

Serolis luethjei n.sp., a New Isopod Crustacean from the Weddell Sea

Johann-Wolfgang Wägele 1986

Fachbereich 7, AG Zoomorphologie, Universität Oldenburg, Postfach 2503, D-2900 Oldenburg, Federal Republic of Germany

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Summary. *Serolis luethjei* n.sp. is described from the Weddell Sea. The new species is closely related to *S. gerlachei* Monod 1925 and *S. johnstoni* Hale 1952. Specimens kept in aquaria did neither burrow in fine sand or mud nor swim with their pleopods but only walked on the tips of their pereopods.

Introduction

During the third expedition of *RV Polarstern* to the Weddell Sea (1984/85) a large number of isopods was captured with an Agassiz-trawl and kept alive in a temperature-controlled container. On one of the expedition's last stations numerous specimens of an hitherto unknown *Serolis* were discovered. Some of them were still alive in Germany after 5 months of captivity. Further specimens were found among the preserved material from the expedition of 1982/83. In the following this species is described; the type material has been sent to the British Museum (Natural History) (B.M.N.H.).

Material

Holotype: male specimen, 30 mm, from 73°23.36'S 21°30.37'W, 465–481 m (type locality). B.M.N.H. 1985:366.

Allotype: ovigerous female, 28 mm, B.M.N.H. 1985: 367.

Paratypes: 2 ovigerous females (27, 28 mm), 2 male specimens (28, 30 mm), B.M.N.H. 1985: 368.

Further material and distribution (Fig. 1): 15 specimens from type locality; juveniles 19–20 mm, males 30–33 mm, females 28–29 mm. One juvenile, 18 mm, from 75°21.88'S 29°22.00'W, depth 423 m. One damaged female, 1 male, 28 mm, from 75°38.9'S 27°10.86'W, depth 289 m. One male, 28 mm, from 72°25.40'S 16°26.63'W, depth 189–260 m.

Abbreviations used in text and figures: A 1,2 = antenna 1,2; Md = mandible; MdP = mandibular palp; Mx 1,2 = maxilla 1,2; Mxp = maxilliped; MxpP = palp of Mxp; P 1–7 = pereopods 1–7; Plp 1–5 = pleopods 1–5; Tel = telson; Urp = Uropod

Description of the Male Holotype (30 mm)

Body longer than wide, broad-oval, less depressed than in other serolids (e.g. *C. trilobitooides* Eights 1833; *S. schythei* Lütken 1858) (Fig. 2), pleon and pleotelson on medial line together as long as thorax and cephalothorax. Cephalothorax wider than long, broadest at posterior half of eyes, with prominent posteromedial spiniform process surpassing first pereonite. Seleniform black eyes well developed, with cuticular ridge behind medial margin. Frontal area between eyes with two transversal keels and shallow medial groove between them. Behind small rostral point a transverse ridge with shallow depression behind it extends laterally to margin of cephalothorax. Posterior zone between and behind eyes convex, with raised area on each side, posterior margins bearing few tubercles, separated from spine by shallower zone (Figs. 2–4; features of figured female similar to male holotype). Dorsal cuticle of cephalothorax as well as of remaining tergites rough, covered with small tubercles. Dorsal posteromedial spines, shorter than that of cephalothorax, present on pereonites 2, 3, 4 and on pleonites 1, 2 and 3. Pereonite 4 longer than pereonites 2 and 3, pereonites 5 and 6 together medially shorter than pereonite 4. Coxal plates of pereonites well-developed, separated by dorsal suture on pereonites 2–4, acute caudal point protruding. Coxal plate of pereonite 6 reaching beyond insertion of uropods. Pleonites 1–3 free, subequal in length, remaining pleotelson twice as long as free pleonites together. Pleural plates of

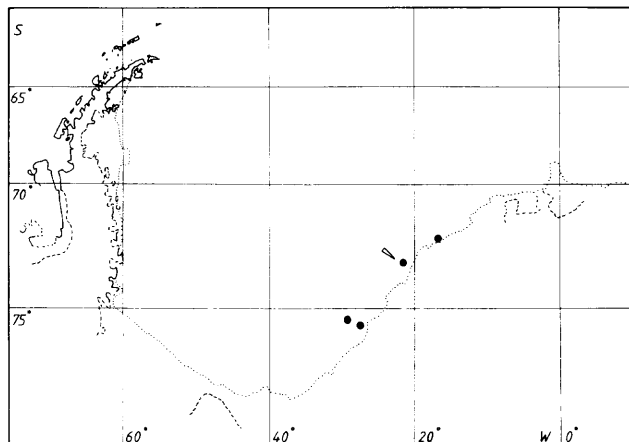


Fig. 1. Map of the Weddell Sea with localities where *Serolis luethjei* n. sp. was discovered. Arrowhead = locus typicus

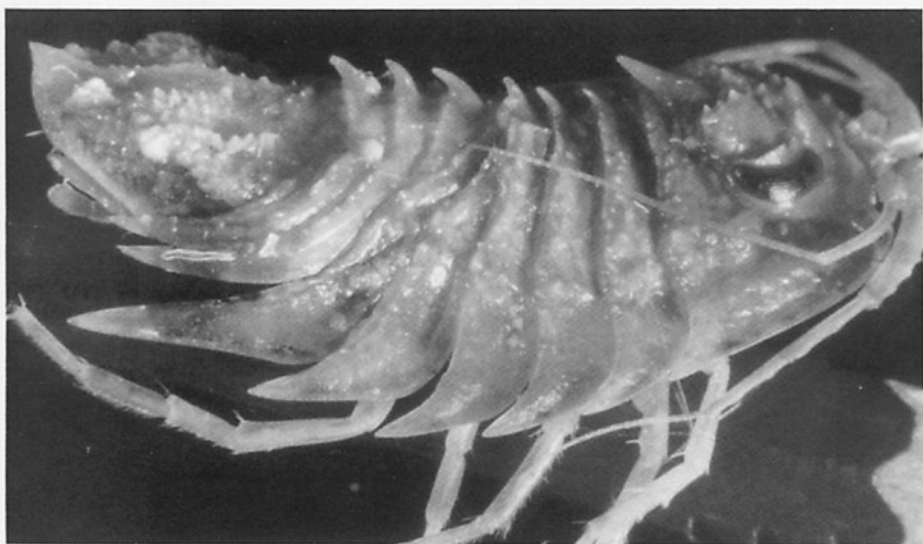


Fig. 2. Living male specimen of *S. luethjei* n.sp. in dorsolateral view (with serpulid tubes on right epimeral plate of second pleonite)

pleonites 2 and 3 not reaching caudal point of pereonite 6, plate of pleonite 3 slightly longer than that of pleonite 2. Pleotelson as broad as long, mediodorsal longitudinal keel bearing irregular tubercles; anteriolateral zones with sickle-shaped raised area on each side, medial margins with prominent tubercles. Cuticle on both sides of medial keel smooth. Pleotelsonic apex rounded. Uropods small, inserting on anterior margin, not reaching pleotelsonic apex. A 1 shorter than A 2, peduncle of 3 articles, third article cylindrical and slightly curved, nearly as long as articles 1 and 2 together. Flagellum of 47 articles, first article longest (= fourth peduncular article of other authors), more distal articles each with a distal group of 3 setae and 1 short aesthetasc, penultimate article without these 3 setae, last article with 3 simple setae and 2 tiny feather-like bristles (Fig. 5). A 2 with 5 peduncular articles, outer surfaces of articles 3–5 bearing bundles of short setae (Fig. 5), articles 4 and 5 long cylindrical, last peduncular article longer than foregoing and than flagellum. Flagellum with 12 articles, proximal ones with few short setae and a row of cuticular scales, apical articles with group of 3–4 distal setae, last article bearing 7 simple setae.

Mandibles with strong endite, pars incisiva forming cutting edge, lacinia mobilis of left Md more than half as broad as cutting edge, lacinia of right Md much smaller, proximally to lacinia 1 stout spine is present. Palp of Md of 3 articles, second article longest, last flattened, distal row on second article with over 30 setae, parallel to it a second row with about 10 smaller setae, last article with row of over 40 setae (detail in Fig. 3). Lateral endite of Mx 1 with 11 apical spines, short medial endite with 1 small seta. Outer lobe of Mx 2 with 2, central lobe with 6 apical spines, inner lobe bearing about 28 more slender spines. Coxa of Mxp half as broad as basipodite, distal part of epipodite only slightly broader than basipodite, separated from basal part and from basipodite by sutures, lateral margin bearing small setae. Truncate apex of basipodite bearing 2 spines, palp of 3 articles, first article broader than long, second article longest, broadening distally, medial margin with numerous simple setae, last article less than half as long and wide than foregoing article, setation as in Fig. 4.

Subchelate P 1 with 2 spines on carpus, palm of propodus with row of 2 alternating types of composite spines (detail in Fig. 5), about 38 spines of each type, and a parallel row of short, simple setae. P 2 much smaller, subchelate, propodus trapezoidal, narrowing distally, palm bearing 2 rows with about 15 and 12 composite, flattened setae (Fig. 6).

Ventral margin of carpus and propodus of P 3 bearing groups of simple setae forming a dense covering, propodus with distal U-shaped row of longer setae (about 14) behind dactylus (Fig. 6), carpus and propodus subequal in length, merus somewhat shorter, dactylus less than half as long as propodus, with 1 short claw. P 4, 5 and 6 very

alike, caudal pereopods increasing in length, similar to P 3, but with groups of setae also on ventral surface of merus. P 7 much shorter than foregoing pereopod, bearing fewer and weaker setae, propodus relatively broader than in P 3–6 (Fig. 8).

Medial angle of sympodite of Plp 1–3 produced, with 2–3 coupling setae, endopods of Plp 1 and 3 smaller than exopod, endopod with 41–44, exopod with 60–70 swimming setae. Exopod of Plp 2 similar to Plp 1 and 3, endopod forming rounded triangle, narrow angle bearing appendix masculina, latter being a long stiletto with acute apex, more than two and a half times longer than endopod. Exopod of Plp 4 operculiform, narrowing distally, lateral margin bearing row of short plumose setae, endopod shorter, with thinner cuticle, bearing no setae. Exopod and endopod of Plp 5 subequal in length, shorter than exopod of Plp 4, with thin cuticle, exopod bearing 2 apical setae. Sympod of Urp nearly triangular, lateral margin with 5, distalo-medial point with 2 plumose setae, exopod shorter and narrower than endopod, both branches long-oval, margins crenulated, exopod with 32, endopod with 24 plumose setae.

Coloration: The species has a light brown colour caused by small chromatophores. The tips of the coxal and epimeral plates are nearly transparent; a darker brown, elongated patch decorates the lateral margin of coxal plates 2–5. The long fourth article of A 2 has a basal, a broader medial and a distal dark ring. A medial and a distal dark ring is also present on the fifth article. The pereopods are of dark brown colour with lighter zones at the distal end of each article.

Features of the Ovigerous Female (allotype, 28 mm)

Body only slightly narrower than in male specimen, sculpturing similar. Most appendages as in male, flagellum of A 1 with 28, flagellum of A 2 with 17 articles. P 2 with normal, not subchelate propodus, resembling P 3 of male. Female pereopods 2–6 always bear on dorsal margins of merus and carpus, among distal setae group, a few apically furcate setae with 3 points (P 2 (F): Fig. 6; P 3 (F): Fig. 7; P 4 (F): Fig. 8). P 7 not weaker than P 6 and with similar setation as other pereopods. Pleopods as in male, but without appendix masculina, endopod of Plp 2 therefore similar to that of Plp 3. Oostegites present on pereonites 1, 2, 3, 4.

Etymology. The species is dedicated to the Registrar of Oldenburg University, Jürgen Lühje, in recognition of his support of our Polar Research Programme and his assistance in initiating cooperative activities with the Alfred-Wegener-Institute (Bremerhaven).

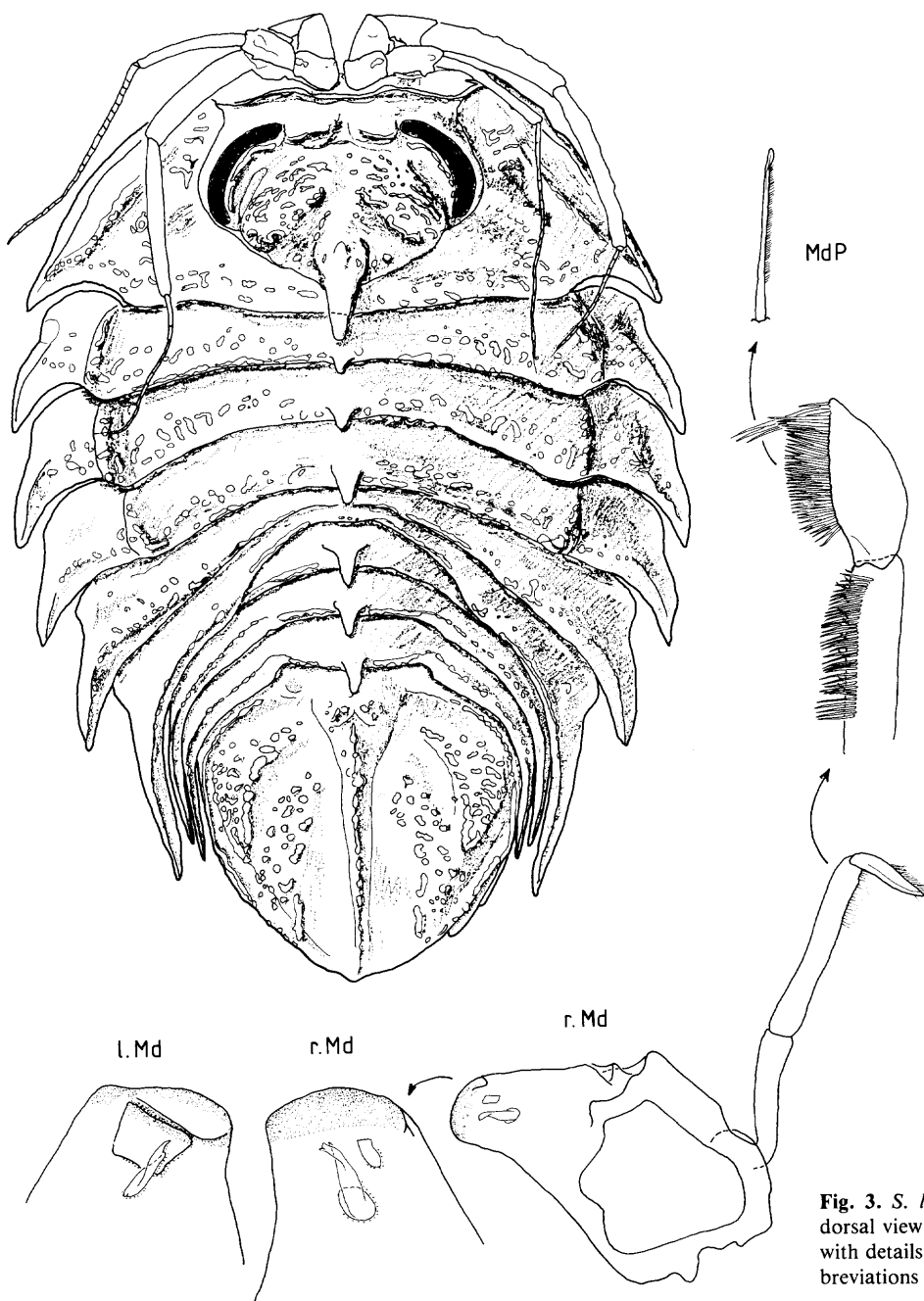


Fig. 3. *S. luethjei* n.sp. Ovigerous female (28 mm) in dorsal view; left (l) and right (r) Md of male holotype with details of pars incisiva. For symbols see list of abbreviations

Discussion

S. elongata Beddard 1884 and *S. pallida* Beddard 1884 (both from Australia) have a similar arrangement of mid-dorsal spines, but have shorter coxal and epimeral plates, larger uropods, broader eyes (see Monod 1971; Harrison and Poore 1984), and pereonite 6 and pleonite 1 are dorsally fused. The small dorsal protuberances of

other species (e.g. *S. exigua* Nordenstam 1933; *S. foresti* Bastida and Torti 1970) cannot lead to confusion with *S. luethjei*. The Antarctic *S. gerlachei* Monod 1925 has also a prominent spine on the cephalothorax and 4 further spines, but the pereonites 1–3 are dorsally smooth; this species also has broader eyes. In *S. johnstoni* Hale 1952 (East Antarctica, from off Amery Ice Shelf and Sabrina Coast) the cephalic spine is more slender, and small

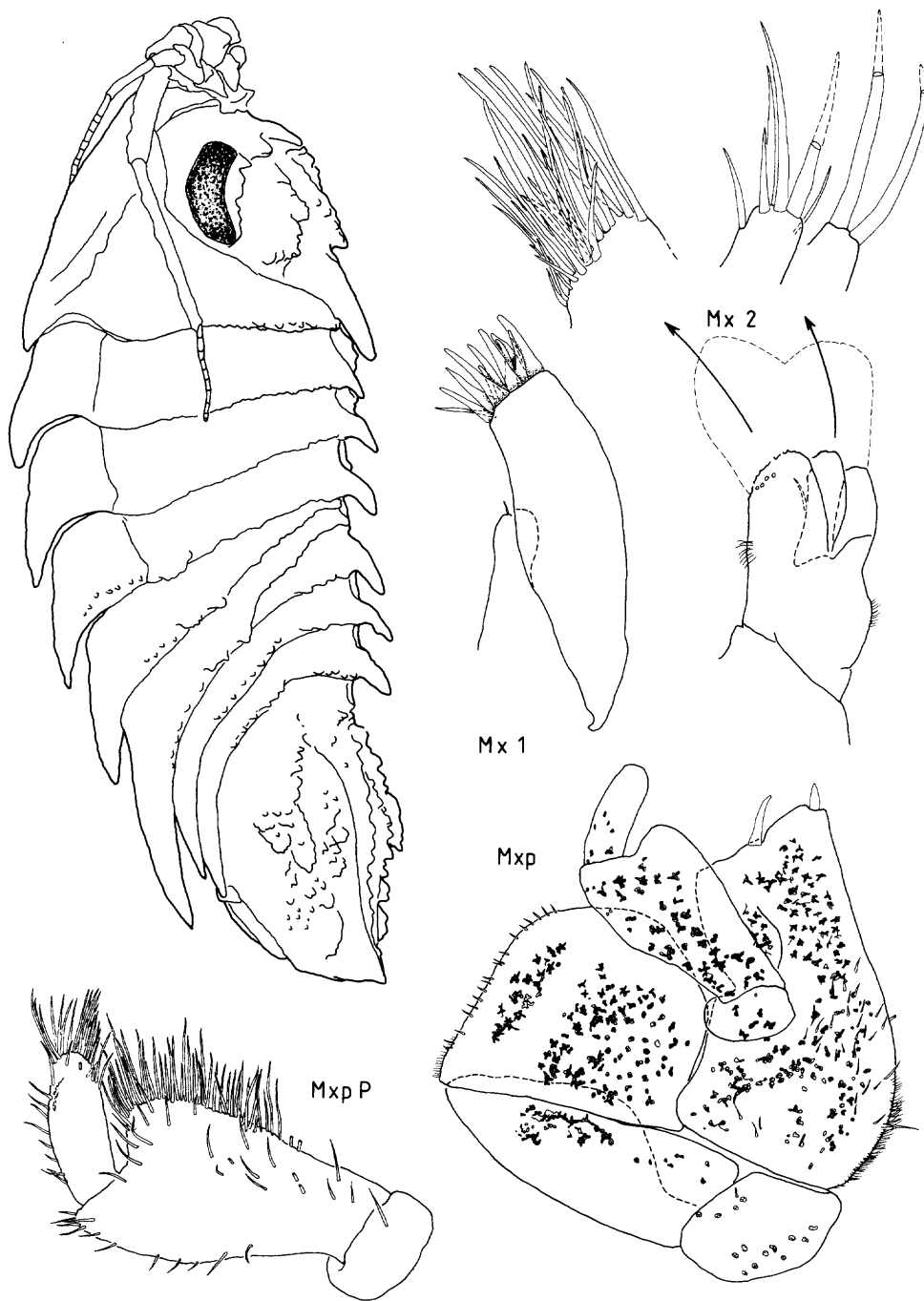


Fig. 4. *S. luethjei* n.sp. Ovigerous female (28 mm) in dorsolateral view and details of male holotype. *Mxp* shown with chromatophores

spines are present on pereonites 2–4 and pleonites 1–3. Also the male propodus of P 1 is less wide in comparison with *S. luethjei* n.sp., the endopod of the Urp is longer, pleural plate of pleonite 2 is produced beyond that of pleonite 3 (Hale 1952: p. 32, though not shown in Fig. 4); the flagellum of A 1 longer (at least 77 joints, in small male specimen still 44 joints); flagellum of A 2 27 joints, propodus of male P 2 shorter (equal in length to merus:

Hale 1957: p. 34), lateral margin of pereonite 5 as long as those of pereonite 3 and 4 together (in *S. luethjei* n.sp. much shorter). *S. gerlachei* and *S. johnstoni* seem to be closely related to the new species, but more detailed descriptions are needed for further comparisons, especially in view of the polymorphism of some serolids (see Holdich and Harrison 1980; Cals 1976). Kussakin (1967) reports the occurrence of *S. johnstoni* from other

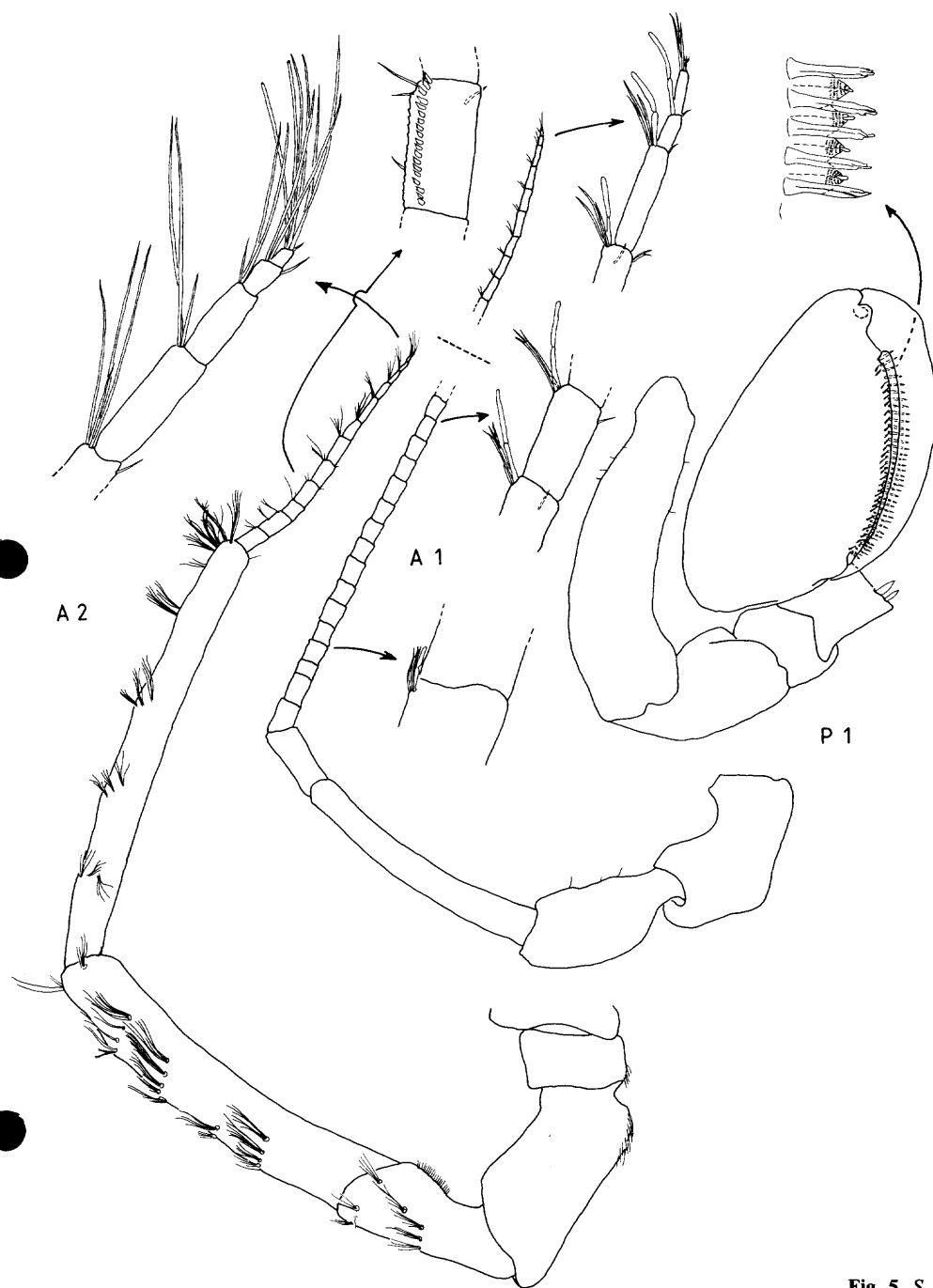


Fig. 5. *S. luethjei* n.sp., details of male holotype

localities, but unfortunately presents no figures. *S. rugosa* Kussakin 1982 also has a similar morphology but no cephalic spine. *S. spinosa* Kussakin 1967 has a similar arrangement of dorsal spines as *S. luethjei* n.sp., but is easily discernible by the very long epimeral and coxal plates.

The new species is only known from the Weddel Sea. Whether it is endemic to this area or not must be decided

when we have a more thorough knowledge of the distribution and taxonomy of Antarctic isopods.

Observations on Living Animals

Specimens were kept in aquaria to study their behaviour. Feeding experiments were not successful. In contrast to other serolids this species did not accept the offered food (fresh krill, pieces of crabs and shrimps, living poly-

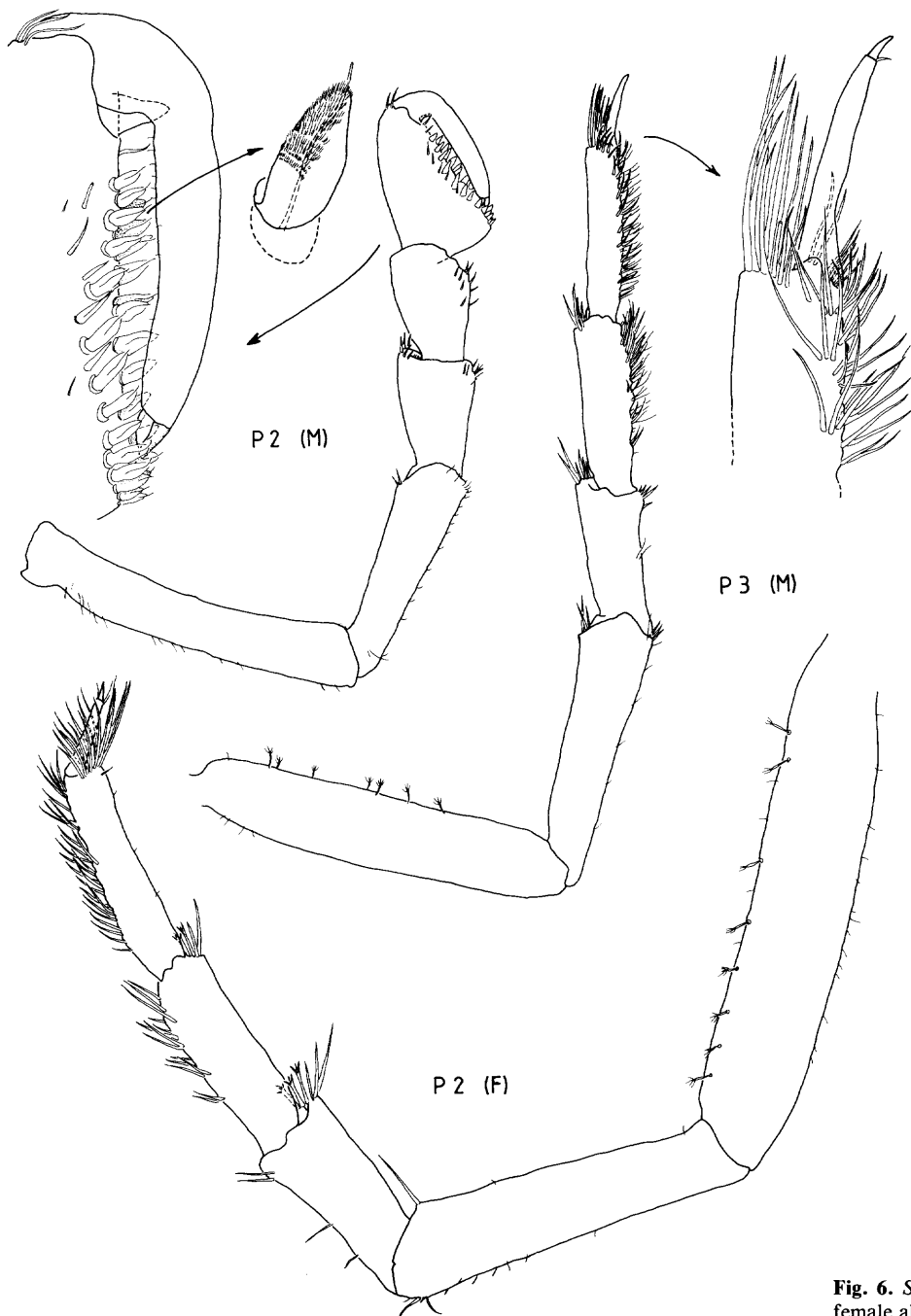


Fig. 6. *S. luethjei* n.sp. (M) = male holotype, (F) = female allotype

chaetes, amphipods, isopods, artificial food for fishes, green algae). While other serolids tend to press their flat body on the sediment and cover their tergites with sand and mud, *S. luethjei* n.sp. always stands on the dactyli of the pereopods and has no other contact with the bottom. The subchelate P 1 (in males also P 2) is kept in front of the mouthparts and does not participate in locomotion. The animals never made an attempt to swim, though the propulsion of pleopods 1–3 is used to support the movement of an animal when it lies on its back and tries

to turn on its legs. The species seems capable of living on irregular ground with stones, sponges and other sessile animals and possibly does not need a fine sediment for burrowing.

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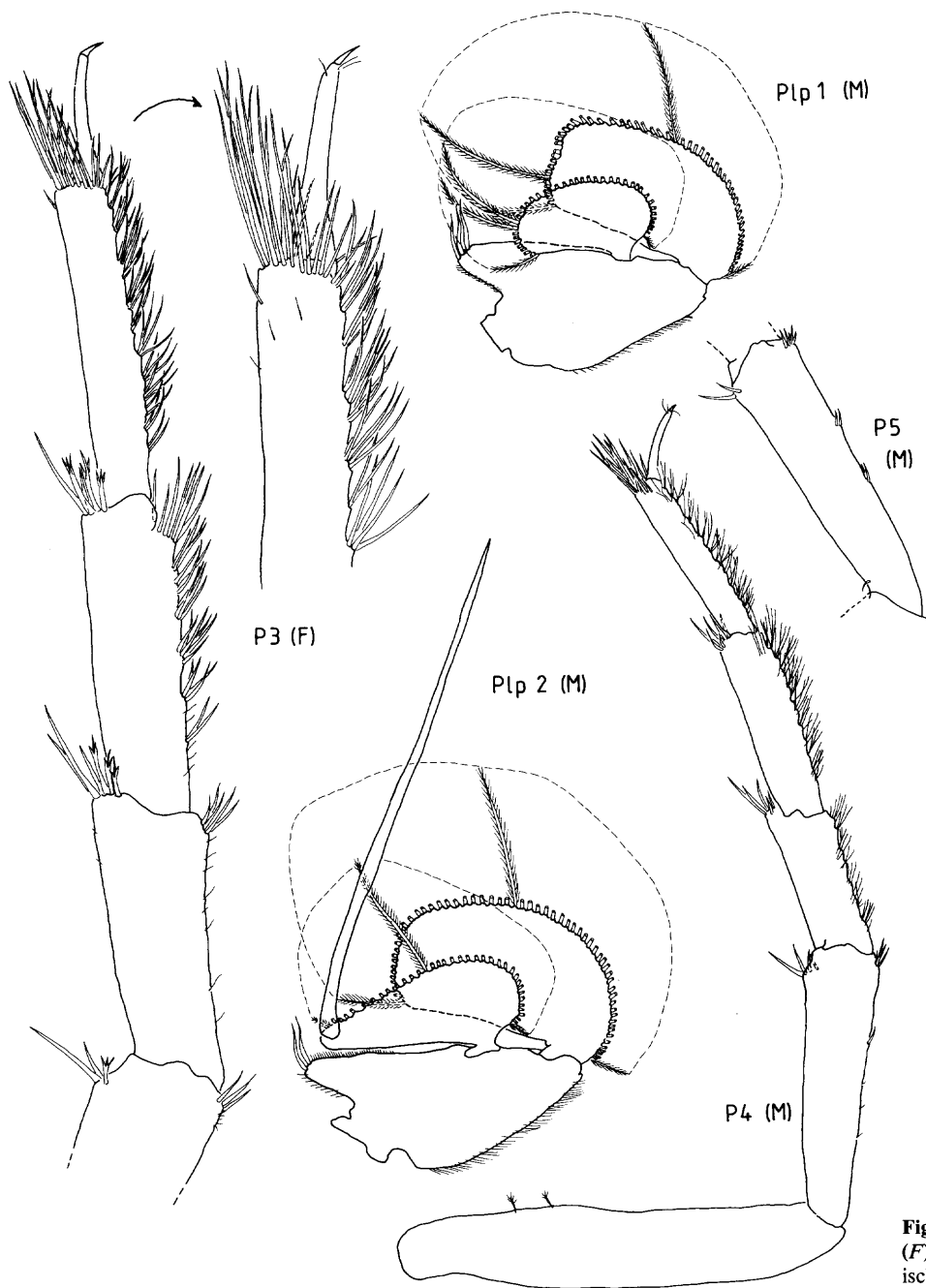


Fig. 7. *S. luethjei* n.sp. (M) = male holotype, (F) = female allotype. Of P 5 (M) only ischium is shown

References

- Bastida R, Torti MR (1970) Crustáceos isópodos: Serolidae. Résultats Scientifiques des Campagnes de la Calypso. Ann Inst Oceanogr 47:61 – 105
- Beddard FE (1884) Report on the Isopoda collected by HMS Challenger during the years 1873 – 1876. Pt I. The genus Serolis. Challenger Rep Zool 11:1 – 85
- Cals P (1976) Polychromatisme, polytypisme scutellaire et modalités de la spéciation chez des crustacés marins subantarctiques. Serolidae (Isopodes flabellifères). Bull Soc Zool Fr 101:1027 – 1028

- Eights J (1833) Description of a new crustaceous animal found on the shores of South Shetland Islands, with remarks on their natural history. Trans Albany Inst 2:53 – 57
- Hale HM (1952) Isopoda, families Cymothoidae and Serolidae. B.A. N.Z.A.R.E. 1929 – 1931, Rep Ser B 6:21 – 36
- Harrison K, Poore GCB (1984) Serolis (Crustacea, Isopoda, Serolidae) from Australia, with a new species from Victoria. Mem Mus Victoria 45:13 – 31
- Holdich DM, Harrison K (1980) Morphological variation in the *Serolis minuta* group (Isopoda: Serolidae) from Australian waters. Zool J Linn Soc 68:373 – 386

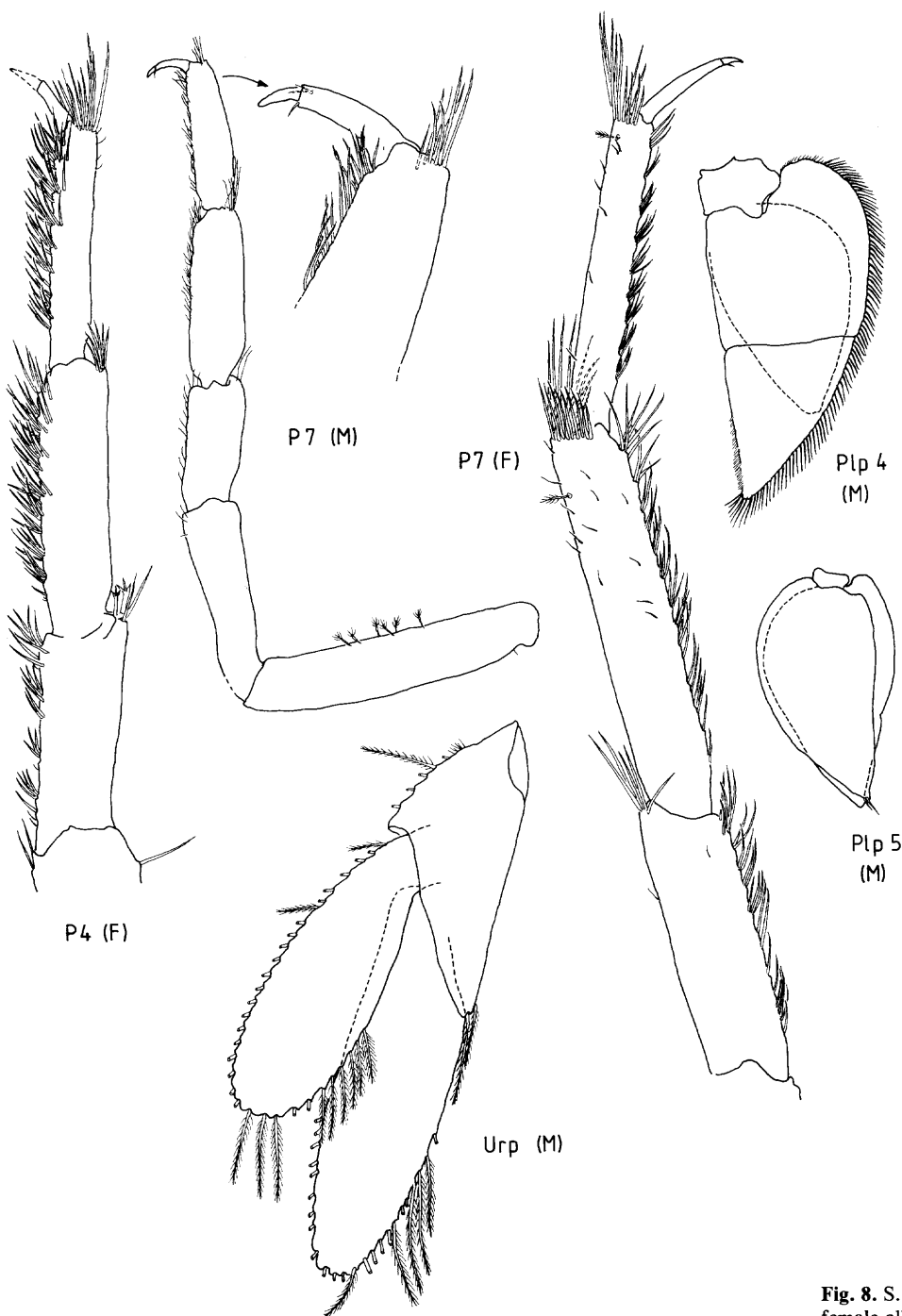


Fig. 8. *S. luehjei* n.sp. (M) = male holotype, (F) = female allotype

Kussakin OG (1967) Isopoda and Tanaidacea from the coastal zones of the Antarctic and Subantarctic. In: Biological results of the Soviet Antarctic Expedition (1955–58) (in Russian). 3. Issled fauny Morei 4:220–380

Kussakin OG (1982) Dopolnenie k faune ravnonogih rakoobraznyh sel' fovyh zon antarktiki (po materialam sovietskoj antarkticeskoj ekspedicii 1965–1968 gg). In: Kafanov AI, Kussakin OG (eds) Fauna i raspredelenie rakoobraznyh notal' nyh i antarkticeskih vod. Vladivostok, pp 73–105

Lütken CF (1858) Beskrivelse av en ny Serolis-Art, *Serolis schythei* Ltk. Vidensk Medd Dan Naturhist Foren Khobenhavn 1858:98–104

Monod T (1925) Isopodes et amphipodes de l'expédition antarctique Belge. Bull Mus Nat Hist Nat Zool 4:296–299

Monod T (1971) Sur quelques isopodes marins d'Australie. 2. Serolidae. Bull Mus Nat Hist Nat Zool 5:325–333

Nordenstam A (1933) Marine Isopoda of the families Serolidae, Idotheidae, Pseudoidotheidae, Arcturidae, Parasellidae, Stenetriidae, mainly from the South Atlantic. Further Zool Res Swed Antarct Exp 1901–1903 3:1–284