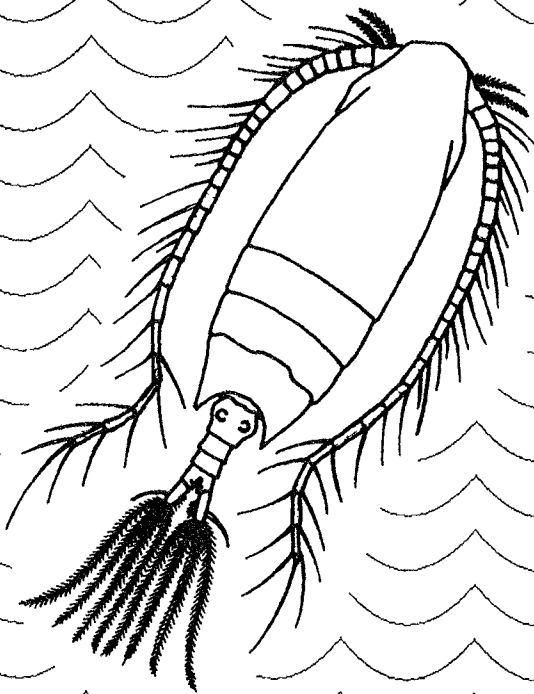


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Elena L. Markhaseva



**CALANOID COPEPODS
OF THE FAMILY AETIDEIDAE
OF THE WORLD OCEAN**

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of the family Aetideidae
of the World Ocean**

Elena L. Markhaseva

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This book is an Identification Manual for calanoid copepods of the family Aetideidae. It is a sequel to the book "Oar-footed crustaceans (Copepoda, Calanoida) of the USSR seas and adjacent waters" in the series (Opredeliteli po faune SSSR, izdavaemye Zoologicheskim Institutom Akademii Nauk SSSR). It includes descriptions and identification keys to 25 genera and 166 species of aetideid calanoid copepods with data on the taxonomy, geographical and vertical distribution. Bibliography: 184 titles, 249 figs., 1 table.

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*Dedicated to the memory
of Konstantin A. Brodsky*

Calanoid copepods of the family Aetideidae of the World Ocean

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Introduction

This book is an Identification Manual for calanoid copepods of the family Aetideidae. It is a sequel to the book "Oar-footed crustaceans (Copepoda, Calanoida) of the USSR seas and adjacent waters" (Brodsky et al., 1983) which includes the "General part" (Brodsky, 1983: 9-138) with data on the morphology, classification, geographical distribution and biology of some species of the Calanoida and the "Systematic part" (Brodsky et al., 1983: 139-356) with descriptions and identification keys of calanoid copepods of the families Calanidae up to and including Spinocalanidae.

From about 180 described species of Aetideidae more than 150 are included in the Manual. Most of the omitted species are poorly described and not examined by the author. The Aetideidae are mostly oceanic inhabitants; they are also found in brackish (*Jaschnovia*) and fresh (*Senecella*) waters. Aetideids occur in all vertical zones of the pelagial and near-bottom environments in all biogeographical zones of the World Ocean, but the majority inhabit deep waters.

The work was performed primarily at the Zoological Institute, Russian Academy of Sciences (St.Petersburg) using the museum's collections, but it prove impossible without access to the collections of other museums and institutes. I thank my colleagues for their help in obtaining material for study. I am particularly grateful to Academician M.E. Vi-

nogradov (Institute of Oceanology, Moscow) and to Dr. M.V. Heptner (Zoological Museum of Moscow State University) for placing at my disposal the unique collection of deepwater plankton catches obtained during the R/V "Vityaz" cruises. In this work I also used material from the S.O.S.C. (Smithsonian Institution, Washington, D.C.), and I am very thankful to Dr. F. Ferrari for loaning this collection to me. At the final stage the opportunity arose to examine the collection of Aetideidae identified by G.O. Sars and housed in the Zoological Museum of Oslo. I am very thankful to Prof. M. Christiansen (Zoological Museum, University of Oslo) for making it possible for me to work with this collection.

List of abbreviations:

The following abbreviations are used in the descriptions (Fig. 1): *Ce*, head, cephalon; *Th1-Th5*, first-fifth thoracic segments; *Gn*, genital segment; *Abd1-Abd4*, first-fourth abdominal segments; *A1*, antennule; *A2*, antenna; *Md*, mandible; *Mx1*, maxillule; *Mx2*, maxilla; *Mxp*, maxilliped; *Gntb*, gnathobase; *P.md*, mandibular palp; *P1-P5*, first-fifth pairs of thoracic (swimming) legs; *R*, rostrum; *Re*, exopodite; *Ri*, endopodite; *B*, basipodite; *C*, coxopodite.

Collection data on the examined material is given in the Table 1; in the descriptions of species, only respective numbers of samples are listed.

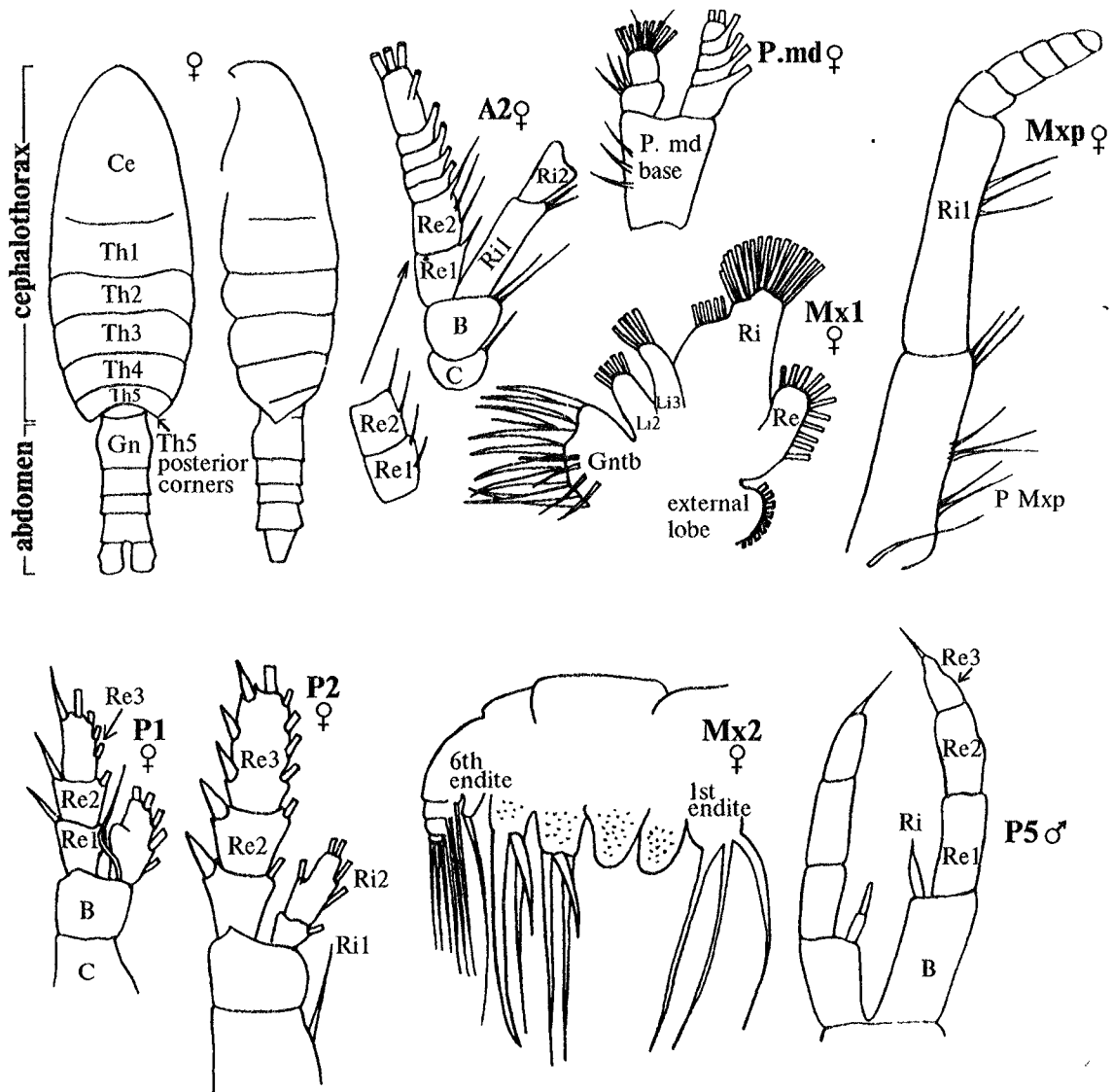


Fig. 1. Ce, head, cephalon; Th1-Th5, first-fifth thoracic segments; Gn, genital segment; Abd1-Abd4, first-fourth abdominal segments; A1, antennule; A2, antenna; Md, mandible; Mx1, maxillule; Mx2, maxilla; Mxp, maxilliped; Gntb, gnathobase; P.md, mandibular palp; P1-P5, first-fifth pairs of thoracic (swimming) legs; R, rostrum; Re, exopodite; Ri, endopodite; B, basipodite; C, coxopodite; P, protopodite.

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Morphology

FEMALE

Total length 1.19-9.20 mm. Cephalothorax 2-8 (more often 3-4) times longer than abdomen. Cephalon and Th1 usually fused (but the line of fusion may be visible). However they are separated more or less clearly in *Chirundinella*, *Pseudochirella*, *Undeuchaeta*, and some species of *Bradyetes*, *Batheuchaeta* and *Chiridiella*. Th4-Th5 are fused in the majority of genera, but in *Azygokeras*, *Aetideopsis*, *Sursamucro*, *Crassantenna*, *Pseudeuchaeta*, *Paracomantenna*, *Mesocomantenna*, *Pseudochirella*, and some species of *Bradyetes* and *Comantenna* they are completely or incompletely separated. Rostrum, if present, 2-pointed (bifurcate) — (*Aetideus*, *Aetideopsis*, *Bradyidius*, *Paivella*), or like a blunt plate (*Crassantenna*, *Lutamator*, *Pseudeuchaeta*, etc.), or conic and 1-pointed (*Chirundina*, *Chirundinella*, *Euchirella*, *Pseudochirella*, *Undeuchaeta*); in *Gaetanus*, it is conic but its tip usually bifurcated. The anterior part of cephalon may form a crest (in some species of *Euchirella*, *Chirundina*, *Chirundinella*, *Pseudochirella*, *Undeuchaeta*; slightly developed crest in some species of *Aetideus* and *Aetideopsis*). Some *Gaetanus* species have a frontal spine in the anterior part of cephalon. Th5 posterior corners symmetrical or asymmetrical, rounded or pointed, sometimes extended into spines of various size and configuration or in lobes of various shape. Genital segment symmetrical or asymmetrical, of various shape, often with projections at one or both sides (in dorsal view), sometimes with 1-2 spines. Ventral swelling more or less pronounced. Abdomen with 4 free segments. Abd1-Abd3 often with transverse row of spinules along posterior borders. Caudal rami with 4 apical, 1 internal (ventrally) and 1 short external setae. A1 23-24-jointed, of various length: sometimes shorter than cephalothorax; more often longer, reaching the end of caudal rami; sometimes twice longer than body.

A2. Usually, Re A2 1.2-2.0 times longer than Ri, but sometimes both rami of equal length, or Re even shorter than Ri. A2 coxopodite with 1 (in *Azygokeras*, with 2) setae, basipodite with 2 (in *Euchirella*, with 1) setae, Ri1 A2 with 1-2 setae, rarely (*Pseudeuchaeta*) without setae. Ri2 A2 internal lobe usually with 7-8 terminal setae (in *Euchirella*, their number may decrease to 1-2, 4-8); external lobe of Ri2 A2 with 6-7 terminal setae and 1 posterior seta (in *Euchirella*, the number of terminal setae may decrease to 3). Re1 A2 with 1-2 setae or without setae; sometimes Re1 and Re2 (*Euchirella*) fused completely or incompletely, or Re2 and Re3 (*Comantenna*, *Mesocomantenna*) partly fused; Re2 with 1-3 setae, or setae absent (*Chiridiella*, *Comantenna*, *Euchirella*); Re3-Re6 with 1 long seta each, Re7 with 1 medial (rarely absent) and 3 terminal setae (rarely with 1 terminal setae, in *Mesocomantenna*).

Comantenna and *Mesocomantenna* with atypically short Re7, which is shorter than the two previous joints together.

Md. P.md base with 2-3 setae, sometimes with 1 seta or without setae; Ri1 Md with 1-3 setae or without setae; Ri2 Md with 9 terminal and 1-2 posterior setae, sometimes their number is differing (*Chiridiella*, *Comantenna*, *Crassantenna*, *Lutamator*, *Mesocomantenna*, *Pseudeuchaeta*, *Paracomantenna*, some species of *Aetideopsis*, *Bradyetes*, *Bradyidius*, *Chiridius*, and *Euchirella*).

Mx1. Mx1 gnathobase with 9 terminal setae nearly equal in length, sclerotized, claw-like, 1 shorter terminal seta and 4 setae on the posterior surface (sometimes number of posterior setae is less). Mx1 second internal lobe with 3-5 setae, rarely with 2 setae (in some species of *Pseudeuchaeta*) or 1 seta (some species of *Chiridiella*); in *Chiridiella*, this lobe may be reduced. Mx1 third internal lobe usually with 3-4 setae; in some aetideids their number is differing: 5 in *Chirundinella* and in some species of *Bradyidius* and *Pseudochirella*; 1-2 in some species of *Chiridiella* and *Euchirella*; 2 in some species of *Comantenna*, *Crassantenna* and *Lutamator*. Protopodite Mx1 near Ri base usually with 3-5 setae, rarely with 2 (some species of *Euchirella*) or without setae (*Chiridiella*). Mx1 Ri commonly with 14-16 setae, this number may be less, for example, 3-5 or 7 in *Chiridiella*, 10 or 11 in *Paivella* and 3-5 in *Euchirella*. Re Mx1 in most of aetideid genera with 11, rarely with 8-10 setae (*Euchirella*, *Aetideopsis*, *Bradyetes*, *Bradyidius*, *Chiridiella*, *Chiridius*, *Chirundinella*, *Euchirella*, *Jaschnovia*). In *Chiridiella*, this number may be 3-6 and Re may be reduced. Mx1 external lobe usually with 7 long and 2 short setae.

Mx2. Usually, Mx2 with 5 well developed endites (6 endites in *Jaschnovia*, *Senecella* and some species of *Aetideopsis*), Ri with 6 long setae, sometimes with additional small setae. First-fifth Mx2 endites with 2 long and 1 short setae covered with fan-arranged hairs; one of the two long setae on fifth endite (rarely also on fourth endite) is thickened and transformed into claw-like spine. Two aetideid genera have Mx2 strongly deviating from typical structure: in *Pseudeuchaeta* setae at the fourth-fifth endites and setae in distal part of Ri are more sclerotized and saber-like and in *Chiridiella* Mx2 are variable within the genus from nearly typical to highly transformed. Mx2 with small spines on external surfaces of endites (in *Paracomantenna* and *Mesocomantenna*, with large strongly sclerotized spines).

Mxp. Mxp protopodite with 1 proximal seta (sometimes absent), between proximal and distal part of the joint commonly with groups of 2, 3 and 3 setae. At the base of group of distal setae an appendage of various configuration (conic, digital-like, etc.) may be present. Mxp protopodite in many *Gaetanus* species with a lateral plate. Ri1 Mxp normally

1.5-2.0 times longer than protopodite (in *Aetideus*, Re and Ri of nearly equal length). Ri2-Ri6 Mxp combined much shorter than Ri1 Mxp.

Re/Ri P1-P4 segmentation: 3/1, 3/2, 3/3, 3/3. Deviations from typical segmentation are as following: Re P1 1-jointed (*Chiridiella*) or 2-jointed (some species of *Gaetanus* and *Euchirella*); Re P2 joints incompletely separated (*Chiridiella*, some *Aetideopsis* species); in *Chiridiella*, also Ri P3-P4 often incompletely separated. Re1 P1 with or without external spine, Re2-Re3 P1 with 1 external spine each. P1 basipodite near the base of Ri with curved long seta covered with fine hairs. Ri P1 external lobe normally well developed, with small spinules terminally, rarely with hairs instead of spinules (*Pseudeuchaeta*); external lobe absent in *Chiridiella* (except *Ch kuniae*). Posterior surfaces of Ri and Re sometimes with fine small spinules, larger spinules on lateral surfaces of coxopodite and basipodite (*Bradyidius*, *Jaschnovia*). The majority of genera without spines or spinules at P4 coxopodite, but sometimes with spines: 2 parallel transverse rows of 4-6 spines (*Paivella*); or bush-like spines near the base of internal seta (*Gaetanus*, *Pseudochirella*, *Euchirella*), sometimes there are only few small spinules (some species of *Aetideus* and *Undeuchaeta*). Terminal Re3 P2-P4 spines serrated externally, the number of spinules varies from 20 to 90. P5 absent (except weak P5 in *Comantenna recurvata* and vestigial P5 found in some specimens of *Sursamucro* and *Aetideopsis*).

MALE

Total length 1.19-8.80 mm. Cephalothorax 2.4-4.0 times longer than abdomen. Cephalon and Th1 fused; Th4-Th5 usually fused, sometimes incompletely (*Aetideopsis*, *Azygokeras*). Rostrum, if present, bifurcate or conic (1-pointed). Crest present or absent. Th5 posterior corners symmetrical, rarely somewhat asymmetrical (some *Pseudochirella* and *Undeuchaeta* species), of various shape. Abdomen of 5 free segments; Abd5 sharply reduced; genital opening on the left. A1 usually 23-24-jointed, but sometimes 20-21-jointed (*Aetideus*), in all the genera, except *Azygokeras*, not geniculated with aesthetascs in most of species. Left and right A1 may have different number of joints.

A2-Mxp. A2 like in females, but with less num-

ber of setae on Re1, Re2 and Ri, some setae of Md palp reduced in size, Md gnathobase vestigial. Mx1 and Mx2 severely reduced. Mxp less equipped than in females.

P1-P4. P1-P4 segmentation more pronounced than in females (i.e. when female has indistinct division, male has complete division). Re P1 equipment as in female, but sometimes external spines reduced, occasionally absent. P4 coxopodite without spines.

P5. Right and left P5 usually present, sometimes right P5 absent (*Aetideus*). P5 biramous or uniramous. If biramous, with 3-jointed left and 2-jointed right Re (in *Azygokeras*, *Chiridiella* and *Pseudeuchaeta*, with 3-jointed). Both left and right Ri 1-jointed (left Ri P5 2-jointed in *Bradyetes matthei*, *Bradyidius arnoldi* and *Comantenna brevicornis*; their P5 are most primitive in aetideids).

Notes. In descriptions of aetideid males, P5 are usually characterized as legs of "simple" or "complex" structure. Of "simple" structure are considered P5 with joints close to cylindrical shape, without specialized structures (projections, extrusions, teeth, grooves, etc.). But even when configuration of P5 joints is simple, they may be swelled at one side or extended, etc. Therefore this definition is very conventional. In some genera P5 is very complex: in *Euchirella* (some species), right Re2 and Ri P5 are transformed into tongs and left Re2 together with Re3 P5 has pincer-form shape; in *Batheuchaeta*, left P5 with Re3 of 2 lobes and complex left Ri with deep grooves and projections; in *Pseudochirella*, left Re2 P5 with teeth and often with projections.

TYPE GENUS: *Aetideus* Brady, 1883.

There are 26 genera in Aetideidae. *Wilsonidius* Tanaka, 1969 is herein considered as synonym of *Chirundina* Giesbrecht (see below). *Gaidiopsis* is not included in the present work due to poor description and loss of the type material. *Pseudotharybis* T. Scott, 1909 is included by Bradford and Jillett (1980) into Aetideidae, however this genus occupies intermediate position between Aetideidae and Tharybidae and needs further study; the same may refer to *Valdiviella* which is sometimes included into Aetideidae or into Euchaetidae and for which Zvereva (1975) suggested a new family.

Key to the genera*

Females

- 1(42) Th5 and genital segment symmetrical.
- 2(19) Rostrum present, not reduced.
- 3(10) Rostrum bifurcate.
- 4(7) Re1 P1 without external spine. Mx1 second internal lobe with 3, protopodite near the base of Ri with 4 setae, Re with 11 setae.
- 5(6) P4 coxopodite near the base of internal seta with two parallel rows of 4-6 spines on posterior surface 18. *Paivella* Vervoort
- 6(5) P4 coxopodite without two parallel rows of 4-6 spines on posterior surface 1. *Aetideus* Brady
- 7(4) Re1 P1 with external spine. Mx1 second lobe with 5 (rarely 4) setae, protopodite near the base of Ri with 5 setae, Re with 8-10 setae.
- 8(9) External spine on Re2 P1 thicker than on Re1 P1, usually more sclerotized and more obtuse. Ri P2 always 2-jointed 6. *Bradyidius* Giesbrecht
- 9(8) External spine on Re2 P1 not thicker than on Re1 P1 and not differing from it in sclerotization and shape. Ri P2 1 or not clearly 2-jointed 2. *Aetideopsis* Sars
- 10(3) Rostrum uniramous (1-pointed), conic.
- 11(14) P4 coxopodite without spines near internal seta.
- 12(13) Ri1 Mxp with lateral blade along external border. Mx1 second internal lobe with 5, third with 4 setae, protopodite near the base of Ri with 5, Ri with 15 and Re with 11 setae 9. *Chirundina* Giesbrecht
- 13(12) Ri1 Mxp without lateral blade along external border. Mx1 second internal lobe with 4, third with 5, protopodite near the base of Ri with 4, Ri with 11, Re with 10 setae 10. *Chirundinella* Tanaka
- 14(11) P4 coxopodite with spines near internal seta.
- 15(16) Ri A2 more than twice shorter than Re A2. Md palp base without setae. Ri Mx1 with no more than 5 setae 13. *Euchirella* Giesbrecht (part.)
- 16(15) Ri A2 less than twice shorter than Re A2. Md palp base with setae. Ri Mx1 with no less than 14 setae.
- 17(18) Th4-Th5 separated (except *P. hirsuta*). Md palp base with 3 setae. Anterior part of cephalon without frontal spine. Mxp protopodite without lateral plate. Re P1 with 3 external spines. 21. *Pseudochirella* Sars (part.)
- 18(17) Th4-Th5 fused. Md palp base with 1-2 setae. Anterior part of cephalon often with frontal spine. Mxp protopodite often with lateral plate. Re P1 with 2 or 3 external spines 14. *Gaetanus* Giesbrecht
- 19(2) Rostrum absent or reduced to blunt plate.
- 20(33) Mxp protopodite without appendage near distal group of 3 setae.
- 21(22) Re P1 1-jointed. Mx2 atypical (Figs. 64-82). Ri Mx1 with 3-5 or 7 setae. Ri P1 without external lobe 7. *Chiridiella* Sars
- 22(21) Re P1 3-jointed. Mx2 of typical structure. Ri Mx1 with 11-16 setae. Ri P1 with external lobe.
- 23(24) Re1 P1 without external spine 15. *Jaschnovia* Markhaseva
- 24(23) Re1 P1 with external spine.
- 25(30) Th5 posterior corners with spines or points directed straightly backward or curved to the back of specimens.
- 26(27) Th5 posterior corners with spines directed straightly backward. Rostrum absent. Th4-Th5 fused 8. *Chiridius* Giesbrecht
- 27(26) Th5 posterior corners with spines curved to the back of specimens. Rostrum present, reduced, like blunt plate. Th4-Th5 separated.
- 28(29) Ri A2 larger than Re A2. Ri2 Md with 4 setae, Md palp base without setae 21. *Crassantenna* Cole et al.
- 29(28) Ri A2 not larger than Re A2. Ri2 Md with 9 setae, Md palp base with 2 setae 24. *Sursamucro* Bradford
- 30(25) Th5 posterior corners without spines (or points), triangular or slightly pointed (in lateral view).
- 31(32) Rostrum absent. Ri2 Md with 9 terminal and 1 posterior seta; Ri1 Md and Md palp base with 2 and 3 setae respectively. Ri P1 external lobe with small spinules apically 3. *Azygokeras* Koeller & Littlepage
- 32(31) Rostrum present, reduced, in form of a blunt plate. Ri2 Md with 4-5 setae; Ri1 Md and Md palp base without setae. Ri P1 external lobe with thin fine hairs apically 16. *Lutamator* Bradford
- 33(20) Mxp protopodite with appendage near distal group of 3 setae.
- 34(39) Re A2 shorter than Ri A2.
- 35(38) Re A2 terminal joint not longer than 2 previous joints together; at least one of terminal setae at this joint much shorter than others.
- 36(37) Re A2 terminal joint with 3 setae 11. *Comantenna* Wilson
- 37(36) Re A2 terminal joint with 1 seta 17. *Mesocomantenna* Alvarez
- 38(35) Re A2 terminal joint much longer than 2 previous joints together; terminal setae nearly equal in length 19. *Paracomantenna* Campaner
- 39(34) Re A2 as long as or longer than Ri A2.
- 40(41) Setae of Ri2-Ri6 Mxp with small crescent-like appendages. Setae in distal part of Ri and on third-fifth endites of Mx2 saber-like, none of them transformed into claw-like spine. External lobe of Ri P1 with fine hairs apically. Re1 P1 without external

* *Senecella* as mostly fresh-water genus is not included into the key.

- spine or with sharply reduced one 20. *Pseudeuchaeta* Sars
- 41(40) Setae of Ri2-Ri6 Mxp without crescent-like appendages. Setae in distal part of Ri and third-fifth endites of Mx2 not saber-like; 1 seta of Mx2 fifth endite transformed into claw-like spine. External lobe of Ri P1 with fine spinules apically. Re1 P1 with external spine not reduced 5. *Bradyetes* Farran
- 42(1) Th5 or genital segment, or both more or less asymmetrical.
- 43(44) Rostrum absent or reduced 4. *Batheuchaeta* Brodsky
- 44(43) Rostrum present and well developed.
- 45(48) P4 coxopodite with spines near internal seta. Re P1 with 3 spines.
- 46(47) Ri A2 more than twice, usually three or four times, shorter than Re A2; Re1 and Re2 A2 completely or incompletely fused. Md palp base and Ri1 Md without seta (rarely with small seta). Ri Mx1 with 3-5 setae. Re P1 2-jointed 13. *Euchirella* Giesbrecht (part.)
- 47(46) Ri A2 less than twice shorter than Re A2; Re1 and Re2 A2 completely separated. Md palp base with 3, Ri1 Md with 2-3 setae. Ri Mx1 with 15-16 setae. Re P1 3-jointed 16. *Pseudochirella* Sars (part.)
- 48(45) P4 coxopodite without spines near internal seta. Re P1 with 2 external spines 25. *Undeuchaeta* Giesbrecht
- 15(16) Right Re2 and Ri P5 transformed into tongs 13. *Euchirella* Giesbrecht (part.)
- 16(15) Right Re2 and Ri P5 not transformed into tongs.
- 17(24) Cephalon with crest.
- 18(19) Re P1 2-jointed 13. *Euchirella* Giesbrecht (part.)
- 19(18) Re P1 3-jointed.
- 20(21) Re3 P5 left bilobated. 10. *Chirundinella* Tanaka
- 21(20) Re3 P5 left non bilobated
- 22(23) Re3 P5 left distally stylet-like, elongated. 25. *Undeuchaeta* Giesbrecht (part.)
- 23(22) Re3 P5 left distally not stylet-like, obtuse-triangular. 9. *Chirundina* Giesbrecht
- 24(17) Cephalon without crest.
- 25(26) P5 without teeth on left Re2, no projections, no crests on other joints of Re and Ri, joints of simple configuration. 14. *Gaetanus* Giesbrecht (part.)
- 26(25) P5 with teeth on left Re2, or projections or crests on other joints of Re and Ri, or joints of complex configuration.
- 27(28) Re P1 2-jointed 13. *Euchirella* Giesbrecht (part.)
- 28(27) Re P1 3-jointed.
- 29(30) Re1 P1 with spine . . . 21. *Pseudochirella* Sars
- 30(29) Re1 P1 without spine 25. *Undeuchaeta* Giesbrecht (part.)

Males

- 1(44) Cephalothorax without hump of complex structure.
- 2(31) Rostrum present.
- 3(8) Rostrum bifurcate.
- 4(5) Th5 posterior corners rounded 18. *Paivella* Vervoort
- 5(4) Th5 posterior corners pointed.
- 6(7) P5 legs uniramous. 6. *Bradyidius* Giesbrecht (part)
- 7(6) P5 legs biramous 2. *Aetideopsis* Sars; 6. *Bradyidius* Giesbrecht (part.).
- 8(3) Rostrum uniramous.
- 9(10) Rostrum rudimentary. Right Re P5 3-jointed 20. *Pseudeuchaeta* Sars
- 10(9) Rostrum not rudimentary. Right Re P5 2-jointed.
- 11(12) Anterior part of cephalon with frontal spine or crest 13. *Gaetanus* Giesbrecht (part.)
- 12(11) Anterior part of cephalon without frontal spine.
- 13(14) Left P5 basipodite with 2 projections on internal border 4. *Batheuchaeta* Brodsky
- 14(13) Left P5 basipodite without 2 projections on internal border.
- 31(2) Rostrum absent.
- 32(33) Right A1 geniculated (6 distal joints enlarged) 3. *Azygokeras* Koeller & Littlepage
- 33(32) Both A1 without geniculation.
- 34(35) P5 with only left uniramous leg 1. *Aetideus* Brady
- 35(34) P5 with both left and right, uni- or biramous legs.
- 36(37) P5 uniramous (except *Ch carnosus*), left P5 5-jointed, right 4-jointed. 8. *Chiridius* Giesbrecht
- 37(36) P5 biramous.
- 38(39) Right Re P5 3-jointed . . . 7. *Chiridiella* Sars
- 39(38) Right Re P5 2-jointed.
- 40(41) Left Re3 P5 distally stylet-like, left Ri P5 1-jointed and no less than 3 times shorter than left Re1 P5 15. *Jaschnovia* Markhaseva
- 41(40) Left Re3 P5 distally not stylet-like, left Ri P5 2-jointed, or, if 1-jointed, longer than left Re1 P5.
- 42(43) Right Re2 P5 filament-like distally, with thin hairs 11. *Comantenna* Wilson
- 43(42) Right Re2 P5 not filament-like distally and without hairs 5. *Bradyetes* Farran
- 44(1) Cephalothorax with hump of complex structure 22. *Pterochirella* Schulz

1. Genus *Aetideus* Brady, 1883

TYPE SPECIES: *Aetideus armatus* Brady, 1883 = *Pseudocalanus armatus* Boeck, 1872, by monotypy.

Aetidius Brady, 1883: 75; Giesbrecht, 1892: 53.

Aetideus Giesbrecht in Giesbrecht & Schmeil, 1898: 31. Emendation.

Euaetideus Sars, 1925: 42 (type species: *Euaetideus giesbrechti* (Cleve, 1904), designated here).

Snelliaetideus Vervoort, 1949: 3 (type-species *Snelliaetideus arcuatus* Vervoort, 1949, by original designation).

Note. Giesbrecht (Giesbrecht & Schmeil, 1898: 31) for grammatical reasons changed the original spelling *Aetidius* in *Aetideus*. The latter spelling is universally accepted and used in numerous literature; also the family name Aetideidae is formed from it. Therefore it is preferable to retain Giesbrecht's emendation and to request the International Commission on Zoological Nomenclature to retain *Aetideus* as correct original spelling.

Description. F e m a l e. Total length 1.40-2.50 mm. Cephalothorax 2.8-4.7 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused: Anterior part of cephalothorax sometimes with crest. Rostrum bifurcate; rami widely arranged, usually strongly sclerotized; some species with undivided massive rostral base. Body surface often with conspicuous chitinous thickenings. Th5 posterior corners symmetrical, rarely rounded, usually prolonged into points extending to distal third of genital segment or exceeding it; Th5 may be transformed into wing-like lobes pointed at tops, reaching Abd2-Abd3. Genital segment symmetrical, length 1.1-1.2 times its width. Spermatheca clearly visible, with two parts: oval ventral and rounded dorsal, connected by curved channel of various length and width. Caudal rami 2.0-3.3 times longer than wide. A1 24-jointed, equal in length to cephalothorax, to body, or even exceeding body by two last joints. Re A2 slightly longer than Ri, coxopodite with 1 seta, basipodite with 2. Ri2 A2 with 14-15 setae (8 terminal at internal lobe, sometimes with additional 1 dorsal seta, and 6-7 terminal at external lobe). Re1 A2 without seta, Re2 A2 with 3 setae, Re3-Re6 with 1 seta each, Re7 with 1 medial and 3 terminal setae. Md palp base with 2 setae, Ri1 Md with 2 setae, Ri2 Md with 9 terminal and 1 (rarely 2) dorsal setae; each joint of Re2-Re4 with 1 long seta, Re5 with 2 terminal setae. Mx1 gnathobase with 9 claw-like terminal and 4 thin surface dorsal setae, second and third internal lobes with 3 and 4 setae respectively, protopodite near Ri base with 4 setae, Ri with 12-14 (Park (1968) noted 15) setae, Re with 11, external lobe with 9 (7 long and 2 short) setae. Mx2 typical of Aetideidae, fourth and fifth endites with 1 thickened seta transformed into claw-like spine. Setation of protopodite and Ri1 Mxp typical

of Aetideidae (protopodite with 1 proximal seta, and from proximal to distal part of the joint with 2, 3 and 3 setae), Ri1 Mxp with 3 medial setae, only sometimes slightly longer than protopodite. P1 with 3-jointed Re and 1-jointed Ri; Ri external lobe with spinules apically; Re1 P1 without spine; Re2 with short spine usually not reaching the middle of Re3. P2 with one- or incompletely 2-jointed Ri and 3-jointed Re. P3-P4 with 3-jointed rami; in most of species, P4 coxopodite with few small spinules near the base of internal seta.

M a l e. Total length 1.22-2.10 mm. Cephalothorax 2.7-3.8 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Rostrum and crest absent. Th5 posterior corners prolonged into points, reaching or slightly exceeding posterior border of Abd1 (Th5 in *A. arcuatus* rounded). Length of caudal rami 1.64-3.70 times its width. A1 20-21-jointed, as long as or slightly longer than cephalothorax. Oral appendages less developed than in females: setae at gnathobase and second internal lobe of Mx1 sometimes absent (in *A. acutus*, after Park, 1974); number of Mx1 setae and joints may be less than in females (Re Mx1 in *A. acutus*, *A. arcuatus* and *A. mexicanus* with 10 setae). P1-P4 as in females. P5 with only left uniramous leg, leg 5-jointed, elongated, sometimes equal in length to abdomen, of simple structure.

Notes. *Euaetideus* Sars, 1925 was united with *Aetideus* by Bradford (1971a) on the base of similarity in external morphology and structure of oral appendages. Bradford also believed that *Snelliaetideus* Vervoort, 1949 should be united with *Aetideus*. Roe (1975) found the male of *Snelliaetideus arcuatus* Vervoort, 1949 and determined its structure as typical of *Aetideus* males and thereby confirmed Bradford's conclusion. *Paivella* is very close to *Aetideus*. The type species of the genus, *P. inaciae* Vervoort, 1965, closely conforms to *Aetideus* diagnosis in females (differs from them by presence of two parallel rows of 4-6 spines on posterior surface of P4 coxopodite), but male differs in presence of both right and left P5 legs and of rostrum.

The genus *Aetideus* includes 11 species. All species except *A. australis* (Vervoort, 1957), most records of which are from subantarctic waters, are included in this work.

Key to species of *Aetideus*

Females

- 1(2) Th5 posterior corners rounded 2. *A. arcuatus* Vervoort
- 2(1) Th5 posterior corners prolonged into points or wing-like lobes pointed at tops.
- 3(8) Th5 posterior corners prolonged into wing-like lobes pointed at tops, reaching at least the middle of Abd2. Anterior part of cephalon with crest.

- 4(5) Excavation between rostral rami without thickenings 4. *A. bradyi* A. Scott
- 5(4) Excavation between rostral rami with 2 thickenings
- 6(7) Total length 1.8-2.2 mm. Duct between ventral and dorsal parts of spermatheca strongly narrowed. Rostral base not visible in dorsal view 6. *A. giesbrechti* Cleve
- 7(6) Total length 1.48-1.80 mm. Duct between ventral and dorsal parts of spermatheca not narrowed. Rostral base visible in dorsal view 1. *A. acutus* Farran
- 8(3) Th5 posterior corners not prolonged into wing-like lobes; points of Th5 not reaching the middle of Abd2. Anterior part of cephalon without crest.
- 9(12) Right P1 basipodite with an external tooth-like projection distally. P4 coxopodite without spinules near the base of internal seta.
- 10(11) Th5 posterior corners divergent, always exceeding posterior border of genital segment. Rostral excavation 0.8-1.2 times as wide as deep 5. *A. divergens* Bradford
- 11(10) Th5 posterior corners not divergent, usually not exceeding posterior border of genital segment. Rostral excavation 1.07-1.16 times as wide as deep 7. *A. mexicanus* Park
- 12(9) Right P1 basipodite without external tooth-like projection distally. P4 coxopodite usually with spinules near the base of internal seta.
- 13(16) Points of Th5 posterior corners not reaching posterior border of genital segment.
- 14(15) Rostrum small (Fig. 12), rami short, widely spaced. Total length 1.6-1.8 mm. A1 shorter than body 10. *A. truncatus* Bradford
- 15(14) Rostrum long (Fig. 9), rami long. Total length 2.2-2.5 mm. A1 longer than body 8. *A. pacificus* Brodsky
- 16(13) Points of Th5 posterior corners reaching or exceeding posterior border of genital segment.
- 17(18) Spermatheca with short duct (Fig. 4) connecting its dorsal and ventral parts 3. *A. armatus* (Boeck, 1872)
- 18(17) Spermatheca with long duct (Fig. 11) connecting its dorsal and ventral parts 9. *A. pseudarmatus* Bradford

Males

(unknown for *A. bradyi* and *A. pseudarmatus*)

- 1(2) Th5 without points 2. *A. arcuatus* Vervoort
- 2(1) Th5 with points.
- 3(10) Points of Th5 posterior corners not exceeding posterior border of Abd1 (in dorsal view).
- 4(7) Second P5 joint 3.34-4.2 times as long as wide.
- 5(6) Ri P2 exceeding border between Re2 and Re3

- P2. External spine at Re2 P1 exceeding the middle of Re3 P1 6. *A. giesbrechti* Cleve
- 6(5) Ri P2 not exceeding border between Re2 and Re3 P2. External spine at Re2 P1 not exceeding the middle of Re3 P1 7. *A. mexicanus* Park
- 7(4) Second P5 joint 2.3-3.1 times as long as wide.
- 8(9) Re3 P3 with terminal spine shorter than Re3 itself 3. *A. armatus* (Boeck)
- 9(8) Re3 P3 with terminal spine longer than Re3 itself 10. *A. truncatus* Bradford
- 10(3) Points of Th5 posterior corners exceeding posterior border of Abd1 (in dorsal view).
- 11(12) Caudal rami 1.64-1.83 times as long as wide 1. *A. acutus* Farran
- 12(11) Caudal rami 2.35-3.7 times as long as wide.
- 13(14) Caudal rami 3.5-3.7 times as long as wide. P5 second joint more than 4 times as long as wide. Total length 1.9-2.1 mm 8. *A. pacificus* Brodsky
- 14(13) Caudal rami 2.35-2.55 times as long as wide. P5 second joint less than 4 times as long as wide. Total length 1.25-1.43 mm. 5. *A. divergens* Bradford

1. *Aetideus acutus* Farran, 1929

(Fig. 2)

Aetideus acutus Farran, 1929: 228, fig. 5; Tanaka, 1957: 36, fig. 25, Bradford, 1971a: 30, fig. 12 (d-h); Park, 1974: 217, fig. 3; Bradford & Jillett, 1980: 14, fig. 5; Vives, 1982: 290; Brenning, 1983: 2; 1985: 29.

Euaetideus acutus: Farran, 1936b: 87; Vervoort, 1957: 51, figs 28-30; Brodsky, 1962: 119, fig. 22, Grice, 1962: 190, pl. 9, figs 1-2; Grice & Hulsemann, 1965: 223; Park, 1968: 545, pl. 5, figs 8-14; Tanaka & Omori, 1970a: 110; Wheeler, 1970: 4.

Description. Female. Total length 1.48-1.80 mm. Cephalothorax 3.6-4.0 times longer than abdomen. Body surface with conspicuous chitinous thickenings. Rostrum powerful, with rami rising from wide undivided base, well visible. Excavation between rostral rami with 2 thickenings. Width of rostral excavation (in dorsal view) about 1.4 times its depth. Base of rostrum well visible when looking dorsally. Crest present, well visible. Th5 posterior corners extended into wing-like lobes pointed at their tops and exceeding posterior border of Abd2. Spermatheca of bag-like form, duct connecting its ventral and dorsal parts not narrowed. A1 reaching posterior border of Abd3 or even caudal rami. Oral appendages and P1-P4 typical of genus, but Ri P2 1-jointed.

Male. (Description after Park (1974) with modifications). Total length 1.22-1.58 mm. Cephalothorax about 3.8 times longer than abdomen. Th5 posterior corners much shorter than in female, their points slightly exceeding posterior border of genital

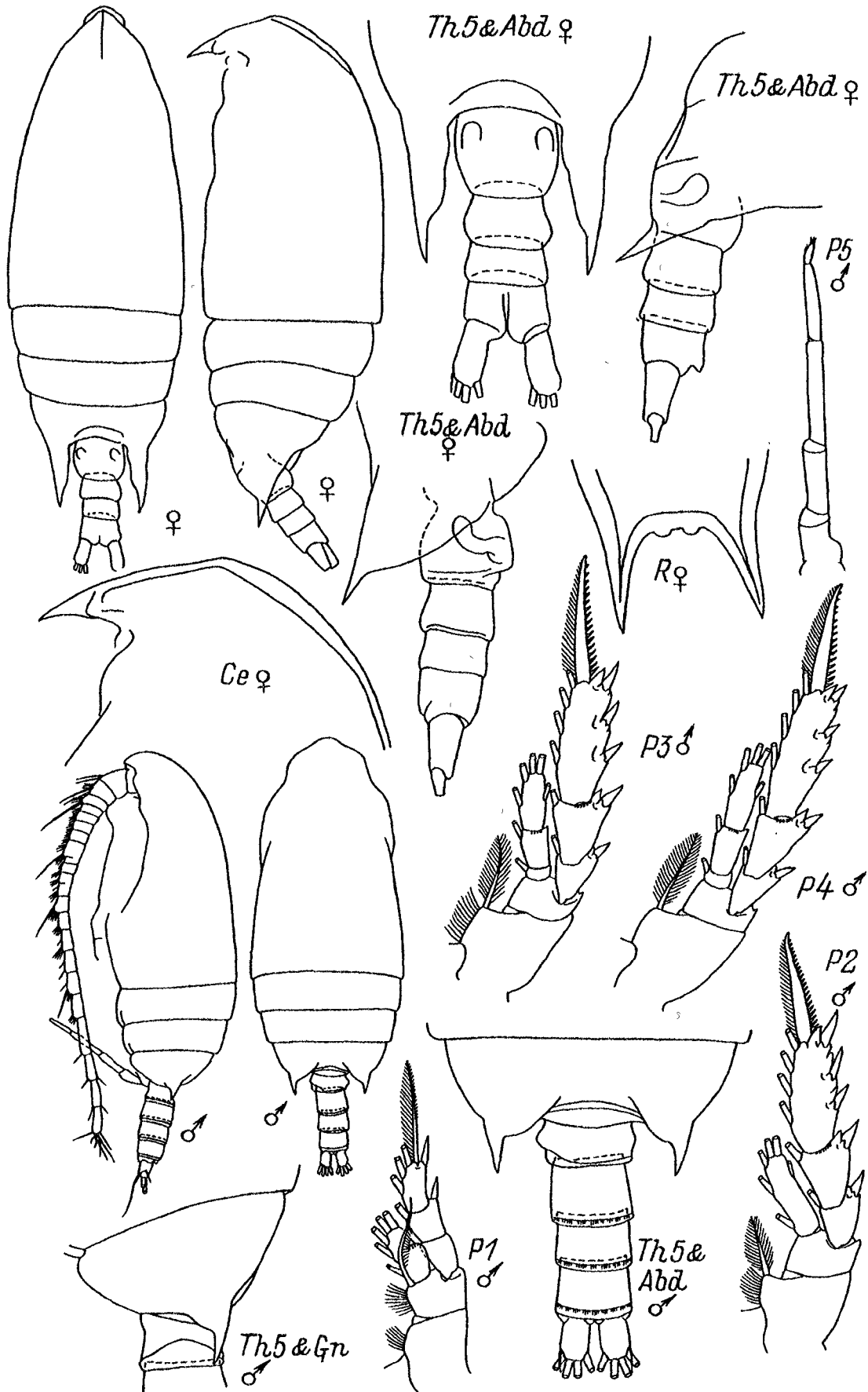


Fig. 2. *Aetideus acutus*. Female (202). Male (from Park, 1974).

segment (in dorsal view). Second abdominal segment 0.83-0.88, third 0.75-0.81 and fourth 0.78-0.81 times as long as wide. Caudal rami 1.64-1.83 times longer than wide. A1 reaching posterior border of Abd3. Setation of A2 coxopodite and basipodite as in female. Ri1 A2 with 1 minute seta, Ri2 A2 external lobe with 6 long and 1 short terminal setae, internal lobe with 6 long setae. Re1 and Re2 A2 without setae. Md palp base with 1 minute seta, Ri1 Md with 1, Ri2 Md with 8 long and 1 shorter terminal setae. Mx1 gnathobase and second internal Mx1 lobe without setae, third internal lobe with 2 setae, protopodite near the base of Ri with 3 setae, Ri with 6, Re with 10 setae. Mxp protopodite with 3 setae in distal part. Ri P2 1-jointed, reaching distal end of Re2 P2. Re3 P2 and Re3 P3 terminal spines longer than Re3, with 23 and 18 teeth respectively. Re3 P4 terminal spine shorter than Re3 with about 16 teeth. P5 second joint 3.41-3.78; third 6.72-7.33 and fourth 6.00-6.60 times as long as wide.

Type locality: to the north-west of the northernmost point of New Zealand.

Geographical distribution. Atlantic Ocean: the north-eastern part up to 40°N (Grice & Hulsemann, 1965; Wheeler, 1970; Roe, 1972a, 1972b; Brenning, 1983, 1985), the regions off Madeira and the Canary Islands, the Caribbean Sea and the Gulf of Mexico (Park, 1970, 1974; Vives, 1982), Pacific Ocean: widespread from 35°N (the Izu region: Tanaka, 1957a; Tanaka & Omori, 1970a; Brodsky, 1962) to 40°S (Farran, 1929). The species is also known from the Malay Archipelago (Vervoort, 1957). Indian Ocean: north-western (Grice & Hulsemann, 1967) and north-eastern (original data) parts.

Vertical distribution. Mainly epipelagic and upper mesopelagic species. Usually found above 200-500 m (Farran, 1929; Tanaka, 1957a; Brodsky, 1962; Grice, 1962; Park, 1968; Tanaka & Omori, 1970a; Bradford, 1971a; etc.).

Material: 25 females from samples 45, 49, 54-55, 202, 407, 410-414, 416-417.

2. *Aetideus arcuatus* (Vervoort, 1949)

(Fig. 3)

Snelliaetideus arcuatus Vervoort, 1949: 3, fig. 7; Park, 1970: 476, 1978: 108, figs 4-5; Bradford, 1971a: 32. *Aetideus arcuatus*: Roe, 1975: 304, fig. 5 (a-m); Brenning, 1983: 2; 1985: 29.

Description. Female. Total length 1.43-1.78 mm. Cephalothorax 2.8-2.9 times longer than abdomen. Rostrum with widely spaced rami, crest absent. Rostral excavation usually 1.4 times as wide as deep. Th5 posterior corners rounded. A1 varies in length: reaching posterior border of genital segment or even the end of caudal rami. Ri Mx1 with 12-13 setae. Ri2 Md with 10 setae (Park (1970) noted 9). Ri1 Mxp by one fourth of its length longer

than protopodite. P4 coxopodite with few small spinules near the base of internal seta. Re3 P2-P4 terminal spines with 15-17 teeth. Ri P2 incompletely 2-jointed.

Male. (Description after Roe (1975) with modifications). Total length 1.22 mm. Caudal rami 3 times longer than wide. Th5 posterior corners rounded. A1 20-jointed reaching posterior border of Abd2. Oral appendages reduced in comparison with those of female. Ri P2 incompletely 2-jointed. P4 coxopodite without spinules near the base of internal seta. Second joint of P5 3.75 times, third 6.4 times and fourth 6.2 times longer than wide.

Type locality: the Malay Archipelago.

Geographical distribution. Atlantic Ocean: the north-eastern and tropical parts (Roe, 1975; Brenning 1983, 1985; original data); the Caribbean Sea. Pacific Ocean: south-eastern part (54-49°S 119-120°W) (Park, 1970, 1978), north-western part (original data), north-eastern part (27°N 115°W) (Bradford, 1971a). The species is found from the Malay Archipelago (Vervoort, 1949).

Vertical distribution. Most likely mesopelagic species, found in hauls 690-790 and 505-1000 m (Park, 1970; Roe, 1975), also in total hauls.

Material: 3 females from samples 2, 3 and 571.

3. *Aetideus armatus* (Boeck, 1872)

(Fig. 4)

Pseudocalanus armatus Boeck, 1872: 6.

Aetidius armatus Brady, 1883: 76, pl. 10, figs 5-16 (part). Giesbrecht, 1892: pl. 14, fig. 7.

Aetideus armatus: Sars, 1901: 25, pls. 13-14, 1903: 159; Wolfenden, 1911: 209, text-fig. 4; With, 1915: 75, pl. 2, fig. 1, text-fig. 16; Sars, 1925: 41; Farran, 1926: 246; 1929: 228; 1936b: 879; Hardy & Gunther, 1935: 157; Wilson, 1942: 170; Vervoort, 1952b (sheet 42): 3, fig. 1; 1957: 44; Matthews, 1964: 24; Bradford, 1971a: 18; Bjornberg, 1973: 326; Motoda & Minoda, 1974: 232; Park, 1978: 104; Bradford & Jillett, 1980: 14; Brenning, 1983: 1; 1985: 29.

Aetideus tenuirostris Wolfenden, 1903: 265; 1904: 111, 116.

Description. Female. Total length 1.60-2.00 mm. Cephalothorax about 3 times longer than abdomen. Crest absent. Rostral rami with wide base. Rostral excavation 0.9-1.2 times as wide as deep. Cephalothorax (Fig. 4) more prominent anteriorly than in *A. pacificus*. Points of Th5 posterior corners exceeding posterior border of genital segment. A1 about as long as body. Ri Mx1 with 13 setae. Oral appendages and P1, as well P3-P4 typical of *Aetideus*. Ri P2 incompletely 2-jointed. Re3 P2-P4 with 15-17 teeth at terminal spines. P4 coxopodite with about 4 small teeth near the base of internal seta.

Male. (Description after Bradford (1971a) with modifications). Total length 1.30-1.53 mm. Cepha-

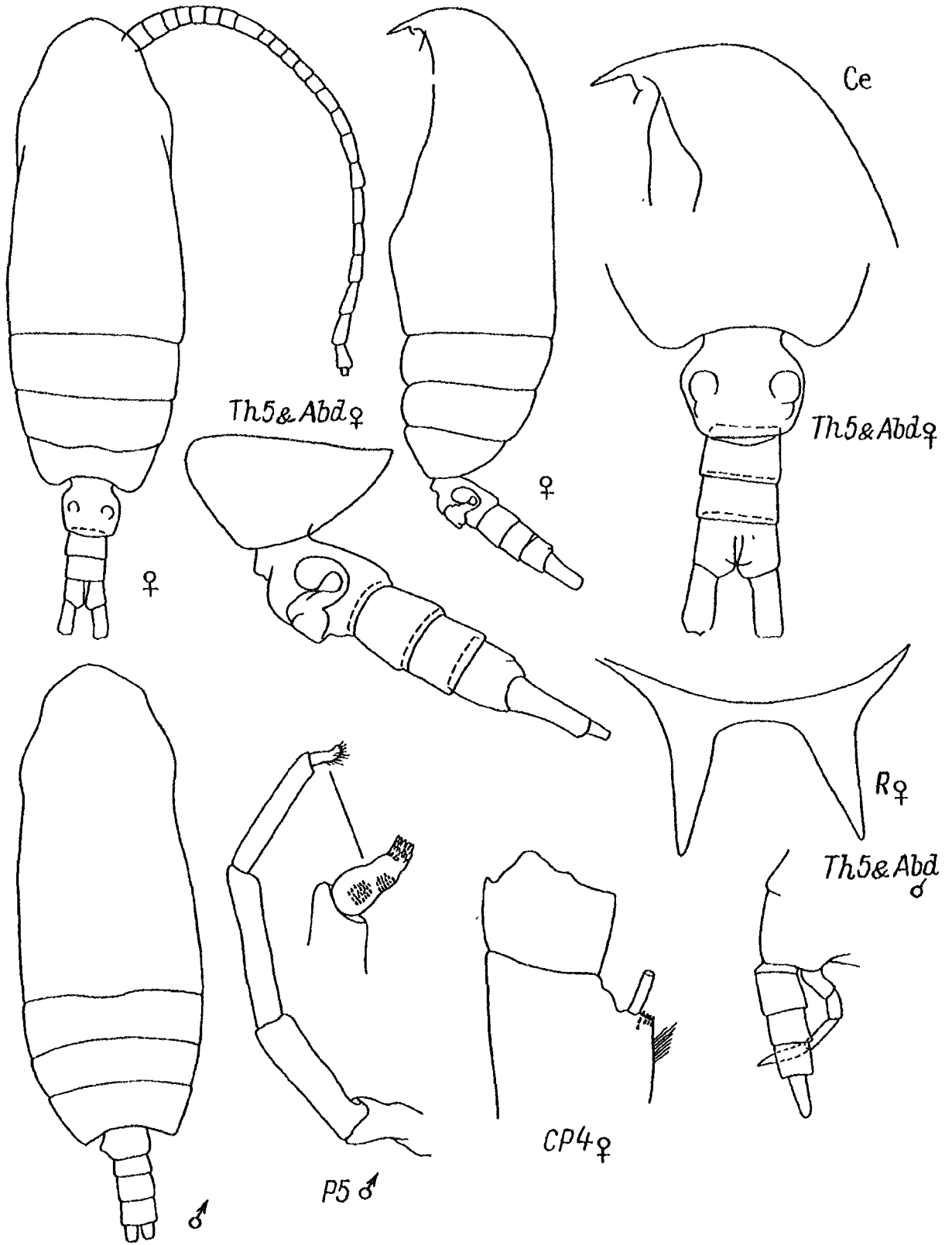


Fig. 3. *Aetideus arcuatus*. Female. C P4 (from Roe, 1975), other figures (571). Male (from Roe, 1975).

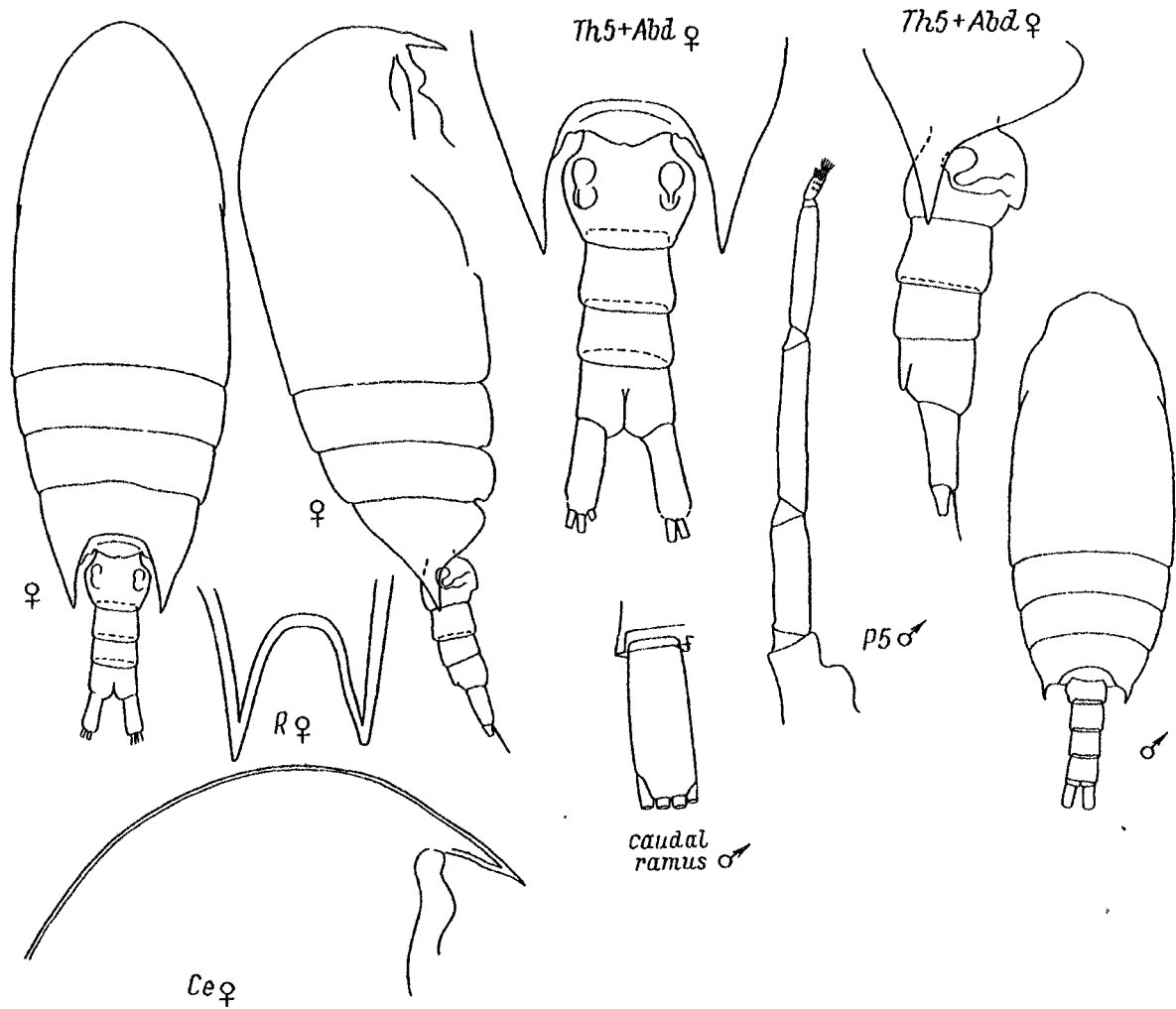


Fig. 4. *Aetideus armatus*. Female (456). Male (from Bradford, 1971a).

lothorax about 2.73 times longer than abdomen. Points of Th5 posterior corners reaching posterior border of genital segment. Caudal rami 2.58-2.70 times as long as wide. A1 slightly longer than cephalothorax. Oral appendages reduced as compared to female. P1-P4 as in female. Terminal spines of Re P2-P4 with 18-24 teeth. Second joint of P5 2.3-3.1 times, third 5.7-7.0 times, and fourth 5.65-6.80 times as long as wide.

Type locality: off Norwegian coast.

Geographical distribution. Atlantic Ocean: widespread, from 62°N (Jespersen, 1934) to 54°S (Hardy & Gunther, 1935), more common in the northern hemisphere. Indian Ocean: the Bay of Bengal, off the Malay Archipelago (Wolfenden, 1911; Sewell, 1929; A. Scott, 1909). As *A. armatus* might be mixed with 3 species described later (Bradford, 1971a), it is difficult to indicate its distribution in the Pacific Ocean. The northernmost locality is possibly the Bering Sea (Motoda & Minoda, 1974),

the southernmost is 52°11'S 167°25'E (Farran, 1936b).

Vertical distribution. Occurs mainly in lower epipelagic and upper mesopelagic layers, but sometimes is recorded deeper than mesopelagic waters (Jespersen, 1934, etc.). *A. armatus* was found to be more abundant in the layers 100 and 250 m (Roe, 1984), 183-366 m (Farran, 1936b) and 500-600 m at day and night time (Roe, 1972a). The species was also found near bottom at 240 m (Matthews, 1964). *A. armatus* serves food for decapods *Systellaspis debilis* (A. M. Edwards), *Gennades elegans* (Smith) and *Sergestes arcticus* Kroyer (Roe, 1984) and to fish *Argyropelecus hemigymnus* Cocco (Roe & Badcock, 1984).

Material: 1 female from sample 456.

Notes. In addition to *A. armatus* previously recorded from the Pacific Ocean (Farran, 1929; Wilson, 1950; Tanaka, 1957a; Vervoort, 1957; Fleminger, 1967), Bradford (1971a) also described therefrom

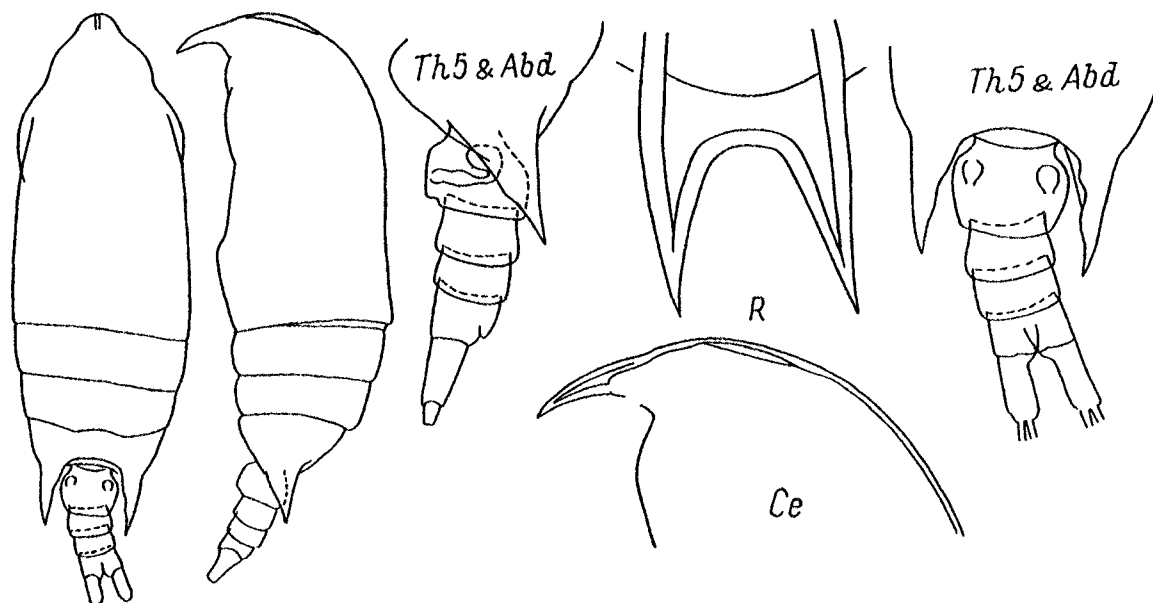


Fig. 5. *Aetideus bradyi*. Female (416).

A. pseudarmatus (from Southwest Pacific), *A. truncatus* (in the mouth of the Gulf of California) and *A. divergens* (off British Columbia). She noted identification problems since the distinguishing characters are variable and difficult to measure.

4. *Aetideus bradyi* A. Scott, 1909

(Fig. 5)

Aetideus bradyi A. Scott, 1909: 38, pl. 5, figs 1-12; Tanaka, 1953: 130; 1957a: 34, fig. 24; Bradford, 1971a: 13, 30, fig. 12 (i-k); Brenning, 1983: 2; 1985: 29.

Euaetideus bradyi: Vervoort, 1957: 48, figs 20b, 21-23, 1963: 122; Grice, 1962: 192, pl. 8, figs 3-4; Tanaka & Omori, 1970a: 111.

Description. Female. Total length 1.38-1.80 mm. Cephalothorax about 3.5 times longer than abdomen. Rostrum with strong sclerotized rami, without thickenings in the excavation. Crest present, better visible dorsally (as straight line). Body surface with conspicuous chitinous thickenings. Posterior Th5 corners extended into wing-like lobes pointed at ends and usually reaching the end of Abd2. A1 almost as long as cephalothorax.

Male unknown.

Type locality: off Malay Archipelago.

Geographical distribution. Atlantic Ocean: the tropical eastern part (Brenning, 1983, 1985; Vervoort, 1963). Pacific Ocean: the equatorial part (Grice, 1962), Californian Current to 38°N (Fleminger, 1964), the south-western part (Bradford, 1971a) and off the coast of Chile (Vidal, 1982). In the region

of the Malay Archipelago (A. Scott, 1909). Probably tropical-subtropical species.

Vertical distribution. Epipelagic and upper mesopelagic species, usually found in the upper 500 m, collected in hauls from 72-146 m (Grice, 1962) and 0-100 m (Vervoort, 1963).

Material: 6 females from samples 213-215, 416, 419.

Notes. Tanaka (1957a; Tanaka & Omori, 1970a) recorded *A. bradyi* from the Izu region. As noted earlier (Vervoort, 1963; Bradford, 1971a) specimens of *A. bradyi* described by Tanaka differ from typical. Therefore the data from this description is not included into the description of *A. bradyi*.

5. *Aetideus divergens* Bradford, 1971

(Fig. 6)

Aetideus divergens Bradford, 1971a: 24, fig. 9.

? *Aetideus armatus* (non Boeck, 1872): Tanaka, 1957a: 31, fig. 23.

Description. Female. Total length 1.69-1.90 mm. Rostrum with button in the middle of excavation between rami. In difference from *A. armatus*, rami with narrow bases. Rostral excavation 0.85-1.2 times as wide as deep (original data and according to Tanaka (1957) and similar to that of *A. pseudarmatus*). Posterior Th5 points exceeding posterior border of genital segment, slightly divergent (in dorsal view). Spermatheca with moderately long, thick duct between ventral and dorsal parts. A1 about as long

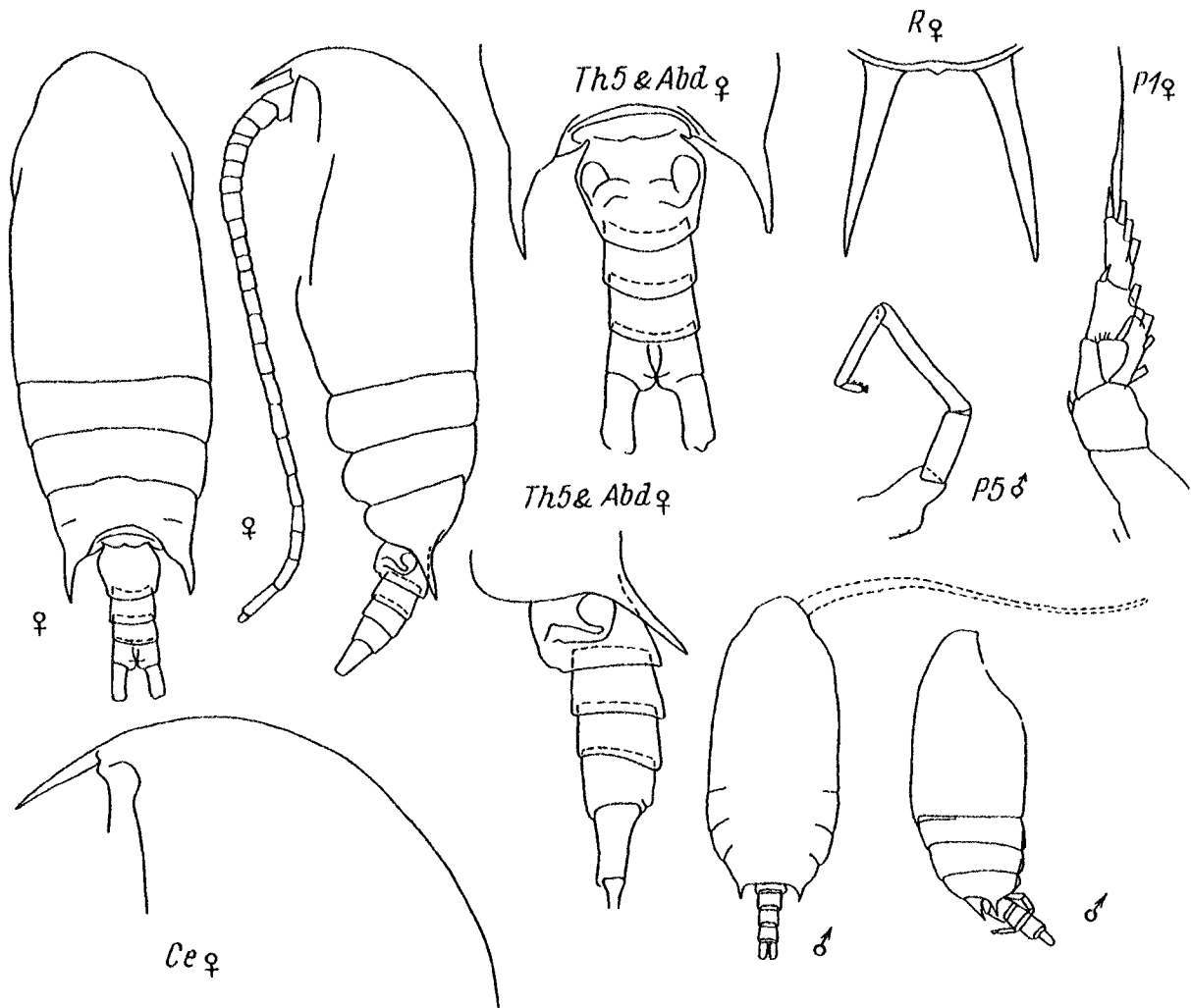


Fig. 6. *Aetideus divergens*. Female (202). Male (from Bradford, 1971a).

as body or reaching the middle of abdomen. Oral appendages basically identical to those of *A. armatus*, Ri2 Md with 10 setae (9 terminal and 1 dorsal). Basipodite of right P1 with external tooth-like projection. P4 coxopodite without teeth near the base of internal seta.

Male. Total length 1.25-1.43 mm. Points of Th5 posterior corners exceeding Abd1. Caudal rami 2.35-2.55 times longer than wide. Re3 P2-P4 terminal spines with 24, 22 and 19 denticles respectively.

Type locality: off British Columbia: 52°02'N 132°53'W.

Geographical distribution. Pacific Ocean: the north-eastern part (Bradford, 1971a), the north-western part (Tanaka, 1957a; original data).

Vertical distribution. The species was found from 150-300 m and from depths of 150, 550 and 1000 m (Tanaka, 1957a; Bradford, 1971a).

Material: 1 female from sample 202.

6. *Aetideus giesbrechti* (Cleve, 1904)

(Fig. 7)

Aetideus giesbrechti Cleve, 1904: 180; Sars, 1905: 3; 1907: 3; Farran, 1908: 10; A. Scott, 1909: 36; pl. 4, figs 1-13; Wolfenden, 1911: 209, pl. 24, fig. 8, text-fig. 5; Farran, 1926: 247; 1929: 228; Mori, 1937: 38, pl. 16, figs 11-13; Tanaka, 1957a: 33-34; Bradford, 1971a: 28, figs 11, 12 (a-c); Wheeler, 1970: 8; Park, 1974: 220, fig. 4; Decey & Brooks, 1977: 263; Bradford & Jillett, 1980: 14, fig. 7; Brenning, 1983: 2; 1985: 29.

Euaetideus giesbrechti: Sars, 1924-1925: 42, pl. 14, figs 1-3; Rose, 1933: 90, fig. 52; Vervoort, 1957: 49, figs 24-27; Grice, 1962: 190, pl. 7, figs 9-27; Grice & Hulsemann, 1965: 223.

Aetideus armatus (non Boeck): Giesbrecht, 1892: 213, pl. 2, fig. 6, pl. 14, figs 2-6, 8-16, pl. 36, figs 6-9.

Description. Female. Total length 1.80-2.20

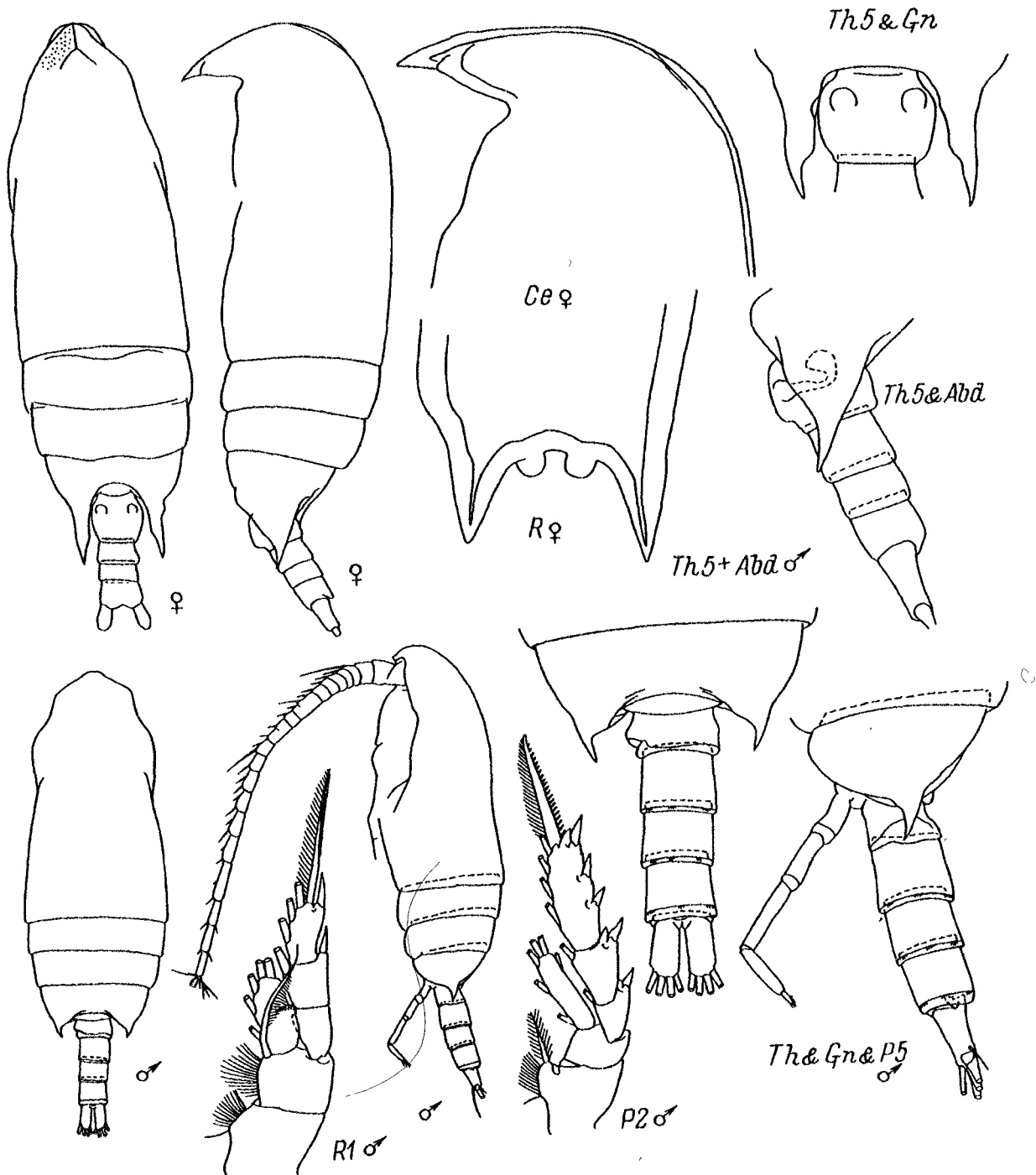


Fig. 7. *Aetideus giesbrechti*. Female (202). Male (from Park, 1974).

mm. Cephalothorax 4-4.7 times longer than abdomen. Body strongly sclerotized, with chitinous thickenings distinctly visible all over the body surface. Rostrum very powerful, with sharply visible rostral rami (in ventral view) rising from the wide undivided base. There are 2 thickenings between rami. Rostral excavation 1.7 times as wide as deep. Crest low, clearly visible (in dorsal and lateral view). Th5 posterior corners extended into wing-like lobes terminating in points reaching posterior border of Abd2. Ventral

and dorsal parts of spermatheca connected by considerably narrowed duct. A1 as long as body. Oral appendages typical of genus.

M a l e. (Description after Park (1974) with modifications). Total length 1.52-1.60 mm. Cephalothorax 3.4 times longer than abdomen. Th5 posterior corners considerably shorter than in females, points reaching posterior border of genital segment (Abd1). Caudal rami 2.27-2.37 times as long as wide. Second abdominal segment 0.93-0.95 times, third

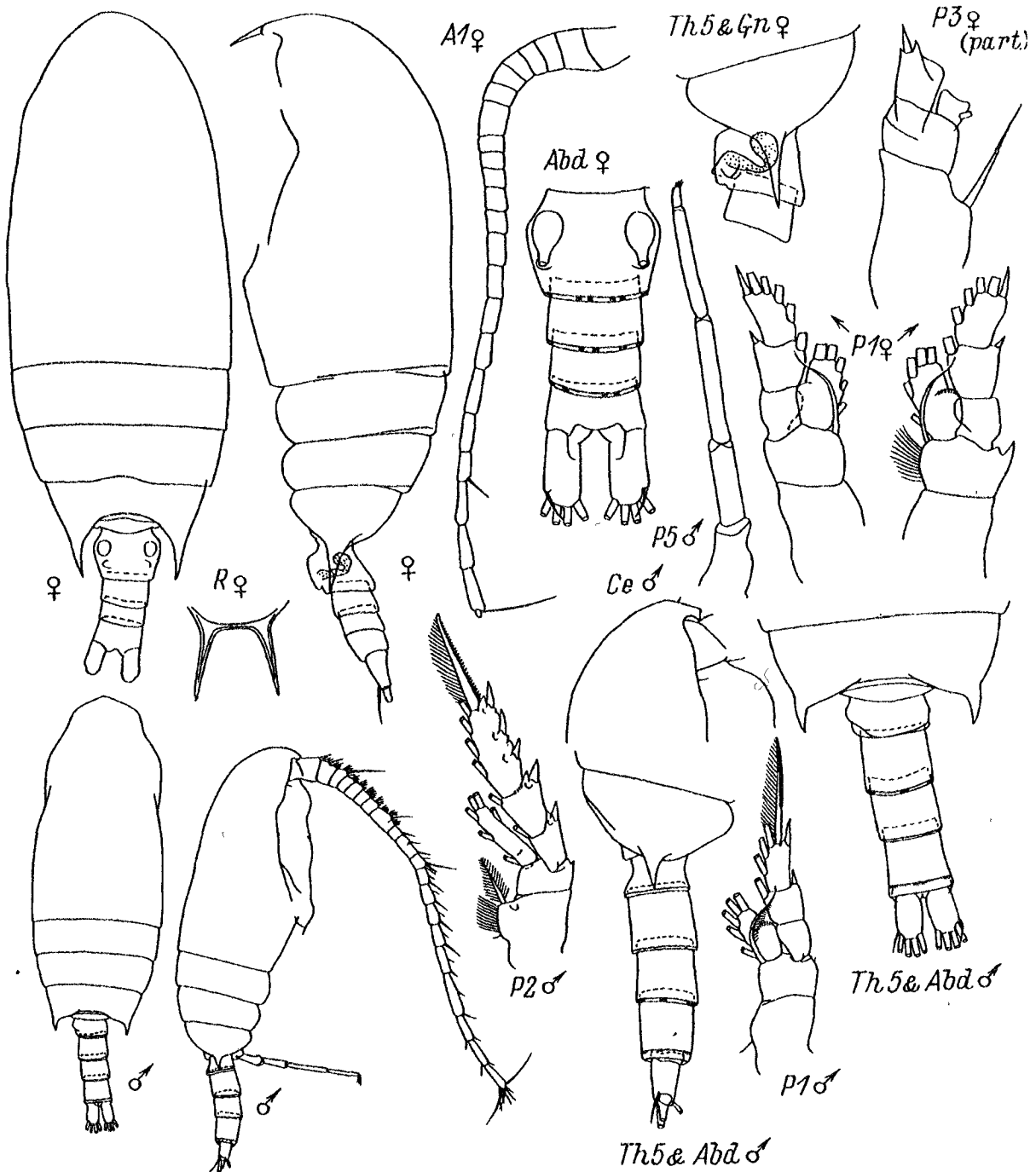


Fig. 8. *Aetideus mexicanus*. Female: general view, R, P1, P3 (part.) (207); other figures from Park, 1974.

0.85-0.86 and fourth 0.88-0.89 times as long as wide. A1 reaching posterior border of Abd3. Oral appendages as in *A. acutus*. Ri P2 exceeding border of Re2-Re3. Re3 terminal spine longer than joint, with 24 teeth. Second P5 joint 3.35-4.00 times, third 6.00-6.25 times and fourth 5.00-6.65 times as long as wide.

Type locality: "the sea West of South Africa" (Cleve, 1904).

Geographical distribution: The species is widespread in tropical and subtropical waters in all oceans. Atlantic Ocean: the northernmost locality is the region of the Faroe Isls, southernmost 30°S (Wolfenden, 1911). Recorded in the Mediterranean, Caribbean and Red Seas (Rose, 1937), in the Gulf of Mexico (Park, 1970, 1974). Pacific Ocean: the northwestern part from Japanese waters (Tanaka, 1957a;

original data), through equatorial part (Grice, 1962) and southward to 40°S (Farran, 1929). Malay Archipelago (A. Scott, 1909). Indian Ocean: (Vervoort, 1957).

Vertical distribution. The species is recorded from the upper 500 m, from hauls 200-350 m (Vervoort, 1957), 0-100 m (Farran, 1929), 250-500 and 0-88 m (Bradford, 1971a).

Material: 11 females from samples 202, 211, 410, 412-413, 416, 420, 421.

Notes. The size of males of *A. giesbrechti* is close to that of *A. mexicanus*. *A. giesbrechti* differs in the higher anterior part of cephalon, comparatively shorter Abd segments and longer Ri2 P2.

7. *Aetideus mexicanus* Park, 1974

(Fig. 8)

Aetideus mexicanus Park, 1974: 215, figs 1-2.

Description. F e m a l e. Total length 1.66-1.84 mm. Cephalothorax 3.6 times longer than abdomen. Rostrum of *A. armatus* type. Rostral excavation 1.07-1.16 times as wide as deep. Th5 points of variable length, usually reaching posterior border of genital segment, but sometimes exceeding it. A1 extending beyond distal end of caudal rami by two last joints or is as long as body. All other appendages like those in *A. pacificus*. Most specimens with asymmetrical P1 (with tooth-like protrusion at external edge of right basipodite); otherwise P1-P3 similar to *A. pacificus*. P4 coxopodite without spinules near the base of internal seta. Re3 P2-P4 terminal spine with 15-17 teeth.

M a l e. (Description after Park (1974) with modifications). Total length 1.58-1.68 mm. Cephalothorax 3 times longer than abdomen. Points of Th5 posterior corners reaching posterior border of Abd1. Second abdominal segment 0.98-1.05 times, third joint 1.08-1.15 times and fourth joint 1.12-1.19 times as long as wide. Caudal rami 1.82-2.00 times as long as wide. A1 reaching about distal end of Abd4. Re3 P2-P3 terminal spines longer than their joints, with 23 and 29 teeth respectively. Second P5 joint 3.7-4.2 times, third joint 8.3-8.7 times and fourth joint 9.0-9.7 times as long as wide.

Type locality: the Gulf of Mexico: 25°15'N, 81°11'W.

Geographical distribution. Atlantic Ocean: The Gulf of Mexico (Park, 1974). Pacific Ocean: tropical part (13°N 133°W) (original data).

Vertical distribution: in the Gulf of Mexico in the upper 500 m (Park, 1974), in the Pacific Ocean in 500-1000 m (original data).

Material: 1 female from sample 207.

Notes. *A. mexicanus* differs from *A. armatus* in the slender body, longer A1 exceeding caudal rami by 2 joints and specially by absence of teeth near

the base of internal seta at P4 coxopodite. The male of *A. mexicanus* is very similar to that of *A. armatus* but differs in the width/length ratio of the caudal rami and Abd2-Abd4. The species is very close to *A. divergens*, differs in the shorter Th5 points (although some specimens with points exceeding posterior border of genital segment were found Park, 1974).

8. *Aetideus pacificus* Brodsky, 1950

(Figs. 9-10)

Aetideus pacificus Brodsky, 1950: 144, fig. 60; Park, 1968: 542, pl. 4, figs 16-24, pl. 5, figs 1-7; Bradford, 1971a: 18.

Description. F e m a l e. Total length 2.20-2.50 mm. Cephalothorax 3.4 times longer than abdomen. Crest absent. Rostral rami not wide, depth of rostral excavation nearly equal its width. Points of Th5 posterior corners reaching distal third of genital segment, not divergent. A1 exceeding caudal rami by last 1-2 joints. Ri2 Md with 11 (9 terminal and 2 posterior) setae. Ri Mx1 with 12 (Park (1968) recorded 15) setae. Ri1 Mxp nearly as long as Mxp protopodite with setation typical of the genus. Ri P2 2-jointed with incompletely separated joints, all remaining P2-P4 rami 3-jointed. Terminal spines of Re3 P2-P4 with about 17 denticles. P4 coxopodite with 4 small spines near the base of internal seta.

M a l e (first description). Total length 1.90-2.10 mm. Cephalothorax 2.7-3.0 times longer than abdomen. Points of Th5 posterior corners extending the end of proximal third of Abd2. Caudal rami 3.7 times as long as wide. A1 reaching Abd2. A2 rami about equal in length. In comparison to female, setation of oral parts reduced. Second abdominal segment 1.24 times as long as wide, third segment 1.37, and fourth segment 1.47 times as long as wide. P1-P4 as in female but without small spinules at P4 coxopodite. Second P5 joint 4.3 times as long as wide, third joint 8.2 and fourth joint 7.5 times as long as wide.

Type locality: 43°30'N 147°30'E.

Lectotype: female; N 1/39801; Kurile-Sakhalin expedition; August 28, 1948; layer 500-1000 m; depth 1070 m, station 17, sample 88; kept in the Zoological Institute, Russian Academy of Sciences, St. Petersburg.

Geographical distribution. Pacific Ocean: north-western part, the Sea of Okhotsk, the Bering Sea (Brodsky, 1950); the Kurile-Kamchatka Trench area (original data), north-eastern part (42°N 154°W) (Park, 1968).

Vertical distribution. The species is recorded in epipelagial (Park, 1968; original data). In the Kurile-Kamchatka Trench area it is found at depths above 500 m, usually in layers 100-200 and 200-500 m,

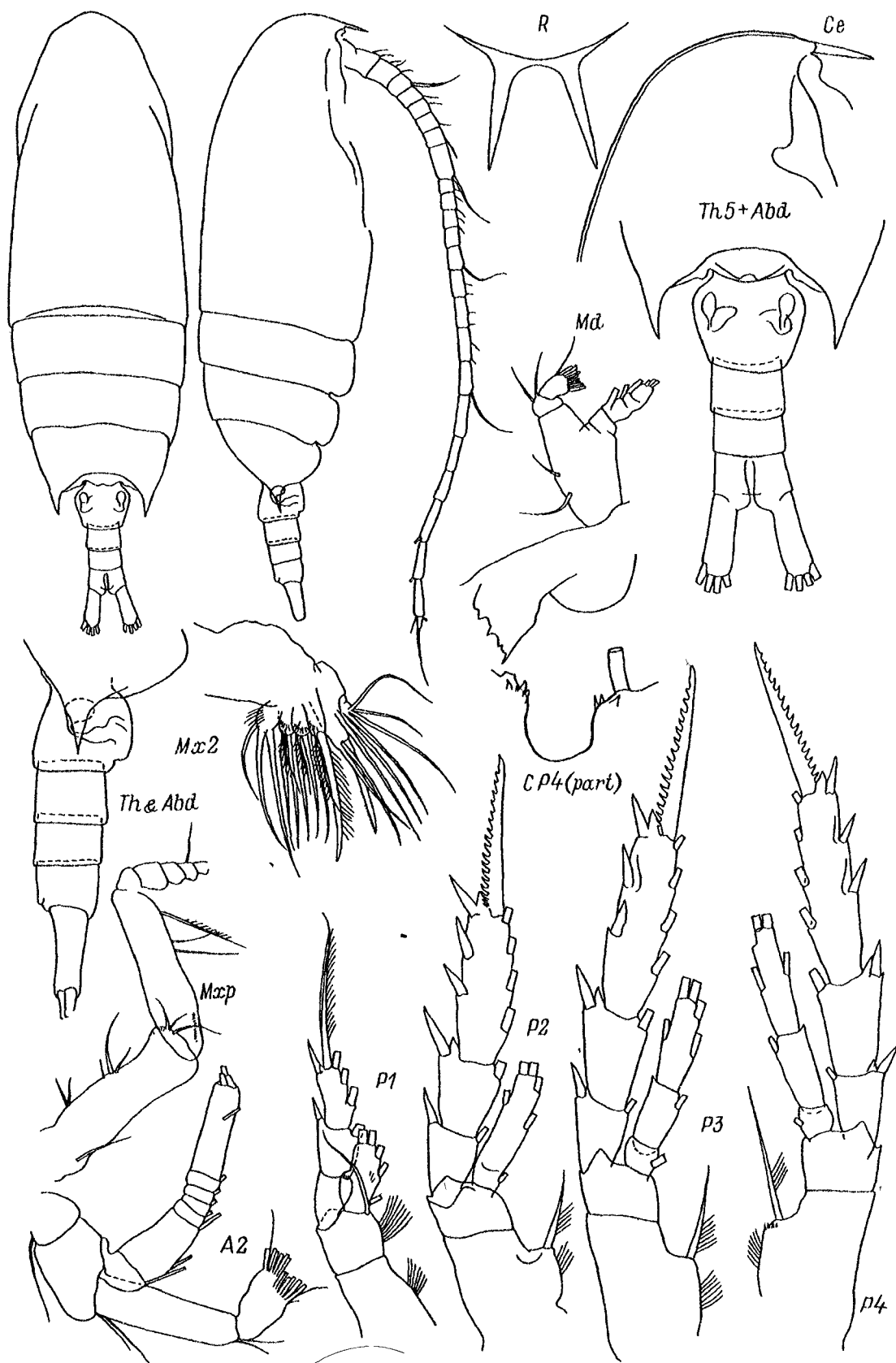


Fig. 9. *Aetideus pacificus*. Female (144).

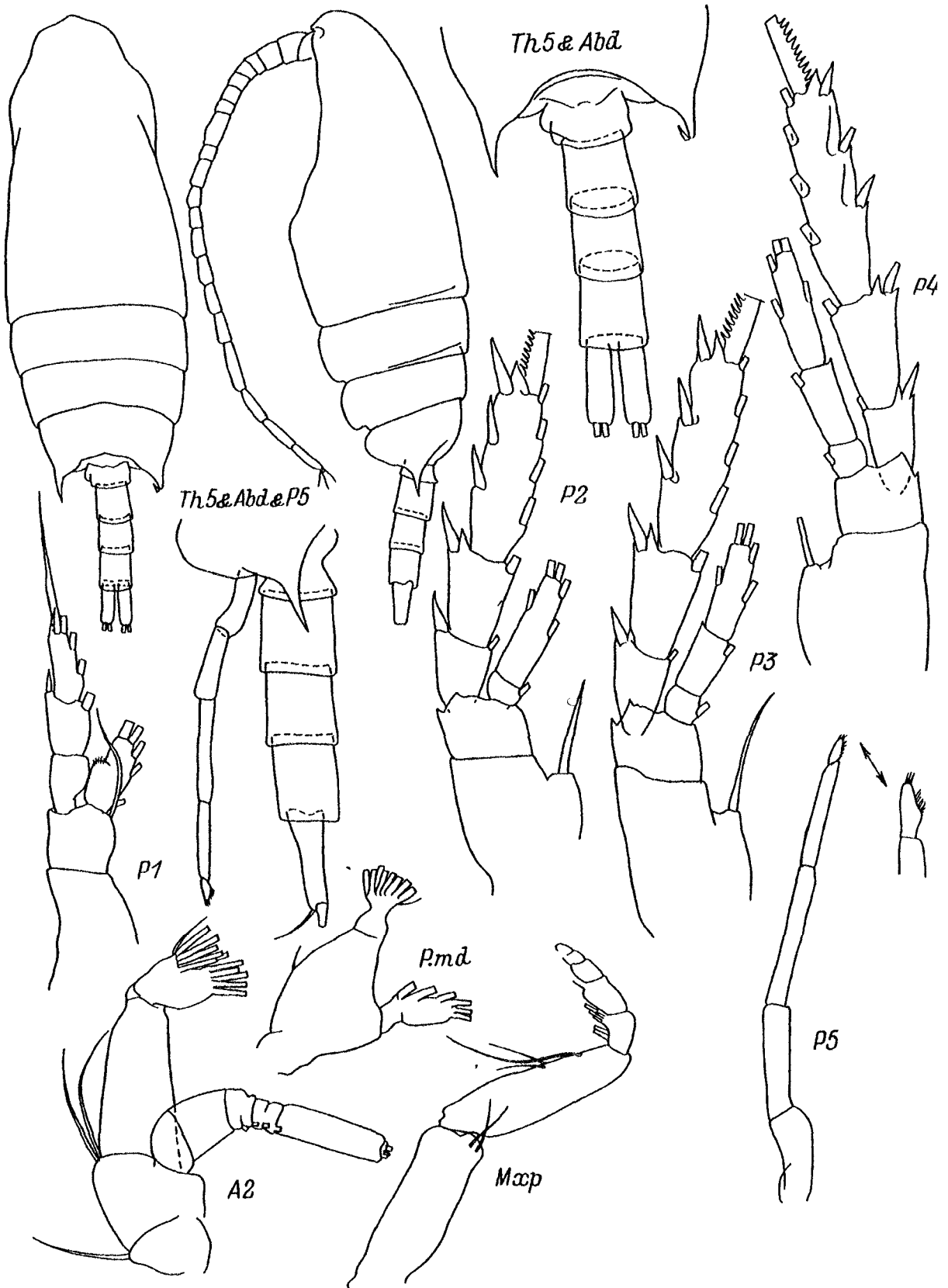


Fig. 10. *Aetideus pacificus*. Male (specimen from Kurile-Kamchatka Trench region).

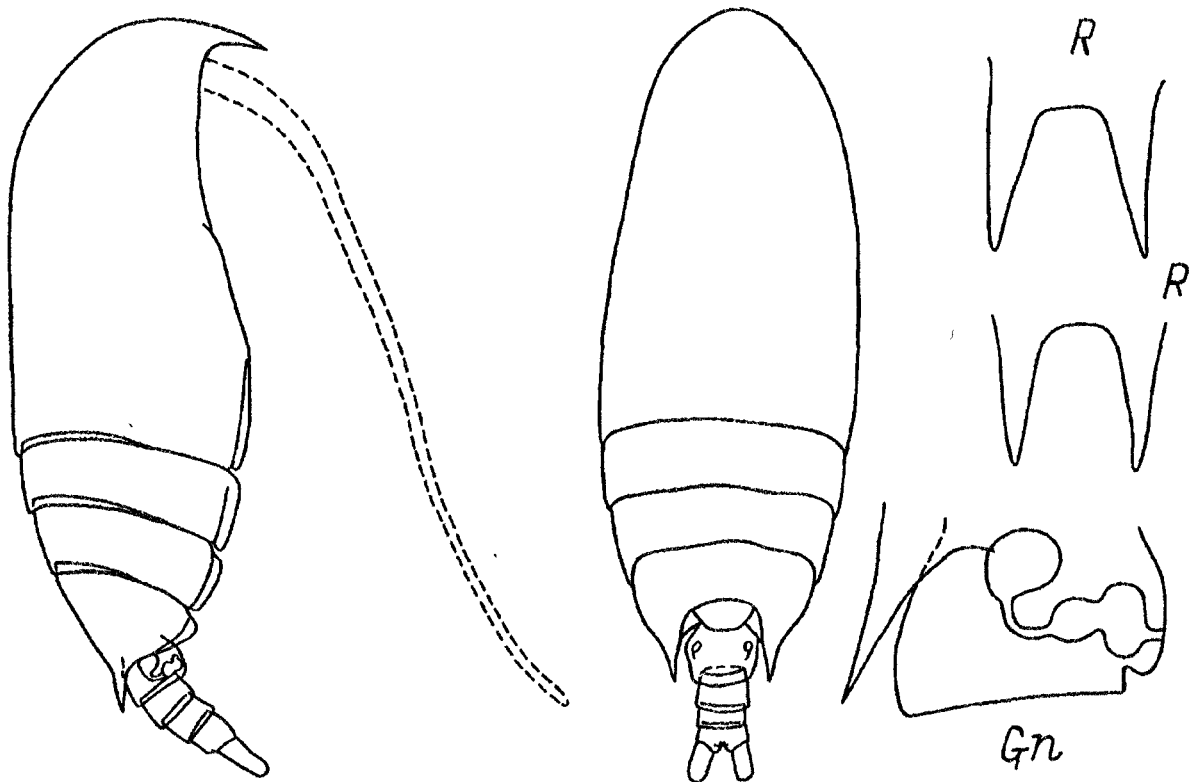


Fig. 11. *Aetideus pseudarmatus*. Female (from Bradford, 1971a).

sometimes in depth range between 500 m and 1000 m (original data).

Material: 34 females and 1 male from samples 3, 7, 59, 71, 78, 79, 89-90, 117-118, 129-132, 143-145, 153-155, 167-170, 185-186, 217-218, 220-224, 227, 238, 248-249.

9. *Aetideus pseudarmatus* Bradford, 1971

(Fig. 11)

Aetideus pseudarmatus Bradford, 1971a: 23, fig 8, Bradford & Jillett, 1980: 14, figs 8, 60.

Description. Female. (Description after Bradford (1971a) with modifications). Total length 1.65-1.80 mm. Rostral rami wide near base. Rostral excavation 0.83-1.07 times as wide as deep. Points of Th5 posterior corners reaching posterior border of genital segment. Dorsal and ventral parts of spermatheca connected by narrow duct (in lateral view), its length at least 5 times greater than width. A1 shorter than body. Oral appendages and swimming legs identical to those of *A. armatus*.

Male unknown.

Type locality: 46°46'S 164°35'E.

Geographical distribution. Atlantic Ocean: the south-eastern part to 32°S (Bradford, 1971a). Pacific Ocean: the south-western part to 39°S (Bradford, 1971a). The species is also found off South Africa.

Vertical distribution. The species is recorded in

hauls in epipelagial (0-50, 100-250 m) and upper mesopelagial (250-500 m) and in total hauls (Bradford, 1971a).

Notes. The species is very similar to *A. armatus* but is distinguished from the closely related species by the longer and narrower duct connecting dorsal and ventral parts of spermatheca, slightly shorter Th5 points and wider rostral rami bases.

The species is not examined by me.

10. *Aetideus truncatus* Bradford, 1971

(Fig. 12)

Aetideus truncatus Bradford, 1971a: 26, fig. 10.

Description. Female. Total length 1.60-1.80 mm. Cephalothorax 3.5 times longer than abdomen. In lateral view, cephalon more prominent near the level of Md and Mx1. Rostrum small, with short widely spaced rami. Rostral excavation 1.46-2.00 times as wide as deep. Rostral rami look very wide (in ventral view). Points of posterior Th5 corners not exceeding posterior border of genital segment. Duct connecting dorsal and ventral parts of spermatheca sufficiently thick (shorter than those of *A. divergens*). A1 not exceeding posterior border of anal segment. Oral appendages and P1-P4 typical of the genus.

Male. (Description after Bradford (1971) a with modifications). Total length 1.45 mm. Body shape

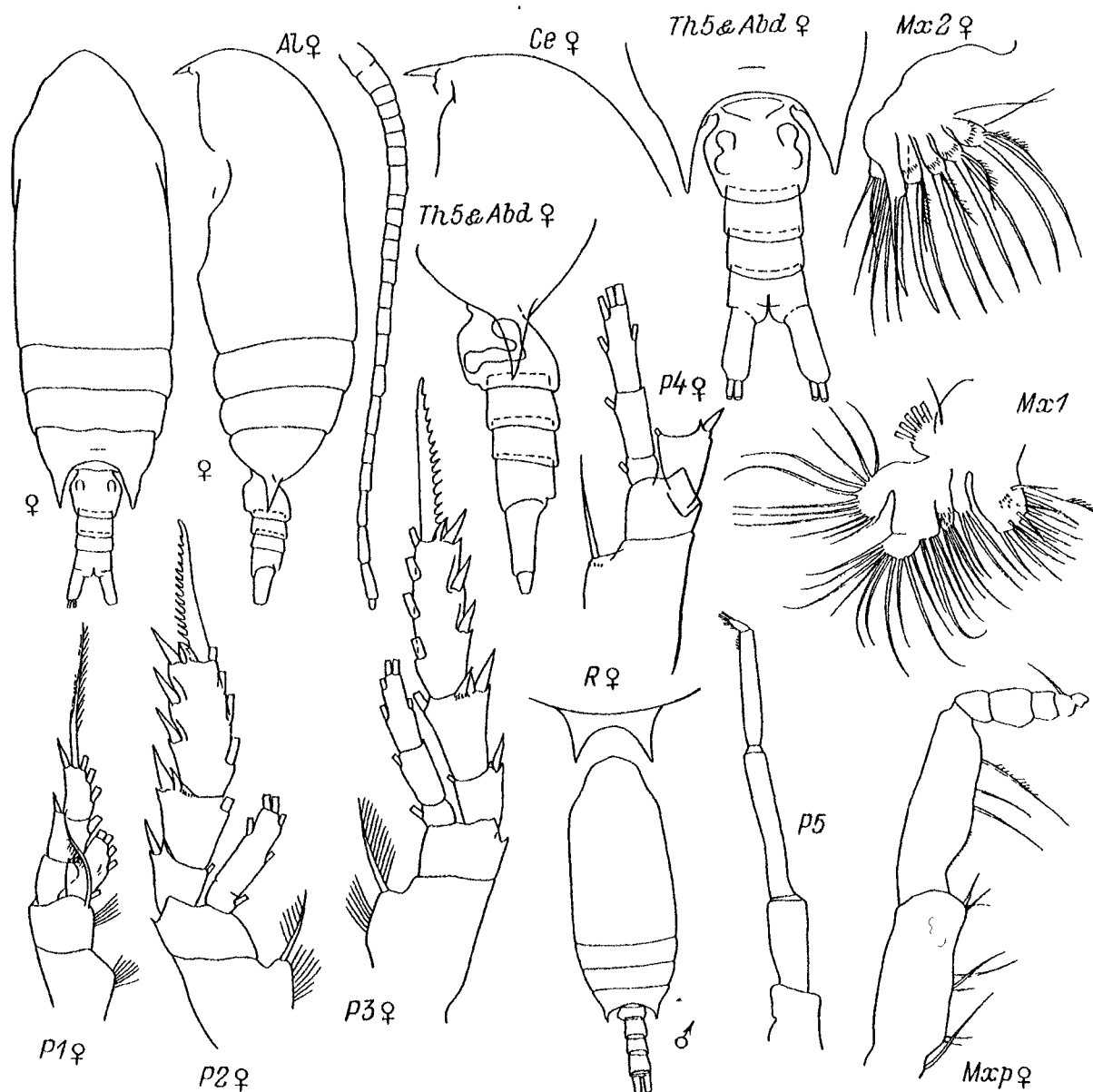


Fig. 12. *Aetideus truncatus*. Female (215). Male (from Bradford, 1971a).

very similar to that of *A. armatus*, points of Th5 not exceeding Abd1. Line of fusion between Th4-Th5 visible in dorsal view. Caudal rami 2.51-2.66 times longer than wide. All appendages of the same structure as in *A. armatus*. Terminal spines at Re3 P2 and P3 with 23 and 21 denticles respectively, the denticles at P3 more widely spaced, than in *A. armatus* since terminal spine is longer than Re3. Second P5 joint 2.32-2.86 times, third joint 6.0-6.51 times, and fourth joint 5.4-6.55 times as long as wide.

Type locality: the Gulf of California: 22°59'N 107°13'W.

Geographical distribution. Pacific Ocean: the north-eastern part, to 32°N (Bradford, 1971a).

Vertical distribution. The species is found in hauls from 121-238, 350-500 and 477-594 m and in total hauls (Bradford, 1971a; original data).

Material: 3 females from samples 209, 214-215.

Notes. Females of this species are distinguished from all other species of the genus by short, widely spaced rostral rami and short Th5 points. Males hardly differ from males of *A. armatus* (ratio of segments and caudal rami overlapping in both species). The only noticeable distinction is in the widely spaced denticles at terminal spine of Re3 in *A. truncatus*, in which the terminal spine Re3 P3 is longer than the joint itself.

2. *Aetideopsis* Sars, 1903

TYPE SPECIES: *Aetideopsis rostrata* Sars, 1903, by subsequent designation (Brodsky, 1950).

Aetideopsis Sars, 1903: 160

Pseudaetideus Wolfenden, 1904: 115 (type species: *Euchaeta armata* Boeck, 1872, by monotypy)

Faroella Wolfenden, 1904: 117 (type species: *Faroella multiserrata* Wolfenden, 1904, by monotypy)

Description. Female. Total length 1.96-4.00 mm. Cephalothorax 2.7-4.0 times longer than abdomen. Cephalon and Th1 completely or incompletely fused, Th4 and Th5 separated, sometimes incompletely (*A. armata*). Rostrum bifurcate; sometimes small with close spaced rami (*A. armata*); well developed with heavily sclerotized rami parallel (*A. antarctica*), or more or less divergent. Some species with slightly elevated crest near rostrum or at the level of A2. Th5 and genital segment symmetrical. Posterior points of Th5 corners are not separated from segment; covering first third of genital segment, reaching its middle length or exceeding it. Body surface sometimes with chitinous thickenings. Abd1-Abd3 with little spinules along posterior border. Genital segment symmetrical, its length 1.2-1.6 times its width. Caudal rami 1.3-1.5 longer than wide. A1 24-jointed, extending posterior border of Abd3, reaching the end of the body, or longer than body (*A. retusa*). Re A2 1.2-1.5 times longer than Ri. Coxopodite A2 with 1 seta, basipodite with 2. Ri1 A2 with 2 (rarely with 1) setae; Ri2 A2 with 13-15 setae (5 long and 3 short terminal at internal lobe and 6 long terminal and 1 short posterior at external lobe). Re1 A2 without setae; Re2 A2 with 2 setae (1 medial and 1 distal); sometimes medial seta absent (*A. armata*, *A. multiserrata*). Re3-Re6 A2 with 1 strong long seta each, Re7 A2 with 1 medial and 3 terminal setae. Re Md longer than Ri. Md palp base with 2 setae; Bradford (1969a) noted 1 seta. Ri1 Md with 3 setae, sometimes with 2 (*A. carinata*, *A. antarctica*); Ri2 Md with 9-10 setae, commonly 8 terminal and 1 (rarely 2) posterior setae. Mx1 gnathobase with 9 terminal claw-like and 1 thin anterior setae and 4 setae on posterior surface. Mx1 second and third internal lobes with 5 and 4 setae respectively; protopodite near Ri base with 5 setae; Ri with 13 setae; Re with 8-10 setae; external lobe with 9 (7 long and 2 short) setae. Mx2 typical of Aetideidae: fourth and fifth endites with 1 thickened seta transformed into claw-like spine. Mxp protopodite 1.1-1.6 times shorter than Ri1 Mxp, setation typical of the family; in *A. armata* there is minute seta present near the base of the joint. From proximal to distal part of Mxp protopodite there are groups of 2, 3 and 3 setae. Sometimes in proximal part of protopodite there is more (*A. carinata*) or less (*A. rostrata*, *A. retusa*) developed projection. Re P1 3-jointed, each joint with an ex-

ternal spine; these spines may be short, not reaching the middle of the next joint (*A. cristata*), extending to the midlength of the following spine or exceeding it. Ri P1 1-jointed; its external lobe with minute spinules apically, in *A. tumorosa* external lobe absent. P2 with 1-, or incompletely 2-jointed Ri (line of separation often visible); Re is 3-jointed. P3 sometimes with 2-jointed Ri, usually Ri 3-jointed, but division between joints may be incomplete. P3 with 3-jointed Re. P4 with 3-jointed rami. External surface of swimming legs coxopodites spinulose in the majority of species. Some specimens of *A. minor* with vestigial P5.

Male. Total length 2.40-4.20 mm. Cephalothorax 2.5-3 times longer than abdomen. Cephalon and Th1 fused, Th4-Th5 incompletely or completely separated. Crest absent. Rostrum less developed than in female of the same species, rami spaced closer in some species (*A. armata*). Genital segment two or more times longer than next one. Points of Th5 posterior corners shorter than in females, not reaching, reaching, or exceeding the posterior border of Abd1. A1 23-jointed, shorter than in female, or reaching Th3-Th4. A2 as in female, only setation is slightly reduced; coxopodite with 1 seta or no; basipodite with 2 setae; Ri1 A2 with 1-2 or no setae; Ri2 A2 with 12-14 setae. Re1 A2 without setae; Re2 A2 with 1 seta. Md palp base with 1 seta, or seta is absent. Ri1 Md with 1 seta; Ri2 Md with 9 (in *A. tumorosa* with 8) setae. Mx1 with reduced setation comparing with female; Ri with 9-11 setae; Re with 9-10 setae. Mx2 reduced. Mxp protopodite usually without medial setae, or with 1-3 very small ones; distal part of joint with 1-2 setae, Ri1 with 3 medial setae. P1 with 3-jointed Re, each joint with an external spine. Spines not reaching the base of the following spine, or exceeding their bases. P2-P4 in segmentation and setation are the same as in females. P5 biramous; not exceeding abdomen in length, or longer; Ri 1-jointed; right Re 2-jointed, left Re 3-jointed, of simple structure.

The genus *Aetideopsis* includes 10 species. The antarctic species *A. antarctica* (Wolfenden, 1908) is not included in this work.

Key to species of *Aetideopsis*

Females

- 1(2) Ri P1 without external lobe 9. *A. tumorosa* Bradford
- 2(1) Ri P1 with external lobe.
- 3(4) Posterior corners of Th5 wing-like, divergent (dorsal view). Genital segment (dorsal view) with lateral swellings 3. *A. carinata* Bradford
- 4(3) Posterior corners of Th5 not wing-like, not divergent (dorsal view). Genital segment (dorsal view) barrel-like without lateral swellings.
- 5(6) Crest present, beginning from rostrum (lateral

- view). First and second external spines of Re1 and Re2 P1 short not reaching the middle length of next joint 4. *A. cristata* Tanaka
- 6(5) Crest absent or, if present, beginning at the level of A2. First and second external spines of Re1 and Re2 P1 reaching the middle length of next joint, or exceeding base of next spine.
- 7(8) Ri P2 1-jointed. Points of Th5 posterior corners short, covering first one-third of genital segment length 1. *A. albatrossae* Shih & Maclellan
- 8(7) Ri P2 2-jointed (though separation between joints may be incomplete). Points of Th5 posterior corners reaching the midlength of genital segment, or exceeding it.
- 9(10) Anterior part of cephalon (lateral view) evidently prominent over rostrum (in front of it) 6. *A. multiserrata* Wolfenden
- 10(9) Anterior part of cephalon (lateral view) fairly smoothly transforming into rostrum, not prominent over base of rostrum.
- 11(12) Rostrum very small, rami rather close-spaced, nearly parallel 2. *A. armata* (Boeck)
- 12(11) Rostrum well developed, rami, if parallel, not close-spaced, usually divergent.
- 13(16) Proximal part of Mxp protopodite (externally) with well visible projection.
- 14(15) Total length 1.96-2.8 mm. Crest absent. Ri2 Md with 9 (8 terminal and 1 posterior) setae. A1 as long as or longer than body 7. *A. retusa* Grice & Hulsemann
- 15(14) Total length 3.0-4.0 mm. Crest present, faintly developed. Ri2 Md with 10 (8 terminal and 2 posterior) setae. A1 reaching the middle length, or end of Abd3 8. *A. rostrata* Sars
- 16(13) Mxp protopodite without projection in proximal part 5. *A. minor* (Wolfenden)

Males

(unknown for *A. minor*; adult male unknown for *A. albatrossae*).

- 1(2) Points of Th5 posterior corners not reaching posterior border of Abd1 2. *A. armata* (Boeck)
- 2(1) Points of Th5 posterior corners reaching or exceeding posterior border of Abd1.
- 3(4) Ri P1 without external lobe 9. *A. tumorosa* Bradford
- 4(3) Ri P1 with external lobe.
- 5(10) Rostral rami spaced closely.
- 6(7) Rostral rami not divergent 6. *A. multiserrata* Wolfenden
- 7(6) Rostral rami more or less divergent.
- 8(9) Total length over 3 mm (3.0-4.2 mm). Genital segment over half shorter than Abd2 8. *A. rostrata* Sars

- 9(8) Total length less than 3 mm (2.35-2.7mm). Genital segment no more than half shorter than Abd2 7. *A. retusa* Grice & Hulsemann
- 10(5) Rostral rami widely spaced, divergent.
- 11(12) Total length about 3.2 mm. External spines of Re1 and Re2 P1 not reaching the midlength of next joint 4. *A. cristata* Tanaka
- 12(11) Total length about 2.4 mm. External spine of Re1 P1 reaching the base of next spine, spine of Re2 P1 reaching the middle length of next joint 3. *A. carinata* Bradford

1. *Aetideopsis albatrossae* Shih & Maclellan, 1981

(Fig. 13)

Aetideopsis albatrossae Shih & Maclellan, 1981: 567, figs 1-2.

Description. Female. (Description after Shih & Maclellan (1981) with modifications). Total length 2.66-2.78 mm. Cephalothorax 2.7-3.0 times longer than abdomen. Body surface with chitinous thickenings. Rostrum with rather widely spaced rami, their external parts parallel. Th5 posterior corners pointed; shorter than in other species, covering first one-third of genital segment length. Genital segment about as wide as long. A1 reaching posterior border of last Abd segment. Re2 A2 with medial seta. Md palp base with 2 setae; Ri1 Md with 3 setae; Ri2 Md with 9 (8 terminal and 1 posterior) setae. Re Mx1 with 10 setae, otherwise setation typical of the genus. External spines of Re1 and Re2 P1 exceeding base of following spine. Ri P1 with small external lobe. Ri P2 1-jointed. Terminal spine of Re3 P2 with 54 denticles. Separation between Ri1 and Ri2 P3 incomplete. Ri P4 3-jointed.

Male. Known after V copepodite stage. Total length 2.20-2.34 mm. Cephalothorax 3.07-3.26 times longer than abdomen.

Type locality: 12°53'N 121°52'E.

Geographical distribution. The species is known from tropical part of the Philippines region of the Pacific Ocean (Shih & Maclellan, 1981).

The species is not examined by me.

2. *Aetideopsis armata* (Boeck, 1872)

(Figs. 14-16)

Euchaeta armata Boeck, 1872: 39; Giesbrecht, 1892: 301. *Aetideopsis armata*: Park, 1975a: 276, figs 3-4; Brenning, 1983: 2, 1985: 29; Roe, 1984: 356.

Chiridius armatus: Sars, 1901: 27, pl. 15, 16, 1903: 161, 1925: 45; With, 1915: 77, fig. 17, pl. 2, fig. 3; Farran, 1926: 247; Jespersen, 1934: 55; Rose, 1937: 165; Lys-holm, Nordgaard & Wiborg, 1945: 11; Wilson, 1950: 189, pl. 22, fig. 310; Matthews, 1964: 6; figs 2, 4-6;

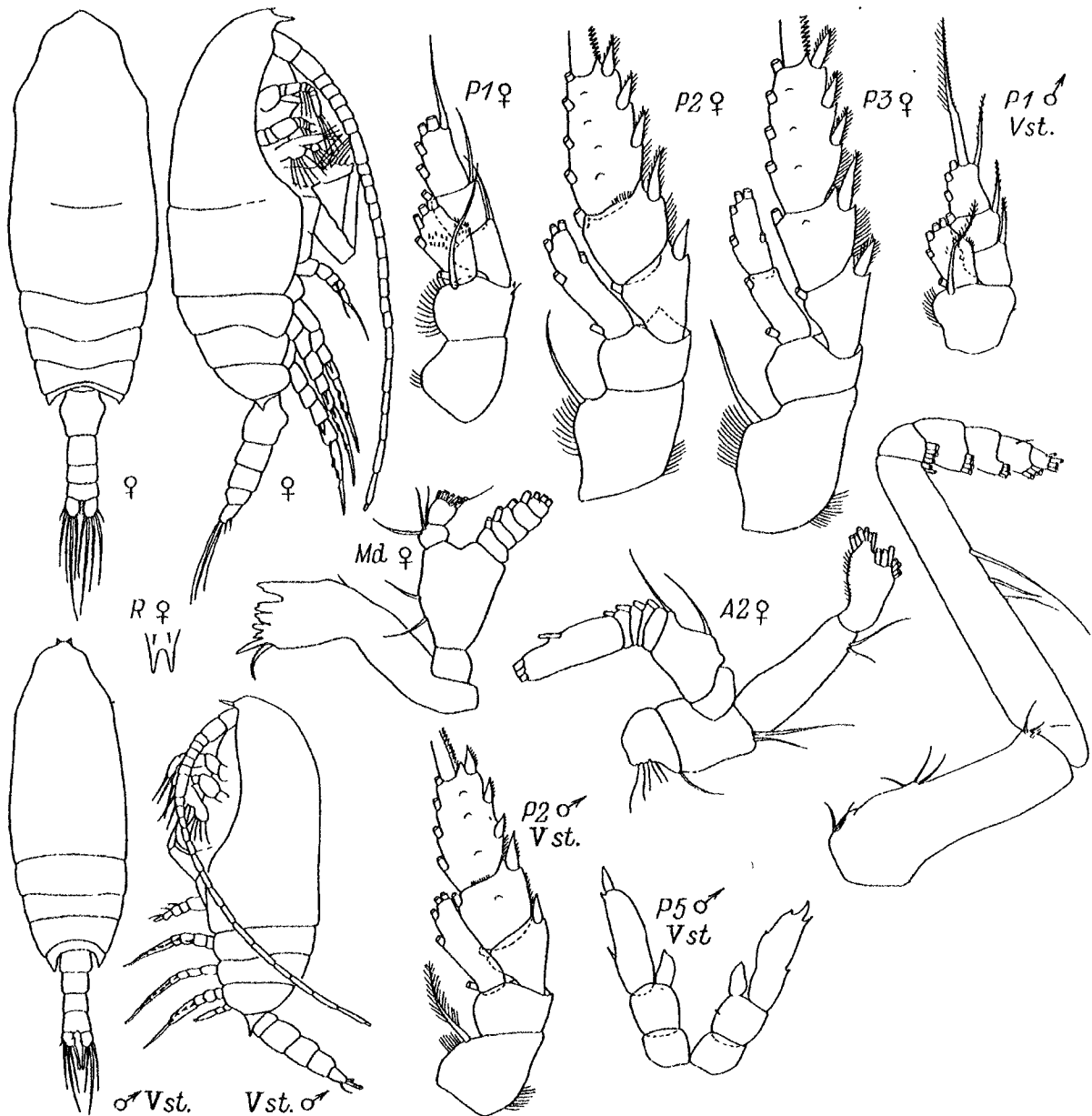


Fig. 13. *Aetideopsis albatrossae*. Female & male (from Shih & Maclellan, 1981).

Tanaka & Omori, 1970a: 114, fig. 2; Bjornberg, 1973: 322.

Pseudaetideus armatus Wolfenden, 1904: 111, 115, pl. 9, fig. 29-31; van Breemen, 1908: 32, fig. 34; Brodsky, 1950: 154, fig. 70; Brodsky & Nikitin, 1955: 416; Vervoort, 1952c (sheet 44): 3, fig. 4, 1963: 125.

Description. Female. Total length 3.28-4.50 mm. Cephalothorax 3.0-3.8 times longer than abdomen. Crest absent. Rostrum very small, smaller than in other species of the genus, rami spaced closer to each other. Th5 points reaching or exceeding the

middle length of genital segment (dorsal view). A1 exceeding posterior border of Abd2. Re A2 without medial seta (Tanaka & Omori (1970a) mentioned such seta in their specimens). Ri2 Md with 10 (8 terminal and 2 posterior) setae. Mxp protopodite without projection. Re1 and Re2 P1 with external spines reaching or slightly exceeding base of next spine. P2 with incomplete separation of Ri joints. Re3 P2 external spines short, not reaching base of following spine. Terminal spines of Re3 P2 with 32 denticles. P3-P4 with 3-jointed rami.

Male. (Description after Sars (1903) and Park

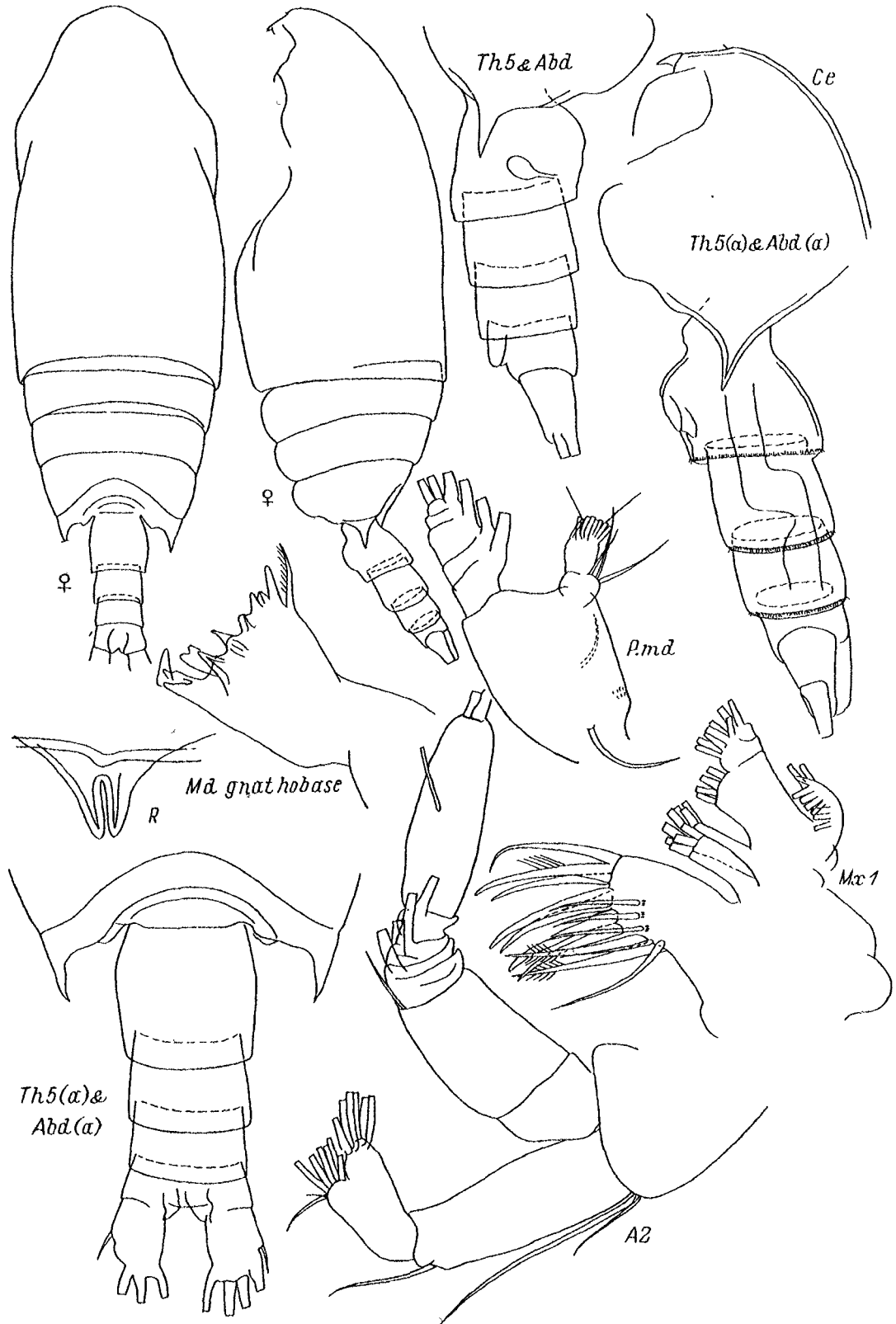


Fig. 14. *Aetideopsis armata*. Female: Th5(a) & Abd(a) (442), other figures (361).

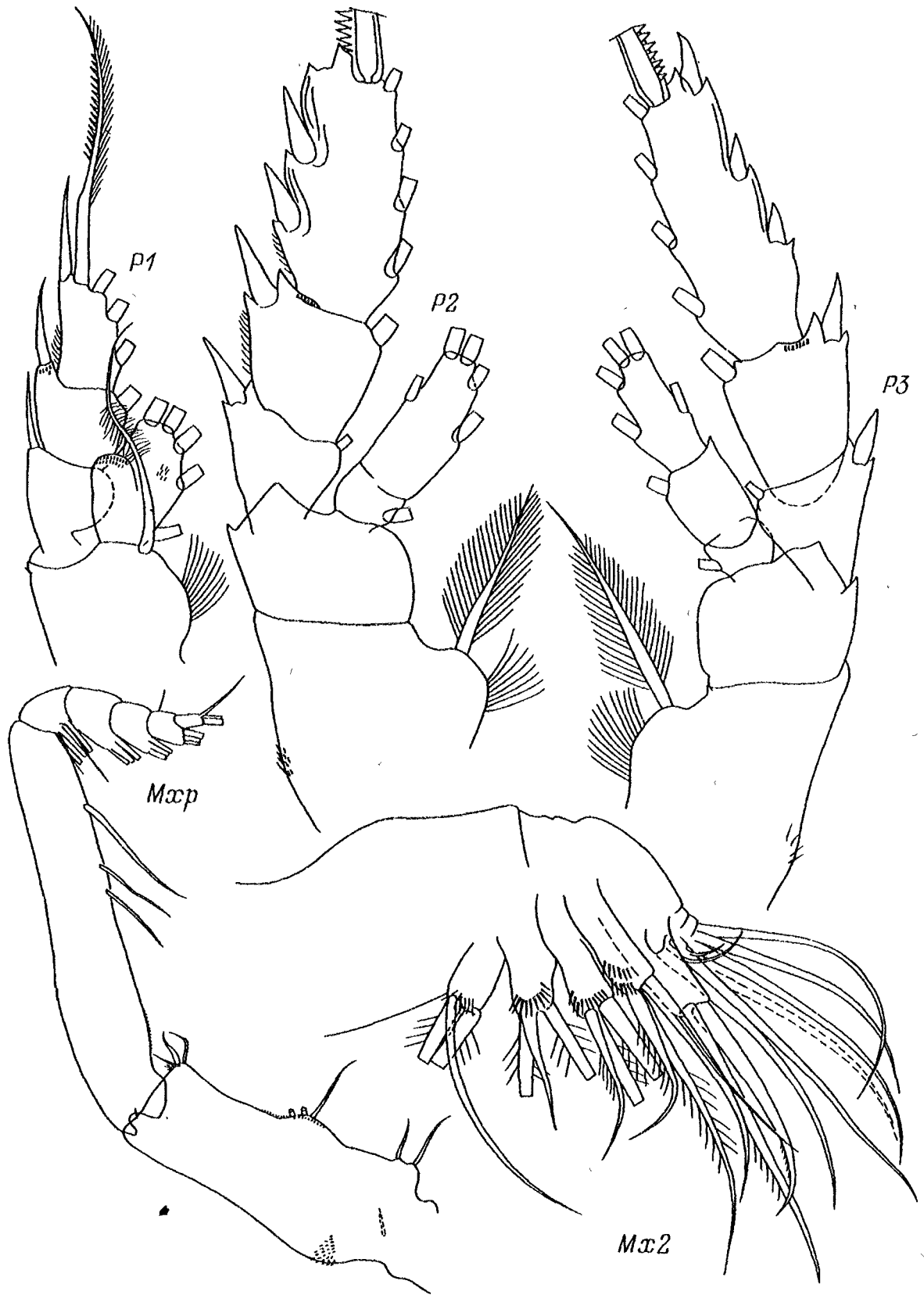


Fig. 15. *Aetideopsis armata*. Female (361).

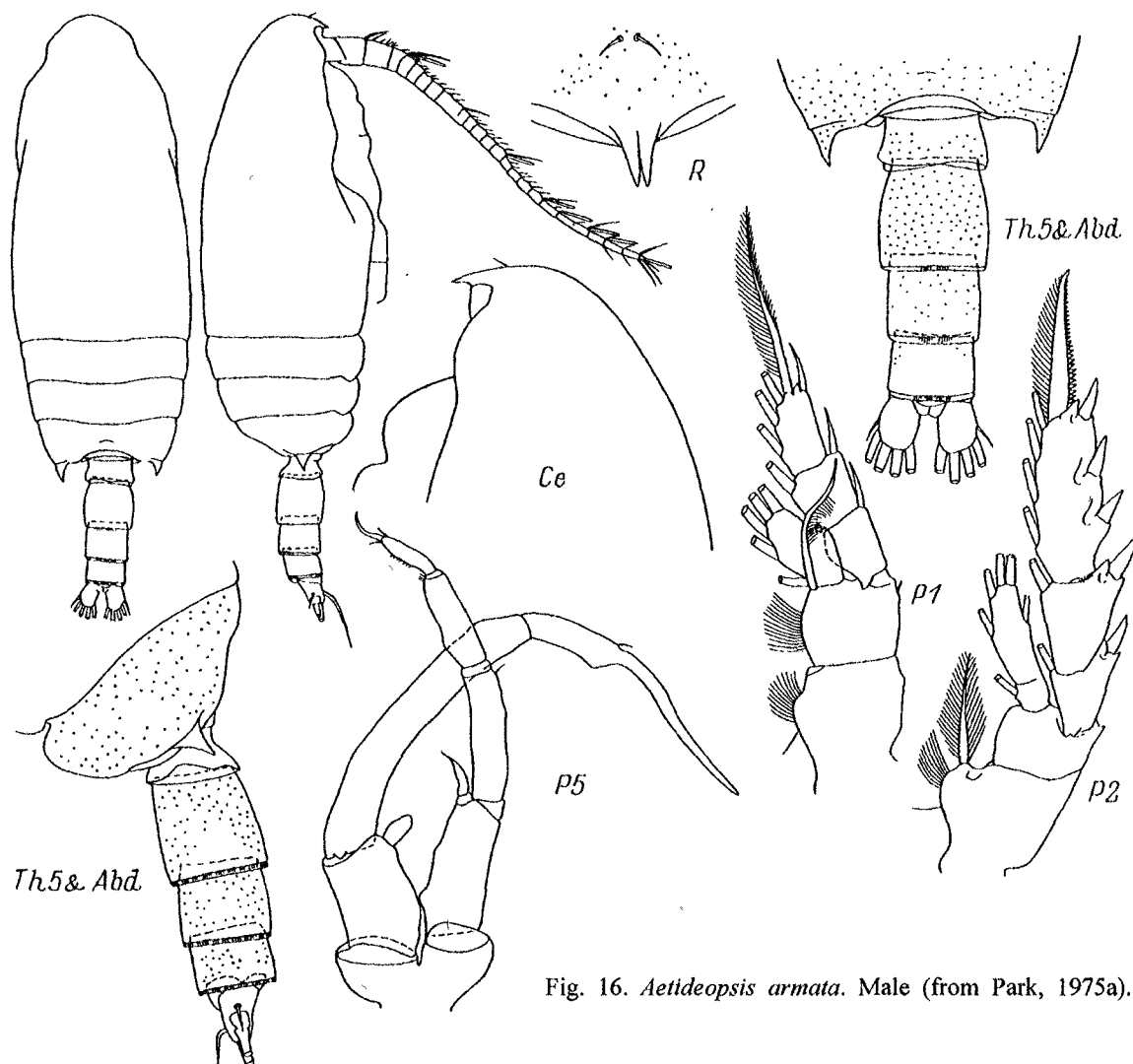


Fig. 16. *Aetideopsis armata*. Male (from Park, 1975a).

(1975a) with modifications). Total length 3.28-4.0 mm. Rostrum, segmentation of body as in female. Points of Th5 slightly not reaching posterior border of Abd1. A1 reaching Th3. Comparing with female oral parts rudimentary. P1-P4 as in female, with only external Re P1 spines shorter. P5 typical of the genus with small terminal spine and 2 thin little spines apically at left Re3.

Type locality: the western coast of Norway.

Geographical distribution. Atlantic Ocean: widespread in the northern part; noted to the North up to 75°N in the Baffin Bay (Jespersen, 1934) and in the Barents Sea (Vervoort, 1952c); to the South down to the Gulf of Guinea (Vervoort, 1963); also found in the Gulf of Mexico and the Caribbean Sea (Park, 1970, 1975a), in the Mediterranean and Adriatic seas (Rose, 1937); not found to the South of the Equator in Atlantic. Pacific Ocean: of rare occurrence. The northernmost finding in the north-western part is the Izu region (Tanaka & Omori, 1970a),

the southernmost: the region of 36°S in the eastern part (original data), also recorded from the tropical part (Wilson, 1950). Indian Ocean: for the first time recorded in the north-western part (original data). K.A. Brodsky recorded *A. armata* (= *P. armatus*) off the central part of the Arctic Ocean: of 78°N 166-168°W (Brodsky, 1950; Brodsky & Nikitin, 1955), however during later examination this species was not found in the collection.

Vertical distribution. The species was found in samples collected from meso- and bathypelagial (Farran, 1908; Jespersen, 1934; Lyscholm, Nordgaard & Wiborg, 1945; Park, 1975a; Roe, 1984), at the depth of 240 m in near bottom layers (Matthews, 1964); also found in epipelagial (Wilson, 1950; Vervoort, 1963). Recorded in total hauls from depths above 3000 m (Sars, 1925, etc.)

Material: 5 females from samples: 361, 368, 403, 441-442.

3. *Aetideopsis carinata* Bradford, 1969

(Figs. 17-18)

Aetideopsis carinata Bradford, 1969a: 81, figs 29-53; Roe, 1975: 306, fig. 5; Vives, 1982: 291; Brenning, 1983: 2, 1985: 29.

Description. *F e m a l e.* Total length 2.66-2.96 mm. Cephalothorax about 3.3 times longer than abdomen. Anterior part of cephalon acute-angled (dorsal view) and obtuse-angled (lateral view). Rostrum with widely spaced and strongly divergent rami. Posterior Th5 corners wing-like, strongly divergent (dorsal view). Points of Th5 posterior corners reaching nearly the midlength of genital segment. Anterior half of genital segment with lateral swellings (dorsal view) and well developed ventral swelling (lateral view). A1 reaching Th3-Th4. A2 setation typical of the genus. Re2 A2 with medial seta. Md palp base with 2 setae (Bradford (1969a) noted 1). Ri1 Md with 2 setae and Ri2 with 9 (7 terminal and 2 posterior setae). Proximal part of Mxp protopodite with external projection. Re1 and Re2 P1 with external spines exceeding the base of following spine. Ri P2 1-jointed and Re P2 3-jointed; Re terminal spine with 26 denticles. P3 with 2-jointed Ri and 3-jointed Re, terminal spine with 29 denticles (Bradford, 1969a). P4 with 3-jointed rami; terminal spine with 30 denticles (Bradford, 1969a).

M a l e. (Description after Bradford (1969a) with modifications). Total length 2.4 mm. Cephalothorax 2.7 times longer than abdomen. Th4-Th5 partly fused. Points of Th5 posterior corners reaching posterior border of Abd1, not divergent. A1 exceeding beyond Th3, 23-jointed. In comparison with female, oral parts rudimentary. Segmentation of P1-P2 as in female, but external spines of Re significantly shorter. P3-P4 with 3-jointed rami; Re3 terminal spines with 30 and 33 denticles respectively. P5 typical of the genus. Left Re2 P5 with 2 thin spines arranged distally.

Type locality: 21°09'S 12°44'E.

Geographical distribution. Atlantic Ocean: the south-eastern part (18°N 25°W and 28°N 14°W) after Roe (1975); tropical part: region of the Canary Islands (Vives, 1982; Brenning, 1983, 1985).

Vertical distribution. The species was found in vertical hauls of mesopelagial (Roe, 1975) and in total tow from 300 m (Bradford, 1969a).

Material: 5 females, from sample 573.

4. *Aetideopsis cristata* Tanaka, 1957

(Fig. 19)

Aetideopsis cristata Tanaka, 1957: 42, fig. 28 (a-m).

Description. *F e m a l e.* (Description after Tanaka (1957a) with modifications). Total length 3.84 mm.

Cephalothorax 3.26 times longer than abdomen. Points of Th5 posterior corners reaching posterior one-third of genital segment length. Body surface with chitinous thickenings. Rostrum with robust widely spaced rami. Crest begins from rostrum (lateral view), covering the first one-third of cephalon length (dorsal view). A1 reaching Abd3 posterior border. Mx2 and Mxp similar to those in *A. rostrata*. Re1 and Re2 P1 external spines short, not reaching the midlength of next joint; Ri with small external lobe. Ri1 and Ri2 P1 incompletely separated. Re3 P2-P4 terminal spines with 27, 30 and 40 denticles respectively.

M a l e. (Description after Tanaka (1957a) with modifications). Total length 3.25 mm. Cephalothorax 2.7 times longer than abdomen. Th4 and Th5 incompletely separated. Points of Th5 corners exceeding posterior Abd1 border. Body surface with chitinous thickenings. Rostrum with wide base, rami divergent. A1 exceeding posterior Th2 border. Ri A2 as long as Re A2; the same refers to Ri and Re Md. Mx1 second and third internal lobes with 2(?) setae; protopodite near the Ri base with 4 setae; Ri with 10 setae; external lobe with 9 setae. Mx2 highly reduced. Ri1 Mxp slightly longer than protopodite. P1-P4 similar to those in female. Re3 P2-P4 terminal spines with 31, 34 and 36 denticles respectively. P5 similar to *A. armata* figured by Sars.

Type locality: the Izu region, Sagami Bay.

Geographical distribution. The species is known from the Izu region only (Tanaka, 1957a).

Vertical distribution. The species was found in vertical total tow from 1000 m (Tanaka, 1957a).

The species is not examined by me.

5. *Aetideopsis minor* (Wolfenden, 1911)

(Figs. 20-21)

Faroella minor Wolfenden, 1911: 214.

Chiridius minor: Farran, 1929: 230.

Aetideopsis minor: Vervoort, 1951: 72, fig. 40, 1957: 52, fig. 8; Bradford, 1971b: 18, fig. 30; Park, 1978: 115, figs 8-9.

Chiridius modestus With, 1915: 82, fig. 19 (a-c), pl. 2, fig. 5 (syn.n.).

Aetideopsis modesta: Bradford, 1969a: 13; Bradford & Jillett, 1980: 19; Park, 1978: 111; Shih & Maclellan, 1981: 567.

Aetideopsis multiserrata (non Wolfenden, 1904): Brodsky, 1950: 146, fig. 62; Markhaseva, 1984: 512.

Description. *F e m a l e.* Total length 2.87-3.90 mm. Cephalothorax 2.7 times longer than abdomen. Rostrum with variously diverging rami. Cephalon with faintly developed crest arranged at A2 level. Points of Th5 posterior corners slightly shorter the midlength, or exceeding the midlength of genital segment (dorsal view). A1 reaching Abd2. Re2 A2 with medial seta. Ri1 Md with 3; Ri2 Md with 10 setae (9 terminal and 1 posterior). Mxp protopodite

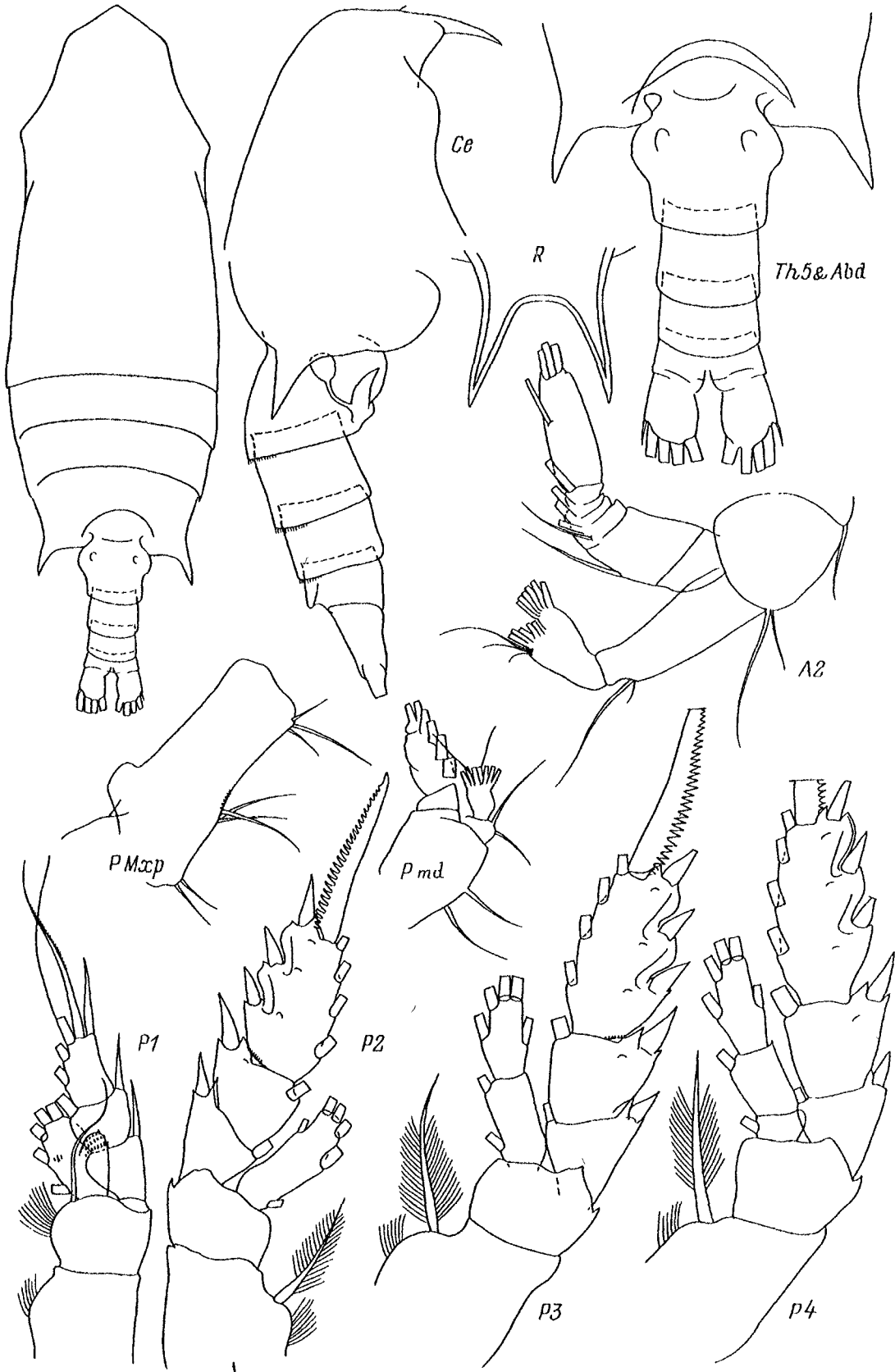


Fig. 17. *Aetideopsis carinata*. Female (573).

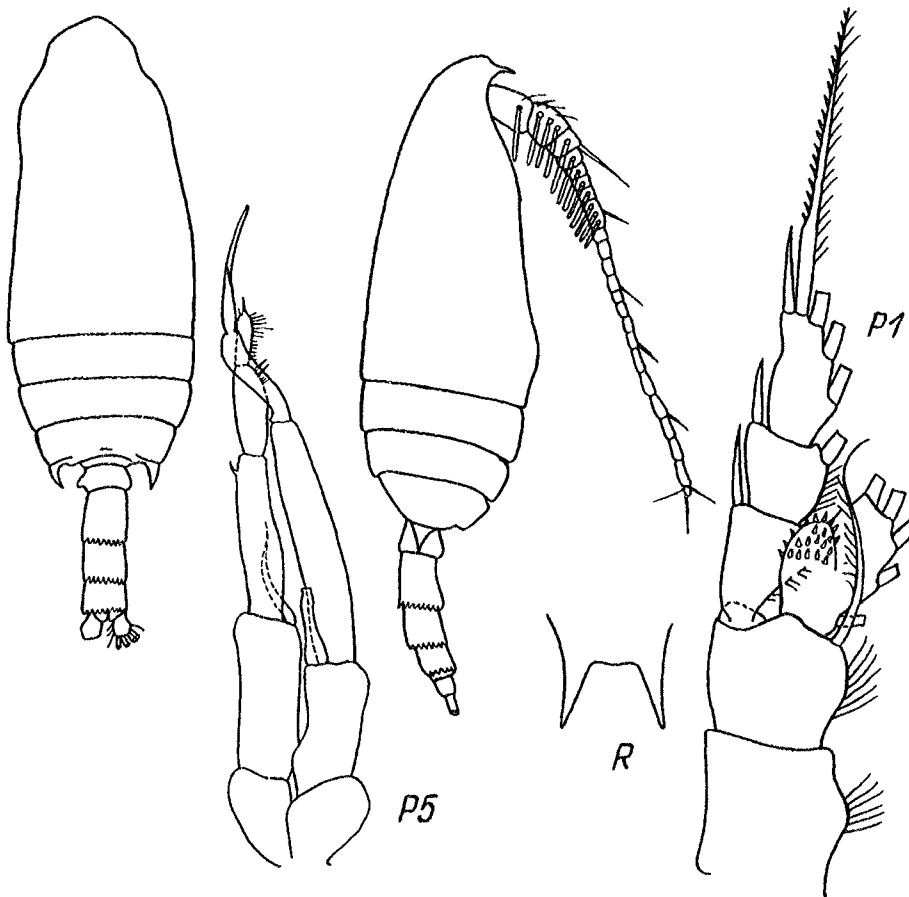


Fig. 18. *Aetideopsis carinata*. Male (from Bradford, 1969a).

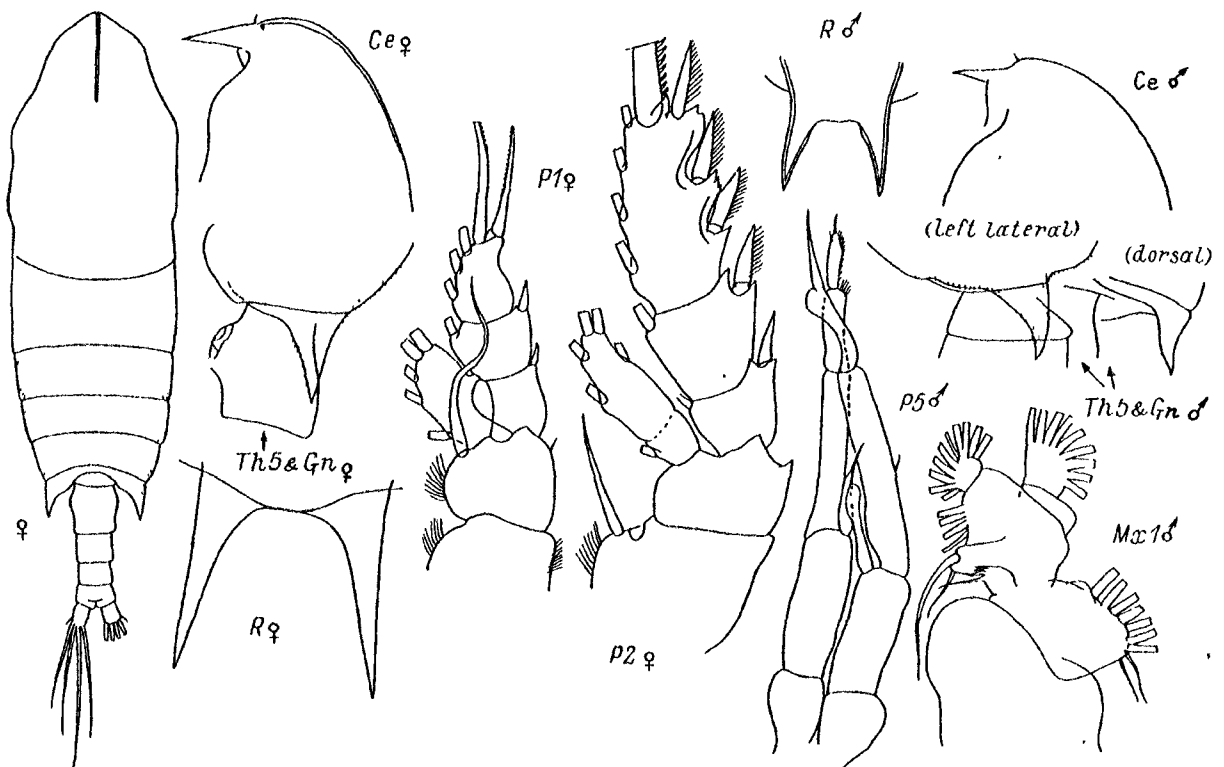


Fig. 19. *Aetideopsis cristata*. Female, male (from Tanaka, 1957a).

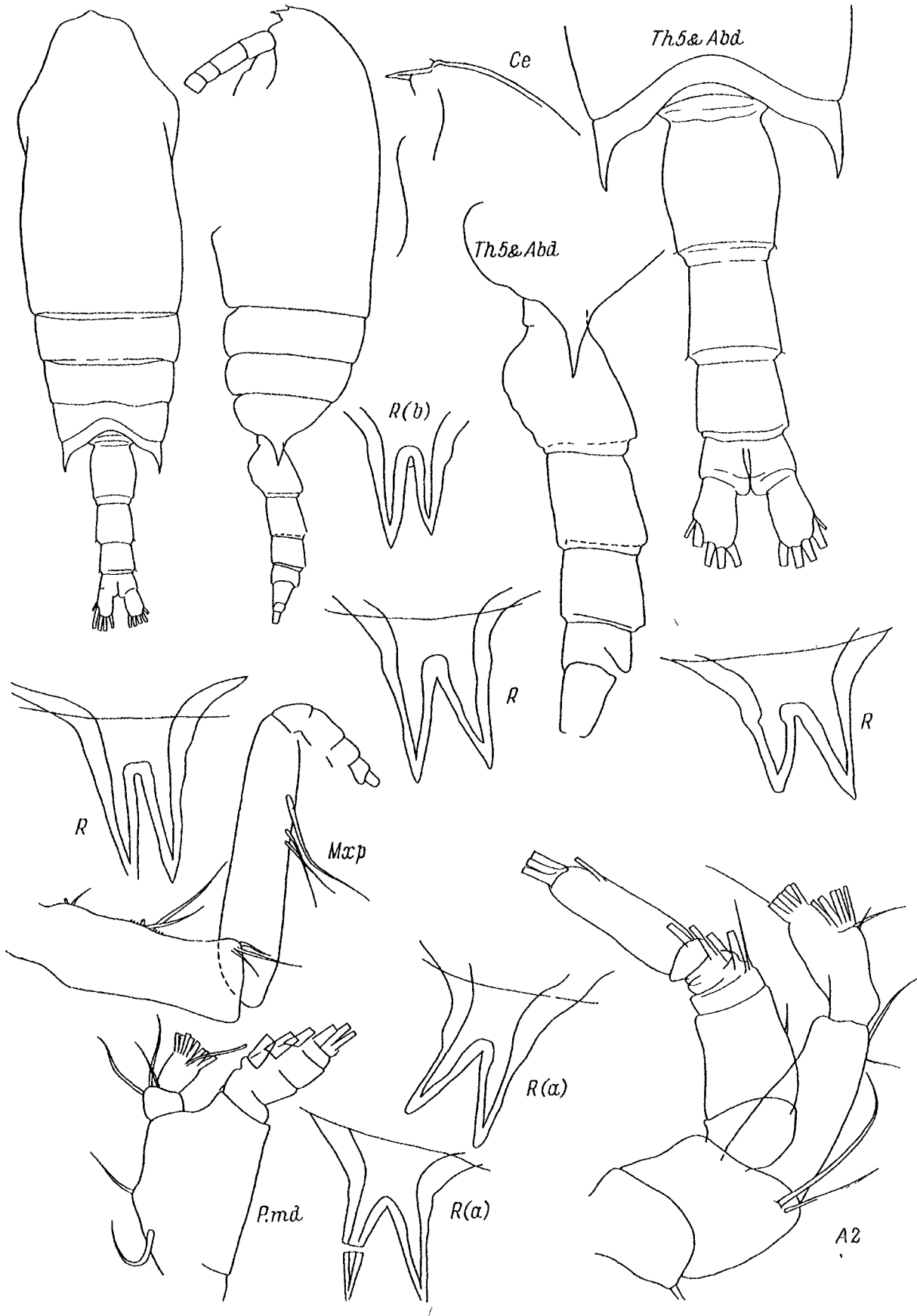


Fig 20 *Aetideopsis minor* Female R(a) (302), R(b) (542), other figures (467)

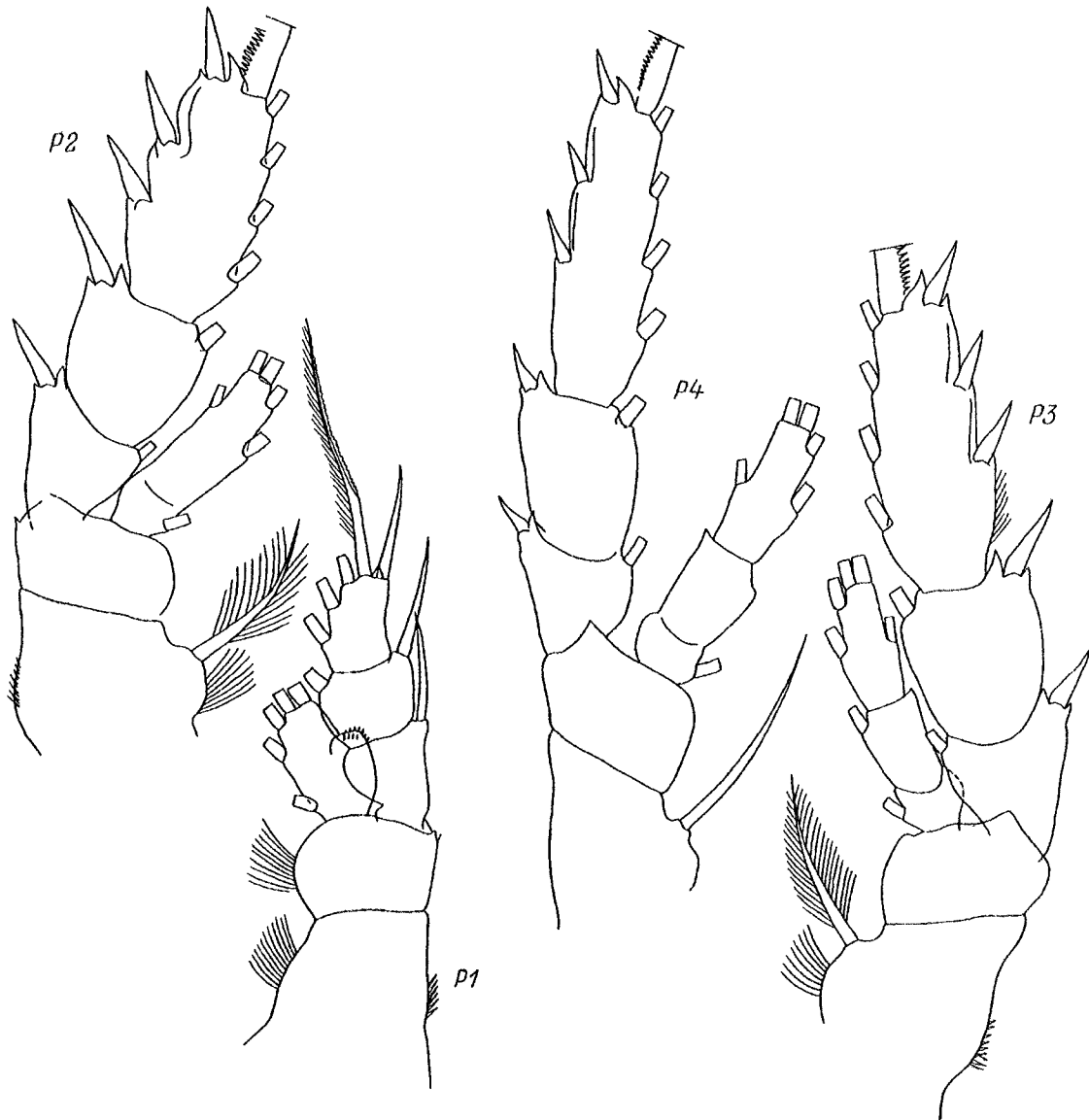


Fig. 21. *Aetideopsis minor*. Female (467).

without projection. Ri P1 with well developed external lobe. Re1-Re2 P1 external spines long, usually exceeding the base of next joint by one third of their length. Ri P2 sometimes incompletely 2-jointed; segmentation of other limbs typical of the genus. The anterior surface of Ri P2-P4 sometimes with minute denticles (after Wolfenden, 1911).

Notes. *A. minor* was described briefly, without figures (Wolfenden, 1911). Later the species was redescribed (Vervoort, 1951; Park, 1978; Bradford, 1971b; Bradford & Jillett, 1980), and considered to be distributed in the Antarctic. Thus, nobody had compared *A. minor* Wolfenden with *A. modesta* (= *Chiridius modestus* With, 1915) from the North Atlantic. During my examination of *Aetideopsis* spe-

cimens from the Arctic Ocean, *A. modesta* (= *Ch. modestus*) was accepted identical to *A. minor* Wolfenden and considered its junior synonym. Features, earlier proposed as distinguishing (shape of rostrum, the degree of rostral rami divergence, length of Th5 points, length of Re3 P2 external spines) proved rather variable (even in specimens from the same sample), and should be considered intraspecific variability.

Male unknown.

Type locality. to the South of 60°S, in region of 85°W.

Geographical distribution. Atlantic Ocean: to the south of northern part to 61°N (With, 1915); the Greenland Sea (original data). Arctic Ocean: the central part. Circumpolar in Antarctic (Wolfenden, 1911;

Farran, 1929; Vervoort, 1951, 1957; Bradford, 1971b; Park, 1978): the northernmost records: 47°43'S (Vervoort, 1957), 50°25'S and 58°58'S (original data). Species may be characterized as bipolar.

Vertical distribution. In high latitudes of the Antarctic the species is found in epipelagic layers (0-100 m) at temperature 0.9° C and -1.4-1.6° C (Vervoort, 1951); the species was also found in hauls from meso-bathypelagial (Vervoort, 1957). In the northern hemisphere the species is known from bathypelagic layers of the Greenland Sea: 1000-3000 and 2000-2800 m and from mesopelagial of the central part of the Arctic Ocean (original data).

Material: 20 females from samples 269, 302, 337-338, 379, 405, 429, 434, 466-467, 491, 511, 523, 542.

6. *Aetideopsis multiserrata* (Wolfenden, 1904)

(Figs. 22-23)

Faroella multiserrata Wolfenden, 1904: 117, pl. 9, figs 26-28; Farran, 1908: 29.

Aetideopsis multiserrata: Sars, 1924-25: 43, pl. 14, figs 4-8; Rose, 1933: 91, fig. 54; Jespersen, 1934: 373; Vervoort, 1952a (sheet 42): 3, fig. 4, 1963: 123; Tanaka, 1957a: 37, fig. 26; Grice & Hulsemann, 1965: 231; Tanaka & Omori, 1970a: 111; Bjornberg, 1973: 322; Park, 1975a: 274, figs 1-2, 1978: 111, figs 6-7; Bradford & Jillett, 1980: 19.

Chiridius multiserratus: Farran, 1926: 248.

Aetideopsis pacifica Esterly, 1911: 315, pl. 28, fig. 24, 25, 30, pl. 31, fig. 86, 103; pl. 32, fig. 113 (syn n.).

Chiridius nasutus With, 1915: 81, text-fig. 18, pl. 2, fig. 4.

Aetideopsis nasuta: Bradford, 1969a: 73; Park, 1978: 111; Shih & Maclellan, 1981: 567.

Aetideopsis rostrata (non Sars, 1903): A Scott, 1909: 40, pl. 5, figs 13-24.

non *Aetideopsis multiserrata*: Brodsky, 1950: 146, fig. 62; Markhaseva, 1984: 512.

Description. Female. Total length 2.52-3.54 mm. Cephalothorax 3.2-3.8 times longer than abdomen. Crest poorly developed, situated at the level of A2. Rostral rami divergent (with varying degree of divergence in different specimens). The species differs well by abrupt line of cephalon in front of rostrum (lateral view). Points of Th5 posterior corners reaching, or not reaching the midlength of genital segment (dorsal view). Position of distal part of spermatheca varying (it is elevated to a different degree in different specimens, and not always globe-shaped). A1 reaching Abd2-3. Re2 A2 without medial seta. Ri2 Md with 10 setae. Mxp protopodite without projection. Re1 and Re2 P1 external spines reaching the base of next spine or exceeding it. Ri P2 joints incompletely separated. Segmentation of P3-P4 typical of the genus.

Male. Total length 2.70-3.25 mm. Cephalothorax 2.5-2.7 times longer than abdomen. Rostrum

with closely spaced no diverging rami. Points of Th5 posterior corners exceeding posterior border of genital segment (dorsal view). A1 not reaching Th4. Comparing to female oral parts rudimentary. Ri1 Md with 3 setae; base of Md palp without seta. First and second internal lobes of Mx1 without seta; third internal lobe with 2 setae; protopodite near the Ri base with 3 setae; Ri with 10, Re with 9 (?) setae; external lobe with 6 setae. Mxp protopodite with 1 medial and 2 distal setae. Ri1 Mxp with 3 medial setae. Distal joint of left Re P5 with terminal spine and minute spine near its apex.

Notes. *A. multiserrata* is well distinguished from the other species of *Aetideopsis* by typical shape of anterior part of cephalon in front of rostrum (lateral view). *A. pacifica* Esterly, 1911 is considered here identical to *A. multiserrata* due to identical shape of anterior part of cephalon. *A. multiserrata* was recorded earlier in the Arctic Ocean (Brodsky, 1950; Minoda, 1967; Vidal, 1971; Markhaseva, 1984), but according to the figures (Brodsky, 1950; Vidal, 1971) and the examined original material from the Arctic Ocean, it is *A. minor* and not *A. multiserrata* that was found to occur there. Thus the previous recordings of *A. multiserrata* in the Arctic Ocean are doubtful. Male described here differs from the earlier described (Tanaka, 1957a; Park, 1975a) in some details: structure of rostrum (lateral view), length of Th5 points and details of setation of oral parts.

Type locality: the North Atlantic.

Geographical distribution. Atlantic Ocean: widespread in the northern hemisphere; the northernmost localities 61°N (With, 1915) and the Strait of Davis about 62°N (Jespersen, 1934). The southernmost locality is the Gulf of Guinea (Vervoort, 1963). Recorded from the Gulf of Mexico (Park, 1975a); the Bay of Biscay (Farran, 1926). Pacific Ocean: in the western and eastern parts; in north-western part up to the Bering Sea (Motoda & Minoda, 1974); in south-eastern part to 66°19'S (original data).

Vertical distribution. The species was found in hauls in meso- more often in bathypelagial (Wolfenden, 1904; With, 1915; Grice & Hulsemann, 1965; Park, 1975a; Deevey & Brooks, 1977), in the Kurile-Kamchatka Trench at depth ranging between 200-3000 m, most probable between 1000 and 2000 m. Mesobathypelagic species.

Material: 22 females and 1 male from samples: 1, 119, 124, 127-128, 140, 145, 171-172, 174, 191, 202, 267, 274, 343, 370, 426, 447, 449, 451, 456.

7. *Aetideopsis retusa* Grice & Hulsemann, 1967

(Figs. 24-25)

Aetideopsis retusa Grice & Hulsemann, 1967: 22, figs 39-45; Wheeler, 1970: 8.

Description. Female. Total length 1.96-2.80

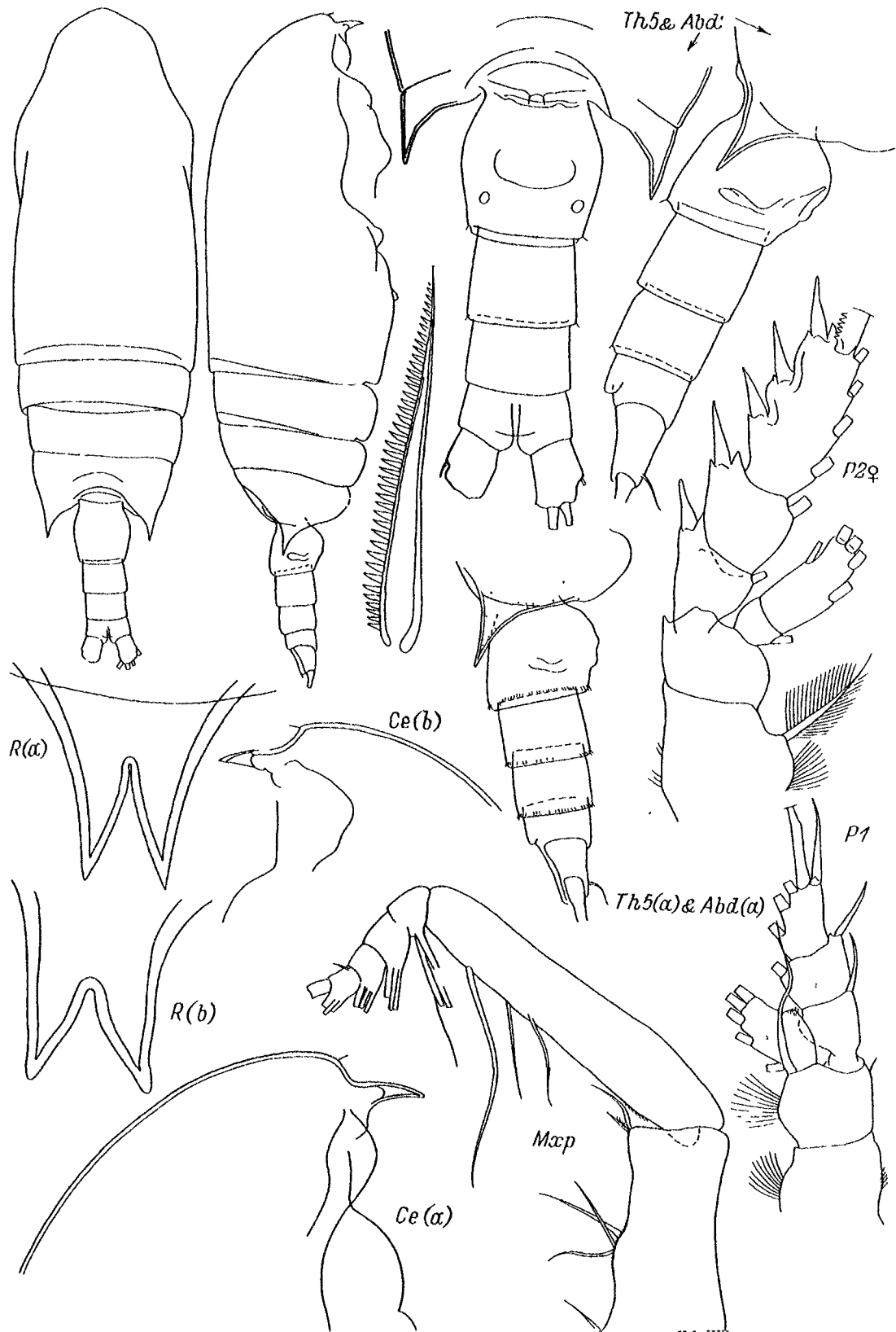


Fig. 22. *Aetideosis multiserrata*. Female: Ce (a), R (a), Th5(a) & Abd(a) (145), Ce(b), R(b) (456), other figures (172).

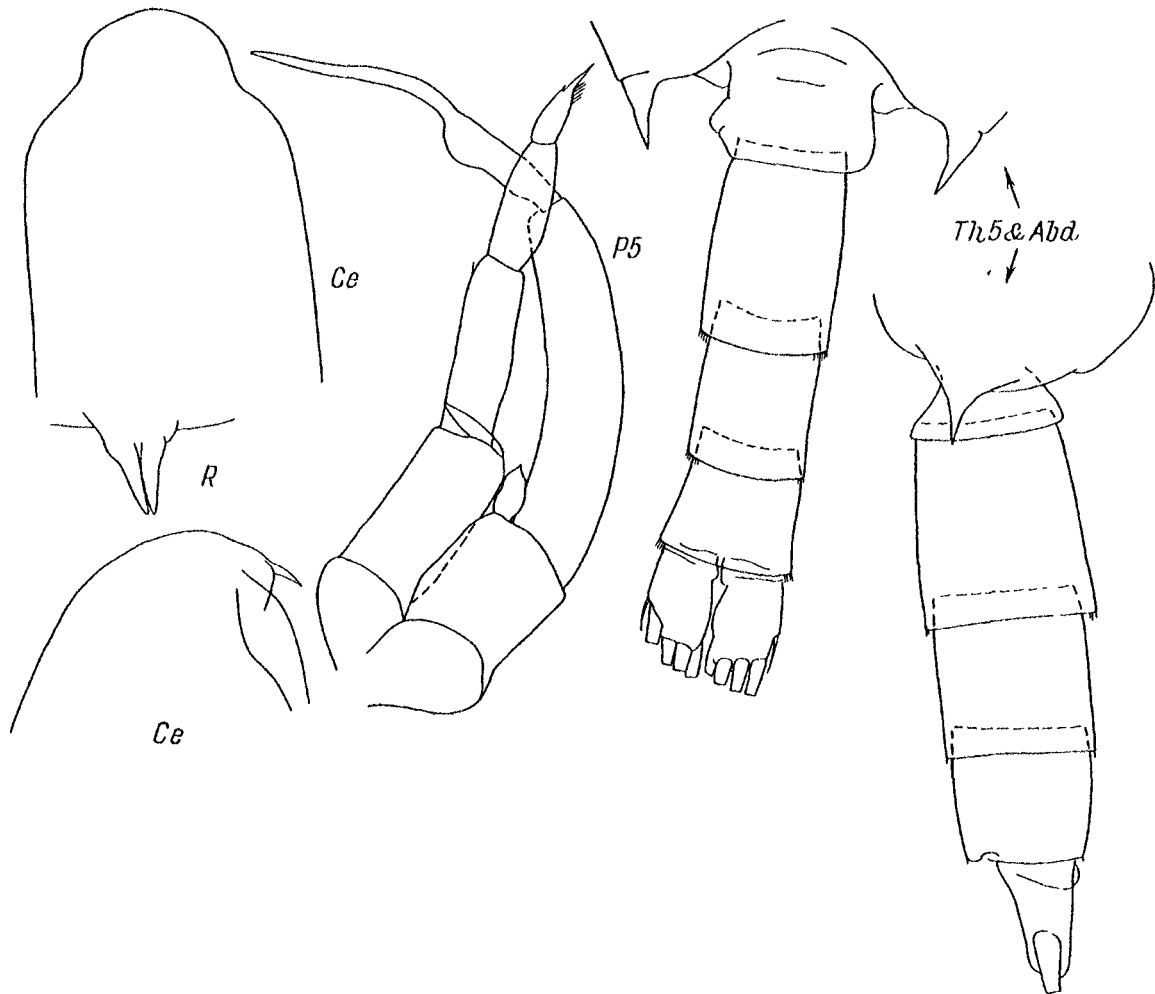


Fig. 23. *Aetideopsis multiserrata*. Male (171).

mm. Cephalothorax 3.2-3.7 times longer than abdomen. Rostrum with robust, divergent, widely spaced rami. Crest absent. Points of Th5 posterior corners reaching the midlength of genital segment (dorsal view). Distal part of spermatheca rounded, medial part rather narrowed. A1 about as long as body, sometimes slightly longer. Re1 A2 without setae; Re2 A2 with 2 setae; Ri1 A2 with 2 setae. Ri2 Md with 9 (8 terminal and 1 posterior) setae. Proximal part of Mxp protopodite with slender projection covered with spinules. Re1 and Re2 P1 with external spines exceeding the base of next spine. P2 with incompletely separated Ri1 and Ri2. P3-P4 with 3-jointed rami.

M a l e. Total length 2.25-2.70 mm. Cephalothorax 2.7-2.8 times longer than abdomen. A1 23-jointed, reaching Th4 (?). Rostral rami spaced closer than in female. Points of Th5 posterior corners exceeding posterior border of genital segment (dorsal view). Oral parts reduced in comparison with fe-

males. P1-P4 as in female. P5 virtually not differing from that of *A. rostrata*.

Type locality: 10°07'S 64°27'E.

Geographical distribution. Atlantic Ocean: the north-western part; region of 37°N 69°W (Wheeler, 1970). Pacific Ocean: the regions of the Kurile-Kamchatka and Aleutian Trenchs (original data). Indian Ocean: the north-western part (Grice & Hulsemann, 1967)

Vertical distribution. In the Indian Ocean the species was found in tow 1020-1970 m. In the Kurile-Kamchatka Trench region in hauls between 2000 and 6000 m, more often at depth ranging between 3000-4000 m. In tows 4300-7070 m and 5065-7140 m of Aleutian Trench (original data). Evidently abyssopelagic species, but may be recorded in lower bathypelagial.

Material: 59 females and 8 males from samples: 21, 68, 82-83, 85-86, 97-100, 102, 121-124, 139, 147-149, 163-165, 175-176, 180, 193, 197, 198.

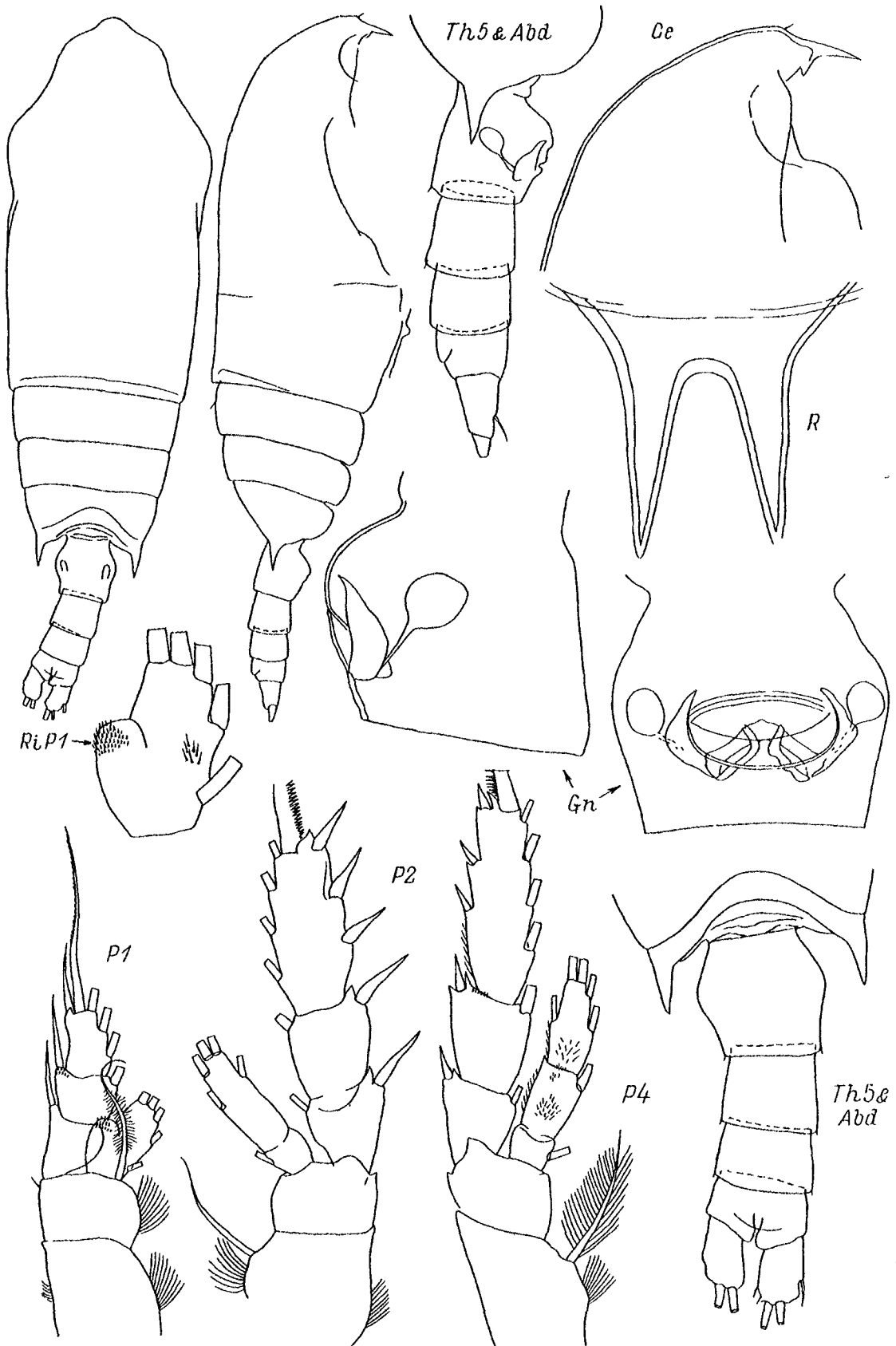


Fig. 24. *Aetideopsis retusa*. Female: general view, Ce, Th5 & Abd, P2 (193), Gn (163), other figures (86).

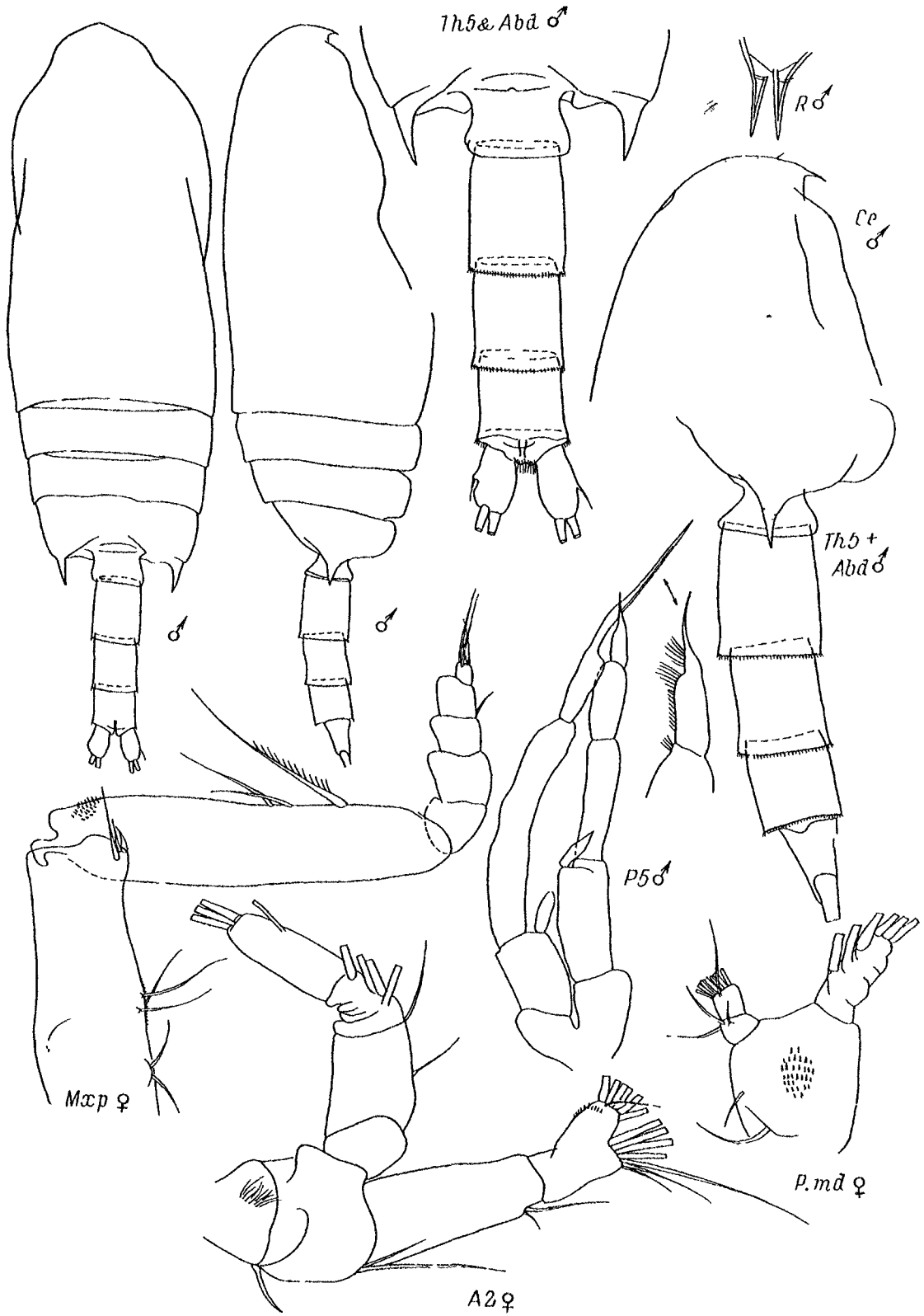


Fig 25. *Aetideopsis retusa* Female (86) Male (164)

8. *Aetideopsis rostrata* Sars, 1903

(Figs. 26-28)

Aetideopsis rostrata Sars, 1903: 160, suppl. 4, 5; With, 1915: 86, text-fig. 22, pl. 2, fig. 6; Rose, 1933: 90, fig. 53; Jespersen, 1934: 52; Brodsky, 1950: 145, fig. 61; Vervoort, 1952a (sheet 42): 3, fig. 3; Brodsky & Nikitin, 1955: 416; Grice & Hulsemann, 1965: 23; Tanaka & Omori, 1970a: 112, fig. 1; Shih & Stallard, 1982: 56, fig. 2.

Aetideopsis divaricata Esterly, 1911: 316, pl. 28, figs 27, 29, 31, 32, pl.31, fig.88, 102 (syn.n.).

Aetideopsis trichecus Vervoort, 1949: 7, figs 2-3 (syn.n.).

Aetideopsis divergens Tanaka, 1957a: 40, fig. 27.

Aetideopsis inflata Park, 1978: 118, figs 11-12 (syn.n.).

Description. Female. Total length 3.80-4.60 mm (3.01-3.14 after Tanaka & Omori (1970a)). Cephalothorax 3-4 times longer than abdomen. Rostrum robust, slightly curved ventrally (lateral view), with robust widely spaced rami. Poorly developed crest arranged at the level of A2 (dorsal and lateral view). Points of Th5 posterior corners reaching or exceeding the midlength of genital segment (dorsal view). A1 reaching the midlength of Abd, or the distal end of Abd3. Re2 A2 with medial seta. Ri2 Md with 10 (8 terminal and 2 posterior) setae. Mx1 and Mx2 typical of the genus. Mxp protopodite with small projection externally. Re1 and Re2 P1 external spines exceeding the base of next spine. Ri P2 segmentation incomplete. Sometimes separation between Ri1 and Ri2 P3-P4 incomplete.

Notes. *A. divaricata* Esterly, 1911, *A. inflata* Park, 1978 and *A. trichecus* Vervoort, 1949 are considered here as synonyms of *A. rostrata* Sars, 1903. I follow the opinion of identity between *A. divergens* and *A. rostrata* (Tanaka and Omori (1970a). Park (1978) established *A. inflata* on the base of shape of genital segment (widest in its anterior part) and total length. The first of the above mentioned features varies in the limits of intraspecific variability examined by us for *A. rostrata*, the same is with respect to specimens length. Park (1978) also recorded the absence of lamelliform projection at Mxp protopodite of *A. inflata*, but this projection varies in the degree of development in *A. rostrata*, and may be visible only at the special position of the joint.

Male. Total length 3.13-4.20 mm. Cephalothorax 3.1 times longer than abdomen. Rostral rami spaced closer than in female, less robust, sometimes slightly asymmetrical. A1 23-jointed, reaching the end of Th3-Th4. Points of Th5 posterior corners exceeding posterior border of genital segment (dorsal view). Comparing to females oral parts rudimentary. P1-P4 as in female. P5 biramous, asymmetrical, typical of the genus.

Notes. In comparison to the description of male *A. rostrata* (Shih & Stallard, 1982), the examined specimens differ in setation of Re2 A2, Mx1, Md (Fig. 28).

Type locality: between Jan Mayen and Finmark.

Geographical distribution. Atlantic Ocean: the north-eastern part (Vervoort, 1952a), southernmost locality is the North Sea (Rose, 1933); the south-western part: 56°25'S-61°51'S (original data). Arctic Ocean: widespread all over the ocean, also in the northern part of the Baffin Bay to about 75°N (Jespersen, 1934; Shih & Stallard, 1982), in the Barents and the Norwegian seas. The record of *A. rostrata* from the Mediterranean Sea (Kovalev & Shmeleva, 1982) is doubtful. Pacific Ocean: in the northern part of the Kurile-Kamchatka and Aleutian Trench (original data), the Izu region (Tanaka & Omori, 1970a); the San-Diego region (Esterly, 1911) as *A. divaricata*; in the southern part as *A. inflata* (Park, 1978).

Vertical distribution. The species was found in vertical hauls taken from mesopelagial (Sars, 1903; Jespersen, 1934; Tanaka & Omori, 1970a). In the Arctic Basin it was found from epi- to bathypelagial, in tow 1000-2700 from the Norwegian Sea (original data). In the Kurile-Kamchatka Trench region it is usually found between 2000 and 4000 m; in haul 2040-3150 m of the Aleutian Trench region (original data). Recorded in haul from 200 m from the Izu region (Tanaka & Omori, 1970a). Assumably bathypelagic, possibly interzonal species. It may be also found outside the limits of bathypelagial.

Material: 75 females and 9 males from samples: 5, 21, 66, 83, 85-86, 95-96, 102, 121, 126-128, 138, 161-163, 175-176, 181, 193, 196, 302, 335, 461, 465-466, 474-475, 486-487, 490, 509, 522, 531, 533, 535-536, 543-545, 547-548, 552, 554, 556-557.

9. *Aetideopsis tumorosa* Bradford, 1969

(Fig. 29)

Aetideopsis tumorosa Bradford, 1969a: 74, figs 1-28; Park, 1978: 118, fig. 10.

Description. Female. Total length 2.50-2.77 mm. Cephalothorax 3-3.5 times longer than abdomen. Rostrum with spaced divergent rami. Points of Th5 posterior corners reaching the last third of genital segment length, slightly divergent (dorsal view). Genital segment with lateral swellings anteriorly (dorsal view). A1 reaching Abd2. Re2 A2 with medial seta. Ri2 Md with 9 seta. Projection at Mxp protopodite absent. Ri P1 without external lobe. External spine at Re1 P1 exceeding the base of next spine; external spine at Re2 P1 exceeding the middle of following joint. Ri P2 with nearly completely fused joints. P3-P4 rami 3-jointed.

Male. (Description after Bradford (1969a) with modifications). Total length 2.40-2.60 mm. Cephalothorax 2.9 times longer than abdomen. Points of Th5 posterior corners reaching the posterior border of genital segment (dorsal view). A1 reaching nearly

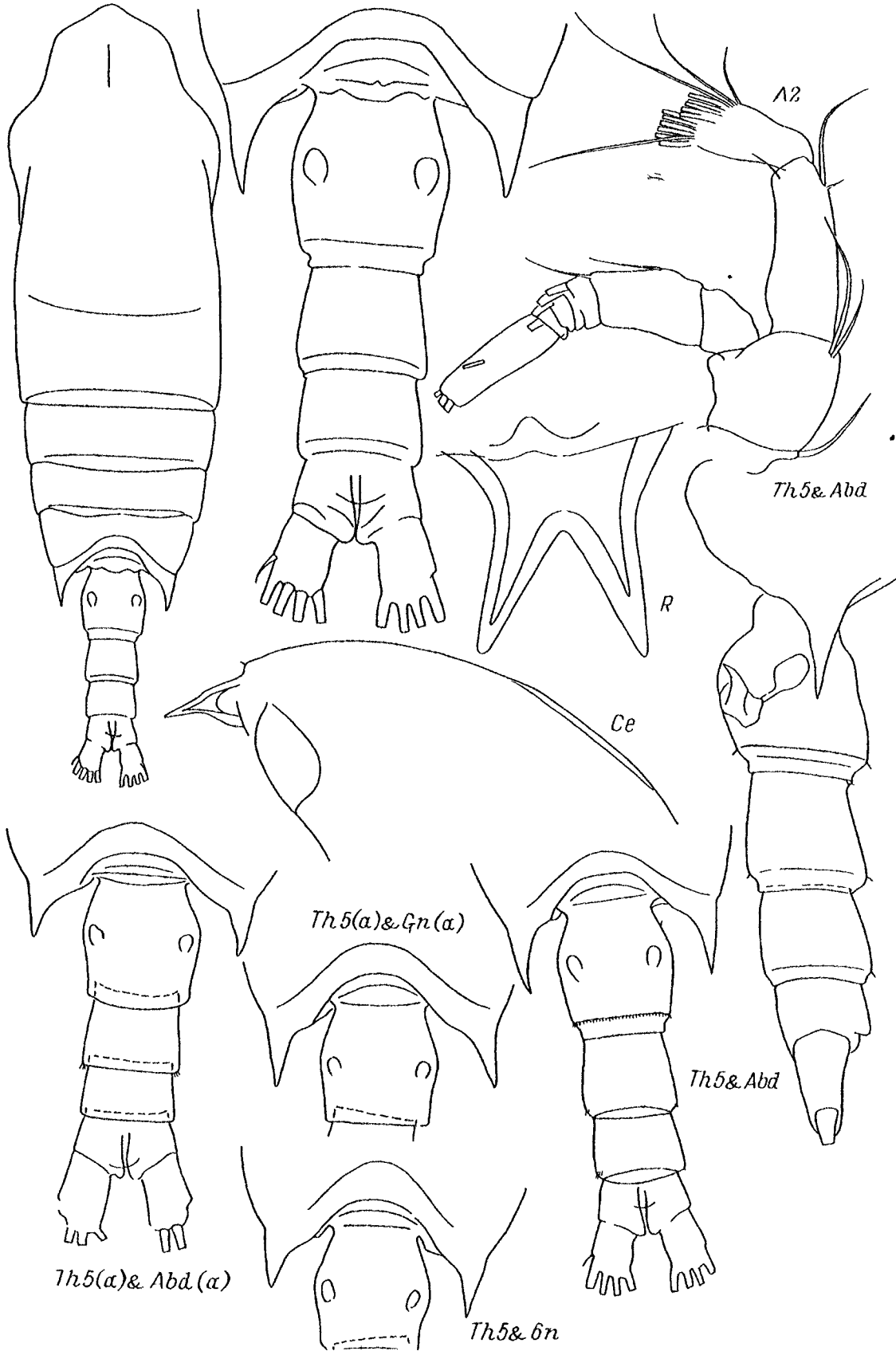


Fig 26 *Aetideopsis rostrata* Female Th5(a) & Abd(a), Th5(a) & Gn(a) (465), other figures (548)

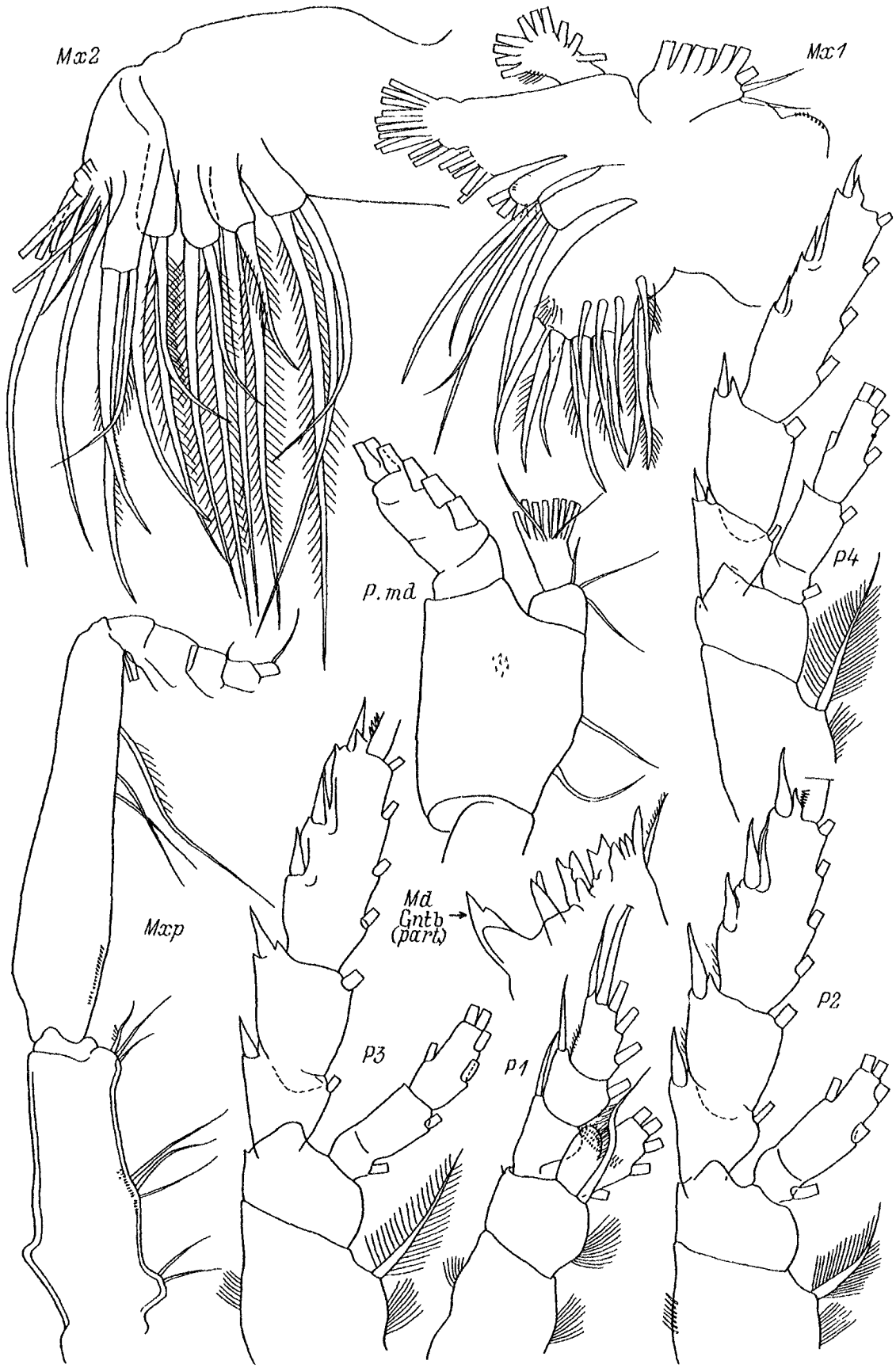


Fig. 27. *Aetideopsis rostrata*. Female (548).

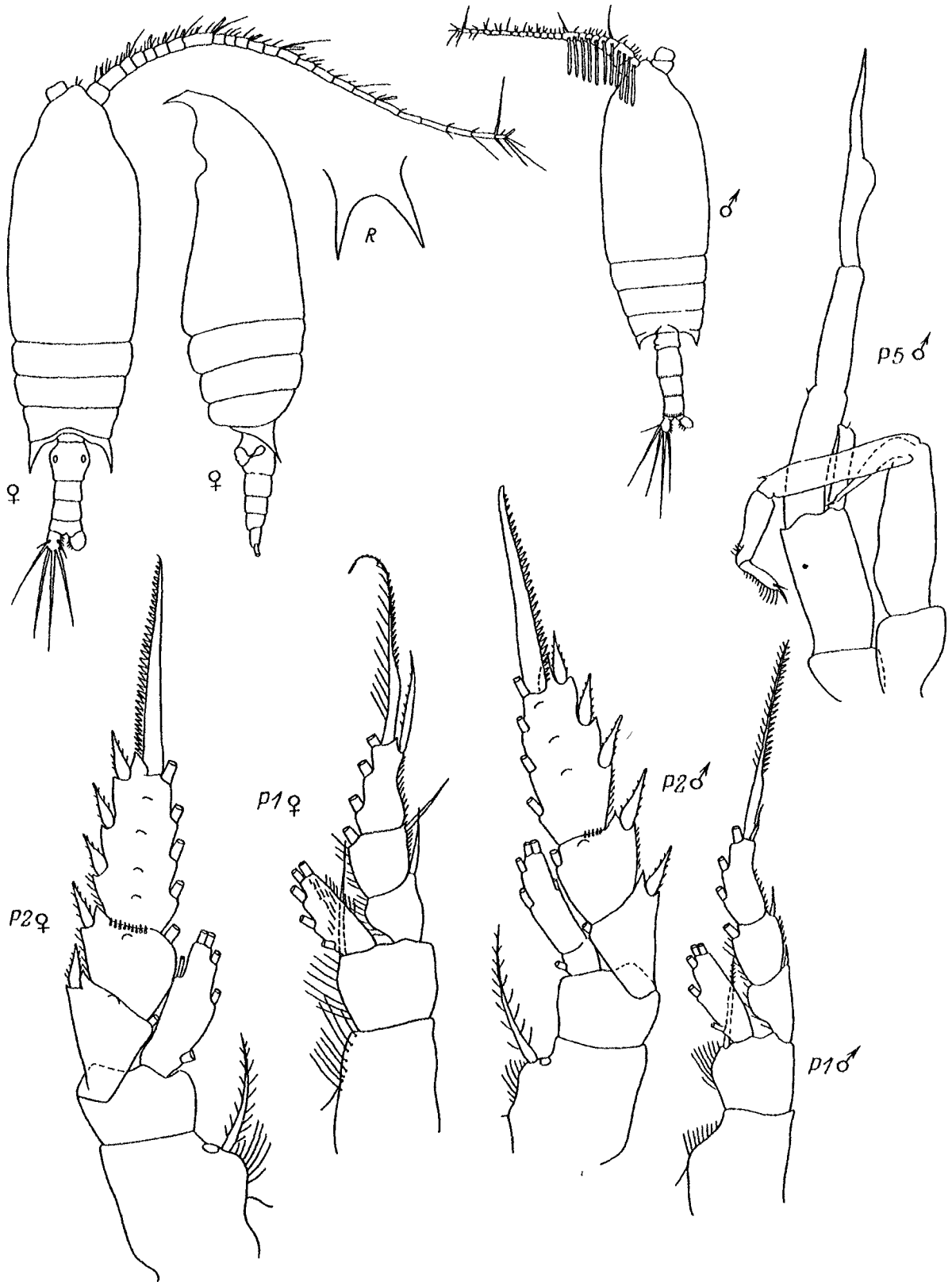


Fig. 29. *Aetideopsis tumorosa*. Female, male (from Bradford, 1969a).

Th2. Oral parts rudimentary compared to female. Ri P1 without external lobe. Re1 and Re2 P1 external spines shorter than in female. Segmentation of Ri P2 better developed than in female. P3-P4 as in female. P5 typical of the genus.

Type locality: 42°26'S 173°52'E.

Geographical distribution. Southern part of the Pacific Ocean: region of 54°S, 119°W (Park, 1978) and region 53-55°S 129-141°W (original data). Found off the New Zealand region (Bradford, 1969a; original data).

Vertical distribution The species was found in total hauls from 200-1500 m and in hauls from 200-500 m (Bradford, 1969a).

Material: 14 females and 5 males from samples: 347, 385, 388, 426, 433.

3. *Azygokeras*

Koeller & Littlepage, 1976.

TYPE SPECIES: *Azygokeras columbiae* Koeller & Littlepage, 1976, by original designation.

Azygokeras Koeller & Littlepage, 1976: 1548

Description. Female. (Description after Koeller & Littlepage (1976) with modifications). Total length 2.58-2.87 mm. Cephalothorax 3.5 times longer than abdomen. Cephalon and Th1 fused, Th4-Th5 separated. Rostrum and crest absent. Th5 posterior corners extending into points not separated from Th5, covering the first one third of genital segment length. Th5 and Abd1 symmetrical. Abd1-Abd3 with minute denticles along posterior border. A1 24-jointed, with numerous setae, annulated in their distal part. Re A2 as long as and Ri A2; coxopodite with 2 setae (instead of 1 in remaining aetideid genera). Basipodite A2 with 2 setae; Ri1 A2 with 2 setae; Ri2 A2 with 14 setae (8 at internal and 6 at external lobe). Re1 A2 without setae; Re2 with 3 setae; Re3-Re6 with 1 seta each; Re7 with 3 terminal setae. Md palp base with 3 setae, Ri1 Md with 2; Ri2 Md with 9 terminal and 1 posterior setae. Re Md typical of Aetideidae, more than 1.5 times longer than Ri. Mx1 gnathobase with 9 claw-like terminal and 2 small setae on the posterior surface, gnathobase surface with minute spinules. Mx1 second and third internal lobes with 4 setae each, protopodite near Ri base with 5 setae; Ri with 15; Re with 11 setae; external lobe with 7 setae. Mx2 typical of Aetideidae.

Mxp protopodite strong, twice longer than wide, with 1 (proximal), 3 medial and 3 distal setae. Ri1 Mxp with 3 setae distally. P1 with 3-jointed Re and 1-jointed Ri, each Re joint with external spine, nearly reaching the base of next spine. Segmentation of P3-P4 typical of Aetideidae. Posterior surfaces of Ri P2-P4 with minute spinules. P2 and P3 with groups of spinules on posterior and anterior surfaces; also with spinules externally at coxopodite and on posterior surface of basipodite near the place of Re.

Male. (Description after Koeller & Littlepage (1976) with modifications). Total length 2.08-2.10 mm. Cephalothorax 3 times longer than abdomen. Rostrum and crest absent. Segmentation of cephalothorax as in female. Th5 more reduced, but posterior Th5 corners of triangular shape, reaching nearly Abd1 posterior border. Left A1 22-jointed, right 21-jointed, nearly all joints with aestetasks. Right A1 geniculated; last 6 segments enlarged (distal portion bent backward and curled slightly inward) their setae transformed into robust spines. A2 similar to that in female, but Ri2 A2 without setae; setae at Re1 and Re2 A2 reduced. Md without gnathobase; base of mandibular palp without setae; Ri1 with 1 seta; Ri2 Md with 9 setae. Compared to female Mx1 and Mx2 rudimentary. Mxp more slender than in female, protopodite without setae; Ri1 Mxp with 1 medial seta. P1 similar to female; external border of basipodite with long thin spinules. P2-P4 as in female. P5 biramous: Ri 1-jointed; Re 3-jointed; legs are of simple structure.

Notes This genus is unique in Aetideidae because of geniculated right A1 in male.

1. *Azygokeras columbiae* Koeller & Littlepage, 1976

(Figs. 30-32)

Azygokeras columbiae Koeller & Littlepage, 1976. 1548, figs 1-3

Male and female typical of the genus.

Type locality: 50°27'N 125°04'W.

Geographical distribution. British Columbia (Koeller & Littlepage, 1976).

Vertical distribution. Probably epibenthic species (Koeller & Littlepage, 1976), usually found in near bottom layers (hauls made to the depths 400-650 m) and never above 300 m.

The species is not examined by me.

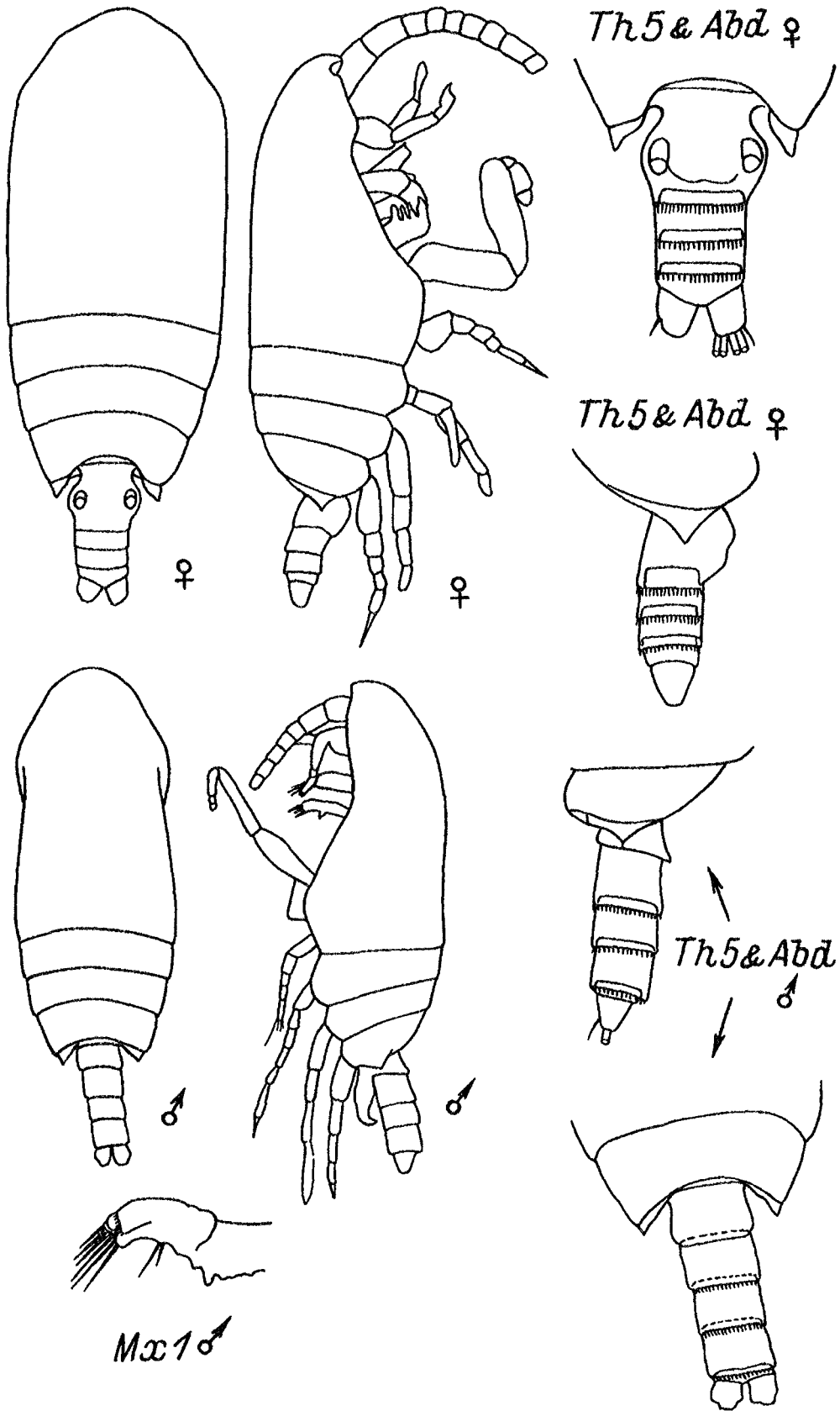


Fig. 30. *Azygokeras columbiae*. Female, male (from Koeller & Littlepage, 1976).

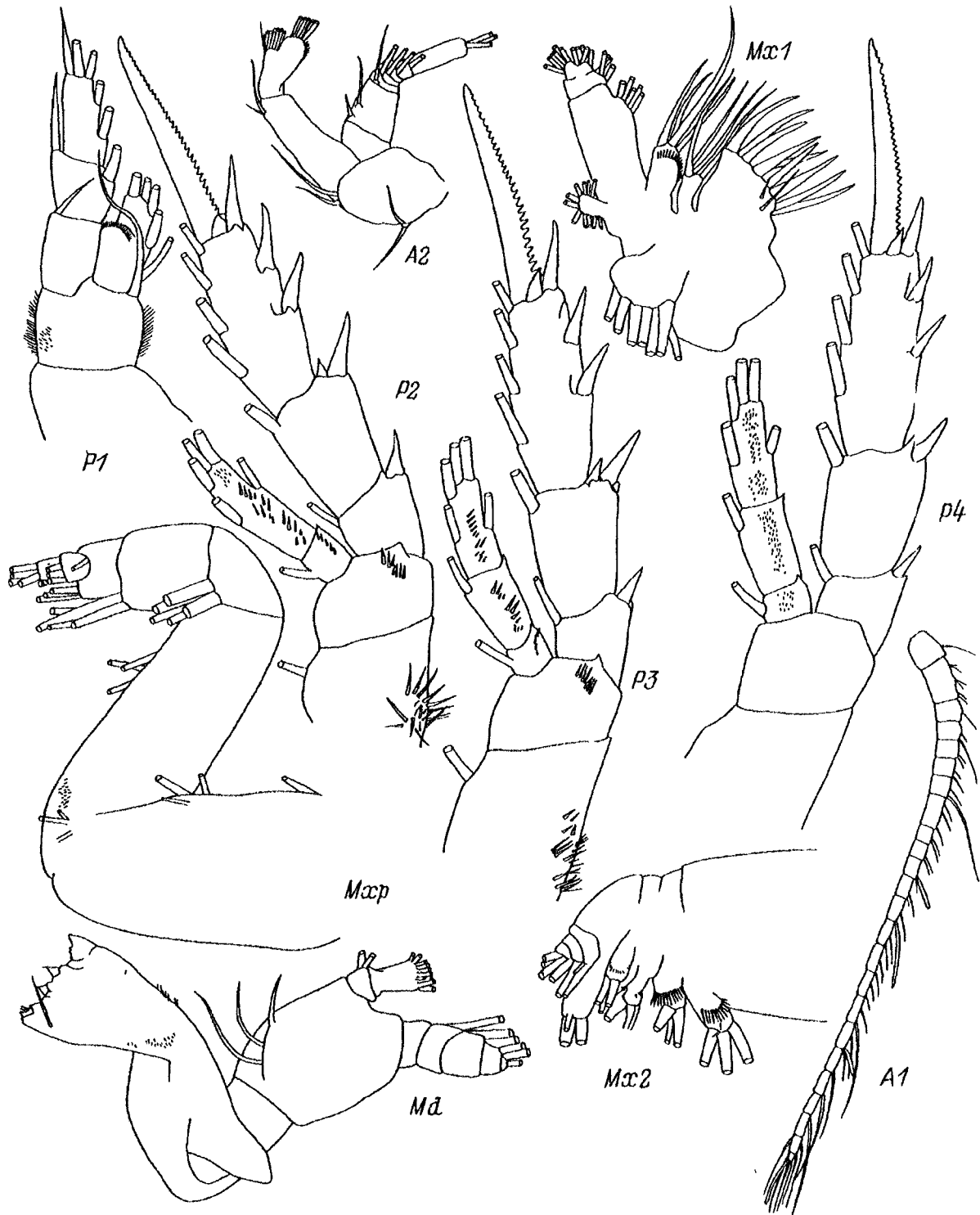


Fig. 31. *Azygokeras columbiae*. Female (from Koeller & Littlepage, 1976).

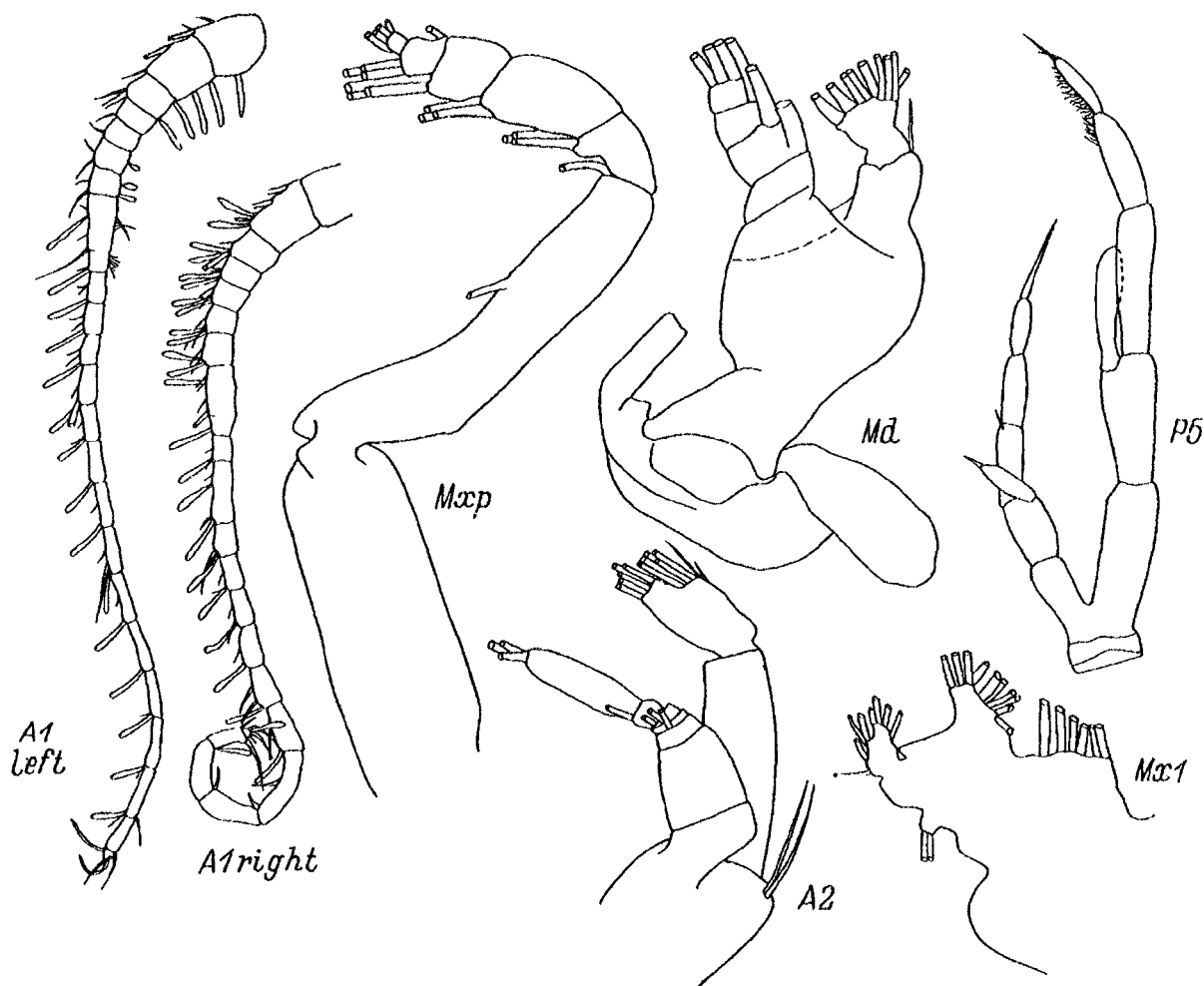


Fig. 32. *Azygokeras columbiae*. Male (from Koeller & Littlepage, 1976).

4. *Batheuchaeta* Brodsky, 1950

TYPE SPECIES: *Batheuchaeta lamellata* Brodsky, 1950, by original designation.

Batheuchaeta Brodsky 1950: 189.

Description. Female. Total length 4.10-5.20 mm. Cephalothorax 4.0-4.5 times longer than abdomen. Cephalon and Th1 incompletely separated, Th4-Th5 fused. Crest absent. Rostrum absent, or rarely present, vestigial. Posterior Th5 corners rounded, or transformed into asymmetrical lobes of various length and size. Genital segment asymmetrical, or symmetrical. Genital swelling sometimes highly developed. Genital field symmetrical, or asymmetrical, with "spectacle-like" structure. Abd1-Abd3 with small denticles along posterior border. A1 24-jointed, reaching Abd2, or exceeding body length by 2-3 distal joints. Re A2 1.2 times longer Ri. A2 coxopodite with 1 seta; basipodite and Ri1 with 2 setae each; Ri2 with 14 (7 setae at internal and 7 at external lobes), rarely with 15 setae. Re1 A2

without setae; Re2 with 1 distal seta. Md palp base with 3 setae; Ri1 Md with 2-3 and Ri2 Md with 10 (9 terminal and 1 posterior) setae; Re typical of Aetideidae. Mx1 gnathobase with 9 claw-like terminal and 4 posterior setae. Mx1 second internal lobe with 5; third with 4 setae; protopodite near Ri base with 5 setae; Ri with 14-16; Re with 11 and external lobe with 9 setae. Mx2 fourth-fifth endites with 1 seta expanding into claw-like spine. Mxp protopodite 1.5-2.0 times longer than Ri with 1 long seta proximally, with groups of 2, 3 and 3 setae and small conical appendage (from proximal to distal). Ri P1 1-jointed. Ri P2 2-jointed. Segmentation of P3-P4 typical of Aetideidae. Re1 and Re2 P2 incompletely separated, all Re joints with external spines. Re2 and sometimes Re1 P2-P4 with a row of denticles near the base of external spine on anterior surface. Ri2 P2 and Ri2-Ri3 P3-P4 posterior surface spinulose. Ri2 P3-P4 with a row of denticles near the border of the segment.

Male. Total length 4.00-4.50 mm. Rostrum present, small, conic, bifid at the apex. Cephalon and Th1 fused as well as Th4-Th5. Posterior Th5

corners rounded or with small prominences. A1 24-jointed. Setation of oral parts reduced compared to female. Segmentation of P1-P4 as in female. Re1 and Re2, or only Re2 P2 with row of denticles on the anterior surface near the base of following external spine. Re2 P3-P4 also with row of denticles. P5 strong, of complex structure, longer than abdomen. Left basipodite robust, with 2 knobs near internal border. Ri P5 1-jointed. Right Ri clavate; configuration of left Ri varies. Right Re P5 2-3-jointed. Left Re 3-jointed, Re3 bilobated, or with appendage near base.

The genus *Batheuchaeta* includes 8 species.

Notes. *Batheuchaeta enormis* Grice & Hulsemann, 1968 removed of *Batheuchaeta* (Von Vaupel Klein, 1984).

Key to the species of *Batheuchaeta*

Females

- 1(6) Genital segment symmetrical.
- 2(3) Lobes of Th5 posterior corners reaching posterior border of genital segment (lateral view) 5. *B. lamellata* Brodsky
- 3(2) Lobes of Th5 posterior corners short, usually not reaching even midlength of genital segment (lateral view).
- 4(5) Genital field symmetrical. Ventral swelling prominent, nose-form (lateral view). Th5 posterior corners with hairs and poorly visible little spines (left view) 7. *B. pubescens* Markhaseva
- 5(4) Genital field slightly asymmetrical. Ventral swelling smooth (lateral view). Th5 posterior corners with minute spinules internally and externally, without hairs 2. *B. antarctica* Markhaseva
- 6(1) Genital segment symmetrical or slightly asymmetrical.
- 7(8) The left side of Th5 with pocket-like projection 6. *B. peculiaris* Markhaseva
- 8(7) The left side of Th5 without pocket-like projection.
- 9(10) Genital segment in its middle length with divided projection on the left (dorsal view) 8. *B. tuberculata* Markhaseva
- 10(9) Genital segment with undivided projections on both sides, on the right side (dorsal view), or without projections.
- 11(12) Th5 posterior corners without lobes. Genital segment without projections 4. *B. heptneri* Markhaseva
- 12(11) Th5 posterior corners with lobes (lateral view). Genital segment with projections on the right, or on the both sides in its first one-third.
- 13(14) Genital field asymmetrical. Denticles at Ri P1 external lobe arranged along distal border 1. *B. anomala* Markhaseva
- 14(13) Genital field symmetrical. Denticles at Ri P1

external lobe arranged near external border 3. *B. gurjanovae* (Brodsky)

Males

(unknown for *B. antarctica*, *B. heptneri*, *B. pubescens* and *B. tuberculata*).

- 1(2) Re1 and Re2 P2 anterior surfaces with a row of minute denticles near the base of external spine. Denticles of Ri P1 external lobe arranged along its external border 3. *B. gurjanovae* (Brodsky)
- 2(1) Re2 P2 anterior surface with a row of minute denticles near the base of external spine. Denticles of Ri P1 external lobe arranged apically.
- 3(4) Left Ri P5 without excavation 8. *B. lamellata* Brodsky
- 4(3) Left Ri P5 with excavation, bilobated.
- 5(6) Left Ri P5 excavation not deeply concave, dividing Ri plate into 2 short lobes 6. *B. peculiaris* Markhaseva
- 6(5) Left Ri P5 excavation deep, dividing Ri plate into 2 long widely spaced horns 1. *B. anomala* Markhaseva

1. *Batheuchaeta anomala* Markhaseva, 1981

(Fig. 33)

Batheuchaeta anomala Markhaseva, 1981: 1155, fig. 4, 1986b: 839, fig. 1.

Description. F e m a l e. Total length 4.70-4.80 mm. Cephalothorax 4.5 times longer than abdomen. Rostrum rudimentary, conic with notch. Lobes of Th5 posterior corners not visible dorsally, they are turned ventrally nearly perpendicularly to the longitudinal body axis (ventral view). Genital segment asymmetrical with hair-covered projection reaching the midlength of the segment on the right (dorsal view); and small hair-covered swelling on the left. Genital segment longer than 3 following segments together. Ventral swelling small, semicircular (lateral view). Genital field asymmetrical. A1 reaching posterior Abd3 border. Ri Mx1 with 15 setae. Oral parts typical of the genus. Denticles at Ri P1 external lobe arranged in row along its distal border.

M a l e. Total length 4.05-4.20 mm. Cephalothorax 3.5-3.6 times longer than abdomen. Rostrum conic, with small notch at the apex. Th5 posterior corners (dorsal view) with small prominences. Abd2-Abd3 with row of minute spinules along posterior border. A1 broken. Ri2 A2 with 14 (7+7) setae. Md palp base with 1 setae; Ri1 and Ri2 Md with 1 and 9 setae respectively. Spinules on external Ri P1 lobe arranged apically. Re1 P1 external spine short. P5 powerful. Left Ri P5 of two-horn shape;

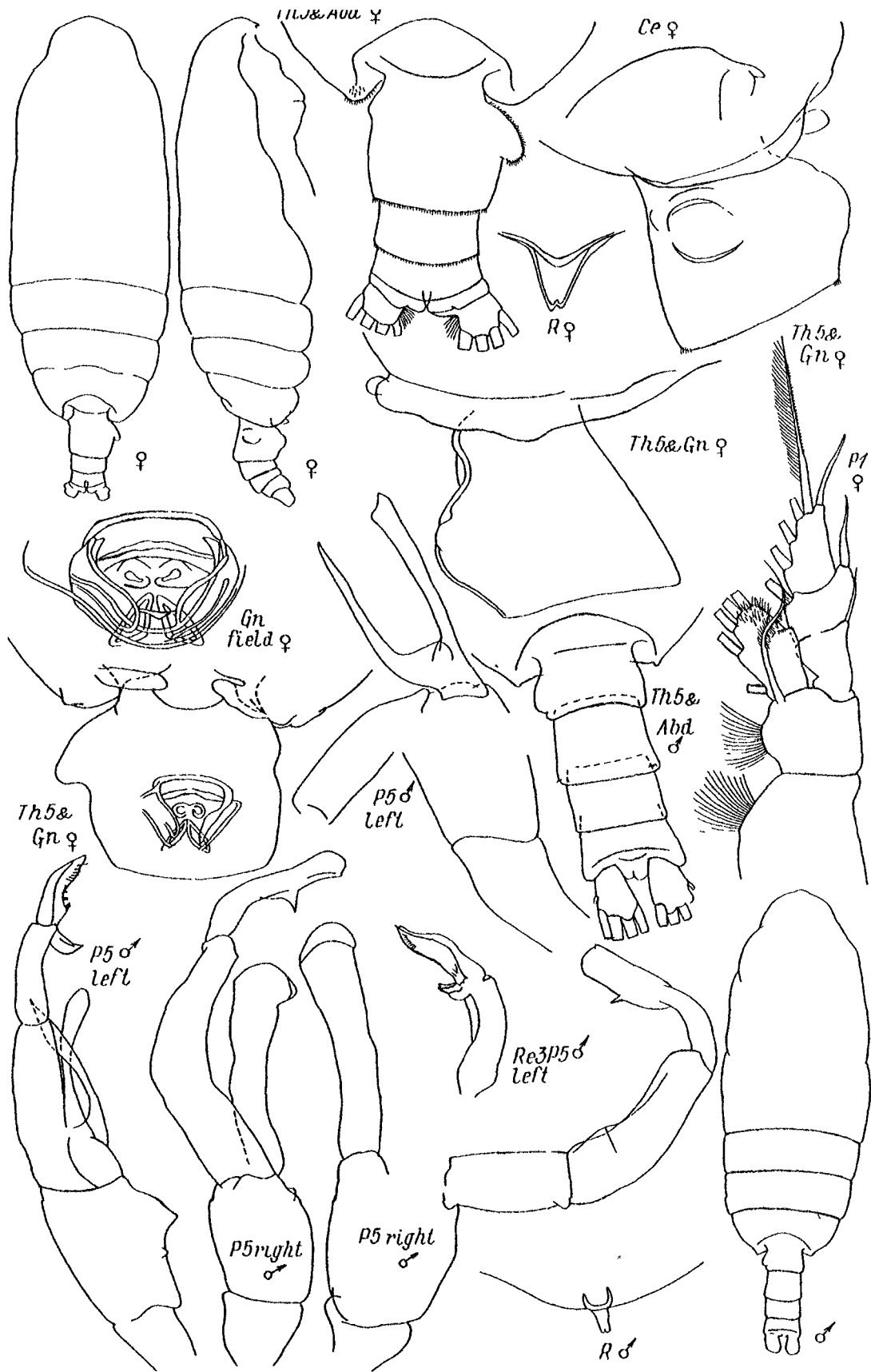


Fig. 33. *Batheuchaeta anomala*. Female (from Markhaseva, 1981). Male (from Markhaseva, 1986b)

Re2 with 2 beak-like projections distally. Re3 P5 left with a small claw apically. Distal joint of right Re with lateral triangular projection (one specimen with 2-jointed Re, another 3-jointed).

Type locality: 45°28'N 155°04'E.

Geographical distribution. Pacific Ocean: the Kurile-Kamchatka Trench (Markhaseva, 1981, 1986b), the Aleutian Trench (original data).

Vertical distribution. Mostly abyssopelagic species (Markhaseva, 1986b), recorded also in lower bathypelagial. Stenothermic and stenohaline species.

Material: 13 females and 2 males from samples: 19, 41, 85, 102-103, 105, 124, 126, 148, 165, 181, 197.

2. *Batheuchaeta antarctica* Markhaseva, 1986

(Fig. 34)

Batheuchaeta antarctica Markhaseva, 1986b: 848, fig. 6.

Description. Female. Total length 4.30 mm. Cephalothorax 4.2 times longer than abdomen. Rostrum absent. Posterior Th5 corners with asymmetrical lobes, right lobe more prolonged than left (dorsal view), internal surfaces of both lobes spinulose (dorsal view), spinules present also on external surfaces (lateral view), lobes small of smooth triangular shape. Genital segment symmetrical. Genital field slightly asymmetrical. Ventral swelling smooth without projections (lateral view). Abdominal segments (except anal one) along posterior border with rows of minute spinules. A1 24-jointed, exceeding body by 2-3 joints. Ri2 A2 with 15 setae. Proximal part of Md palp base with surface spinules. Mx1 second internal lobe with 4-5 setae, all other features of setation of oral parts typical of the genus. Spinules at Ri P1 external lobe very small, arranged apically in rows parallel to the distal border of lobe. Segmentation of P1-P2 typical of the genus. Re3 P3, Ri and Re P4 broken, Ri P3 3-jointed. Row of minute spinules present only near the base of external spine at Re2 P2.

Male unknown.

Type locality: 62°54'S 118°52'E.

Geographical distribution. Antarctic part of the Indian Ocean (Markhaseva, 1986b).

Vertical distribution. The species was found in total haul from 3700 m (Markhaseva, 1986b).

Material: 1 female from sample 379.

3. *Batheuchaeta gurjanovae* (Brodsky, 1955)

(Figs. 35-37)

Pseudocharella gurjanovae Brodsky, 1955: 189, fig. 3.

Batheuchaeta gurjanovae. Markhaseva, 1986b: 841, fig. 2.

Batheuchaeta brodskyi Markhaseva, 1981: 1152, figs 1-2

Description. Female. Total length 4.1-4.5 mm. Cephalothorax 3.3 times longer than abdomen. Rostrum sometimes present, vestigial, with small notch at apex, but usually absent. Right Th5 posterior corner with a group of hairs (lateral view). Lobes of Th5 posterior corners short, not visible dorsally, but well visible laterally and turned ventrally, reaching the middle of genital segment. Genital segment asymmetrical, with a small projection densely covered anteriorly with hair-like setae. Genital segment as long as 3 following segments together. Ventral swelling small, of triangular shape (lateral view). Genital field symmetrical. A1 reaching the end of Abd3. Oral parts typical of the genus. Ri Mx1 with 14-15 setae. Ri P1 with group of spinules arranged on external lobe laterally. P2-P4 typical of the genus.

Male. Total length 3.90. Rostrum small, bifid at the apex. Re1 P2 with minute spinules arranged in row near the base of external spine. Ri P1 external lobe with a group of spinules arranged apically.

Type locality. Kurile-Kamchatka Trench area.

Lectotype: male from sample 42.

Geographical distribution. Pacific Ocean: the Kurile-Kamchatka Trench (Brodsky, 1955; Markhaseva, 1981; 1986b), Aleutian and Izu-Bonin Trench area (original data).

Vertical distribution. Mostly abyssopelagic species, more common in lower abyssal (6000-8000 m) (Markhaseva, 1986b). Stenothermic and stenohaline species.

Material: 52 females and 4 males from samples: 18-19, 41-42, 86, 99-100, 102, 124, 128, 149-150, 163, 177-179, 181, 197-198, 202.

4. *Batheuchaeta heptneri* Markhaseva, 1981

(Fig. 38)

Batheuchaeta heptneri Markhaseva, 1981: 1155, fig. 3, 1986b: 839, 841.

Description. Female. Total length 5.00-5.10 mm. Cephalothorax 4.3 times longer than abdomen. Rostrum very small, not bifid on apex. Posterior Th5 corners rounded. Genital segment asymmetrical, widest in midlength, with projection more developed on the left, as long as 2 following segments together (dorsal view). Ventral swelling of semicircular shape. Genital field symmetrical. A1 reaching Abd2. Md palp base with 3 setae. Ri Mx1 with 14-15 setae; otherwise oral parts typical of the genus. Ri P1 external lobe distal border with row of denticles apically. P2-P4 typical of the genus.

Male unknown.

Type locality: 44°20'N 150°53'E.

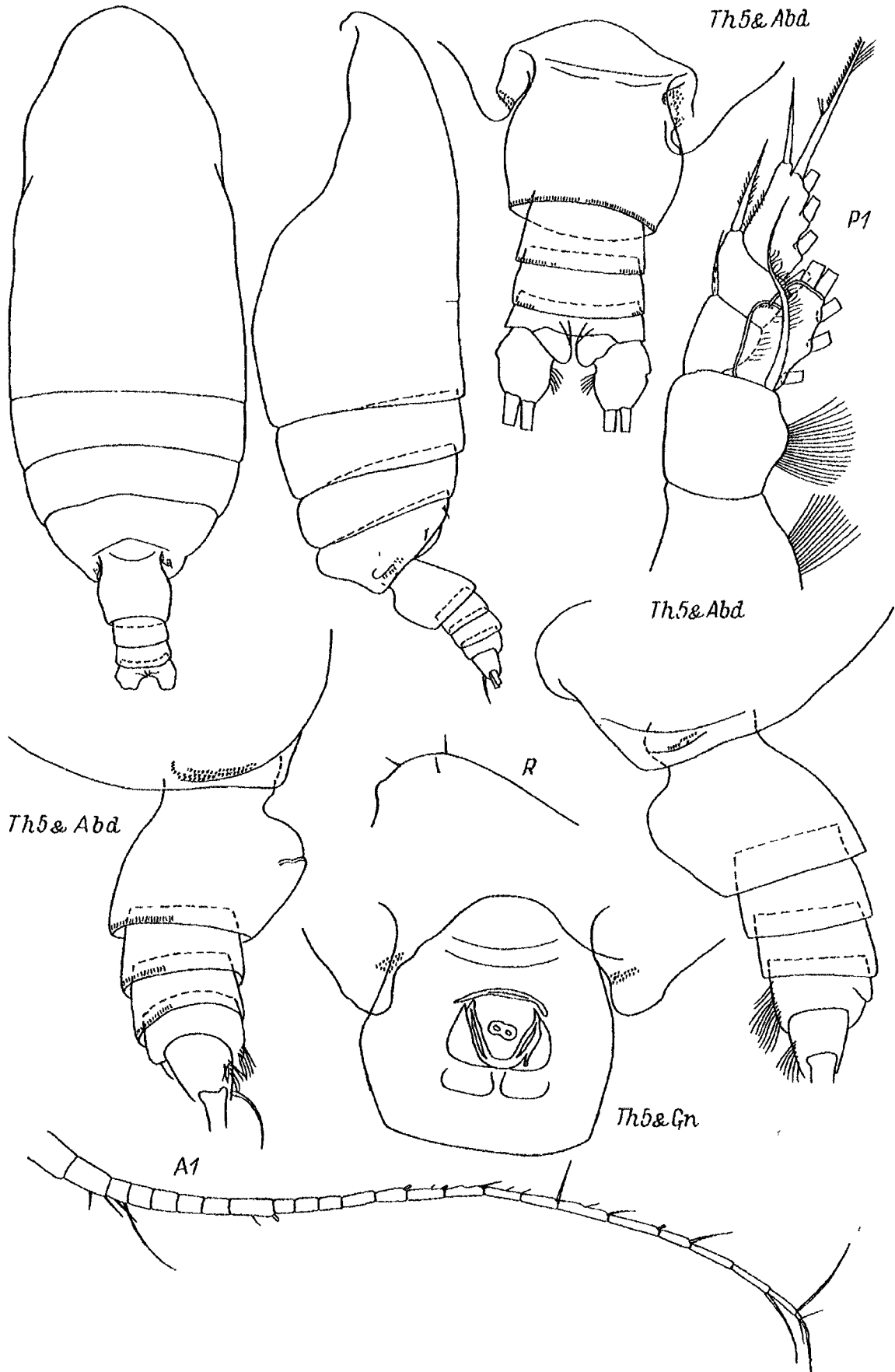


Fig. 34. *Batheuchaeta antarctica*. Female (from Markhaseva, 1986b).

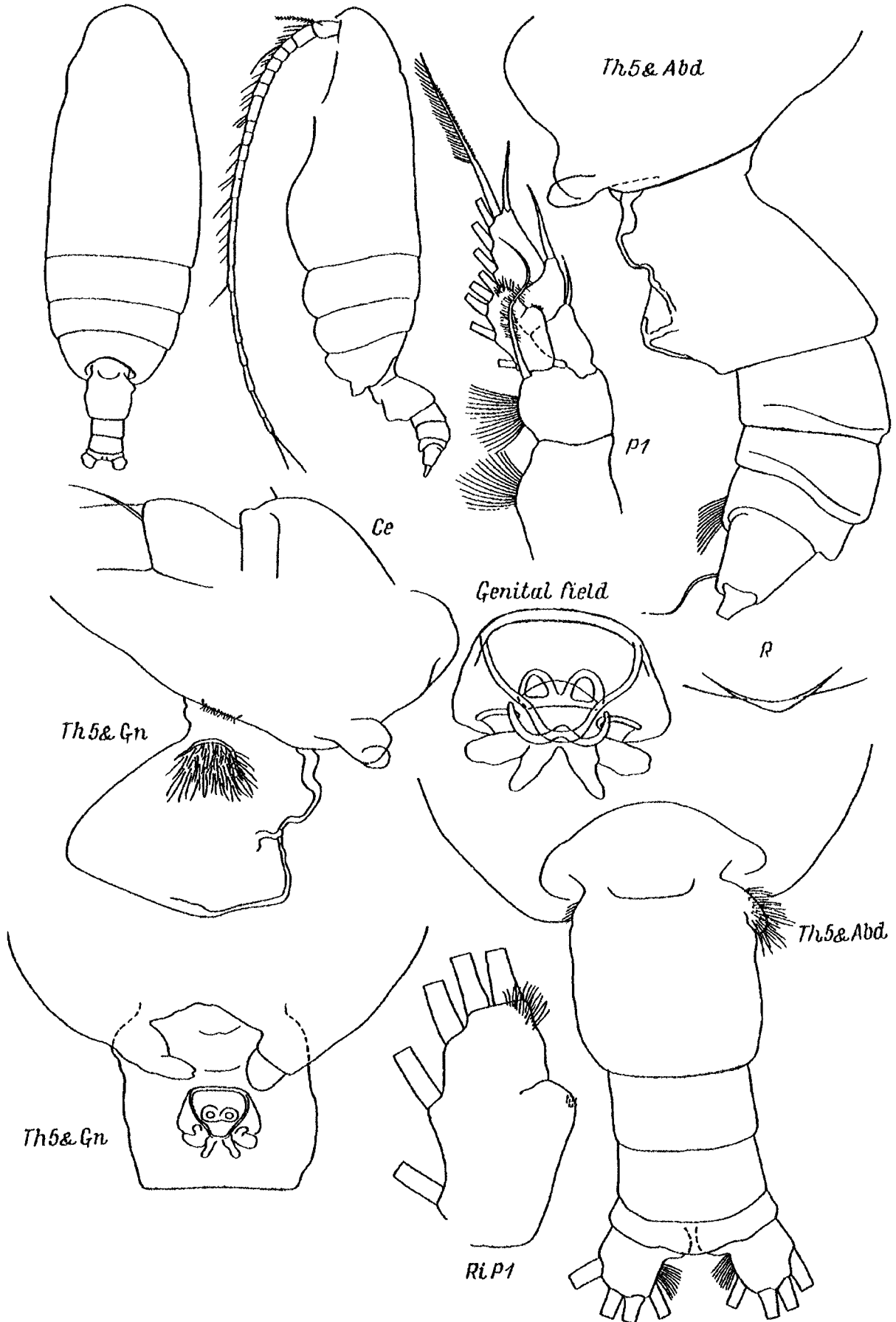


Fig. 35. *Batheuchaeta gurjanovae*. Female (from Markhaseva, 1981).

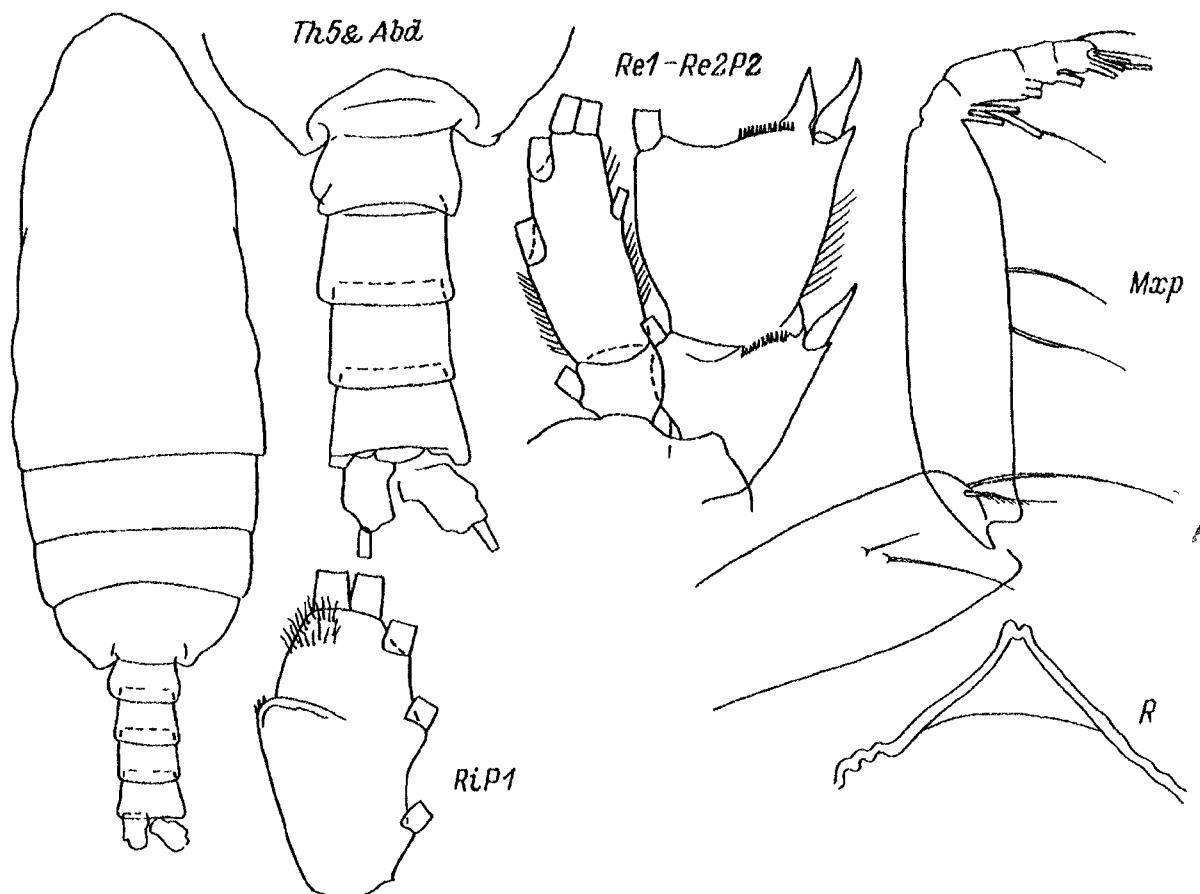


Fig. 36. *Batheuchaeta gurjanovae*. Male: general view, Th5 & Abd, Mxp (41), other figures (from Markhaseva, 1986b).

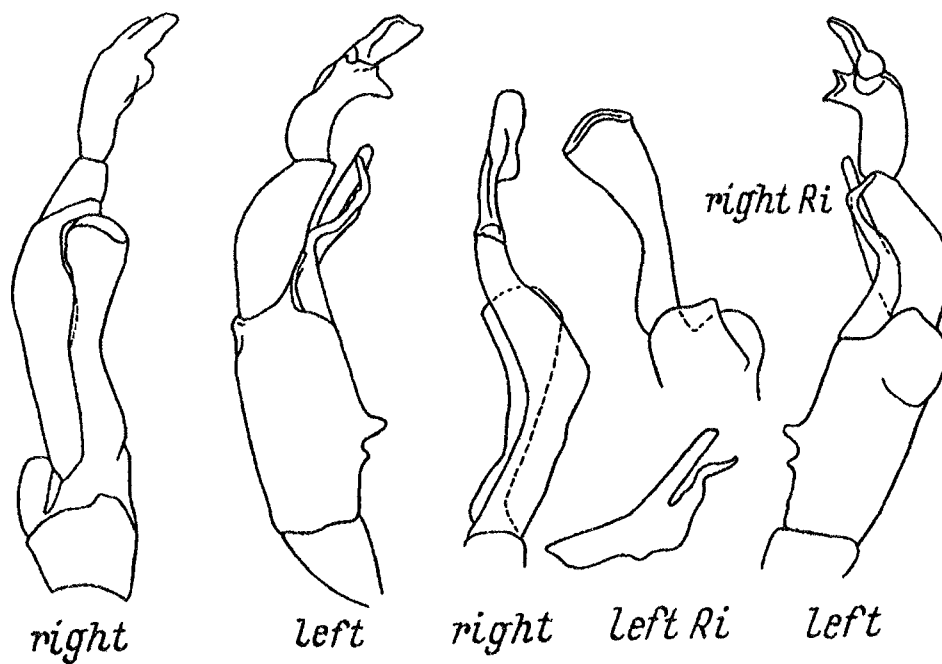


Fig. 37. *Batheuchaeta gurjanovae*. Male: P5 (from Brodsky, 1955).

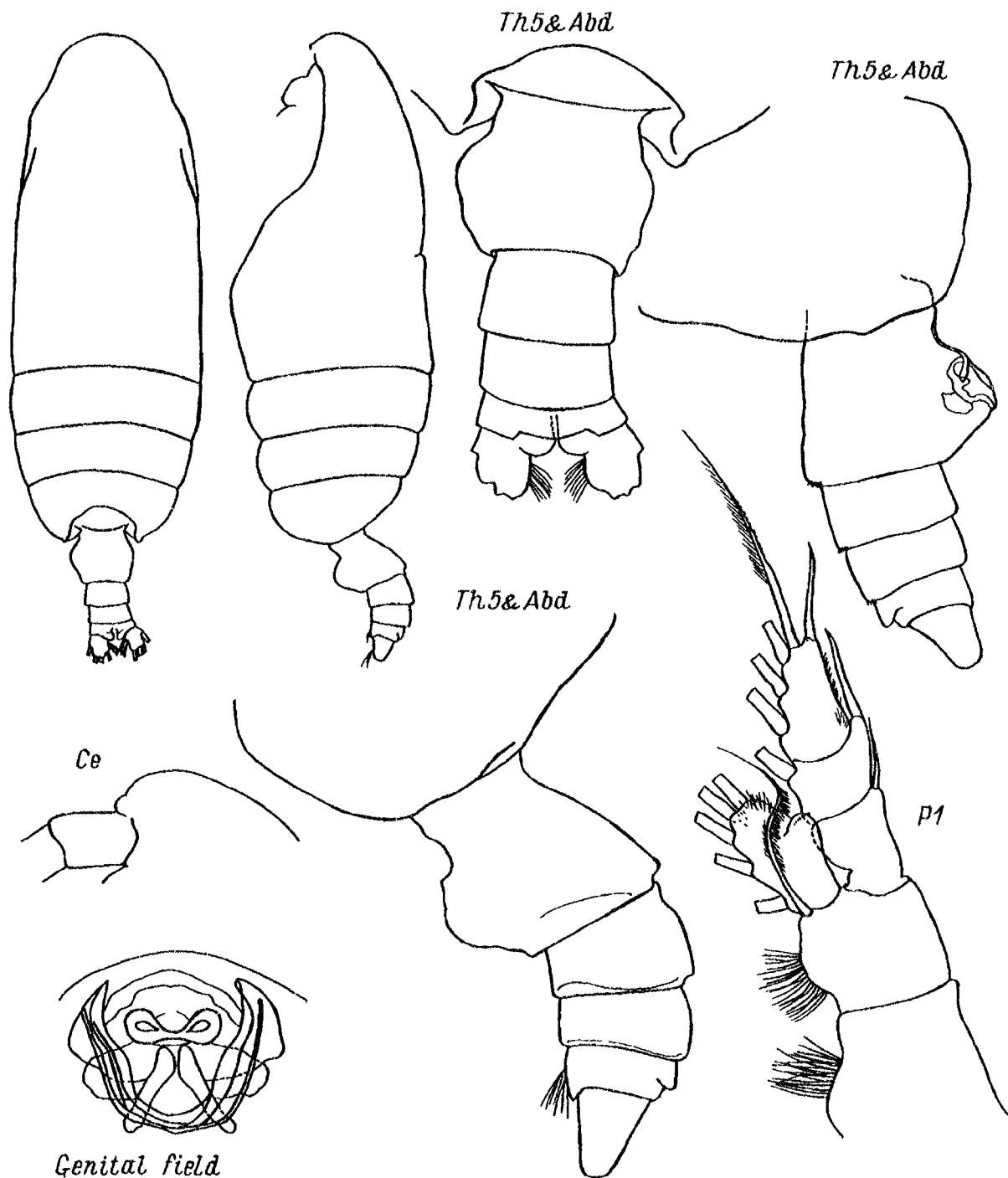


Fig. 38. *Batheuchaeta heptneri*. Female (from Markhaseva, 1981).

Geographical distribution. Pacific Ocean: the Kurile-Kamchatka Trench (Markhaseva, 1981, 1986b), Aleutian Trench (original data).

Vertical distribution. Most probably abyssopelagic species.

Material: 9 females from samples: 19, 41, 70, 86, 124, 126, 140, 163, 197.

5. *Batheuchaeta lamellata* Brodsky, 1950

(Figs. 39-40)

Batheuchaeta lamellata Brodsky, 1950. 189, figs 106, 107, Markhaseva, 1981: 1157, fig 5, 1986b: 843; Grice & Hulsemann, 1967 14

Description. Female. Total length 4.70-5.20 mm. Cephalothorax 4.0-4.6 times longer than abdomen. Rostrum absent. Th5 lobes large, extremely asymmetrical, lamelliform, varying in shape. When looking ventrally, lobes look as if reaching last third of genital segment, when looking laterally as long as, slightly longer or shorter than the genital segment. Genital segment symmetrical. Ventral swelling strongly prominent with rounded apex. Genital segment is longer than 3 following segments together. Genital field asymmetrical. A1 reaching posterior border of genital segment. Ri Mx1 with 14-16 setae. Oral parts typical of the genus. Ri P1 external lobe with row of spinules along distal border apically. P2-P4 typical of the genus.

Male. Total length 4.50 mm. Cephalothorax 3.3 times longer than abdomen. Right Ri P5 longer than left, with lateral projection. Left Ri narrowed in proximal part, both Ri rounded at apex. Distal joint of right Re with claw-like appendage at the top.

Type locality: Kamchatka, Shipunsky Peninsula, 90 miles to SE off Shipunsky Cape.

Lectotype: female from sample 474.

Geographical distribution. Atlantic Ocean: the species is found for the first time in the north-eastern Atlantic (original data). Pacific Ocean: the north-western part, the Kurile-Kamchatka, Aleutian and Marian Trenches Indian Ocean: the western part (Grice & Hulsemann, 1967), antarctic part (original data).

Vertical distribution. Most probably abyssopelagic species. Stenotherm and stenohalin species.

Material: 57 females and 11 male from samples: 1, 9, 19, 69-70, 85-86, 97, 102, 104-105, 122, 124, 126-128, 139-140, 147, 163-164, 175-176, 181, 192-193, 197, 201, 379, 456, 474.

6. *Batheuchaeta peculiaris* Markhaseva 1983

(Figs. 41-42)

Batheuchaeta peculiaris Markhaseva, 1983: 1740, fig. 1; 1986: 843, fig. 3.

Description. Female. Total length 4.60 mm. Cephalothorax 4 times longer than abdomen. Rostrum vestigial, conic with small notch and base wider than in *B. anomala*. On the left of Th5 there is pocket-like projection (lateral view), and similar thickening (dorsal view). Th5 posterior corners rounded, with rounded densely haired borders. Genital segment strongly asymmetrical, with deep excavation in the middle of left side (dorsal view), as long as 3 following segments together. Genital field asymmetrical, "spectacle-like" structure not pronounced. A1 reaching posterior border Abd3. Re2 A2 1.2 times longer than Ri. Md palp base with 3 setae and group of minute spinules near the base of setae. Ri1 Md

with 3 setae. All remaining oral parts typical of the genus. Mxp protopodite 1.5 times shorter Ri1 Mxp. Ri P1 external lobe with row of spinules apically along external border. P2-P4 typical of the genus.

Male. Total length 4.15 mm. Cephalothorax 4.1 times longer than abdomen. Rostrum present, very small, similar to that of *B. anomala*. Th5 posterior corners with faintly developed prominences. Anal segment very small. A1 24-jointed, reaching Abd 3. Structure of oral parts and swimming legs similar to that in *B. anomala*, but Ri2 A2 with 13 setae. Ri1 Md without seta; Ri2 Md with 10 setae. Left Ri P5 excavation is not deep, Re3 bilobated.

Type locality: 45°49'N 153°33'E.

Geographical distribution. Pacific Ocean: the Kurile-Kamchatka Trench (Markhaseva, 1983a, 1986b). Species found for the first time in the Antarctic sector of the Pacific Ocean (original data).

Vertical distribution. Mostly abyssopelagic species, with occurrence probability in lower bathypelagic.

Material: 3 females and 2 males from samples: 123, 127, 148, 328.

7. *Batheuchaeta pubescens* Markhaseva, 1986

(Fig. 43)

Batheuchaeta pubescens Markhaseva, 1986b: 846, fig. 5.

Description. Female. Total length 4.10 mm. Cephalothorax 4.3 times longer than abdomen. Rostrum absent. Posterior Th5 corners prolonged into small rounded lobes of various configuration on the right and left (lateral view). Posterior Th5 corners covered with hairs and very minute spinules (left lateral view). Lateral surfaces of anterior part of genital segment with groups of knobs (dorsal view). Genital segment and genital field symmetrical. "Spectacle-like" structure of genital field distinctly visible. Ventral swelling (lateral view) occupying middle of genital segment, protruded as nose. A1 24-jointed, nearly as long as body. Ri1 A2 with 15 setae. Oral parts typical of the genus. Ri P1 external lobe with denticles arranged in row parallel to distal border of lobe apically. Near Re1 and Re2 P2 external spines there are rows of minute spinules. Ri P3 3-jointed, Re and Ri P4 broken.

Male unknown.

Type locality: 62°54'S 118°52'E.

Geographical distribution. Indian Ocean: the antarctic part (original data).

Vertical distribution. The species was found in total tow from 3700 m (Markhaseva, 1986b).

Material: 1 female from sample: 379.

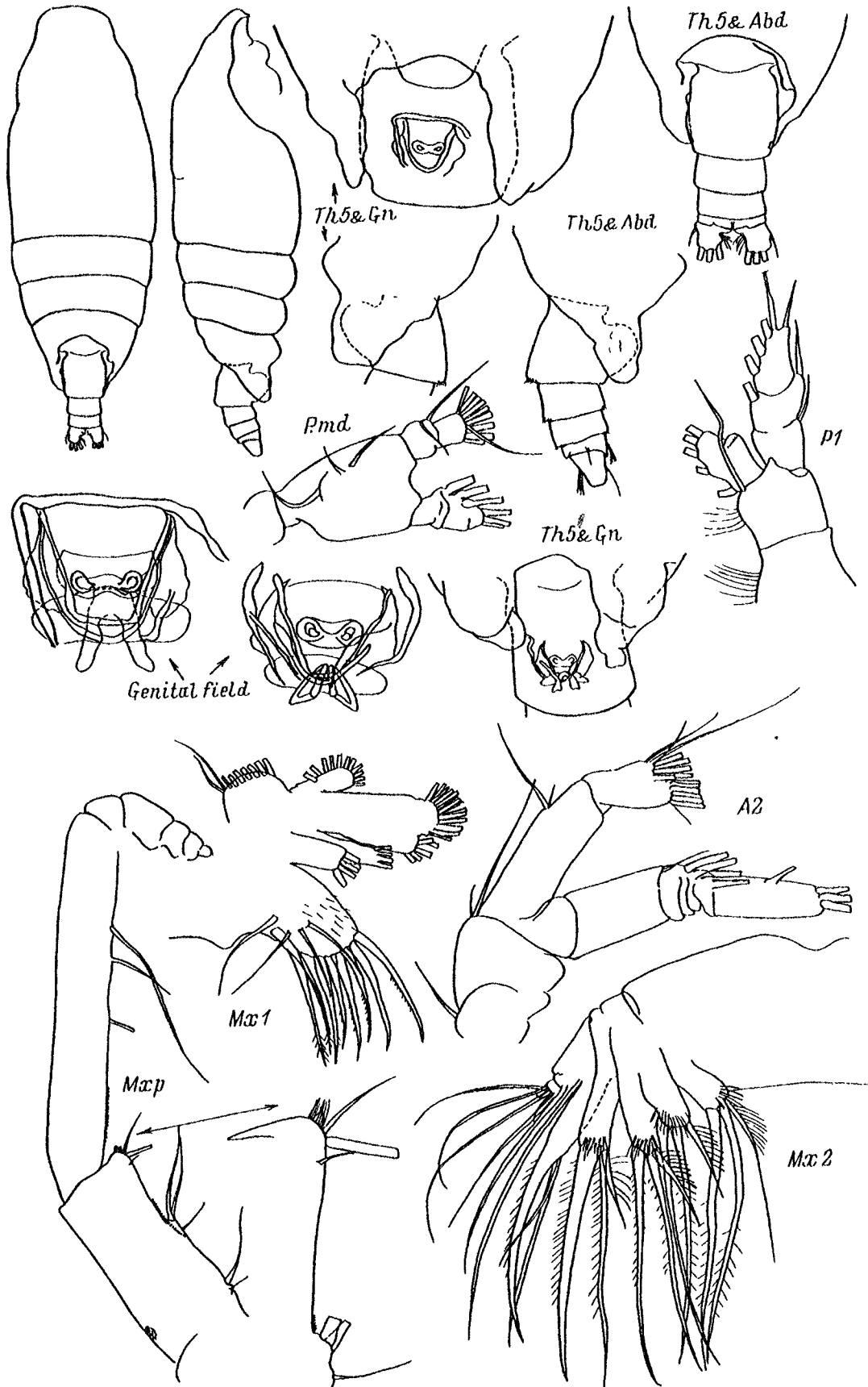


Fig. 39. *Batheuchaeta lamellata*. Female (from Markhaseva, 1981).

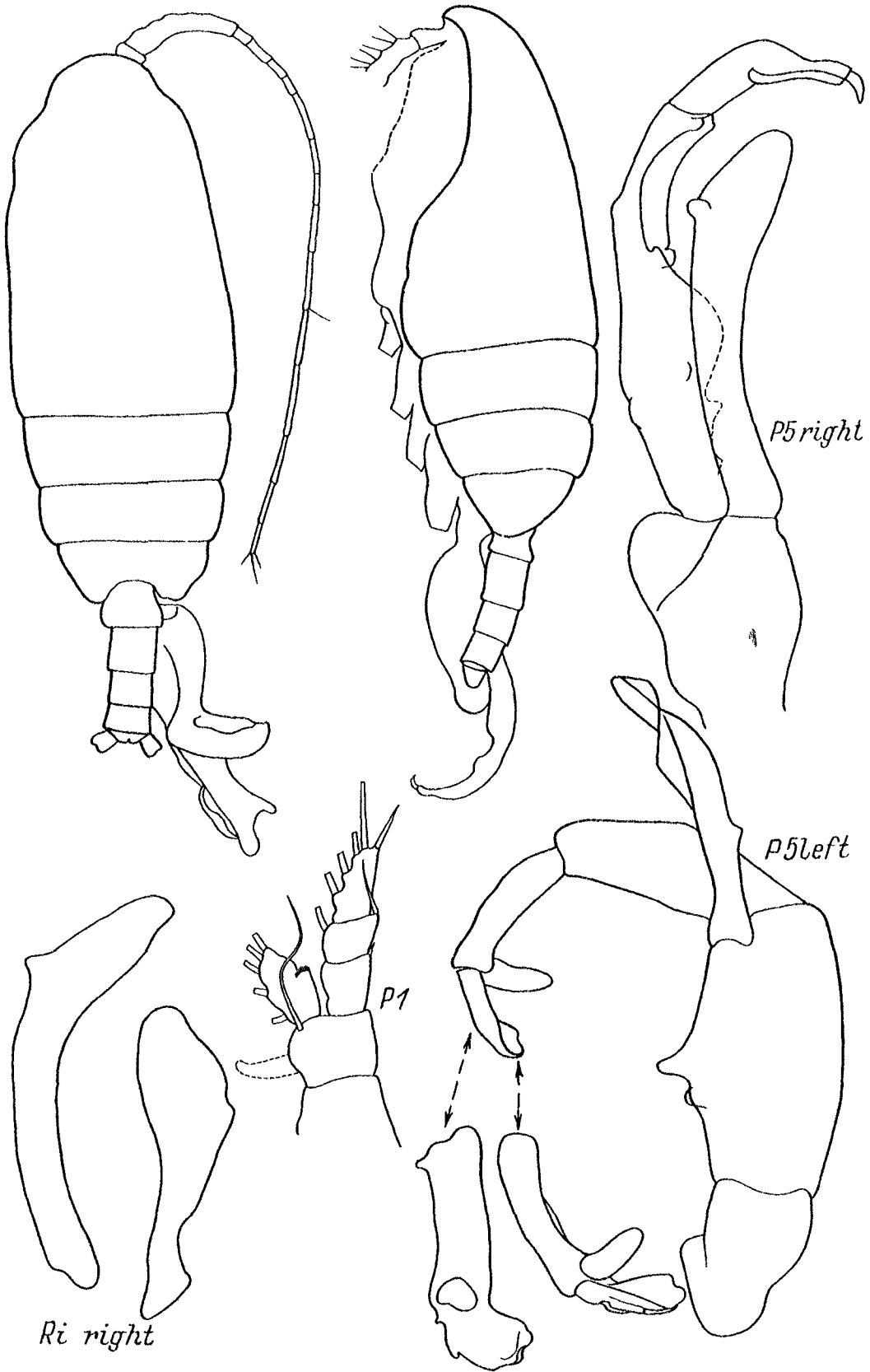


Fig. 40. *Batheuchaeta lamellata*. Male (from Brodsky, 1950).

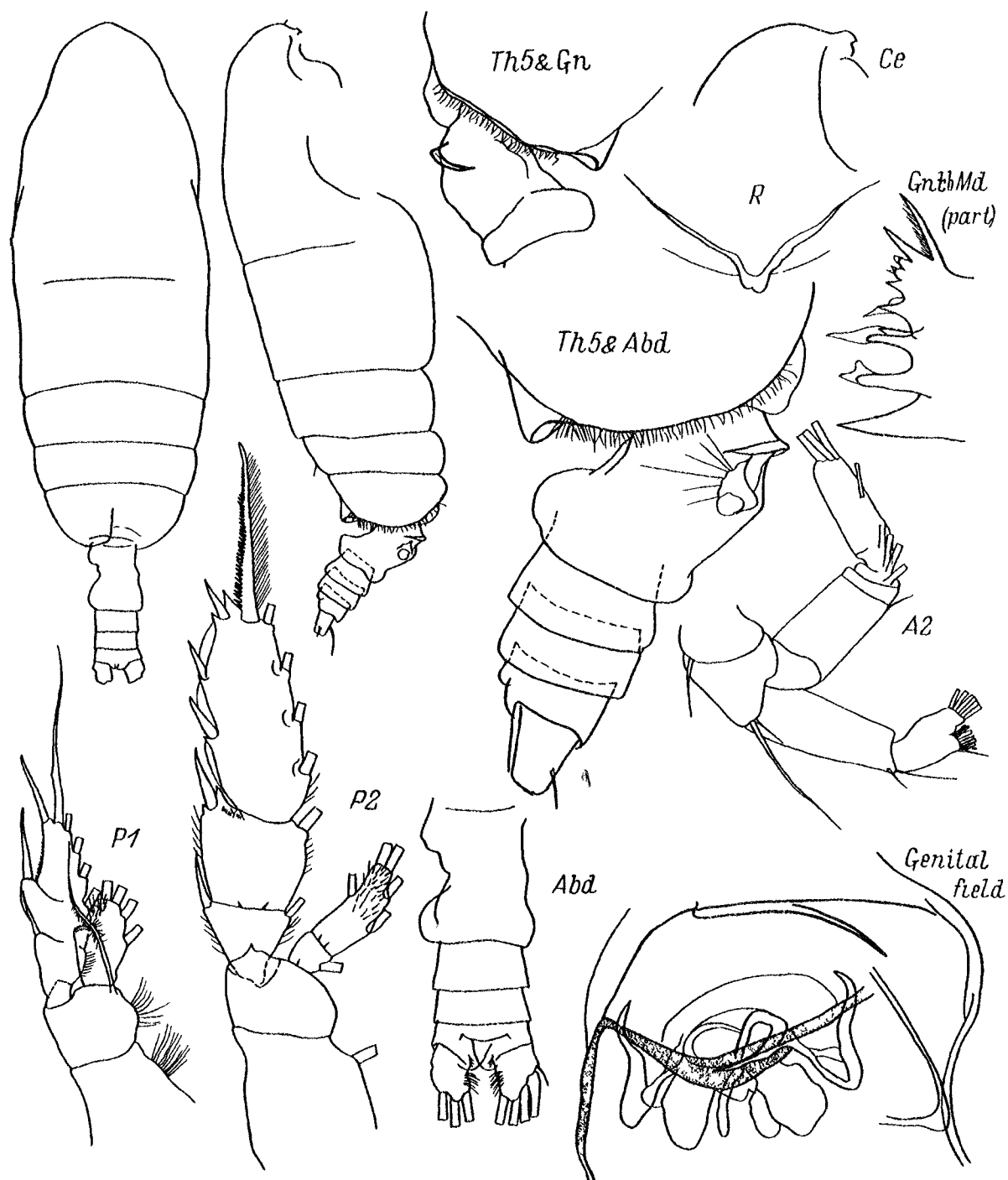


Fig 41. *Batheuchaeta peculiaris*. Female (from Markhaseva, 1983b)

8. *Batheuchaeta tuberculata*

Markhaseva, 1986

(Fig 44)

Batheuchaeta tuberculata Markhaseva, 1986 844b, fig 4

Description F e m a l e. Total length 4.30 mm. Cephalothorax 4.4 times longer than abdomen. Ros-

trum absent Posterior Th5 corners asymmetrical, the right corner more prominent than left one Genital segment asymmetrical, with protuberance on the right and bifid projection in the midlength on the left and with small semicircle projection near border with Abd2 (posteriorly) on the left Genital field symmetrical with "spectacle-like" structure. A1 24-jointed, as long as body. Re A2 15 times longer Ri. R1 Mx1 with 13-14 setae. Setation of Mx2, Md

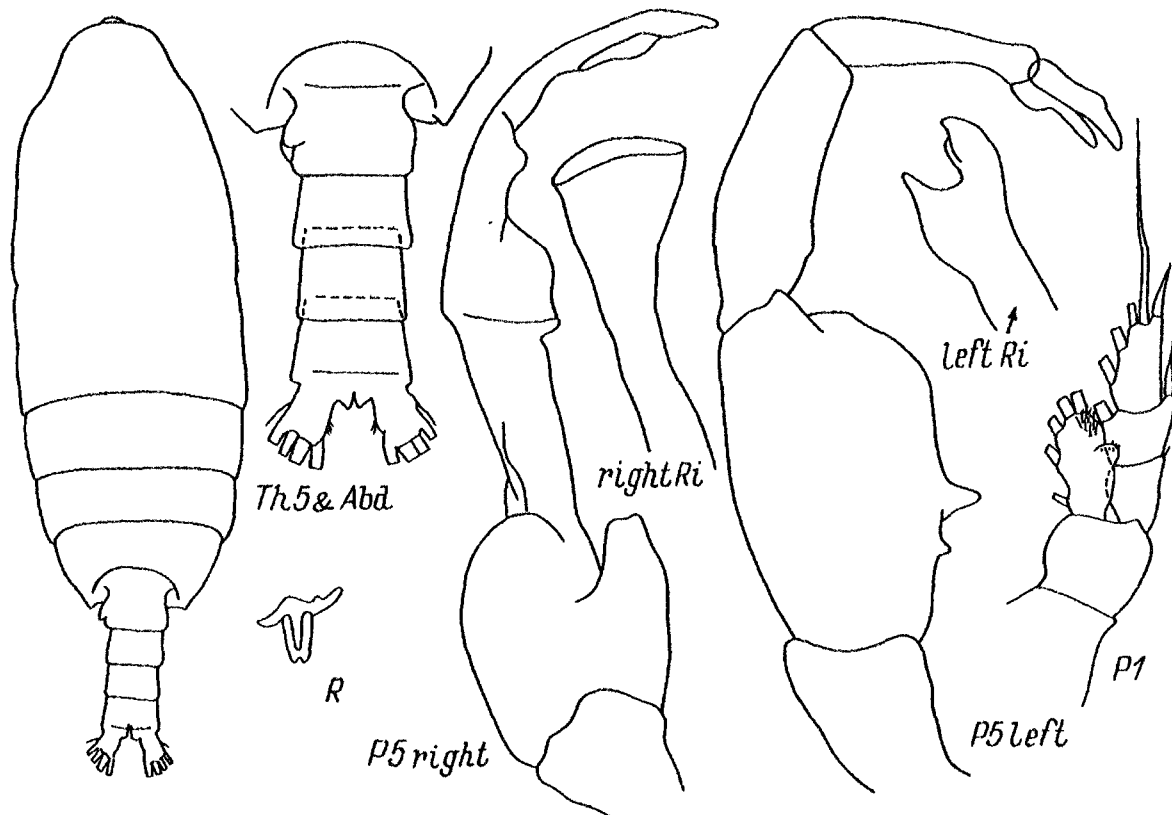


Fig. 42. *Bathoeuchaeta peculiaris*. Male (from Markhaseva, 1986b).

and Mxp and segmentation of P2-P4 typical of the genus. Spinules of Ri P1 external lobe arranged in rows along distal border. Row of spinules at P2 present only near the base of external spine. Re P3-P4 broken, Ri 3-jointed with spinules on posterior surfaces Ri2-Ri3.

Male unknown.

Type locality: 45°43'N 153°45'E.

Geographical distribution. Pacific Ocean: the Kurile-Kamchatka Trench (Markhaseva, 1986b).

Vertical distribution. The species was found in total haul from 7000 m (Markhaseva, 1986b).

Material: 1 female from sample 128.

5. *Bradyetes* Farran, 1905

TYPE SPECIES *Bradyetes inermis* Farran, 1905, by monotypy.

Bradyetes Farran, 1905: 31.

Description. Female. Total length 1.19-3.2 mm. Cephalothorax 3-4 times longer than abdomen. Rostrum absent. Cephalon and Th1, as well as Th4-Th5 incompletely or completely fused. Th5 posterior corners rounded or pointed. Genital segment and Th5 symmetrical. Abdominal segments with thin spinules along posterior border. A1 nearly as long as cephalothorax, reaching the midlength of genital segment. Ri A2 about as long as Re, or Re 1.2 times

longer. Coxopodite A2 with 1; basipodite with 1-2 setae; Re1 with 2 setae[†] or no, Re2 with 2 setae; Re3-Re6 with 1 seta each; Re7 with 1 medial and 3 terminal setae. Ri1 A2 with 2 setae; Ri2 with 6-7 terminal and 1 posterior setae at external and 6 terminal and 2 posterior setae at internal lobe. Md palp base with 1-2 setae; Ri1 Md with 1-2 setae; Ri2 Md with 3 or 9 setae. Mx2 of *B. matthei* with 3 setae at each first to fourth endites; distal part of Ri Mx2 with 5-6 setae. Ri1 Mxp 1.5-1.7 times longer than protopodite; protopodite with seta proximally and groups of 2, 3 and 3 setae (from proximal to distal part of the joint), with digital appendage near the distal group of setae. Setae at Ri1 Mxp arranged in the middle of joint. P1 with 3-jointed Re; every joint with external spine. Ri P1 1-jointed, external lobe developed. P2 with 2-jointed Ri and 3-jointed Re. P3-P4 with 3-jointed rami.

Male. Total length 0.90-2.52 mm. Cephalothorax nearly 2.3-4.0 times longer than abdomen. Rostrum absent. A1 about as long as cephalothorax. P5 biramous. The right leg with 2-, the left with 3-jointed Re. Right Ri P5 always 1-jointed, left Ri P5 1- or 2-jointed. P5 of simple structure.

The genus *Bradyetes* includes 2 species.

Notes. *Bradyetes brevis* Farran, 1936a, earlier attributed to *Bradyetes* should be removed into genus *Jaschnovia* due to the absence of digital appendage at Mxp protopodite and absence of Re1 P1 external

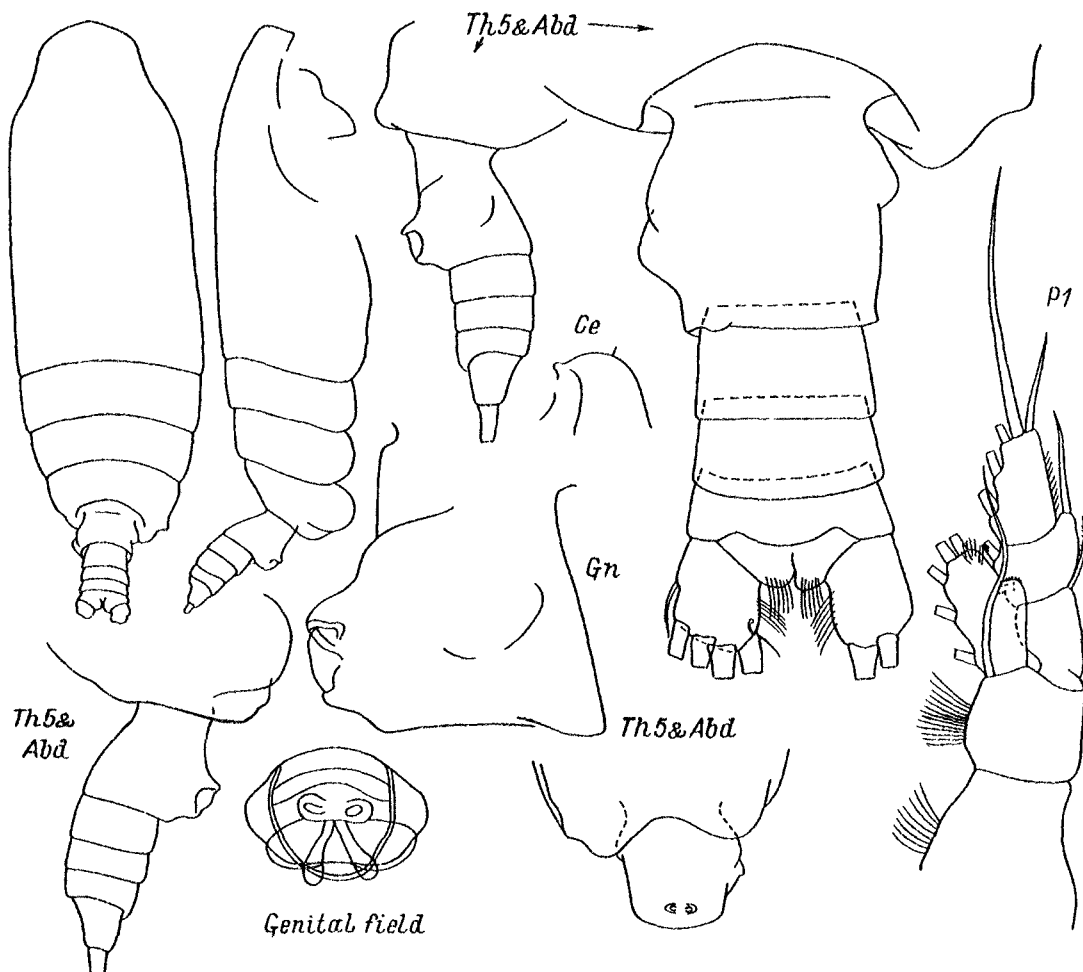


Fig. 44. *Batheuchaeta tuberculata*. Female (from Markhaseva, 1986b).

1. *Bradyetes inermis* Farran, 1905

(Figs. 45-46)

Bradyetes inermis Farran, 1905: 32, pl. 3, figs 13-20, pl. 4, figs 13-14; Vervoort, 1952b (sheet 43): 3; Grice, 1972: 224, figs 2-22; Vives, 1982: 291.

Description. Female. (Description after Grice (1972) and Farran (1905) with modifications). Total length 2.57-3.20 mm. Cephalon and Th1 indistinctly separated, Th4-Th5 fused. Th5 posterior corners rounded. Genital segment nearly as long as wide and about as long as 2 following segments together. A2 basipodite with 1; Re1 A2 with 2 setae. Md palp base with 1; Ri1 Md with 1 and Ri2 with 3 setae. Mxp protopodite with long digital appendage distally near the setae group, nearly as long as the longest seta of this group. P1 basipodite with 1 short seta near distal angle of external border. Re1 P1 external spines long, exceeding the base of following spine.

Male. Total length 2.44-2.52 mm. Cephalothorax about 2.3 times longer than abdomen. Rostrum

absent. A1 slightly longer than cephalothorax. Md palp base with 1 seta; Ri1 Md with 1 seta; Ri2 Md with 7 setae. Ri P5 1-jointed.

Type locality: 53°58'N 12°28'W.

Geographical distribution. Atlantic Ocean: the west coast of Ireland (Farran, 1905), the north-western part 39°46'N 70°34'W (Grice, 1972), the region of Madeira (Vives, 1982).

Vertical distribution. Most probably benthopelagic species, found in horizontal hauls at depths 1000-1500 m taken 20-50 cm from bottom (Grice, 1972), also found in total vertical hauls from 300-700 m (Farran, 1905; Vives, 1972).

The species is not examined by me.

2. *Bradyetes matthei* Johannessen, 1976

(Figs. 47-48)

Bradyetes matthei Johannessen, 1976: 19, figs 1-2

Description. Female. Total length 1.19-1.32 mm. Cephalon and Th1 fused (line of fusion slightly

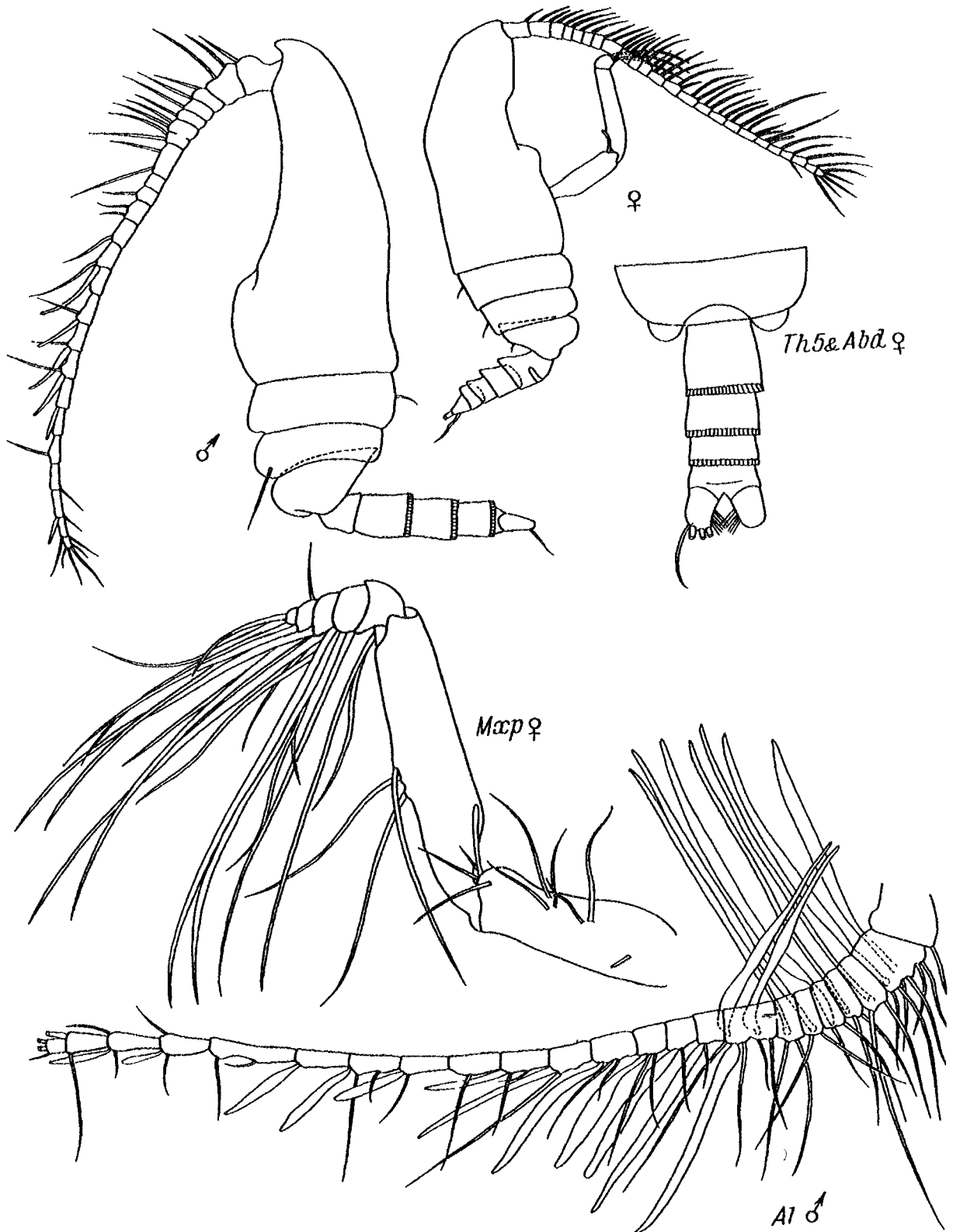


Fig. 45. *Bradyetes inermis*. Female, male (from Grice, 1972).

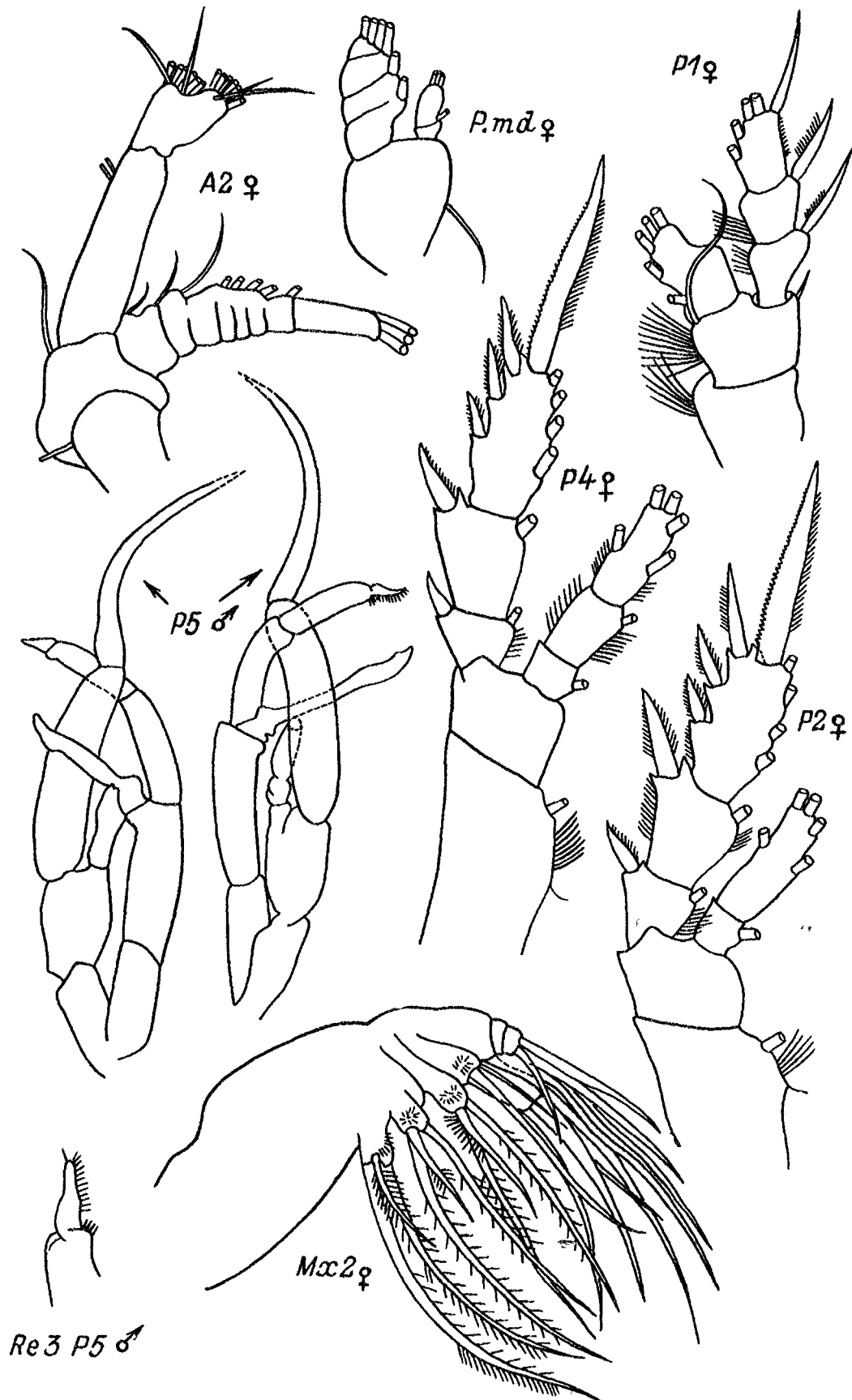


Fig. 46. *Bradyetes inermis* Female, male (from Grice, 1972).

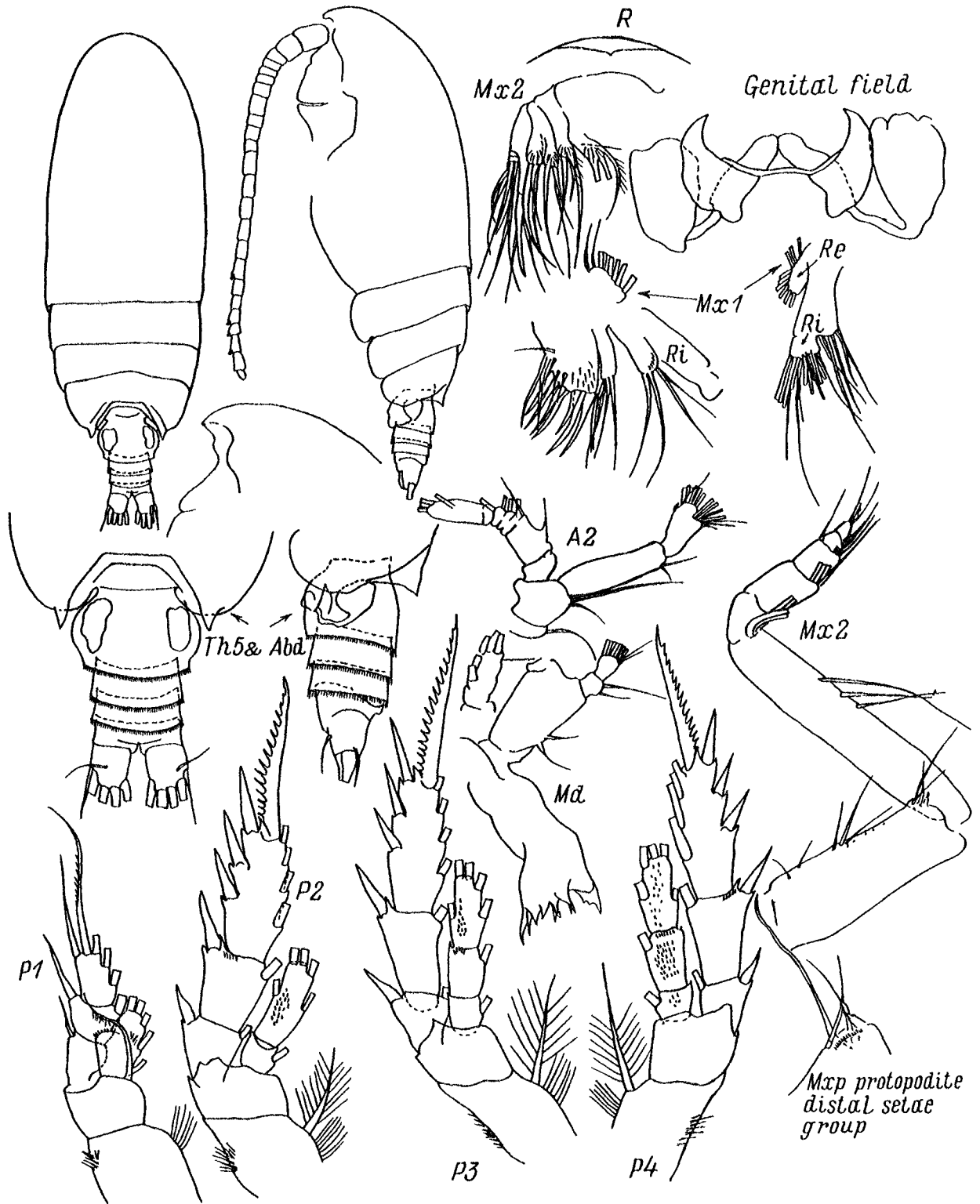


Fig. 47. *Bradyetes matthei*. Female (paratype).

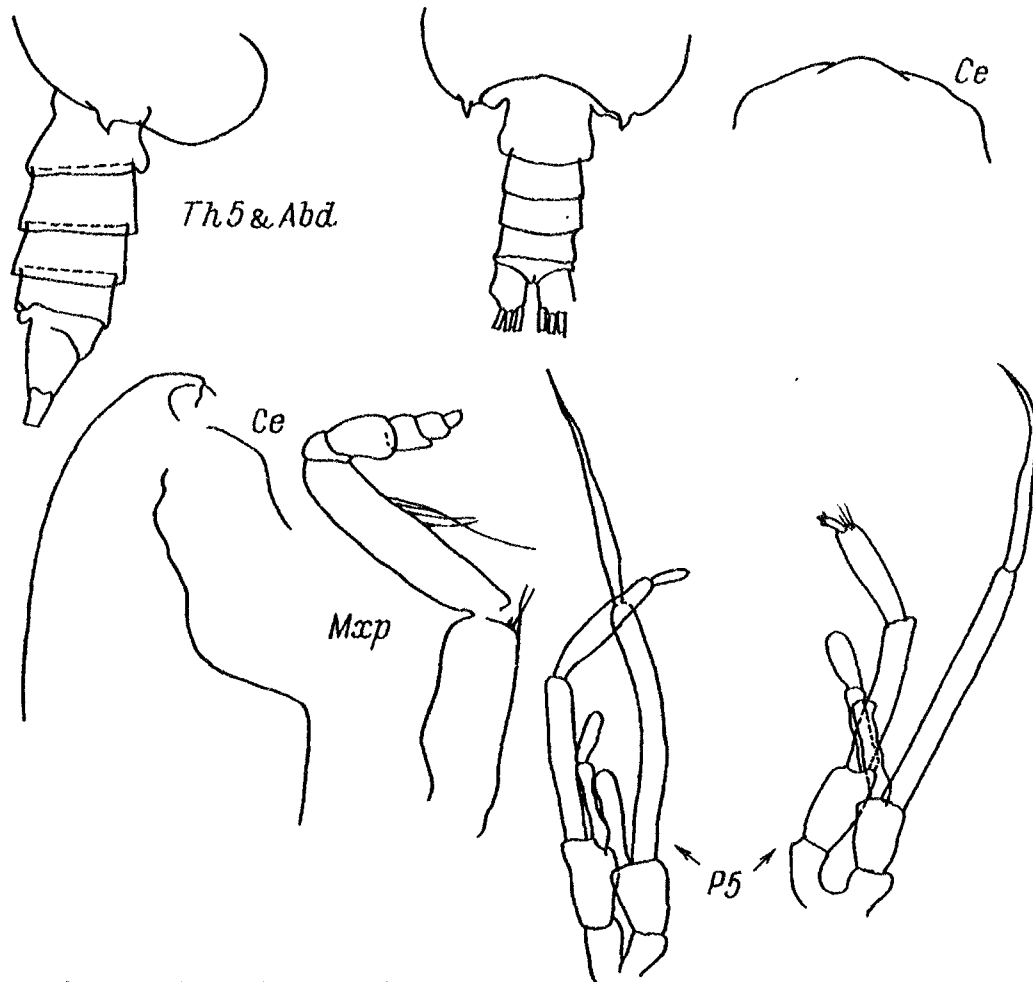


Fig. 48. *Bradyetes matthei*. Male (paratype).

visible), Th4-Th5 incompletely separated. Th5 posterior corners pointed. Genital segment is longer than 2 following segments together, wider than long. A2 basipodite with 2 setae; Re1 A2 without setae. Md palp base and Ri1 Md with 2 setae each; Ri2 Md with 9 terminal setae. Mx1 gnathobase with 9 terminal spines and 4 setae on surface. Mx1 second internal lobe with 5; third with 4 setae; protopodite near Ri base with 5 setae, Ri with 15 setae; Re with 10 setae; external lobe with 9 setae. Digital appendage near distal setae group is small. Setation and segmentation of P1-P4 typical of the genus. Re P1-P4 with groups of small spinules near external border of joint. Ri2 P2, Ri2-Ri3 P3 and Ri1-Ri3 P4 with surface spinules.

M a l e. Total length 0.90-0.92 mm. Cephalothorax 4 times longer than abdomen. Left A1 24-jointed and right A1 23-jointed. Comparing to female oral parts poorer developed and equipped. P5 with 2-jointed left Ri P5.

Type locality: 60°46'N 05°10' E.

Geographical distribution. Fensfjord (Johannessen, 1976).

Vertical distribution. The species was found from depths 548-552 and 570-580 m (Johannessen, 1976).

Material: 3 females and 1 male (paratypes) kept in Zoological Museum of Bergen (Norway) under the number N 57596 were examined.

6. *Bradyidius* Giesbrecht, 1897

TYPE SPECIES: *Bradyidius armatus* Giesbrecht, 1897, by monotypy.

Bradyidius Giesbrecht, 1897 (19.VII): 253

Bradyanus Vanhöffen, 1897a (13.IX): 322 (type species:

Bradyanus armatus Vanhöffen, 1897), by monotypy

Undinopsis Sars, 1902: 31 (type species: *Undinopsis bradyi*

Sars, 1902, by monotypy); Rose, 1933: 91; Brodsky, 1950: 148.

Description. **F e m a l e.** Body length 1.59-4.50 mm (1.2 mm only once recorded in *B. tropicus* (Wolfenden, 1905)). Cephalothorax 3-4 times longer than abdomen. Crest absent. Rostrum present, robust, bifurcate, with divergent or (rarely) nondivergent

rami. Cephalon and Th1 completely or incompletely fused, line of separation often visible. Th5 and Th4 fused, line of fusion often visible. Th5 posterior corners prolonged into points, usually reaching the first third of genital segment length, points may be longer, even exceeding posterior border of genital segment. Genital segment nearly as long as wide, sometimes longer than wide, or wider than long. Genital segment usually more than 2 times longer than following segment. Abd1-Abd3 with small spinules along posterior border. A1 24-jointed, exceeding Th3, as long as cephalothorax or even longer. Numerous A1 joints with long setae and aestetasks. Re A2 nearly 1.2 times longer Ri A2. Coxopodite with 1; basipodite with 2; Ri1 A2 with 2; Ri2 A2 with 6-8 setae at internal and 6-7 setae at external lobe (usually in combination 6 terminal and 1 posterior at external lobe). Re1 A2 without setae or with 1 seta; Re2 with 2-3 setae; Re3-Re6 with 1 long seta each; Re7 with 1 seta near the middle of joint or removed to its distal part and 3 terminal setae. Md palp base with 2 (*B. hirsutus* with 1) setae; Ri1 Md with 2-3; Ri2 with 9, rarely 8 or 11 terminal and often 1-2 little posterior setae. Mx1 gnathobase with 9 terminal claw-like setae, 1 thin seta and 3-4 setae on posterior surface, there are often also small teeth (near the bases of posterior setae) and hairs. Mx1 second internal lobe with 5; third with 4 setae; protopodite near Ri base with 5; Ri with 13, or 15-17 setae, Re with 10 setae; external lobe with 7 long and 2 short thinner setae. Mx2 typical of Aetideidae. Mx2 fourth and fifth endites with 1 seta thickened into claw-like spine. Mxp typical of family: protopodite in its proximal part usually with 1 seta, and from proximal to distal with 3 groups of 2 (1), 3 and 3 setae. Ri1 Mxp with 3 medial setae, nearly 1.2-1.3 times longer than protopodite. Re P1 3-jointed with external spine at each joint, external spine of Re2 usually significantly thicker than of Re1; Ri 1-jointed, external lobe well developed. P2 with 2-jointed Ri and 3-jointed Re. P3-P4 rami 3-jointed. Posterior surfaces of Ri P2-P4 often spinulose. External spines of Re2-Re3 longer than in other genera of Aetideidae. P1-P4 coxopodites often with groups of surface spinules.

M a l e. Body length 1.19-3.30 mm. Cephalothorax about 2.4-3.0 times longer than abdomen. Crest absent. Rostrum almost as in female, but its rami usually not so divergent, may be nearly parallel. Cephalon and Th1, as well as Th4-Th5 fused, rarely line of fusion visible. Points of Th5 posterior corners short, or reaching, or even exceeding posterior border of genital segment. Abd2 twice or more longer than genital segment. Caudal rami 1.3-1.4 times longer than wide. A1 21-24-jointed on the left and 20-24-jointed on the right, it may be shorter, reaching the end of Th2, or much longer, even exceeding caudal rami. As compared to female setation of Re1-Re2 A2 rudimentary, Md gnathobase rudimentary, Md

palp setation also partly reduced. Protopodite Mxp usually with 2 distal setae. Mx1 with partly rudimentary seta. Mx2 as well as Mx1 rather reduced. P1-P4 with segmentation like in female, only external spines of Re P1 may be considerably shorter. P5 uni-, or biramous, left and right usually of the same length. When uniramous, in both legs are commonly of equal length; sometimes right leg 3 times shorter. When P5 biramous, Ri 1-jointed (rarely 2-jointed), usually styliform. In comparison to abdomen, P5 length may be different: shorter, or even twice longer. P5 of "simple" structure.

The genus *Bradyidius* includes 15 species. Descriptions of *B. tropicus* (Wolfenden, 1905) that remained inaccessible, and *B. hirsutus*, *B. plinói*, *B. spinifer* and *B. styliformis* recorded of the southern hemisphere are not given here.

Key to the species of *Bradyidius*

Females

(unknown for *B. angustus*)

- 1(6) Rostrum with nondivergent or parallel rami.
- 2(5) Rostrum with nondivergent rami. Specimens 1.67-2.70 mm in length.
- 3(4) Points of Th5 posterior corners short, hardly reaching the end of first third of genital segment 4. *B. curtus* Markhaseva
- 4(3) Points of Th5 posterior corners longer, reaching nearly posterior third of genital segment 2. *B. arnoldi* Fleminger
- 5(2) Rostrum with parallel rami. Specimens 4.40-4.50 mm in length 6. *B. pacificus* Brodsky
- 6(1) Rostrum with divergent rami.
- 7(12) Points of Th5 posterior corners reaching and even exceeding posterior border of genital segment. Re2 A2 with 3 setae. Re1 P1 external spine exceeding the base of Re2 P1 external spine, often reaching the middle of Re2 P1 length.
- 8(9) Points of Th5 posterior corner turned up (lateral view) 5. *B. luluae* Grice
- 9(8) Points of Th5 posterior corner straight.
- 10(11) Genital segment 1.09 times wider than long. Re1 A2 with 1 small seta. Spermatheca elongate-oval 10. *B. subarmatus* Markhaseva
- 11(10) Genital segment 1.2-1.3 times wider than long. Re1 A2 without seta. Spermatheca rounded 3. *B. armatus* Giesbrecht
- 12(7) Points of Th5 posterior corners not reaching posterior border of genital segment. Re2 A2 with 2 setae. Re1 P1 external spine not reaching the base of external spine of Re2 P1 (sometimes almost reaching).
- 13(14) Th5 posterior corners divergent. Points of Th5 posterior corners nearly reaching posterior border of genital segment 7. *B. rakuma* (Zvereva)

- 14(13) Th5 posterior corners nondiverging. Points of Th5 posterior corners shorter.
 15(16) Rostral rami rather divergent, obtuse angle in their base 8. *B. saanichi* Park
 16(15) Rostral rami not so divergent, acute angle in their base 9. *B. similis* (Sars)

Males

(unknown for *B. rakuma* and *B. curtus*)

- 1(8) P5 uniramous.
 2(5) Right P5 nearly 3 times shorter than left.
 3(4) Distal (third) joint of right P5 with 1 terminal small spine 3. *B. armatus* Giesbrecht
 4(3) Distal (third) joint of right P5 with 2 terminal small spines 10. *B. subarmatus* Markhaseva
 5(2) Right P5 nearly as long as left.
 6(7) Specimens longer than 2 mm. A1 reaching the end of Th2 5. *B. luluae* Grice
 7(6) Specimens 1.37 mm in length. A1 reaching posterior border of Abd2 1. *B. angustus* Tanaka
 8(1) P5 biramous.
 9(10) Ri P5 left 2-jointed. A1 reaching caudal rami. Specimens shorter than 2 mm in length 2. *B. arnoldi* Fleminger
 10(9) Ri P5 left 1-jointed. A1 shorter. Specimens longer than 2 mm.
 11(14) Points of Th5 posterior corners short, not reaching posterior Abd1 border (dorsal and lateral view). P5 nearly twice longer than abdomen.
 12(13) Re1 P1 without external spine 6. *B. pacificus* Brodsky
 13(12) Re1 P1 with external spine 8. *B. saanichi* Park
 14(11) Points of Th5 posterior corners longer, reaching or even exceeding posterior Abd1 border. P5 shorter. 9. *B. similis* (Sars)

1. *Bradyidius angustus* (Tanaka, 1957)

(Fig. 49)

Undinopsis angustus Tanaka, 1957a: 45, fig. 29.

Description. Male. (Description after Tanaka (1957a) with modifications). Total length 1.37 mm. Cephalothorax 3 times longer than abdomen. Rostrum with weakly divergent rami. Points of Th5 posterior corners reaching Abd1 posterior border. A1 22(?)-jointed, reaching Abd2 posterior border. Re P1 external spines short. Ri2-Ri3 P2-P4 posterior surfaces with minute spinules. Terminal spines of Re P2-P4 with 22-24, 25 and 27 teeth respectively. P5 uniramous, 4-, 5-jointed, nearly equal in length.

Female unknown.

Type locality: the Izu region.

Geographical distribution. Pacific Ocean: the Izu region (Tanaka, 1957a).

Vertical distribution. The species was found in total haul from 1000 m (Tanaka, 1957a).

The species is not examined by me.

2. *Bradyidius arnoldi* Fleminger, 1957

(Fig. 50)

Bradyidius arnoldi Fleminger, 1957: 355, pl. 1, figs 1-13

Description. Female. (Description after Fleminger (1957) with modifications). Total length 1.67 mm. Cephalothorax 4 times longer than abdomen. Rostrum with nondiverging rami. Points of Th5 posterior corners reaching the posterior third of genital segment (dorsal view), directed towards the back side of specimen (lateral view). A1 nearly as long as cephalothorax. Re1 P1 external spine very short; Re2 P1 spine thick, reaching the base of next spine. Ri P2-P4 posterior surfaces spinulose.

Male. Total length 1.19-1.23 mm. Cephalothorax 2.8 times longer than abdomen. Points of Th5 posterior corners not exceeding posterior border of Abd1. A1 reaching nearly the end of body, right 20-, left 21-jointed. Ri P2-P4 with surface spinules as in female. P5 nearly twice longer than abdomen, biramous. Right Ri P5 1-jointed, left 2-jointed; Right Re P5 2-jointed, left 3-jointed.

Type locality: the Gulf of Mexico.

Geographical distribution. The Gulf of Mexico (Fleminger, 1957).

Vertical distribution. The species was found in surface or near surface hauls, in night samples, between T 16.7°C and 23.5°C (Fleminger, 1957).

The species is not examined by me.

3. *Bradyidius armatus* Giesbrecht, 1897

(Figs. 51-52)

Pseudocalanus armatus (non Boeck, 1872). Brady, 1878: 46, pl. 4, figs 1-9, 11 (female).

Bradyidius armatus Giesbrecht, 1897: 253; Vervoort, 1952b (sheet 43): 3, fig 1; Markhaseva, 1993: 47, 50, figs 1-10.

Bradyanus armatus Vanhöffen, 1897a: 322.

Undinopsis bradyi Sars, 1902: 32, pl. 32, pl. 19, 20; Rose, 1933: 92, fig. 55.

Bradyidius bradyi: Matthews, 1964: 18, fig. 7; Bradford, 1976: 6; Bradford & Jillett, 1980: 21

Description. Female. Total length 2.65-2.70 mm. Cephalothorax about 3-4 times longer than abdomen. Rostrum with divergent rami. Points of Th5 posterior corners exceeding posterior border of geni-

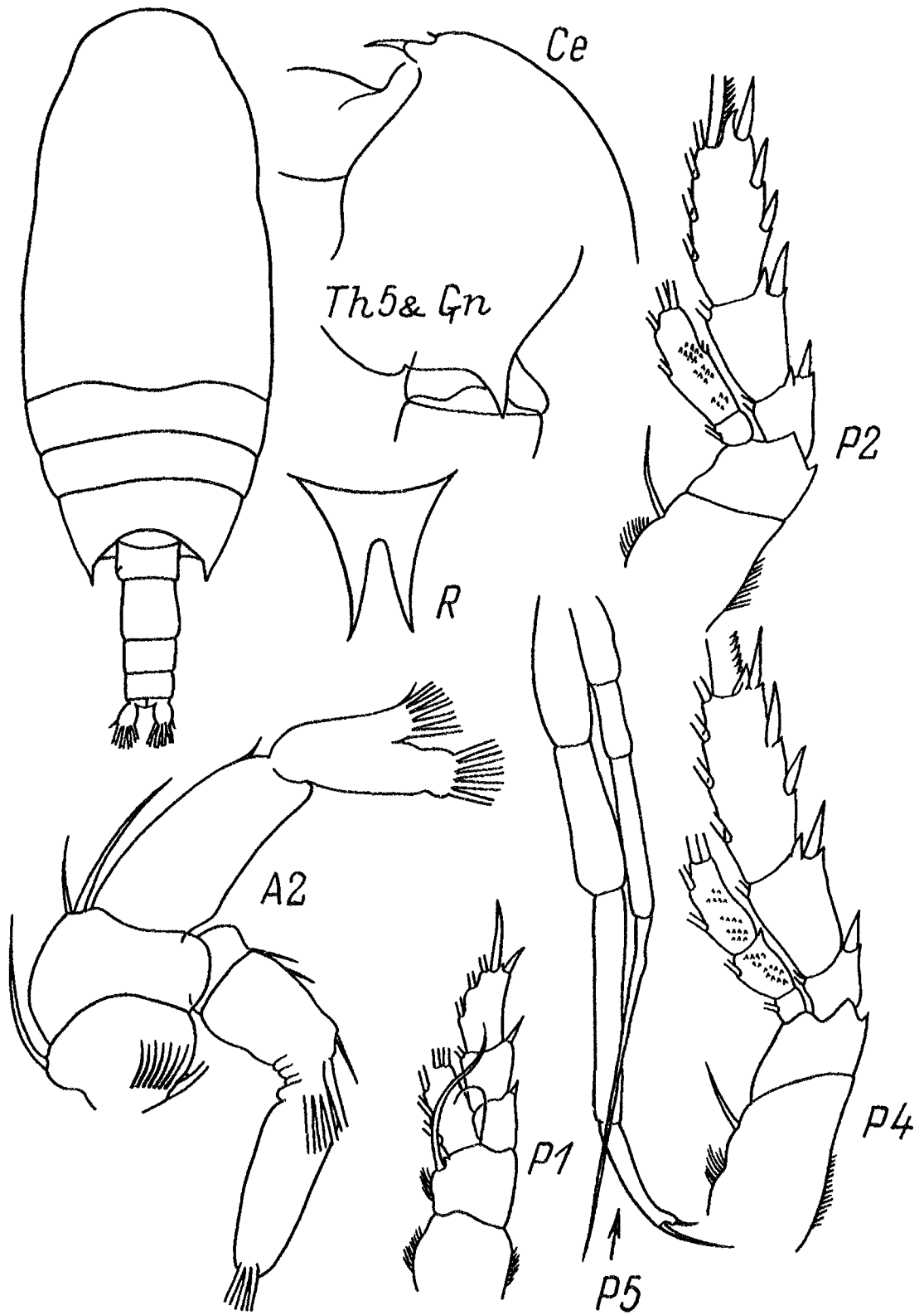


Fig. 49 *Bradyidius angustus* Male (from Tanaka, 1957a)

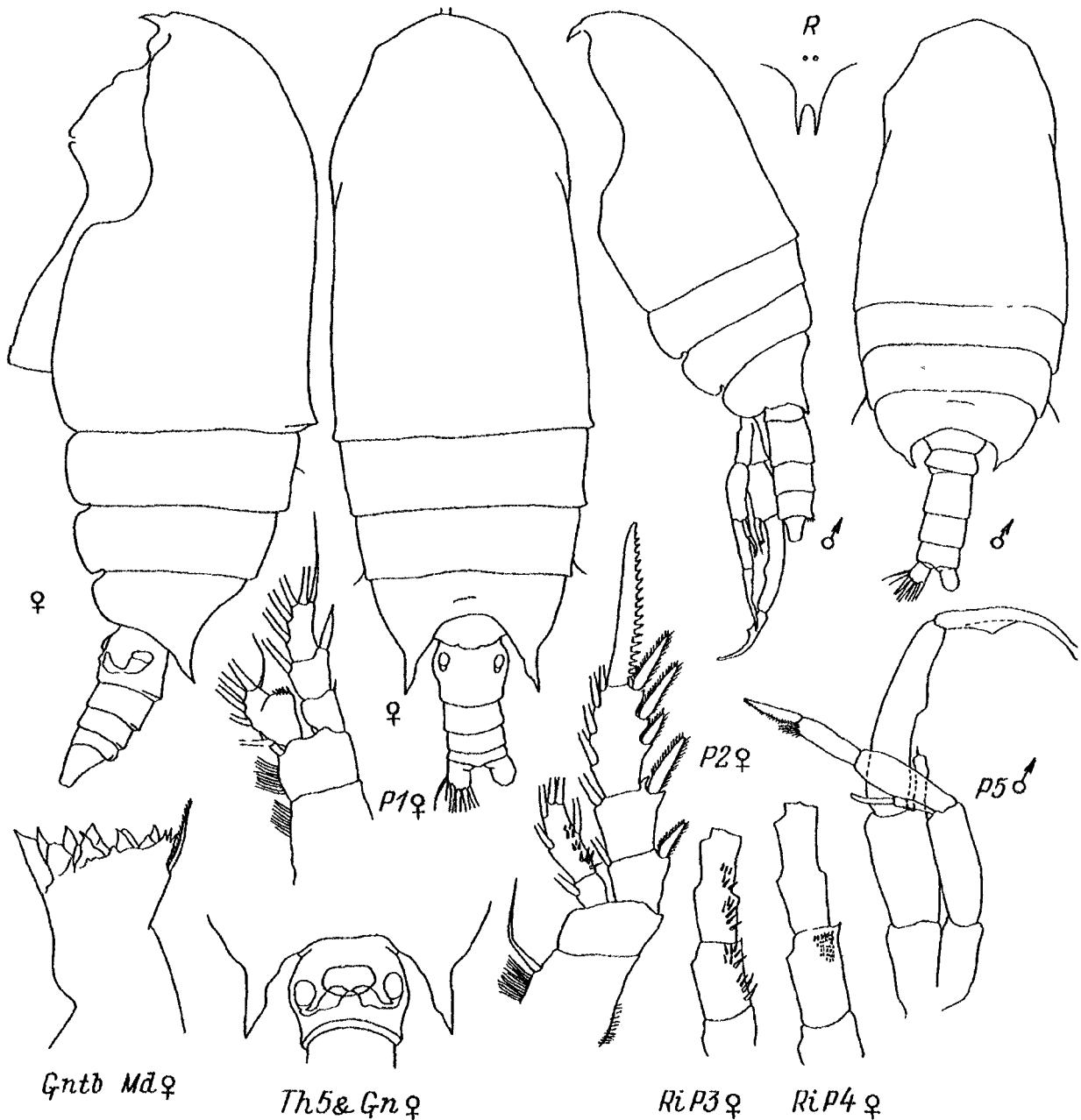


Fig. 50. *Bradyidius arnoldi*. Female, male (from Fleminger, 1957).

tal segment. Genital segment 1.2-1.3 times wider than long. Spermatheca rounded. A1 nearly as long as cephalothorax, reaching or exceeding posterior border of genital segment. Re1 A2 without setae; Re2 A2 with 3 setae. Ri1 Md with 2; Ri2 Md with 9 terminal setae. Re1 P1 external spine somewhat exceeding the base of next spine. Posterior surfaces of Ri P2-P4 spinulose.

M a l e. (Description after Sars (1902) and Matthews (1964) with modifications). Total length 1.50-2.20 mm. Cephalothorax 3 times longer than abdo-

men. Points of Th5 posterior corners exceeding posterior border of Abd1. P5 uniramous. Left P5 long, 5-jointed; right P5 more than 3 times shorter and 3-jointed, sometimes absent. Its distal joint (third) with 1 terminal and 1 external spine (in all — 2 spines).

Geographical distribution. Off the coasts of Great Britain (Brady, 1878) and of Norway (Sars, 1902; Matthews, 1964; original data), the Norwegian and the Barents seas (Vervoort, 1952b).

Vertical distribution. Probably epibenthic species.

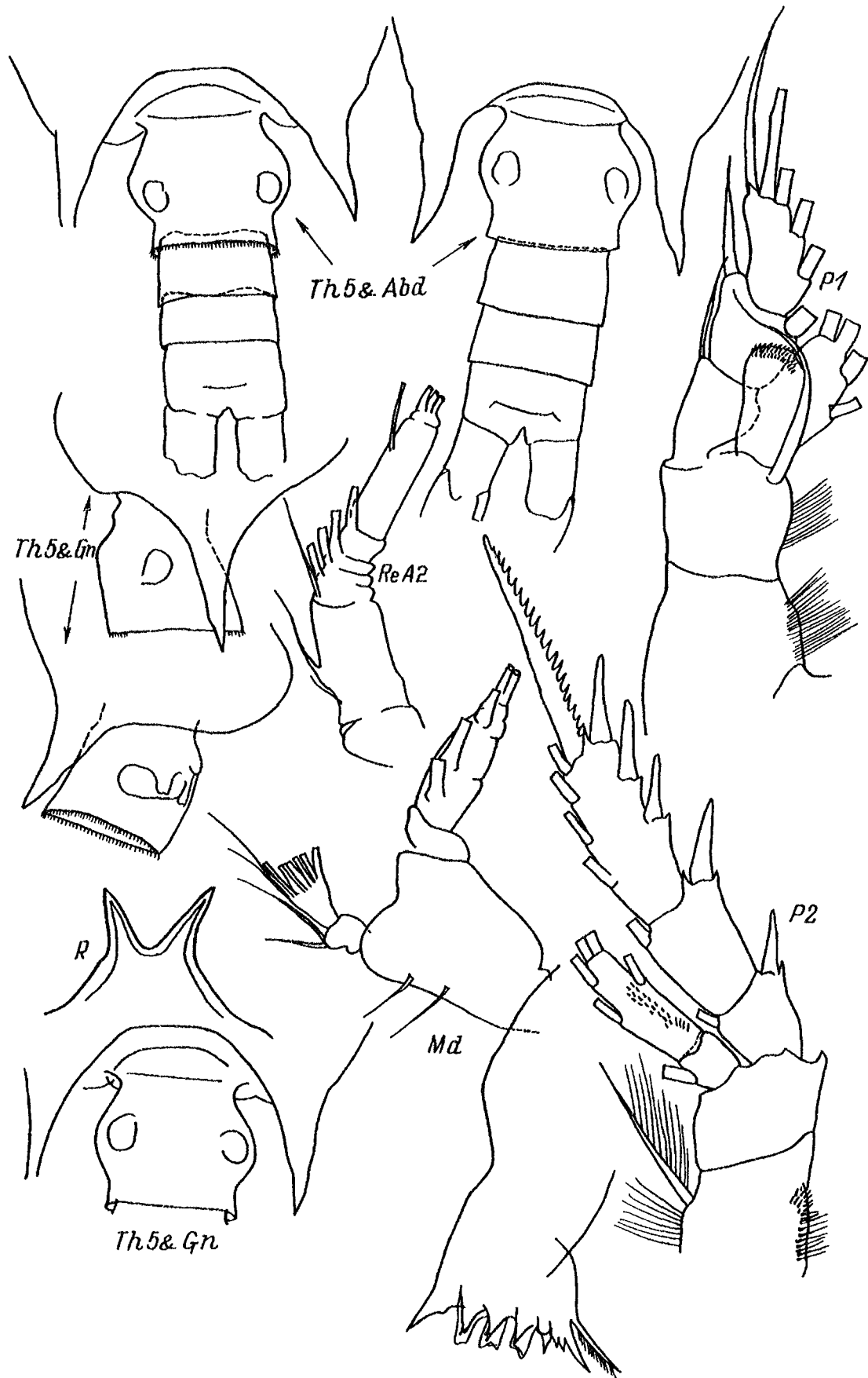


Fig. 51. *Bradyidius armatus*. Female (from Maikhasova, 1993).

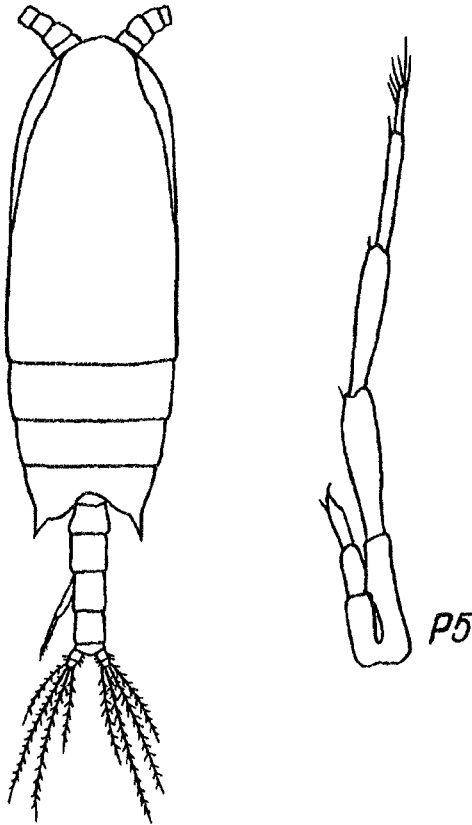


Fig. 52. *Bradyidius armatus*. Male (from Sars, 1902).

Often was found close to the bottom at depths of 36-73 m (Sars, 1902) over muddy bottoms.

Material: 5 females (N 20653) kept in the Zoological Museum of Oslo University.

4. *Bradyidius curtus* Markhaseva, 1993

(Fig. 53)

Bradyidius curtus Markhaseva, 1993: 50, 53; figs 35-43.

Description. Female. Total length 2.80-2.90 mm. Cephalothorax 3.0-3.8 times longer than abdomen. Rostrum with nondivergent rami. Points of Th5 posterior corners short, reaching the end of first one third of genital segment (dorsal view), directed to the back of specimen (lateral view). A1 reaching Th4. Re1 A2 without setae; Re2 A2 with 3 (2 medial and 1 distal) setae. Md palp base and Ri1 Md with 2 setae each; Ri2 Md with 9 setae. Posterior surface of Mx1 gnathobase with 4 thin setae and small teeth near bases. Ri Mx1 with 15 setae. Otherwise Mx1, Mx2 and Mxp typical of the genus. External spines of Re1 and Re2 P1 exceeding base of next spine (sometimes Re1 P1 external spine is not exceeding); spine of Re3 nearly twice longer than its joint. Ri P2-P4 with minute spinules on posterior surface. Terminal spines of Re3 P2-P4 with about 24, 24 and 25 denticles respectively.

Male unknown.

Type locality: 49°53'N 155°38'E.

Geographical distribution. Pacific Ocean: the north-western part of the region of the Kuril Islands.

Vertical distribution. The species was found in hauls 86-94 m, 50-140 m, 0-157 m.

Material: 27 females from samples: 43, 260-261.

5. *Bradyidius luluae* Grice, 1972

(Fig. 54)

Bradyidius luluae Grice, 1972. 224, figs 23-41; Johannessen, 1976: 23

Description. Female. (Described after Grice (1972) with modifications). Total length 2.55-3.12 mm. Cephalothorax about 4 times longer than abdomen. Rostrum with divergent rami. Points of Th5 posterior corners exceeding posterior border of genital segment (dorsal view), directed upwards (lateral view). A1 reaching Th5. Re1 A2 with 1 seta; Re2 A2 with 3 (2 medial and 1 distal) setae. Ri1 Md with 2 setae; Ri2 Md with 8 terminal and 2 posterior setae. Ri Mx1 with 16 setae. Otherwise Mx1, Mx2 and Mxp typical of the genus. External spine of Re1 P1 exceeding the base of next spine.

Male. Total length 2.04-3.25 mm. Cephalothorax nearly twice longer than abdomen. Points of Th5 posterior corners short, not reaching posterior border of Abd1. A1 reaching the end of Th2, left 22-jointed, with long (proximally) and short (distally) aesthetascs. Comparing to female oral parts rudimentary. External spines of Re P1 shorter than in female. Ri P2-P4 with numerous minute spinules on posterior surface. P5 uniramous, 5-jointed, shorter than abdomen.

Type locality: 39°46'N, 70°34'W.

Geographical distribution. Atlantic Ocean: the north-western part, the Norwegian coast (Grice, 1972; Johannessen, 1976).

Vertical distribution. Evidently benthopelagic species. Found at depth about 1500 m in 20-50 cm above bottom (Grice, 1972) and in direct proximity to the bottom (Johannessen, 1976).

The species is not examined by me.

6. *Bradyidius pacificus* (Brodsky, 1950)

(Figs. 55-56)

Undinopsis pacificus Brodsky, 1950 149, fig 65

Bradyidius pacificus: Bradford, 1976. 6, Bradford & Jillett, 1980. 21.

Description. Female. Total length 4.40-4.50 mm. Cephalothorax 3.3 times longer than abdomen. Rostrum with divergent rami. Points of Th5 posterior corners reaching posterior third of genital segment, straight. A1 reaching nearly the midlength of ab-

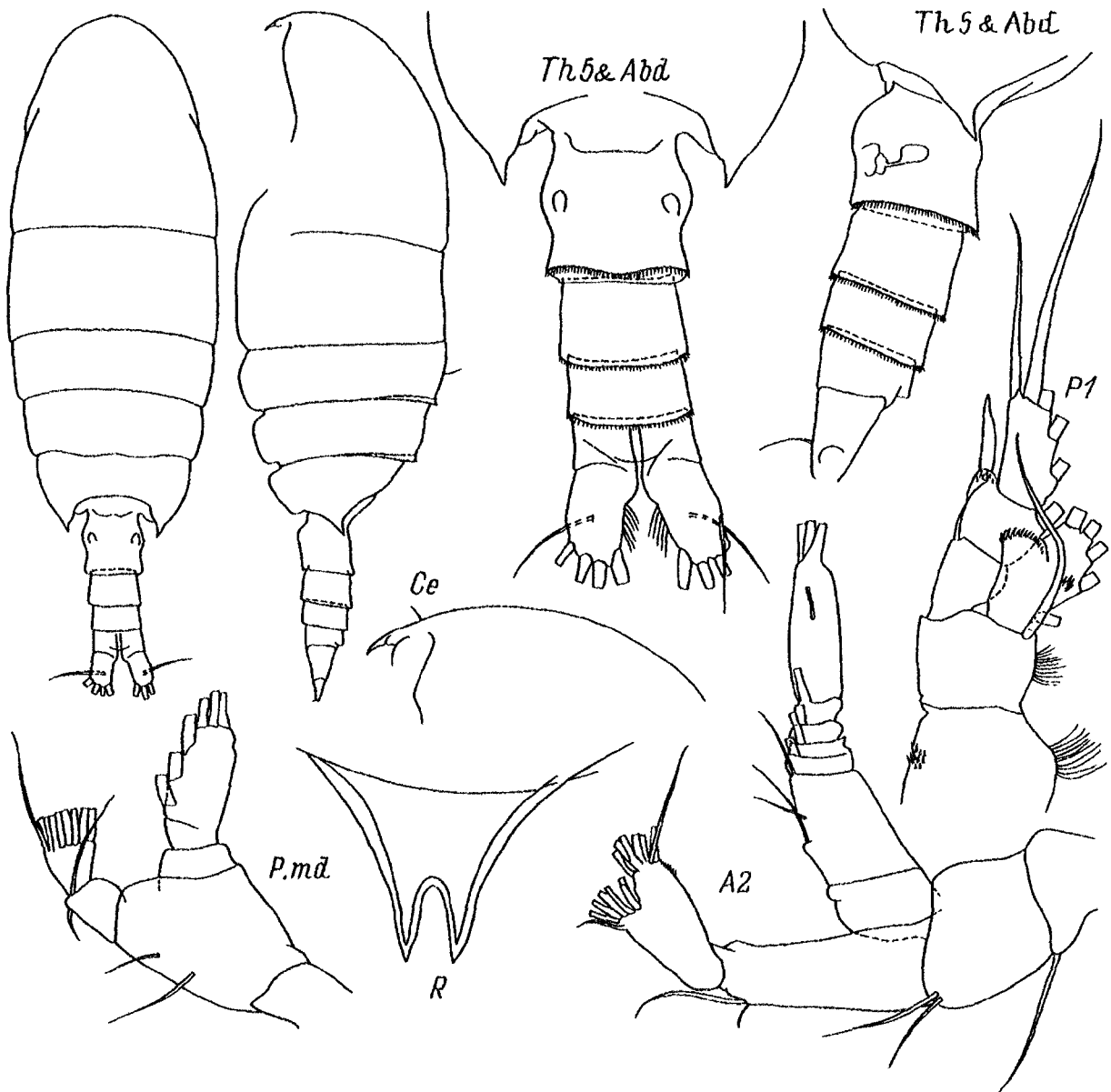


Fig. 53. *Bradyidius curtus*. Female (from Markhaseva, 1993).

domen. Re1 A2 without setae; Re2 A2 with 2 setae. Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 1 posterior setae. Mx1 gnathobase with 4 setae on posterior surface; Ri Mx1 with 14 setae. Mx2 and Mxp typical of the genus (setae in proximal Mxp group broken). External spines of Re1 and Re2 P1 not reaching the base of next spine; external spine of Re3 P1 long, twice longer than its joint. Terminal spines of P3-P4 exopodites with 32-32 denticles.

M a l e. Total length 3.30 mm. Cephalothorax 2.9 times longer than abdomen. Rostrum as in female, rami less divergent. Points of Th5 posterior corners not exceeding posterior border of Abd1. A1 24-jointed, reaching Abd5. A2 setation as in female,

only Ri2 A2 with 11 setae. Comparing to female, oral parts rudimentary. Re1 P1 without external spine. Ri3 P3-P4 with minute surface spinules. P5 about twice longer than abdomen, biramous, both Ri 1-jointed, styliform. Right Re 2-, left Re 3-jointed.

Type locality: the Sea of Okhotsk.

Lectotype: female from the sample 257.

Geographical distribution. The Sea of Okhotsk, the Bering Sea (Brodsky, 1950; original data).

Vertical distribution. The species was found in hauls from 1000 m (Brodsky, 1950), also 25-50 and 50-100 m (original data).

Material: about 100 females and 2 males from samples: 1, 231, 243, 245, 251, 253-257.

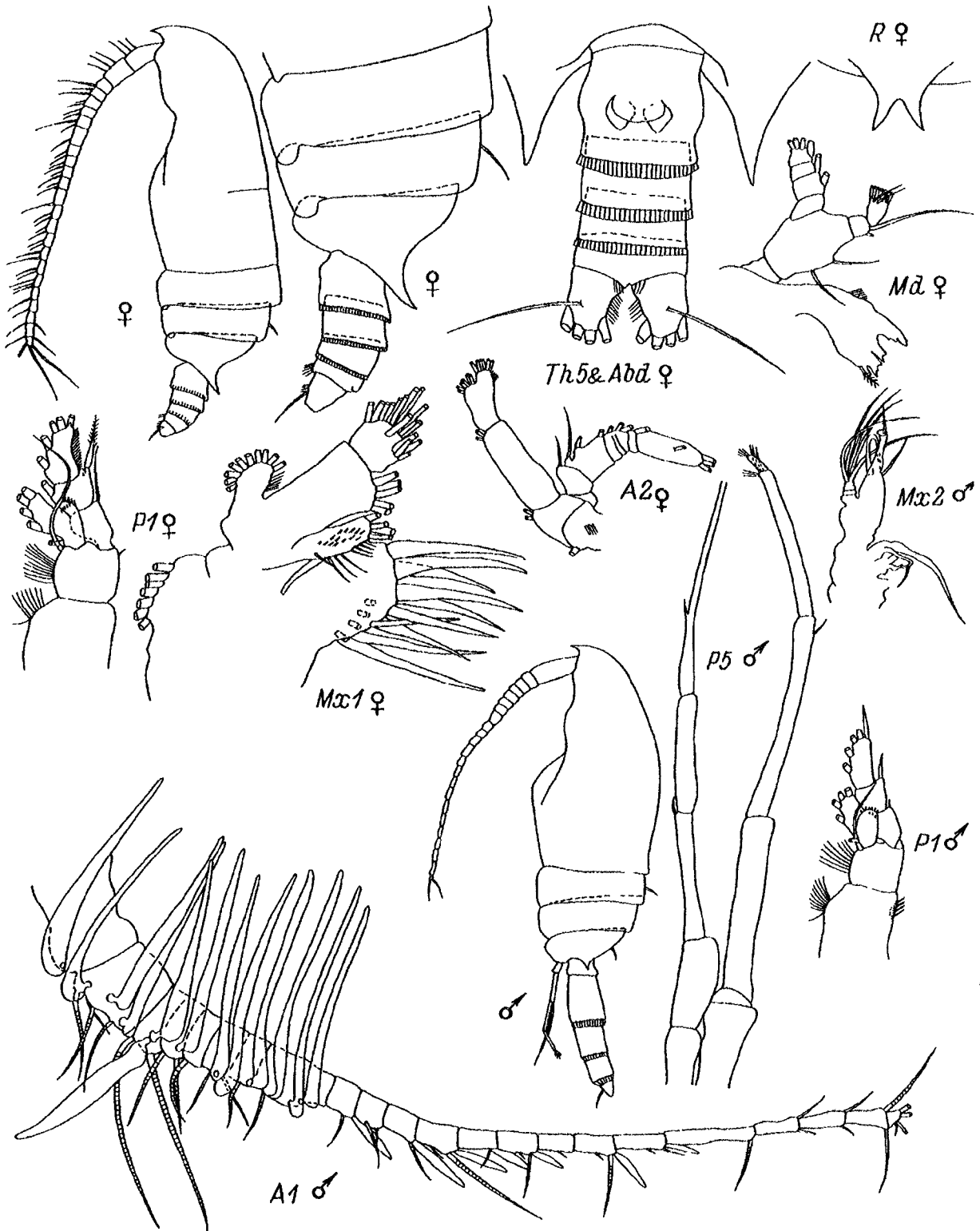


Fig. 54. *Bradyidius luluae*. Female, male (from Grice, 1972).

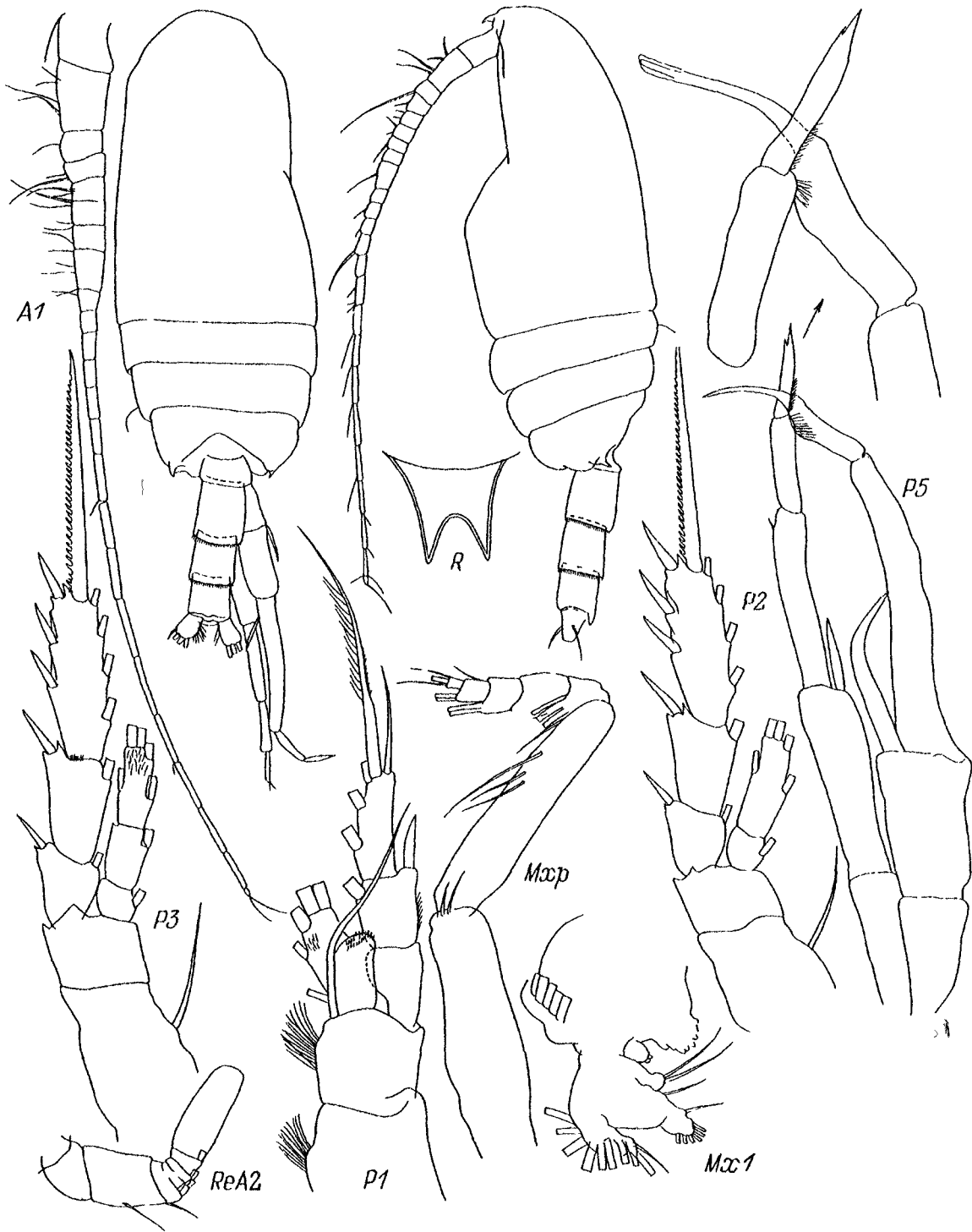


Fig. 56. *Bradyidius pacificus*. Male (257).

7. *Bradyidius rakuma* (Zvereva, 1977)

(Figs. 57-58)

Aetideopsis rakuma Zvereva, 1977: 6-8, fig. 1.*Bradyidius rakuma*: Bradford & Jillett, 1980: 19-20.

Description. Female. Total length 3.10-3.30 mm. Cephalothorax nearly 4 times longer than abdomen. Rostrum with divergent rami. Points of Th5 posterior corners long, slightly divergent, not reaching posterior border of genital segment (lateral and dorsal view). A1 slightly longer than cephalothorax. Re2 A2 without setae; Re2 A2 with 2 setae. Ri1 Md with 2 setae; Ri2 Md with 9 terminal setae. Posterior surface of Mx1 with 4 setae; Ri with 15 setae. Mx2 and Mxp typical of the genus. External spines of Re1 and Re2 P1 exceeding the base of next spine. P2-P4 typical of the genus.

Type locality: Tobuty Bay, Aniva Gulf.

Geographical distribution. The Sea of Okhotsk, Tobuty Bay (Rakuma region), Aniva Gulf (Zvereva, 1977).

Vertical distribution. Evidently benthopelagic species. Found at depth 60 m on sandy bottoms (Zvereva, 1977).

Material: 1 female from sample 240.

8. *Bradyidius saanichi* Park, 1966

(Fig. 59)

Bradyidius saanichi Park, 1966: 805-811, figs 1-3.

Description. Female (Described after Park (1966) with modifications). Total length 2.33-2.56 mm. Cephalothorax 3.4 times longer than abdomen. Rostrum with rather divergent rami, with obtuse angle in their base. Points of Th5 posterior corners not reaching posterior border of genital segment, directed obliquely upwards to the back of specimen (lateral view), nondiverging (dorsal view). A1 slightly shorter than cephalothorax. Re1 A2 without setae; Re2 A2 with 2. Ri2 Md with 9 terminal setae. Mx1 gnathobase with 4 posterior setae; Ri with 17 setae. Otherwise oral parts typical of the genus. External spine of Re1 P1 nearly reaching base of Re2 P1 external spine, which is slightly longer than that of Re1 P1 and somewhat exceeding base of external spine of Re3 P1. Re3 P1 external spine twice longer than that of Re2 P1. Segmentation of P3-P4 typical of the genus. P3-P4 with minute spinules.

Male. Total length 2.01-2.24 mm. Cephalothorax 2.4 times longer than abdomen. Points of Th5 posterior corners not exceeding posterior border of Abd1. Left A1 24-jointed, right 23-jointed. Comparing to female, oral parts rudimentary. P1-P4 similar to that in female, only external spines of Re P1 shorter. P5 asymmetrical, biramous. Both Ri P5

1-jointed, styliform. Right Re P5 2-jointed, left 3-jointed.

Type locality: 48°40'N 123°30'E.

Geographical distribution: Saanich Inlet, Vancouver Island, British Columbia (Park, 1966).

The species is not examined by me.

9. *Bradyidius similis* (Sars, 1902)

(Figs. 60-61)

Undinopsis similis Sars, 1902: 34, pl. 21, 1925: 44; Rosc, 1933: 92, fig. 56.

Bradyidius similis: Vervoort, 1952b (sheet 43): 3, fig. 2; Shih, Rainville & Maclellan, 1981: 1079, figs 79-108.

?*Bradyanus armatus* Vanhöffen, 1897b. 280, fig. 17.

Undinopsis armatus: Vanhöffen, 1907, pl. 21, fig. 24, pl. 22. figs 28-30.

Description. Female. Total length 2.84-3.24 mm. Cephalothorax 3.2-3.3 times longer than abdomen. Rostrum with slightly divergent rami (in some specimens nearly non divergent). Points of Th5 posterior corners reaching or exceeding the mid-length of genital segment. A1 24-jointed, reaching nearly the end of cephalothorax. Re1 A2 without setae; Re2 A2 with 2. Ri1 Md with 2; Ri2 Md with 8 terminal setae. Mx1 gnathobase with 4 posterior setae; Ri with 15-17 setae; second internal lobe with 4 (according Shih, Rainville & Maclellan, 1981 with 5 setae); third with 5 (in our specimen with 4) setae. Mx2 and Mxp typical of the genus. Re1 P1 external spine slightly not exceeding or reaching the base of external spine at Re2 P1. In its turn, the latter exceeds the base of Re3 P1 external spine; twice longer than its joint. Terminal spines of Re3 P2-P4 with 24 denticles. Ri P2-P4 with minute surface denticles.

Male. Total length 2.40-2.77 mm. Cephalothorax 2.39-2.60 times longer than abdomen. Rostrum with slightly divergent rami. Points of Th5 posterior corners reaching posterior border of Abd1 or exceeding it. Right A1 23-jointed, left 24-jointed, reaching Th4. Penultimate joint of right A1 with group of denticles. Comparing to female oral parts rudimentary. Re1 P1 external spine shorter than in female. P2-P4 as in females. P5 biramous. Both Ri 1-jointed. Left Re P5 2-, right 3-jointed.

Type locality: Norwegian fjords.

Geographical distribution. Of Norwegian fjords (Sars, 1902). Saguenay fjord and the adjacent St. Lawrence estuary (Shih, Rainville & Maclellan, 1981). North-eastern Atlantic, Norwegian Sea (Vervoort, 1952b), found in the north-eastern part of the Barents Sea (original data).

Vertical distribution. The species was found near bottom at depth 91-183 m (Sars, 1902) and in total haul from 156 m (original data).

Material: 2 females and 2 males from sample 458.

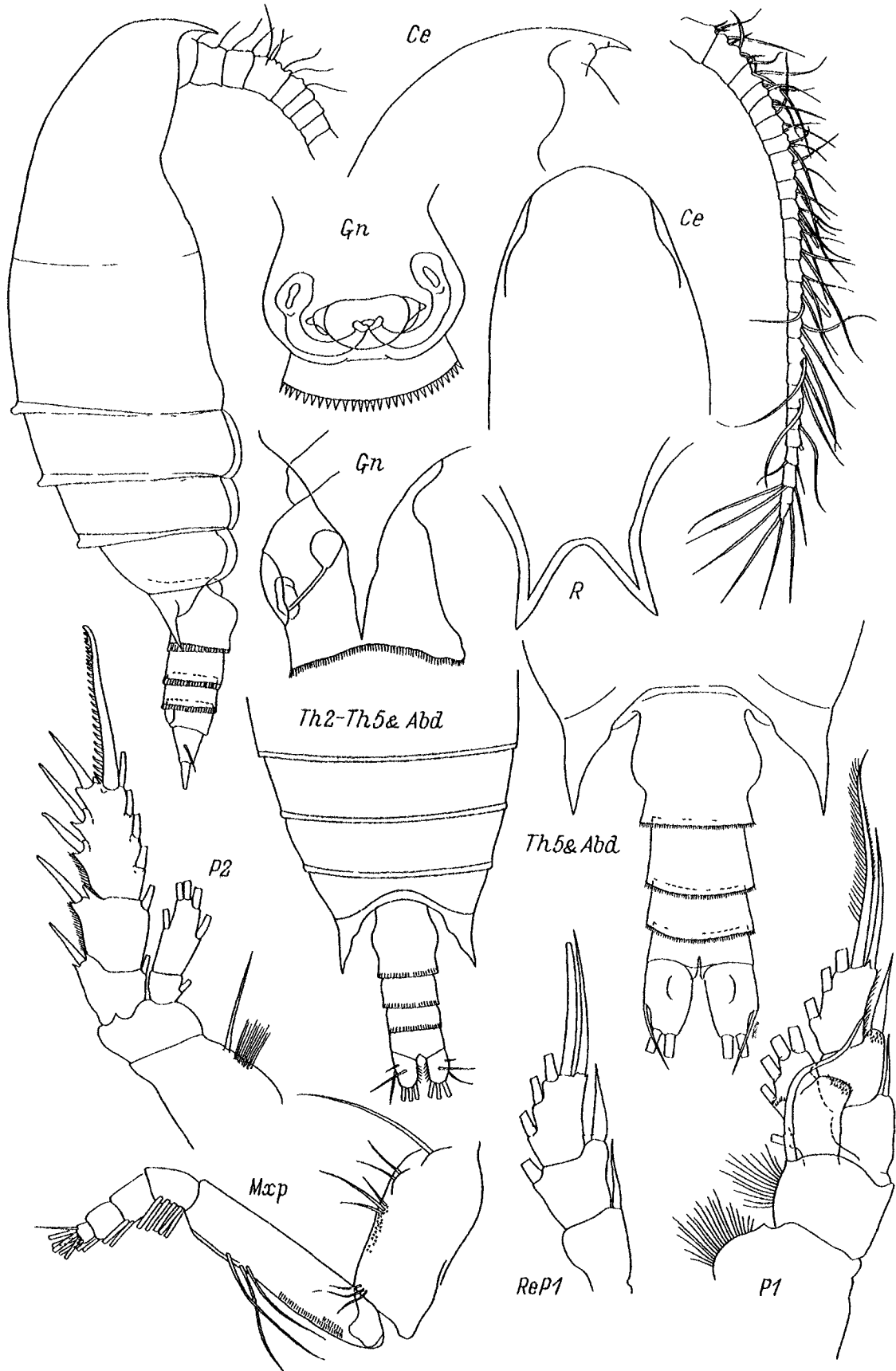


Fig. 57. *Bradydus rakuma*. Female: general view, Th2-Th5 & Abd, Ce, Gn, Mxp, P2 (from Zvereva, 1977 & unpublished), other figures (240).

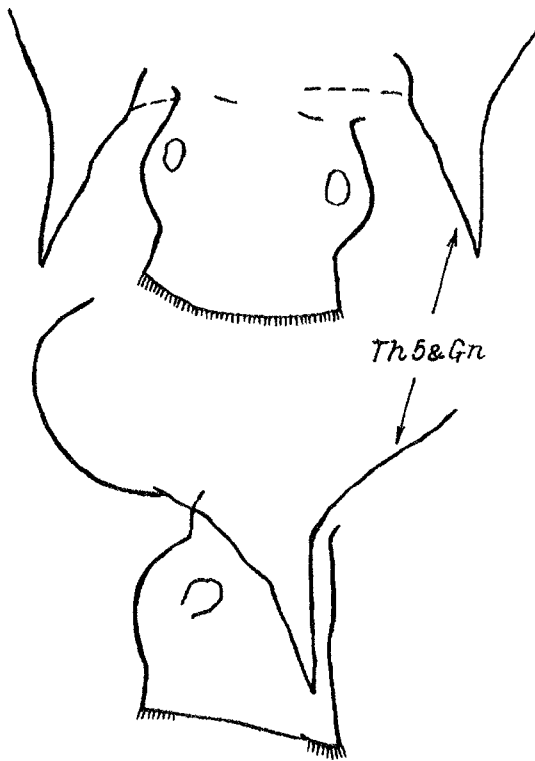


Fig. 58. *Bradyidius rakuma* Female (holotype) (240).

10. *Bradyidius subarmatus* Markhaseva 1993.

(Figs. 62-63)

Bradyidius subarmatus Markhaseva, 1993: 50, figs 11-34.

Description. Female. Total length 2.60-2.80 mm. Cephalothorax 4 times longer than abdomen. Rostrum with nondiverging rami. Points of Th5 posterior corners reaching posterior border of genital segment (dorsal and lateral view). Genital segment nearly 1.09 times wider than long. Spermatheca elongate-oval. Re1 A2 with 1 seta; Re2 A2 with 3 setae. Ri Md with 2 (sometimes with another small seta); Ri2 Md with 9 long terminal and 1 posterior short setae. Posterior surface of gnathobase with 4 setae, Ri with 16 setae. All other features of Mx2 and Mxp typical of *Bradyidius*. External spine of Re1 P1 long, reaching nearly the midlength of Re2 P1 spine. Ri P2-P4 with minute surface spinules. P4 coxopodite with thickened hairs on internal surface. Terminal spines of P3-P4 with 20-23 denticles.

Male. Total length 2.00 mm. Cephalothorax nearly 3.3 times longer than abdomen. Rostrum with divergent rami. Points of Th5 posterior corners exceeding posterior border of genital segment, reaching the end of the first third of Abd2 length. A1 reaching posterior border of Abd4. Comparing to female oral parts rudimentary, setation partly reduced. Md palp base with 1 seta. Ri1 Md without seta; Ri2 Md

with 8 setae. Mxp protopodite without setae; Ri1 Mxp with 3 medial setae. External spines of Re1-Re3 P1 shorter than those in female. P2-P4 similar to that in females, but P4 coxopodite without hairs on internal surface. P5 very close to *B. armatus*, but distal (third) joint of right P5 with 2 terminal short spines and 1 short external spine (overall 3 small, short spines).

Type locality: Raunefjord.

Geographical distribution. Off Norwegian coast in Raunefjord, Langesudsfjord and Fanafjord (Markhaseva, 1993).

Vertical distribution. The species commonly found in near bottom hauls from 140-160 m (Markhaseva, 1993).

Material: 1 female, holotype 66810 and 37 females, 1 male, paratypes N 2/66811 material kept in the Zoological Institute, Russian Academy of Sciences and 2 females, paratypes N 20653 kept in the Zoological Museum of Oslo University (Norway).

7. *Chiridiella* Sars, 1907

TYPE SPECIES: *Chiridiella macrodactyla* Sars, 1907, by subsequent designation (Brodsky, 1950).

Chiridiella Sars, 1907: 7

Description. Female. Total length 2.30-2.50 mm. Cephalothorax 3.5-5.0 times longer than abdomen. Cephalon and Th1 separated, incompletely separated or fused, Th4-Th5 fused. Crest absent. Rostrum absent. Posterior Th5 corners always rounded, symmetrical. Genital segment symmetrical. A1 23-24-jointed, shorter, or longer than cephalothorax, sometimes longer than body. Re A2 usually longer or sometimes as long as Ri (*Ch. subaequalis*). Re1-Re2 A2 without setae, Re3-Re6 with 1 seta each, Re7 with 3 terminal setae. A2 coxo- and basipodite usually with 1 seta each; Ri1 A2 without setae (except *Ch. kuniae*); Ri2 A2 usually with 6 terminal setae on external and 6-8 on internal lobe (9 in *Ch. chainae* (Grice, 1969)). Md palp base without setae, also Ri1 Md (Sars (1925) figured seta in *Ch. macrodactyla*), Ri2 Md may possess between 1 (*Ch. gibba*) and 8 setae (*Ch. atlantica*). Compared to other genera Aetideidae, Mx1 reduced: second internal lobe, Re or external lobe may be absent, also setation of Mx1 may be reduced. Mx1 gnathobase with 8-11 or 13 setae; second internal lobe, if present, have from 1 to 3 setae (*Ch. subaequalis*, *Ch. kuniae*); third internal lobe with 1 (*Ch. ovata*) commonly with 2-4 setae; Ri with 3-5 or 7; Re, if present, with 3-6, 8-10 setae; external lobe, if present, with 4-9 setae. Mx2 within *Chiridiella* strongly changing from structure close to typical of the genus to completely modified. Setation of endites, and sometimes endites themselves heavily reduced or transformed,

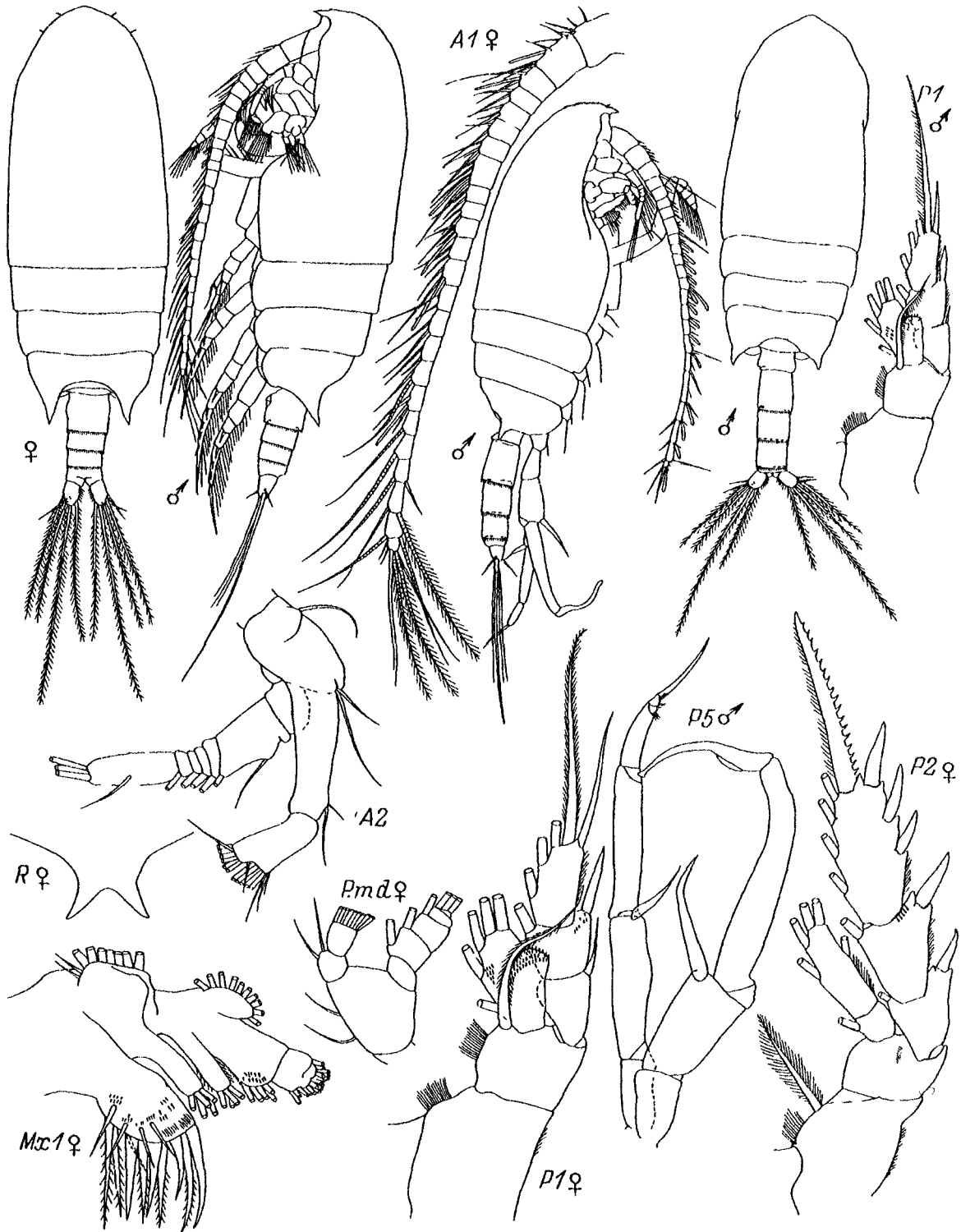


Fig. 59. *Bradydus saanichi*. Female, male (from Park, 1966).

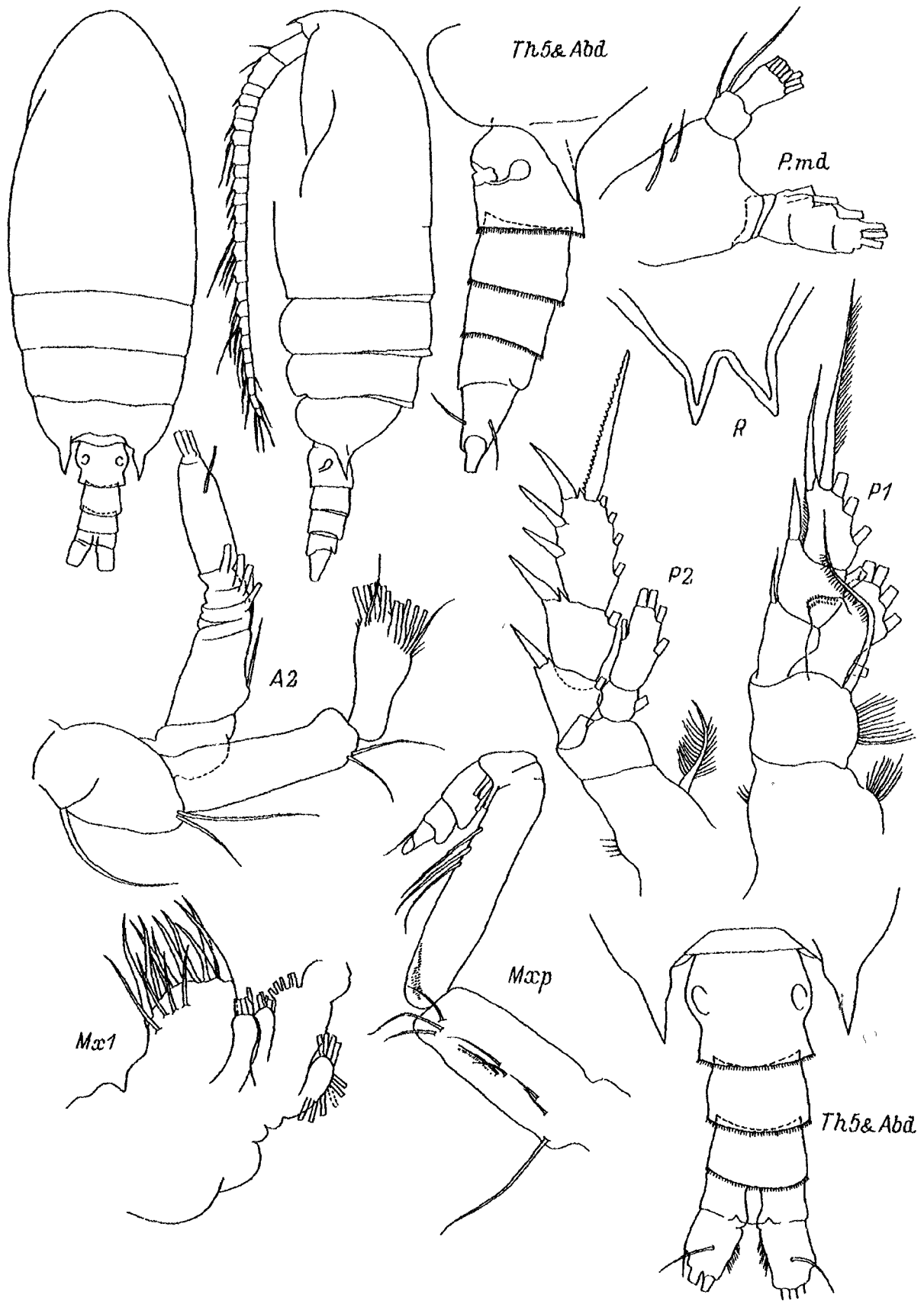


Fig. 60. *Bradyidius similis*. Female (458).

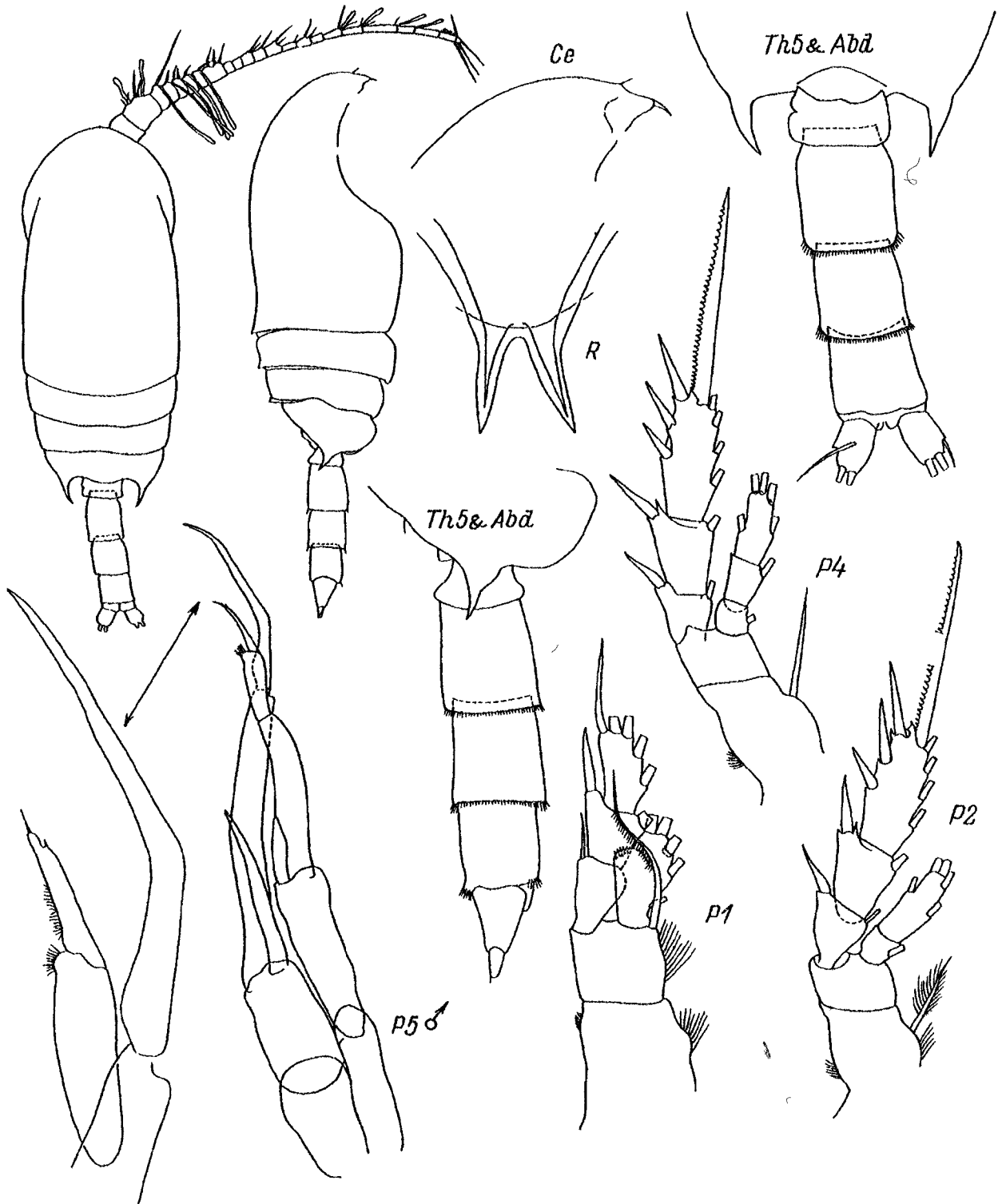


Fig. 61. *Bradyidius similis*. Male (458).

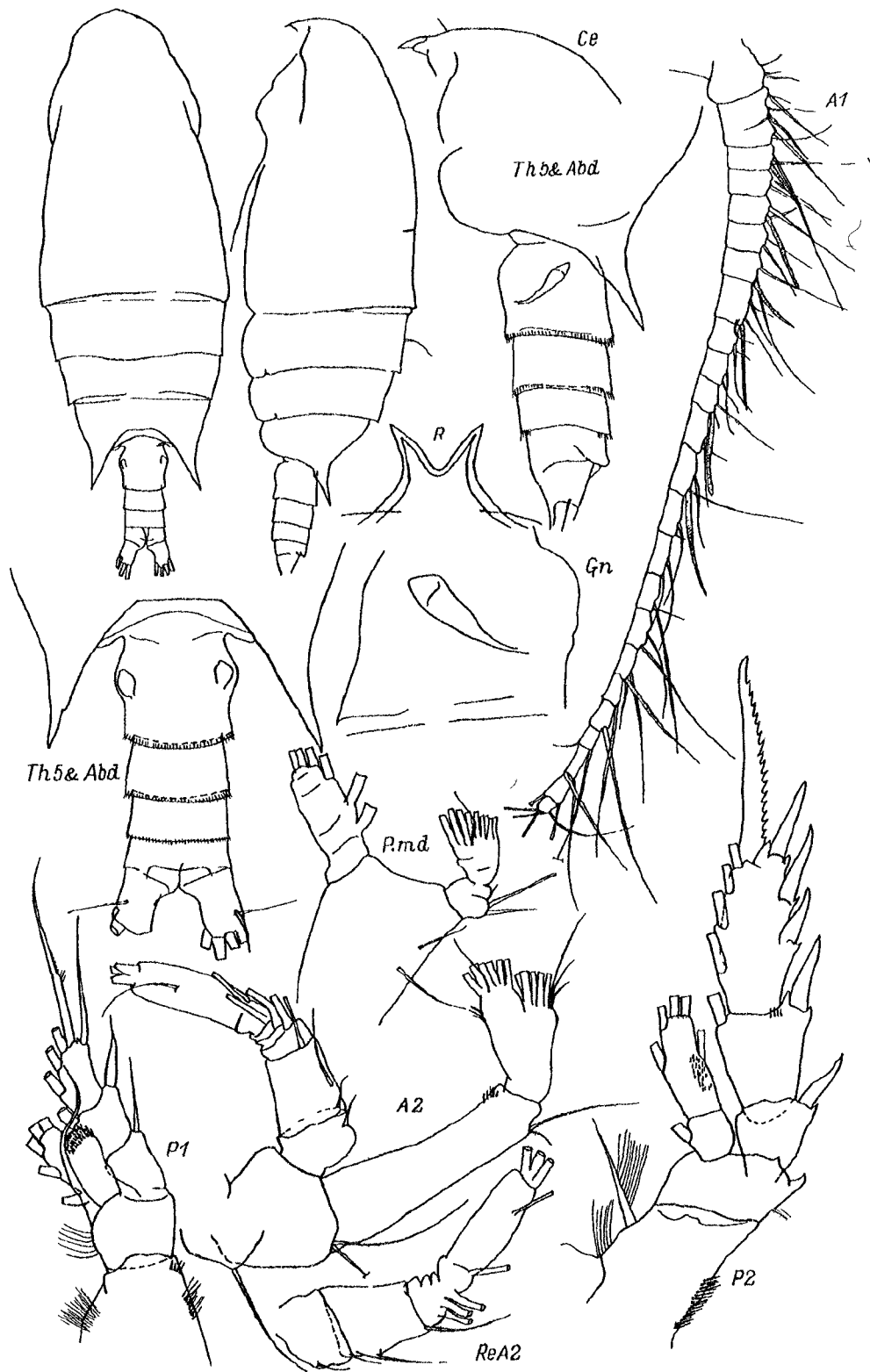


Fig 62 *Bradyidius subarmatus* Female (from Markhaseva, 1993)

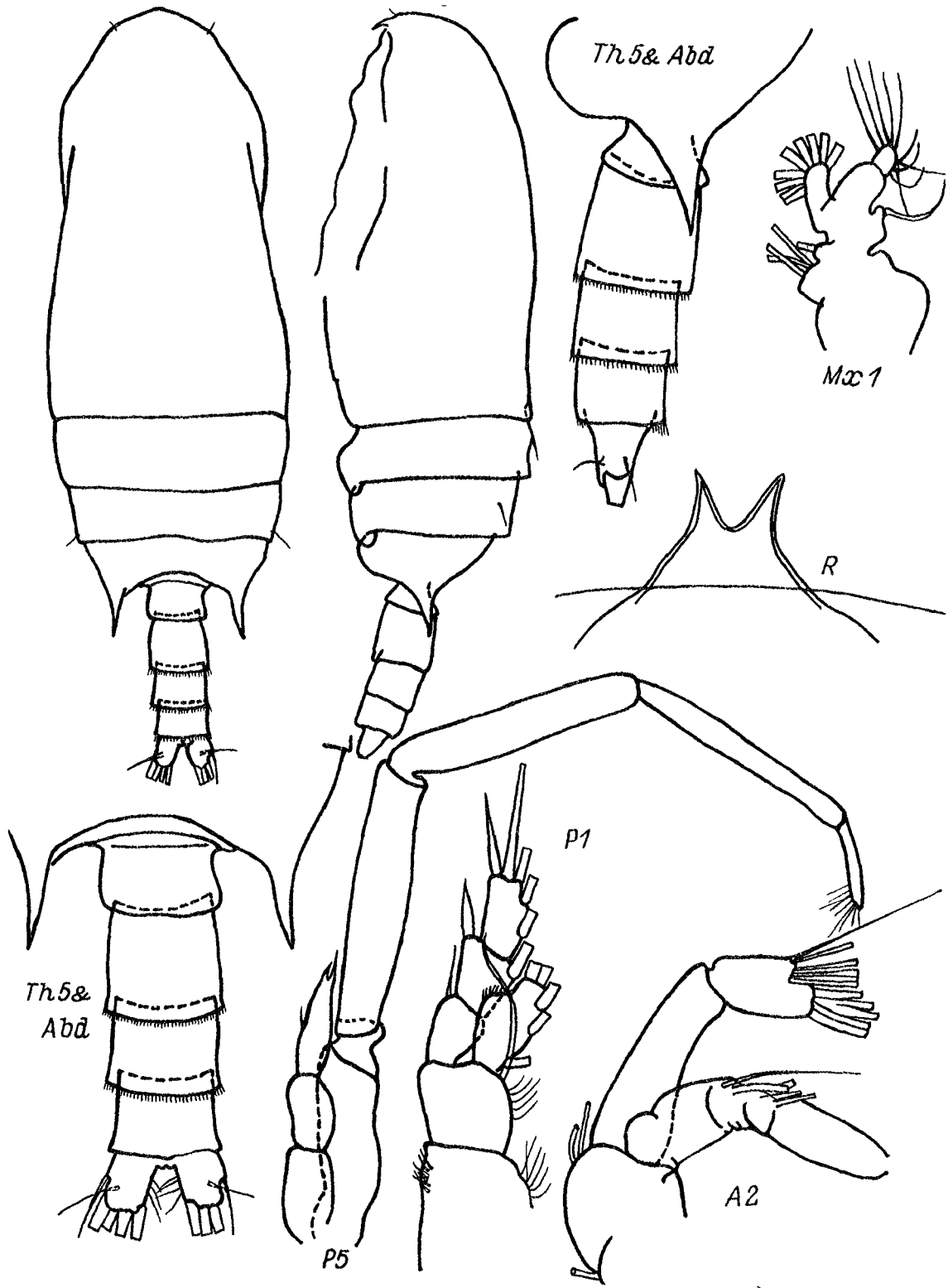


Fig. 63. *Bradyidius subarmatus*. Male (from Markhaseva, 1993).

and only a few setae remained of the distal part of Ri. Structure of Mx2 mostly close to typical of the family may be observed in *Ch. bispinosa*, *Ch. brachydactyla*, *Ch. chainae*, *Ch. kuniae*, *Ch. subaequalis* (in these species even distal part of Ri is present); in other species setation of first-fifth endites is different through the reduction in number of setae. Further, 2 spines, a bigger and smaller one, both arranged like pincers, appear on third-fourth endites: *Ch. bichela*, *Ch. brooksi*. In further transformation of Mx2, the pincers-like spines are present only on one of endites and setation of first-second endites become even more reduced (on second endite only one small seta present): *Ch. abyssalis*, *Ch. atlantica*, *Ch. gibba*, *Ch. macrodactyla*, *Ch. megadactyla*, *Ch. ovata*, *Ch. sarsi*. Then one can observe the reduction in number of endites: 4 in *Ch. reducta* and *Ch. smoki*, 3 in *Ch. pacifica*. Mxp protopodite with setation more typical of Aetideidae is observed in *Ch. subaequalis* (1+1+3+3) (the first figure denotes seta in proximal part of joint, the three following figures denote number of setae in 3 groups from proximal to distal part of the joint); *Ch. bispinosa* (0+1+3+3); *Ch. brachydactyla* (0+1+2+3); *Ch. kuniae* (1+1+2+3); *Ch. chainae* (0+0+1+3), in other species of the genus all groups of setae (except distal group with 1-2 setae) get reduced. Ri1 Mxp usually with 2 or 3 medial setae. P1 with 1-jointed rami; Re with 1 or 2 external spines; Ri without external lobe (only in *Ch. kuniae* it is with external lobe). P2 with 3-jointed Re, separation between Re1 and Re2 often incomplete; Ri usually 1-jointed. P3-P4 with 3-jointed Re, sometimes division incomplete, and 3-jointed, incompletely 2-3-jointed and even 1-jointed Ri. P4 without internal seta on coxopodite and without hairs near seta base. Males known only for *Ch. abyssalis* and *Ch. pacifica*, they are very similar in structure. Body shape, P1-P4 similar to that in females of the corresponding species, but separation of P2-P4 joints may be more complete. Oral parts remarkably reduced. P5 biramous with 1-jointed Ri and 2-3-jointed Re, of simple structure.

The genus *Chiridiella* includes 18 species. The descriptions of 15 species (except *Ch. trichamata*, that is known after fifth copepodite stage; *Ch. atlantica* known of tropical Atlantic and *Ch. megadactyla* of the Ross Sea) are given below.

Key to species of *Chiridiella*

Females

- 1(24) Mx2 with 5 endites.
- 2(11) Mx2 not strongly modified in comparison with typical. Setation type of Mx2 similar to typical, first-fifth endites are nearly of the same size, without pincers-like spines. Mxp protopodite with distal setae group, and with setae at least in one of two other groups.
- 3(4) Ri P1 with external lobe . . . 8. *Ch. kuniae* Deevey
- 4(3) Ri P1 without external lobe.
- 5(8) Re P1 with 1 external spine.
- 6(7) Mx2 first-second endites with 3 setae each 4. *Ch. brachydactyla* Sars
- 7(6) Mx2 first-second endites with 2 setae each 6. *Ch. chainae* Grice
- 8(5) Re P1 with 2 external spines
- 9(10) Mx1 second and third internal lobes with 1 and 4 setae respectively; Ri with 7 setae; Re with 4 setae 15. *Ch. subaequalis* Grice & Hulsemann
- 10(9) Mx1 second internal lobe reduced, third with 2 setae and short filament; Ri with 3 setae; Re with 8-9 setae 3. *Ch. bispinosa* Park
- 11(2) Mx2 strongly modified in comparison with typical. Mx2 first-fifth endites of varying size. Setation type of Mx2 is not typical, some number of setae on third-fifth endites transformed into pincers-like spines; those on fifth endite are often of vermiform structure. Mxp with distal setae group.
- 12(15) Setae of third and fourth endites arranged like pincers.
- 13(14) Re P1 with 1 external spine. A1 longer than body 5. *Ch. brooksi* Deevey
- 14(13) Re P1 with 2 external spines. A1 nearly as long as cephalothorax 2. *Ch. bichela* Deevey
- 15(12) Setae of fourth endite arranged like pincers.
- 16(17) Specimens more than 4 mm in length. Ri2 Md with 8-9 terminal setae terminal. Re Mx1 with 5, or 8 setae 13. *Ch. sarsi* Markhaseva
- 17(16) Specimens less than 4 mm in length. Ri2 Md with less than 8 setae. Re Mx1 with 3-4, or without setae.
- 18(19) Ri2 Md with 1 seta. Mx1 without Re 7. *Ch. gibba* Deevey
- 19(18) Ri2 Md with 3-4 setae. Mx1 with Re, Re with 3-4 setae.
- 20(21) Mxp protopodite with 1 seta in distal group 10. *Ch. ovata* Deevey
- 21(20) Mxp protopodite with 2 setae in distal group.
- 22(23) P3-P4 with 3-jointed rami 9. *Ch. macrodactyla* Sars
- 23(24) P3-P4 with 1-jointed Ri, with slight traces of separation between Re1 and Re2 1. *Ch. abyssalis* Brodsky
- 24(1) Mx2 with 3-4 endites.
- 25(26) Mx2 with 3 endites . . . 11. *Ch. pacifica* Brodsky
- 26(25) Mx2 with 4 endites.
- 27(28) Re1 P2 and Re1 P3 with external spines. Second endite of Mx2 with seta. 14. *Ch. smoki* Markhaseva
- 28(27) Re1 P2 and Re1 P3 without external spine. Second endite of Mx2 without seta 12. *Ch. reductella* Markhaseva sp. n.

1. *Chiridiella abyssalis* Brodsky, 1950

(Figs. 64-65)

Chiridiella abyssalis Brodsky, 1950. 192, fig. 108, Markhaseva, 1983b: 120, figs 1-2

Chiridiella reducta (part) Brodsky, 1950. 194, fig 111 (male only).

Description. Female. Total length 2.45-2.90 mm. Cephalothorax 3.2-4.0 times longer than abdomen. Anterior part of lateral skeleton structures of genital field wavy (lateral view). A1 24-jointed, as long as cephalothorax, reaching the end of genital segment. Ri A2 about two third of Re in length. External lobe of Ri2 A2 with 6 terminal, internal lobe with 6-7 terminal setae. Coxo- and basipodite A2 with 1 seta each. Ri2 Md with 3-4 setae. Mx1 gnathobase with 10 setae; second internal lobe absent; third with 3 setae; Ri with 4 setae; Re with 4 setae; external lobe with 7-8 setae. Mx2 of "macroductyla" type with 5 endites: first (proximal) with 1-2 setae, second with 1 very small, weak, often poorly visible seta; third endite with 1 long seta. Re P1 with 1 external terminal spine. External lobe of Ri P1 not developed. Ri P2-P4 1-jointed, P3-P4 with traces of separation between Ri1 and Ri2.

Male. Total length 2.70-3.00 mm. Cephalothorax (dorsal view) with small projection on top anteriorly. Cephalothorax about 3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. A1 24-jointed, reaching the end of Abd2 (sometimes with aesthetascs). Ri2 A2 with 6 terminal setae at external lobe and 6-7 terminal setae on internal lobe. Ri1 A2 without setae; coxo- and basipodite with 1 seta each. Ri1 Md with 4 setae. Mx1 and Mx2, as well as Mxp setation reduced compared to females. P1 with 1-jointed rami. Re P1 with 1 external terminal spine. P2 with 3-jointed Re and incompletely 2-jointed Ri. P3-P4 with 2-jointed Ri and 3-jointed Re. P5 with 1-jointed Ri and 3-jointed Re. P5 of simple structure. Left and right legs nearly equal in length.

Type locality: North-western part of the Pacific Ocean.

Lectotype: *Ch. abyssalis* (female) from sample 474.

Geographical distribution. Pacific Ocean: the north-western part (Brodsky, 1950), the Kurile-Kamchatka Trench region and the Aleutian Trench (original data). The central part of Arctic Basin (Markhaseva, 1983b).

Vertical distribution. The species was found of abyssopelagic also in total hauls (original data) of the Kurile-Kamchatka Trench. In the central part of the Arctic Basin from hauls with ranges: 200-750, 250-960, 740-1572 and 1100-4330 m. Most probably the species is meso- and upperbathypelagic in Arctic Basin and abyssopelagic in the north-western part of the Pacific Ocean.

Material: 23 females and 3 males from samples: 138, 176, 196, 460, 477, 483-485, 488, 490, 492-507, 510, 512-514, 517-520, 524, 548, 554, 558, 560, 563.

2. *Chiridiella bichela* Deevey, 1974

(Fig. 66)

Chiridiella bichela Deevey, 1974: 451, figs 5-6

Description. Female. Total length 2.50-2.80 mm. Cephalothorax 3.7-4.0 times longer than abdomen. Anterior margin of lateral skeleton structures of genital field wavy. A1 23-jointed, reaching genital segment, Abd2. Ri A2 is two third of Re length. Coxo- and basipodite A2 with 1 seta each; external lobe of Ri2 A2 with 6 terminal; internal lobe with 7 terminal setae. Ri2 Md with 6 terminal setae. Mx1 gnathobase with 10 setae; second internal lobe rudimentary; third internal lobe with 2; Ri with 4; Re with 8; external lobe with 8 setae. First Mx2 endite with 3 setae; second with 1 short seta, third and fourth endites with 1 long and 1 short spines arranged in pincers-like form; fifth endite with long curved spine; distal part of Ri with only 2 (or 3) setae. Mxp protopodite with groups of 1, 2 and 1 setae. Ri1 Mxp with 3 medial setae. Re P1 with 2 external spines. External lobe of Ri P1 reduced. P2 with incompletely 3-jointed Re and 1-jointed Ri. P3-P4 with 1-jointed Ri and incompletely 3-jointed Re. P4 coxopodite without hairs and seta.

Male known after the fifth stage only.

Type locality: 32°10'N 64°30'W.

Geographical distribution. Atlantic Ocean: the Sargasso Sea (Deevey, 1974). Pacific Ocean: for the first time recorded in the region of the Kurile-Kamchatka Trench (original data).

Vertical distribution. In hauls between 2300-3400 m of the Kurile-Kamchatka Trench region (original data). In haul 1500-2000 m of the Sargasso Sea (Deevey, 1974). Most evidently bathy-, abyssopelagic species.

Material: 2 females from samples: 67, 82.

3. *Chiridiella bispinosa* Park, 1970

(Fig. 67)

Chiridiella bispinosa Park, 1970 493, 497, fig 78-88

Description. Female. Total length 2.50 mm. Cephalothorax about 5 times longer than abdomen. A1 24-jointed, as long as body, or reaching the midlength of genital segment. Re A2 1.5 times longer Ri A2; external lobe of Ri2 A2 with 6 terminal; internal with 5 long and 3 short terminal setae. Coxo- and basipodite A2 with 1 seta each. Ri2 Md with 8 (with 6 after Park (1970)) setae. Mx1 gnathobase with 10-11 setae; second internal lobe reduced; third

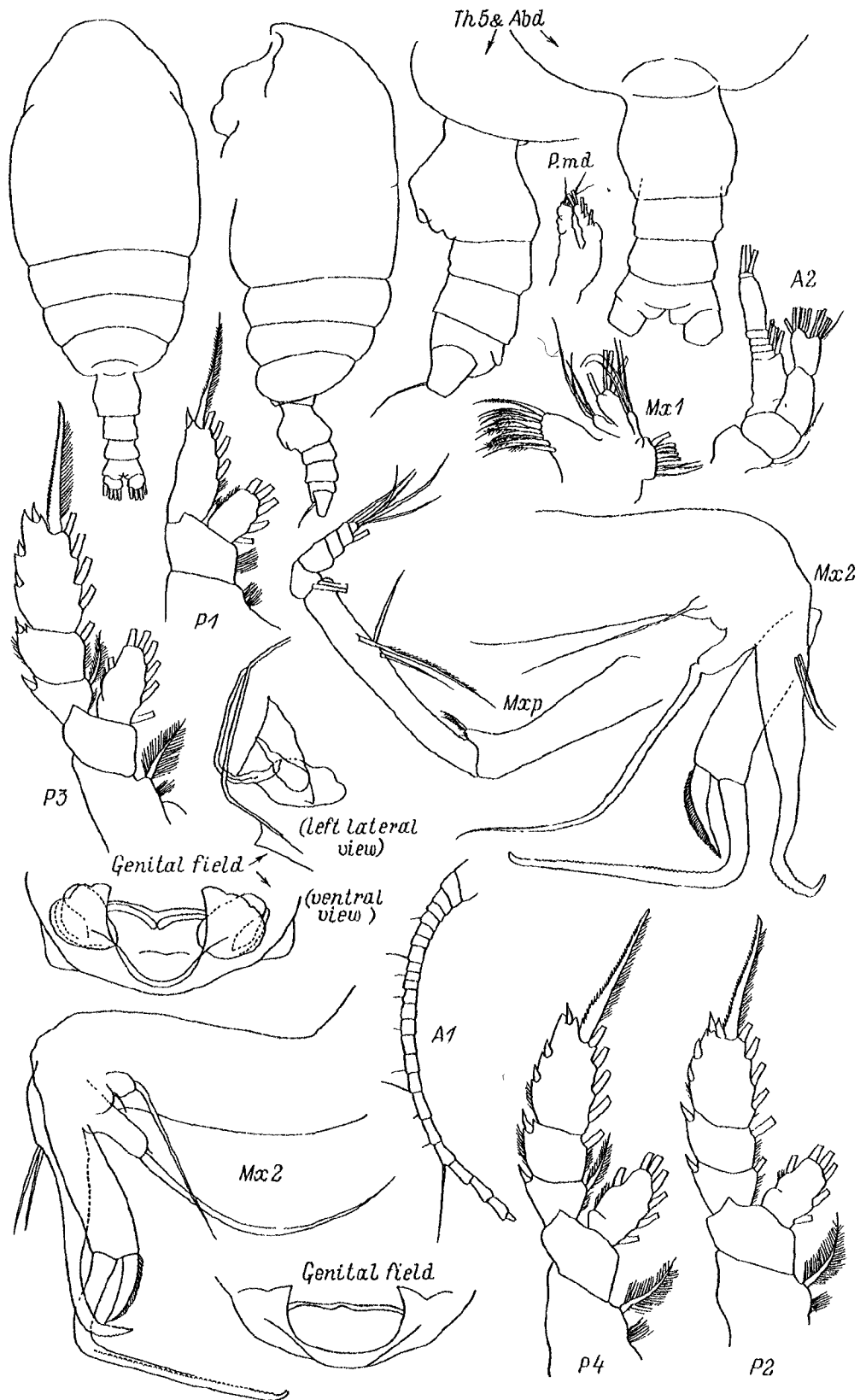


Fig. 64. *Chiridiella abyssalis*. Female (from Markhaseva, 1983a with additions after specimens from the central part of Arctic Basin).

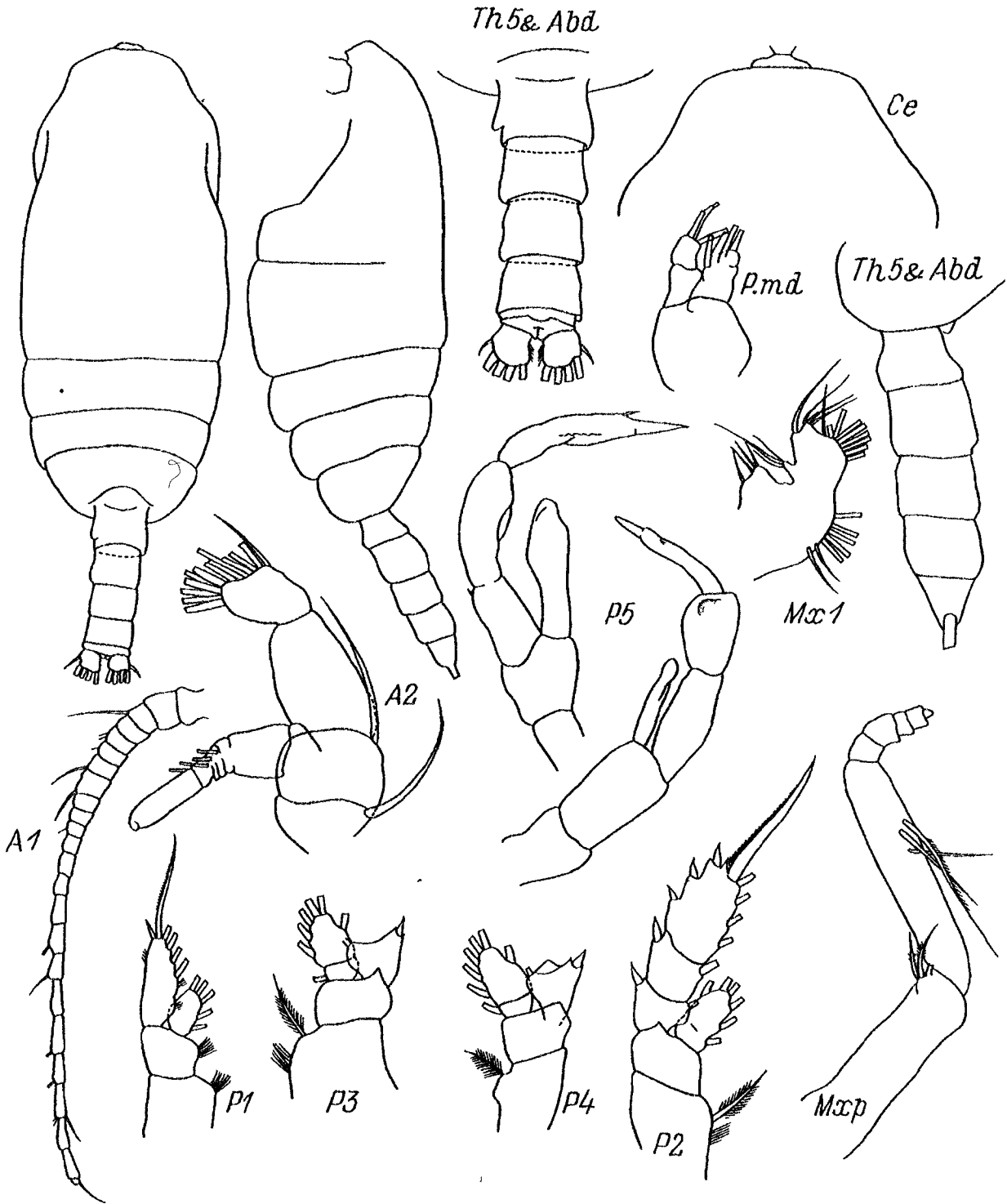


Fig 65. *Chiridiella abyssalis*. Male (518).

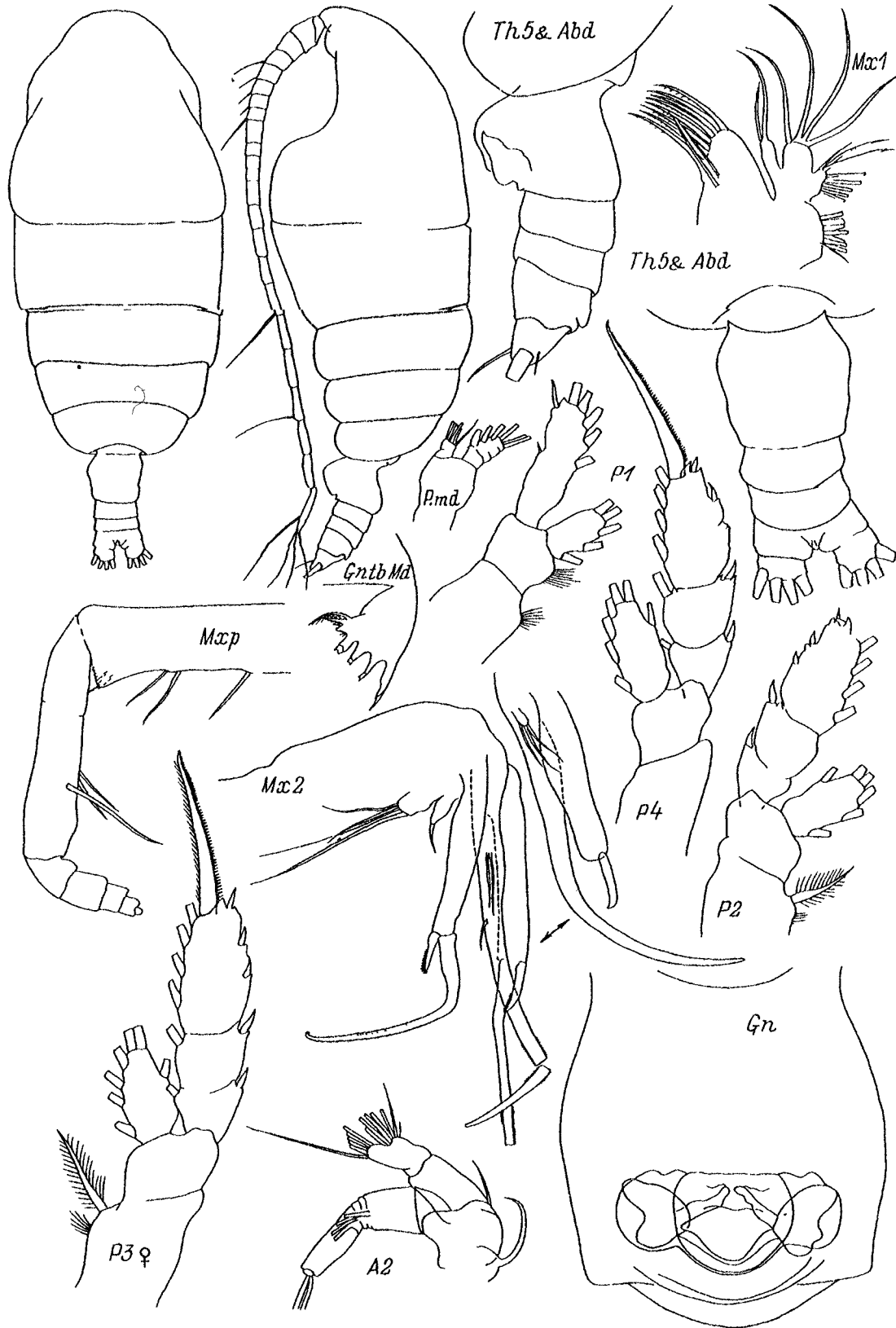


Fig. 66. *Chiridella bichela* Female (67).

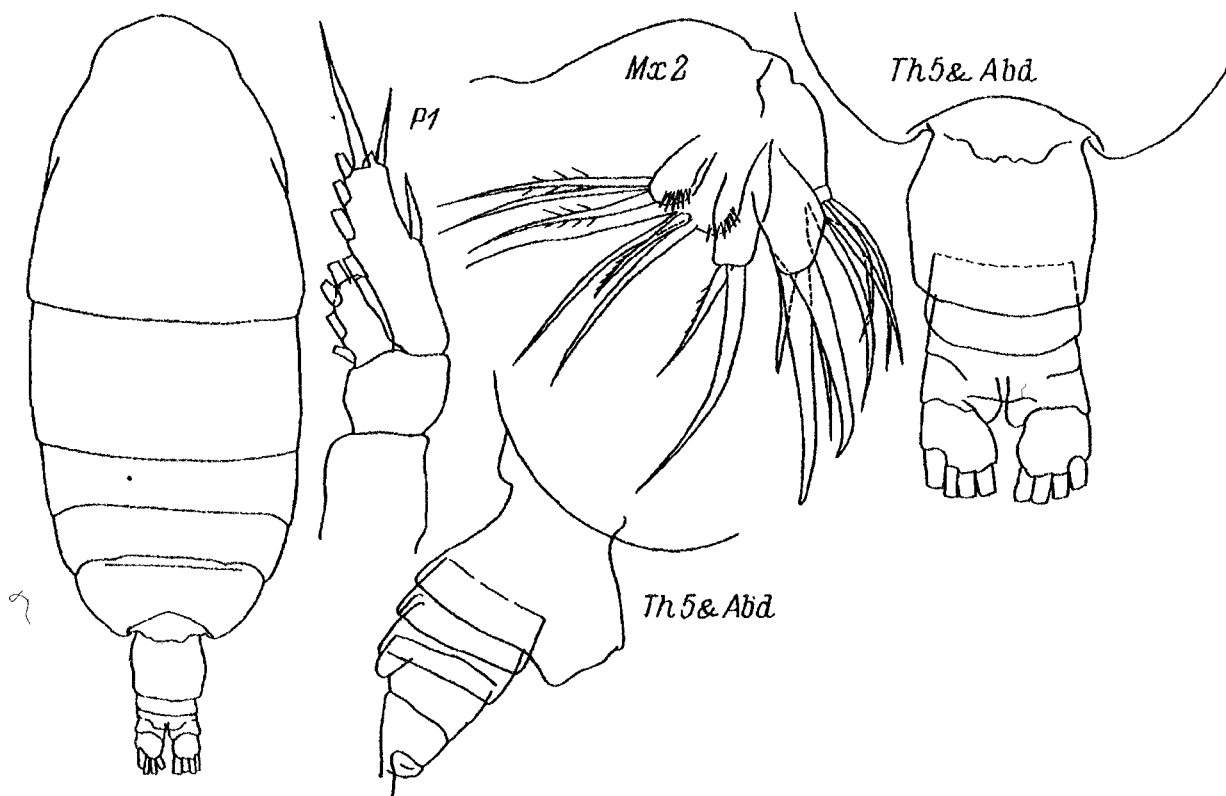


Fig. 67. *Chiridiella bispinosa*. Female (398).

internal lobe with 2 setae and short filament; propodite near Ri base with 1 seta; Ri with 3; Re with 8-9; external lobe with 9 setae. Fourth and fifth Mx2 endites with thick spine each; distal part of Ri is not reduced, with 4 setae. Mxp propodite without proximal seta; and with groups of 1, 3 and 3 setae. Ri1 Mxp with 3 medial setae. Both P1 rami 1-jointed, Re with 2 external spines, external lobe of Ri not developed. P2 with 1-jointed Ri. Re P2 and P2-P3 rami 3-jointed.

Male unknown.

Type locality: 27°08'N 89°55'W.

Geographical distribution. Atlantic Ocean: the Gulf of Mexico (Park, 1970). Indian Ocean: the western part (original data).

Vertical distribution. The species was found in haul 513-1000 m (Park, 1970).

Material: 1 female from sample 398.

4. *Chiridiella brachydactyla* Sars, 1907

(Fig. 68)

Chiridiella brachydactyla Sars, 1907: 9, 1924-25: 52, pl.16, figs 12-17.

non *Chiridiella brachydactyla*: Grice & Hulsemann, 1965: 231, fig. 9 (a-p).

Description. F e m a l e. (Description after Sars (1925) with modifications). Total length 3.50 mm.

Cephalothorax about 4.6 times longer than abdomen. A1 24-jointed, reaching the end of genital segment. Mx2 with first and second endites typical of Aetideidae; third endite with only 2 setae (short and long); fourth endite with claw-like spines (1 short and 1 long); fifth endite ending in short claw-like spine; distal part of Ri reduced to 3 setae. Mxp propodite with groups of 1, 2 and 3 setae. Ri1 Mxp with 3 setae, joint wide, 1.2 times longer than propodite. P1-P4 of the same structure as in *Ch. macrodactyla*.

Type locality: the Azore Islands.

Geographical distribution. Atlantic Ocean: the northern part (Sars, 1924).

Vertical distribution. The species was found in total haul from 4800 m (Sars, 1924).

Material. Slides N 5114 and 5115 from collections of the Zoological Museum of Oslo University were studied.

5. *Chiridiella brooksi* Deevey, 1974

(Fig. 69)

Chiridiella brooksi: Deevey, 1974: 444, figs 1-2.

Description. F e m a l e. Total length 2.70-2.80 mm. Cephalothorax about 4 times longer than abdomen. A1 23-jointed, exceeding body by 3-4 joints. Ri A2 two third of Re length. Coxo- and basipodite A2 with 1 seta each; external and internal lobes of

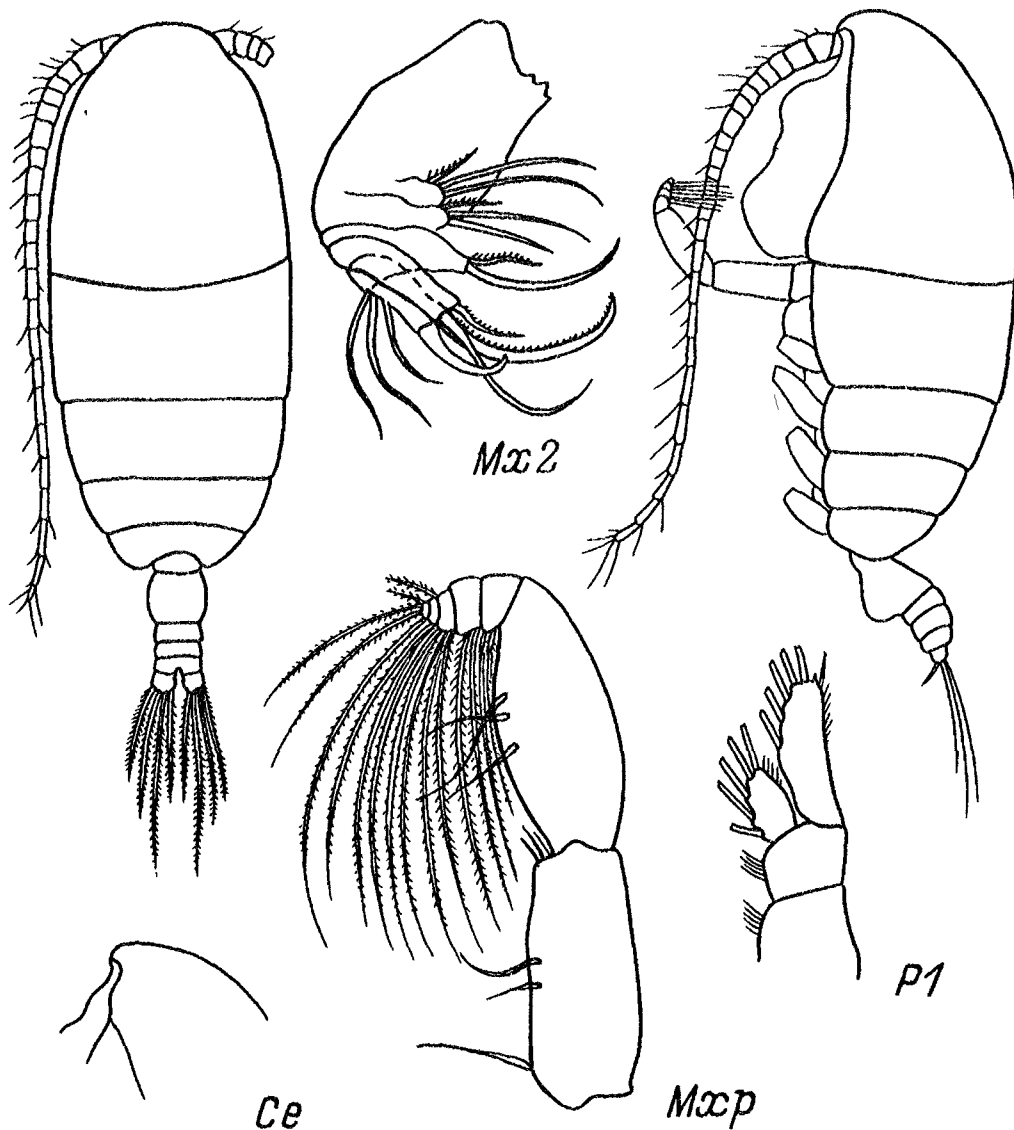


Fig. 68. *Chiridiella brachydactyla*. Female (from Sars, 1924).

Ri2 A2 with 6 terminal setae each. Ri2 Md with 3-4 setae. Mx1 gnathobase with 10-11 setae; second internal lobe reduced; third internal lobe with 3, Ri with 4, Re with 5-6 setae and external lobe with 8 setae. Mx2 of *Ch macrodactyla* type with 5 endites. Mxp protopodite with 1 seta distally. Ri1 Mxp with 3 medial setae. Re P1 with 1 external terminal spine. Ri P1 without external lobe. P2 with 1-jointed Ri and 2-jointed (incompletely 3-jointed) Re. P3-P4 with 3-jointed Re and incompletely 3-jointed (2-jointed) Ri. P4 coxopodite with rudimentary internal seta without hairs.

Male known after the fifth stage only.

Type locality: 32°10'N 64°30'W.

Geographical distribution. Atlantic Ocean: the Sargasso Sea (Deevey, 1974). Pacific Ocean: the species is found for the first time in the tropical part (original data).

Vertical distribution. The species was found in hauls between 442 and 1500 m (Deevey, 1974; original data). Most evidently lower meso- upper bathypelagic species.

Material: 1 female from sample 206.

6. *Chiridiella chainae* Grice, 1969

(Fig. 70).

Chiridiella chainae Grice, 1969: 446, 449, figs 1-15; Deevey, 1974. 465, figs 16, 17d.

Description. Female. (Description after Grice (1969) with modifications). Total length 3.56 mm. Cephalothorax about 4 times longer than abdomen. A1 23-jointed, slightly exceeding caudal rami. Re A2 about twice longer Ri. Ri2 A2 external lobe

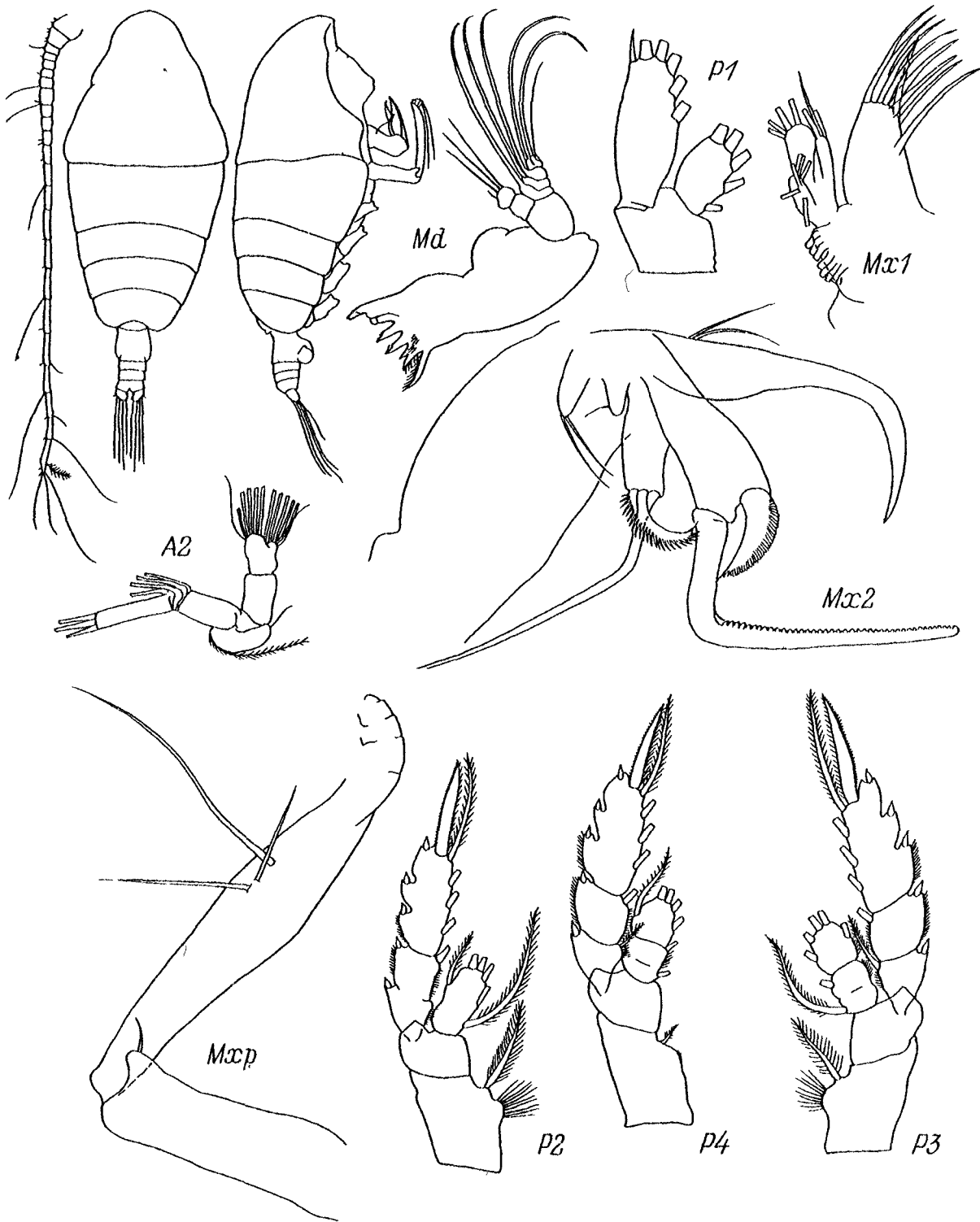


Fig. 69. *Chiridiella brooksi*. Female: Mx1, Mx2, Mxp & P1 (206), other figures from Deevey (1974).

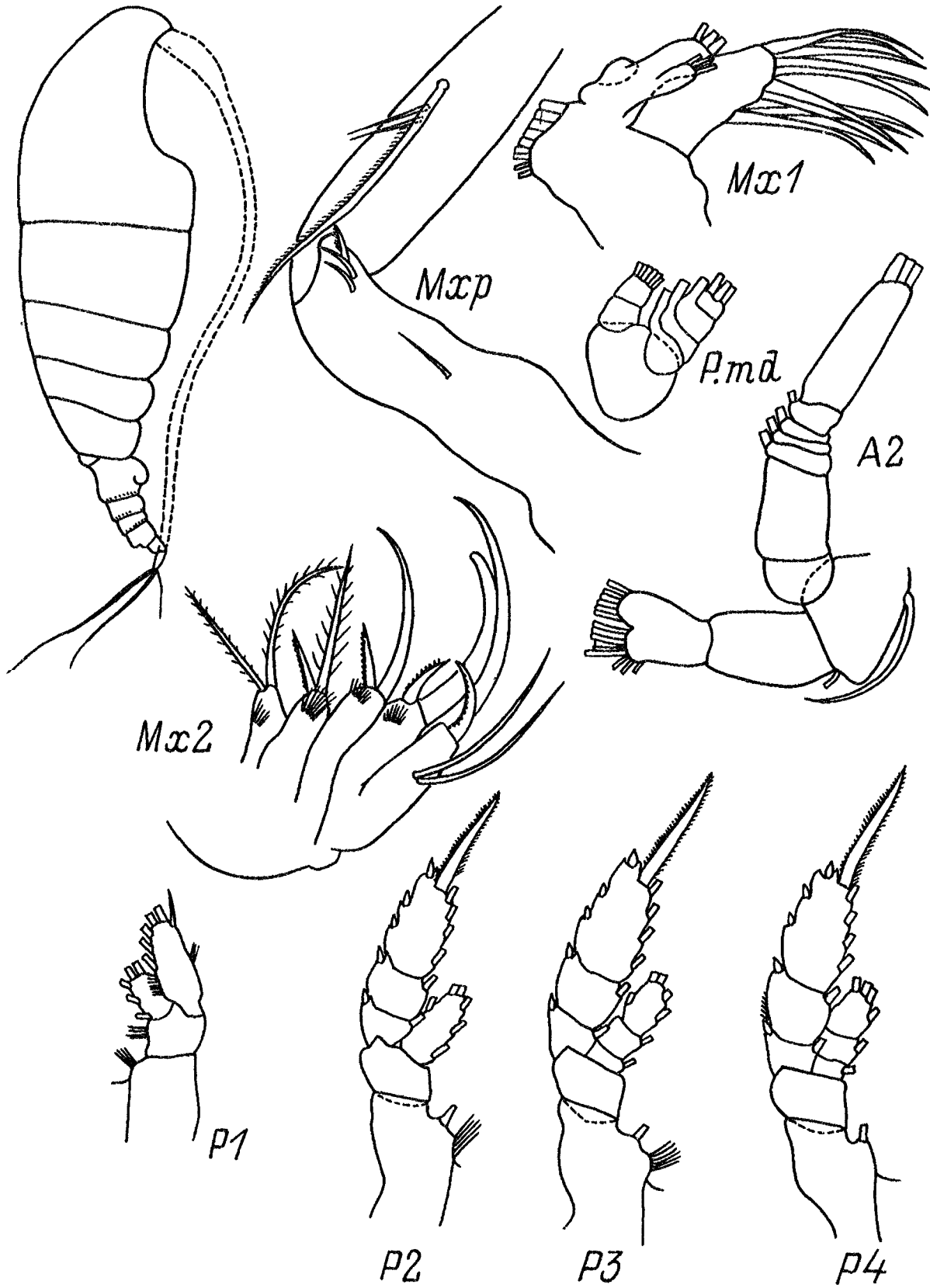


Fig. 70. *Chiridiella chainae*. Female (from Grice, 1969).

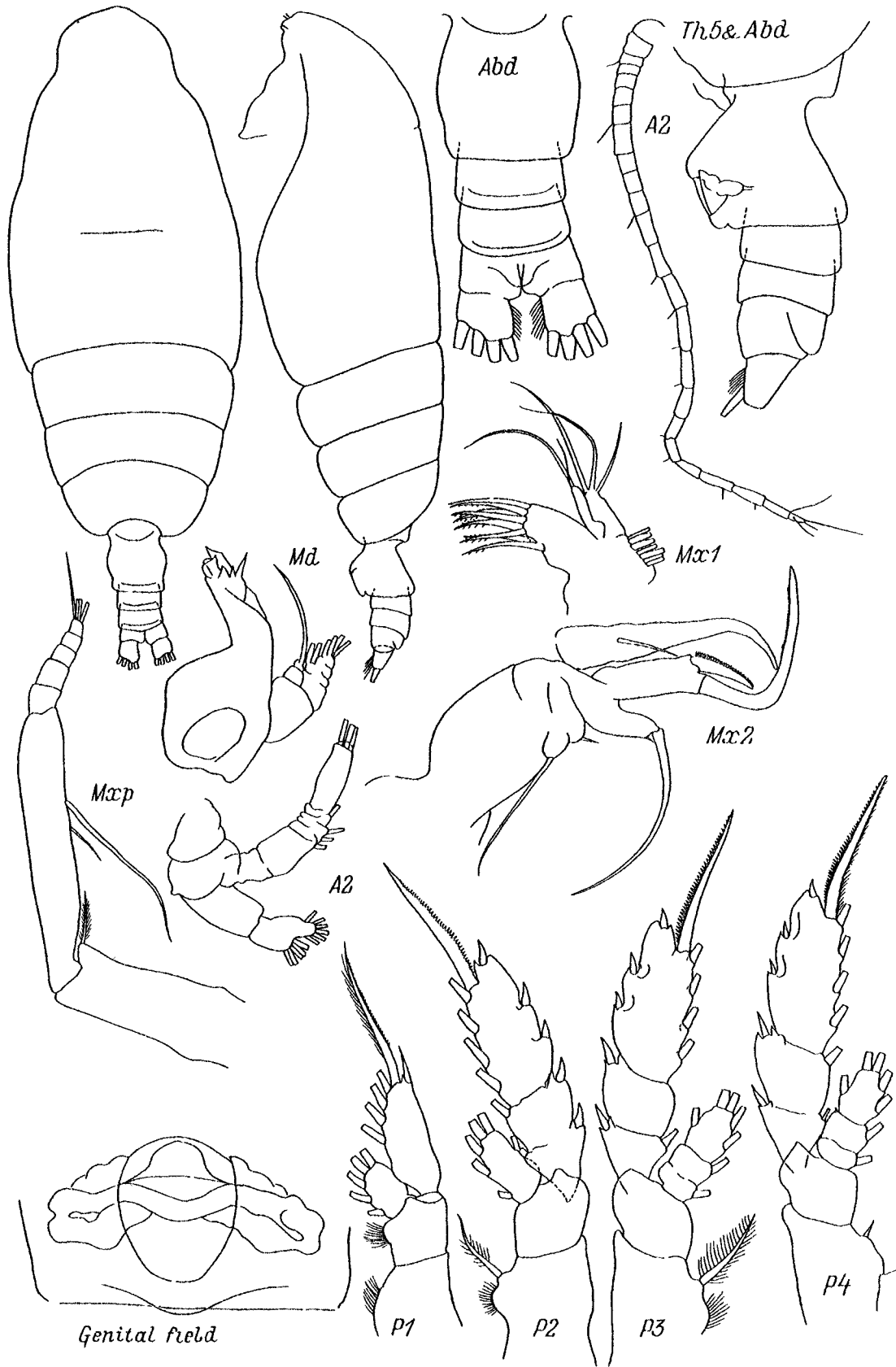


Fig. 71. *Chridiella gibba*. Female (93).

with 6 terminal setae; internal lobe with 6 long and 3 short terminal setae. Coxo- and basipodite A2 with 1 seta each. Ri2 Md with 6 setae. Mx1 gnathobase with 10 setae; third internal lobe with 4 setae (after Deevey (1974) with 2); Ri with 3 setae; external lobe with 9 setae; second internal lobe and Re reduced. Mx2 third-fifth endites with one of spines thick, sclerotized, fourth-fifth endites with short spines also thickened. P1 with 1-jointed rami. Re P1 with 1 external terminal spine. P2 with 1-jointed Ri and 3-jointed Re. After Grice (1969) P3-P4 with 3-jointed, and after Deevey (1974) with 2-jointed rami.

Male unknown.

Type locality: 20°40'N 84°26'W.

Geographical distribution. The Caribbean Sea, the Sargasso Sea (Grice, 1969; Deevey, 1974).

Vertical distribution. The species was found in haul 500-1000 and total haul from 3200 m (Grice, 1969; Deevey, 1974).

The species was not examined by me.

7. *Chiridiella gibba* Deevey, 1974

(Fig. 71)

Chiridiella gibba Deevey, 1974: 445, 448, figs 3-4.

Chiridiella macrodactyla (non Sars, 1907): Farran, 1908: 46, pl. 4, figs 6-14.

Description. Female. Total length 2.58-3.00 mm. Cephalothorax about 4 times longer than abdomen. Anterior part of cephalon compressed laterally nearly the area of A1 segmentation. Anterior margin of lateral skeleton structures of genital field wavy (lateral view). A1 24-jointed, reaching the middle of abdomen, or longer than body. Re A2 1.6 times longer than Ri. External lobe of Ri2 A2 with 6 terminal setae; internal lobe with 5 long and 2 short terminal setae. A2 without setae on coxo- and basipodite. Ri2 Md with 1 seta. Mx1 gnathobase with 9 setae; second internal lobe reduced; third internal lobe with 2 setae; Ri with 3 setae; Re reduced; external lobe with 7 setae. Mx2 of *Ch. macrodactyla* type, similar to *Ch. gibba* (Deevey, 1974), differing from the latter in invisible differs by not visible small additional seta on the first endite. Mxp protopodite with 1 seta in distal part; Ri1 Mxp with 2 setae in medial group (sometimes there is 1 seta). Re P1 with 1 external terminal spine. Ri P1 external lobe reduced. Ri P2 1-, Re indistinctly 3-jointed. Re P3-P4 3-jointed; Ri indistinctly 3-jointed. P4 protopodite with rudimentary internal seta, hairs absent.

Type locality: 32°10'N 64°30'W.

Geographical distribution. The Sargasso Sea (Deevey, 1974). The species is recorded for the first time in the Pacific Ocean: the Kurile-Kamchatka area and in the Indian Ocean: the western part (original data).

Vertical distribution. The species was found in the hauls between 500 and 1500 m (Deevey, 1974) and in haul 1050-1500 m from the Kurile-Kamchatka Trench region (original data).

Material: 3 females from samples: 93, 398.

8. *Chiridiella kuniae* Deevey, 1974

(Figs. 72-73)

Chiridiella kuniae Deevey, 1974: 451, 454, figs 7-8.

Chiridiella brachydactyla (non Sars, 1907): Grice & Hulsemann, 1965: 231, fig. 9 (a-p).

Description. Female. Total length 4.10 mm. Cephalothorax about 4 times longer than abdomen. A1 about as long as cephalothorax. Re A2 about 1.8 Ri length. Ri2 A2 external lobe with 6 terminal setae; internal lobe with 5 long and 3 short terminal setae. A2 coxo- and basipodite and Ri1 with 1 seta each. Ri2 Md with 9 setae. Mx1 gnathobase with 13 setae; second and third internal lobes with 3 and 4 setae respectively; protopodite near the base of Ri with 3; Ri with 7; Re with 10 setae; external lobe with 4 setae. Mx2 of *Ch. brachydactyla* type, with thickened spine on fourth and fifth endites only, on fifth endite spine is shorter; distal part of Ri is not reduced, with 6 setae. Mx2 endites with groups of spinules on external surfaces. Mxp protopodite with 1 seta in proximal part of joint and then with 3 groups of setae: of 1, 2 and 3 setae and minute teeth. Ri1 Mxp with 3 medial setae. Re P1 with 2 external spines. Ri P1 with poorly developed external lobe. Ri P2 with 2-jointed Ri and 3-jointed Re. P3-P4 with 3-jointed rami.

Male known after the fifth copepodite stage only.

Type locality: 32°10'N 64°30'W.

Geographical distribution. Atlantic Ocean: the north-eastern part, the Sargasso Sea (Grice & Hulsemann, 1965; Deevey, 1974).

Vertical distribution. The species was found in haul 1000-1500 m (Deevey, 1974).

The species is not examined by me.

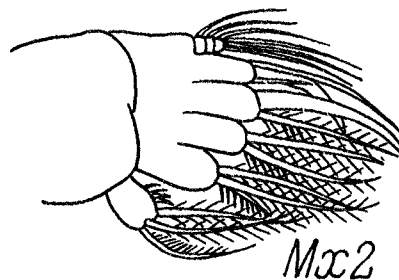


Fig. 72. *Chiridiella kuniae*. Female: Mx2 (from Grice & Hulsemann, 1965).

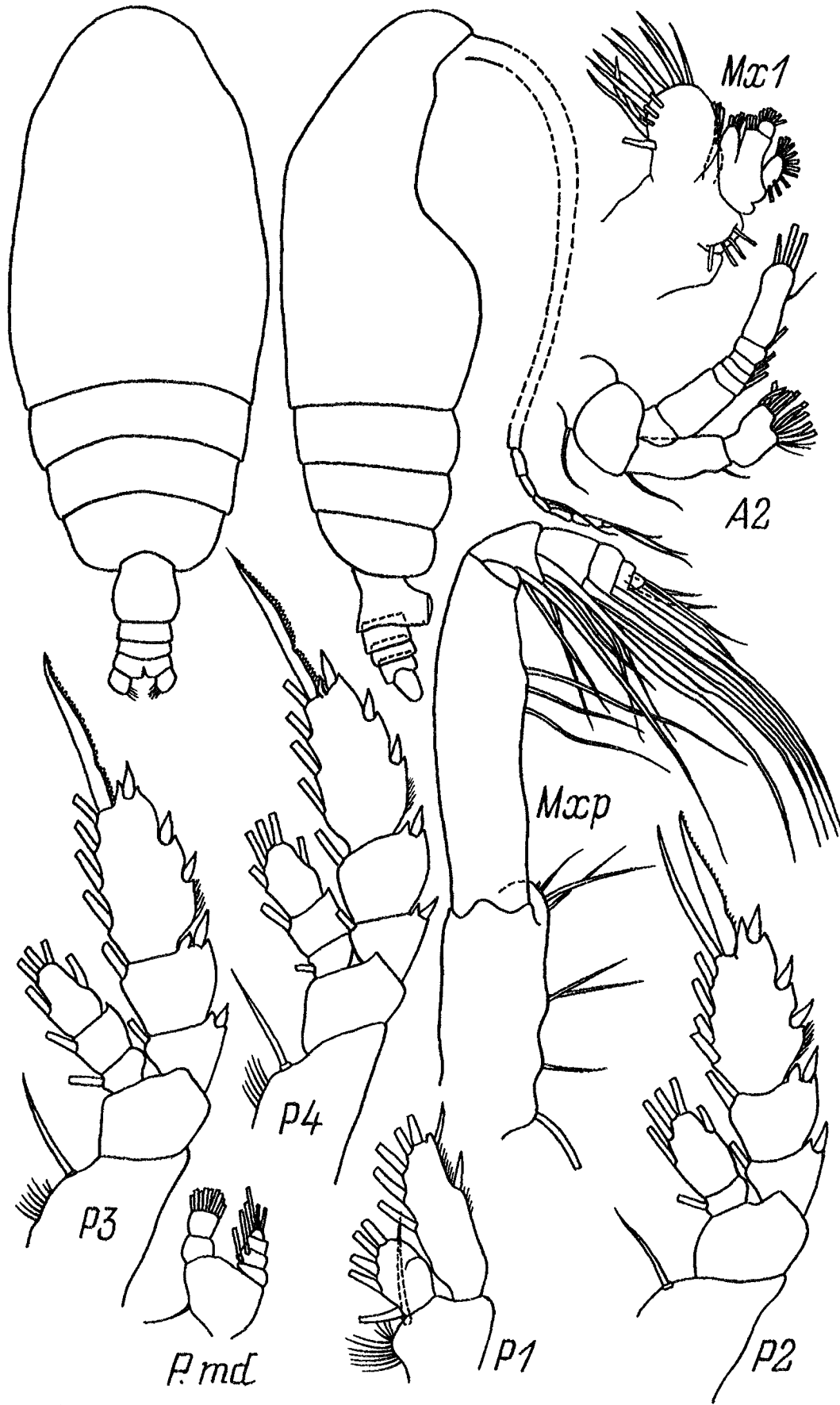


Fig 73 *Chridiella kumae* Female (from Grice & Hulsemann, 1965)

9. *Chiridiella macrodactyla* Sars, 1907

(Figs. 74-75)

Chiridiella macrodactyla Sars, 1907: 8, 1924-25: 50, pl. 16, figs 1-11; Deevey, 1974: 465, fig. 15
non *Chiridiella macrodactyla* Farran, 1908: 46, pl. 4, figs 6-14; Tanaka, 1957a: 57, fig. 35.

Description. F e m a l e. Total length 2.35-2.65 mm (3.15 mm after Deevey, 1974). Cephalothorax slightly less than 4 times longer than abdomen. A1 slightly longer than cephalothorax, 24-jointed. Ri A2 somewhat longer than half length of Re A2. Ri2 A2 with 5 long and 3 short terminal setae on internal and 6 terminal setae on external lobe. A2 coxo- and basipodite with 1 seta each. Ri2 Md with 3 setae. Mx1 with 2 setae on the third internal lobe; Ri with 5 setae; Re with 4 setae, and external lobe with 8 setae; second internal lobe reduced. Mx2 with 1 (Sars, 1907; 1924), 2 (Sars, 1925) setae on first (proximal) endite; 1 long and 1 short setae on the third; fourth endite with 2 different length pincer-form spines. The longer of the spines is claw-like, prolonged and abruptly curved near its base with straight terminal part, internally covered with small spinules. The shorter spine is thick and also slightly curved, covered with hairs internally. Fifth Mx2 endite prolonged into spine-like projection, smoothly curved. Distal part of Ri Mx2 rudimentary and represented by 2 thin setae. Ri1 Mxp by about one fourth of its length exceeding protopodite, the last one with 2 setae in distal group; Ri1 Mxp with 3 medial setae. P1 with 1-jointed rami. Re P1 with 1 external terminal spine. Ri P1 without external lobe. Re P2-P4 3-jointed. Ri P2 1-jointed. Ri P3-P4 3-jointed.

Male unknown.

Notes. Inadequacy and sometimes contradictory nature of the species description (Sars, 1907; 1924-25) (e.g. the description of Mx2 structure) and recent appearance of description of a few closely related species (Deevey, 1974), make the status of *Ch. macrodactyla* rather obscure. Three females attributed by us as *Ch. macrodactyla* were found in our collections. Their cephalon and Th1 incompletely separated; Ri P3-P4 3-jointed, subdivision is incomplete. These specimens also differ from *Ch. macrodactyla*, comprehensively described by Sars (1924-25) and Deevey (1974) with respect to Ri2 Md and Mxp protopodite setation. Further revision of the species may be possible only after receiving more material. *Ch. ovata* Deevey, 1974 and *Ch. abyssalis* Brodsky, 1950 are similar to *Ch. macrodactyla*. *Ch. sarsi* is also very close to *Ch. macrodactyla*. *Ch. macrodactyla* differs from *Ch. abyssalis* in 3-jointed P3-P4 rami; from *Ch. ovata* in presence of 2 (not 1) setae in distal group on Mxp protopodite; from *Ch. sarsi* in number of setae on Re2 Md (5 setae) and in smaller size.

Type locality: the Asore Islands.

Geographical distribution. The description of the species distribution presents a problem due to possible confusion with earlier close species. Most probable distribution area is the Atlantic and Indian Oceans.

Material: 3 females from samples: 379, 397, 457.

10. *Chiridiella ovata* Deevey, 1974

(Fig. 76)

Chiridiella ovata Deevey, 1974: 456, 458, figs 10-11 (e, f); Roe, 1975: 306, fig. 6.

Description. F e m a l e. (Description after Deevey (1974) and Roe (1975) with modifications). Total length 2.35 mm. Cephalothorax 4 times longer than abdomen. A1 reaching genital segment, 23-jointed. Ri A2 is two third of Re length; external lobe of Ri2 with 6 terminal setae, internal with 5 long and 2 short terminal setae. A2 coxopodite with 1 seta. Ri2 Md with 4 setae. Mx1 gnathobase with 8 (?) setae; second internal lobe reduced; third internal lobe with 1 seta; Ri with 4 setae; Re with 3 setae; external lobe with 8 setae. Mx2 of *Ch. macrodactyla* type, very close to *Ch. abyssalis*, differing by absence of small seta on the third endite (Roe (1975) mentioned similar seta). Mxp protopodite with 1 seta in distal group. Ri1 Mxp with 3 medial setae. Re1 P1 with 1 external terminal spine, external lobe is not developed. P2-P4 with 1-jointed Ri and 3-jointed; Re joints with traces of division in P3-P4.

Male unknown.

Notes. The species is very close to *Ch. abyssalis*, differing in lesser number of setae on third internal lobe of Mx1 (1 seta); lesser number of setae in distal part of protopodite (1) and lesser number of A1 joints (23).

Type locality: 32°10'N 64°30'W.

Geographical distribution. Atlantic Ocean: the Sargasso Sea, the north-eastern part (18°N 25° W) (Deevey, 1974; Roe, 1975).

Vertical distribution. The species was found in hauls between 500 and 1500 m (Deevey, 1974) and 1000-1200 m (Roe, 1975). Evidently it is the lower meso- upper bathypelagic species.

The species is not examined by us.

11. *Chiridiella pacifica* Brodsky, 1950

(Figs. 77-78)

Chiridiella pacifica Brodsky, 1950: 193, fig. 109; Deevey, 1974: 458, 460, 463, 465, figs 11 (a, b, d), 12-14, 17 (e).

? *Chiridiella macrodactyla* (non Sars, 1907): Tanaka, 1957a: 57, fig. 35.

Description. F e m a l e. Total length 2.50-3.10 mm. Cephalothorax 4-5 times longer than abdomen. Anterior part of lateral skeleton structures of genital

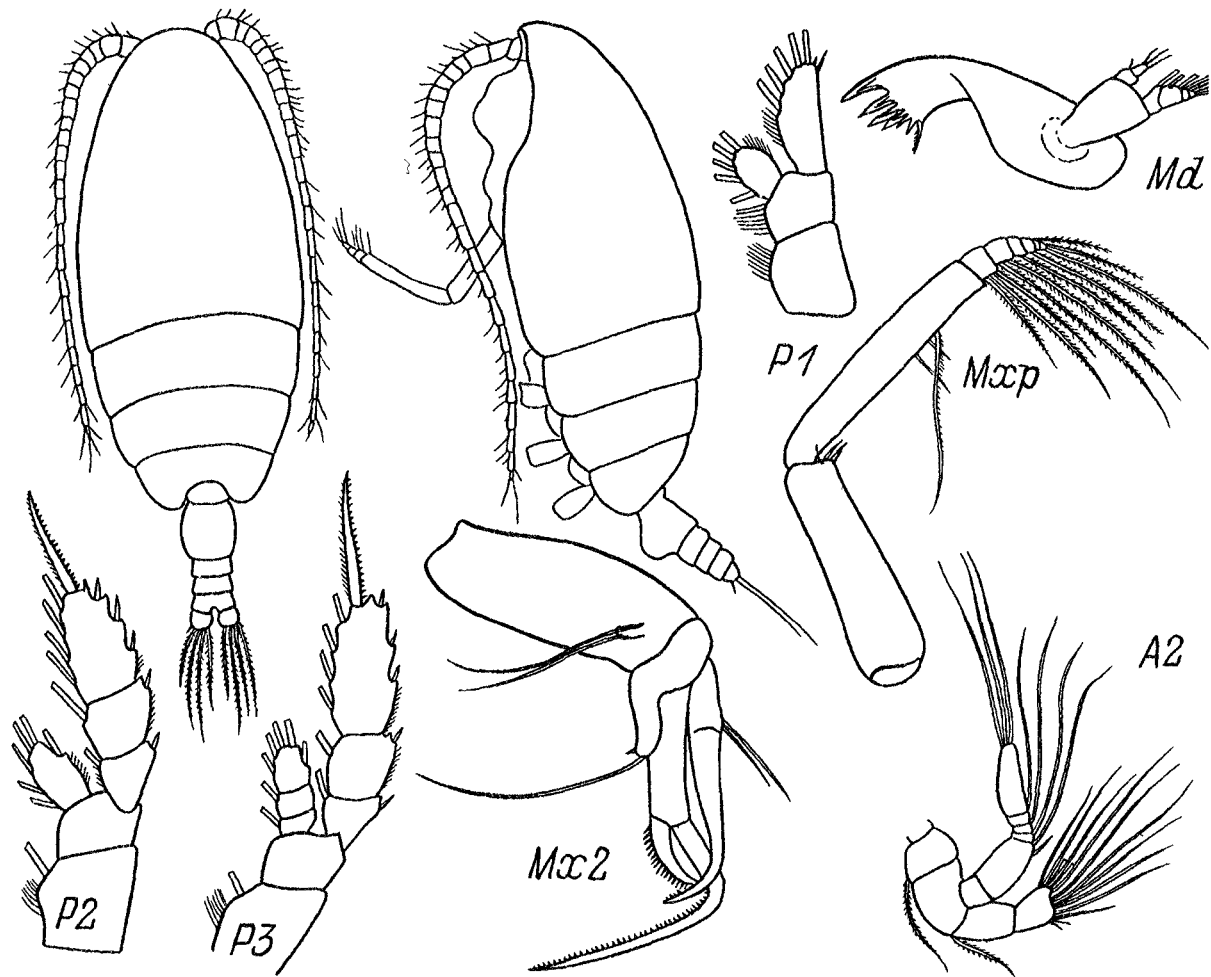


Fig. 74. *Chiridiella macrodactyla*. Female (from Sars, 1924).

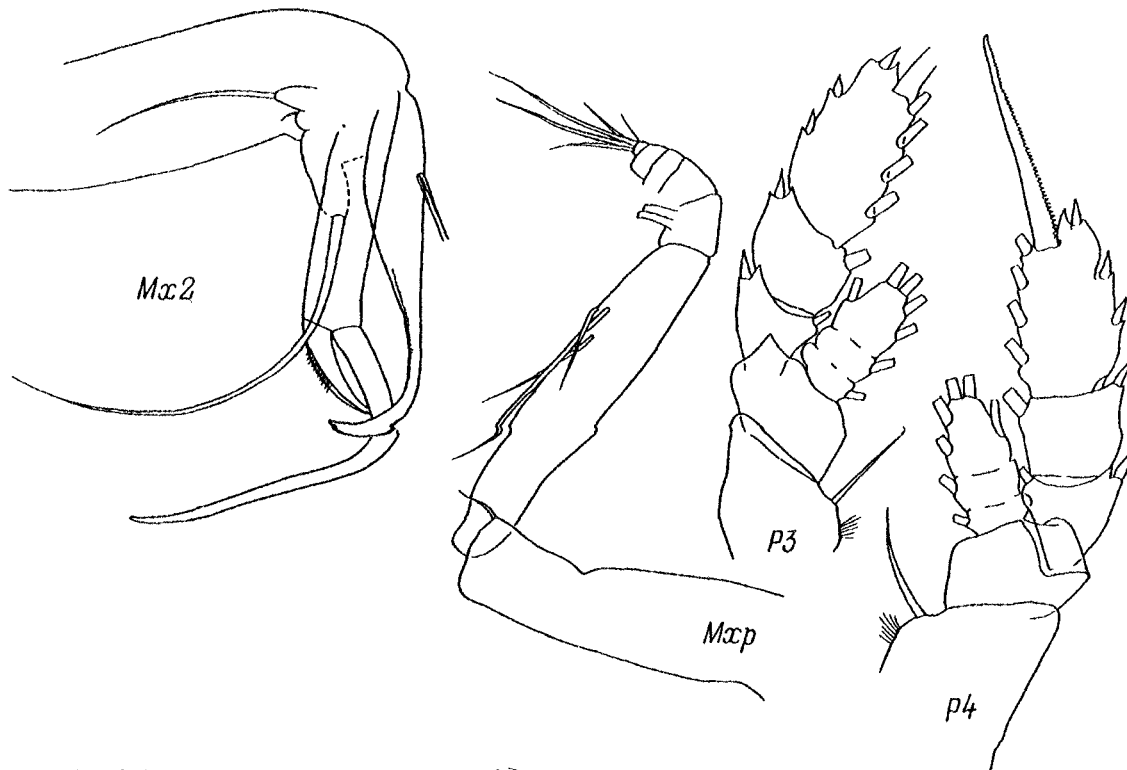


Fig. 75. *Chiridiella macrodactyla*. Female (457). \times

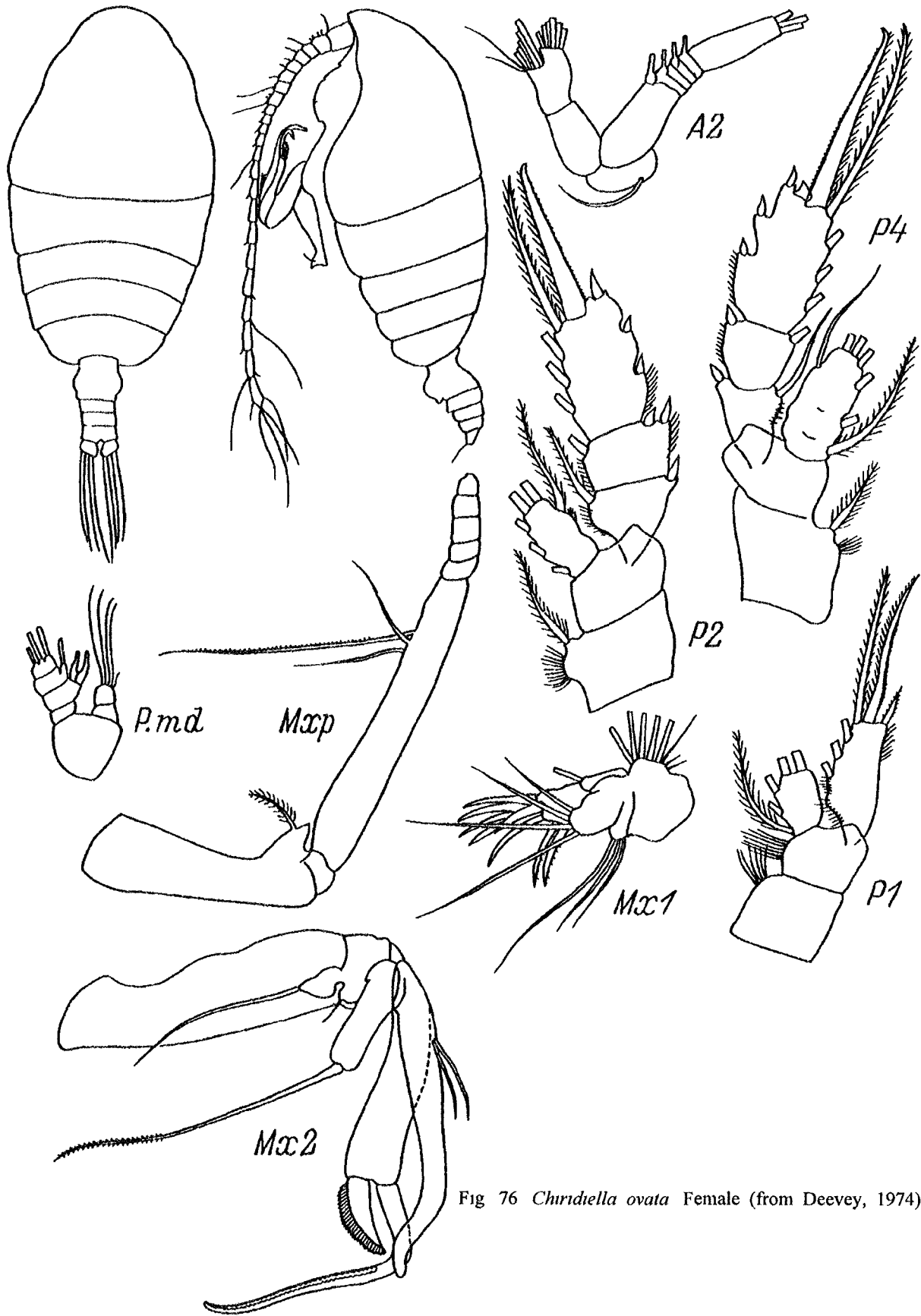


Fig 76 *Chiridiella ovata* Female (from Deevey, 1974)

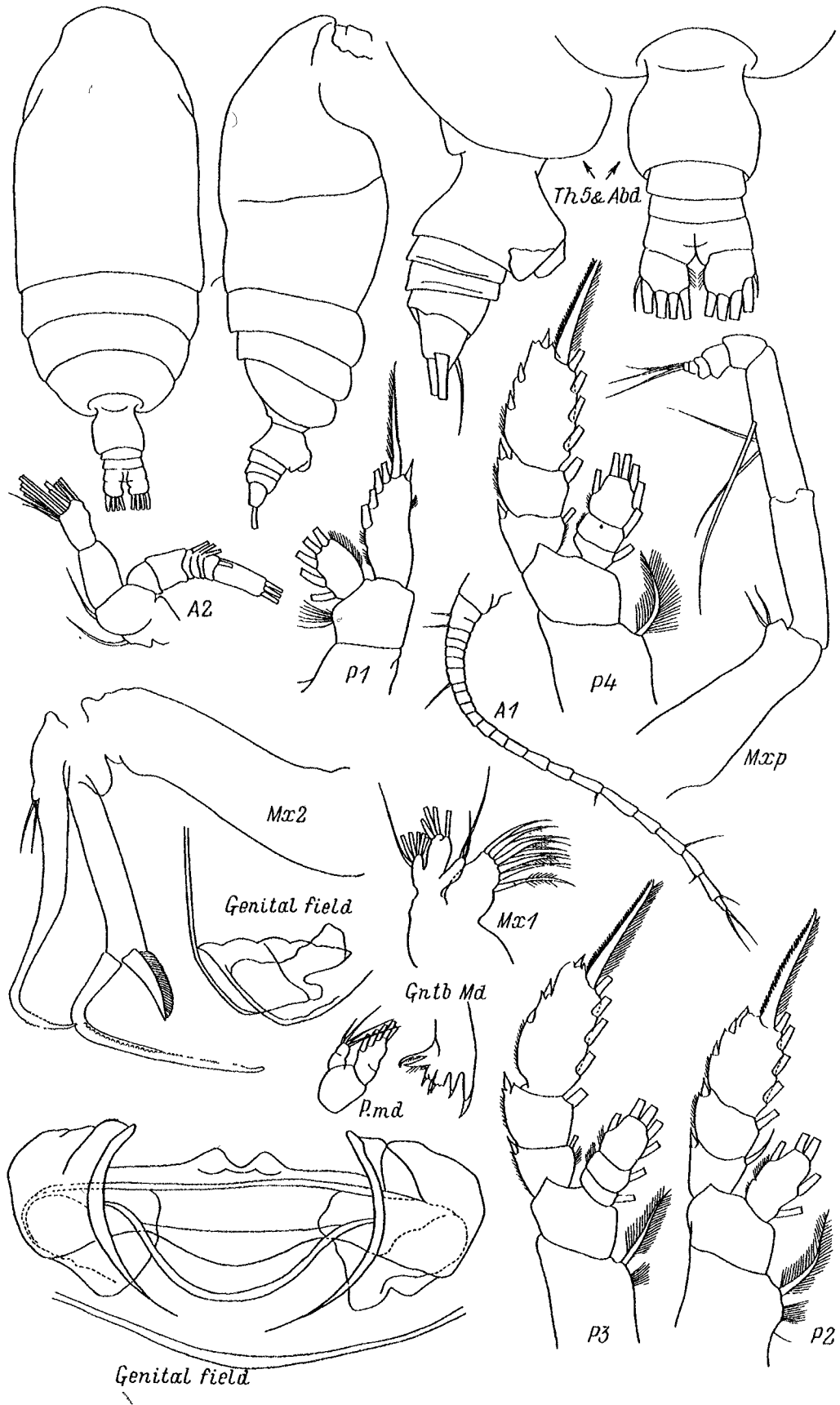


Fig. 77. *Chiridiella pacifica*. Female (21).

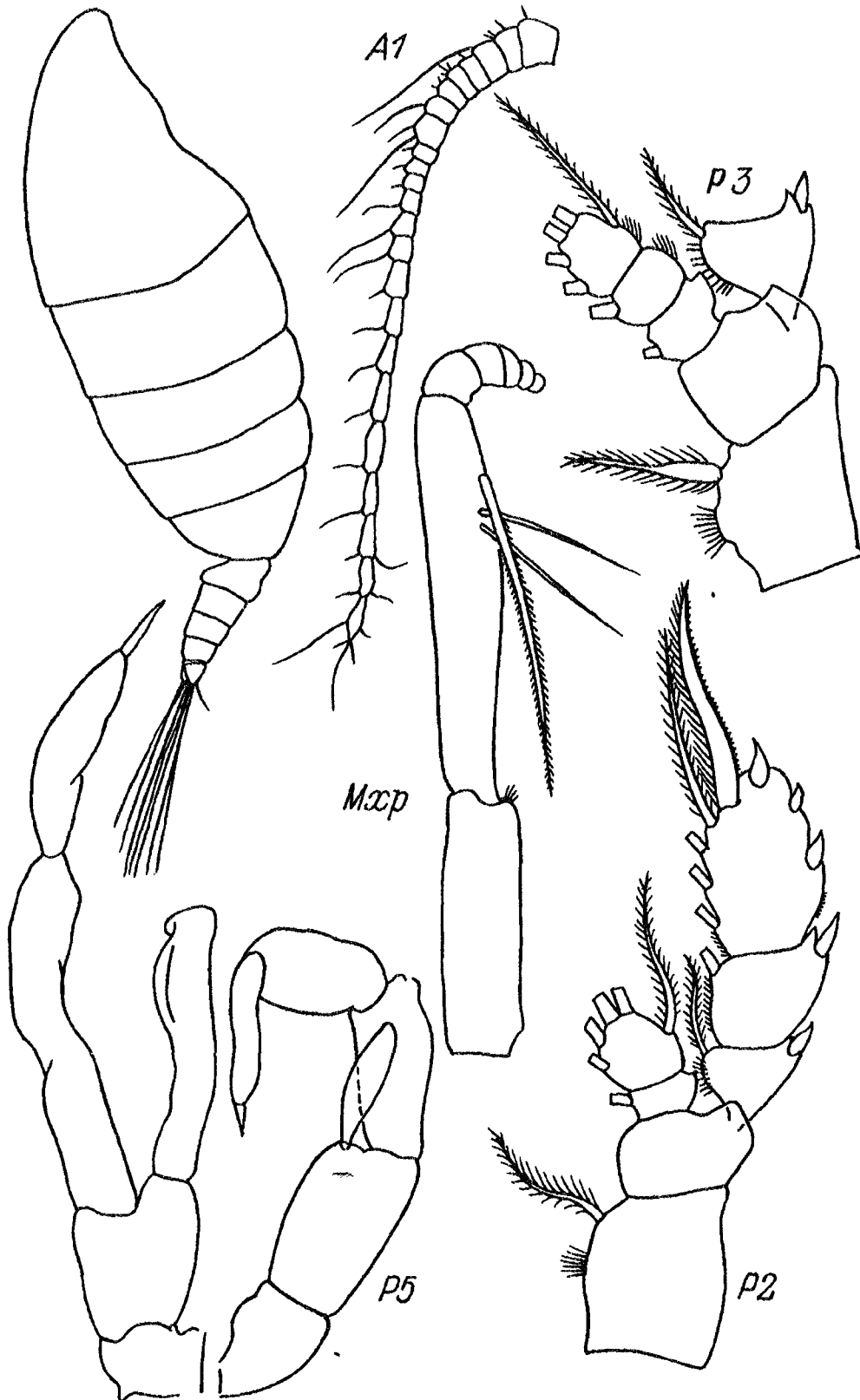


Fig. 78. *Chridiella pacifica*. Male (from Deevey, 1974)

field is not wavy. A1 24-jointed, as long as cephalothorax. Ri A2 is about two third of Re length. External lobe of Ri2 A2 with 5-6 terminal setae; internal lobe with 6-7 terminal setae. A2 coxo- and basipodite with 1 seta each. Ri2 Md usually with 4 setae. Mx1 gnathobase with 10 setae; second internal lobe reduced; third with 2 setae (3 setae after Deevey (1974)); Ri with 4 setae, Re with 6-7 setae; external lobe reduced. First and second Mx2 endites reduced; third endite present, without setae; fourth endite with spines of pincer-form arrangement; fifth endite transformed into single curved spine; distal part of Ri Mx2 represented by 2 setae. Mxp protopodite with 2 setae in distal group. Ri1 Mxp with 3 setae in medial part, 1.5 times longer than protopodite. Re P1 with 1 external spine. P2 with 1-jointed (sometimes with traces of separation) Ri and 3-jointed Re. Re P3-P4 3-jointed; Ri completely or incompletely 3-jointed.

Male. (Description after Deevey (1974)). Total length 2.85 mm. Md and Mx2 rudimentary. A1 reaching abdomen. Ri A2 slightly longer and wider than Re. Ri2 Md with 8 setae. Mxp and P1 similar to that in females. Ri P2 2-jointed; Ri and Re P3-P4 3-jointed. P4 coxopodite without hairs. P5 biramous; Ri 1-jointed.

Type locality: the north-western part of the Pacific Ocean.

Lectotype: female from sample N 474.

Geographical distribution. Atlantic Ocean: the Sargasso Sea (Deevey, 1974). Pacific Ocean: the north-western part (Brodsky, 1950; original data), regions of the Aleutian, Kurile-Kamchatka and Marian Trenches, Izu region (Tanaka, 1957). Indian Ocean: for the first time recorded in the western part (original data).

Vertical distribution. Species was found in hauls between 1000 and 3800 m in the Kurile-Kamchatka and Aleutian Trench area (original data) and between 1000 and 2000 (mostly between 1500 and 2000 m) in the Sargasso Sea (Deevey, 1974).

Material: 9 females from samples: 21, 63, 86, 96, 139, 196, 201, 395, 401.

12. *Chiridiella reductella* Markhaseva sp. n.

(Fig. 79)

Chiridiella reducta Brodsky, 1950: 195, fig. 110 (part. female only)

Description. Female. Total length 2.40-3.10 mm. Cephalothorax 3 times longer than abdomen. Anterior part of skeleton structures of genital field wavy (lateral view). A1 23-jointed, shorter than cephalothorax. Re A2 1.7 times longer than Ri. Right A2 Re5-Re6 with groups of minute spinules. Mx1 gnathobase with 10 setae; Ri with 3; Re with 1

seta; external lobe with 8 setae (second and third lobes not visible, possibly reduced). Mx2 with absolutely reduced first endite; second endite without equipment; third with 1 long seta; distal part of Ri absent, even setae on the fifth endite absent. Distal part of Mxp protopodite with 1 seta. Ri1 Mxp with 2 medial setae. Re P1 with 1 small terminal spine. Re1 P2 and Re1 P3 without external spines, 3-jointed (P2 indistinctly 3-jointed). Ri P2-P4 1-jointed.

Male unknown.

Notes. Brodsky (1950) described *Ch. reducta* after male and female. Female from type series of *Ch. reducta* was lost, according to Brodsky's (1950) figures is identical to the above species. Male designated as lectotype actually exists and should be attributed to *Ch. abyssalis*. Therefore the name *Ch. reducta* is synonymized with *Ch. abyssalis* (Markhaseva, 1983).

Type locality. 82°28'N 167°38'E.

Geographical distribution. Arctic Basin: central part (Brodsky, 1950; original data).

Vertical distribution. The species was found in total hauls from 2000 m (Brodsky, 1950) and in haul 250-900 m (original data).

Holotype, 1 female, N 1/64822, 82°28'N 167°38'E, "SP-17", Sta 1, 24 June 1968, in haul 250-900 m.

Material: 1 female from sample 521.

13. *Chiridiella sarsi* Markhaseva, 1983

(Fig. 80)

Chiridiella sarsi Markhaseva, 1983b: 122, fig. 3

Description. Female. Total length 4.40-4.50 mm. Cephalothorax 3.1-3.3 times longer than abdomen. Anterior part of skeleton structures of the genital field not wavy (ventral view). A1 24-jointed, reaching Abd2. Ri A2 is two third of Re length. External lobe of Ri2 A2 with 6 terminal setae; internal with 5 long and 2 short terminal setae. A2 coxo- and basipodite with 1 seta. Ri2 Md with 8-9 setae. Mx1 gnathobase with 8-10 setae; second internal lobe reduced, third internal lobe with 3 setae; Ri with 4 setae; Re with 5, often 8 setae; external lobe with 7 setae (examined specimens differed in structure of Mx1). Mx2 similar to *Ch. abyssalis*: first endite with 2 setae. Distal group of Mxp protopodite with 2 setae and nipple. Ri1 Mxp with 3 medial setae. P1 with 1-jointed rami. Re P1 with 1 external terminal spine. P2-P4 with 1-jointed Ri. P3-P4 with faint traces of subdivision between Ri1 and Ri2 as well as Ri2 and Ri3.

Male unknown.

Type locality: 86°34'N 94°20'E.

Geographical distribution. Arctic Ocean: the central part (Markhaseva, 1983b).

Vertical distribution. The species was found in hauls 750-4350 m and 1110-4300 (Markhaseva, 1983b).

Material: 2 females from samples: 510, 515.

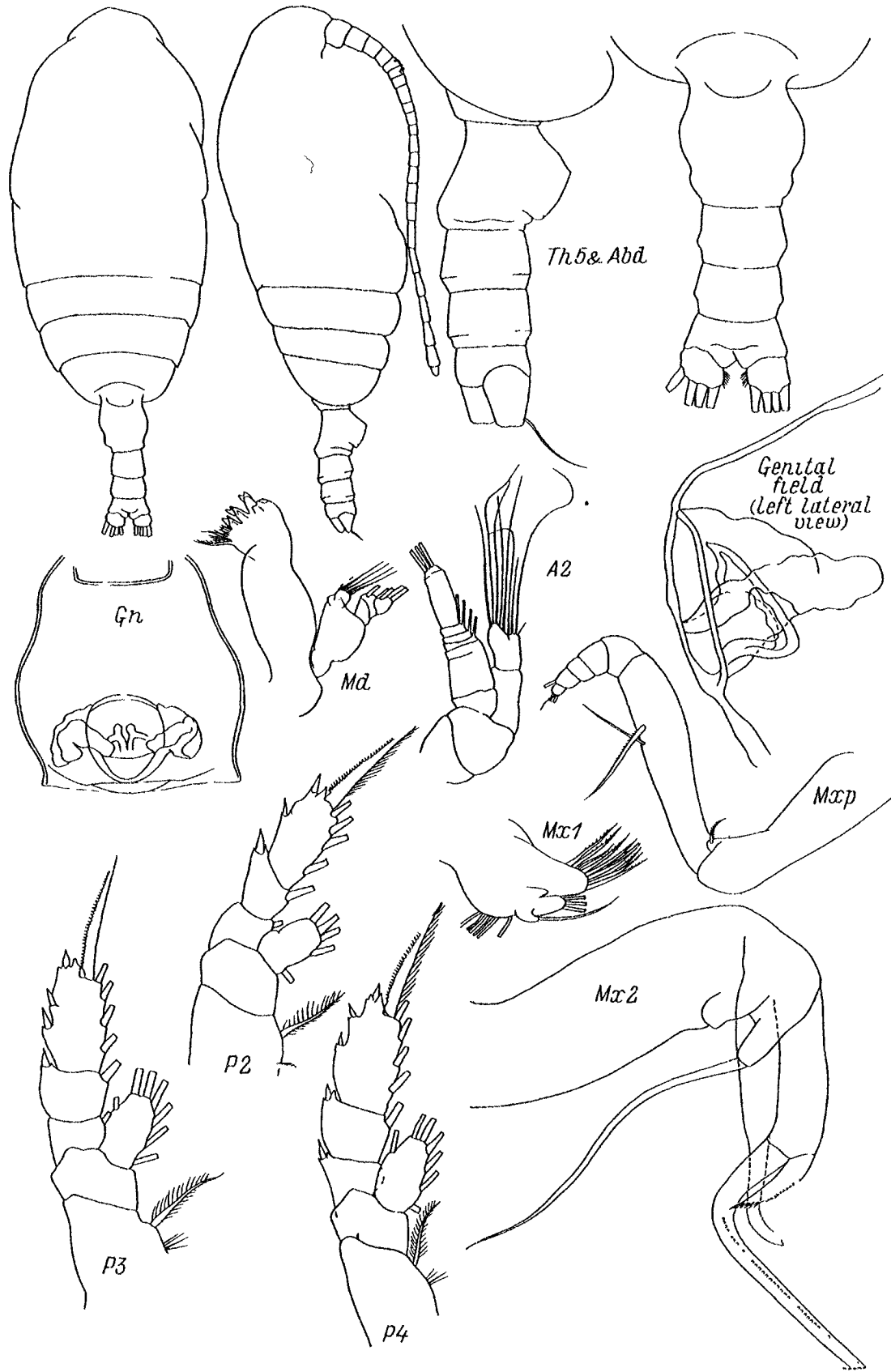


Fig 79. *Chridiella reductella* sp.n Female (521)

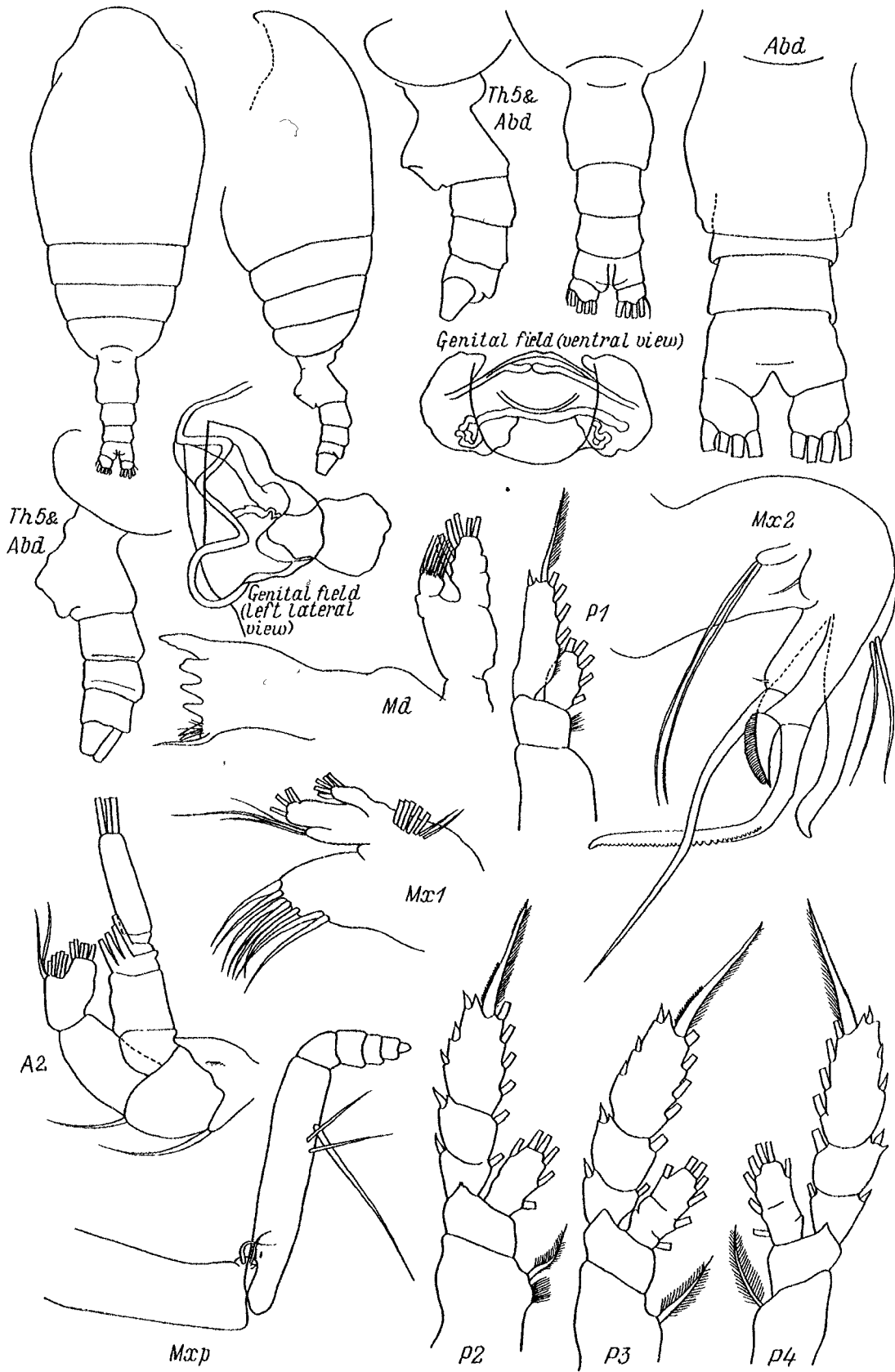


Fig. 80. *Chiridiella sarsi*. Female (from Markhaseva, 1983a).

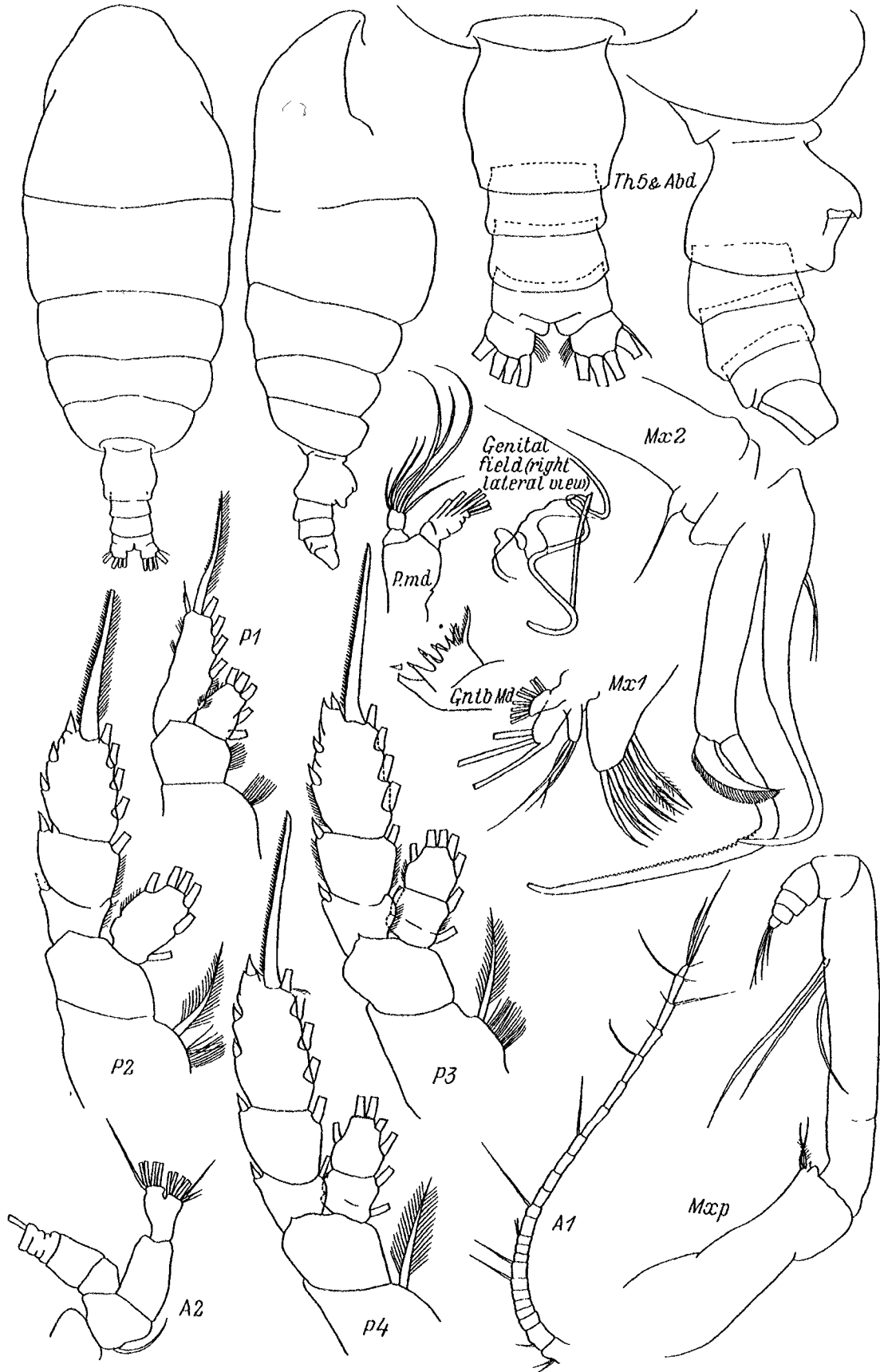


Fig. 81. *Chiridiella smoki*. Female (from Markhaseva, 1983a).

14. *Chiridiella smoki* Markhaseva, 1983

(Fig. 81)

Chiridiella smoki Markhaseva, 1983b: 123, fig. 4.

Description. Female. Total length 3.80 mm. Cephalothorax 3.8 times longer than abdomen. Anterior part of skeleton structures of genital field wavy (lateral and ventral view). A1 24-jointed, not longer than cephalothorax. Ri2 A2 with 6 terminal setae on external lobe and 5 long and 3 short terminal setae on internal lobe. A2 coxopodite with 1 seta. Ri2 Md with 7 setae. Mx2 with 4 endites: first (proximal) with 1 seta; second without seta. Mx1 gnathobase with 9 setae; second internal lobe absent; third with 3; Ri with 3; Re with 8 setae; external lobe reduced. Distal group of Mxp protopodite with 2 setae and small nipple. Ri Mxp with 3 medial setae. Ri P2 1-jointed. Ri P3-P4 2-jointed (with complete separation between Ri2 and Ri3). P4 coxopodite without hairs.

Male unknown.

Type locality: 45°20'N 153°54'E.*Geographical distribution.* Pacific Ocean: the Kurile-Kamchatka Trench area (Markhaseva, 1983b).*Vertical distribution.* Abyssopelagic species.*Material:* 6 females from samples: 105, 122, 124, 139, 140, 163.15. *Chiridiella subaequalis*
Grice & Hulsemann, 1965

(Fig. 82)

Chiridiella subaequalis Grice & Hulsemann, 1965: 231, 234, fig. 10 (a-l).

Description. Female. Total length 2.81-3.00 mm. Cephalothorax about 4 times longer than abdomen. Anterior margin of the skeleton structures of the genital field nearly smooth (ventral view). A1 23(?)-jointed, slightly shorter, as long as cephalothorax. Ri2 A2 with 6 terminal setae on external lobe and 6-7 terminal setae on internal lobe. Re A2 as long as Ri A2. A2 basipodite without setae; coxopodite with 1 seta. Ri2 Md with 9 seta. Gnathobase of Mx1 with 9; second and third internal lobes with 1 and 4 setae respectively; Ri with 7 setae; Re with 4 setae; external lobe with 8-9 setae. Third-fifth Mx2 endites each with 1 seta strongly thickened into spine, they are of nearly equal size. Mxp of examined specimen somewhat differing from that described by Grice & Hulsemann (1965): presence of 3 (instead of 2) medial setae on Ri1 Mxp; haired external surface of Ri3, Ri4 Mxp. P1 with 1-jointed Ri and Re, the latter of our specimens with external proximal spine not reaching the base of following terminal spine (after Grice & Hulsemann the spine

exceeds the base of the next spine). P2 with 1-jointed Ri; Re incompletely 3-jointed. Ri P2-P3 incompletely 3-jointed.

Male unknown.

Notes. Despite minor differences in setation of Mxp, and length of first external spine on Re P1 we attributed the studied species to *Ch. subaequalis*.*Type locality:* 29°57'N 22°53'W.*Geographical distribution.* Atlantic Ocean: the north-eastern part (Grice & Hulsemann, 1965). Pacific Ocean: for the first time in the region of the Kurile-Kamchatka Trench. In the indoceanic sector of Antarctic, to the South 62°S (original data).*Vertical distribution.* The species was found in hauls with known sampling ranges: 3000-4000 m (Grice & Hulsemann, 1965) and 1500-2000 m (original data).*Material:* 2 females from samples: 73, 379.8. *Chiridius* Giesbrecht, 1892TYPE SPECIES: *Chiridius poppei* Giesbrecht, 1892, by monotypy.*Chiridius* Giesbrecht, 1892: 224.

Description. Female. Total length 1.59-4.60 mm. Cephalothorax 2.00-4.00 times longer than abdomen. Rostrum absent. Cephalon and Th1, as well as Th4-Th5 fused. Th5 posterior corners extended into points not separated from segment; symmetrical, reaching the end of first one third of genital segment length, the middle or end of second third of genital segment length (dorsal view). Th5 points directed straightly to the end of the body, sometimes slightly divergent (dorsal view). Distal part of spermatheca oval or rounded, flowing duct thin (in *Ch. obtusifrons* the duct is slightly narrower than the distal part of spermatheca). Posterior Abd1-3 border with minute spinules. Genital segment symmetrical. Genital segment as long as wide, sometimes slightly longer than wide. Genital segment 1.3-1.6 times longer than Abd2. Caudal rami 1.5 times wider than long. A1 24-jointed as long as cephalothorax, reaching the middle of genital segment, Abd2, or even the posterior border of Abd3 (*Ch. mexicanus*). Re A2 1.5-2.0 times longer than Ri. A2 coxopodite with 1; basipodite with 2 setae; Ri1 A2 with 2 setae; Ri2 with 8 (rarely 7) setae (4-5 of which longer and stronger) on internal lobe, and 6 long and often 1 short posterior setae on external lobe. Re1 A2 without setae; Re2 with 2 (1 medial and 1 distal) setae; Re3-Re6 with long strong seta each; Re7 A2 with 1 medial short and 3 terminal setae. Md palp base with 2 setae; Ri1 with 2 setae; Ri2 with 8-9 terminal (sometimes 7 terminal and 1 posterior (*Ch. polaris*, *Ch. pacificus*) setae: the 1-3 of them thinner and shorter. Re Md nearly 1.5-2.0 times longer Ri. Mx1 gnatho-

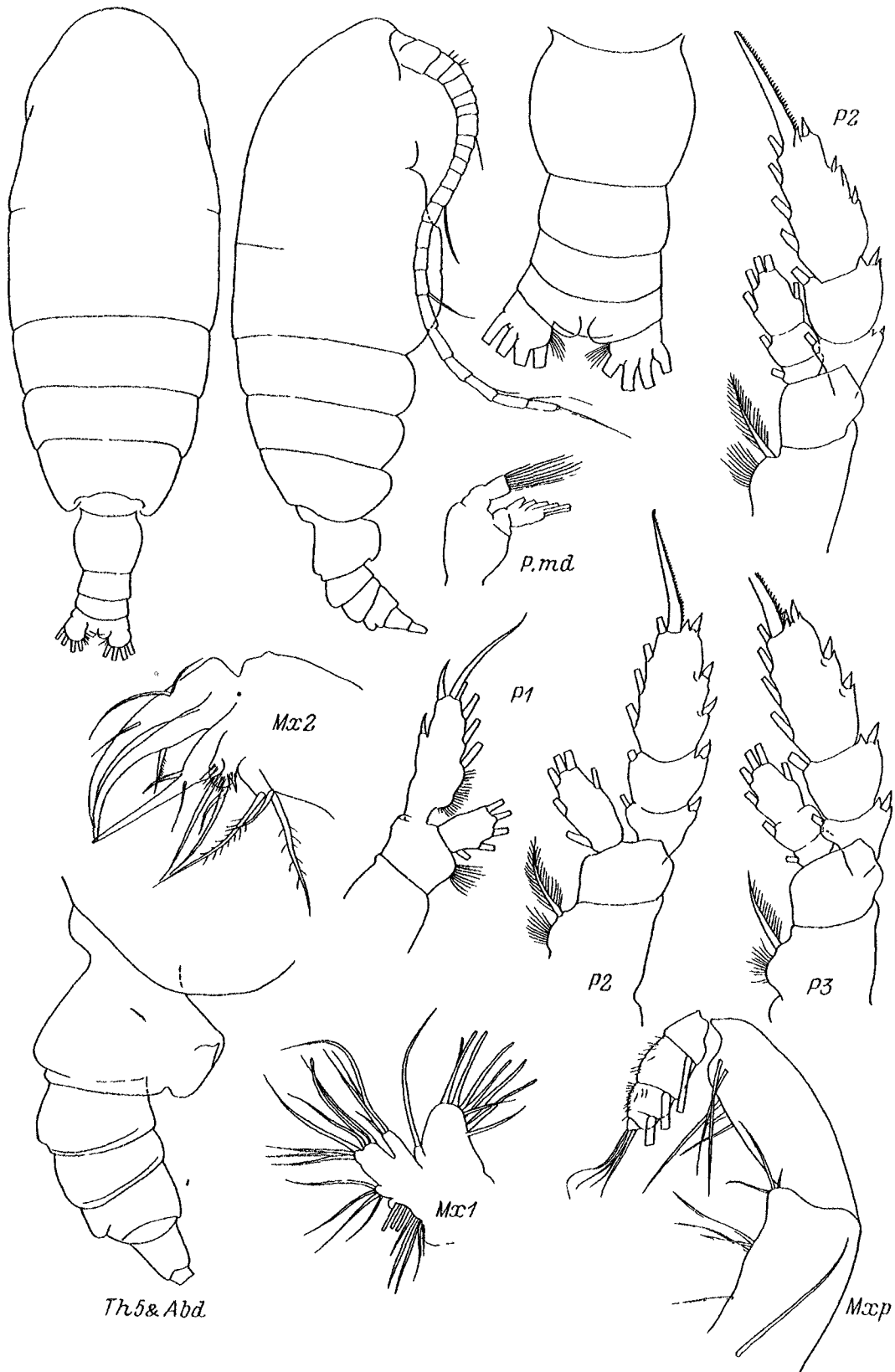


Fig. 82. *Chiridiella subaequalis*. Female (73).

base with 9 claw-like terminal, 1 anterior setae and 4 setae on posterior surface; second internal lobe with 5 setae; third internal lobe with 4 setae; protopodite near Ri base with 4 setae (of which 1 strong and long, the remaining short and thin); Ri with 11-13 setae; Re with 8 or 10 setae; external lobe with 7 (rarely 6) long and 2 short setae. Mx2 typical of the family: 1 seta (of 3) on fourth and fifth endites transformed into claw-form. Ri1 Mxp 1.2-1.5 times longer than protopodite, protopodite with groups of 2, 3 and 3 setae (from proximal to distal part of the joint), and with another seta proximally. Lateral surface of Ri2 Mxp sometimes with semicircular row of surface spinules (*Ch. polaris*). Re P1 3-jointed, each joint with external spine; anterior surface of Re2 P1 often with group of spinules. Ri P2 1-2-jointed. Re P2 2-3-jointed, Ri P2 not reaching or reaching the border between Re2-Re3 P2, sometimes even exceeding it (*Ch. poppei*). Re3 P2 border between second and third external spines sometimes with bulge (*Ch. molestus*). P3-P4 rami clear, rarely indistinct 3-jointed. Re3 P4 external spines often significantly shorter and thinner than those of P3.

Male. Total length 1.50-3.80 mm. Cephalothorax nearly 2.5-3.3 times longer than abdomen. Rostrum absent (some specimens of *Ch. pacificus* have 1-pointed rostrum). Cephalon and Th1, as well as Th4-Th5 fused, line of fusion poorly visible dorsally. Posterior Th5 corners prolonged into points not separated from the segment, reaching the midlength of genital segment or exceeding its posterior border. Posterior border of Abd2-4 with minute spinules. Abd2 1.4-1.9 times longer than genital segment. A1 23-jointed, shorter or as long as cephalothorax, reaching the end of genital segment, posterior border of Abd2. Re A2 1.3-1.6 times longer than Ri. Ri2 A2 with 11-12 setae. A2 coxopodite with 1 seta; basipodite with 1-2 setae, Ri1 A2 with 1 seta, smaller than in female. Md palp base with 1 seta, or seta absent. Setae (usually 1 seta) on Ri1 Md shorter and thinner than in female; Ri2 Md with 9 setae (Tanaka noted 8 setae for *Ch. molestus* (Tanaka, 1957a). Mx1 Ri with 8-9 setae; Re with 9 setae, gnathobase and second internal lobe without setae. Mxp with protopodite 1.06-1.40 times longer than Ri1 Mxp, the latter usually with 3 medial setae, and with only 1 such seta in *Ch. molestus*. Segmentation and setation of P1 the same as in female, but first and second external spines smaller. P2 with 2-jointed Ri, sometimes segmentation indistinct (*Ch. poppei*), the line of separation better outlined than in female. In other species Ri P2 reaching or not reaching the border between Re2 and Re3 P2 (exceeding the border of Re2-Re3 P2 in *Ch. poppei* only). First and second external Re3 spines usually as in female of corresponding species. P3-P4 with 3-jointed rami (in *Ch. obtusifrons* segmentation in P4 vague). P5 uniramous, only in some specimens

of *Ch. pacificus* rudimentary Ri present in both rami. If P5 uniramous: usually right leg 4-jointed and longer than left 5-jointed leg (in *Ch. poppei* they are of nearly the same length).

The genus *Chiridius* includes 8 species, all of them except *Ch. mexicanus* Park, 1975 (male unknown) are described below. *Ch. subantarcticus* Park, 1978 is herein considered to be synonym of *Ch. polaris* Wolfenden.

Key to species of *Chiridius*

Females

(unknown for *Ch. longispinus*)

- 1(6) Re Mx1 with 8 setae. Posterior points of Th5 corners reaching the midlength of the genital segment, usually longer. Specimens 1.59-2.80 mm in length.
- 2 (3) Re3 P2 (often also P3) with bulge near the base of third external spine and excavation near the base of second external spine. Ri2 Md usually with 8 setae 3. *Ch. molestus* Tanaka
- 3 (2) Re3 P2 without bulge and excavation between second and third external spines. Ri2 Md commonly with 9 setae.
- 4 (5) Specimens 1.59-2.20 mm in length. Cephalothorax 2.7-3.2 times longer than abdomen. Re1, Re2 P1 external spines not reaching the base of next spine. Ri P2 1-jointed, exceeding Re2-Re3 P2 border 7. *Ch. poppei* Giesbrecht
- 5 (4) Specimens 2.45-2.80 mm in length. Cephalothorax 3.2-4.2 times longer than abdomen. Re1, Re2 P1 external spines reaching or exceeding the base of next spine. Ri P2 2-jointed (sometimes separation is obscure), mostly not reaching the border between Re2-Re3 P2 1. *Ch. gracilis* Farran
- 6(1) Re Mx1 with 10 setae. Posterior points of Th5 reaching to the end of first third of genital segment, rarely reaching, or even exceeding its middle. Specimens 2.8-4.6 mm in length.
- 7(8) Ri2 Md with 9 terminal setae. Cephalothorax 2.0-2.9 times longer than abdomen. Distal part of spermatheca slightly widened. 4. *Ch. obtusifrons* Sars
- 8(7) Ri2 Md with 8 (7 terminal and 1 posterior) setae. Cephalothorax 2.7 (2.7-3.6) times longer than abdomen. Distal part of spermatheca significantly wider than flowing duct, bladder-like.
- 9(10) Specimens 2.80-3.05 mm in length. Posterior points of Th5 reaching or exceeding the middle of genital segment. Re3 P1 external spine 1.30-1.47 longer Re2 P1 external spine 5. *Ch. pacificus* Brodsky
- 10(9) Specimens 3.30-4.25 mm in length. Posterior points of Th5 reaching the end of first third of genital segment, sometimes reaching or exceeding its midlength. Re3 P1 external spine 1.04-1.26 times

longer than Re2 P1 external spine
 6. *Ch. polaris* Wolfenden

Males

- 1(2) Posterior points of Th5 corners exceeding the posterior border of genital segment
 5. *Ch. pacificus* Brodsky
- 2(1) Posterior points of Th5 corners not longer than genital segment.
- 3(4) Right P5 nearly as long as left. Re1 and Re2 P1 external spines very short, not reaching the middle of the next joint . . . 7. *Ch. poppei* Giesbrecht
- 4(3) Right P5 longer than left. Re1 and Re2 P1 external spines reaching the midlength of the next joint or longer.
- 5(6) Posterior points of Th5 corners hardly reaching the midlength of Abd1. Ri1 Mxp with 1 medial seta 3. *Ch. molestus* Tanaka
- 6(5) Posterior points of Th5 corners usually reaching the posterior border of Abd1. Ri1 Mxp with 3 medial setae.
- 7(8) Re1 P1 external spine reaching and exceeding the base of following spine
 6. *Ch. polaris* Wolfenden
- 8(7) Re1 P1 external spine not reaching the base of following spine.
- 9(10) P5 is shorter than half length of P4. Specimens 1.52 mm in length 2. *Ch. longispinus* Tanaka
- 10(9) P5 is longer. Specimens more than 1.96 mm in length.
- 11(12) Terminal joint of left P5 3 times longer than wide 1. *Ch. gracilis* Farran
- 12(11) Terminal joint of left P5 4.4-5.0 times longer than wide 4. *Ch. obtusifrons* Sars

1. *Chiridius gracilis* Farran, 1908

(Figs. 83-84)

Chiridius gracilis Farran, 1908: 30, pl 2, figs 1-3; Vervoort, 1952b (sheet 44) 3, fig. 2; Tanaka, 1957a: 48, fig. 30, Tanaka & Omori, 1970a: 117, Park, 1975a: 283, figs 7-8; 1978: 122, fig. 13, Vives, 1982: 291; Roe, 1984: 356; Brenning, 1983: 2, 1985: 29.

Description. Female. Total length 2.45-2.80 mm. Cephalothorax 3.21-4.20 times longer than abdomen. Points of Th5 posterior corners exceeding the midlength of genital segment (usually reaching the end of second third of segment length). Genital segment widest in its midlength. A1 as long as cephalothorax, or reaching the end of genital segment (sometimes to the middle of Abd2 (Park, 1975a)). Ri2 Md with 9 setae (sometimes with 8). Re Mx1

with 8 setae. External spines on Re P1 not reaching (rarely exceeding) the base of following spine. Re P2 3-jointed (sometimes separation between Re1 and Re2 incomplete). Ri P2 incompletely 2-jointed, usually not reaching (rarely reaching) the border between Re2-Re3 P2. Re3 P2 without excavation between second and third external spines; first and second external spines long, reaching the base of next spine.

Male. Total length 1.96-2.32 mm. Cephalothorax 3.1 times longer than abdomen. Points of Th5 posterior corners are not longer than Abd1. A1 23-jointed, shorter than cephalothorax. Ri2 Md with 8 long and 1 short seta. Mx1 with 2 setae on second (?) internal lobe; Re with 9 setae; Ri also with 9 setae. Ri1 Mxp with 3 medial setae. External spines of Re1 and Re2 P1 not reaching the bases of next spines. P2 with incompletely 2-jointed Ri. First and second external spines of Re3 P2 reaching the base of next spine; Ri P2 reaching the border between Re2-Re3 P2.

Type locality: the North Atlantic to the west of Ireland.

Geographical distribution. Atlantic Ocean: the northernmost finding in the Norwegian Sea (71°N), the southernmost in the region of the South Sandwich Islands. Pacific Ocean: the northernmost finding from the Izu region (Tanaka & Omori, 1970a), the southernmost from the antarctic sector of the Pacific Ocean (region of 62°33'S 127°37'W original data). Indian Ocean: the species found for the first time in the north-eastern part (original data).

Vertical distribution. The species recorded in the majority of total hauls from depths 300-8300 m, and in hauls from 500-1000 m (Park, 1975b). Evidently mesopelagic species most common in total hauls from 500 to 1000 m.

Material: 34 females and 3 males from samples: 2, 201, 215, 274, 280, 346-347, 350-352, 354-355, 358-359, 361, 364, 373, 375, 419, 426, 432, 438, 451, 465.

2. *Chiridius longispinus* Tanaka, 1957

(Fig. 85)

Chiridius longispinus Tanaka, 1957a: 51, fig. 32

Description. Male. (Description after Tanaka (1957) with modifications). Total length 1.52 mm. Cephalothorax 3 times longer than abdomen. Points of Th5 posterior corners as well as A1 reaching the end of genital segment. Ri2 Md with 9 setae. Mx1 with 6 setae on external lobe; Re with 9 setae; Ri with 9 setae and 2 setae on protopodite near Ri base; second and third internal lobes with 1 seta each. Mx2 significantly reduced. External spine of Re1 P1 nearly reaching the distal border of Re2 P1. P2 with 2-jointed Ri. P5 shorter than half length of P4.

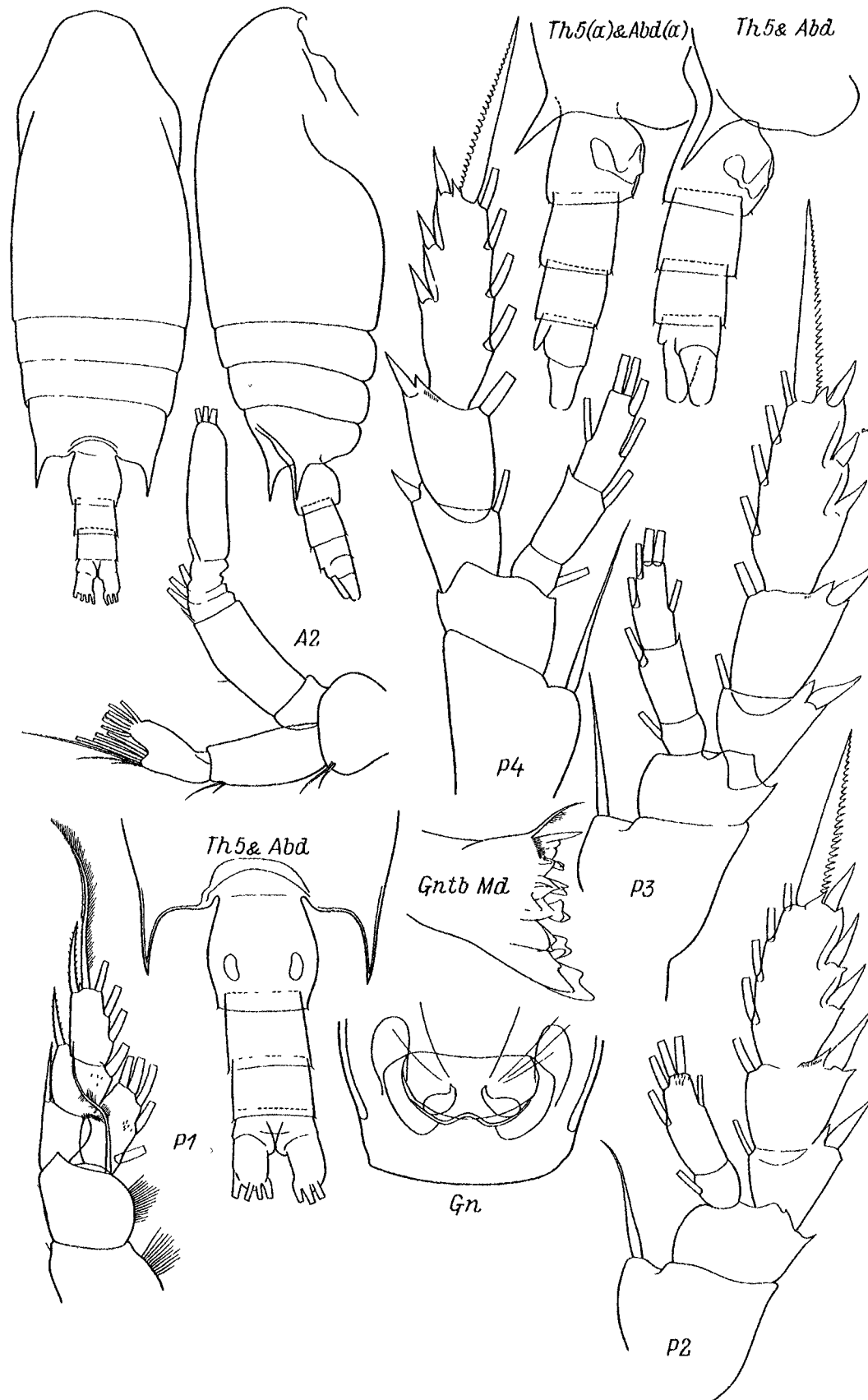


Fig. 83. *Chiridius gracilis*. Female: general view, Th5 & Abd, P2-P4 (438), Gntb Md (427), Gn (451), Th5(a) & Abd(a) (375), P1 (352), A2 (573).

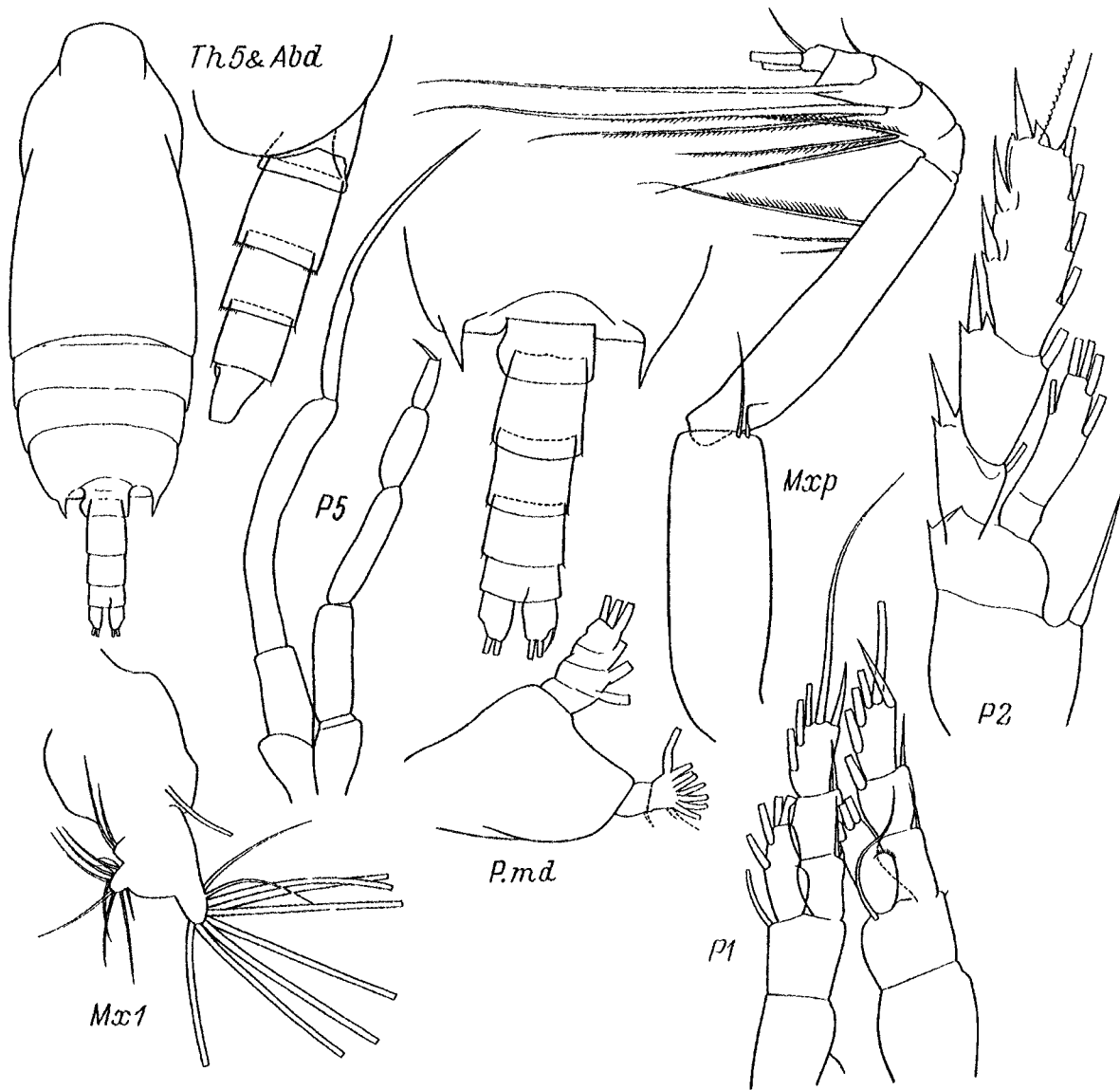


Fig. 84. *Chiridius gracilis*. Male: general view, Th5 & Abd, P2, P5 (359), P.md, Mxp, Mx1, P1 (364).

Type locality: the Izu region.

Geographical distribution. Pacific Ocean: from the Izu region only (Tanaka, 1957a).

Vertical distribution. The species found in total haul from 1000 m (Tanaka, 1957a).

The species is not examined by me.

3. *Chiridius molestus* Tanaka, 1957

(Figs. 86-87)

Chiridius molestus Tanaka, 1957a: 53, fig. 33 (a-f) (male).

Chiridius subgracilis Park, 1975a: 285, figs 9-10; Bradford & Jillett, 1980: 23, fig. 12.

? *Chiridius gracilis* (non Farran, 1908): A. Scott, 1909. 42, pl. 11, figs 1-9.

Description. Female. Total length 2.30-2.70 mm. Cephalothorax 2.8-3.75 times longer than abdomen. Points of Th5 posterior corners slightly exceeding the midlength of genital segment or reaching the end of its last third. Abd1 is widest in its second third. A1 as long as or shorter than cephalothorax. Ri2 Md with 8 terminal setae. Re Mx1 with 8 setae (9 setae after Park (1975a)). Some specimens found with P5 rudiments, and with 9 setae on Ri2 Md and Re Mx1 with 10 setae. External spines of Re1 and Re2 P1 varying in length: sometimes reaching to or exceeding the base of next spine (or not reaching the base of next spine). P2 with 3-jointed Re and incompletely 2-jointed Ri. Edge between second and third Re3 P2 external spines of the characteristic shape: with bulge near the base of third external

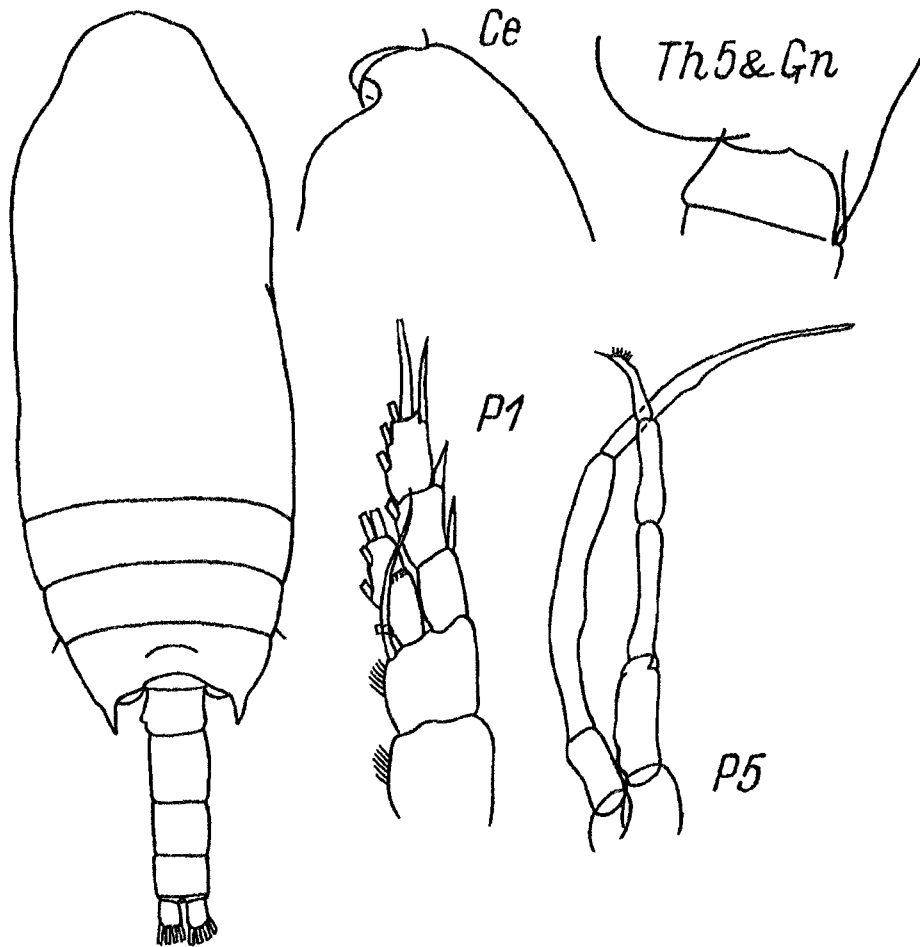


Fig. 85. *Chiridius longispinus*. Male (from Tanaka, 1957a).

spine and with excavation close to the base of second external spine. Ri2 P2 reaching or not reaching the border between Re2-Re3 P2; terminal spine with 23-26 denticles. Re3 P3 edge between second and third external spines similar to that in Re3 P2. P3-P4 rami 3-jointed, with 22-28 denticles on terminal spines of Re3.

M a l e. Total length 1.80-2.04 mm. Cephalothorax 2.30-3.2 times longer than abdomen. Points of Th5 posterior corners reaching the middle of Abd1. A1 as long as cephalothorax, reaching the middle of Abd3. Ri2 Md with 9 setae (8 setae after Tanaka (1957)). Mx1 with 1 seta near Ri base; Ri with 9 setae; Re with 9 setae. Ri1 Mxp with 1 medial seta. External spines of Re1, Re2 P1 shorter than in the same joint in females. Ri not reaching the border between Re2 and Re3 P2. Ri P2 2-jointed. Re P3-P4 3-jointed. Left P5 slightly longer than two third of right P5.

Notes. After Bradford & Jillett (1980) and on the from the examined material, *Chiridius subgracilis* Park, 1975 is considered identical to *Chiridius molestus* Tanaka, 1957. The New Zealand authors left the name *subgracilis* (Bradford & Jillett, 1980). Ac-

cording to the priority rule, it should be considered the junior synonym, and the name *Chiridius molestus* should be assumed valid.

Type locality: the Izu region.

Geographical distribution Due to possible mixture between *Ch. molestus* with *Ch. gracilis*, it is difficult to describe the species distribution area. Atlantic Ocean: the northernmost finding: 48°N (original data), known also from the Gulf of Mexico (Park, 1975a) and the region of the Canary Islands (Vives, 1982). Pacific Ocean: from the Izu region (Tanaka, 1957a; Tanaka & Omori, 1970a), region off the New Zealand (Bradford & Jillett, 1980; original data), the south-eastern part off South America (original data), southernmost locality not further than 46°S. From the Malay Archipelago ? (A. Scott, 1909), Indian Ocean: found for the first time (original data).

Vertical distribution. Evidently mostly mesopelagic species, found in the hauls with known depth ranges 200-500, 500-1000 m (Bradford & Jillett, 1980), recorded in epipelagial (A. Scott, 1909; Bradford & Jillett, 1980); found in total hauls from 4000 m.

Material: 45 females and 2 males from samples: 266, 267, 313, 387-389, 422-428, 445, 447-451, 457.

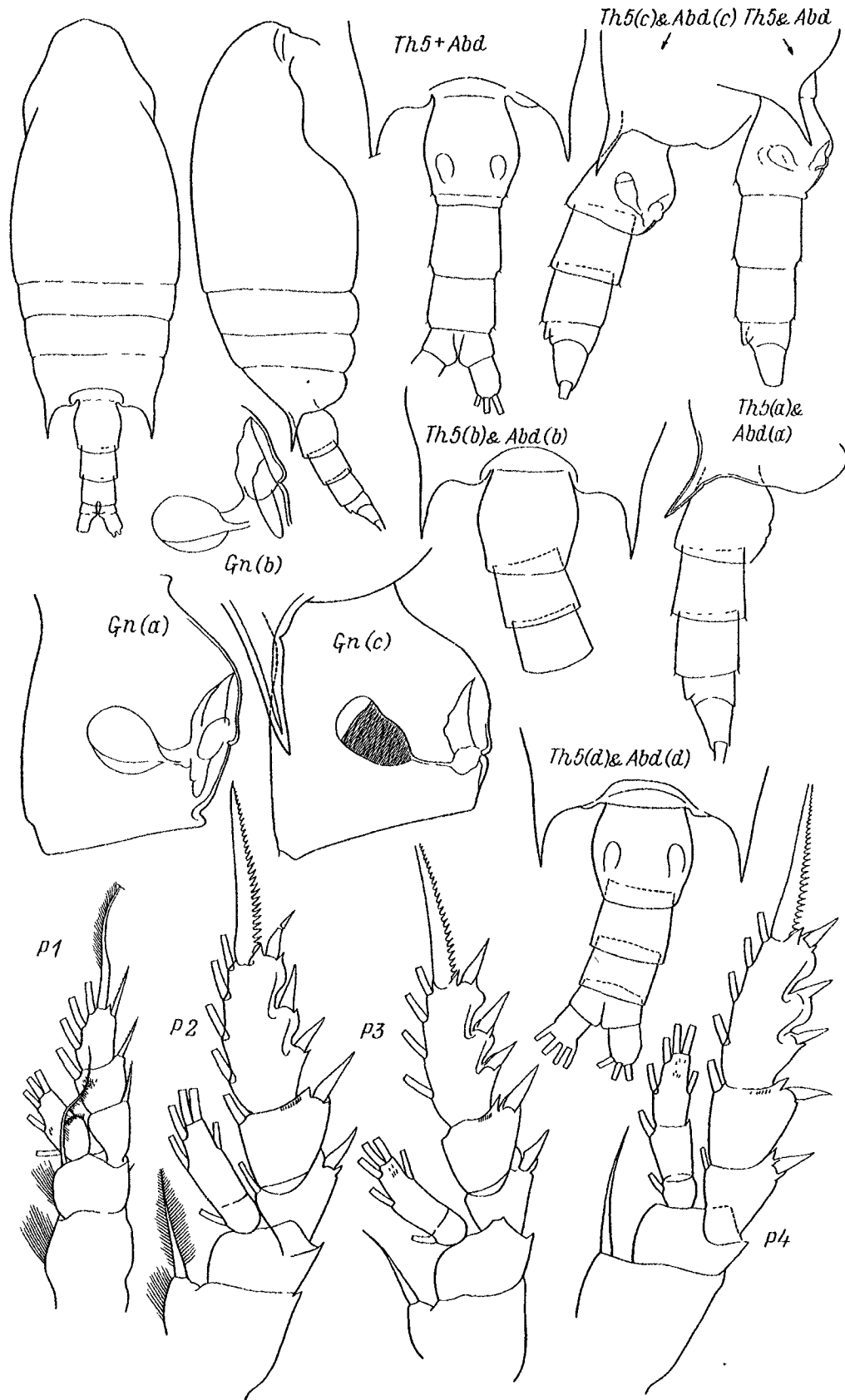


Fig. 86. *Chiridus molestus*. Female: general view, Th5(a) & Abd(a) (428), Th5 & Abd, Gn(a), Gn(b), P1-P3 (457), Th5(b) & Abd(b) (426), Th5(c) & Abd(c), Gn(c) (449), Th5(d) & Abd(d) (428).

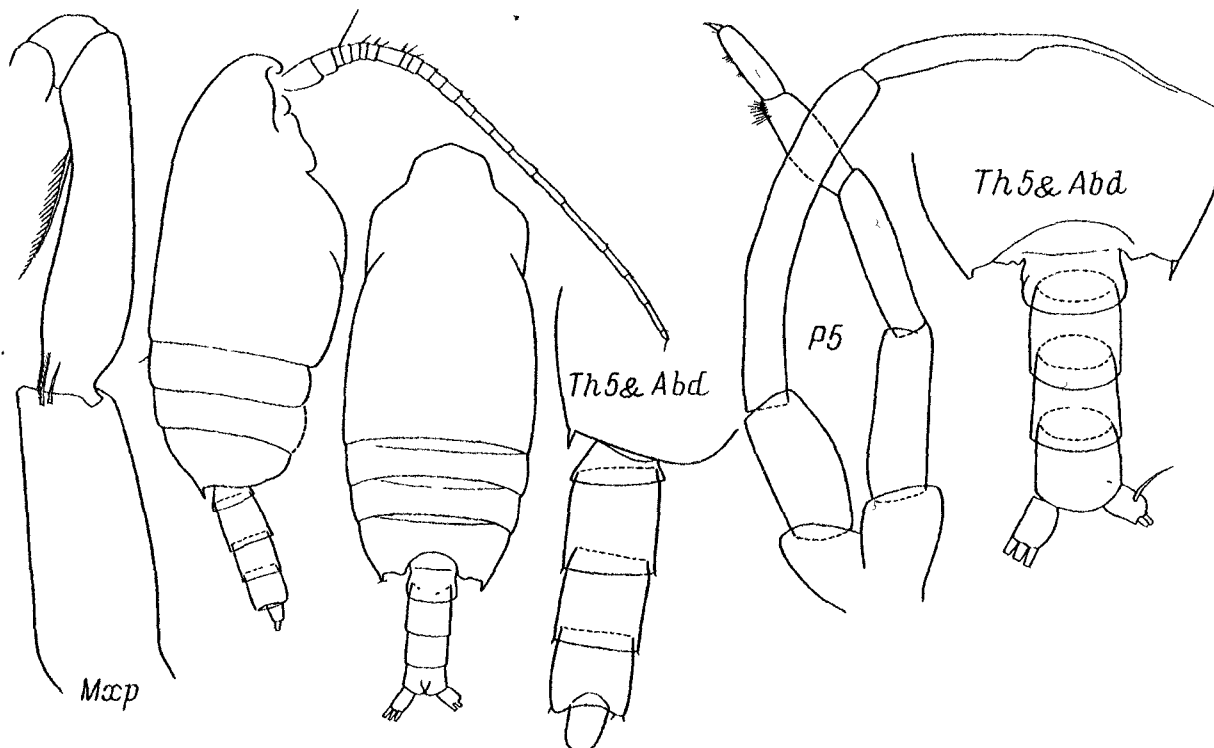


Fig. 87. *Chiridius molestus*. Male (388).

4. *Chiridius obtusifrons* Sars, 1902

(Figs. 88-90)

Chiridius obtusifrons Sars, 1902: 29, pl. 17; Damas & Koefoed, 1907: 408; Van Breemen, 1908: 34, fig. 37; With, 1915: 83; pl. 11, fig. 2 (a-b), text-fig. 20 (a-e); Bigelow, 1926: 306; Jespersen, 1934: 56; Brodsky, 1950: 153, fig. 69; Vervoort, 1952c, (sheet 44): 3, fig. 3; Brodsky & Nikitin, 1955: 423; Johnson, 1963: 92; Grice & Hulsemann, 1965: 223; ? Bjornberg, 1973: 323; ? Kovalev & Shmeleva, 1982: 83; Markhaseva, 1984: 511.

Description. Female. Total length 3.50-4.60 mm. Cephalothorax 2.0-2.9 times longer than abdomen. Points of Th5 posterior corners reaching the end of first third of genital segment, sometimes almost its midlength. Th5 usually slightly divergent (dorsal view), sometimes not divergent. Spermatheca significantly smaller than in other species of the genus. Genital segment is widest in its middle third. A1 slightly longer than cephalothorax. Ri2 Md with 9 setae. Re Mx1 with 10 setae. External spines of Re1 and Re2 P1 exceeding the base of the next spine. Ri P2 1-jointed, not reaching the border between Re2 and Re3 P2. Re P2 indistinctly 3-jointed; first and second external spines of Re3 P2 short, not reaching the base of next spine, terminal spine with 27-31 denticles. P3 and P4 with incompletely 3-jointed rami.

Male. Total length 2.90-3.20 mm. Cephalothorax 2.6-3.0 times longer than abdomen. Points of Th5 posterior corners slightly short of the posterior border of Abd1. A1 about as long as cephalothorax. Ri2 Md with 9 setae. Mx1 second internal lobe with 1-2 setae; protopodite near the base of Ri with 3 setae; Ri with 8-9 setae; Re with 9 setae; external lobe with 6 setae. Ri1 Mxp with 3 medial setae. External spines of Re1 and Re2 P1 shorter than in females, short of the base of next spine. P2 with incompletely 3-jointed Re. P3 with indistinctly 3-jointed rami. P4 with 3-jointed rami. Right P5 longer than left.

Geographical distribution. The species is widespread in the Arctic Basin, mostly in its central part. Common in the Strait of Davis, the Norwegian and Greenland Seas, recorded in the Barents Sea (Jespersen, 1934; Vervoort, 1952c; etc). The southernmost finding in the Atlantic Ocean: near the coast of North America in the region 42°24'N (Bigelow, 1926). The following records of the species are problematic: the Mediterranean Sea (Kovalev & Shmeleva, 1982); near South America coast in the region of 52°53'S (Bjornberg, 1973).

Vertical distribution. The species was found in the Arctic Basin in hauls in epi- and mesopelagial (Brodsky & Nikitin, 1955), in the Norwegian Sea in haul 200-800 m (Sars, 1902). Also known in significant number in total hauls from 2000 m. More common in tows from 350-500 and 600-800 m (Jes-

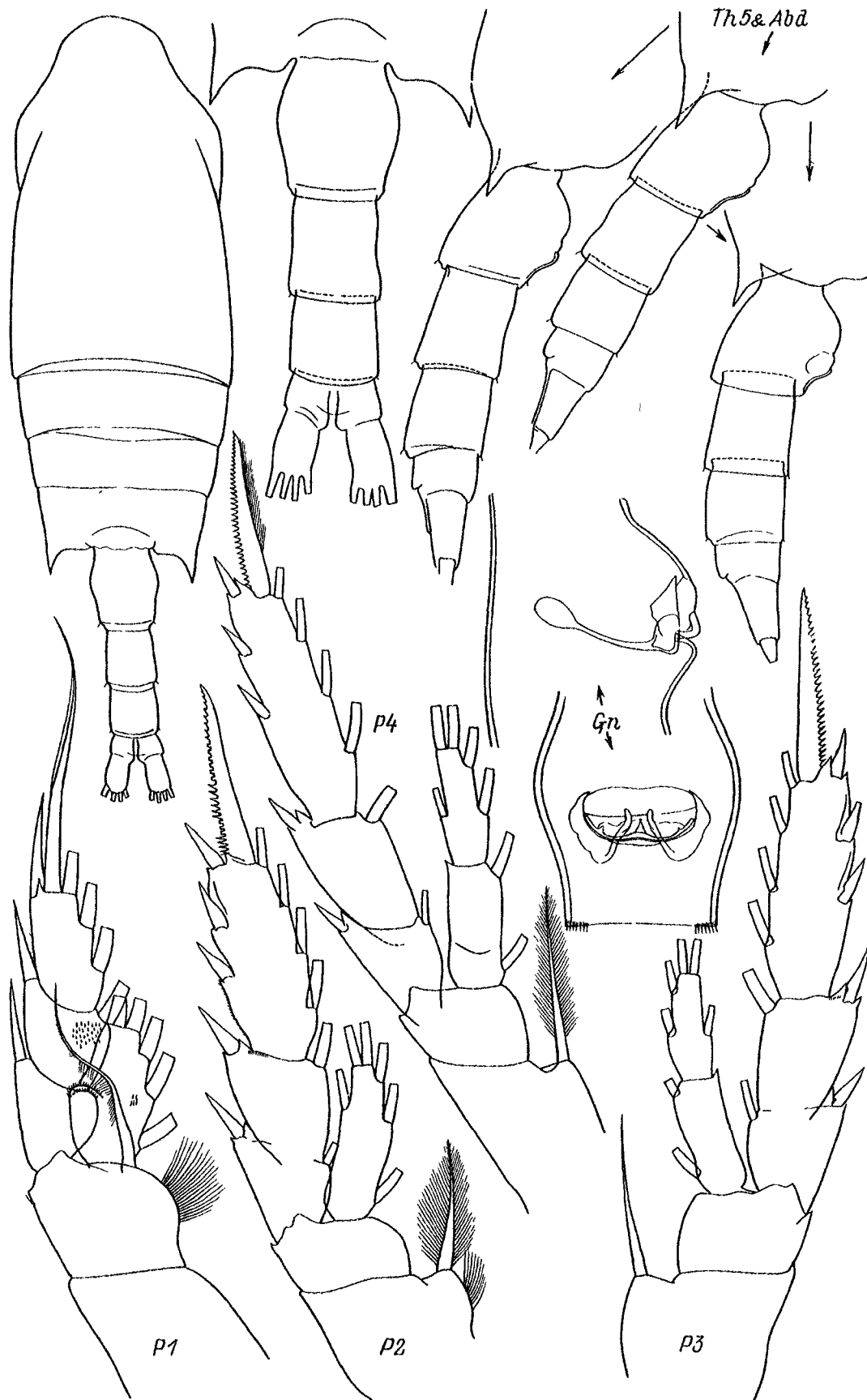


Fig. 88. *Chiridius obtusifrons*. Female (475).

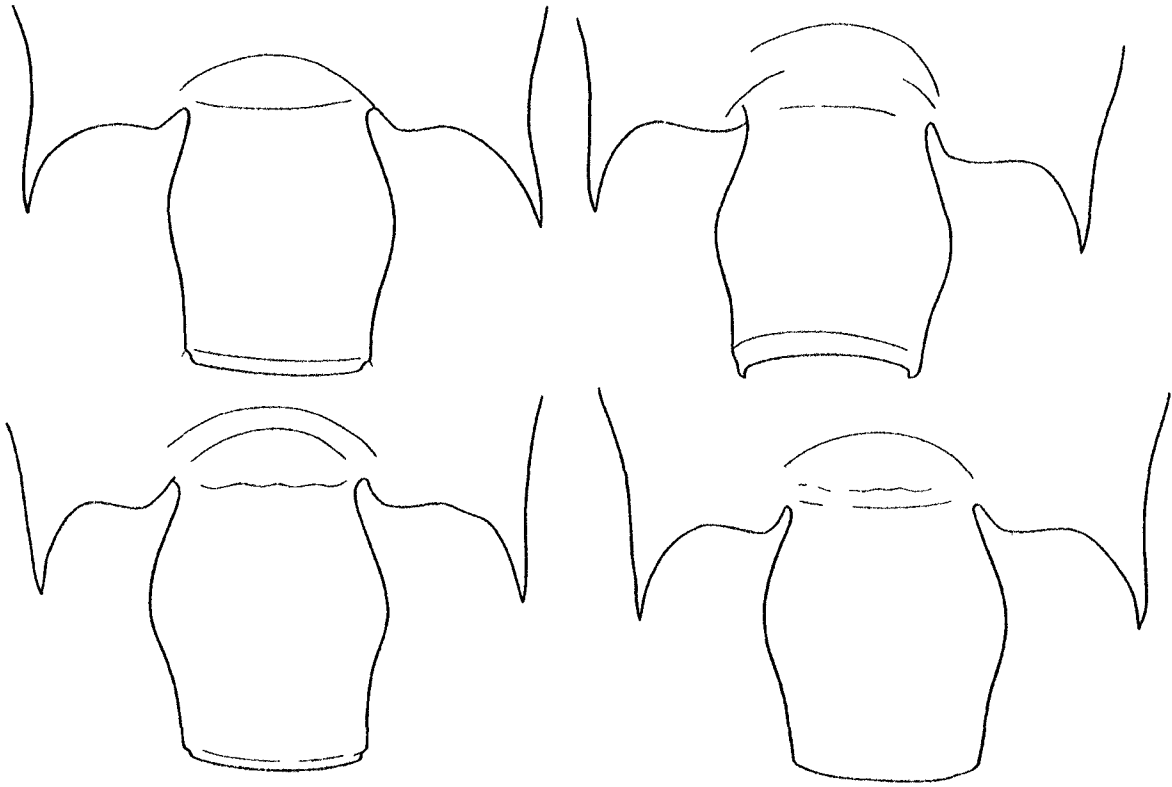


Fig 89 *Chridius obtusifrons* Female types of Th5 & Gn in specimens from the Arctic Basin

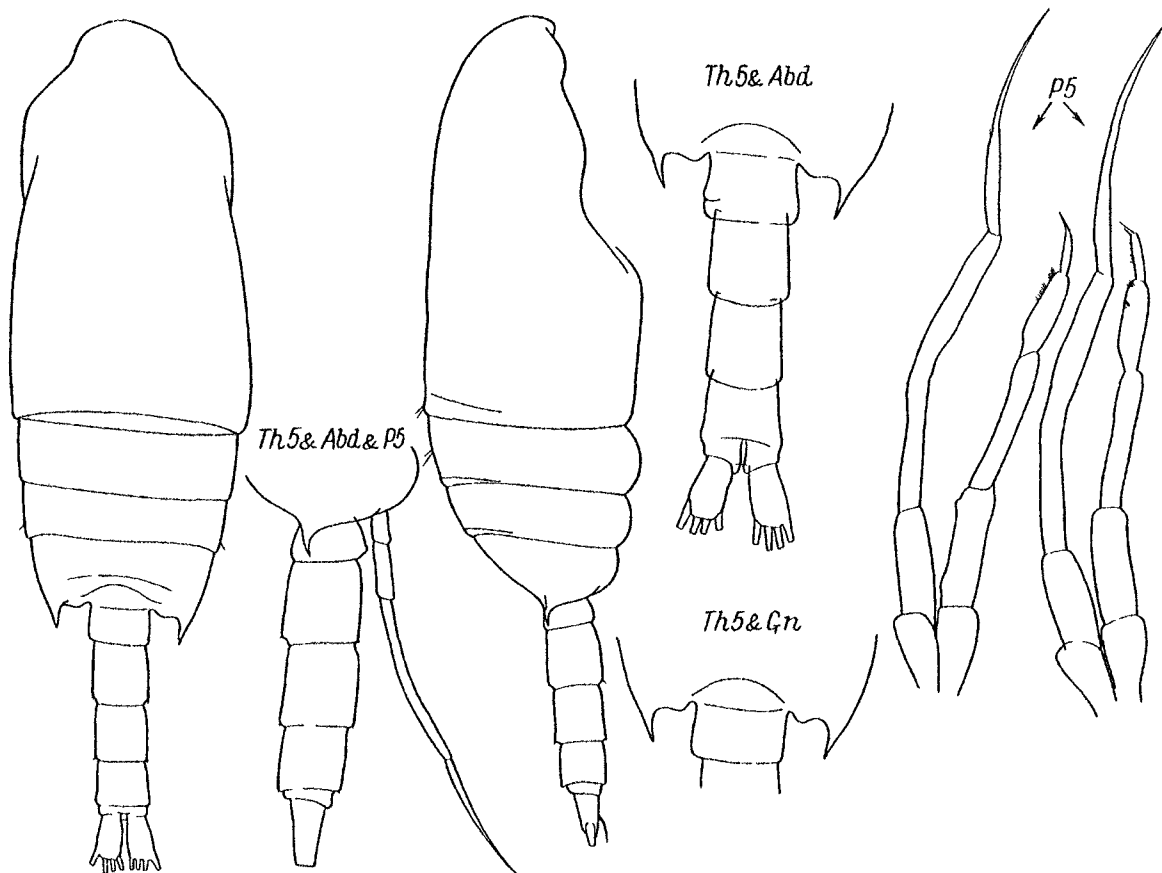


Fig 90 *Chridius obtusifrons* Male (475)

persen, 1934) and in 0-50, 50-200 m in the eastern sector of the central part of Arctic Basin (Markhaseva, 1984).

Material: 72 females and 6 males from samples: 471-472, 475-477, 481-482, 489, 508, 516, 522, 524, 526, 528-529, 533-534, 537, 540-542, 545.

5. *Chiridius pacificus* Brodsky, 1950

(Figs. 91-93)

Chiridius pacificus Brodsky, 1950: 152, fig. 68; Bradford & Jillett, 1980: 23, fig. 13

Chiridius carnosus Tanaka, 1957a: 55, fig. 34 (syn. n.)

Description. F e m a l e. Total length 2.70-3.50 mm. Cephalothorax 2.7-3.5 times longer than abdomen. Points of Th5 posterior corners always reaching the midlength of genital segment or exceeding it. In the majority of specimens Th5 corners not divergent, even slightly converged. Genital segment is widest on a border between first and second third of its length, or in its second third. A1 reaching the midlength of genital segment, or the midlength of Abd2. Ri2 Md with 7 long terminal and 1 small thin posterior seta. Re Mx1 with 10 setae. External spines of Re1-Re3 P1 long, usually exceeding the base of next spine; third external spine of Re P1 1.30-1.47 times longer than second one. P2 usually with 3-jointed Re and 2-jointed Ri, in some specimens division is incomplete. First and second external spines of Re3 P2 relatively long; reaching, or even exceeding the base of next spine, terminal spine with 32-35 denticles. P3 and P4 with 3-jointed rami, terminal spines with 25-34 denticles. First, second and third external spines of Re3 P4 significantly thinner and smaller than in P3.

M a l e. Total length 2.36-2.65 mm. Cephalothorax 3.2-3.5 times longer than abdomen. Points of Th5 posterior corners longer than Abd1. A1 slightly shorter than cephalothorax. Ri2 Md with 8 long terminal, and 1 short thin posterior seta. Mx1 rudimentary, third (?) internal lobe with 3 setae; propodite near Ri base with 3 setae; Ri with 9 setae; Re with 9 setae. P2 with 2-jointed Ri. First and second external spines of Re3 are as long as in females. P3 and P4 with 3-jointed rami. P5 sometimes with rudimentary Ri in both legs.

Notes. Females are similar to *Ch. polaris*. Difficulties in distinguishing between these species arise from their high variability. *Ch. pacificus* differs from *Ch. polaris* in: smaller size; longer points of Th5 posterior corners and high ratio in length of second and third external spines of P1. The assumption of identity between males of *Ch. pacificus* and *Ch. carnosus* (Bradford & Jillett, 1980) has been confirmed. *Ch. pacificus* is also similar to *Ch. mexicanus*, differing in: larger size, longer Th5 points, A1 and external spines of Re1 and Re2 P1 and Re P2.

Type locality: the southern part of the Sea of Okhotsk.

Lectotype: female from sample 246.

Geographical distribution. Pacific Ocean: southern part of the Okhotsk Sea, region of the Kurile-Kamchatka Trench (original data), Sagami region (Tanaka, 1957a), between 41-45°S and 168-175°E off New Zealand (Bradford & Jillett, 1980).

Vertical distribution. Most likely meso- upper-bathypelagic species; found in hauls with known sampling ranges between 500 and 2000 m in the Kurile-Kamchatka Trench region, more often in 500-1000 m (original data). Also found in series of total hauls from 1000 to 1500 m.

Material: 22 females and 1 male from samples: 64, 80, 86, 91-93, 119, 121, 140, 157-158, 171-173, 246.

6. *Chiridius polaris* Wolfenden, 1911

(Figs. 94-97)

Chiridius polaris Wolfenden, 1911: 211, text-fig. 6, pl. 24, figs 9-12; Farran, 1929: 229; Vervoort, 1957: 53, figs 16, 31-34.

Chiridius subantarcticus Park, 1978: 125, fig. 14 (syn. n.)

Chiridius obtusifrons (non Sars, 1902): A. Scott, 1909: 43, pl. 44, figs 1-3.

Description. F e m a l e. Total length 3.30-4.25 mm. Cephalothorax 2.9-3.6 times longer than abdomen. Points of Th5 posterior corners usually reaching the first third of genital segment, sometimes its middle, or even exceeding it. Th5 posterior corners straight (dorsal view), rarely converging, or sometimes slightly divergent. Genital segment widest in the second third of its length, or near the border between first and second thirds. A1 reaching the midlength of genital segment or the midlength of Abd2. Ri2 Md with 7 long terminal and 1 small thin posterior seta. Re Mx1 with 10 setae. External spines of Re1 and Re2 P1 exceeding the base of next spines. Ratio between Re3 P1 external spine and that of Re2 P1 is (1.04-1.26):1. P2 with 3-jointed Re and 2-jointed Ri; segmentation of Ri not always complete. First and second Re3 P2 external spines usually long, reaching or exceeding the base of next spines. P3-P4 rami 3-jointed (sometimes with incomplete separation of first and second joints of Re and Ri. Re3 P3 external spines shorter and thinner than of P2, not reaching the base of following spines, those of P4 thinner.

M a l e. Total length 3.55-3.80 mm. Cephalothorax 2.5-2.9 times longer than abdomen. Points of Th5 posterior corners not longer than genital segment. A1 slightly shorter than cephalothorax. Ri2 Md with 8 long and 1 short seta. Mx1 third internal lobe with 2 setae; propodite near Ri base with 3 setae; Ri with 9 setae; external lobe with 7 long and 2 short setae. Re1 P1 first external spine exceeding the base of next spine. P2 with 2-jointed



Fig. 91. *Chiridus pacificus*. Female: general dorsal and left lateral view (after specimen from type locality), right lateral view and Mx2 (119).

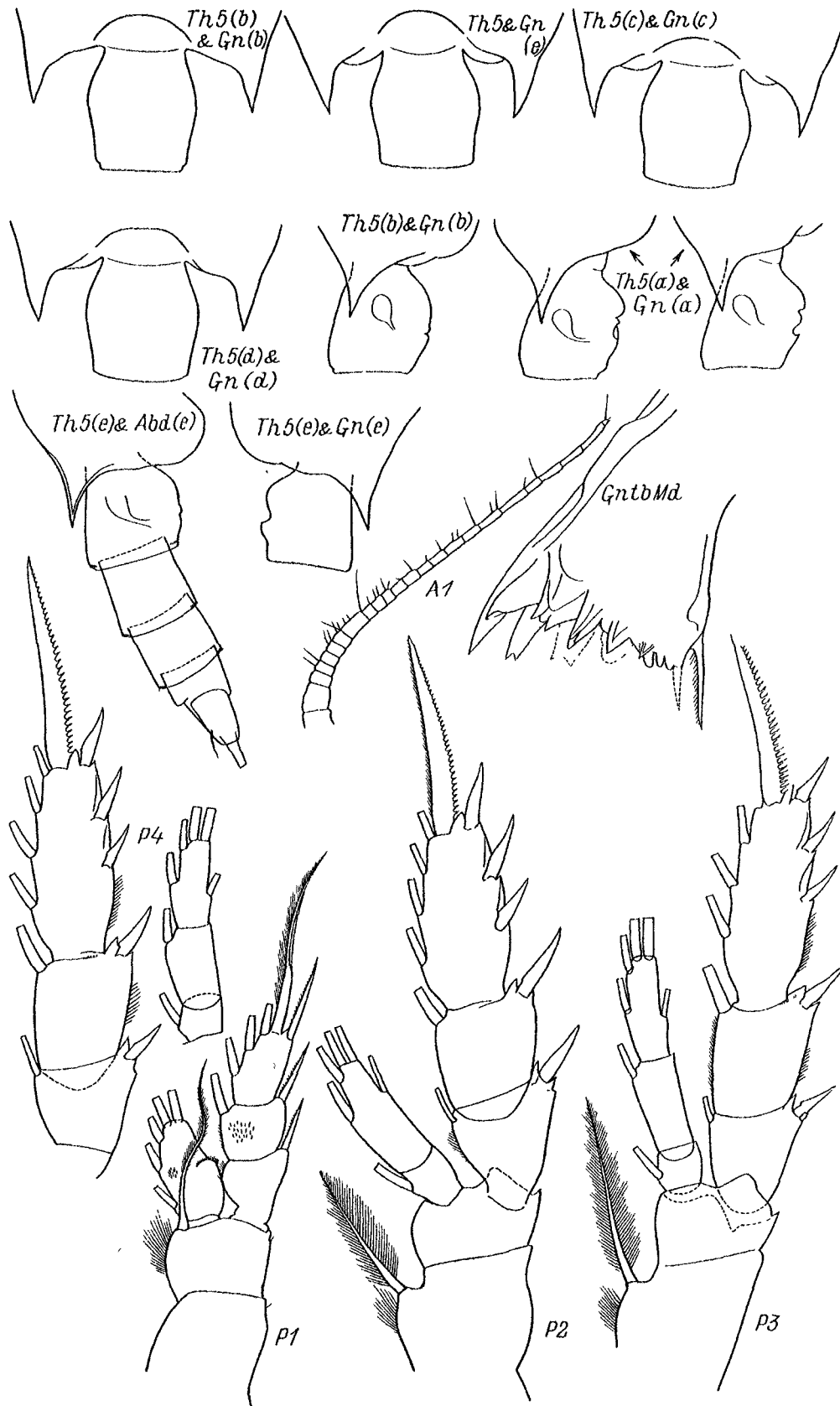


Fig. 92. *Chiridius pacificus*. Female: Th5(a) & Gn(a) (86), Th5(b) & Gn(b) (119), Th5(c) & Gn(c) (157), Th5(d) & Gn(d) (172), Th5(e) & Gn(e) & Th5(e) & Abd(e) and other figures (246).

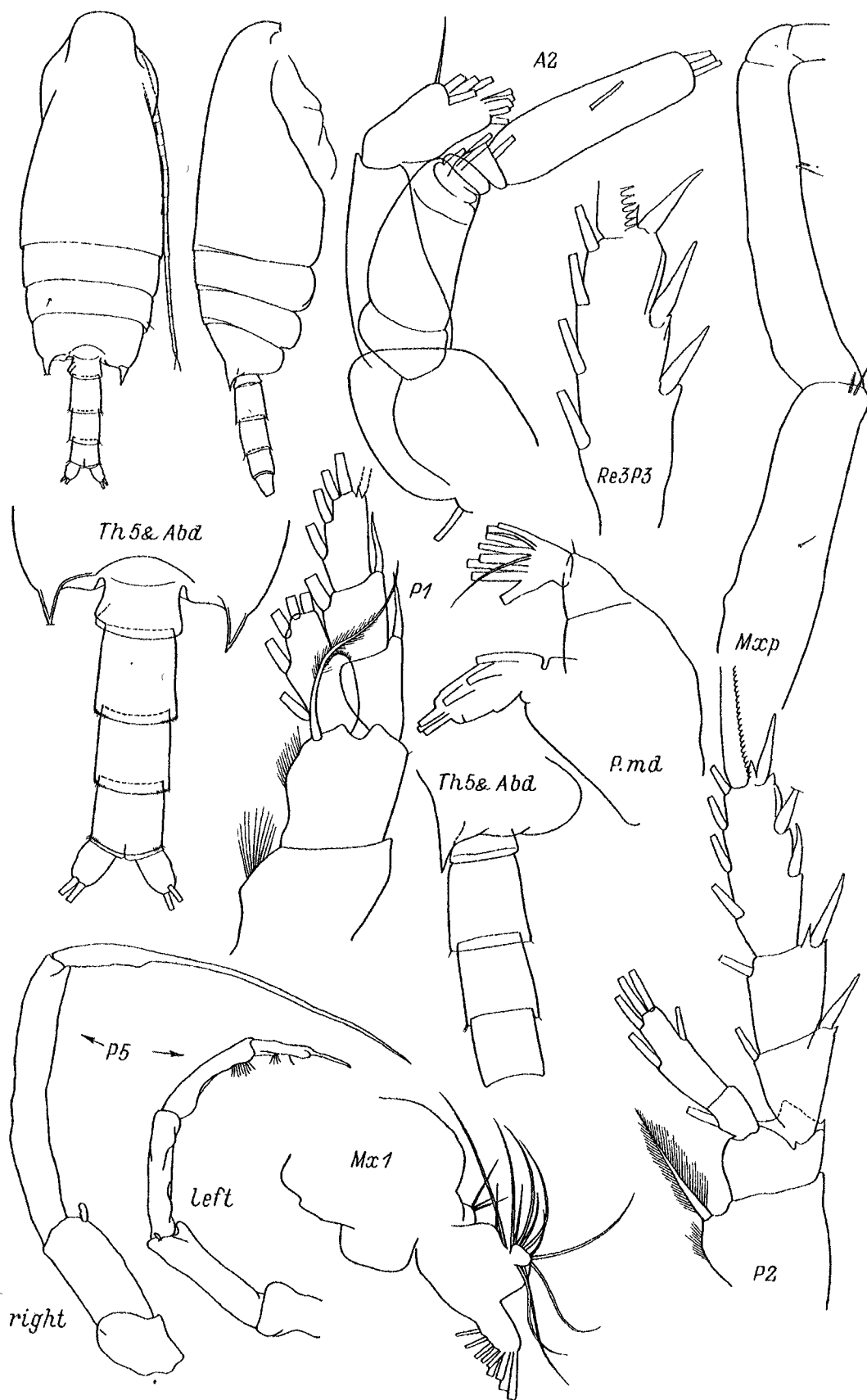


Fig. 93. *Chiridius pacificus*. Male (119).

Ri; Re3 first and second external spines as in females. P3 and P4 with 3-jointed rami.

Notes. Description (Wolfenden, 1911) and redescription of the species (Vervoort, 1957) were from the single female. so far only few *Ch. polaris* males are known. In literature the species is mentioned without descriptions and figures. The examination of *Ch. polaris* demonstrated the significant variability in body size; length and shape of points of Th5 posterior corners; i.e. the features used in distinguishing *Ch. polaris* and *Ch. pacificus* and *Ch. subantarcticus* Park, 1978. The latter species is considered here to be identical to *Ch. polaris*. It was established (Park, 1978) after the study of 2 females on the base of characters (lesser size and than in *Ch. polaris* and differing shape and length of Th5) found by me within range of variability in *Ch. polaris*. One of the characters reasonable for establishing *Ch. subantarcticus* as a new species is setation of Mx1: 4 setae on protopodite near the Ri base (after Vervoort (1957) with 5 setae). The other reason was Mx1 setation with 5 setae on second internal lobe (Park, 1978) in contrast to 4 setae recorded by Vervoort (1957) for *Ch. polaris* in the redescription. It may seem to be an occasional mistake in the text and figures of the redescription (Vervoort, 1957). Such setation, untypical for *Chiridius*, is not found either in the first description (Wolfenden, 1911), or in the original material. Park (1978) also noted the presence of slightly divergent points of Th5 posterior corners, exceeding the midlength of genital segment and longer than in *Ch. polaris*. In records by Wolfenden (1911) and Vervoort (1957) Th5 points cover only the first third of genital segment. It may result from insufficient material for comparison, whereas our examination was based on the analysis of significant number of specimens from various geographical areas. This examination showed remarkable variability of length of Th5 posterior points: there were specimens with Th5 points covering the first third of the genital segment, also (rarely) covering its midlength and sometimes exceeding the midlength. In some specimens Th5 points were divergent, in others not divergent. Slight differences in the number of denticles in Re terminal spines may hardly be considered adequate for distinguishing the species. Therefore *Ch. subantarcticus* Park, 1978 and *Ch. polaris* Wolfenden, 1911 are considered identical in this publication.

Type locality: to the south of 60°S in the indoceanic sector of Antarctic.

Geographical distribution. Bipolar species: circumpolar in Antarctic, found in Subantarctic with the northernmost finding: 49°19'S 120°19'W (Park, 1978), was recorded to the South from 60°S (66-69°S) (Farran, 1929; Vervoort, 1957). Also found in the region of the Kurile-Kamchatka Trench.

Vertical distribution. Probably belowbathypelagic-upperabyssopelagic species. In high latitudes evi-

dently mesopelagic. It was found in the region of the Kurile-Kamchatka Trench between 2000 and 4000 m (original data), in Antarctic in mesopelagial (Vervoort, 1957). In total hauls from mesopelagial (Farran, 1929; original data).

Material. 25 females and 4 males from samples: 18, 65, 67, 81, 85, 102, 140, 163, 175, 218, 277, 283, 286, 290(?), 292, 301-302, 311, 344, 384, 430, 474.

7. *Chiridius poppei* Giesbrecht, 1892

(Fig. 98)

Chiridius poppei Giesbrecht, 1892: 224, Taf.14, figs 14-18, Taf. 36, figs 10-12; A. Scott, 1909: 41, pl. 11, figs 10-17; Sars, 1924-25: 45, pl. 15, figs 16-18; Farran, 1929: 229; Jespersen, 1934: 55; Tanaka, 1937: 254, fig. 5; Lysholm, Nordgaard & Wiborg, 1945: 13; Brodsky, 1950: 152, fig. 67; Vervoort, 1952c (sheet 42): 3, fig. 1; Tanaka, 1957a: 55; Grice, 1962: 192, pl. 8, figs 5-7; Vervoort, 1963: 124; Grice & Hulsemann, 1967: 14; Park, 1975a: 280, figs 5-6; Tanaka & Omori, 1970: 118; Bjornberg, 1973: 323; Park, 1978: 124; Bradford & Jillett, 1980: 24, 26, fig. 14; Chahsavarchard & Razouls, 1982: 28, 39, fig. 7 (i); Vives, 1982: 291; Roe, 1984: 356; Brenning, 1983: 3, 1985: 29.

Description. Female. Total length 1.59-2.20 mm. Cephalothorax 2.7-3.2 times longer than abdomen. Points of Th5 posterior corners reaching, or slightly exceeding the midlength of genital segment. A1 nearly as long as cephalothorax, or reaching the posterior border of genital segment, posterior border of Abd2. Ri2 Md with 9 terminal setae. Re Mx1 with 8 setae. Re1 and Re2 P1 external spines shorter than in other species of genus, not reaching the base of next spine. P2 with 3-jointed Re (in original material the separation between Re1 and Re2 incomplete) and 1-jointed Ri (with traces of separation), reaching the line of division between Re2 and Re3 P2. Re3 P2 external spines short, not reaching the base of next spine; terminal spine with 23-27 denticles. P3 and P4 with 3-jointed rami; terminal spines with 24-26 denticles.

Male. (Description after Tanaka (1957a) and Park (1975a) with modifications). Total length 1.50-1.58 mm. Cephalothorax 2.5-2.7 times longer than abdomen. Th5 points reaching the midlength of Abd1. A1 reaching the posterior border of Abd1, or posterior border of Abd2. Md palp base with 1 seta. Ri2 Md with 9 setae. Mx1 third internal lobe with 1 seta; protopodite near Ri base with 3 setae; Ri with 8 (Tanaka noted 9 setae), 9 setae on Re and 6 (7 mentioned by Tanaka) on external lobe. Ri1 Mxp with 3 setae in its middle part, 2 of them very short and small. External spines of Re1 and Re2 P1 shorter and thinner than in female. P2 with

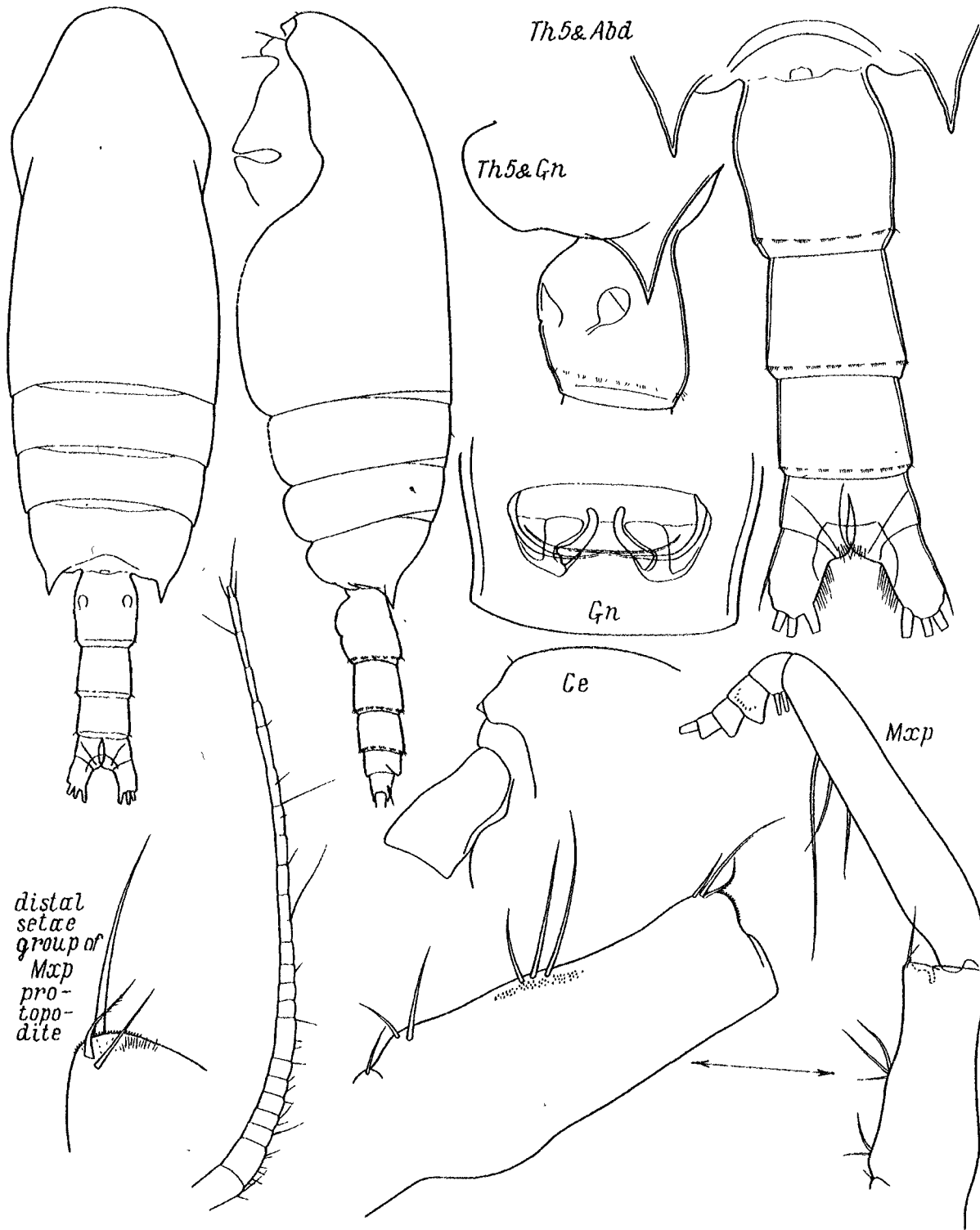


Fig. 94. *Chiridius polaris*. Female: Th5 & Gn, Ce (384), other figures (102, 163).

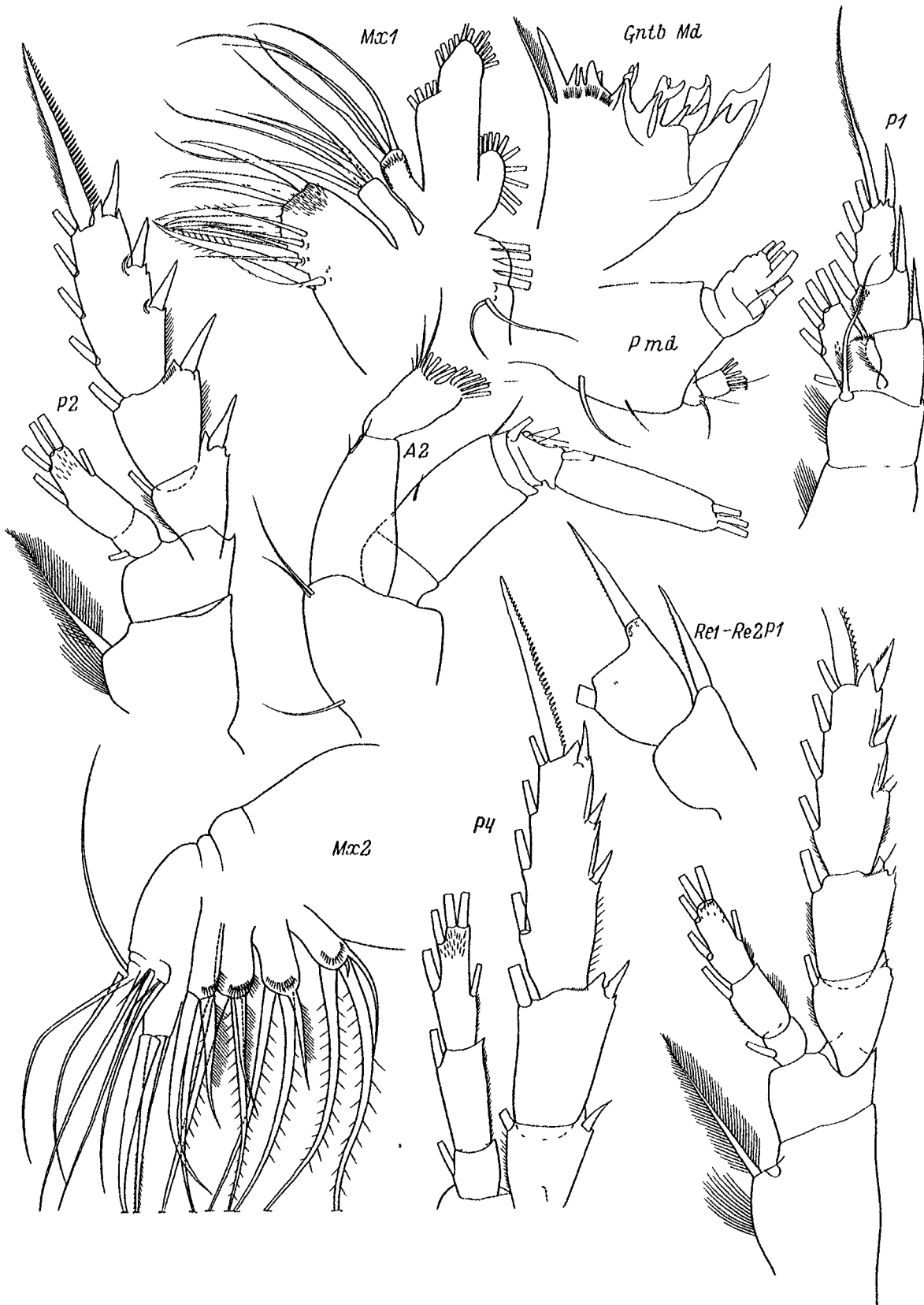


Fig 95. *Chridus polaris* Female: A2, P. md, Gntb Md, P4 (384, 430), Mx1, Mx2, Re1-Re2 P1 (163), P1-P4 (102)



Fig. 96. *Chiridius polaris*. Female: a (65), b (81), c (85), d (102), e (140), f (163), g (294), h (384), i (430).

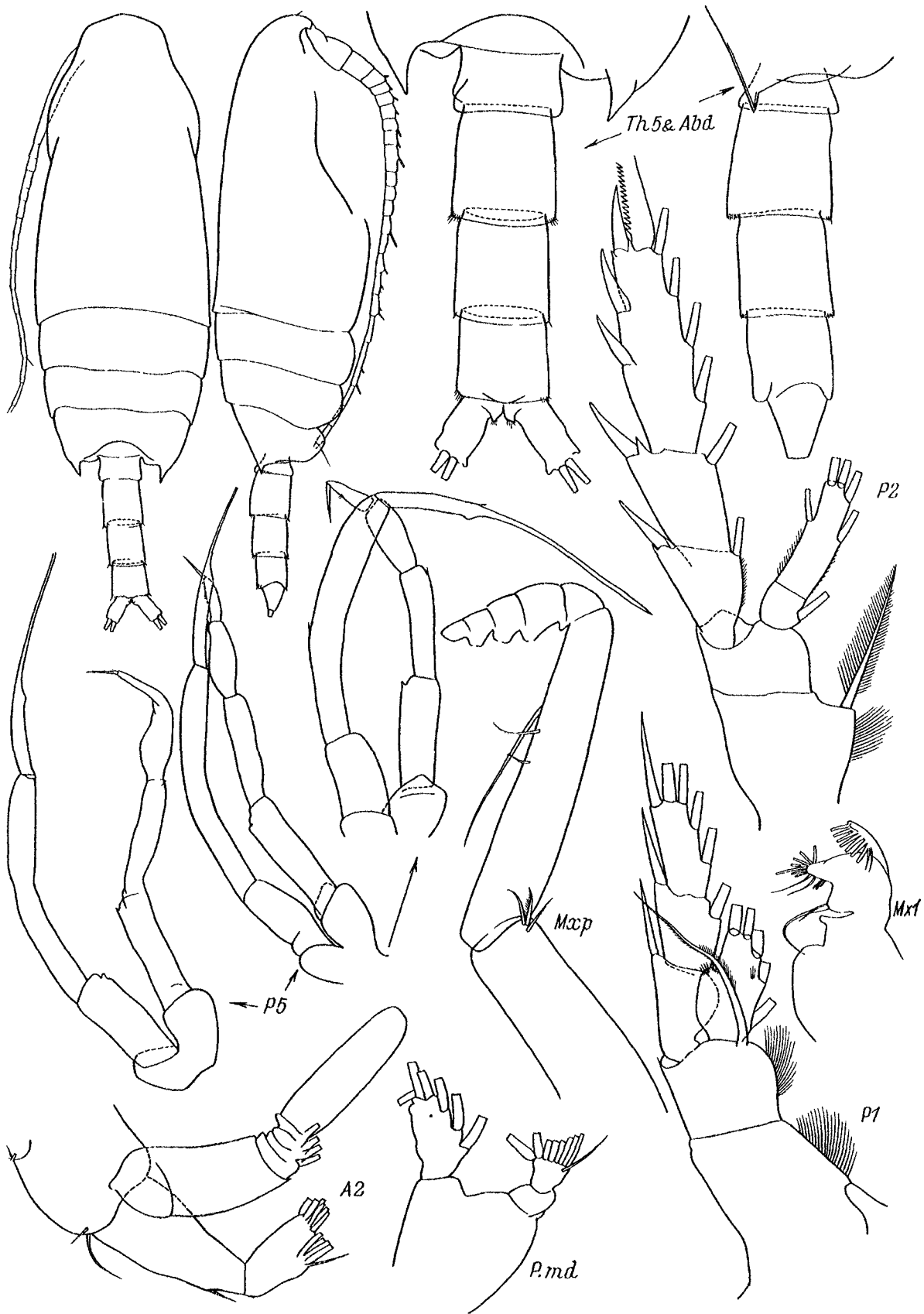


Fig. 97. *Chiridius polaris*. Male (67, 85, 175).

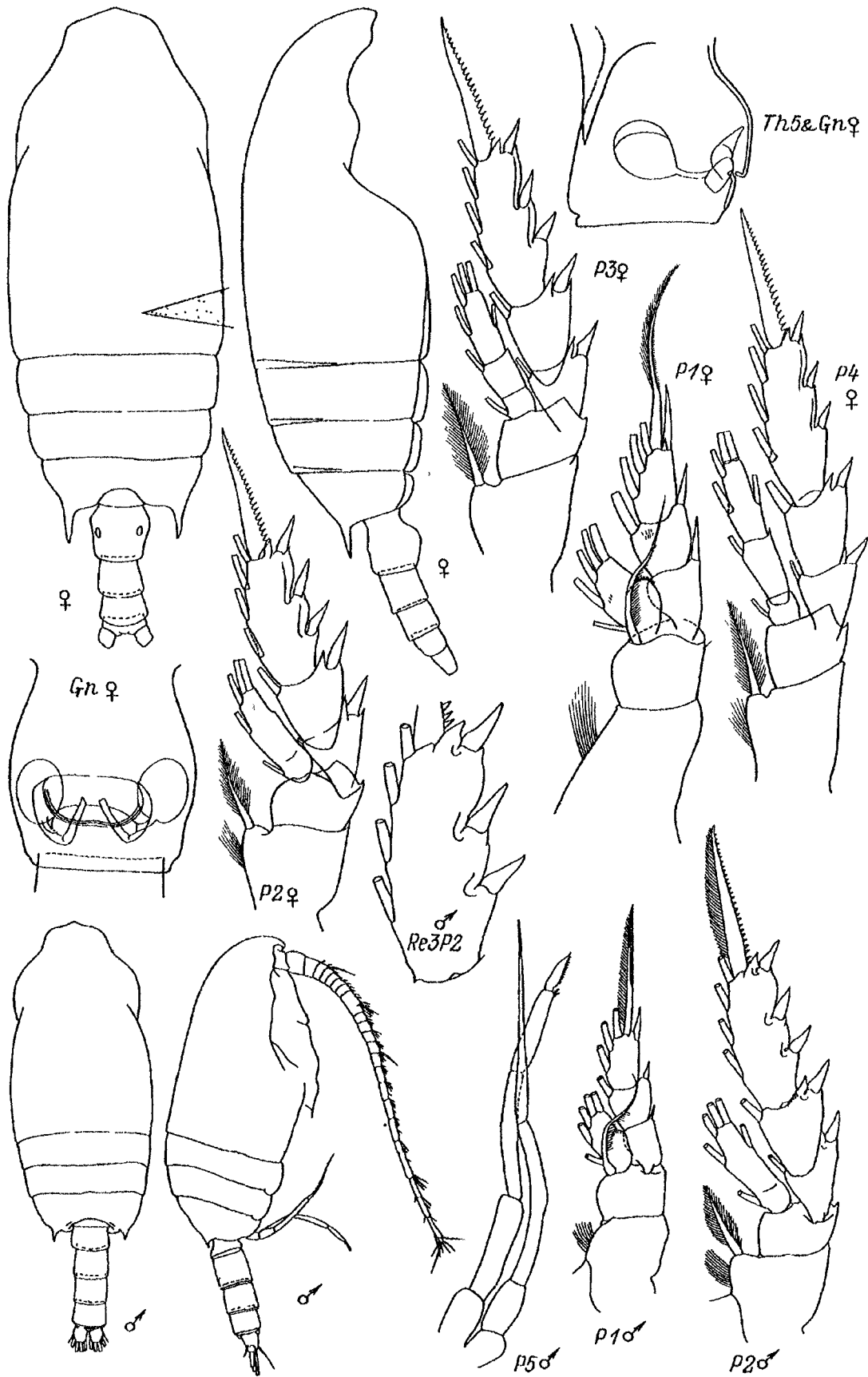


Fig. 98. *Chiridius poppei*. Female: general view (from Bradford & Jillett, 1980), Gn, P1-P4 (573). Male (from Park, 1975), P5 (from Tanaka, 1957).

separation of Ri joints more pronounced than in female; in other features it is as in female; terminal spine with 27 denticles. P3 and P4 with 3-jointed rami, terminal spines with 25 and 20 denticles respectively. P5 of almost the same length.

Type locality: the Mediterranean Sea.

Geographical distribution: the species found in the Atlantic, Pacific and Indian Oceans. The northernmost locality in the Atlantic Ocean is the Strait of Davis (Jespersen, 1934), the southernmost is the Gulf of Guinea (Vervoort, 1963). In the Gulf of Mexico (Park, 1975a), in the region of Florida (Owre, 1962), the Mediterranean and Adriatic seas (Giesbrecht, 1892; Sars, 1925; Hure, 1955). Pacific Ocean: in the region of Marian Trench (original data), the northernmost finding: the Izu region (Tanaka & Omori, 1970a), the southernmost: near the coast of South America (45°01'S 76°33'W) (Bjornberg, 1973), near New Zealand (Bradford & Jillett, 1980; original data), in tropical part. Indian Ocean: (Grice & Hulsemann, 1967, original data). In the Malay Archipelago region (A. Scott, 1909).

Vertical distribution: The species was found in series of hauls from mesopelagial (Lyscholm, Nordgaard & Wiborg, 1945; Tanaka, 1957a; Bradford & Jillett, 1980), also recorded from epipelagial (Vervoort, 1963; Grice, 1962; Chahsavar-Archard, C. & Razouls, 1982; Roe 1984; etc.), and also in total hauls from depths of few km.

Material: 16 females from samples: N 202, 360, 367, 386, 399, 575.

9. *Chirundina* Giesbrecht, 1895

TYPE SPECIES: *Chirundina streetsii* Giesbrecht, 1895, by monotypy.

Chirundina Giesbrecht, 1895: 249

Wilsonidius Tanaka, 1969: 266 (syn. n.) (type species: *Wilsonidius alaskaensis* Tanaka, 1969, by monotypy); Bradford & Jillett, 1980: 92

Description. Female. Total length slightly less than 4.00 and to 5.50 mm. Cephalothorax 3-4 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused (line of fusion is often visible). Rostrum present, well developed, 1-pointed. Crest present or absent. Posterior Th5 corners symmetrical, rounded, or slightly prolonged; often with small knob or tooth at the top. Genital segment symmetrical, widest in its posterior half. Caudal rami nearly as long as wide. Posterior borders of Abd2-3 with rows of minute spinules. A1 24-jointed, longer than cephalothorax, often reaching the end of caudal rami. Re A2 1.5-2.0 times longer than Ri; Re1 A2 with 1; Re2 A2 with 3 setae; Re3-Re6 with 1 long seta each; Re7 with 1 medial and 3 terminal setae. Ri1 A2 with 2 setae distally; Ri2 A2 with 8 setae on the internal and 6-7 setae on external lobes. A2 coxopodite with 1; basipodite with 2 setae. Md palp

base with 3 setae; Ri1 Md with 2, Ri2 Md with 10 (9 terminal and 1 posterior) setae. Mx1 with 14 setae on gnathobase (9 claw-like terminal setae; 1 thin anterior seta and 4 setae on the posterior surface). Second and third internal Mx1 lobes with 5 and 4 setae respectively; protopodite near Ri base with 5 setae; Ri with 15 setae; Re with 11 setae and external lobe with 9 setae. Mx2 fourth and fifth endites with 1 setae transformed in thickened spine. Mxp protopodite with 1 seta proximally, with 2, 3 and 3 setae (from proximal to distal end of the joint), distal setae group with small knob near setae bases. Ri1 Mxp about twice longer than protopodite and with "lamella" along external surface of joint. P1 with complete or incomplete separation between Re1 and Re2. Re1 P1 with external spine, or spine absent. P2 with 1-jointed, or indistinct 2-jointed Ri. All other rami of swimming legs 3-jointed.

Male. Total length 3.75-5.20 mm. Cephalothorax about 3-4 times longer than abdomen. Cephalon usually with crest, lower than in females. Posterior Th5 corners rounded. A1 right 20-, left 21-jointed. Re1 A2 without setae; Re2 A2 with 1 seta. Md palp base without setae; Ri1 Md with 1 seta; Ri2 Md with 9 setae. Mx1 and Mx2 rudimentary. Mxp close to that in *Undeuchaeta*. Segmentation and setation of P1-P4 as in females, only the Re1 P1 spine may be shorter. P5 biramous, with 1-jointed Ri. Left Re P5 3-jointed, right Re 2-jointed. P5 very close to that in *Undeuchaeta*.

The genus *Chirundina* includes 3 species.

Notes. Tanaka (1969) described monotypic genus *Wilsonidius* and noted that *W. alaskaensis* is close to *Undeuchaeta*. It is considered here that *W. alaskaensis* should be removed to *Chirundina*. The only distinction between *Wilsonidius* and *Chirundina* is the absence of crest on cephalon. This character in Aetideidae may vary within one genus, crest may be present or absent in *Euchirella*, *Aetideus*, *Aetideopsis*, etc.

Key to species of *Chirundina*

Females

- 1(2) Crest on cephalon absent 1. *Ch. alaskaensis* (Tanaka)
 2(1) Crest on cephalon present.
 3(4) Re1 P1 with external spine 3. *Ch. streetsii* Giesbrecht
 4(3) Re1 P1 without external spine 2. *Ch. indica* Sewell

Males

(unknown for *Ch. alaskaensis*)

- 1 (2) Re1 P1 with external spine 3. *Ch. streetsii* Giesbrecht

- 2 (1) Re1 P1 without external spine
 2. *Ch. indica* Sewell

1. *Chirundina alaskaensis*

(Tanaka, 1969), comb. n.

(Fig. 99)

Wilsonidius alaskaensis Tanaka, 1969: 268, figs 8-9; Bradford & Jillett, 1980: 92.

Description. Female. (Description after Tanaka (1969) with modifications). Total length 3.70 mm. Cephalothorax slightly less than 3 times longer than abdomen. Segmentation, shape of the body and A1 typical of the genus. A1 reaching the end of Abd3. Re P1 3-jointed. Re1 P1 without external spine. Ri P2 1-jointed. Other rami of swimming legs 3-jointed. P4 coxopodite without internal seta.

Male unknown.

Type locality: 55°35'N 132°33'W.

Geographical distribution. Pacific Ocean: the region of the south coast of Alaska (Tanaka, 1969).

Vertical distribution. The species was found in haul between 530 and 622 m (Tanaka, 1969).

The species is not examined by me.

2. *Chirundina indica* Sewell, 1929

(Fig. 100)

Chirundina indica Sewell, 1929: 119, fig. 45, 1947: 92, fig. 20; Grice, 1962: 196, pl. 11, figs 5-20; Tanaka, 1969: 262, fig. 5.

Description. Female. (Description after Sewell (1929, 1947) and Tanaka (1969) with modifications). Total length 4.05-5.00 mm. Cephalothorax nearly 3.8 times longer than abdomen. Anterior part of cephalon with low crest, much lower than in *Ch. streetsii*. Posterior corners of Th5 smooth; without knob. A1 reaching Abd3. Oral parts typical of the genus. Re P1 indistinctly 3-jointed, with traces of separation between Re1 and Re2; Re1 without external spine; Ri 1-jointed. P2 with 3-jointed Re; Ri with traces of subdivision into 2 joints. P3-P4 with 3-jointed rami.

Male. Total length 3.75-4.10 mm. Cephalon with well outlined crest, lower than in *Ch. streetsii*. A1 right 20-, left 21-jointed, reaching the end of the body. Re A2 1.25-1.50 times longer than Ri A2; Ri2 A2 with 8 setae on each lobe (after Tanaka (1969) with 6 setae on external and 7 setae on internal lobes). Mx1 without setae on first and second internal lobes, third internal lobe with 1 seta; propodite near Ri base with 5 setae (with 3 after Tanaka (1969)); Ri with 5 setae (with 8 setae after Tanaka (1969)); Re with 10 setae (11 setae after

Tanaka (1969)); external lobe with 5 setae. Comparing to female setation of other oral parts reduced. Re1 and Re2 P1 separated; Re1 without spine. P2-P4 as in female. P5 very close to that in *Ch. streetsii*.

Type locality: 5°56'N 76°22'E.

Geographical distribution. Pacific Ocean: equatorial part, (Grice, 1962), the region of Philippines (Tanaka, 1969). Indian Ocean: the Arabian Sea, the Gulf of Aden (Sewell, 1929, 1947).

Vertical distribution. The species was found in total hauls from 146-549 m (Sewell, 1929, 1947; Grice, 1962; Tanaka, 1969).

The species is not examined by me.

3. *Chirundina streetsii* Giesbrecht, 1895

(Figs. 101-102)

Chirundina streetsii Giesbrecht, 1895: 246, 249, pl. 1, figs 5-10; A. Scott, 1909: 43, pl. 12, figs 1-11; With, 1915: 141, pl. 5, fig. 4 (a-f), pl. 8, fig. 5 (a-b), text-fig. 38 (a-k); Sars, 1924-25: 77, pl. 22, figs 8-13; Tanaka, 1957b: 190, fig. 53 (a-i), 1969: 262; Vervoort, 1963: 152; Tanaka & Omori, 1970b: 143; Park, 1978: 179, figs 52-53; Bradford & Jillett, 1980: 27, fig. 15 (A-E); Roe, 1984: 357; Von Vaupel Klein, 1984: 51, figs 3 (f), 6 (a), 7 (a, m), 11 (f), 13 (f), 16 (a-b), 17 (c), 18 (b), 25(b); Brenning, 1985: 29.

Description. Female. Total length 4.15-5.55 mm. Cephalothorax about 3-4 times longer than abdomen. High crest present. Posterior Th5 corners slightly prolonged, often ending in small knob or teeth, their shape may vary (With, 1915, text-fig. 38 (b, c, d, e, j)) especially in lateral view. A1 24-jointed, longer than cephalothorax, often reaching the distal end of caudal rami. Re A2 1.5 times longer than Ri A2. P1 with indistinct separation between Re1 and Re2; each joint with external spine, Ri 1-jointed. P2 with 1-jointed Ri with faint traces of separation, and 3-jointed Re. P3-P4 rami 3-jointed.

Male. (Description after Tanaka (1957b); Tanaka & Omori (1970b) and With (1915) with changes). Total length 3.80-5.20 mm. Cephalothorax 2.7-3.8 times longer than abdomen. Cephalon with crest, lower than in female. Posterior Th5 corners rounded. Abd2-4 with row of spinules along posterior border. A1 reaching the midlength of Abd, left 21-, right 20-jointed. Mx1, Mx2 and Mxp rudimentary. P1-P4 with same segmentation as in female. Re1 P1 external spine shorter than in female. P5 similar to that in *Undeuchaeta plumosa*. Both Ri P5 1-jointed. Right Ri slightly shorter than right Re1. Left Ri slightly longer than right Re1. Re1 P5 right with 2 big and 1 small teeth proximally on the external edge. Right Re2 P5 with groove and terminal spine, the latter is equalling two third of joint in length. Re of left leg 3-jointed, Re2 comparatively

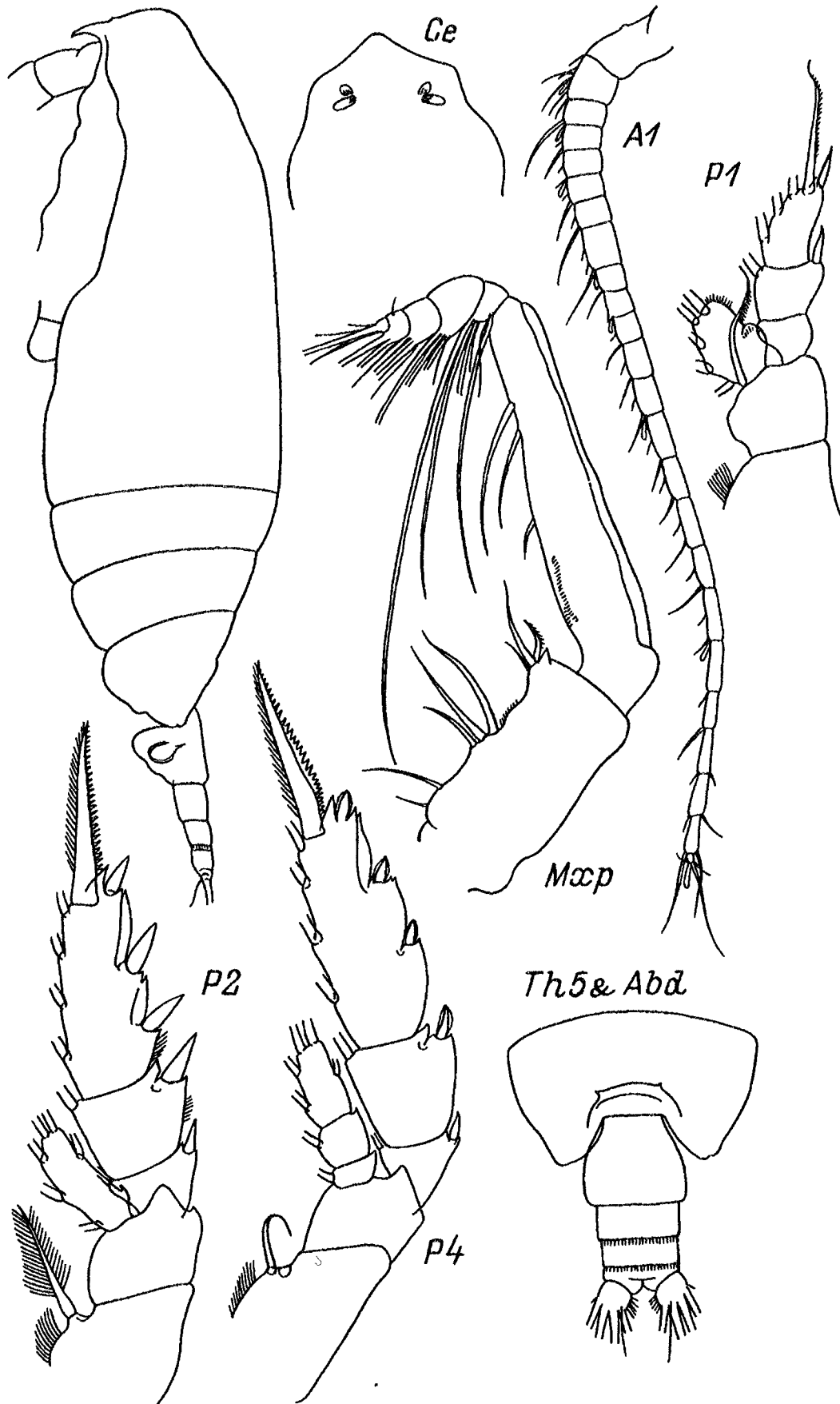


Fig. 99. *Chirundina alaskaensis*. Female (from Tanaka, 1969).

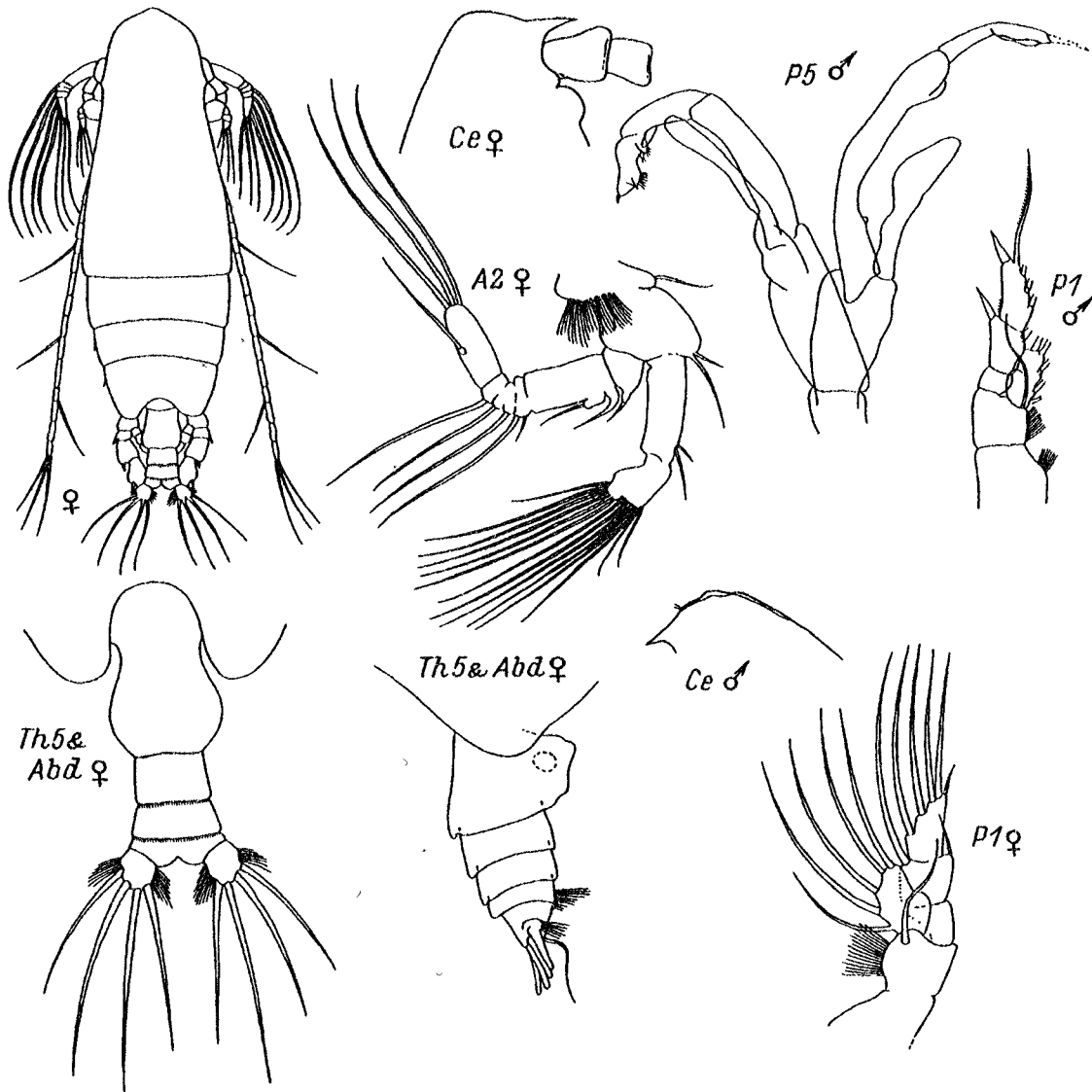


Fig. 100. *Chirundina indica*. Female (from Sewell, 1929). Male (from Tanaka, 1969).

short with short spine and with obtuse tooth and rounded projection.

Type locality: 35°N 125°E.

Geographical distribution. Atlantic Ocean: widespread in the North Atlantic, the northernmost finding: 63,5° N (With, 1915), the Gulf of Guinea (Verwoort, 1963), to the South of the Equator found up to 35°S (Wolfenden, 1911). Pacific Ocean: the northernmost finding 35° N (Tanaka & Omori, 1970b; Giesbrecht, 1895), in equatorial zone (Grice, 1962), in the western part found from the Japanese waters to New Zealand (Bradford & Jillett, 1980), in eastern part from 35°N to 32-33°S (Bjornberg, 1973; original data), in the antarctic sector in the region of 54°S

(Park, 1978). Indian Ocean: from the Arabian Sea (Sewell, 1947) up to 31°S in the western and up to 43°S in the eastern (original data) part of the Ocean.

Vertical distribution. The species was found in the hauls from epi- and mesopelagial (Grice, 1962; Park, 1970; Tanaka & Omori, 1970b; Roe, 1984), single findings are known from bathypelagial (Grice & Hulsemann, 1967). Also in total hauls from 8000 m. Roe noted that species may commit vertical migrations and serve as a food for few decapod species (Roe, 1984).

Material: 41 female from samples: 49, 201-202, 390-392, 395, 400-401, 444.

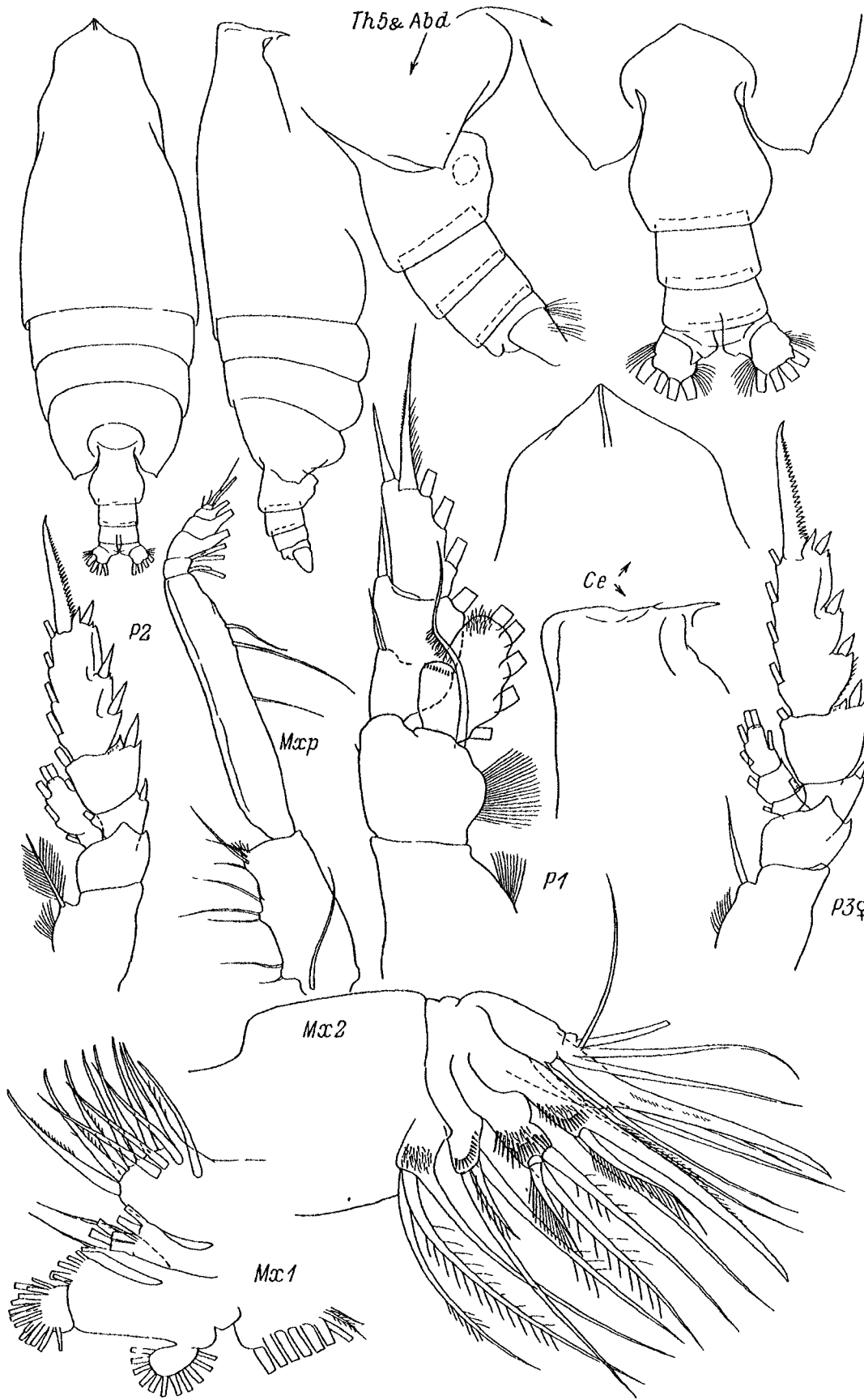


Fig. 101. *Chirundina streetsi* Female (574)

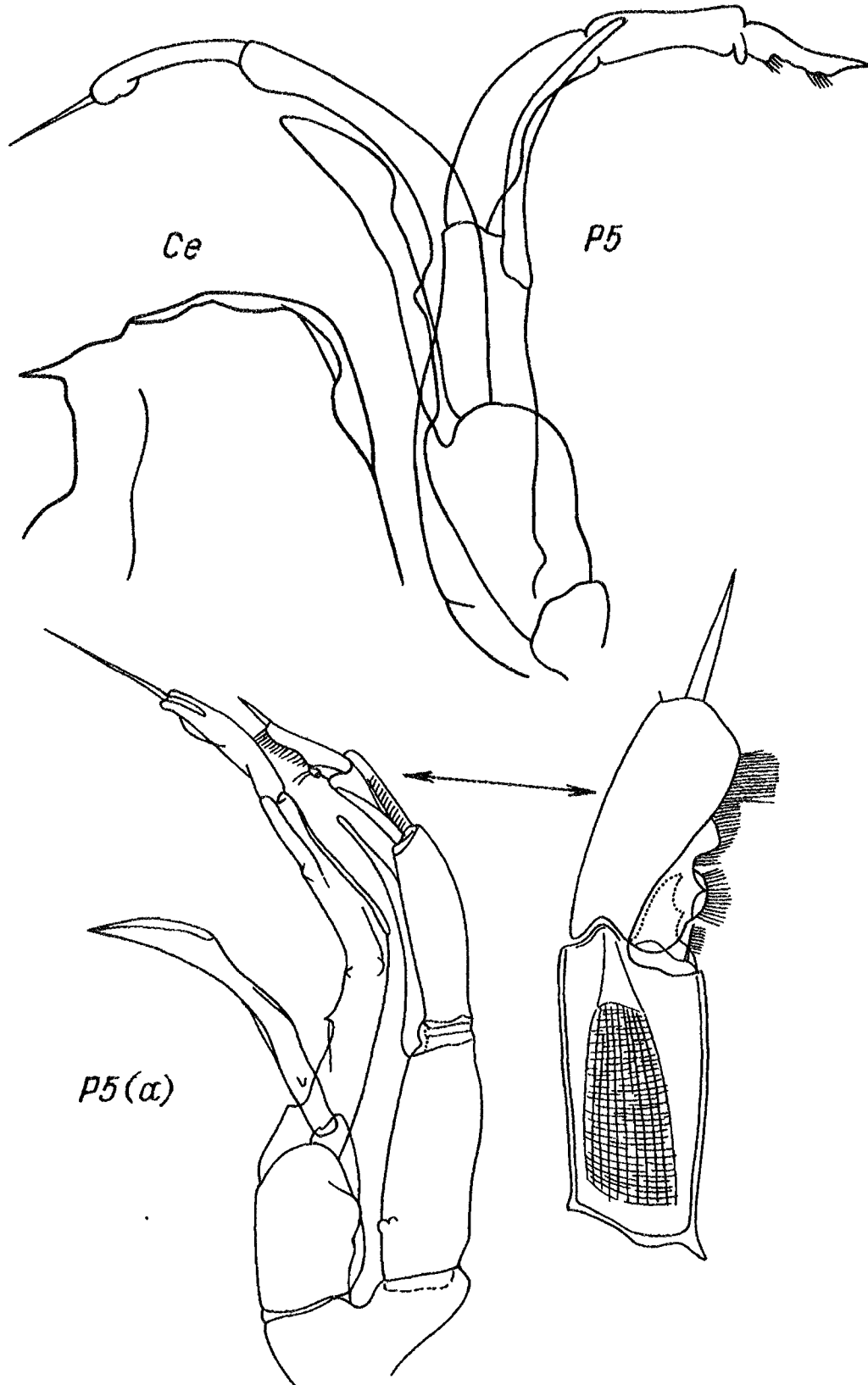


Fig. 102 *Chirundina streetsi*. Male: P5, Ce (from Tanaka, 1957b), P5(a) (from With, 1915).

10. *Chirundinella* Tanaka, 1957

TYPE SPECIES: *Chirundinella cara* Tanaka, 1957, by monotypy.

Chirundinella Tanaka, 1957b: 197; Bradford & Jillett, 1980: 27; Von Vaupel Klein, 1984: 51.

Description. Female. Total length 7.44-8.10 mm. Cephalothorax about 4.2 times longer than abdomen. Cephalon and Th1 separated, Th4-Th5 fused. Crest present. Rostrum present, 1-pointed. Posterior Th5 corners rounded. One of setae of caudal rami very long, 3 times longer than others. A1 24-jointed. Re A2 longer than Ri. Ri Md slightly longer than half Re Md length. Mx1 with 4 setae on protopodite near Ri base; Re with 10 setae and 3 setae on the posterior surface of gnathobase. Mx2 and Mxp similar to that of *Pseudochirella*. P1 with 1-jointed Ri and 3-jointed Re. Re1 with spine (figured by Tanaka (1957b), but not mentioned in the description (Tanaka, 1969)). P2 with 2-jointed Ri and 3-jointed Re. Segmentation of P3-P4 typical of Aetideidae.

Male. Total length 6.7 mm. Cephalothorax 2.67 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Very low crest and robust rostrum present. Posterior Th5 corners rounded. Abd2-4 with minute spinules along posterior border. Oral parts and P1-P4 similar to those in females. P5 similar to that in *Pseudochirella*, but left Re3 P5 bilobated.

Monotypic genus.

1. *Chirundinella magna* (Wolfenden, 1911)

(Figs. 103-104)

Chirundinella magna Tanaka, 1969: 265, fig. 6 (a-f); Bradford & Jillett, 1980: 27; Von Vaupel Klein, 1984: 51.

Chirundina magna Wolfenden, 1911: 241, pl. 28, figs 10-13, text-fig. 27 (a-b); Park, 1978: 176.

Pseudochirella magna: Sewell, 1929: 129, fig. 49, 1947: 12, 96, text-fig. 21 (a-c); Vervoort, 1949: 48, figs 22-23, 1963: 151.

Chirundinella cara Tanaka, 1957b: 197, fig. 57 a-j; Grice & Hulsemann, 1967: 14.

Chirundinella cara Tanaka, 1953: 131 (nomen nudum).

Description. Female. (Description after Tanaka (1969) and Vervoort (1949) with modifications). Total length 7.44-8.10 mm. Shape and body segmentation, as well as cephalon structure, typical of the genus. Caudal rami are about as long as wide. A1 exceeding the caudal rami by 3 last joints. Ri2 A2 with 7 setae on the internal and 7 setae on the external lobes; coxopodite with 1 seta; basipodite and Ri1 A2 with 2 setae each; Re1 A2 without seta; Re2 A2 with 1 seta. Md palp base with 2 setae. Mx1 gnathobase with 9 claw-like terminal

setae, 1 thinner short and 3 setae on the posterior surface. Second and third Mx1 internal lobes with 4 and 5? setae respectively; protopodite near Ri base with 4 setae; Re with 10 setae; external lobe with 9 setae. Re1 P1 with external spine. Coxopodite P4 with row of thin setae along internal edge.

Male. (Description after the same authors). Total length 6.70 mm. Cephalothorax 2.67 times longer than abdomen. Shape and segmentation of the body typical of the genus. Caudal rami as long as wide. A1 reaching the midlength of Th4-Th5, 24-jointed. A2 similar to that in females. Oral parts and swimming legs similar to those in female. P5 biramous. Both Ri 1-jointed. Left Re 3-jointed, Re3 bilobated. Right Re 2-jointed.

Type locality: Sagami Bay.

Geographical distribution. Atlantic Ocean: tropical part (Vervoort, 1949). Pacific Ocean: the south-eastern and north-western parts (Tanaka, 1957b, 1969). Indian Ocean: tropical part, the Arabian Sea (Sewell, 1929; Grice & Hulsemann, 1967). Malay Archipelago (Vervoort, 1949).

Vertical distribution. In the Arabian Sea in haul 275-817 m (Grice & Hulsemann, 1967), in other regions in total hauls from depths 1000-3000m.

The species is not examined by me.

11. *Comantenna* Wilson, 1924

TYPE SPECIES: *Bryaxis brevicornis* Sars, 1902, by monotypy.

Bryaxis Sars, 1902: 35 (nom. praecoc., non Kugelann, 1794, Coleoptera, Pselaphidae) (type species: *Bryaxis brevicornis* Sars, 1902, by monotypy)

Comantenna Wilson, 1924: 1 (nom.n. pro *Bryaxis* Sars); Matthews, 1964: 27; Campaner, 1978: 872; Alvarez, 1986: 858.

Bryaxona Strand, 1929: 10 (nom n. pro *Bryaxis* Sars)

Description. Female. Total length 1.70-4.00 mm. Cephalothorax about 3-4 times longer than abdomen. Cephalon and Th1 fused, as well as Th4-Th5; the latter may be separated. Rostrum absent. Th5 posterior corners extending into points, directed backwards (lateral view). Genital segment symmetrical. A1 23-24-jointed, usually shorter than body. A2 coxopodite with 1 and basipodite with 2 setae. Ri1 A2 with 1 seta; Ri2 with 14-15: (8-9 setae on internal lobe (of which 4-5 longer ones) and 6 setae (sometimes with 1 more posterior seta) on external lobe. Re A2 shorter than Ri. Re2-Re3 A2 sometimes fused. Re1 A2 without setae. Re2 A2 with 1 seta or without seta. Terminal joint of Re A2 very short; at least 1 of 3 terminal setae short. Ri Md short, not longer than Re1 Md; Ri2 with 4-5 setae and Ri1 Md with 1. Md palp base with 2 setae (or they are absent). Re Mx1 with 11 setae. Mx2 typical of Aetideidae. Fifth Mx2 endite with 1 setae transformed into thick, claw-like spine. First-fourth Mx2 endites with groups

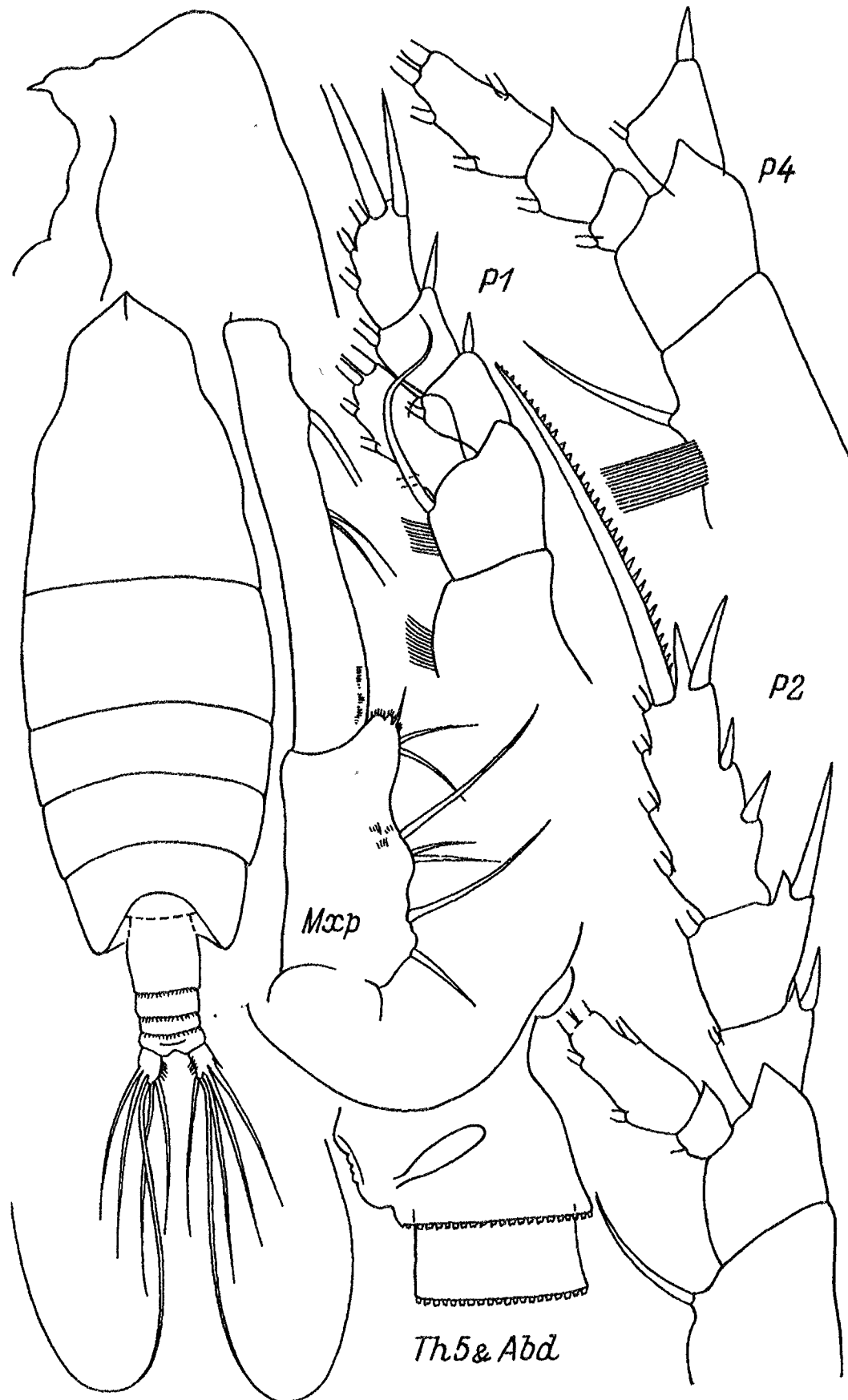


Fig. 103. *Chirundinella magna*. Female (from Tanaka, 1957b).

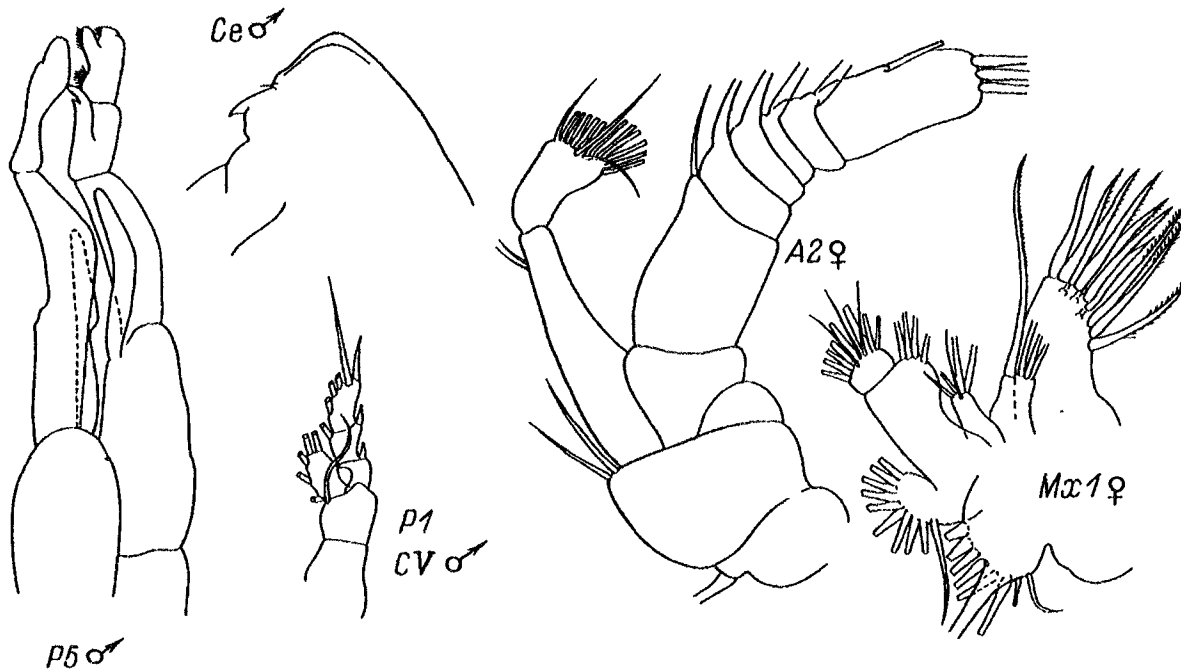


Fig. 104. *Chirundinella magna*. Female: A2, Mx1 and male: Ce, P1 (from Tanaka, 1969), P5 (from Vervoort, 1949).

of minute spines, some of them may be enlarged. Mxp robust, protopodite in its proximal part sometimes with 1 small, thin seta, then (from proximal to distal end of the joint) with groups of 2, 3 and 2-3 setae, near the base of distal setae group with digital appendage. Ri1 Mxp with 2-3 medial setae. Setae of Ri2-Ri6 Mxp comparatively short and not highly sclerotized. Ri P1 1-jointed, its external lobe often reduced. Ri P2 2-jointed. All other rami of swimming legs 3-jointed. Re1-Re3 P1 external spines long, significantly longer than joints themselves; seta on basipodite near Ri base present (*C. brevicornis*), or absent. P5 usually absent, but some specimens of *C. recurvata* has vestigial P5 (Grice & Hulsemann, 1970).

M a l e. Total length 1.20 mm. Th5 posterior points are straight. A1 23-jointed. A2 as in female. Comparing to female oral parts rudimentary. Mxp protopodite without digital appendage. P5 biramous: left Ri 2-jointed, right Ri 1-jointed. Re P5 left Re 3-jointed: terminal joint short. Right Re 2-jointed with terminal joint prolonged in its distal half, ending in curved thread-like filament, supplied with thin hairs.

Male is known for *C. brevicornis* only, for *C. crassa*, *C. curtisetosa*, and *C. recurvata* unknown.

The genus *Comantenna* includes 4 species.

Description of *C. curtisetosa* is given below, but the species is not included into the key for identification because P1-P4 are damaged and therefore non described. The species status evidently needs specification.

Key to species of *Comantenna*

Females

- 1(2) Ri P1 external lobe well developed. P1 basipodite with seta near Ri base. Specimens less than 3 mm in length 1. *C. brevicornis* (Sars)
- 2(1) Ri P1 external lobe slightly developed, or absent. P1 basipodite without seta near Ri base. Specimens over 3 mm in length.
- 3(4) Right Th5 posterior corner slightly shorter than left (dorsal view). Mxp protopodite with 2 setae in distal group. Ri1 Mxp with 2 medial setae. Ri2 Md with 5 setae 4. *C. recurvata* Grice & Hulsemann
- 4(3) Right Th5 posterior corner as long as left (dorsal view). Mxp protopodite with 3 setae in distal group. Ri1 Mxp with 3 medial setae. Ri2 Md with 4 setae 2. *C. crassa* Bradford

1. *Comantenna brevicornis* (Sars, 1902)

(Fig. 105-106)

Bryaxis brevicornis Sars, 1902: 35, pl. 22-23; Farran, 1905: 32, pl 4, fig. 6; Rose, 1933: 102, fig. 74; Vervoort, 1952b (sheet 43): 3, fig 5.

Comantenna brevicornis: Matthews, 1964: 26, fig. 8.

Description. **F e m a l e.** Total length 1.70-2.60 mm. Cephalothorax about 3 times longer than ab-

domen. Points of Th5 posterior corners sharpened, upturned and directed backward (lateral view). A1 24-jointed, significantly shorter than cephalothorax. Re2 and Re3 A2 fused. Md, Mx2 typical of the genus. Mx1 gnathobase with 9 setae. Second and third Mx1 internal lobes with 2 and 3 setae respectively; protopodite near Ri base with 4 setae; Ri with 9 setae; Re with 11 setae and external lobe with 6 setae. Mxp protopodite typical of the genus. Ri1 Mxp with 3 medial setae. Ri P1 external lobe better developed than in other species of the genus. P1 with setae near Ri base.

M a l e. Total length 1.2 mm. Body robust, smoothly rounded in anterior part and widest at the level of Th2. Th4 and Th5 fused. Points of Th5 posterior corners reduced to obtuse angles, not directed backward as in females. Abd2 slightly longer than Abd1, anal segment very short. A1 23-jointed, nearly as long as cephalothorax A1 proximal part with numerous aesthetascs. A2 similar to that in females, but 3 terminal setae of distal Re joint better developed. Md gnathobase absent. Md palp base and Re as in females; Ri setae comparatively longer, than those in females. Mx1 with rudimentary lobes, without setae and chewing spines; Ri comparatively well developed, with 8 setae. Mx2 reduced to small single lobe with 1 rudimentary spine. Mxp evidently poorer developed than in females, protopodite significantly thinner. Ri1 Mxp without setae, thin, with single setae. Setae of 5 terminal Ri Mxp joints comparatively longer than in females. P1-P4 as in females. Left Ri P5 2-jointed. Right Ri 1-jointed. Left Re 3-jointed, its terminal joint short. Right Re 2-jointed, distal part of Re2 prolonged, curved in its terminal part and covered with thin hairs.

Type locality: the Norwegian coast.

Geographical distribution. The Norwegian coast, the Barents Sea, the northern part of the North Sea, Irish waters, the north-eastern Atlantic (Sars, 1902; Vervoort, 1952c).

Vertical distribution. Most probably benthopelagic species. Recorded at depths from 91 to 274 m near bottom (Sars, 1902).

Color: bright yellow.

Material. Female and male that are kept in Zoological Museum, of Oslo University (Norway) were examined.

2. *Comantenna crassa* Bradford, 1969

(Fig. 107)

Comantenna crassa Bradford, 1969b: 484, 486, figs 70-81; Bradford & Jillett, 1980: 29, fig. 16.

Description. **F e m a l e.** (Description after Brad-

ford (1969b) with modifications). Total length 3.80 mm. Cephalothorax nearly 4 times longer than abdomen. Th1 and cephalon fused, Th4 and Th5 separated. Re2 A2 and Re3 fused. Ri2 Md with 4 setae. In other features Md and Mx2 typical of the genus. Ri1 Mxp with 3 medial setae. Mx1 gnathobase with 14 setae (9 terminal large, 1 small and 4 setae on the posterior surface). Second and third internal Mx1 lobes with 4 and 3 setae respectively; protopodite with 4 setae near Ri base; Ri with 12 setae; Re with 11 setae and external lobe with 4 setae. Ri P1 external lobe reduced; protopodite near Ri base without setae. P1-P4 typical of the genus.

M a l e unknown.

Notes. *C. recurvata* Grice & Hulsemann 1970 very similar, if not identical, to the above described species.

Type locality. 37°07'S 177°14'E.

Geographical distribution. Pacific Ocean: the south-eastern part, off New Zealand, off the Bay of Plenty (Bradford, 1969b).

Vertical distribution. Most possibly benthopelagic species, found at depths 1260-1234 m at T° 3.9°C (Bradford, 1969b).

The species is not examined by me.

3. *Comantenna curtisetosa*

Alvarez, 1986

(Fig. 108)

Comantenna curtisetosa Alvarez, 1986: 859, figs 1-11.

Description. **F e m a l e.** (Description after Alvarez (1986) with modifications). Total length 2.2 mm. Cephalothorax 4 times longer than abdomen. Re A2 terminal joint short; its seta short. Ri2 A2 external lobe with 6 long and 1 short posterior seta. Ri2 A2 internal lobe with 4 long and 4 short setae. Mx1 gnathobase with 9 thick and 1 small thin terminal seta and 4 setae on its posterior surface. Mx1 second internal lobe with 4 setae; third with 2 setae; protopodite near Ri base with 3 setae; Ri with 12; Re with 11; external lobe with 5 setae. Mx2 fifth endite with 1 seta transformed into thick spine, first-third endites with groups of surface spines. Mxp typical of the genus. Md palp base and P1-P4 damaged and therefore non-described. Vestigial P5 presents.

Male unknown.

Type locality: 21°37'S 40°03'W.

Geographical distribution. The species was found off Brazilian continental shelf and slope (Alvarez, 1986).

Vertical distribution. The species was found at depth 900 m near bottom (Alvarez, 1986).

The species is not examined by me.

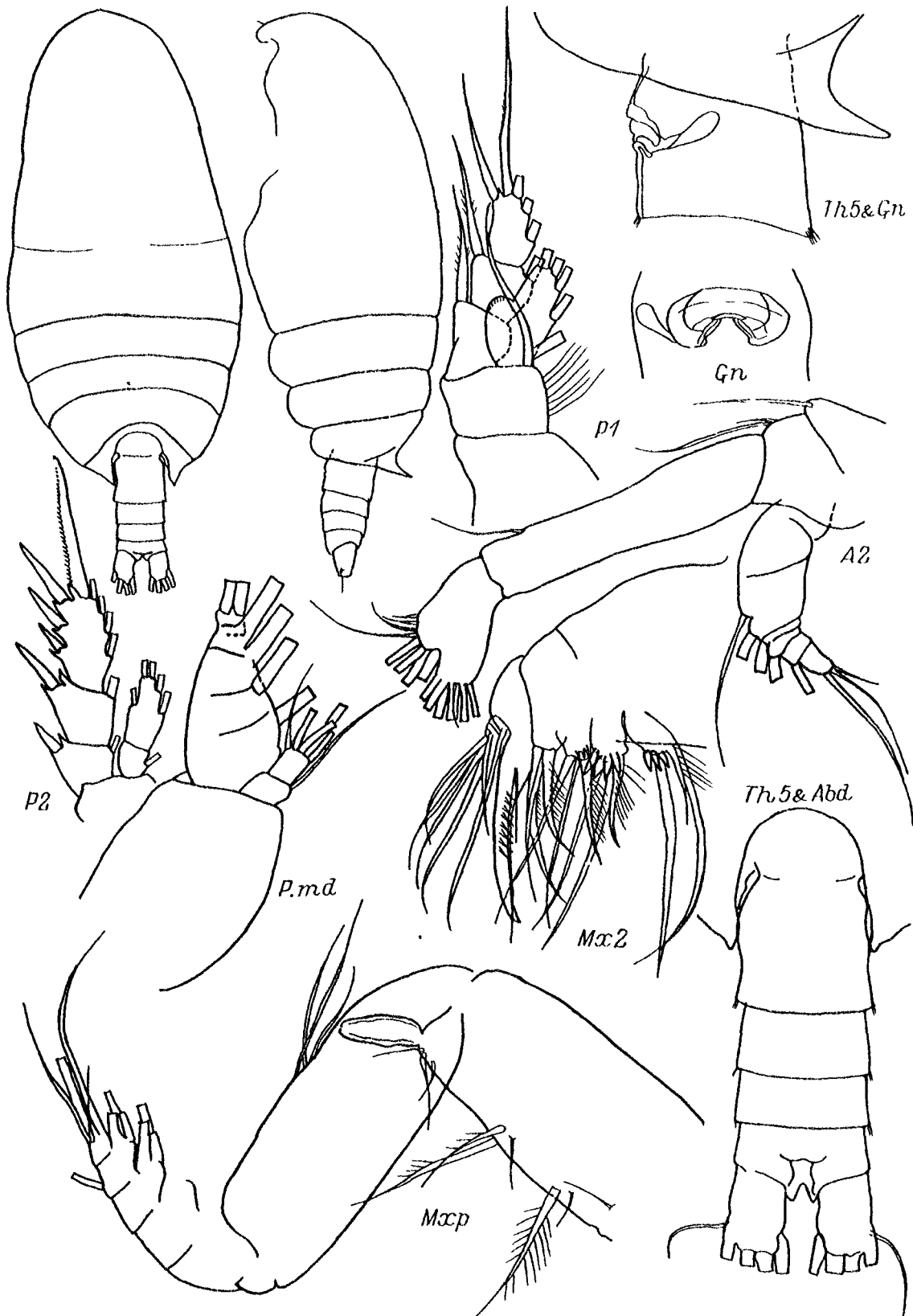


Fig. 105. *Comantenna brevicornis*. Female (N 20648 is kept in the Zoological Museum of Oslo University).

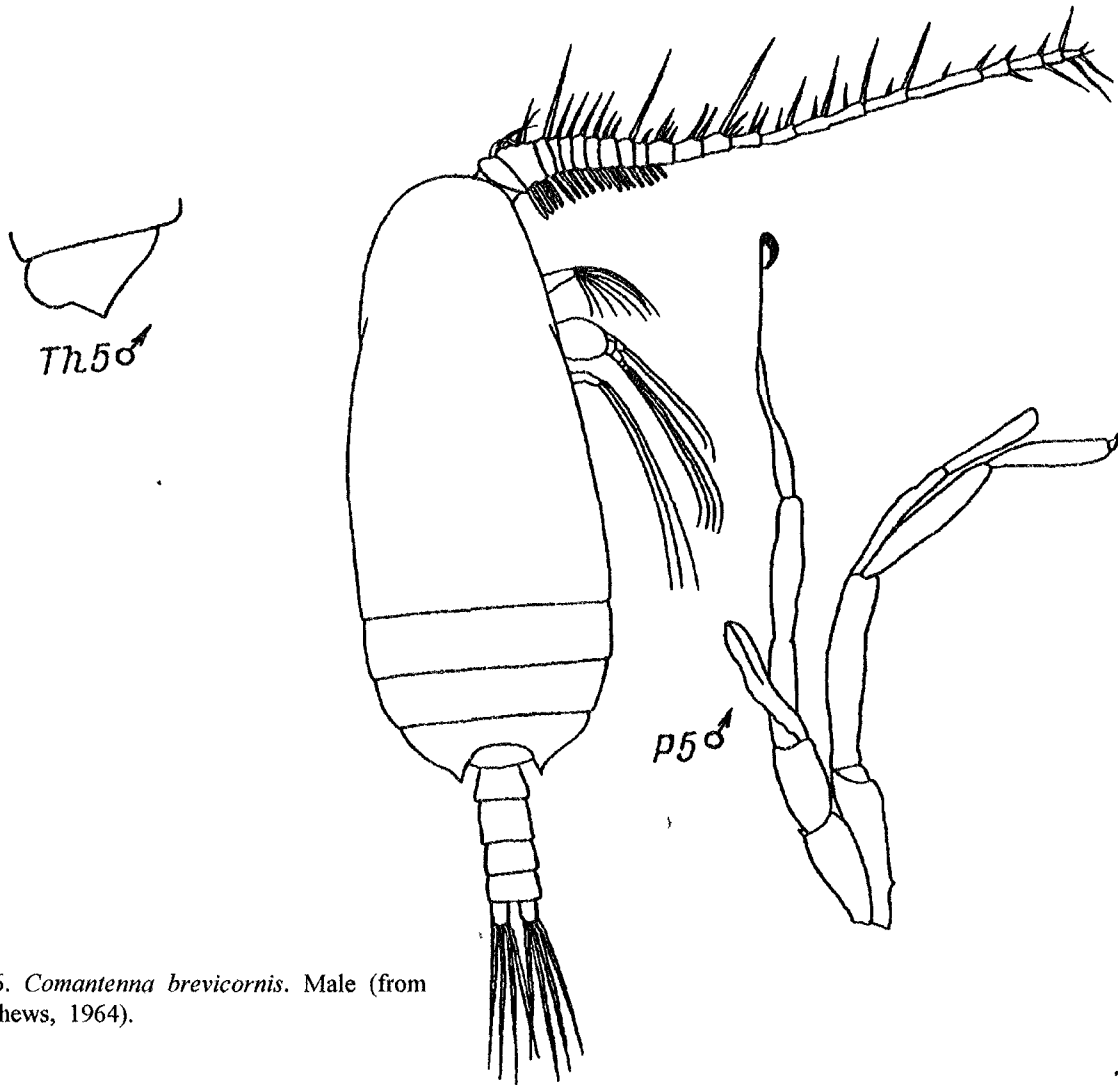


Fig. 106. *Comantenna brevicornis*. Male (from Matthews, 1964).

4. *Comantenna recurvata* Grice & Hulsemann, 1970

(Fig. 109)

Comantenna recurvata Grice & Hulsemann, 1970: 188, pl. 1, figs 20-24, pl. 2, figs 25-35; Alvarez, 1986: 862, figs 12-24.

Description. Female. (Description after Grice & Hulsemann (1970) and Alvarez (1986) with modifications). Total length 3.50-4.00 mm. Cephalothorax about 3.7 times longer than abdomen. Th4 and Th5 separated. A1 23-jointed, reaching Th3. Re A2 three fourth of Ri A2 length; Re1, Re2 and Re3 A2 separated (Grice & Hulsemann, 1970) (after Alvarez (1986) fused). Re A2 7-jointed; 2 terminal setae long, 1 short. Ri2 Md with 5 setae, in other features Md typical of the genus. Mx1 gnathobase with 9 thick and 1 thinner terminal setae and 4 posterior

setae. Mx1 second lobe with 4 or 3 setae and third internal lobe with 3 setae, protopodite near Ri base with 4 setae; Ri as well as Re with 11 setae. Mxp protopodite with groups of 2, 3 and 3 setae (from proximal to distal part of joint). Ri1 Mxp with 2-3 medial setae. P1-P4 segmentation typical of the genus. Ri P1 external lobe reduced, terminal setae on basipodite near Ri base absent. In some specimens vestigial P5 present (Grice & Hulsemann, 1970).

Male unknown.

Type locality: 39°45'N 70°34'W.

Geographical distribution. Atlantic Ocean: to the South of Woods Hole, Massachusetts (Grice & Hulsemann, 1970), off Brazilian coast in the region of 25°S (Alvarez, 1986).

Vertical distribution. The species was collected at depths 1750-1822 m in a 30 cm layer over bottom surface, at the T° 3°C (Grice & Hulsemann, 1970), and also near bottom at depth 1100 m (Alvarez, 1986).

The species is not examined by me.

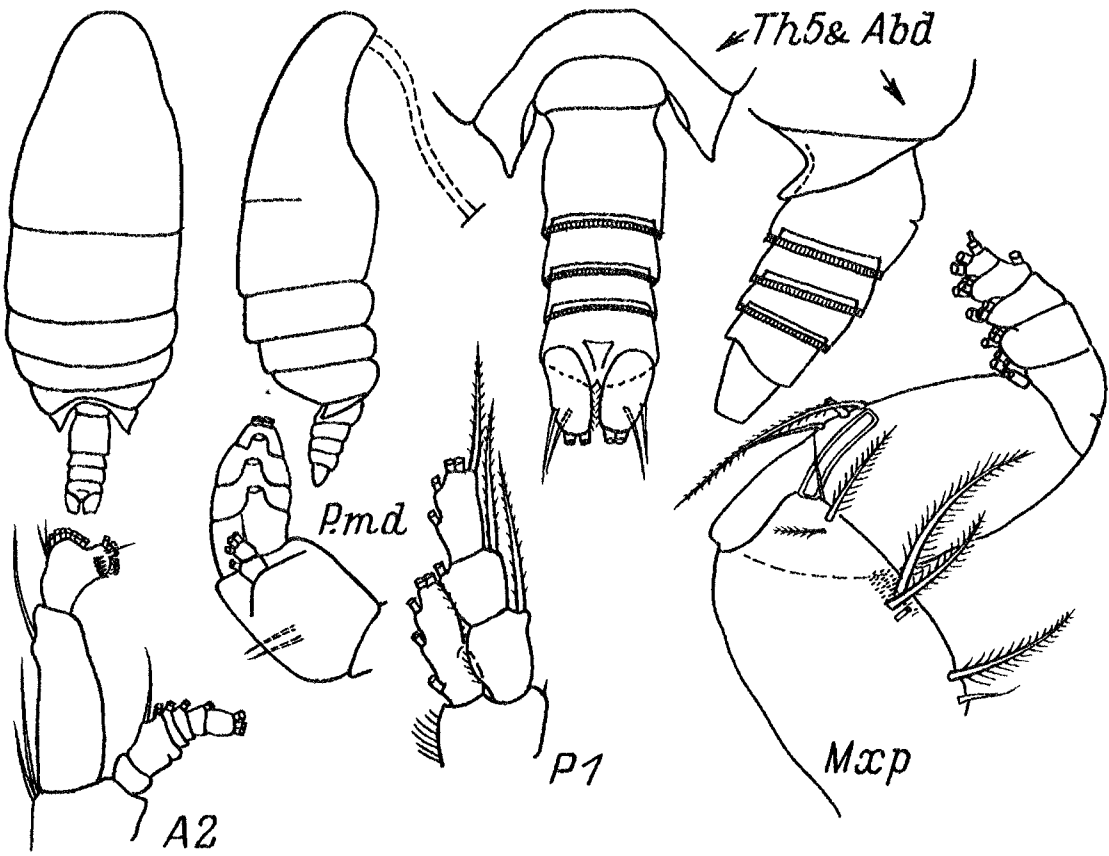


Fig 107. *Comantenna crassa* Female (from Bradford, 1969b)

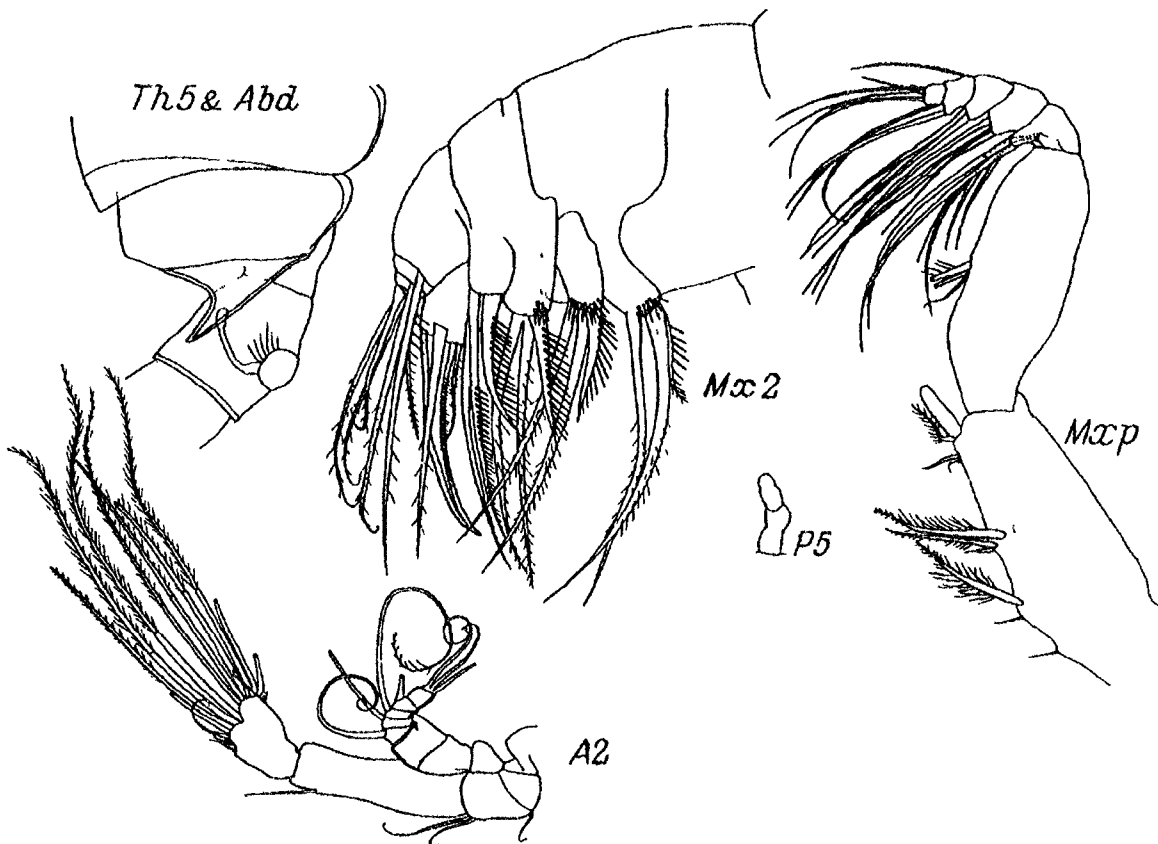


Fig 108 *Comantenna curtisetosa*. Female (from Alvarez, 1986).

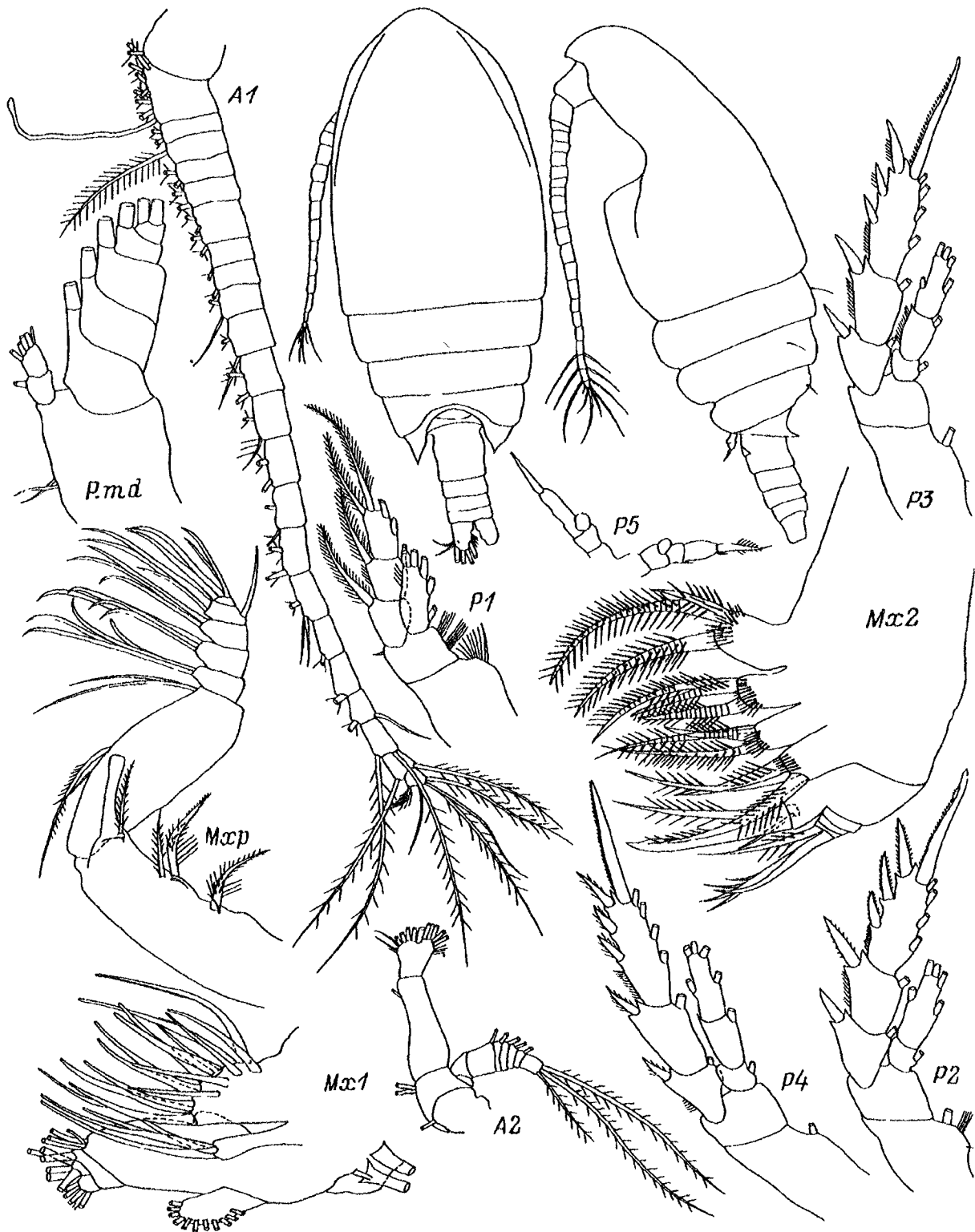


Fig. 109. *Comantenna recurvata*. Female (from Grice & Hulsemann, 1970).

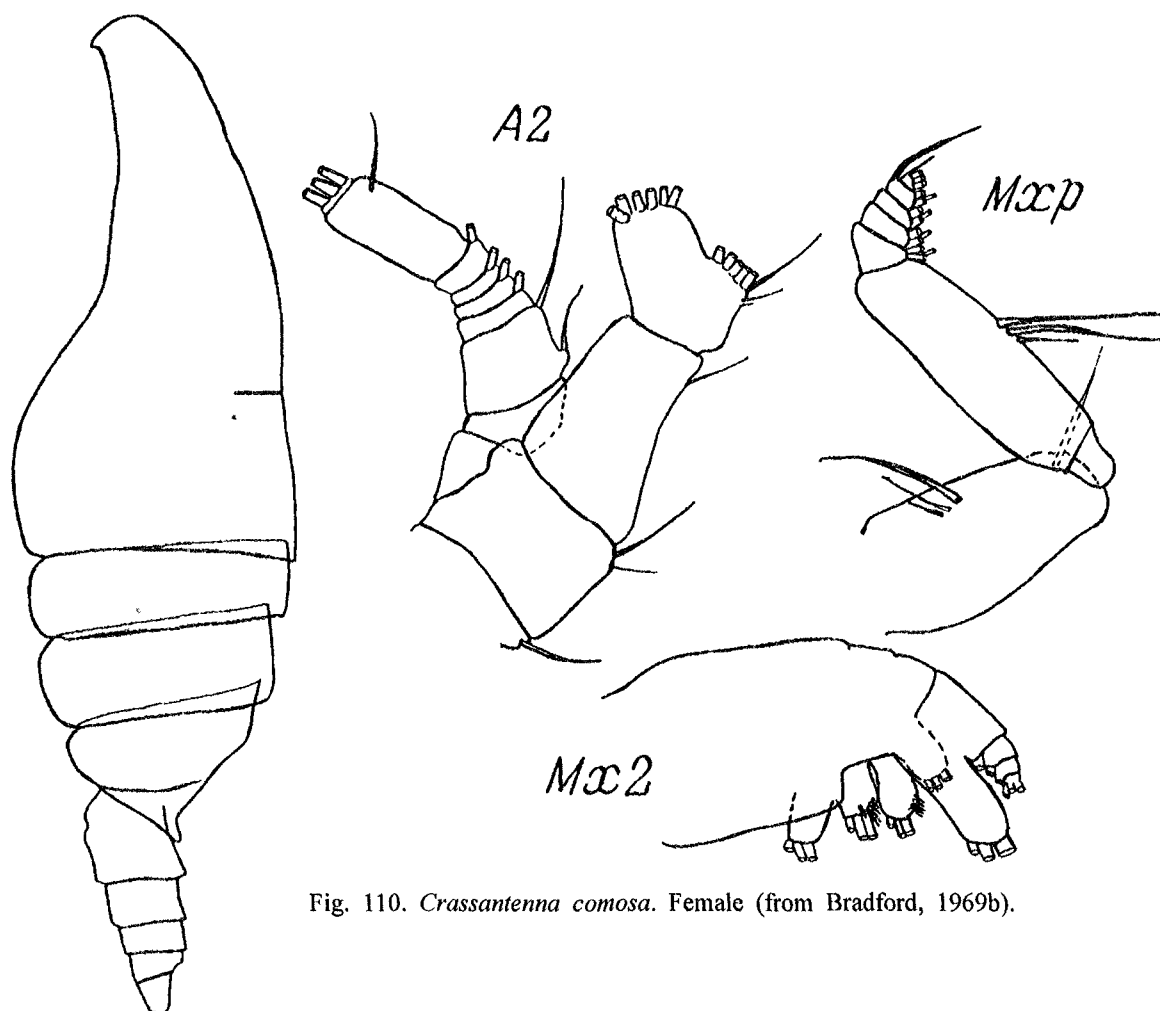


Fig. 110. *Crassantenna comosa*. Female (from Bradford, 1969b).

12. *Crassantenna* Cole & al., 1972

Crassantenna [Bradford, 1969b: 493, unavailable name]
Cole & al., 1972: 194; Bradford & Jillett, 1980: 29.

TYPE SPECIES: *Crassantenna comosa* Bradford, 1969,
by original designation (in Cole & al., 1972).

Notes. The genus *Crassantenna* was described (Bradford, 1969b) including 2 species neither of which was designated as the type species. According to Article 13b of the International Code of Zoological Nomenclature, this name of the genus is unavailable. The authorship of the genus should belong to the compilers of the Section Crustacea in the Zoological Record (Vol. 106, Section 10, part 1), who were the first to designate the type species (*C. comosa*). The same species was designated later as the type species by Bradford & Jillett (1980).

Description Female. (Description after Bradford (1969b) with modifications). Total length 3.30-3.70 mm. Cephalothorax about 4 times longer than abdomen. Cephalon and Th1 fused (line of fusion visible), Th4 and Th5 separated. Rostrum rudimentary, in form of a blunt rounded plate. Crest absent.

Th5 and genital segment symmetrical. Th5 posterior corners extending into points upturned backward. A1 24-jointed, reaching nearly Th3, with long annulate setae. Re A2 longer than Ri A2, but later more massive; coxopodite with 1; basipodite with 1-2 setae; Ri1 A2 with 1 seta. Ri2 A2 internal lobe with 7 setae (5 long and 2 short setae); external lobe with 6 setae, possibly 1 more posterior small seta. Re1 A2 with 2 setae, or they are absent. Re2 A2 with 2 setae. Re3-Re6 A2 with 1 seta each, Re7 typical of Aetideidae with 3 terminal setae. Mx1 gnathobase with 12 setae (only 2 of them are on the posterior surface). Mx1 second internal lobe with 4 setae; third internal lobe with 2-3 setae; propodite near Ri base with 4-5 setae; Ri with 11 or 15 setae; Re with 11 setae; external lobe with 8 setae. Mxp protopodite without seta in proximal part; in other features typical of Aetideidae. Re P1 3-jointed, Re1 P1 with external spine. Ri P1 1-jointed, external lobe well developed with small minute denticles apically. Ri P2 2-jointed, all other swimming leg rami 3-jointed. P4 coxopodite without spines.

Male unknown.

The genus *Crassantenna* includes 2 species.

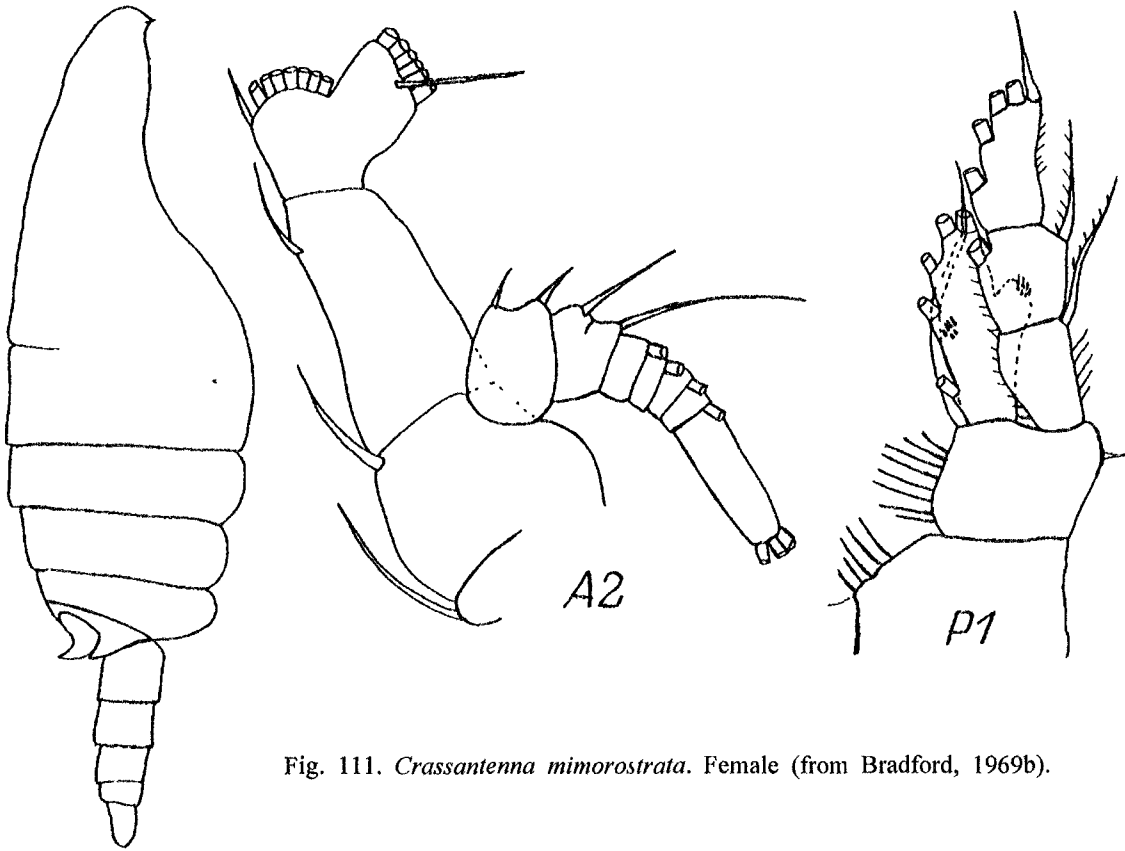


Fig. 111. *Crassantenna mimorostrata*. Female (from Bradford, 1969b).

Key to species of *Crassantenna*

Females

- 1(2) Re1 A2 without setae. Third Mx1 internal lobe with 2 setae 1. *C. comosa* Bradford
 2(1) Re1 A2 with 2 setae. Third Mx1 internal lobe with 3 setae 2. *C. mimorostrata* Bradford

1. *Crassantenna comosa* Bradford, 1969

(Fig. 110)

Crassantenna comosa Bradford, 1969b: 493, figs 143-157; Bradford & Jillett, 1980: 29, fig. 17, 70.

Description. Female. (Description after Bradford (1969b) with modifications). Total length 3.7 mm. Cephalothorax more than 3 times longer than abdomen. Rostrum present in form of a blunt plate. Th5 posterior corners upturned backward. A1 reaching Th5. Re A2 almost as wide as Ri A2. Re1 A2 without seta; Re2 A2 with 2 setae. Md palp base without setae; Ri1 Md with 1; Ri2 Md with 4 setae. Second Mx1 internal lobe with 4 setae; third with 2 setae. P1-P4 damaged.

Male unknown.

Type locality: 34°56'S 175°23'E.

Geographical distribution. Pacific Ocean: east of North Cape, north of New Zealand (Bradford, 1969b).

Vertical distribution. The species found in trawl

at 1383-1397 m, most likely benthopelagic species (Bradford, 1969b).

The species was not examined by me.

2. *Crassantenna mimorostrata* Bradford, 1969

(Fig. 111)

Crassantenna mimorostrata Bradford, 1969b: 495, figs 158-170.

Description. Female. (Description after Bradford (1969b) with modifications). Total length 3.1-3.3 mm. Rostrum present in a form of a very small point. Cephalothorax about 3 times longer than abdomen. Th5 posterior corners upturned backward. A1 reaching Th3. Re A2 slender than Ri A2. Re1 A2 with 2 setae; Re2 A2 with 2 setae. Md palp base without setae; Ri1 Md with 1; Ri2 Md with 4 setae. Second and third Mx1 internal lobes with 4 and 3 setae respectively; gnathobase with one of posterior setae rudimentary. Re P1 with external spine on each joint.

Male unknown.

Type locality: 34°38'S 174°36'E.

Geographical distribution. Pacific Ocean: continental slope off north-east of New Zealand (Bradford, 1969b).

Vertical distribution. The species was found at depth 1234-1697 m and assumed benthopelagic (Bradford & Jillett, 1980).

The species was not examined by me.

13. *Euchirella* Giesbrecht, 1888

TYPE SPECIES *Undina messinensis* Claus, 1863, by monotypy.

Euchirella Giesbrecht, 1888: 336.

Description. Female. Total length about 3-8 mm. Cephalothorax 3.5-7.0 times longer than abdomen. Cephalon and Th1 completely, or incompletely fused (line of fusion sometimes visible), Th4-Th5 fused. Crest present, or absent. Rostrum 1-pointed, usually well developed, rarely rudimentary (*E. curticauda*). Th5 posterior corners usually rounded (lateral and dorsal view), sometimes rounded-rectangular (dorsal view), rarely slightly prolonged. They may be symmetrical, rarely asymmetrical and poorly prolonged. Genital segment symmetrical, or asymmetrical; asymmetry may be slight (*E. unispina*), or rather outlined. Caudal rami nearly as long as wide, sometimes 1.3-1.4 wider than long. A1 23-jointed, usually longer than cephalothorax, sometimes exceeding caudal rami. A2 with typical of the genus short Ri: less than half Re length; more often about one third, or fourth of Re length. A2 coxopodite with 1 seta; basipodite usually with 1, sometimes with 2 (*E. rostrata*) setae, or seta absent (*E. maxima*). Ri1 A2 usually with 1 seta, rarely seta absent. Internal Ri2 A2 lobe with 1-2 or 4-8 setae; external with 3-6 (7) setae, often its lateral border with fine spinules. Re1 A2 and Re2 A2 completely or not completely fused, lacking setae, sometimes tooth-like projection present (from 1 to 3). Structure and setation of Re2-Re7 A2 typical of Aetideidae. Md palp base usually without setae, sometimes with 1 seta (*E. curticauda*), or sclerotized sharp projection (*E. amoena*). Ri1 Md, usually, without setae, rarely with 1 seta (*E. curticauda*, *E. messinensis*). Ri2 Md usually with 9 setae (in *E. bitumida* with 7-8 setae). Mx1 gnathobase with 2-4 setae on posterior surface, 9 terminal claw-like setae, and often 1 thin seta. Mx1 second internal lobe with 3-4 setae; third internal lobe with 1 (*E. bella*), or 2, 3 setae, often 1 small, possibly sensory knob present. Mx1 protopodite near Ri base, usually with 3 setae, sometimes 2; Ri with 3-5 setae; Re with 11, rarely with 10, or 8 setae; external lobe with 6, 8 or 9 setae. Mx2 with 1 seta transformed into claw-like spine on fourth and fifth endites; distal part of Ri with 6 long setae. Mxp protopodite shorter than Ri1 Mxp, with seta proximally (near the base of the joint), or this seta absent, and with 3 groups of 2, 3 and 3 setae (looking from proximal to distal part of the joint), with a group of minute spinules near the base of distal setae group. Ri1 Mxp with 3 medial setae. P1 with 2-jointed Re; with 2 external spines and 1-jointed Ri with well developed external lobe. P2 with 3-jointed Re and 1-jointed Ri. P3-P4 rami 3-jointed. P4 coxopodite with sclerotized spines

of different size and number (usually from 1 to 5, or from 8 to 13 spines) near the base of internal seta on the posterior surface: instead of spines there may be 5 minute spinules (*E. amoena*) or 1 big sclerotized spine containing of 5-8 fused smaller ones (*E. maxima*).

Male. Total length 2.50-7.35 mm. Cephalothorax 3.5-4.0 times longer than abdomen. Rostrum present, sometimes virtually absent (*E. curticauda*). Crest present (high, or low), or absent. Cephalon and Th1 as well as Th4-Th5 fused. Posterior Th5 corners usually rounded. A1 longer than cephalothorax, reaching the end of Abd2 or the end of caudal rami, often with aesthetascs. Re A2 usually 1.4-1.5 times longer than Ri. Comparing with that in females setation reduced, when described, then: for Ri2 A2 usually 6 setae on external and 6-7 setae on internal lobes; 8 setae on Ri2 Md and 10-11 setae on Re and Ri Mx1 each; 5-7 setae on external Mx1 lobe. Mx2 strongly reduced. Re P1 usually 2-jointed (Re1 and Re2 fused, but the division between joints is much more pronounced than in females); usually Re1-Re2 P1 external spines strongly reduced; 1 of the spines may absent, terminal external spine usually present. P2-P4 segmentation close to that in females. P5 biramous, or only right P5 biramous. Re P5 left 3-jointed; Ri P5 left, if present, 1-jointed, more often present as rudiment, rarely well developed. Fixed projection between left Re2 and Re3 P5 left form nippers (tongs) with parts equal, or unequal length. Re P5 right 2-jointed; Ri P5 right 1-jointed; sometimes nearly as long as Re1 of its leg, forming or not forming tongs with Re. P5 right basipodite enlarged in the majority of species. Right Re P5 significantly longer, than left Re.

The genus *Euchirella* includes 25 species.

20 species of *Euchirella* are described below, except: species with unclear status (*E. orientalis* Sewell, 1929 and *E. tanssii* Omori, 1965)), *E. paulinae*, known off the tropical part of the Indian Ocean and *E. isettae* found in the eastern Pacific and off the coasts of South and Central America. Two species from antarctic and subantarctic waters *E. latirostris* and *E. rostromagna*, which, following Park (1978) and Bradford & Jillett (1980) may be identical are not described here either.

Notes. The synonymy to *Euchirella* species is given below in brief version from Von Vaupel Klein's (1984) detailed synonymy.

Key to species of *Euchirella*.

Females

- 1(6) Genital segment symmetrical.
 2(3) Crest present; rostrum rudimentary
 4. *E. curticauda* Giesbrecht
 3(2) Crest absent; rostrum not rudimentary.

- 4(5) Md palp base with chitinous projection. P4 coxopodite with 5 very poorly visible small spines. Ri2 A2 with 3 setae on external lobe and 1 seta on internal lobe. Rostrum small 1. *E. amoena* Giesbrecht
- 5(4) Md palp base without chitinous projection. P4 coxopodite with 8-9 clearly recognizable spines. Ri2 A2 with 6 setae on external and 8 setae on internal lobes. Rostrum large 14. *E. rostrata* (Claus)
- 6(1) Genital segment asymmetrical.
- 7(16) Crest present.
- 8(9) P4 coxopodite with 2-3 spines 11. *E. pseudopulchra* Park
- 9(8) P4 coxopodite with 1 spine.
- 10(11) Th5 posterior corners slightly asymmetrical, not rounded (dorsal and lateral view). Ri2 A2 with 5 setae on each (internal and external) lobe 8. *E. maxima* Wolfenden
- 11(10) Th5 posterior corners symmetrical, rounded, or rounded-rectangular (dorsal and lateral view). Ri2 A2 with 6 setae on each lobe.
- 12(13) Crest low 7. *E. grandicornis* Wilson
- 13(12) Crest high.
- 14(15) Genital segment with 2 projections: to the right and left (dorsal view). Re1 A2 with small projection 3. *E. bitumida* With
- 15(14) Genital segment with only 1 projection: to the left (dorsal view), occupying all length of the segment. Re1 A2 without projection 6. *E. galea* Giesbrecht
- 16(7) Crest absent.
- 17(34) Genital segment with left lateral side swelled (dorsal view), or with large projection in the left half of the segment dorsally; if the right projection also present, it is significantly smaller than the left one (dorsal view).
- 18(23) P4 coxopodite with 1 spine.
- 19(20) Posterior border of genital segment with projection on the right, exceeding the anterior border of Abd2. Left projection absent (dorsal view) 19. *E. unispina* Park
- 20(19) Posterior border of genital segment without projection on the right. The projection of left lateral margin of segment, occupying nearly all segment's length (dorsal view).
- 21(22) Genital segment with ear-like, small, nearly symmetrical projections on the right and on the left in the anterior part of segment (dorsal view). Specimens longer than 5 mm 20. *E. truncata* Esterly
- 22(21) Genital segment without ear-like projections. Specimens less than 5 mm in length 12. *E. pseudotruncata* Park
- 23(18) P4 coxopodite with 2 spines.
- 24(27) Left and right lateral sides of genital segment (dorsal view) without swellings. Projection present on the dorsal side in the left half of genital segment. Ri1 Md with 1 small seta.
- 25(26) Projection on the dorsal side of genital segment highly large, exceeding the posterior border of genital segment and covering 2 following abdominal segments 10. *E. messinensis messinensis* (Claus)
- 26(25) Projection on the dorsal side of genital segment small only slightly exceeding the posterior border of genital segment 9. *E. messinensis indica* Vervoort
- 27(24) Left lateral side of genital segment (dorsal view) with swelling, or bilobated, or non-lobated projection. Ri1 Md without seta.
- 28(29) The posterior part of dorsal side of genital segment with 3 projections (left lateral view) 5. *E. formosa* Vervoort
- 29(28) The posterior part of genital segment without projections (left lateral view).
- 30(31) Ri2 A2 lobes with not less than 6 setae each 13. *E. pulchra* (Lubbock)
- 31(30) Ri2 A2 with 5 setae on external lobe and 4 setae on internal lobe.
- 32(33) Projection on the left of genital segment bilobated (dorsal view) 16. *E. speciosa* Grice & Hulsemann
- 33(32) Projection on the left of genital segment not bilobated (dorsal view) 20. *E. venusta* Giesbrecht
- 34(17) Genital segment with large projection on the right side (dorsal view), left side without swelling or projection.
- 35(36) Projection on the right of genital segment smooth, covering nearly all length of segment (dorsal view). P4 coxopodite with 3-4 (5) spines 2. *E. bella* Giesbrecht
- 36(35) Projection on the right of genital segment abruptly prominent, covering its posterior part only; or ear-like. P4 with 2-3 spines.
- 37(38) Projection on genital segment is ear-like, arranged in its anterior half 15. *E. similis* Wolfenden
- 38(37) Projection on genital segment is not ear-like, but abruptly prominent, arranged in its posterior half 17. *E. splendens* Vervoort

Males

(unknown for *E. grandicornis*, *E. pseudopulchra*, *E. similis* & *E. speciosa*)

1(6) P5 always biramous. Ri P5 left well developed, nearly as long as Re1 P5, or equal to its half length. Re2 and Ri P5 right are not elongated and not sharpened into their distal parts; do not form tongs. Ri P5 right not exceeding distal border of right Re1 P5.

2(3) Crest absent. Rostrum large 15. *E. rostrata* (Claus)

- 3(2) Crest present. Rostrum not large.
- 4(5) Terminal part of right Re2 P5 with teeth
 4. *E. curticauda* Giesbrecht
- 5(4) Terminal part of right Re2 P5 without tooth
 8. *E. maxima* Wolfenden
- 6(1) P5 not always biramous, if left P5 with Ri, then
 Ri rudimentary. Re2 and Ri P5 right elongated
 and sharpened in their distal parts forming tongs;
 Ri P5 right significantly exceeding distal border
 of right Re1 P5.
- 7(18) Crest present.
- 8(9) Crest high
 . . . 3. *E. bitumida* With; 6. *E. galeata* Giesbrecht
- 9(8) Crest low.
- 10(15) Left P5 basipodite shorter than right coxopodite
 P5.
- 11(12) Right Re1 P5 with less than 4 tooth-like pro-
 jections 13. *E. pulchra* (Lubbock)
- 12(11) Right Re1 P5 with 4 tooth-like projections.
- 13(14) Left Re3 P5 not reaching the first projection
 of right Ri P5
 10. *E. messinensis messinensis* (Claus)
- 14(13) Left Re3 P5 exceeding the first projection of
 right Ri P5 2. *E. bella* Giesbrecht
- 15(10) Left P5 basipodite nearly as long as right P5
 coxopodite.
- 16(17) Specimens less than 4.7 mm in size. Parts of
 left Re3 P5 tongs equal in length
 9. *E. messinensis indica* Vervoort
- 17(16) Specimens more than 4.7 mm in size. Parts
 of left Re3 P5 tongs not equal in length
 5. *E. formosa* Vervoort
- 18(7) Crest absent.
- 19(20) Robust spine present near place wherefrom right
 Re P5 begins 1. *E. amoena* Giesbrecht
- 20(19) No spine present near place wherefrom right
 Re P5 begins.
- 21(26) P5 left without rudimentary Ri. When closed
 tongs of Re P5 left compact, rounded, clavate-like.
- 22(25) Proximal part of right Re1 P5 with 1 big tooth.
- 23(24) Specimens less than 3.8 mm in length. Proximal
 part of right Ri1 P5 with robust tooth
 12. *E. pseudotruncata* Park
- 24(23) Specimens over than 3.8 mm in length. Proximal
 part of right Ri1 P5 without tooth, but closer to
 the midlength of joint with 1 medium sized tooth
 19. *E. unispina* Park
- 25(22) Proximal part of right Re1 P5 with 1 middle
 sized tooth it is not larger than the three following
 ones 18. *E. truncata* Esterly
- 26(21) Rudimentary Ri at P5 left present. When closed
 tongs of Re P5 left not compact, oblong, not clavate
 17. *E. splendens* Vervoort,
 20. *E. venusta* Giesbrecht

1. *Euchirella amoena* Giesbrecht, 1888

(Fig. 112)

Euchirella amoena Giesbrecht, 1888: 336, 1892: 233, 242,
 244, 743, pl. 15, fig. 20 ("amona"); Grice, 1962:
 194, pl. 10, figs 5-10; Von Vaupel Klein, 1972: 506,
 pl. 4 (a-c), tabs. 1, 2, 1984: 36; Park, 1976b: 107,
 fig. 1 (a-l); Bradford & Jillett, 1980: 32, fig. 19.

Euchirella brevis Sars, 1905a: 12, 1924-25: 71, pl. 21,
 figs 1-7.

Description. Female. Total length 2.70-4.00 mm. Cephalothorax 4-5 times longer than abdomen. Rostrum comparatively small. Posterior Th5 corners of nearly rectangular shape (dorsal view) with small knobs in distal part. Genital segment symmetrical. A1 reaching the midlength of Abd. Ri A2 very short about fifth of Re A2 length; coxopodite and Ri1 A2 with 1 seta each; basipodite without setae (after Park (1976b) with 1 seta). Ri2 A2 with 1 seta on internal and 3 on external lobes. Md palp base with spine-like robust projection, typical of the species. Ri1 Md without setae; Ri2 Md with 9 setae. Mx1 gnathobase with 2 setae on posterior surface. Mx1 second internal lobe with 4; third with 2 setae; protopodite near place where Ri comes from with 2 (with 3 setae after Park (1976)); Ri with 4; Re with 8 and external lobe with 8 setae. Re1 P1 with 2 spines; first external spine reaching the middle of second spine. P2 with 1-jointed Ri, Re terminal spine with about 21 teeth. P3-P4 typical of the genus. P4 coxopodite with 5 very poorly visible small teeth.

Male. Total length 3.00-3.85 mm. In general appearance similar to female. Crest absent. P5 with uniramous left leg and large biramous right one. Ri P5 left absent; Ri right P5 longer than Re. Re1 P5 right with large spine-like projection in the middle of internal margin; Re2 is about one third of Re1 P5 right.

Type locality: the equatorial Pacific.

Geographical distribution. The species widespread in tropical, subtropical and temperate zones of the Atlantic, Pacific and Indian oceans (Vervoort, 1963). Pacific Ocean: recorded in the south-western part (Farran, 1929; Bradford & Jillett, 1980; Von Vaupel Klein, 1984), in the south-eastern part off Peru region (Tanaka & Omori, 1969); in the north-western and tropical parts (Tanaka & Omori, 1969; Von Vaupel Klein, 1972; original data).

Vertical distribution. The species is known from epipelagial (Tanaka & Omori, 1969; Bradford & Jillett, 1980) and from total hauls from 2000 m.

Material: 5 females and 1 male from samples: 395, 400, 573.

2. *Euchirella bella* Giesbrecht, 1888

(Fig. 113)

Euchirella bella Giesbrecht, 1888: 336, 1892: 233, 241,

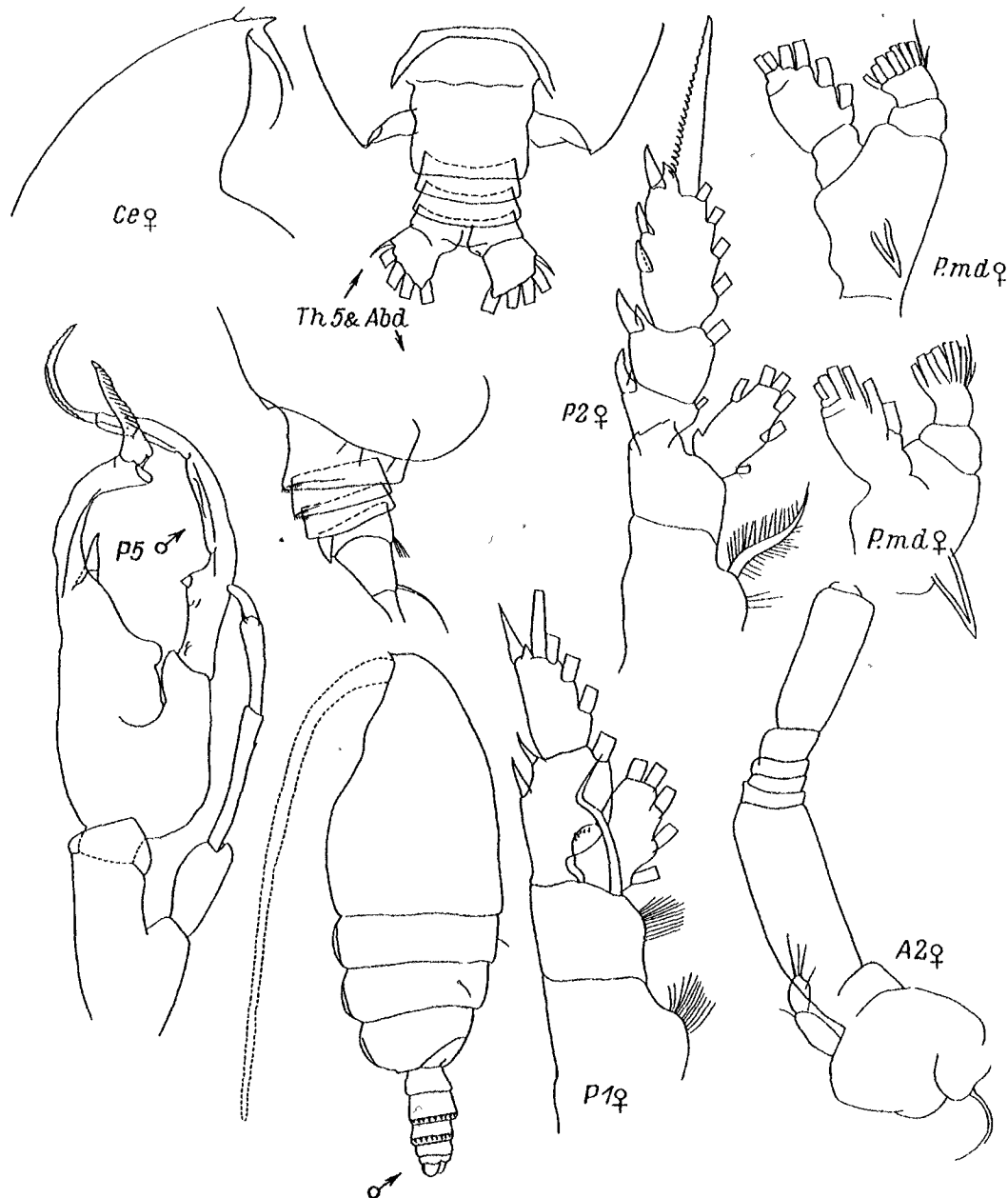


Fig. 112. *Euchiarella amoena*. Female (573). Male (from Bradford & Jillett, 1980).

244, 743, pl. 15, fig. 26; Grice, 1962: 194, pl. 9, figs 1-13; Vidal, 1966: 28, pl. 8, figs 4-9; Tanaka & Omori, 1969a: 38, fig. 2 (a-l); Von Vaupel Klein, 1972: 506, fig. 2 (a, b), tabs. 1, 2, 1984:36.

Euchiarella bella var. *Indica* Wolfenden, 1906: 1006, pl.96, figs 17-20.

Euchiarella hessei A. Scott, 1909: 54.

Euchiarella areata Tanaka, 1957b: 186, fig. 50 (a-h).

non *Euchiarella bella*: Wilson, 1950: 218, pl. 9, figs 92-94, pl. 19, figs 248, 261-265.

Description. F e m a l e. Total length 3.70-4.18

mm. Cephalothorax nearly 3.5-4.4 times longer than abdomen. Crest absent. Rostrum clearly visible, robust. Th5 posterior corners rounded (dorsal and lateral view). Genital segment slightly asymmetrical with smooth projection on the right (dorsal and lateral view). A1 reaching nearly the midlength of abdomen, or exceeding caudal rami. Ri A2 4-5 times shorter than Re. Coxo-, basipodite and Ri1 A2 with 1 seta each. Ri2 A2 lobes with 5 setae each. Md palp base and Ri1 Md without setae; Ri2 Md with 9 setae. Mx1 gnathobase with 2 setae on posterior

surface; second and third lobes with 3 and 1 setae respectively; protopodite near Ri base with 2 setae (1 long, robust and 1 small); Ri with 4 setae; Re with 10 setae and external lobe with 7 setae. Mx2 and Mxp typical of the genus. P1 with first external spine slightly exceeding the base of second one. P2-P4 typical of the genus. Terminal Re spines with 20-21 denticles. P4 coxopodite with 3-4 robust, thick spines (with 5 spines after Grice, 1962; Tanaka & Omori, 1969a; Von Vaupel Klein, 1984), coming from general base.

M a l e. (Description after Tanaka & Omori (1969a) with modifications). Total length 3.26-3.70. Crest present, very low. A2 with 6 setae on each Ri2 lobe. P5 biramous. Left Ri P5 rudimentary, not reaching proximal border of right protopodite. Right Ri P5 with 4 (in original specimen with 3) projections, Re also with 4 projections.

Type locality: 15°N 138°W.

Geographical distribution. Pacific Ocean: known from the region of Peru and to 20°S (Tanaka & Omori, 1969a), from the equatorial part (Grice, 1962; Von Vaupel Klein, 1972; 1984), the region of Marian Trench (original data), the north-western part of the Izu region (Tanaka, 1957a). Indian Ocean: to the South to 5°S (Von Vaupel Klein, 1984).

Vertical distribution. The species is known from epipelagial (Sewell, 1947; Grice, 1962; Von Vaupel Klein, 1984), in total hauls from mesopelagial and depths from 8000 m (original data).

Material: 1 female from sample 201.

3. *Euchirella bitumida* With, 1915

(Figs. 114-115)

Euchirella bitumida With, 1915: 131, pl. 5, fig. 9 (a-g), pl. 8, fig. 4 (a-e), text-fig. 34; Sars, 1924-25: 74, pl. 21, figs 15-18; Tanaka & Omori, 1969a: 40, fig. 3 (a-g); Von Vaupel Klein, 1972: 506, fig. 2 (c-d), pl. 5, tabs. 1, 2; 1984: 37; Park, 1976b: 107, 109, fig. 2 (a-l); Bradford & Jillett, 1980: 32, fig. 20 (A-H).

Description. *F e m a l e.* Total length 4.70-7.10 mm. Cephalothorax about 4.4-5.0 longer than abdomen. Crest present, as high triangular-rounded plate (lateral view). Rostrum short, robust. Th5 posterior corners slightly rectangular (dorsal view). Genital segment asymmetrical with projections on the left and on the right (dorsal view). A1 reaching nearly the end of abdomen. Ri A2 longer than one third of Re length. Ri1 A2 with 1 seta; Ri2 A2 with 6 setae on each lobe. Coxo- and basipodite A2 with 1 seta each. Md palp base and Ri1 Md without setae; Ri2 Md with 7 setae. Mx1 gnathobase with 3 setae on posterior surface; second and third internal lobes with 4 and 2 setae respectively; protopodite with 3 setae near Ri base; Ri with 4 (after Park (1976b) with 5 setae), Re with 11 and external

lobe with 8 setae. Mx2 and Mxp typical of the genus. First Re P1 external spine exceeding the mid-length of the second one. P4 coxopodite with 1 robust spine. Terminal P2-P4 spines with about 20 denticles.

M a l e. (Description after Tanaka & Omori (1969a) and Bradford & Jillett (1980) with modifications). Total length 4.80-6.10 mm. Cephalothorax less than 4 times longer than abdomen. Cephalon with crest lower than in female, of more or less triangular shape (lateral view). Rostrum as in females. Abd2-4 with thin denticles along posterior border. A1 reaching, or exceeding the end of caudal rami. Ri2 A2 with 6 setae on each external and internal lobes. Ri2 Md with 8 setae. Comparing to female Mx1 setation rudimentary: Ri with 10 setae; external lobe with 6 setae (after Bradford & Jillett (1980) with 7 setae). Mx2 rudimentary. First 2 spines on Re P1 strongly reduced. Left Re P5 exceeding the first thickening on right Ri. Left Ri very small; Re3 with tongs, configuration varying depending on view. Right P5 with Ri slightly shorter than Re, the latter with denticles in its distal part.

Type locality: the Norwegian Sea.

Geographical distribution. Atlantic Ocean: species widespread in Atlantic up to 63°N (Jespersen, 1940) and nearly to the Equator to the South (Vervoort, 1963). Pacific Ocean: up to 52°N (Tanaka & Omori, 1969a, b) to the North and up to New Zealand (Bradford & Jillett, 1980) to the South. In the region of the Malay Archipelago (Vervoort, 1963).

Vertical distribution. The species was found in hauls from epipelagial (Bradford & Jillett, 1980), meso- bathypelagial (With, 1915; Park, 1976b), after latter author, at night time the species occurs away from mesopelagial in the upper 100 m. It was also recorded in total haul from 700-2000 m.

Material: 2 females from samples 455, 574.

4. *Euchirella curticauda* Giesbrecht, 1888

(Fig. 116)

Euchirella curticauda Giesbrecht, 1888: 336, 1892: 233, 241, 244, 743, pl. 15, figs 3, 13, 25, pl. 36, figs 19, 20; With, 1915: 118, pl. 4, fig. 3 (a-m), pl. 8, fig. 2 (a-c), text-fig. 30 (a-e), Tanaka & Omori, 1969a: 42; Von Vaupel Klein, 1972: 506, fig. 3 (a-b), tabs. 1, 2, 1984: 38; Park, 1976b: 107, 110, fig. 3 (a-m), Bradford & Jillett, 1980: 32, 35, fig. 21 (A-G); Brenning, 1984: 29.

Description. *F e m a l e.* Total length 3.50-4.55 mm. Cephalothorax 5-6 times longer than abdomen. Crest present, comparatively high, triangular (lateral view). Rostrum rudimentary, nearly absent. Th5 posterior corners rounded, with slightly prolonged tops (lateral and dorsal view). Genital segment symmet-

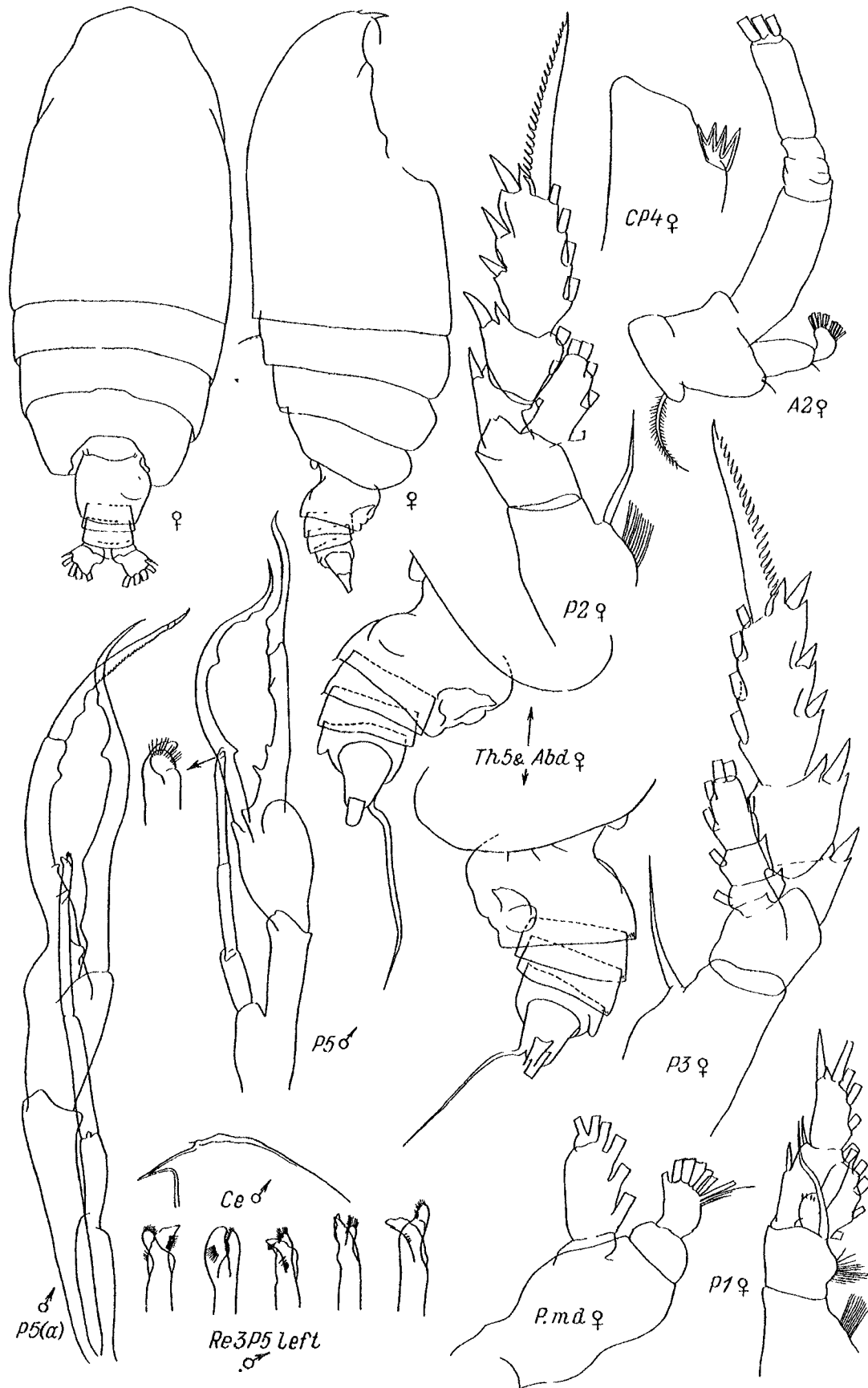


Fig. 113. *Euchiarella bella*. Female (201). Male P5(a) (212), other figures (from Tanaka & Omori, 1969a)

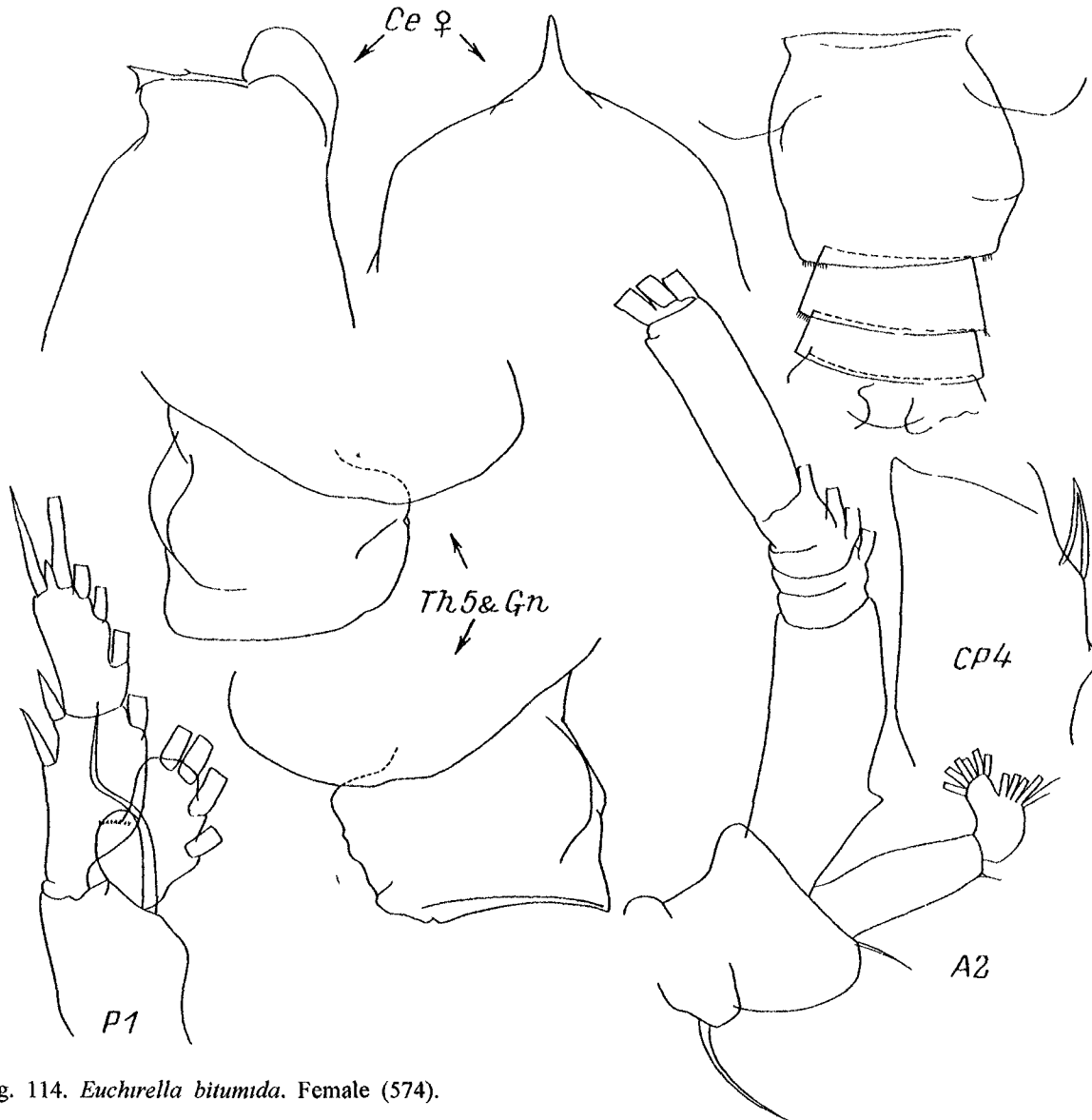


Fig. 114. *Euchirella bitumida*. Female (574).

rical, nearly 1.5 times longer than wide. Abd3 with conical projection (right view). A1 nearly as long as cephalothorax. Ri A2 about one fourth of Re length; coxo- and basipodite as well as Ri1 A2 with 1 seta; Ri2 A2 with 2 setae on internal and 3-4 setae on external lobes. Md palp base and Ri1 Md with 1 seta each. Ri2 Md with 9 setae. Mx1 gnathobase with 3 setae on posterior surface; second internal lobe with 4 setae; third with 2 setae (3 setae after Von Vaupel Klein (1984)); protopodite near Ri base with 3 setae; Ri with 3 setae; Re with 11 setae; external lobe with 9 setae. Mx2 typical of the genus. Mxp protopodite with small projection distally near external border. Re P1 first spine exceeding the midlength of next spine. P4 coxopodite with 6-8 spines (after Park (1976b) with 13; after Tanaka & Omori (1969a) with 8-11; after Bradford & Jillett (1980) with 12-13 spines).

M a l e. (Description after Park (1976b) and Bradford & Jillett (1980) with modifications). Total length 3.14-4.30 mm. General appearance close to that in female. Crest slightly lower than in female. Rostrum nearly absent. Both P5 of about same length, biramous. Ri P5 left well developed, reaching nearly the middle of its Re1 P5. Re2 P5 right transformed into comb-like structure, with row of teeth. P5 rami are not transformed into tongs.

Type locality: the equatorial part of the Pacific Ocean.

Geographical distribution Atlantic Ocean: the species is widespread in Atlantic, the northernmost locality about 66°N, southernmost locality 11°S. Pacific Ocean: to the North up to 55°N and to the South to New Zealand (Bradford & Jillett, 1980). Indian Ocean: species recorded in its tropical part (Vervoort, 1963).

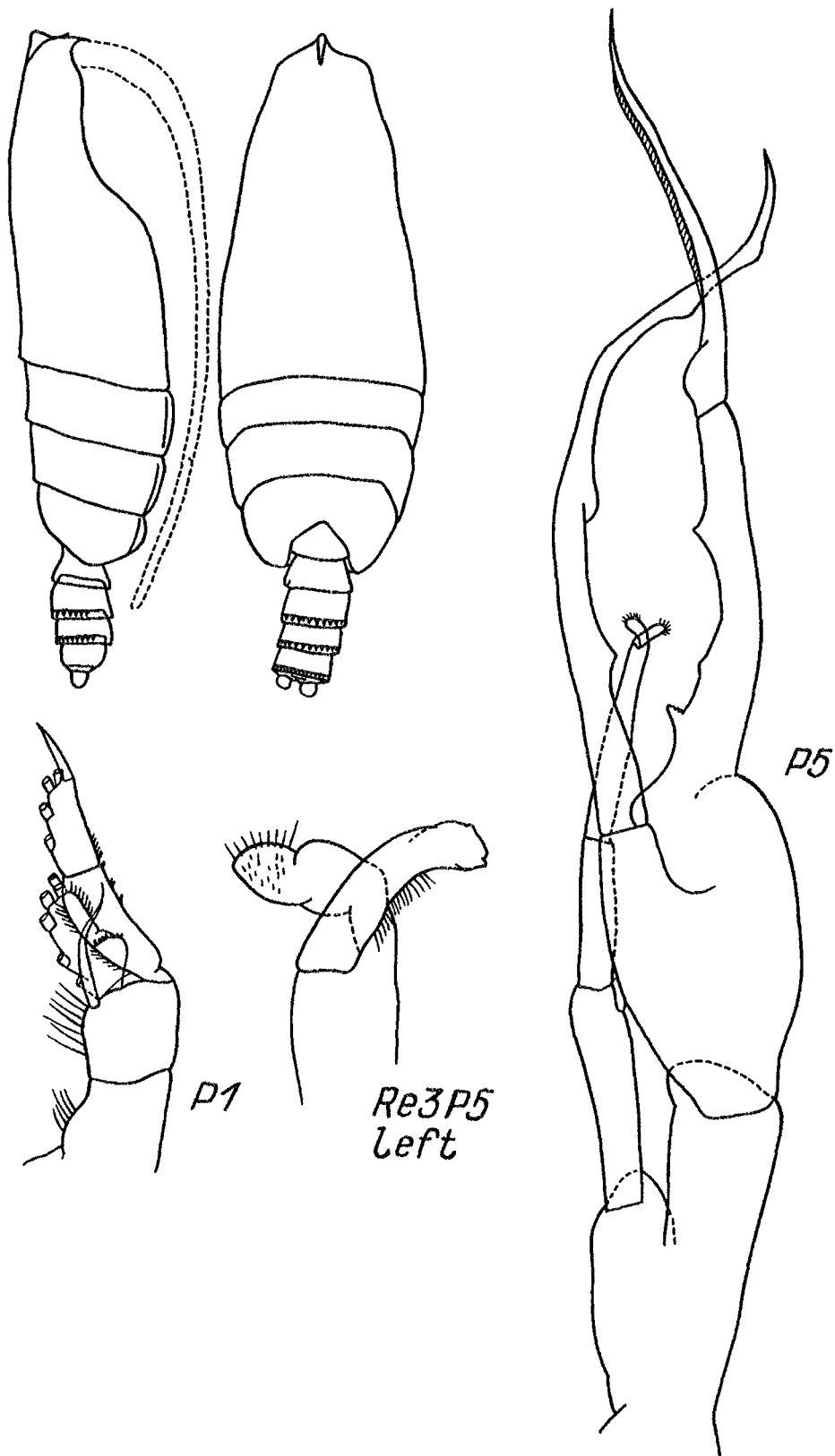


Fig. 115. *Euchirella bitumida*. Male (from Bradford & Jillett, 1980).

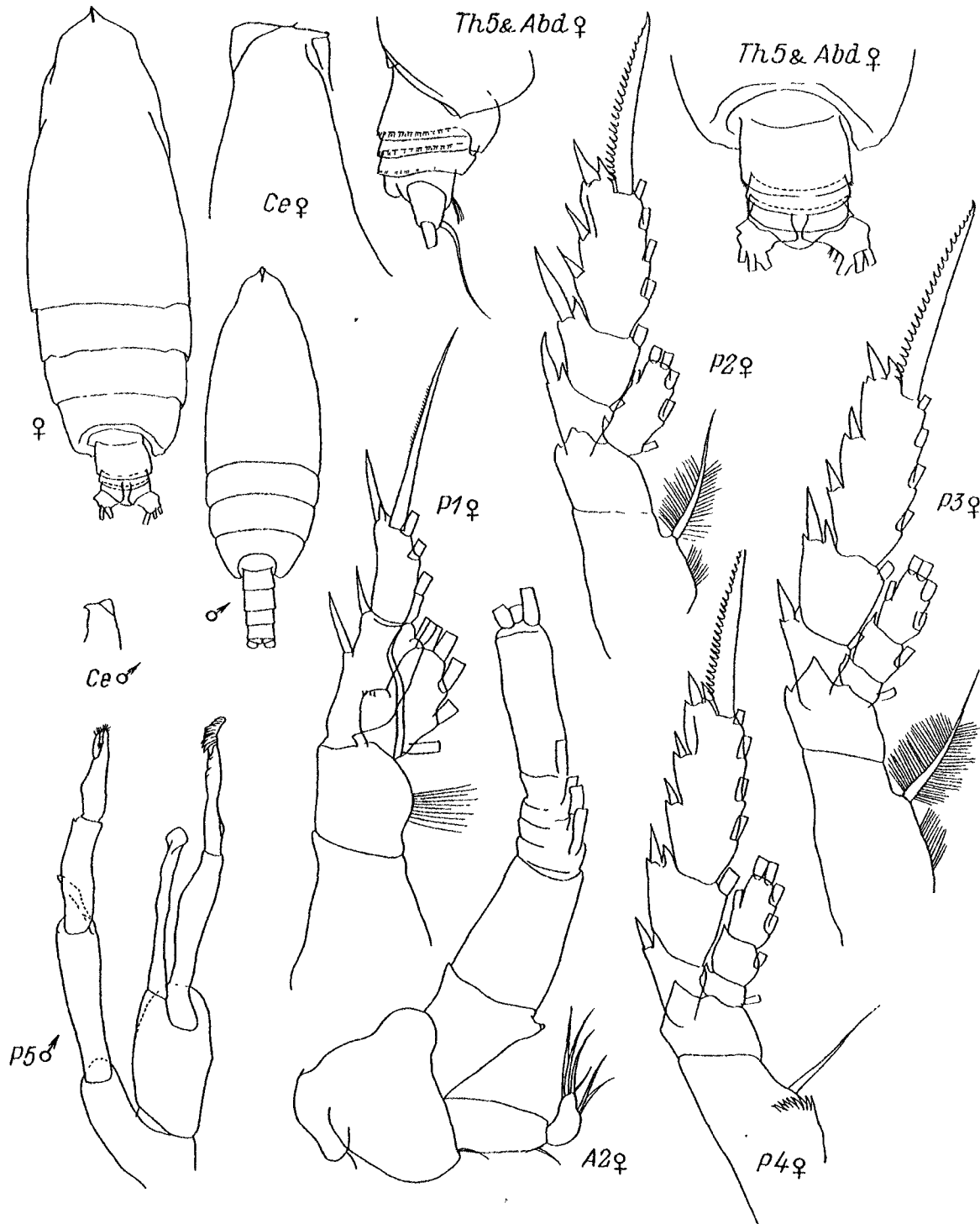


Fig. 116. *Euchiarella curticauda*. Female (170). Male (from Bradford & Jillett, 1980).

Vertical distribution. The species was found in epipelagial (Grice, 1962; Tanaka & Omori, 1969a, b; Bradford & Jillett, 1980), later some authors, Park (1976b) and the present author, also recorded the species from mesopelagial. Park found the species to 3000 m, but noted the major number of specimens

between 500-1000 m in daytime and in the upper 100 m at night. The species also found in total hauls from 700-1400 m.

Material: 8 females and 1 male from samples 170, 390, 400-401, 419, 573.

5. *Euchirella formosa* Vervoort, 1949

(Figs. 117-118)

Euchirella formosa Vervoort, 1949: 29, figs 14-15, 1963: 134; Bradford & Jillett, 1980: 35, fig. 22; Von Vaupel Klein, 1984: 38.

Euchirella trigrada Tanaka, 1957b: 184, fig. 49.

Euchirella orientalis Tanaka & Omori, 1969a: 52, fig. (7 a-i); Von Vaupel Klein, 1972: 506, fig. 4 (a-b), tabs. 1, 2, 1980: 152.

Description. Female. Total length 4.80-5.50 mm. Cephalothorax 4.0-5.0 times longer than abdomen. Crest absent. Rostrum well developed. Th5 posterior corners rounded (lateral view), of slightly rectangular shape (dorsal view). Genital segment slightly asymmetrical with 2 (dorsal view) and 3 (lateral view) swellings on the left and 1 swelling on the right. A1 reaching the end of genital segment. Ri A2 is about one fourth of Re A2 length. Ri2 A2 with 5 setae on external and 4 setae on internal lobe. Coxopodite, basipodite and Ri1 A2 with 1 seta each. Mx1 gnathobase with 3 setae on posterior surface; second and third internal lobes with 4 and 2 setae respectively; protopodite near Ri base with 3 setae (1 robust long and 2 small, thin setae); Ri with 4 setae; Re with 11 setae, and external lobe with 8 setae. Md palp base and Ri1 Md without setae; Ri2 Md with 9 setae. Mx2 and Mxp typical of the genus. Re P1 first external spine reaching the middle of the next spine. P2-P4 typical of the genus. Re terminal spines with 23-24 denticles. P4 coxopodite with 2 spines.

Male. (Description after Tanaka & Omori (1969a) with modifications). Total length 4.75-5.20 mm. Cephalothorax 4 times longer than abdomen. Cephalon differs from that of female by low crest with lens in its anterior part. Abd2-3 with minute denticles along posterior border. A1 reaching the end of Abd2. External Ri2 A2 lobe with 5 setae; internal lobe with 5 long setae and 1 short setae. Mx1 with strongly reduced first-third internal lobes; external lobe with 6 setae; Re with 10 setae; Ri and protopodite near Ri base with 5 setae together. Re1 A2 with 1 small spine. Left P5 basipodite exceeding right protopodite. Left Re1 P5 not reaching proximal border of right Ri. Re1 of right P5 with 4 swellings along internal margin.

Notes. *E. formosa* close to *E. orientalis* Sewell, 1929. Some authors (Tanaka & Omori, 1969a; Von Vaupel Klein, 1972, 1980) considered these species to be synonymous. Von Vaupel Klein in his recent work (1984: 50) noted, that *E. orientalis* Sewell, 1929 (non Tanaka & Omori, 1969a), though doubtful species, should be considered as self-dependent.

Type locality: 10°49'S 123°59'E.

Geographical distribution. Pacific Ocean: the species was found from the north-western (Brodsky, 1962; Tanaka, 1957b; Tanaka & Omori, 1969a) and

tropical parts (Von Vaupel Klein, 1984), from the region of the Kurile-Kamchatka Trench (original data), in the south-western (Bradford & Jillett, 1980) and south-eastern (Grice & Hulsemann, 1968; original data) parts. Indian Ocean: the species was found in the western part to 29°S (Grice & Hulsemann, 1967). Known from the region of the Malay Archipelago (Vervoort, 1949; Von Vaupel Klein, 1984).

Vertical distribution: The species was found in epipelagial (Vervoort, 1949; Von Vaupel Klein, 1984; Bradford & Jillett, 1980), known also from total hauls.

Material: 1 female from sample 169.

6. *Euchirella galeata* Giesbrecht, 1888

(Fig. 119)

Euchirella galeata Giesbrecht, 1888: 336 (part.), 1892: 233, 241, 743, pl. 15, fig. 18, pl. 36, fig. 26 (? part., non pl. 36, fig. 22); Vervoort, 1949: 32, fig. 16 (a-c); Tanaka & Omori, 1969: 43, fig. 4 (a-k); Von Vaupel Klein, 1972: fig. 3c, tabs. 1-2, 1984: 38; Bradford & Jillett, 1980: 32.

Description. Female. Total length 5.20-6.70 mm. Cephalothorax 4-5 times longer than abdomen. Crest present, sufficiently high. Rostrum straight, robust (lateral view). Genital segment slightly wider than long; abruptly asymmetrical, left side (dorsal view) with very large projection along the length of the segment. A1 longer than body by 2 last segments (Vervoort (1949) noted A1 reaching distal Abd3 border). Ri A2 about 3 times shorter than Re. Coxo- and basipodite, as well as Ri1 A2 with 1 seta each; Ri2 A2 with 6 setae on each lobe. Md palp base and Ri1 Md without setae; Ri2 Md with 9 setae. Mx1 gnathobase with 3 setae on posterior surface; second and third internal lobes with 4 and 2 (?) setae respectively. Mx1 protopodite near Ri base with 3; Ri with 4 setae; Re with 11 setae, external lobe with 6 setae. Mx2 and Mxp typical of the genus. Re P1 first external spine long, reaching the last third of the length of second external spine. P2-P4 typical of the genus. P4 coxopodite with 1 spine.

Male. (Description after Tanaka & Omori (1969a) with modifications). Total length 4.70-5.33 mm. Cephalothorax nearly 4 times longer than abdomen. Crest significantly lower than in female, rostrum slightly larger. Oral parts and P1-P4 close to that in *E. bitumida*.

Type locality: the eastern part of the Pacific Ocean.

Geographical distribution. Most likely the species is distributed in the Pacific and Indian oceans. It is difficult to specify the area of distribution more or less accurately since the species might be mixed with *E. grandicornis*, as was mentioned earlier (Von Vaupel Klein, 1984).

Vertical distribution. The species is usually found in the upper 500 m (Sewell, 1929; Vervoort, 1949;

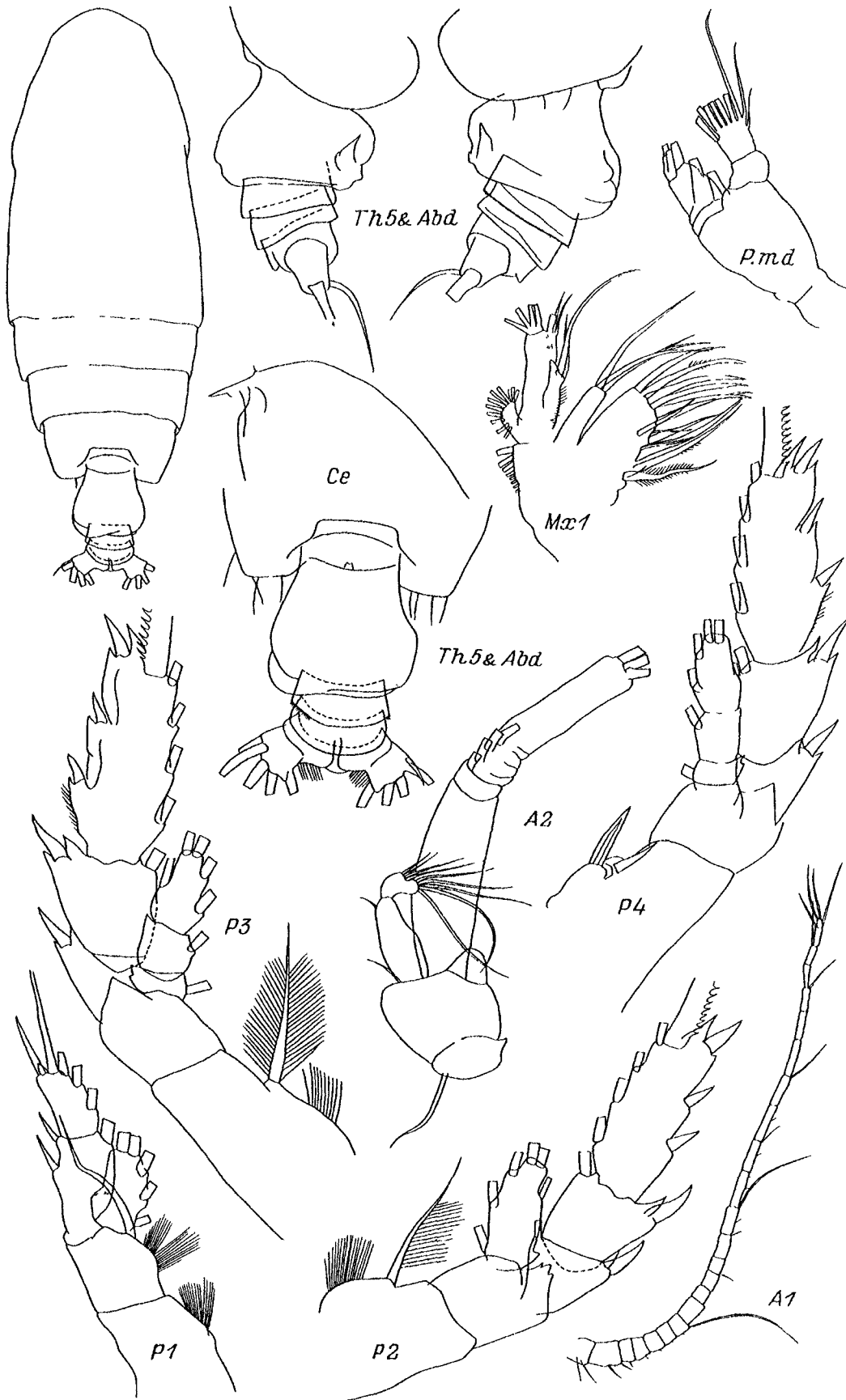


Fig. 117. *Euchirella formosa*. Female (169).



Fig. 118. *Euchirella formosa*. Male (from Tanaka & Omori, 1969a).

Tanaka & Omori, 1969a,b); in the region of the Malay Archipelago it was found near surface (Von Vaupel Klein, 1984).

Material: 2 females from samples 401-402.

7. *Euchirella grandicornis* Wilson, 1950

(Fig. 120)

Euchirella grandicornis Wilson, 1950: 223, pl. 9, figs 98-100, Tanaka & Omori, 1969a: 45, fig. 5 (a-i); Bradford & Jillett, 1980: 32; Von Vaupel Klein, 1980: 153, 1984: 38. ? *Euchirella galeata* Giesbrecht, 1888: 336 (? part.); 1892: 233, 241, 743, pl. 15, fig. 18, pl. 36, fig. 22 (part. non pl. 36, fig. 26); Wilson, 1950: 221, pl. 9, fig. 90 (female part. non pl. 9, fig. 89, pl. 23, fig. 337).

Description. F e m a l e. Total length 5.97-6.80 mm. Cephalothorax 4.0-4.6 times longer than abdomen. Anterior part of cephalon with low, rounded crest (lateral view). Rostrum small, pointed. Th5

widely rounded laterally. Genital segment nearly as long as wide, asymmetrical, with small projection on back side in posterior half on the left (dorsal and lateral view). Posterior borders of Abd1-3 with minute spinules. A1 23-jointed, reaching the end of caudal rami. Re A2 2.6 times longer than Ri, Ri2 A2 with 6 setae on each lobe. Ri2 Md with 9 setae. Mx1 with 3 setae on posterior surface of gnathobase and 4 and 2 setae (Tanaka & Omori (1969a) mentioned 3 setae) on second and third internal lobes respectively; protopodite near Ri base with 3 setae; Ri with 4 setae (3 after Tanaka & Omori (1969a)); Re with 11 setae; external lobe with 7-8 setae. Mx2 and Mxp, as well as P1-P4 typical of the genus. P4 coxopodite with 1 spine.

Type locality: between Peru and Galapagos Isles.

Geographical distribution. Pacific Ocean: the species was found in the north-eastern part from the region of 14°N 132°W (original data) and off the area between Peru and Galapagos Isles (Wilson, 1950; Tanaka & Omori, 1969a; Von Vaupel Klein, 1984).

Vertical distribution. The species was found in total hauls from 549-4600 m (Wilson, 1950; Tanaka & Omori, 1969a; Von Vaupel Klein, 1984) and in layer 153-500 m (original data).

Material: 2 females from sample 203.

8. *Euchirella maxima* Wolfenden, 1905

(Figs. 121-122)

Euchirella maxima Wolfenden, 1905: 18, pl. 6, figs 9-11, With, 1915: 127, pl. 4, fig. 5 (a-h), text-fig 33 (a-i), Sars, 1924-25: 75, pl. 22, figs 1-7; Tanaka & Omori, 1969a: 48, 1969b: 157, fig. 1 (a-g); Von Vaupel Klein, 1972: 500, 506, pl. 5c, 6 (a-b), tabs. 1-2, 1984: 41; Park, 1976b: 101, 107, 112, fig. 4 (a-l), tab. 1, 1978: 149-151, fig. 30; Bradford & Jillett, 1980: 33.

Description. F e m a l e. Total length 6.50-8.70 mm. Cephalothorax nearly 6-7 times longer than abdomen. Crest present, high. Rostrum strongly reduced. Posterior Th5 corners asymmetrical, not rounded. Genital segment asymmetrical, with small projection on the right in anterior half of the segment (dorsal view). Ri2 A2 with 5 setae on each lobe. Ri as long as one third of Re length. A2 basipodite without seta; Ri1 A2 with 1 seta. Mx1 protopodite near Ri base with 3 setae; Ri with 3 setae; Re with 11 setae. P4 coxopodite with 1 powerful spine (formed by fusion of 5-8 spines).

M a l e. (Description after Park (1978) with modifications). Total length 6.10-7.35 mm. Cephalothorax 3.3 times longer than abdomen. Crest present. Rostrum small, better developed than in females. Th5 posterior corners rounded. Ri A2 is a fourth of Re A2 length. Ri2 A2 external lobe with 6 setae and internal lobe with 6 long and 1 small short setae. Ri2 Md with 8 setae. Mx1 and Mx2 setation severely reduced. Re P1 with very small

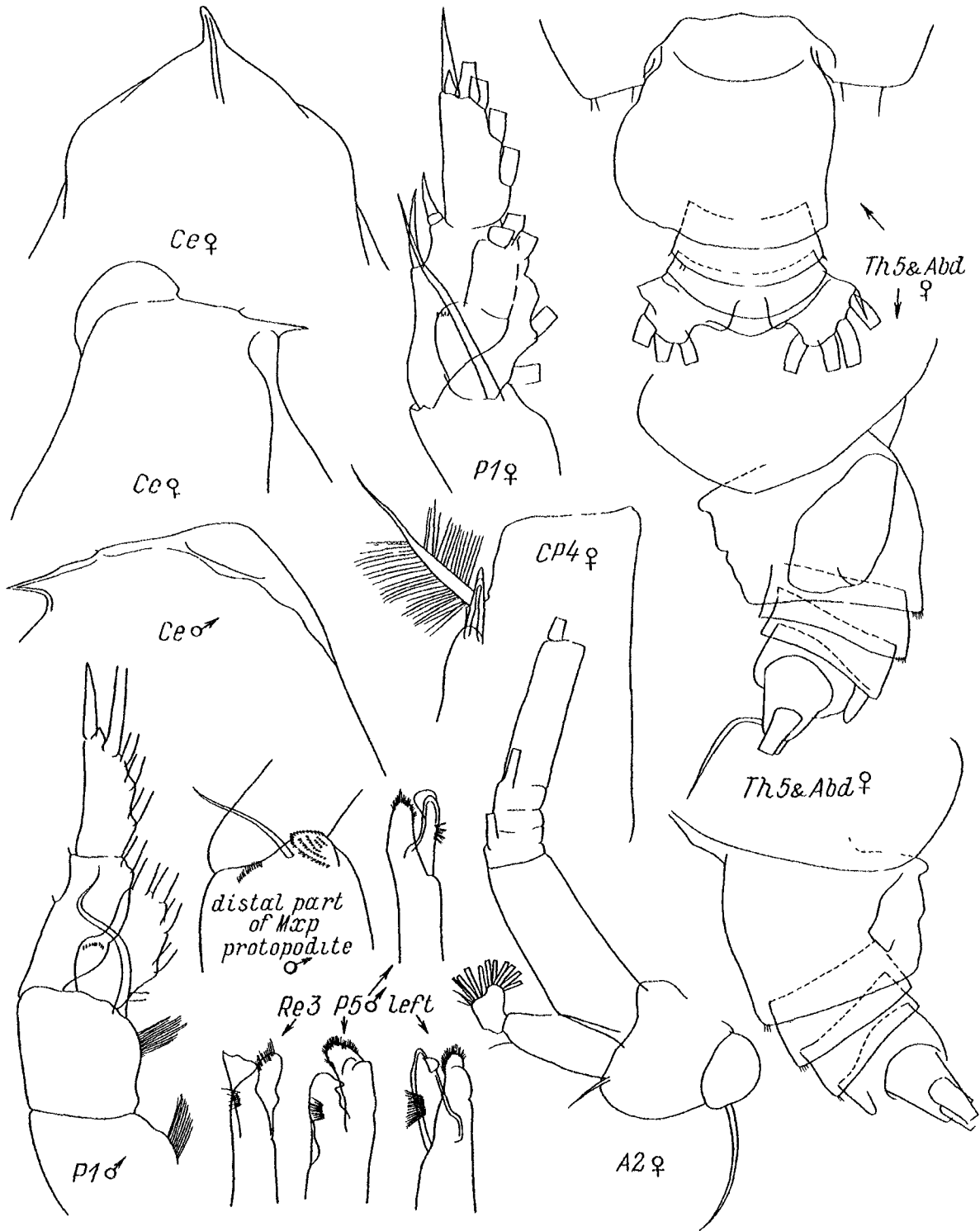


Fig. 119. *Euchirella galeata* Female (401). Male (from Tanaka & Omori, 1969a).

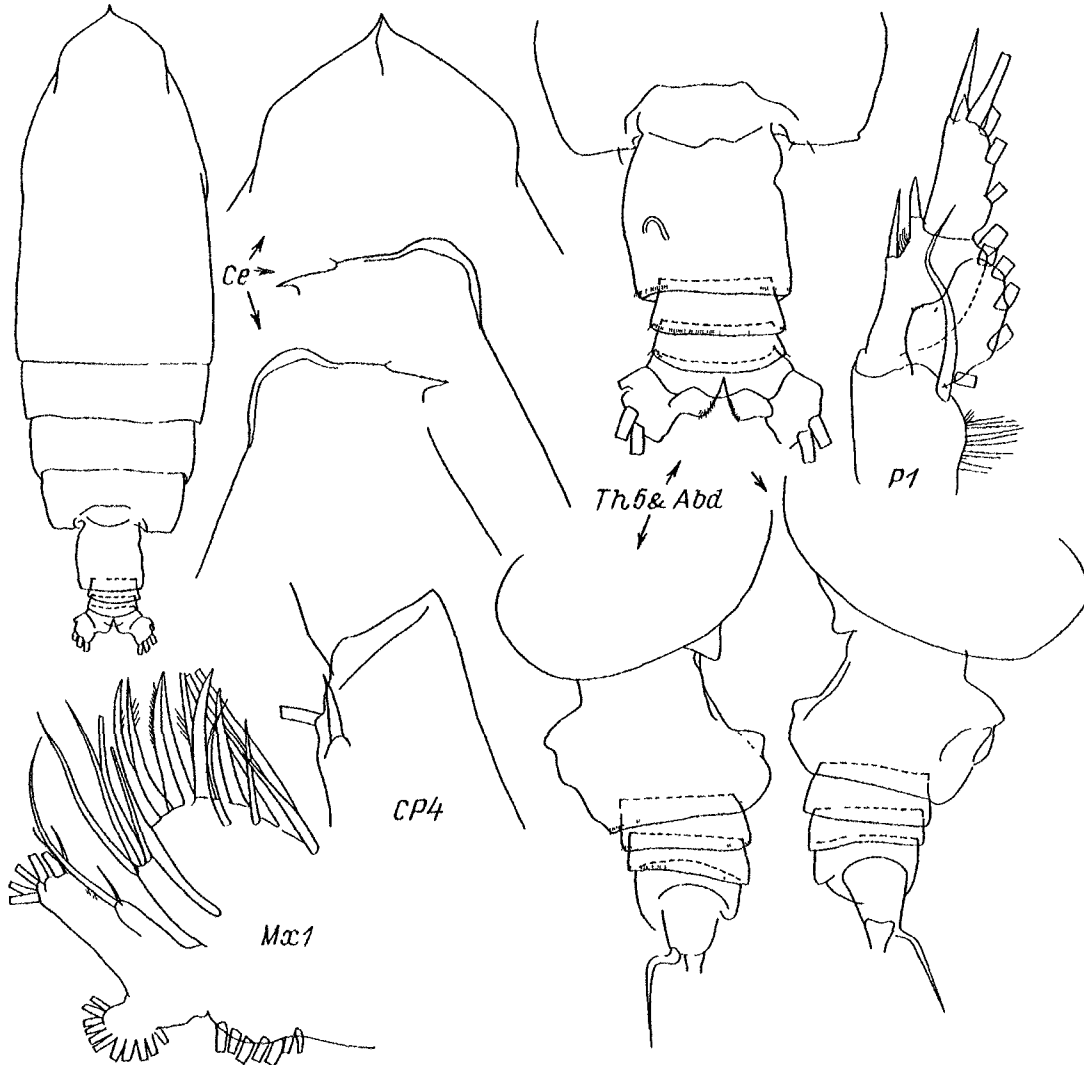


Fig. 120. *Euchirella grandicornis*. Female (203).

first external spine; second external spine is adequately developed. P5 biramous; both Ri well developed. Re P5 right 2-jointed; Ri nearly as long as Re1, Ri external surface with 2 knobs. P5 right rami do not form tongs.

Type locality. tropical Atlantic.

Geographical distribution. Atlantic Ocean: the species was found in the north-eastern, northern and tropical Atlantic up to 63°N to 35°S (Jespersen, 1940; Wolfenden, 1911), in the Gulf of Mexico, Gulf of Guinea (With, 1915; Sars, 1925; Wolfenden, 1905; Vervoort, 1963; Park, 1976b). Pacific Ocean: northern, western and south-eastern parts (Tanaka & Omori, 1969a; original data); in the southern part up to 34°S (Grice & Hulsemann, 1968); in the antarctic part from the region of

55°S (Park, 1978). The species is also recorded from the Indian Ocean.

Vertical distribution. The species was found in hauls from epipelagial and upper mesopelagial (Vervoort, 1963; Owre & Foyo, 1967; Tanaka & Omori, 1969a; Park, 1978; Von Vaupel Klein, 1984), also from total hauls from deeper layers.

Material 2 females from samples 444, 447.

9. *Euchirella messinensis indica*

Vervoort, 1949

• (Fig. 123)

Euchirella messinensis Tanaka, 1957b: 180, fig 46.

Euchirella indica Vervoort, 1949 23, fig 8b, 11, 12

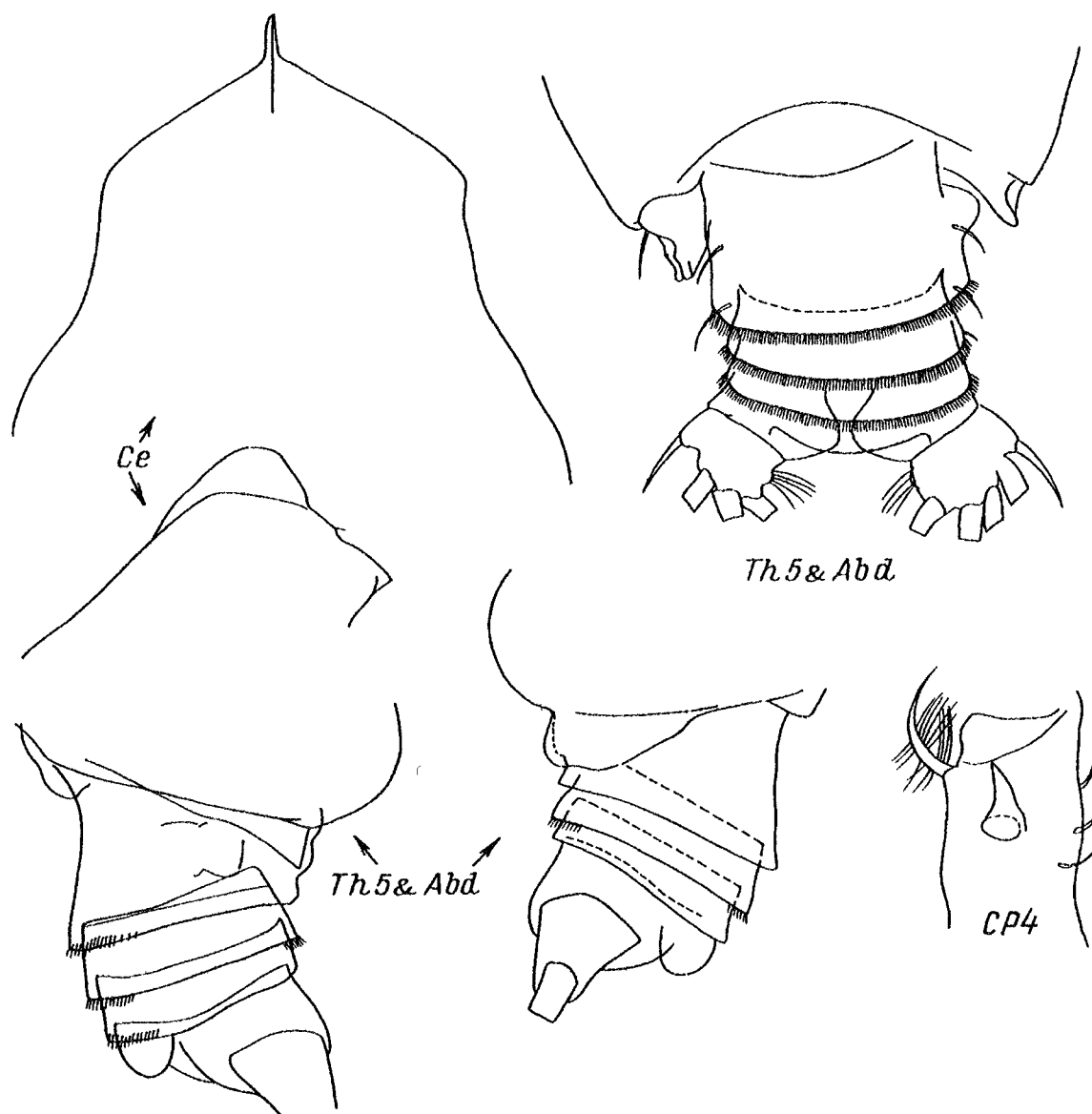


Fig. 121. *Euchirella maxima*. Female (447).

(a-b); 1963:134; Bradford & Jillett, 1980: 37, fig. 23. *Euchirella messinensis indica* Tanaka & Omori, 1969a: 48, fig. 6 (f-m); Von Vaupel Klein, 1972: 506, pl. 1-2, 5d, tab. 1-2, 1982: 5, 1984: 35.

Description. F e m a l e. Total length 3.85-5.30 mm. (After Bradford & Jillett (1980)). The body shape is similar to *E. messinensis messinensis*. Differs in the shape of genital segment, although asymmetrical, but with projection in left posterior part of the segment smaller than in *E. messinensis messinensis* (dorsal view). All other features in structure of body and limbs close to that in *E. m. messinensis*.

M a l e. Total length 4.00-4.20 mm. Cephalon

with low crest. Body shape close to *E. m. messinensis*. Left Re P5 exceeding the first projection on Ri P5 right.

Type locality: 4°21'N 120°01'E.

Geographical distribution. Most probably the species is distributed in tropical and subtropical parts of the Indian and Pacific oceans (Vervoort, 1949; Tanaka & Omori, 1969a; Von Vaupel Klein, 1984), recorded off New Zealand (Bradford & Jillett, 1980).

Vertical distribution. The species was found mostly in total hauls, rarely from mesopelagial.

Material: 9 females and 1 male from samples 49, 395, 406.

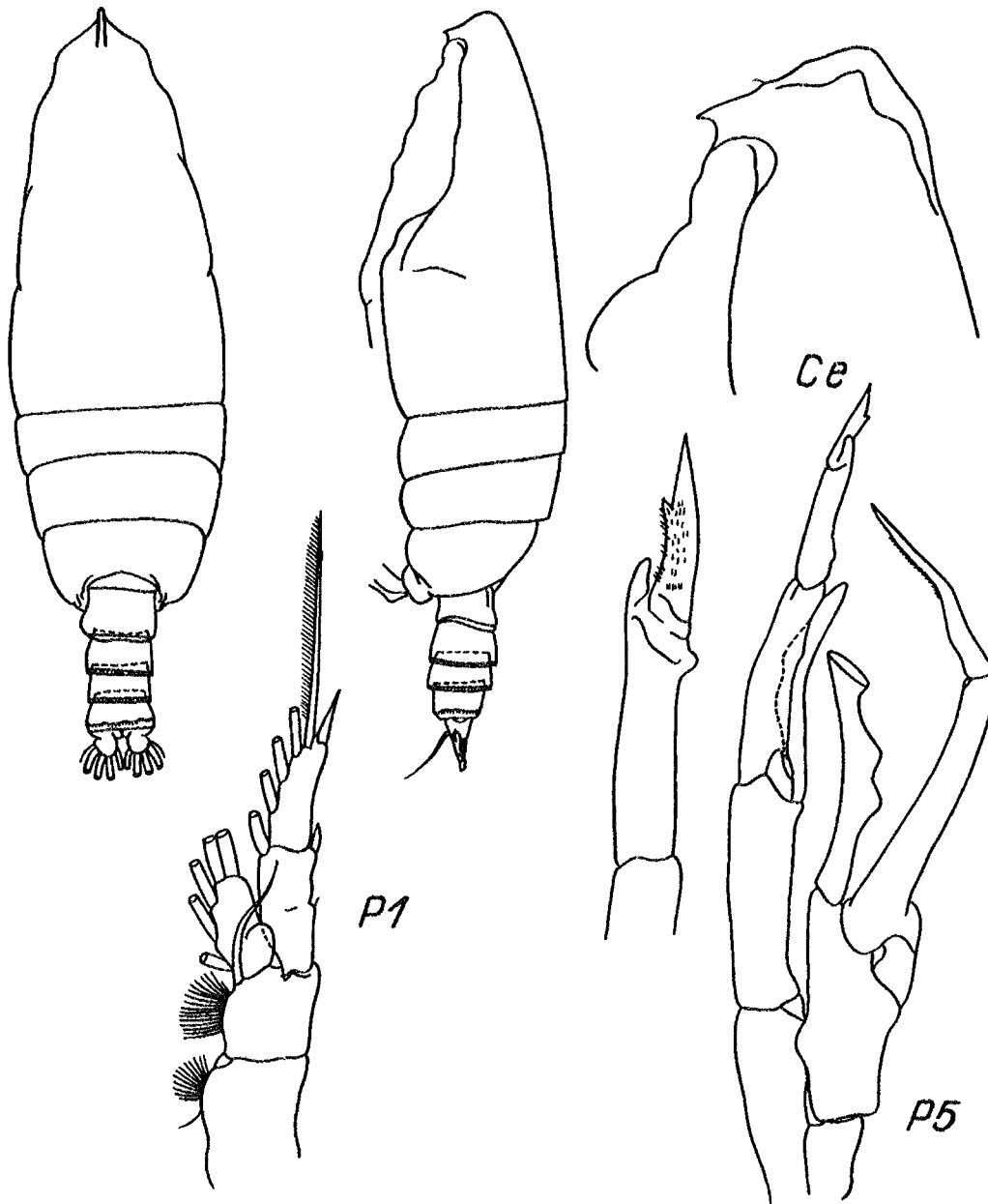


Fig. 122. *Euchirella maxima*. Male (from Park, 1978).

10. *Euchirella messinensis messinensis*
(Claus, 1863)

(Fig. 124)

Undina messinensis Claus, 1863: 187, pl. 31, figs 8-17.

Euchirella messinensis: Giesbrecht, 1892: 233, 239, 244, 743, pl. 15, figs 1-2, 12, 14-17, 21, 24, pl. 36, figs 14-15, 18, 24; Sars, 1924-25: 65, pl. 19, figs 6-13; Tanaka & Omori, 1969a: 51, fig. 6 (a-e); Von Vaupel Klein, 1972: 506, fig. 4 (b-c), tabs 1, 2, 1982: 376, figs 1-2, pl. 1-3; Park, 1976: 113, fig. 5; Bradford & Jillett, 1980: 39, fig. 25.

Euchirella messinensis messinensis: Von Vaupel Klein, 1982: 6, figs 1-16, pl. 1-23, 1984: 34.

Description. Female. Total length 4.40-6.20 mm. Cephalothorax nearly 4 times longer than abdomen. Rostrum comparatively large. Crest absent. Posterior Th5 corners rounded (lateral view), of slightly rectangular shape (dorsal view). Genital segment abruptly asymmetrical: its left side with large projection, covering 2 next abdominal segments (dorsal and lateral view). Genital segment nearly 1.2 times longer than wide. A1 slightly longer than cephalothorax, 24-jointed. Ri A2 about 5 times shorter than Re. Coxo- and basipodite and Ri1 A2 with 1 seta each. Ri2 A2 with 5 setae on external and 4 on internal lobe. Md palp base without setae; Ri1 Md with 1 very small seta; Ri2 Md with 9 setae. Mx1 with 3 setae on posterior gnathobase surface.

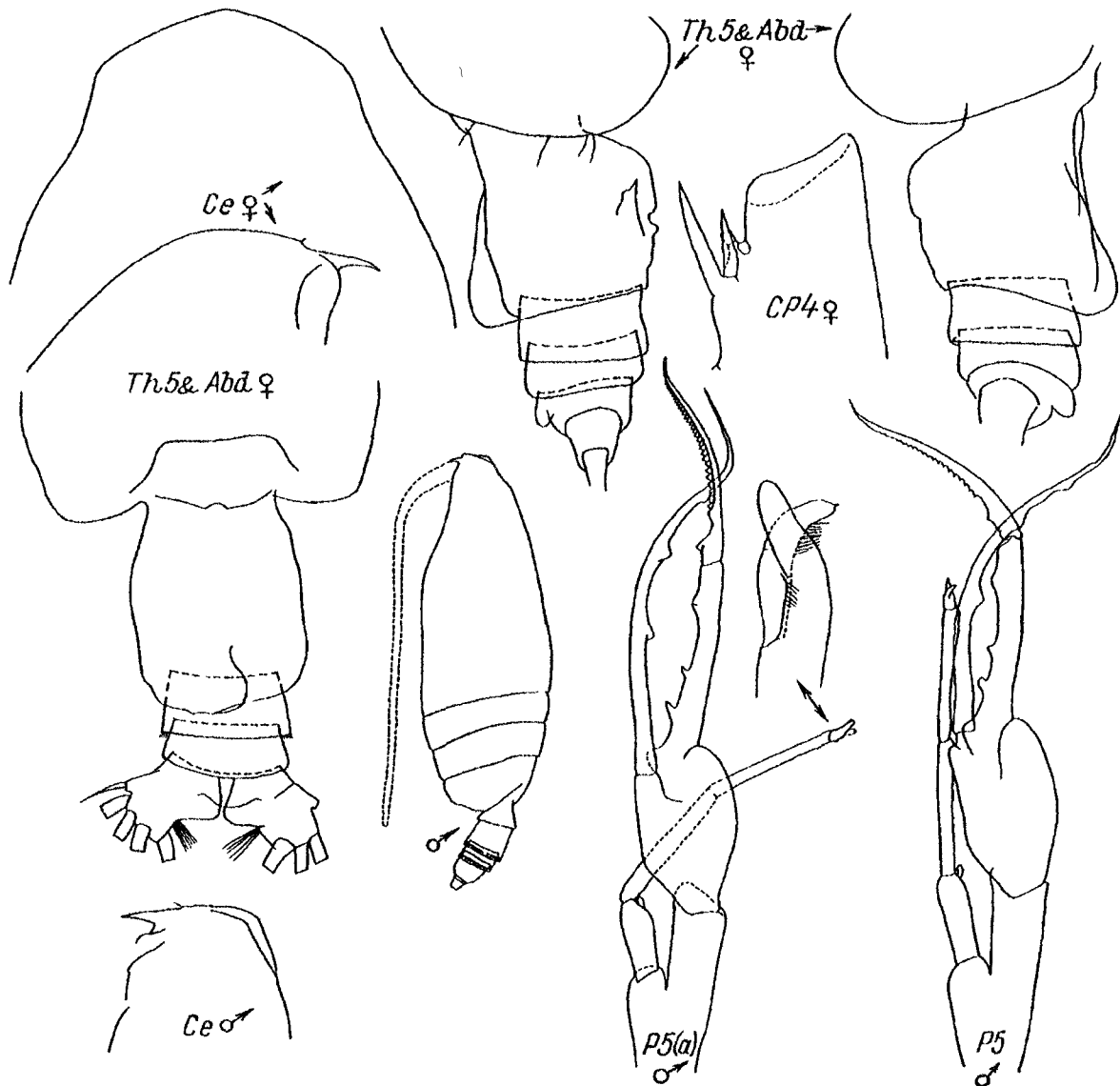


Fig. 123. *Euchirella messinensis indica*. Female: C P4 (from Bradford & Jillett, 1980). Male: general view, Ce, P5(a) (from Bradford & Jillett, 1980), other figures (49).

and 4 and 3 setae (1 long and 2 small) on second and third internal lobes respectively; propodite with 3 setae near Ri base; Ri with 4 setae and Re with 11 setae. Mx2 and Mxp typical of the genus. P1 Re1 with first external spine longer than the second and exceeding two third of its length. P2-P4 typical of the genus. Terminal Re spines with about 19 denticles. P4 coxopodite with 2 spines.

M a l e. (Description after Bradford & Jillett (1980) with modifications). Total length 2.80-5.46 mm. Differs from female in low crest. Rostrum well developed. Re3 P5 left not reaching the first projection of Ri of right leg.

Type locality: the Mediterranean Sea.

Geographical distribution is difficult to describe since the species is very close to *E. messinensis*

indica and was probably mixed with *E. messinensis messinensis*. Some authors consider that further investigations would confirm allopatry of these species, and restrict distributional area of *E. m. messinensis* to the Atlantic Ocean and the Mediterranean Sea and *E. m. indica* to Indo-Pacific region (Von Vaupel Klein, 1984).

Due to the above mentioned reason the vertical distribution is difficult to describe. In the Gulf of Mexico species was found in day time in 500-2000 m, with the richest catches upper than 1000 m, at night the richest catches were in the upper 100 m. This is a good evidence of intensive diurnal migrations (Park, 1976b). The species was also recorded in haul 0-150 m in the north-western Atlantic (Von Vaupel Klein, 1984).

Material: 1 female from sample 573.

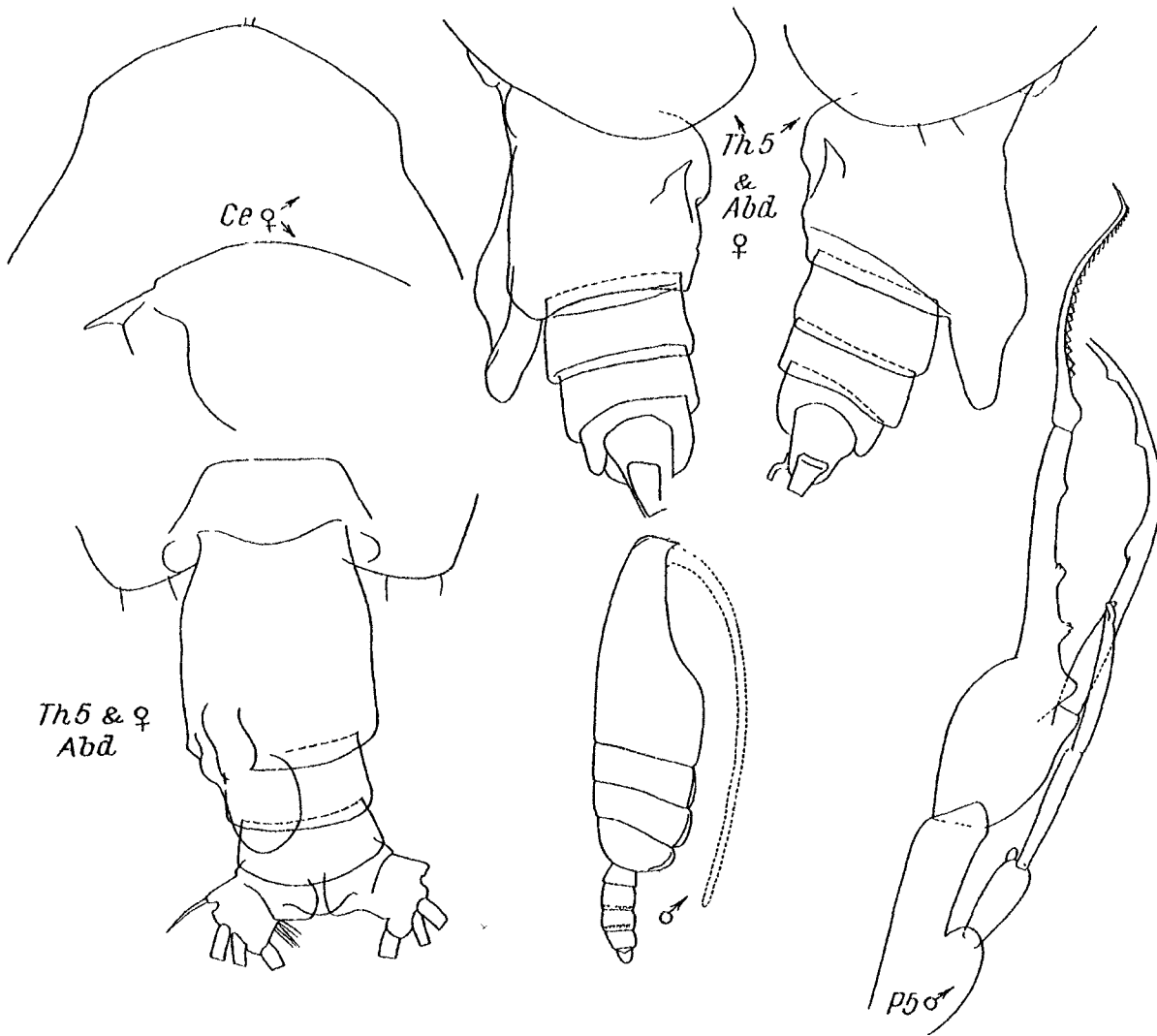


Fig. 124. *Euchirella messinensis messinensis* Female (573). Male (from Bradford & Jillett, 1980).

11. *Euchirella pseudopulchra* Park, 1976

(Fig. 125)

Euchirella pseudopulchra Park, 1976a: 208, 211, fig. 1 (A-L), 1976c: 101; Bradford & Jillett, 1980: 33; Von Vaupel Klein, 1980: 153, 1984: 41, fig. 2, (b, c, d, e, f).

Euchirella pulchra (non Lubbock, 1856): Davis, 1949: 31, pl. 3, figs 42-43, pl. 4, figs 44-48 (female only).

Description. Female. Total length 3.55-4.35 mm. Cephalothorax 4 times longer than abdomen. Anterior part of cephalon of rectangular shape (lateral view), with crest. Rostrum small. Th5 posterior corners rounded (lateral view), close to rectangular shape (dorsal view). Genital segment asymmetrical (dorsal view), with wide round swelling in anterior part of left side and depressed in its midlength on the right. Posterior surface of genital segment depressed (left

lateral view), with low chitinous crease anteriorly on the right side. Genital swelling well pronounced, shifted anteriorly. A1 reaching the end of Abd2. A2 with long Re and small Ri that is less than half length of Re1 A2. Coxopodite, basipodite and Ri1 A2 with 1 seta each; Ri2 A2 with 6 setae at each lobe. Md palp base and Ri1 Md without setae. Mx1 with 2(?) setae on posterior surface of gnatho-base; second internal lobe with 4 setae; third internal lobe with 2 setae; protopodite near Ri base with 3 setae; Ri with 4 setae; Re with 11 and external lobe with 6 setae. Mx2 and Mxp typical of the genus. Re1 P1 with 2 external spines equal in length. P4 with 2-3 spines.

Male unknown.

Type locality: the north-eastern part of the Pacific Ocean, Washington Sound.

Geographical distribution. Pacific Ocean: the north-western, northern and south-eastern parts (Park, 1976a; Von Vaupel Klein, 1984; original data).

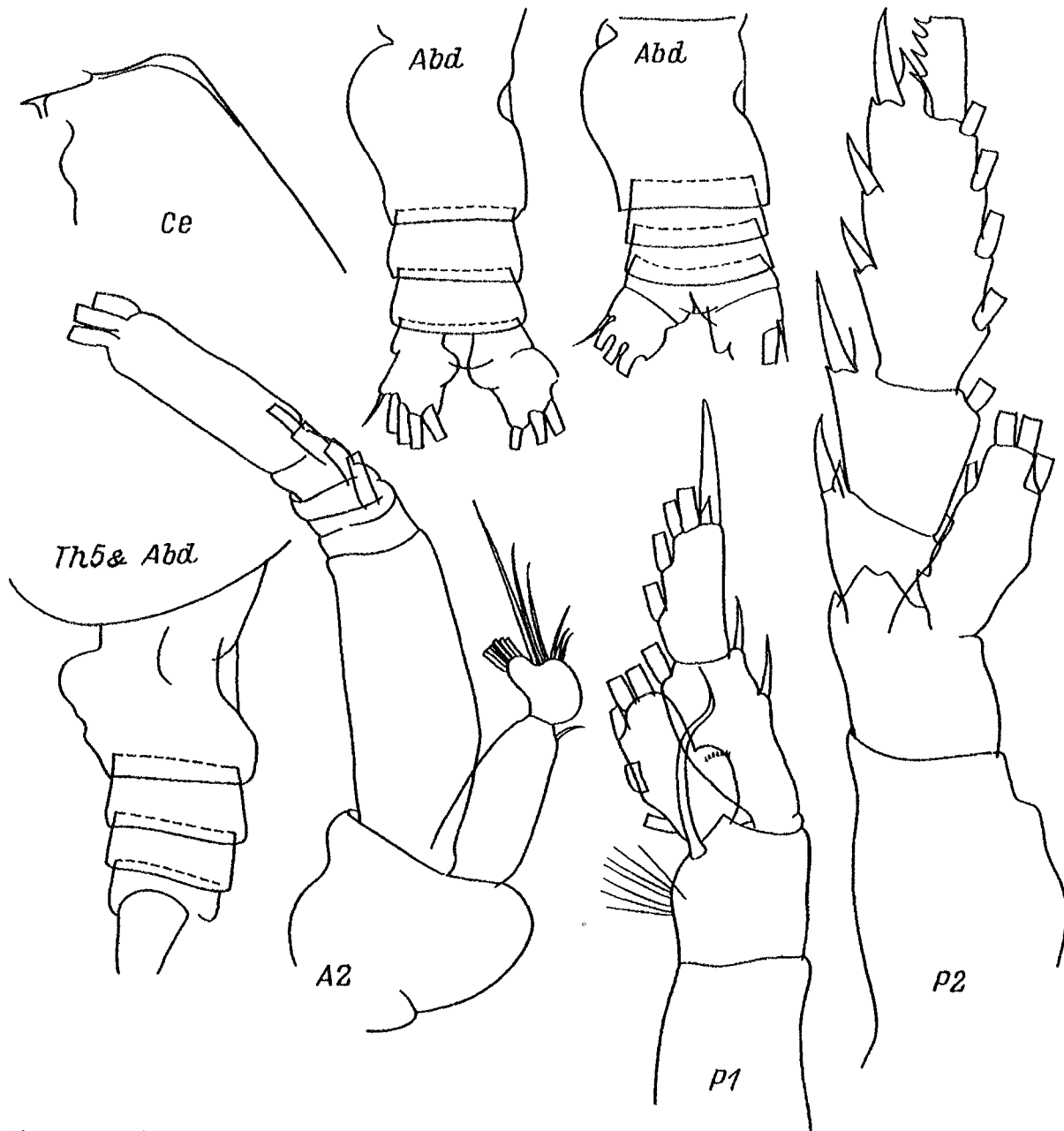


Fig. 125. *Euchiarella pseudopulchra*. Female (574, 575).

Vertical distribution. The species was found in epipelagial (Park, 1976a), in total hauls between 500 and 2000 m.

Material: 2 females from samples 6, 575.

12. *Euchiarella pseudotruncata* Park, 1975

(Figs 126-127)

Euchiarella pseudotruncata Park, 1975c: 291, 294, figs 1-2, 1976b: 101, 115, fig. 6 (a-i), tab. 1, 2; Bradford & Jillett, 1980: 33; Von Vaupel Klein, 1980: 153, 1984: 43.

Description. Female. (Description after Park (1975c) with modifications). Total length 4.30-4.66 mm. Cephalothorax 4 times longer than abdomen. Rostrum present, small. Crest absent. Posterior corners of Th5 rounded, slightly rectangular (dorsal view). Genital segment slightly asymmetrical, with rounded projection on the left, slightly longer than wide (dorsal view). A1 slightly exceeding the caudal rami. Ri A2 slightly shorter than half Re length; Re1-Re2 A2 incompletely fused; Re1 A2 with triangular appendix. Coxopodite, basipodite and Ri1 A2 with 1 seta each; Ri2 A2 with 7 setae on external and 8 setae on internal lobes. Md palp base and Ri1 Md without setae. Mx1 with 13 setae on gnatho-

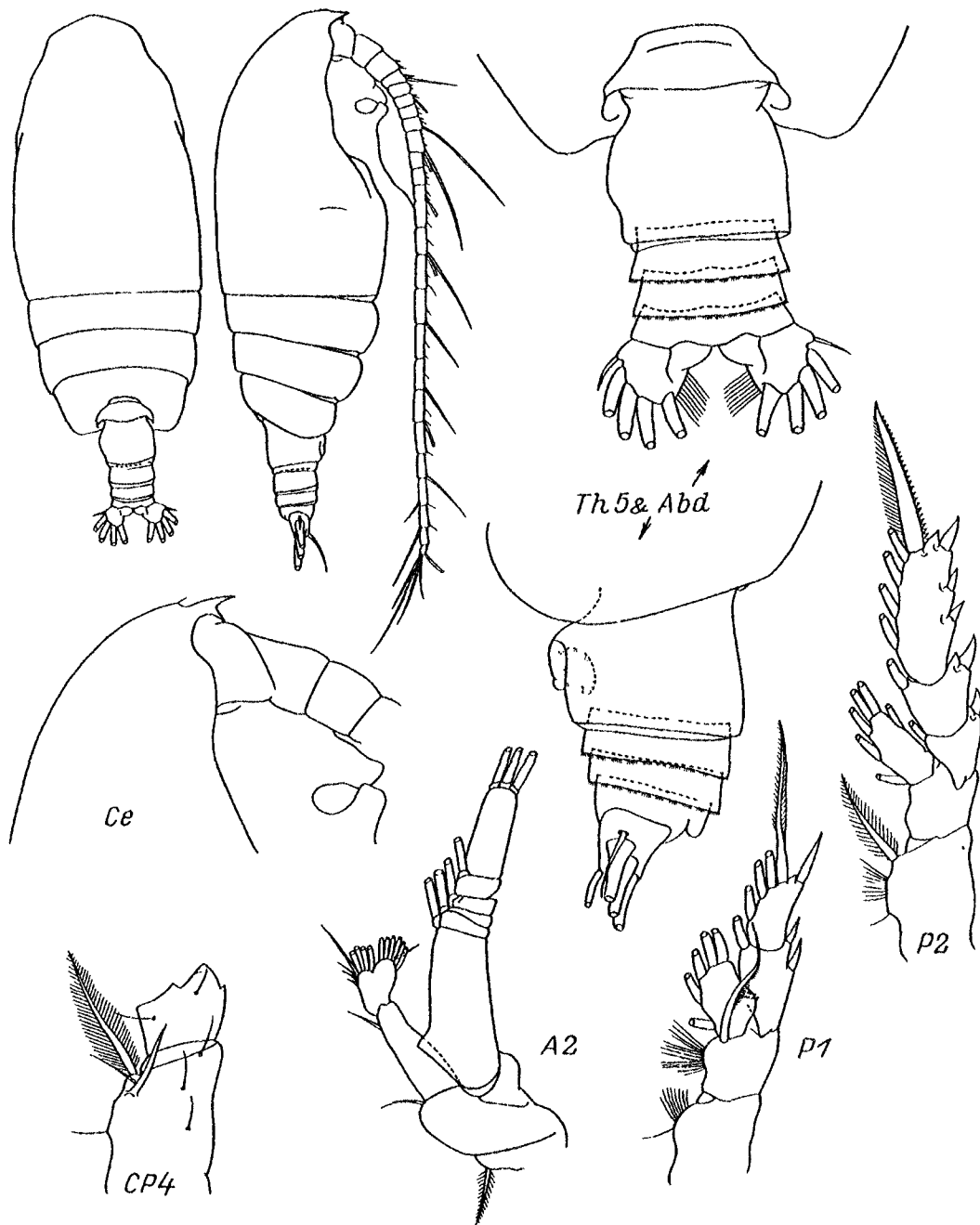


Fig. 126. *Euchirella pseudotruncata*. Female (from Park, 1975c).

base; 4 and 3 setae on the second and third internal lobes respectively; 3 setae on protopodite near Ri base; Ri with 5 setae; Re with 11 setae and 8 setae on external lobe. Mx2 and Mxp typical of the genus. Re P1 first external spine reaching nearly the midlength of second spine. P2-P4 typical of the genus. P4 coxopodite with 1 long spine.

M a l e. Total length 3.32-3.80 mm. Cephalothorax about 3.5 times longer than abdomen Seg-

mentation of cephalothorax as in females. Rostrum present. Crest absent. Th5 posterior corners rounded A1 reaching the distal Abd2 end. Ri A2 well developed and is two third of Re length. Oral parts reduced: Md without gnathobase; Mx1 internal lobes reduced, its protopodite without setae; Ri poorly developed with 5 setae; Re with 11 and external lobe with 7 setae. Mx2 severely reduced. Mxp is extremely faint. Re P1 with single rudimentary spine.

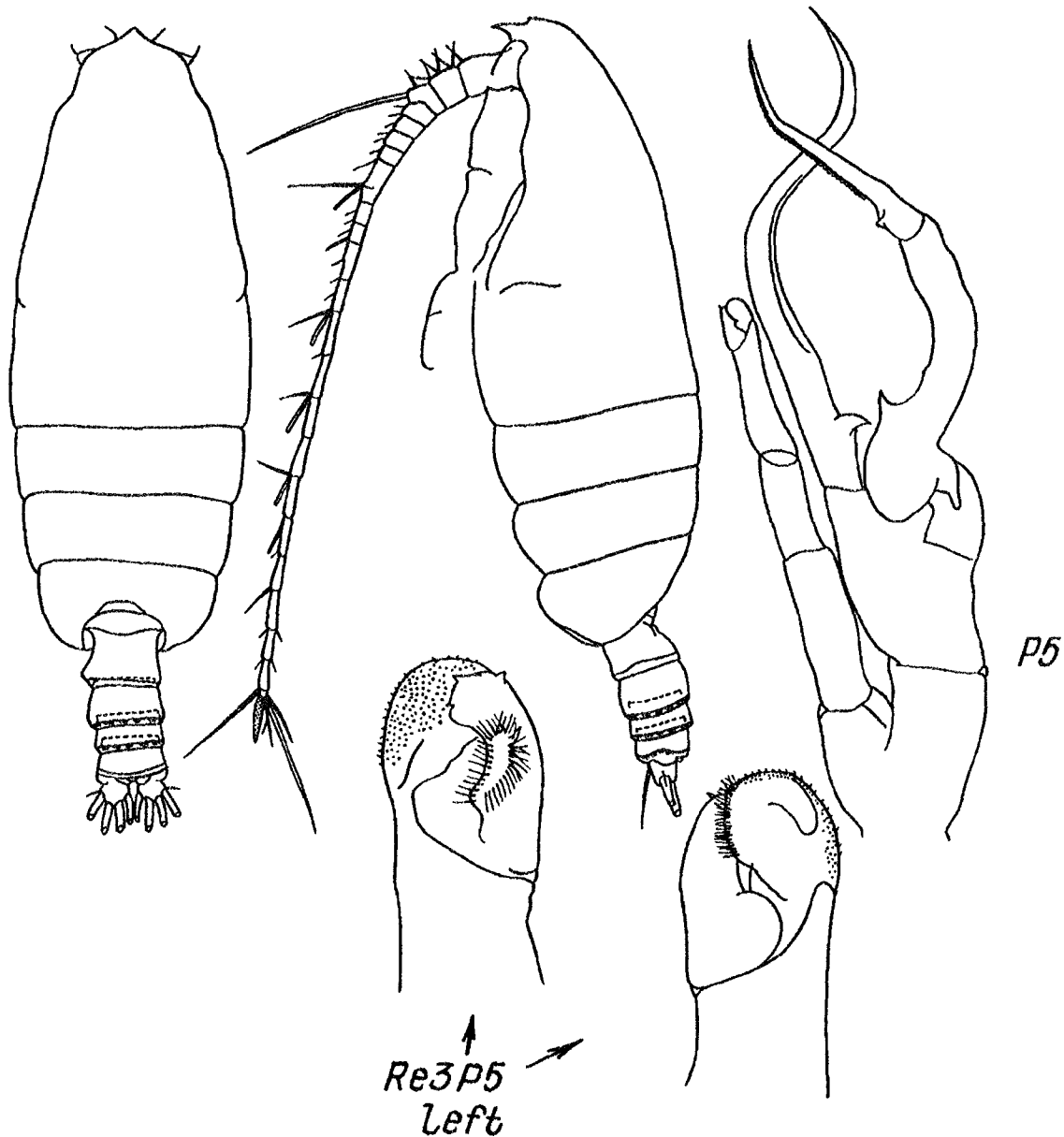


Fig. 127. *Euchirella pseudotruncata*. Male (from Park, 1975c).

P2-P4 segmentation as in females. P4 coxopodite without spine. P5 with uniramous left leg and well developed biramous right one. Right basipodite reaching about the midlength of Re1 P5 left. Right Ri P5 present as curved spine-like projection.

Type locality: the Gulf of Mexico.

Geographical distribution. The Sargasso Sea, the Caribbean Sea, the Gulf of Mexico (Park, 1975c; Von Vaupel Klein, 1984).

Vertical distribution. In the Gulf of Mexico the species was found in all sampled depths between 200 and 2000 m, and not found in the upper 100 m. The species was also recorded in epipelagial in the Sargasso Sea (Park, 1975c).

The species is not examined by me.

13. *Euchirella pulchra* (Lubbock, 1856)

(Fig. 128)

Undina pulchra Lubbock, 1856: 26, pl. 4, figs 5-8, pl. 7, fig. 6; Claus, 1863: 186.

Euchirella pulchra: Giesbrecht, 1888: 336, 1892: 233, 241, 244, 743, pl. 15, figs 22-23, pl. 36, figs 13, 27; Sars, 1924-25: 69, pl. 20, figs 5-7; Vervoort, 1949: 20, fig. 9 (d, h); Tanaka, 1957b: 178, fig. 45; Grice, 1962: 194, pl. 10, figs 1-4; Tanaka & Omori, 1969a: 55, fig. 8 (a-f); Von Vaupel Klein, 1972: 506, pl. 3 (a-d), tabs. 1, 2, 1980: 152, 1984: 43, figs 2 (b, c, d-f, 6 j), 11 (e), 16 (j-k, v); Park, 1976a: 210, fig. 2 (A-F), 1976b: 101, 107, 116, fig. 7 (a-l); Bradford & Jillett, 1980: 33; Brenning, 1985: 29.

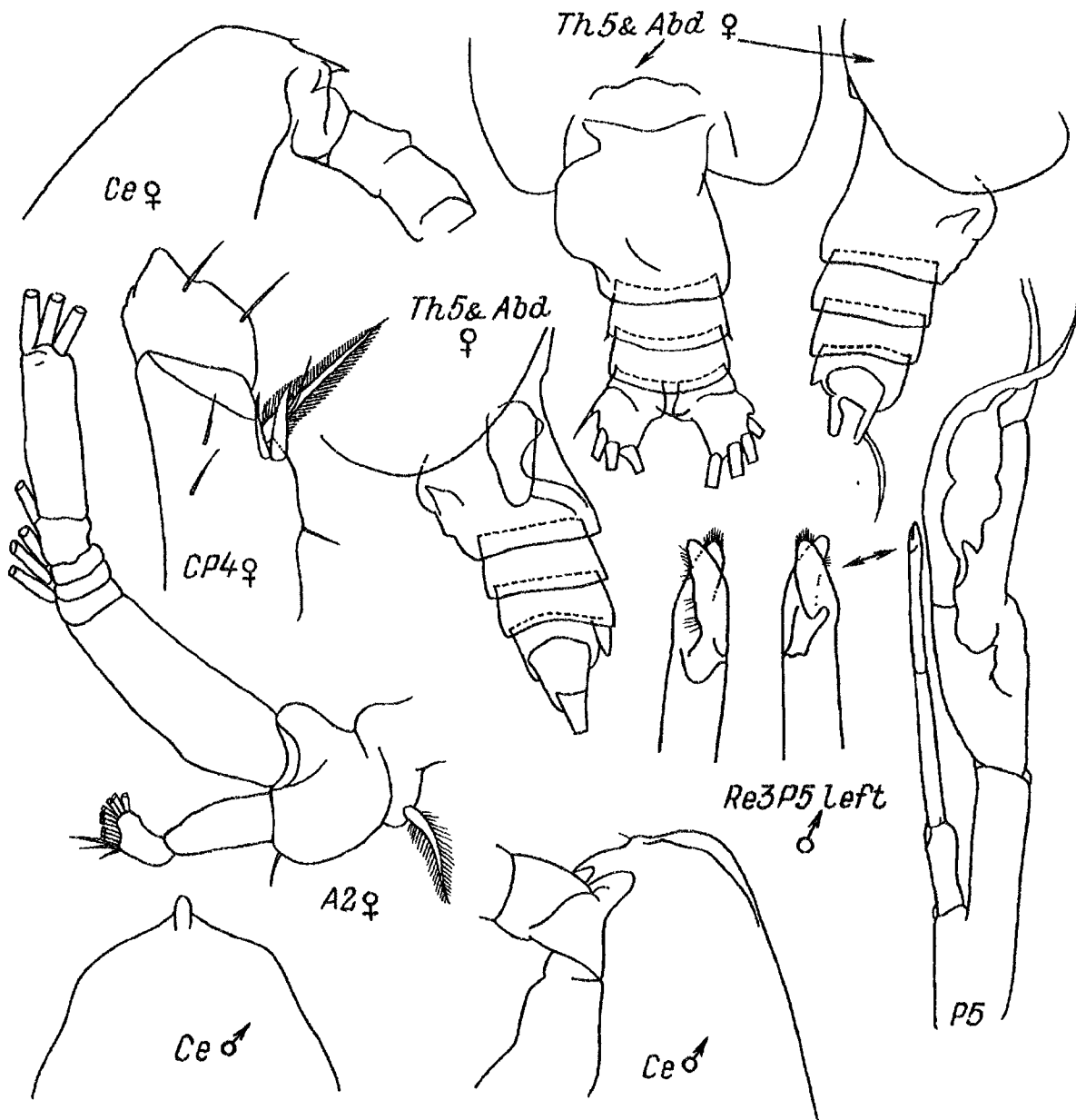


Fig. 128. *Euchirella pulchra*. Female: A2, C P4. Male: Ce, P5 (from Park, 1976a), other figures (573).

Description. Female. Total length 3.04-4.40 mm. Cephalothorax about 4 times longer than abdomen. Crest absent. Anterior part of cephalon (lateral view) rounded or slightly triangular. Rostrum well developed. Genital segment asymmetrical with large "ear-like" swelling on the left and small depression on the right. Th5 posterior corners symmetrical, rounded. A1 reaching about the end of genital segment, or Abd3 Ri A2 nearly 3 times shorter than Re A2. Coxo- and basipodite A2 with 1 seta each; both lobes of Ri2 A2 with 6 setae. Second and third Mx1 internal lobes with 1 and 2 setae respectively; protopodite near Ri base with 3 setae; Ri with 4 setae; Re with 11 setae and external lobe with 6 setae. Mxp protopodite with 1 seta proxi-

mally (Von Vaupel Klein, 1984). Other oral parts and P1-P4 typical of the genus. P4 coxopodite with 2 spines.

Male. (Description after Park (1976a) with modifications). Total length 3.06-4.15 mm. Cephalon with low crest. Rostrum well developed. Left P5 without Ri; Re1 not reaching the distal end of right basipodite. Ri P5 right with 4 projections along external margin; 3 projections visible on Re1.

Type locality Tropical Atlantic.

Geographical distribution. The species is widespread in the tropical, subtropical and temperate zones of the World Ocean.

Vertical distribution The species was found in epipelagial (Vervoort, 1949; 1963; Sewell, 1947; Gri-

ce, 1962; Von Vaupel Klein, 1984). The species was recorded at night in the Gulf of Mexico, in the daytime numerous specimens were recorded between 500 and 1000 m, the deepest limit 2000 m (Park, 1976b). The species was found in total hauls from 800-1000 m (Tanaka & Omori, 1969a).

Material: 3 females from samples 419, 573.

14. *Euchirella rostrata* (Claus, 1866)

(Fig. 129)

Undina rostrata Claus, 1866: 11, pl. 1, fig. 2
Euchirella rostrata Giesbrecht, 1892: 234, 243, 245, pl. 2, fig. 11, pl. 15, figs 11-12, 27, 28, pl. 36, figs 16-17, 23; Sars, 1924-25: 69, pl. 20, figs 8-15; Tanaka & Omori, 1969a: 56; Von Vaupel Klein, 1972: fig. 5 (a), tab. 1-2, 1984: 44; Park, 1976: 101, 117, fig. 8 (a-j), tab. 1-2, 1978: 147, fig. 29 (A-K); Bradford & Jillett, 1980: 33, 39, figs 3-4; Brenning, 1985: 29.

Description. F e m a l e. Total length 2.95-3.95 mm. Cephalothorax about 4 times longer than abdomen. Crest absent. Rostrum comparatively long. Posterior Th5 corners rounded. Genital segment symmetrical. A1 nearly as long as body. Ri A2 more than 2 times shorter than Re A2. Ri2 A2 with 8 setae on internal and 6 setae on external lobe; basipodite with 2 setae; Ri1 A2 with 1 seta. Md palp base and Ri1 Md without setae; Ri2 Md with 9 setae. Mx1 gnathobase with 4 setae on posterior surface; second and third internal lobes with 3 (2 long and 1 short) and 2 setae respectively; protopodite near Ri base with 3 setae; Ri with 3; Re with 10 (after Park (1978) with 10-11) setae; external lobe with 9 setae. Re P1 first external spine long, covering two third of the length of second spine. P4 coxopodite with 7-9 denticles (9 after Von Vaupel Klein (1984)).

M a l e. Total length 2.50-3.10 mm. Crest absent. Both spines of Re1 P1 well developed. P5 biramous, Ri well developed, right one of clavate shape. Re and Ri right not forming tongs.

Type locality: the western part of the Mediterranean Sea.

Geographical distribution. The species is widespread in tropical, subtropical and temperate regions of the Pacific, Indian and Atlantic oceans (Vervoort, 1957). The species is known from the northwestern and north-eastern, as well as south-western and south eastern parts of the Pacific Ocean, antarctic and subantarctic waters of the Pacific and Indian oceans (Farran, 1929; Brodsky, 1950; Vervoort, 1957; Tanaka & Omori, 1969a; Bjornberg, 1973; Park, 1978; Bradford & Jillett, 1980; Von Vaupel Klein, 1984; original data).

Vertical distribution. The species was found in hauls from epipelagial (Farran, 1929; Tanaka & Omori, 1969a; Bradford & Jillett, 1980), mesopelagial (Park, 1976b) and total hauls from 1300 m.

Material: 23 females and 4 males from samples 5-6 and 573.

15. *Euchirella similis* Wolfenden, 1911

(Fig. 130)

Euchirella similis Wolfenden, 1911: 238, text-fig. 23 (a-d), pl. 28, figs 1-2; Park, 1978: 147, 155, figs 35-36; Bradford & Jillett, 1980: 33, 43, fig. 27 (A-C); Von Vaupel Klein, 1980: 152, 1984: 46

Description. F e m a l e. Total length 4.00-5.41 mm. Cephalothorax about 4 times longer than abdomen. Rostrum comparatively small. Crest absent. Posterior Th5 corners rounded. Genital segment abruptly asymmetrical with large "ear-like" projection on the right. A1 reaching the Abd4. Ri A2 about a fourth of Re length. Ri2 A2 internal lobe with 4 setae; external lobe with 5 setae. Coxo-, basipodite and Ri1 A2 with 1 seta each. Mx1 gnathobase with 13 setae. Second and third internal lobes with 4 and 3 setae respectively; protopodite with 3 setae near Ri base; Ri with 4 setae; Re with 11 setae and 8 setae on external lobe. Mx2, Mxp and P1-P4 typical of the genus. P4 coxopodite with 2-3 spines.

? M a l e. (Body was damaged, its size is unknown). In the same sample with females a male was found, but its status is doubtful. As male of *E. similis* is so far unknown, there is high probability that the present male belongs to this species.

Type locality: the Atlantic Ocean between 17°28'N and 35°39'S.

Geographical distribution. The species was found in the Atlantic and Indian oceans (Wolfenden, 1911; Von Vaupel Klein, 1984), in the south-western (Vervoort, 1957; Bradford & Jillett, 1980) and the south-eastern parts of the Pacific Ocean (Grice & Hulsemann, 1968; Bjornberg, 1973; original data). In Antarctic: region of 54°S 119°W (Park, 1978).

Vertical distribution. The species was usually recorded in hauls from depth about 1000 m (Park, 1978; Bradford & Jillett, 1980), in original material it was found from 500 m.

Material: 1 female and 1 male from sample 449.

16. *Euchirella speciosa* Grice & Hulsemann, 1968

(Fig. 131)

Euchirella speciosa Grice & Hulsemann, 1968: 324, figs 14-19; Tanaka & Omori, 1969b: 160; Bradford & Jillett, 1980: 43, figs 28, 67; Von Vaupel Klein, 1980: 152, 1984: 46.

Description. F e m a l e. (Description after Grice & Hulsemann (1968) with modifications). Total length 4.40-5.10 mm. Cephalothorax about 5 times longer than abdomen. Anterior part of cephalon smoothly

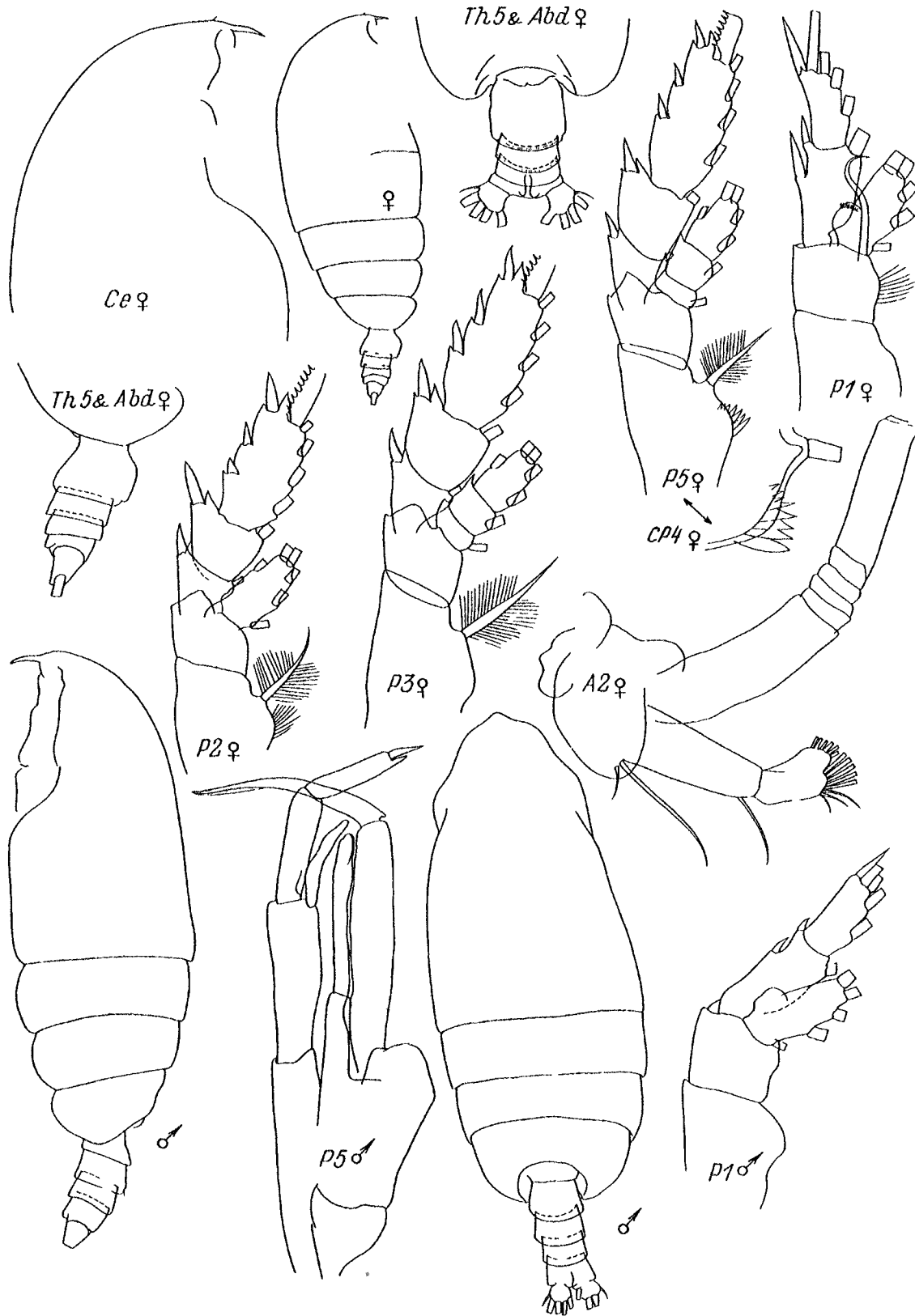


Fig. 129. *Euchirella rostrata*. Female (574). Male (573).

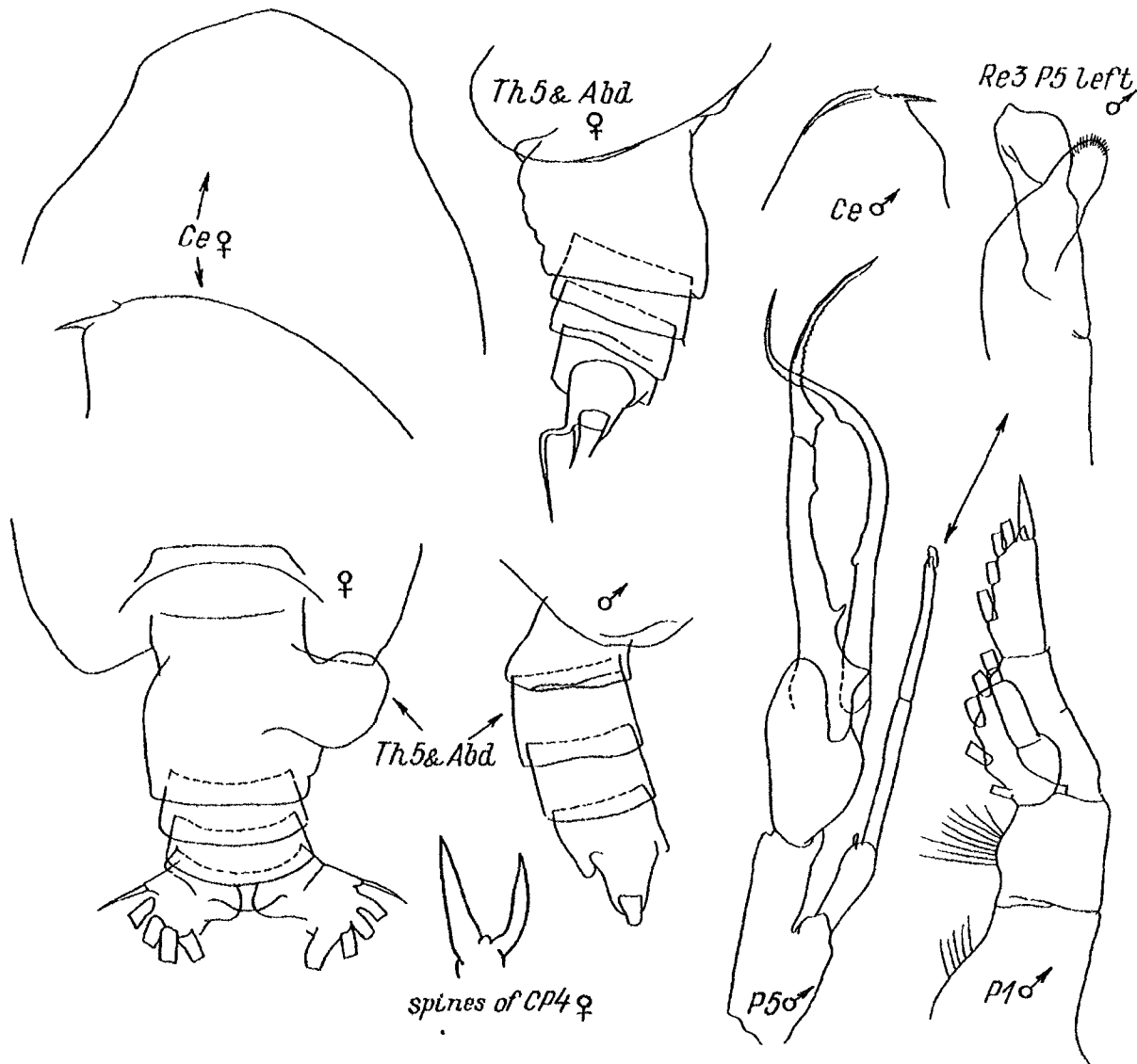


Fig. 130. *Euchirella similis*. Female and male (449).

rounded (lateral view), without crest. Posterior Th5 corners rounded (lateral view), rectangular (dorsal view). Genital segment asymmetrical: in dorsal view left side with 2 small projections. A1 reaching caudal rami. Ri A2 is a fourth of Re length. External Ri2 A2 lobe with 5, internal with 4 setae; basipodite and Ri1 A2 with 1 seta each. Mx1 gnathobase with 3 setae on posterior surface. Re P1 with 3 external spines. P2-P4 segmentation typical of the genus. P4 coxopodite with 2 robust spines.

Male unknown.

Type locality: 30°57'-31°05'S 89°13'-89°35'W.

Geographical distribution. Pacific Ocean: the southwestern and south-eastern parts (Grice & Hulsemann, 1968; Bradford & Jillett, 1980; Von Vaupel Klein, 1984).

Vertical distribution. The species was found in epipelagial, in total hauls from depths from 1700 m.

The species is not examined by me.

17. *Euchirella splendens* Vervoort, 1963

(Figs. 132-133)

Euchirella splendens Vervoort, 1963: 135, 138, figs 13-16, Von Vaupel Klein, 1972, fig. 4 (d), tab. 1-2, 1980: 152, 1984: 47; Park, 1975c: 291, 296, fig. 4 (A-E), 1976b: 101, 118, 121, fig. 9 (a-k), tab. 1-2, 1978: 147, Bradford & Jillett, 1980: 33; Brenning, 1985: 29.

Description. *Female*. Total length 3.88-5.05 mm. Cephalothorax about 4 times longer than abdomen. Crest absent. Rostrum comparatively small. Th5 posterior corners (lateral view) rounded. Genital segment on the right posteriorly with projection of slightly varying shape. A1 reaching Abd4. Coxopodite, basipodite and Ri1 A2 with 1 seta each. Ri A2 is about a fourth of Re length; internal Ri2 A2 lobe with 4 setae; external lobe with 5 setae. Md palp base and Ri1 Md without setae; Ri2 Md with

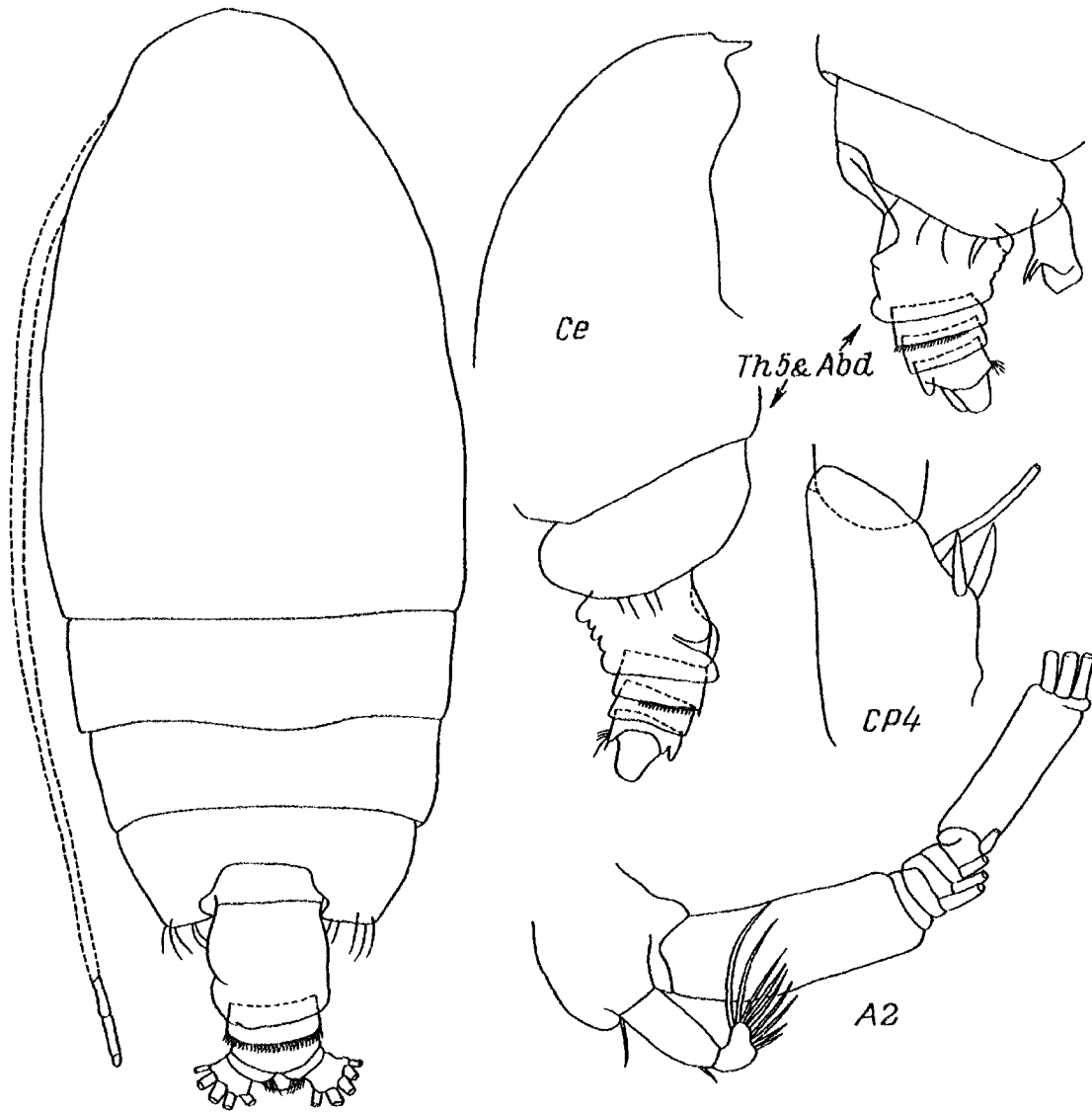


Fig. 131. *Euchirella speciosa*. Female (from Grice & Hulsemann, 1968).

9 setae. Mx1 gnathobase with 13 setae; second and third internal lobes with 4 and 3 setae respectively; protopodite near Ri base with 3; Ri with 4 setae; Re with 11 setae and external lobe with 8 setae. Mx2, Mxp and P1-P4 typical of the genus. P4 coxopodite with 2 spines.

M a l e. (Description after Park (1976b) with modifications). Total length 3.40-3.76 mm. Cephalon without crest. Rostrum better developed than in females. Cephalothorax about 3.5 times longer than abdomen. P5 left with Re1 reaching the distal end of right basipodite; Ri P5 right with 3 projections along external margin; Re1 P5 right with 4 teeth-like projections along internal margin, third projection of Re1 is at the level of first projection on Ri (with curved top).

Type locality: the Gulf of Guinea.

Geographical distribution. Atlantic Ocean: tropical part, the Gulf of Mexico, the Caribbean Sea,

the Gulf of Guinea, in the region of the Canary Isles and Cape Verde Islands, (Vervoort, 1963; Park, 1975c; 1976b; Von Vaupel Klein, 1984).

Vertical distribution. In the Gulf of Mexico the species was found in the day time between 200 and 3000 m, at night in large numbers in the upper 100 m (Park, 1976b).

Material: 2 females from sample 573.

18. *Euchirella truncata* Esterly, 1911

(Fig. 134)

Euchirella truncata Esterly, 1911: 322, pl. 26, fig. 5, pl. 28, fig. 35, pl. 29, fig. 63, pl. 30, fig. 71, pl. 31, fig. 104; Park, 1968: 545, pl. 5, figs. 15-22; Tanaka & Omori, 1969a: 57, fig. 9 (a-g); Von Vaupel Klein, 1972: fig. 5 (d), pl. 5 (b), tab. 1-2; Park, 1975c: 291, 294, fig. 3, 1976b: 101; Bradford & Jillett, 1980: 33, 43, fig. 29 (A-F); Von Vaupel Klein, 1984: 47.

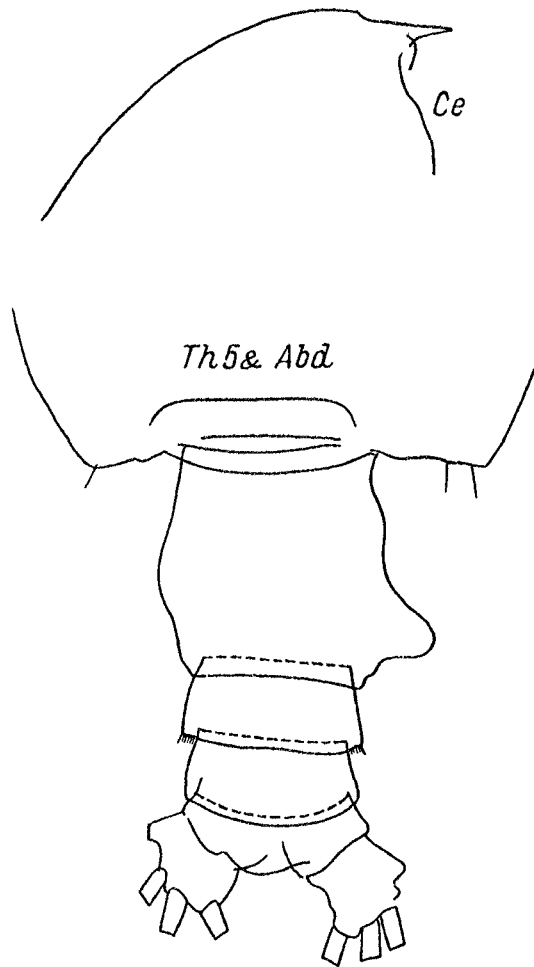


Fig. 132. *Euchirella splendens*. Female (573).

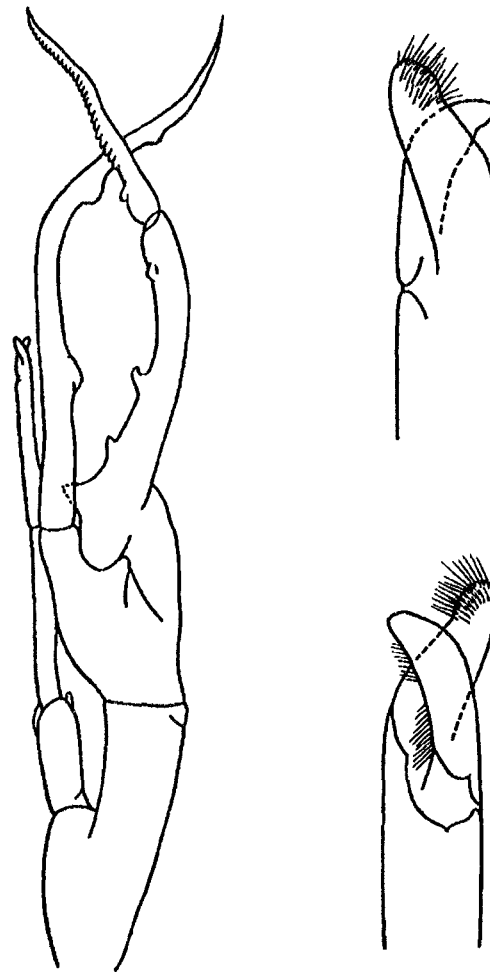


Fig. 133. *Euchirella splendens*. Male (from Park, 1975c).

Euchirella propria Esterly, 1911: 321, pl. 27, figs 14, 20, pl. 30, figs 67, 83, pl. 31, fig. 85.

Euchirella gracilis Wolfenden, 1911: 237, pl. 27, figs 8-10, text-fig. 22.

Euchirella intermedia With, 1915: 124, pl. 4, fig. 4 (a-c), pl. 8, fig. 3, text-fig. 32 (a-f); Sars, 1924-25: 68, pl. 20, figs 1-4; Tanaka, 1957b: 183, fig. 48 (a-f); Park, 1968: 545.

Description. Female. Total length 5.20-6.80 mm. Cephalothorax about 3.8-5.0 times longer than abdomen. Crest absent. Rostrum comparatively not large. Genital segment asymmetrical, both sides with small "ear-like" projections anteriorly (dorsal view); with large projection on the left reaching the posterior border of segment (lateral view), oval-rounded with "dotted structure". Genital segment is as long as wide. A1 reaching caudal rami. Ri A2 slightly shorter than half Re length. Coxopodite, basipodite and Ri A2 with 1 seta each; Ri2 A2 with 7 setae on each lobe (after Von Vaupel Klein (1984) internal lobe with 1 more seta). Md palp base and Ri1 Md without setae; Ri2 Md with 9 setae. Mx1 gnathobase with 3 setae on posterior surface; second internal lobe

with 4; third with 3 setae; protopodite near Ri base with 2 small and 1 long setae; Ri with 4 long and 1 short thin setae; Re with 11; external lobe with 8 setae. Mx1 and Mx2 typical of the genus. Re P1 first external spine short, hardly reaching the base of the second external spine. P2-P4 typical of the genus. P4 coxopodite with 1 long spine.

Male. (Description after Tanaka & Omori (1969a) and Park (1975c) with modifications). Total length 4.50-5.60 mm. Cephalothorax about 4 times longer than abdomen. Crest absent. Rostrum longer than in females. A1 reaching the end of caudal rami. Ri A2 1.4 times shorter than Re, Ri2 A2 with 6 setae on external lobe and 7 setae on internal lobe. Ri Mx1 with 11 setae, its external lobe with 6 setae. Re1 P1 external spines reduced. Re1 P5 left reaching the distal end of right basipodite; Re3 with 2 large tooth-like projections distally.

Type locality: San Diego region.

Geographical distribution. Atlantic Ocean: northern and southern parts (Wolfenden, 1911; With, 1915; Sars, 1925; etc.). Pacific Ocean: in the southwestern and south eastern parts (Tanaka & Omori,

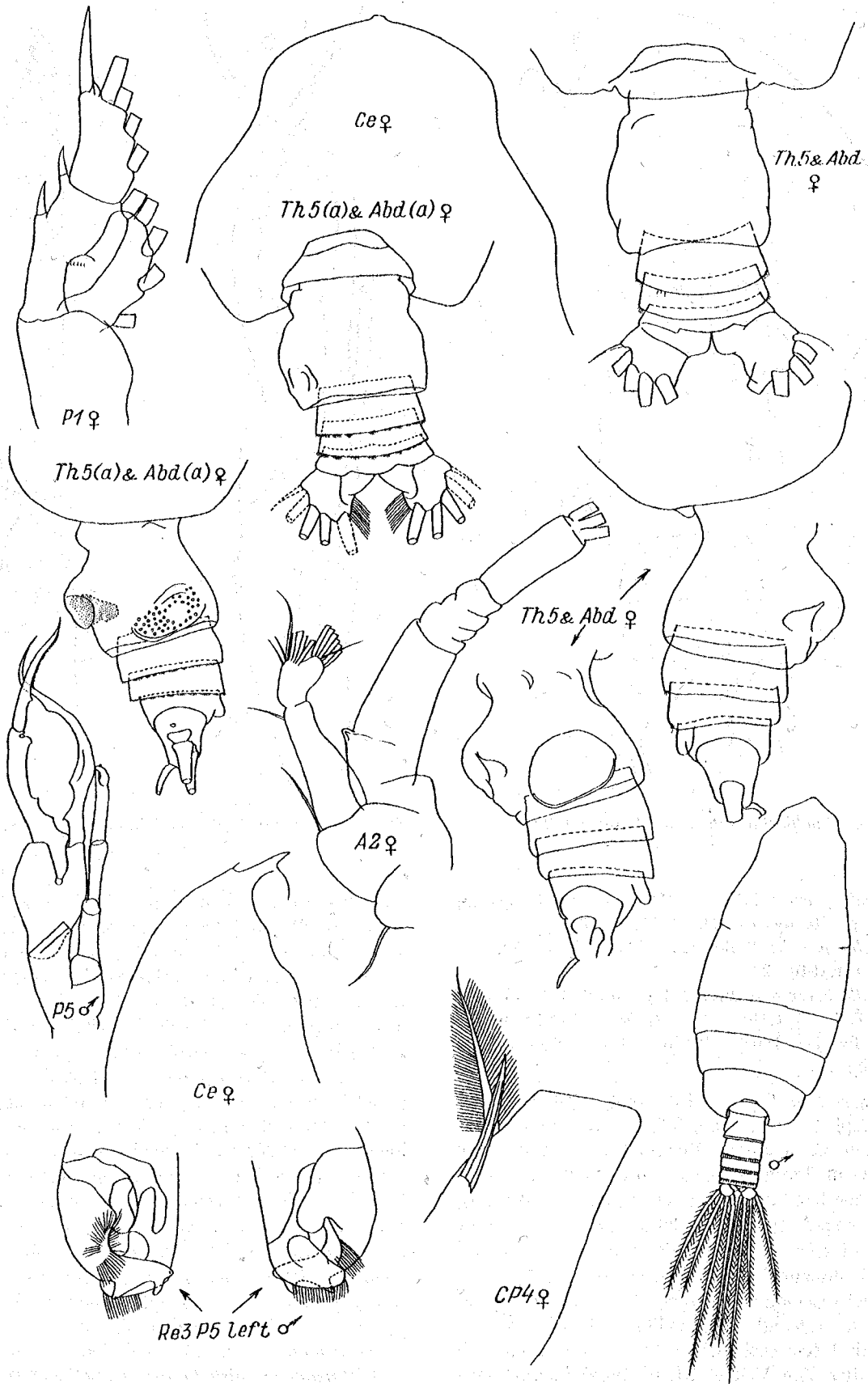


Fig. 134. *Euchiarella truncata*. Female: Th5(a) & Abd(a) and male (from Park, 1968), other figures (573).

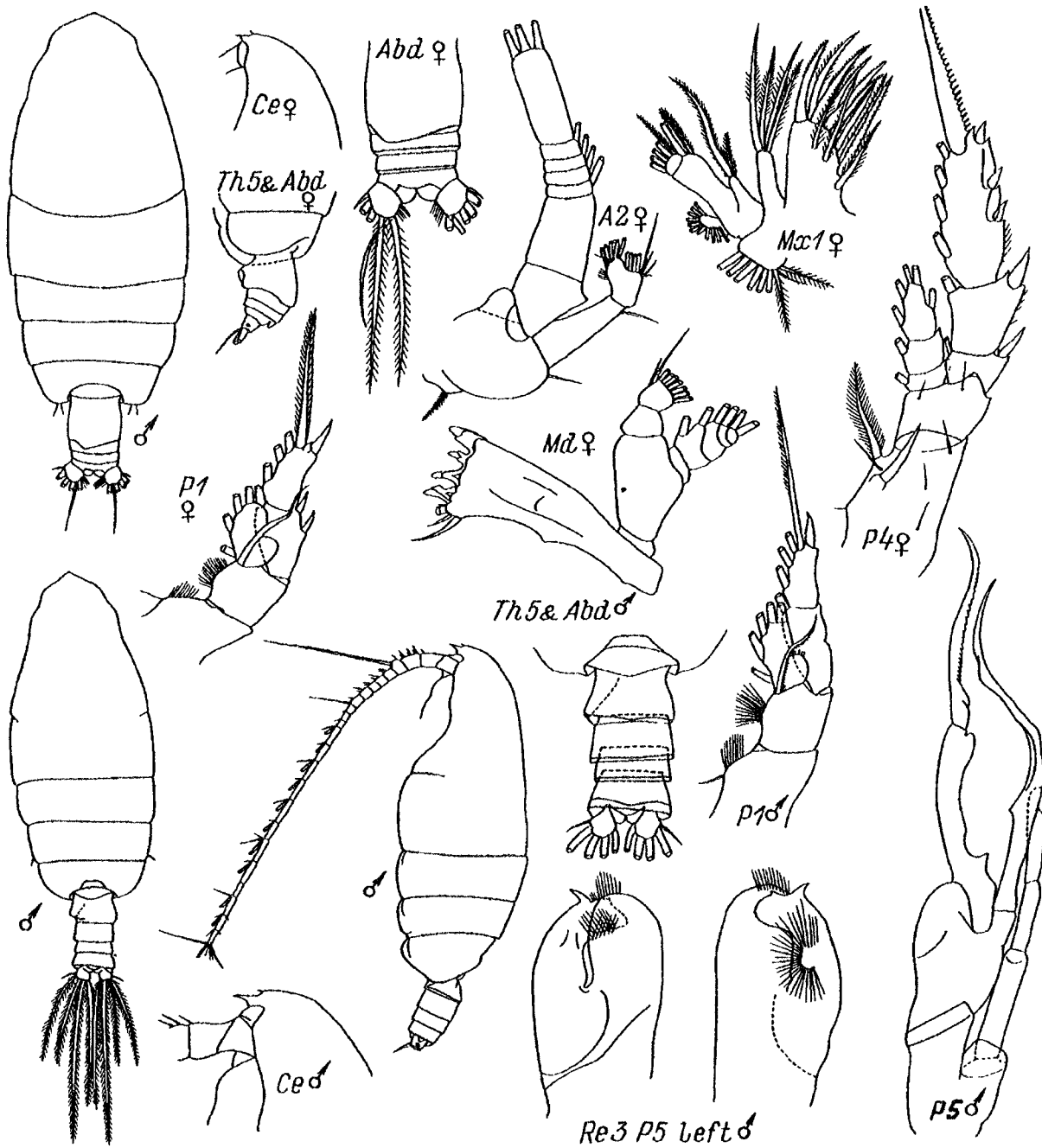


Fig. 135. *Euchiarella unispina*. Female, male (from Park, 1968).

1969a; Bradford & Jillett, 1980; original data); in the northwestern part (Tanaka & Omori, 1969a), the northern part (Park, 1968) and the north-eastern part (Esterly, 1911). Indian Ocean: the Arabian Sea. The region of the Malay Archipelago (Sewell, 1947; Vervoort, 1949; Von Vaupel Klein, 1984).

Vertical distribution. The species was found from epipelagial (Vervoort, 1949; Von Vaupel Klein, 1984), mesopelagial (Tanaka & Omori, 1969a) and total hauls from depths 300-3000m.

Material: 3 females from sample 573.

19. *Euchiarella unispina* Park, 1968

(Fig. 135)

Euchiarella unispina Park, 1968: 546, pl.6, figs 1-21, pl. 7, figs 1-11; Von Vaupel Klein, 1972: fig. 5 (c), tab. 1-2, 1980: 153, 1984: 47; Park, 1976b: 101; 1978: 147; Bradford & Jillett, 1980: 33.

Euchiarella acuta Tanaka & Omori, 1969a: 34, fig. 1 (a-n); Park, 1976b: 101.

Description. F e m a l e. (Description after Park

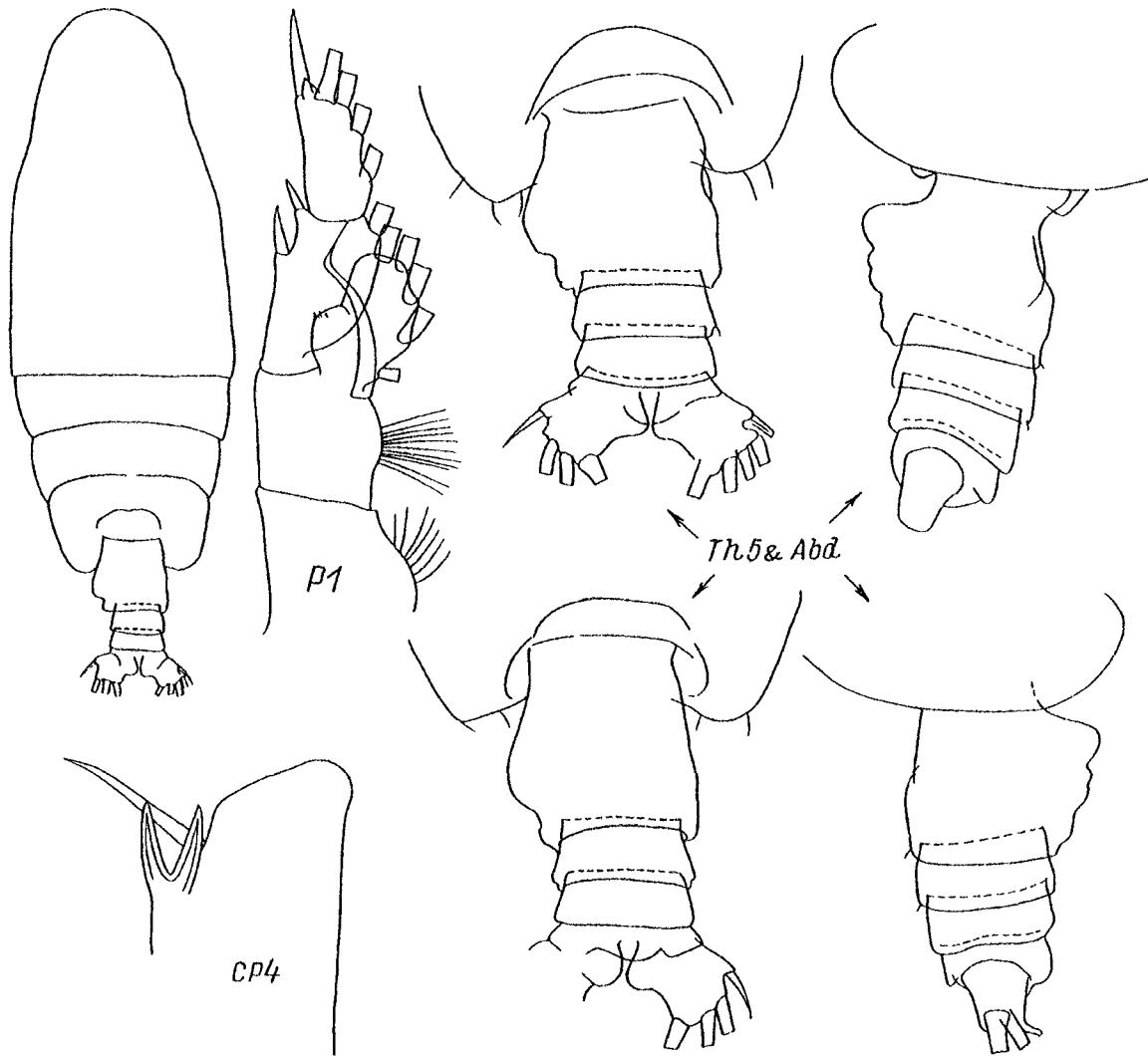


Fig. 136. *Euchirella venusta*. Female (403).

(1968) with modifications). Total length 4.28-4.89 mm. Cephalothorax 4.3 times longer than abdomen. Crest absent. Posterior Th5 corners rounded. Genital segment nearly as long as wide, slightly asymmetrical: elongated on the left posteriorly (dorsal view). A1 reaching the end of caudal rami, some joints with aesthetascs. Ri A2 shorter than Re1-Re2 A2 together, latter without setae. Coxopodite, basipodite and Ri1 A2 with 1 seta each; Ri2 A2 with 8 setae on internal and 7 on external lobes. Md palp base with small seta on posterior surface; Ri1 Md without setae; Ri2 Md with 9 setae. Mx1 with 3 setae on posterior surface of gnathobase; second internal lobe with 4 setae; third with 3 setae; protopodite near Ri base with 3 setae; Ri with 5 setae; Re with 11; external lobe with 8 setae. Mx2 and Mxp typical of the genus. P1-P4 segmentation typical of the genus. Line of fusion between Ri P2 joints sometimes visible. P4 coxopodite with 1 robust spine.

Male. Total length 3.84-4.03 mm. Cephalothorax 3.7 times longer than abdomen. Body segmentation as in females. Posterior Th5 corners rounded. Posterior border of Abd1-3 with thin spinules. A1 reaching the end of Abd2. Ri A2 better developed than in females, of two third length of Re; basipodite and Re1 without setae. Oral parts in comparison with those in females reduced. P1 with Re1 lacking external spine; Ri P2 with the joints fusion line invisible. P4 coxopodite without spines. P5 with uniramous left leg and well developed biramous right one. Right P5 basipodite well developed, reaching the middle of Re1 P5 left.

Notes This species is close to *E. truncata*, but female differs in smaller size and shape of genital segment. Males of this species are characterized by the shape of teeth on left Re3 P5 and number and shape of projections on Re and Ri of right P5.

Type locality: 31°54'N 155°00'W.

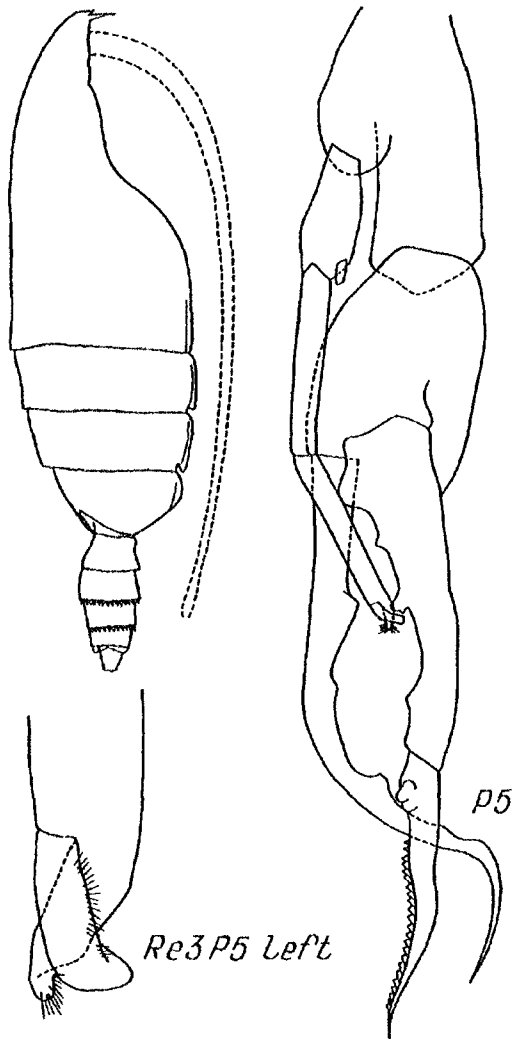


Fig. 137. *Euchiarella venusta*. Male (from Bradford & Jillett, 1980).

Geographical distribution. Pacific Ocean: the north-eastern part (Park, 1968). The region of the Malay Archipelago (Von Vaupel Klein, 1984).

Vertical distribution. The species was found from epipelagial (Park, 1968; Von Vaupel Klein, 1984). The species is not examined by me.

20. *Euchiarella venusta* Giesbrecht, 1888

(Figs 136-137)

Euchiarella venusta Giesbrecht, 1888: 336, 1892: 233, 241, 244, 743, pl. 15, fig. 19, pl. 36, fig. 21; Vervoort, 1949: 20, fig. 10 (a-d); Tanaka, 1957b: 182, fig. 47 (a-g); Grice, 1962: 194, pl. 9, figs 14-25; Omori,

1965: 64, figs 22-24; Tanaka & Omori, 1969a: 59, fig. 10 (a-i); Von Vaupel Klein, 1972: pl. 4 (d), tab. 1-2, 1980: 152, 1984: 48; Park, 1976b: 101; Bradford & Jillett, 1980: 33, 43, fig. 30 (A-H).

?*Euchiarella tansui* Omori, 1965: 60, figs 1-18; Tanaka & Omori, 1969a: 33, 61, 1969b: 155, 160; Park, 1976b: 101, 1978: 147; Bradford & Jillett, 1980: 33, 43; Von Vaupel Klein, 1980: 153, 1984: 48.

Description. Female. Total length 4.25-4.88 mm. (Description after Bradford & Jillett (1980) with modifications). Cephalothorax nearly 4 times longer than abdomen. Crest absent. Rostrum well developed. Posterior Th5 corners rounded (lateral and dorsal view). Genital segment asymmetrical, its shape varying. A1 reaching the midlength of abdomen. As mentioned by Tanaka & Omori (1969a), A1 exceeding caudal rami. Coxo-, basipodite, Ri1 A2 with 1 seta each; Ri2 A2 with 5 setae on external and 4 setae on internal lobe. Md palp base and Ri1 Md without setae; Ri2 Md with 9 setae. Mx1 gnathobase with 3 setae on posterior surface; second and third internal lobes with 4 and 2(?) setae respectively; protopodite near Ri base with 3 setae (2 long and 1 short); Ri with 4 setae; Re with 11 setae and external lobe with 6 setae. Ri1 Mxp with 2 small smooth projections distally and externally. In other features, Mxp and Mx2 typical of the genus. Re P1 first external spine reaching the middle of the second external spine. P4 coxopodite with 2 spines.

Male. (Description after Tanaka & Omori (1969a) with modifications). Total length 3.57-4.16 mm. Cephalothorax about 3.4 times longer than abdomen. Crest absent. Rostrum faintly developed. Ri2 A2 with 6 setae on external and 7 setae on internal lobes. First-third internal lobes of Mx1 highly reduced; external lobe with 5 setae; Re with 11 setae; Re1 with 2 very small spines. Left P5 basipodite reaching the distal border of right coxopodite. Left Re P5 faint, its distal end exceeding the third projection of right Re P5.

Notes. The species is very close to *E. speciosa* Grice & Hulsemann, 1968. Some authors consider that *E. tansui* is an aberrant form of *E. venusta* (Tanaka & Omori, 1969a; Von Vaupel Klein, 1984).

Type locality: the tropical part of the Pacific Ocean.

Geographical distribution. Pacific Ocean: tropical and subtropical parts (Grice, 1962), in the north-western part from the Izu region (Tanaka, Omori, 1969a), the south-western part (Bradford & Jillett, 1980). Indian Ocean: tropical and subtropical parts (Grice & Hulsemann, 1967; Sewell, 1947).

Vertical distribution. The species was basically found from epipelagial (Vervoort, 1949; Grice, 1962; Bradford & Jillett, 1980; Von Vaupel Klein, 1984), also in total hauls from 300-1500 m.

Material: 1 female from sample 403.

14. *Gaetanus* Giesbrecht, 1888

TYPE SPECIES: *Gaetanus miles* Giesbrecht, 1888, by subsequent designation (Brodsky, 1950).

Gaetanus Giesbrecht, 1888: 335.

Gaidius Giesbrecht, 1895: 349 (type species: *Gaidius pungens* Giesbrecht, 1895, by monotypy).

Mesogaidius Wolfenden, 1911: 223 (type species: *Gaidius intermedius* Wolfenden, 1905, designated here).

Pseudogaetanus Brodsky, 1950: 168 (type species: *Gaetanus robustus* Sars, 1905, by monotypy).

Description. Female. Total length 1.70-9.20 mm. Cephalothorax 3-5 times longer than abdomen. Rostrum present, 1-pointed, not large, often with small excavation (notch) on the top. Frontal spine, if present, of different shape and size. Cephalon and Th1 fused (sometimes line of fusion visible). Th4-Th5 fused. Posterior Th5 corners symmetrical, rounded, with spines of different size and shape (absent in *G. inermis*). Genital segment symmetrical. Posterior borders of Abd1-3 often with rows of minute spinules. Caudal rami slightly longer than wide, or as long as wide. A1 of varying length: sometimes slightly longer than cephalothorax, longer than body, or even twice longer than body. Re A2 1.1-1.5 times longer than Ri A2. Re1 A2 without setae, or with 1-2 seta. Re2 A2 with 1-3 setae; Re3-Re6 with 1 seta each; Re7 with 3 terminal and 1 medial seta. Ri1 A2 with 1-2 setae; Ri2 A2 usually with 7 terminal (rarely with 6) and 1 posterior setae on external and 8 (rarely 7) setae on internal lobe. Md palp base with 1-2 setae; Ri1 Md with 1-2; Ri2 Md with 9 terminal setae; often with 1-2 small, thin posterior setae. Mx1 gnathobase with 9 claw-like spines and 1 small terminal seta and 4 setae on posterior surface of the lobe. Mx1 second internal lobe with 4-5 setae; third internal lobe with 4 setae; protopodite near Ri base with 5 setae; Ri with 14-15 setae; Re with 11 setae, and external lobe with 9 setae. Mx2 fourth and fifth endites with one of setae thickened and stronger sclerotized. Mxp protopodite with lateral plate of different size and configuration (or absent); with 3 groups (from proximal to distal end of joint) of 2, 3 and 3 setae (distal group with additional small teat-like appendage), and usually with 1 seta at the base of joint in its proximal part. Ri1 Mxp with 3 setae. Re P1 2-3-jointed, with 2-3 external spines. Ri P2 2-jointed, rarely the division between joints incomplete. Other P2-P4 rami 3-jointed. P4 coxopodite with group of 11-35 spines, arranged as bush.

Male. Total length 1.86-7.00 mm. Cephalothorax about 3 times longer than abdomen. Rostrum present. Frontal spine, if present, smaller than in females. Spines on posterior Th5 corners reduced in comparison with that in females, rarely absent. Number of A1 joints less than in females, joints are usually with aesthetascs. Setation of oral parts

reduced in comparison with that in females. Lateral plate on Mxp protopodite absent. Number of spines on Re P1 usually less than in females. P2-P4 like that in females, but spines on P4 coxopodite absent. P5 asymmetrical, biramous, Ri 1-jointed. Left Re P5 3-jointed, right 2-jointed. P5 of simple structure.

Notes. In this book I follow Park (1975b) who united *Gaetanus* Giesbrecht, 1888 and *Gaidius* Giesbrecht, 1895 and use the name *Gaetanus* due to the rule of priority.

The genus *Gaetanus* includes 22 species. Two new species *G. pseudolatifrons* Markhaseva sp.n. and *G. rubellus* Markhaseva sp.n. are described below.

Key to species of *Gaetanus*

Females

- 1(30) Anterior part of cephalon with frontal spine.
- 2(13) Re1 A2 with 1 seta, Re2 A2 with 3 setae (in one case Re1 with 2 and Re2 with 2 setae). Second internal Mx1 lobe with 5 setae. Re P1 usually with 3, sometimes with 2 external spines.
- 3(4) Re P1 indistinctly 3-jointed. Re P1 with 2 external spines. Lateral plate of Mxp protopodite reduced; sometimes there are visible traces of the plate 17. *G. paracurvicornis* Brodsky
- 4(3) Re P1 clearly 3-jointed. Re P1 with 3 external spines. Lateral plate of Mxp protopodite well developed.
- 5(8) Spines of Th5 posterior corners straight, situated in about the middle of the posterior Th5 border (lateral view).
- 6(7) Frontal spine strongly curved in direction to rostrum (lateral view). Specimens less than 5 mm in size. Re1 and Re2 with 2 setae each 3. *G. brachyurus* Sars
- 7(6) Frontal spine directed straight forward and curved to rostrum by its top only. Specimens more than 5 mm in size 8. *G. curvicornis* Sars
- 8(5) Spines of Th5 posterior corners curved and removed ventrally (lateral view).
- 9(10) Frontal spine short. Specimens more than 7 mm in size 1. *G. antarcticus* Wolfenden
- 10(9) Frontal spine long. Specimens less than 6 mm in size.
- 11(12) Frontal spine directed backward from rostrum in its proximal part, and curved to rostrum distally 12. *G. latifrons* Sars
- 12(11) Frontal spine directed upward and anteriorly in its proximal part, then distally to the rostrum 19. *G. pseudolatifrons* Markhaseva sp.n.
- 13(2) Re1 A2 without seta; Re2 A2 with 1-2 setae. Second internal Mx1 lobe with 4 setae. Re P1 always with 2 external spines.
- 14(17) Mxp protopodite without lateral plate.
- 15(16) Re P1 evidently 3-jointed 2. *G. armiger* Giesbrecht

- 16(15) Re P1 2-jointed, or indistinctly 3-jointed . . .
 10. *G. simplex* Brodsky
- 17(14) Mxp protopodite with lateral plate.
- 18(25) Re2 A2 with 1 seta.
- 19(20) Spines on Th5 posterior corners not exceeding
 the midlength of genital segment. Frontal spine
 small 14. *G. minispinus* Tanaka
- 20(19) Spines on Th5 posterior corners exceeding at
 least the midlength of genital segment. Frontal spine
 large.
- 21(24) Frontal spine straight, not curved to rostrum
 by its top.
- 22(23) Spines on Th5 posterior corners reaching the
 posterior third of genital segment length. External
 spine of Re P1 not reaching the midlength of the
 next segment 18. *G. pileatus* Farran
- 23(22) Spines on Th5 posterior corners slightly ex-
 ceeding the midlength of genital segment. External
 spine Re P1 exceeding the midlength of following
 segment 23. *G. secundus* Esterly
- 24(21) Frontal spine curved to rostrum by its top . .
 13. *G. miles* Giesbrecht
- 25(18) Re2 A2 with 2 setae.
- 26(27) Spines on Th5 posterior corners curved dorsally
 (lateral view) 5. *G. brevicornis* Esterly
- 27(26) Spines on Th5 posterior corners directed straight
 backward (lateral view).
- 28(29) Re P1 2-jointed; Ri P2 1-jointed. Specimens
 less than 3 mm in size 15. *G. minor* Farran
- 29(28) Re P1 3-jointed, Ri P2 2-jointed. Specimens
 more than 4.5 mm in size . 11. *G. kruppii* Giesbrecht
- 30(1) Cephalon without frontal spine.
- 31(32) Th5 posterior corners without spines
 9. *G. inermis* Sars
- 32(31) Th5 posterior corners with spines of various
 size and configuration.
- 33(38) Re1 A2 with 1 seta. Re2 A2 with 3 (rarely
 2) setae. Second Mx1 internal lobe with 5 setae.
 Re P1 3-jointed. Re P1 with 3 external spines.
- 34(35) Re2 A2 with 2 setae. Lateral plate of Mxp
 protopodite faintly developed. Specimens less than
 4 mm in size 4. *G. brevicaudatus* Sars
- 35(34) Re2 A2 with 3 setae. Lateral plate of Mxp
 protopodite well developed. Specimens more than
 7 mm in size.
- 36(37) Th5 posterior corners with 1 small tooth each,
 rounded on their tops. Ri1 Md with 1 seta; Re2
 Md with 9 terminal and 1 posterior setae
 22. *G. rubellus* Markhaseva sp.n.
- 37(36) Th5 posterior corners with large spine each,
 spines slightly curved dorsally. Ri1 Md with 2 setae;
 Ri2 Md with 9 terminal and 2 posterior setae . .
 21. *G. robustus* Sars
- 38(33) Re1 A2 without setae. Re2 A2 with 2 setae.

- Second Mx1 internal lobe with 4 setae. Re P1
 2-3-jointed. Re P1 with 2 external spines.
- 39(40) Mxp protopodite with lateral plate
 7. *G. brevispinus* (Sars)
- 40(39) Mxp protopodite without lateral plate.
- 41(42) Md palp base with 1 seta. Ri P2 1-jointed .
 20. *G. pungens* (Giesbrecht)
- 42(41) Md palp base with 2 setae. Ri P2 2-jointed.
- 43(44) Spines on Th5 posterior corners long, reaching
 the midlength of genital segment
 24. *G. tenuispinus* (Sars)
- 44(43) Spines on Th5 posterior corners significantly
 shorter.
- 45(46) Re P1 clearly 3-jointed. Specimens more than
 4 mm in size 6. *G. breviostris* Brodsky
- 46(45) Re P1 unclearly 3-jointed. Specimens less than
 4 mm in size 16. *G. minutus* (Sars)

Males

(unknown for *G. brevicaudatus*, *G. curvicornis*, *G. inermis*, *G. minispinus*, *G. minor*, *G. paracurvicornis*, *G. pseudolatifrons* and *G. rubellus*).

- 1(14) Cephalon with frontal spine.
- 2(7) Left Re3 P5 is bilobated (with complete or in-
 complete division into lobes). It is 1.5-2.2 shorter
 than left Re2 P5.
- 3(4) Spines on Th5 posterior corners short, not reaching
 the posterior border of genital segment. Re3 P5
 left bilobated with complete subdivision into lobes
 1. *G. antarcticus* Wolfenden
- 4(3) Spines on Th5 posterior corners long, exceeding
 the posterior border of genital segment. Left Re3
 P5 bilobated with incomplete subdivision into lobes.
- 5(6) Left Ri P5 as long as one third of left Re1 P5
 length. Left Re3 P5 is less than half of left Re2
 P5 length 3. *G. brachyurus* Sars
- 6(5) Left Ri P5 significantly shorter than one third
 of left Re1 P5 length. Left Re3 P5 significantly
 longer than half of left Re2 P5
 12. *G. latifrons* Sars
- 7(2) Left Re3 P5 prolonged, stylet-like, never bilobated.
 It is always longer than left Re2 P5.
- 8(9) Frontal spine removed from anterior part of cepha-
 lon dorsally (lateral view), poorly visible
 2. *G. armiger* Giesbrecht
- 9(8) Frontal spine is in anterior part of cephalon (lateral
 view), well visible.
- 10(11) Spines on Th5 posterior corners long, longer
 than half length of genital segment
 10. *G. simplex* Brodsky
- 11(10) Spines on Th5 posterior corners significantly
 shorter.
- 12(13) Left Ri P5 longer than half length of left Re1
 P5, or even longer 11. *G. kruppii* Giesbrecht

- 13(12) Left Ri P5 shorter than half length of left Re1 P5 18. *G. pileatus* Farvan; 5. *G. brevicornis* Esterly (Detailed description and figures of *G. brevicornis* Esterly are missing, therefore convincing differences between males of these species were not obtained).
- 14(1) Cephalon without frontal spine.
- 15(16) Cephalon with crest in anterior part 23. *G. secundus* Esterly
- 16(15) Cephalon without crest in anterior part.
- 17(18) Left Re3 P5 bilobated. Specimens about 7 mm in size 21. *G. robustus* Vervoort
- 18(17) Left Re3 P5 stylet-like. Specimens not more than 4.1 mm in length.
- 19(20) Th5 posterior corners without spines 13. *G. miles* Giesbrecht
- 20(19) Spines on Th5 posterior corners present.
- 21(22) Spines on Th5 posterior corners exceeding posterior border of genital segment 24. *G. tenuispinus* (Sars)
- 22(21) Spines on Th5 posterior corners significantly shorter.
- 23(24) Stylet-like Re3 P5 wide 7. *G. brevispinus* (Sars)
- 24(23) Stylet-like Re3 P5 narrow.
- 25(26) Specimens less than 4 mm in size 6. *G. brevirostris* Brodsky
- 26(25) Specimens more than 4 mm in size.
- 27(28) Left Re2 P5 with uneven internal border with excavation near Re3 base; Re2 longer than Re3 20. *G. pungens* Giesbrecht
- 28(27) Left Re2 P5 with smooth internal border without excavation near Re3 base, Re2 shorter than Re3 16. *G. minutus* (Sars)

1. *Gaetanus antarcticus* Wolfenden, 1905

(Figs. 138-139)

Gaetanus antarcticus Wolfenden, 1905: 7, pl. 3, fig. 1, 1908: 30, pl. 3, fig. 6, 1911: 229; Farran, 1929: 233; Hardy & Gunther, 1935: 159, Sewell, 1947: 65, text-fig. 11; Wilson, 1950: 229; Vervoort, 1957: 62, figs 41-43; Grice & Hulsemann, 1967: 15; 1968: 324; Tanaka & Omori, 1970a: 131, fig. 8; Bjornberg, 1973: 323; Park, 1975b: 10, 13, 1978: 141, figs 25-26; Vives, 1982: 291.

Gaetanus brevicaudatus Wolfenden, 1911: 227, text-fig. 15 (nom. praecoc, non Sars, 1907) (syn n.).

Gaetanus wolfendemi Park, 1975b: 12 (nom. nov pro *brevicaudatus* Wolfenden).

Gaidius robustus (non Sars, 1905) (female only): Grice & Hulsemann, 1967: figs 60-64.

Description Female. Total length 7.60-9.08

mm. Cephalothorax about 5 times longer than abdomen. Frontal spine not large, directed forward and slightly curved to rostrum. Spines on Th5 posterior corners curved and removed to ventral part of posterior Th5 border (lateral view), exceeding the middle of genital segment and nearly reaching the posterior border of segment. A1 nearly as long as the body. Re1 A2 with 1 seta; Re2 A2 with 3 setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 2 very small posterior setae. Second internal Mx1 lobe with 5 setae; third internal lobe with 4 setae and small teat; Ri with 15 setae. Mxp protopodite with lateral plate. P1 with 3-jointed Re, with external spine on each joint. Ri P2 2-jointed. P4 coxopodite with 38 spines.

Male. (Description after Grice & Hulsemann (1967) with modifications). Under the name *G. robustus* Grice & Hulsemann (1967) figured a male that I consider to be *G. antarcticus*. This is because cephalon with frontal spine. It is curved to rostrum (lateral view). Th5 posterior corners with small spine each. P5 very close to that of *G. robustus*. Re3 P5 left bilobated with clear subdivision into 2 lobes, not stylet-like, shorter than Re2 P5.

Notes. *Gaetanus brevicaudatus* Wolfenden, 1911 also known under the new name of *Gaetanus wolfendemi* Park, 1975 should be synonymized with *Gaetanus antarcticus* Wolfenden, 1905. The only distinction from the species described by Wolfenden (1911) is the lesser size of the specimen (5.9 mm) as compared to *G. antarcticus*. In other features (frontal spine shape, shape of spines on Th5 corners, P1 setation and presence of lateral plate on Mxp protopodite) they are identical.

Type locality: 64°18'S 90°27'E.

Geographical distribution Atlantic Ocean: the northernmost locality near the north-western coast of Africa (Vives, 1982) in the region of 30°N, the southernmost from the region of South Georgia (Hardy & Gunther, 1935). Pacific Ocean: recorded in the north-western part in the Izu region (Tanaka & Omori, 1970a) and the Marquesas Islands (Wilson, 1950), in the south-eastern part of the Pacific Ocean (Grice & Hulsemann, 1968; Bjornberg, 1973; Park, 1978; original data), in the antarctic part of the Pacific Ocean (original data), to the South to 71°S (Farran, 1929). Indian Ocean: northernmost are findings in the Gulf of Oman and the Arabian Sea (Sewell, 1947), also found in the south-eastern part (Grice & Hulsemann, 1967) and in antarctic section South off 60°S (Wolfenden, 1905; Vervoort, 1957; original data);

Vertical distribution The species was found from mesopelagial and bathypelagial (Hardy & Gunther, 1935; Vervoort, 1957), in total hauls from 500-600 m (Grice & Hulsemann, 1967; Wilson, 1950), however more often in hauls from depths over 1000 m.

Material: 7 females from samples 379, 382-383, 443.



Fig. 138. *Gaetanus antarcticus*. Female (379).

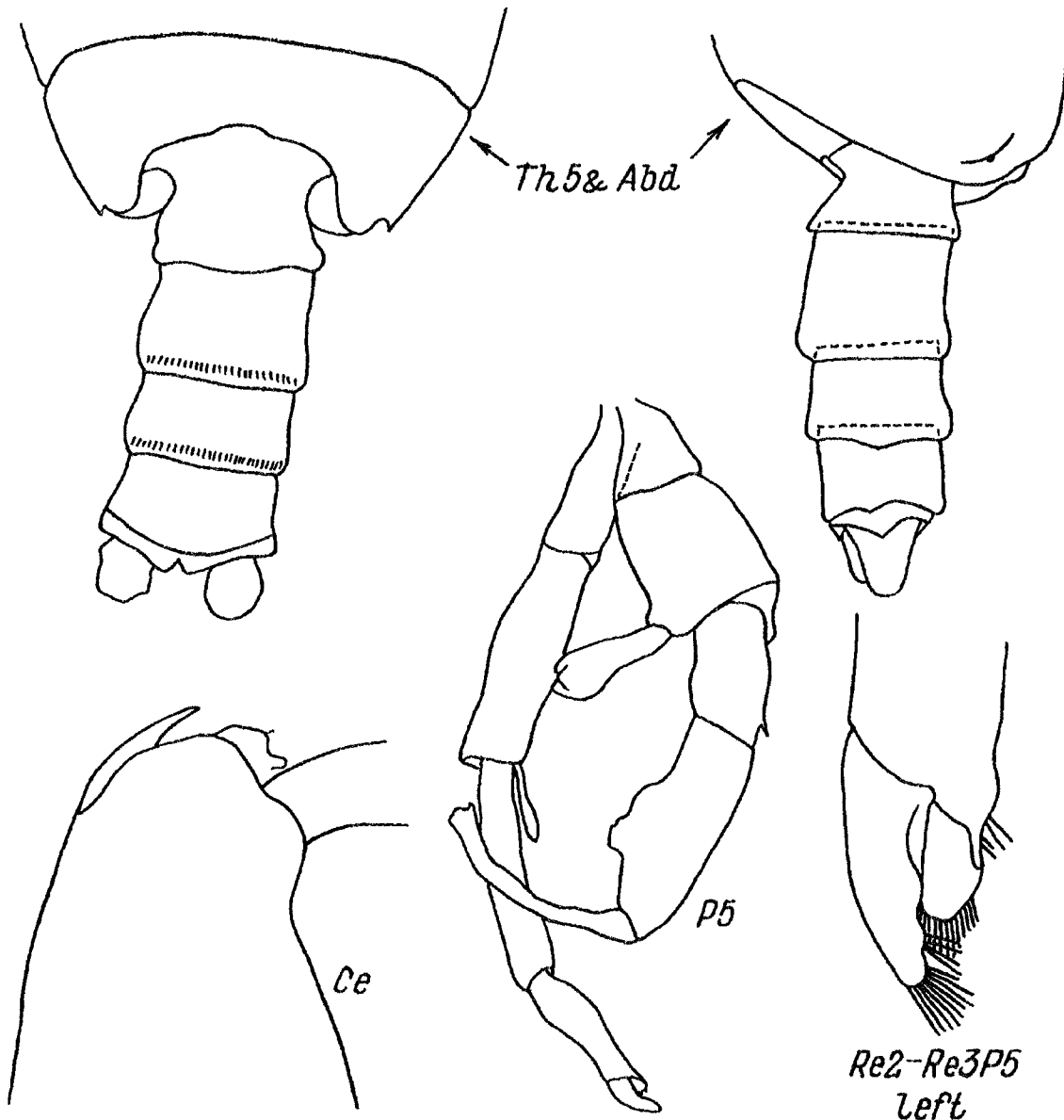


Fig. 139. *Gaetanus antarcticus*. Male (from Grice & Hulsemann, 1967).

2. *Gaetanus armiger* Giesbrecht, 1888

(Figs. 140-141)

Gaetanus armiger Giesbrecht, 1888: 355, 1892: 219, 224, 744, taf 14, figs 19-20, 22-23, 26, 28-29, taf 36, figs 2, 4-5, Vervoort, 1963: 129, Tanaka & Omori, 1970a: 133, Park, 1975b: 10, 13, 27, figs 10-11, Roe, 1984: 357

Gaetanus atlanticus Wolfenden, 1904: 132, Jespersen, 1934: 61

Description. Female. (Description after Giesbrecht (1892) and Park (1975b) with modifications). Total length 2.70-4.70 mm. Cephalothorax about 3.5 times longer than abdomen. Frontal spine present, not large, curved to rostrum. Spines on Th5

are in the middle of posterior border (lateral view), reaching the last fourth of genital segment. A1 by 2-3 last joints longer than body. Re1 A2 without setae; Re2 A2 with 2 (1 medial situated on conic protrusion and 1 distal) setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 setae. Second internal Mx1 lobe with 4 setae, Ri with 14 setae. Mxp protopodite without lateral plate. Re P1 3-jointed. Re1 P1 without spine; Re2 and R3 with external spine each. Ri P2 2-jointed P4 coxopodite with about 14-17 thin spines.

Male. Total length 2.60-3.16 mm. Frontal spine very small and close to cephalon (lateral view) and removed posteriorly. Spines on Th5 posterior corners not reaching the posterior border of genital segment. A1 reaching posterior border of genital

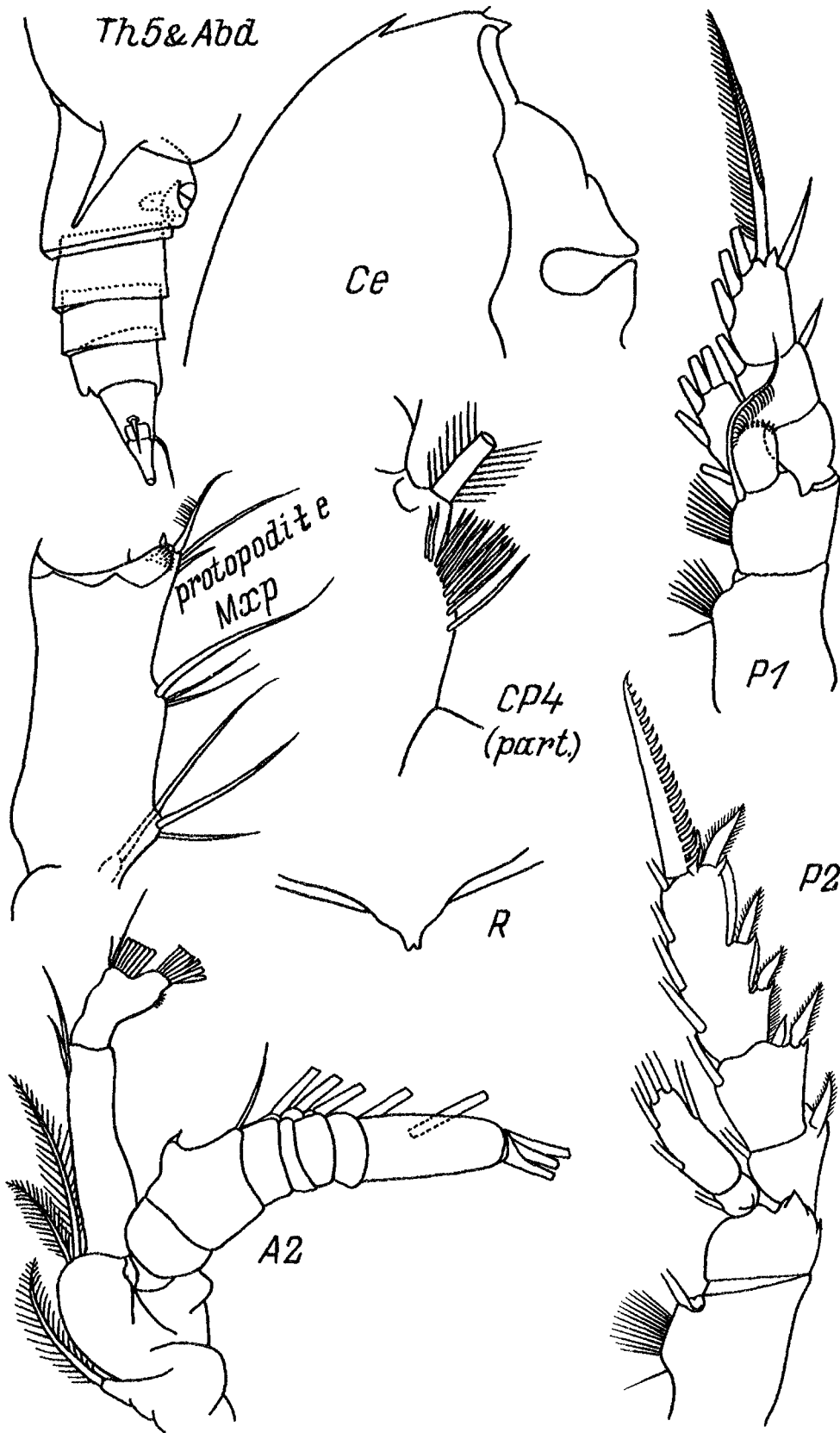


Fig. 140. *Gaetanus armiger* Female: P2 (from Giesbrecht, 1892), other figures (from Park, 1975b).

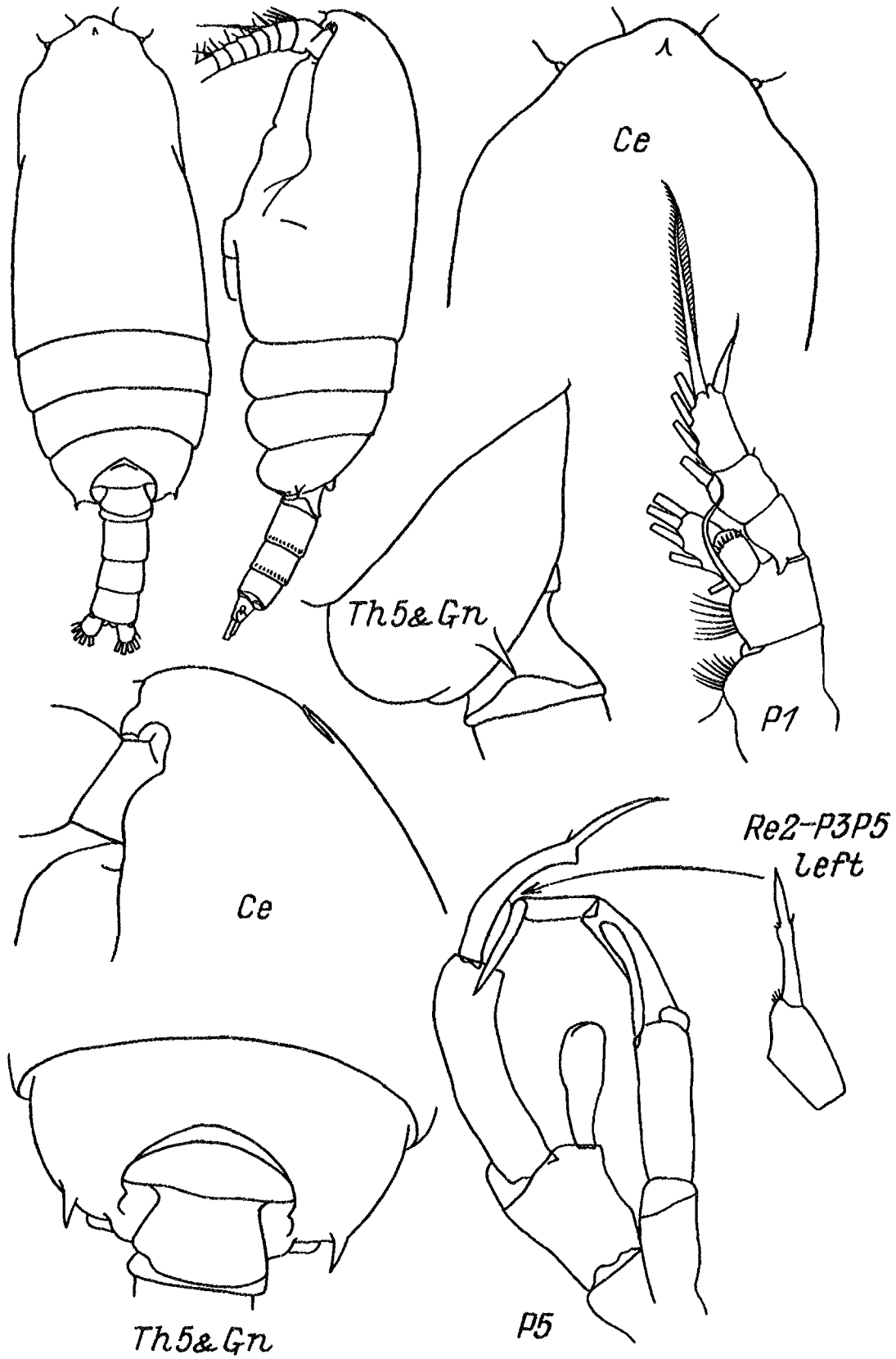


Fig 141 *Gaetanus armiger*. Male (from Park, 1975b).

segment. Re2 A2 with 2 setae. Md palp base with 2 minute setae. Ri Mx1 with 9 long setae and few very small rudimentary setae; Re with 11 setae and external lobe with 9 setae. Mxp protopodite with 1 medial and 3 distal setae. Re P1 3-jointed; only Re3 with well developed external spine. P4 coxopodite without spines, all other features of P2-P4 as in females. Both Re joints of right P5 of about equal length. Left Ri P5 nearly reaching the distal part of Re1; Re3 P5 left is stylet-like, slightly longer than Re2 of its leg.

Notes. Park considered that a male described by Tanaka (1969) supposedly attributed to *G. armiger* actually belongs to some other species (Park, 1975b).

Type locality: Equatorial part of the Pacific Ocean.

Geographical distribution. Atlantic Ocean: the species was found to the North to 61°N (Jespersen, 1934), to the South to the Gulf of Guinea, widespread to the North from the Equator. Pacific Ocean: found in the north-western (Tanaka & Omori, 1970), northern (Wilson, 1950) and equatorial parts (Giesbrecht, 1888), the southernmost finding in the south-eastern part is the region of 11°S (Wilson, 1950). Indian Ocean: in the Bay of Bengal (Sewell, 1929). In the region of the Malay Archipelago (A. Scott, 1909).

Vertical distribution. The species was found in hauls from meso-, bathypelagial (Park, 1975b) and epipelagial (Mori, 1937). In total hauls from depths 500 to 5000 m.

The species is not examined by me.

3. *Gaetanus brachyurus* Sars, 1907

(Figs. 142-144)

Gaetanus brachyurus Sars, 1907: 10, 1924-25: 62, pl. 18, figs 9-10; Grice & Hulsemann, 1967: 23, 1968: 327; Park, 1975b: 14, figs 1-2.

Description. Female. Total length 5.00-7.15 mm. Cephalothorax about 5 times longer than abdomen. Frontal spine present, not large, curved and directed to rostrum. Spines on Th5 posterior corners straight, reaching nearly the midlength of genital segment (dorsal view), situated in the middle of posterior Th5 border (lateral view). A1 slightly shorter than body, or exceeding it by 2-3 last joints. Re1 A2 with 2 setae; Re2 A2 with 2 setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 long, robust terminal setae and 1 posterior seta. Mx1 internal lobe with 5 setae; Ri with 15 setae. Mxp protopodite with lateral plate. P1 Re 3-jointed (in one case 2-jointed (Grice & Hulsemann, 1967)), with external spines on each joint. Ri P2 2-jointed. P4 coxopodite with 26-30 spines.

Male. (Description after Park (1975b) with modifications). Total length 5.16 mm. Frontal spine larger than in female. Spines on posterior Th5 corners exceeding the posterior border of genital segment. A1 slightly longer than body. First 2 ReA2 joints without setae. Md palp base with small seta. Ri

Mx1 with 9 setae; Re Mx1 with 11 setae; external lobe with 9 setae. Mxp protopodite with 3 setae distally. Re P1 3-jointed, each joint with external spine. P2-P4 as in females, but P4 coxopodite without spines. Both Re joints of right P5 of about equal length. Left Ri P5 is about one third of Re1 length. Left Re3 P5 not stylet-like, bilobated. It is less than half left Re2 P5 length.

Type locality: North Atlantic, to the North of the Canary Islands.

Geographical distribution. Atlantic Ocean: found to the North to the Strait of Davis (Jespersen, 1934), known from the Gulf of Mexico (Park, 1975b), the southernmost finding in the region of 26° N (Sars, 1925). Pacific Ocean: the south-eastern part (Grice & Hulsemann, 1968), for the first time noted in the north-western part off the Kurile-Kamchatka Trench region (original data). Indian Ocean: recorded from the western part (Grice & Hulsemann, 1967).

Vertical distribution. The species was found once near surface (Sars, 1925), recorded in hauls from bathypelagial (Grice & Hulsemann, 1967) and in total hauls from 1500-5000 m.

Material: 1 female from sample 103.

4. *Gaetanus brevicaudatus* (Sars, 1907)

(Fig. 145).

Chiridius brevicaudatus Sars, 1907: 7.

Gaidius brevicaudatus: Sars, 1924-25: 48, pl.15, figs 1-13; Bjornberg, 1973: 323.

Gaetanus brevicaudatus: Park, 1975b: 13.

Description. Female. Total length 3.90-4.50 mm. Cephalothorax about 3.6 times longer than abdomen. Frontal spine absent. Spines on Th5 posterior corners situated in the middle of Th5 posterior border (lateral view), very short. A1 by 3 last joints longer than body. Re1 A2 with 1 (after Sars (1925)) seta; Re2 A2 with 2 (1 medial and 1 distal) setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 long, robust terminal setae and 1 posterior seta. Mx1 second internal lobe with 5 setae; Ri with 14 setae. Mxp protopodite with thin poorly visible lateral plate. Re P1 3-jointed, each joint with external spine. Re P1 first external spine reaching the base of the second external spine; second external spine not reaching the base of third external spine. Ri P2 2-jointed. P4 coxopodite with about 30 spines.

Male unknown.

Type locality: 27°43'N 18°28'W.

Geographical distribution. Atlantic Ocean: the species is known only from the Canary Islands region (Sars, 1925). Pacific Ocean: recorded for the first time in the north-western part in the region of Izu-Bonin Trench (original data), also known from the south-eastern part (Bjornberg, 1973).

Vertical distribution. The species was found in total hauls from depths of more than 1000 m.

Material: 1 female from sample 202.

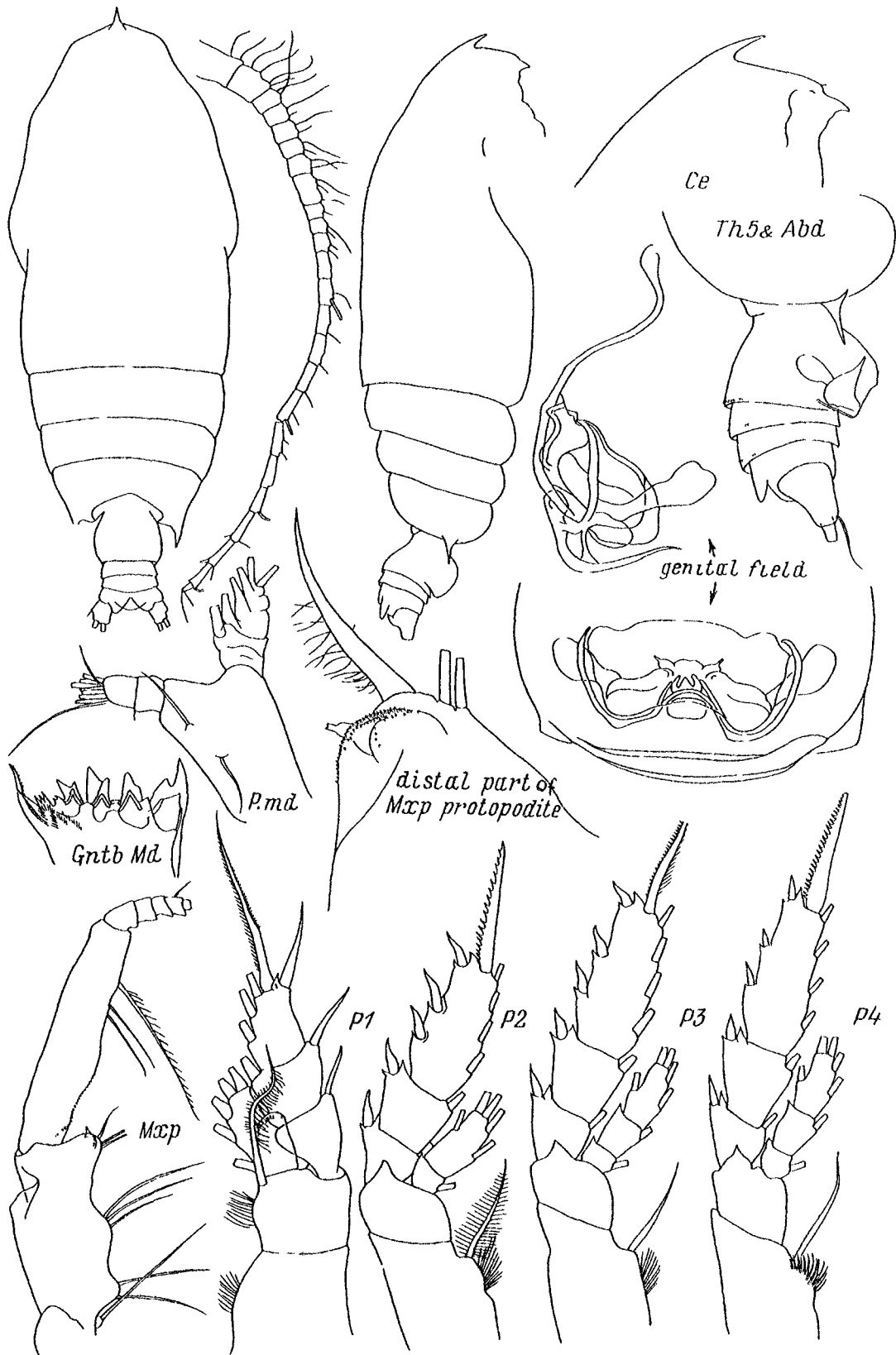


Fig. 142. *Gaetanus brachyurus*. Female (103)

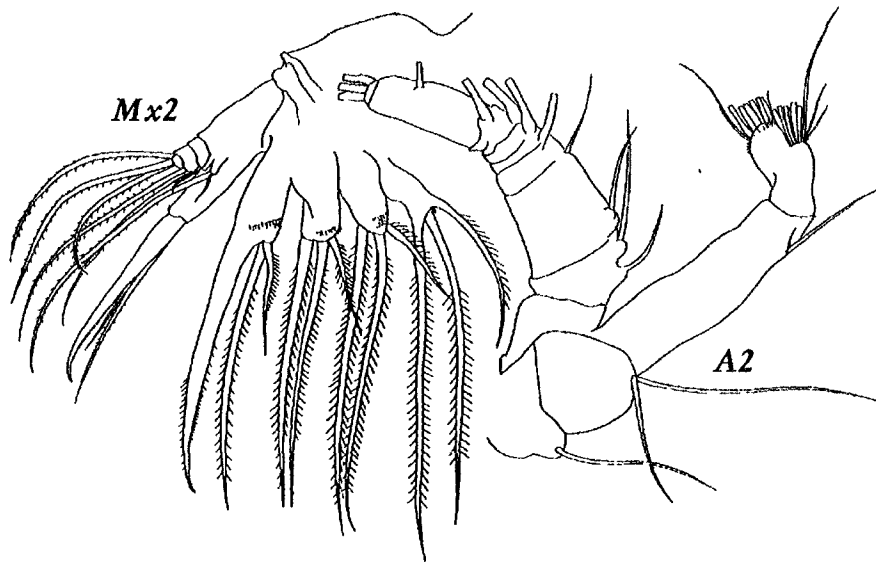


Fig. 143. *Gaetanus brachyurus*. Female (103).

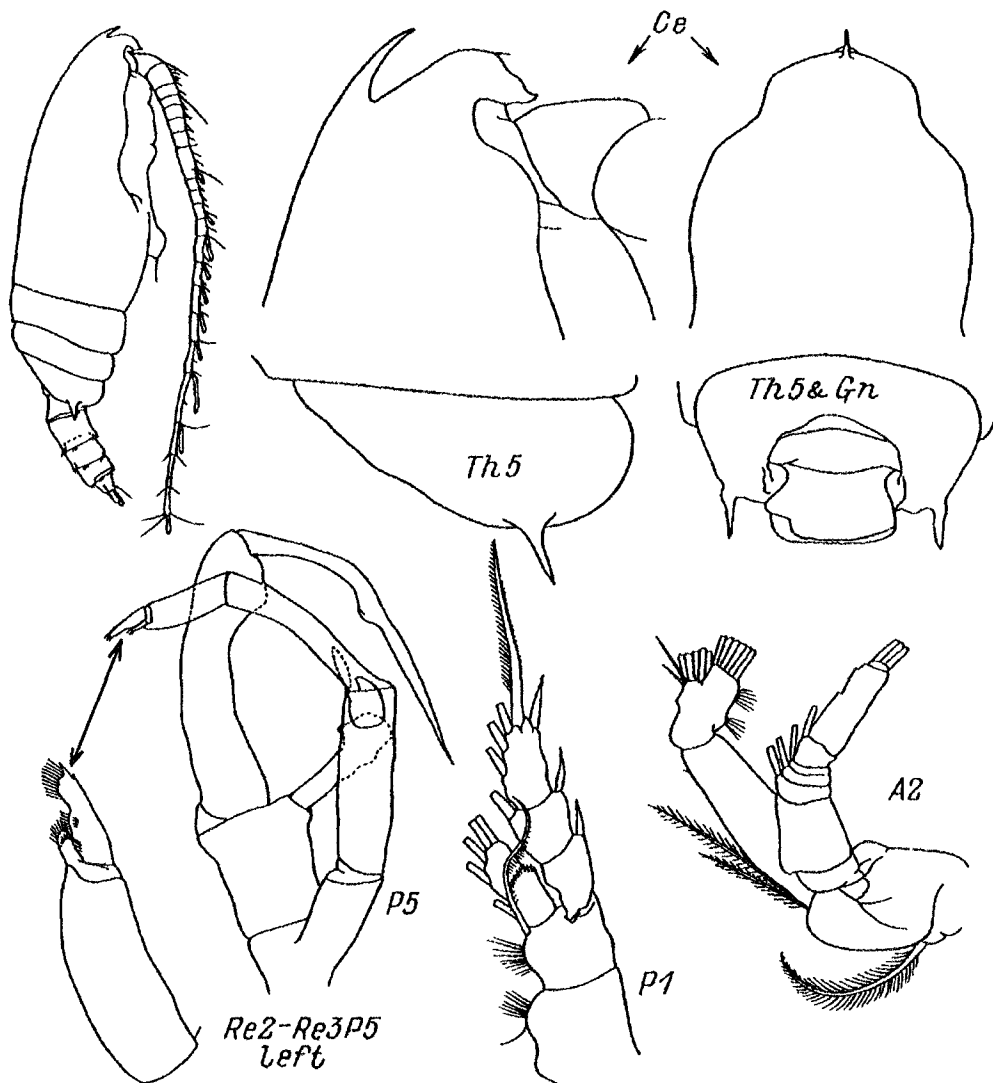


Fig. 144. *Gaetanus brachyurus*. Male (from Park, 1975b).

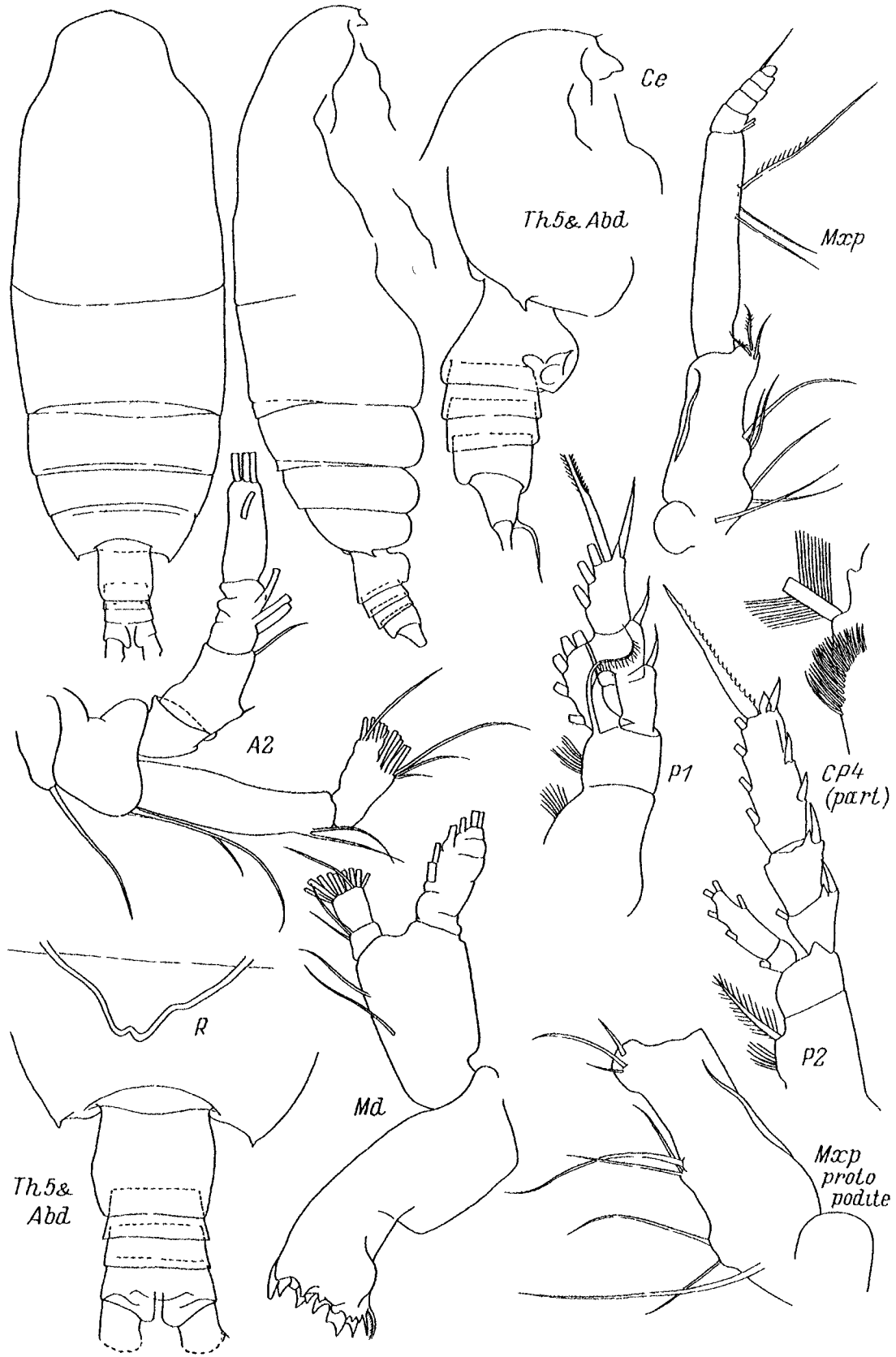


Fig. 145. *Gaetanus brevicaudatus*. Female (202).

5. *Gaetanus brevicornis* Esterly, 1906

(Figs. 146-147)

Gaetanus brevicornis Esterly, 1906: 56, pl. 11, fig. 4, pl. 12, fig. 55; Vervoort, 1963: 128; Tanaka & Omori, 1970a: 133; Park, 1975b: 10, 23, fig. 7; Bradford & Jillett, 1980: 48, fig. 31.

Gaetanus rectus Wolfenden, 1911: 232, fig. 18, pl. 26, figs 14-16; Sewell, 1929: 105.

Gaetanus ascendens Esterly, 1913: 182, pl. 10, figs 1, 3, 6, pl. 11, fig. 39, pl. 12, fig. 56; Brodsky, 1950: 165, fig. 80.

Gaetanus curvispinus Wilson, 1950: 229, pl. 10, figs 108-113.

Gaetanus hamatus A. Scott, 1909: 50, pl. 9, figs 16-22.

Description. F e m a l e. Total length 3.70-4.98 mm. Cephalothorax 3.4-4.0 longer than abdomen. Frontal spine present, not large, strongly curved to rostrum. Spines on Th5 posterior corners situated in the middle of posterior border of Th5 (lateral view), abruptly curved dorsally (lateral view), divergent (dorsal view). A1 longer than body by 2-3 joints. Re1 A2 without setae; Re2 A2 with 2 setae. Md palp base with 2 setae; Ri1 Md with 1; Ri2 Md with 9 terminal setae. Mx1 second internal lobe with 4 setae; Ri with 14 setae. Mxp protopodite with lateral plate. Lateral plate with a deep excavation, elongated towards the distal part of the joint. Re P1 indistinctly 3-jointed. Re1 P1 without spine; 2 next joints with external spines. Ri P2 2-jointed. P4 coxopodite with about 20 spines.

M a l e. Published descriptions of *G. brevicornis* male (Wilson (1950); Bradford & Jillett, (1980)) are brief, therefore the species is not included into the key for identification. Total length 4.25 mm. Frontal spine more powerful than in females. Spines on Th5 posterior corners shorter and less pronounced than in females. Right P5 slightly longer, than left.

Type locality: off the San Diego region.

Geographical distribution. Atlantic Ocean: the northernmost locality region of 32°N in the Sargasso Sea (Deevey & Brooks, 1977), found in the Gulf of Mexico, the Gulf of Guinea, tropical Atlantic (Wolfenden, 1911; Vervoort, 1963; Park, 1975b). Pacific Ocean: found in the north-western part (Tanaka & Omori, 1970a), in the region of the Marian Trench (original data), the north-eastern (Esterly, 1906; original data), south-western (Bradford & Jillett, 1980; original data) and south-eastern (original data) parts. Indian Ocean: in the Arabian Sea and the Bay of Bengal (Sewell, 1929, 1947), in the region of 12°S (original data). The species was recorded in the region of the Malay Archipelago (A. Scott, 1909).

Vertical distribution. The species was found in hauls 160-500 m from the tropical part of the Pacific Ocean (original data) also in total hauls from depths 300-7000 m.

Material: 9 females from samples 201, 204, 386, 401, 444, 449.

6. *Gaetanus brevirostris* (Brodsky, 1950)

(Fig. 148)

Gaidius brevirostris Brodsky, 1950: 159, fig. 73.

Gaetanus brevirostris: Park, 1975b: 13.

Description. F e m a l e. Total length 4.00-4.20 mm. Cephalothorax about 3 times longer than abdomen. Frontal spine absent. Spines on Th5 posterior corners short, situated in the middle of posterior Th5 border (lateral view). A1 as long as cephalothorax, or longer than cephalothorax by 1-2 joints. Re1 A2 without setae. Re2 A2 with 2 setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 terminal setae. Second Mx1 internal lobe with 4 setae; Ri with 14 setae. Mxp protopodite without lateral plate. Re P1 3-jointed. Re1 P1 without external spine. Spine on Re2 P1 exceeding the mid-length of the next segment. P4 coxopodite with 19-28 spines.

M a l e. Total length 4.0 mm. Frontal spine absent. Spines on Th5 posterior corners shorter than Abd1. Right Re3 not bilobated, stylet-like.

Type locality: the north-western part of the Pacific Ocean.

Lectotype. female from sample 474.

Geographical distribution. Pacific Ocean: the north-western part, the Kurile-Kamchatka Trench region, the region of Aleutian Trench (Brodsky, 1950; original data).

Vertical distribution. The species found in the hauls from bathypelagial-upper abyssopelagial (original data).

Material: more than 10 females from samples: 63-65, 81, 126, 138, 161, 193, 196.

7. *Gaetanus brevispinus* (Sars, 1900)

(Figs. 149-152).

Chiridius brevispinus Sars, 1900: 68, pl. 19.

Gaidius brevispinus: Sars, 1903: 162, suppl. pl. 6, fig. 2; With, 1915: 94, text-fig. 24, pl. 2, fig. 7, pl.3, fig. 1; Brodsky, 1950: 158, fig. 72, Tanaka, 1957a: 62, fig. 38 (a-e) (female only); Tanaka & Omori, 1970a: 119.

Gaetanus brevispinus: Park, 1975b: 11, 13.

Gaidius affinis Sars, 1905: 9 (syn. n.), 1924-25: 47, pl. 14, figs 9-13, pl. 15, figs 14-15; Vervoort, 1957: 56, figs 35-39; Bradford & Jillett, 1980: 58, fig. 38.

Gaetanus affinis: Park, 1975b: 13

Gaidius intermedius Wolfenden, 1905: 6, pl. 3, figs 4-5 (syn. n.); Farran, 1929: 231; Hardy & Gunther, 1935: 157; Davis, 1949: 27, Vervoort, 1951: 81, 1957: 60, fig. 40; Park, 1978: 131, 135, figs 18-20.

Gaetanus intermedius: Park, 1975b: 13.

Mesogaidius intermedius: Wolfenden, 1911: 224, text-fig. 12, pl. 26, figs 1-2.

Gaidius major Wolfenden, 1904: 114, pl. 9, figs 7-8.

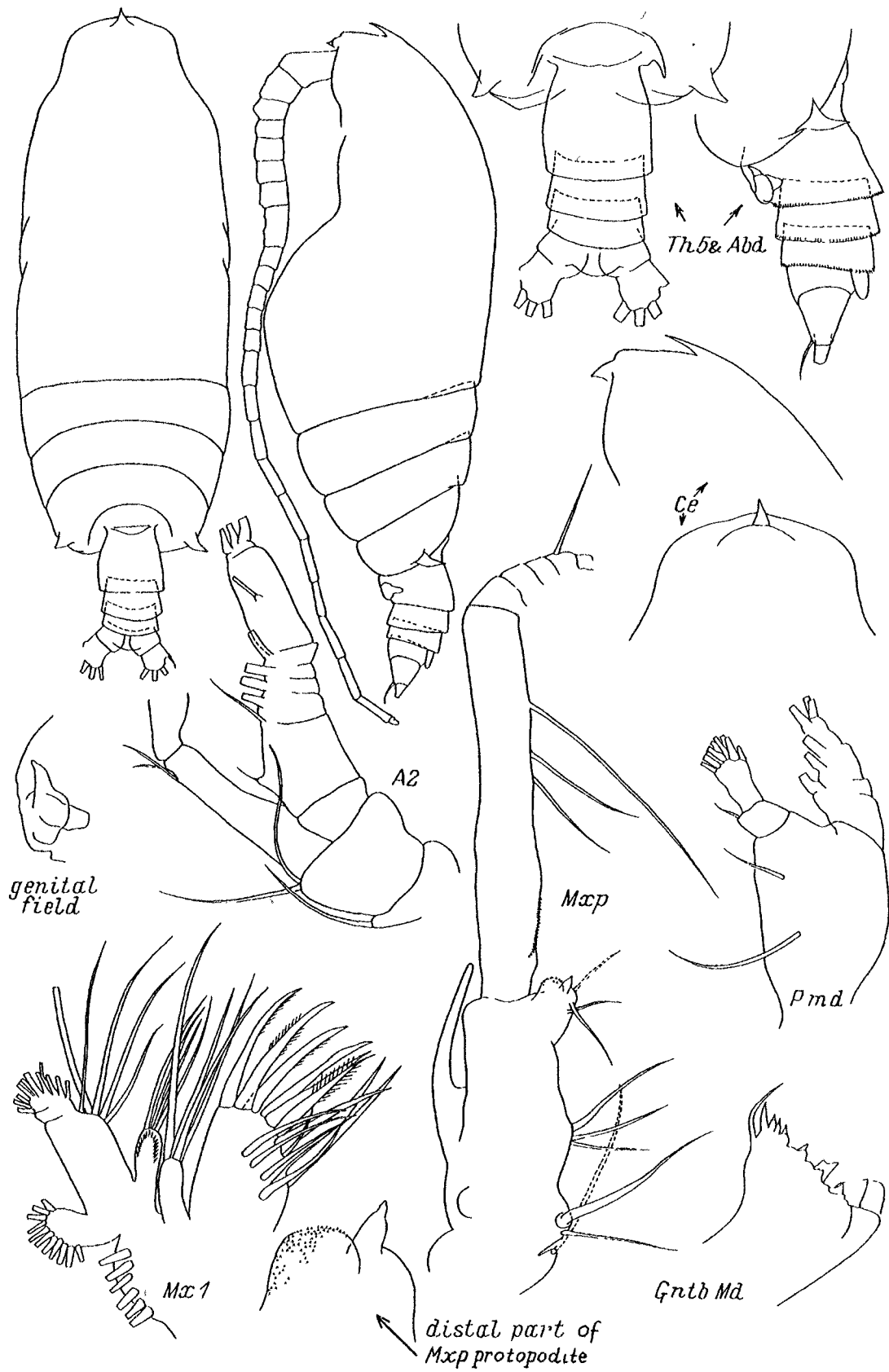


Fig. 146. *Gaetanus brevicornis*. Female (201).

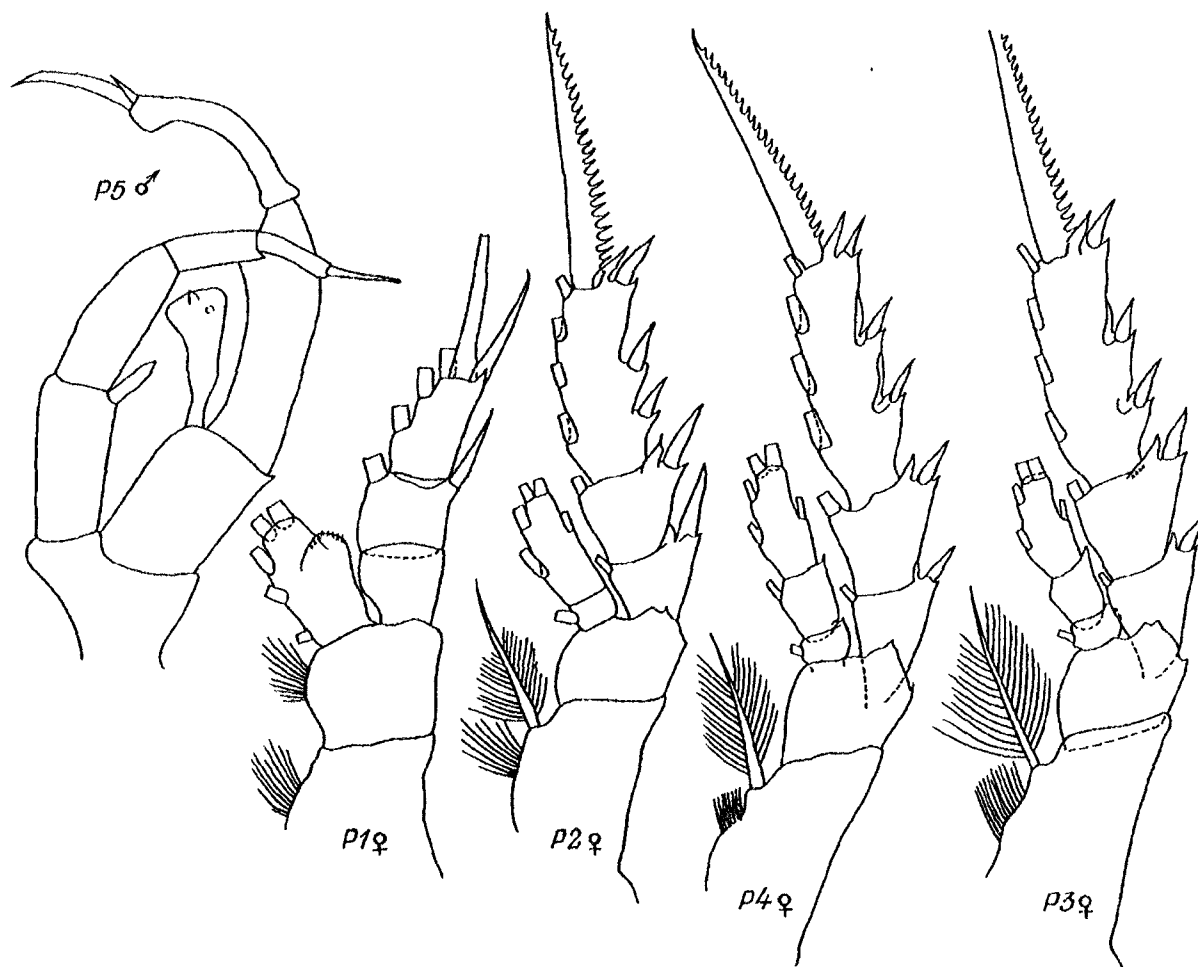


Fig. 147. *Gaetanus brevicornis*. Female (201). Male (from Wilson, 1950)

Gadius robustus (non Sars, 1905). Vervoort, 1949. 12, figs 5-6

Description Female. Total length 3.60-4.90 mm. Cephalothorax 3.0-3.7 times longer than abdomen. Frontal spine absent. Posterior Th5 corners with moderate spine, covering about one third of genital segment length (dorsal view), directed slightly to the ventral side of specimen (lateral view). A1 length varying: possibly longer than cephalothorax, reaching Abd2 - the end of caudal rami. Re1 A2 without setae; Re2 A2 with 2 setae. Md palp base with 2 setae; Ri1 Md with 2; Ri2 Md with 9 terminal setae. Second Mx1 internal lobe with 4 setae; Ri with 14-15 setae. Mxp protopodite with lateral plate, its shape varying. Re P1 3-jointed. Re2 and Re3 P1 with external spines; second external spine not reaching the base of next spine. Ri P2 2-jointed; P2-P4 typical of the genus. P4 coxopodite with about 23-27 spines.

Male. Total length 2.30-4.10 mm. Frontal spine absent. Cephalothorax about 3-4 times longer than abdomen. Length of spines on Th5 posterior corners varying. A1 slightly shorter than body. Num-

ber of setae on Re1-Re2 A2 reduced. After With's evidence (With, 1915: pl. 3, fig. 1e) setation of the third internal Mx1 lobe reduced; Ri supplied with 12 setae; Re with 11 setae. Mxp protopodite with only 2 distal setae (With, 1915, pl. 3, fig. 1). Re1 P1 without external spine; Re2 P1 with small poorly visible spine. P2-P4 as in females, but P4 coxopodite without spines. Left Re3 P5 not bilobated, elongated, rather triangular then stylet-like, but wide. It is shorter than Re2 of its leg.

Notes. *G. brevispinus* was described from the Arctic Basin (Sars, 1900). Close species *G. affinis* from the North Atlantic (Sars, 1905a) and *G. intermedius* from Antarctic (Wolfenden, 1905) were later described. The following features were proposed as distinguishing for these species: shape of lateral plate on Mxp protopodite, length of spines on Th5, position of rostrum between A1 in lateral view and body length. These features are highly variable. It seems that in classifying the specimens to particular species the researchers paid more attention to the geographical locality of finds than to the morphological structure. Thus it was considered that *G. brevispinus* occurs mostly in the Arctic Basin,

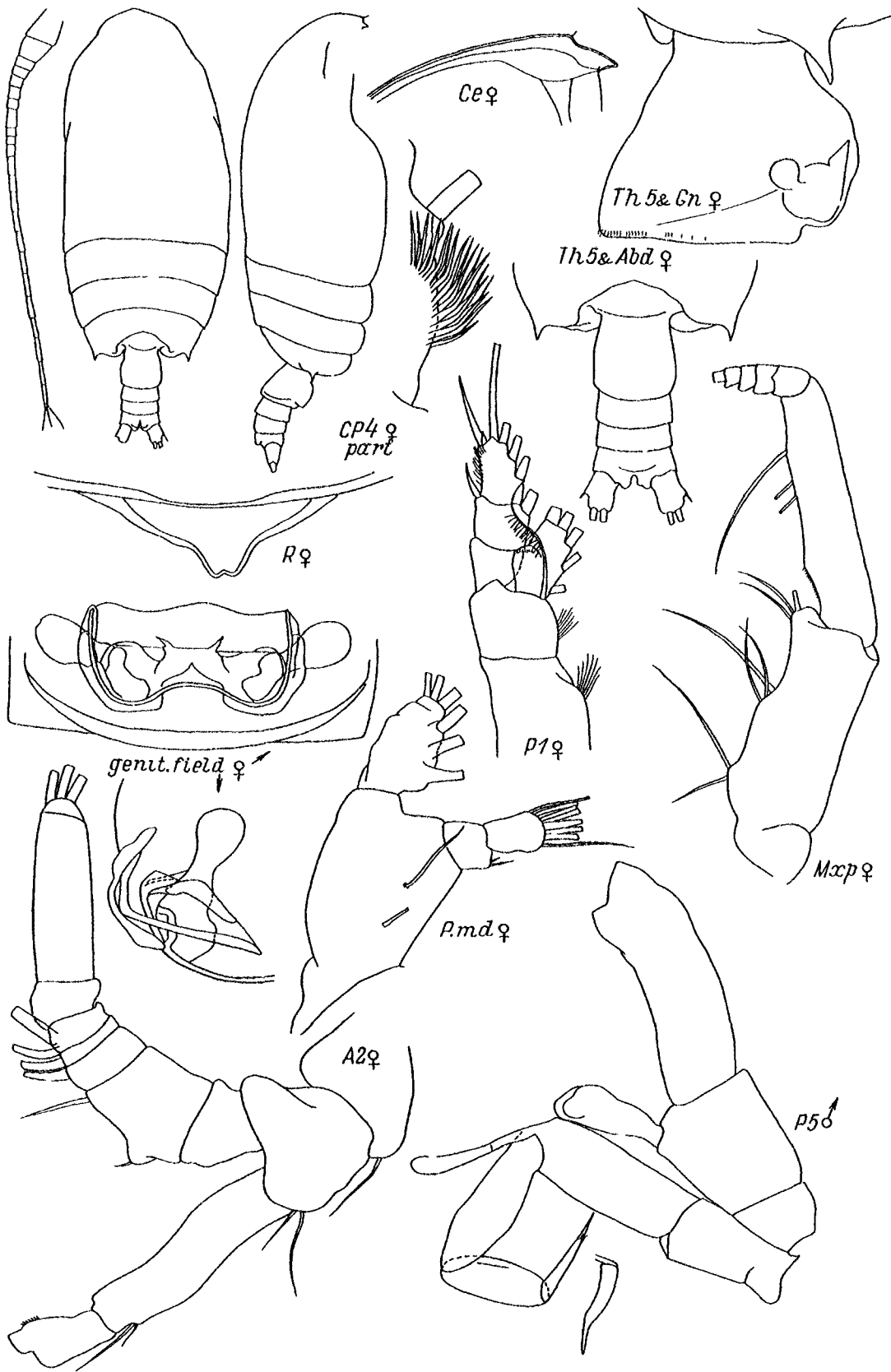


Fig. 148. *Gaetanus brevisrostris* Female (126). Male (from Brodsky, 1950)

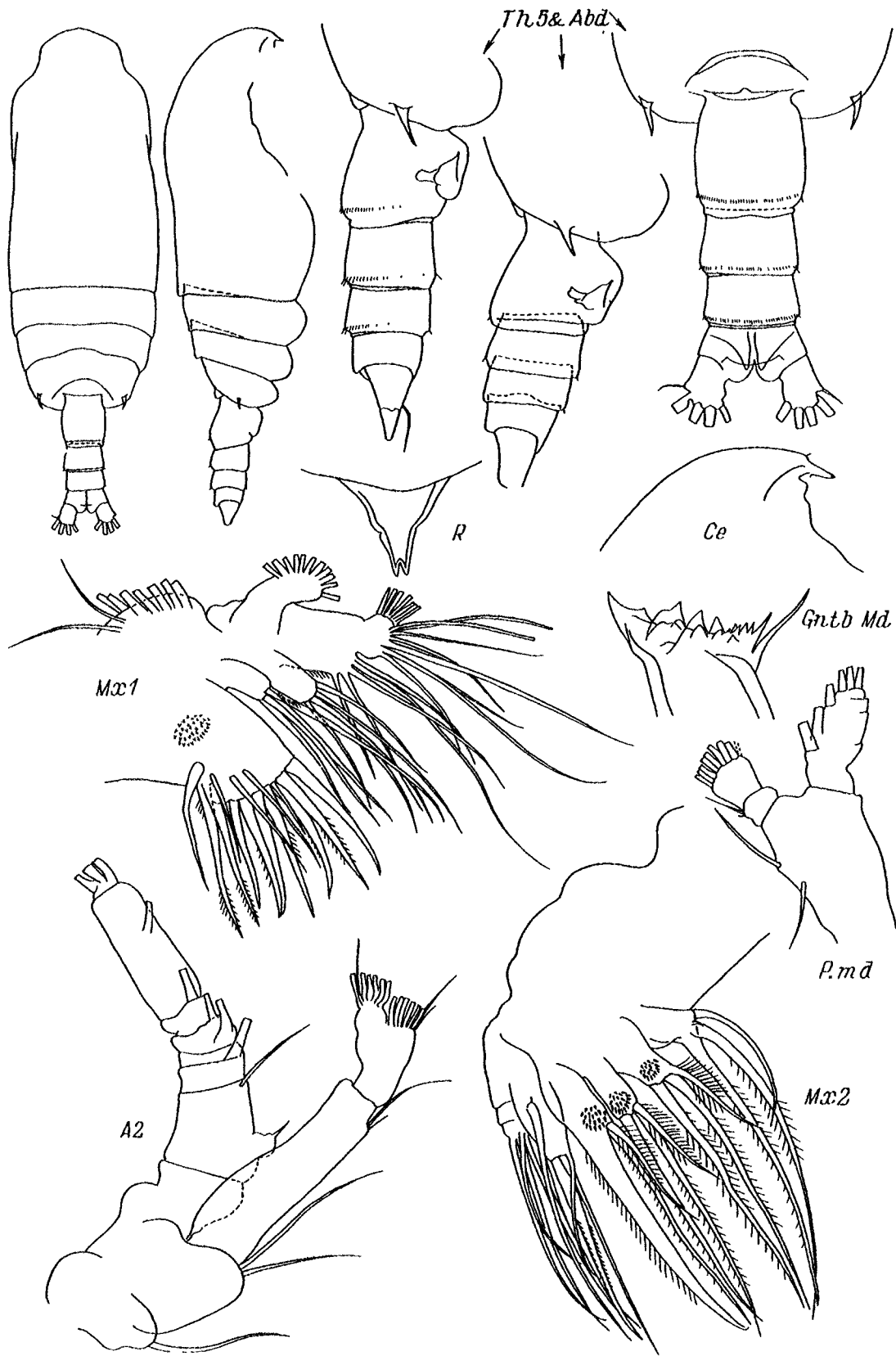


Fig. 149. *Gaetanus brevispinus*. Female (530).

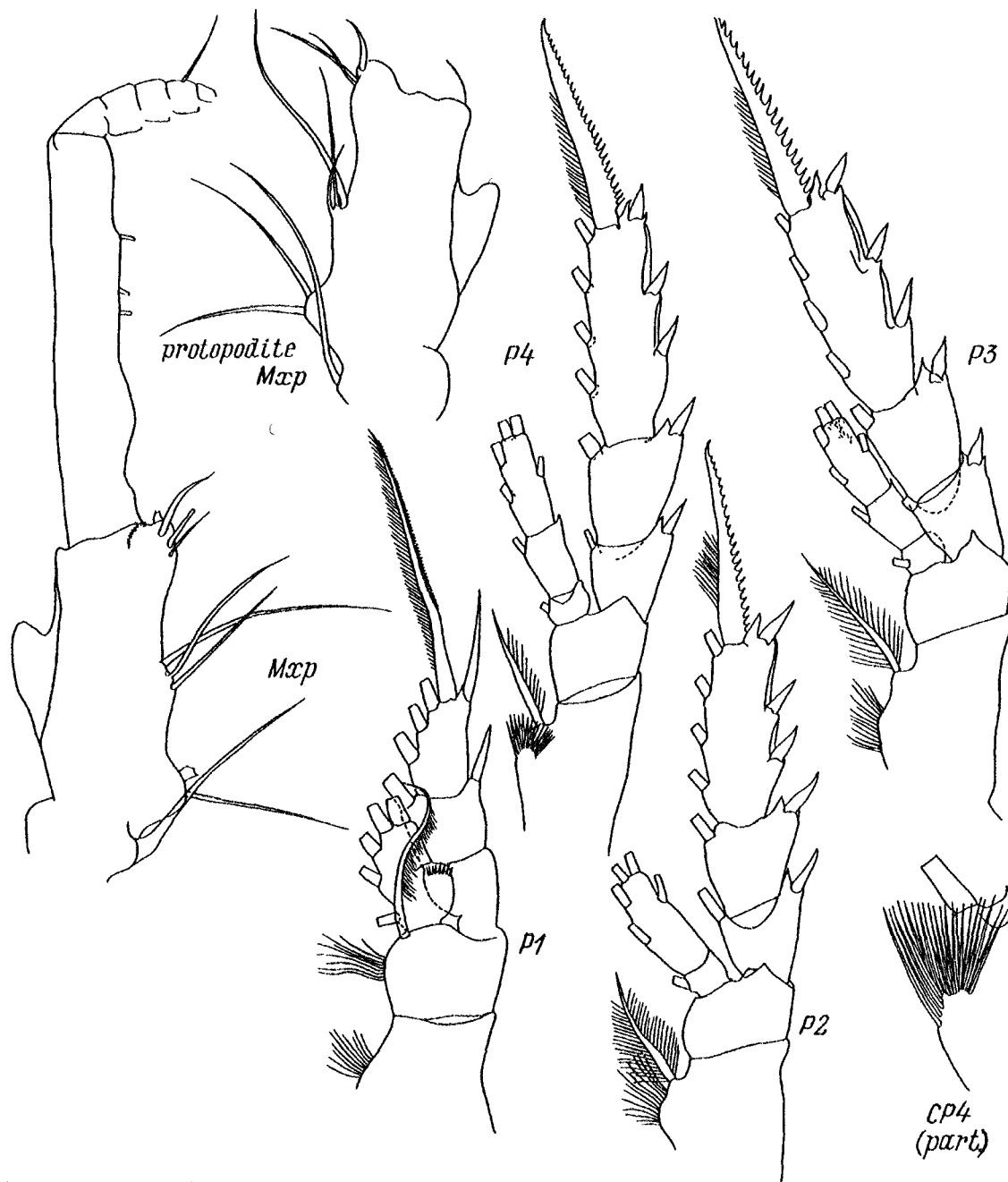


Fig. 150 *Gaetanus brevispinus*. Female (530)

G. affinis in temperate Atlantic and tropical waters of the Atlantic and the Pacific oceans and *G. intermedius* in the Southern Hemisphere mostly to the South from 35°S (Sars, 1905; Vervoort, 1952d, 1957, 1963; Park, 1978; Bradford & Jillett, 1980; etc.). *G. affinis* and *G. intermedius* were recognized as very close species (Vervoort, 1957). Park (1978) proposed their identity, but did not synonymize them. The relations between these two species and *G. brevispinus* were not discussed. I have studied the specimens of these 3 species from regions adjacent to their type localities and failed to verify the validity of earlier proposed features as distinguishing for the

species. They were found as very much varying not only between specimens from distant localities, but also in specimens of one population, often in specimens of the same sample. Furthermore the degree of variability was found more pronounced on populational level than between distant populations. No significant differences in body size were found. For groups of specimens from the central part of the Arctic Ocean, the Norwegian Sea and the northwestern part of the Pacific Ocean (localities considered to be typical for *G. brevispinus*) total body length was 4.40-4.85 mm, for specimens from region of 40°N 66°W (close to typical for *G. affinis* locality)

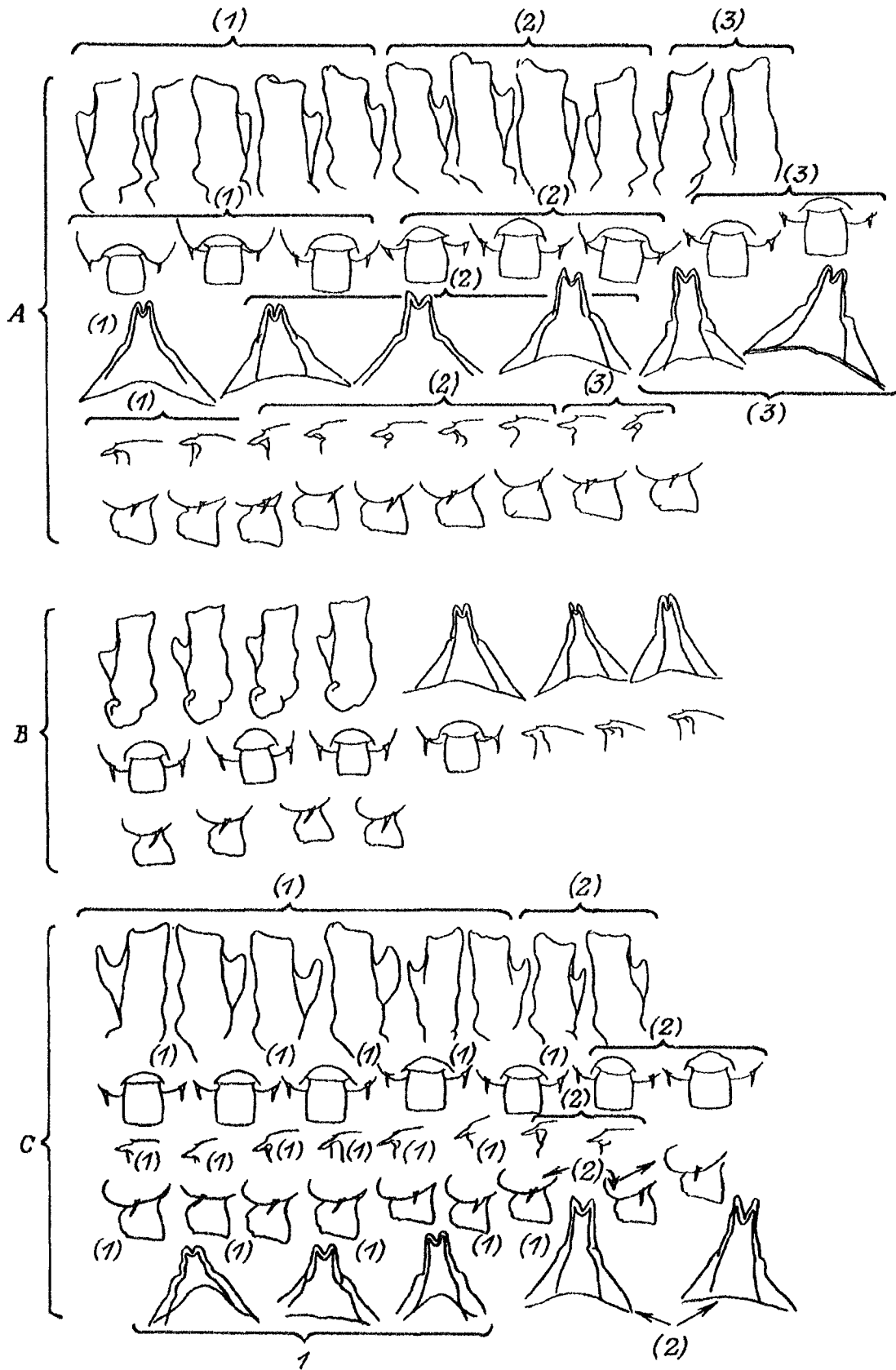


Fig. 151. *Gaetanus brevispinus*. Female. Types of P Mxp configuration, Th5 & Gn, R in specimens from: A — (1) the central part of Arctic Basin, (2) the Norwegian Sea, (3) the north-western part of the Pacific Ocean; B — Northern Atlantic and C — (1) Antarctica, (2) south-western part of the Pacific Ocean.

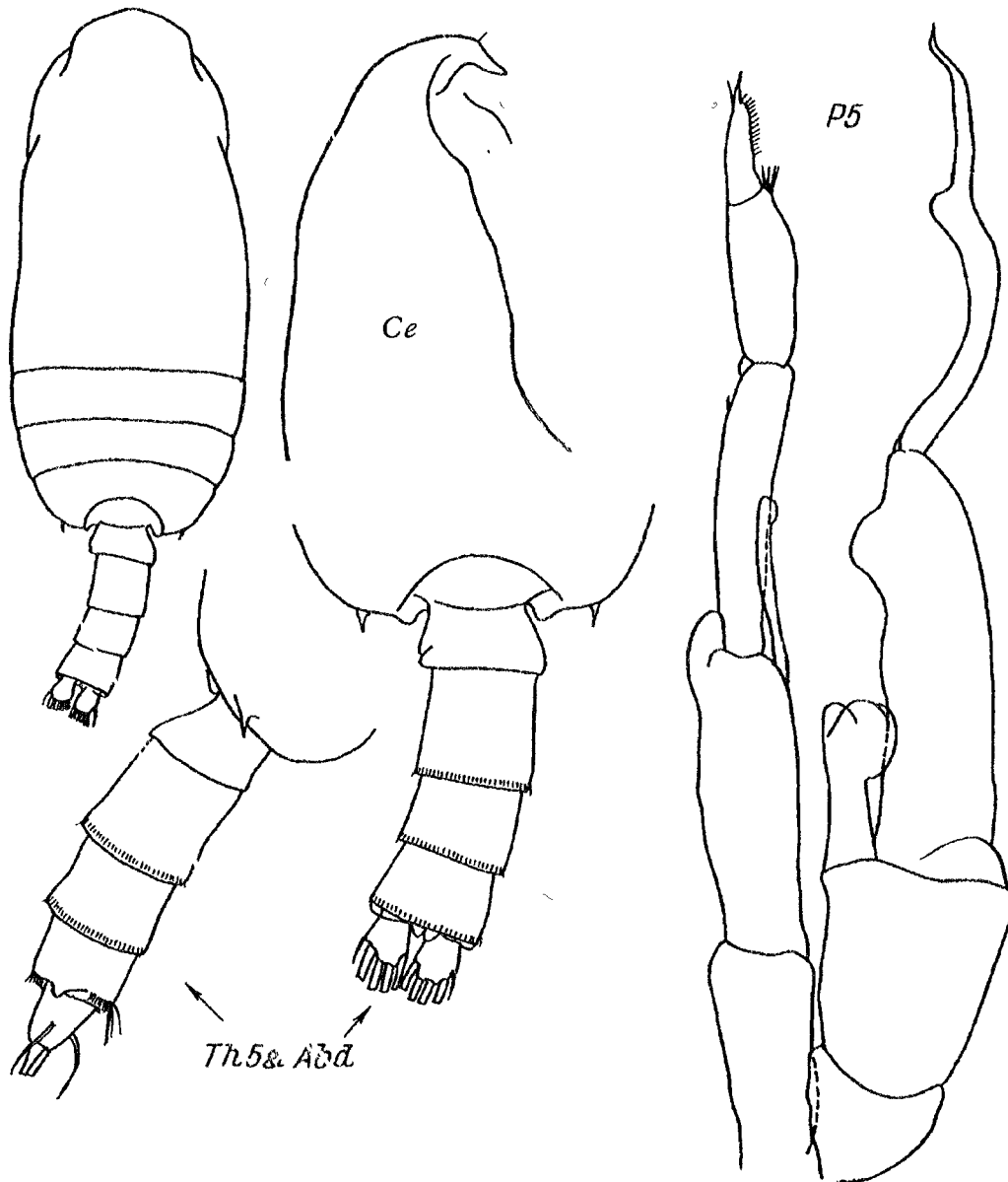


Fig. 152. *Gaetanus brevispinus*. Male (?).

3.85-4.65 mm and for specimens from Antarctic and south-eastern Atlantic (localities typical for *G. intermedius*): 4.30-4.90 mm. P5 structure of *G. affinis* and *G. intermedius* males after Park (1975b) is nearly identical, and in my opinion it is identical to that of *G. brevispinus*. Thus Park's assumption concerning the identity of *G. affinis* and *G. intermedius* is concerned, and in my opinion both species are identical to *G. brevispinus*.

Type locality: Arctic Basin.

Geographical distribution. Cosmopolitan species (except, Indian Ocean), but in the equatorial and subtropical zones rather infrequent. The species is recorded from the Gulf of Guinea, the region of the Malay Archipelago, the south-eastern and tropical parts of the Pacific Ocean (Vervoort, 1949, 1963; Wilson, 1950; Bjørnørg, 1973; etc.). However the

species is often recorded in boreal zones of the Atlantic and Pacific oceans as well as to the North up to the central part of the Arctic Ocean 86°N (original data); the species is distributed circumpolar, in subantarctic and antarctic zones where it was found mostly to the South between 35°S and 76°S (Farran, 1929).

Vertical distribution. In high latitudes the species sometimes occurs near surface, but usually deeper than 200 m, in other regions of the World Ocean it was found in hauls from meso- and bathypelagial (Jespersen, 1934; Vervoort, 1957; original data, etc.) and in a big number of total hauls from depths from 3000 m.

Material. 72 females and 9 males from samples 18, 61-64, 72-73, 79, 90-94, 118-121, 132, 134-136, 145-146, 156-160, 171-174, 188-191, 195, 218, 251,

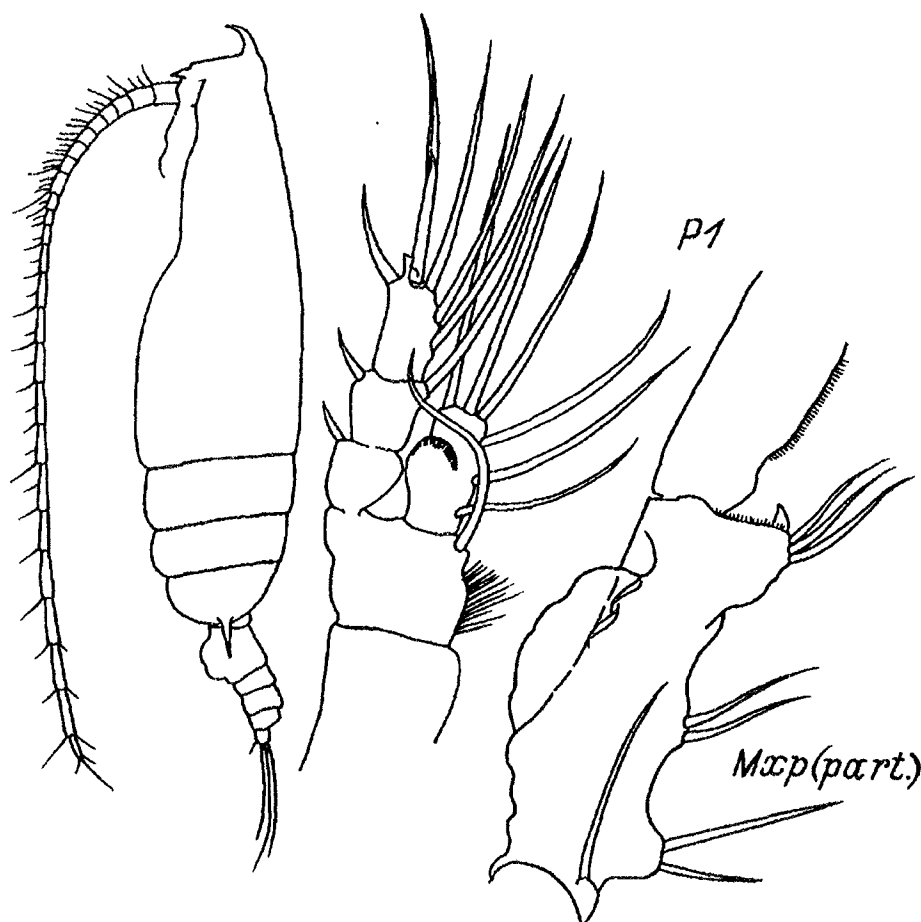


Fig. 153. *Gaetanus curvicornis*. Female: general view (from Sars, 1924), P1, Mxp (part.) (from Sewell, 1947).

294, 359, 376, 384, 393, 429, 431, 435-436, 447, 449, 453, 456, 473, 476, 525, 527, 530, 532-533, 535, 539, 542-543, 545-547, 551-555, 570, 574.

8. *Gaetanus curvicornis* Sars, 1905

(Fig. 153)

Gaetanus curvicornis Sars, 1905 : 11, 1924-25: 55, pl. 17, fig. 2; Jespersen, 1934: 61; Sewell, 1947: 67, text-fig. 12; Bjornberg, 1973: 323; Park, 1975b: 11, 13; Vives, 1982: 291; Deevey & Brooks, 1977: 263.

Description. Female. (Description after Sars (1924-25), Sewell (1947) and Vervoort (1952) with modifications). Total length 3.70-4.75 mm. Cephalothorax 3-4 times longer than abdomen. Spines on Th5 posterior corners straight, situated in the middle of Th5 posterior border (lateral view), covering nearly one third or a fourth of genital segment length. Frontal spine present; directed upward and anteriorly near its base, but its top curved to rostrum. Posterior borders of Abd2-3 without spinules (Sewell, 1947). A1 as long as body, or longer by 3 last joints

(Sars, 1925; Sewell, 1947). Re2 A2 with 2 first setae rising from the small projections (Sewell, 1947). Second Mx1 internal lobe with 5 setae. Mxp propodite with lateral plate. Re P1 3-jointed, with external spine on each joint, second external spine not exceeding the midlength of Re3 P1. Ri P2 2-jointed. P4 coxopodite with about 12 spines.

Male unknown.

Type locality: 36°46'N 26°41'W.

Geographical distribution. Atlantic Ocean: the North Atlantic, recorded off the Azores Islands region and between these islands and the coasts of Spain and Portugal, from the region of Madeira, the Sargasso Sea (Sars, 1925; Jespersen, 1934; Deevey & Brooks, 1977; Vives, 1982); it was found to the North to the Baffin Bay and the west of Greenland (Jespersen, 1934). Pacific Ocean: the south-eastern part in the region of 38°S (Bjornberg, 1973). Indian Ocean: recorded in the Arabian Sea (Sewell, 1947).

Vertical distribution. The species was found in hauls from meso- and meso-bathypelagial (Deevey & Brooks, 1977; Vives, 1982), in total hauls from 1500-5700 m.

The species is not examined by me.

9. *Gaetanus inermis* Sars, 1905

(Figs. 154-155)

Gaetanus inermis Sars, 1905: 12, 1924-25: 64, pl. 19, figs 3-5; Park, 1975b: 11, 13.

Gaidius inermis: Grice & Hulsemann, 1968: 327.

Description Female. Total length 6.20-7.35 mm. Cephalothorax 4 times longer than abdomen. Frontal spine absent. Spines on Th5 posterior corners absent. A1 about as long as cephalothorax. Re1 A2 with 1 seta; Re2 A2 with 3 setae. Md palp base and Ri1 Md with 2 setae each; Ri2 Md with 9 long terminal and 2 small posterior setae. Second Mx1 internal lobe with 5 setae; third with 4 setae and additional teat; Ri Mx1 with 14 setae. Lateral plate on Mxp protopodite present. Re P1 3-jointed, with external spine on each joint; first and second external spines exceeding the distal border of Re2 and Re3. P2 with 2-jointed Ri. P4 coxopodite with about 35 thin spines.

Male unknown.

Type locality: 36°46'N 26° 41'W.

Geographical distribution. Atlantic Ocean: the north-eastern part (Sars, 1925; Rose, 1929). Pacific Ocean: south-eastern part (Grice & Hulsemann, 1968), off Peru (Wilson, 1950), found for the first time in the north-western part in the Kurile-Kamchatka Trench region (original data).

Vertical distribution. The species was found in hauls from abyssopelagial (original data) and in total hauls from 3000 and 6000 m.

Material: 6 females from samples 19, 83, 85, 97, 123, 163, 193.

10. *Gaetanus simplex* Brodsky, 1950

(Fig. 156)

Gaetanus simplex Brodsky, 1950: 163, fig. 77; Bjornberg, 1973: 324; Deevey & Brooks, 1977: 263.

Gaetanus intermedius Campbell, 1930: 178, pl. 1, figs 2-3 (nom. praecoc., non Wolfenden, 1905); Park, 1973: 1597, figs 1-2.

Gaetanus campbellae Park, 1975b: 12 (nom. nov. pro *intermedius* Campbell).

Description. Female. Total length 3.20-3.50 mm. Cephalothorax about 3.5-4.0 times longer than abdomen. Frontal spine present, not large, curved to rostrum. Spines on Th5 posterior corners situated in dorsal part of Th5 posterior border (lateral view), usually exceeding the midlength of genital segment, but may vary in length. A1 shorter than body, usually reaching genital segment. Re1 A2 without seta; Re2 A2 with 2 setae. Md palp base and Ri1 Md with 2 setae; Ri2 Md with 9 terminal setae. Second internal Mx1 lobe with 4 setae; Ri Mx1 with 14 setae. Lateral plate on Mxp protopodite absent. P1

with 2-jointed Re with external spine on each joint, sometimes indeterminate traces of subdivision of Re1 and Re2 visible. P2 with 2-jointed Ri. P4 coxopodite with about 12-17 spines.

Male. Total length 2.65-3.10 mm. Cephalothorax about 3 times longer than abdomen. Frontal spine nearly the same as in females. It is not removed from anterior part of cephalon posteriorly as in close species *G. armiger*. Spines on Th5 slightly not reaching the posterior border of genital segment. Compared to females oral parts reduced. Setation of A2 the same as in females. Ri Mx1 with 8-9 setae; Re with 11 setae. Md palp base without setae. Ri1 Md with 1 seta; Ri2 Md with 9 setae. Mxp protopodite with 2 setae distally. Re P1 indistinctly 3-jointed (after Park (1973) 2-jointed). P2-P4 as in females, but P4 coxopodite without spines. P5 very close to that of *G. armiger*.

Notes. When genera *Gaetanus* and *Gaidius* were united (Park, 1975b) the new name *Gaetanus campbellae* Park, 1975 was proposed for this species. However, this species already had more earlier name of *G. simplex*.

Type locality: the north-western part of the Pacific Ocean.

Lectotype: female from sample 474.

Geographical distribution. Atlantic Ocean: the Sargasso Sea region of 32°N (Deevey & Brooks, 1977). Pacific Ocean: the south-eastern part (Bjornberg, 1973), sufficiently widespread in the northern part, in the Sea of Okhotsk and the Sea of Japan, the region of the Kurile-Kamchatka Trench (original data), the Bering Sea (Motoda & Minoda, 1974) and the north-eastern part (Park, 1973).

Vertical distribution. The species was recorded from epipelagial, more often in meso-, upper bathypelagial, single findings known from lower bathy- and abyssopelagial (original data).

Material: more than 200 females and 18 males from samples 11, 19, 61-62, 71-72, 77-79, 89-91, 118, 132, 145, 156-157, 165, 169-172, 182-186, 189-190, 195, 216-218, 222, 227-228, 235, 241-243, 245, 247-248, 250-251, 258-259, 474.

11. *Gaetanus kruppii* Giesbrecht, 1903

(Figs. 157-158)

Gaetanus kruppii Giesbrecht, 1903: 202, Vervoort, 1963: 126; Mazza, 1965: 285, figs 1-10; Owre & Foyo, 1967: 44, fig. 119, 134, 243; Tanaka & Omori, 1970a: 135, fig. 10, Park, 1975b: 11, 24, fig. 8, 1978: 136, figs 21-22; Bradford & Jillett, 1980: 48, fig. 32.

Gaetanus major Wolfenden, 1903: 125, 1904: 111, 114, 132, 145, pl. 9, figs 7-8, 1908: 40, fig. 45, 1911: 231; Farran, 1905: 26, 33, 1926: 249.

Gaetanus microcanthus Wilson, 1950: 231, pl. 11, figs 114-116, pl. 19, fig. 246

Description. Female. Total length 4.70-5.70

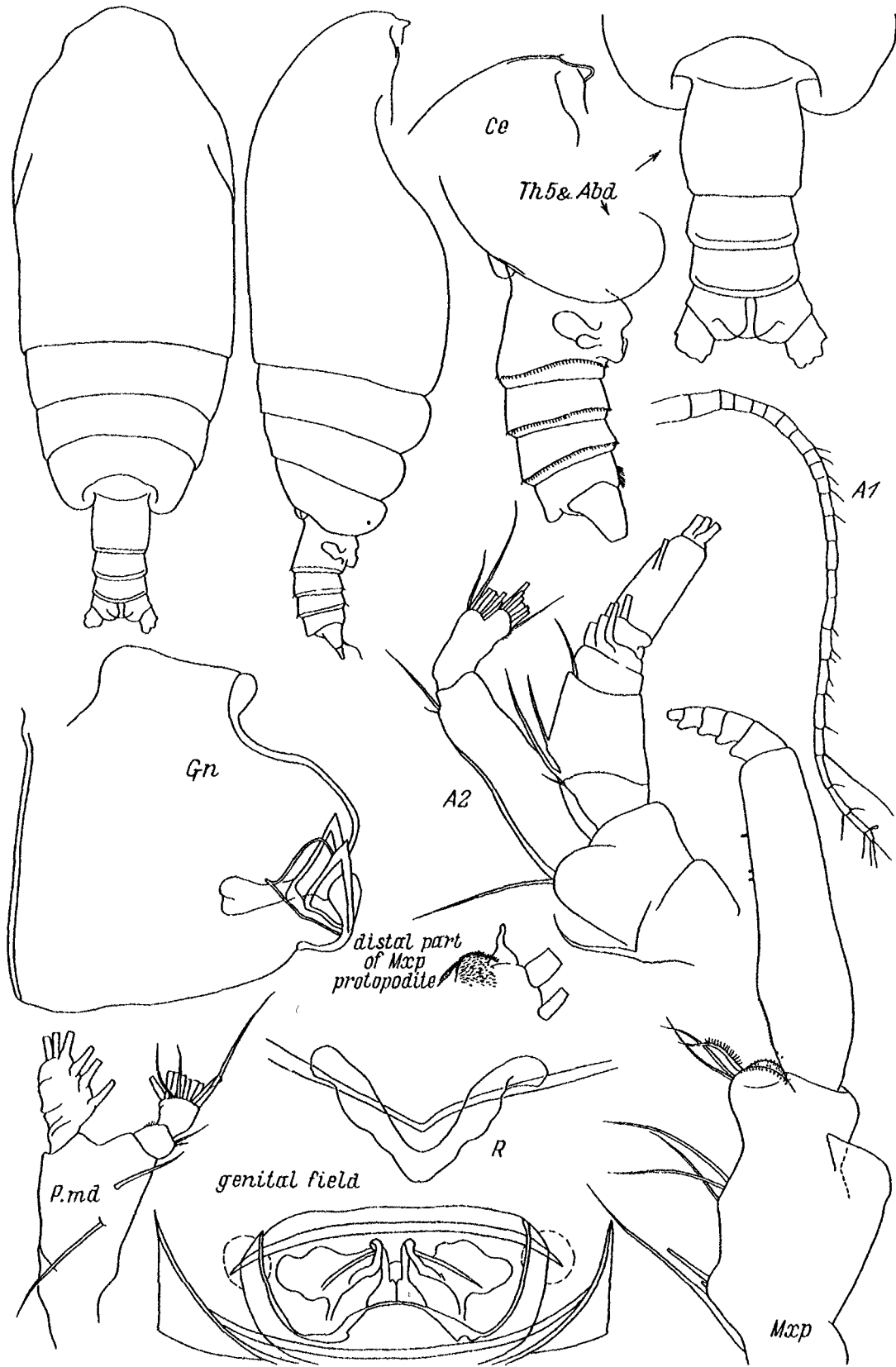


Fig. 154. *Gaetanus inermis*. Female (163).

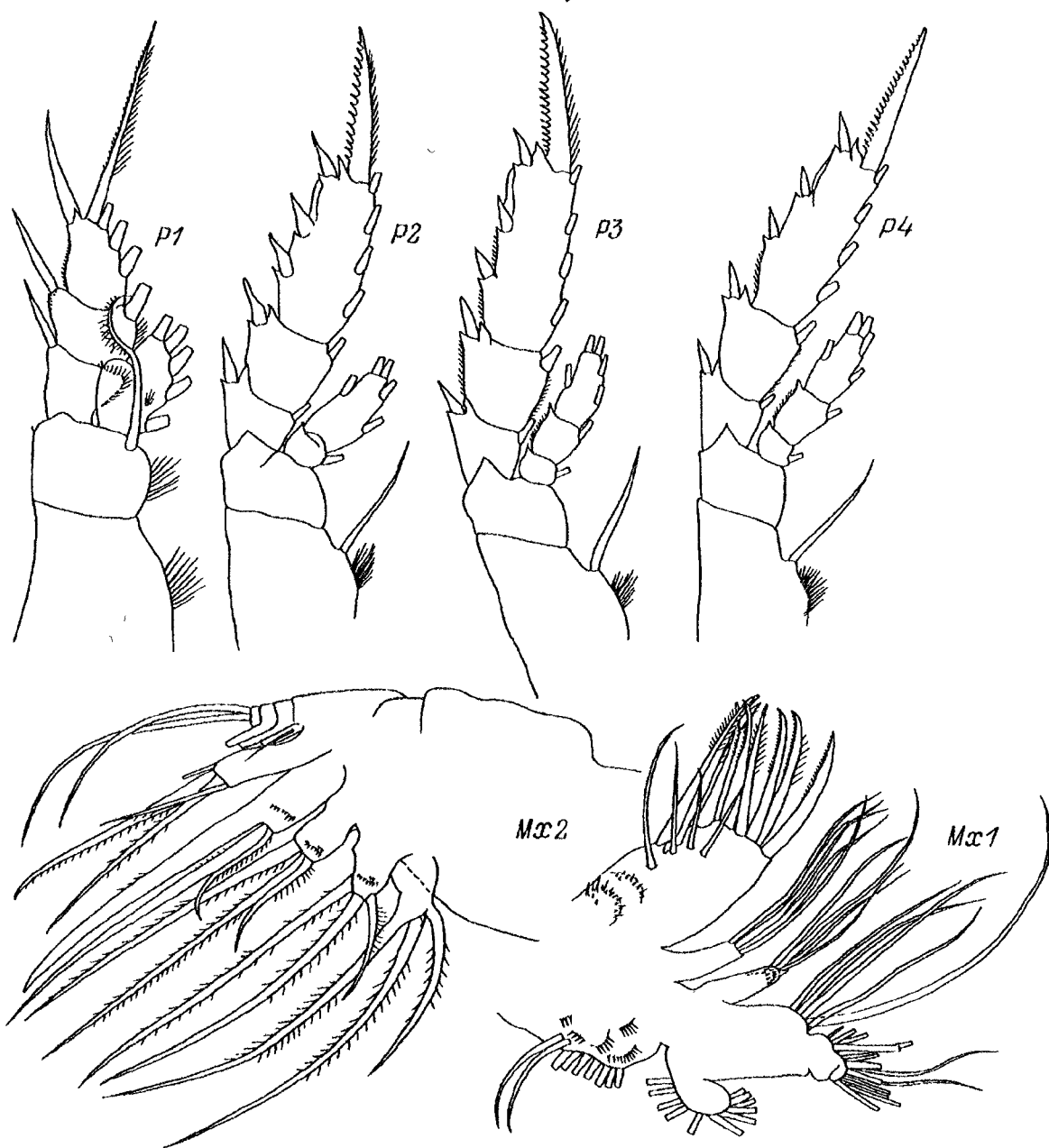


Fig. 155. *Gaetanus inermis*. Female (163).

mm. Cephalothorax about 3.7-4.0 longer than abdomen. Frontal spine present, not large, curved to rostrum. Spines on Th5 posterior corners in the middle of Th5 posterior border (lateral view), straight, not reaching the middle of genital segment. A1 longer than body by 3-4 last joints. Re1 A2 without setae; Re2 A2 with 2 setae. Second internal Mx1 lobe with 4 setae; Ri with 15. Md palp base with 2 setae; Ri1 Md with 1; Ri2 Md with 9 terminal setae. Lateral plate on Mxp protopodite present, deeply cut. Re P1 with indistinctly 3-jointed Re. Re1 P1 without spine; Re2 P1 with spine reaching the

last third of Re3, also equipped with external spine. Ri P2 indistinctly 2-jointed. P4 coxopodite with about 23 spines.

Male. Total length 4.50-5.20 mm. Cephalothorax about 3.0-3.4 times longer than abdomen. Frontal spine present, varying in shape, longer than in females. Spines on Th5 posterior corners small. A1 reaching the end of cephalothorax - Abd4, or exceeding caudal rami by 2 last joints. Re1 A2 without setae; Re2 A2 with 2 setae. Md palp base with 1 seta; Ri2 Md with 9 setae. Re Mx1 with 10-11 setae; Ri with 9 setae. Re P1 incompletely 3-jointed;

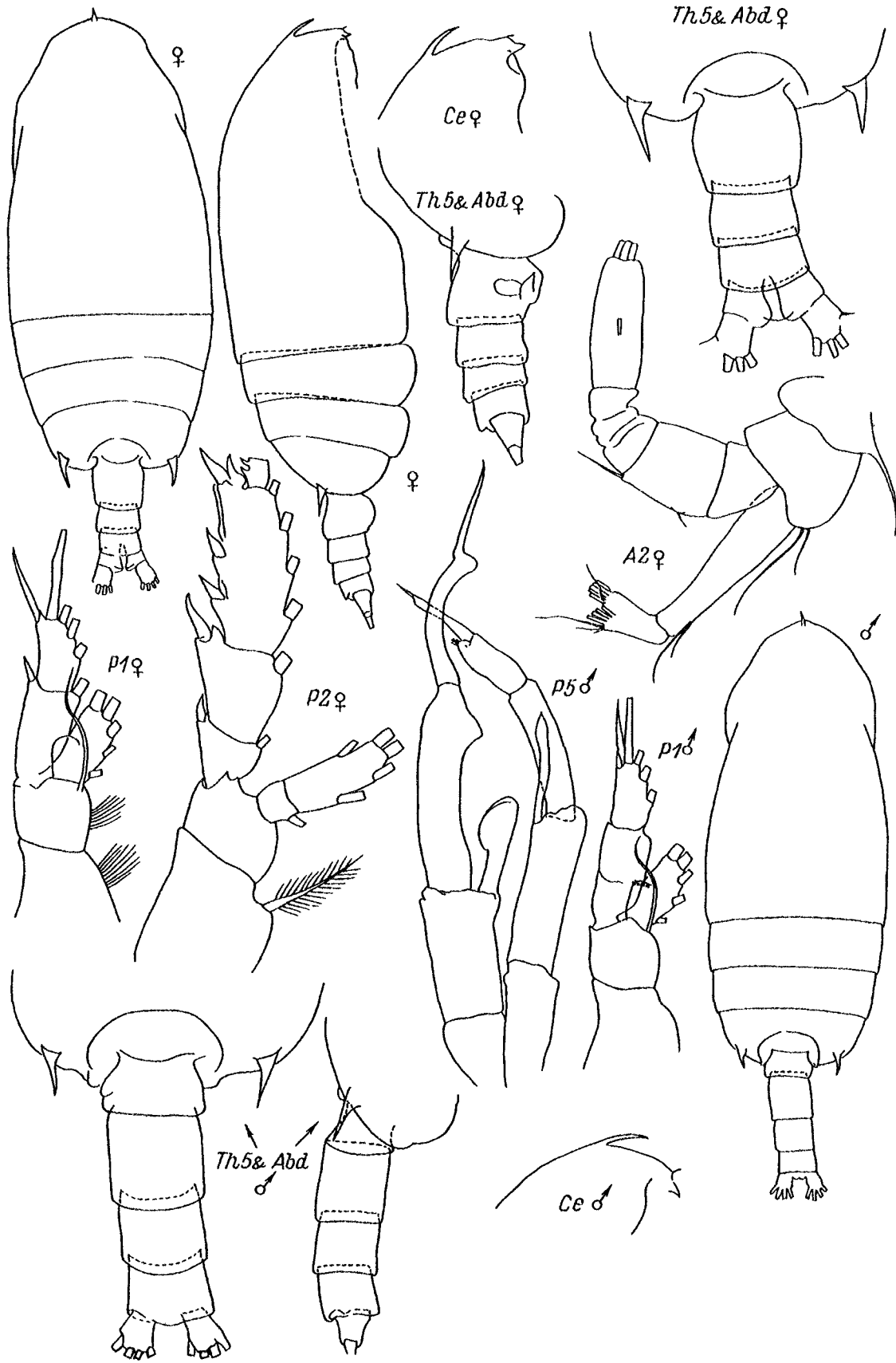


Fig. 156. *Gaetanus simplex*. Female (170). Male (171).

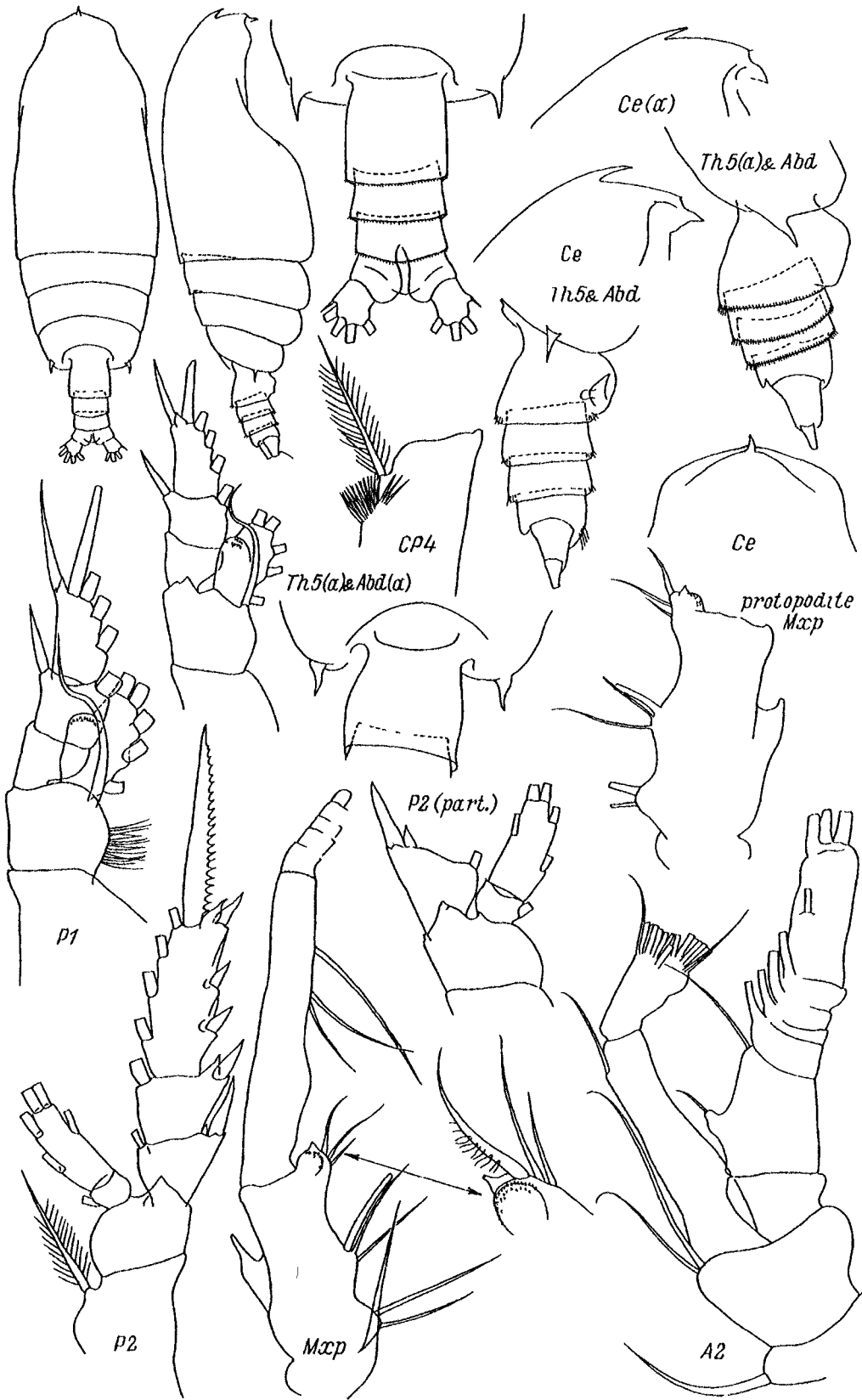


Fig. 157. *Gaetanus kruppi*. Female: general view, Ce, Th5 & Abd, A2, Mxp, P1-P2, C P4 (202), other figures (360).

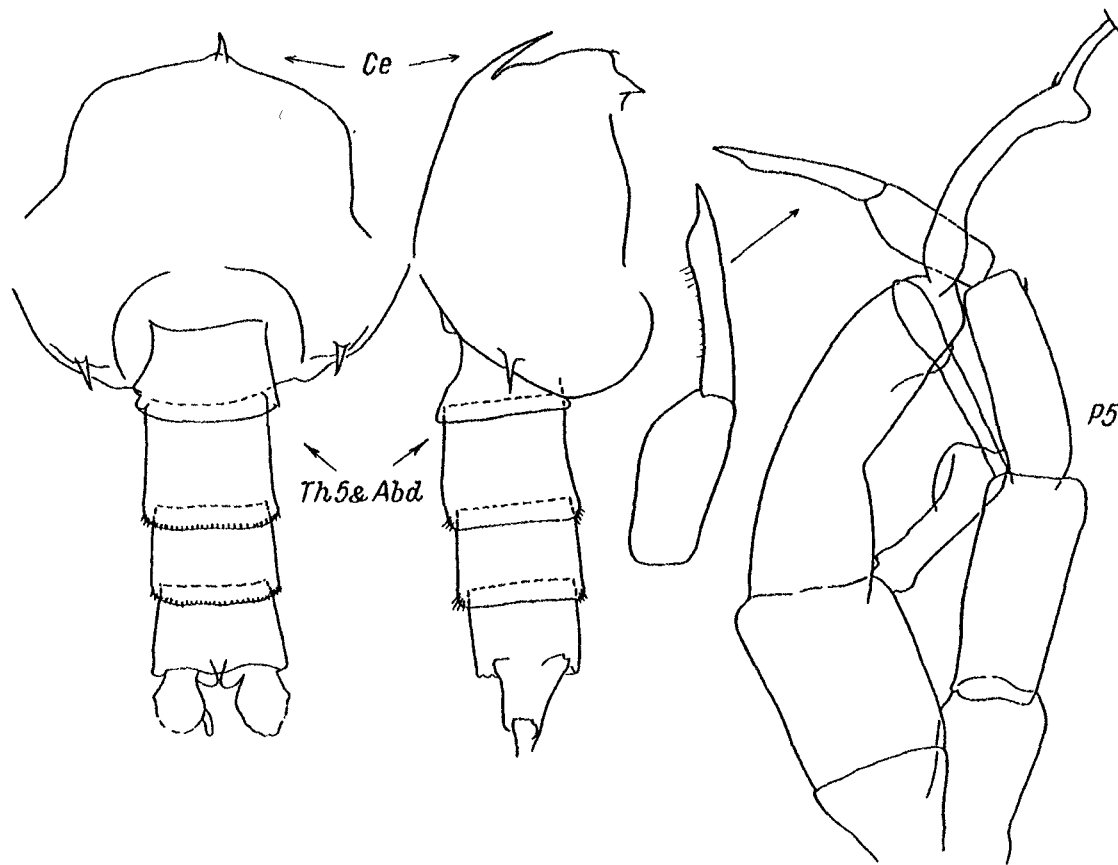


Fig. 158. *Gaetanus krupii*. Male (443).

Re1-Re2 without external spines. Ri P2 2-jointed. Left Ri P5 covering two third of Re1 P5 length, and in original specimen even slightly longer than the joint. Re3 left P5 not bilobated, stylet-like, it is longer than Re2 of its leg.

Type locality: the Mediterranean Sea.

Geographical distribution. The species is widespread in the Atlantic, Pacific and Indian oceans (Vervoort, 1963). In the Atlantic Ocean found to the North till 65°N (With, 1915) and to the South to 39°S (Wolfenden, 1911). In the Pacific Ocean: in the north-western part to the North up to Japan (Tanaka & Omori, 1970a), to the South down to the Marian Trench region (original data), in the north-eastern part recorded in the region of Vancouver (Esterly, 1906), in the south-eastern part the most southern finding in the region of 59°S (Park, 1978), known also from the New Zealand region (Bradford & Jillett, 1980).

Vertical distribution. The species was found in hauls from lower meso-, upper bathypelagial (Farran, 1926; Park, 1975b), also in total hauls from depths 600-8000 m.

Material: 9 females and 1 male from samples 3-4, 47, 201-202, 360, 443.

12. *Gaetanus latifrons* Sars, 1905

(Figs. 159-160)

Gaetanus latifrons Sars, 1905: 4, 11; Vervoort, 1957: 61, 1963: 133; Owre & Foyo, 1967: 44, fig. 244; Grice & Hulsemann, 1967: 15, 1968: 324; Tanaka & Omori, 1970a: 138, fig. 11; Park, 1975b: 11, 15, fig. 3, 1978: 144; Bradford & Jillett, 1980: 51, fig. 33.

Gaetanus holti Farran, 1905: 26, 33, pl. 6, figs 1-12, Wolfenden, 1908: 31, 1911: 232, text-fig. 12.

Gaetanus longispinus Wolfenden, 1905: 7, pl. 3

Description. Female. Total length 4.40-5.40 mm (after Wolfenden (1911) 3.75 mm). Cephalothorax about 3-4 times longer than abdomen. Frontal spine present, robust, beginning from anteriordorsal part of cephalon and its base directed forward (lateral view); its top often slightly curved to rostrum. Spines on Th5 posterior corners removed to ventral side of specimen (lateral view), curved, usually longer than genital segment. In dorsal view, they are slightly divergent. A1 reaching the midlength of abdomen, or exceeding caudal rami by 3 last joints. Re1 A2 with 1 seta, Re2 A2 with 3 setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with

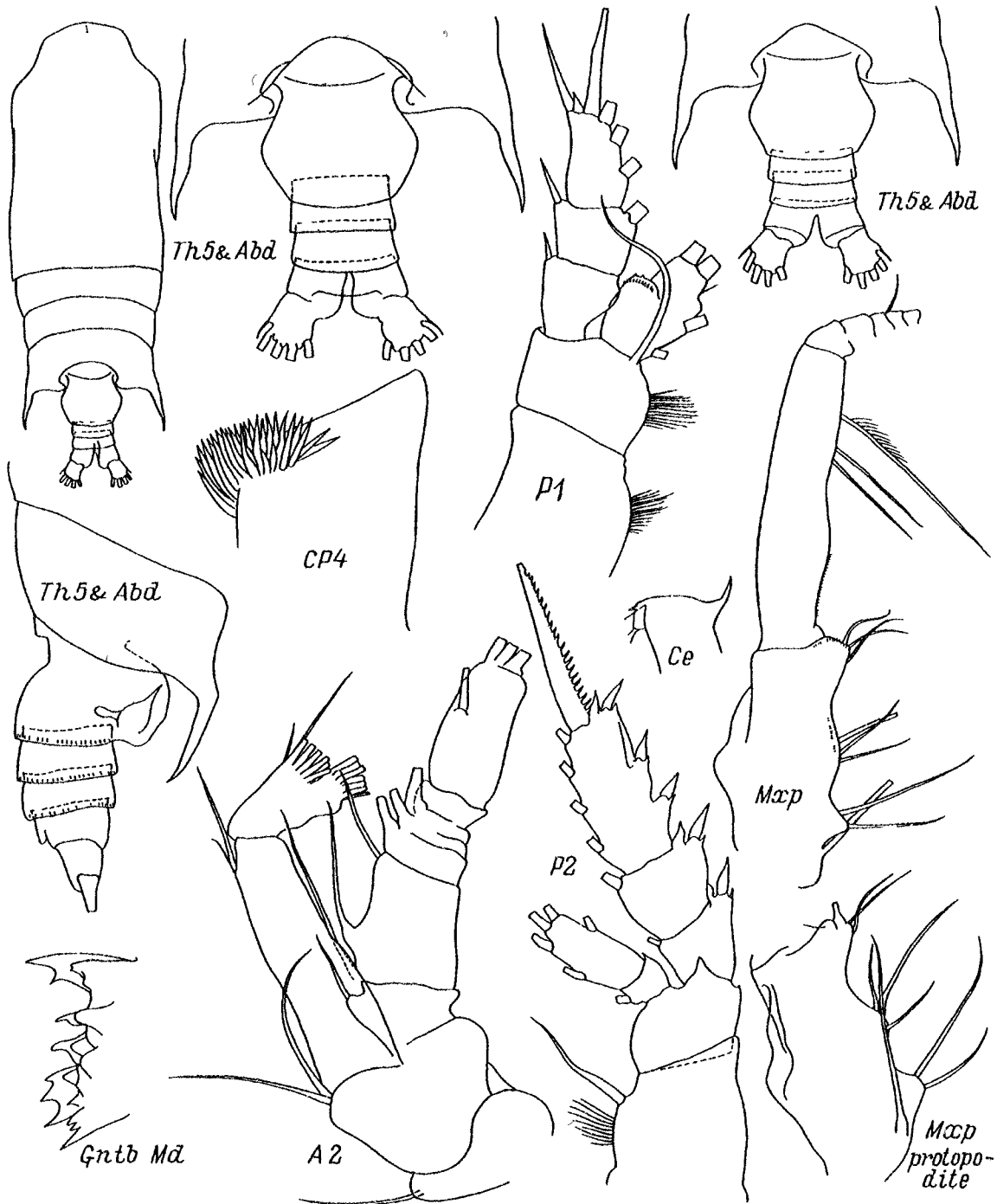


Fig. 159. *Gaetanus latifrons*. Female: Ce (from Sars, 1924), other figures (387).

9 terminal and 2 short posterior setae. Mxp protopodite with lateral plate. Re P1 3-jointed, with external spines on each joint. Ri P2 2-jointed. P4 coxopodite with about 15-19-25 spines.

M a l e. (Description after Park (1975b) with changes). Total length about 4 mm. Frontal spine small, directed to rostrum. Spines on Th5 posterior corners, as in females, removed to ventral side of specimen (lateral view), long, exceeding the posterior

border of genital segment. A1 reaching distal end of Abd2. Re1 and Re2 A2 without setae. Third internal Mx1 lobe with 3 small setae; Ri Mx1 with 11 setae; external lobe with 9 setae. Re P1 3-jointed Re1 and Re2 P1 with small external spines; Re3 also with external spine. Re2 P5 right longer than Re1. Ri P5 left is less than a fourth of Re1 length. Re3 P5 left bilobated, not stylet-like, short; it is about two third of Re2 length.

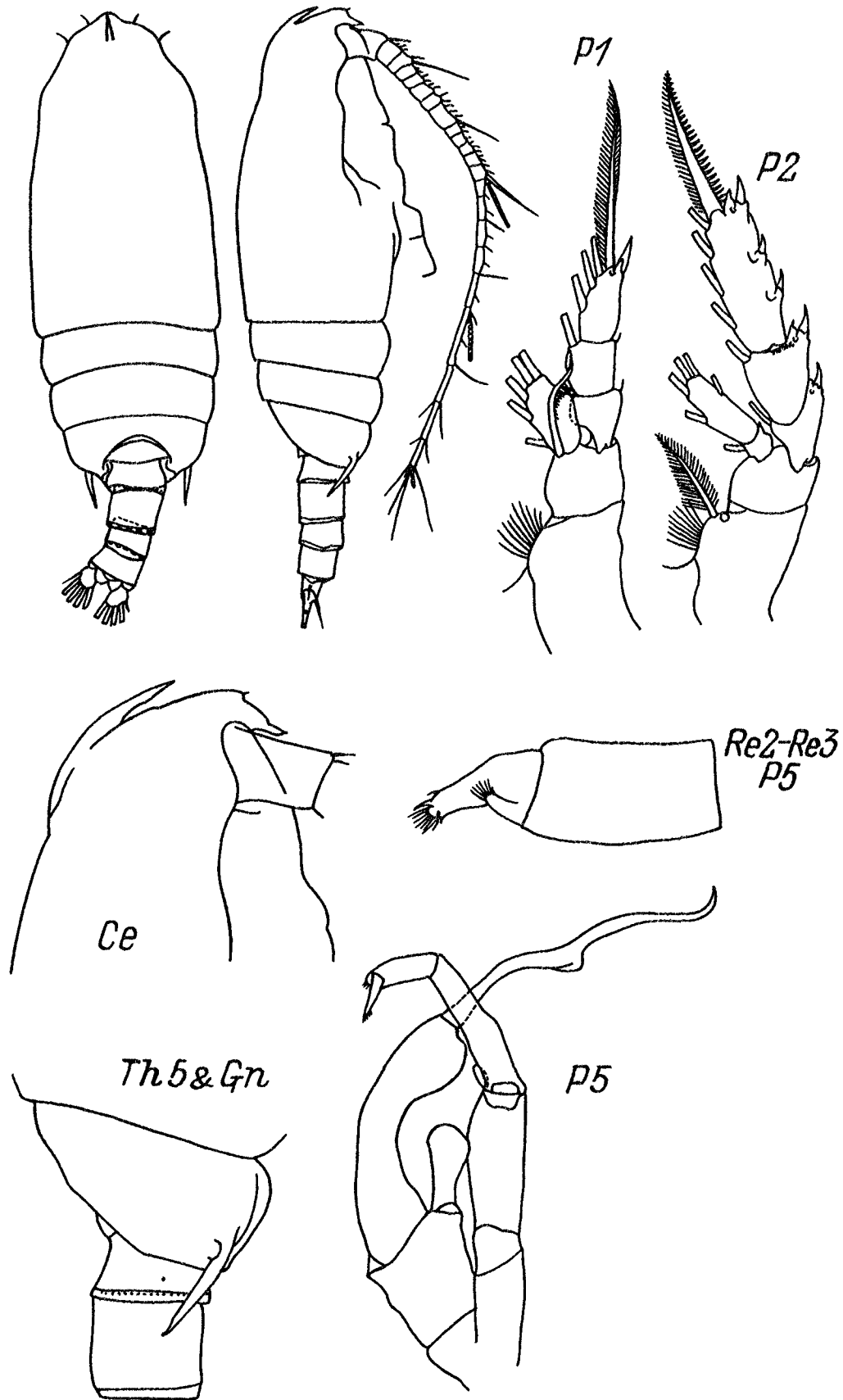


Fig. 160. *Gaetanus latifrons*. Male (from Park, 1975b)

Type locality North Atlantic.

Geographical distribution. Atlantic Ocean: the species widespread in the northern part, the northernmost finding is in the region of 61-65°N (With, 1915), the southernmost: in the Gulf of Guinea (Vervoort, 1963). Pacific Ocean: the most northern finding in the Japanese waters (Tanaka & Omori, 1970a), the southernmost region of 47°S (Bjornberg, 1973). Indian Ocean: found in the Bay of Bengal (Sewell, 1929; 1947), the southernmost finding in the region of 29°S (Grice & Hulsemann, 1967), and in the south-eastern part to 45-48°S (Vervoort, 1957; original data).

Vertical distribution. The species mostly found in meso-, bathypelagial (Farran, 1908, 1926; Park, 1975b; Deevey & Brooks, 1977, original data).

Material: 10 females from samples 387, 392, 400-401, 403, 419.

13. *Gaetanus miles* Giesbrecht, 1888

(Figs. 161-162)

Gaetanus miles Giesbrecht: 1892: 219, 224, 744, pl. 14, figs 21, 24-25, 27, 30, pl. 36, figs 1-3, Grice, 1962: 192, pl. 8, figs 8-13, Park, 1975b: 11, 13. non *Gaetanus miles*. Park, 1975b: 19, figs 4-5.

Description. F e m a l e. Total length 3.40-3.80 mm. Cephalothorax more than 4 times longer than abdomen. Frontal spine present, less than in *G. pileatus* and *G. secundus* and slightly curved to rostrum. Spines on Th5 posterior corners straight, arranged in the middle of posterior Th5 corner (lateral view), reaching the midlength of genital segment (dorsal view). A1 twice longer than body. Re1 A2 without setae; Re2 A2 with 1 distal setae. Md palp base with 1? seta; Ri1 Md with 1 seta; Ri2 Md with 9 terminal setae. Second internal Mx1 lobe with 4 setae; Ri Mx1 with 14 setae. Mxp protopodite with lateral plate, usually strongly cut, its shape variable. Re P1 indistinctly 3-jointed, with 2 external spines; the former of them exceeding the midlength of Re3 P1. Ri P2 2-jointed.

M a l e. Total length about 3 mm. Cephalothorax about 3 times longer than abdomen. Frontal spine absent. Spines on Th5 posterior corners were not seen. A1 shorter than body, reaching the last abdominal segment. Re1-Re2 A2 without setae. Md palp base with 1 seta; Ri2 Md with 9 terminal setae; Ri Mx1 with 7 setae; Re with 11 setae. Mxp protopodite without lateral plate, with 2 setae distally. Re P1 indistinctly 3-jointed; first 2 joints without external spines. P2 with 2-jointed Ri. Re3 P5 left stylet-like, not bilobated.

Type locality: the north-eastern part of the Pacific Ocean.

Geographical distribution. Due to mixing of this species with *G. secundus* Esterly, 1911 it is difficult

to give exact range of the species distributional area. *G. miles* is distributed in the Atlantic, Indian and Pacific oceans from temperate to tropical waters. Atlantic Ocean: the species known to about 61°N (With, 195), in the Baffin Bay found in the region of 74°N (Jespersen, 1934), to the South from the Equator recorded only once (Wolfenden, 1911). Pacific Ocean: the northernmost finding region of 35°N (Giesbrecht, 1892), the southernmost 32°S (original data). Indian Ocean: tropical waters (original data), in the Arabian Sea and the Bay of Bengal (Sewell, 1929, 1947).

Vertical distribution. The species is one of *Gaetanus* species regularly found in surface waters (Vervoort, 1963; Bjornberg, 1973; Park, 1975b; Bradford & Jillett, 1980). In original material the species was found from epi- and mesopelagial, also recorded from total hauls from depths 500-3000 m.

Material: 13 females and 1 male from samples 204-205, 207, 403, 444, 446.

14. *Gaetanus minispinus* Tanaka, 1969

(Fig. 163)

Gaetanus minispinus Tanaka, 1969: 260, fig. 4, Tanaka & Omori, 1970a: 140; Park, 1975b: 11, 13, Bradford & Jillett, 1980: 51, fig. 35

Description. F e m a l e. (Description after Tanaka (1969) with modifications). Total length 5.15-5.56 mm. Cephalothorax about 3.5 times longer than abdomen. Frontal spine present, small, directed to rostrum. Th5 posterior corners with small spines not covering even first third of genital segment. A1 by 2 last joints longer than the body. Re1 A2 without setae; Re2 A2 with 1 seta near distal margin of joint. Ri2 Md with 9 terminal setae. Mx1 second internal lobe with 4 setae; Ri with 14 setae. Mxp protopodite with lateral plate. Re P1 with slight subdivision of 2 first joints; with 2 external spines. First external spine reaching the distal margin of Re3 P1. Ri P2 2-jointed. P4 coxopodite with about 23 spines.

Male unknown.

Notes. According to Tanaka (1969) the species is very close to *G. kruppii*, but differs in small frontal spine on cephalon; in smaller spines on Th5 posterior corners, and the shape of lateral plate of Mxp protopodite.

Type locality: the South China Sea, the region of Bashi Channel.

Geographical distribution. The South China Sea, the New Zealand region (Tanaka & Omori, 1970a; Bradford & Jillett, 1980).

Vertical distribution. The species was found in haul 500-1000 m (Bradford & Jillett, 1980), also in total hauls from 680-915 m.

The species is not examined by me.

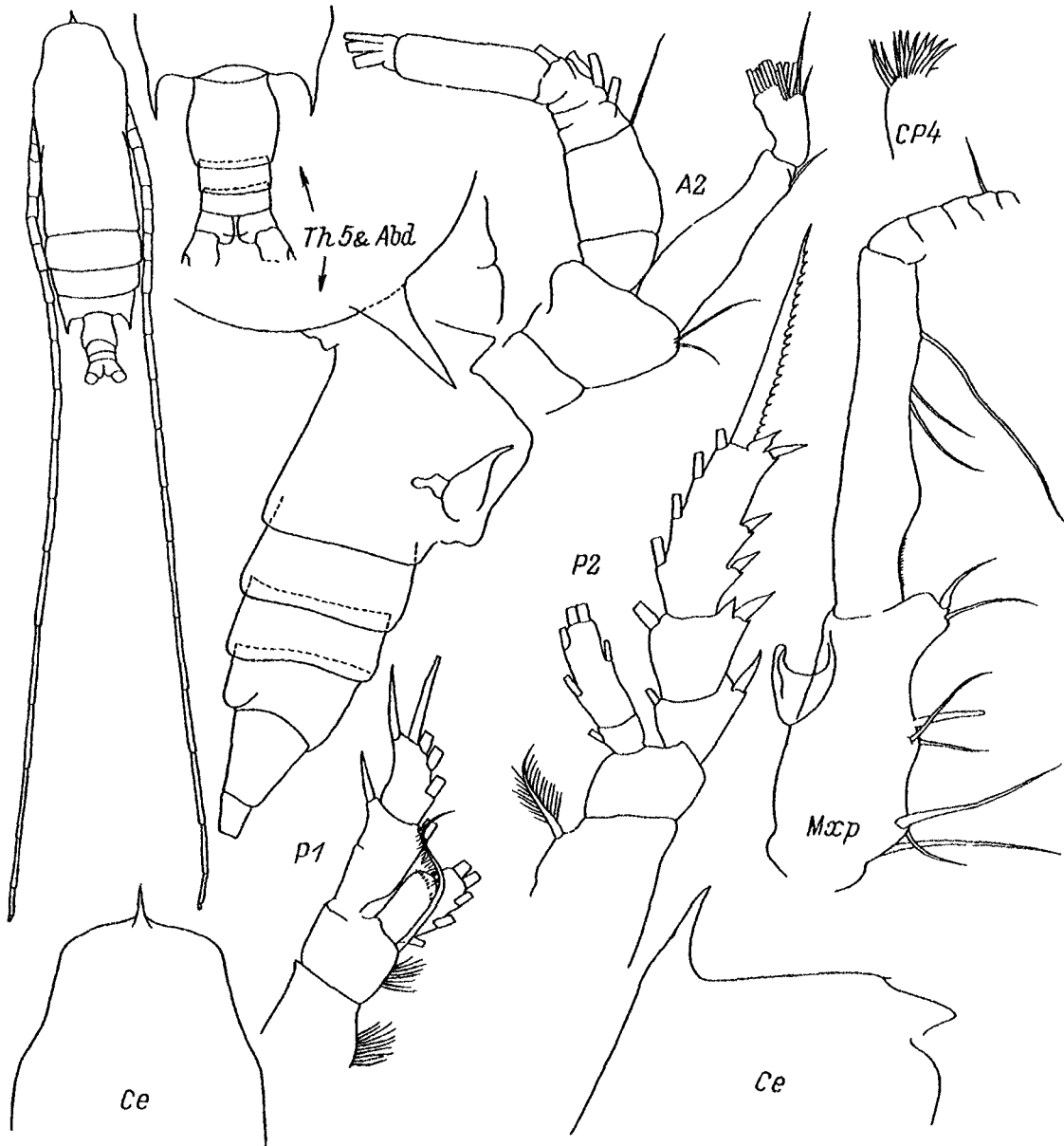


Fig. 161. *Gaetanus miles*. Female (205).

15. *Gaetanus minor* Farran, 1905

(Fig. 164)

Gaetanus minor Farran, 1905 34, pl. 5, figs 1-11, Ver-voort, 1957: 61; Tanaka, 1957b. 172, fig 42 (e-g); Grice, 1962 192, figs 14-20, Owre & Foyo, 1967: 45, fig. 246; Tanaka & Omori, 1970a: 140, Park, 1975b: 10, 1978 144, figs 27-28, Bradford & Jillett, 1980 55, fig. 36

Description Female. Total length 1.70-2.40 mm. Cephalothorax about 4 times longer than abdomen. Frontal spine present, curved to rostrum. Spines of

Th5 posterior corners covering about three fourth of genital segment length, straight and removed to the back side of specimen (lateral view). A1 about as long as body. Re1 A2 without setae; Re2 A2 with 2 setae. Md palp base with 2 setae; Ri1 Md with 1; Ri2 with 9 terminal setae. Second Mx1 internal lobe with 4 setae; Ri with 13 (?) setae. Mxp protopodite with lateral plate. Re P1 2-jointed, each joint with 1 external spine. Ri P2 1-jointed. P4 coxopodite with 12-15 spines.

Male unknown.

Type locality: the Atlantic Ireland Slope.

Geographical distribution. The northernmost dis-

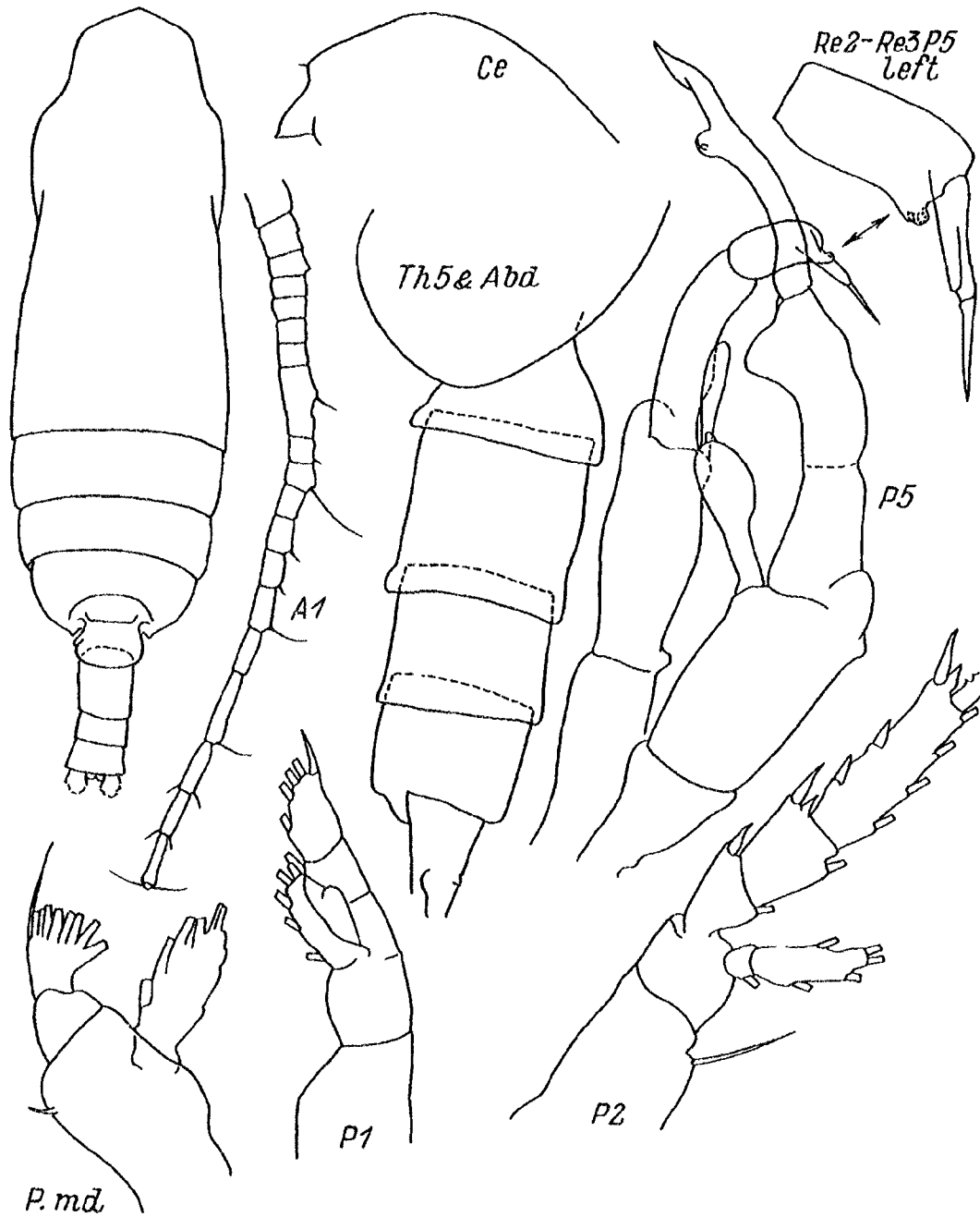


Fig 162. *Gaetanus miles*. Male (204).

tribution in the Atlantic Ocean: to the south-west of Iceland (Jespersen, 1934), the southernmost; region of 32°S (Wolfenden, 1911). Pacific Ocean: the northernmost finding in the Izu region (Tanaka, 1957b), the southernmost in the region of 49°S (Park, 1978) Indian Ocean: found in the Arabian Sea and the Bay of Bengal (Sewell, 1929, 1947), the southernmost locality in the region of 27°S (Grice & Hulsemann, 1967). The species is known from tropical waters of all oceans.

Vertical distribution The species was found in samples from meso-, bathypelagial, rarely from

epipelagial (Farran, 1905, 1929, With, 1915; Bradford & Jillett, 1980) and from total hauls from depths 500-7000 m.

Material 16 females from samples 46, 49-50, 52-53, 201-202, 400, 413, 416, 420, 443, 456-457, 573.

16. *Gaetanus minutus* (Sars, 1907)

(Figs. 165-166)

Gaidius minutus Sars, 1907 10, 1924-25: 49, pl 14, figs 14-18, Sewell, 1929 100, Vervoort, 1952d (sheet 45)

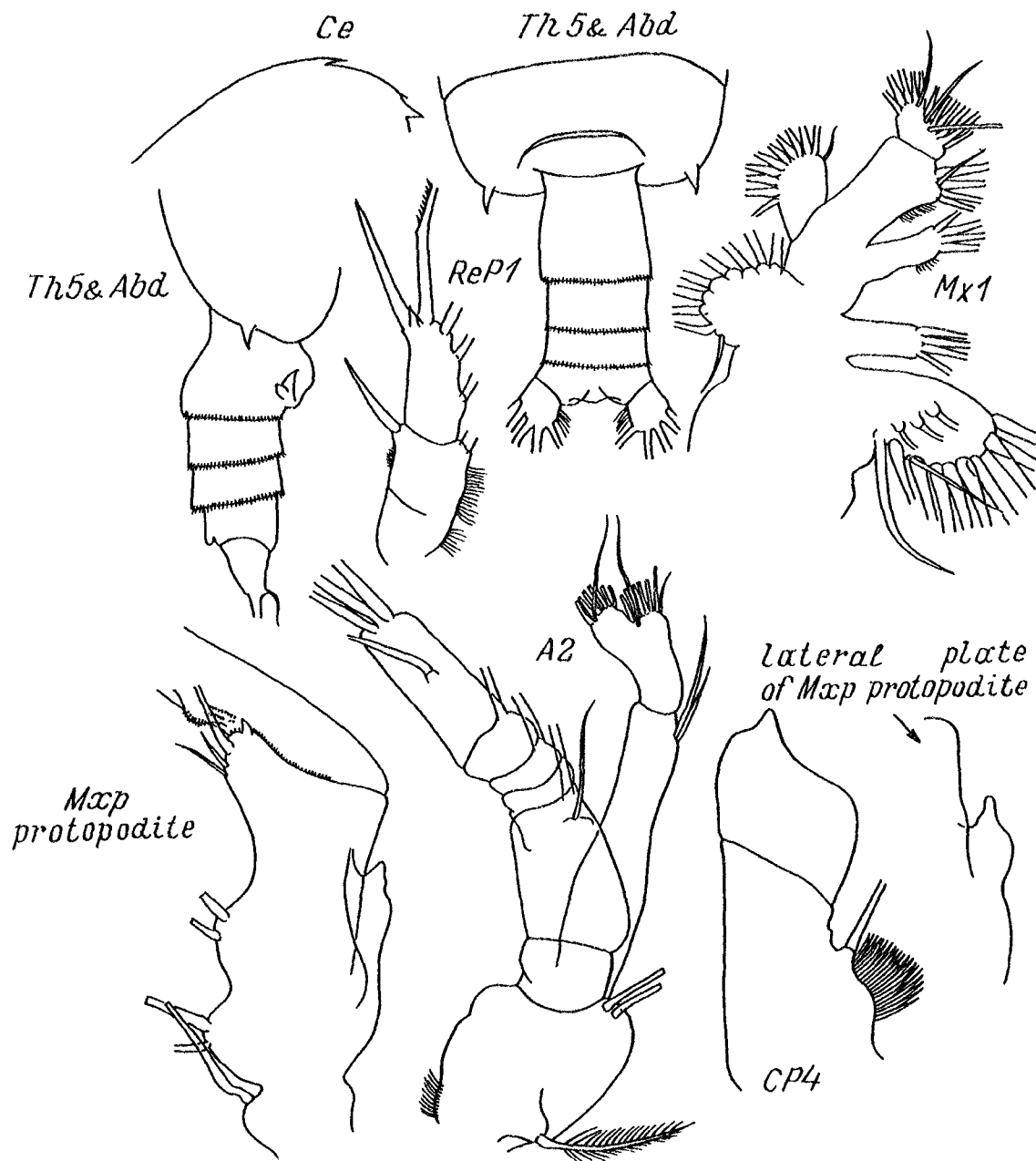


Fig. 163. *Gaetanus minispinus*. Female (from Tanaka, 1969).

3, fig. 4; Wilson, 1950: 234; Tanaka, 1957a: 64, fig. 39 (a-f).

Gaetanus minutus Park, 1975b: 30, fig. 13.

Gaidus moderatus Tanaka, 1957a: 66, fig. 40.

Gaidus columbiae Park, 1967: 231, figs 1-3; Bradford & Jillett, 1980: 58, figs 39, 62.

Gaidus variabilis Brodsky, 1950: 160, fig. 74 (syn.n.); Tanaka & Omori, 1970a: 127, fig. 6 (a-k); Deevey & Brooks, 1977: 263.

Gaetanus variabilis: Park, 1975b: 13.

Description. Female. Total length 2.30-3.70 mm. Cephalothorax 3-4 times longer than abdomen.

Th5 posterior corners with spines of varying size and shape, often asymmetrical, sometimes covering first third of genital segment length, sometimes reduced to small knobs. A1 longer than cephalothorax: reaching the end of genital segment, or the end of caudal rami. Re1 A2 without setae; Re2 A2 with 2 setae. Md palp base with 2 (after Tanaka & Omori (1970) with 3 setae); Ri1 Md with 2 (1 of them small, poorly visible) setae; Ri2 Md with 9 terminal setae. Second internal Mx1 lobe with 4 setae; Ri with 14 setae. Mxp protopodite without lateral plate. P1 with indistinctly 3-jointed Re. Re1 and Re2 P1

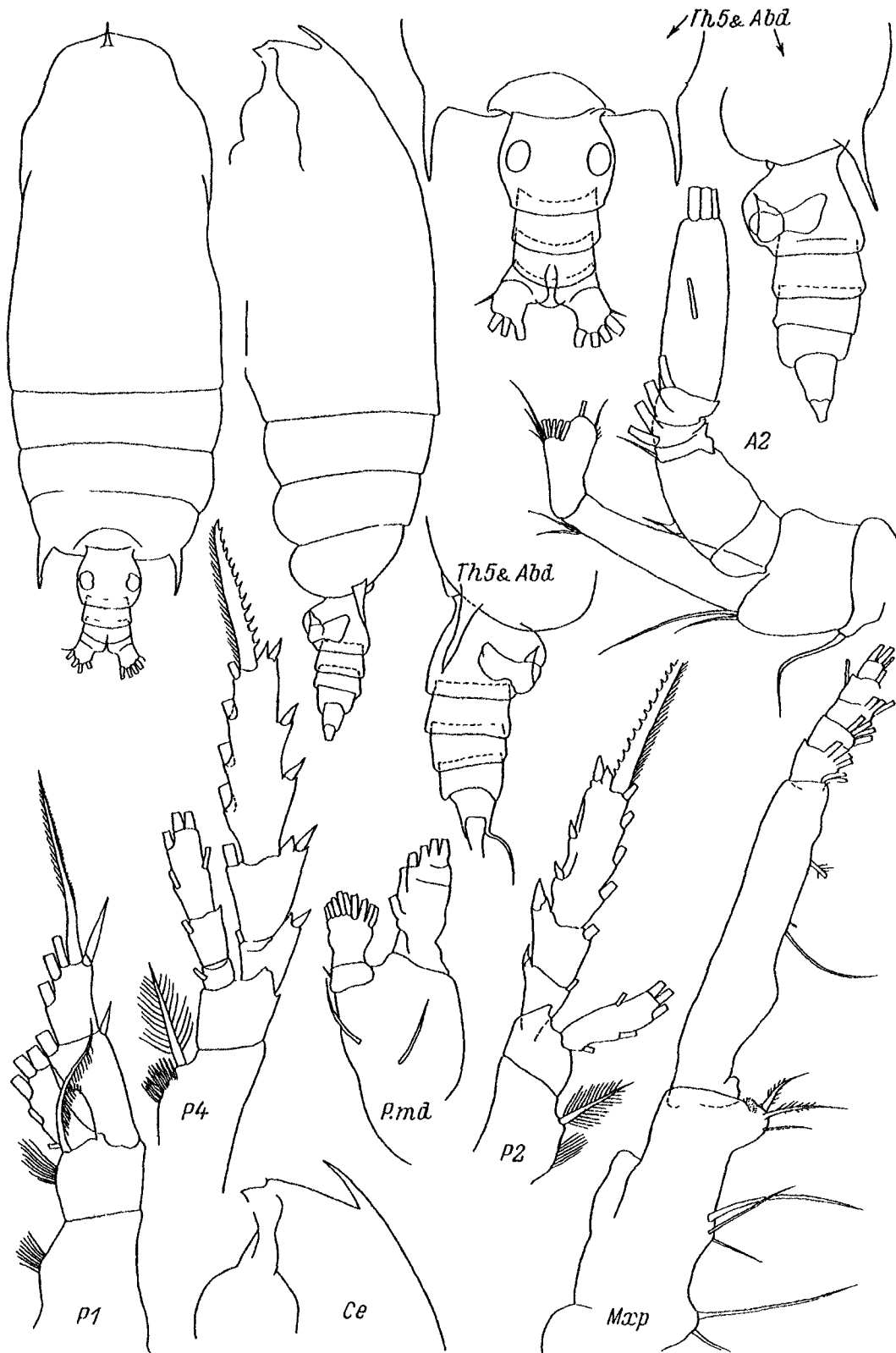


Fig 164. *Gaetanus minor*. Female (202).

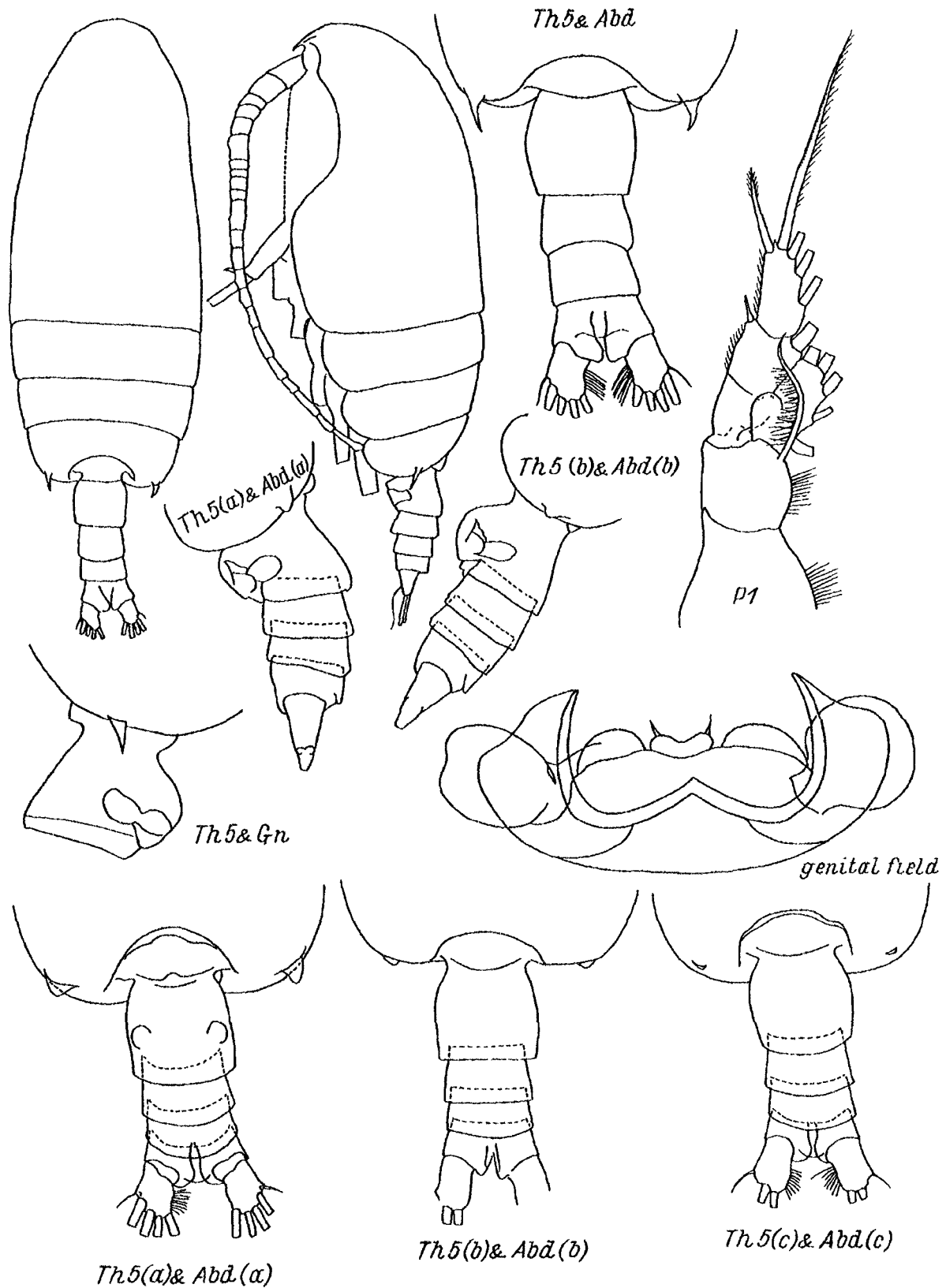


Fig. 165. *Gaetanus minutus*. Female: dorsal view, Th5 & Abd, Gn, P1 (70), Th5 (a) & Abd (a) (119), Th5 (b) & Abd (b) (120), Th5 (c) & Abd (c) (159), lateral view, Th5 & Gn: figure made by K.A. Brodsky after specimens from the north-western part of the Pacific Ocean

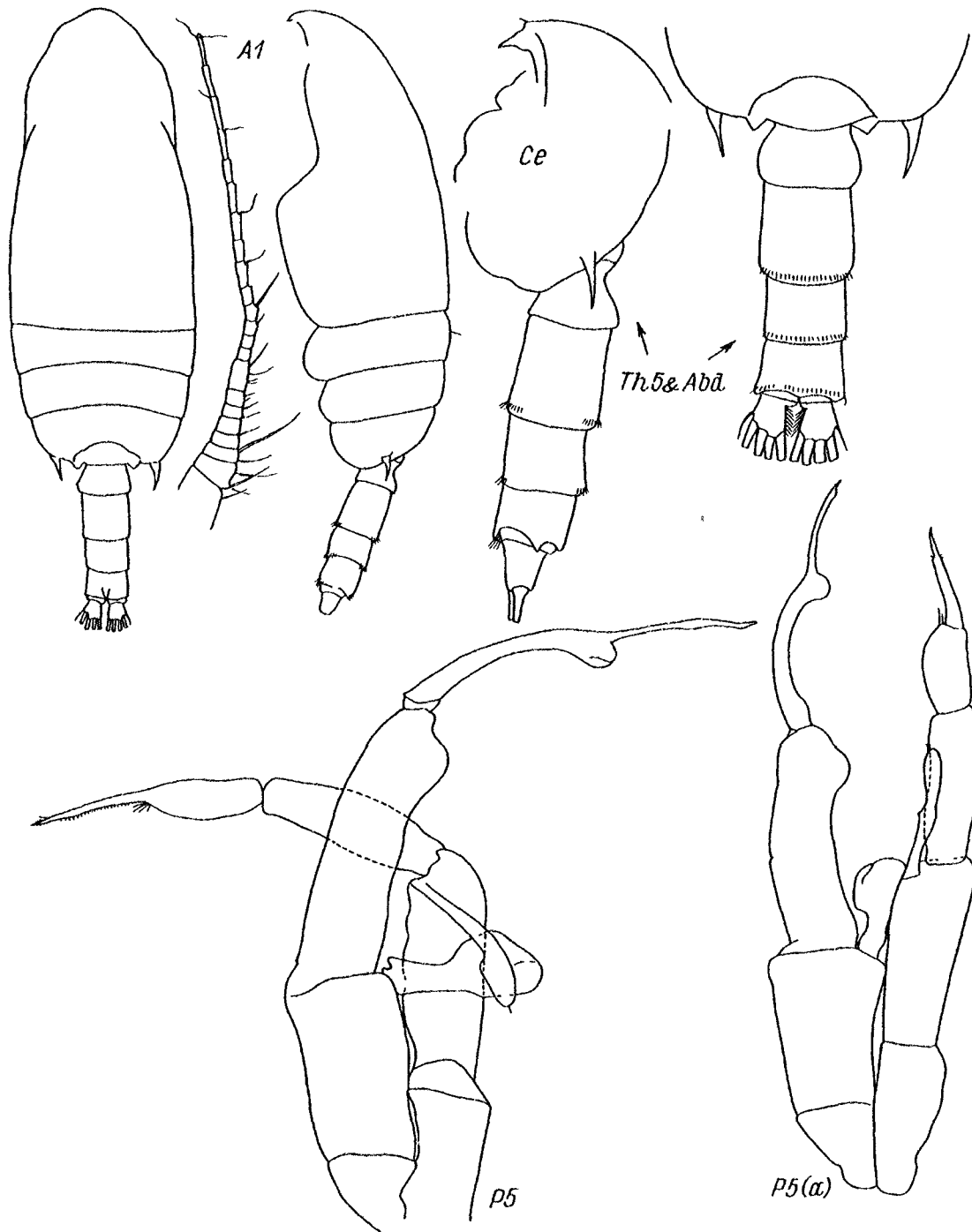


Fig. 166. *Gaetanus minutus*. Male: P5 (a): figure made by K.A. Brodsky after specimens from the north-western part of the Pacific Ocean, other figures (70).

incompletely fused, line of fusion visible; Re with 2 external spines. P2 with 2-jointed Ri and 3-jointed Re. P4 coxopodite with 17-20 spines.

Male. Total length 1.70-3.40 mm. Cephalothorax about 3.0-3.4 times longer than abdomen. Frontal spine absent. Shape and length of spines of Th5 posterior corners strongly variable as in females, but usually not reaching posterior Abd1 border. A1 longer than cephalothorax, sometimes they shorter,

often reaching the end of caudal rami. Setation of oral parts reduced in comparison with that in females. Segmentation of P2-P4 as in females. First external Re spine reduced to very small one. P4 coxopodite without spines. Left Re3 P5 not bilobated, stylet-like. P5 similar to that of *G. tenuispinus*.

Notes The species is characterized by high variability. The vast original material on the species was examined for this study, and resulted in a pro-

posal to synonymize *Gaidius variabilis* Brodsky (= *Gaetanus variabilis* (Brodsky)) with *G. minutus* (Sars, 1907). The latter species was recently re-described by Park (1975b) in details. This detailed redescription has permitted to clarify the status of *G. variabilis*.

Type locality: region of 36-46°N and 7-27°W (Sars, 1925).

Geographical distribution. Atlantic Ocean: the species was found to the North to 48°N (Lysholm, Nordgaard & Wiborg, 1945), to the South to the Gulf of Mexico (Park, 1975b). Pacific Ocean: the species is known from the Sea of Okhotsk, the Bering Sea and the Sea of Japan, from the Izu region, regions of the Kurile-Kamchatka and Marian Trench (Brodsky, 1950; Tanaka & Omori, 1970a, original data); in the north-eastern part it is recorded in the region of British Columbia, from the Strait of Georgia (Park, 1967), from the eastern tropical part (Wilson, 1950) and the New Zealand region (Bradford & Jillett, 1980). Indian Ocean: in the south-western part 10°N and 6°S (Sewell, 1929; Grice & Hulsemann, 1967).

Vertical distribution. The species was found in hauls from epipelagial and meso-bathypelagial, also in total hauls from 500-7500 m.

Material: 250 females and 10 males from samples 18, 60-64, 71-73, 78-82, 89-95, 118-120, 123, 132, 134-137, 145-146, 156-160, 169-174, 182-186, 188-191, 201, 204-205, 216-219, 221-222, 224-225, 227-229, 230, 232-237, 239-240, 242, 244, 246, 248, 250, 474.

17. *Gaetanus paracurvicornis* Brodsky, 1950

(Fig. 167)

Gaetanus paracurvicornis Brodsky, 1950: 167, fig. 84, 1952: 49, Park, 1975b: 11, 13; Markhaseva, 1980b: 626, figs 4-11

Description. F e m a l e. Total length 4.60-5.10 mm. Cephalothorax 4.5-5.5 times longer than abdomen. Frontal spine present, robust, directed forward in its base, its top curved to rostrum. Spines of Th5 posterior corners arranged in the middle of lateral border (lateral view), straight, reaching about the midlength of genital segment. A1 by 3 last joints longer than body. Re1 A2 with 1 seta; Re2 A2 with 2 setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 1 posterior setae. Second internal Mx1 lobe with 5 setae; Ri with 15 setae. Mxp protopodite without lateral plate, but in some specimens traces of the plate visible. P1 with 3-jointed Re; subdivision between Re2 and Re3 is incomplete; external spines on Re2 and Re3 present. Ri P2 2-jointed. P4 coxopodite with about 30 thin spines.

Male unknown.

Type locality: the Kurile-Kamchatka Trench region.

Lectotype: female of fifth copepodite stage from sample 474.

Geographical distribution. Atlantic Ocean: the first finding in the North Atlantic (original data). Pacific Ocean: in the northern part in the regions of Kurile-Kamchatka and Aleutian Trenches; for the first time found in the south-eastern part near the coast of Chile (original data). For the first time in the indoceanic sector of Antarctica: to the South from 62°S (original data).

Vertical distribution. Abysso-, bathypelagic species, found between 3000 and 5000 m (original data).

Material: 42 females from samples 68, 85, 97-98, 139, 147, 193, 379, 444, 447, 456.

18. *Gaetanus pileatus* Farran, 1903

(Figs. 168-169)

Gaetanus pileatus Farran, 1903: 16, pl.17, figs 1-11; Vervoort, 1963: 132; Tanaka & Omori, 1970a: 141; Park, 1975b: 11, 13, 20, fig. 6, 1978: 139, figs 23-24; Bradford & Jillett, 1980: 55, fig. 37.

Gaetanus caudani Canu, 1896: 442; Giesbrecht & Schmeil, 1898: 33; Sars, 1905a: 4; Sewell, 1947: 56.

Gaetanus clarus Esterly, 1906: 57, pl. 9, fig. 5, pl. 14, fig. 90; Brodsky, 1950: 166, fig. 81.

Gaetanus recticornis Wolfenden, 1911: 288, Taf. 26, fig. 13, text-fig 16 (a-c).

Gaetanus unicornis Esterly, 1906: 57, pl. 9, fig. 3, pl.12, fig. 54, pl. 13, fig. 76; Brodsky, 1950: 166, fig. 82.

Gaetanus kruppai (non Giesbrecht, 1903): Sewell, 1947: 62, fig. 10 (male only).

Description. F e m a l e. Total length 4.90-6.70 mm. Cephalothorax about 5 times longer than abdomen. Frontal spine present in anterior-dorsal part of cephalon (lateral view), directed forward, long, its top not curved to rostrum. Spines on Th5 posterior corners straight, arranged in the middle of posterior Th5 margin (lateral view), exceeding the middle of genital segment, covering nearly two third of its length, slightly divergent (dorsal view). A1 by 5-7 last joints longer than body. Re1 A2 without setae; Re2 A2 with 1 seta. Second Mx1 internal lobe with 4 setae; third internal lobe with small sensory teat except setae; Ri with 14-15 setae. Md palp base with 2 setae; Ri1 Md with 1 seta; Ri2 Md with 9 terminal setae. Mxp protopodite with lateral plate. P1 with 2-jointed Re, with external spines on each joint. First external spine not reaching the midlength of the next joint. P4 coxopodite with 17-20 spines.

M a l e. Total length 4.44-5.08 mm. Frontal spine large, strongly curved to rostrum. Spines of Th5 posterior corners small. A1 reaching Abd3-4. Both right Re P5 joints of about equal length. Ri



Fig. 167. *Gaetanus paracurvicornis*. Female (147).

P5 left is about half, or one third of Re1 P5 length; Re3 P5 nearly two third of Re2 P5 length, stylet-like, not bilobated.

Notes. As noted earlier (Park, 1975b) shape and length of frontal spine is highly varying. This variability dependent on the size of specimens: larger specimens usually with larger frontal spine directed further backward. Shape of lateral plate on Mxp protopodite is also varying (Park, 1975b).

Type locality: south and south-western coast of Ireland, Atlantic Ireland slope.

Geographical distribution. Atlantic Ocean the northernmost locality is in the region of 65°N (With, 1915), the southernmost in the Gulf of Guinea (Ver-

voort, 1963). Pacific Ocean: the northernmost findings in the Izu region (Tanaka & Omori, 1970a) and San Diego region (Esterly, 1911), the southernmost in the region of 56°S (Park, 1978). Indian Ocean: the Arabian Sea and the Bay of Bengal, and the southernmost locality is in the region of 45°S 125°E (original data). The species is found in tropical and subtropical zone of all oceans.

Vertical distribution Species is found in meso-pelagial (Farran, 1926; Sewell, 1947; Park, 1975b; Bradford & Jillett, 1980; Vives, 1982) and total hauls from depths from 600 to 5000 m.

Material: 8 females from samples 392, 400, 403, 419?, 443-444, 447, 449.

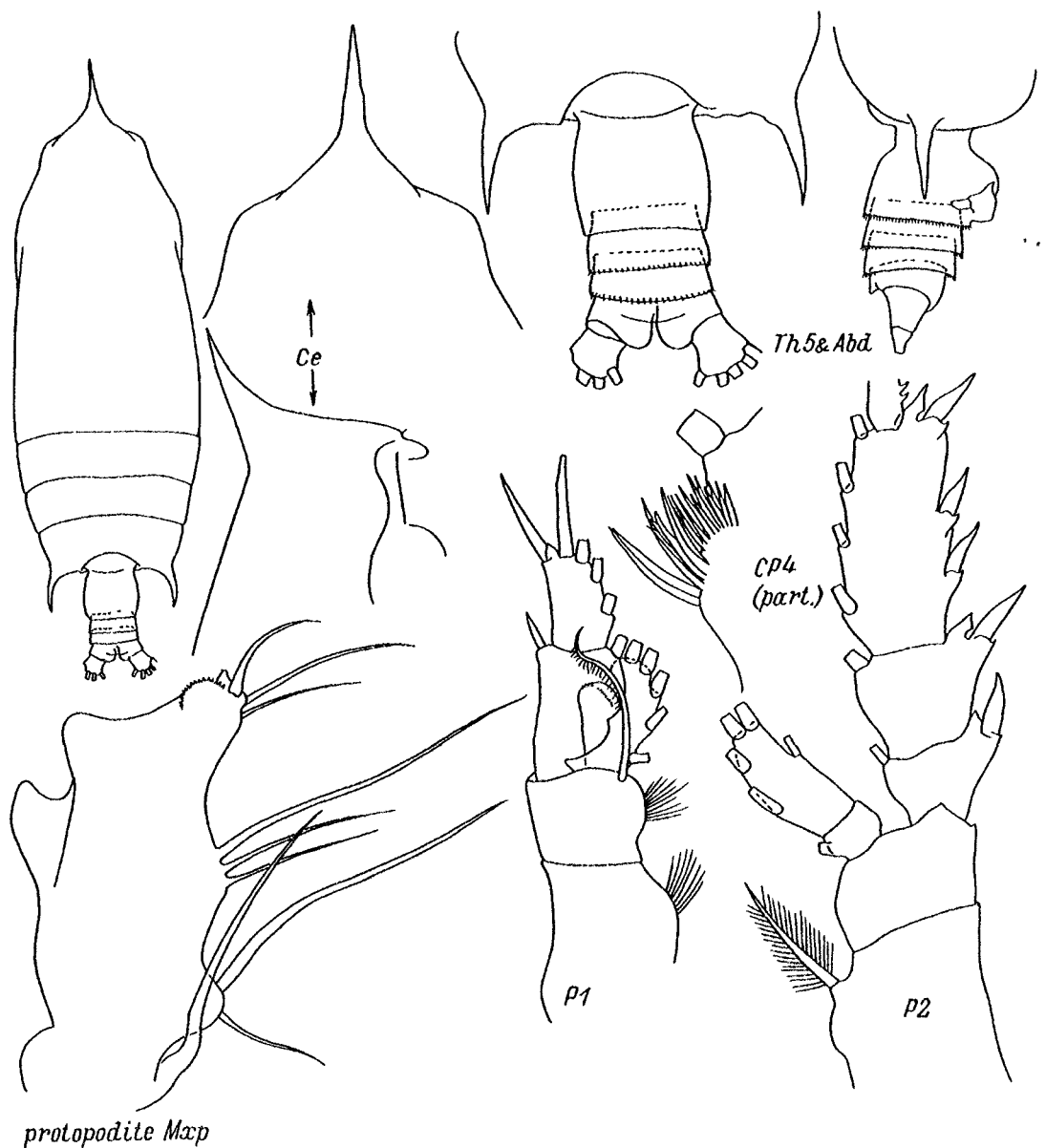


Fig. 168. *Gaetanus pileatus*. Female (447).

19. *Gaetanus pseudolatifrons*
Markhaseva sp. n.

(Fig. 170)

Description. Female. Total length 3.60-3.70 mm. Cephalothorax about 4 times longer than abdomen. Frontal spine present, slightly curved to rostrum. Th5 posterior corners with long spines, reaching the last fourth of genital segment, they are removed to ventral side (lateral view) and slightly curved. A1 longer than body by about 5 last joints. Re1 A2 with 1 seta; Re2 A2 with 3 setae. Md

palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 long terminal and 2 short posterior setae. Second internal Mx1 lobe with 5 setae; Ri with 15 setae. Mxp protopodite with lateral plate. Re P1 3-jointed, with external spines on each joint; each of these spines not reaching the base of the next spine. P4 coxopodite with about 18 spines.

Male unknown.

Notes The species is closely similar to *G. latifrons* Sars, 1905, differing in shape of frontal spine and the body of *G. latifrons* much more sclerotized; specimens of the latter species are larger (4.4-5.4 mm) than *G. pseudolatifrons*

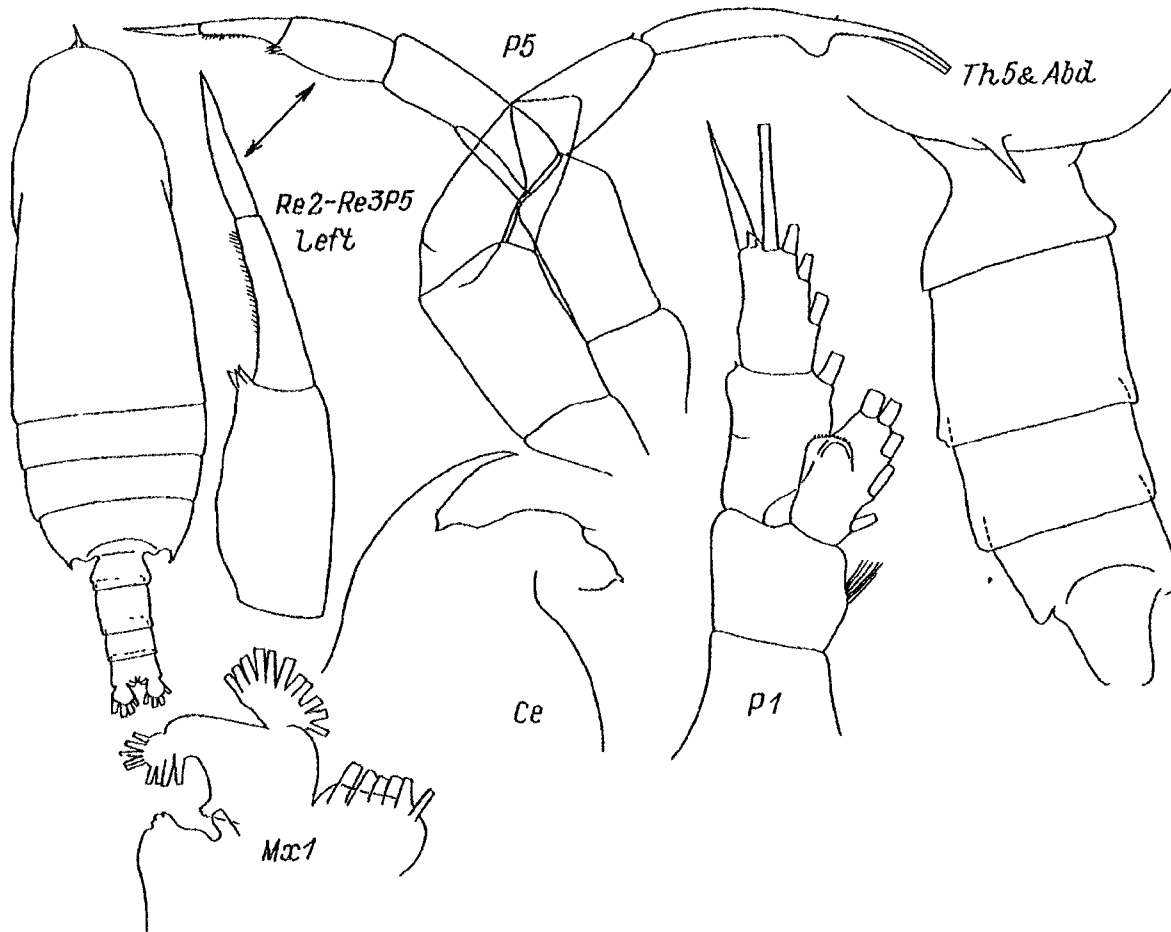


Fig. 169. ? *Gaetanus pileatus*. Male (419).

Type locality: tropical part of the Pacific Ocean (14°N 132° W).

Geographical distribution. Pacific Ocean: the eastern part, the region of Marian Trench (original data).

Vertical distribution The species was found in haul 715-1000 m and in total haul from 8000 m

Material: 3 females from samples 201, 208.

Holotype 1 female N 1/66263, 14°N 132°W, R/V "Akademik Korolev", 40th cruise, 27.10.1985, St. ABC, layer 715-1000 m, collector A. Korshenko and 1 female paratype 2/66264 (the same locality data).

20. *Gaetanus pungens* (Giesbrecht, 1895)

(Fig. 171-172)

Gaidius pungens Giesbrecht, 1895. 246, 248, pl 1, figs 1-4, Vervoort, 1949 10, fig 4, Tanaka, 1957a 60, fig. 37 (f-k) (male only), Vervoort, 1957.58; Tanaka & Omori, 1970a 119, fig 3, Park, 1975b 13, 1978 130; Bradford & Jillett, 1980: 61, fig 42

Gaetanus pungens: Park, 1975b: 13

Description F e m a l e. Total length 2.65-3.20 mm. Cephalothorax slightly more than 3 times longer than abdomen. Spines of Th5 posterior corners exceeding the midlength of genital segment and covering about three fifth of its length. The species is very close to *G. tenuispinus* being only more slender. Oral parts and swimming legs are identical to those in *G. tenuispinus*, with the only difference in that Md palp base with 1 (not 2) setae (Park, 1978, original data).

Male. (Description after Tanaka and Omori (1970a) with modifications). Total length 2.28 mm. Cephalothorax 3.3 times longer than abdomen. Spines of Th5 posterior corners covering about first third of Abd1. A1 exceeding the posterior border of Abd4. Re A2 slightly longer than Ri. Re2 A2 with 2 setae. Md palp base with 1 seta; Ri2 Md with 9 terminal setae. Ri Mx1 with 11 setae; first-third Mx1 internal lobes reduced, and Ri with 10 setae.

Notes The first description of this species is very brief (Giesbrecht, 1895), containing the useful data only on body size and figures of Re P1 2-jointed and Ri P2 1-jointed. Wolfenden (1911:114) suggested the identity of this species with *G. tenuispinus* (Sars,



Fig. 170. *Gaetanus pseudolatifrons* sp.n.. Female (208).

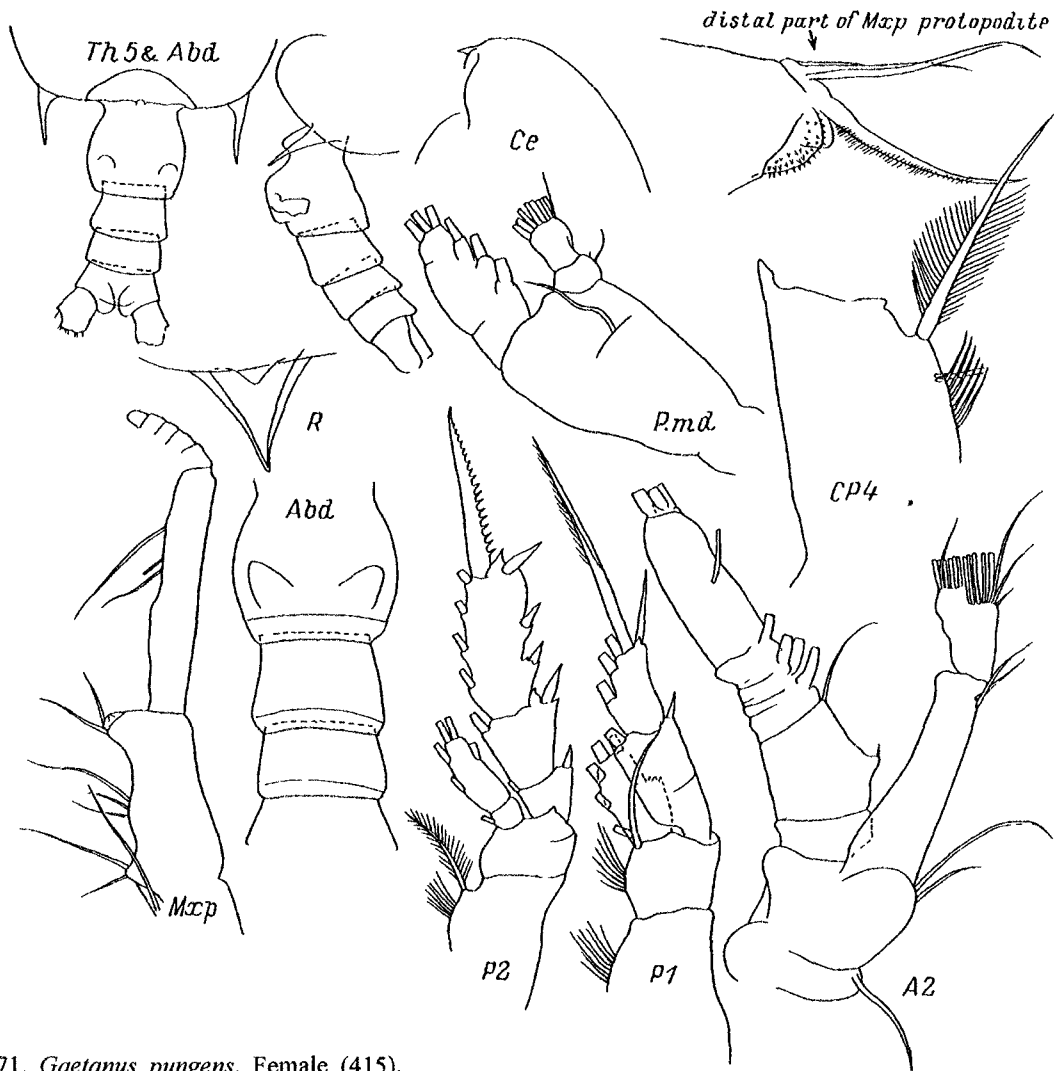


Fig 171. *Gaetanus pungens*. Female (415).

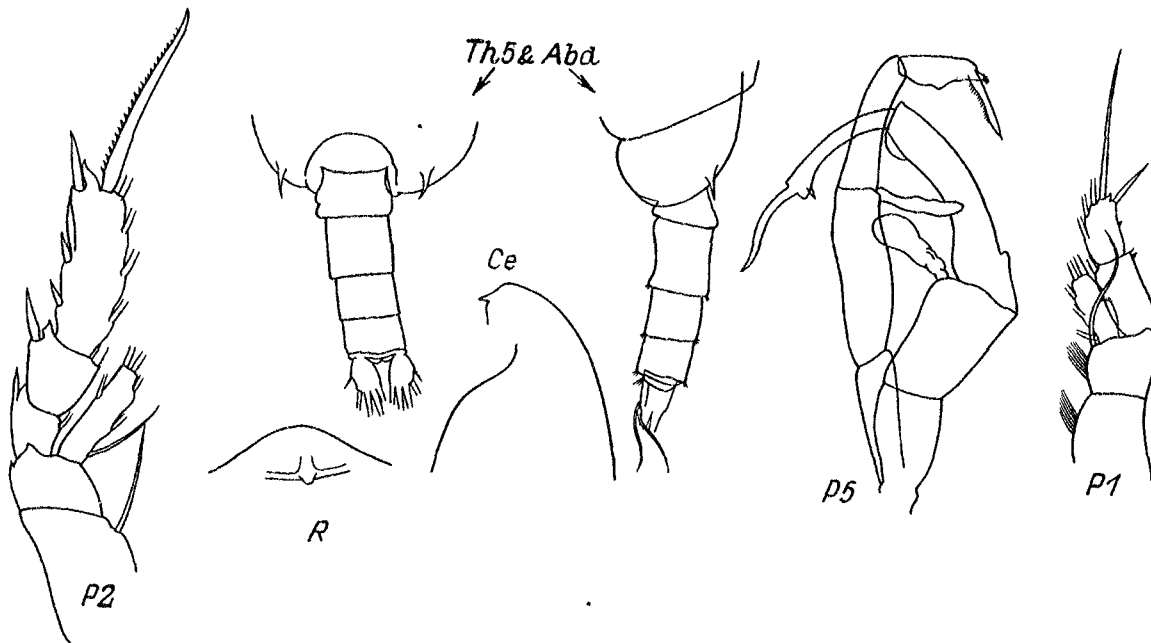


Fig. 172. *Gaetanus pungens*. Male (from Tanaka & Omori, 1969a).

1900). Later on the base of this conclusion the species was synonymized with *G. tenuispinus* (Bradford & Jillett, 1980). However this decision is premature, because Park (1978:131) found a highly distinguishable feature between these species: the presence of 1 seta on Md palp base in *G. pungens* and of 2 setae in *G. tenuispinus*. It may be added that the shape of genital segment (dorsal view) is also useful: the genital segment in *G. pungens* is narrower in its anterior part than in *G. tenuispinus*.

Type locality: 35°N 125°W.

Geographical distribution. Pacific Ocean: the north-western and north-eastern parts (Giesbrecht, 1895; Tanaka & Omori, 1970a), the New Zealand region (Bradford & Jillett, 1980): till 61°S. Indian Ocean: the north-eastern part (original data). The Malay Archipelago (Vervoort, 1949).

Vertical distribution. Species is known from total hauls from 500-2000m.

Material: 2 females from samples 415, 418.

21. *Gaetanus robustus* Sars, 1905

(Figs. 173-174)

Gaetanus robustus Sars, 1905 : 11, 1924-25: 63, pl. 19, figs 1-2; Jespersen, 1934: 63; Park, 1975b: 13.

Gaetanus robustus: Grice & Hulsemann, 1967: 24 (female only); 1968: 324; Tanaka & Omori, 1970a: 122, fig. 4 (a-h), Bjornberg, 1973: 323.

Pseudogaetanus robustus: Brodsky, 1950. 168, fig. 86.

Gaidius validus Farran, 1908: 32, pl. 2, figs 11-17.

Mesogaidius maximus Wolfenden, 1911: 224, text-fig. 13, pl.26, figs 3-6.

non *Gaidius robustus*: Vervoort, 1949: 12, figs 5-6; Grice & Hulsemann, 1967 (male only), figs 60-64.

Description. F e m a l e. Total length 7.50-9.20 mm. Cephalothorax about 4.5 times longer than abdomen. Spines of Th5 posterior corners robust, slightly curved to the back side of specimen (lateral view), situated in the ventral part of Th5 posterior border, reaching the midlength of genital segment, or even slightly longer (lateral view). A1 reaching the end of caudal rami, or slightly shorter. Re1 A2 with 1 seta; Re2 A2 with 3 setae. Md palp base with 2 setae; Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 2 short posterior setae. Second Mx1 internal lobe with 5 setae; Ri with 14-15 setae. Mxp protopodite with lateral plate. Re P1 3-jointed, with external spine on each joint. First and second internal spines not reaching the base of the next spine. Ri P2 2-jointed. P4 coxopodite with more than 30 spines.

M a l e. Total length 7.00 mm. Frontal spine absent. Posterior Th5 corners with poorly visible spines. Re3 P5 left bilobated, not stylet-like, about 2.5 times shorter than Re2.

Type locality: the Azores Islands region.

Geographical distribution. Atlantic Ocean: to the

North to 62°N (Jespersen, 1934), in North Atlantic the southernmost locality 31°N (Sars, 1925), found in the southern part (Wolfenden, 1911). Pacific Ocean: in the north-western part from the Kamchatka to the Izu region (Tanaka & Omori, 1970a; original data) in the south-eastern part between 30° and 40°S (Grice & Hulsemann, 1968; Bjornberg, 1973). Indian Ocean: between 12°S and 37°S (Grice & Hulsemann, 1967).

Vertical distribution. The species was found in the Kurile-Kamchatka Trench area from bathy- and upper abyssopelagial, in other regions from hauls from meso- and bathypelagial.

Material: 10 females from samples 7, 18, 47, 73, 94, 134-137, 161, 457, 468, 474.

22. *Gaetanus rubellus* Markhaseva sp.n.

(Fig. 175)

Description. F e m a l e. Total length 7.30 mm. Cephalothorax 4.5 times longer than abdomen. Frontal spine absent. Th5 posterior corners with moderate spines with thick bases, removed to the ventral side of Th5 posterior border (lateral view). A1 reaching the midlength of abdomen. Re1 A2 with 1 seta; Re2 A2 with 3 setae. Md palp base with 2 seta; Ri2 Md with 9 terminal and 1 posterior short seta. Second Mx1 internal lobe with 5 setae; Ri with 11 setae. Mxp protopodite with lateral plate. Re P1 3-jointed, with external spine at each joint. First and second external spines not reaching the distal border of Re2 and Re3 P1. P4 coxopodite with about 35 thin spines.

Male unknown.

Notes. The species is very similar to *G. inermis* Sars, 1905, differing in the presence of spines on Th5 posterior corners and by longer external spines of Re1 and Re2 P1.

Material: 1 female from sample 202.

Holotype: 1 female, N 1/66262, Izu-Bonin Trench region, 29° 17'N 142°47'E, R/V "Vitjaz", 57th cruise, 10.05.1975, Sta. 7406, layer 0-8370 m, ring-trawl.

23. *Gaetanus secundus* Esterly, 1911

(Fig. 176)

Gaetanus secundus Esterly, 1911: 317, pl.26, fig. 3, pl. 28, figs 38, 43, pl. 30, figs 73, 84.

Gaetanus ferox With, 1915: 111, text-fig. 28 (a-b); Grice & Hulsemann, 1967: 23, figs 56-59.

Gaetanus miles (non Giesbrecht, 1888): Park, 1975b: 19, figs 4-5.

Description. F e m a l e. Total length 3.80-5.20 mm. Cephalothorax about 5 times longer than abdomen. Frontal spine present, long and

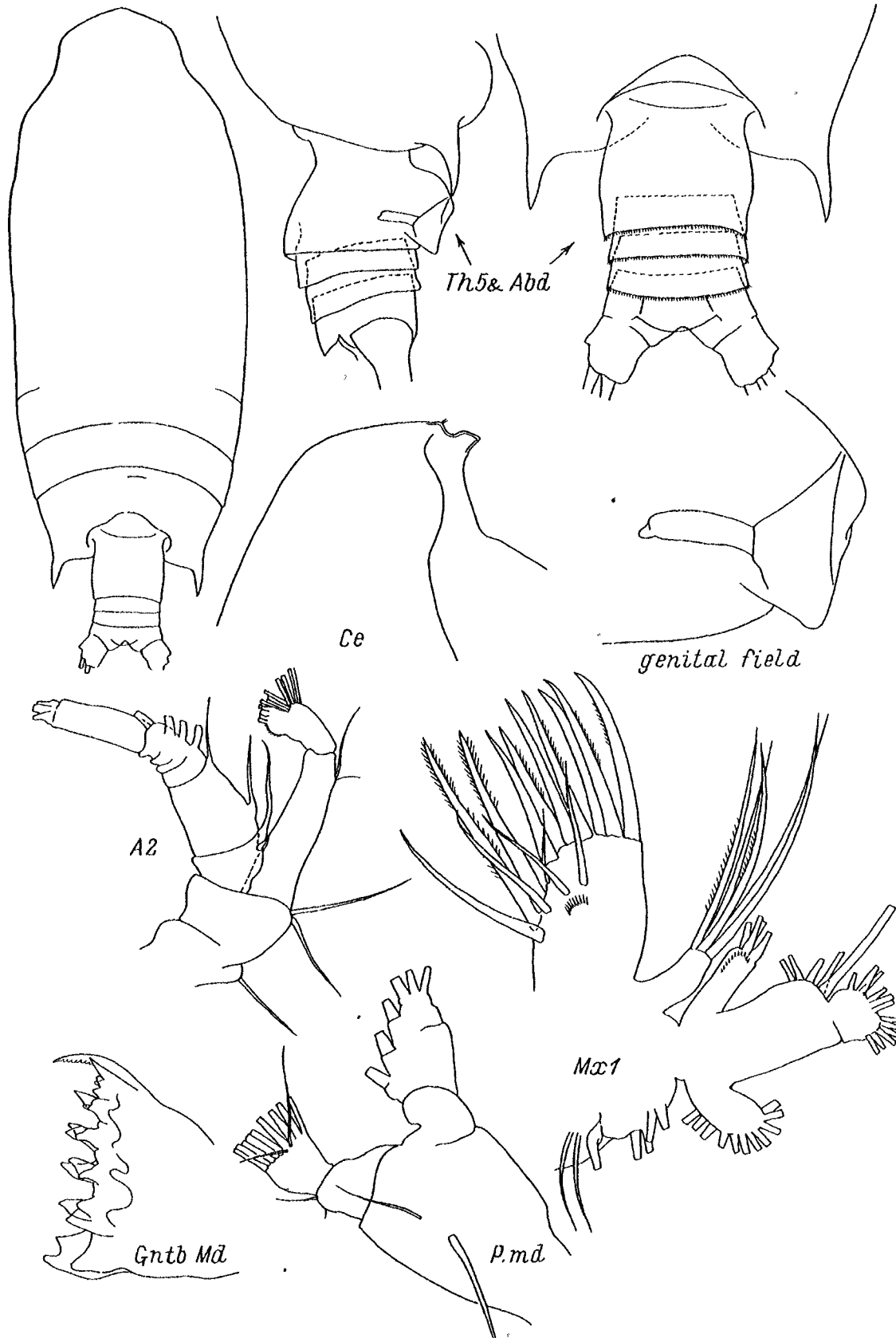


Fig. 173. *Gaetanus robustus*. Female (468).

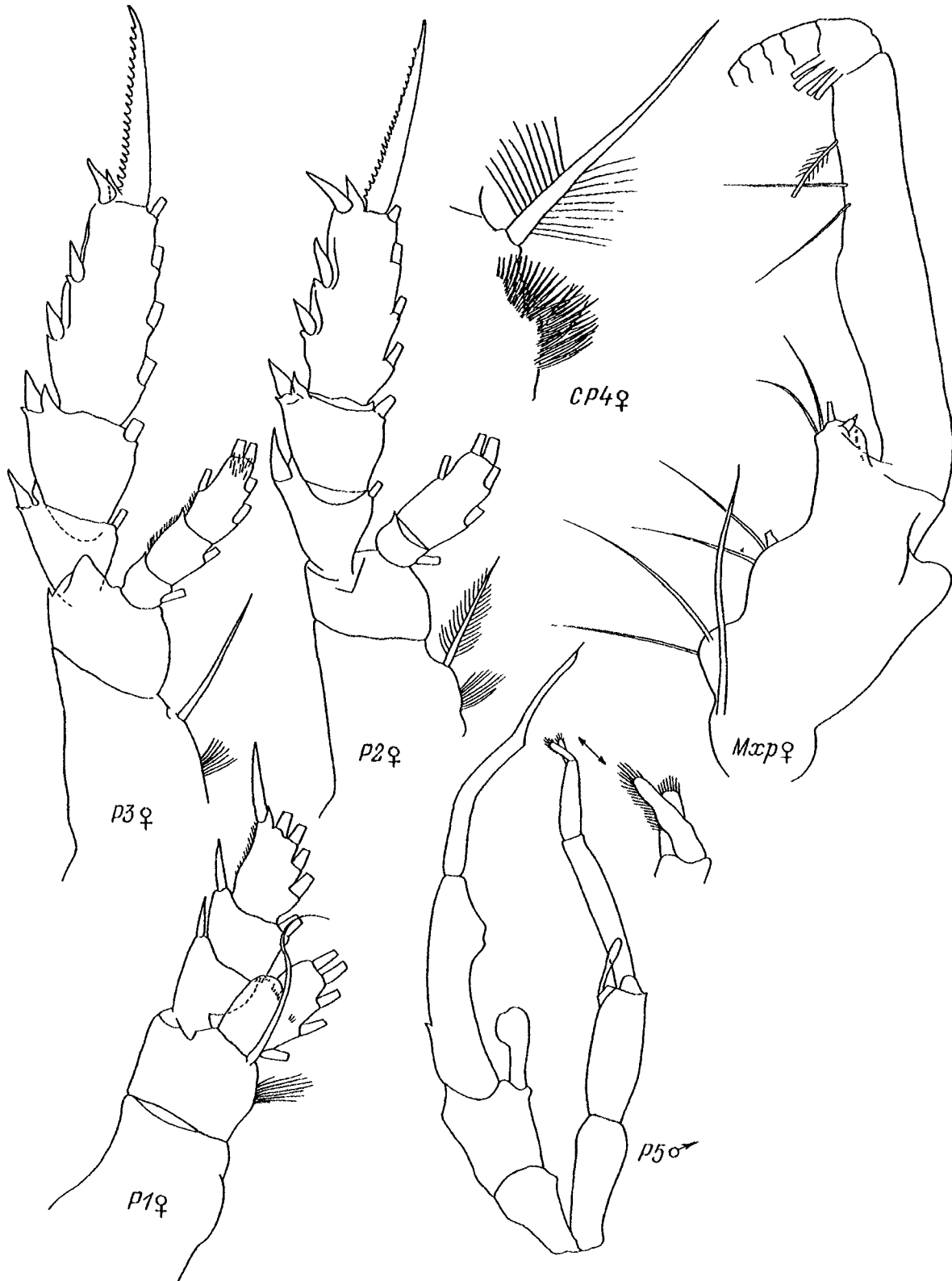


Fig. 174. *Gaetanus robustus*. Female (468). Male: figure made by K.A. Brodsky after specimen from the Pacific Ocean

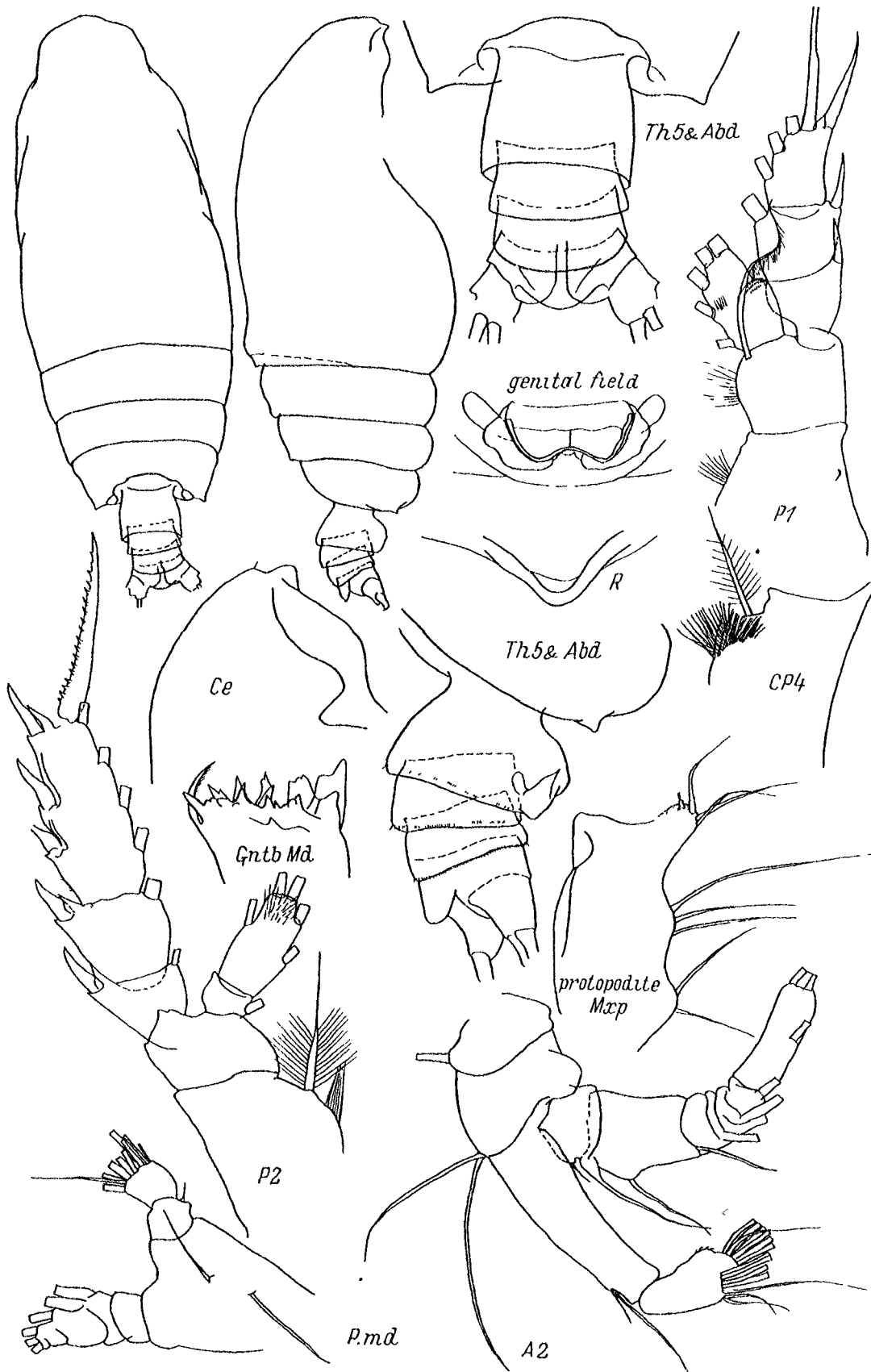


Fig. 175. *Gaetanus rubellus* sp.n. Female, holotype (202).

robust, directed forward, its top not curved, or weakly curved to rostrum. Spines on Th5 posterior corners in the middle of posterior Th5 margin (lateral view), straight, exceeding the middle of genital segment. A1 twice longer than body (nearly of the same length as in *G. miles*). Re1 A2 without setae; Re2 A2 with 1 seta. Md palp base with 1 seta; Ri1 Md with 1 seta; Ri2 Md with 9 terminal setae. Second Mx1 internal lobe with 3 (?) setae; Ri with 14-15 setae. Mxp protopodite with lateral plate. Re P1 2-jointed; with 2 external spines: first exceeding the midlength of last Re P1 joint. Ri P2 1-jointed, with traces of subdivision between joints. P4 coxopodite with about 13 spines.

Male. (Description after Park (1975b) with changes). Total length 3.00-3.55 mm. Frontal spine absent. Medial crest present. Spines of Th5 posterior corners small, hardly visible, often asymmetrical. Rostrum well developed. A1 reaching the end of caudal rami. Re1 and Re2 A2 without setae. Md palp base with small setae. Ri Mx1 with 9 setae; Re with 11 setae; external lobe with 7 setae. Mxp protopodite with 3 setae distally. P1 clearly 3-jointed. Only Re3 P1 with external spine. Re P5 right 2-jointed, joints of about same length. Ri P5 left nearly reaching the midlength of Re1.

Notes. *G. secundus* was united with *G. miles* (Vervoort, 1963:131). I consider it wise to reestablish the species status for *G. secundus*. The detailed description of *G. miles* (Giesbrecht, 1892) and a brief, but comprehensive description of *G. secundus* (Esterly, 1911) give a relevant base to distinguish between these two species (see the key to *Gaetanus* species above).

Type locality: the north-eastern part of the Pacific Ocean, San-Diego region.

Geographical distribution. Due to confusion between this species and *G. miles*, it is difficult to describe its distribution. The localities worth mentioning are: the Gulf of Mexico (Park, 1975b), the Pacific Ocean from the regions of Izu Bonin and Marian Trenches (original data) and off the San Diego region (Esterly, 1911), and the Indian Ocean in the region of 28°S (original data).

Vertical distribution. The species was found between 500 and 2000 m (Park, 1975b), also in total hauls from depths of 8000 m.

Material: 11 females from samples 201-202, 403, 410, 413, 416.

24. *Gaetanus tenuispinus* (Sars, 1900)

(Figs. 177-178)

Chiridius tenuispinus Sars, 1900: 67, pl. 18, 1902: 30, pl. 18.

Gaidius tenuispinus: Brodsky, 1950: 161, fig. 75; Vervoort, 1957: 58, fig. 40; Tanaka, 1957a: 60, fig. 37 (a-e) (female only); Owre & Foyo, 1967: 43, figs 5, 239-240; Tanaka & Omori, 1970a: 124, fig. 5; Wheeler, 1970: 10, figs 31-32; Bradford, 1971b: 21, figs 61-63; Bjornberg, 1973: 323; Park, 1978: 127, figs 15-17; Bradford & Jillett, 1980: 61, fig. 41 (male only).

Gaetanus tenuispinus: Park, 1975b: 13, 30, fig. 12.

Gaidius boreale Wolfenden, 1902: 362, 365, 1903: 265.

Gaidius similis A. Scott, 1909: 51, pl. 7, figs 1-11.

Gaidius gracilis Brady, 1918: 19, pl. 7.

Description. **Female.** Total length 3.00-3.80 mm. Cephalothorax about 3.6-3.8 times longer than abdomen. Frontal spine absent. Posterior Th5 corners with spines always exceeding the midlength of genital segment, usually covering three-four fifth of genital segment length, sometimes reaching its posterior border. A1 reaching the midlength of abdomen, or the end of caudal rami. Re1 A2 without setae, Re2 A2 with 2 setae. Md palp base with 2 setae; Ri1 Md with 2 setae (1 of them very small, poorly visible) setae; Ri2 Md with 9 terminal setae. Mx1 second internal lobe with 4 setae; Ri with 15 setae. Mxp protopodite without lateral plate. P1 with indistinct subdivision between Re1 and Re2 (some authors noted complete division (Park, 1975b). External spine of Re2 P1 covering about one third of the length of the next segment, external spine of Re3 P1 about as long as its joint. Ri P2 2-jointed. P4 coxopodite with group of about 20 thin spines.

Male. Total length 2.00-3.43 mm. Cephalothorax about 3 times longer than abdomen. Th5 posterior corners with spines strongly varying in length, usually they are longer than Abd1, but sometimes as long as Abd1, or even shorter. A1 reaching about the midlength of abdomen. A2 setation as in females; reduced on Ri2 A2 only; Ri1 A2 much thicker than in females. Md palp base with 1 seta; Ri2 Md with 9 terminal setae. First-third internal Mx1 lobes reduced, protopodite base and Ri together with about 7-8 setae (12 after Tanaka & Omori (1970a)); Re with 11 setae, external lobe with 7 setae. Mxp protopodite with 2 setae (3 according to Park (1975b) in distal group. Re P1 incompletely 3-jointed (according to Park (1975b) 3-jointed). Re2 P1 often with rudimentary external spine. Ri P2 2-jointed. P4 coxopodite without spines and hairs. Re3 P5 left stylet-like, not bilobated about as long as Re3 of its leg. Ri P5 left covering about four fifth of Re1 P5 left length.

Geographical distribution. Cosmopolitan species. Widespread in the Norwegian and Greenland seas, found in the Central part of Arctic Basin to 86°N (Johnson, 1963; original data). Atlantic Ocean: widespread in the northern part, however between 19°N and the Equator only single findings are registered (Wheeler, 1970), in the southern part found from 30°S to the South (Wolfenden, 1911) to the region

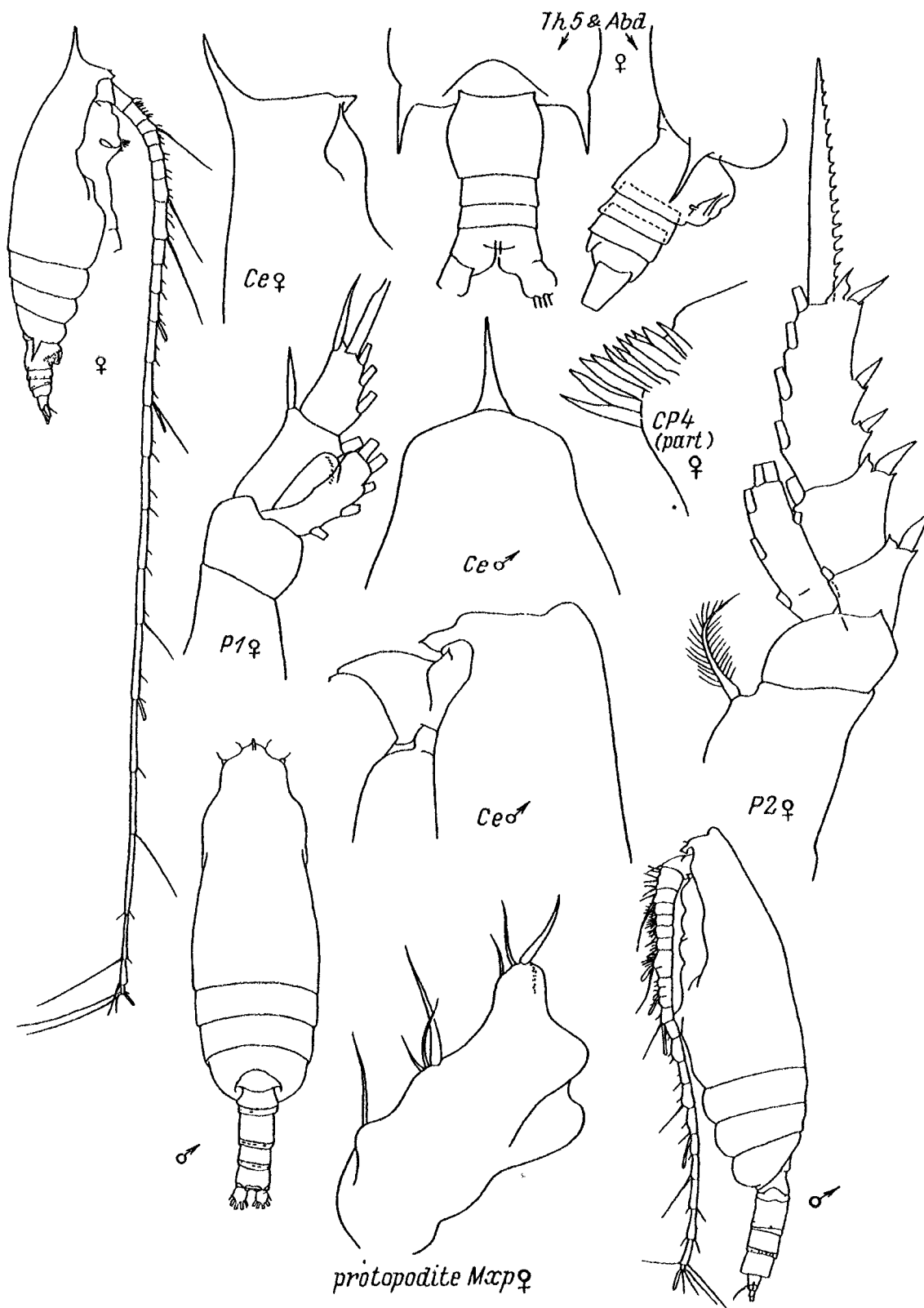


Fig. 176. *Gaetanus secundus*. Female (201). Male (from Park, 1975b).

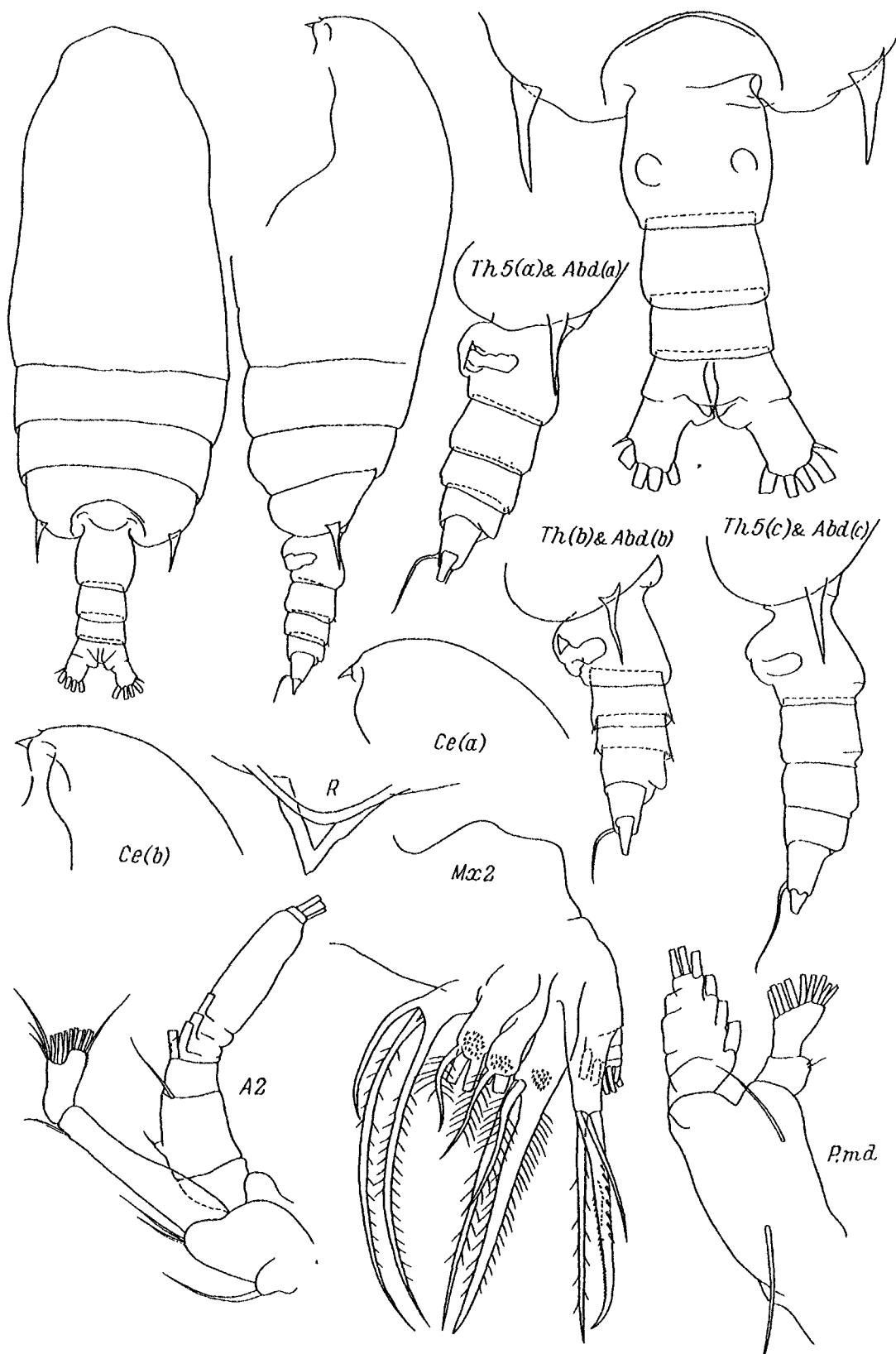


Fig. 177. *Gaetanus tenuispinus*. Female: Ce (a), Th5 (a) & Abd (a) (134-137), Th5 (b) & Abd (b) (482), other figures (542).

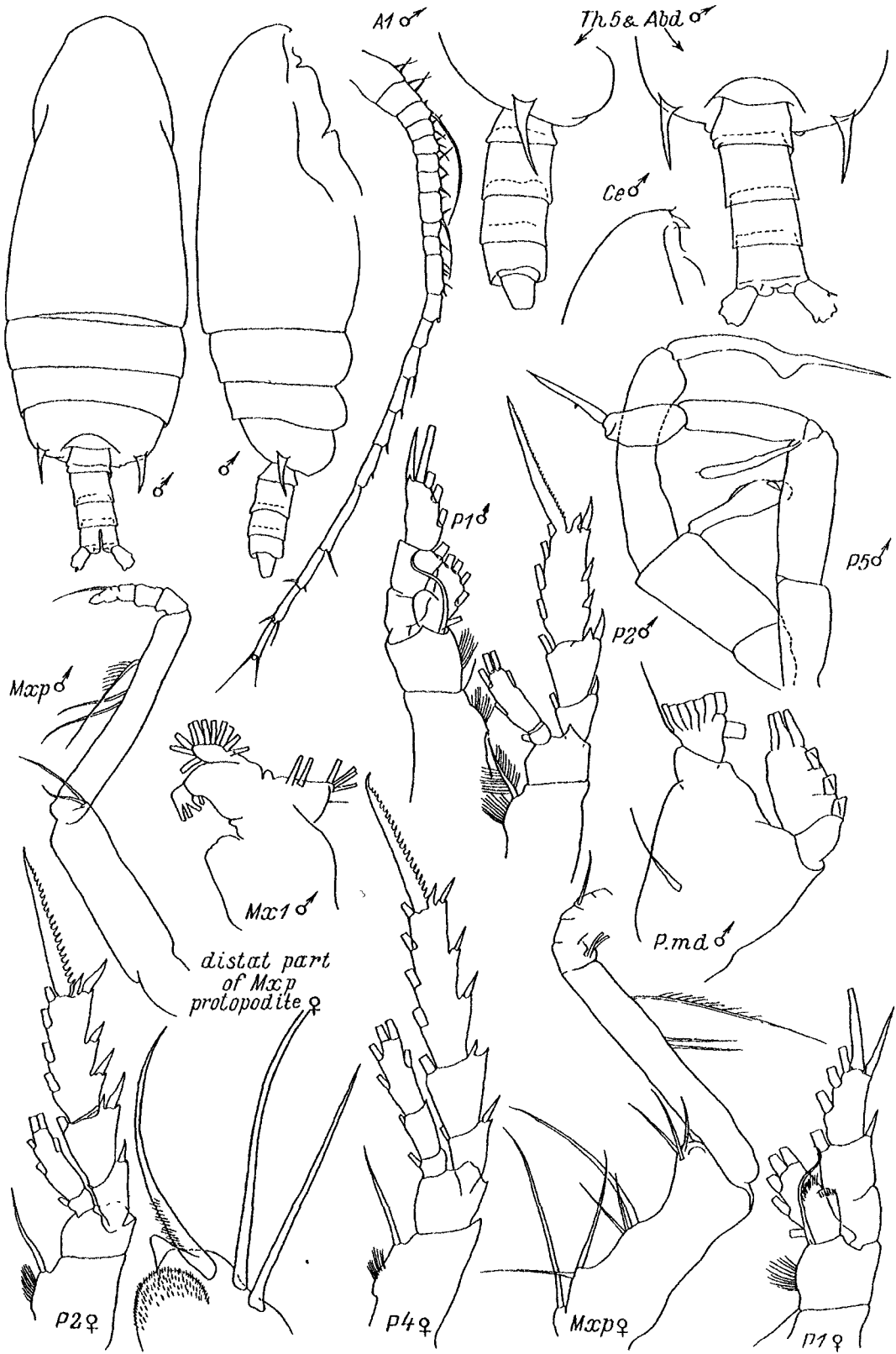


Fig. 178. *Gaetanus tenuispinus*. Female (542). Male (Norwegian Sea).

of South Georgia (Hardy & Gunther, 1935). Pacific Ocean: the Bering Sea, along north-western part, in the region of Aleutian Slope (original data), off California (Wilson, 1950), in the south-eastern and south-western parts (Bjornberg, 1973; Bradford & Jillett, 1980; original data). Widespread in the Antarctic to the South down to 68°S (original data). Indian Ocean: rarely found: once to the North from the Equator (Grice & Hulsemann, 1967), more often occurring in subantarctic antarctic part to the South to 65°S (Vervoort, 1957; original data).

Vertical distribution. Mostly meso-bathypelagic species, rare in abyssal (Wheeler, 1970), in the Arctic Basin recorded in hauls from epipelagial (Johnson, 1963; original data), in Antarctic sometimes between 100 and 250 m.

Material: about 200 females and 7 males from samples 62, 64, 80, 90, 92, 119, 134-137, 145, 158, 171-173, 188, 194, 201-202, 380, 404-405, 430, 432-436, 445-449, 451, 457, 464, 469, 470, 474, 479, 482, 522, 524, 529, 534-535, 538, 542, 545-546, 549, 551, 555.

15. *Jaschnovia* Markhaseva, 1980

TYPE SPECIES *Scolecithrix tolli* Linko, 1913, by monotypy.

Derjuginia Jaschnov, 1947: 3-4 (nom. praecoc.), non Popov, 1931, Pisces, Zoarcidae
Jaschnovia Markhaseva, 1980: 63

Description. Female. Total length 2.15-2.50 mm. Cephalothorax 3.1-4.0 times longer than abdomen. Body oval, or elongate-oval, anterior end of cephalon rounded. Crest and rostrum absent. Cephalon and Th1 fused, sometimes indistinctly separated. Between Th4 and Th5 often the suture of fusion is visible. Th5 posterior corners rounded, or pointed. Th5 and genital segment symmetrical. Cephalothorax about 3-4 times longer than abdomen, genital segment with minute spinules dorsally; posterior borders of abdominal segments with minute spinules. Genital segment of female as long as, or slightly longer than 2 following segments together. A1 24-jointed nearly as long as cephalothorax, slightly shorter, or slightly longer than cephalothorax. Re A2 7-jointed, longer than 2-jointed Ri. A2 coxopodite with 1 seta; basipodite with 2 setae. Re1 and Re2 A2 with 2 setae each; Re3-Re6 with 1 long setae each; Re7 with 3 long terminal setae. Ri1 A2 with 2 setae, Ri2 A2 with 13-14 (6-7 setae on external and 7 setae on internal lobes). Md palp base with 2 setae; Ri 2-jointed, not more than half shorter Re. Ri1 Md with 2 setae; Ri2 Md with 9

setae. Mx1 gnathobase with 9 claw-like terminal spines and 4 setae on posterior surface, distal part of this lobe with group of spinules. Mx1 second internal lobe with 5 setae; third internal lobe with 4 setae and surface spinules distally. Mx1 protopodite near Ri base with 5 setae; Ri with 15-16 setae; Re with 10 setae. Mx2 with six endites, endites with minute spinules on the surface. One of setae of Mx2 fifth endite thickened into claw-like spine; in distal part of Ri 6 setae. Mx p protopodite with 1 long seta in proximal part, further with groups of 2, 3 and 3 setae; without digital appendage. Ri1 Mx p slightly longer than protopodite, with 3 setae distally. Re P1-P4 3-jointed. Ri P1 1-jointed. Ri P2 2-jointed. Re1 P1 without external spine; Re2-Re3 with external spine each. Posterior surface of Re2-Re3, of all Ri joints and P4 coxopodite with minute spinules. P4 coxopodite near internal seta base with group of 6-8 larger spines on the posterior surface.

Male. Total length 1.85-2.30 mm. Cephalothorax 2.7-2.8 times longer than abdomen. Rostrum absent. Posterior Th5 corners rounded (lateral view), slightly pointed and curved externally (dorsal view). A1 23-jointed, reaching the middle of posterior border of genital segment. Oral parts in comparison with those in females rudimentary. P1-P4 as in females, not so strongly spinulose. P5 biramous. Right Ri unclearly 2-jointed, left 1-jointed. P5 of simple structure. Right Re P5 2-jointed. Right Re2 P5 proximal part with group of spinules on lateral surface and with dense thin hairs along internal margin, with long curved spine distally. Left Re P5 3-jointed. Left Re1 P5 with dense thin hairs along internal margin; Re2 P5 swollen, with group of hairs distally; Re3 the shortest and prolonged into spine distally and also with hairs in proximal part of its internal margin.

The genus *Jaschnovia* includes 2 species.

Key to species of *Jaschnovia*

Females

- 1(2) Th5 posterior corners rounded (dorsal and lateral view) 1. *Ja. brevis* (Farran)
2(1) Th5 posterior corners pointed (dorsal and lateral view) 2. *Ja. tolli* (Linko)

Males

- 1(2) Th5 posterior corners not curved externally (dorsal view) 1. *Ja. brevis* (Farran)
2(1) Th5 posterior corners curved externally (dorsal view) 2. *Ja. tolli* (Linko)

1. *Jaschnovia brevis* (Farran, 1936)

(Figs. 179-180)

Bradyetes brevis Farran, 1936a: 238, figs 1-12; Vervoort, 1952b (sheet 43): 3, fig. 4; Wheeler, 1970: 8.

Derjugma tolli (non Jaschnov, 1947): Johnson, 1963: 96.

Jaschnovia johnsoni Markhaseva, 1980. 68, 75, fig. 3 (syn.n.)

Description. F e m a l e. Total length 2.31-2.45 mm. Cephalothorax 3.1-3.5 times longer than abdomen. Th5 posterior corners rounded. A1 nearly as long as cephalothorax, or reaching Th3. Oral parts and P1-P4 typical of the genus.

M a l e. Total length 1.85-2.30 mm. Cephalothorax 2.8 times longer than abdomen. Th5 posterior corners rounded, not curved externally (dorsal view). A1 reaching the midlength of genital segment. P1-P4 as in females, only P4 surface setation weaker. P5 typical of the genus.

Notes. *Bradyetes brevis* Farran, 1936 herein is removed from *Bradyetes* to *Jaschnovia* and *Ja johnsoni* Markhaseva, 1980 is considered its junior synonym. The most important distinguishing features between genera *Jaschnovia* and *Bradyetes* are: in *Jaschnovia* Mxp protopodite without digital appendage distally, Re1 P1 without external spine.

Type locality: 72°55'N 25°W.

Geographical distribution. The central part of Arctic Basin (Johnson, 1963; original data), the region of New Siberian Islands (Markhaseva, 1980a). Atlantic Ocean: the north-western part: region of 37°N (Wheeler, 1970), the Greenland Sea (Farran, 1936a).

Vertical distribution. The ecology of the species is obscure: it was found in total hauls from 50 m when net contacted with bottom (Farran, 1936a) and in near-bottom tows from depths 17 m (Markhaseva, 1980a) which might be considered an evidence of relation the life cycle to the sea bed, on the other hand the species was found in under ice hauls (surface) in the central part of Arctic Basin (Markhaseva, 1980a).

Material: 24 females and 3 males from samples 564-566, 568.

2. *Jaschnovia tolli* (Linko, 1913)

(Figs. 181-182)

Scolecithrix tolli Linko, 1913: figs 23-25.

Derjugma tolli: Jaschnov, 1947. 3, fig.1, Brodsky, 1950: 156, fig. 71.

Jaschnovia tolli: Markhaseva, 1980. 65, figs 1-2.

Description F e m a l e. Total length 2.15-2.50 mm. Cephalothorax about 4 times longer than abdomen. Th5 posterior corners prolonged and pointed, reaching the midlength of genital segment. A1 reaching the midlength of genital segment. Ri2 A2 external

lobe with 6 setae. Ri Mx1 with 16 setae. Oral parts and P1-P4 typical of the genus.

M a l e. Total length 2.10-2.20 mm. Cephalothorax about 2.7 times longer than abdomen. Th5 posterior corners rounded (lateral view), pointed and curved externally (dorsal view). A1 reaching the posterior border of genital segment. Oral parts in comparison with those in females rudimentary. P1-P4 as in females, but P4 weakly spinulose on their surface. P5 typical of the genus.

Type locality: The East Siberian Sea near New Siberian Islands.

Geographical distribution. The species is widespread in coastal Siberian seas: the Kara Sea, Laptev, East Siberian and Chuckchee seas, in the Baffin Bay and also the White Sea. There are findings in the Barents Sea (Zelikman, 1961), and data on recording outside the Arctic Basin in the Sea of Okhotsk (Brodsky, 1957).

Vertical distribution. The species may be found under desalination. Adult specimens were found in the end of September and in October in the East Siberian Sea and in the Laptev Sea (Jaschnov, 1947). The majority of specimens were found in September in the White Sea in the near bottom tows obtained with Beyer net (original data). It seems highly probable that at some stages of the life cycle the species is connected with near-bottom layers.

Material: 2 females and 2 males from sample 459 and some specimens of both sexes in non-catalogued material obtained from the White Sea.

16. *Lutamator* Bradford, 1969

TYPE SPECIES *Lutamator hurleyi* Bradford, 1969, by monotypy.

Lutamator Bradford, 1969b: 491; Bradford & Jillett, 1980: 11; Alvarez, 1984: 99

Description F e m a l e. (Description after Bradford (1969b) and Alvarez (1984) with changes). Total length 5.15-5.20 mm Cephalothorax 3, or more than 4 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Rostrum in form of a blunt rounded plate. Crest absent. Th5 and genital segment symmetrical; Th5 pointed. A1 24-jointed, some joints with long annulate setae. Re A2 as long as Ri A2; Ri thicker than Re; coxopodite and basipodite with 1 seta each; Ri1 A2 with 1 seta; Ri2 A2 with 8 setae on internal (7+1) and 6 long terminal and 1 posterior setae on external lobe. Re1 A2 with 1 seta; Re2 A2 with 2 setae; Re3-Re6 with 1 seta each; Re7 with 3 terminal setae. Md palp base and Ri1 Md without setae; Ri2 with 4-5 setae. Mx1 gnathobase with 11-12 setae. Mx1 second internal lobe with 4-5 setae; third lobe with 2-3 setae; protopodite near Ri base with 4 setae; Ri

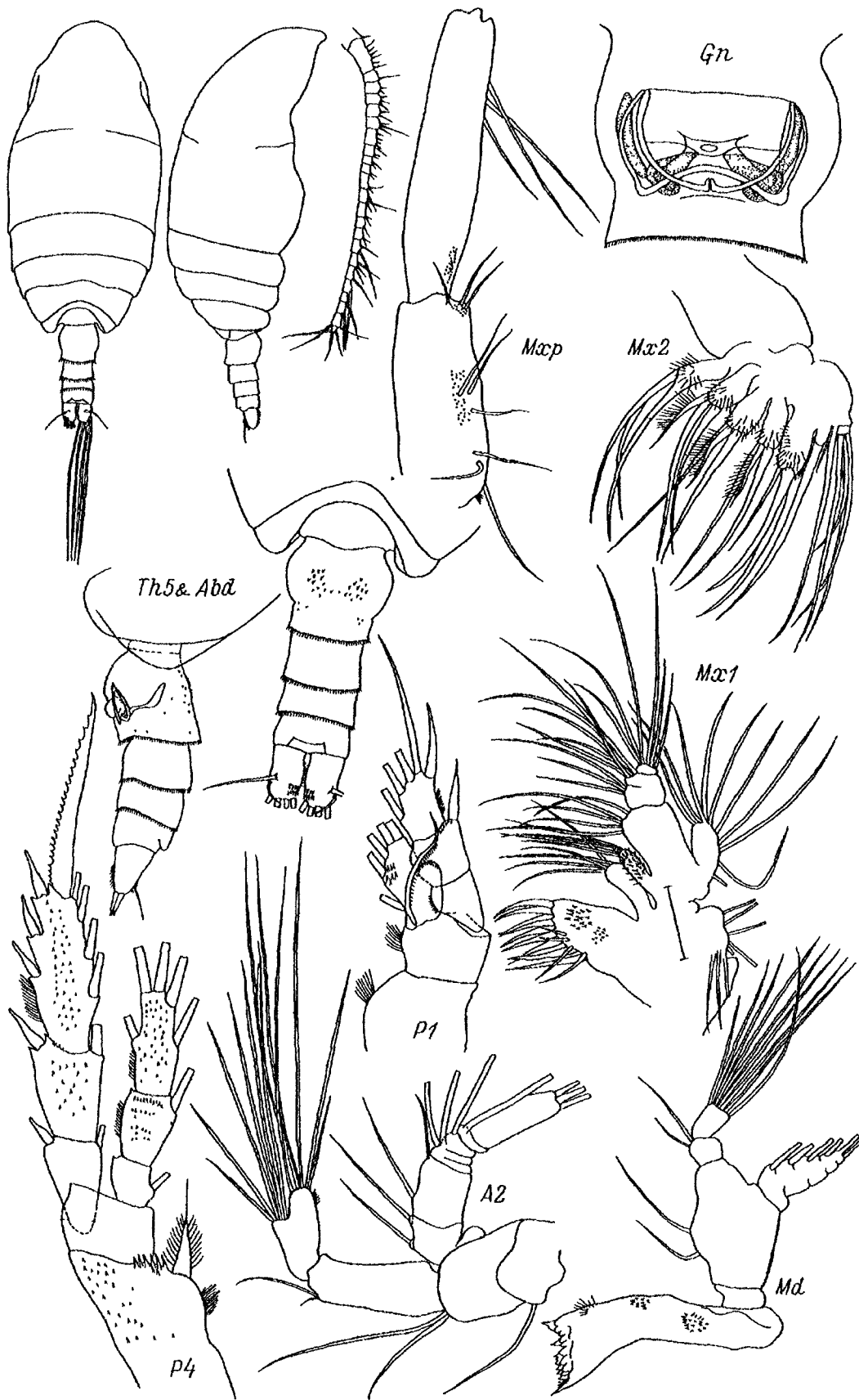


Fig. 179. *Jaschnovia brevis*. Female (from Markhaseva, 1980a).

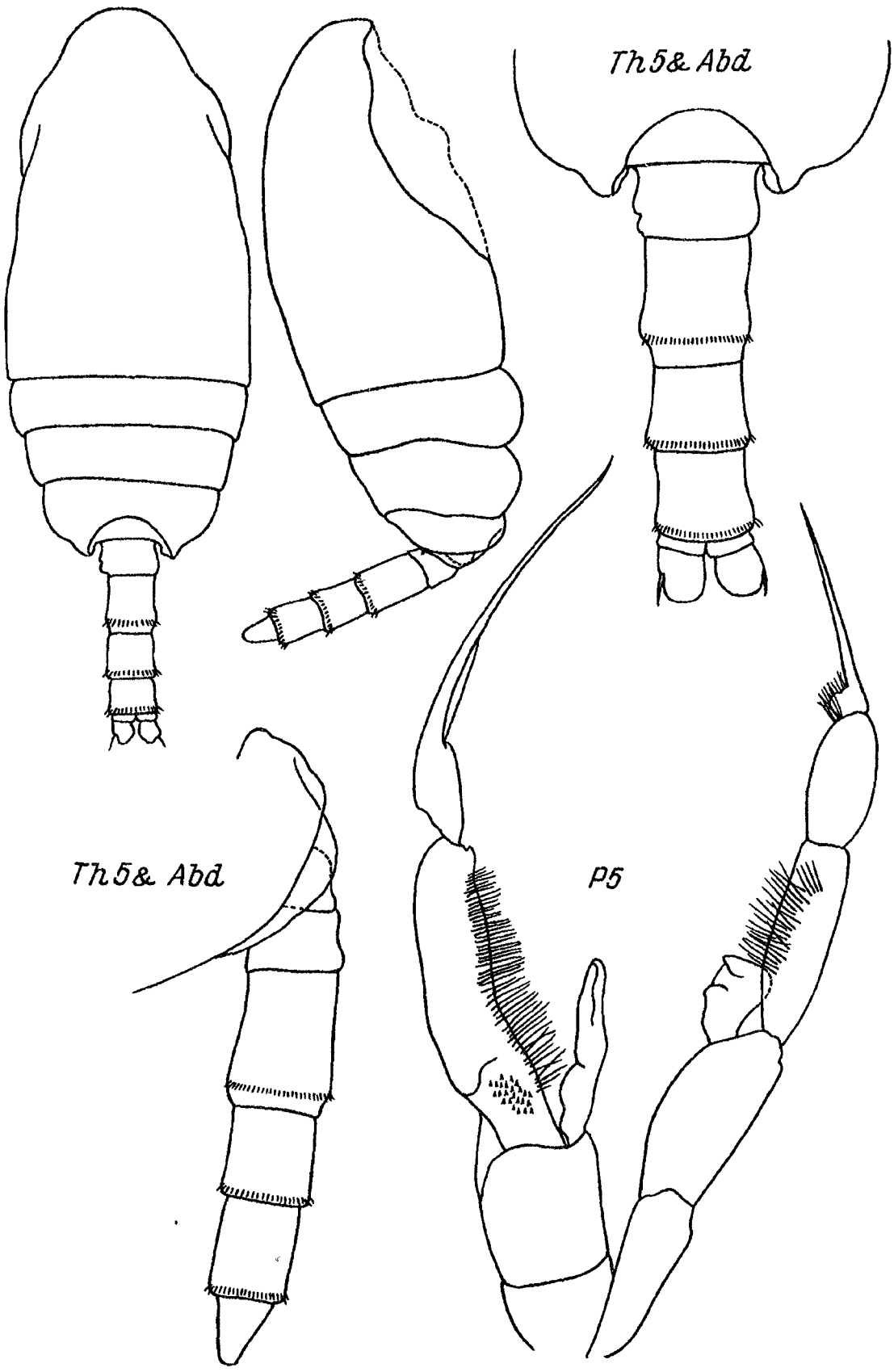


Fig. 180. *Jaschnovia brevis*. Male (from Markhaseva, 1980a).

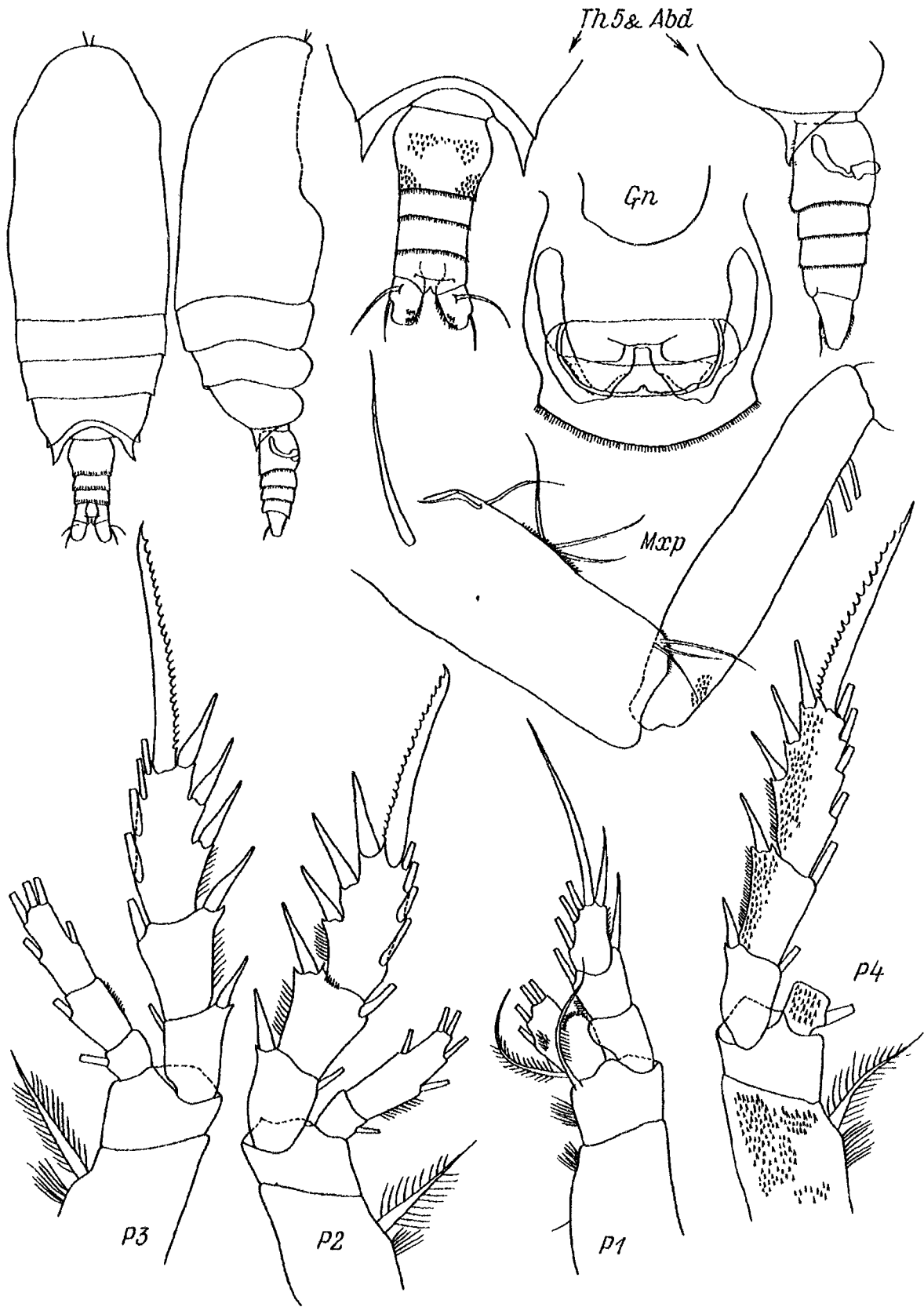


Fig. 181. *Jaschnovia tolli*. Female (from Markhaseva, 1980a).

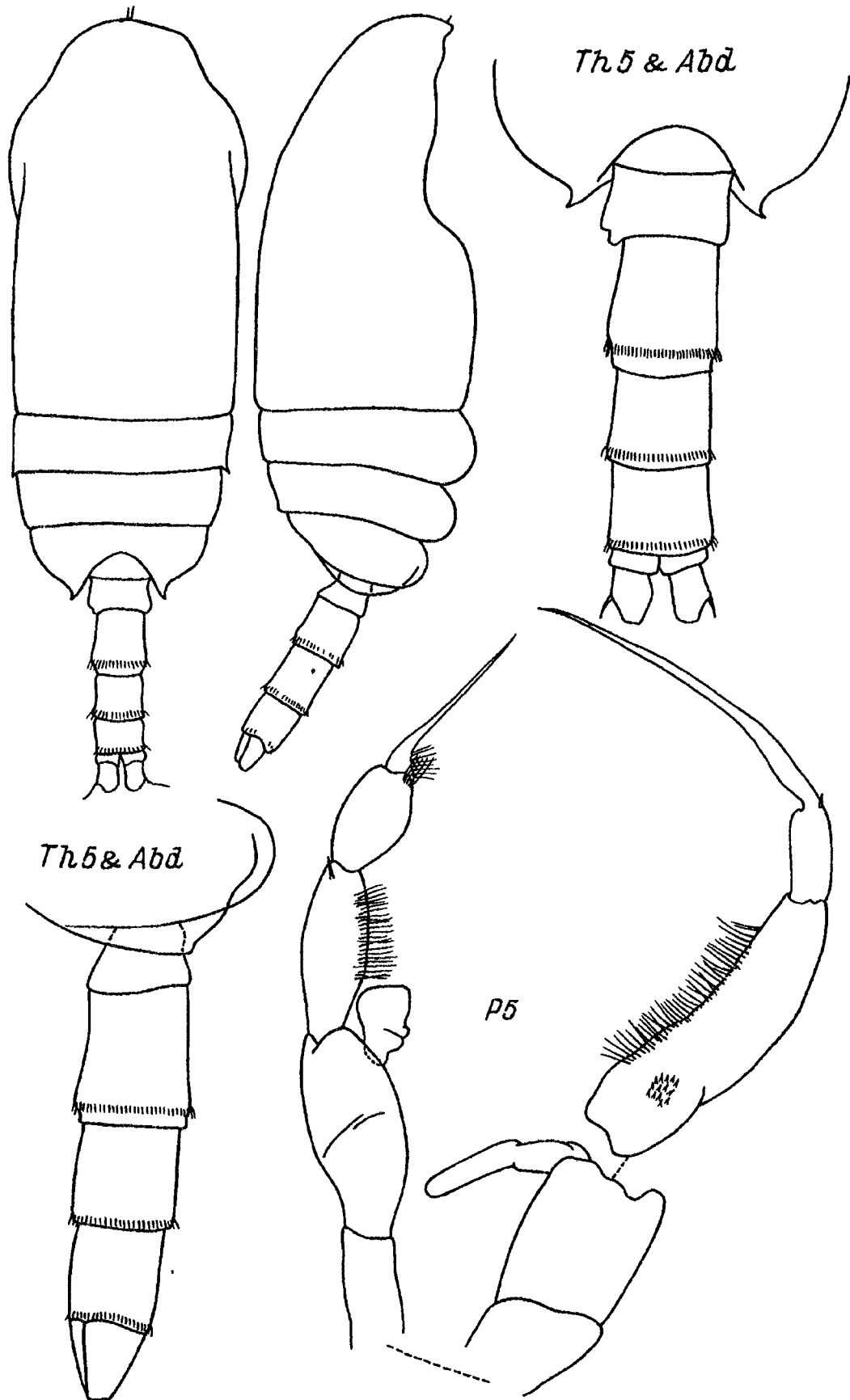


Fig 182 *Jaschnovia tolli* Male (from Markhaseva, 1980a)

and Re with 11 setae each. Mx2 with 1 spine on fourth and fifth endites thickened and more sclerotized than the rest. Mxp protopodite without seta in the proximal part of joint. Digital appendage absent; in distal setae group there are 2-3 setae; otherwise limb is typical of Aetideidae. Re P1 3-jointed. Re P1 with external spines on each joint. In distal external corner of P1 basipodite small spine present. Ri P1 1-jointed; external lobe well developed and with hairs along external border. Ri P2 2-jointed. All other swimming legs rami 3-jointed. Spines on P4 coxopodite absent.

Male unknown.

The genus *Lutamator* includes 2 species.

Key to species of *Lutamator*

Females

- 1(2) Mx1 second internal lobe with 5 and third internal lobe with 2 setae 1. *L. elegans* Alvarez
 2(1) Mx1 second internal lobe with 4 setae and third internal lobe with 3 setae 2. *L. hurlei* Bradford

1. *Lutamator elegans* Alvarez, 1984

(Fig. 183)

Lutamator elegans Alvarez, 1984: 99-110, 104, figs 13-30.

Description. F e m a l e. (Description after Alvarez (1984) with modifications). Total length 5.2 mm. Cephalothorax nearly 3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Th5 ending with a small point. Rostrum in form of a short blunt plate. A1 24-jointed, reaching the end of cephalothorax. Ri A2 as long as Re A2. Coxopodite A2, basipodite and Re1 A2 with 1 seta each; Re2 A2 with 2 setae; Ri1 A2 with 1 seta; external lobe of Ri2 A2 with 7 long terminal and 1 shorter posterior seta; internal lobe with 7 (4 long and 3 short setae). Md palp base and Ri1 Md without seta; Ri2 Md with 5 setae. Mx1 gnathobase with 12 setae. Mx1 second internal lobe with 5 setae; third internal lobe with 2 setae; protopodite near Ri base with 4 setae; Ri and Re with 11 setae each; external lobe with 8 setae. Mx2 with claw-like spine at fifth and fourth endites. First-fourth Mx2 endites with spinules on surface near proximal margin of lobes. Mxp robust with groups of 2, 3 and 3 setae (from proximal to distal end of the joint). P1-P4 with segmentation typical of the family. Re P1 with external spines on each joint. Ri P1 with well developed external lobe covered with hairs; basipodite with small spine in external distal corner of joint. P2 coxopodite with internal seta. P3 and P4 coxopodites without such seta. Number of teeth on terminal spines of P2-P4 Re3 is 46, 50 and 54 respectively.

Male unknown.

Type locality: off the Brazilian coast.

Geographical distribution. The species is known off the Brazilian coast (Alvarez, 1984).

Vertical distribution. The species was found at depths 900 m and 460 m above the sea bed (Alvarez, 1984).

The species was not examined by me.

2. *Lutamator hurlei* Bradford, 1969

(Fig. 184)

Lutamator hurlei Bradford, 1969: 491, figs 128-142.

Description F e m a l e. (Description after Bradford (1969b) with modifications). Total length 5.15 mm. Cephalothorax about 4 times longer than abdomen. Genital segment with ventral swelling prominent (lateral view). Line of fusion between Th4-Th5 visible. A1 reaching Th3. Re1 A2 with 1 seta; Re2 A2 with 2 setae. Md palp base without setae; Ri1 Md without seta. Mx1 second internal lobe with 4 setae; third internal lobe with 3 setae. Mx2 fifth endite large. P1-P4 typical of the genus.

Male unknown.

Type locality: off East Cape, north-east New Zealand.

Geographical distribution. The species is known from type locality only (Bradford, 1969b).

17. *Mesocomantenna* Alvarez, 1986

TYPE SPECIES. *Mesocomantenna spinosa* Alvarez, 1986, by original designation.

Mesocomantenna Alvarez, 1986: 865.

Description. F e m a l e. (Description after Alvarez (1986) with modifications). Total length 1.90 mm. Cephalothorax about 3.7 times longer than abdomen. Rostrum absent. Crest absent. Cephalon and Th1 incompletely fused; Th4-Th5 separated. Th5 and genital segment symmetrical. Posterior Th5 corners prolonged into spines directed backward. A1 24-jointed, exceeding Th2. Re A2 shorter Ri A2; basipodite with 2; Ri1 with 1 seta. Ri2 A2 internal lobe with 4 long and 4 short terminal setae; external lobe with 6 long terminal seta. Re1 A2 without setae; Re2 A2 with 1 seta; latter joint partly fused with Re3 A2; Re3-Re6 A2 with 1 seta each, Re7 A2 short as in genus *Comantenna* and supplied with 1 terminal short seta. Md palp base with 2 very small setae; Ri1 Md with 1; Ri2 Md with 5 setae. Mx1 gnathobase with 9 terminal claw-like setae and 4 setae on the surface. Second and third Mx1 internal lobes with 3 setae each; protopodite near the Ri base with 3 setae; Ri and Re with 11 setae each;

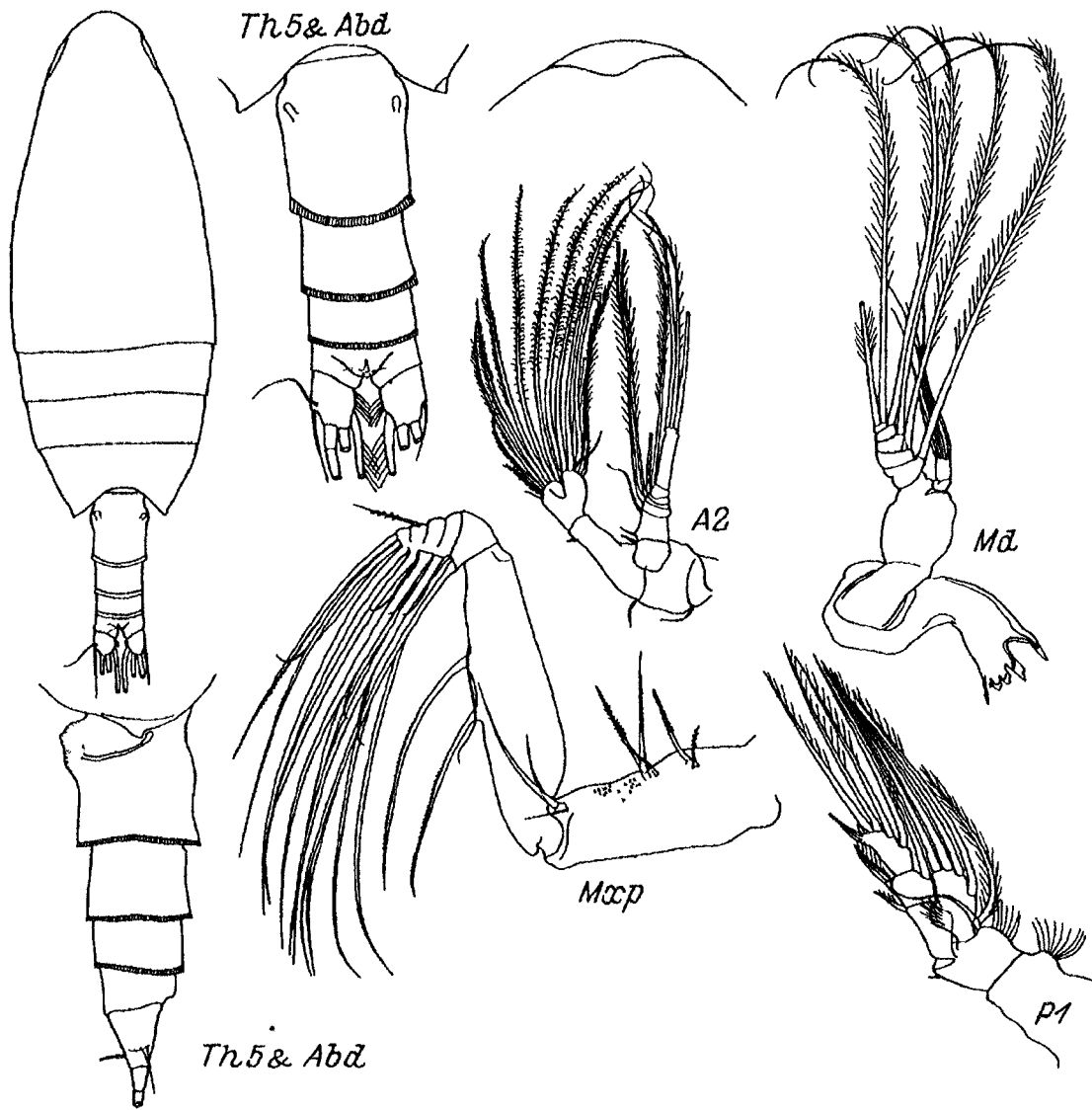


Fig 183 *Lutamator elegans* Female (from Alvarez, 1984)

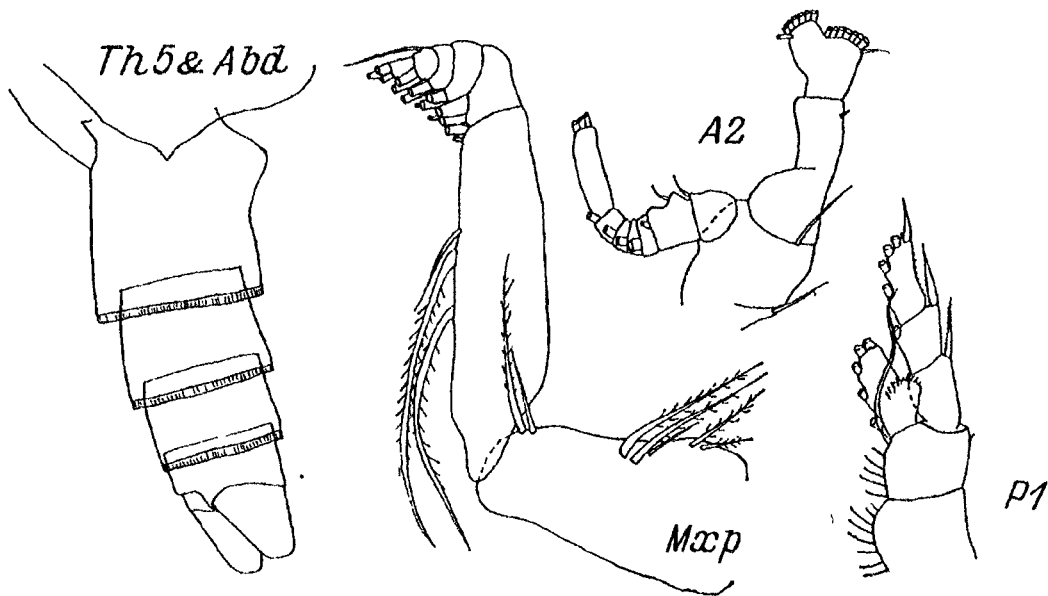


Fig 184 *Lutamator hurlei* Female (from Bradford, 1969b)

6 setae on external lobe. Lateral surfaces of first and second endites of Mx2 near setae bases with thick sclerotized spines similar to that in *Paracomantenna*. One seta of Mx2 fifth endite is thickened into claw-like spine. Mxp protopodite setation typical of Aetideidae, and in the distal setae group with big digital appendage. Re P1 with external spines at all 3 joints; spines long; exceeding length of next joint. Ri P1 1-jointed with well developed external lobe, with hairs along external border. Ri P2 2-jointed, other rami of swimming legs 3-jointed. P4 coxopodite without spines.

Male unknown.

Monotypic genus.

1. *Mesocomantenna spinosa*

Alvarez, 1986

(Fig. 185)

Mesocomantenna spinosa Alvarez, 1986: 865, 868-869, figs 25-42.

Description. Female. Total length 1.9 mm. Cephalothorax about 3.7 times longer than abdomen. Cephalon partly fused with Th1. Rostrum absent. Th5 posterior corners upturned backwards, reaching almost the posterior end of genital segment (dorsal view). A1 24-jointed, exceeding Th2. Structure of oral parts and P1-P4 typical of the genus.

Male unknown.

Type locality: 26°58'S 46°32'W.

Geographical distribution. The species is known from type locality only: the continental shelf and slope of Brazil (Alvarez, 1986).

Vertical distribution. The species was found at depth 346 m (Alvarez, 1986).

The species was not examined by me.

18. *Paivella* Vervoort, 1965

TYPE SPECIES: *Paivella inaciae* Vervoort, 1965, by original designation.

Paivella Vervoort, 1965: 199; Wheeler, 1970: 11.

Description. Female. Total length 1.27-1.42 mm. Cephalothorax 3.0-3.4 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Rostrum present, bifurcate. Crest absent. Th5 posterior corners pointed, symmetrical, as well as genital segment. Genital segment with lateral projections (*P. naporai*), or without (*P. inaciae*) them. A1 23-jointed, reaching the midlength of abdomen, or the end of caudal rami. Re A2 longer than Ri A2. A2 coxopodite with 1 seta; basipodite with 2

setae. Ri1 A2 with 1-2 setae; Ri2 with 7-8 terminal setae on internal lobe and 6 terminal and 1 posterior setae on external lobe. Re1 A2 with 1 seta; or it is absent; Re2 with 2-3 setae; Re3-Re6 with 1 seta each; Re7 with 3 terminal setae. Md palp base and Ri1 Md with 2 setae. Ri2 Md with 9 terminal and 1 posterior seta. Mx1 gnathobase with 9 terminal setae and 4 setae on surface. Second Mx1 internal lobe with 3-4; third internal lobe with 3-4 setae; protopodite with 4-5 setae; Ri with 10-11 setae; Re with 11 setae; external lobe with 7-9 setae. Fourth and fifth Mx2 endites with 1 seta thickened into claw-like spine. Re P1 3-jointed. Re1 P1 without external spine; Ri external lobe well developed, with fine spinules along external border apically. Ri P2 1-jointed, all other swimming leg rami 3-jointed. P4 coxopodite with 2 parallel rows of 4-6 spines on the posterior surface near the base of internal seta proximally.

Male. Total length 1.15 mm. Cephalothorax about 3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 completely fused. Rostrum present, as in female. Crest absent. Th5 posterior corners rounded. A1 reaching the midlength of Abd2. A2 as in female. Ri1 and Ri2 A2 without setae. Md as in females; gnathobase strongly reduced. Mx1 and Mx2 reduced. Mxp setation in comparison with that in female reduced. P1-P4 as in females, but Ri P2 indistinctly 2-jointed. P4 coxopodite without internal seta and rows of spines on posterior surface of joint. P5 uniramous. P5 left 5-jointed, apical joint ending with spine, covered with hairs. P5 right 4-jointed, apical joint in its distal part prolonged into needle-shaped appendage and significantly shorter than left P5, reaching the midlength of third joint of left leg.

The genus *Paivella* includes 2 species.

Key to species of *Paivella*

Females

- 1(2) Genital segment without lateral projections 1. *P. inaciae* Vervoort
 2(1) Genital segment with lateral projections 2. *P. naporai* Wheeler

1. *Paivella inaciae* Vervoort, 1965

(Fig. 186)

Paivella inaciae Vervoort, 1965: 201-210, figs 36-41.

Description. Female. Total length 1.42-1.46 mm. Cephalothorax about 3.4 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 completely fused. Rostrum present, bifurcate. Th5

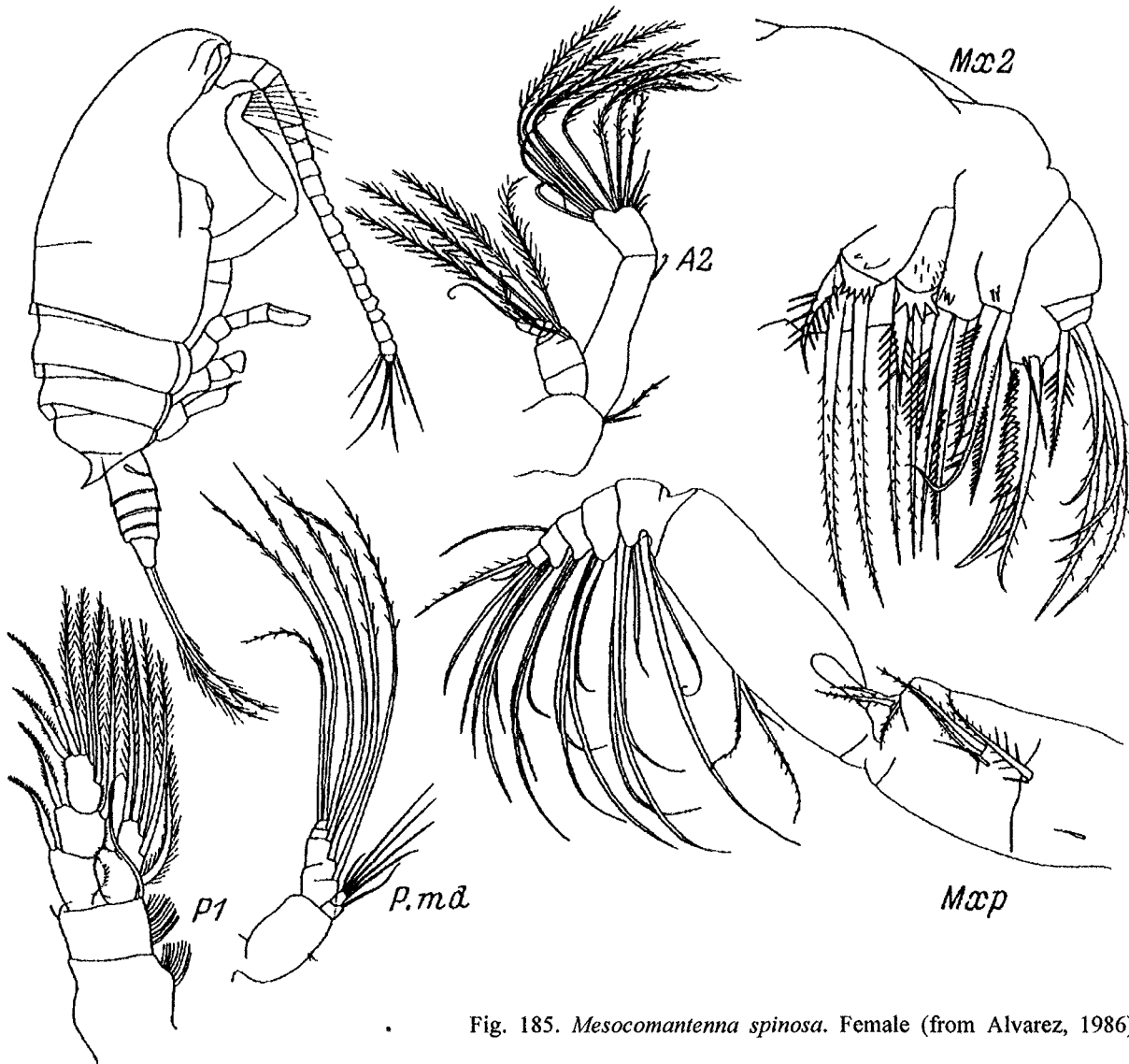


Fig. 185. *Mesocomantenna spinosa*. Female (from Alvarez, 1986).

posterior corners of triangular shape, pointed (dorsal and lateral view), slightly exceeding the midlength of genital segment. Posterior margins of the Abd1-4 without teeth. Caudal rami exactly twice as long as wide. A1 23-jointed, reaching the end of caudal rami. A2 coxopodite with 1 seta; basipodite with 2 fine setae. Re1 A2 without setae; Re2 with 3 setae; Re7 with 3 terminal setae. Ri1 A2 with 2 setae; Ri2 with 8 setae on internal and 6+1 on external lobe. Md palp base with 2 setae; Ri1 Md with 2 and Ri2 Md with 9 terminal and 1 posterior setae. Mx1 gnathobase with 9 terminal setae and 4 setae on posterior surface. Second Mx1 internal lobe with 3 setae; third internal lobe with 4 setae; propodite near Ri base with 4 setae; Ri with 10 setae; Re with 11 setae; external lobe with 9 setae. Mx2 with seta slightly thickened into spine on fourth endite, and rather thickened spine on fifth endite. Mxp typical of the genus. Re1 P1 without spine. Ri external lobe well developed, with spinules an-

teriorly. Ri P2 1-jointed. P4 coxopodite with 2 transverse rows of 6 acute spines on posterior surface.

M a l e. (Description after Vervoort (1965) with modifications). Total length 1.15 mm. Cephalothorax about 3.1 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 completely fused. Rostrum as in females, but with shorter points. Th5 posterior corners rounded. Genital segment with opening on the left. Caudal rami as in females. A1 reaching the midlength of Abd2: 8-10, 20-21 and 24-25 joints fused. The setation of A2 strongly reduced; Ri1 A2 and Ri2 A2 without setae. Re1 A2 with 2 setae of lesser size than in female. Md as in female. Mx1 reduced, gnathobase without setae; third internal lobe with 2 setae; propodite with 3 setae near Ri base; Ri with 3 setae; Re with 10 setae; external lobe with 5 setae. Mxp as in females, but number of setae reduced. P1-P4 as in females, but Re1 and Re2 P1 completely separated. Ri P2 with incomplete segmentation. P4 coxopodite without spines on pos-

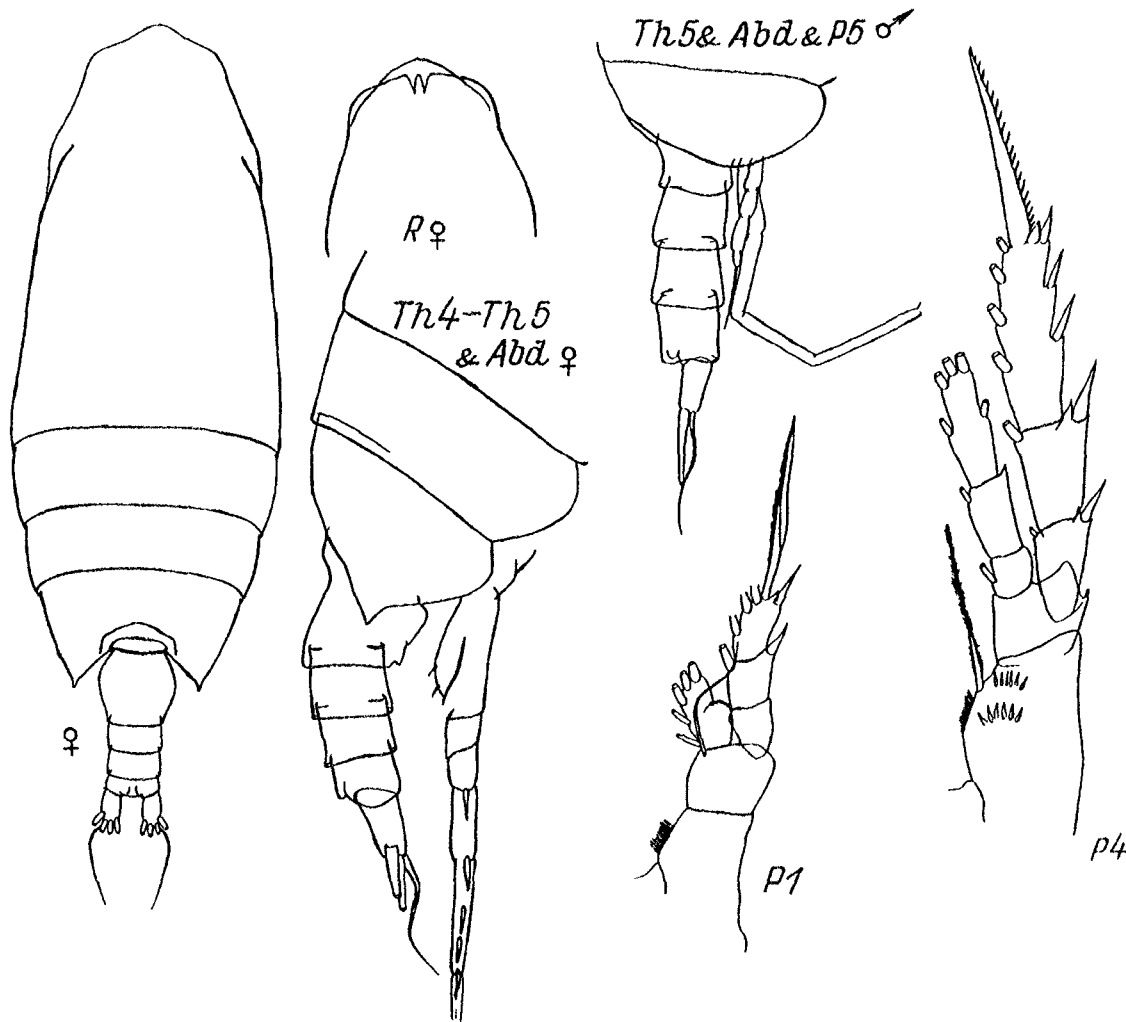


Fig. 186. *Paivella inaciae*. Female, male (from Vervoort, 1965).

terior surface and internal seta. P5 uniramous. Left P5 elongated, 5-jointed, terminal joint ending into spine with patch of spiniform hairs; Right P5 4-jointed, terminal joint ending in fine long point. P5 left and right legs of unequal length.

Type locality: 5°56'N 4°26'E.

Geographical distribution. The species is known off Nigeria, known from type locality only.

Vertical distribution. The species was found between 95 m depth and surface (Vervoort, 1965).

The species was not examined by me.

2. *Paivella naporai* Wheeler, 1970

(Fig. 187)

Paivella naporai Wheeler, 1970 10-11, figs 33-48.

Description. Female. (Description after Wheeler (1970) with modifications). Total length 1.27 mm. Cephalon and Th1, as well as Th4-Th5 fused. Rostrum present, biramous. Th5 posterior corners

triangular and pointed, covering about one third of length of genital segment. Genital segment produced into 2 distinct protuberances extending ventrally and laterally, visible in dorsal view. Caudal rami twice longer than wide. A1 22-jointed, reaching the mid-length of Abd. A2 coxopodite with 1 seta; basipodite with 2 setae. Re1 A2 with 1 seta; Re2 A2 with 2 setae; Ri1 A2 with 1 seta; Ri2 A2 with 14 setae (7 on external and 7 on internal lobes). Md palp base with 2 setae; Ri1 Md with 2; Ri2 Md with 9 terminal and 1 posterior seta. Mx1 gnathobase with 9 terminal setae and 4 setae on posterior surface. Second Mx1 internal lobe with 4 setae; third internal lobe with 3 setae; protopodite near Ri base with 5 setae; Ri with 11 setae; Re with 11 setae; external lobe with 7 setae. Mx2 with seta thickened into sclerotized spine on fourth and fifth endites. Mxp protopodite with groups of 2, 2 and 2 setae. Re1 P1 without external spine. Ri P1 with well developed external lobe, apically covered by teeth. Ri P2 1-jointed. P4 coxopodite with 2 transverse rows of spines on the posterior surface.

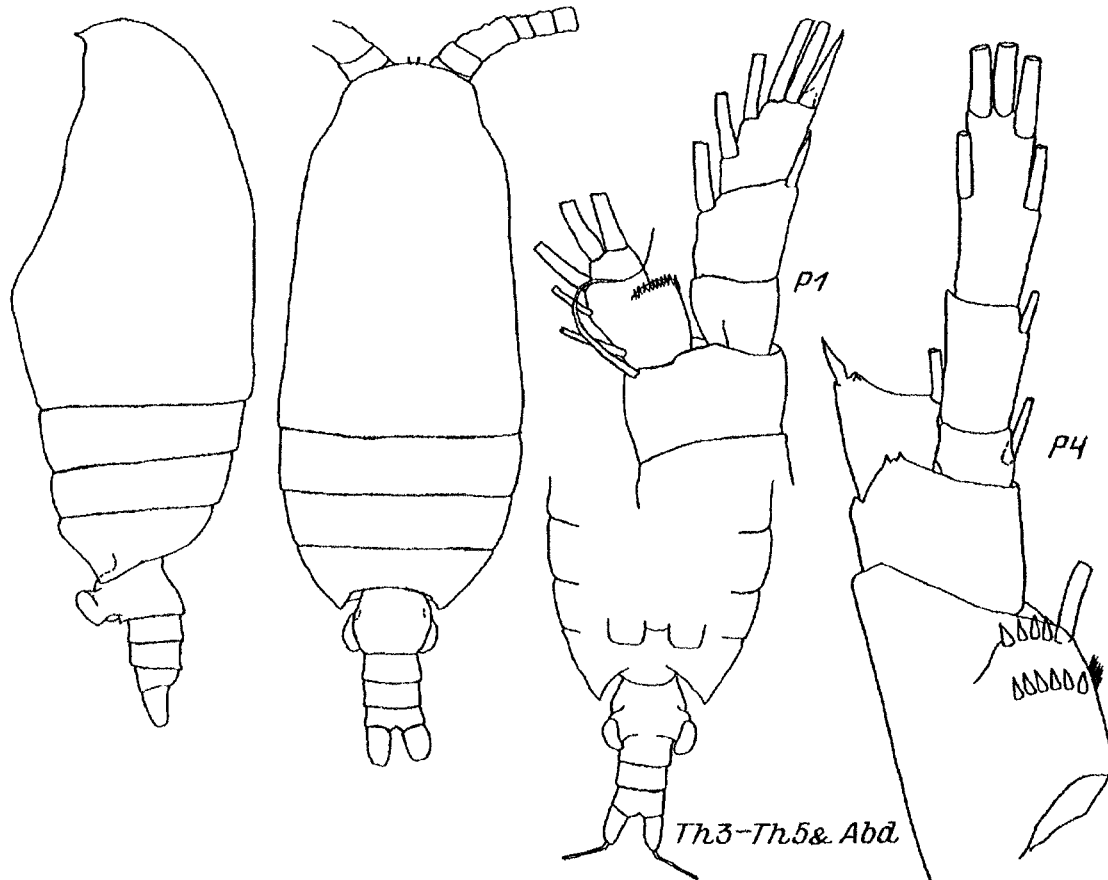


Fig. 187. *Paivella naporai*. Female (from Wheeler, 1970).

Male unknown.

Type locality: 15°00'S 30°00'W.

Geographical distribution The species was found from South Atlantic (Wheeler, 1970).

Vertical distribution. The species was found between 2755 and 4000 m (Wheeler, 1970).

The species was not examined by me.

19. *Paracomantenna* Campaner, 1978

TYPE SPECIES: *Bryaxis minor* Farran, 1905, by original designation.

Paracomantenna Campaner, 1978: 871, Alvarez, 1986: 858

Description. F e m a l e. (Description after Campaner (1978) with modifications). Total length 1.4-1.9 mm. Cephalothorax 3.0-3.8 times longer than abdomen. Cephalon and Th1, fused as well as Th4-

Th5, or they are separated. Crest and rostrum absent. Th5 and genital segment symmetrical. Posterior Th5 corners prolonged into points, upturned backward. A1 23-jointed. Re A2 slightly shorter, or as long as Ri A2. A2 basipodite with 1-2 setae; Ri1 A2 with 1 seta; Ri2 A2 with 8 setae on internal and 5 terminal and 1 posterior setae on external lobes. Re1 A2 without setae; Re2 A2 with 1 setae; each joint of Re3-Re6 A2 with 1 seta; Re7 with 3 terminal setae. Length of Re7 A2 typical of Aetideidae. Md palp base with 1 seta; or seta absent, Ri1 Md with 1 and Ri2 Md with 4-5 setae. Mx1 gnathobase with 9 terminal thickened claw-like spines; 1 seta of lesser size and 4 setae on posterior surface. Second Mx1 internal lobe with 4 setae; third internal lobe with 3 setae; protopodite near Ri base with 4-5 setae; Ri with 12 setae; Re with 11 setae; external lobe with 7 setae. Fourth and fifth endites of Mx2 each with 1 seta thickened into sclerotized spine (after Farran (1905), only seta on the fifth endite is thickened into spine). Surfaces of Mx2 first and second

endites, or first-fourth endites with rows of large foliaceous, thick, strongly sclerotized spines. Mxp protopodite with or without digital appendage near the base of distal setae group, otherwise Mxp protopodite setation typical of Aetideidae, but there may be 2, not 3 setae in distal setae group. Re P1 3-jointed, each joint with external spine. Ri P1 external lobe well developed, with hairs apically. Ri P2 2-jointed; all other P2-P4 rami 3-jointed. P4 coxopodite without spines.

Male unknown.

Notes Campaner (1978) established *Paracomantenna* from the following features: developed terminal setae on Re7 A2, shape of large spines on Mx2 endites surfaces. *P. minor* (Farran, 1905) = *Bryaxis minor* Farran, 1905 was chosen as the type species, but as properly noted later, (Bradford & Jillett 1980) it is questionable why *P. minor* and *P. magalyae* are attributed to the same genus despite the absence of sensory (digital) appendage on Mxp protopodite in *P. minor*.

The genus *Paracomantenna* includes 3 species.

Key to species of *Paracomantenna*

Females

- 1(2) Distal part of Mxp protopodite without tube-like or digital appendage 3. *P. minor* (Farran)
 2(1) Distal part of Mxp protopodite with tube-like or digital appendage.
 3(4) Md palp base with 1 small seta; Ri2 Md with 5 setae. Mxp protopodite distally with tube-like appendage. Total length 1.4 mm
 1. *P. gracilis* Alvarez
 4(3) Md palp base without seta; Ri2 Md with 4 setae. Mxp protopodite distally with digital appendage. Total length 1.8-1.9 mm . 1. *P. magalyae* Campaner

1. *Paracomantenna gracilis*

Alvarez, 1986

(Fig. 188)

Paracomantenna gracilis Alvarez, 1986: 869, 872, 875, figs 43-58.

Description. Female. (Description after Alvarez (1986) with modifications). Total length 1.4 mm. Cephalothorax about 3 times longer than abdomen. Cephalon and Th1 fused, incomplete suture visible dorsally. Rostrum absent. Th5 posterior corners upturned, not reaching the midlength of genital segment (dorsal view). A1 23-jointed, reaching Th4. Re A2 as long as Ri A2; Re1 without seta; Re2 with 1 distal seta; Re7 longer than 4 previous joints with 3 long terminal setae. A2 basipodite with 2 setae. Ri1 A2 with 1 seta; Ri2 A2 with 4 long

and 4 small setae on internal lobe and 5 long and 1 small setae on external lobe. Md palp base with 1 small seta. Ri1 Md with 1 seta; Ri2 Md with 5 setae. Mx1 gnathobase with 8 terminal and 4 surface setae. Second internal Mx1 lobe with 4; third with 3 setae; protopodite near Ri base with 4 setae; Ri with 12 setae; Re with 11 setae; external lobe with 8 setae. First-fourth Mx2 endites with spines and teeth on the posterior surface, those on the second endite are largest (4 longer and 4 smaller); one of seta on fourth and fifth endites transformed into spine; that on fifth endite strong, with row of 17 laminar spines. Mxp protopodite with 1 proximal seta, and 3 groups (from proximal to distal part of the joint) of 2, 3 and 3 setae and with long tube-like appendage in distal setae group. P1-P4 with segmentation typical of Aetideidae. Re P1 3-jointed with external spine on each joint. Ri P1 external lobe well developed, with hairs apically.

Male unknown.

Type locality 28°36'S 47°55'W.

Geographical distribution. Atlantic Ocean: off the Brazilian coast (Alvarez, 1986).

Vertical distribution The species was collected at 135 m depth above sea bottom (Alvarez, 1986).

The species was not examined by me.

2. *Paracomantenna magalyae*

Campaner, 1978

(Fig. 189)

Paracomantenna magalyae Campaner, 1978: 872, 876, figs 35-36, 38-52; Alvarez, 1986: 875, fig. 61.

Description. Female. (Description after Campaner (1978) with modifications). Total length 1.80-1.90 mm. Cephalothorax nearly 3.8 times longer than abdomen. Cephalon and Th1 separated. Rostrum absent. Th5 with upturned posterior corners varying in shape and length. A1 24-jointed, reaching Th4. Re2 A2 with 1 seta. Ri1 A2 with 1 seta; Ri2 A2 with 4 long and 4 very small setae on internal and 5 long and 1 small posterior seta on external lobes. Re7 A2 longer than Re3-Re6 together. Md palp base without seta. Ri1 Md with 1 seta; Ri2 Md with 4 setae. Mx1 gnathobase with 9 terminal claw-like, 1 thin spine and 4 setae on posterior surface. Second Mx1 internal lobe with 4 setae; third with 3 setae; protopodite near Ri base with 5 setae; Ri with 12 setae; Re with 11 setae; external lobe with 7 setae. Mx2 with row of robust thick short spines along anterior and upper margins of first and second endites. Mxp protopodite with 3 groups of 2, 3 and 3 (?) setae (from proximal to distal part of joint); in addition to setae in distal group with digital appendage. P1-P4 with segmentation typical of Aetideidae. Re P1 with external spine on each joint. Ri P1 external lobe well developed with hairs along

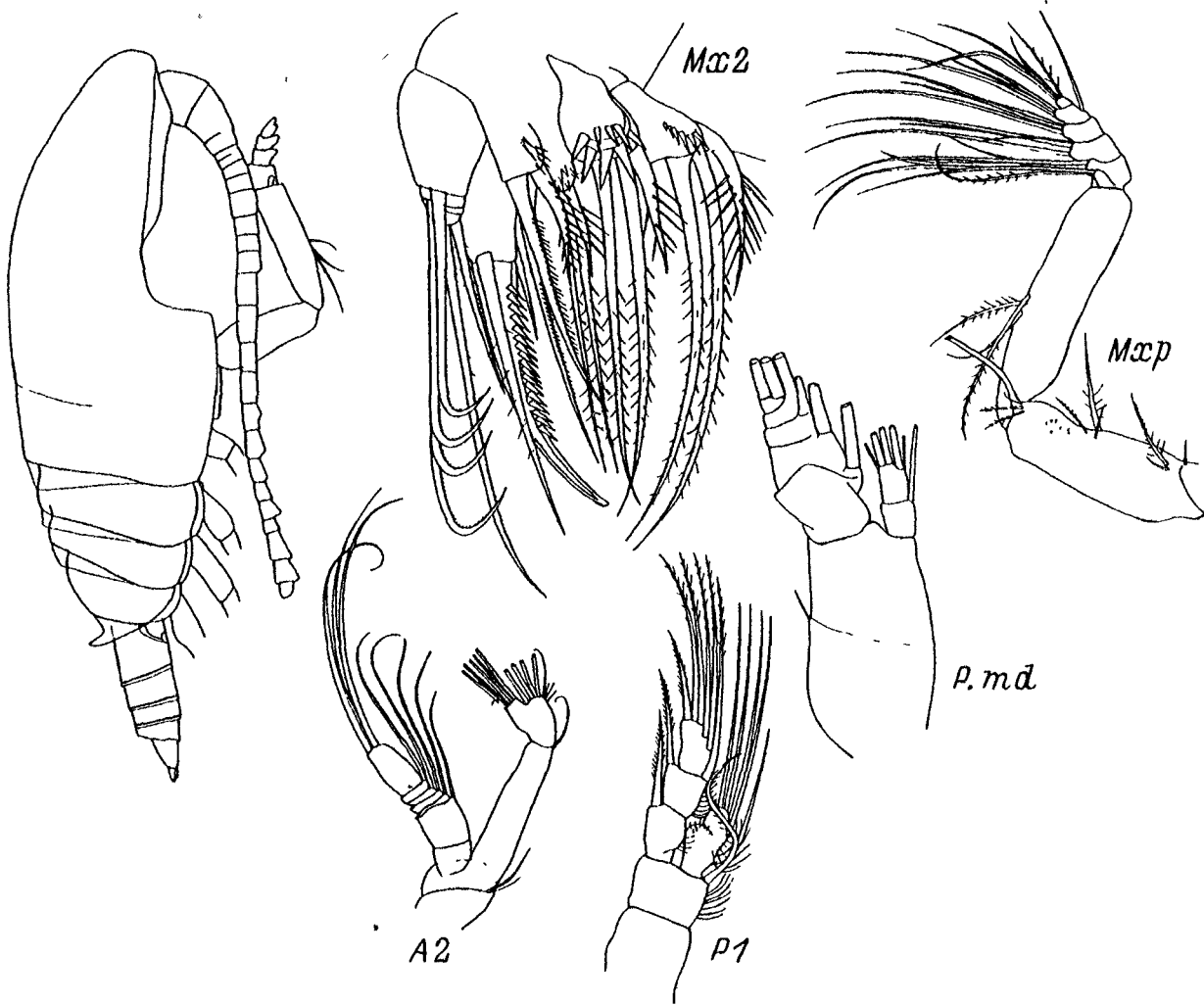


Fig. 188. *Paracomantenna gracilis*. Female (from Alvarez, 1986).

external border apically. P1 basipodite with small external spine in distal corner.

Type locality: 23°19'S 41°57'W.

Geographical distribution. Atlantic Ocean: off Brazilian continental shelf (Campaner, 1978; Alvarez, 1986).

Vertical distribution. The species was found at depth 100 m and 113 m in benthopelagic' locality (Campaner, 1978; Alvarez, 1986).

The species was not examined by me.

3. *Paracomantenna minor* (Farran, 1905)

(Fig. 190)

Bryaxis minor Farran, 1905: 32, pl.4, figs 1-5, 7-12; Rose, 1933: 102, fig 75; Vervoort, 1952b (sheet 43): 2, fig 6 (a, b, f, g).

Paracomantenna minor: Campaner, 1978: 871.

Description. Female. (Description after Farran (1905) with modifications). Total length 1.6 mm.

Cephalon and Th1 fused, Th4-Th5 separated. Th5 posterior corners upturned. A1 24-jointed, reaching Th4. Re A2 very short; Re7 longer than Re2 with 3 terminal setae. Mx1 gnathobase with 9 terminal spines. Second Mx1 internal lobe with 4 setae; third internal lobe with 3 setae; protopodite near Ri base with 2 setae; Ri with 10 setae; Re with 11 setae. Mx2 with strong terminal spine on fifth endite, and lesser strong terminal spine on fourth endite. First-fourth Mx2 endites with short spines along anterior and upper margins. Digital appendage on Mxp protopodite not observed. P1-P4 with segmentation typical of Aetideidae. Re P1 3-jointed with external spine on each joint. Ri P1 with well developed external lobe.

Type locality: 53°58'N 12°28'W.

Geographical distribution. The species is known off the West coast of Ireland (Farran, 1905).

Vertical distribution. The species was found in tow nets attached to trawl at 382 fath. (Farran, 1905).

The species was not examined by me.

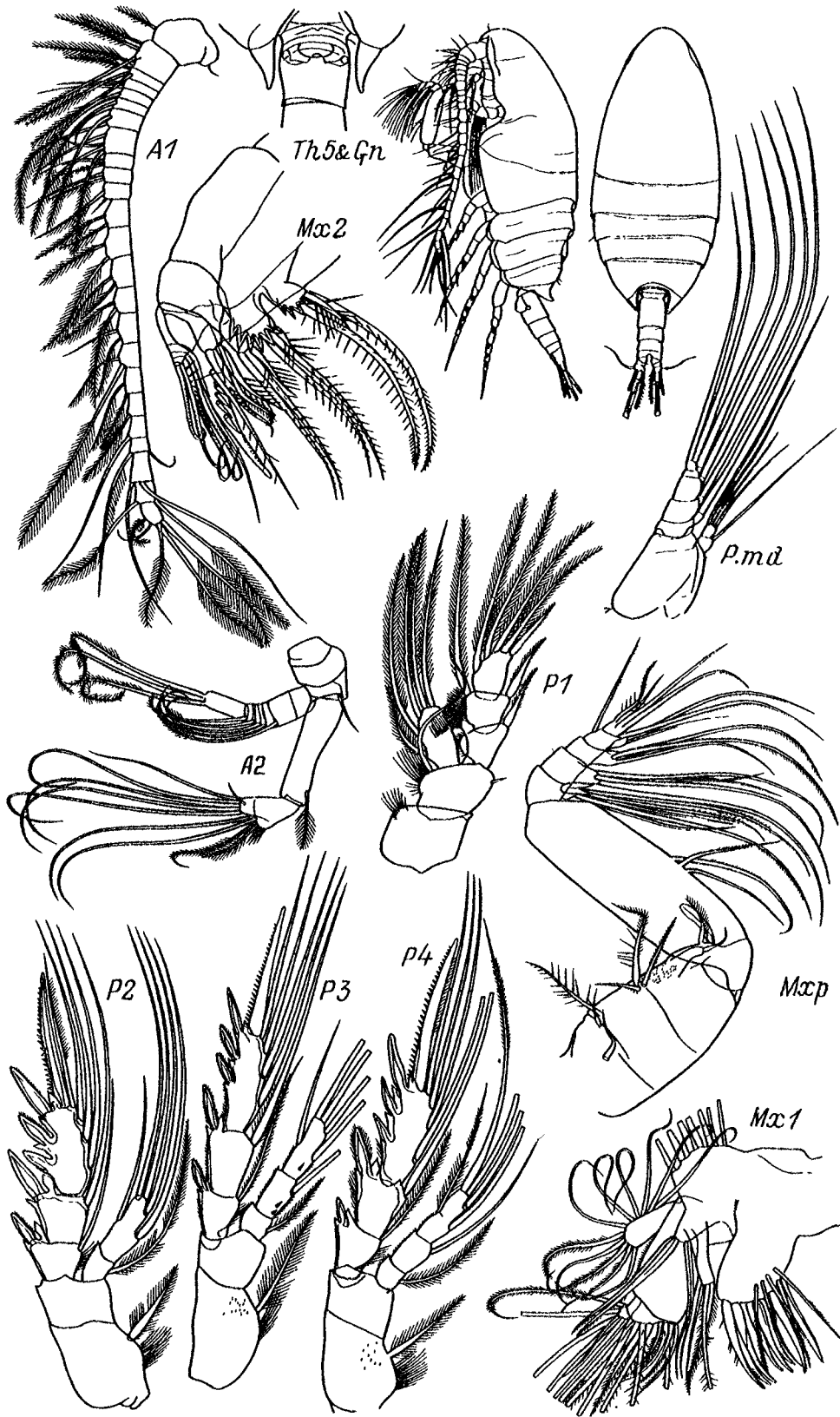


Fig. 189. *Paracomantenna magalyae*. Female (from Campaner, 1978).

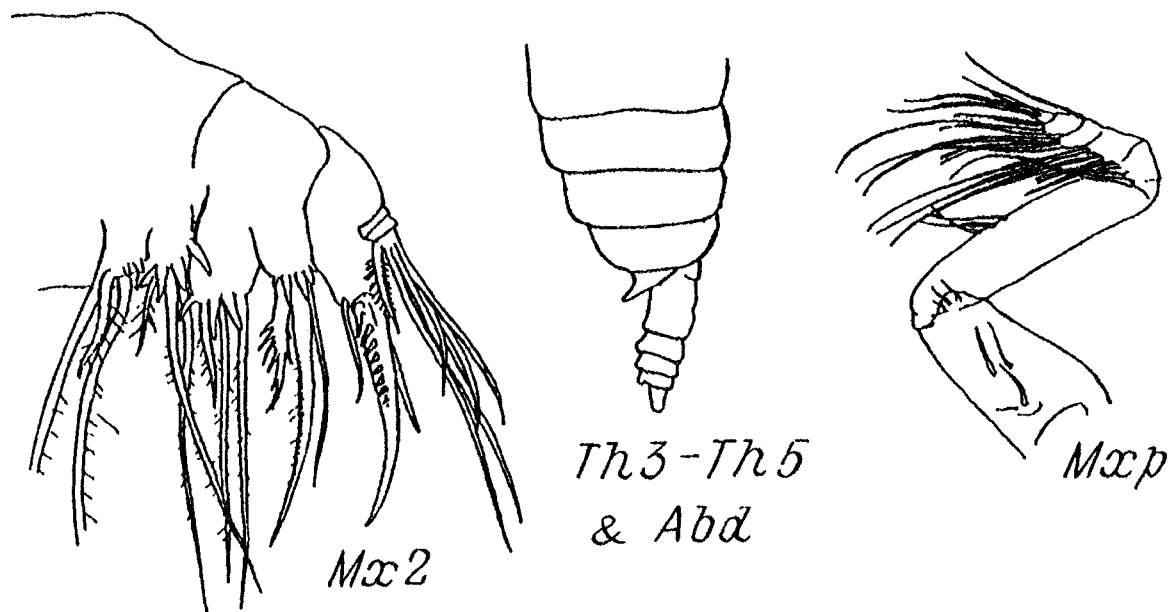


Fig. 190. *Paracomantenna minor*. Female (from Farran, 1905).

20. *Pseudeuchaeta* Sars, 1905

TYPE SPECIES *Pseudeuchaeta brevicauda* Sars, 1905, by monotypy.

Pseudeuchaeta Sars, 1905: 18.

Autanepsius Wolfenden, 1906. 350 (type species: *Autanepsius minor* Wolfenden, 1906, designated here)

Description. Female. Total length 4.8-10.5 mm. Cephalothorax 2.8-4.0 longer than abdomen. Crest absent. Rostrum severely reduced, in a form of a blunt rounded plate. Cephalon and Th1, as well as Th4-Th5 partly or completely fused, line of fusion usually well visible. Th5 posterior corners symmetrical, rounded, with small triangular tops, or prolonged into small short points directed exactly backward, or to back side of specimen (lateral view). Posterior borders of abdominal segments with minute thin spinules. Genital segment symmetrical, nearly as long as 2 following abdominal segments together. Distal part of spermatheca small, rising duct rather narrow. A1 24-jointed, sometimes as long as, or slightly longer, but usually shorter than cephalothorax. Re nearly as long as Ri A2; coxopodite with 1 seta; basipodite with 1-2 setae (sometimes absent). Re1 and Re2 A2 with 2 setae; Re3-Re6 with 1 long, robust seta each; Re7 with 3 terminal setae. Ri1 A2 without setae (Sars (1924) figured 1 seta); Ri2 A2 with 12-13 (6 on external and 6-7 setae on internal lobes). Md palp base with 1 seta; Ri1 Md with 1 seta; Ri2 Md with 4-8 setae. Ri Md more than half shorter than Re. Mx1 gnathobase small; with 11-13 setae; 7-8 of them usually more sclerotized. Second and third internal Mx1 lobes with

2-4 and 3-4 setae respectively; protopodite near Ri base with 5 setae; Ri with 14-16 setae; Re with 11 setae; external lobe with 8-9 setae. Mx2 fifth endite longer than others; all endites with bushes of spinules; Ri with 6 robust, strongly sclerotized setae. Mxp large with robust setae on Ri distal joints, supplied with setae with sensory bodies in form of new moon (crescent-like). Proximal part of Mxp protopodite with 1 seta; subsequently groups of 2, 3 and 3 setae. Mxp protopodite distally with 1 big digital appendage near group of setae, shorter or longer than those of distal group. Re P1 3-jointed. Re1 P1 without spine (in *P. spmata* spine present); Re2-Re3 P1 with spines. Ri P1 with well developed external lobe, with thin long hairs apically. Ri P2 2-jointed, all other swimming leg's rami 3-jointed.

Male. Total length 5.9-8.8 mm. Cephalothorax 3.1-3.8 times longer than abdomen. Rostrum rudimentary, in a form of cone. Posterior Th5 corners rounded (lateral view) and slightly elongated (dorsal view). Abd2 is the longest and widest. Abd2-4 with minute spinules along posterior border. A1 nearly as long as cephalothorax, or reaching Abd3. Ri A2 longer than Re A2. A2 coxopodite and basipodite with 1 seta each; Re1 A2 without seta; Re2 A2 with small projection, or seta proximally (or both absent), otherwise setation as in females. Ri2 Md with 8-9 setae; gnathobase strongly reduced. Mx1 and Mx2 setation strongly reduced. Mxp protopodite near the base of distal setae group with appendage. P1-P4 as in females. P5 biramous with 1-jointed Ri and 3-jointed left Re; right Re 3-jointed. Left Re3 P5 with spinules along internal border.

The genus *Pseudeuchaeta* includes 6 species.

Key to species of *Pseudeuchaeta*

Females

- 1(4) Th5 posterior corners are not prolonged into points, but triangularly rounded, sometimes pointed on tops
 2(3) Re1 P1 with external spine 6. *P. spinata* Markhaseva
 3(2) Re1 P1 without external spine 2. *P. brevicauda* Sars
 4(1) Th5 posterior corners prolonged into small spines
 5(6) Mx1 second internal lobe with 2 setae and with 3 on third internal lobe. Ri2 Md with 4 setae 4. *P. magna* Bradford
 6(5) Mx1 second internal lobe with more than 2 and third internal lobe with more than 3 setae. Ri2 Md with no less than 5 setae.
 7(8) Mx1 second internal lobe with 3 and third internal lobe with 4 setae. Ri2 Md with 5 setae. Th5 posterior corners with very short points, covering less than one third of genital segment length 5. *P. major* Wolfenden
 8(7) Mx1 second internal lobe with 4 and third internal lobe with 3 setae. Ri2 Md with 7-8 setae. Th5 posterior corners prolonged into points, covering no less than one third of genital segment length (dorsal view).
 9(10) Ri2 Md with 8 setae. Total length 10.3-10.5 mm 1. *P. arctica* Markhaseva
 10(9) Ri2 Md with 7 setae. Total length 6.8 mm 3. *P. flexuosa* Bradford

Males

(unknown for *P. flexuosa*, *P. magna*, *P. major*, *P. spinata*)

- 1(2) Left Re3 P5 with small terminal spine. Total length about 6 mm 2. *P. brevicauda* Sars
 2(1) Left Re3 P5 without small terminal spine. Total length about 9 mm 1. *P. arctica* Markhaseva

1. *Pseudeuchaeta arctica*
 Markhaseva, 1986

(Figs. 191-193)

Pseudeuchaeta arctica Markhaseva, 1986c: 1892, figs 1-2.

Description. F e m a l e. Total length 10.30-10.50 mm. Cephalothorax 2.8-3.0 times longer than abdomen. Rostrum in form of a small rounded plate. Th5 posterior corners prolonged into non divergent points (dorsal view), directed backward (lateral view). Genital segment is widest in its anterior third (dorsal view). A1 nearly reaching the end of cephalothorax. A2 typical of the genus (on internal Ri2 A2 lobe

7 setae). Ri2 Md with 8 setae; otherwise setation typical of the genus. Mx1 gnathobase with 12 setae; its second and third internal lobes with 4 and 3 setae respectively; protopodite near Ri base with 5 setae; Ri with 15 sclerotized setae; partly very strong; Re with 11 setae; external lobe with 9. Mx2 typical of the genus, setae robust, sclerotized. Mxp with digital appendage not exceeding the length of longest seta in the distal group, some Ri setae strongly sclerotized, with minute sensory crescent-like bodies. Re1 P1 without external spine. P2-P4 typical of the genus.

M a l e. Total length 8.80 mm. Cephalon and Th1 fused, line of Th4-Th5 fusion visible. Cephalothorax 3.1 times longer than abdomen. Th5 posterior corners slightly prolonged (dorsal view). Abd2 is the longest among abdominal segments. Abd 2-4 with thin spinules along posterior border. Length and width of caudal rami nearly equal. A1 nearly as long as cephalothorax. Ri A2 1.7 times longer than Re. Ri2 A2 with 12 setae; coxopodite and basipodite with 1 seta each; Re1 A2 without seta; Re2 A2 with 1 short seta; Re3-Re6 with long setae; Re7 with 3 terminal setae. Md palp base and Ri1 Md without setae; Ri2 Md with 8 setae. Mx1 second internal lobe with 1 seta; third internal lobe with 2 setae; protopodite near Ri base with 4 setae; Ri with 12; Re with 10(?) setae; external lobe with 6 setae. Mx2 strongly reduced. Mxp protopodite setation reduced; appendage not visible. Swimming legs as in females. P5 biramous. Left and right legs with 3-jointed Re and 1-jointed Ri. Terminal left Re3 joint with 2 spines, with short thick spinules together with setae along its internal side.

Type locality: 81°42'N 126°70'W.

Geographical distribution. Eastern sector of the central part of the Arctic Basin.

Vertical distribution. The species was found in trap to trawl hauls from depths 3300-3500 m. Most likely benthopelagic species.

Material. 2 females and 2 males from samples: 561, 562.

2. *Pseudeuchaeta brevicauda* Sars, 1905

(Figs. 194-196)

Pseudeuchaeta brevicauda Sars, 1905: 5, 18; Farran, 1908: 31; Sars, 1924-25: 102, pl 29, figs 1-12; Jespersen, 1934: 69; Lysholm, Nordgaard & Wiborg, 1945: 21, Sewell, 1947: 106, text-fig 22; Wilson, 1950: 316, Vervoort, 1957: 69, 1963: 155, Grice & Hulsemann, 1965: 223, 1967: 15, 1968: 324; Tanaka & Omori, 1970b: 146, figs 12-13; Bjornberg, 1973: 325; Park, 1978: 187, 190, figs 57-58; Bradford & Jillett, 1980: 64, 66, fig. 43; Markhaseva, 1986c: 1895.

Autanepsius minor Wolfenden, 1906: 350

Description. F e m a l e. Total length 4.80-6.58 mm. Cephalothorax 3.4-3.9 times longer than abdomen. Rostrum in form of a rounded plate. Cepha-

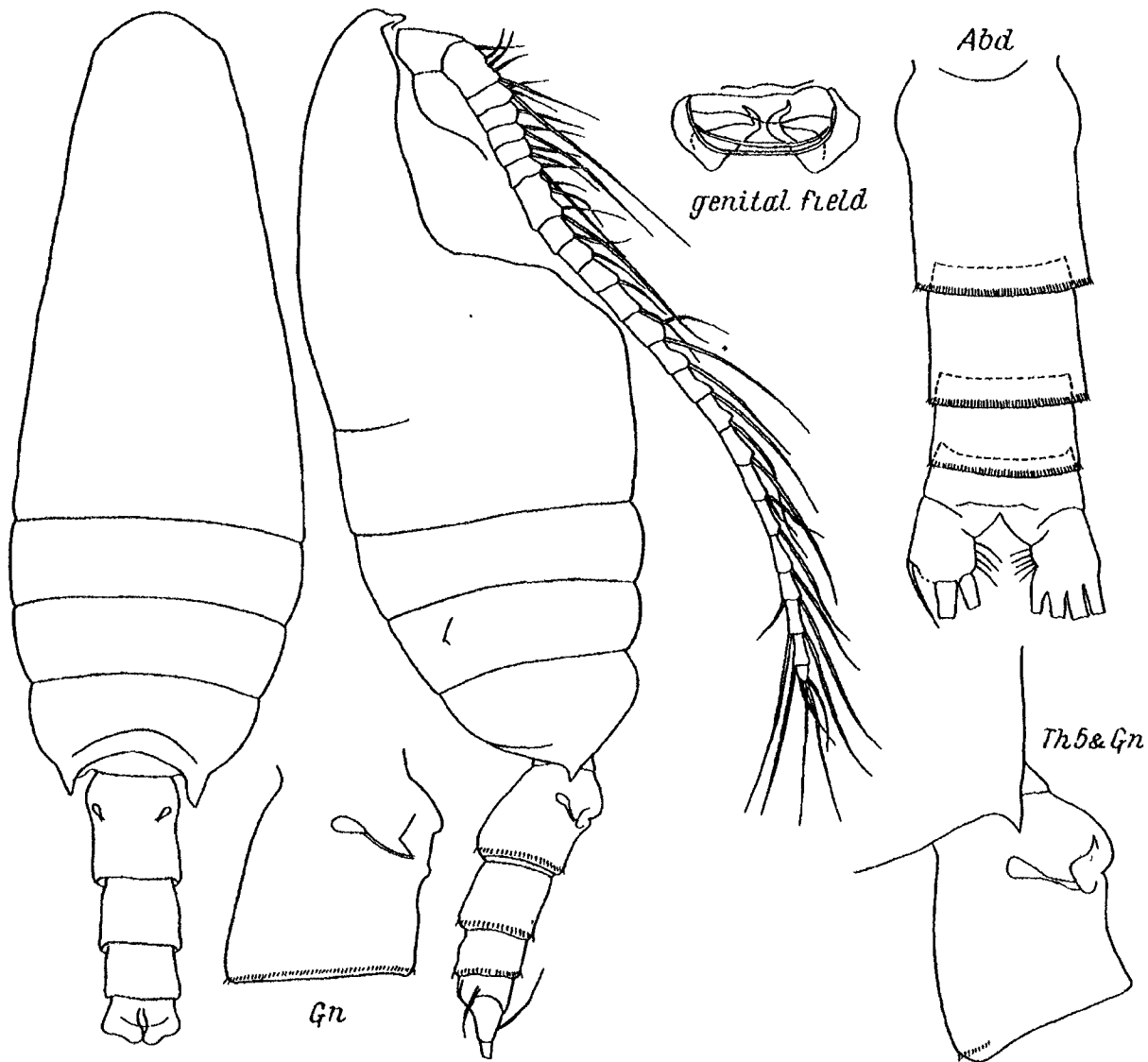


Fig. 191. *Pseudeuchaeta arctica*. Female (from Markhaseva, 1986c).

lon and Th1 incompletely fused (Park (1978) mentioned complete separation between cephalon and Th1). Th5 posterior corners triangular with rounded, or sometimes slightly prolonged tops (Tanaka & Omori, 1970b). Genital segment nearly as long as 2 following segments, widest in the first third of its length. A1 reaching the anterior border of Th5, or the end of cephalothorax. A2 rami equal in length; sometimes Ri slightly longer. A2 coxopodite and basipodite usually with 1 seta, Tanaka and Omori (1970b) recorded 2 setae on basipodite, but according to Sewell (1947) and from original data this seta is absent. Re1 and Re2 A2 with 2 setae each (according to Sars (1924) figure with 1 seta). Md palp base and Ri1 Md with 1 seta each; Ri2 Md with 8-9 setae (according to Sars (1925) with 7 setae). Mx1 with 13 setae on gnathobase; second internal lobe with 4 setae; third internal lobe with 3 setae;

protopodite near Ri base with 5 setae (Bradford & Jillett (1980), Park (1978), Tanaka & Omori (1970b) mentioned 4 setae); Ri with 13-14 sclerotized setae; Re with 11 (Sewell (1947) noted 10 setae); external lobe with 8 setae. Mx2 typical of the genus. Appendage on Mxp protopodite shorter than the longest seta in distal group. Re P1 without external spine. Swimming legs typical of the genus. Length of Re2 P1 spine varying: sometimes it reaches the midlength of the next joint, sometimes almost its end (Tanaka & Omori, 1970b; Park, 1978; Bradford & Jillett, 1980).

M a l e. (Description after Tanaka and Omori (1970b) with modifications). Total length 5.90 mm. Cephalothorax 3.8 times longer than abdomen. Cephalon and Th1 separated, Th4 and Th5 fused. Rostrum in form of a cone. A1 reaching the end of Th3. Ri A2 slightly longer than Re A2; Re2 A2 with small projection at proximal border; basipodite

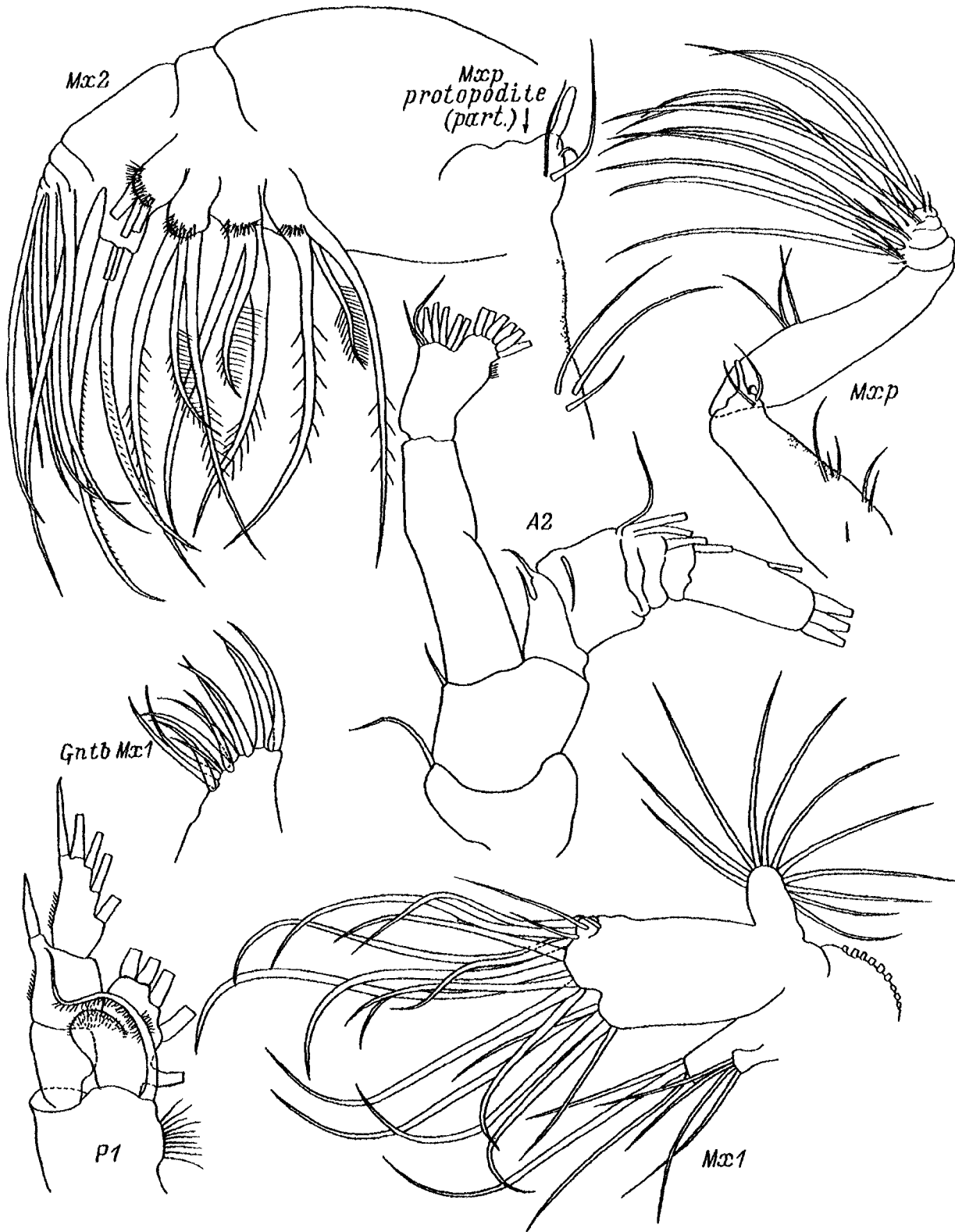


Fig. 192. *Pseudeuchaeta arctica*. Female (from Markhaseva, 1986c).

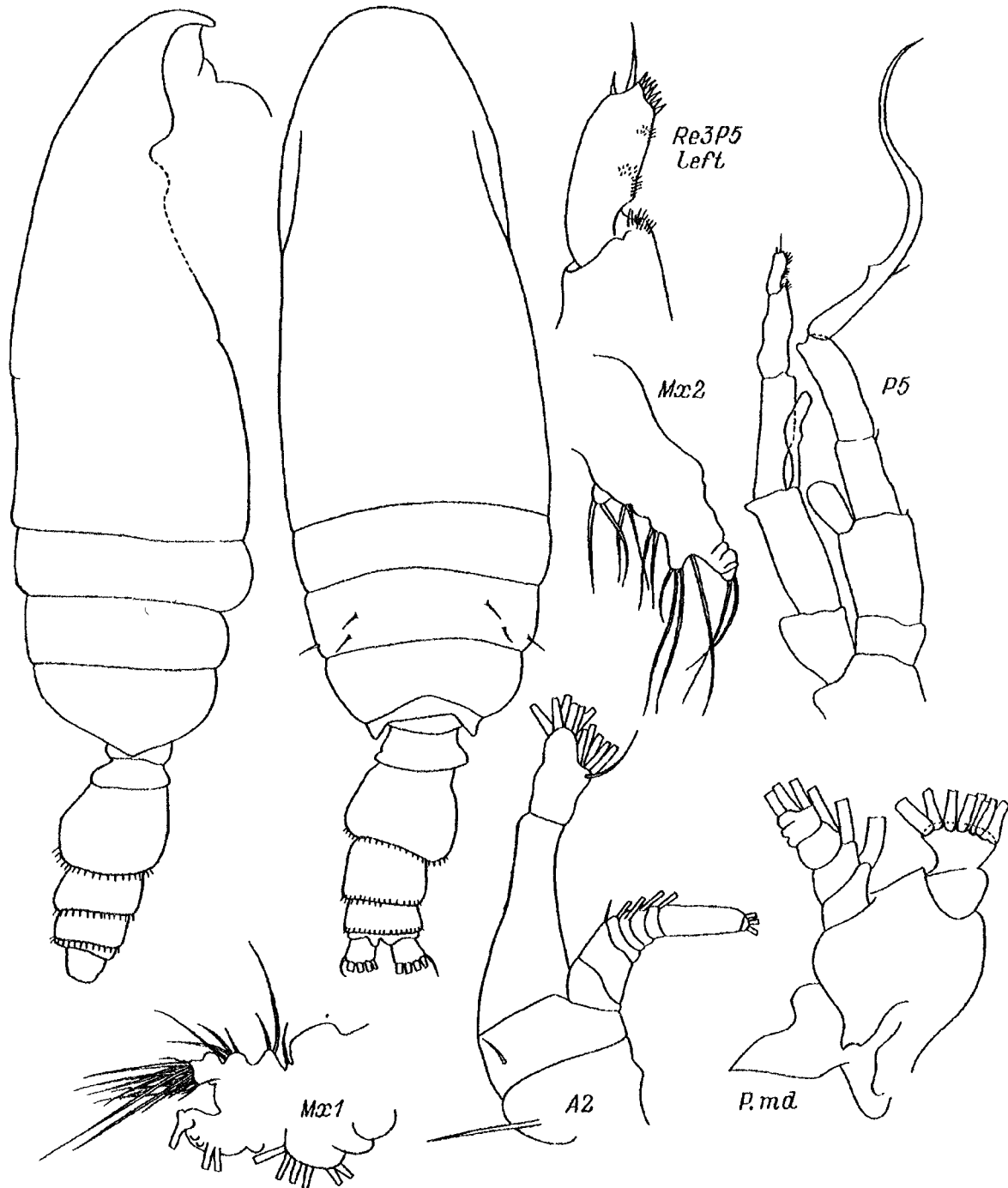


Fig. 193. *Pseudeuchaeta arctica*. Male (from Markhaseva, 1986c).

with small seta; Ri external lobe with 6 setae. Ri2 Md with 9 setae; gnathobase strongly reduced. Re Mx1 with 11 setae; Ri with 8 setae; protopodite with 4 setae near Ri base; third internal lobe with 1 seta; second internal lobe without seta; gnathobase with 1 small seta. Mx2 well developed: first-sixth endites with 2, 3, 3, 3, 3 and 1 setae respectively; Ri with 5 setae. Protopodite and Ri1 Mxp nearly equal in length; appendage present in distal part of protopodite. Re P1 3-jointed and Ri 1-jointed. Re1 P1 without external spine; Re2 P1 with long spine,

reaching the base of Re3 external spine. Swimming legs rami as in females. Re P2 terminal spine with about 50 spinules. Re3 P5 internal margin spinulose, Ri elongated, swollen in the midlength of the joint. Right leg with 3-jointed Re; Re1 and Re3 with external small spine; Re3 prolonged in saber-like projection. Left leg with 3-jointed Re; Re1 and Re3 with external small spine; Re3 prolonged in saber-like projection. Left Re3 P5 without 2 spinules, but with short tooth terminally and row of minute spinules along internal margin.

Type locality: the north-eastern part of the Atlantic Ocean.

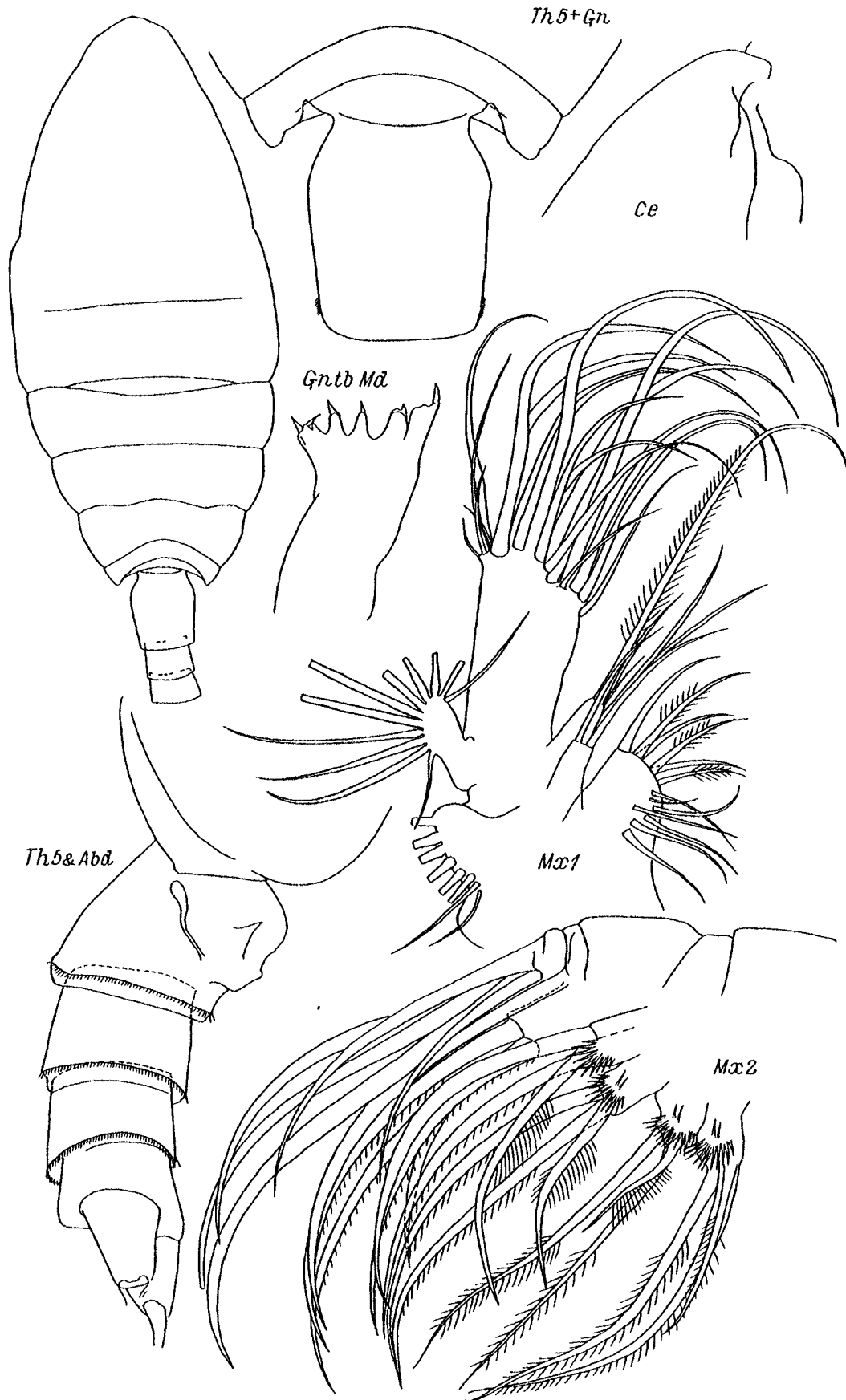


Fig. 194. *Pseudeuchaeta brevicauda*. Female (140).

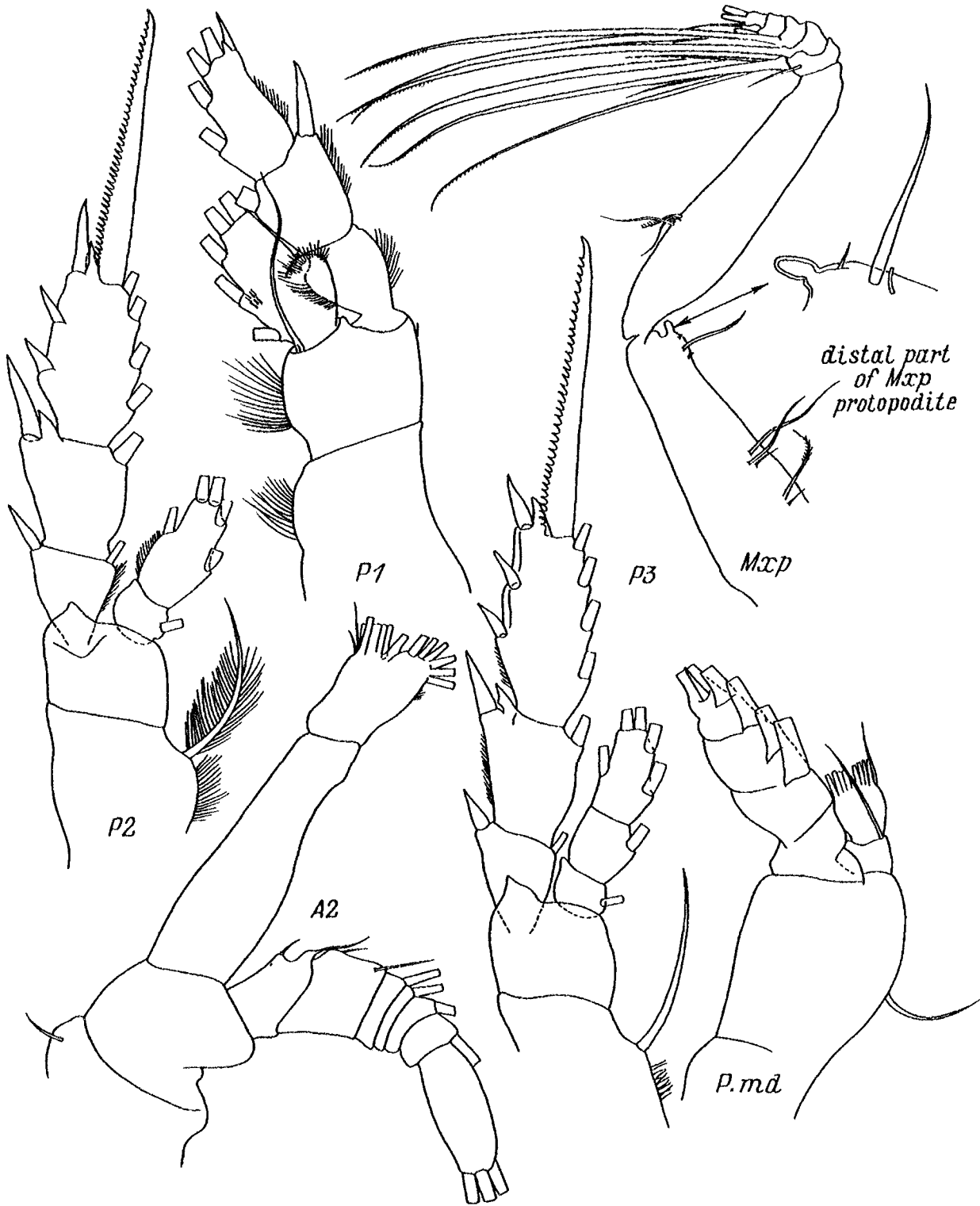


Fig 195 *Pseudeuchaeta brevicauda* Female (140)

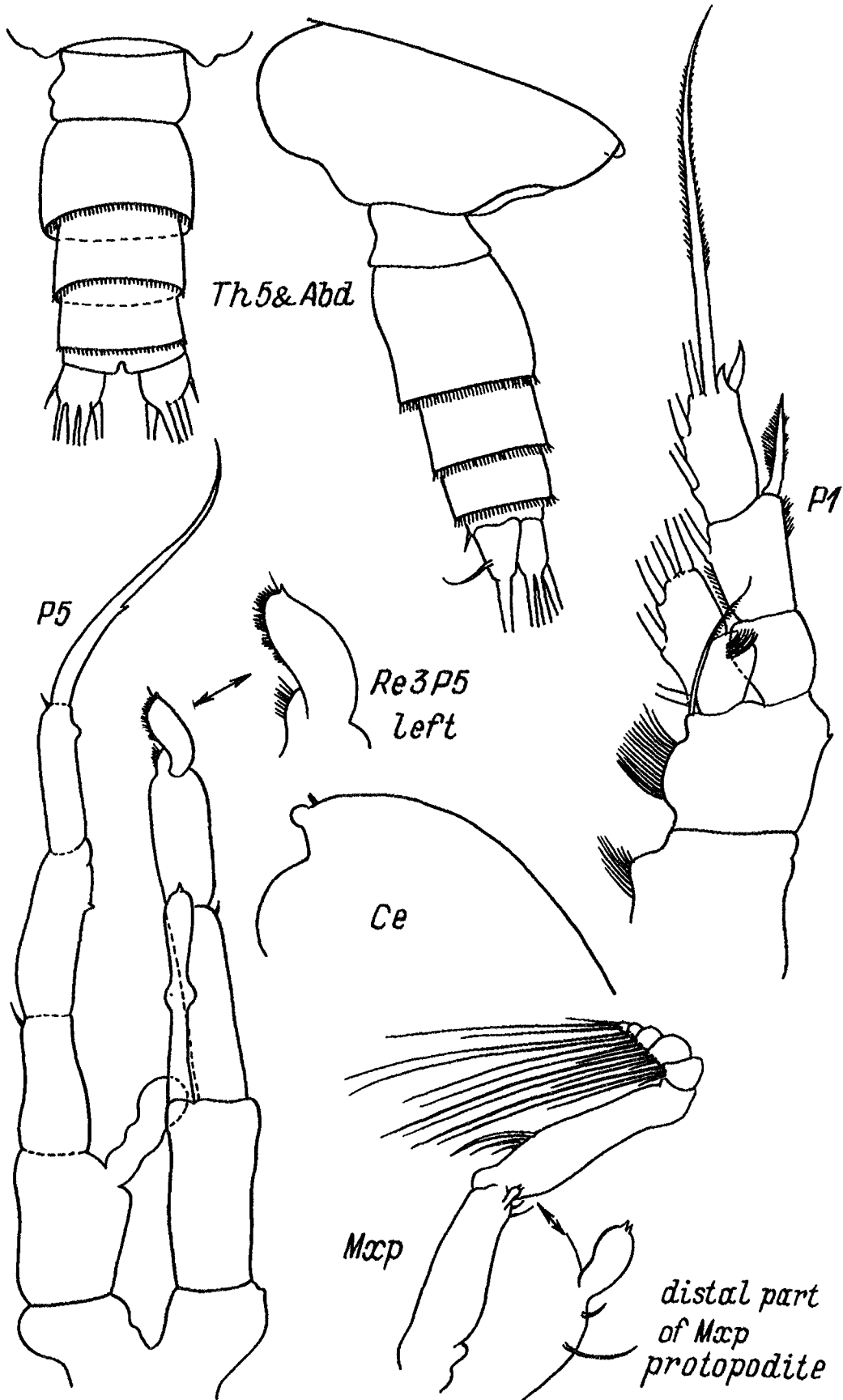


Fig. 196. *Pseudeuchaeta brevicauda*. Male (from Tanaka & Omori, 1970).

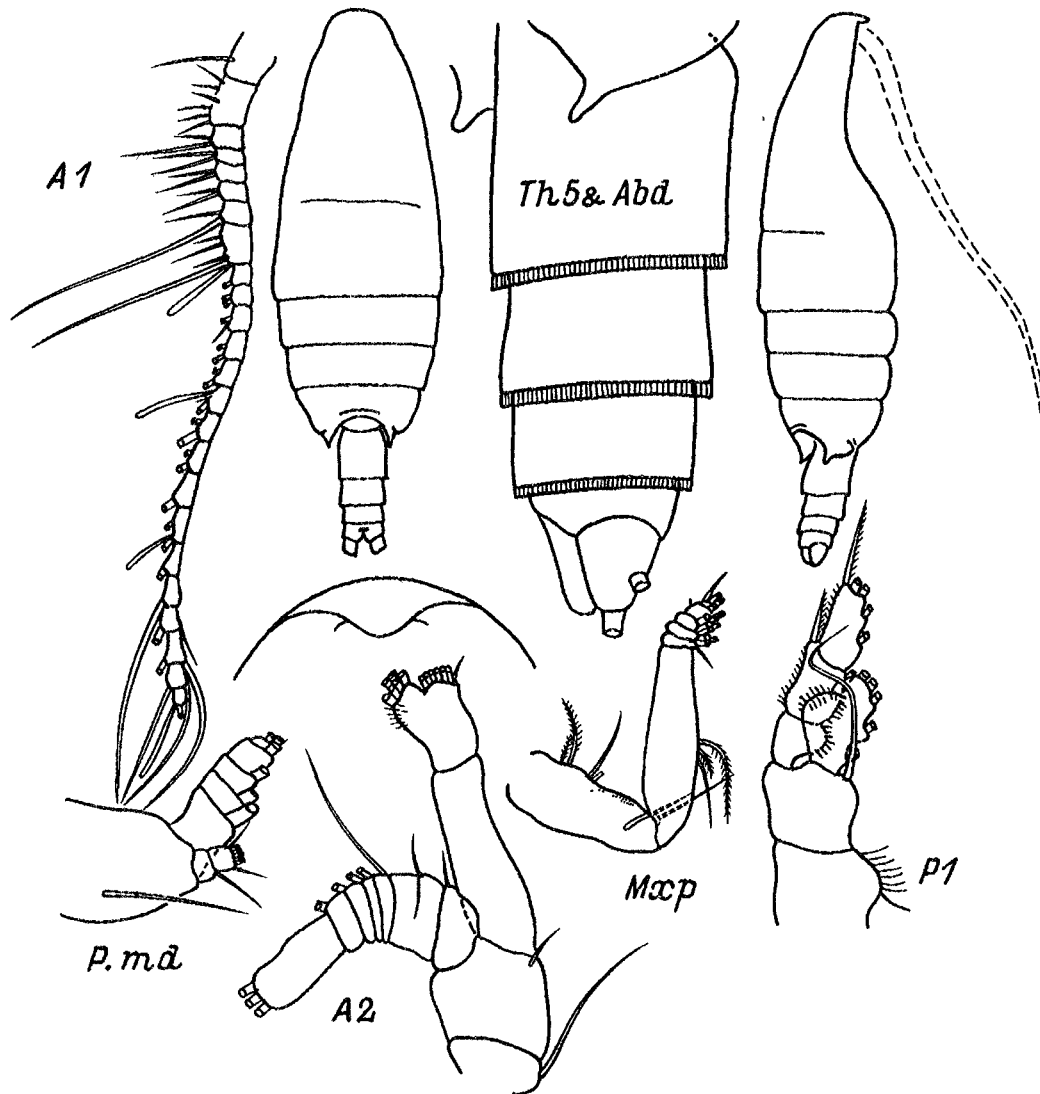


Fig. 197. *Pseudeuchaeta flexuosa*. Female (from Bradford, 1969b).

Geographical distribution. Atlantic Ocean: widespread in the Northern Hemisphere: up to North till 62°N (Jespersen, 1934), to the South down to the Gulf of Guinea (Vervoort, 1963). Pacific Ocean: found in the north-western part: the Izu region, in the Marian and Kurile-Kamchatka Trench area (Tanaka & Omori, 1970; original data), the south-eastern (Bjornberg, 1973; original data) and south-western parts near New Zealand (Bradford & Jillett, 1980), proceeding to the South to 59°08'S (Park, 1978). Indian Ocean: recorded in the western (Grice & Hulsemann, 1967) and eastern (original data) parts, in the Arabian Sea (Sewell, 1947). In high latitudes of Antarctic recorded to the South to 60°S (Vervoort, 1957; original data).

Vertical distribution. The species is mostly found in bathypelagial (Vervoort, 1957; Grice & Hulsemann, 1967), rarely outside this vertical zone. Also found in total hauls from depths over 7000 m. Most likely bathypelagial species.

Material. 5 females from samples: 48, 140, 201, 381, 398-399, 447.

3. *Pseudeuchaeta flexuosa* Bradford, 1969

(Fig. 197)

Pseudeuchaeta flexuosa Bradford, 1969b: 488, figs 98-111, Bradford & Jillett, 1980 66, fig 44.

Description. Female. (Description after Bradford, 1969b) with modifications. Total length 6.8 mm. Cephalothorax 3.5 times longer than abdomen. Rostrum as in *P. magna*. Posterior Th5 corners prolonged into points longer than in *P. magna* and directed backward (lateral view). A1 shorter than cephalothorax. A2, Mx1 and Mx2 typical of the genus. Ri2 Md with 7 setae; otherwise typical of the genus. Appendage of Mxp protopodite shorter than setae in distal group. Second internal Mx1 lobe

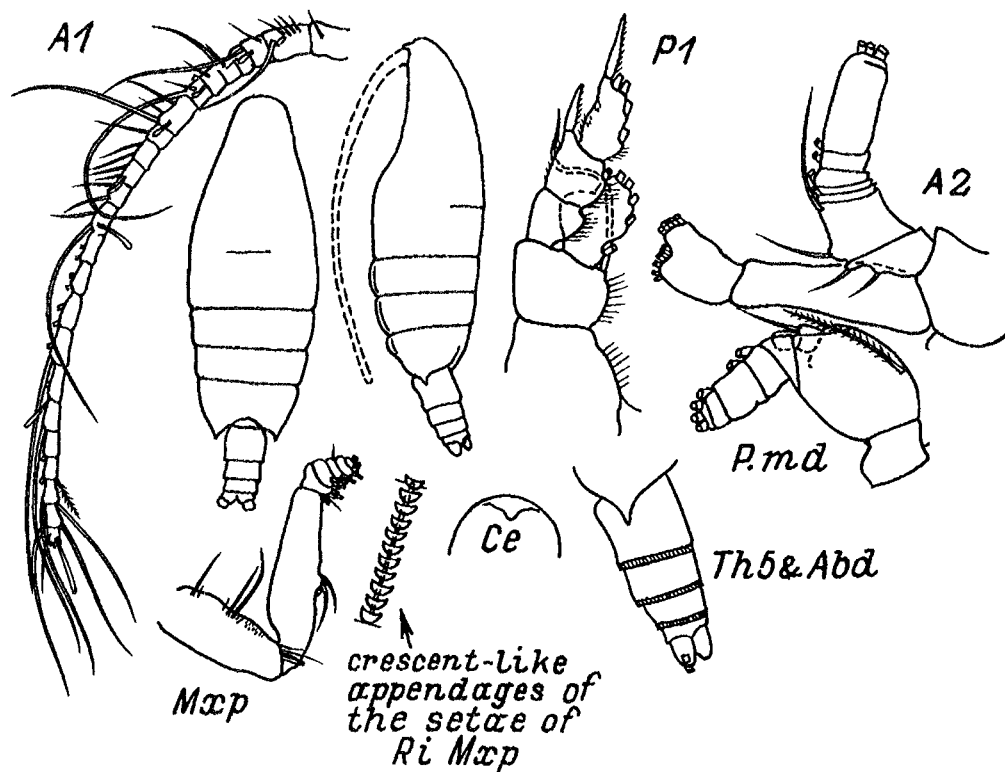


Fig. 198. *Pseudeuchaeta magna*. Female (from Bradford, 1969b).

with 4 setae; third with 3 setae; Ri with 14 setae. Re1 P1 without spine. P2-P4 damaged.

Male unknown.

Type locality: 34°38'N 174°36'E.

Geographical distribution. The species known from the type locality only.

Vertical distribution. The species was found in haul from depth 1700 over bottom surface. Evidently benthopelagic species.

The species was not examined by me.

4. *Pseudeuchaeta magna* Bradford, 1969

(Fig. 198)

Pseudeuchaeta magna Bradford, 1969b: 486, figs 82-97; Bradford & Jillett, 1980: 66, fig. 45.

Description. F e m a l e. (Description after Bradford, (1969b) with modifications). Total length 9.4 mm. Cephalothorax 4 times longer than abdomen. Rostrum blunt, rounded, rudimentary. Posterior Th5 corners prolonged into short points, directed strictly backward (lateral view). A1 reaching nearly the end of cephalothorax. A2, Mx1 and Mx2 typical of the genus. Ri2 Md with 4 setae; otherwise typical of the genus. Appendage of Mxp protopodite not longer than adjacent setae. Mx1 with 1 seta on gnathobase and 2 and 3 setae on second and third internal lobes respectively; Ri with 14 setae; external lobe

with 9 setae. Re1 P1 without external spine. Terminal spines of Re3 P2-P4 with 42, 38 and 41 teeth respectively.

Male unknown.

Type locality: 34°38'N 174°34'E.

Geographical distribution. The species is known of type locality only.

Vertical distribution. The species was found in haul from 1700 m near bottom. Most likely benthopelagic species.

The species was not examined by me.

5. *Pseudeuchaeta major*

Wolfenden, 1911

(Fig. 199)

Pseudeuchaeta major: Park, 1978 : 187

Autanepsius major Wolfenden, 1911 : 351, text-fig. 79

Description. F e m a l e. (Description after Wolfenden (1911) with modifications). Total length 8.15 mm. Genital segment as long as wide and as long as 3 following abdominal segments together. A1 slightly shorter than cephalothorax. Re A2 slightly longer than Ri. Ri2 Md with 5 setae. Mx1 gnathobase with 10 setae; second internal lobe with 3 setae; third internal lobe with 4 setae; Ri with 15 setae; external lobe with 9 setae. Re1 P1 without external spine.

Male unknown.

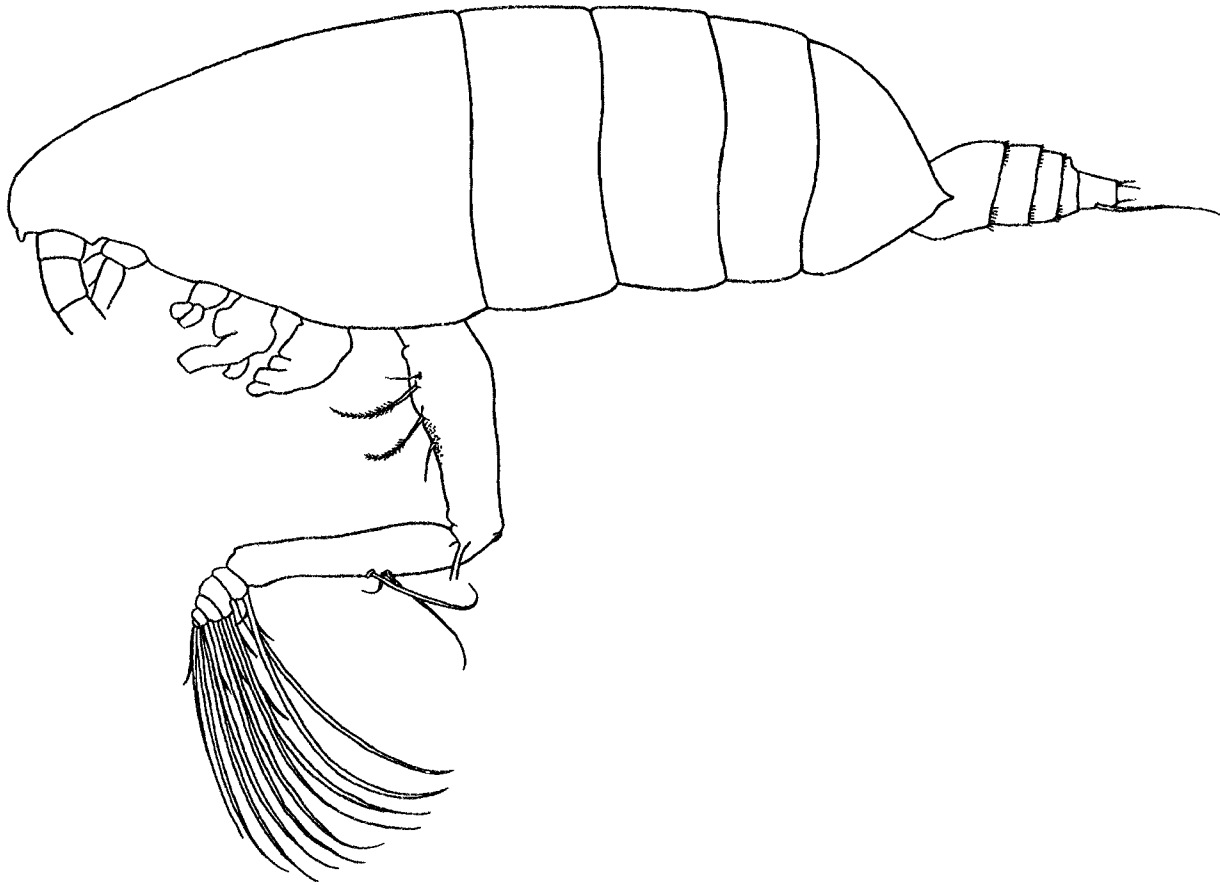


Fig. 199. *Pseudeuchaeta major*. Female (from Wolfenden, 1911).

Type locality: equatorial Atlantic.

Geographical distribution. The species is known from the type locality only.

The species was not examined by me.

6. *Pseudeuchaeta spinata* Markhaseva, 1986

(Figs. 200-201)

Pseudeuchaeta spinata Markhaseva, 1986c: 1894, fig. 4.

Description. F e m a l e. Total length 6.5 mm. Cephalothorax 3.1 times longer than abdomen. Rostrium in form of a small rounded plate. Th5 posterior corners slightly divergent (dorsal view) and pointed (dorsal and lateral view). A1 exceeding cephalothorax. A2 rami of about equal length. Coxo- and basipodite A2 with 1 seta each. Ri1 A2 without setae; Ri2 A2 with 12 (6+6) setae. Re1 and Re2 A2 with 2 setae each. Md palp base with 1 seta; Ri1 Md more than half shorter Re, Ri2 Md with 3-4 setae. Mx1 gnathobase with 11 setae; second internal lobe with 4 setae; third internal lobe with 3 setae; Mxp protopodite near Ri base with 5 setae;

Ri with 15-16 setae; Re with 11 setae; external lobe with 9 setae. Mx2 typical of the genus: with 6 strong, strongly sclerotized setae in distal part of Ri. Mxp strong, with setation typical of the genus, setae of Ri2-Ri5 robust, strongly sclerotized, with crescent-like appendages typical of the genus. Mxp protopodite near the base of distal setae group with digital appendage longer than setae. Re P1 with external spines at every joint. Spine on Re1 P1 short, less than one third of joint length. Segmentation and setation of P2-P4 typical of the genus, number of teeth on terminal spine of P2 over 60, on P4 over 50.

Notes. The species is distinguished from other species of the genus in the presence of spine on Re1 P1. Digital appendage of Mxp protopodite in *P. spinata* is significantly longer than in other species of genus. A1 slightly longer than cephalothorax whereas in other species they are shorter than or equal to cephalothorax.

Type locality: 43°42'N 149°39'E.

Geographical distribution. The Kurile-Kamchatka Trench area (Markhaseva, 1986c).

Vertical distribution. Abyssopelagic species, found in haul 5130-6120 m.

Material: 1 female from sample: 179.

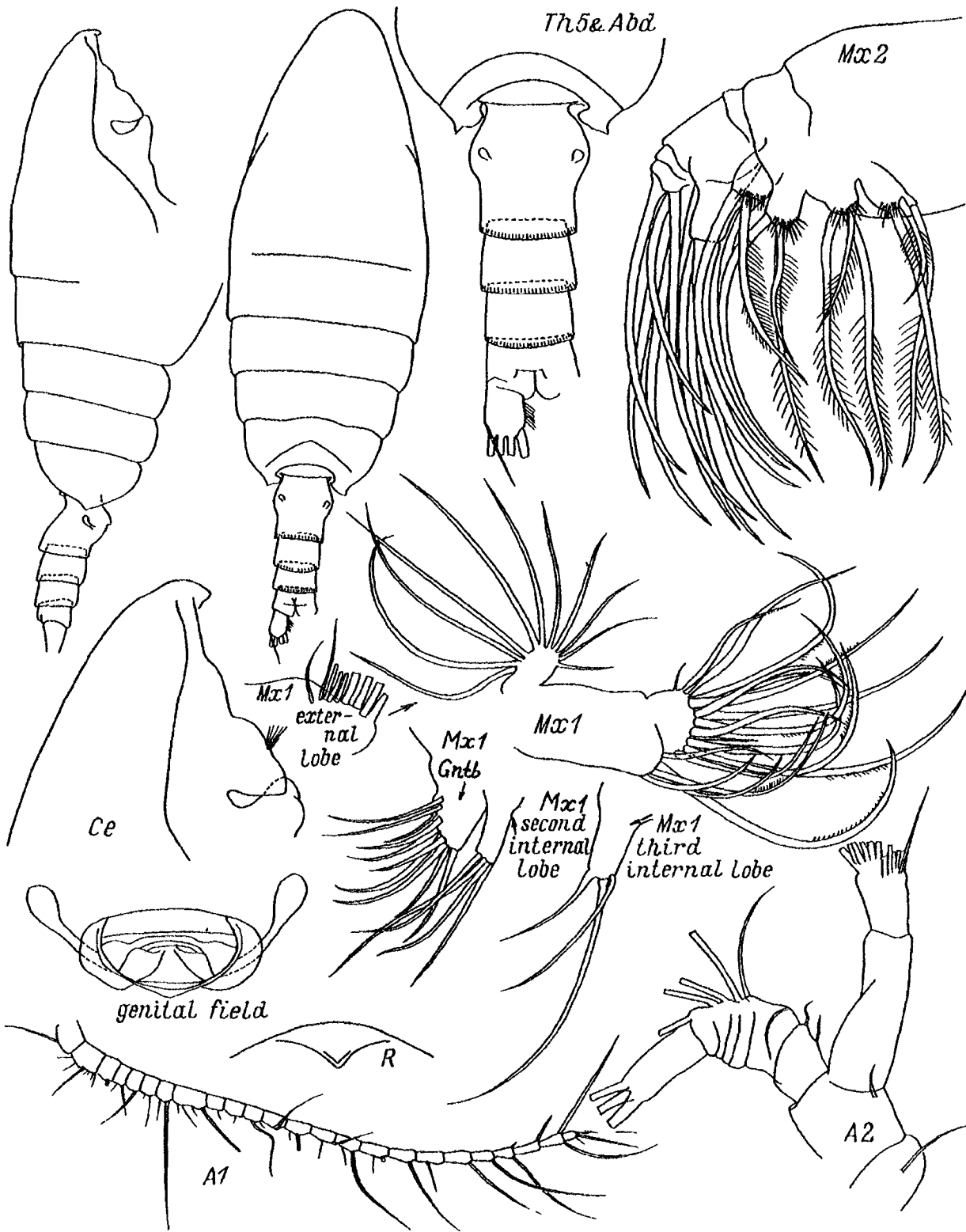


Fig. 200. *Pseudeuchaeta spinata*. Female (from Markhaseva, 1986c).

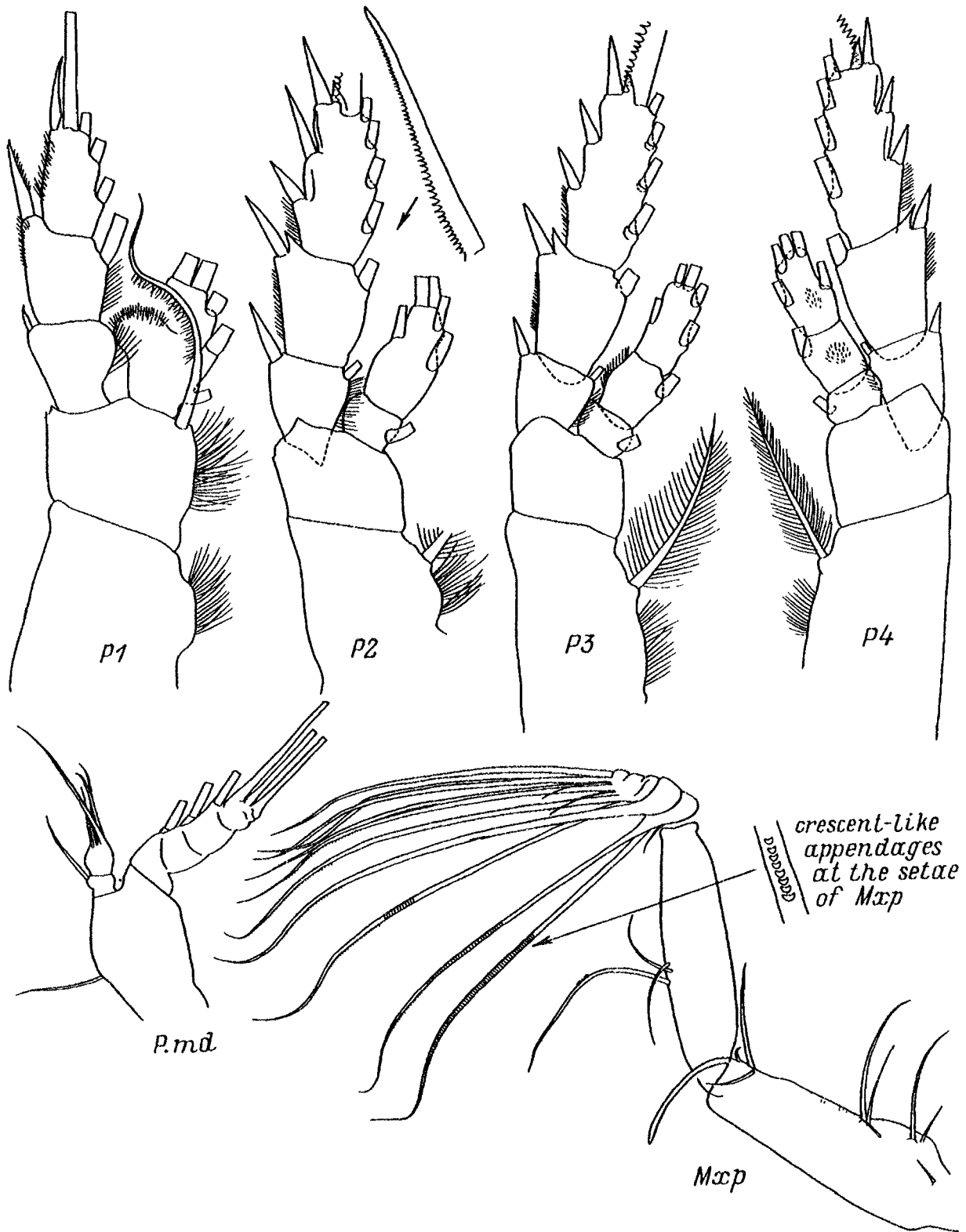


Fig. 201. *Pseudeuchaeta spinata*. Female (from Markhaseva, 1986c).

21. *Pseudochirella* Sars, 1920

TYPE SPECIES. *Pseudochirella obesa* Sars, 1920 (designated here).

Pseudochirella Sars, 1920: 5.

Description. Female. Total length 3.6-9.2 mm. Cephalothorax 3.0-4.6 times longer than abdomen. Cephalon and Th1 distinctly or indistinctly separated, Th4 and Th5 separated (except *P. hirsuta*). Crest absent. Rostrum present, uniramous. Th5 corners rounded, rarely with spines, sometimes prolonged into rounded, or triangular lobes, symmetrical, slightly or abruptly asymmetrical. Genital segment symmetrical, slightly or abruptly asymmetrical, in shape: barrel-like, or with different projections. Genital segment nearly as long as wide, or rarely twice longer (*P. divaricata*). Ventral swelling developed in different degree: smooth (*P. hirsuta*), or strongly prominent (*P. dubia*). Genital field arranged in about the middle of genital segment (ventral view), sometimes removed laterally (*P. fallax*, *P. mariana*). Genital segment - Abd3 in the majority of species with minute spinules along posterior border. A1 24-jointed (rarely 23-jointed), usually longer than cephalothorax, sometimes longer than body. Re A2 1.5-1.8 times longer than Ri. A2 coxopodite with 1 seta; basipodite with 2 (rarely with 1 seta: *P. mariana*) setae; Ri1 with 1-2 setae; Ri2 with 6 long and 1 short posterior setae at external lobe and 6-7 (5 in *P. mariana*) long and 1-2 (rarely 3) shorter posterior setae at internal lobe. Re1 A2 without setae, or with rudiment of seta, sometimes (*P. dubia*, *P. hirsuta*) with well developed seta; in the latter species, in addition to 1 distal seta, Re2 with 2 well developed setae. Re3-Re6 A2 with 1 seta each; Re7 with 1 medial and 3 terminal setae. Md palp base with 3 setae; Ri1 Md with 2 setae; rarely with third additional small seta; Ri2 Md with 9 long terminal and 1-2 short posterior setae. Mx1 gnathobase with 9 claw-like and 1 short terminal setae and 4 setae on posterior surface (in *P. mariana* with 3 posterior setae). Second Mx1 internal lobe with 5 setae; third with 4 setae (in *P. mariana* and *P. fallax* with 5 setae); protopodite near Ri base with 5 setae; Ri with 15-16 setae; Re with 11 setae; external lobe with 7 long and 2 shorter setae. Setae of the fourth and fifth Mx2 endites transformed into claw-like spines. Mx2 typical of Aetideidae. Mxp protopodite 1.6-1.9 times shorter than Ri1 Mxp, with 1 seta in proximal part of joint, further with 3 setae groups: proximal with 1-2 setae, medial of 3 setae and distal group of 3 setae and sensory knob. P1 with 3-jointed Re, separation between Re1 and Re2 possibly incomplete, each joint with an external spine, commonly that on Re1 is long, exceeding the base of spine on Re2. Ri P1 1-jointed. Ri P2 2-jointed, sometimes separation between joints incomplete, other rami of swimming

legs 3-jointed. P4 coxopodite with group of spines sclerotized in various degree, varying in size and number (from 5 to 30).

Male. Total length 3.20-7.20 mm. Cephalon and Th1, as well as Th4 and Th5 usually fused, rarely separated. Cephalothorax about 3 times longer than abdomen. Rostrum developed poorer than in females. Th5 posterior corners symmetrical, sometimes slightly asymmetrical, rounded, rarely with spines, or teeth. A1 22-24-jointed, may be shorter or longer than body. Comparing to female setation of A2 diminished. Md palp base usually with 1 seta; Ri1 Md with 1 seta; Ri2 with 8-9 setae. Mx1, Mx2 and Mxp severely reduced, setation weaker than in females. P1-P4 as that in female. P4 coxopodite without spines. External spines of Re1 P1 and Re2 P1 shorter than in females of relevant species. P5 powerful, of complex structure, usually longer than abdomen, biramous. Right and left basipodites strongly sclerotized, large, wide. Ri P5 1-jointed. Right Re 2-jointed, left 3-jointed.

The genus *Pseudochirella* includes 27 species described from adults and 2 species: *P. calcarata* Sars, 1920 and *P. cryptospina* (Sars, 1920) described from fifth copepodite stage. Their descriptions are given below except of *P. semispina* Vervoort, 1949 and 2 species described from juveniles.

Key to species of *Pseudochirella*

Females

- 1(32) Genital segment symmetrical, or slightly asymmetrical.
- 2(21) Genital segment symmetrical.
- 3(18) Th5 posterior corners symmetrical.
- 4(7) Re2 A2 with 3 setae.
- 5(6) Th4 and Th5 distinctly separated. Ventral swelling of genital segment strongly protruded. Genital segment (lateral view) nearly twice thicker than Abd2. Total length 4.8-6.1 mm 7. *P. dubia* Sars
- 6(5) Th4 and Th5 indistinctly separated. Ventral swelling of genital segment slightly protruded. Genital segment (lateral view) only 1.2 times thicker than Abd2. Total length more than 6 mm 11. *P. hirsuta* (Wolfenden)
- 7(4) Re2 A2 with 1 seta.
- 8(9) Th5 posterior corners with spines reaching about the midlength of genital segment 24. *P. spinosa* (Wolfenden)
- 9(8) Th5 posterior corners without spines, rounded, or prolonged into triangular, or rounded lobes.
- 10(11) Th5 posterior corners protruded into lobes, rounded 18. *P. obtusa* (Sars)

- 11(10) Th5 posterior corners protruded into lobes (rounded or triangular).
- 12(13) Lobes of posterior Th5 corners rounded 13. *P. lobata* (Sars)
- 13(12) Lobes of posterior Th5 corners triangular.
- 14(17) Total length over than 8 mm.
- 15(16) Ventral swelling of genital segment well developed, rectangular. P4 coxopodite with 18-20 spines 9. *P. formosa* Markhaseva
- 16(15) Ventral swelling of genital segment small, rounded. P4 coxopodite with 5 spines.
- 17(14) Total length less than 6 mm 2. *P. batillipa* Park
- 18(3) Th5 posterior corners slightly asymmetrical. (Asymmetry produced by presence of minute spine on the right, or Th5 transformed into wing-like slightly asymmetrical lobes, ending in spines).
- 19(20) Th5 posterior corners transformed into wing-like lobes ending in spines. Genital segment twice longer than wide 6. *P. divaricata* (Sars)
- 20(19) Th5 posterior corners not transformed into wing-like lobes, rounded with spine on the right. Genital segment nearly as long as wide 26. *P. vervoorti* Tanaka & Omori
- 21(2) Genital segment slightly asymmetrical.
- 22(27) Th5 posterior corners rounded.
- 23(26) Th5 posterior corners slightly asymmetrical with small rounded projection on the right, or small spine on the left (lateral view). Shape of genital segment almost barrel-like (dorsal view).
- 24(25) Th5 posterior corners with small spine on the left (lateral view), without projection on the right (lateral view). P4 coxopodite with 16 spines. Genital segment broadened in its anterior part (dorsal view) 12. *P. limata* Grice & Hulsemann
- 25(24) Th5 posterior corners without small spines on the left, with small rounded projection on the right (lateral view). P4 coxopodite with 7-10 spines. Genital segment broadened in its middle (dorsal view) 17. *P. obesa* Sars
- 26(23) Th5 posterior corners symmetrical. Genital segment with large shoulder-like swellings in its anterior part (dorsal view). 25. *P. tanakai* Markhaseva
- 27(22) Th5 posterior corners prolonged into triangular lobes, or ending with spines.
- 28(29) Th5 posterior corners prolonged into triangular lobes 22. *P. scopularis* (Sars)
- 29(28) Th5 posterior corners not prolonged into triangular lobes, ending with spines.
- 30(31) Spines on Th5 posterior corners upturned (lateral view) 5. *P. dentata* (A. Scott)
- 31(30) Spines on Th5 posterior corners stretching directly backward (lateral view). 20. *P. palliata* (Sars)
- 32(1) Genital segment abruptly asymmetrical.
- 33(36) Right Th5 posterior corner with spine, left without spines.
- 34(35) Total length about 5 mm. Genital segment on the right posteriorly with large bifid projection 10. *P. gibbera* Vervoort
- 35(34) Total length over than 7 mm. Genital segment on the right posteriorly with small and non bifid projection 23. *P. spectabilis* Sars
- 36(33) Both left and right Th5 posterior corners without spines.
- 37(40) Th5 posterior corners prolonged into triangular lobes.
- 38(39) Projections of genital segment present in its posterior part 3. *P. bilobata* Vervoort
- 39(38) Projections of genital segment present in its anterior part 1. *P. accepta* Zvereva
- 40(37) Th5 posterior corners with rounded lobes, symmetrical or slightly asymmetrical.
- 41(46) Th5 posterior corners symmetrical.
- 42(45) One sufficiently large projection present on the right of genital segment.
- 43(44) Projection present in posterior part of genital segment 15. *P. mawsoni* Vervoort
- 44(43) Projection present in anterior part of genital segment 21. *P. pustulifera* (Sars)
- 45(42) Two small projections present on the left and one small on the right in posterior part of genital segment 16. *P. notacantha* (Sars)
- 46(41) Th5 posterior corners slightly asymmetrical.
- 47(50) Genital field present in near-medial part of genital segment (ventral view). Third internal lobe of Mx1 with 4 setae.
- 48(49) Genital segment with projection only on the right 19. *P. pacifica* Brodsky
- 49(48) Genital segment with projections on the left and right 4. *P. bowmani* Markhaseva
- 50(47) Genital field removed to the right (ventral view). Third internal Mx1 lobe with 5 setae.
- 51(52) Genital segment with 2 large projections on the right. Mx1 gnathobase posterior surface with 3 setae 14. *P. mariana* Markhaseva
- 52(51) Genital segment with 1 projection on both right and left sides. Mx1 gnathobase posterior surface with 4 setae 8. *P. fallax* (Sars)

Males

(unknown for: *P. accepta*, *P. bilobata*, *P. bowmani*, *P. dentata*, *P. divaricata*, *P. formosa*, *P. gibbera*, *P. limata*, *P. lobata*, *P. mariana*, *P. palliata*, *P. scopularis*, *P. semispina*, *P. spinosa*, *P. tanakai*, *P. vervoorti*)

1(10) Re2 P5 left P5 without tooth, or with 1 tooth in its distal part.

- 2(3) Th5 posterior corners with spines. Re3 P5 left only slightly longer than wide 19. *P. pacifica* Brodsky
- 3(2) Th5 posterior corners without spines, rounded, or with small teeth on the left and right. Re3 P5 left about 4 times longer than wide.
- 4(5) Th5 posterior corners with tooth on the right and left, better visible 23. *P. spectabilis* Sars
- 5(4) Th5 posterior corners without teeth, rounded.
- 6(7) Distal part of right Re P5 blade-like 2. *P. batillipa* Park
- 7(6) Distal part of right Re P5 of different shape, usually rounded.
- 8(9) Size of specimens about 4 mm. Re3 P5 left rounded apically, without knob 8. *P. fallax* (Sars)
- 9(8) Total length more than 7 mm. Re3 P5 left of triangular shape apically with knob 12. *P. hirsuta* (Wolfenden)
- 10(1) Re2 P5 left with 2-3 teeth in distal part of joint.
- 11(14) Re2 P5 left with 3 teeth distally.
- 12(13) Th5 posterior corners with spines 16. *P. notacantha* (Sars)
- 13(12) Th5 posterior corners without spines 7. *P. dubia* (Sars)
- 14(11) Re2 P5 left with 2 teeth distally.
- 15(18) Th5 posterior corners with spines.
- 16(17) Re3 P5 left 2 times longer, than wide 15. *P. mawsoni* Vervoort
- 17(16) Re3 P5 left more than 3 times longer than wide 18. *P. obtusa* (Sars)
- 18(15) Th5 posterior corners without spines.
- 19(20) Re2 P5 right with excavation and rounded swelling proximally 17. *P. obesa* Sars
- 20(19) Re2 P5 right smooth, without excavation and swelling 21. *P. pustulifera* Sars

1. *Pseudochirella accepta* Zvereva, 1976

(Fig. 202)

Pseudochirella accepta Zvereva, 1976: 200, figs 1-12; Markhaseva, 1989: 39, figs 7 B (18).

Description. Female. Total length 7.20-7.60 mm. Cephalothorax about 3.5 times longer than abdomen. Th5 posterior corners prolonged into slightly asymmetrical (dorsal view), triangular (lateral view) lobes. Genital segment asymmetrical with projections on the right and left (dorsal view) anteriorly. Abd1-3 with hairs scattered over segments surface. A1 24-jointed, reaching nearly Abd3. Re1 A2 without setae; Re2 A2 with distal seta only; Ri1 A2 with 2 setae.

Ri1 Md with 3 setae; Ri2 Md with 9 long terminal and 2 posterior short setae. Otherwise structure of oral parts typical of the genus. Separation between Re1 and Re2 P1 complete. P4 coxopodite with 13-14 spines, otherwise structure of swimming legs typical of the genus.

Male unknown.

Type locality: 55°05'N 171°06'E.

Geographical distribution. The Bering Sea, the Kurile-Kamchatka Trench area (original data). Recorded for the Bering Sea by Motoda and Minoda (1974) in reality, *P. spectabilis*, probably prove *P. accepta*.

Vertical distribution. Abyssopelagic species found in hauls from abyssal depths (original data), and also in total hauls from depths of more than 1500 m.

Material: 6 females from samples: 8, 102-103, 124, 193, 197.

2. *Pseudochirella batillipa* Park, 1978

(Fig. 203)

Pseudochirella batillipa Park, 1978: 176, figs 50-51; Markhaseva, 1982: 106, figs 1-9, 1989: 35, figs 5; 7 A (8); 8 (3 a, b); 12

Description. Female. Total length 5.58-6.10 mm. Cephalothorax about 3.8 times longer than abdomen. Th5 posterior corners symmetrical, reaching the midlength of genital segment, ending very small conically pointed knob. Genital segment symmetrical; Abd2-3 with hairs. A1 nearly as long as body. Ri1 A2 with 1 seta; Ri2 A2 with 7+7 setae on each of lobes. Re1 A2 without setae; Re2 with only distal seta. Ri1 Md with hairs along external border and with 2 setae; Ri2 Md with 9 terminal and 2 posterior setae. Mx1, Mx2, Mxp and P1-P4 typical of the genus. P4 coxopodite with 10-12 (after Park (1978) with 11-13) spines.

Male. Total length 5.4 mm. Cephalothorax 3.2 times longer than abdomen. Th5 posterior corners without spines. Anterior border of cephalon smooth triangular. A1 reaching Abd4. Re2 P5 distally saber-like; left Re2 without tooth.

Type locality: between 63°48'S 135°02'W and 63°57' 135°06'W.

Geographical distribution. Bipolar species. In the northern hemisphere the species was found in the Greenland Sea, the eastern sector of the Arctic Basin and in the Pacific Ocean: in the region of the Kurile-Kamchatka Trench (Markhaseva, 1984; original data). In the southern hemisphere species was found in the antarctic waters in the region of South Sandwich Islands and the antarctic sector of the Pacific Ocean to the South from 60°S (Park, 1978).

Vertical distribution. Very likely abyssopelagic species, found in the hauls from abysso- and bathypelagial in the region of the Kurile-Kamchatka Trench, in haul

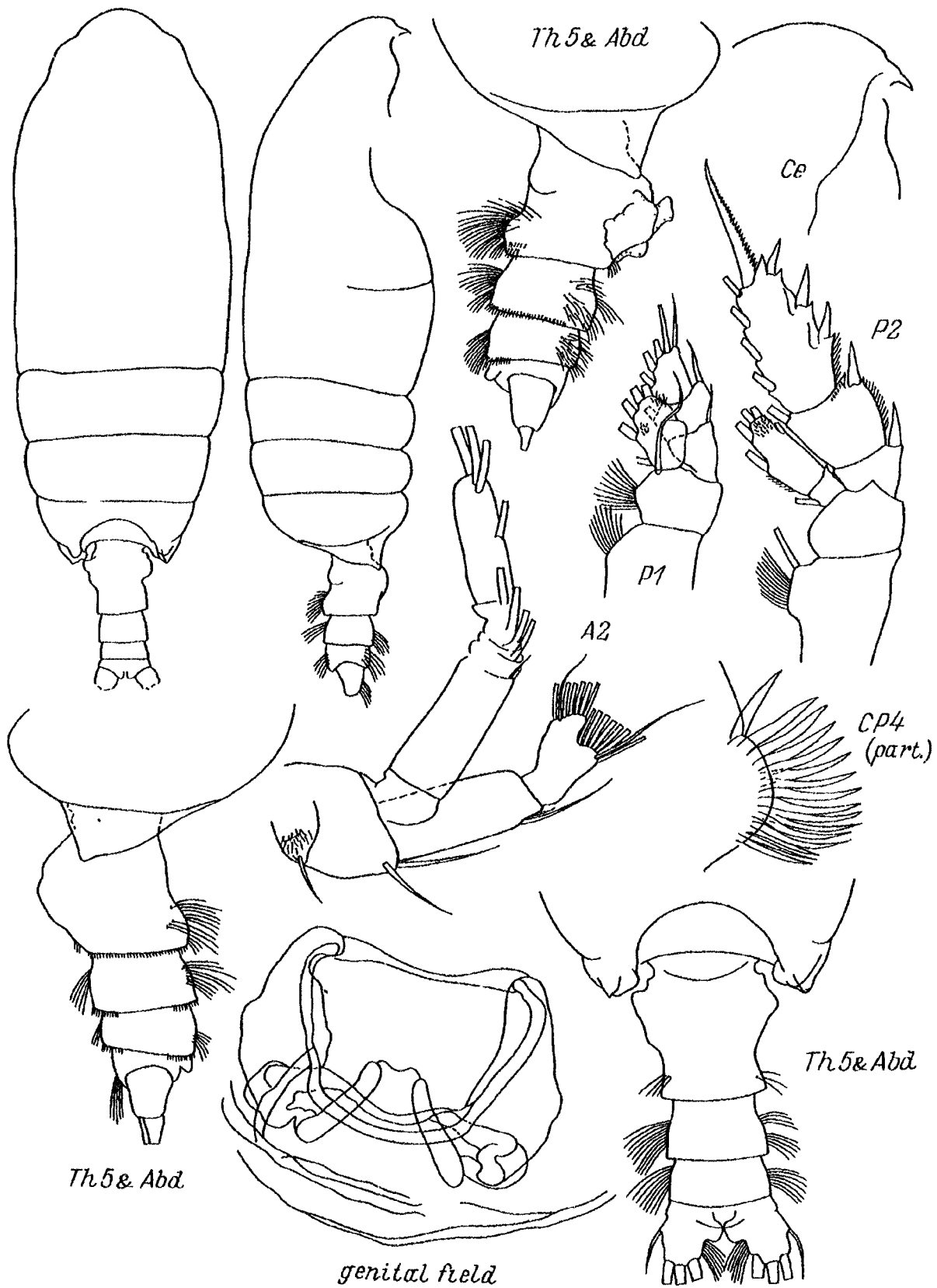


Fig 202 *Pseudochirella accepta* Female (103)

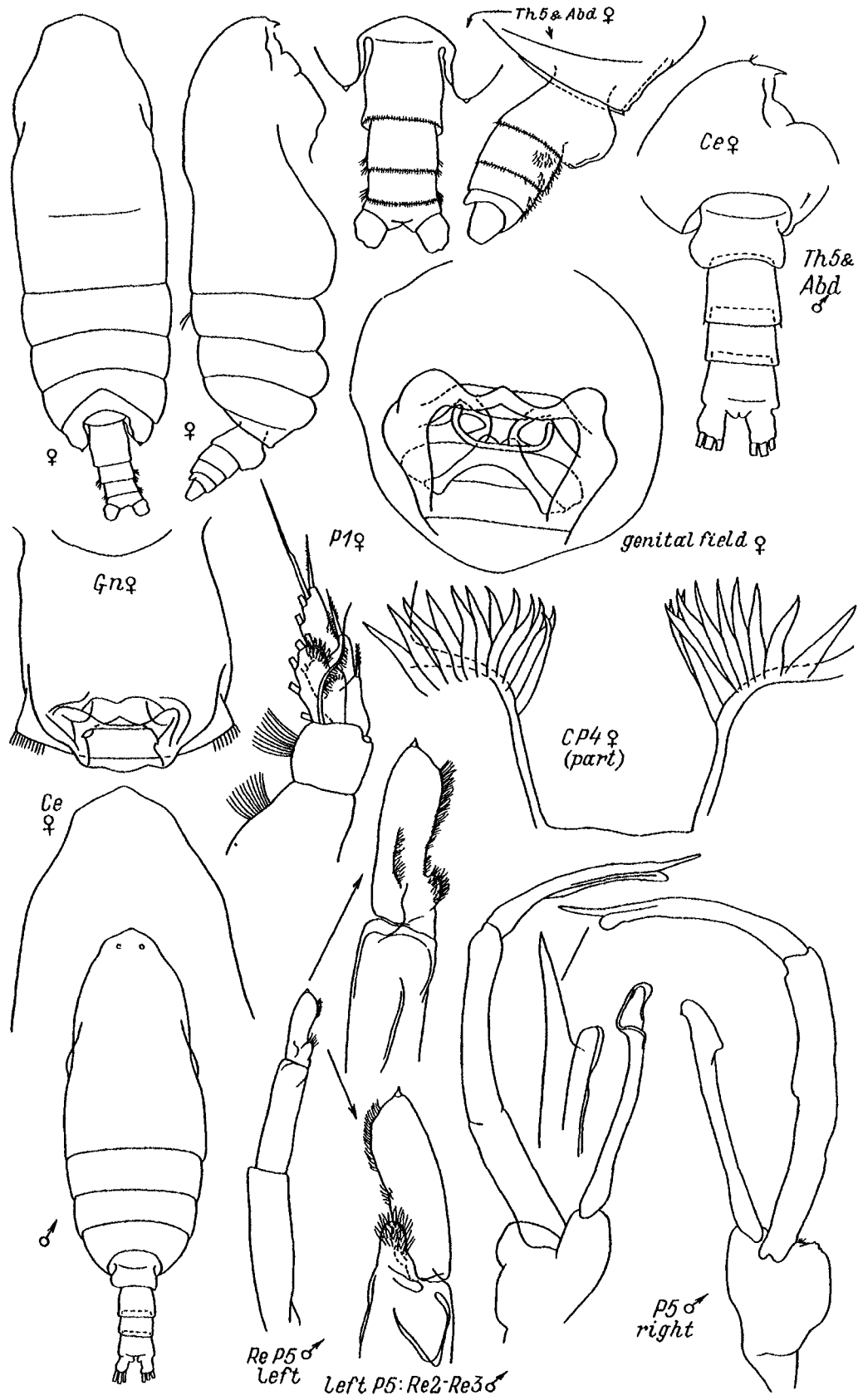


Fig. 203. *Pseudochirella batillipa*. Female (from Markhaseva, 1982). Male (from Markhaseva, 1989).

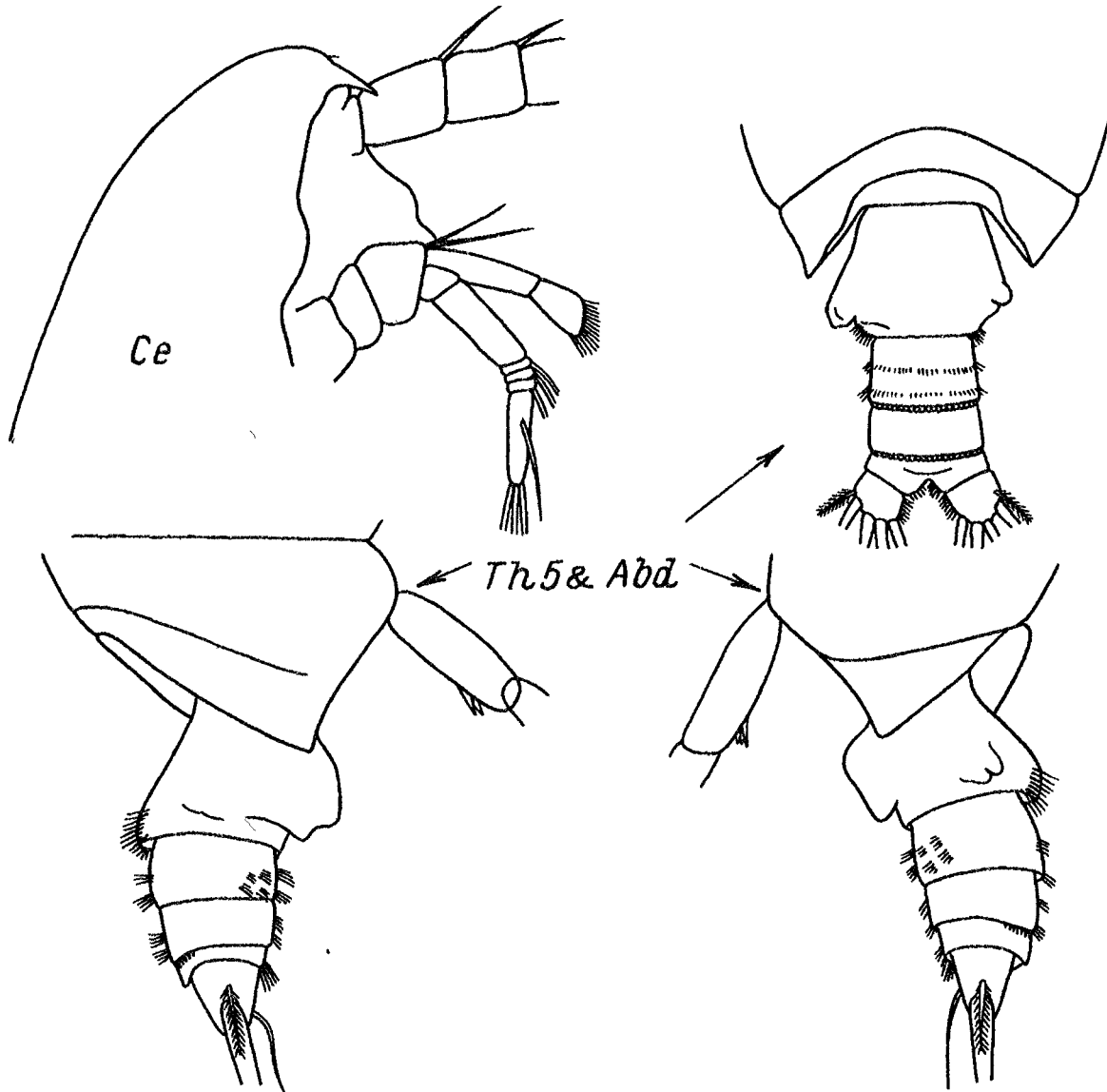


Fig. 204. *Pseudochirella bilobata*. Female (from Vervoort, 1949).

1100-2800 m in the Greenland Sea (original data), also in total hauls from depths of more than 1 km.

Material: 14 females and 1 male from samples: 83, 103, 192-193, 270, 297, 301, 310, 344, 462-463, 540, 554.

3. *Pseudochirella bilobata* Vervoort, 1949

(Fig. 204)

Pseudochirella bilobata Vervoort, 1949: 38, fig. 18, Markhaseva, 1989. 39, fig 7 (B 19)

Description. F e m a l e. (Description after Vervoort (1949) with modifications). Total length 5.05 mm. Cephalothorax 3.4 times longer than abdomen.

Th5 symmetrical, posterior corners prolonged into triangular lobes (lateral view). Genital segment slightly asymmetrical; with lateral projections of different shape and size on the right and on the left posteriorly (dorsal view). Ventral swelling strongly protruded (lateral view). Abd1-3 with surface hairs. A1 reaching posterior border of Abd1. Re P1 clearly 3-jointed; external Re P1 spine reaching the base of spine of following segment. P4 coxopodite with 14 spines of the same type as in *P. palliata* and *P. divaricata*.

Male unknown.

Type locality: the Flores Sea (8°00'S 121°41'E).

Geographical distribution The species is known from the type locality only (Vervoort, 1949).

Vertical distribution. The species was found in haul from 2500 m (Vervoort, 1949).

The species was not examined by me.

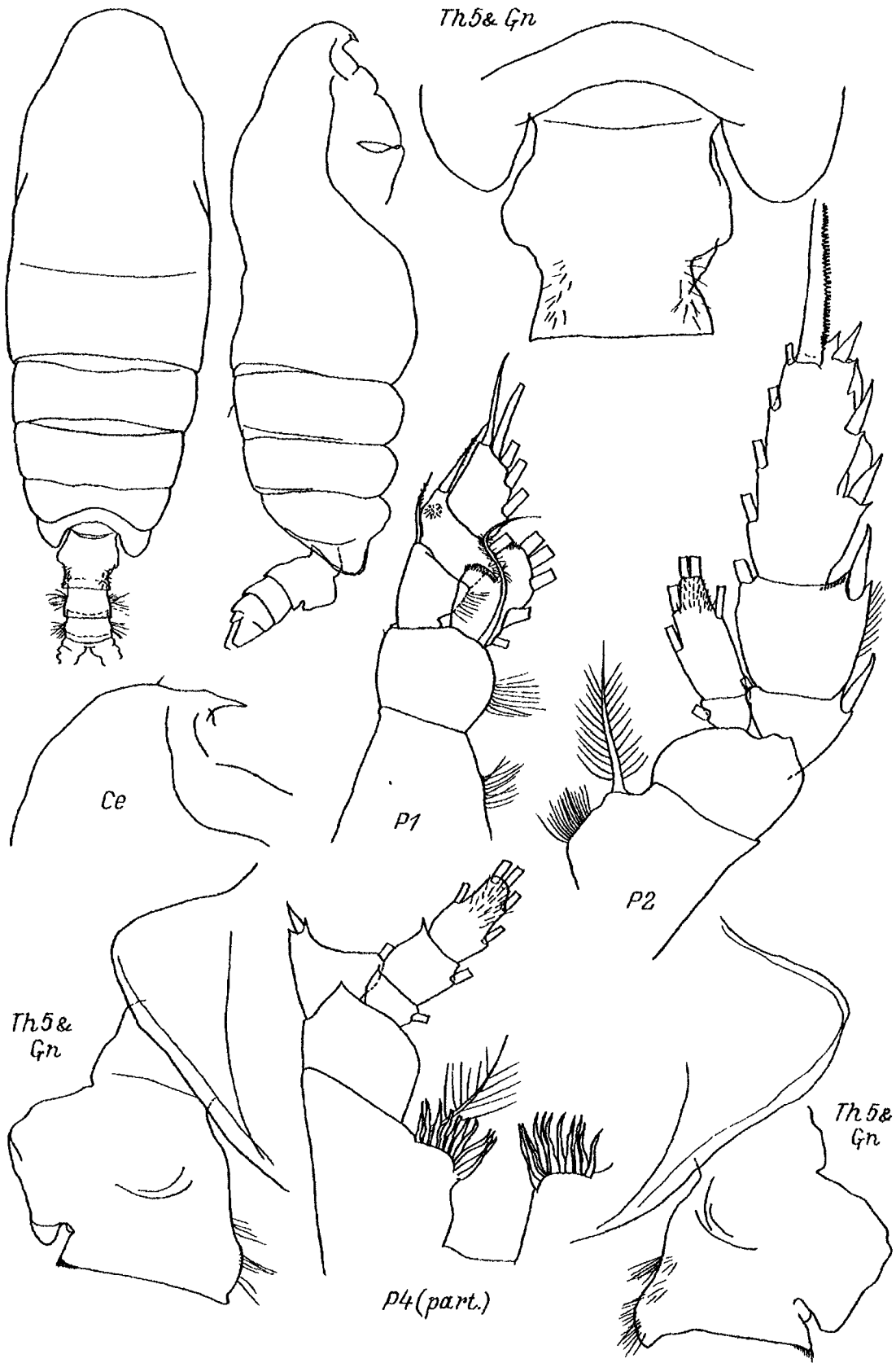


Fig. 205. *Pseudochirella bowmani*. Female (from Markhaseva, 1986a).

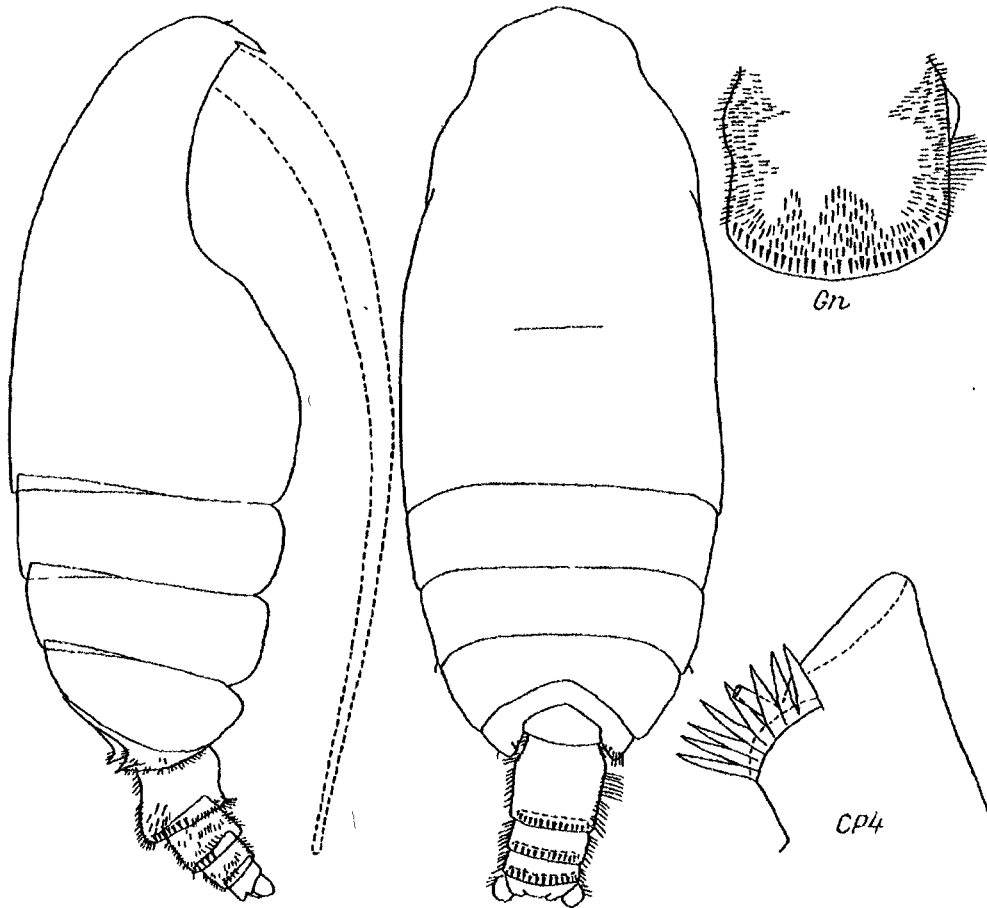


Fig. 206. *Pseudochirella dentata*. Female (from Bradford & Jillett, 1980).

4. *Pseudochirella bowmani* Markhaseva, 1986

(Fig. 205)

Pseudochirella bowmani Markhaseva, 1986a: 462, figs 1-2, 1989: 40, fig. 7 (B 25).

Description. Female. Total length 6.15 mm. Cephalothorax about 4 times longer than abdomen. Posterior Th5 corners prolonged into slightly asymmetrical lobes, rounded at tops. Abd1-3 with bushes of hairs. Genital segment asymmetrical, nearly as long as wide, widest in the second third of its length and nearly as long as 2 following segments together. Genital segment with projections on the right and left. Ventral swelling well developed, of tube-like shape. A1 broken. Ri1 A2 with 2 setae. Re1 A2 without setae; Re2 A2 with distal seta only. Md palp base with 3 setae; Ri1 Md with 9 terminal and 2 posterior setae. Mx1, Mx2 and Mxp typical of the genus. Re P1 3-jointed. Ri P2 2-jointed. P4 coxopodite with 11 fan-shaped spines.

Notes. The species is similar to *P. scopularis*

and *P. accepta*, differing in smooth rounded lobes of Th5 posterior corners, configuration of genital segment and number of spines on P4 coxopodite (in *P. scopularis* with 9 spines, in *P. accepta* with 13 spines). Ri P2 is distinguished from those in *P. scopularis* by clearly 2-jointed structure.

Male unknown.

Type locality: the south-eastern part of the Pacific Ocean: 22°50'S 97°30'W.

Geographical distribution. The species is known of the type locality only (Markhaseva, 1986a).

Vertical distribution. The species was found in haul from 3090 m.

Material: 1 female from sample 264.

5. *Pseudochirella dentata* (A. Scott, 1909)

(Fig. 206)

Euchirella dentata A. Scott, 1909: 59, pl.13, figs 13-21.

Pseudochirella dentata: Bradford & Jillett, 1908: 67, fig. 46; Markhaseva, 1989: 39, fig. 7 (A 15).

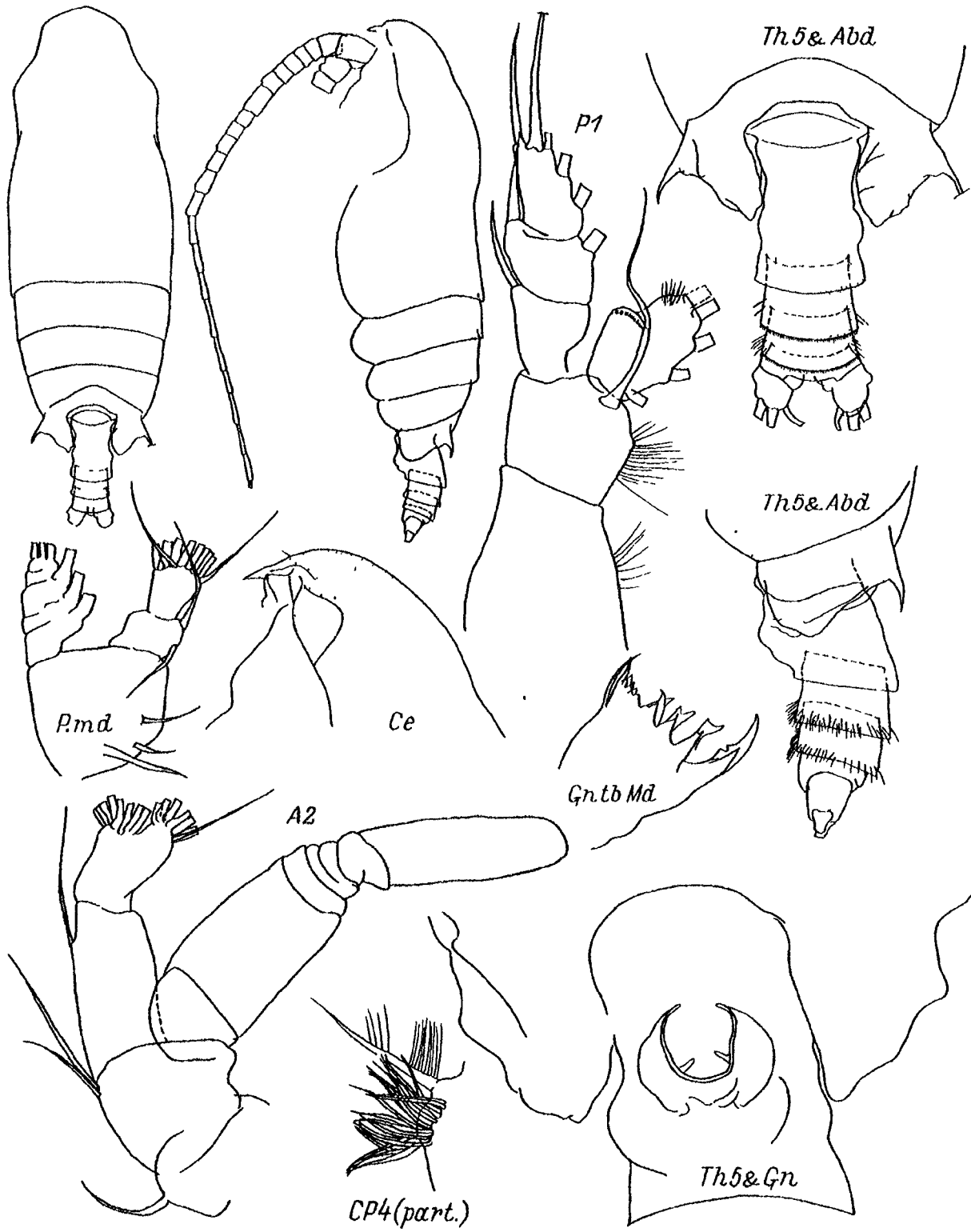


Fig. 207. *Pseudochirella divaricata* Female (398)

Description. F e m a l e. (Description after A. Scott (1909), Bradford & Jillett (1980) with modifications). Total length 5.70-7.50 mm. Cephalothorax 3.0-3.5 times longer than abdomen. Th5 posterior corners prolonged into moderate spines upturned to the back side of specimen (lateral view), slightly asymmetrical. Genital segment slightly asymmetrical: more swollen on the right side. Abd1-3 surface with hairs. A1 reaching the end of the body. Ri1 A2 with 1 seta; Re1 A2 with 1 seta. Re2 A2 with the distal seta only. Re P1 indistinctly 3-jointed. Ri P2 indistinctly 2-jointed. P4 coxopodite with 7-9 spines.

Male unknown.

Type locality: Manipa Strait, 3°20'S 127°22'E.

Geographical distribution. The region of Malay Archipelago and New Zealand (Bradford & Jillett, 1980).

Vertical distribution. The species was found in hauls from 900-1500 m (A. Scott, 1909; Bradford & Jillett, 1980).

The species was not examined by me.

6. *Pseudochirella divaricata* (Sars, 1905)

(Fig. 207)

Gaidus divaricatus Sars, 1905 : 10.

Pseudochirella divaricata: Sars, 1924-25: 91, pl. 25, figs 5-7; Jespersen, 1934: 66; Grice & Hulsemann, 1967: 15; Bjornberg, 1973: 325; Deevey & Brooks, 1977: 263; Markhaseva, 1989: 38, fig. 7 (A 9).

Description. F e m a l e. Total length 4.30-4.40 mm. Cephalothorax about 3.4 times longer than abdomen. Th5 posterior corners wing-like (dorsal view), slightly asymmetrical, widely arranged, each with spine. In lateral view this spine seems to be removed to the back side of specimen. Genital segment symmetrical, with moderate widening in nearly the midlength of segment, twice longer than wide and as long as 3 following segments together. Body surface with chitinous thickenings. Abd2-3 with hairs. A1 nearly as long as cephalothorax, or body. Ri1 A2 with 1 seta; Re1 A2 without setae. Re2 A2 with the distal seta only. Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 2 posterior setae. Third Mx1 internal lobe with appendage and 4 setae. Re P1 3-jointed. Ri P2 2-jointed. P4 coxopodite with 21 spines (according to Sars (1925), with 8-12 spines).

Male unknown.

Type locality: 36°17'N 28°53'W.

Geographical distribution. The species was found in the Davis Strait (Jespersen, 1934). Atlantic Ocean: in the region of 32°N-43°N 10°W-42°W (Sars, 1925), in the Sargasso Sea (Deevey & Brooks, 1977). Pacific Ocean: the south-eastern part (Bjornberg, 1973). Indian Ocean: the western part (Grice & Hulsemann, 1967; original data).

Vertical distribution. Possibly bathypelagic species: found in haul 1500-2000 m (Deevey & Brooks,

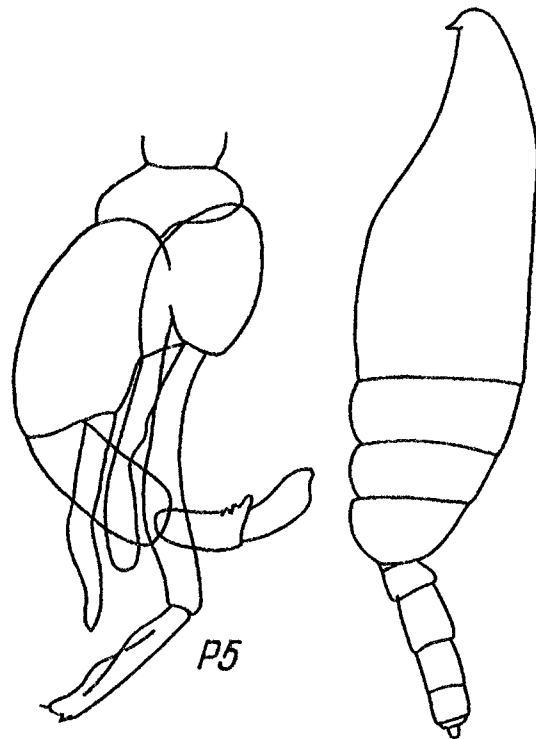


Fig. 208. *Pseudochirella dubia*. Male (from Sars, 1924).

1977), in haul 225-2600 m (Grice & Hulsemann, 1967), also in total hauls from depths 2000-5700 m (Sars, 1925; Jespersen, 1934; original data).

Material: 1 female from sample 398.

7. *Pseudochirella dubia* (Sars, 1905)

(Figs. 208-209)

Undeuchaeta dubia Sars, 1905: 15.

Pseudochirella dubia. Sars, 1924-25: 96, pl. 14, figs 10-15; Jespersen, 1934: 67; Grice & Hulsemann, 1967: 15; Bjornberg, 1973: 325, Markhaseva, 1989: 38, fig. 7 (A 1), 8 (7 a, b).

Euchirella granulata A. Scott, 1909: 58, pl. 13, figs 1-12 (syn. n.).

Pseudochirella obtusa (non Sars, 1905) (male only): Vervoort, 1949: 37, fig. 21c.

Description. F e m a l e. Total length 4.80-6.10 mm. Cephalothorax 3.5-4.0 times longer than abdomen. Th5 posterior corners rounded, symmetrical. Genital segment symmetrical, nearly as long as wide, and nearly as long as 2 following segments together. Ventral swelling strongly protruded, widest in its posterior part (lateral view). Abd1-3 with hairs on the surface. Body surface of some specimens with chitinous thickenings. A1 longer than cephalothorax, reaching Abd2-3, or the end of caudal rami. Ri1 A2 with 2 setae. Re1 A2 with 1 seta, small (according to A. Scott (1909), this seta is much longer); Re2 A2 except distal seta with 2 more setae: proximal and medial. Ri1 Md with 2; Ri2 Md with 9 terminal

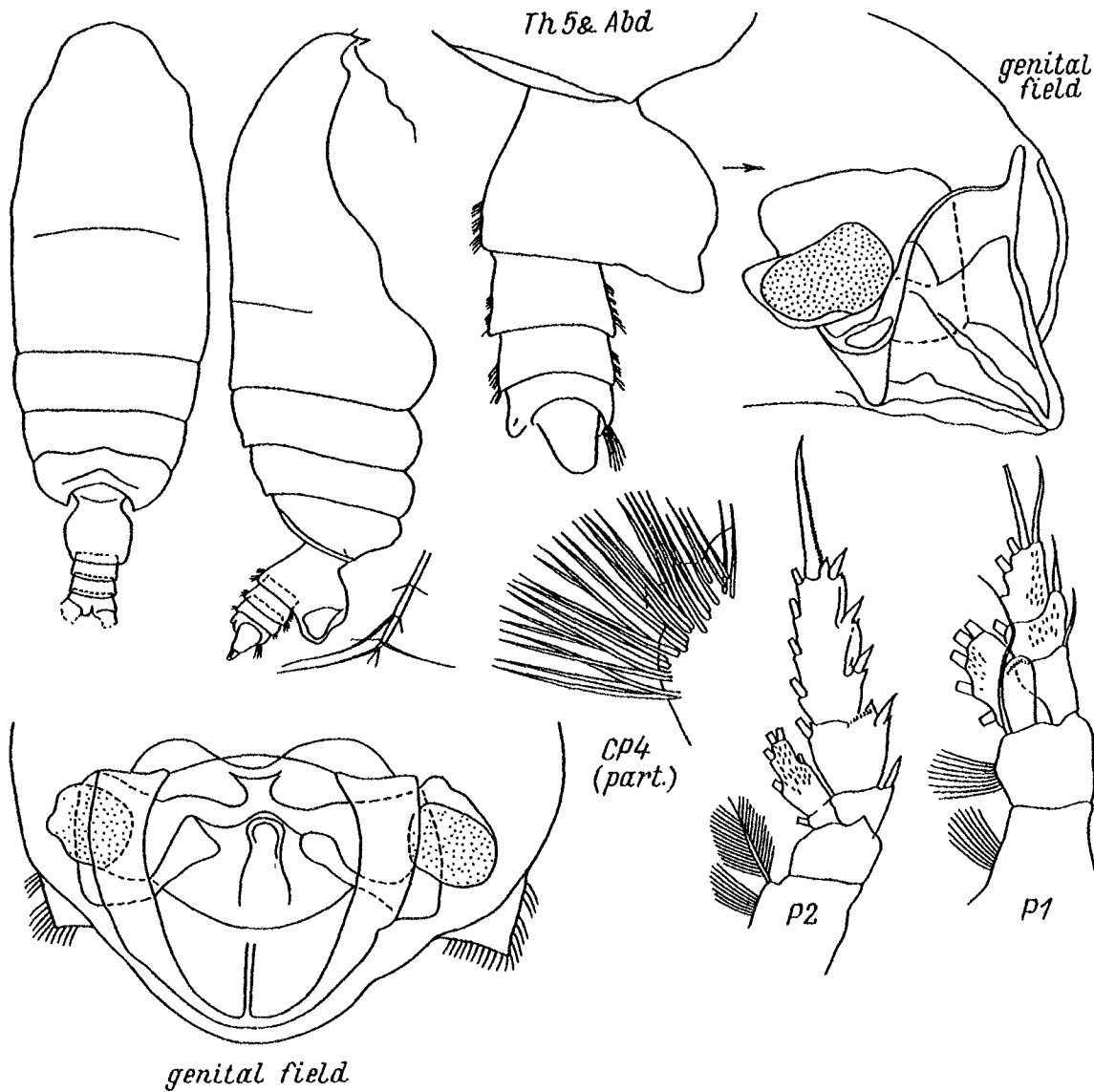


Fig. 209. *Pseudochirella dubia*. Female (70).

and 2 posterior setae. Mx1, Mx2 and Mxp typical of the genus. Re P1 3-jointed. Ri P2 indistinctly 2-jointed (after Sars (1925) and A. Scott (1909) Ri distinctly 2-jointed). P4 coxopodite with about 30 thin fan-like arranged spines (Sars (1925) noted 14 spines).

M a l e. (Description after Sars (1925) with modifications). Total length 4.00 mm. Cephalon and Th1 indistinctly separated. Th5 posterior corners rounded, without spines. Cephalothorax about 3 times longer than abdomen. Left Re2 P5 with 3 teeth in distal part of joint.

Type locality: 36°17' N 28°53' W (Sars, 1905).

Geographical distribution. The species is known from boreal, subantarctic and tropical-subtropical zones of the World Ocean (A. Scott (1909); Grice &

Hulsemann (1967); Bjornberg (1973)). The species is registered to the North to 62°N: the Davis Strait (Jespersen, 1934). Atlantic Ocean: to the South to South Sandwich Islands. Pacific Ocean: to the Kurile Islands (original data). The species was found to the South from 60°S in the indoceanic and pacific sectors of the Southern Ocean (original data).

Vertical distribution. Abysso-bathypelagic species, found in hauls in lower bathypelagial-abyssal (Grice & Hulsemann, 1967; original data), in the Kurile-Kamchatka region (original data). The species was recorded from total hauls from 7000 m.

Material: 36 females and 1(?) male from samples: 66, 68-70, 82-83, 86, 97, 103, 121, 124, 126, 128, 139-140, 163-164, 181, 192, 200, 270, 339, 379.

8. *Pseudochirella fallax* Sars, 1920

(Fig. 210-211)

Bradyetes major Sars, 1907. 9.*Pseudochirella fallax* Sars, 1920. 6, 1924-25. 96, pl 26, figs 5-9, Grice & Hulsemann, 1965: 223; Wheeler, 1970. 8, Markhaseva, 1989 40, fig 4, 7 (B 27); 8 (4A)

Description Female. Total length 3.60-3.80 mm. Cephalothorax 4.0-4.6 times longer than abdomen. Rostrum developed weaker than in other species of genus. Th5 posterior corners slightly asymmetrical (dorsal view), prolonged into rounded lobes. Genital segment slightly asymmetrical: lateral swelling on the left more prominent than on the right. Genital field removed laterally (ventral view). Abd1-3 surface with hairs. A1 about as long as body. Re1 A2 without setae; Re2 A2 with the distal seta only. Ri1 A2 with 1 seta. Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 2 posterior setae. Second and third Mx1 internal lobes with 5 setae each. Mx2 and Mxp typical of the genus. Re P1 3-jointed. Ri P2 2-jointed. P4 coxopodite with 20-23 spines (Sars (1925) recorded 14 spines).

Male. Total length 3.20 mm. Cephalothorax about 3.6 times longer than abdomen. Th5 posterior corners without spines, slightly asymmetrical (dorsal view). A1 longer than body by 2-3 last joints. Mx1, Mx2 and setation of other oral parts reduced in comparison with those in females. Re1-Re2 A2 and Ri1 A2 without seta. Ri2 A2 with 5 setae on each lobe. Md palp base with 1 seta; Ri1 Md with 2 small setae; Ri2 Md with 9 terminal setae. Mx1 gnathobase without setae; second and third internal Mx1 lobes with 3 and 5 setae respectively; protopodite near Ri base with 3 setae; Ri with 12 setae. Re P1 3-jointed, but 1 external spine significantly shorter than in female. Ri P2 2-jointed. P4 coxopodite without spines and setae. Re2 P5 left with 1 tooth. Left Re3 P5 nearly 4 times longer than wide.

Notes. The male of this species was once mentioned (Sars, 1925), who recorded its similarity with male of *P. dubia*, but Sars did not describe or figure this male. The male described herein was obtained from the same sample with female and was attributed to the present species; however its structure is not identical to that of *P. dubia* male normal in the understanding of Sars.

Type locality: the central part of North Atlantic.

Geographical distribution. Atlantic Ocean: northern part (Sars, 1925; Grice & Hulsemann, 1965; Wheeler, 1970; Deevey & Brooks, 1977). Indian Ocean: the western part (original data).

Vertical distribution. Bathypelagic species, found in hauls from 1500-2000 m (Deevey & Brooks, 1977), 2000-3000 m (Grice & Hulsemann, 1965), also in total hauls from 1500-4800 m (Sars, 1925; original data).

Material: 1 female and 1 male from sample 399.

9. *Pseudochirella formosa*

Markhaseva, 1989

(Fig. 212)

Pseudochirella formosa Markhaseva, 1989. 33, figs 1, 7 (A 6).

Description. Female. Total length 9.20 mm. Cephalothorax 3.6 times longer than abdomen. Th5 posterior corners symmetrical, prolonged into triangular lobes, reaching nearly the midlength of genital segment (lateral and dorsal view). Genital segment symmetrical, with moderate projections (dorsal view) in the midlength of segment. Ventral swelling significantly prominent. Abd1-3 with hairs. A1 as long as body. Re1 A2 without setae; Re2 A2 with 1 distal seta. Ri1 A2 with 1 seta; Ri2 A2 internal lobe with 7 (6+1) terminal setae. Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 2 posterior setae. Mx1, Mx2 and Mxp typical of the genus. Re P1 3-jointed. Ri P2 incompletely 2-jointed. P4 coxopodite with 18-20 spines.

Male unknown.

Type locality: 62°54'S 118°52'E.

Geographical distribution The species is known from type locality only.

Vertical distribution. The species was recorded from total haul from 3700 m (Markhaseva, 1989).

Material: 1 female from sample 379.

11. *Pseudochirella gibbera*

Vervoort, 1949

(Fig. 213)

Pseudochirella gibbera Vervoort, 1949. 41, fig. 19, (?) Grice & Hulsemann, 1967: 24; Markhaseva, 1989. 39, fig. 7 (B 17).

Description. Female. (Description after Vervoort (1949) with modifications). Total length 5.50 mm. Cephalothorax 4.3 times longer than abdomen. Th5 posterior corners asymmetrical: left corner rounded, right one with spine. Genital segment abruptly asymmetrical, much wider than long; right side with large projection covered with hairs distally, with smaller projection on the left (dorsal view). Oral parts similar to those in *P. obtusa*. Re P1 3-jointed. Ri P2 (?) 1-jointed. P4 coxopodite with 5 strong, pointed spines.

Notes. Grice and Hulsemann (1967) had attributed their specimens to the present species, but this attribution may be doubtful, because the authors recorded the absence of spine on Th5 posterior corner. The latter character is very important for identification of the species *Pseudochirella*.

Type locality: the Timor Sea: 10°49'S 123°59'E.

Geographical distribution. The Timor Sea (Vervoort, 1949).



Fig. 210. *Pseudochirella fallax*. Female (399).

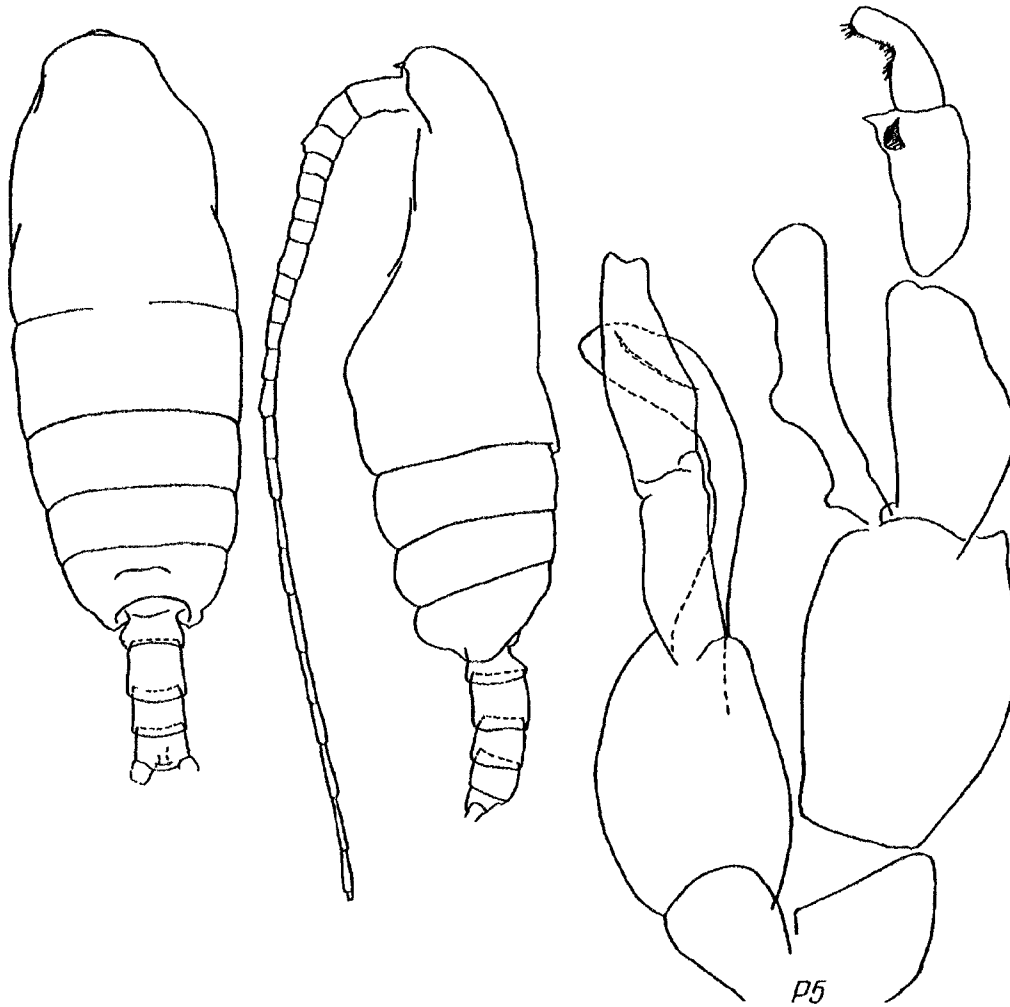


Fig 211 *Pseudochirella fallax* Male (from Markhaseva, 1989).

Vertical distribution. The species was found in haul from 1800 m (Vervoort, 1949).

The species was not examined by me.

11. *Pseudochirella hirsuta* (Wolfenden, 1905)

(Figs. 214-215)

Euchirella hirsuta Wolfenden, 1905 17, pl 6, figs 7-8, 1911 240, pl 28, fig 7-9, Farran, 1929 237

Pseudochirella hirsuta Vervoort, 1957 69; Park, 1978 163, figs 41-42, Markhaseva, 1989 36, figs 6, 7 (A 2), 8 (5 a, b)

Description. Female. Total length 8.50-9.41 mm. Cephalothorax 4.0-4.2 times longer than abdomen. Cephalon narrower anteriorly, indistinctly separated from Th1, Th4-Th5 virtually completely fused. Th5 posterior corners symmetrical, of smooth triangular shape (lateral view), covering nearly the first third of genital segment, with hairs in available specimens. Th5 posterior corners (dorsal view) with

somewhat bifid tops. Genital segment symmetrically widened in its midlength (dorsal view). Ventral swelling not prominent. Abd1-3 surface with hairs. A1 by 1-2 last joints longer than body. Ri1 A2 with 2 setae; Re1 A2 with 1 seta; Re2 A2 with 2 medial and 1 distal seta. Ri1 Md with 2 setae; Ri2 Md with 9 long terminal and 2 posterior setae. Second Mx1 internal lobe with 4 setae and appendage Mxp protopodite with knob in its proximal third part. Mx2 typical of the genus. Re P1 3-jointed. Ri P2 2-jointed. P4 coxopodite with 15 (after Park (1978) with 10-13) robust spines.

Male. Total length 7.20 mm. Cephalothorax 3.4 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. A1 reaching nearly Abd2. Oral parts reduced in comparison to those in females. Re P1 3-jointed; Re1 external spine is very small. General type of P5 structure is typical of males of *Pseudochirella*. Re2 P5 left with tooth, Re3 P5 left nearly 4 times longer than wide.

Type locality: South Atlantic: region of 35°S and 2-8°E.

Geographical distribution. The species occurs cir-

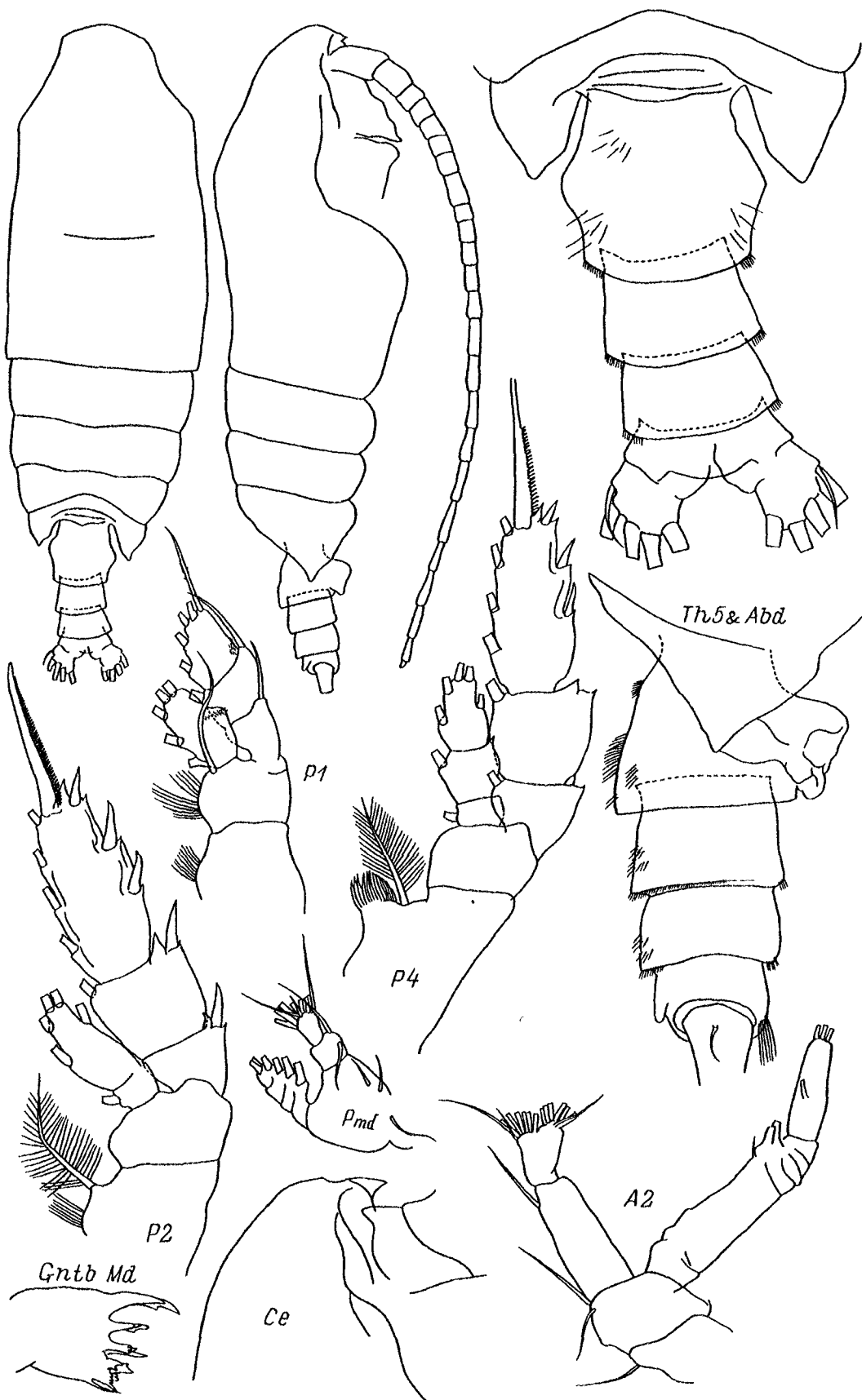


Fig. 212. *Pseudochirella formosa*. Female (from Markhaseva, 1989) with additions after the same specimen).

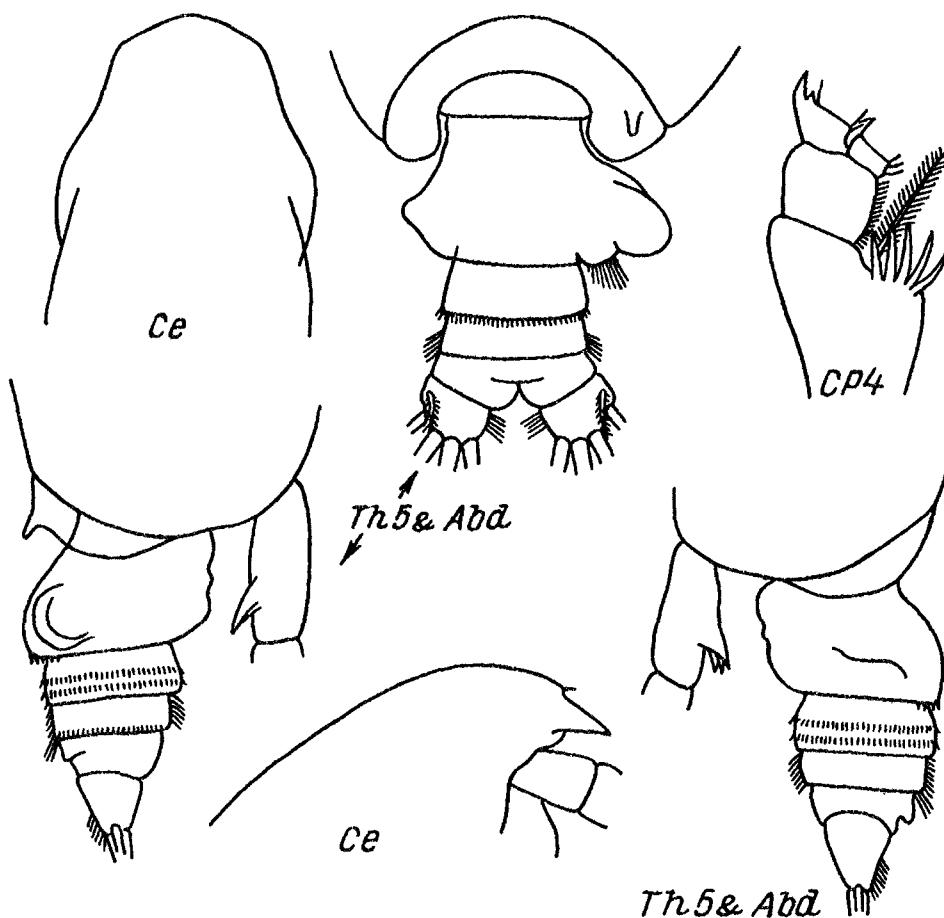


Fig. 213. *Pseudochirella gibbera*. Female (from Vervoort, 1949).

cumpolar in Antarctic and Subantarctic, may be characterized as subantarctic-antarctic. Atlantic Ocean: the northernmost locality of 35°S (Wolfenden, 1911). Pacific Ocean: the species is distributed to the North to 30°S along the coast of South America (Bjornberg, 1973; Grice & Hulsemann, 1968; original data). According to original data was recorded in the region of 39-42°S 130-144°W. Indian Ocean: it is known from the region off 30°S 66°E (Grice & Hulsemann, 1967; original data). The northernmost findings of the species in the Indian and Atlantic oceans, probably may be explained by the fact that the species is transported with meridional water currents from Subantarctic, i.e. the latter localities, do not actually belong to the distribution area proper, but to the zone of the species eviction.

Vertical distribution. Probably meso-bathypelagic species, found in layer 1000-2000 m (Hardy & Gunther, 1935), hauls from 350-1786 and 350-2394 m (Grice & Hulsemann, 1967), also found in total hauls from depths 400-3000 m (original data), recorded from total hauls from depths 600-5000 m (Wolfenden, 1911; Farran, 1929; Vervoort, 1957; Bjornberg, 1973; Park, 1978).

Material: 140 females and 11 males from sam-

ples: 266, 268-269, 272, 274-275, 285, 290, 296, 299, 307, 309, 312-313, 316-320, 322-325, 327, 329-332, 334, 338-342, 346-348, 353-354, 358, 363-364, 370, 372-376, 379, 383, 395, 434.

12. *Pseudochirella limata* Grice & Hulsemann, 1968

(Fig. 216)

Pseudochirella limata Grice & Hulsemann, 1968: 327, figs 20-25; Markhaseva, 1989: 39, fig. 7 (A 11).

Description. Female. (Description and figures after Grice & Hulsemann (1968) with modifications). Total length 7.33 mm. Th5 posterior corners rounded, covering half length of genital segment; left one with very small spine (lateral view). Genital segment with moderate ventral swelling (lateral view), nearly symmetrical (dorsal view), more widened anteriorly. A1 reaching the end of caudal rami. Re P1 incompletely 3-jointed (Re2 and Re3 incompletely separated). Ri P2 2-jointed. P4 coxopodite with 16 not large spines.

Male unknown.

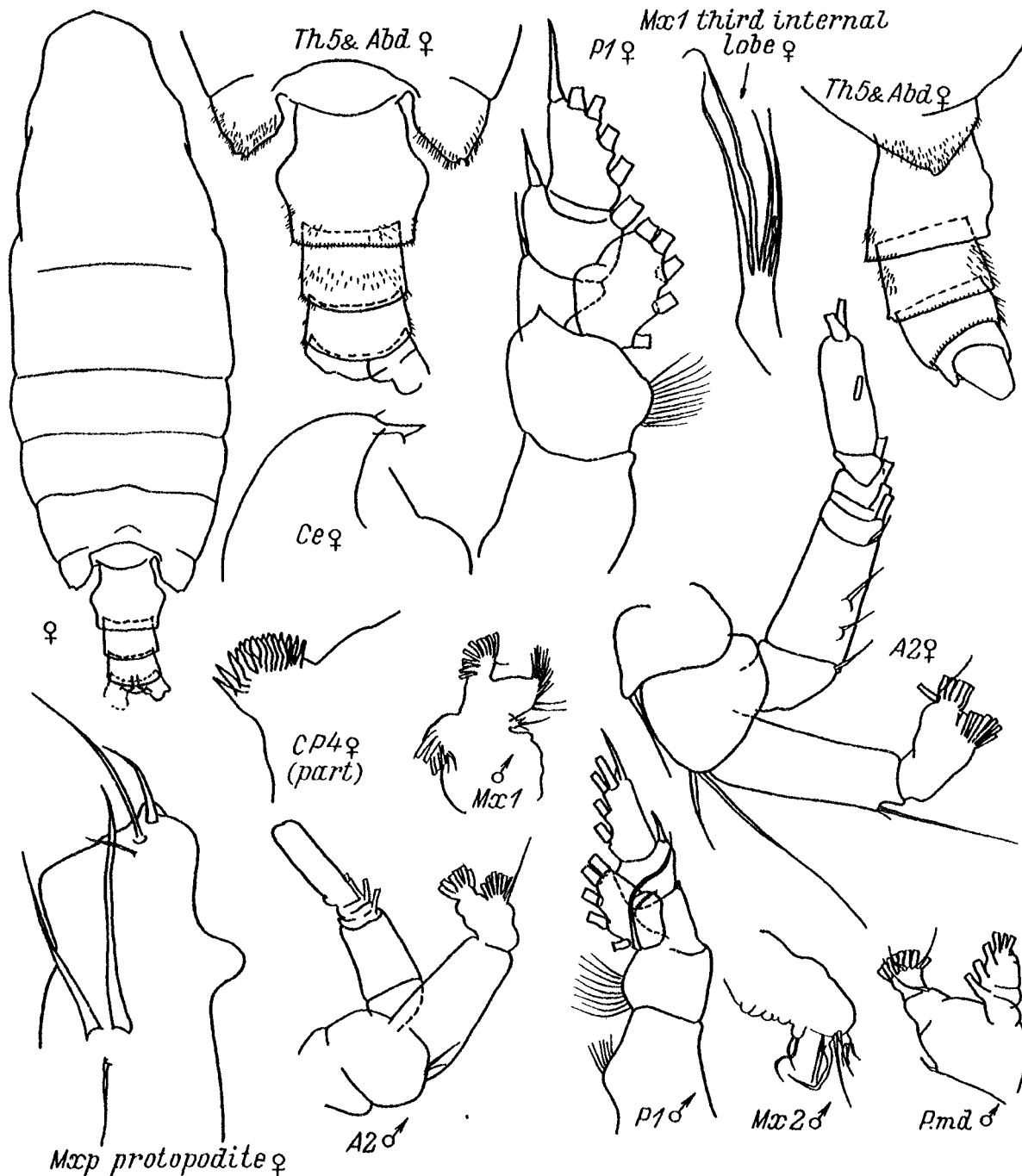


Fig. 214. *Pseudochirella hirsuta*. Female (434). Male (375).

Type locality: the south-eastern part of the Pacific Ocean: 30°59'S 92°28'W.

Geographical distribution. The species is known of the type locality only.

Vertical distribution. The species was found in total haul from 3800 m (Grice & Hulsemann, 1968).

The species was not examined by me.

13. *Pseudochirella lobata* (Sars, 1907)

(Fig. 217)

Undeuchaeta lobata Sars, 1907. 11

Pseudochirella lobata Sars, 1924-25 93, pl 25, figs 11-13,
Markhaseva, 1989 38, fig 7 (A 5)

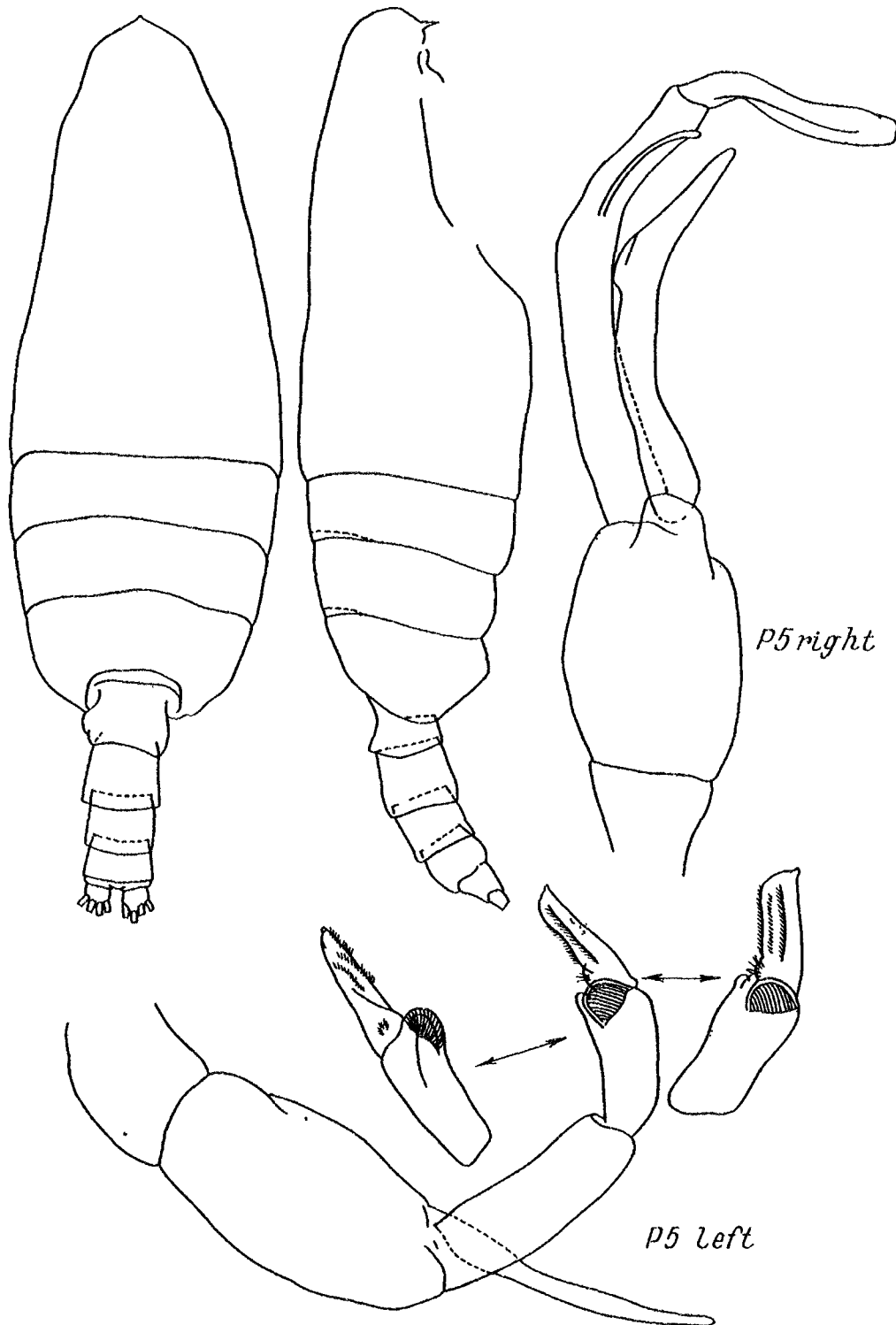


Fig 215 *Pseudochirella hirsuta* Male (from Markhaseva, 1989)

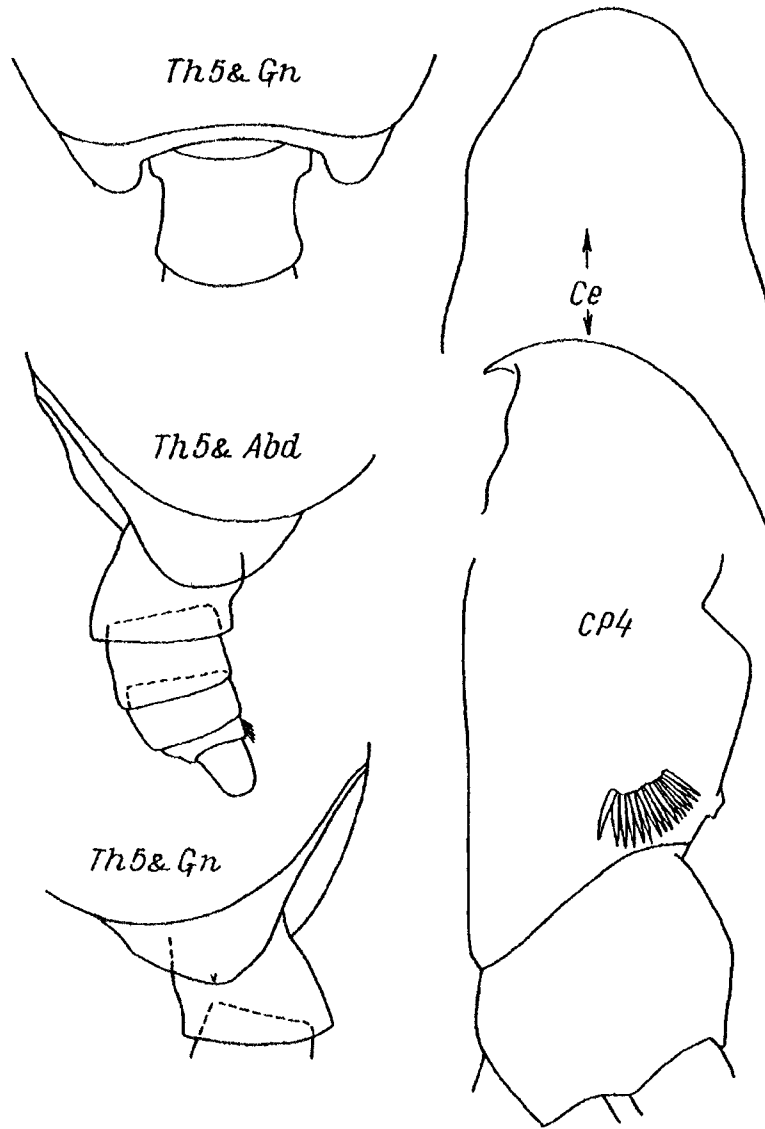


Fig. 216. *Pseudochirella lmata*. Female (from Grice & Hulsemann, 1968).

Description. Female. (Description after Sars (1924-25) with modifications). Total length 6.50 mm. Cephalothorax about 4 times longer than abdomen. Lobes of Th5 posterior corners rounded, not reaching the midlength of genital segment. Genital segment symmetrical (dorsal view), more broadened in its midlength. Abd2-3 covered with hairs. A1 reaching the midlength of abdomen. Re P1 3-jointed. Ri P2 2-jointed. P4 coxopodite with row of fan-like 12 little spines.

Male unknown.

Type locality. 38°04'N 26°07'W.

Geographical distribution. The species is known of the type locality only.

Vertical distribution. The species was found in total haul from 2500 m (Sars, 1925).

The species was not examined by me.

14. *Pseudochirella mariana*

Markhaseva, 1989

(Fig. 218)

Pseudochirella mariana Markhaseva, 1989 34, figs 2, 7 (B 26)

Description Female. Total length 3.60 mm. Cephalothorax 4.7 times longer than abdomen. Th5 posterior corners prolonged into slightly asymmetrical, rounded lobes. Genital segment abruptly asymmetrical with 2 projections on the right (dorsal view). Genital field removed to the right side of specimen. A1 broken. A2 basipodite with 1 seta; Ri1 A2 with 1 seta; Ri2 A2 with 5 long and 1 short posterior setae on internal lobe. Re1 A2 without setae; Re2 A2 with 1 distal seta. Ri1 Md with 2 long and 1

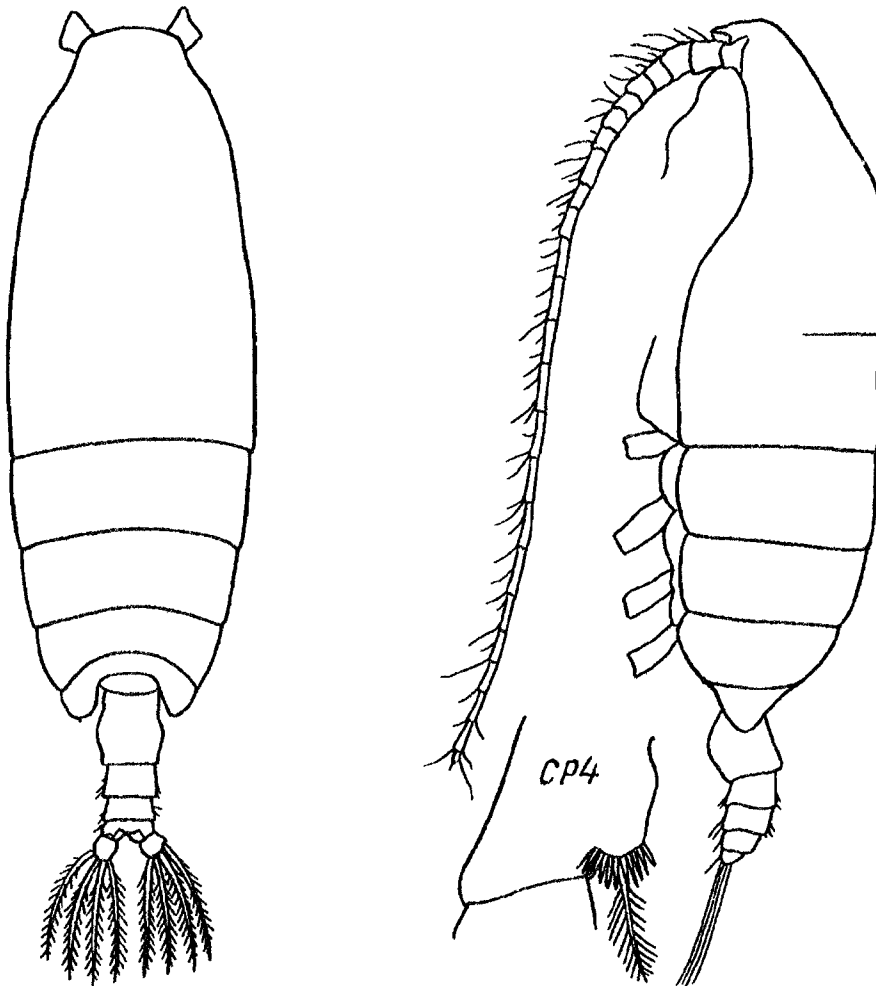


Fig. 217. *Pseudochirella lobata*. Female (from Sars, 1924).

short setae; Ri2 Md with 9 long terminal and 2 short posterior setae. Mx1 with 3 setae on posterior surface of gnathobase, second and third Mx1 internal lobes with 5 setae each. Mx2 typical of *Pseudochirella*. In proximal group of setae on Mxp propodite only 1 seta visible. Re P1 3-jointed. Ri P2 2-jointed P4 coxopodite with about 23 spines.

Male unknown

Type locality, the region of the Marian Trench: 11°13'N 141°47'E.

Geographical distribution. The species is known from the type locality only.

Vertical distribution Species was found in total haul from 7470 m (Markhaseva, 1989).

Material 1 female from sample: 201.

15. *Pseudochirella mawsoni*

Vervoort, 1957

(Figs. 219-220)

Pseudochirella mawsoni Vervoort, 1957 64, figs 44-48, Park, 1978 173, 176, figs 48-49, Bjornberg, 1973.

324, Bradford & Jillett, 1980 68, fig 47, Markhaseva, 1989 40, fig 7 (B 21)

Pseudochirella notacantha (non Sars, 1905) Vervoort, 1957 67, figs 49-53 (male)

Pseudochirella tuberosa Grice & Hulsemann, 1968 327, figs 26-33

Description. Female. Total length 5.42-6.75 mm. Cephalothorax 3.3-4.0 times longer than abdomen. Th5 posterior corners rounded. Genital segment asymmetrical: right side in its posterior part with significant projection, left one swollen in its midlength (dorsal view). Configuration of genital segment varying (already mentioned (Park, 1978)) A1 reaching the end of genital segment - the end of caudal rami. Re1 A2 with very small seta arranged on the knob; Re2 A2 with the distal seta only. Ri1 A2 with 1 (after Park (1978) with 2) setae. Ri1 Md with 2; Ri2 Md with 9 long terminal and 2 posterior setae. Third internal Mx1 lobe with 4 setae and sensory appendage. Mx2 and Mxp typical of *Pseudochirella* Re P1 3-jointed with indistinct separation between Re1 and Re2. Ri P2 incompletely 2-jointed. P4 coxopodite with 6-10 spines.

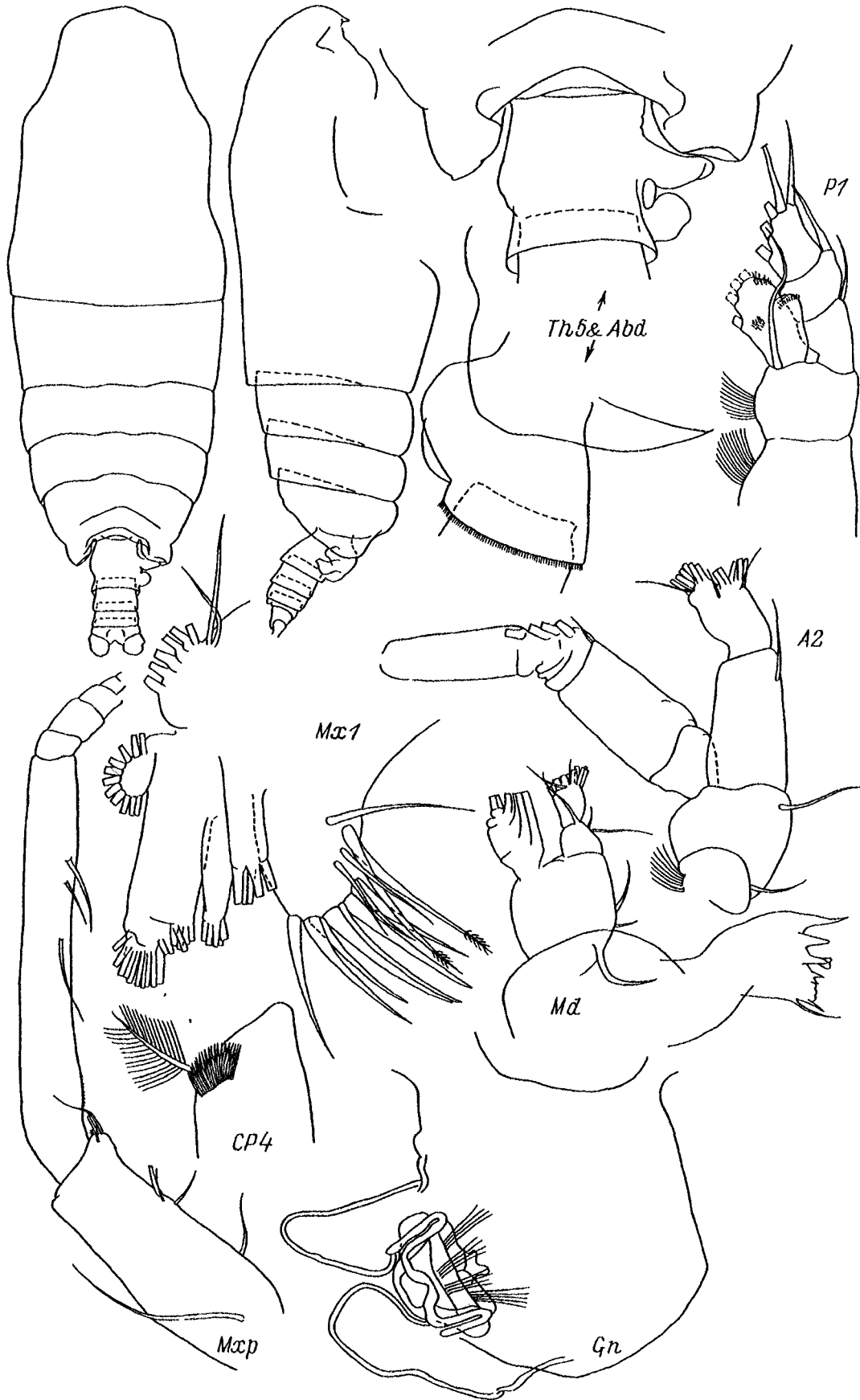


Fig 218. *Pseudochirella mariana*. Female (from Markhaseva, 1989) with additions

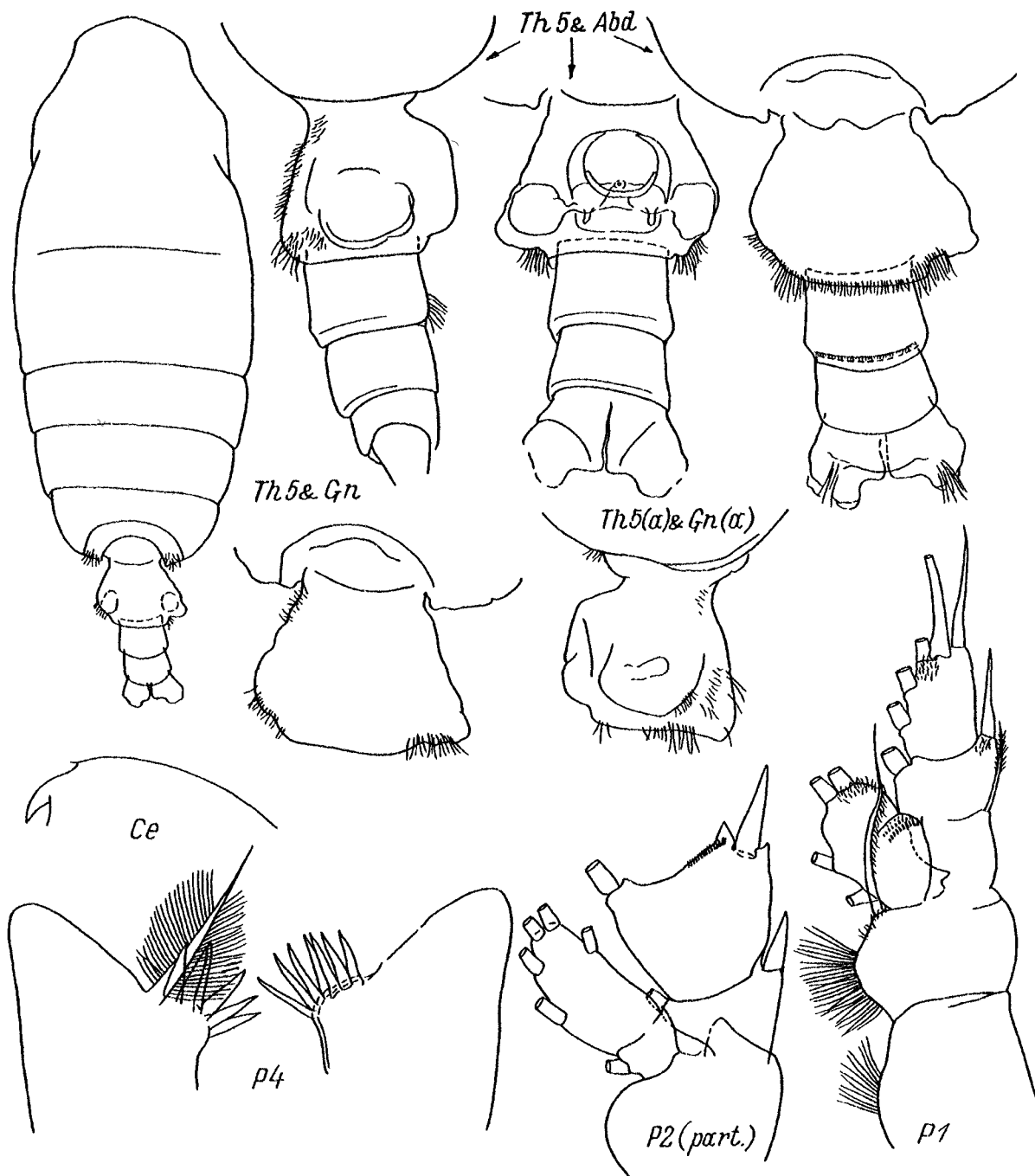


Fig. 219. *Pseudochirella mawsoni*. Female: Th5 & Gn (dorsal view) (453), other figures (382).

M a l e. Total length 5.20-5.66 mm. Cephalothorax 2.6-3.3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 completely fused. Th5 posterior corners rounded, with spines on both sides (removed dorsally). A1 reaching Abd2. Oral parts reduced in comparison with those in females. Re P1 3-jointed; external spine on Re1 very small. Ri P2 indistinctly 2-jointed. P5: left Re2 with 2 teeth in the distal part of the joint; Re3 about twice longer than wide.

Type locality. Antarctica.

Geographical distribution. The species may be characterized as subantarctic-antarctic. It is distributed circumpolar. To the North from Antarctic Convergence the species was found: Pacific Ocean: widespread along the coast of South America to 31°S (Grice & Hulsemann, 1968; Bjornberg, 1973; original data), also in the region of 40-42°S 124-144°W (original data), recorded off the New Zealand region

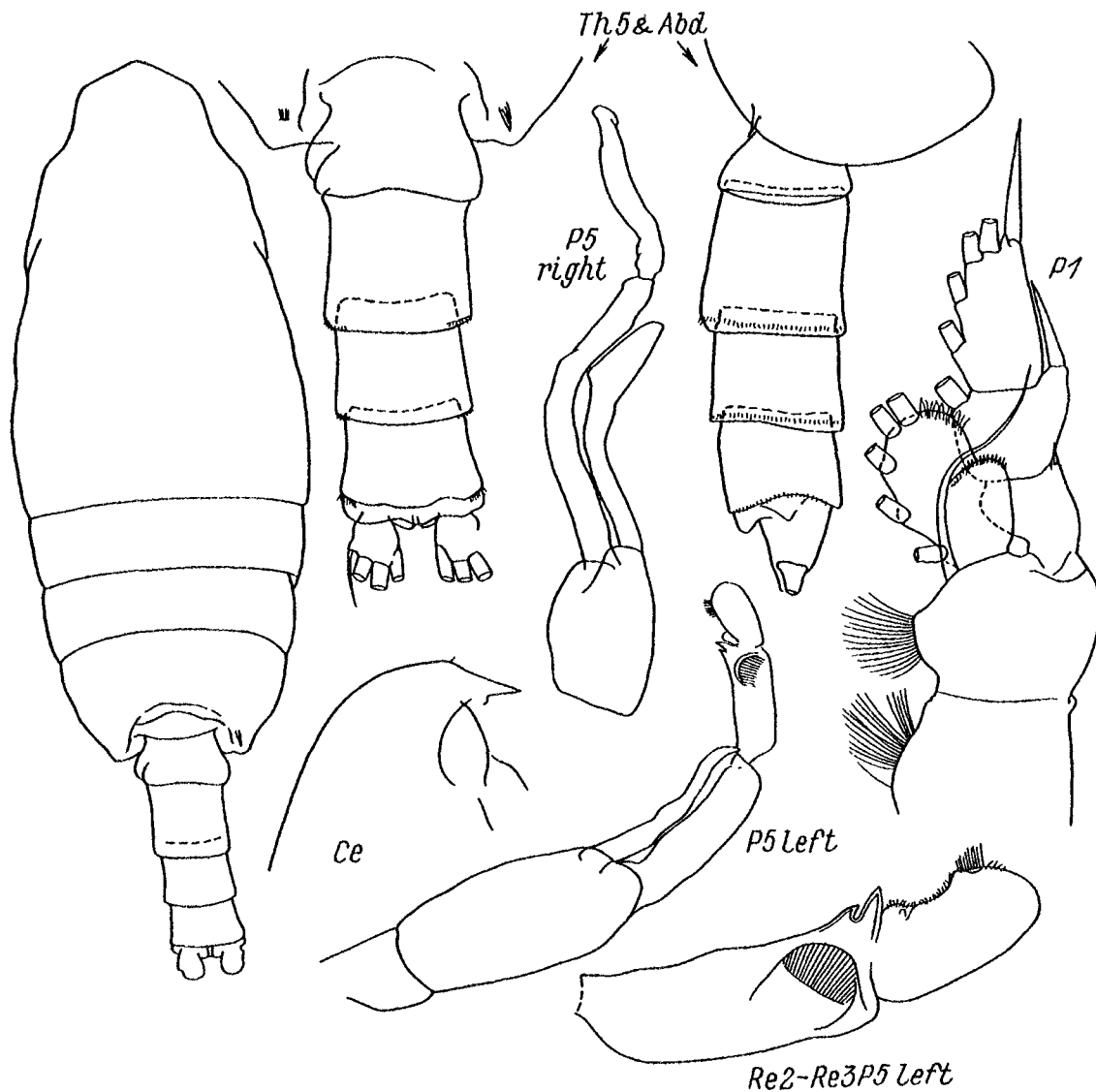


Fig. 220. *Pseudochirella mawsoni*. Male (366).

(Bradford & Jillett, 1980); Indian Ocean: in the region of 45°S (Vervoort, 1957).

Vertical distribution. Mesopelagic species found in hauls from 750-550 and 750-1000 m (Vervoort, 1957), 0-183 and 0-366 m (Bjornberg, 1973), 0-313 m (Park, 1978), 0-500 m (Grice & Hulsemann, 1968), and also in total hauls from depths of 3700 m.

Material: 271 females and 39 males from samples: 266-272, 274-276, 280, 283, 285, 287, 289-290, 298-299, 302-305, 307, 314-317, 319-324, 329-330, 332-334, 338-343, 345-349, 353-354, 357-358, 363, 366, 369-371, 373, 376, 382, 384, 431, 435-436, 447, 453.

16. *Pseudochirella notacantha* (Sars, 1905)

(Figs. 221-222)

Gaidius notacanthus Sars, 1905a: 9.

Pseudochirella notacantha: Sars, 1924-25: 86, pl. 24, figs 7-12; Farran, 1929: 323, Sewell, 1929: 128; Jespersen, 1934: 66; Hardy & Gunther, 1935: 159, Sewell, 1947: 98, text-fig. 21d; Vervoort, 1952g (sheet 48): 3, fig. 2, 1963: 151; Markhaseva, 1989: 37, figs 7 (B 23), 8 (6a, b).

Chirundina parvispina With, 1915: 151, pl. 8, fig. a, textfigs 42 (a-g), 43 (a-h).

Pseudochirella squalida Grice & Hulsemann, 1967: 24,

figs 65-70, 1968: 324; Bjornberg, 1973: 325; Deevey & Brooks, 1977: 263; Bradford & Jillett, 1980: 71, fig. 50; Ferrari, 1980: 537, figs 1-4.

non *Gaidius notacanthus*: Farran, 1908: 10, 33, pl. 3, fig. 7; Scott, 1909: 52, pl. 21, figs 24-33.

non *Churundina notacantha*: With, 1915: 148, pl 5, fig. 7, pl. 6, fig. 1, text-fig. 41.

non *Pseudochirella notacantha*: Vervoort, 1957: 67, figs. 49-53.

Description. Female. Total length 5.45-6.80 mm. Cephalothorax 3.7-4.2 times longer than abdomen. Th5 posterior corners symmetrical, rounded. Genital segment asymmetrical, with moderate knob-like projections on the left and right, of variable shape. Abd1-3 covered with hairs. A1 as long as cephalothorax — reaching caudal rami. Re1 A2 with 1 very small seta; Re2 A2 with 1 distal seta. Ri1 A2 with 2 setae; Ri1 Md with 2 (?) setae; Ri2 Md with 9 long terminal and 2 posterior setae. Mx1, Mx2 and Mxp typical of the genus. Re P1 unclearly 3-jointed. Ri P2 indistinctly 2-jointed. P4 coxopodite with 6-9 spines.

Male. Total length 4.90-5.80 mm. Cephalon and Th1, as well as Th4-Th5 fused (Sars (1925) recorded the separation of joints). Th5 posterior corners with spines. Cephalothorax about 3 times longer than abdomen. Oral parts reduced in comparison with those in female. Re1 P1 with very small external spine. Ri P2 virtually 2-jointed. Spines on P4 coxopodite absent. Re2 P5 with 3 teeth in distal part of joint. Re3 P5 with rounded top.

Type locality: North-eastern Atlantic.

Geographical distribution. Atlantic Ocean: northern part (Sars, 1925; Deevey & Brooks, 1977; Ferrari, 1980), the species is distributed to the North to 62°N (With, 1915; Jespersen, 1934). Pacific Ocean: it was found in the southern part only; in south-eastern part the southernmost findings were in the region of 62-71°S (Hardy & Gunther, 1935; Farran, 1929; Bjornberg, 1973; Park, 1978; original data), and in the south-western part (Bradford & Jillett, 1980). Indian Ocean: (Sewell, 1947; Grice & Hulsemann, 1967; original data).

Vertical distribution. Meso-bathypelagic species. In the north-western Atlantic mostly found in hauls between 400 and 1000 m, but also recorded in hauls: 0-200, 200-300, 300-400 and 1425-1839 m (Ferrari, 1980), found in hauls 350-1710 m (Grice & Hulsemann, 1967), in haul from 300 m (Bjornberg, 1973) and also from total hauls from depths 1000-3000 m (Sars, 1925; Bjornberg, 1973; original data).

Material: 58 females and 6 males from samples: 266, 313, 353, 355-360, 362-369, 371, 375, 419, 571.

17. *Pseudochirella obesa* Sars, 1920

(Figs. 223-224)

Pseudochirella obesa Sars, 1920: 6, 1924-25: 94, pl. 24,

figs 1-4; Jespersen, 1934: 66; Owre & Foyo, 1967: 27, 49, figs 131-281; Roe, 1975: 307, fig. 7; Bradford & Jillett, 1980: 71, fig. 48, Von Vaupel Klein, 1984: 52, figs 5 (a), 7 (n), 8 (i, m), 12 (d), 15 (j, k), 16 (i, l, m, n), 17 (d), 18 (c, g, i); Markhaseva, 1989: 39, figs 7 (A 12), 8 (10 b).

Pseudochirella tuberculata Tanaka, 1957b: 195, fig. 56; Tanaka & Omori, 1969b: 166; Grice & Hulsemann, 1967: 15.

Description. Female. Total length 5.00-6.20 mm. Cephalothorax about 4 times longer than abdomen. Th5 posterior corners slightly asymmetrical, rounded, with knob on the right arranged ventrally (lateral view); this part of segment covered with hairs. Genital segment slightly asymmetrical, more prominent on the left than on the right (dorsal view) and covered with hairs. Genital segment slightly wider than long. A1 reaching the end of genital segment. Re1 A2 and Re2 A2 with 1 seta each. Ri1 A2 with 2 setae. Ri1 Md with 2 (according to Von Vaupel Klein (1984) with 3) setae, Ri2 Md with 9 long terminal and 1 short posterior setae (according to Von Vaupel Klein (1984) with 2 setae). Mx1, Mx2 and Mxp typical of the genus. Re P1 3-jointed, separation between Re1 and Re2 incomplete. Ri P2 2-jointed. P4 coxopodite with 7-8 or 7-10 spines.

Male. (Description after Roe (1975) with modifications). Total length 5.76 mm. Cephalothorax about 3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 separated. Th5 posterior corners rounded, without spines. A1 21-jointed, reaching Abd3. Oral parts and their setation reduced in comparison with those in females. Re P1 3-jointed, external spine of Re1 P1 small. Ri P2 1-jointed, but line of fusion poorly visible. P4 coxopodite without spines. Left Re2 P5 with 2 teeth in distal part of joint. Right Re2 P5 with excavation and rounded projection in proximal part of joint.

Type locality: the north-eastern Atlantic, region of the Bay of Biscay.

Geographical distribution. Tropical-boreal species, panoeceanic distributed in tropical and subtropical zones of the World Ocean, also found in boreal zone. The northernmost locality in the region of the Strait of Davis (Jespersen, 1934), the southernmost in the region of the New Zealand (Bradford & Jillett, 1980). The China Sea (original data).

Vertical distribution. More probably mesobathypelagic species. Found in layer 700-1250 m (Roe, 1975), once recorded near surface (original data), known from total hauls from depths 300-4800 m (Sars, 1925; Jespersen, 1934; Tanaka, 1957b; Grice & Hulsemann, 1967; Bradford & Jillett, 1980; original data).

Material: 3 females from samples: 262, 263, 265. Specimens from the collections of the National

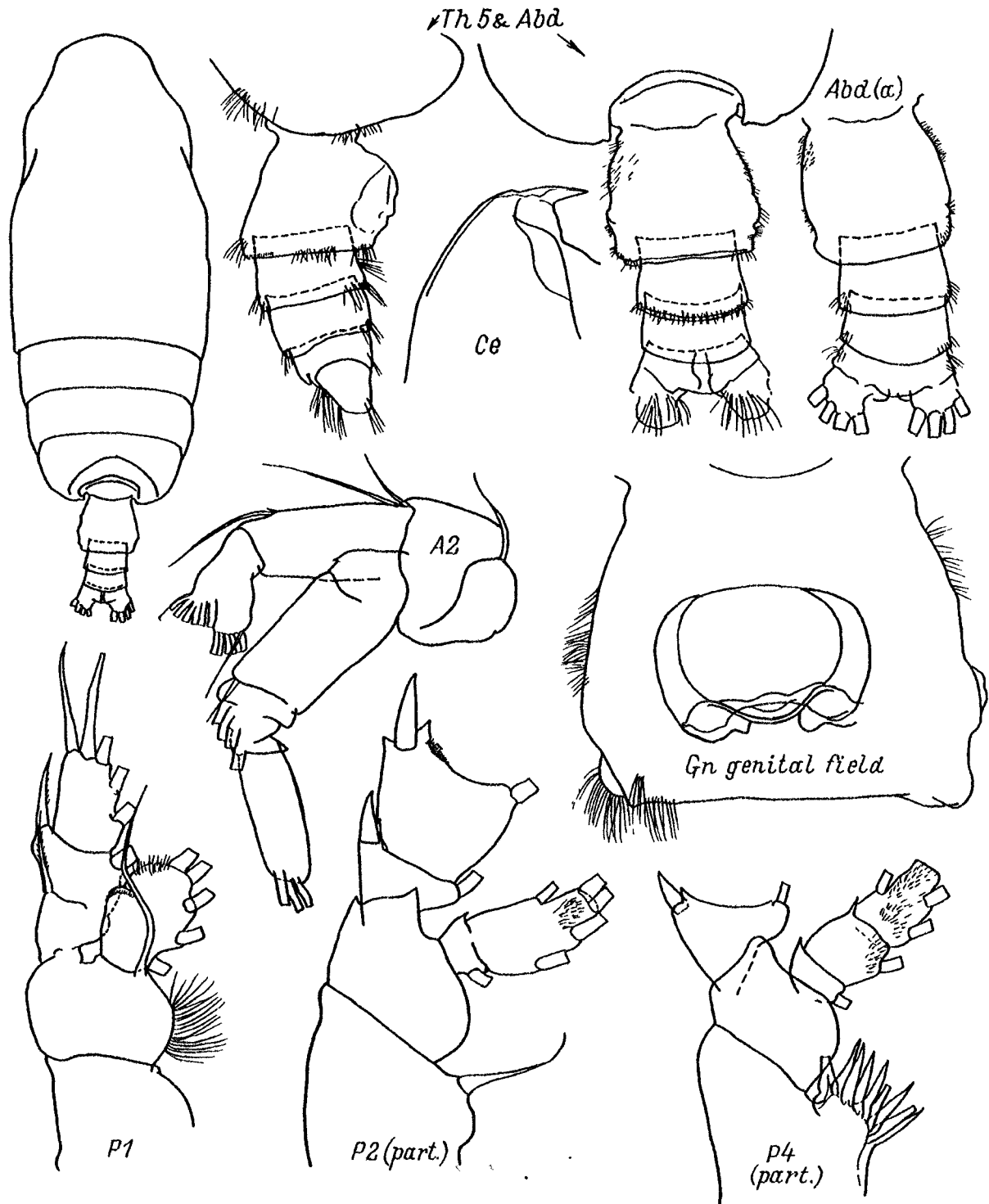


Fig. 221. *Pseudochirella notacantha*. Female: Abd (α) (419), other figures (440).

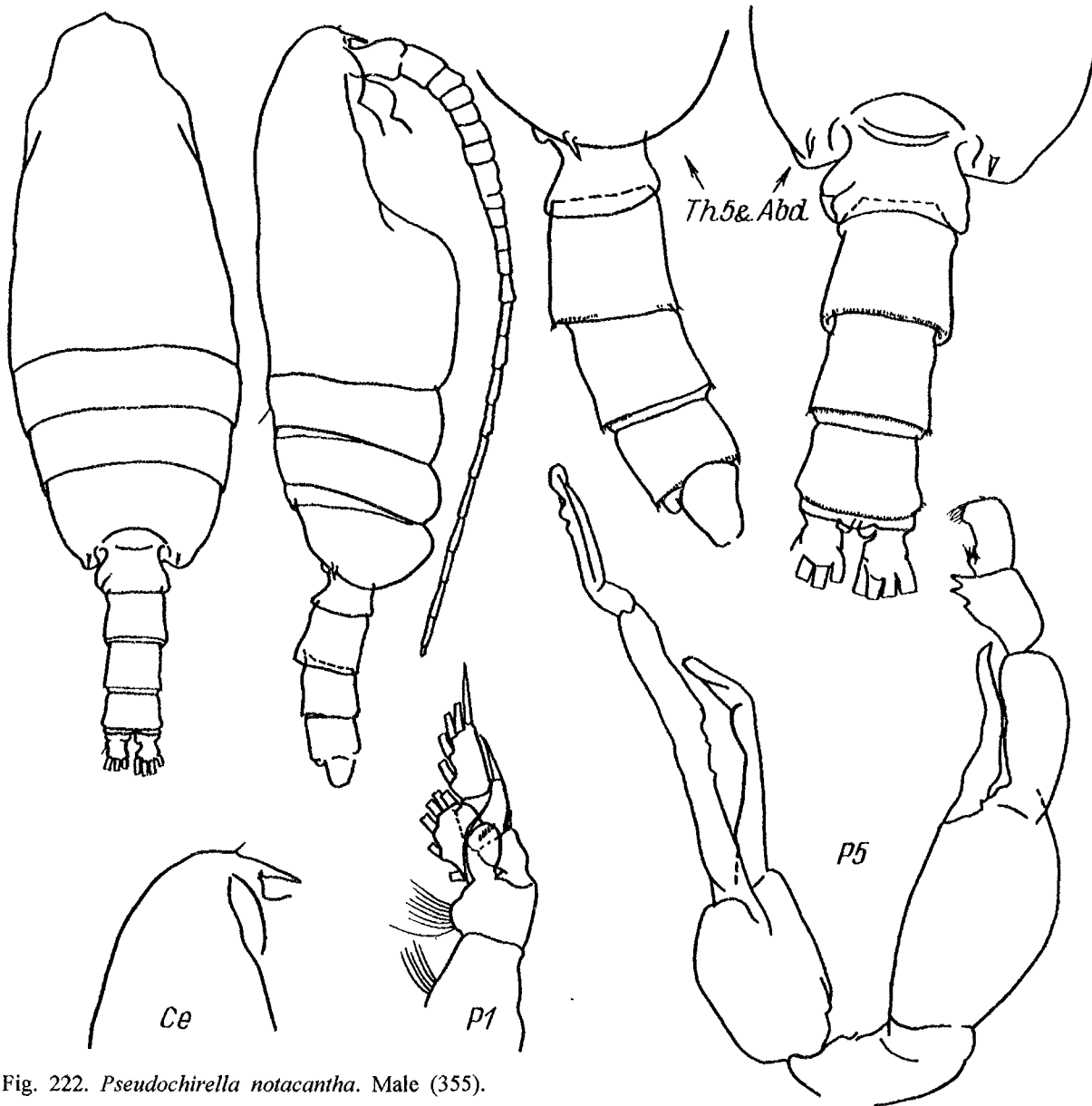


Fig. 222. *Pseudochirella notacantha*. Male (355).

Museum of Natural History (Washington, D.C.) were examined.

18. *Pseudochirella obtusa* (Sars, 1905)

(Figs. 225-226)

Undeuchaeta obtusa Sars, 1905a: 4, 13.

Euchirella obtusa Farran, 1908: 40, pl.11, figs 20-21, pl. 4, figs 1-2.

Pseudochirella obtusa: Sars, 1924-25: 83, pl.24, figs 1-4; Sewell, 1929: 131, fig. 50, 1947: 101; Jespersen, 1934: 65, 131; Davis, 1949: 32, pl. 4, figs 49-53, pl. 5, figs 54-55; Vervoort, 1952g (sheet 48): 3, fig. 3 (a, b, c) (female only), 1963: 150; Grice & Hulsemann, 1967: 15; Bjornberg, 1973: 324; Bradford & Jillett, 1980: 71, fig. 49 (female only); Ferrari, 1980: 543, 545; Von Vaupel Klein, 1984: 52, fig. 17 (d); Roe,

1984: 357; Markhaseva, 1989: 36, fig. 7 (A 4), 8 (9 a, b).

Euchirella dubia (non Sars, 1905): A. Scott, 1909: 60, pl. 14, figs 1-7.

Chirudina abyssalis With, 1915: 147, pl. 5, fig. 5 (a-f), text-fig. 40 (a-c).

Pseudochirella polyspina Brodsky, 1950: 185, fig. 102; Tanaka, 1957b: 194, fig. 55; Tanaka & Omori, 1969b: 169 (female only); Grice & Hulsemann, 1967: 15; Von Vaupel Klein, 1970: 15, fig. 4 (f); Bjornberg, 1973: 324; Deevey & Brooks, 1977: 263; Park, 1978: 169, figs 45-47.

Pseudochirella spinifera Brodsky, 1950: 188, fig. 104; Tanaka & Omori, 1969b: 164, fig. 4.

non *Pseudochirella polyspina* (male only): Tanaka & Omori, 1969b: fig. 2.

non *Pseudochirella obtusa* (male only): Vervoort, 1949: 37, fig. 21 (c), 1952g (sheet 48): 3, fig. 3 (f); Bradford & Jillett, 1980: 71, fig. 48

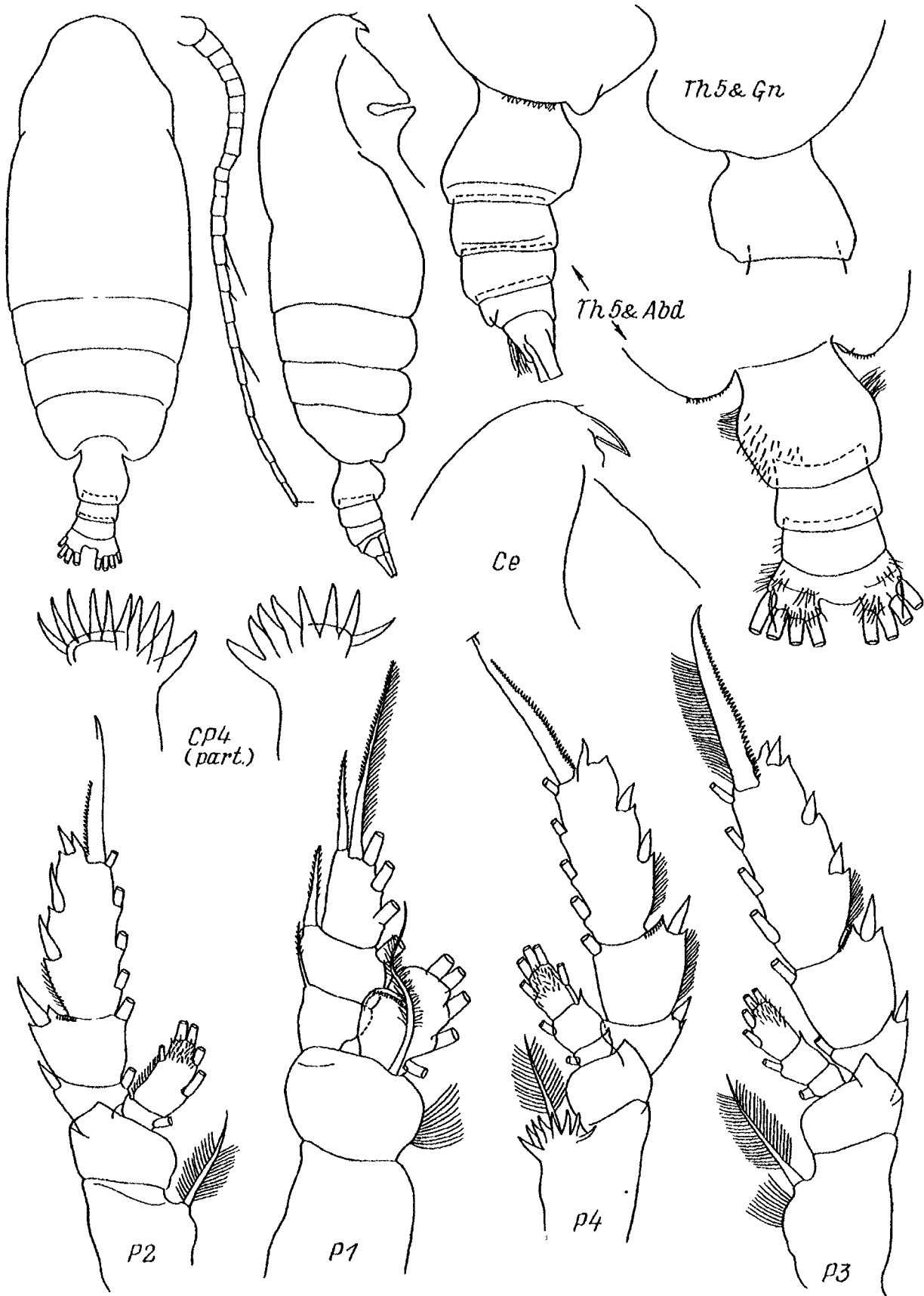


Fig. 223. *Pseudochirella obesa*. Female (263).

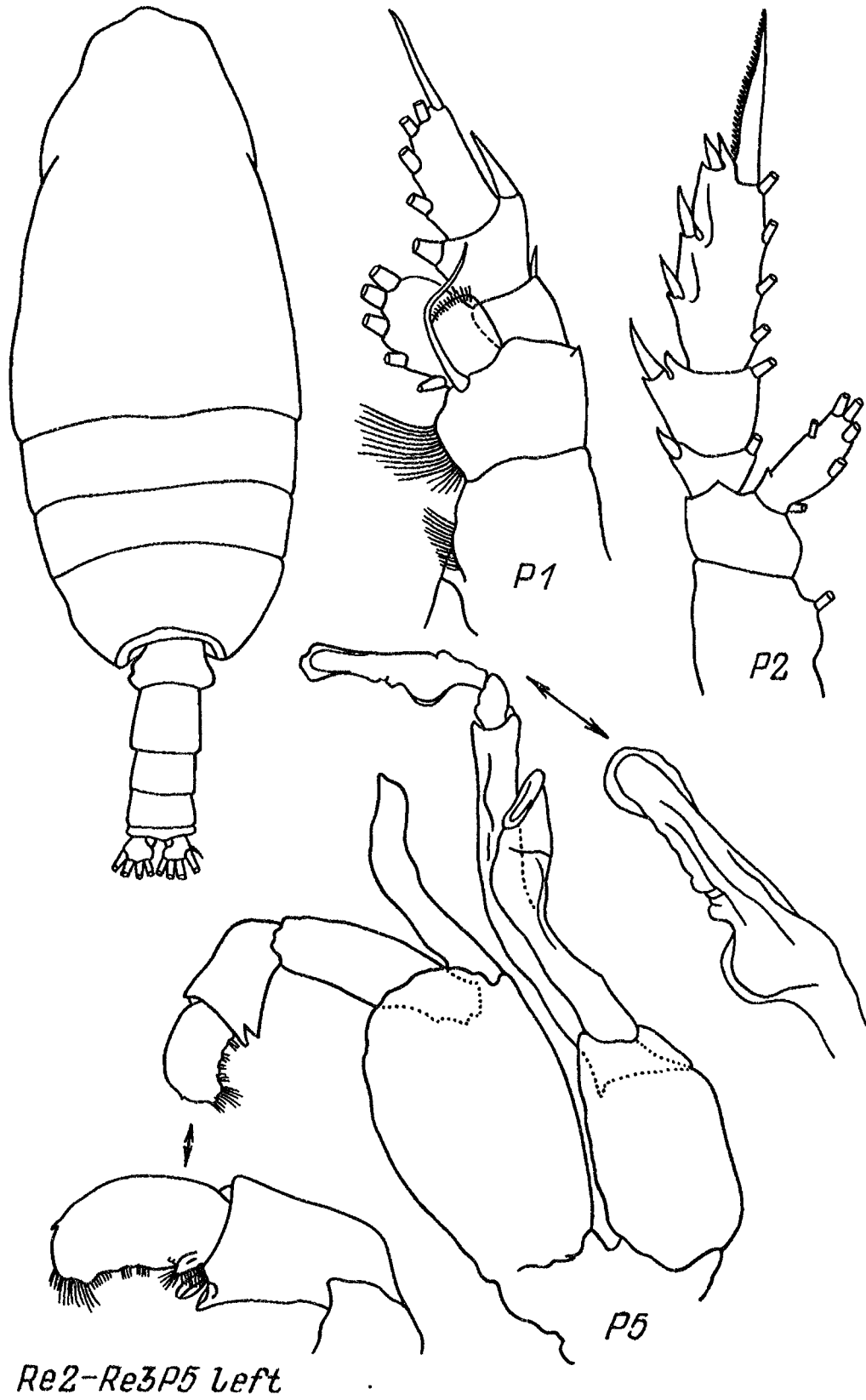


Fig. 224 *Pseudochirella obesa*. Male (from Roe, 1975).

Description Female. Total length 5.25-6.50 mm. Cephalothorax about 3-4 times longer than abdomen. Th5 posterior corners rounded, sometimes covered with hairs, symmetrical. Genital segment barrel shaped; symmetrical; widest in about its mid-length, as long as wide. Abd1-3 are covered with hairs to different degree in different specimens. Length of A1 varying: possibly slightly longer than cephalothorax, or reaching the end of caudal rami. Ri1 A2 with 1 seta, often with 2 setae. Re1 A2 with very small seta arranged on a knob. Re2 A2 with 1 distal seta. Ri1 Md with 2 setae; Ri2 Md with 9 long terminal setae and 2 posterior setae. Re P1 3-jointed with indistinctly separated Re1 and Re2. Ri P2 2-jointed. P4 coxopodite with 8-15 spines.

Male. Total length 4.80-5.50 mm. Cephalothorax slightly less than 3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused (line of fusion sometimes visible dorsally). Th5 posterior corners rounded, with spines removed to the back side of specimen (lateral view). Oral parts with reduced setation. Re P1 3-jointed, Re P1 external spine not exceeding the midlength of Re2 P1. Ri P2 2-jointed. Left Re2 P5 with 2 teeth, left Re3 P5 more than 3 times longer than wide.

Notes. The first description of *P. obtusa* (Sars, 1905) and subsequent redescription (Sars, 1924-1925) are brief and inadequately documented. This misled Brodsky (1950) in his assumption to originate *P. polyspina* from the north-western part of the Pacific Ocean. I have examined *P. polyspina* type series and disclosed that Re P1 of *P. polyspina* is indistinctly 3-jointed, not 2-jointed as considered earlier (Brodsky, 1950). Ri P2 indistinctly 2-jointed and not 1-jointed (Brodsky, 1950). On the basis of these data (the vast material from numerous geographical sites) and the literature (Sars, 1905, 1924-1925; Park, 1978; Bradford & Jillett, 1980) I have come to the conclusion on the identity between *P. obtusa* and *P. polyspina*. It should be pointed out that the figures of male identified by Vervoort (1949) as *P. obtusa* and later adduced in the report on aetideids from New Zealand region (Bradford & Jillett, 1980) should evidently be attributed to the male of *P. dubia* (Sars, 1905). The male described under the name *P. spinifera* Brodsky (1950) and later synonymized with *P. polyspina* (Park, 1978) should probably be considered as a male of *P. obtusa*.

Type locality: North Atlantic.

Geographical distribution. Atlantic Ocean: the species was recorded to the North to 62°N (With, 1915; Jespersen, 1934). Pacific Ocean: to the North up to the Bering Sea (Motoda & Minoda, 1974; original data), to the South down to 67-68°S; circumpolar (Park, 1978; original data).

Vertical distribution. Bathy-mesopelagic species: in hauls basically occurs between 1000 and 2000 m (Grice & Hulsemann, 1967; Deevey & Brooks, 1977; Ferrari, 1980; etc; original data), was found

in large amounts in total hauls from depths from 5000 m (Sars, 1925; Bjornberg, 1973; Park, 1978; Bradford & Jillett, 1980; etc.; original data). There are single findings of the species from epipelagic (Vervoort, 1963; Minoda, 1971).

Material: more than 500 females and 50 males from samples: 5, 18, 20-21, 61, 63, 65, 69-73, 81, 86, 92-94, 102-103, 119-121, 126-128, 132, 134-137, 145-146, 156-163, 171, 173-174, 181, 189-191, 195, 199, 218, 226, 246, 267, 269-273, 275-276, 280, 282-283, 285, 287, 293-297, 300-302, 304, 306, 310, 312, 314, 316-317, 322, 334, 336, 338, 341, 363, 376, 379, 474, 569.

19. *Pseudochirella pacifica* Brodsky, 1950

(Figs. 227-228)

Pseudochirella pacifica Brodsky, 1950: 189, fig. 105; Zvereva, 1976: 201, figs 13-20; Markhaseva, 1989: 40, fig. 7 (B 24); 8 (1 a,b).

Description. Female. Total length 7.00-7.60 mm. Cephalothorax about 4 times longer than abdomen. Th5 posterior corners rounded, right one covered with hairs distally. Genital segment asymmetrical with significant projection on the right densely covered with hairs (dorsal view). Abd1-3 covered with hairs. A1 reaching the midlength of abdomen. Re1 A2 with 1 very small seta; Re2 A2 with the distal seta only. Ri1 A2 with 1 seta. Ri1 Md with 2 setae; Ri2 Md with 9 long terminal setae and 1 posterior seta. Mx1, Mx2, Mxp typical of the genus. Separation between Re1 and Re2 P1 incomplete. Ri P2 incompletely subdivided into 2 joints. P4 coxopodite with 9-10 spines.

Male. Total length about 6 mm. Cephalothorax about 3 times longer than abdomen. Th5 posterior corners with small spines. Left Re2 P5 with 1 tooth distally.

Type locality: the north-western part of the Pacific Ocean, Kamchatka, 90 miles to the south-east off Cape Shipunsky.

Lectotype: male from sample 474.

Geographical distribution. Evidently the species may be characterized as tropical-boreal. Pacific Ocean: often found in the north-western part; in the Sea of Okhotsk, in the region of the Kurile-Kamchatka and Marian trenches (original data).

Vertical distribution. Bathy-abyssopelagic species. In the region of the Kurile-Kamchatka Trench often found in layer 2000-3000 m, however also found in hauls between 1000-2000 m, 3000-4000 and 4000-5000 m (original data).

Material: 23 females and 6 males from samples: 1, 19, 21, 66, 69, 73, 81, 83, 95-96, 121-123, 140, 161, 175, 181, 201.

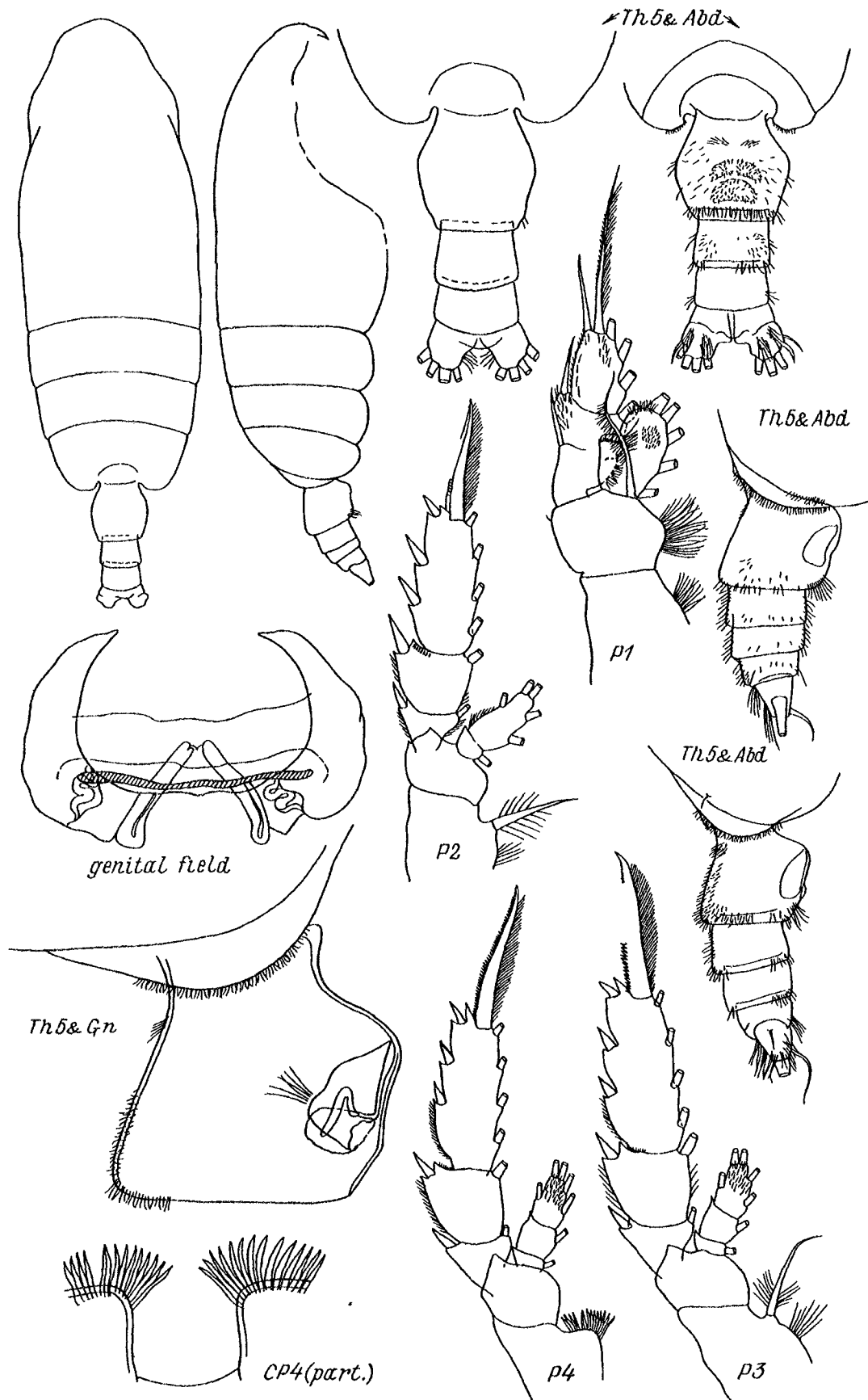


Fig. 225. *Pseudochrella obtusa*. Female (569).

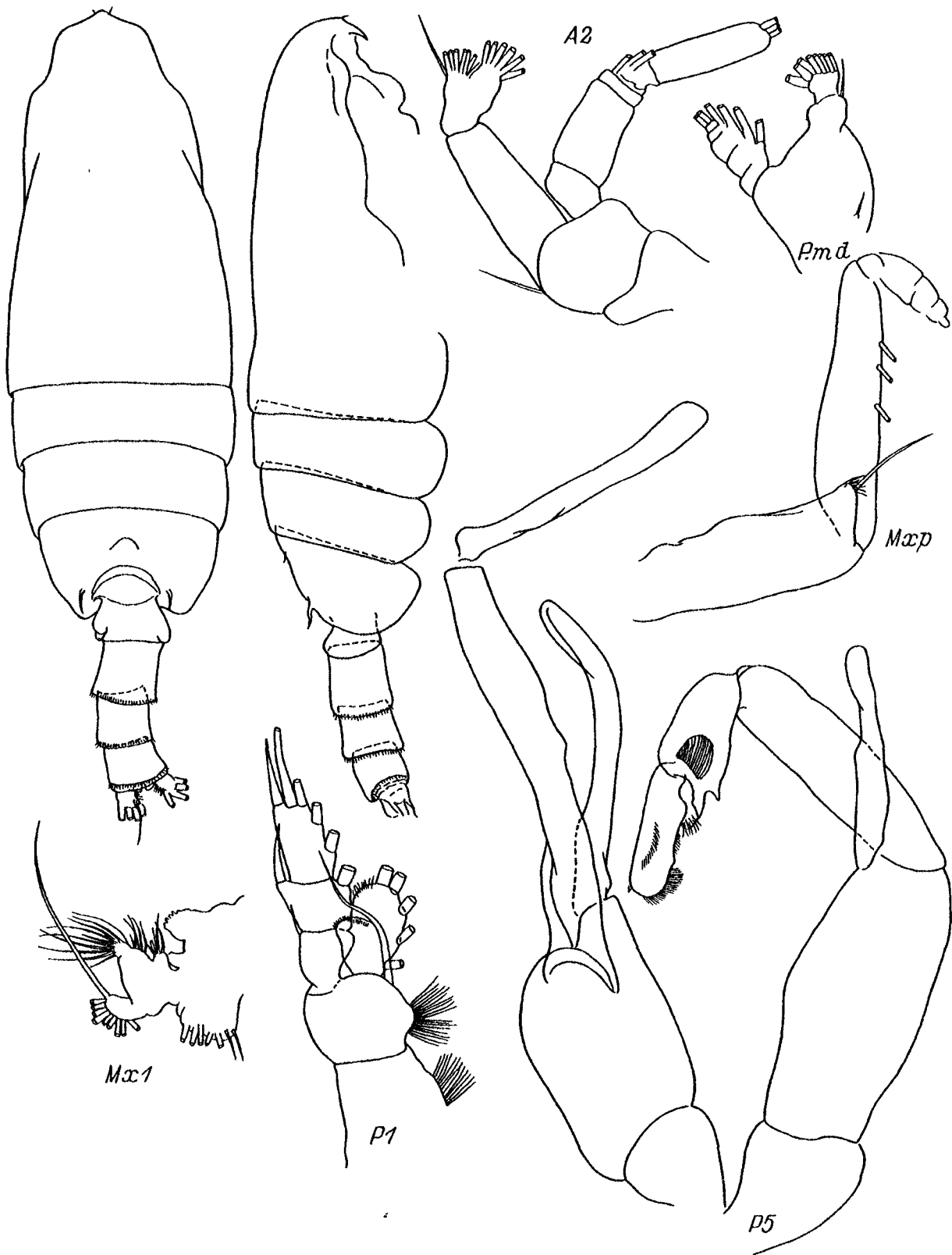


Fig. 226. *Pseudochirella obtusa*. Male (94).

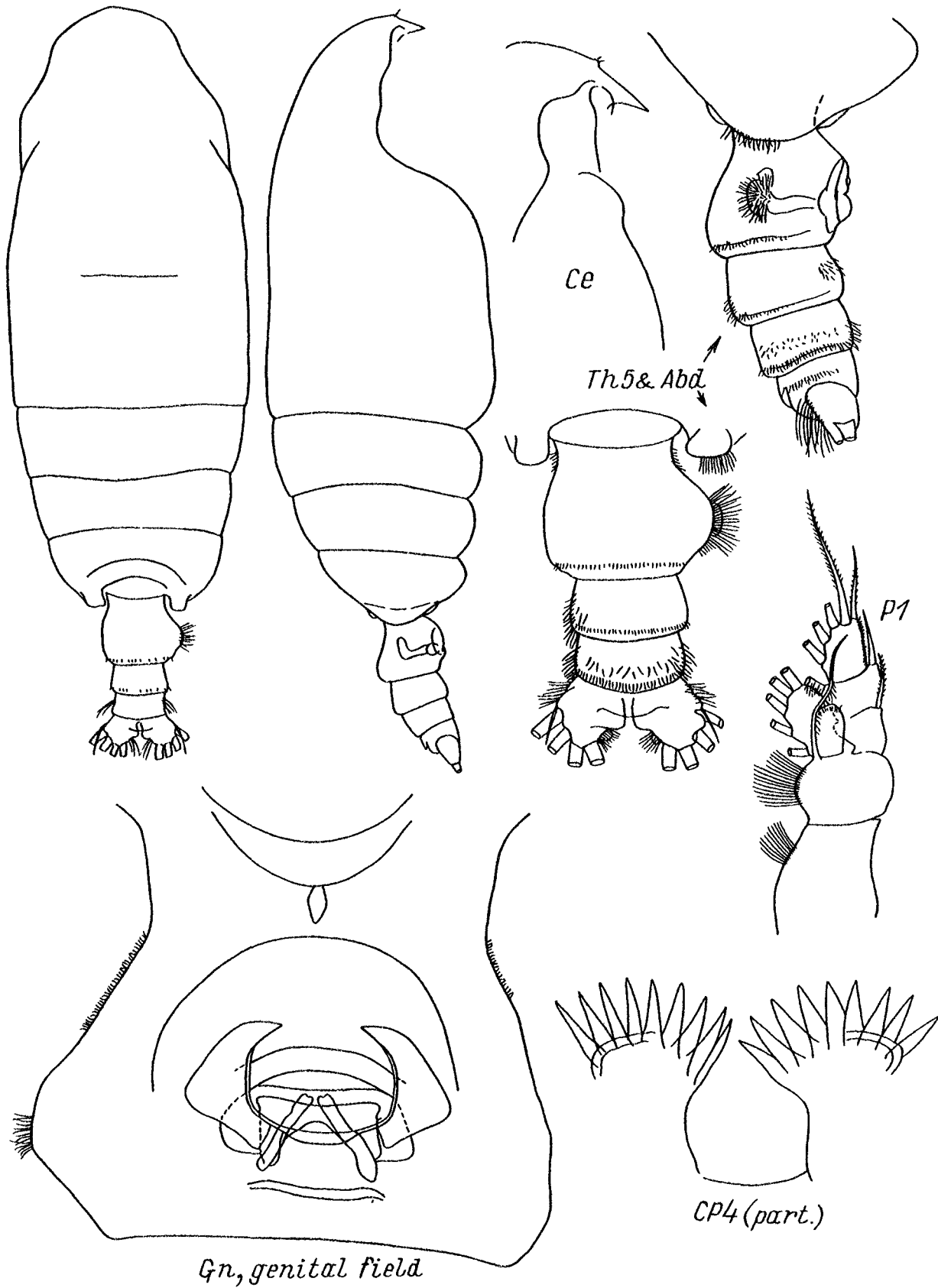


Fig. 227 *Pseudochirella pacifica* Female (1).

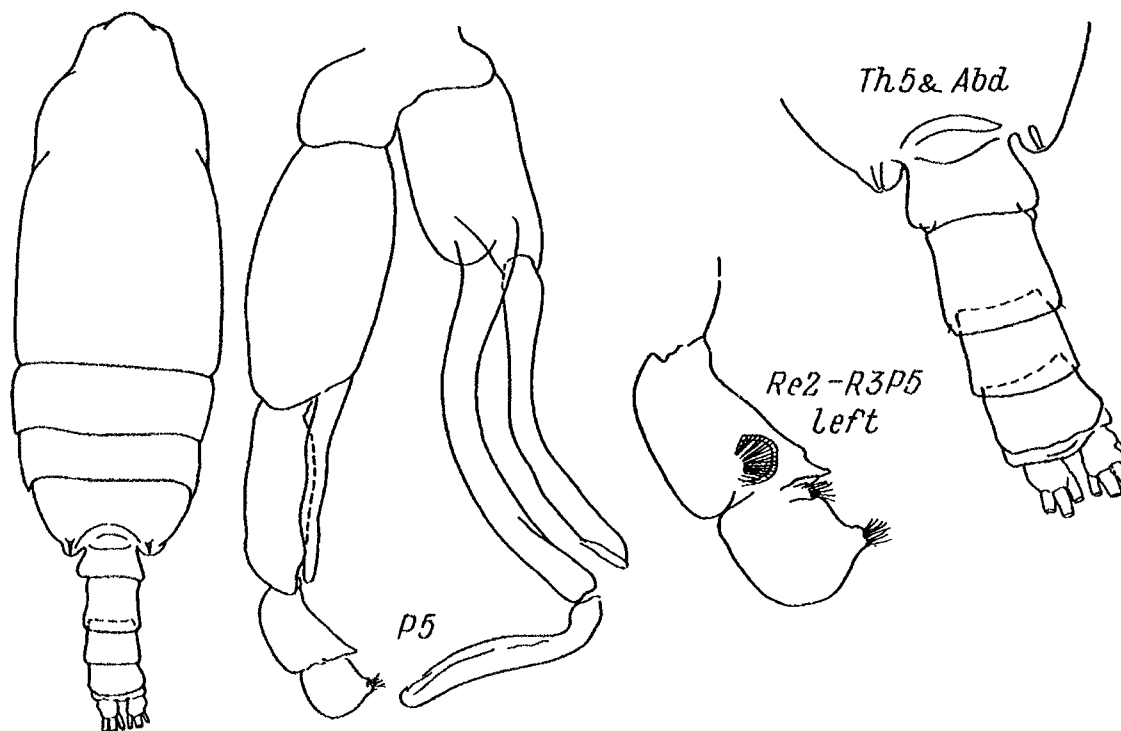


Fig. 228. *Pseudochirella pacifica*. Male (201).

20. *Pseudochirella palliata* (Sars, 1907)

(Fig. 229)

Undeuchaeta palliata Sars, 1907: 11.

Pseudochirella palliata Sars, 1924-25: 92, pl. 25, figs 8-10; Markhaseva, 1989: 39, fig. 7 (A 16).

Description. Female. Total length 5.50-7.20 mm. Cephalothorax about 4 times longer than abdomen. Th5 posterior corners prolonged into lobes, ending with short spine, slightly asymmetrical (dorsal and lateral view). Genital segment slightly asymmetrical; lateral swelling on the right slightly more prominent than that on the left (dorsal view); segment is widest in its second third. A1 slightly longer than cephalothorax, reaching the end of genital segment. Re1 A2 without setae; Re2 A2 with the distal seta only. Ri1 Md with 1 seta. Ri2 Md with 9 terminal setae and 2 posterior setae. Mx1 third internal lobe with 4 setae and appendage. Mx2, Mxp typical of the genus. Re P1 3-jointed; Re1 and Re2 incompletely separated. Ri P2 2-jointed. P4 coxopodite with 13 spines.

Male unknown.

Type locality: 36°17'N 28°53'W.

Geographical distribution. Atlantic Ocean: North Atlantic (Sars, 1925). Pacific Ocean: in the region of the Kurile-Kamchatka Trench (Markhaseva, 1989).

Vertical distribution. Evidently abyssopelagic species: in the Atlantic Ocean known from total

haul from 3000 m (Sars, 1925) and from abyssal depths: 4000-5000 m from the region of the Kurile-Kamchatka Trench (original data).

Material: 1 female from sample 124.

21. *Pseudochirella pustulifera* (Sars, 1905)

(Figs. 230-231)

Undeuchaeta pustulifera Sars, 1905: 14.

Chirundina pustulifera: With, 1915: 145, text-fig. 39, pl. 5, fig. 6.

Pseudochirella pustulifera: Sars, 1924-25: 85, pl. 24, figs 5-6; Jespersen, 1934: 65; Grice & Hulsemann, 1967: 15, 1968: 324; Bjornberg, 1973: 325; Deevey & Brooks, 1977: 263; Park, 1978: 165, figs 43-44; Ferrari, 1980: 545; Markhaseva, 1989: 40, fig. 7 (B 22), 8 (11 b).

Euchirella wolfendeni Farran, 1908: 38, pl. 2, figs 18-19, pl. 4, fig. 3.

non *Chirundina pustulifera*: Wilson, 1932: 49, fig. 30 (a-c) (male).

non *Pseudochirella pustulifera*: Tanaka, 1957b: 192, fig. 54; Tanaka & Omori, 1969b: 162, fig. 3.

Description. Female. Total length 6.60-7.40 mm. Cephalothorax 4.0-4.6 times longer than abdomen. Th5 posterior corners symmetrical and rounded. Genital segment asymmetrical, projection on the right is more prominent than on the left, projections arranged in the midlength of the segment

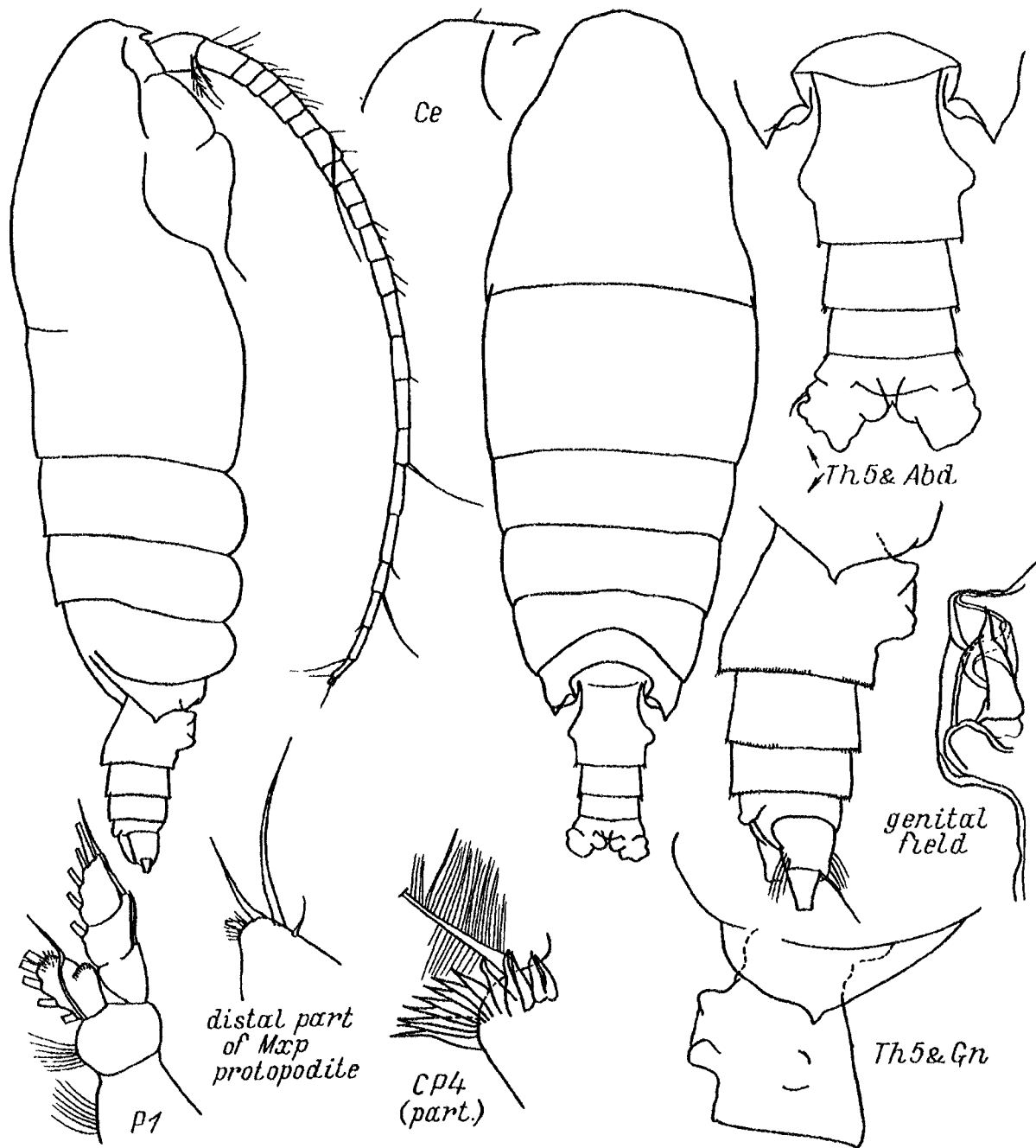


Fig. 229. *Pseudochirella palliata*. Female (124).

(dorsal view). Shape of projections variable. A1 as long as body. Re1 A2 with small seta arranged on the small knob; Re2 A2 with 1 seta distally. Ri1 A2 with 1 seta. Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 2 posterior setae. Mx1 second internal lobe with 4 setae and minute appendage. Mx2, Mxp typical of the genus. Re P1 3-jointed. Separation between Re1 and Re2 P1 incomplete. Separation of Ri P2 joints is also indistinct. P4 coxopodite with 6-9 (after With (1915) with 11) spines.

M a l e. Total length 6.20-6.50 mm. Cephalothorax about 3 times longer than abdomen. Cephalon

and Th1 as well as Th4-Th5 fused. Th5 posterior corners rounded, spines absent. Oral parts reduced in comparison with those in females. A1 reaching the distal end of Abd3. Re P1 3-jointed. Re1 P1 external spine exceeding the midlength of Re2 P1 (after Park (1978) it is significantly shorter). P4 coxopodite without setae and spines. Left Re2 P5 with 2 teeth distally.

Type locality: North Atlantic.

Geographical distribution. The species may be characterized as antitropical; found in antarctic, subantarctic, boreal and also subtropical zones of

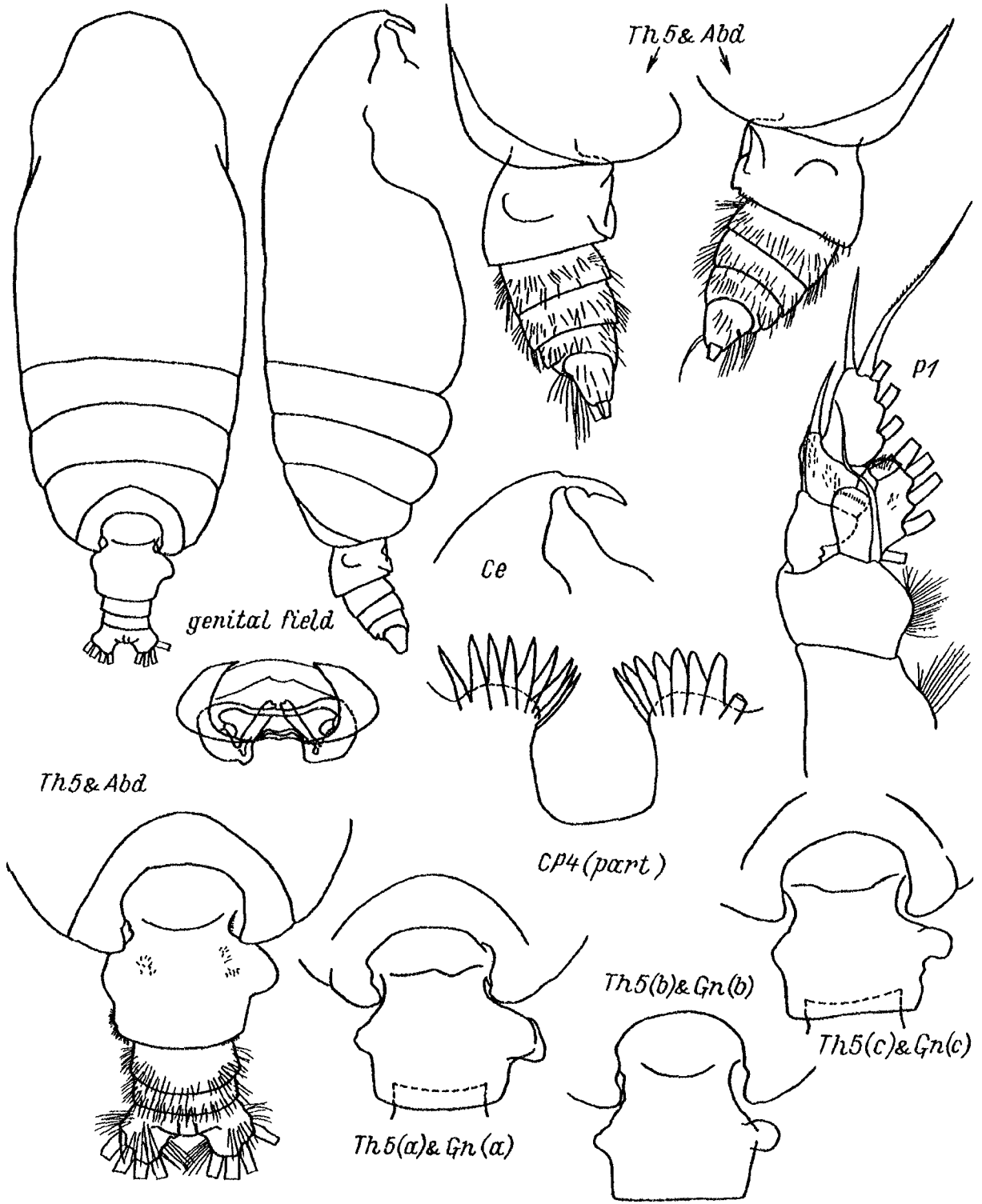


Fig. 230. *Pseudocharella pustulifera*. Female: Th5 (a-c) & Abd (a-c) (267), other figures (447).

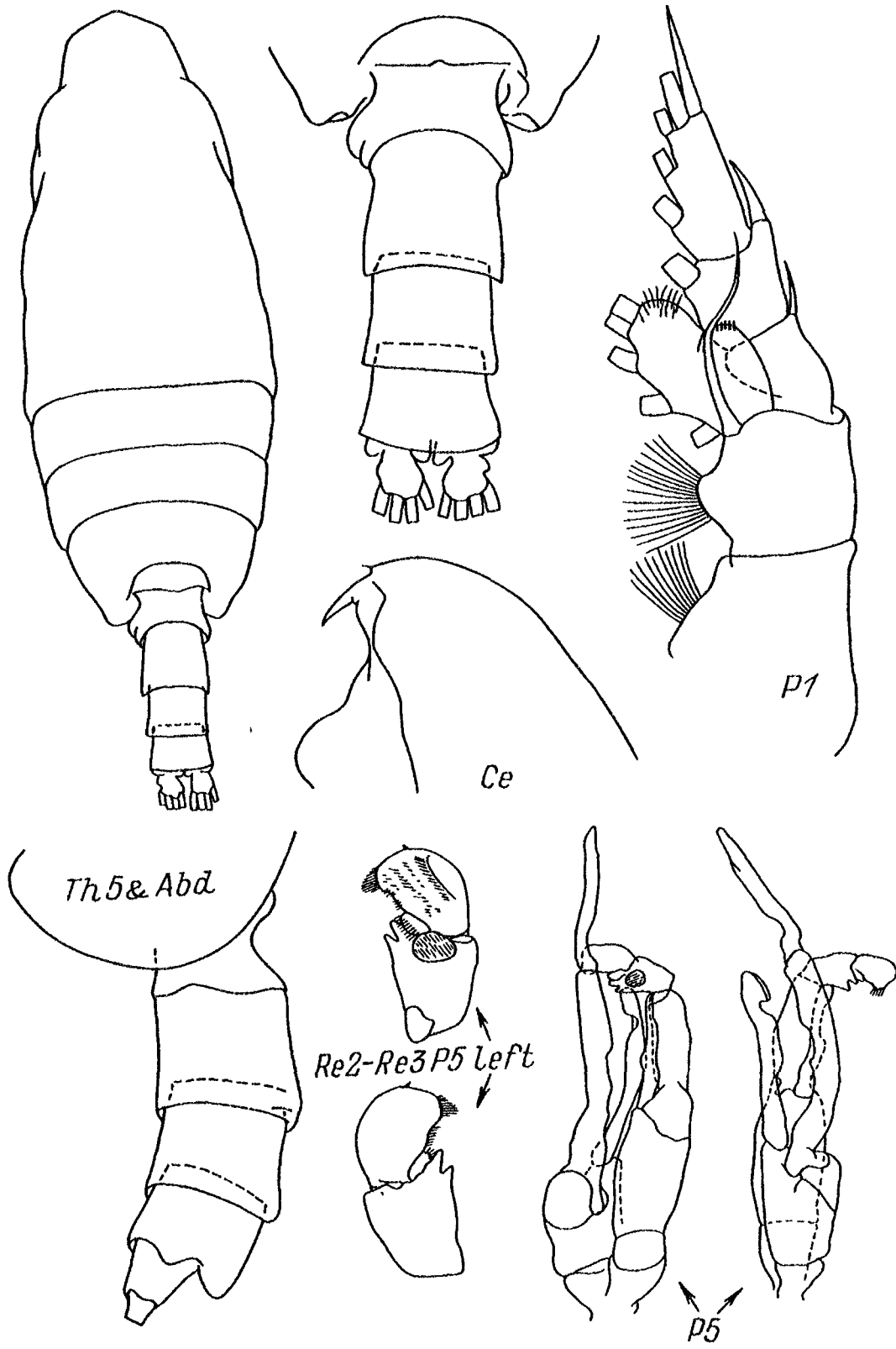


Fig. 231. *Pseudocharella pustulifera*. Male: P5 (from Park, 1978), other figures (271).

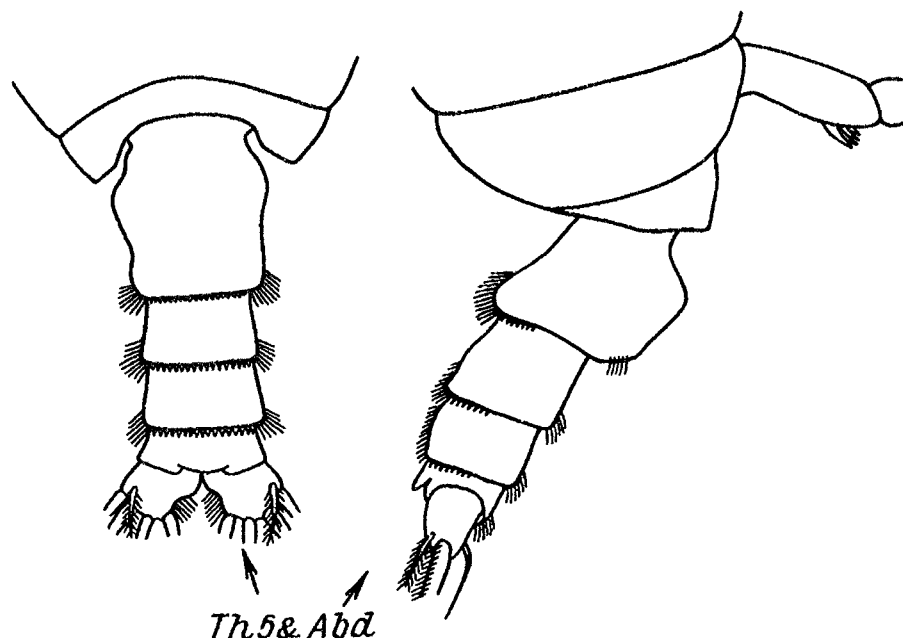


Fig. 232. *Pseudochirella scopularis*. Female (from Vervoort, 1949).

the World Ocean, but not recorded from the tropics. The species is common in the boreal Atlantic (Farran, 1908; With, 1915; Sars, 1925; Jespersen, 1934; Deevey & Brooks, 1977; Ferrari, 1980) and south-eastern part of the Pacific Ocean (Grice & Hulsemann, 1968; Bjornberg, 1973). The northernmost finding: in the Norwegian Sea (Østvedt, 1955).

Vertical distribution. Bathy-mesopelagic species, was found from meso- (Ferrari, 1980) and bathypelagic (Deevey & Brooks, 1977; Ferrari, 1980) and meso-bathypelagic (Grice & Hulsemann, 1967), recorded once from epipelagic (Park, 1978). Found in total hauls from depths 1000 to 5700 m (Sars, 1925; original data).

Material: 16 females and 1 male from samples: 267, 271, 300, 302, 314, 336, 348, 376, 447.

22. *Pseudochirella scopularis* (Sars, 1905)

(Fig. 232)

Undeuchaeta scopularis Sars, 1905: 14-15.

Pseudochirella scopularis Sars, 1924-25: 90, pl. 25, figs 1-4; Vervoort, 1949: 46, fig. 21 (a-b); Ferrari, 1980: 543, 545; Markhaseva, 1989: 39, fig. 7 (A 14).

Description. Female. (Description after Vervoort (1949) and Sars (1925) with modifications). Total length 5.00-6.40 mm. Cephalothorax 3.5-4.0 times longer than abdomen. Th5 posterior corners prolonged into triangular lobes, ending with acute

corners (Sars, 1925), or their tops are not pointed (Vervoort, 1949). Genital segment slightly asymmetrical and covered with hairs in its posterior part. Genital segment the widest in its first half. A1 reaching the midlength of abdomen (Sars, 1925), reaching the end of abdomen (Vervoort, 1949). According to Vervoort (1949) oral parts and swimming legs are as in *P. obtusa*. Ri P2 indistinctly 2-jointed. P4 coxopodite with 9 spines.

Male unknown.

Type locality: 46°N 7°09'W.

Geographical distribution: Atlantic Ocean: the north-eastern and north-western Atlantic (Sars, 1925; Ferrari, 1980). The Molluccan Sea (Vervoort, 1949).

Vertical distribution. The species is known from haul 500-600 m (Ferrari, 1980), also from total hauls from depths 3000 m (Sars, 1925).

The species was not examined by me.

23. *Pseudochirella spectabilis* (Sars, 1900)

(Figs. 233-235)

Undeuchaeta spectabilis Sars, 1900: 59, pl. 15, 16.

Pseudochirella spectabilis: Brodsky, 1950: 185, fig. 103; Markhaseva, 1989: 38, fig. 7 (A 6).

Euchirella elongata Wolfenden, 1905: 19, pl. 6, figs 12-13, 1911: 239, text-fig. 25, pl. 28, fig. 6.

Pseudochirella elongata: Vervoort, 1957: 69; Park, 1978: 159, figs 37-40; Markhaseva, 1984: 512, figs 1-2; 1989: 39, fig. 7 (B 18); 8 (2 a, b).

Description F e m a l e. Total length 7.17, about 8 mm. Cephalothorax 3.4-4.5 times longer than abdomen. Th5 posterior corners prolonged into asymmetrical lobes ending with small spine. Genital segment asymmetrical, widened more in its posterior half; projection on the right is more developed than that on the left, varying in shape. A1 as long as cephalothorax, or reaching the mid-length of abdomen. Re1 A2 without setae, Re2 A2 with the distal setae only. Ri1 A2 with 1 seta. Ri1 Md with 2 setae, Ri2 Md with 9 terminal and 2 posterior setae. Mx1 third internal lobe with 4 setae and sensory appendage. Mx2, Mxp typical of the genus. Re P1 3-jointed, separation between Re1 and Re2 incomplete. Ri P2 2-jointed. P4 coxopodite with 8-12 spines, weaker on the left leg than on the right.

M a l e. Total length 6.00-6.66 mm. Cephalothorax about 3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Th5 posterior corners with small spine. A1 reaching the middle length of abdomen. Oral parts reduced in comparison with those in females. Re P1 3-jointed. Re1 P1 external spine shorter than in female. P5 powerful, configuration of joints changing in dependence of position of leg.

Notes. Sars (Sars, 1900) never recorded the asymmetry of Th5 posterior corners and genital segment. However, the studied type specimen of *Undeuchaeta spectabilis* Sars, 1900 (F 2449 deposited in the Zoological Museum of Oslo University) possesses genital segment and Th5 asymmetrical and identical in structure to that in *P. elongata* (Wolfenden, 1905). Thus my previous assumption concerning the identity between *P. elongata* (Wolfenden, 1905) and *P. spectabilis* (Sars, 1900) was confirmed, and the former species should be considered the junior synonym of *P. spectabilis* (Sars, 1900).

Type locality: central part of the Arctic Basin (in the region off 84°N).

Geographical distribution. Bipolar species, distributed circumpolar in Arctic, Antarctic and Subantarctic (Sars, 1900; Wolfenden, 1905, 1911; Brodsky, 1950; Brodsky & Nikitin, 1955; Vervoort, 1957; Minoda, 1967; Park, 1978; Markhaseva, 1989). The species was found in the Bering Sea (Minoda, 1971; Motoda & Minoda, 1974), it is most likely that this finding is actually *P. accepta*.

Vertical distribution. Probably mesopelagic species, single findings are known from epipelagial (Sars, 1900; Bjornberg, 1973; original data) In epipelagial of the Arctic Basin under the T 1.6°C (original data). Recorded in hauls between 500 and 750 m (Vervoort, 1957), 200-750 m and 750-bottom (original data), also in total hauls from depths 3000 m (Wolfenden, 1911; Park, 1978).

Material 103 females and 6 males from samples: 267, 270-272, 276, 278, 281-283, 285, 289, 291, 293, 296-297, 302, 304, 306, 335-338, 344, 376,

378-379, 393, 429, 470, 483, 487, 490, 492, 500-501, 507, 524, 544-545, 547, 554.

24. *Pseudochirella spinosa* (Wolfenden, 1911)

(Fig. 236)

Euchirella spinosa Wolfenden, 1911. 235, taf 27, figs 3-7
Pseudochirella spinosa Markhaseva, 1989 38, fig 7 (A3)

Description. F e m a l e. (Description after Wolfenden (1911) with modifications). Total length 6.20 mm. Cephalothorax 4 times longer than abdomen. Th5 posterior corners prolonged into straight spines reaching about the midlength of genital segment (dorsal view). A1 shorter than body. Ri1 A2 with 1 seta; Re2 A2 without medial seta. Re P1 3-jointed. Ri P2 2-jointed. P4 coxopodite with 13 spines.

Male unknown.

Type locality the Atlantic Ocean between 28°S 20°W and 18°N 30°W.

Geographical distribution Species is known of type locality only.

Vertical distribution: found in total hauls from 1200 and 3000 m (Wolfenden, 1911).

25. *Pseudochirella tanakai* Markhaseva, 1989

(Fig. 237)

Pseudochirella tanakai Markhaseva, 1989 34, figs 3, 7 (A 13).

Pseudochirella pustulifera (non Sars, 1905) Tanaka, 1957b: 192, fig 54, Tanaka & Omori, 1969b 162, fig 3

Description. F e m a l e. Total length 5.70-6.45 mm. Cephalothorax about 3.8-4.4 times longer than abdomen. Th5 posterior corners rounded and symmetrical. Genital segment with projections on the right and left, slightly asymmetrical, forming type of shoulders of the segment. A1 reaching nearly the midlength of abdomen, or about as long as body. Re1 A2 with 1 small seta; Re2 A2 with 1 distal seta. Ri1 A2 with 1 seta Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 1 posterior setae. Mx1, Mx2, Mxp typical of the genus. Re P1 incompletely 3-jointed. P2 indistinctly 2-jointed. P4 coxopodite with 4-7 spines.

M a l e. (Description after Tanaka & Omori (1969b) with modifications). Total length 5.51 mm. Cephalothorax about 3 times longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Th5 posterior corners rounded, spines absent. A1 reaching distal border of Abd2. Re A2 as long as Ri A2

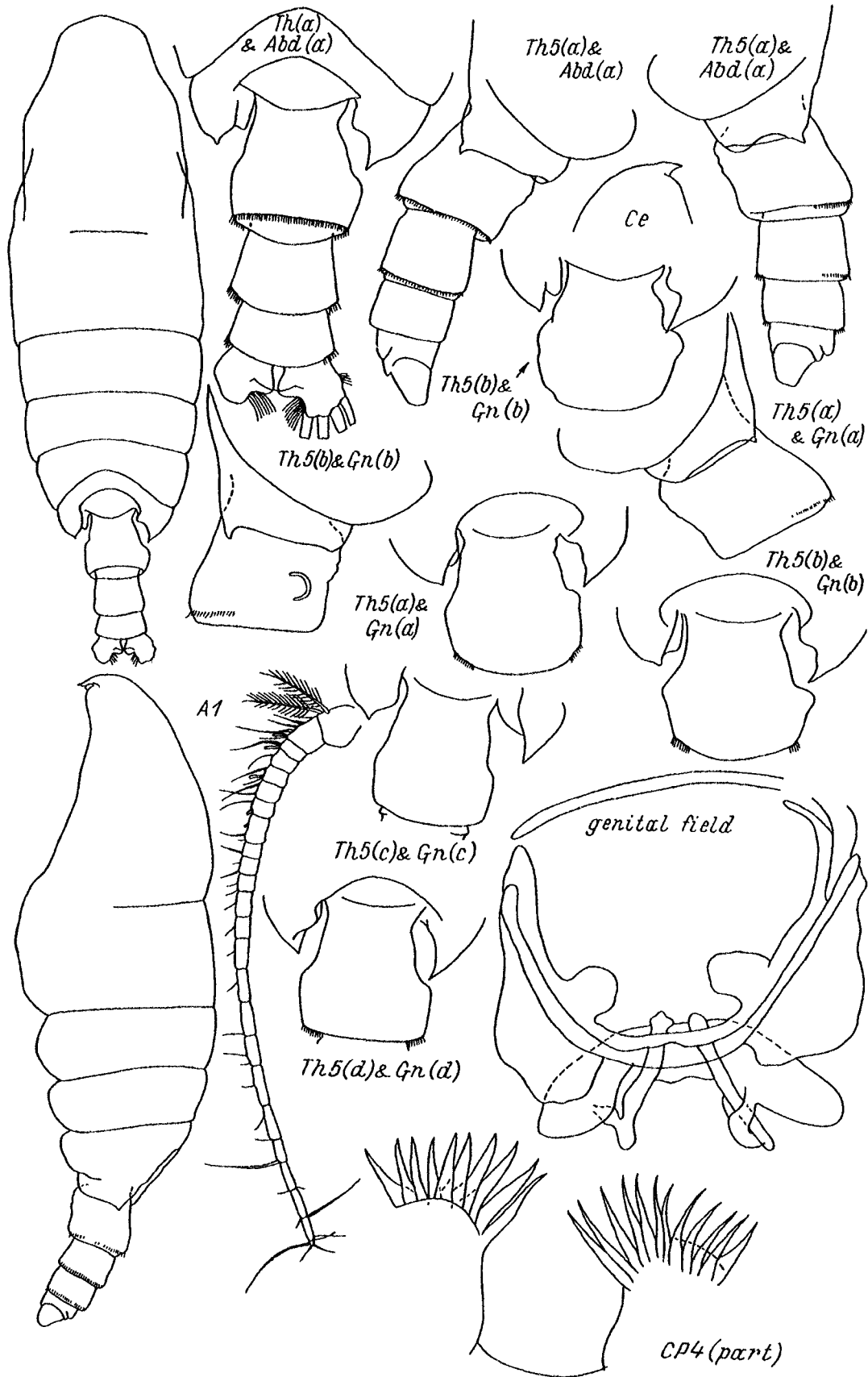


Fig. 233. *Pseudochirella spectabilis*. Female: general view, Th5 (a) & Abd (a), A1, Gn (specimens from the Central part of Arctic Basin), Th5 & Gn (A & B different specimens), P4 coxopodite (393), Th5 (b) & Gn (b) (429), Th5 (c) & Gn (c) (500), Th5 (d) & Gn (d) (501).

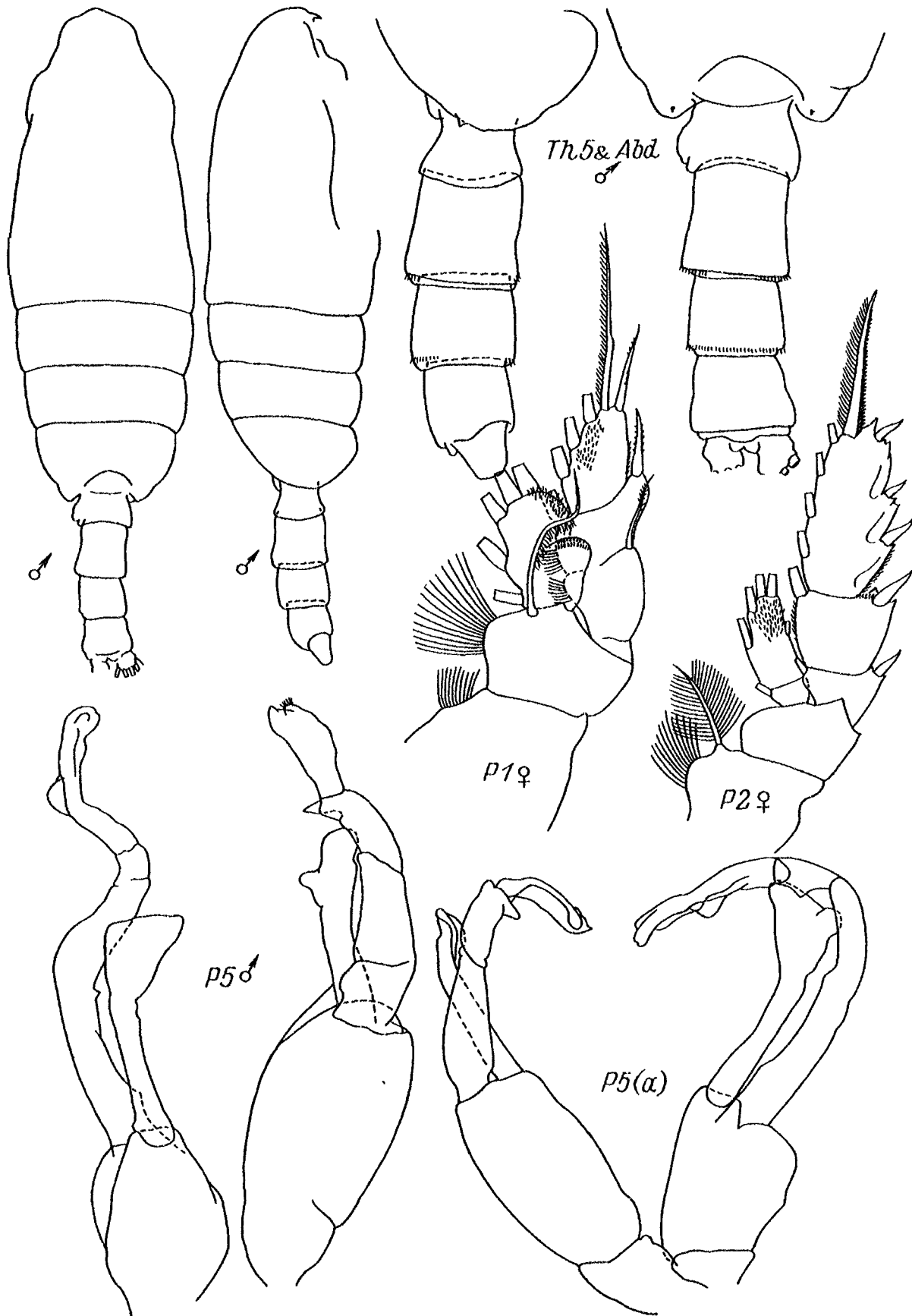


Fig. 234. *Pseudochirella spectabilis*. Female: P1, P2 (after the specimens from the central part of the Arctic Basin). Male: general view, Th5 & Abd (507), P5 & P5 (a) (490).

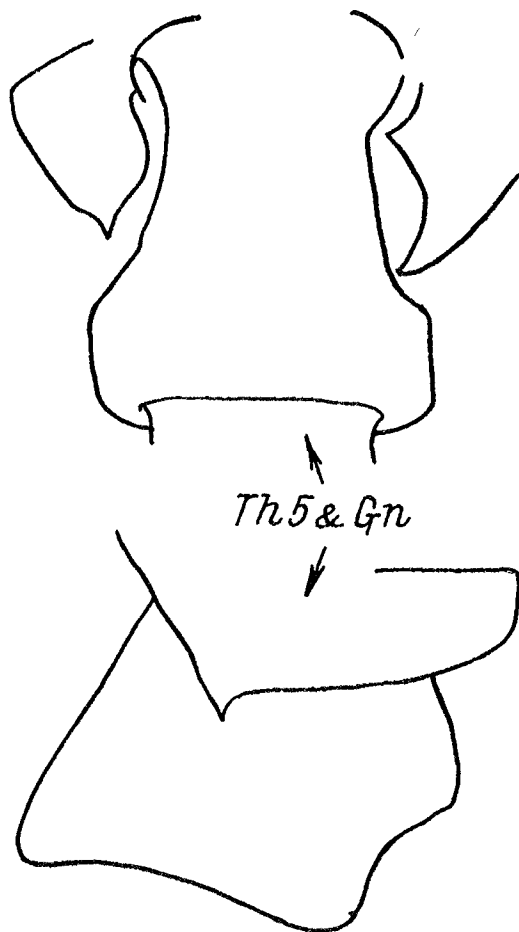


Fig. 235. *Pseudochirella spectabilis*. Female: Th5 & Gn (F 2449 is kept in the Zoological Museum of Oslo University).

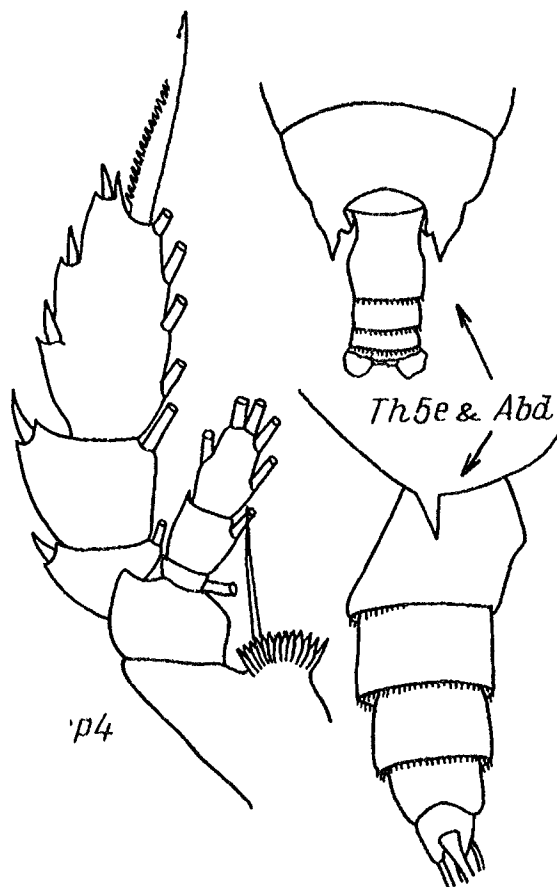


Fig. 236. *Pseudochirella spinosa*. Female (from Wolfenden, 1911).

Ri2 A2 with 6 long setae on external lobe and 7 long and 1 small setae on internal lobe. Mx1 with 7 setae on external lobe; Re with 11 setae; Ri with 13, protopodite near Ri base with 5 setae; third internal lobe with 4 setae; second internal lobe with 2 reduced setae and gnathopod with 7 reduced setae. Re P1 3-jointed. Re1 P1 external spine very small. Left Re2 P5 with a tooth on distal border.

Notes. The present male was described by Tanaka & Omori (1969b) under the name *Pseudochirella pustulifera* (Sars) together with female that was later considered independent species *P. tanakai* (Markhaseva, 1989). However the status of the male is still doubtful.

Type locality: the Kurile-Kamchatka Trench area.

Geographical distribution. Pacific Ocean: the region of the Kurile-Kamchatka Trench (original data) and from the Izu region (Tanaka & Omori, 1969).

Vertical distribution. Bathypelagic species. Recorded between 1000 and 2000 m (original data), also known from total hauls from depths 7000 m (Tanaka & Omori, 1969; original data).

26. *Pseudochirella vervoorti* Tanaka & Omori, 1969

(Fig. 238)

Pseudochirella vervoorti Tanaka & Omori, 1969b: 166, fig. 5; Markhaseva, 1989: 38, fig. 7 (A 10).

Description. Female. Total length 5.66-5.71 mm. Cephalothorax about 4.5 times longer than abdomen. Th5 asymmetrical; with spine on the right. Genital segment symmetrical, barrel-like; this and following segments covered with hairs. A1 reaching the distal border of Abd4. Ri1 A2 with 1 seta. Re1 A2 without setae; Re2 A2 without medial seta. Ri1 Md with 2 setae; Ri2 Md with 9 terminal and 1 posterior (according to Tanaka & Omori (1969b) with 11) setae. Mx1, Mx2 and Mxp typical of the genus. P1 with indistinct separation between Re1 and Re2 of 3-jointed Re. P2 with 2-jointed Ri. Left P4 coxopodite with 12 spines, right with 9 spines. Male unknown.

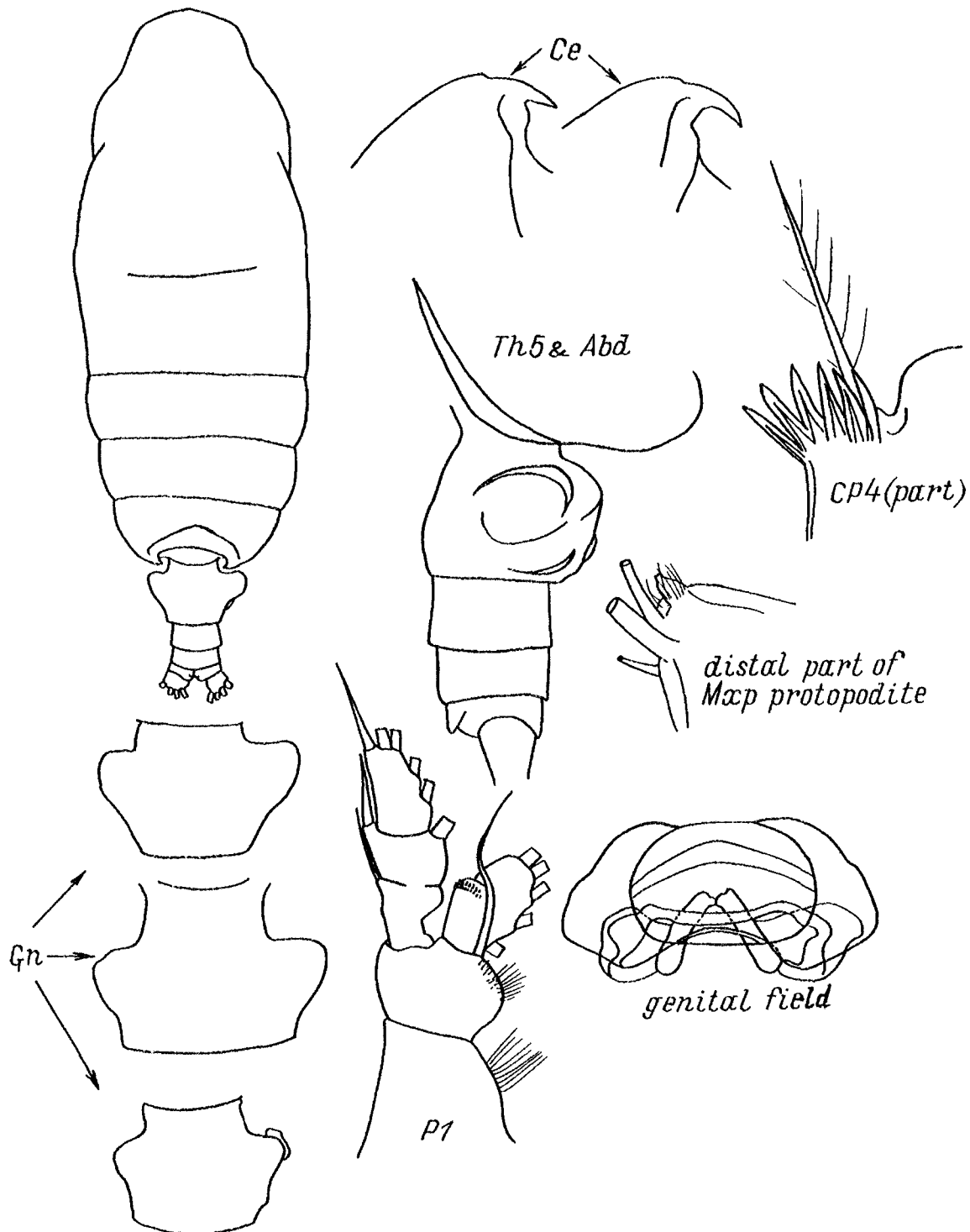


Fig. 237. *Pseudochirella tanakai*. Female (from Markhaseva, 1989).

Notes. Tanaka & Omori (1969b) noted close connection between the present species and *P. semispina* Vervoort, 1949 but distinguished the species in segmentation of Ri P2 (in *semispina* Ri P2 1-jointed), in higher number of spines on coxopodite of P4 (in *semispina* 7-8), in different proportion of Ri and Re A2 (in *semispina* Re is 1.2 Ri) and in different arrangement of hairs on genital segment.

Type locality: the Izu region.

Geographical distribution. The species is known from the Izu region (Tanaka & Omori, 1969b) and the Marian Trench region (original data).

Vertical distribution. The species was found in hauls from 1400 m and 1560 m (Tanaka & Omori, 1969b) and from total haul from 7500 m (original data).

Material: 1 female from sample: 201.

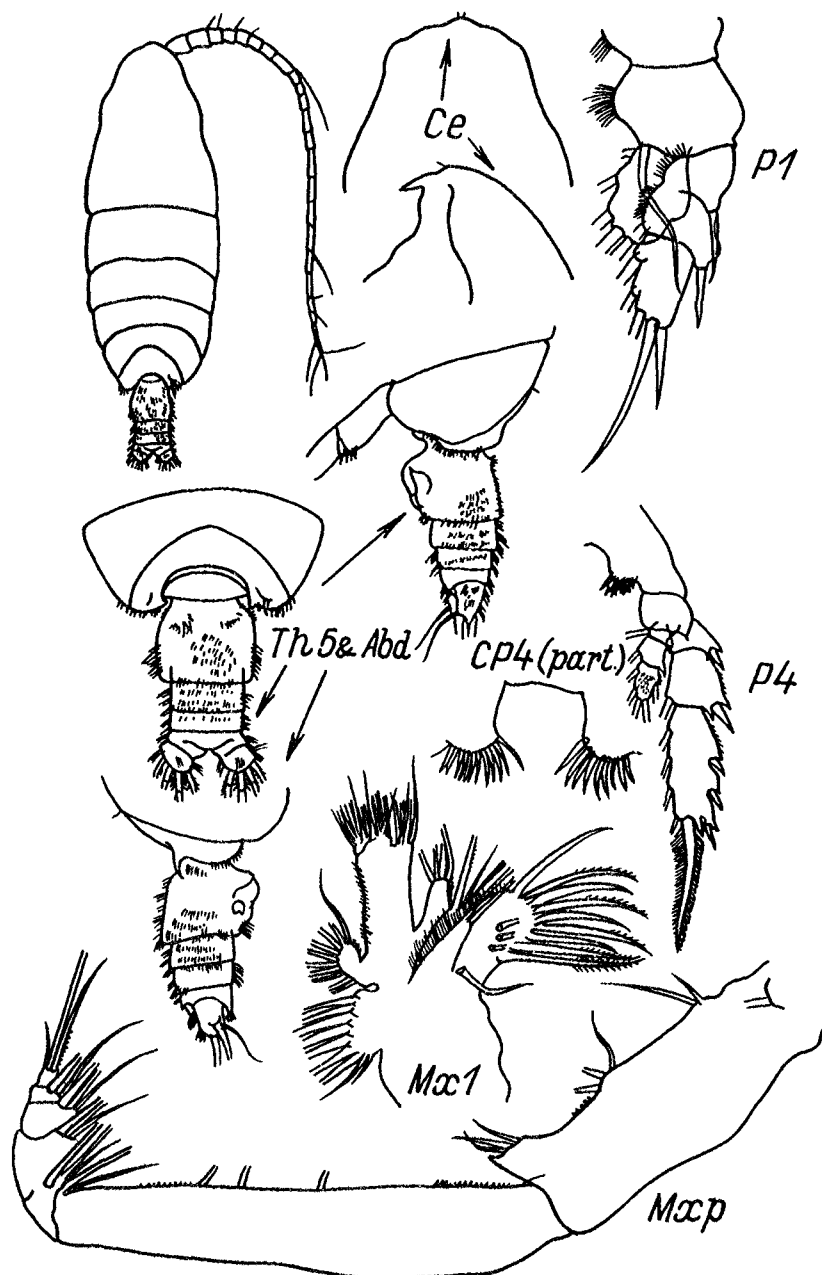


Fig. 238. *Pseudochirella vervoorti*. Female (from Tanaka & Omori, 1969b)

22. *Pterochirella* Schulz, 1990

TYPE SPECIES. *Pterochirella tuerkayi* Schulz, 1990, by original designation.

Pterochirella Schulz 1990: 182.

Description. Male. (Description after Schulz (1990) with modifications). Total length 3.28 mm. Cephalothorax about twice longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused. Th5 posterior corners rounded. Dorsal body wall of cepha-

lothorax transformed into "deep transverse cleft encompassed by number of paired lobe-like structures" (Schulz, 1990: 182). Th1 with two wing-like projections. Rostrum absent, but 2 thin filaments present. Re as long as Ri A2. A1 without geniculation. P1-P4 segmentation typical of Aetideidae. P5 biramous, left and right protopodites of about equal length. Ri 1-jointed. Re P5 3-jointed (right Re indistinctly), right Re distal joint long, tapering distally.

Notes. *Pterochirella* is the unique genus among Aetideidae in the transformation of dorsal body side of cephalon and Th1.

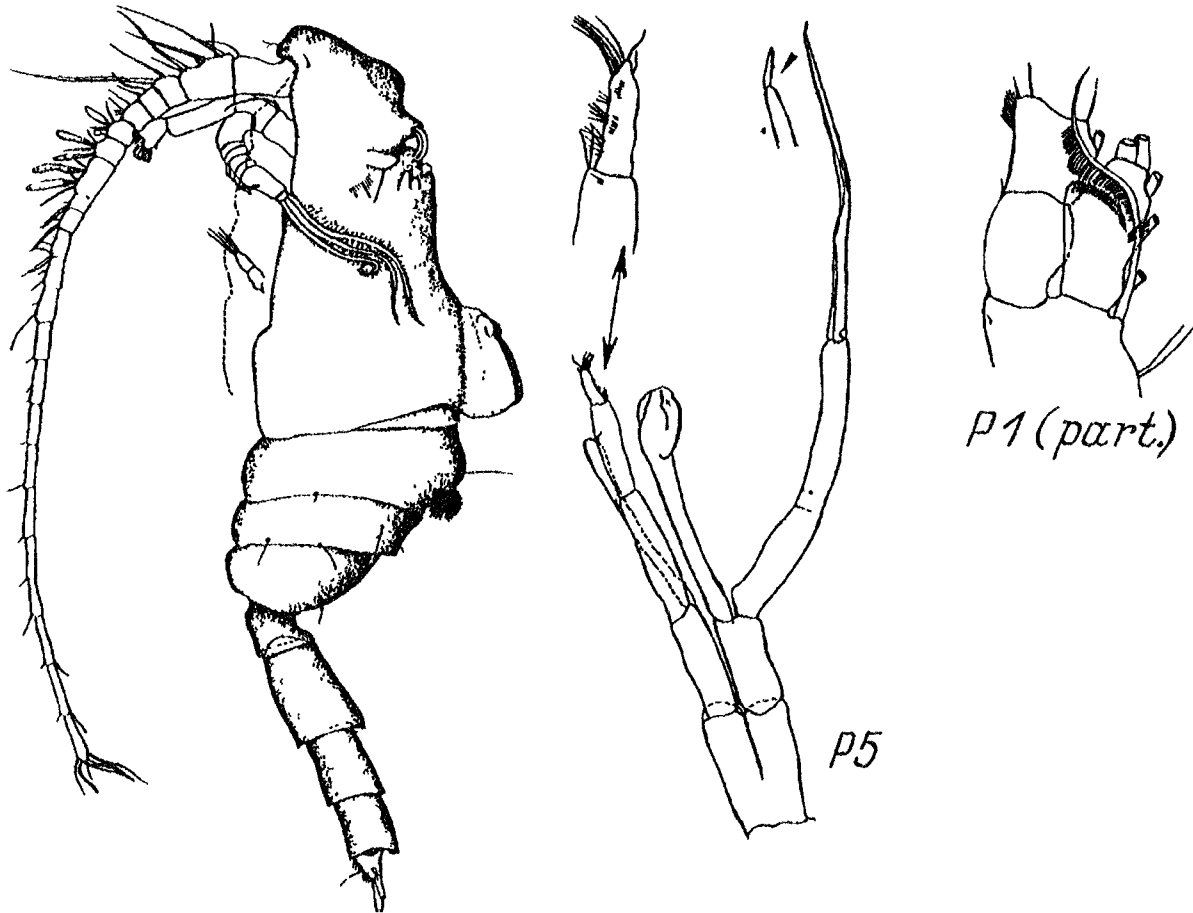


Fig. 239. *Pterochirella tuerkayi*. Male (from Schulz, 1990).

1. *Pterochirella tuerkayi* Schulz, 1990

(Fig. 239)

Pterochirella tuerkayi Schulz, 1990. 182-183, 186, figs 1-3

Description Male. (Description after Schulz (1990) with modifications). Total length 3.28 mm. Cephalothorax about twice longer than abdomen. Cephalon and Th1, as well as Th4-Th5 fused, line of fusion visible (dorsal view). Anterior part of cephalon with hump (lateral view), of acute triangular shape, rounded on the apex. Cephalon constricted behind proximal third (dorsal view). Rostrum absent, but 2 small filaments rising from of A1 level present. Anterior part of cephalon at the level of Md with transverse cleft, accompanied by bilateral symmetrical processes: 1 mediodorsal, digitate structure; 1 lateral lobe pointing dorsal and several lobe-like structures bordered by irregular delicate hair-fringe encompassing area of indentation more posteriorly. Th1 with wing-like projections (dorsal and lateral view). Th2 with row of strong bristles (dorsal view). Th5 corners rounded. Genital segment with genital aperture on the left. Caudal rami slightly longer than

wide. A1 reaching distal end of Abd2; 8th and 9th and 24-25th joints fused; 9th and 10th, as well as 12th and 13th partially fused; 20 and 21 joints fused on the right and separated on the left side. A1 1-9 joints with long aesthetascs, distal segments with short ones. A2 with 1 seta on coxo- and 2 setae on basipodite; Re1 and R2 A2 without setae; Re7 with 3 terminal setae; Ri2 A2 with 7+6 setae. Md palp base without gnathobase, with 1 seta on the base; Re Md longer than Ri Md; Ri1 Md with 1; Ri2 Md with 9 setae. Mx1 internal lobes reduced, protopodite near Ri base with 2 setae; Ri with 10 setae; Re with 11 setae and external lobe with 7 setae. Mx2 severely reduced. Mxp protopodite with distal setae group only. P1-P4 with segmentation and setation typical of Aetideidae. Re1 and Re2 P1 with very small external spines. Ri P1 external lobe present, covered with spinules. Terminal spines of Re3 P2-P4 with 25, 25 and 28 teeth respectively. Ri2 P3-P4 with minute surface spinules P5 biramous. Right and left coxopodites of equal length; left basipodite slightly longer than right. Right Re very long, indistinctly 3-jointed; distal (Re3) joint slightly longer than Re1 and Re2 together and tapering into fine point. Right Ri 1-jointed, spoon-shaped distally. Left Re P5 clearly 3-jointed: Re1 with 1 small distal

seta equal in length to Re2-Re3 together; Re2 with spinules distally; Re3 with rows of hairs along internal margin. Ri P5 left with 1 short small terminal spine.

Female unknown.

Type locality: 12°30,7'N 45°41,6'E.

Geographical distribution. Indian Ocean: the Gulf of Aden (Schulz, 1990).

Vertical distribution. The species was found at depth 1318 m in 10 cm above sea-bed (Schulz, 1990).

The species was not examined by me.

23. *Senecella* Juday, 1923

TYPE SPECIES, *Senecella calanoides* Juday, 1923, by monotypy.

Senecella Juday 1923: 205; 1925: 1; Rylov, 1930: 7; Gurney, 1931: 19; Marsh, 1933: 49; Pirozhnikov, 1958: 626; Borutsky & Stepanova, 1991: 437.

Description. F e m a l e. (Description after Juday (1925) and Marsh (1933) with modifications). Total length 1.98-3.35 mm. Th5 posterior corners rounded. Genital segment nearly as long as 3 following segments. A1 25-jointed, reaching Abd1-2. Re1 P1 without external spine. Posterior surface of P1-P4 without minute spinules.

M a l e. (Description after Borutsky & Stepanova (1991) with modifications). Total length 2.45-2.55 mm. A1-25-jointed. Oral parts of male significantly reduced in comparison with those in female. P5 biramous, of simple structure.

The genus *Senecella* includes 2 species.

Key to species of *Senecella*

Females

- 1(2) Re3 P2-P4 with 2 external spines. Genital segment symmetrical 1. *S. calanoides* Juday
2(1) Re3 P2-P4 with 3 external spines. Genital segment slightly asymmetrical . 2. *S. siberica* Vyshkvartzeva

Males

- 1(2) Left Ri P5 with digitiform process as long as Re1 1. *S. calanoides* Juday
2(1) Left Ri P5 with digitiform process significantly longer than Re1 2. *S. siberica* Vyshkvartzeva

1. *Senecella calanoides* Juday, 1923

(Fig. 240)

Senecella calanoides Juday, 1923: 205; 1925: 2, pl.1, figs 1-6, pl. 2, figs 7-14, pl. 3, figs 15-20; Marsh, 1933: 49, pl. 24; Borutsky & Stepanova, 1991: 437-439, fig. 196.

Description. F e m a l e. (Description after Borutsky & Stepanova (1991), Juday (1925) and Marsh (1933) with modifications). Total length 1.98-3.35 mm. A1 25-jointed. Re1 A2 with 1-2 setae (Juday, 1925; Marsh, 1933). Re2 A2 with 2-3 (Juday, 1925; Marsh, 1933). Ri1 A2 with 2 setae and Ri2 A2 with 7 setae on both lobes. Md palp base with 2 setae, Ri1 Md with 2 setae; Ri2 Md with 9 setae. Second and third internal Mx1 lobes with 3 (?) setae each; protopodite near Ri base with 5 setae; Ri with 12 and Re with 10 setae; external lobe with 7 setae. Mx2 with sixth endite supplied with 1 long seta (as in *Jaschnovia*). Re P1 3-jointed; Re1 P1 without external spine. Ri P1 well developed. Re3 P2-P4 with 2 external spines unique of Actideidae. P4 coxopodite with 1 robust internal spine.

M a l e. (Description after Borutsky & Stepanova (1991) with modifications). Total length 2.45-2.55 mm. A1 25-jointed. P4 coxopodite without internal spine. P5 biramous. Right Re P5 2-jointed; Re1 with 1 small spine distally. Narrow plate emerges from internal distal corner of Re1 right extending along internal margin of Re2. Re relatively short with small seta distally; terminal spine long. Right Ri 1-jointed, elongated. Left Re2 with short terminal spine; Ri 1-jointed.

Type locality: Finger lakes, New York.

Geographical distribution. The species was found in the Siberian seas and in the mouth of Siberian rivers (Pirozhnikov, 1958; Borutsky & Stepanova, 1991), in lakes of Canada and North American States.

Ecology. Mostly brackish-water species, possibly found in marine and fresh waters. In the northern Siberia found in abundance under salinities not higher than 15-20 ‰. The species is common in zooplankton of the North American fresh lakes. Total length of specimens depends on the locality, varying from 3.15-3.35 to 2.62- 2.95 in the direction from sea to river mouth (Smirnov, 1938). In North Siberia adult females emerge in the second half of September, become more numerous in January; in summer only naupliar and copepodite stages may be found. In American lakes specimens get matured in July-August (Borutsky & Stepanova, 1991).

2. *Senecella siberica* Vyshkvartzeva, 1994

(Fig. 241)

Senecella siberica Vyshkvartzeva, 1994: 113-120, figs 1-2

Description. F e m a l e. (Description after Vyshkvartzeva, 1994). Total length 3.0-3.3 mm. Cephalothorax about 2.9-3.0 times longer than abdomen. Rostrum absent. Th5 posterior corners rounded, rea-

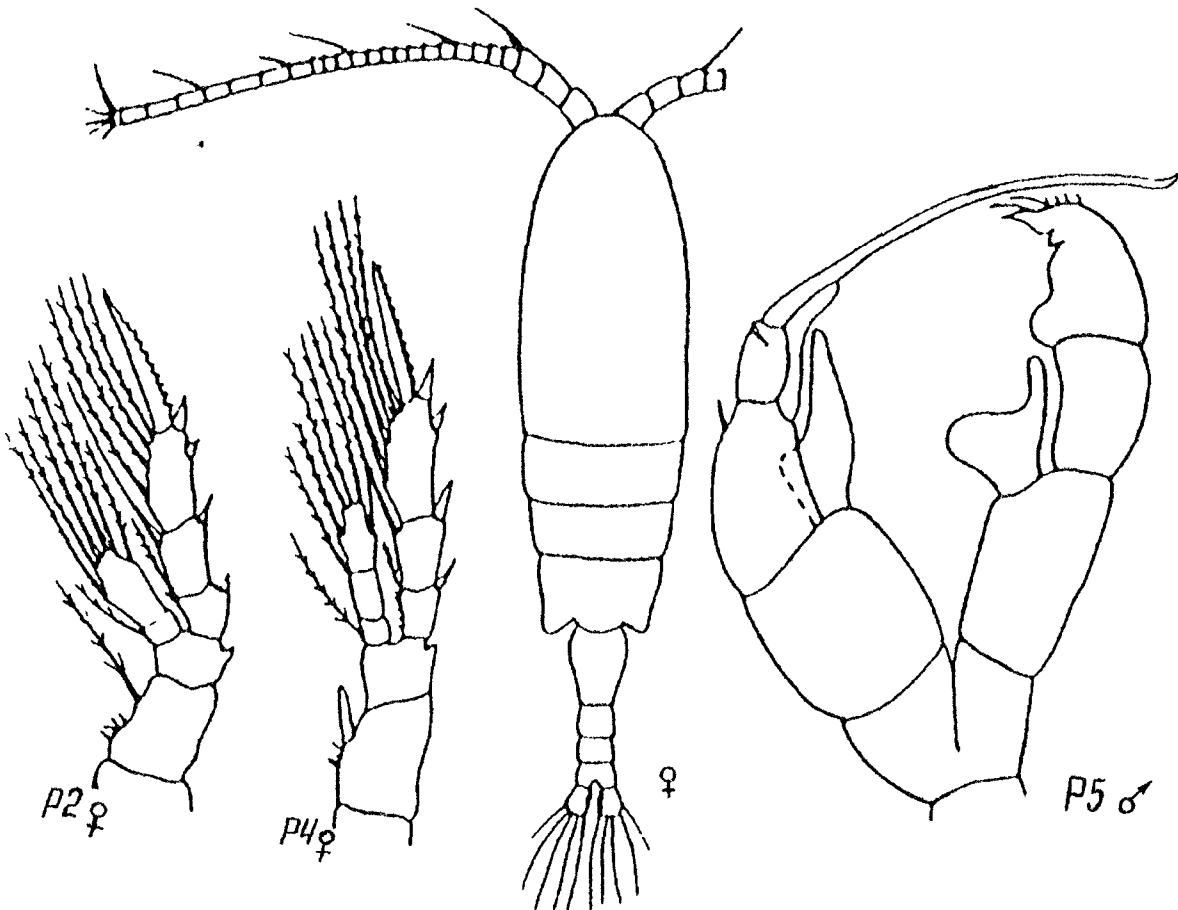


Fig. 240. *Senecella calanoides*. Female, male (from Juday, 1923).

ching the anterior third of genital segment's length. Genital segment is nearly as long as 3 following segments together, slightly asymmetrical (ventral view). A1 24-jointed. Ri A2 slightly shorter than Re. Re1 and Re2 A2 with 2 setae each. Md palp base with 2 setae; Ri1 with 2 setae; Ri2 with 10 setae. Mx1 gnathobase with 9 terminal spines and 4 posterior setae; second and third internal lobes with 5 and 4 setae respectively; protopodite near Ri base with 5 setae; Ri with 16 setae; Re with 10 setae. Mx2 with 6 endites; sixth endite with 2 setae. Mxp protopodite with 1 seta proximally and groups of 2, 3 and 3 setae (from proximal to distal part of the joint). Segmentation of P1-P4 typical of Aetideidae. Re1 P1 without external spine; Re2-Re3 P1 with external spine each. Re3 P2-P4 with 3 external spines each.

M a l e. Total length 2.8-2.88 mm. Cephalothorax nearly 2.5-2.6 times longer than abdomen. Rostrum present, very small, conical. A1 24-jointed, symmetrical, reaching the end of cephalothorax. A2 similar to female, but the setae of Re1-Re2 are shorter. Md palp base with 1 rudimentary seta; Ri1 Md without seta; Ri2 with 8 setae. Md gnathobase, Mx1 and Mx2 are severely reduced. P1-P4 almost like in

females, but external spines of Re2 P1 and of the 1st and 2nd spines of Re3 P2-P4 are shorter. P5 is large and asymmetrical. Right Ri P5 long clapper-like, reaching slightly beyond of right Re2; Re1 subcylindrical, 2 times as long as wide; a narrow hyaline lamella rises at the inner distal angle of this segment and extends inwards along Re2; Re2 is small, with small spine at its outer distal angle and long terminal hook, not separated from the joint. Left Ri is about trapezoidal with a narrow base and cup-like wide distal edge and with digitiform process at the outer distal angle, reaching far beyond Re1. Re1 left is oblong, 1.5 times as long as wide with convex outer edge; Re2 is larger than Re1, distal margin hyaline, wavy with small spine in the inner distal angle and digitiform process near its base.

Type locality: Neelov Bay (71°46'N 128°51'E).

Geographical distribution. The Kara and Laptev Sea and their bays and estuaries (Vyshkvarzeva, 1994).

Ecology. The species was found in waters with salinities from 1 to 22‰ and T° from -0.48 to +8° C; possibly may inhabit freshwater bodies of North Siberia. The species seems to reproduce in winter (Vyshkvarzeva, 1994).

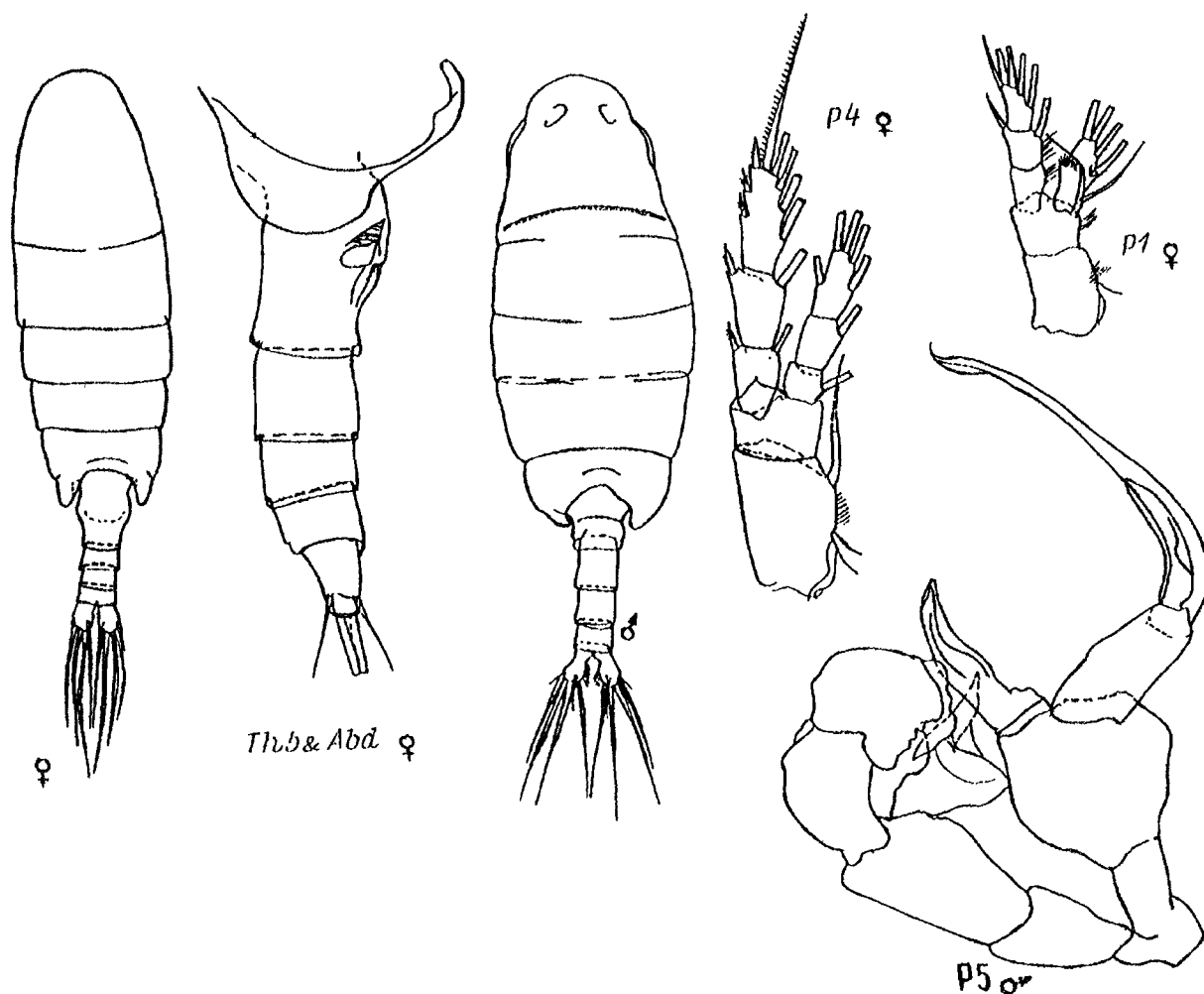


Fig. 241. *Senecella siberica*. Female, male (from Vyshkvartzeva, 1994).

24. *Sursamucro* Bradford, 1969

Type species: *Sursamucro spinatus* Bradford, 1969, by monotypy.

Sursamucro Bradford, 1969b: 488; Bradford & Jillett, 1980: 77.

Description. Female. (Description after Bradford (1969b) with modifications). Total length 6.45 mm. Cephalothorax about 4 times longer than abdomen. Cephalon and Th1 fused, Th4-Th5 separated. Rostrum reduced, in a form of blunt rounded plate. Crest absent. Th5, as well as genital segment symmetrical. Th5 prolonged into spines upturned backward. A1 24-jointed, reaching Th4-Th5. Re A2 nearly as long as Ri A2. A2 coxopodite with 1 seta; basipodite with 2 setae. Ri1 A2 with 2 setae; Ri2 A2 external lobe with 7 terminal setae; Re1 and Re2 with 2 setae each; Re3-Re6 with 1 seta each; Re7 A2 typical of Aetideidae with 3 terminal setae. Md palp base with 2 setae; Ri1 Md with 1 seta; Ri2 Md with 9 setae. Mx1 gnathobase with 14 setae;

second and third internal lobes and protopodite near Ri base with 4 setae each; Ri and Re with 11 setae each; external lobe with 9 setae. According to Bradford (1969b), Mx2 typical of Aetideidae: one of seta of fifth endite is more spine-like than others. Mxp typical of Aetideidae: proximal part of joint without seta and distal part without appendage. P1 with 3-jointed Re with external spines at each joint; basipodite with small seta in external distal part of joint. Ri P2 2-jointed. All other rami of swimming legs 3-jointed. P4 coxopodite without spines. P5 sometimes present, vestigial.

Male unknown.

Monotypic genus.

1. *Sursamucro spinatus* Bradford, 1969

(Fig. 242)

Sursamucro spinatus Bradford, 1969b: 488, 491, figs 112-127.

Description. Female. (Description after Brad-

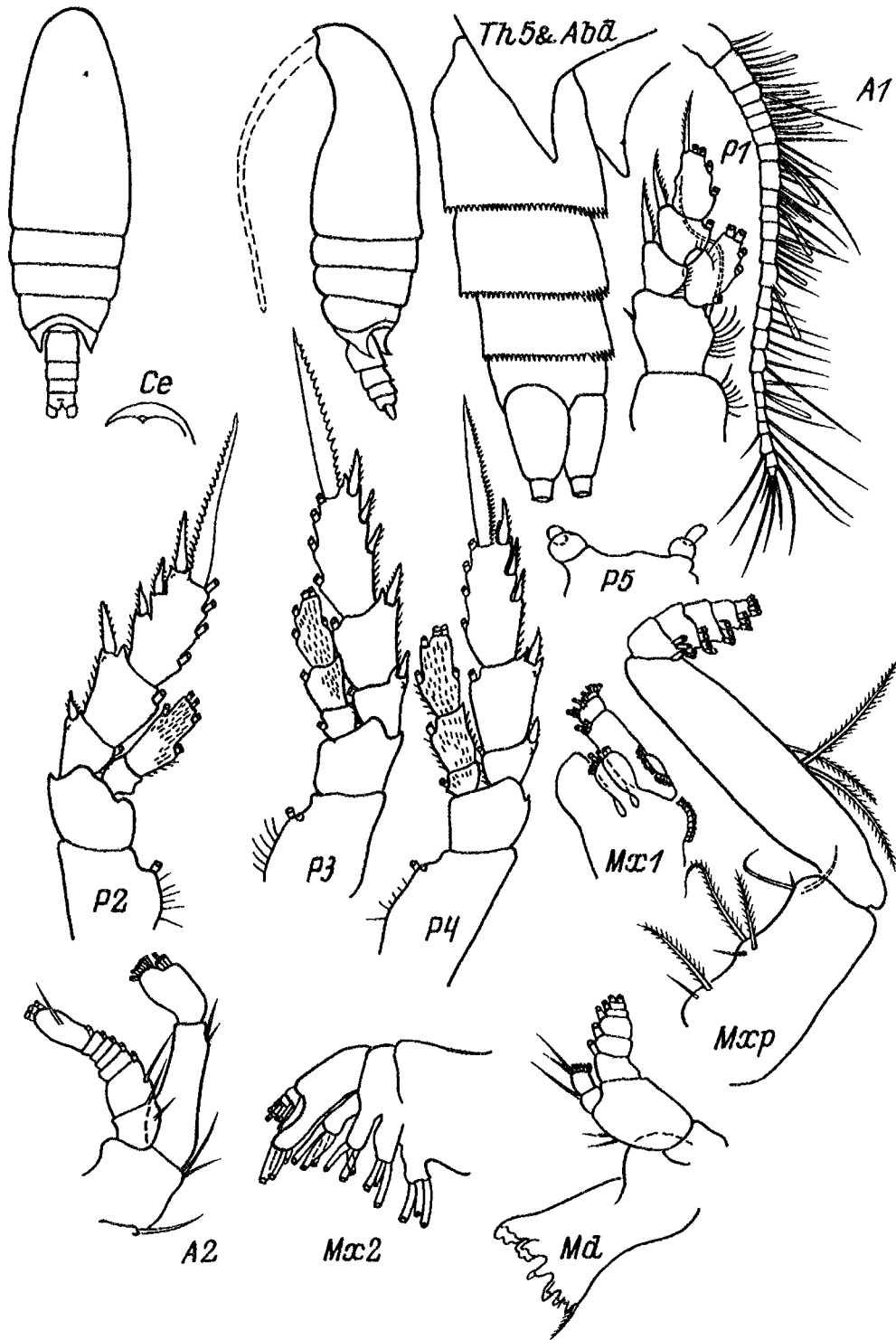


Fig. 242. *Sursamucro spinatus*. Female (from Bradford, 1969).

ford (1969b) with modifications). Total length 6.45 mm. Cephalothorax more than 4 times longer than abdomen. Md palp base with 2 setae; Ri1 Md with 1 seta. Second and third Mx1 internal lobes with 4 setae each. Fifth Mx2 endite with spine-like seta. P5 present as chitinous ridge.

Type locality. off Bay of Plenty, NE New Zealand.

Geographical distribution. Continental slope off the West and East coast of North New Zealand (Bradford, 1969b).

Vertical distribution. Benthopelagic species (Bradford, 1969b).

The species was not examined by me.

25. *Undeuchaeta* Giesbrecht, 1888

TYPE SPECIES: *Undeuchaeta major* Giesbrecht, 1888, by subsequent designation (Brodsky, 1950).

Undeuchaeta Giesbrecht, 1888: 335.

Mesundeuchaeta Wolfenden, 1911: 244 (type species: *Mesundeuchaeta asymmetrica* Wolfenden, 1911, by monotypy).

Description. Female. Total length 3.00-6.60 mm. Cephalothorax 3-4 times longer than abdomen. Crest present, or absent. Rostrum present, 1-pointed. Cephalon and Th1 indistinctly separated, or fused; Th4-Th5 fused. Th5 posterior corners prolonged into obtuse triangular, or triangular lobes, one of them sometimes may be rounded. Genital segment asymmetrical: with small projection (*U. incisa*, *U. major*), or spine (*U. plumosa*, *U. bispinosa*) on the right. Generally genital segment with spinules along posterior border, sometimes groups of minute hairs present in the other parts of segment. A1 23-24-jointed, nearly as long as cephalothorax, or reaching Abd3. Re A2 nearly twice longer Ri A2. Re1 A2 without seta, or with 1 very small reduced seta. Re2 A2 with 1 poorly visible distal seta (sometimes with 2 very small setae); Re3-Re6 with 1 long seta each; Re7 with 1 medial and 3 terminal setae. Ri1 A2 with 2 distal setae; Ri2 A2 with 6 long and 1 short posterior setae on external and 8 (6 long, 2 short, or 7 long, 1 short) setae on internal lobe. Md palp base with 3 setae; Ri1 Md with 2 setae (in *U. intermedia* only 1 seta visible), and Ri2 Md with 9 terminal and 1 short posterior seta. Mx1 gnathobase with 9 claw-like and 1 thin terminal setae, and also with 4 setae on posterior surface of Mx1 gnathobase. Second Mx1 internal lobe with 5 setae; third with 3 setae; protopodite near Ri base with 5 setae; Ri with 14-15 setae; Re with 11; external lobe with 9 setae. Mx2 typical of the genus: setae of the fourth and fifth endites are transformed into sclerotized, claw-like. Mxp protopodite 1.7-1.9 times shorter than Ri1 Mxp. Re3 Mxp nearly twice wider than each of neighboring joints (Re2 and Re4). Protopodite in its proximal part with 1 seta, and with 2, 3 and 3 setae (from proximal to distal part of the joint). Re P1 3-jointed, separation between Re1 and Re2 P1 indistinct. Re1 P1 without external spine; other Re P1 joints with spines. Ri P1, Ri P2 1-jointed, remaining rami of swimming legs 3-jointed. P4 coxopodite without large spines, rarely with small spinules.

Male. Total length 2.85-5.58 mm. Cephalothorax about 3 times longer than abdomen. Cephalon and Th1, as well as, Th4 and Th5 fused. Rostrum developed poorer than in females, 1-pointed. Crest, if present, not large. Th5 posterior corners slightly asymmetrical, rounded. A1 22-23-jointed, reaching the end of cephalothorax, or the distal end of Abd3. A2 setation reduced: coxopodite without setae; basipodite with 1 seta; Re1 A2 with 1 very small seta

(or it is absent); Re2 A2 without seta; medial seta of Re7, if present, very small. Md palp base with 1 seta; Ri1 Md with 1; Ri2 Md with 9 terminal setae, posterior one absent. Mx1 reduced in comparison to females. Re Mx1 with 10 setae. Mx2 and Mxp reduced in comparison to females. Park (1978) described *U. incisa* Mxp protopodite with 3 groups of 1, 2 and 3 setae (from proximal to distal part of the joint). Separation between Re1 and Re2 P1 better outlined than in female. Re1 P1 as in female without spine; external spine of Re2 shorter than in female. Ri P2 indistinctly 1-jointed, with traces of separation into 2 joints. All other joints of P1-P4 3-jointed. P5 powerful, biramous; usually not shorter, sometimes even longer than abdomen, coxopodites fused; basipodites powerful, strongly sclerotized. Left one longer than right by about one third of its length. Left and right Ri P5 1-jointed. Left Re P5 3-jointed; Re3 P5 apically prolonged into stylet-like projection with spine-like top; distal part of Re2 P5 with tooth-like projection. Right Re P5 2-jointed.

Notes. *U. major* Giesbrecht, 1888 was designated as type species after subsequent indication (Brodsky, 1950; Park, 1978).

The genus *Undeuchaeta* includes 4 species. Following Vervoort (1957) I am inclined to consider *U. bispinosa* as junior synonym of *U. intermedia*.

Key to species of *Undeuchaeta*

Females

- 1(4) Cephalon with crest.
 - 2(3) Th5 posterior corners nearly equally prolonged, triangular (lateral and dorsal view). Total length less than 5.5 mm. 3. *U. major* Giesbrecht
 - 3(2) Th5 posterior corners not equally prolonged, one of them shorter and rounded (lateral view). Total length more than 5.5 mm 1. *U. incisa* Esterly
- 4(1) Cephalon without crest.
 - 5(6) Th5 posterior corners always triangular (lateral and dorsal view). Genital segment with spine on genital field (lateral view). 2. *U. intermedia* A. Scott
 - 6(5) Th5 posterior corners not always triangular: right one usually rounded. Genital segment without spine on genital field (lateral view) 4. *U. plumosa* (Lubbock)

Males

- 1(4) Cephalon without crest.
 - 2(3) Ri P5 left exceeding distal border of left Re2. The second third of Ri external border with 2 teeth-like projections 2. *U. intermedia* A. Scott
 - 3(2) Ri P5 left not reaching the distal border of Re2 left. The second third of Ri external border without teeth-like projections 4. *U. plumosa* (Lubbock)
- 4(1) Cephalon with crest.

- 5(6) Left Re2 P5 twice, or more longer than wide 1. *U. incisa* Esterly
 6(5) Left Re2 P5 1.5, or less longer than wide 3. *U. major* Giesbrecht

1. *Undeuchaeta incisa* Esterly, 1911

(Figs. 243-244)

Undeuchaeta incisa Esterly, 1911: 319, pl. 27, figs 12, 19, pl. 28, fig. 28, pl. 29, fig. 59; Brodsky, 1950: 181, fig. 101; Vervoort, 1957: 72; Park, 1978: 183, figs 54-56; Bradford & Jillett, 1980: 80, fig. 56; Von Vaupel Klein, 1984: 54-55.

Pseudochirella incisa: Grice, 1964: 262, figs 41-42.

Mesundeuchaeta asymmetrica Wolfenden, 1911: 244, text-fig. 28, pl. 29, figs 4-7.

Undeuchaeta superba With, 1915: 137, text-fig. 37, pl. 4, fig. 6, pl. 5, fig. 1.

Undeuchaeta magna Tanaka, 1957b: 203, fig. 60.

Description. Female. Total length 5.70-6.60 mm. Cephalothorax about 3.4-4.0 times longer than abdomen. Crest present. Th5 posterior corners slightly asymmetrical: left one more prolonged than right one, their shape varying. Genital segment asymmetrical: with small projection on the right (dorsal view). Small spine present near genital field on the right (lateral and ventral view). Genital field with "spectacle-like" structure, similar to that in *Batheuchaeta*. A1 24-jointed, reaching about the end of genital segment. Re1 A2 without setae; Re2 with 2 minute setae. Mx1 protopodite near Ri base with 5 setae; Ri with 14-15 setae. Oral parts and P1-P4 typical of the genus. P4 coxopodite with few small spinules near the base of internal seta (Grice, 1964; Park, 1978; Bradford & Jillett, 1980), in original material such spinules were not visible.

Male. Total length 4.08-5.58 mm. Cephalothorax about 3.0-3.2 times longer than abdomen. Crest present, lower than in female. Cephalon and Th1, as well as Th4-Th5 fused. Th5 posterior corners slightly asymmetrical, rounded. A1 slightly shorter than body, 24-jointed. Oral parts reduced in comparison with female. P1-P4 as in female; separation between Re1 and Re2 more complete. Left Ri P5 shorter than Re1 nearly by one third of its length. Right Ri as long as Re1 with 2 projections proximally.

Type locality: the north-eastern part of the Pacific Ocean, region off California.

Geographical distribution. Atlantic Ocean: the species is widespread: in the North to till 65°N (With, 1915), in the South to 35°S (Wolfenden, 1911), recorded in the boreal and subtropical zones (Grice, 1964; Wolfenden, 1911). Pacific Ocean: the western part from the Sea of Okhotsk to the region of New Zealand (Tanaka, 1957b; Bradford & Jillett, 1980;

original data); in the eastern part known from the region off California (Esterly, 1911), off Peru (Grice & Hulsemann, 1968), from southern subtropical zone (original data) and its antarctic sector (Park, 1978; original data).

Vertical distribution. The species was often found in total hauls from mesopelagial (Grice & Hulsemann, 1968; Park, 1978; Bradford & Jillett, 1980; original data); once in total haul from 3000 m. Most likely upper bathypelagic, mesopelagic species.

Material: 6 females and 1 male from samples: 201, 390, 432.

2. *Undeuchaeta intermedia*

A. Scott, 1909

(Fig. 245)

Undeuchaeta intermedia A. Scott, 1909: 63, pl. 23, figs 1-8; Vervoort, 1957: 73; Grice, 1962: 199, pl. 12, figs 15-18; Bjornberg, 1973: 325.

Undeuchaeta bispinosa Esterly, 1911: 318, pl. 26, fig. 4, pl. 29, figs 48, 56; Sewell, 1929: 127, text-figs 47-48, 1947: 103; Brodsky, 1950: 183, fig. 100.

Description. Female. Total length 3.56-4.50 mm. Cephalothorax slightly less than 4 times longer than abdomen. Crest absent. Th5 posterior corners slightly asymmetrical, sometimes right one rounded (lateral and dorsal view). Right side of genital segment with definitely visible (dorsal view) spine, and with one spine to the left and right from genital field (ventral and lateral view). A1 23-jointed, nearly as long as cephalothorax. Re1 A2 without setae. Mx1 protopodite with 4-5 setae near Ri base; Ri with 14 setae; otherwise oral parts typical of the genus. P1-P4 typical of the genus.

Male. (Description after Sewell (1929) with modifications). Total length 3.62-3.69 mm. Oral parts severely reduced in comparison to females. Re1 P1 3-jointed. P5 right: Re1 with sharply visible spine on lateral side (in about first third of joint), and with small projection on the opposite side; internal part of joint covered with wavy lines nearly parallel. Left Ri P5 reaching distal end of Re1. Re2 with spine-like projection on external distal border, internal proximal angle of Re3 extended into spine-like projection.

Type locality: the Malay Archipelago.

Geographical distribution. Pacific Ocean: the equatorial, north-eastern, northern, south-eastern parts (Esterly, 1911; Grice, 1962; Bjornberg, 1973). Indian Ocean: the western part (Grice & Hulsemann, 1967; original data), the region of Malay Archipelago (A. Scott, 1909).

Vertical distribution. The species was not found in surface layers (Vervoort, 1957), found in total hauls from 1500 m (original data).

Material: 3 females from samples: 400-401, 403.

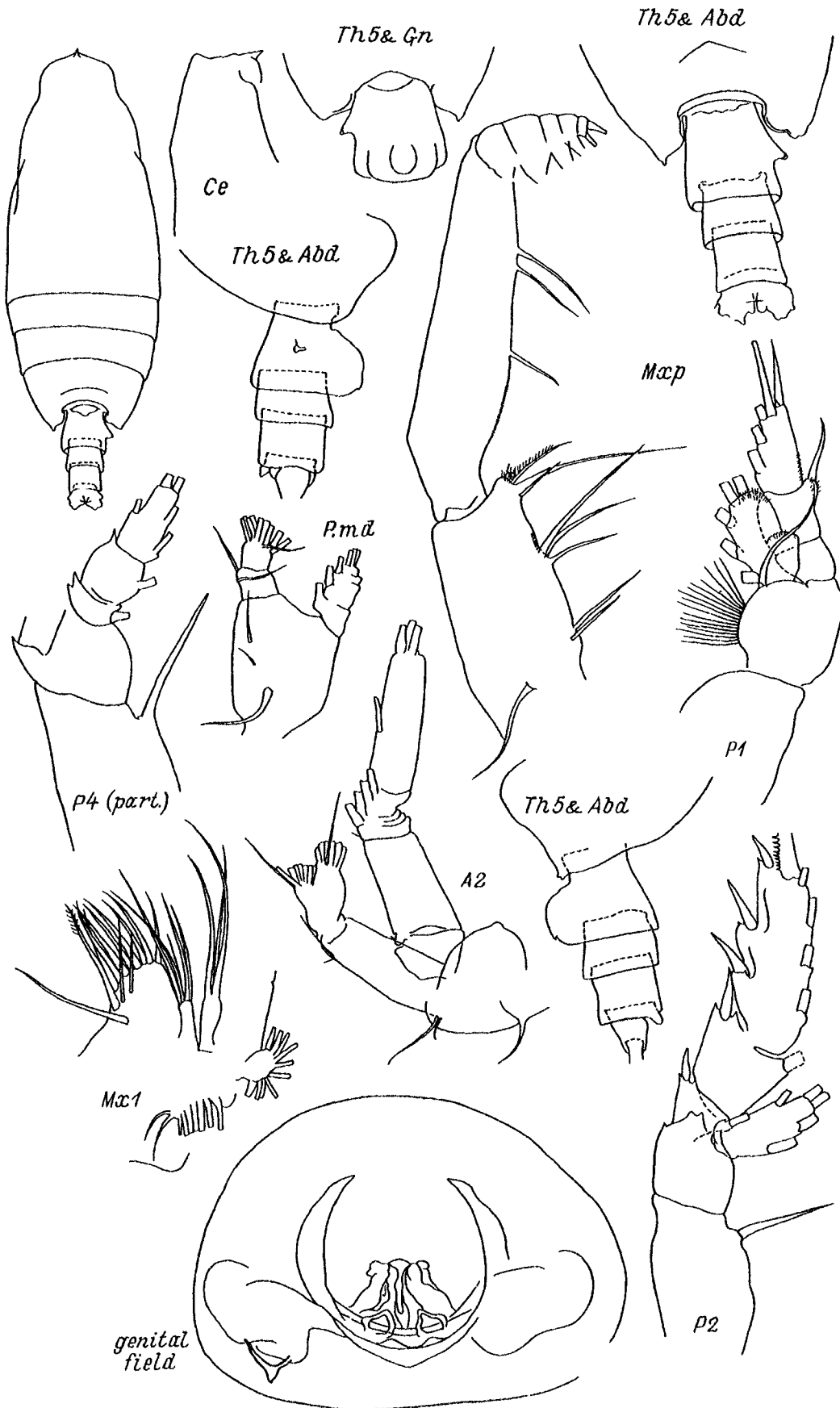


Fig. 243. *Undeuchaeta incisa*. Female (201).

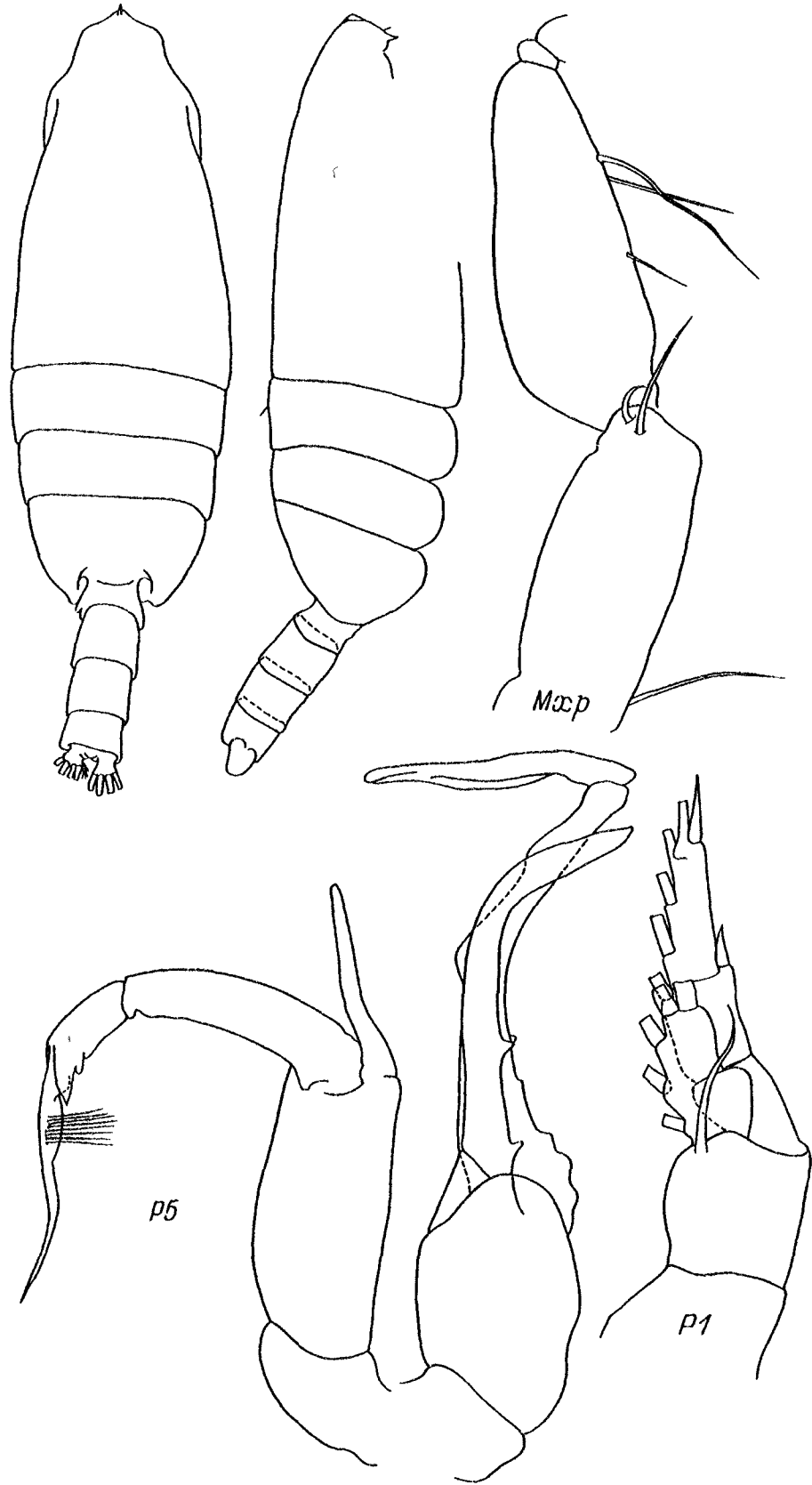


Fig. 244. *Undeuchaeta incisa*. Male (390).

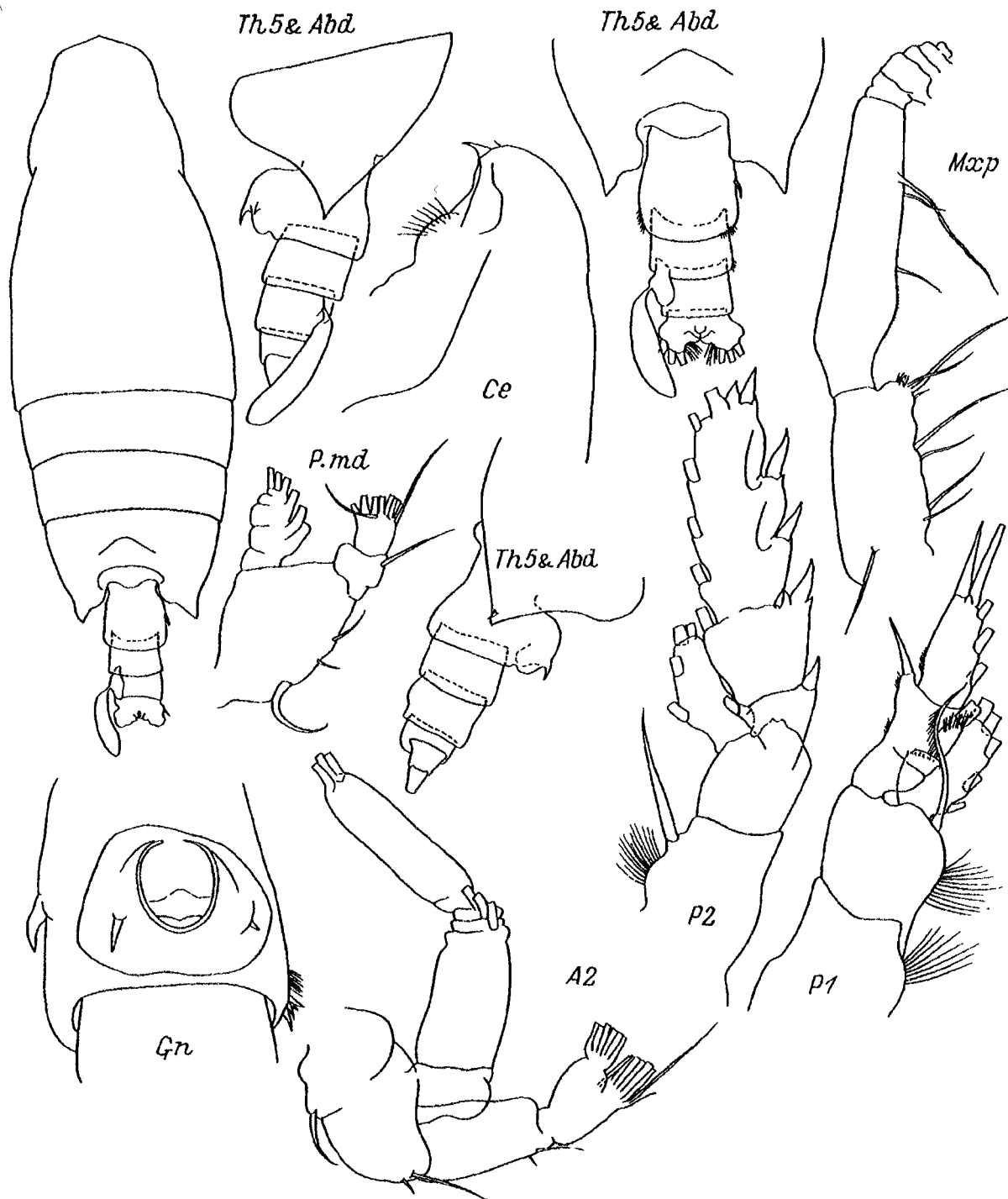


Fig. 245. *Undeuchaeta intermedia*. Female (401).

3. *Undeuchaeta major* Giesbrecht, 1888

(Figs. 246-247)

Undeuchaeta major Giesbrecht, 1888: 336, 1892: 227, pl. 37, figs 56-57, 59; With, 1915: 136, pl. 5, fig. 2, text-fig. 36; Sars, 1924-25: 81, pl. 23, figs 7-12; Brodsky, 1950: 182, fig. 99; Vervoort, 1952h (sheet 49): 3, fig. 3, 1957: 71; Tanaka, 1957b: 202, fig.

59; Owre & Foyo, 1967: 50, fig. 130, 283; Tanaka & Omori, 1970b: 144; Park, 1978: 182; Bradford & Jillett, 1980: 80, fig. 57.

Chirundina angulata Sars, 1905: 4, 13.

Description. F e m a l e. Total length 4.15-5.50 mm. Cephalothorax about 4 times longer than abdomen. Crest present. Th5 posterior corners slightly asymmetrical, prolonged into triangular lobes of

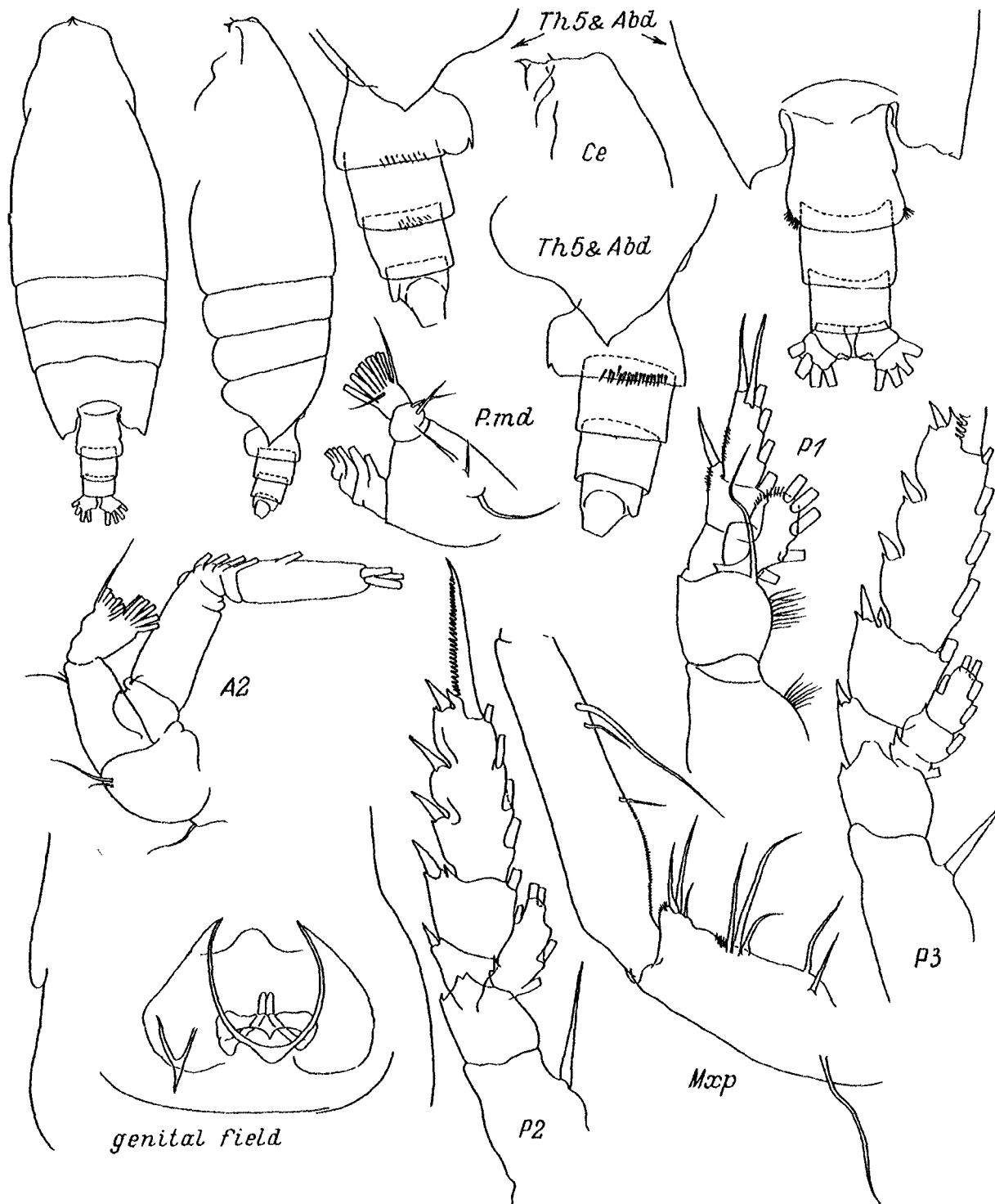


Fig. 246. *Undeuchaeta major*. Female: Gn (574), other figures (202).

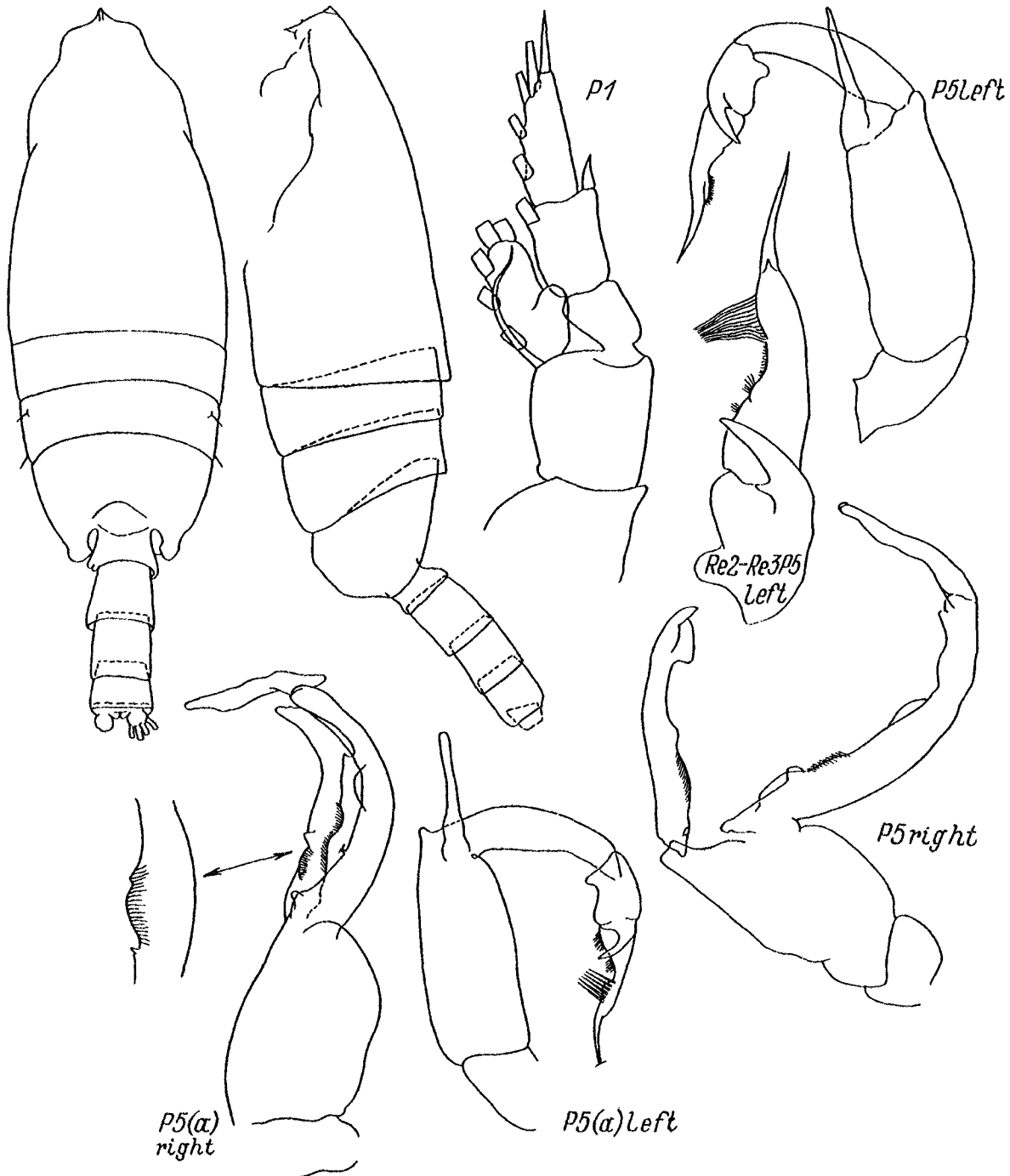


Fig. 247. *Undeuchaeta major*. Male: P5 (a) (202), other figures from (573).

about the same length. Genital segment asymmetrical, similar to that of *U. incisa*, with small projection on the right (dorsal view). Right part of genital field with spine (lateral view). A1 23-jointed, reaching the end of Abd2. Re1 A2 with 1 small seta. Oral parts and P1-P4 typical of the genus. P4 coxopodite with spinules (Tanaka & 1957b; Bradford & Jillett, 1980), examined original specimens devoid of such spinules.

M a l e. Total length 3.90-4.92 mm (or 6.00-6.60 mm (Esterly, 1911; Farran, 1929; Vervoort, 1952h)). Cephalothorax about 3 times longer than abdomen. Cephalon with crest, slightly lower than in females. Th5 posterior corners rounded. A1 reaching the end of Abd2. Oral parts reduced in comparison with female. P1-P4 as in female. P5 typical of the genus. Re2 P5 1.5 times (or less) longer than wide.

Type locality: 20°N 173°E.

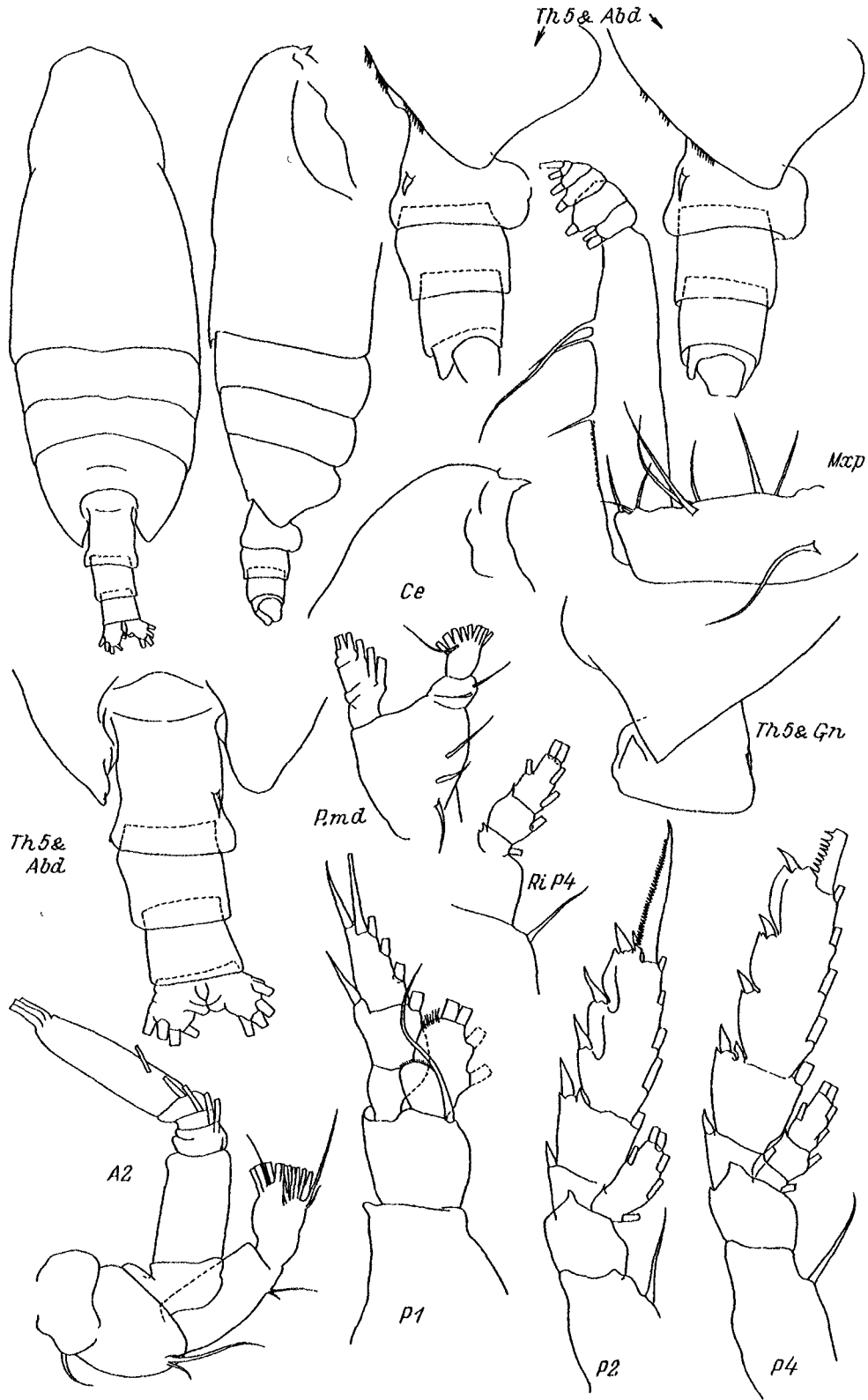


Fig. 248. *Undeuchaeta plumosa*. Female (456).

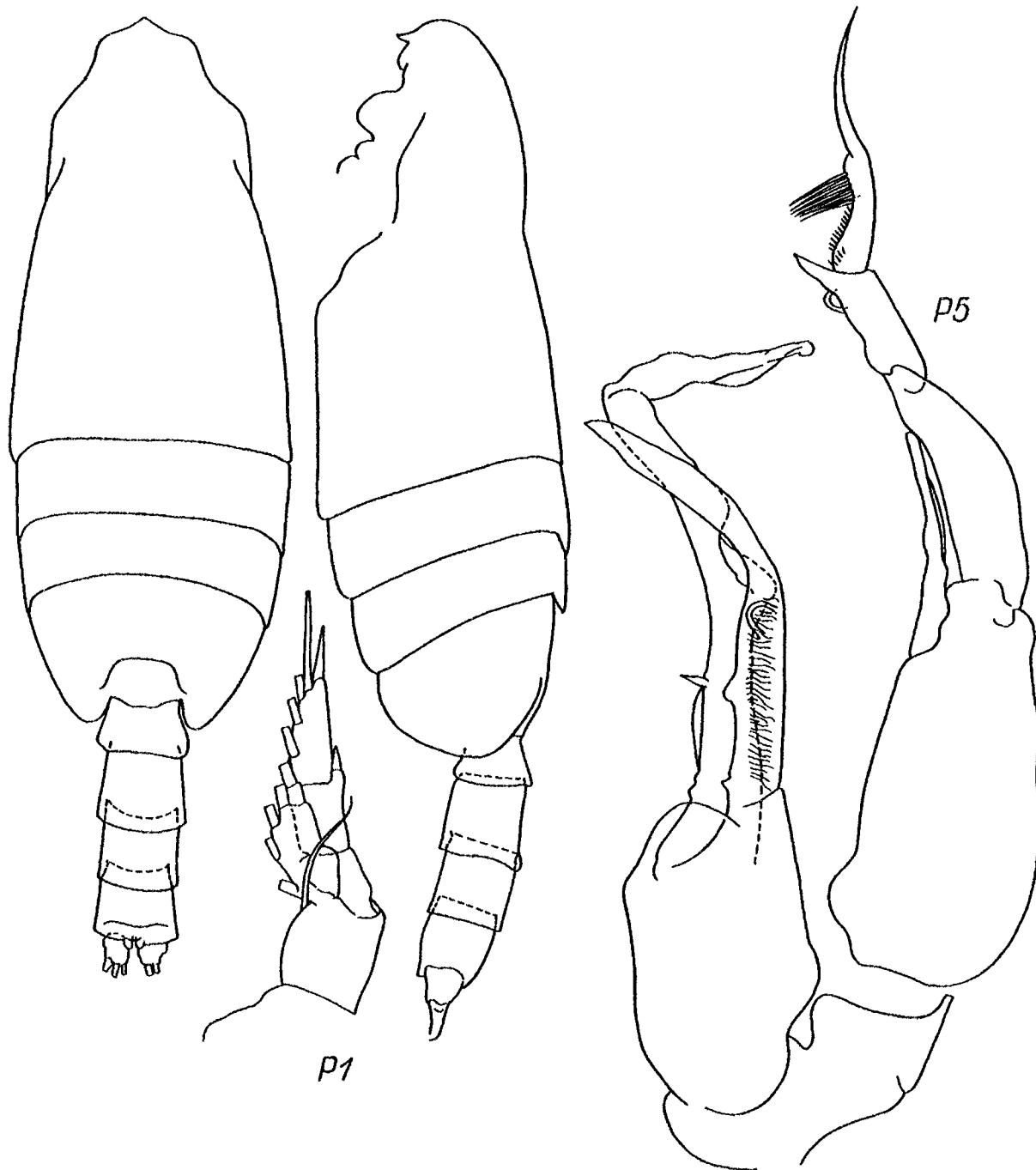


Fig. 249. *Undeuchaeta plumosa*. Male (456).

Geographical distribution. Atlantic Ocean: widespread: the northernmost finding 63°N (Jespersen, 1940), the southernmost about 52°S (Hardy & Gunther, 1935). Widespread in the Pacific Ocean; the northernmost finding in the Sea of Okhotsk (original data); frequent in the Indian Ocean (Wolfenden, 1911; Grice & Hulsemann, 1967), in the Arabian Sea and the Bay of Bengal (Sewell, 1947). In the

Antarctic the southernmost locality is the Ross Sea (Farran, 1929).

Vertical distribution. Deep-water species, sometimes occurring in surface layers (mostly at night (Vervoort, 1957)). Recorded in total hauls from meso- and bathypelagial.

Material: 12 females and 4 males from samples: 201-202, 391, 400-401, 573.

4. *Undeuchaeta plumosa*
(Lubbock, 1856)

(Figs. 248-249)

Undina plumosa Lubbock, 1856: 24, pl.9, figs 3-5.

Undeuchaeta plumosa: A. Scott, 1909: 62, pl.22, figs 1-8; Sars, 1925: 79; Vervoort, 1957: 70, 1963: 154; Grice, 1962: 199, pl. 12, figs 1-14; Owre & Foyo, 1967: 50, figs 285-288; Tanaka, 1969b: 265; Tanaka & Omori, 1970b: 145; Bjornberg, 1973: 325; Park, 1978: 182; Bradford & Jillett, 1980: 83, fig. 58.

Undeuchaeta minor Giesbrecht, 1888: 336, 1892: 228, 232, 766, pl.14, figs 31-34, pl. 37, figs 55, 58; Esterly, 1905: 149, fig. 17; Van Breemen, 1908: 44, fig. 50; With, 1915: 132, pl. 5, fig. 3, text-fig. 35.

Description. Female. Total length 3.00-4.20 mm. Cephalothorax about 3-4 times longer than abdomen. Crest absent. Th5 posterior corners asymmetrical: in lateral view the right one rounded, the left obtuse-triangular. Their configuration may vary. Genital segment asymmetrical due to presence of spine on the right side. A1 nearly as long as cephalothorax, or reaching Abd3. Re1 A2 without setae.

Mxp protopodite with 5 setae near Ri base; Ri with 15 setae. Oral parts and P1-P4 typical of the genus.

Male. Total length 2.85-3.90 mm. Crest absent. Th5 posterior corners rounded. Cephalothorax about 3 times longer than abdomen. A1 reaching the end of cephalothorax, or Abd2. Oral parts reduced in comparison to those in female; P1-P5 typical of the genus.

Type locality. the Atlantic Ocean.

Geographical distribution. Widespread in the Atlantic Ocean in the North to 62°N (Jespersen, 1940), to the South to 35°S (Wolfenden, 1911). Widespread in the Pacific Ocean; the northernmost locality is the Sea of Okhotsk about 49°N (original data), the southernmost about 52°S (Farran, 1929). The species is also widespread in the Indian Ocean.

Vertical distribution. The main zone of inhabitation is most likely mesopelagial, but often occurs in epipelagial (A.Scott, 1909; Mori, 1937; Grice, 1962; Tanaka & Omori, 1970b; Vervoort, 1963; Morris, 1970; Bradford & Jillett, 1980).

Material: more than 70 females and 6 males from samples: 49, 51, 201-202, 390-391, 394, 400, 437, 439, 456-457.

Table 1. Oceanographic station list for examined aetideids

Ocean	Region	Vessel, cruise, date	Station No	Coordinates	Equipment	Layer (m)	NN				
1	2	3	4	5	6	7	8				
Pacific	North-western, Kurile-Kamchataka Trench	"Vitjaz" 2 cruise 11-12 Oct 1949	162	44°35'N 151°58'E	--	0-8500	1				
		15 Oct 1949	166	42°10'N 155°17'E	--	0-500 0-4000	2 3				
		16 Oct 1949	167	42°10'N 155°15'E	--	--	4				
		"Vitjaz" 4 cruise 6 June 1950	426	47°38'N 153°04'E	--	0-174	5				
		8 June 1950	433	48°39'N 152°55'E	--	--	6				
		Bering Sea	"Vitjaz" 5 cruise 17 August 1950	524	55°52'N 164°08'E	K100*	0-4000	7			
			23 August 1950	532	55°05'N 171°04'E	--	0-1600	8			
			23 August 1950	537	57°25'N 175°43'E	BJN	1000 3700	9			
			7 September 1950	565	65°04'N 179°02'W	BJN	0-10	10			
			North-western part	"Vitjaz" 7 cruise 9 July 1951	898	49°52'N 155°21'E	--	--	11		
	North-western part, Kurile-Kamchataka Trench	"Vitjaz" 14 cruise 9 May 1953	2076	43°39'N 149°24'E	BR 80	20-50	12				
						50-100	13				
						100-200	14				
						190-300	15				
						300-500	16				
						520-1050	17				
						BR 113 2000-4000	18				
						3860-7100	19				
						24 May 1953	2119	46°11'N 154°55'E	--	1200-2320	20
						25 May 1953	2120	46°31'N 154°38'E	BR 80	2200-5250	21
										0-50	22
										100-200	23
										200-500	24
										500-1000	25
										1000-2000	26
										BR 113 1900-3900	27
										3600-6900	28
	23 June 1953	2208	49°29'N 158°42'E	BR 80	0-50	29					
					50-100	30					
					100-200	31					
					200-500	32					
					BR 80 500-1000	33					
					1000-2000	34					
					BR 113 2000-4000	35					
					1 July 1953	2218	43°48'N 149°56'E	BR 80	0-50	36	
									50-100	37	
									100-200	38	
	200-500	39									
	500-1000	40									
	BR 113 4000-6000	41									
	6000-8500	42									
	North-western part, Kurile Islands region	"Vitjaz" 18 cruise 22 May 1954	2768	49°53'N 155°38'E	BJN	50-140	43				
2769						--	50-100	44			

* BJN — Big Judey net

JOMN & BR 80 — modified Judey's nets with mouth square 0.5 m²BR 113 — modified Judey's nets with mouth square 1.0 m²K 100 — modified Nansen's nets with mouth square 0.75 m²

RT — Ring trawl

1	2	3	4	5	6	7	8	
Pacific	North-western part	"Vitjaz" 19 cruise 18 October 1954	3204	33°11'N 156°16'E	BR 80	0-500	45	
		20 October 1954	3206	30°48'N 155°02'E		560-1080	46	
		19 October 1954		30°48'N 155°02'E	RT	0-5500	47	
		"Vitjaz" 22 cruise 22 October 1955	3515	28°08'N 141°07'E	RT	0-4400	48	
		"Vitjaz" 22 cruise 28 October 1955	3528	27°48'N 130°40'E	BR 80	0-714	49	
		South-western part	"Vitjaz" 26 cruise 8 December 1957	3812	14°49'S 172°56'E	--	0-500	50
			17 December 1957	3814	17°57'S 183°15'E	--	0-500	51
			26 December 1957	3823	23°17'S 174°13'E	BR 113	0-750	52
			20 January 1957	3842	33°16'S 171°59'E	BR 113	0-500	53
	22 January 1957		3844	29°57'S 172°00'E	--	0-500	54	
	13 February 1958		3874	16°10'N 173°03'E	--	0-100	55	
	North-western part, Kurile-Kamchatka Trench		"Vitjaz" 39 cruise 14-15 July 1966	5603	46°11'N 153°30'E	BR 113	0-50 50-100 76-202 100-200 190-500 500-750 740-1000 1020-1500 1510-2030 2060-2520 2530-3000 2920-3460 3420-3960	56 57 58 59 60 61 62 63 64 65 66 67 68
			16 July 1966	5605	46°15'N 153°18'E	--	0-8200	69
			19 July 1966	5607	46°10'N 153°13'E	RT	0-5000	70
		20-21 July 1966	5608	45°57'N 153°15'E	BR 113	320-490 1000-1500 1500-2000	71 72 73	
		23-24 July 1966	5610	45°47'N 153°18'E	BR 113	0-50 50-100 100-200 210-300 300-500 500-750 750-990 1950-2480 2380-2890 2690-3650 3100-4830 ?3876-4900	74 75 76 77 78 79 80 81 82 83 84 85	
		25 July 1966	5611	45°43'N 153°20'E	RT	0-8000	86	
		27-31 July 1966	5612	45°34'N 152°56'E	BR113	0-50 45-100 100-200 200-500 480-740 730-1000 1050-1500 1510-2100 1990-2500 2460-2950	87 88 89 90 91 92 93 94 95 96	

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Pacific	North-western part, Kurile-Kamchatka Trench	"Vityaz" 39 cruise 27-31 July 1966	5612	45°28'N 152°31'E	BR113	3020-4000	97		
						3930-4950	98		
						4940-5930	99		
						5880-7080	100		
								6980-7970	101
		27-31 July 1966	5612	45°28'N 152°31'E	RT	3440-4730	102		
						1440-7392	103		
						0-7870	104		
						0-4200	105		
		1 August 1966	5612a	45°22'N 152°42'E	JOMN	0-50	106		
						0-100	107		
						50-100	108		
						80-200	109		
						190-490	110		
						500-1000	111		
						980-1980	112		
1990-3980	113								
4110-6930	114								
	5617					45°48'N 152°42'E	BR 113	0-50	115
				50-100	116				
				100-200	117				
				200-500	118				
				500-1000	119				
				1020-1940	120				
				2260-3350	121				
				2980-3960	122				
				4040-4970	123				
				2830-5950	124				
				6000-6990	125				
4-5 August 1966		45°43'N 153°45'E	RT	3000-6040	126				
				2-6540	127				
				2-7040	128				
17 August 1966	5621	45°06'N 155°54'E	BR 113	0-100	129				
				100-220	130				
				200-300	131				
				310-510	132				
				490-750	133				
				770-970	134				
				1000-1550	135				
				1540-2000	136				
				1970-2480	137				
				2320-2920	138				
				3050-3870	139				
19-20 August 1966	5624	45°20'N 153°54'E	RT	0-4600	140				
23-24 August 1966	5626	45°11'N 152°28'E	BR 113	0-50	141				
				50-100	142				
				100-200	143				
				200-300	144				
				300-500	145				
				1470-1980	146				
				2940-3990	147				
				4170-5200	148				
				5020-6140	149				
				5950-6850	150				
				7000-9120	151				
26 August 1966	5627	44°10'N 150°29'E	BR 113	0-50	152				
				50-100	153				
				100-200	154				
				190-300	155				
				290-500	156				
				500-750	157				
				740-1010	158				
				1000-1500	159				
				1500-2020	160				
1990-2500	161								
				2480-3000	162				

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Pacific	North-western part, Kurile-Kamchatka Trench	"Vitjaz" 39 cruise 28 August 1966		44°20'N 150°53'E	RT	0-6940	163		
		29-31 August 1966	5628	43°52'N 149°49'E	BR 113	3090-4100 4050-5090	164 165		
						JOMN	0-50	166	
							50-97	167	
							110-210	168	
							200-300	169	
							200-510	170	
							500-750	171	
							690-990	172	
							970-1510	173	
							1430-1980	174	
							1980-2980	175	
							2980-3960	176	
							4030-6780	177	
							5780-7200	178	
				3 September 1966	5631	43°47'N 149°56'E	BR 113	5130-6210 5850-6920	179 180
							RT	?-6500	181
				8 September 1966	5635	44°25'N 149°10'E	BR 113	0-50	182
								50-100	183
								100-200	184
								200-300	185
								300-500	186
								500-740	187
						740-990	188		
						1010-1480	189		
						1450-1990	190		
						2080-2490	191		
						2500-2920	192		
						2970-3880	193		
	Northern part, Aleutian Trench	"Vitjaz" 45 cruise 16-17 June 1969	6144	51°43'N 167°57'W	BR 113	785-1040 1030-1520	194 195		
						2040-3150	196		
						4300-7070	197		
						5065-7140	198		
	Japan Trench	28-29 June 1969	6151	37°38'N 143°51'E	BR 113	2450-3050 3360-3912	199 200		
	Marian Trench	"Vitjaz" 57 cruise 25 April 1975	7362	11°13'N 141°47'E	RT	0-7470	201		
	Izu-Bonin Trench	10 May 1975	7406	29°177'N 142°47'E	RT	0-8370	202		
	North-eastern part	"Akademik Korolev" 40 cruise 13 October 1985	103	14°N 132°30'W	BJN	153-500	203		
			14 October 1985	106	13°45'N 132°15'W		162-501	204	
			16 October 1985	117	13°30'N 132°15'W		205-610	205	
			19 October 1985	131	12°30'N 134°30'W		442-1000	206	
			21 October 1985	142	13°N 133°W		500-946	207	
			27 October 1985	ABC	14°N 132°30'W	JOMN	715-1000	208	
			28 October 1985				2510-3920	209	
			29 October 1985	162	14°N 132°45'W		3100-4600	210	
			1 November 1985	187	14°30'N 134°30'W	BJN	151-183	211	
				188	14°10'N 134°30'W		27-102	212	
			2 November 1985	194	12°30'N 134°30'W		10-100	213	
				196	12°N 134°30'W		50-100	214	

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Pacific	North-western part	"Professor Khromov" 4 cruise 24 August 1984	157	12°N 133°W		100-200	215
	Sea of Okhotsk	"Gagara" 30 June 1932	9	46°22'N 145°54'E		50-100 200 500 0-3000	216 217 218
		"Gagara" 5 July 1932	12	49°02'N 145°21'E	BJN	200-440	219
		6 July 1932	14	49°24'N 147°18'E		200-500	220
		7 July 1932	16	49°25'N 150°07'E		100-200 0-960	221 222
		8 July 1932	17	49°25'N 152°E		100-200 200-500	223 224
		9 July 1932	18	50°03'N 152°40'E		200-500 500-1340	225 226
		11 July 1932	23	51°38'N 155°36'E		200-475	227
		7 August 1932	41	53°11'N 149°53'E		200-500	228
		10 August 1932	44	52°57'N 145°50'E		100-200	229
			45	52°03'N 144°52'E		0-500	230
		11 August 1932	47	53°03'N 143°33'E		25-50	231
		19 August 1932	55	55°38'N 143°E		100-200 200-500	232 233
		11-12 September 1932	60	55°12'N 145°10'E		50-100 100-200 200 830	234 235 236
		14 September 1932	65	55°28'N 151°30'E		200-300	237
		15 September 1932	67	55°41'N 154°03'E		100-200 200-600	238 239
	Sea of Okhotsk, Aniva Bay, Tobutu Bay	12 August 1946	--	--	dredge	60 m, fine sand	240
	Southern part of Sea of Okhotsk	"Toporok" 25 August 1948	11	--	BJN	100-180	241
		28 August 1948	13	--		25-50 0-100 200 300 0-600	242 243 244 245
		26 August 1948	14	--	Deryugin's net	0-1450	246
	Sea of Okhotsk, off Cape Aniva	7 September 1949	74	--	BJN	0-500	247
		8 September 1949	75	--		0-500	248
			76	--		0-200 0-500	249 250
			77	--			251
	Kurile Islands, Shikotan Island region	10 September 1949	81	--	--	0-10	252
	Cape Zeleny, Shikotan Island region	11-12 September 1949	88	--	--	0-463	253
		12 September 1949	92	--	--	0-196	254
		13 September 1949	93	--	--	50-100 0-200	255 256
	Sea of Okhotsk	1 October 1949	146	--	--	80	257
	Kurile Islands, Paramushir Island region	"Lebed" 6 July 1954	52	--	BJN	100-184	258
		19 July 1954	94	--	Ichtioplankton net	0-157	259
	Kurile Islands, Paramushir Island, to the north of cape Vasil'ev, Pacific coast	1954	97	--	--	0-157	260
			169	--	--	94-86	261

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Pacific	Equatorial part	"Albatross" 9 September 1899	—	01°45'N 137°36'W	—	surface	262	
		Between Peru and Easter Island	"Albatross" 4 December 1904	4679	17°26'S 86°46'W	—	0-540	263
	"Albatross" 11 December 1904		4687	22°50'S 97°30'W	—	0-3600	264	
	South China Sea	"Albatross" 9 November 1908	5320	20°58'N 120°03'E	—	0-900	265	
		South-eastern part	"Eltanin" 5 cruise 13 September 1962	213	41°05'S 74°54'W	Isaacs Kidd trawl	606	266
	14 September 1962		215	45°01'S 75°33'W		1219	267	
	Antarctic part		2 October 1962	235	59°06'S 67°59'W		1830	268
		5 October 1962	248	59°56'S 69°W		1373	269	
		19 October 1962	262	62°26'S 67°45'W		2428	270	
		22 October 1962	275	66°28'S 72°37'W		1885	271	
		24 October 1962	282	67°04'S 75°19'W		1830	272	
		29 October 1962	297	63°41'S 71°16'W		2255	273	
		4 November 1962	313	58°S 70°40'W		802	274	
		Atlantic	Southern part	"Eltanin" 8 cruise 7 April 1963	563	48°15'S 40°24'W	Isaacs Kidd trawl	732
	13 April 1963			567	54°25'S 27°12'W		1135	276
	14 April 1963			570	56°04'S 27°24'W		933	277
	15 April 1963			571	54°S 25°W		1491	278
	16 April 1963			572	54°S 25°W		889	279
	17 April 1963			575	55°29'S 24°18'W		1867	280
19 April 1963	578			57°17'S 27°22'W		1464-1867	281	
21 April 1963	580			57°23'S 23°11'W		3074	282	
29 April 1963	592			55°11'S 25°53'W		2562	283	
	593			55°21'S 29°20'W		549	284	
1 May 1963	597			55°49'S 24°48'W		1922	285	
3 May 1963	601			58°18'S 25°38'W		933	286	
5 May 1963	605			58°28'S 22°20'W		1812	287	
9 May 1963	611			58°53'S 27°03'W		1047	288	
17 May 1963	626			60°28'S 29°20'W		1067	289	
	627			60°40'S 28°54'W		666	290	
18 May 1963	632			59°47'S 27°47'W		769-1071	291	
20 May 1963	634			59°40'S 24°47'W		664	292	
21 May 1963	635			59°35'S 24°41'W		1537	293	
23 May 1963	640			58°11'S 23°11'W		1537	294	
24 May 1963	642	57°20'S 24°40'W		312	295			
	643	57°45'S 24°17'W		617-1160	296			

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Atlantic	Southern part	"Eltanin" 8 cruise	654	57°56'S		1812	297
		28 May 1963		27°38'W			
		"Eltanin" 9 cruise	668	47°S	Isaacs	1495	298
		19 August 1963		35°03'W	Kidd trawl		
			670	50°23'S		1565	299
				34°55'W			
		25 August 1963	683	55°13'S		1867	300
				38°20'W			
		26 August 1963	687	55°24'S		2214	301
				37°57'W			
		27 August 1963	691	56°25'S		3118	302
				36°57'W			
		27 August 1963	692	56°29'S		1034	303
				37°03'W			
		28 August 1963	696	56°53'S		3001	304
				37°27'W			
		30 August 1963	701	58°05'S		2086	305
				37°44'W			
		4 September 1963	714	58°24'S		1574	306
				33°07'W			
		6 September 1963	716	56°51'S		3144-3197	307
				34°25'W			
			718	56°55'S		1307	308
		33°59'W					
7 September 1963	720	56°07'S		2818-2873	309		
		34°03'W					
11 September 1963	729	52°54'S		2328	310		
		33°57'W					
		53°03'S		459-549	311		
		34°11'W					
Pacific	off the coast of South America	24 September 1963	741	40°16'S		2635	312
				78°18'W			
		26 September 1963	742	33°33'S		864	313
				72°45'W			
			743	33°18'S		1830	314
				72°27'W			
	Antarctic part	"Eltanin" 10 cruise	775	58°05'S		686	315
		17 October 1963		82°50'W			
		19 October 1963	778	59°S 82°W		1251-1691	316
			779	59°38'S		2053	317
				82°27'W			
		20 October 1963	781	59°52'S		339-549	318
				82°50'W			
		24 October 1963	788	63°S		915	319
				82°22'W			
			789	63°11'S		2196	320
				82°17'W			
		25 October 1963	792	63°54'S		1501-1720	321
				82°49'W			
		30 October 1963	811	64°47'S		461-1263	322
				78°08'W			
		5 November 1963	835	62°04'S		915	323
				75°18'W			
10 November 1963	846	57°52'S		1860	324		
		74°43'W					
12 November 1963	849	56°56'S		1080-1226	325		
		74°43'W					
		850	57°57'S		2233	326	
			75°11'W				
13 November 1963	852	56°31'S		3111	327		
			74°56'W				
17 November 1963	857	62°50'S		344	328		
			78°43'W				
21 November 1963	864	61°20'S		1383	329		
			78°55'W				
22 November 1963	866	59°45'S		1219	330		
			78°35'W				
23 November 1963	867	59°25'S		2776	331		
			78°27'W				

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Pacific	Antarctic part	25 November 1963	868	57°06'S 78°56'W		987-1230	332
		27 November 1963	874	57°06'S 79°04'W		1491	333
		"Eltanin" 10 cruise 29 November 1963	877	55°22'S 78°08'W		1940	334
		"Eltanin" 12 cruise 14 March 1964	998	61°51'S 55°56'W	Isaacs Kidd trawl	732-1373	335
		19 March 1964	1014	65°08'S 47°45'W		1025-1153	336
		1 April 1964	1050	60°46'S 31°04'W		412-494	337
		4 April 1964	1057	59°28'S 31°20'W	—		338
		10 April 1964	1071	59°S 36°49'W		1967-2333	339
		"Eltanin" 13 cruise 29 May 1964	1121	62°14'S 89°55'W	Isaacs Kidd trawl	824-849	340
		7 June 1964	1132	66°17'S 93°02'W		1381-1812	341
			1133	66°04'S 92°38'W		560-791	342
		9 June 1964	1137	66°19'S 98°38'W		567-659	343
		10 June 1964	1141	66°15'S 102°37'W		2416-2435	344
		25 June 1964	1162	59°37'S 130°19'W		714-933	345
		28 June 1964	1167	55°28'S 129°45'W		1047	346
		30 June 1964	1170	55°01'S 129°56'W		988-1080	347
		"Eltanin" 21 cruise 3 January 1966	279	57°02'S 85°16'W	Isaacs Kidd trawl	700-850	348
Atlantic	Antarctic part	"Eltanin" 22 cruise 8 March 1966	1584	56°23'S 35°05'W	Isaacs Kidd trawl	1131-1548	349
Pacific	South-eastern part	"Eltanin" 24 cruise 16 July 1966	1719	39°58'S 150°31'W		1900	350
			1720	40°S 150°12'W		350	351
		21 July 1966	1728	44°54'S 145°20'W		385	352
		23 July 1966	1734	42°41'S 144°41'W		900	353
		25 July 1966	1737	40°13'S 144°44'W		1500	354
		26 July 1966	1740	41°10'S 142°43'W		1500	355
			1741	41°13'S 142°41'W		630	356
		5 August 1966	1753	42°47'S 134°35'W		850	357
			1755	42°31'S 134°23'W		850-1350	358
		7 August 1966	1761	40°32'S 135°29'W		1350	359
		9 August 1966	1766	38°17'S 134°32'W		900-1250	360
		10 August 1966	1769	36°05'S 134°05'W		520	361
		13 August 1966	1773	40°16'S 132°32'W		700	362
		14 August 1966	1778	41°46'S 130°16'W		800	363
		16 August 1966	1781	39°40'S 130°12'W		950	364
		20 August 1966	1793	39°44'S 127°05'W		1200	365

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Pacific	South-eastern part	22 August 1966	1798	42°06'S 124°38'W		750	366	
		27 August 1966	1810	35°15'S 124°20'W		1250	367	
		"Eltann" 24 cruise 2 September 1966	1811	36°05'S 95°24'W		650	368	
		"Eltann" 25 cruise 17 October 1966	336	49°57'S 100°03'W	Isaacs Kidd trawl	582	369	
		19 October 1966	340	50°03'S 105°05'W		1190	370	
			341	50°12'S 104°50'W		561	371	
		26 October 1966	347	50°14'S 127°32'W		1350	372	
	Antarctic part	29 October 1966	352	55°31'S 126°28'W		1155	373	
		31 October 1966	353	60°S 127°31'W		2450	374	
		3 November 1966	355	62°33'S 127°32'W		420	375	
			357	62°46'S 128°12'W		1750	376	
		"Ob" 1 cruise 22 February 1956	0	66°S 93°E	K 100	0-400	377	
	Indian	Antarctic part	10 March 1956	34	64°21'S 115°55'E			378
			11 March 1956	36	62°54'S 118°52'E	RT	0-3700	379
21-22 March 1956			47	64°05'S 133°46'E	K 100	0-235	380	
23 March 1956			48	63°18'S 135°13'E	BR 113	0-3600	381	
						0-2600	382	
Pacific		Antarctic part	29 March 1956	57	64°03'S 161°59'E		0-2000	383
							0-3800	384
			14 April 1956	80	39°01'S 169°03'E	K 100	0-600	385
South-western part		15 April 1956	83	37°31'S 163°59'E	BR 80	0-1200	386	
		16 April 1956	85	36°32'S 160°32'E	K 100	0-1200	387	
	17 April 1956	88	34°52'S 155°28'E	BR 80	0-1500	388		
		89	34°22'S 153°59'E		0-500	389		
	Indian	South-eastern part	1 May 1956	92	37°41'S 134°19'E		0-500	390
4 May 1956			96	43°55'S 127°47'E		0-600	391	
			97	45°26'S 125°52'E		0-2200	392	
Antarctic part		12 May 1956	111	64°24'S 92°52'E	BR 113	0-2700	393	
		South-eastern part	25 May 1956	129	31°20'S 66°04'E	K 100	surface	394
26 May 1956			130	28°34'S 65°21'E		0-200	395	
Western part		28 May 1956	132	22°28'S 64°02'E	K 100	0-2300	397	
		29 May 1956	135	19°09'S 63°07'E	RT BR 113	0-4300	398	
		30 May 1956	137	14°43'S 62°57'E	K 100	0-3300	399	
		31 May 1956	138	12° 12'S 62°53'E	BR 113	0-1250	400	
						0-2800	401	
North-western part		31 May 1956	139	09°58'S 62°45'E	K 100	0-120	402	
		1 June 1956	140	07°50'S 60°30'E		0-1500	403	

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Indian	Antarctic part	"Ob" 2 cruise	218	63°21'S	K 100	0-500	404		
		12 February 1957		39°59'E					
		25 February 1957	243	61°33'S				405	
Atlantic	South-eastern part	11-12 March 1957	259	37°49'S 19°45'E			406		
Indian	Eastern part	23 April 1957	305	25°28'S 96°58'E		0-240	407		
			306	23°40'S 97°01'E		0-518	408		
								409	
		24 April 1957	307	21°26'S 97°04'E		0-540 0-200	410 411		
		25 April 1957	308	19°08'S 96°58'E		0-200	412		
		26 April 1957	309	16°48'S 96°54'E		0-500 0-200	413 414		
		27 April 1957	310	14°41'S 97°03'E		0-577	415		
		28 April 1957	311	12°49'S 96°58'E		0-610 0-244	416 417		
Indian	North-eastern part	1 May 1957	312	10°54'S 94°57'E		0-220 0-1000	418 419		
		6 May 1957	319	01°58'N 88°14'E	BR 80	0-1000	420		
		7 May 1957	320	04°01'N 88°20'E		0-200	421		
		Pacific	South-western	"Ob" 3 cruise	344	38°30'S	K 100	0-650	422
				11 March 1958		151°40'E			
		12 March 1958	345	39°94'S 153°45'E		0-500	423		
		14 March 1958	348	42°34'S 159°E	—	0-100	424		
		16 March 1958	351	45°30'S 164°38'E	K 100	0-500	425		
		17 March 1958	352	46°11'S 165°50'E		0-1500 0-700	426 427		
		18 March 1958	355	49°10'S 166°23'E		0-500	428		
	Antarctic part	25 March 1958	367	63°50'S 165°25'E	BR 80	1100-2200	429		
		28 March 1958	371	68°16'S 165°16'W	K 100	0-550	430		
		2 April 1958	381	70°S 160°20'W		0-1000	431		
	Southern part	8 April 1958	391	52°25'S 159°51'W		0-500	432		
Indian	South-eastern part	15 April 1958	397	53°09'S 141°26'W		0-500	433		
Pacific	Antarctic part	26 April 1958	413	58°58'S 109°21'W		0-2130	434		
		28 April 1958	415	55°18'S 109°20'W		0-1200	435		
	South-eastern part	29 April 1958	417	51°22'S 109°27'W		0-1200	436		
		30 April 1958	419	47°36'S 109°20'W		0-520 0-1100	437 438		
		1 May 1958	420	45°53'S 109°27'W		0-500	439		
		3 May 1958	423	39°44'S 109°16'W		0-1200	440		
		7 May 1958	430	27°37'S 109°25'W		0-1100	441		
		13 May 1958	435	29°50'S 93°34'W		0-1050	442		
		19 May 1958	440	31°59'S 78°27'W		0-2300	443		

1	2	3	4	5	6	7	8	
Pacific	South-eastern part	"Ob" 3 cruise	442	32°25'S		0-1300	444	
		20 May 1958		75°42'W		0-500	445	
		21-22 May 1958	444	32°56'S		0-500	446	
				72°55'W		0-2100	447	
		22 May 1958	445	33°03'S		0-550	448	
				72°10'W				
		1 June 1958	446	37°S		0-580	449	
				74°05'W				
		2 June 1958	447	40°55'S		0-530	450	
		74°42'W						
		3 June 1958	448	45°04'S		0-500	451	
				75°33'W				
Atlantic	Antarctic part	10 June 1958	461	60°47'S		0-500	452	
		12 June 1958	466	56°34'S		0-1000	453	
				63°08'W				
			13 June 1958	467	55°35'S		0-500	454
					64°22'W			
		North-western part	"Akademik Kurchatov" 14 cruise 18 February 1973	1207	13°18'N 62°59'W	Sigsby trawl	0-2970	455
	North-eastern part	"Ivan Kruzenshtern" 24 July 1982	4	48°33'N 18°52'W		0-4320	456	
		25 July 1982	9	48°30'N 19°04'W		0-4430	457	
Arctic Basin	Barents Sea	3 August 1982	15	70°N 54°E		0-156	458	
	White Sea	15 October 1977	8			100-200 & 200-260	459	
	Central part	"Lena" 3 cruise 27 October 1957	10	82°16'N 5°56'E	K 100		460	
	Greenland Sea	"Lena" 4 cruise 12 March 1958	3	76°27'N 13°15'E		500-1330	461	
			16 March 1958	13			0-1500	462
	Norwegian Sea	"Akhil" 22 July 1977		72°52'N 4°40'E		1100-2800	463	
			"MI-846" 13 cruise 7 July 1977		66°55'N 6°W		0-2000	464
			21 July 1977		71°10'N 0°		0-2100	465
			"MI-721" 62 cruise 3 August 1977		72°50'N 0°			466
			4 July 1977		74°30'N 4°18'E		0-500	467
					47°40'N	Isaacs Kidd trawl	500-800	468
Arctic Basin	Greenland Sea	"Ob" 17 August 1956	3	78°N 7°E	Nansen net	300-500	469	
		18 August 1956	5, 7	78°N 5°W		0-300	470	
		19 August 1956	8	78°N 7°E		0-320	471	
			20 August 1956	10	78°N 11°E		0-200	472
	Norwegian Sea	"Sevastopol" 5 October 1958	1735	66°43'N 04°11'W		0-2500	473	
	Pacific	Kamchatka peninsula, Shupunsky peninsula, 90 miles to the south-east of Shupunsky Cape	"Severnyy Polus" 10 cruise 25 July 1946	1		K 100	0-4000	474
Arctic Basin	Central part	"S" 1948				below 200 m	475	
		"SP-3" 21 May 1954	1	87°N 179°08'W	Nansen net	0-3900	476	
		22 July 1954	7	88°12'N 152°03'W		2-900 300-2200	477 478	
		16 October 1954	15	88°10'N 82°22'W		850-1750	479	
		17 October 1954		88°40'N 83°22'W		850-1750 50-100	480 481	
		"SP-4" 30 May 1955	1	81°12'N 180°24'E		90-260	482	

1	2	3	4	5	6	7	8
Arctic Basin	Central part	"SP-4" 3	4	81°41'N		900-1750	483
		27 June 1955		180°57'E			
		27 July 1955	8	82°23'N		250-900	484
				173°53'W		900-3167	485
		13 September 1954	9	79°44'N		270-800	486
				177°32'E		800-1500	487
		19 October 1954	11	79°49'N	Nansen	800-1990	488
				176°40'E			
		1 November 1954	12	80°14'N		0-270	489
				177°47'E		800-1750	490
		16 September 1955	15	83°14'N		100-300	491
				176°17'W		300-970	492
						970-2918	493
		27 October 1955	16	85°43'N		950 2319	494
				179°12'E			
		21 November 1955	17		Nansen	275-970	495
		22 November 1955		85°41'N		300-1000	496
				178°17'W		1000-2182	497
		16 December 1955	18	86°09'N	Nansen	275-900	498
				174°45'W		900-3912	499
		20 January 1956	19	87°04'N		0-2350	500
				177°36'E			
		17 February 1956	20	86°36'N		225-925	501
				180°02'E		905-3945	502
					Nansen	900-3980	503
		19 March 1956	21	87°02'N		240-900	504
				170°12'W		900-4038	505
"SP-5" 23 May 1955	1	82°54'N		50-2686	506		
		150°20'E		233-770	507		
21 September 1955	12	84°58'N	Nansen	190-770	508		
		143°40'E					
24 November 1955	14	86°02'N		1310-4320	509		
		115°51'E					
21 December 1955	15	86°29'N		1100-4330	510		
		99°32'E		710-1100	511		
				740 1110	512		
24 January 1956	16	86°25'N		200-750	513		
		86°01'E					
15 March 1956	18	86°34'N		1100 4330	514		
		94°20'E					
18 March 1956			Nansen	760-4350	515		
East Siberian Sea	"SP-6" 29 May 1956	1	75°12'N		50-100	516	
			177°32'E				
	"SP-16"	32/10	85°31'N		0 1000	517	
	25 February 1971		125°37'W				
	25 September 1971	4	86°32'N	Nansen	250-2020	518	
			101°34'W				
	22 August 1971	3	86°39'N		250 1940	519	
			99°09'W				
	15 November 1971	5	86°20'N		0-2580	520	
			92°27'W				
	"SP-17"	1	82°28'N	Judey	250-900	521	
	24 June 1968		167°38'E				
	"SP-19"	7/3	81°26'N	Nansen	0 237	522	
	6 June 1971		150°53'E		50 237	523	
					237-750	524	
					2600-3000	525	
	6 June 1971	8/4	82°20'N	Nansen	0-50	526	
			143°20'E		210-750	527	
	11 June 1971	9/5	82°29'N		0-50	528	
			141°37'E		50-220	529	
					220 750	530	
					750 1650	531	
	17 June 1971	10/6	82°56'N		190-750	532	
			140°32'E		750 2120	533	

1	2	3	4	5	6	7	8	
Arctic Basin	Central part	"SP-19"	11/7	83°33'N		50-200	534	
		13 July 1971		140°45'E		200-750	535	
							750-2410	536
		11 August 1971	12/8	83°09'N		0-50	537	
				137°59'E		50-200	538	
						200-750	539	
						0-3800	540	
		5 September 1971	13/9	83°12'N		200-750	541	
				143°05'E				
		14 September 1971	14/10	83°33'N		200-550	542	
				142°39'E		200-750	543	
						750-1300	544	
		27 September 1971	15/11	84°33'N		0-50	545	
				142°17'E		0-200	546	
						200-750	547	
						750-3300	548	
		16 October 1971	16/12	84°46'N		0-50	549	
				141°44'E		50-250	550	
						250-750	551	
						750-3360	552	
		13 November 1971	17/13	86°12'N		200-750	553	
				134°55'E		300-3400	554	
		2 December 1971	18/14	86°47'N		50-250	555	
				122°16'E		250-750	556	
						760-1000	557	
		"SP-19"	16	85°12'N		800-2250	558	
		20 February 1973		37°14'W				
		"SP-20"	7	78°29'N		0-10	559	
		1 December 1970		175°37'W				
	10	78°40'N		740-1572	560			
		176°27'W						
"SP-22"	14	81°42'N	Sigsby trawl	3500	561			
11 June 1977		126°70'W						
9 August 1977	34	79°26'N		3290	562			
		137°39'W						
26 August 1977	7	81°09'N	Nansen net	0-3200	563			
		170°44'W						
"SP-23"	20	83°30'N	circopelagic tow		564			
9 October 1977		150°42'E						
20 October 1977		83°35'N			565			
		150°21'E						
24 October 1977		83°28'N			566			
		151°42'E						
	Laptev Sea, New Siberian Islands region	2 August 1973			Judey net	surface	567	
		1 September 1973				near-bottom catch	568	
Atlantic	Northern	"Lomonosov" 5 cruise	354	51°32'N	K 100	0-819	569	
		2 May 1959		30°W				
		North-western	"Lomonosov" 6 cruise	422	40°56'N		0-2000	570
			26 August 1959		66°W			
		North-eastern	2 October 1959	508	34°53'N			571
				14°59'W				
	Northern			17°N 18°W			572	
		"Ekvalan", "Zvezda"					573	
Pacific	North-western						574	
		"Kuro-Sio" 1 cruise	6				575	
		14 July 1965						

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