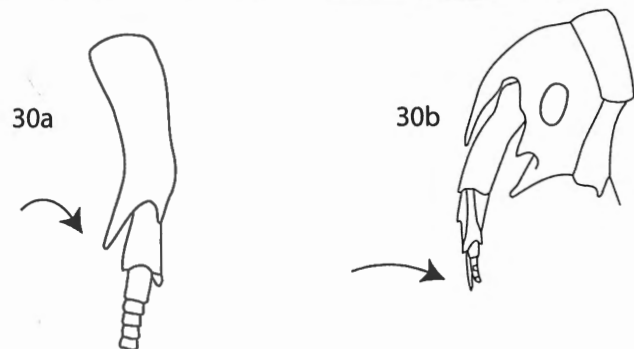


30a(27). Antenna 1 longest process of peduncular article 1 not exceeding beyond distal margin of article 2

Gnathiphimedia fuchsi

30b. Antenna 1 longest process of peduncular article 1 exceeding beyond distal margin of article 3

31

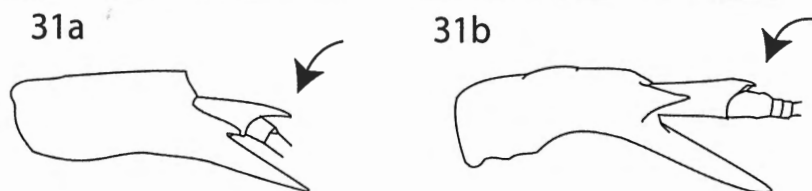


31a. Antenna 1 distal margin of first article with 3 processes; longest process of peduncular article 2 exceeding beyond distal margin of article 3

Iphimediella margueritei

31b. Antenna 1 distal margin of first article with 2 processes, longest process of peduncular article 2 not exceeding beyond distal margin of article 3

32

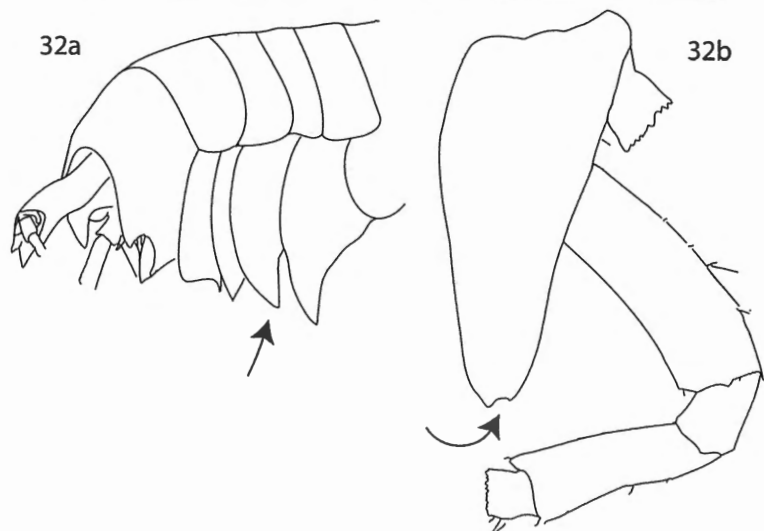


32a. Coxa 3 pointed distally. Coxa 5 posteriorly pointed

Gnathiphimedia mandibularis

32b. Coxa 3 bifid to truncate distally. Coxa 5 posteriorly rounded

33

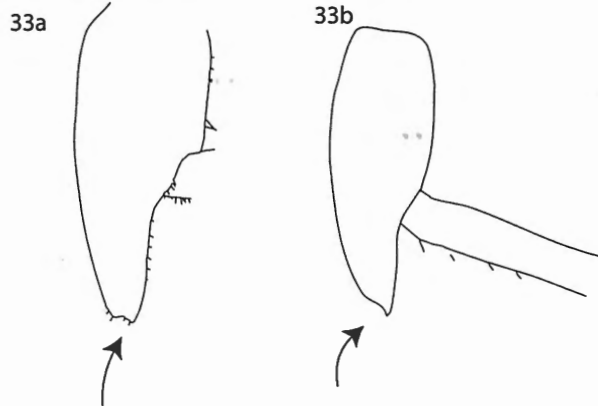


33a. Coxa 2 weakly excavate to truncate distally, paired teeth on pleonite 3 half the length of those on preceding segment

Gnathiphimedia watlingi

33b. Coxa 2 pointed distally, paired teeth on pleonite 3 subequal in length of preceding segment

Gnathiphimedia barnardi

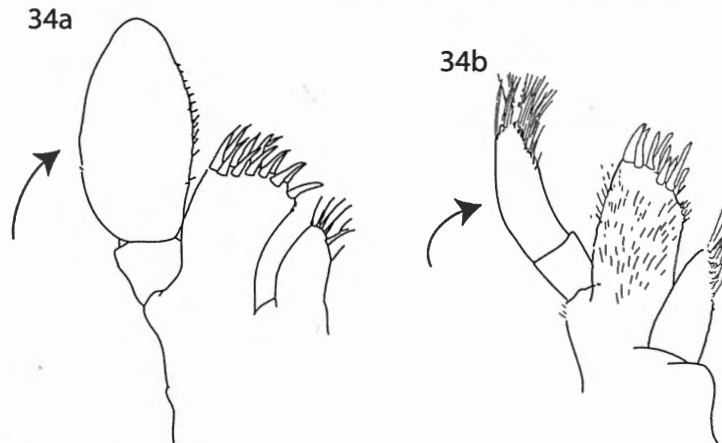


34a(24). Maxilla 1 second palp article palp strongly expanded to oval shape

Maxilliphimedia longipes

34b. Maxilla 1 second palp article palp normal

35

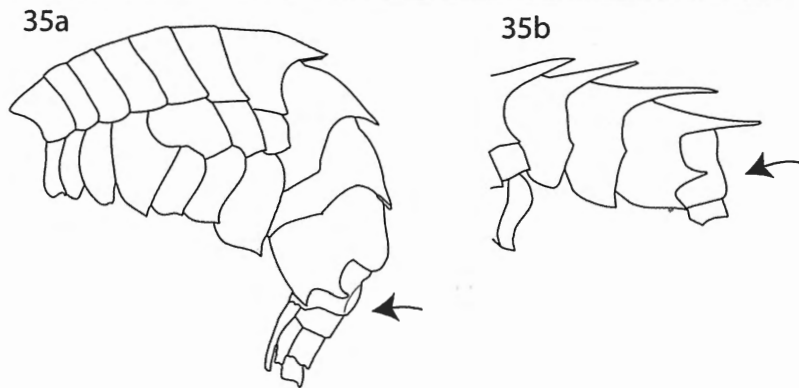


35a. Mid-dorsal carina on urosomite 1 as weak elevation present

Iphimediella bransfieldi

35b. Mid-dorsal carina on urosomite 1 absent

36

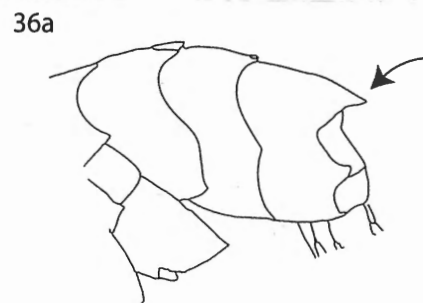


36a. Mid-dorsal carinae on some or all pleonites and/or pereonite 7

37

36b. Mid-dorsal carinae on pleonites wanting

40

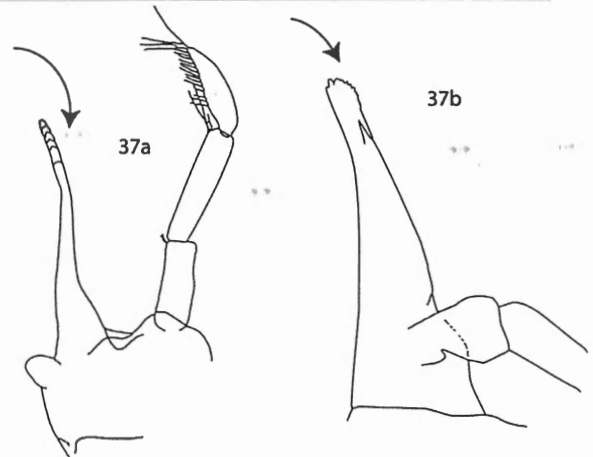


37a. Incisor with teeth along needle-like apex

Parapanoploea oxygnathia

37b. Incisor with teeth along medial side, or with apical teeth

38

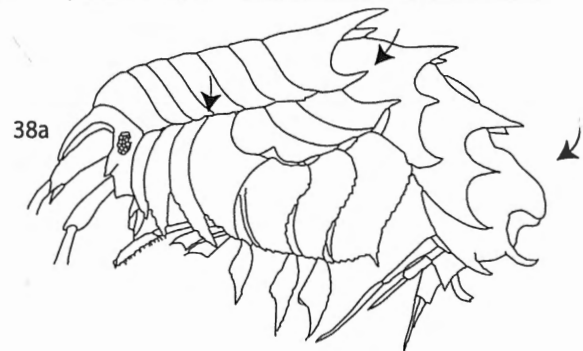


38a. Posteroventral corners of all pereonites strongly produced and pointed; mid-dorsal low rounded carinae on pleonites 1-3

Iphimedia pacifica

38b. Posteroventral corners of pereonites not produced on anterior pereonites, somewhat produced posteriorly, mid-dorsal carinae on pleonites 2-3, or 3 only

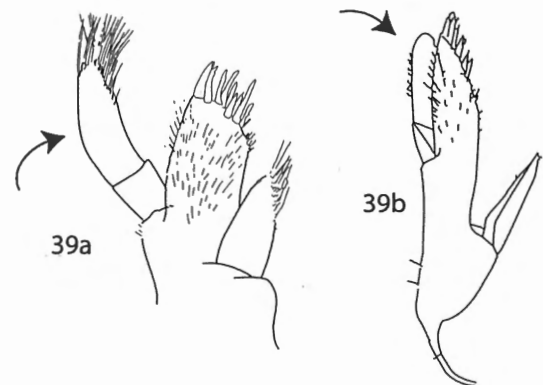
39



39a. Maxilla 1 palp longer than outer plate. Second article of maxilliped palp medially not produced forward and not guarding along inside of article 3

Iphimediella georgei

39b. Maxilla 1 palp subequal to outer plate. Second article of maxilliped palp medially produced guarding along inside of article 3

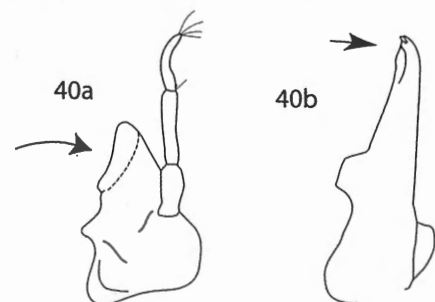
Iphimediella dominici

40a(36). Mandibular body bulky, incisor not toothed

41

40b. Mandibular body elongate and strongly tapering distally or needle-like, incisor toothed

43

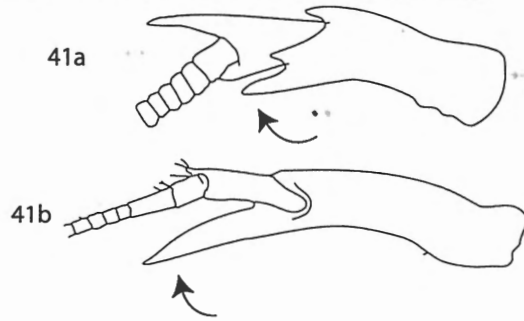


41a. Antenna 1 longest process of peduncular article 1 not exceeding beyond distal margin of article 3

Gnathiphimedia macrops

41b. Antenna 1 longest process of peduncular article 1 exceeding beyond distal margin of article 3

42

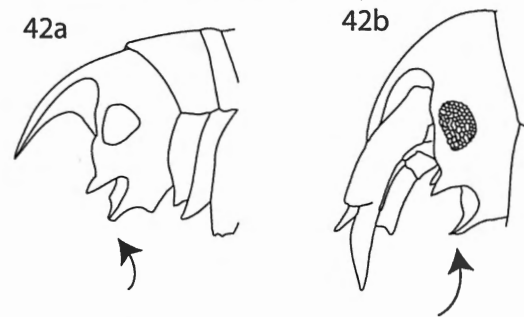


42a. Posterior process of head notch stout and slightly curved

Gnathiphimedia sexdentata

42b. Posterior process of head notch slender and rather straight

Gnathiphimedia incerta

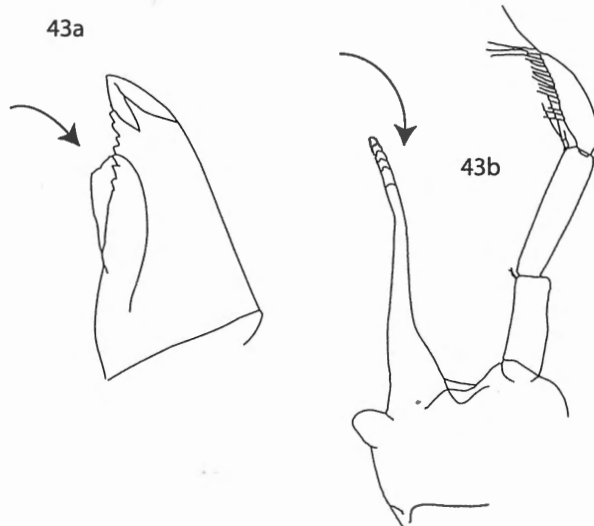


43a(40). Incisor with teeth along medial side. Maxilla 1 palp longer than outer plate

Iphimediella ruffoi

43b. Incisor with teeth along needle-like apex. Maxilla 1 palp subequal to outer plate

44



44a. Posterolateral process on epimeral plates 1-2 rounded and weakly produced. Antenna 1 longest process of peduncular

article 2 not exceeding beyond distal margin of article 3

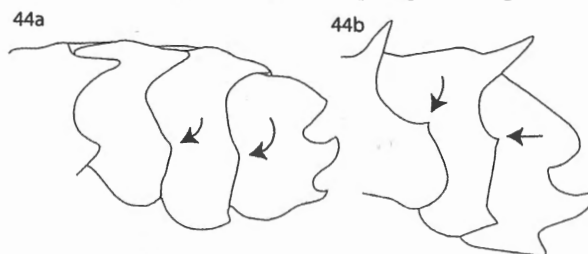
Parapanoploea recessa

44b. Posterolateral process on epimeral plates 1-2 produced and pointed.

Antenna 1 longest process of peduncular

article 2 exceeding beyond distal margin of article 3

Parapanoploea longirostris



Anchiphimedia K.H. Barnard, 1930

Type-species. *Anchiphimedia dorsalis* K.H. Barnard, 1930

Diagnosis (modified after Barnard & Karaman, 1991). Dorsal side of body with paired teeth and rounded mid-dorsal carinae. Antenna 1 peduncular articles 1-2 long, subequal. Mouthparts projecting conically. Upper lip incised. Mandibular incisor oblique, smooth. Lower lip without inner lobes. Maxilla 1 palp 2-articulate, very small. Maxilla 2 without facial row of setae. Maxilliped with broad outer plate, apical margin somewhat funnel-shaped; palp 4-articulate, article 2 broad and unproduced mediolaterally. Coxae 1-4 progressively longer, truncate to weakly excavate apically. Gnathopod 2 longer than 1, both chelate.

Anchiphimedia dorsalis K.H. Barnard, 1930

(Fig. 38a-b, Colour plate 3g, Map 18: rhomb)

References and synonymy. De Broyer *et al.* 2007: 94.

Diagnosis. Paired teeth on pereonite 7 and pleonites 1-2; low mid-dorsal carina on pleonites 2-3 (as rounded keels); low

mid-dorsal carina as rounded keel on urosomite 1 present. Posterolateral process on epimeral plate 1 rounded and weakly produced; on plate 2 produced and pointed; on plate 3 strongly produced and pointed. Posteroventral corner on epimeral plate 1 rounded; on plates 2-3 pointed. Subantennal notch narrow, with both margins rounded apically. Antenna 1 distal margin of first article with 1 process; longest process of peduncular article 1 not exceeding beyond distal margin of article 2; longest process of peduncular article 2 not exceeding beyond distal margin of article 3; first peduncular article equal in length to second. Upper lip incised. Mandibular body elongate and strongly tapering distally; incisor not toothed and oblique. Lower lip with small mediolateral notches. Maxilla 1 palp much shorter than outer plate, 2-articulate. Apical margin of maxilliped outer plate funnel-shaped, 2nd article of maxilliped palp medially not produced forward and not guarding along inside of article 3. Coxa 1 subrectangular and excavate distally with both ventral corners subacute. Coxa 2 excavate distally and apically wide. Coxa 3 with obliquely truncate apex, only weakly concave. Coxa 4 pointed distally and excavate posterolaterally. Coxa 5 posteriorly rounded; posterior margin of basis straight, posteroventral corner subacutely pointed. Coxa 6 posteriorly rounded; posterior margin of basis straight, posteroventral corner pointed. Pereopod 7 coxa posteriorly pointed; posterior margin of basis

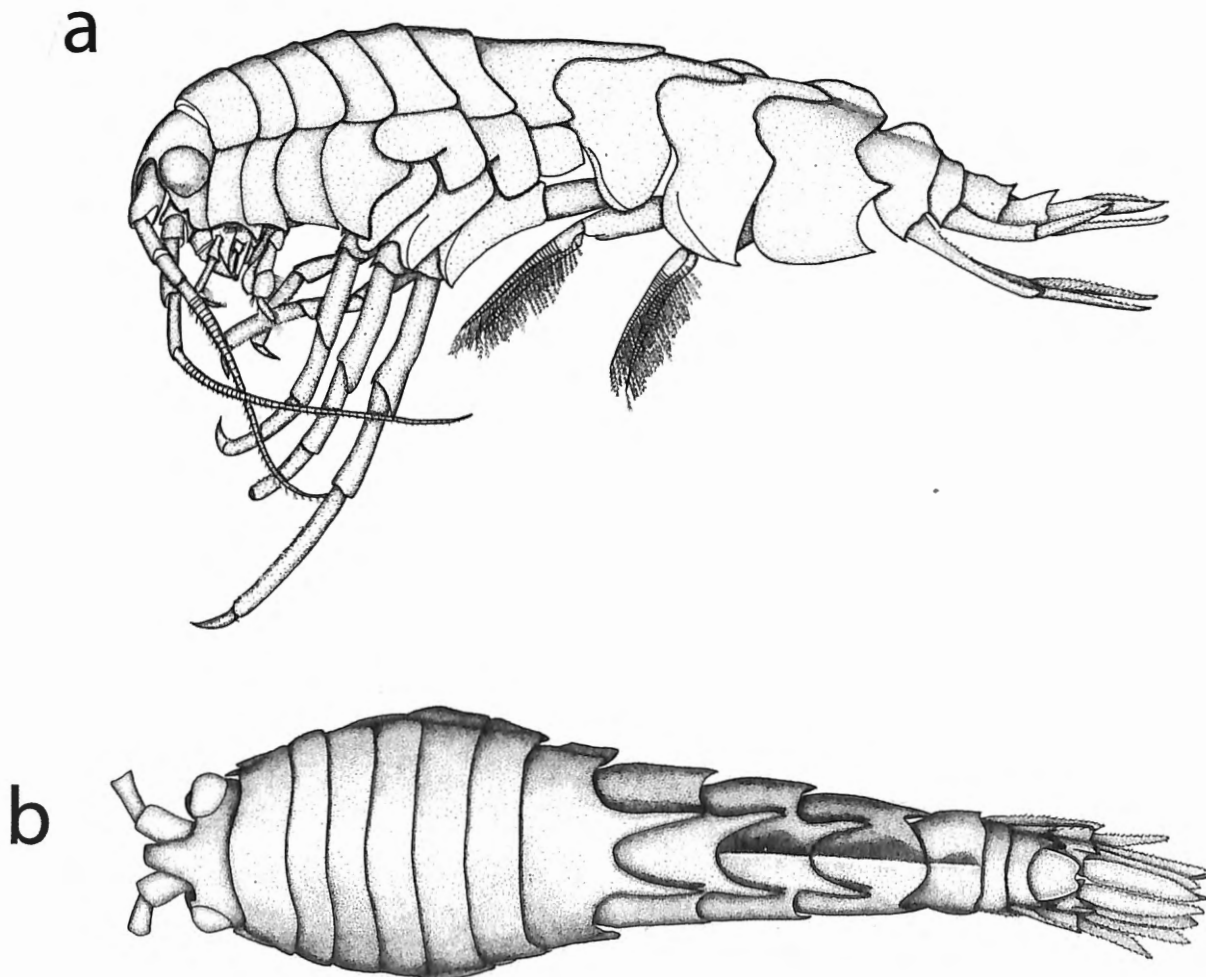


Fig. 38a-b. *Anchiphimedia dorsalis*. a) left lateral view; b) dorsal view.