

A new species of *Acutiserolis* Brandt, 1988 (Isopoda: Serolidae) from the deep sea of southern Brazil

Elaine F. Albuquerque and Ingrid A. Costa

(EFA; IAC) Instituto de Ciências Biológicas e Ambientais. Laboratório de Bentos/Carcinologia. Universidade Santa Úrsula. Rua Jornalista Orlando Dantas, 59, Botafogo. CEP 22231-010, Rio de Janeiro, Brasil.
(EFA) E-mail: elaineusu@hotmail.com

Abstract

A new species of Serolidae is described from deep waters off the southern coasts of Brazil, between 1190 and 1555 meters depth. *Acutiserolis coineauae* sp. nov. The specimens were collected during the cruise TAAF MD55/Brazil. *A. coineauae* is compared with *Serolis insignis* Moreira, 1977 and *Acutiserolis neaera* (Beddard, 1884) illustrated and diagnosed.

Key words: Serolidae, New species, Deep sea, MD55/Brazil.

Introduction

The genus *Acutiserolis* Brandt, 1988 belongs to the family Serolidae Dana, 1852, which are mainly distributed on the continental shelves of the Southern Hemisphere in Antarctica, Australia, and South America. However some species were described for the Californian and the Georgian coasts. Others occupy the deep sea (Beddard, 1984a e b; Bastida et al., 1970; Moreira, 1977; Wägele, 1994; Poore and Brandt, 1997; Held, 2000).

The Serolidae were first studied by Dana (1852) and the Brazilian species were extensively described by Moreira (1971; 1972; 1974a; 1974b; 1976; 1977). More recently, Brandt (1988, 1991) and Wägele (1994) both established new genera and subgenera for this family. Brandt (1991) and Wägele (1994) proposed a phylogeny of the Serolidae based on morphological characters. This family has 21 genera and 86 species. Held (2000) proposed molecular phylogenetic hypotheses for 16 species of this family from Antarctic waters and the deep-sea of South America and Australia.

The diagnosis of genus *Acutiserolis* Brandt, 1988 was expanded by Poore and Brandt (1997) and there are seven species of this genus.

A large number of benthic organisms has been collected by the TAAF MD55/Brazil cruise on the seamounts from Vitoria to Trindade along the southern coast of Brazil in autumn 1987 (Tavares, 1999). The isopods were abundant in most of the

benthic samples, especially the Serolidae that were represented by six species. Among the material a new species of the genus *Acutiserolis* Brandt, 1988 was found on the bathyal zone. This new species is described in this contribution.

Material and Methods

Specimens of Serolidae were collected from the deep sea, by means of a beam trawl during the MD55/Brazil cruise organized by Santa Ursula University (Brazil) and the Muséum national d'Histoire naturelle de Paris (France). The type material is deposited in the Museum of Zoology, São Paulo (MZUSP).

All illustrations are of left limbs unless otherwise noted, labeled as follows: AT1 = antennula; AT2 = antenna; MD = mandible; MX1, 2 = maxillae 1, 2; MXP = maxilliped; P1-P7 = pereopods 1-7; PL1-PL5 = pleopods 1-5; Ur = uropod; l = left; r = right, other alphabetical letters are even used to show details.

Systematics

Suborder Sphaeromatidea Wägele, 1989
Family Serolidae Dana, 1852
Genus *Acutiserolis* Brandt, 1988
Type species: *Serolis spinosa* Kussakin, 1967

Acutiserolis coineauae sp. nov.
(Figures 1 to 6)

Material examined

Holotype: male, 53 mm. TAAF MD55/Brazil 1987 St 67, Cabo Frio, Rio de Janeiro, Brazil. 24°12'S and 042°15'W, 1555 m, 02/VI/1987 (MZUSP 18085).

Paratypes: Cabo Frio, TAAF MD55/Brazil 1987 St 67, 24°12'S, 042°15'W, 1555 m: ♂ 50 mm, ♀ 34,5 mm, ♀ 19 mm, 02/VI/1987 (MZUSP 18969). Cape São Tomé, TAAF MD55/Brazil 1987 St 3, 21°24'S, 039°56'W, 1360 m: ♂ 28 mm, 2♂ 29 mm, ♀ 29 mm, 2♀ 28 mm, 1 manca 7 mm, 09/V/1987 (MZUSP 18970). TAAF MD55/Brazil 1987 St 59, 21°36'S, 039°59'W, 1190 m: ♀ 58 mm, 1 manca 7,5 mm, 31/V/1987 (MZUSP

18971). Abrolhos: TAAF MD55/Brazil 1987 St 44, 18°58'S, 037°48'W, 1200 m: ♂ 27 mm, ♀ 30 mm, 2♀ 18 mm, ♀ 17,5 mm, 27/V/1987 (MZUSP 18972). TAAF MD55/Brazil 1987 St 45, 19°01'S, 037°47'W, 1500 m: ♂ 26 mm, 27/V/1987 (MZUSP 18973).

Etymology: The species is named after Dr. Nicole Coineau, who has been outstanding in the isopod taxonomy studies.

Description of male holotype: Colour (in alcohol), light yellowish with some brown dots.

Head: greatest width by far across frontal margin; antero-lateral angles acutely projected with a continuous sharp transverse ridge at the base of antennae; eyes seleniform small, prominent and convex without distinct ommatidia; posterior on the head three somewhat flat tubercles and two

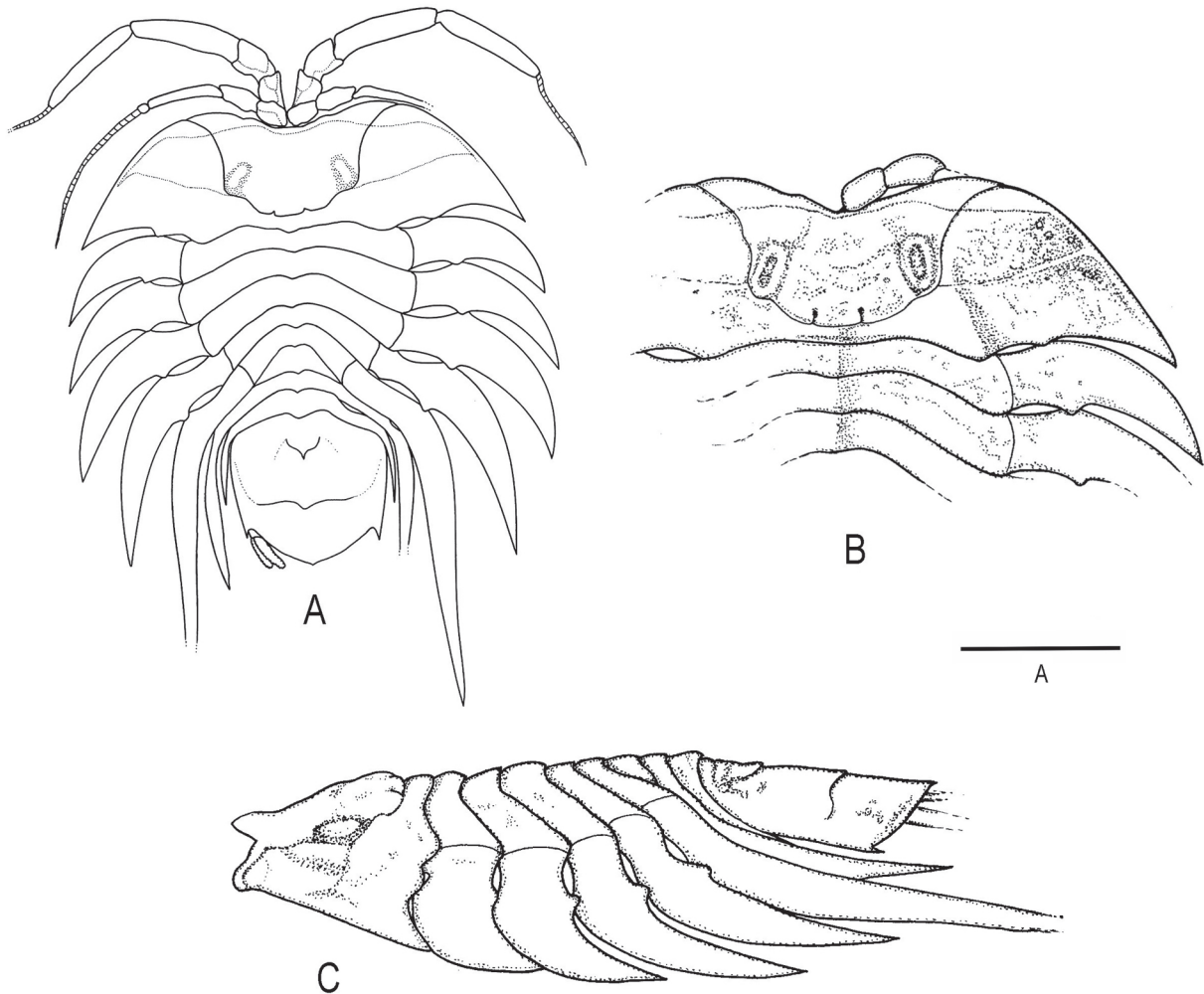


Figure 1. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). A, Habitus in dorsal view- scale bar=10 mm; B, Head and pereonites 2-3 in dorsal view; C, Habitus in lateral view.

little excavations. Body broad, about 1.2 times as wide as long. Greatest width of body between tips of coxa 3.

Pereon: pereonites 2-6 free, with dorsal surface smooth, lacking tubercles or rugae; pereonite 1 with anterolateral margin convex and concave posterior; posterolateral corner produced as an acute triangular plate and two sharp carinae on either of the expanded lateral sides, one of which transverse; pereonites 6 not fused dorsally; coxal plates elongate, curved separated from one another at the lateral margins by large gaps; sternites 5-7 ventrally fused, with groove between each pereonite; sutures between the dorsal coxae plates and tergites of pereonites 2-6 visible dorsally; Pereonites 2-6 with a smooth pointed spine at the mid-distal margin. Coxal plates 4 reaching the middle of pleotelson; coxal plate 5 reaching the apex of pleotelson; coxal plates 6 are about twice the total length of pleotelson. Pereonite 7 without coxal plates.

Pleon: pleonite 1 not visible dorsally; pleonites 2 and 3 with narrow elongate diverging epimera; epimera 2 exceeding pleotelson; epimera 3, 60% length of pleotelson. Pleotelson broad, depressed, 35% of total length, as long as wide; lateral margins widely convex distally, with deep postero-lateral excavations flanked laterally by a spiniform

point; A sharp transversal ridge runs from one side to another at the middle of pleotelson; this ridge has a mid-posterior mark prominent and spiniform. Near the base there is a ridge forming a pointed and spiniform elevation, and on the both sides of this elevation exists a little oblique ridge. A long longitudinal keel is present at the pleotelson; uropods are dorsally visible and are inserted in the last third of pleotelson.

Antenna 1: peduncular article 2 slightly narrower than article 1; article 3 almost as long as first two together and article 4 the smallest. Flagellum of over 50 articles; flagellar article 1 without aesthetasc; one single aesthetasc present on each other articles; ultimate article elongate, narrow, with five apical setae and one pectinate seta.

Antenna 2: with short first peduncular article; second smaller than third; articles 3 and 4 similar in length, without setae; flagellum composed of 23 articles; articles without serrated process at ventral surface, terminal article shorter than penultimate with some simple apical setae.

Mandibles: Asymmetrical, left lacinia mobilis a broad blade, at least two-thirds width of incisor; spine simple and straight. Right lacinia mobilis with one strong tooth and denticles, spine simple and straight; incisor strong and wider than lacinia

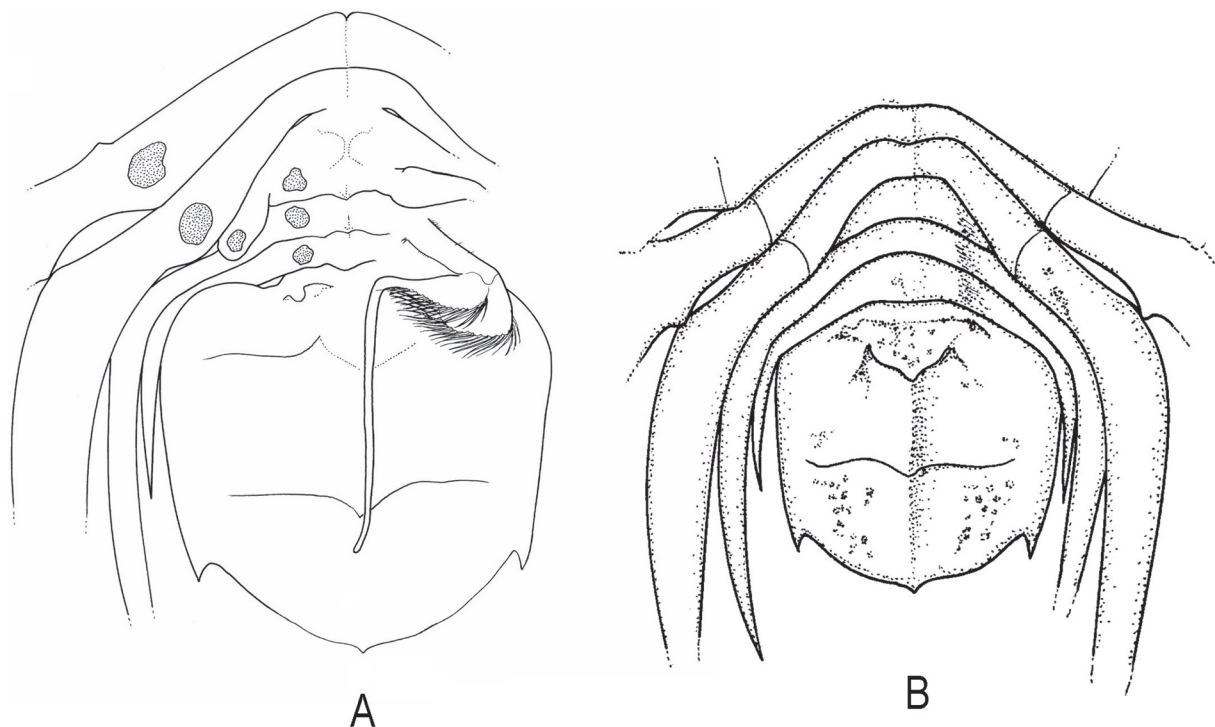


Figure 2. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). A, ventral view of pereonites 5-6, pleonites 1-3 and pleotelson; B, dorsal view of pereonites 5-6, pleonites 1-3 and pleotelson.

mobilis; both mandibles without molar process; mandibular palp 3-articulated, second article longer, with 20 plumose setae along distal part of lateral margin, third article lanceolate, with row of 68 plumose setae, last 4 longer.

Maxilla 1: outer lobe with 11 strong apical teeth, inner lobe small, distally rounded, with short apical seta.

Maxilla 2: inner lobe with 21 slender setae distally setulated and with two setae near base of median lobe; medial lobe with four long setae; outer lobe with two long setae and one small.

Maxilliped: coxa and epipod lateral to it separated by suture; large quadrangular epipod,

a stronger endite longer than the epipod; endite with oblique distal margin bearing two short spiniform setae, media to posterolateral surface of endite covered with several simple and some long setae; epipod and endite not fused; maxilliped palp three-jointed, with first article smallest, bearing four setae, the second article longest with two rows of mesial setae with hiatus between, third article with some lateral setae and many distal setae.

Pereopod 1: prehensile; basis almost bare and ischium without setae; merus with short setae on ventro-distal angle; carpus with ventral margin slightly convex, distal margin truncate with two stout composite setae on distal corner; propodus

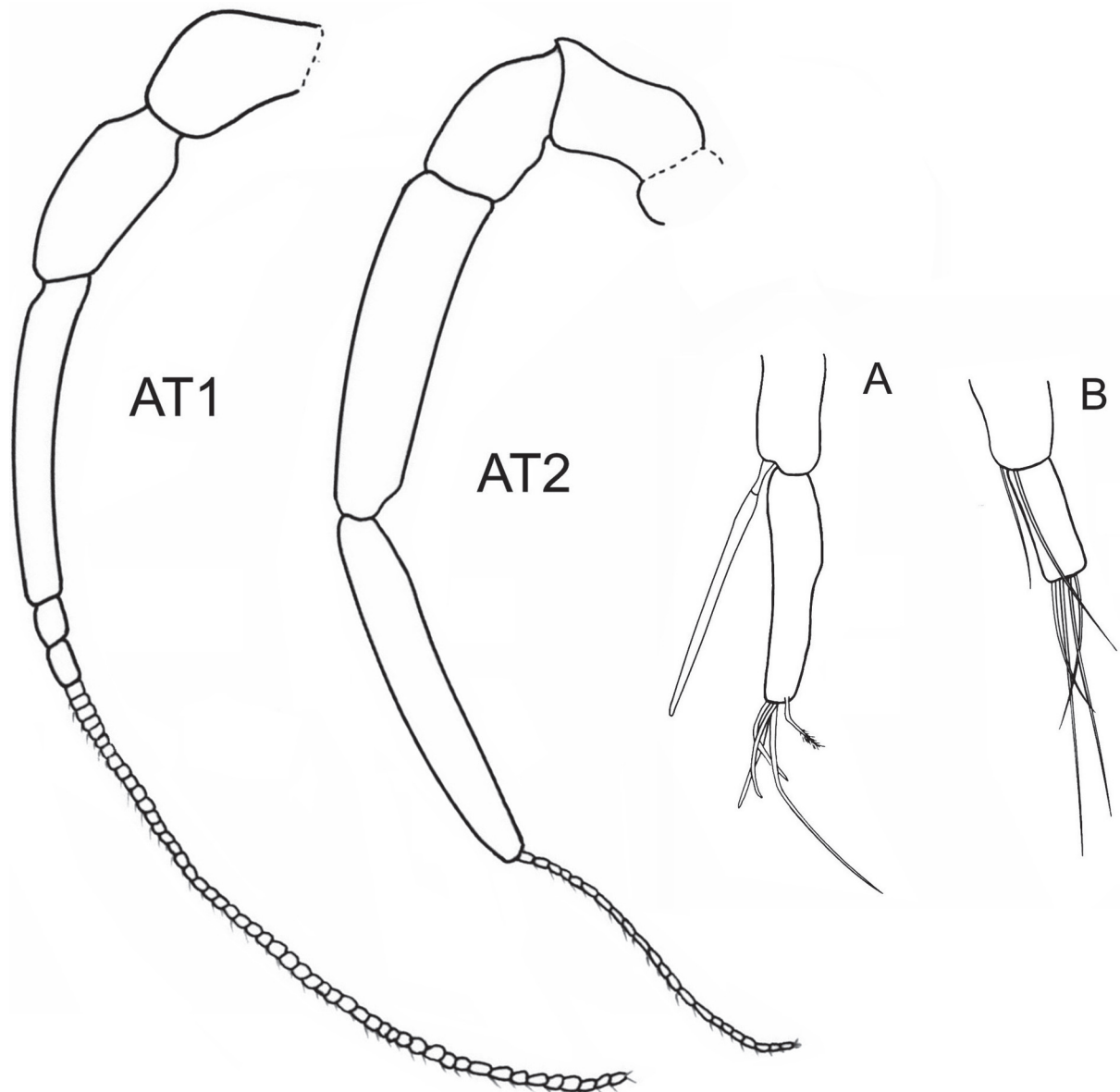


Figure 3. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). AT1-AT2, A, details of antenna 1 extremity; B, details of antenna 2 extremity.

greatest width 50% of length, curved palm with row of 45 alternating flattened and spiniform setae, each with apical projection and with row of short lateral setae submarginally; dactylus curved and tapering with a row of setae at dorsal and ventral margin, unguis weakly differentiated, reaching carpus.

Pereopod 2: Basis very elongated and slender, with some simple setae on dorsal and ventral margin; ischium 75% length of basis, with a row of simple setae on ventral margin and a tufts of plumose setae near the distal corner; merus and carpus subequal in length; merus with a row of plumose setae on ventral margin and some pectinate setae on dorsal margin; carpus with a row of plumose setae on ventral margin; propodus with prominent heel, greatest width 71% of length; palm with row of 15 alternating flattened and spiniform setae, each with apical projection and with three short

setae on dorsal margin and one short setae on distal corner; dactylus strongly curved on to heel of palm, with some simple setae on dorsal margin, unguis small.

Pereopods 3-6: very similar; basis, ischium and merus progressively shorter; carpus longer than merus with setae on lower margin; ischium and merus with a clump of plumose setae dorsodistally and merus bearing some pectinate setae; ventrally merus – propodus with composite sensorial setae, except for P3 that also bear some pectinate setae on merus; propodus tip with long composite sensorial setae, except for P6 that also bear some pectinate setae; dactylus very slender and tapering.

Pereopod 7: about 0.6 length of pereopod 6; dorsal margin of basis with some setae; at dorsal margin of ischium near basis, one simple setae and near merus with some simple and plumose setae; ventral margin of ischium bearing simple and plu-

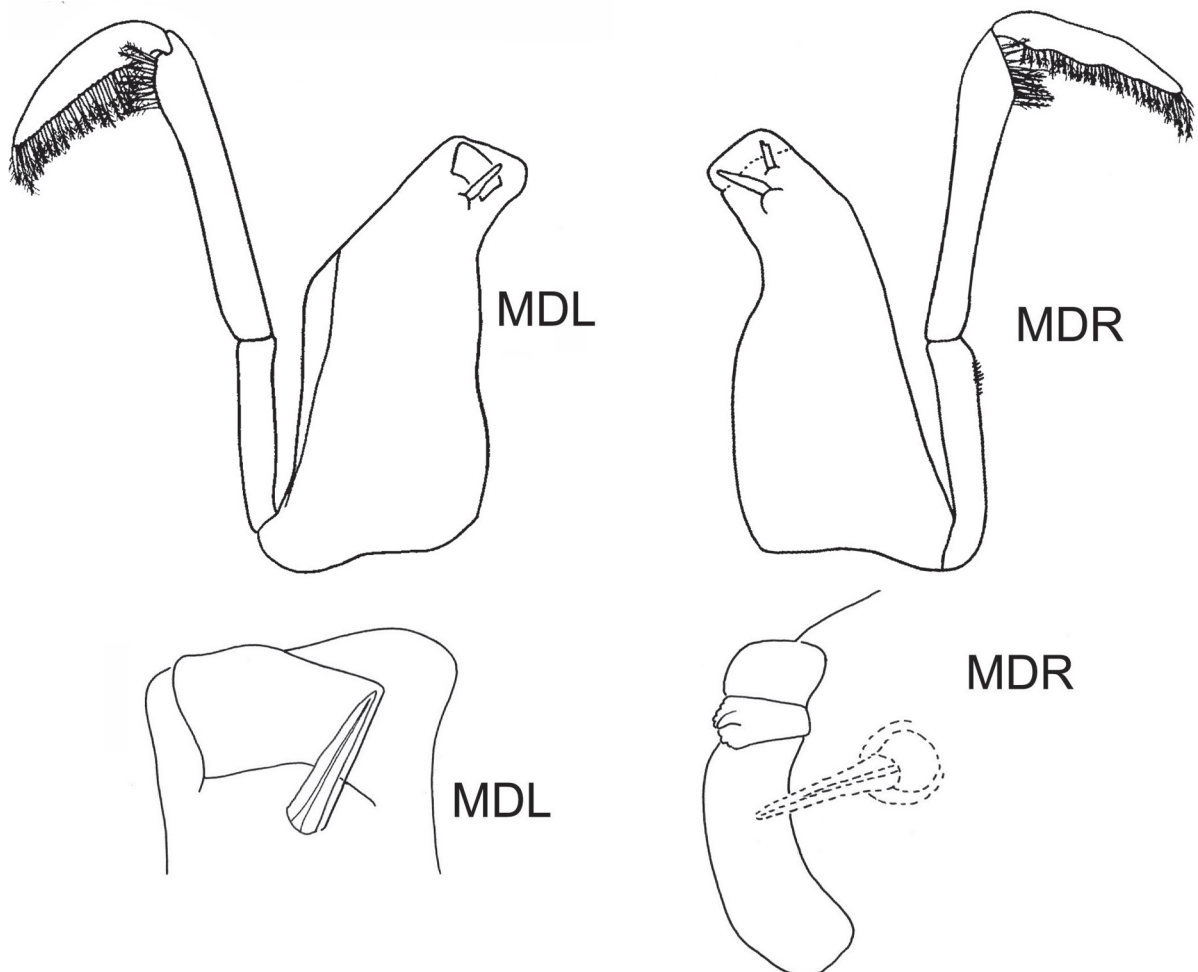


Figure 4. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). Left (MDL) and right (MDR) mandibles (with details of *lacinia mobilis*).

mose setae; ventral margin of merus, carpus and propodus densely covered by long plumose setae; carpus and propodus with strong simple setae on distal margins; propodus width 0.3 length; dactylus about 40% length of propodus, closing back on palm, more curved than in pereopods 3-6.

Pleopod 1: peduncle subtriangular with two proximal setulate setae; endopod almost semicircular with 23 marginal plumose setae; exopod larger and also semicircular, with 46 marginal plumose setae.

Pleopod 2: peduncle rectangular, with two setulate setae on proximal ventral margin; endopod narrower than in pleopod 1, with 19 marginal plumose setae, with apical slender *appendix masculina*, four times as long as endopod; exopod larger, semicircular with 47 marginal plumose setae.

Pleopod 3: peduncle narrower than in pleopod 2, with two proximal setulate setae on ventral margin; endopod almost semicircular with 19 marginal plumose setae; exopod almost semicircular with 44 marginal plumose setae.

Pleopod 4: exopod operculiform, chitinized, 2-articulated with lateral row of about 135 short marginal plumose setae; endopod bilobed, with one short rounded lobe and a long narrow lobe bordered by fine setae.

Pleopod 5: rami with transverse suture; exopod with 10 distal plumose setae; endopod as long as exopod, without setae.

Uropod: peduncle triangular; exopod 0,85 length of endopod, distally rounded; exopod and endopod with crenulate margins; exopod with 31 plumose setae; endopod 3.1 times as long

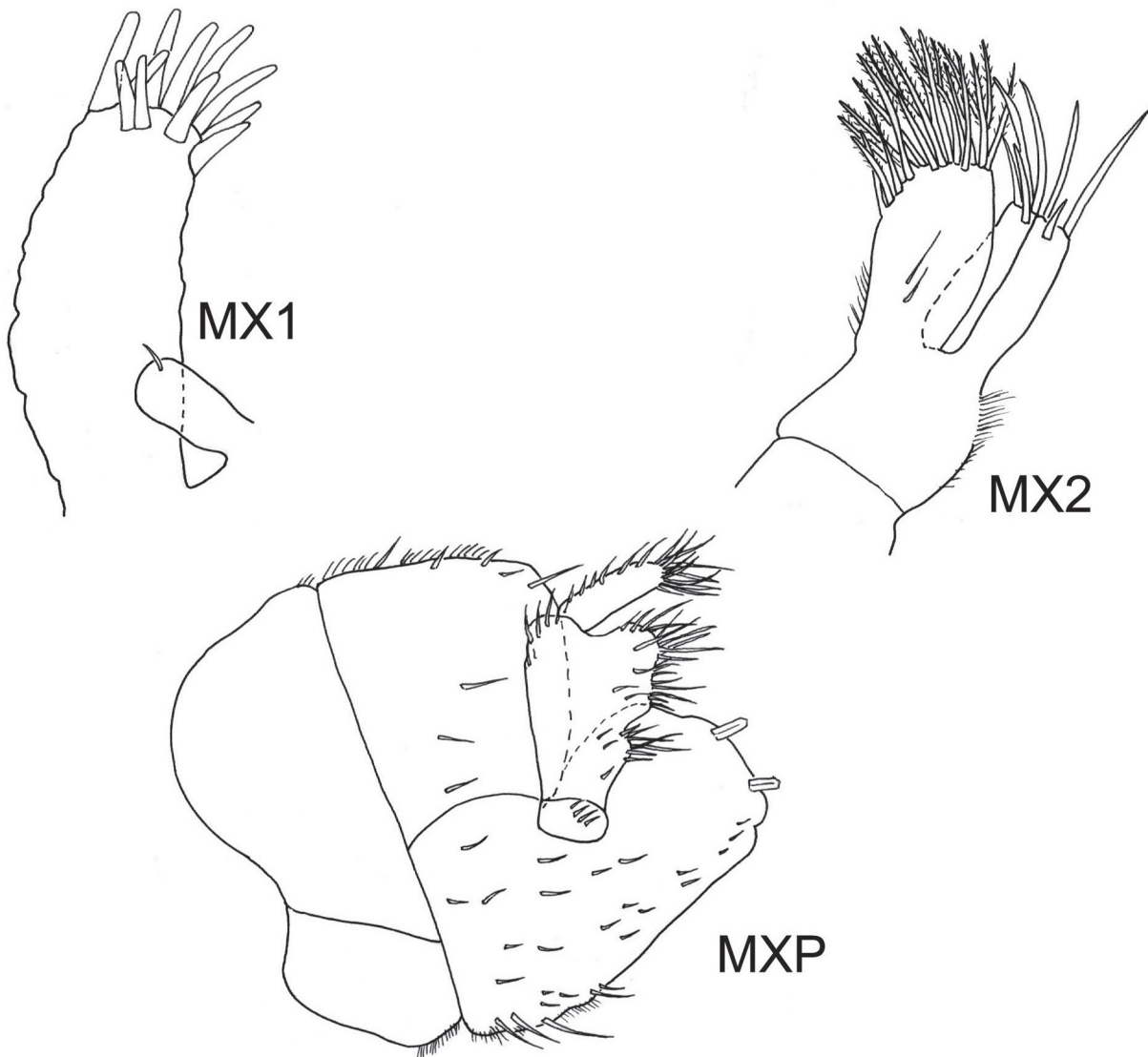


Figure 5. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP n° 18085). Maxilla 1, maxilla 2, and maxilliped.

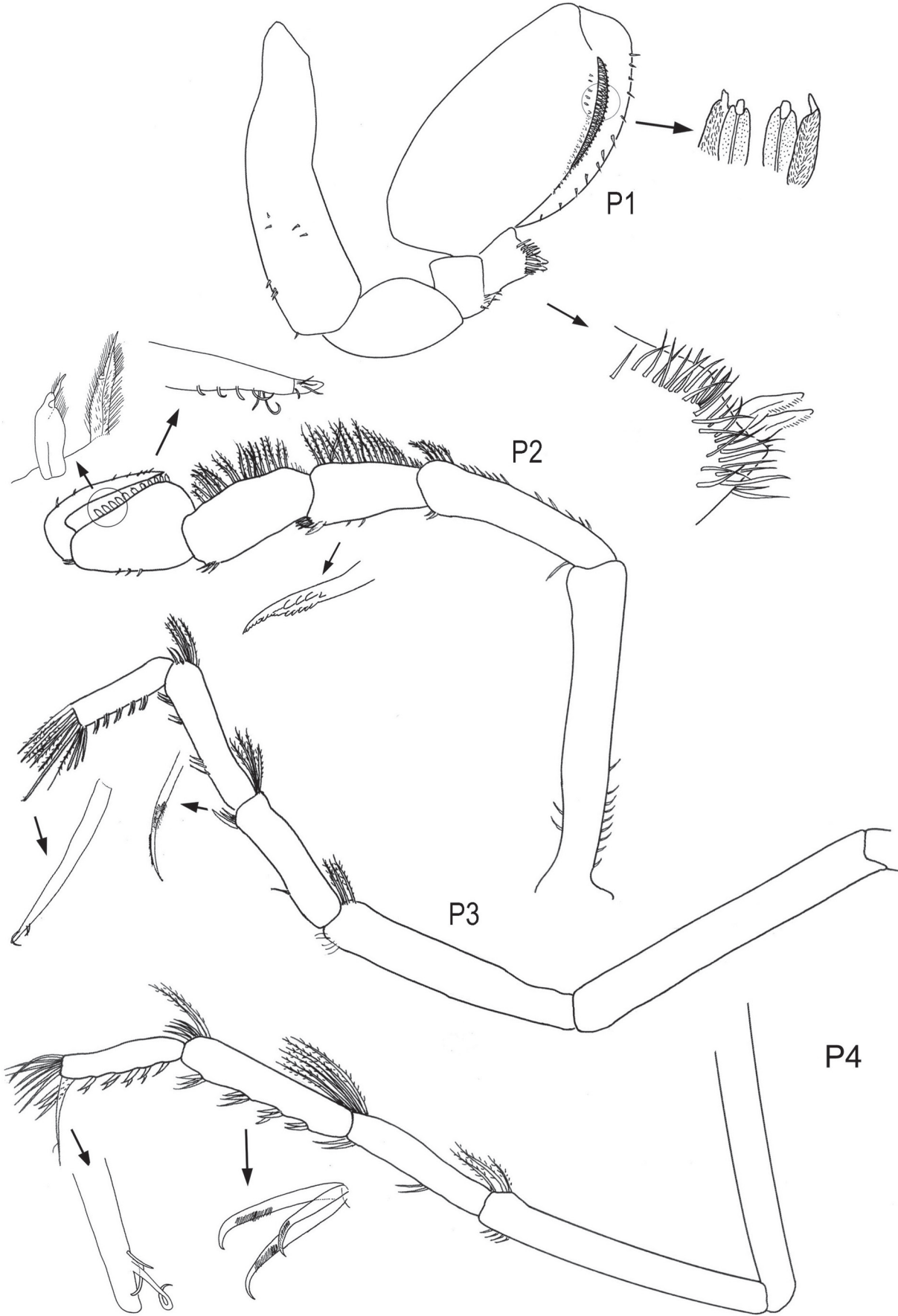


Figure 6. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). Pereopods 1-4 and details of setae.

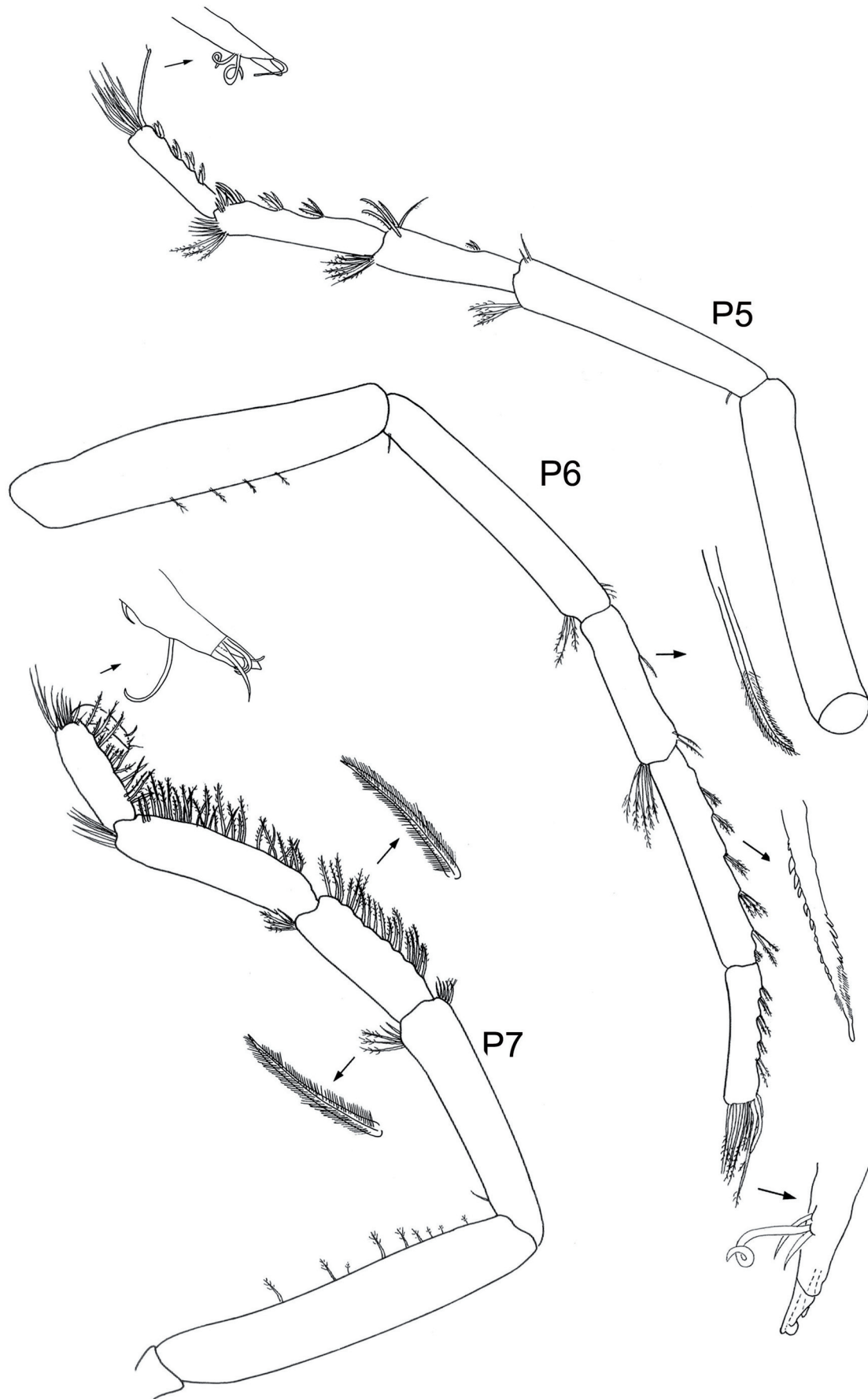


Figure 7. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). Pereopods 5-7 and details of setae.

as wide, distally rounded, with 18 distomedial setae.

Geographical distribution: The species is known only from Brazil deep-sea: Abrolhos (BA), Cape São Tomé (RJ) and Cabo Frio (RJ) between 1190 and 1555 meters depth.

Remarks: The new species is closely related to *Serolis insignis* Moreira, 1977 and *Acutiserolis neaera* (Beddard, 1884), both collected in Brazilian waters off Rio de Janeiro. Adult males of *Acutiserolis coineauae* sp. nov. range in size from 26 to 53 mm and females are 17, 5 to 58 mm long and have similar body proportions to males.

Acutiserolis coineauae sp. nov. differs from *Serolis insignis* mainly by the absence of four flattened tubercles, directed distally and placed in transverse row on the head; smallest eyes, occupying less of half the length of the head and without distinct ommatidia; presence of two little excavations posterior on the head and flagellum of antenna 1 composed of 50 short articles. *Acutiserolis neaera* differs of *A. coineauae* sp. nov. mainly by the flagellum of antenna 1 composed of 20 short articles; eyes covering almost all the length of the head; head with two smaller median spines and two outer ones with a bifid extremity; pleotelson

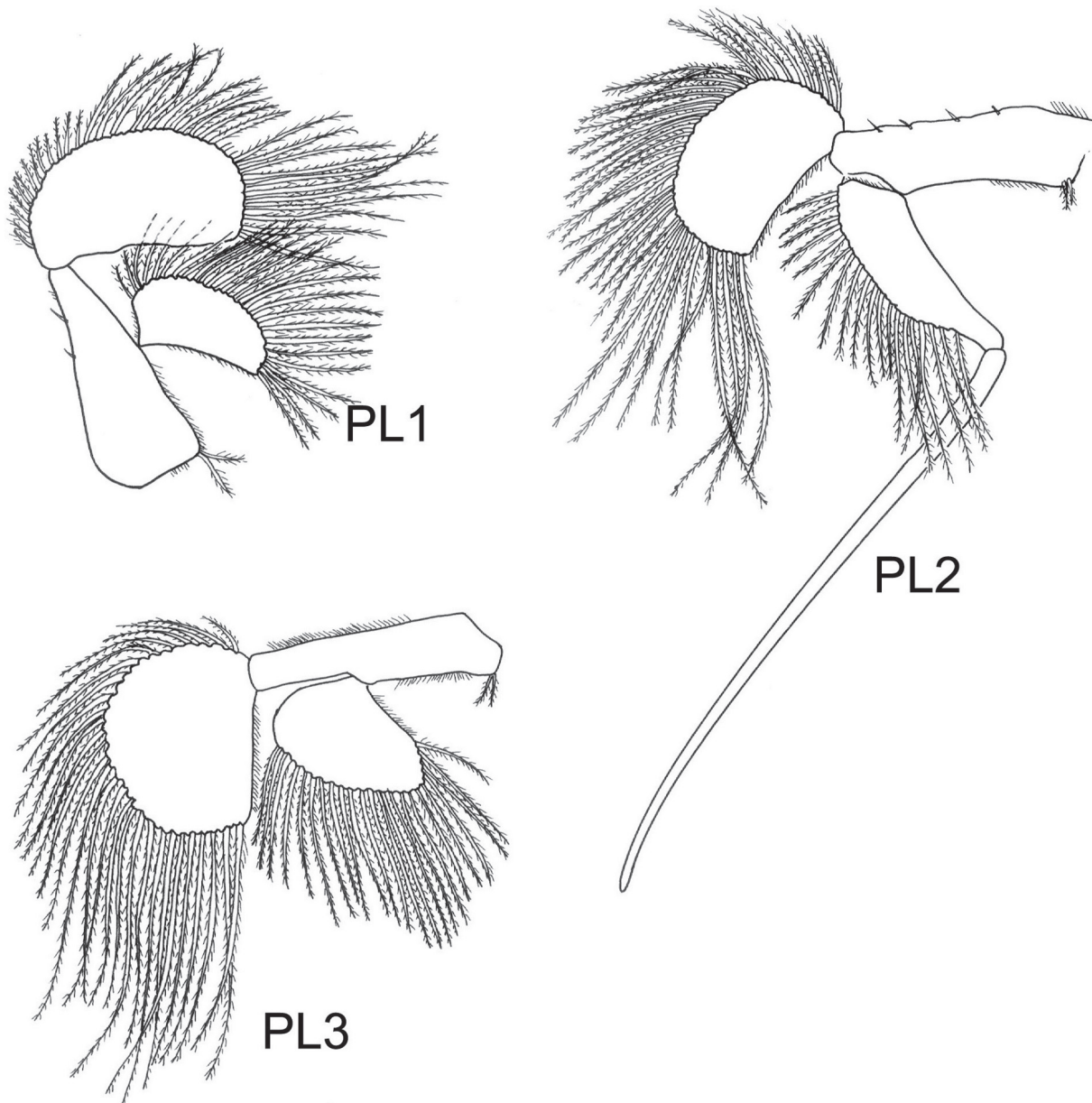


Figure 8. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). Pleopods 1-3.

with three spines interconnected by the transverse keel.

A. coineauae sp. nov. also differs of *A. macdonnellae* (Menzies, 1962), *A. maryannae* (Menzies, 1962), *A. margaretae* (Menzies, 1962), principally by the absence of pleotelson ornamentation. *A. bromleyana* and *A. cidaris* are other species morphologically close to new species, however, both can be easily distinguished from *A. coineauae* sp. nov because they have not the endopod of pleopod 4 bilobed and the epipod and endite of maxilliped not separated by sutures.

Discussion

Brandt (1988) proposed two new genera for some species of *Serolis*. *Acutiserolis* for six species

and *Acanthoserolis* for two species. *Acutiserolis* has very long and acute coxal plates and *Acanthoserolis* is characterized by a spine armature on the dorsal part of pleotelson. Wägele (1994) reduced both genera to subgenera of *Serolis*, so that this genus was not reduced to a small number of species and considered the presence of pleopod 4 endopod bilobed the best character diagnostic for *Serolis*. According to Poore and Brandt (1997), the specimens of *Acutiserolis* observed by them, did not possess the pleopod 4 endopod bilobed and no species of *Serolis* possess so extreme posterior elongation coxal plates, thus not accepting the status of subgenera for *Acutiserolis*. However, in the drawings of *Serolis neaera* Beddard, 1884, included by Brandt (1988) in the genus *Acutiserolis*, the endopod of pleopod 4 is bilobed. Held (2000) suggested either that not all species that are currently included to

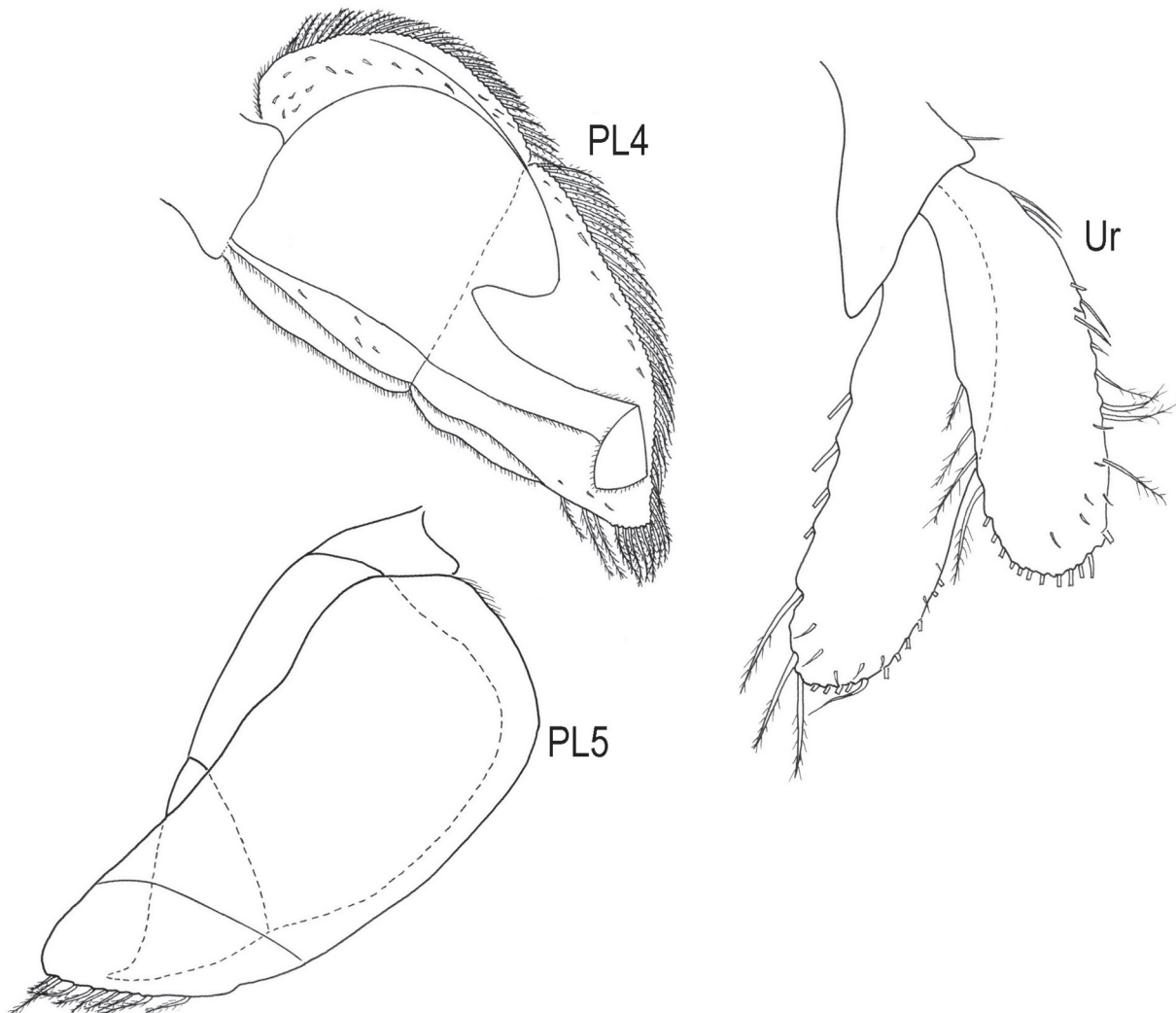


Figure 9. *Acutiserolis coineauae* sp. nov., male holotype (MZUSP 18085). Pleopods 4-5; Uropod.

genus *Acutiserolis* has the endopod of pleopod 4 bilobed or that there is an extensive amount of intra-specific morphological variation. All the specimens of *Acutiserolis coineauae* sp. nov, examined in this study, have the endopod of pleopod 4 bilobed and for this reason, we don't believe that this character is a intraspecific morphological variation.

According to Held (2000), the molecular data provide solid support for a monophylum consisting of *Cuspidoserolis*, *Serollella*, *Septenserolis* and *Acutiserolis*. This author said that a sexually dimorphic pereopod 7 is known for the first three genera and is also visible in the *Acutiserolis bromleyana*. *Acutiserolis coineauae* also present this sexual dimorphism. According to Held (2000), a sexually dimorphic pereopod 7 forms a potential morphological synapomorphy and supports the molecular phylogeny and said that it seems logical to reestablish *Acutiserolis* Brandt, 1988 as a valid genus.

The new species *Acutiserolis coineauae* has characters of *Acutiserolis* such as body dorsoventrally flattened, outline oval; caudal point of sixth coxal plate surpassing caudally epimera of pleon and telsonic apex, but has also characters of *Acanthoserolis* such head dorsally with two small fronto-medial elevations and three caudally directed lobes between the eyes, presence of interlocking keys, second pair of epimera reaching half of the length of pleotelson, pleotelson dorsally with long acute, frontomedial, caudally directed elevation and with a pair of curved ridges, situated close to the anterior and lateral margins of the segment and uropods inserting caudolaterally in the last third of pleotelson.

The systematic of genus *Serolis* is not clear yet and redescription of many species are still needed and new cladistic analyses are required to assess more accurately the phylogenetic relationships within the Serolidae.

Acknowledgements

We thank Dr. Jeanete Maron Ramos (University Santa Úrsula) for making available specimens for this study. We also thanks to Dr^a Angelika Brandt and Dr. Gary Poore for scientific advice and criticism on this manuscript. The authors are very grateful to Paulo César Onofre, who helped to prepare the line drawings.

References

- Bastida, R. and Torti, M.R. 1970. Crustaceos Isopodos Serolidae. Resultats Scientifiques des Campagnes de la Calypso. Annales de l'Institut Oceanographique, 47(9):62-105.
- Beddard, F.E. 1884a. Preliminary notice of the Isopoda collected during the voyage of H.M.S. 'Challenger'-Part I. *Serolis*. Proceedings of the Zoological Society of London, 23: 330-341.
- Beddard, F.E. 1884b. Report on the Isopoda collected by H.M.S. Challenger during the years 1873-76. Part I. - The genus *Serolis*. Report on the Scientific Results of the Voyage of H.M.S. Challenger during the years 1873-76. Zoology, 11:1-85, pls. I-X.
- Brandt, A. 1988. Antarctic Serolidae and Cirolanidae (Crustacea:Isopoda). New Genera, new Species, and redescription. Koeltz Scientific Books, Konigsstein. Theses Zoologicae, 10. Edit. Ronald Fricke, 143p.
- Brandt, A. 1991. Zur Besiedlungsgeschichte des antarktischen Schelfes am Beispiel der Isopoda (Crustacea, Malacostraca). Berichte zur Polarforschung, 98:1-240.
- Held, C. 2000. Phylogeny and biogeography of serolid isopods (Crustacea, Isopoda, Serolidae) and the use of ribosomal expansion segments in molecular systematics. Molecular Phylogenetics and Evolution, 15(2):165-178.
- Moreira, P.S. 1971. Species of *Serolis* (Isopoda, Flabellifera) from southern Brazil. Boletim do Instituto Oceanográfico, São Paulo, 20(1):85-104.
- Moreira, P.S. 1974a. New records of species *Serolis* (Crustacea, Isopoda, Flabellifera) from off southern Brazil. Boletim do Instituto Oceanográfico, São Paulo, 23:89-101.
- Moreira, P.S. 1974b. New records and a new species of *Serolis* (Crustacea, Isopoda, Flabellifera) from southern Brazil. Boletim do Instituto Oceanográfico, São Paulo, 23:121-153.
- Moreira, P.S. 1976. A remarkable new species of *Serolis* (Isopoda, Flabellifera) from the continental shelf of southern Brazil. Bulletin of Marine Science, 26(2):216-224.
- Moreira, P.S. 1977. New bathyal species of *Serolis* (Isopoda, Flabellifera) from the western south Atlantic Ocean. Crustaceana, 33(2):133-147.
- Poore, G.C.B. and Brandt, A. 1997. Crustacea Isopoda Serolidae: *Acutiserolis cidaris* and *Caecoserolis novaecaledoniae*, two new species from the Coral Sea. In: A. Crosnier (ed.), Résultats des Campagnes Musorstom, 18. Mémoires du Muséum d'Histoire Naturelle, 176:151-168.
- Tavares, M. 1999. The cruise of the Marion Dufresne off the Brazilian coast: account of the scientific results and list of stations. Zoosystema, 21(4):597-605.
- Wägele, J-W. 1994. Notes on Antarctic and South American Serolidae (Crustacea, Isopoda) with remarks on the phylogenetic biogeography and a description of new genera. Zoologische Jahrbücher, Abteilung für Systematik, 121:3-69.

Received: February 2008

Accepted: July 2008