Taxonomic review of the genus *Stenocaris* Sars (Copepoda, Harpacticoida, Cylindropsyllidae), with (re)descriptions of two *Stenocaris* species from the Far East

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Abstract

29 The taxonomic concept of the genus *Stenocaris* Sars, 1909 is uncertain because none of the
30 synapomorphies for the species of *Stenocaris* are defined. Detailed comparison of previous
31 records of *Stenocaris minor* (T. Scott, 1892) from different localities reveals that this species
32 represents a species complex composed of two species, *S. minor* s. str. and *S. minor* sensu
33 Cottarelli & Venanzetti, 1989. Because the latter species has fundamental differences in the
34 nature of the fifth leg in females and the sexual dimorphism of the second leg in males, we
35 propose a new species for *S. minor* sensu Cottarelli & Venanzetti, *S. figaroloensis* sp. nov. We
36 also suggest that *S. minor* sensu Apostolov, 1971, *S. minor* sensu Marinov, 1971, and *S. minor*
37 sensu Apostolov & Marinov, 1988 from the Black Sea and *S. minor* sensu Wilson, 1932 from
38 North America should be relegated to *species inquirenda* in the genus. Taxonomic review of the
39 morphology of all *Stenocaris* species indicated that the generic concept must be restricted to
40 accommodate *S. minor* s. str., *S. gracilis* Sars, 1909, *S. intermedia* Itô, 1972, *S. figaroloensis* sp.
41 nov., and the South Korean new species, *S. marcida* sp. nov., based on the synapomorphic
42 confluent fifth legs in males. As a result of our analysis, two *Stenocaris* species, *S. baltica* Arlt,
43 1983 and *S. pygmaea* Noodt, 1955, are transferred to the genus *Vermicaris* Kornev &
44 Chertoprud, 2008 as *V. baltica* (Arlt, 1983) comb. nov. and *V. pygmaea* (Noodt, 1955) comb.
45 nov. based on the synapomorphic reduction of the second and fifth legs. Additionally, *S.*
46 *arenicola* Wilson, 1932 and *S. kliei* (Kunz, 1938) are allocated to a new genus, *Huysicaris* gen.
47 nov., mainly characterized by the caudal rami with a recurved dorsal spinous process and convex
48 inner margins, as *H. arenicola* (Wilson, 1932) comb. nov. and *H. kliei* (Kunz, 1938) comb. nov.
49 A marine interstitial harpacticoid collected from the subtidal substrate off Dok-do Island in the
50 East Sea of South Korea is proposed as *S. marcida* sp. nov. and the distribution of *S. intermedia*,
51 originally known from its type locality in Japanese waters only, is extended to the East Sea of
52 Korea and Russia. We provide their detailed descriptions and illustrations and discuss the
53 morphological characters supporting their identities.

55 **Keywords.** *Huysicaris* gen. nov., *Huysicaris arenicola* (Wilson, 1932) comb. nov., *Huysicaris*
56 *kliei* (Kunz, 1938) comb. nov., interstitial meiofauna, Korean waters, Russian waters, *Stenocaris*
57 *figaroloensis* sp. nov., *Stenocaris marcida* sp. nov.

Introduction

Harpacticoids are the second-most species-rich and abundant group in the meiofaunal community after nematodes (*Hicks & Coull*, *1983*). They exhibit diverse morphological adaptations as a result of the benthic habitats they have colonized, *e.g.*, endobenthic species have specialized thoracic appendages or a well-developed rostrum to facilitate burrowing (*Gee & Huys*, *1996*; *Corgosinho*, *2012*; *Kim & Lee*, *2020*), and interstitial species underwent three morphological trends to swim or crawl within the lacunae between sediment particles: miniaturization of body size, elongation along the body axis, and reduction of the setal armature of the thoracic legs (*Noodt*, *1971*; *Martínez Arbizu & Moura*, *1994*; *Huys & Conroy-Dalton*, *2006a*; *Corgosinho*, *2012*).

The family Cylindropsyllidae Sars, 1909, currently comprising 39 species in 13 genera, is a representative of mesopsammic harpacticoids (*Richter*, *2019*). Members of this family have an interstitial lifestyle and exhibit the above morphological trends except for miniaturization, and a cylindrical or vermiform habitus without a distinct constriction between the prosome and urosome, and slender swimming legs with reduced segmentation and setal armature (*Huys & Conroy-Dalton, 2006a*; *Richter, 2019*). These morphological features likely enhance their flexibility and ability to wriggle between sand grains and shell gravel in shallow coastal and sublittoral environments (*Huys*, *1988*; *Huys & Conroy-Dalton*, *1993*, *2006a*; *Huys & Lee*, *2018*), but some species have been documented in deep-sea mud (*Becker et al.*, *1979*; *Moura & Pottek*, *1998*; *Richter*, *2019*). *Huys (1992)* reported a strong correlation between the distribution of cylindropsyllid species and sediment conditions. Cylindropsyllids are also morphologically characterized by the fifth leg forming a single plate in both sexes and the sexual dimorphism of the second and third swimming legs in the male (*Huys*, *1988*).

Since *Lang*'s *(1948)* familial concept of the Cylindropsyllidae (a subfamily at that time), the genus *Stenocaris* Sars, 1909 had until the 1970s served as a repository to accommodate more advanced cylindropsyllid harpacticoids (*i.e.*, retaining a slender-type maxilliped with a geniculate claw, a non-prehensile endopod of the first leg, the second and third legs with reduced endopod segmentation), without any morphologic or phylogenetic inference. Therefore, the monophyly of this genus is questionable (*Huys*, *1988*; *Huys & Conroy-Dalton*, *1993*, *2006b*) and apomorphies have not been defined (*Richter*, *2019*). These taxonomical problems were partially resolved by the following contributions. *Apostolov (1982)* established a new genus *Stenocaropsis* Apostolov, 1982 to accommodate *Stenocaris pristina* Wells, 1968 and *Stenocaris valkanovi* Marinov, 1974 which possess two-segmented endopods on the second and third legs against *Sars*'s *(1909)* generic diagnosis with the one-segmented endopods on these legs. However, *Apostolov (1982)* questionably retained in *Stenocaris* two deep-sea species, *Stenocaris abyssalis* Becker, Noodt & Schriever, 1979 and *Stenocaris profundus* Becker, Noodt & Schriever, 1979, which have the same endopodal segmentation as *Stenocaropsis*. Although *Kunz (1994)* assigned the latter two deep-sea species to *Stenocaropsis*, *Moura & Pottek (1998)* established a new genus *Selenopsyllus* Moura & Pottek, 1998 for *Becker et al.*'s *(1979)* two deep-sea species and two new Antarctic species, *Selenopsyllus dahmsi* Moura & Pottek, 1998 and *Selenopsyllus*

98   *antarcticus* Moura & Pottek, 1998. The latter were characterized by a six-segmented female
99   antennule, at most, with an aesthetasc on the third segment (*Moura & Pottek, 1998*). *Huys &*
100   *Conroy-Dalton (1993)* transferred *Stenocaris kerguelenensis* Bodiou, 1977 to a new
101   monophyletic genus *Navalonia* Huys & Conroy-Dalton, 1993. *Kornev & Chertoprud (2008)*
102   removed *Stenocaris minuta* Nicholls, 1935 and *Stenocaris pontica* Chappuis & Serban, 1953,
103   and placed them in a new genus, *Vermicaris* Kornev & Chertoprud, 2008. As a result of these
104   efforts, *Stenocaris* currently comprises seven valid species: *Stenocaris minor* (T. Scott, 1892), *S.*
105   *gracilis* Sars, 1909 (type species; *cf. Huys, 2009*: 98), *S. arenicola* Wilson, 1932, *S. kliei* Kunz,
106   1938, *S. pygmaea* Noodt, 1955 [*Apostolov (1972)* and *Apostolov & Marinov (1988)* considered it
107   a junior synonym of *V. pontica* (Chappuis & Serban, 1953), but it was reinstated as a valid
108   species of *Stenocaris* by *Huys & Conroy-Dalton (1993*: 295*)*], *S. intermedia* Itô, 1972, and *S.*
109   *baltica* Arlt, 1983. However, their phylogenetic relationship is still unclear.
110   Taxonomical surveys on the marine harpacticoid family Cylindropsyllidae from South
111   Korea have been limited. *Back et al. (2009)* only reported the occurrence of this family in a
112   sublittoral environment off Sungap-do Island in the Yellow Sea during a survey of the
113   meiofaunal community in a sand-mining area. The following sections provide a taxonomical
114   report of the family in this area based on the specimens identified as *S. intermedia* and a new
115   *Stenocaris* species from the subtidal sediments of the East Sea (including Russian waters),
116   describe the morphological characteristics supporting their identities, and review the
117   phylogenetic relationships among *Stenocaris* species to resolve the polyphyly of the genus.
118
119   **Material & Methods**
120   Sediment samples were collected from the sublittoral benthic environments off Ulleung-do and
121   Dok-do Islands (South Korea) and the coast of Primorsky (Russia) in the East Sea (Sea of Japan)
122   via scuba diving (depths of 8.0–30.5 m) or with a Smith-McIntyre grab (depth of 73.3 m) (Fig.
123   1). These field samplings were approved by the National Marine Biodiversity Institute of Korea
124   (MABIK) and the National Institute of Biological Resources (NIBR). Samples were immediately
125   preserved in 95% ethanol or in 4% formalin solution. In the laboratory, they were filtered
126   through a 50-μm sieve under tap water. Harpacticoid copepods were removed using a Pasteur
127   pipette under a Leica M165 C stereomicroscope. Specimens of two *Stenocaris* species were
128   prepared and mounted in lactic acid on a temporary reverse slide (*Humes & Gooding, 1964*).
129   Total body length was measured from the anterior tip of the rostrum to the posterior end of the
130   caudal rami in lateral view using an Olympus DP28 microscope camera. Line drawings of the
131   whole specimen and its dissected appendages were prepared using a camera lucida on an
132   Olympus BX53 compound microscope equipped with a differential interference contrast
133   objective. After morphological examination, the dissected parts were transferred to and
134   permanently mounted in glycerin on Higgins-Shirayama (H-S) slides comprising two coverslips
135   (*Shirayama et al., 1993*). The slides were deposited in the MABIK or NIBR in South Korea.
136   Maps of sampling stations and the distribution of *Stenocaris* species were generated using Ocean
137   Data View ver. 5.6.1 (*Schlitzer, 2022*).

138   We followed *Huys et al. (1996)* for the morphological terminology of the body and
139   appendages, and *Lang (1934)* for the setal armature formulae of swimming legs. Abbreviations
140   used in the text, tables and figure captions are as follows: acro, acrothek composed of one
141   aesthetasc and two setae (fused basally); ae, aesthetasc; apo, apophysis; EXP(ENP)1(2, 3), first
142   (second, third) exopodal (endopodal) segment; P1–P6, first to sixth thoracic leg. We also
143   followed *Huys & Conroy-Dalton (2006b)*'s designations for armature elements on the fifth leg
144   (innermost = seta *a*, second innermost = seta *b* … outermost = seta *h* in females and seta *f* in
145   males) to compare their positions and modifications in other genera or species.
146   The electronic version of this article in Portable Document Format (PDF) will represent a
147   published work according to the International Commission on Zoological Nomenclature (ICZN),
148   and hence the new names contained in the electronic version are effectively published under that
149   Code from the electronic edition alone. This published work and the nomenclatural acts it
150   contains have been registered in ZooBank, the online registration system for the ICZN. The
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154   22B9CC0869DB]. The online version of this work is archived and available from the following
155   digital repositories: PeerJ, PubMed Central and CLOCKSS.
156
157   **Results**
158
159   **Taxonomy**
160
161   Order Harpacticoida Sars, 1903
162   Family Cylindropsyllidae Sars, 1909
163   Genus *Stenocaris* Sars, 1909
164
165   Type species.—*Stenocaris gracilis* Sars, 1909
166   Other species.—*S. minor* (T. Scott, 1892), *S. intermedia* Itô, 1972, *S. figaroloensis* sp. nov., and
167   *S. marcida* sp. nov.
168
169   Amended diagnosis.—Cylindropsyllidae. Habitus slender, cylindrical. Rostrum triangular, as
170   long as first antennular segment, defined at base. Genital somite and third urosomite completely
171   fused in ♀ forming genital double-somite. Anal somite as long as penultimate somite. Caudal
172   rami elongate, at least 2.5 times as long as wide; seta I diminutive, principal seta V styliform or
173   composite (styliform proximal part and slender setiform distal part) in ♀. Antennule six- or
174   seven-segmented, with aesthetasc on fourth and terminal segments in ♀, haplocer and nine- or
175   ten-segmented in ♂; second segment distinctly elongated in both sexes. Antenna with allobasis;
176   exopod one-segmented, bearing 2 terminal setae. Mandibular palp two-segmented, uniramous,
177   with one seta on basis, and one lateral and three or four distal setae on endopod. Maxillule with

178   two setae on coxal endite; exopod and endopod represented by two setae and three or four setae,
179   respectively. Maxilla with two syncoxal endites and one-segmented endopod. Maxilliped well-
180   developed, with geniculate endopodal claw. P1 endopod non-prehensile; ENP2 with one small
181   and two long setae. P2–P4 exopods three-segmented; P2–P3 EXP3 with two outer spines and P4
182   EXP3 with one or two outer spines; P2 EXP3 without and P3–P4 EXP3 with one inner seta; P2
183   EXP3 in ♂ strongly modified, as long as EXP1 and EXP2 combined, with wavy inner margin,
184   and one stout and distally recurved apical spine, and lacking inner element; P4 exopod longer
185   than those of P2–P3. Endopods in ♀ one-segmented in P2–P3 and two-segmented in P4. P2 in ♂
186   with spinous anterior process on basis and two-segmented endopod. P3 in ♂ with two-segmented
187   endopod; ENP1 with apophysis in *S. minor* and *S. figaroloensis* sp. nov., but without apophysis
188   in other species; ENP2 modified into a stout apophysis in *S. gracilis* and *S. intermedia*, subovate
189   in *S. minor* and *S. figaroloensis* sp. nov., and with spinose projection in *S. marcida* sp. nov. Setal
190   armature formula of P1–P4 as in Table 1.
191   P5 forms a single plate in both sexes, with seven distal elements in ♀, of which innermost
192   one spine-like (fused basally in *S. gracilis*, *S. intermedia* and *S. marcida* sp. nov.) and second
193   innermost one spine-like (seta-like in *S. minor* and *S. figaroloensis* sp. nov.), and five distal setae
194   in ♂; baseoendopods separate in ♀, but fused medially in ♂.
195   P6 with two or three setae in ♀ and three setae in ♂.
196   Remarks.—See the discussion (below) on a *Stenocaris minor* species complex, and taxonomic
197   positions of *S. arenicola*, *S. baltica*, *S. kliei*, and *S. pygmaea*.
198
199   *Stenocaris marcida* sp. nov.
200   urn:lsid:zoobank.org:act: 45861574-3D8E-42CB-ADEE-E32EA4F3334D
201   Figs. 2–7
202
203   Type locality.—Sublittoral sandy sediments off Dok-do Island, Korea (37˚14'5.63"N
204   131˚51'43.19"E); 73.3 m depth.
205   Type material.—Holotype: ♀ dissected on 11 slides (MABIK CR00252790) collected from the
206   type locality, November 2, 2018. Allotype: ♂ dissected on eight slides (MABIK CR00252791),
207   collection data as in holotype. Paratypes: 1♀ (MABIK CR00252792), 2♀♀, 2♂♂ (MABIK
208   CR00252793) preserved together in a vial with 99% ethanol, collection data as in holotype; J.G.
209   Kim leg.
210
211   Description of female (based on the holotype MABIK CR00252790).—Total body length about
212   736.0 μm (length range = 736.0–842.8 μm; mean = 786.7 μm, n =4); habitus (Fig. 2A, B)
213   slender, cylindrical, without distinct separation between prosome and urosome. Integument of
214   cephalothorax, all somites, and caudal rami pitted, with several sensilla and pores except for
215   penultimate somite. Posterior border of cephalothorax and all somites with smooth hyaline frill.
216   Cephalothorax occupying 25% of body length, slightly tapering anteriorly in dorsal aspect. P5-
217   bearing somite longer than third free pedigerous somite. Genital somite and third urosomite

218   completely fused forming genital double-somite, longer than preceding somite; genital pores
219   (Fig. 4G) separate, each covered by small plate bearing two setae (representing P6); mid-ventral
220   copulatory pore located at same level of genital pores, probably covered by membrane with
221   opening (Fig. 4G). Two free urosomites and anal somite slightly tapering posteriorly. Anal
222   somite elongate, as long as penultimate somite, with one pair of dorsal sensilla and three pairs of
223   ventrolateral pores; operculum wide, with smooth posterior margin.
224   Rostrum (Figs. 2A, 3A) prominent, triangular, defined at base, not exceeding first
225   antennulary segment, slightly longer than maximum width; with one pair of subapical sensilla.
226   Caudal rami (Fig. 2A–D) slightly divergent, as long as anal somite, about 3.1 times as
227   long as maximum width; medial margin slightly concave in dorsal view; dorsal surface with one
228   pore subdistally, and ventral surface with one pore proximally and one pore subdistally; with
229   seven setae: setae I and II inserted in distal fifth of lateral margin at same level; seta I diminutive,
230   noticeable at high magnification; seta II as long as caudal ramus; seta III arising from dorsal
231   surface subdistally, about 1.3 times longer than caudal ramus; terminal setae IV and V fused
232   basally; seta IV slender, about 1.5 times as long as caudal ramus; principal seta V composite,
233   with styliform proximal part slightly shorter than seta IV, and long slender setiform distal part;
234   seta VI short, ventrally inserted in distal margin; seta VII tri-articulate basally, arising in middle
235   of caudal ramus on dorsal surface, slightly shorter than caudal ramus.
236   Antennule (Fig. 3A) slender, longer than cephalothorax, seven-segmented. First segment
237   small, with one small seta ventrally. Second segment elongated, about 5.9 times as long as
238   preceding one, with four bi-articulate and four slender setae, and one tube pore. Third segment
239   small, twice as long as wide, with four bi-articulate setae. Fourth segment smaller than preceding
240   one, with one seta and one distal peduncle bearing one aesthetasc and one small seta. Fifth
241   segment smaller than preceding one, with one seta. Sixth segment smallest, with one seta.
242   Terminal segment slightly longer than two preceding ones combined, tapering distally, with one
243   seta, six bi-articulate setae, and acrothek. Setal formula: 1-[1], 2-[8], 3-[4], 4-[1 + (1 + ae)], 5-
244   [1], 6-[1], 7-[7 + acro].
245   Antenna (Fig. 4A). Coxa small, unornamented. Allobasis elongate, 3.8 times as long as
246   maximum width. Exopod arising at proximal third of allobasis, one-segmented, slender, with two
247   long setae distally. Free endopodal segment elongate; inner margin with two unipinnate spines,
248   one proximal spinule, and one subdistal group of spinules; distal margin oblique, with one
249   delicate seta (indicated by arrowhead in Fig. 4A), two pinnate spines, and three geniculate setae,
250   of which outermost one spinulose and fused to one delicate seta; with hyaline frills distally and
251   subdistally.
252   Mandible (Fig. 4B). Coxa well-developed, transversely elongate, with one medial bulge;
253   gnathobase with one bicuspidate and three multicuspidate teeth, and one unipinnate seta fused to
254   one stout spine. Palp uniramous, two-segmented; basis elongate, about 4.6 times as long as wide,
255   with one subdistal seta; endopod elongate, twice as long as wide, with one lateral seta, and two
256   distal sets of two setae basally fused.

257   Maxillule (Fig. 4C). Praecoxa with one row of posterior spinules; arthrite well-developed,
258   with seven spines distally and two pinnate setae subdistally, and one long and one small seta on
259   anterior surface. Coxa small, unornamented; cylindrical endite with one spinulose and one bare
260   seta. Basis with one row of spinules both posteriorly and anteriorly; distal margin with one
261   spinulose and three bare setae; subdistal endite with two bare setae. Exopod and endopod
262   represented by two and three bare setae, respectively.
263   Maxilla (Fig. 4D). Syncoxa unornamented, with two endites: proximal endite with one
264   unipinnate spine, and one bare and one unipinnate seta distally; distal endite with three
265   unipinnate setae. Allobasis drawn out into stout claw, with spinules subdistally and two setae
266   proximally. Endopod one-segmented, with four distal setae.
267   Maxilliped (Fig. 4E). Syncoxa elongate, 2.7 times as long as wide, subdistally with one
268   unispinulose seta. Basis longer than preceding segment, 2.8 times longer than maximum width,
269   with one outer spinule subdistally. Endopod small, with one unipinnate and geniculate claw.
270   P1 (Fig. 3B). Praecoxa large, triangular, unornamented. Coxa rectangular, about 0.6 times
271   as long as broad, pitted, with one row of anterior spinules; posterior surface with three rows of
272   spinules. Basis smaller than preceding segment, with one row of antero-distal spinules, one
273   anterior pore, and one long inner seta (uniplumose distally); outer seta absent. Exopod three-
274   segmented, slightly longer than endopod, with spinular ornamentation along outer margins;
275   length ratio of EXP1–EXP3 1: 0.81: 0.78; EXP1 and EXP2 with one small unipinnate outer
276   spine; EXP3 with four unispinulose spines, of which distal and inner ones geniculate. Endopod
277   reaching middle of EXP3, two-segmented, with outer spinular ornamentation; ENP1 elongate,
278   slightly exceeding distal end of EXP1, with one unipinnate seta posteriorly; ENP2 slender, as
279   long as preceding segment, distally with one unipinnate geniculate spine, and one long
280   geniculate seta (uniplumose proximally), and posteriorly with one small bare seta.
281   P2 (Fig. 5A). Praecoxa small, unornamented. Intercoxal sclerite subrectangular, distal
282   margin concave. Coxa rectangular, pitted (not figured), unornamented. Basis smaller than
283   preceding segment, with one bare outer seta and one anterior pore. Exopod three-segmented,
284   much longer than endopod; length ratio of EXP1–EXP3 1: 0.66: 1.05; EXP1 and EXP2 with
285   spinular ornamentation along outer margin subdistally and with distal surface frill, spinous
286   process bearing anterior spinules distally, and unipinnate outer spine, respectively; EXP3 with
287   spinular ornamentation along outer and distal margins, two unipinnate outer spines, and two
288   pinnate distal spines, of which inner one ornamented with more distinct spinules. Endopod one-
289   segmented, reaching distal fourth of EXP1, 3.6 times as long as broad, with one pinnate spine
290   distally, one small bare posterior seta subdistally, and one long uniserrate posterior seta
291   proximally.
292   P3 (Fig. 5B). Protopod and intercoxal sclerite as in P2, but smaller than in P2; outer seta
293   of basis longer than those of P2 and P4. Ornamentation and segmentation of both rami largely as
294   in P2. Length ratio of EXP1–EXP3 1: 0.66: 1.19; exopodal armature as in P2 except for presence
295   of one uniserrate inner seta in EXP3. Endopod one-segmented, not exceeding middle of EXP1,
296   with one stout pinnate spine distally and one small posterior seta subdistally.

297   P4 (Fig. 5C). Protopod and intercoxal sclerite as in P2 and P3, but smaller than in P2 and
298   P3. Exopod longer than in P2 and P3; length ratio of EXP1–EXP3 1: 0.97: 0.65; EXP1 with three
299   groups of outer spinules, outer distal corner not produced, with one row of stout spinules, and
300   distal hyaline frill expanded roundly; ornamentation of EXP2 as in EXP1 except for presence of
301   only one group of outer spinules; EXP1 and EXP2 with one pinnate outer spine; EXP3 with
302   distal hyaline frill, two pinnate outer spines, two pinnate distal spines, and one uniserrate inner
303   seta. Endopod two-segmented, as long as EXP1; ENP1 without setal armature; ENP2 smaller and
304   slenderer than preceding segment, with one fishbone-like spine distally and one small posterior
305   seta subdistally.
306   P5 (Fig. 4F). Exopod and baseoendopod fused forming a single plate; with eight
307   elements: seta *a* spiniform, fused to baseoendopod, serrate subdistally; other setae setiform, setae
308   *b*, *d*, *e* longer than others, and seta *c* half-length of seta *b*, and seta *f* shortest; outer basal seta *h*
309   very long, bi-articulate basally, uniplumose distally.
310   Description of male (based on allotype MABIK CR00252791). Body slightly shorter than
311   female, about 702.0 μm (range = 698.5–744.1 μm; mean = 714.9 μm, n = 3); habitus (Fig. 6A) as
312   in female, except for the following characters.
313   Cephalothorax (Fig. 6A) with mid-dorsal integumental window.
314   Urosome (Figs. 6A, 7A) six-segmented, genital somite and third urosomite separated;
315   spermatophore elongate, about 1/5 of body length, extending to the middle of third urosomite.
316   Caudal rami (Figs. 6A, 7A). Seta III 1.8 times as long as caudal ramus. Seta V composite
317   as in female, but with more slender styliform proximal part.
318   Antennule (Fig. 6B) haplocer, ten-segmented, with geniculation between seventh and
319   eighth segments. First segment small, posteriorly with one patch of minute spinules, one row of
320   spinules, and one bare seta. Second segment longest, with one tube pore, one uniplumose, one bi-
321   articulate, and seven bare setae. Third segment small, being at right angle with previous segment,
322   with one bi-articulate and six bare setae; outer margin concave. Fourth segment smaller than
323   preceding one, with two setae. Fifth segment swollen, with one uniplumose, one bi-articulate and
324   three single setae, and one distal peduncle bearing one long aesthetasc and one bare seta (fused
325   basally). Sixth segment small, with one long and one small uniplumose seta. Seventh segment
326   elongate, slightly curved inwardly, with one uniplumose and two bare setae. Eighth segment
327   slightly shorter than preceding one, with one minute seta. Ninth segment smallest, unarmed.
328   Terminal segment as long as seventh segment, tapering distally, with one bare and six bi-
329   articulate setae, and acrothek. Setal formula: 1-[1], 2-[9], 3-[7], 4-[2], 5-[5 + (1 + ae)], 6-[2], 7-
330   [3], 8-[1], 9-[0], 10-[7 + acro].
331   P2 (Fig. 7B). Protopod and intercoxal sclerite as in female. Basis with spinose inner
332   process anteriorly. EXP1 and EXP2 as in female. EXP3 elongate, 0.85 times as long as EXP1
333   and EXP2 combined, uneven along inner margin, with three pinnate outer spines and one
334   modified stout distal seta recurved distally, and with one oblique row of minute spinules.
335   Endopod two-segmented, not reaching middle of EXP2; ENP1 with convex inner margin and

336   one distally uniserrate seta posteriorly; ENP2 1.7 times as long as preceding segment, with one
337   small, distally recurved distal seta.
338   P3 (Fig. 7C). Protopod and intercoxal sclerite as in female. Basis with one row of anterior
339   spinules proximally and distally. Exopod as in female. Endopod two-segmented, not reaching
340   distal end of EXP1; ENP1 small, slightly longer than wide, unarmed; ENP2 about 1.5 times as
341   long as preceding segment, with one small and stout distal seta, and one spinose projection on
342   inner margin.
343   P5 (Fig. 5D). Baseoendopods of right and left legs fused medially; each with one lateral
344   and three anterior pores. Exopod and baseoendopod fused forming a single plate, tapering
345   distally, with truncate distal end; with six elements: seta *a* smallest, seta *b* twice as long as rami
346   length, seta *c* slightly shorter than seta *b*, setae *d* and *e* slightly longer than seta *a*, and outer basal
347   seta *f* three times as long as ramus, bi-articulate basally, uniplumose distally.
348   P6 (Fig. 7A) asymmetrical, only one functional, each represented by small plate, with one
349   bi-articulate and two bare setae, of which middle one longest.
350
351   Variability.—Proximal styliform part of composite caudal seta V broken off in several females
352   (see Fig. 2D). This could lead to the misconception that the female's caudal seta V is styliform.
353
354   Etymology.—The specific name *marcida* is derived from the Latin adjective *marcidus*, meaning
355   withered, and alludes to the relatively short seta on the male P3 ENP2. It is in the nominative
356   singular, gender feminine.
357
358   Remarks.—*Stenocaris marcida* sp. nov. resembles Scott's (1892) *S. minor* s. str. in the seven-
359   segmented female antennule and armature of swimming legs, and in the setiform seta *b*
360   (= second innermost seta) on female P5. However, the new species is characterized by the
361   following structures: (1) seta *a* (= innermost spine) on female P5 is fused to segment, and distally
362   serrate and blunt (not fused to ramus and pinnate in *S. minor* s. str.); (2) the recurved, stout distal
363   spine of male P2 EXP3 is slightly shorter than the length of P2 EXP1 (very long, distinctly
364   longer than P2 EXP1 and EXP2 combined in *S. minor* s. str.); (3) male P2 EXP3 approximately
365   twice as long as EXP2 (slightly longer than EXP2 in *S. minor* s. str.); (4) male P2 ENP2
366   approximately twice as long as ENP1, bearing a small distal spine, which is setule-like in the
367   distal part (slightly longer than ENP1, with a long and pinnate seta in *S. minor* s. str.); (5) the
368   sexual dimorphism of male P3 is different in that male P3 ENP2 of *S. marcida* sp. nov. exhibits
369   an apophysis of a small spinose process and has a spine-like seta shorter than the distal segment,
370   while, in *S. minor* s. str., a stout apophysis appears in P3 ENP1, and subovate ENP2 has a long
371   and slender distal seta; (6) caudal seta V is composite, and it is composed of a styliform proximal
372   part and a slender setiform distal part (it is most probably non-composite in both sexes in *S.*
373   *minor* s. str.). In addition, caudal seta VI in both sexes of *S. minor* s. str. (*Scott, 1892, 1900*) is
374   very small and bulbous whereas it is normal in the new species.

375   The new species shares sexual dimorphism of P3 with *S. gracilis* and *S. intermedia*,
376 suggesting a close relationship. However, *S. marcida* sp. nov. is readily distinguishable from
377 them by the combination of the female seven-segmented antennule (*vs.* six-segmented in the
378 other two species), male P3 ENP2 with a small spinous process (*vs.* absent, but the segment
379 drawn out into an apophysis in the other two species), and the setiform seta *b* on female P5 (*vs.*
380 spiniform in the other two species; *Sars, 1909*; *Itô, 1972*).
381
382 *Stenocaris intermedia* Itô, 1972
383 Figs. 8–12.
384 *Stenocaris intermedia Itô, 1972*: p. 323, Figs. 13–16; *Kornev & Chertoprud, 2008*: p. 280, Fig.
385 146E.
386
387 Material examined: 2♀♀, 1♂ (NIBRIV0000900838, NIBRIV0000900839,
388 NIBRIV0000900840) each dissected on a slide, 5♀♀, 4♂♂ (NIBRIV0000900841) preserved
389 together in a vial with 99% ethanol, sublittoral sediments at Gwaneum-do Islet off Ulleung-do
390 Island in the East Sea of Korea (37˚33'02.60"N 130˚54'26.50"E), September 16, 2016, 30.5 m
391 depth, T.W. Jung leg.; 1♀, 1♂ (NIBRIV0000900842, NIBRIV0000900843) each dissected on a
392 slide, 6♀♀, 4♂♂ (NIBRIV0000900844) preserved together in a vial with 99% ethanol,
393 sublittoral sediments at the coast of Primorsky in the East Sea of Russia (42˚37'20.00"N
394 131˚07'41.40"E), October 9, 2019, water depth 8 m, S.H Kim, J.W Kang leg.
395
396 Description of female (based on NIBRIV0000900838).—Total body length ranged 966.1–1087.3
397 μm (mean = 1016.1 μm, n = 7; Korean population); body (Fig. 8A) slender, cylindrical, without
398 clear distinction between prosome and urosome; integuments pitted and covered with sensilla
399 and pores except for penultimate somite; smooth hyaline frill present in all somites.
400 Cephalothorax representing 18% of body length. Free pedigerous somites slightly narrower than
401 cephalothorax. First urosomite (P5-bearing somite) slightly tapering towards anterior end and
402 other urosomites slightly tapering towards posterior end. Genital somite and third urosomite
403 completely fused in female forming genital double-somite (Fig. 8A); genital slits separate, each
404 covered by small plate with three small setae (representing P6) and copulatory pore covered by
405 oval-shaped bulb (Fig. 10G, H). Anal somite 1.4 times as long as wide, with one pair of lateral
406 secretory pores subdistally (Fig. 8B) and one pair of dorsal sensilla; anal operculum wide,
407 moderately rounded, unarmed (Fig. 8A).
408   Rostrum (Fig. 8A) triangular, defined at base, with one pair of subapical sensilla; slightly
409 shorter than maximum width.
410   Caudal rami (Fig. 8A, B) slightly divergent, cylindrical, about three times as long as
411 maximum width, with one dorsal and two lateral pores; with seven setae: position of each seta as
412 in *S. marcida* sp. nov.; seta I diminutive, shortest; setae II short, about 1/3 of ramus length; seta
413 III displaced to dorsal surface subdistally, as long as seta II; seta IV slightly shorter than setae II
414 and III, fused to seta V basally; principal seta V conical, spiniform, about 1/3 of ramus length;

415   seta VI short, as long as setae II and III; seta VII tri-articulate at base, dorsally inserted near inner
416   margin in middle of ramus, as long as setae II and III.
417   Antennule (Fig. 9A) six-segmented. First segment small, with one small seta, and
418   ornamented with one row of outer spinules and two rows of minute posterior spinules. Second
419   segment longest, about 3.4 times as long as maximum width, with one secretory pore and eight
420   setae (four bare and four bi-articulated). Third segment 0.4 times shorter than preceding one,
421   with four setae, of which two setae bi-articulated basally. Fourth segment smaller then preceding
422   one, about 1.7 times as long as wide, with one long seta and one distal peduncle bearing one seta
423   and one aesthetasc (basally fused). Fifth segment shortest, about 1.8 times as long as wide, with
424   one bi-articulated seta. Sixth segment slightly tapering towards apical end, about 5.5 times as
425   long as maximum width, with two bare setae, six bi-articulate setae, and acrothek. Armature
426   formula: 1-[1], 2-[8], 3-[4], 4-[1 + (1 + ae)], 5-[1], 6-[8 + acro].
427   Antenna (Fig. 9B). Coxa small, with one row of minute spinules. Allobasis elongate,
428   about four times as long as wide, with two rows of spinules near abexopodal margin. Exopod
429   slender, one-segmented, with one pinnate and one plumose seta. Free endopodal segment, with
430   one proximal row of inner spinules, one subdistal row of anterior spinules, one subdistal row of
431   posterior spinules, and one distal outer hyaline frill; lateral armature composed of two uniserrate
432   inner spines; distal armature comprised of one minute bare seta (indicated by arrowhead in Fig.
433   9B), two serrate spines, three unipinnate, geniculate setae, of which outermost one bearing row
434   of stout spinules and basally fused to adjacent small seta.
435   Mandible (Fig. 10A, B) with well-developed coxa bearing one medial bulge and one row
436   of spinules; gnathobase well-developed, with one bi-cuspidate and three multicuspidate teeth,
437   one unipinnate seta fused to small spine, and one row of minute spinules. Uniramous palp
438   consisting of basis and one-segmented endopod; basis elongate, about 3.7 times as long as
439   maximum width, with one subdistal seta; endopod small, about 2.3 times as long as wide, with
440   one lateral and four apical setae (two sets of setae merged basally).
441   Maxillule (Fig. 10C). Praecoxa large, with one row of posterior spinules; well-developed
442   arthrite with seven spines distally, of which two anterior ones ornamented with one large spinule
443   subdistally, and one anterior spine ornamented with few long spinules proximally, two plumose
444   setae laterally, and one long and one small bare seta on anterior surface; posterior surface with
445   two rows of minute spinules, and lateral margin with one spinule. Coxal endite reaching middle
446   of praecoxal arthrite, with one pinnate spine and one bare seta. Basis with one row of spinules
447   anteriorly, and one pinnate and three bare setae distally; subdistal endite with two bare setae.
448   Both exopod and endopod incorporated into basis, represented by two and three setae,
449   respectively.
450   Maxilla (Fig. 10D). Syncoxa large, with two endites: proximal endite distally with one
451   unipinnate spine (fused to endite basally) and two unipinnate setae; distal endite with one spine
452   (bearing few spinules) and two setae (bearing several spinules medially). Allobasis drawn out
453   into a stout claw (bearing few spinules subdistally) accompanied by three setae proximally.
454   Endopod represented by four setae fused together basally.

455   Maxilliped (Fig. 10E) prehensile, three-segmented. Syncoxa elongate, about 3.2 times as
456   long as wide, with one plumose seta subdistally. Basis elongate, 3.4 times as long as maximum
457   width, unarmed. Endopod small, one-segmented, with one curved, geniculate claw bearing
458   spinular row.
459   P1 (Fig. 10F). Coxa wide, unornamented. Intercoxal sclerite wide. Basis smaller than
460   coxa, with one large anterior pore, and one long plumose inner seta; without outer seta.
461   Segmentation, setation, and ornamentation of both rami as in *S. marcida* sp. nov. Length ratio of
462   EXP1–EXP3 1: 0.84: 0.84; outer spines on EXP3 unipinnate or pinnate, and distal setae
463   unispinulose medially and uniplumose subdistally. Endopod not exceeding distal end of EXP3;
464   ENP1 reaching middle of EXP2, with one uniserrate inner seta; inner margin convex medially;
465   ENP2 narrower and 0.9 times longer than preceding segment; with two unispinulose and
466   geniculate distal setae, of which inner one uniplumose proximally, and one small bare posterior
467   seta subdistally.
468   Segmentation and setation of P2–P4 as in *S. marcida* sp. nov.
469   P2 (Fig. 11A). Praecoxa small, triangular. Intercoxal sclerite subrectangular, with
470   concave distal margin. Coxa large, unornamented. Basis with one bare outer seta; anterior
471   surface with one pore and one row of spinules. Length ratio of EXP1–EXP3 1: 0.66: 1.05; EXP1
472   and EXP2 with outer spinules subdistally and with distal surface frill, and spinous process
473   bearing anterior spinules distally; EXP3 with spinular ornamentation along outer and distal
474   margins; two distal setae on EXP3 bipinnate (ornamented with more distinct spinules than those
475   of outer spines), of which inner distal seta 1.5 times longer than outer distal seta. Endopod one-
476   segmented, reaching distal fourth of EXP1, with one outer row of fine spinules; with one distal
477   spine, one small inner seta, and one uniserrate inner seta; distal spine ornamented with more
478   distinct spinules and uniserrate inner seta more deeply serrate than that of *S. marcida* sp. nov.
479   P3 (Fig. 11B). Praecoxa unornamented. Intercoxal sclerite smaller than in P2. Coxa with
480   two rows of minute anterior spinules. Basis with long plumose outer seta exceeding distal end of
481   EXP1; anteriorly with one pore and one row of spinules as in P2. Length ratio of EXP1–EXP3 1:
482   0.66: 1.10; two distal elements of EXP3 ornamented with more distinct spinules than those of
483   outer elements as in P2; inner setal armature of EXP3 uniserrate in distal fourth. Endopod one-
484   segmented, reaching distal fourth of EXP1, with one stout pinnate spine distally and one small
485   inner seta subdistally; distal margin with hyaline frill.
486   P4 (Fig. 11C). Praecoxa and coxa larger than those of P2 and P3; coxa with two rows of
487   posterior spinules. Intercoxal sclerite smaller than in P2 and P3. Basis with one bare outer seta;
488   anteriorly with one pore and one row of spinules as in P2 and P3. Exopod distinctly longer than
489   in P2 and P3; length ratio of EXP1–EXP3 1: 1: 0.76; EXP1 and EXP2 each with three groups
490   and one group of outer spinules; distal margin with hyaline frill and expanded roundly;
491   ornamentation of EXP2 as in EXP1 except for presence of only one group of outer spinules; two
492   outer spines of EXP3 stouter than those of *S. marcida* sp. nov., inner distal seta 1.3 times longer
493   than outer distal seta. Endopod as long as EXP1, two-segmented; ENP1 and ENP2 each with

494   hyaline frill distally; ENP1 unarmed, and ENP2 with one fishbone-like spine distally and one
495   small posterior seta subdistally.
496   P5 (Fig. 11D). Baseoendopod and exopod fused into a robust plate, with three anterior
497   secretory pores proximally; with eight elements: seta *a* spiniform, stout, fused to segment
498   basally, reaching proximal quarter of next strong spine (seta *b*), with strongly serrate tip; seta *b*
499   also spiniform, 1.5 times as long as ramus; setae *c–g* setiform, seta *c* shorter than seta *b*, and seta
500   *d* 1.8 times as long as ramus; setae *e* and *f* pinnate subdistally, seta *e* exceeding tip of seta *b*,
501   twice as long as seta *f*; seta *g* bare, slightly exceeding tip of seta *a*; outer basal seta *h* longest, bi-
502   articulate basally, and uniplumose subdistally.
503
504   Description of male (based on NIBRIV0000900840). Body length 912.9 μm (range = 859.9–
505   978.3 μm; mean = 934.6 μm; n = 5; Korean population); habitus (Fig. 8C) as in female, but
506   sexual dimorphism expressed as follows.
507   Urosome (Figs. 8C, 12A) six-segmented; genital and first abdominal somites separate.
508   Caudal rami (Fig. 12A, B) about 2.5 times longer than maximum width, tapering towards
509   posterior end; with seven setae; position of each seta as in female; seta I diminutive, shortest as
510   in female; seta II slightly longer than ramus; seta III 1.3 times as long as ramus; seta IV slightly
511   shorter than seta II; principal seta V elongate, composite, composed of slender spiniform
512   proximal part and long setiform distal part, as long as urosomites 1–4 combined.
513   Antennule (Fig. 9C) haplocer, ten-segmented, with geniculation between seventh and
514   eighth segments. First segment small, with one bare seta and two rows of posterior spinules.
515   Second segment longest, about 3.6 times as long as maximum width, with two plumose and
516   seven bare setae, and one pore. Third segment tapering distally, with seven setae. Fourth segment
517   minute, with two setae distally. Fifth segment swollen, with seven setae, one cylindrical process
518   bearing one slender seta and one long aesthetasc (fused basally). Sixth segment small, with one
519   small and one long seta. Seventh segment elongate, about twice as long as wide, with two setae.
520   Eighth segment shorter than preceding one, with one small seta. Ninth segment 0.36 times as
521   long as preceding one, unarmed. Terminal segment 3.5 times as long as preceding one, tapering
522   distally, with one bare and six bi-articulate setae, and acrothek. Armature formula: 1-[1], 2-[9],
523   3-[7], 4-[2], 5-[5 + (1 + ae)], 6-[2], 7-[2], 8-[1], 9-[0], 10-[7 + acro].
524   P2 (Fig. 12C). Protopod and intercoxal sclerite as in female. Inner distal corner of basis
525   forming a distinct spinous process anteriorly. Exopod three-segmented; EXP1 and EXP2 as in
526   female, but outer distal corner less produced and ornamented with small anterior spinules; outer
527   spines on each exopodal segment smaller than those in female; EXP3 longer than that in female,
528   as long as EXP1 and EXP2 combined; inner margin wavy, with two groups of setules; distal
529   element modified into a strong spine recurved distally and with one row of spinules medially and
530   one minute setule apically; with three pinnate outer spines. Endopod two-segmented, as long as
531   EXP1; ENP1 with one serrated seta posteriorly; ENP2 slightly shorter than preceding segment,
532   with one apical seta curved outwardly.

533   P3 (Fig. 12D). Praecoxa (not figured) and coxa unornamented. Intercoxal sclerite (not
534 figured) as in female. Basis with long plumose seta. Exopod as in female, but EXP3 relatively
535 shorter than in female. Endopod two-segmented; ENP1 small, unarmed; ENP2 strongly modified
536 into a recurved apophysis, about 3.9 times as long as preceding segment, with one unipinnate
537 distal seta.
538   P5 (Fig. 12A, E) as in *S. marcida* sp. nov.; with two anterior pores and six setae: seta *a*
539 shortest; seta *b* twice as long as ramus; seta *c* 0.6 times as long as seta *b*; seta *d* short, twice as
540 long as seta *a*; seta *e* slightly shorter than seta *d*; and outer basal seta *f* longest, uniplumose
541 subdistally.
542   P6 (Fig. 12A, F) as in *S. marcida* sp. nov.; with two asymmetrical plates, only one leg
543 functional, each with three setae, of which outer one about two times longer than others.
544
545 Variability.—The length ratio of seta *b* of the female P5 is variable between populations. The
546 length ratio of seta *b* to the ramus of P5 in the Korean population is higher (1.6 times) than in the
547 Japanese (see *Itô, 1972*: 328, Fig. 15-5 and 15-6) and Russian (see Fig. 11E) populations (about
548 0.9 times). It is likely that this morphological variability depends on the body size of the
549 organisms of each population; The specimens of the Korean population (966.1–1087.3 μm) are
550 smaller than the specimens of the two other populations (1200.0 μm in the Japanese population;
551 1077.3−1245.5 μm in the Russian population).
552
553 Remarks.—This marine harpacticoid was originally described by *Itô (1972)* based on both sexes
554 living on an intertidal sandy beach at Akkeshi, Hokkaido, Japan, and subsequently recorded in
555 sublittoral environments in the White Sea (Russia) by *Kornev & Chertoprud (2008)*. The latter
556 authors provided a brief description of the body and caudal rami, the armature of P2–P4, and a
557 drawing of the female's caudal rami, recognizing only differences in the length of female (1200
558 μm in the Japanese specimens *vs.* 923 μm in the Russian specimens). However, *Kornev &*
559 *Chertoprud's (2008)* setal armature differs from the original description. *Itô (1972)* considered a
560 setule-like element near the inner subdistal margin in P2–P3 ENP1 and P4 ENP2 as a setule.
561 However, based on both the illustrations of *Itô* (1972: Fig. 15) and our observation of specimens
562 from the East Sea (arrowheads in Fig. 11A–C), this element can be interpreted as a minute seta,
563 indicating that the armature patterns of P2–P4 endopods are '210', '110', and '0.110',
564 respectively. The fact that *Kornev & Chertoprud (2008)* provided the armature formula of P4
565 endopod as '0.010' conceivably implies either that their report is an observational error or that
566 the specimens from the White Sea actually represent a new and as yet undescribed distinct
567 species with close affinity to *S. intermedia*. Without re-examination of Kornev & Chertoprud's
568 specimens, the latter decision might be premature because the complete description of the
569 armature complement of P4 was omitted in older records of *Stenocaris* species (*cf. Scott, 1892,*
570 *1900*; *Sars, 1909*).
571   *Stenocaris intermedia* displays certain features in common with *S. gracilis*, *i.e.*, the
572 sexual dimorphic condition of male P3 endopod consisting of ENP1 without any apophysis and

573 ENP2 modified into a long apophysis, the female six-segmented antennule, and female P5 with a
574 stout seta *a* (fused to ramus) and a spiniform seta *b*. However, these two species can be
575 distinguished based on three features: the relative length of the terminal to the penultimate
576 segments in the female antennule (at least threefold in *S. intermedia vs.* twofold in *S. gracilis*);
577 the element on male P3 ENP2 (delicate and uniplumose in *S. intermedia vs.* stout, recurved, and
578 spine-like in *S. gracilis*); and the structure of female caudal seta V (distinctly small and stout
579 spine-like in *S. intermedia vs.* non-composite seta-like in *S. gracilis*; approximately one-third the
580 length of the caudal ramus in *S. intermedia vs.* extremely long, about 5 times the length of the
581 caudal ramus in *S. gracilis*) (*Sars, 1909*; *Itô, 1972*). The latter characteristic is the most
582 conspicuous feature of *S. intermedia*.
583   Our specimens of *S. intermedia* from the East Sea (South Korean and Russian waters)
584 largely correspond to the original description. However, we observed several minor differences
585 that can be considered intraspecific variability: the mandibular palp is more elongated and the
586 two outer elements on P4 EXP3 are more developed in our specimens; also, seta *b* on the female
587 P5 is distinctly longer than that of *Itô*'s *(1972)* specimen (about threefold as long as seta *a* in our
588 specimens *vs.* twofold in the Japanese specimens). When *Itô (1972)* described this species, he
589 presented two morphological variations in the female P5 in the length-to-width ratio of a single
590 segment and the thickness and length of setae/spines. We observed similar variations between
591 specimens from the same locality or geographical population (South Korean *vs.* Russian
592 specimens). Thus, we assumed that *S. intermedia* has high intra-population variability in this leg,
593 although the details of P5 are important for separating harpacticoid species (*e.g.*, *Kim et al.*,
594 *2021*; *Yeom et al., 2021*).
595
Discussion
597 **On the taxonomic status of the *Stenocaris minor* complex**
598 Based on only female specimens, *Scott (1892)* originally described this species (as
599 *Cylindropsyllus minor* at that time) from the Firth of Forth, Scotland, with a brief description and
600 illustrations of the body, antennule, maxilliped, and P1–P5 (his figures of P2 and P3 were
601 erroneously labeled P3 and P2, respectively; see *Scott, 1892*: Plate XL, Figs. 21, 22).
602 Subsequently, he revised the previous description of the female specimen (in particular, the
603 relative length ratio of antennular segments, and setation of both rami of P1) and provided
604 information on the males including the sexual dimorphic features of P2 and P3, based on
605 specimens from the type locality (see *Scott, 1900*: Plate XIV, Figs. 23–32). Since this correction,
606 *S. minor* has been reported from a variety of coastal regions: Korshamn, Norway (*Sars, 1911*);
607 Helgoland Island, Germany (*Kunz, 1938*); Roscoff, France (*Monard, 1935*); Naushon Island, and
608 Massachusetts (*Wilson, 1932*); the Bulgarian coast of the Black Sea (*Apostolov, 1971*; *Marinov*,
609 *1971*; *Apostolov & Marinov, 1988*); and Figarolo Island (Olbia, Italy) in the Mediterranean Sea
610 (*Cottarelli & Venanzetti, 1989*).
611   The description of *Sars (1911)* has been accepted as an appropriate standard for
612 *Stenocaris minor* (*Kunz, 1938*; *Lang, 1948*). However, the fact that most of subsequent records

613 include insufficient descriptions and illustrations, or are occasionally known from only one sex,
614 may have hampered comprehensive comparisons, possibly broadening the taxonomic concept of
615 *S. minor*. Because harpacticoid species complexes can be divided into several cryptic species
616 (*e.g., Fiers & Kotwicki, 2013*; *Huys & Mu, 2021*; *Karaytuğ et al., 2021*), some of these records
617 might be part of a *Stenocaris minor* complex. *Monard (1935)* and *Kunz (1938)* reported the
618 characteristics of males of this species from European waters near the type locality. Despite
619 discrepancies in details of P2 (length ratio of segments and setal armature), they were considered
620 identical to *Stenocaris minor* due to their geographical proximity. Several authors have
621 documented the sympatric occurrence of *Stenocaris minor* from the Black Sea, but the
622 descriptions given by *Apostolov (1971)*, *Marinov (1971)*, and *Apostolov & Marinov (1988)*
623 deviate from *S. minor* s. str. in several respects. *Apostolov*'s *(1971)* specimens have only one
624 outer spine on P3–P4 EXP3, no inner seta on P4 EXP3, and female P5 is broad and has a distinct
625 notch on the distal margin, conceivably reminiscent of the legs of immature copepodid stages or
626 that of different species (see *Apostolov, 1971*: Figs. 29–31). Except for observable errors in male
627 P2 ENP2 without a distal element and the reduced setation of male P5, the Bulgarian specimens
628 of *Marinov (1971)* differ from the Scottish specimens described by *Scott (1900)* in the sexual
629 dimorphism of male P3 endopod (one-segmented in the Bulgarian specimens *vs*. two-segmented
630 in the Scottish specimens and other records), raising doubts about its actual identity. The caudal
631 rami of *S. minor* sensu Apostolov & Marinov, 1988 were illustrated as possessing composite
632 terminal seta V (with the setiform part distally), at least 1.5-fold as long as the caudal ramus (*vs*.
633 slightly longer). Despite these differences, limited information and inaccuracy have hampered
634 determination of the Black Sea specimens' taxonomic identities. Pending collection of
635 *Stenocaris* species from the Black Sea, *S. minor* sensu Apostolov, 1971, *S. minor* sensu Marinov,
636 1971, and *S. minor* sensu Apostolov & Marinov (1988) are here relegated to *species inquirenda*
637 of *Stenocaris*.
638   *Wilson (1932)* reported the first occurrence of *S. minor* in North America based on
639 females collected from freshwater in Naushon Island, Massachusetts. His insufficient description
640 and figures of the caudal ramus and female P5 hamper morphological comparison between
641 American specimens and the reports of *Scott (1900)* and *Sars (1911)*. Re-description of the
642 species is essential to rule its identity and would facilitate the discovery of a new species given
643 the wide geographical area. Therefore, the American population is also regarded as a *species*
644 *inquirenda* in the genus.
645
646 *Stenocaris figaroloensis* sp. nov.
647 urn:lsid:zoobank.org:act: AE4F4E54-05E9-4F05-8AD6-55E8CE752934
648
649 *Stenocaris minor* (T. Scott, 1892) *sensu* Cottarelli & Venanzetti (1989)
650
651 Original description.—Cottarelli & Venanzetti (1989—as *Stenocaris minor*): 202–204; Fig. 10.
652 Type locality.— Italy, Figarolo Island (the Tyrrhenian Sea); sandy sediments at a depth of 1 m.

653   Type material.—The female and male specimens illustrated *by Cottarelli & Venanzetti (1989)* in
654   his figure 10 are here fixed as the syntypes of *S. figaroloensis* sp. nov. in accordance with *ICZN*
655   *(1999)* Arts. 16.4, 72.3, and 72.5.6.
656   Etymology.—The species name is named after the type locality of the new species. It is in the
657   nominative singular, gender feminine.

658

659   Remarks.—*Cottarelli & Venanzetti (1989)* recorded both sexes of *Stenocaris* species under the
660   name *S. minor* from the Tyrrhenian Sea, the Mediterranean Sea (Italy), providing details of the
661   mandible, P2–P5, and male P6. Although their description contained some uncertain
662   characteristics, such as the absence of a setule-like element on P2 ENP1 and P4 ENP2, only one
663   outer spine on P4 EXP3, and male P3 endopod comprising only one segment, the Italian
664   population differs significantly from the re-descriptions of *S. minor* by *Scott (1900)* and *Sars*
665   *(1911)*: (1) The mandibular endopod has one lateral and three apical setae (*vs.* one lateral and
666   four apical setae). (2) Male P2 ENP1 lacks a long seta posteriorly (*vs.* present). (3) The relative
667   length and nature of elements on the female P5, *i.e.*, the stout seta *a* is remarkably uniserrate
668   medially and flagellate distally (this form is not known from other congeners), and setae *c*, *f*, and
669   *g* are markedly shorter than other elements. Based on these differences, we attribute *Cottarelli &*
670   *Venanzetti*'s *(1989)* specimens to a distinct species named *S. figaroloensis* sp. nov.

671

672   **On the polyphyletic status of *Stenocaris***
673   The monophyly of the genus *Stenocaris* has been questioned in many previous works (*e.g.*
674   *Apostolov, 1982*; *Huys & Conroy-Dalton, 1993*; *Kunz, 1994*; *Moura & Pottek, 1998*; *Kornev &*
675   *Chertoprud, 2008*). This taxonomic confusion might have been resulted from the long-accepted
676   simple criteria used to distinguish cylindropsyllid genera, such as segmentation of the thoracic
677   legs and the degree of development of the maxilliped. However, recent researches have clarified
678   the characteristics of the body and caudal rami, the nature of the mouth appendages, the sexually
679   dimorphic structures of P2–P3, and the setation pattern of the swimming legs as well as P5 in
680   both sexes to (re-)define the general classification of the family Cylindropsyllidae (*Huys &*
681   *Conroy-Dalton, 1993*; *Moura & Pottek, 1998*; *Huys & Conroy-Dalton, 2006a, b*; *Kornev &*
682   *Chertoprud, 2008*; *Richter, 2019*). In addition, *Richter (2019)* recognized that any apomorphies
683   for the genus have not been defined. Following these approaches, a reevaluation of the
684   morphological features of the species of *Stenocaris* is needed to support the monophyly of the
685   genus.
686   *Arlt (1983)* originally described *Stenocaris baltica* based on only one male specimen
687   collected from a fine sandy substrate at 13-m depth in the Baltic Sea. Although he claimed that a
688   relationship of this species with *Stenocaris* was supported by the well-developed maxilliped
689   (being not reduced as in *Cylindropsyllus*) and the six-segmented antennule, his illustrations of
690   the antenna and swimming legs (*Arlt, 1983*: Fig. 14) raised doubts about the true generic identity
691   of *S. baltica* since it could be attributed to *Vermicaris*. The following characteristics of this
692   species appear to be strongly related to the latter genus: the total body length (440 μm in the

693   male) is distinctly smaller than other *Stenocaris* species (about 1000 μm); the antennary exopod
694   is extremely reduced and expressed as a small seta (*vs*. one-segmented, with two apical setae in
695   *Stenocaris*), P1 ENP2 has only two apical setae (*vs*. three setae in *Stenocaris*), male P2 ENP2 is a
696   semicircular process lacking a distal element (*vs*. oblong, bearing one distal seta in *Stenocaris*),
697   and male P3 ENP2 is one-segmented (*vs.* two-segmented in *Stenocaris*). The P5 in both sexes of
698   Cylindropsyllidae is a single plate, but *Arlt (1983)* questionably mentioned that the exopod is
699   separated from the baseoendopod. Note that *Arlt*'s *(1983*: Fig. 14*)* illustration of P5 bearing a
700   single apical seta is probably reminiscent of male P6, and he stated that the baseoendopod was
701   damaged during preparation. This is undoubtedly based on an observational error. Given these
702   morphological features, this species should be reinstated in *Vermicaris* as *V. baltica* (Arlt, 1983)
703   comb. nov.
704   *Noodt (1955)* described *Stenocaris pygmaea* from the Bay of Biscay in the Atlantic
705   Ocean based on one female specimen (body length 370 μm), stating its close affinity with both *S.*
706   *minuta* (= *V. minuta*) and *S. pontica* (= *V. pontica*). Based on the morphology of the Bulgarian
707   species identified as *S. pontica*, Marinov (1971) presumed this species to be identical to *S.*
708   *pontica* described from the Romanian coast of the Black Sea, and subsequent authors (*e.g.*
709   *Apostolov, 1972*; *Apostolov & Marinov, 1988*) considered it as a junior synonym of the latter.
710   However, *S. pygmaea* was reinstated as a valid species by *Huys & Conroy-Dalton (1993)*, who
711   pointed out a significant difference in segmentation of the P2 endopod between the two species,
712   supporting the removal of its synonym with *S. pontica*. Although this unusual condition of *S.*
713   *pygmaea* deviates from the generic boundary of *Vermicaris*, this species can be allocated to the
714   latter as *V. pygmaea* (Noodt, 1955) comb. nov. rather than being placed in *Stenocaris*. This is
715   substantiated in the one-segmented female P3 endopod, semicircular apically, and lacking any
716   elements, and in that female P5, which is smaller than those of other genera, with reduced
717   armature with 2–3 setae. We suggest that these two characters could be potential autapomorphies
718   for *Vermicaris*.
719   Within the family, the morphology of caudal rami in *S. arenicola* and *S. kliei* displays a
720   reduced ramal length and a dorsal spinous process. Members of the family, except for
721   *Monsmeteoris* Richter, 2019, have elongated caudal rami that are at least twice as long as broad.
722   In the *Navalonia* clade comprising the genera *Bolbotelos*, *Boreovermis*, *Willemsia*, and
723   *Navalonia*, it is modified into bulbous appendages (*Huys & Conroy-Dalton, 1993*). However, in
724   *S. arenicola* and *S. kliei*, these rami are strongly reduced: they are as long as broad and have a
725   convex inner margin. *Huys & Conroy-Dalton (1993)* proposed phylogenetic relationships among
726   *Boreopontia heipi* Willems, 1981, *S. arenicola*, and *S. kliei* based on the presence of a dorsal
727   spinous process on the caudal rami; they also re-examined Wilson's collection of *S. arenicola*,
728   for which *Wilson (1932)* gave only a brief drawing of the habitus. Although four *Stenocaropsis*
729   species have a process similar to the above three species, there are also fundamental differences
730   (*Huys & Conroy-Dalton, 1993*: 293). *Huys & Conroy-Dalton (1993)* suggested that this recurved
731   process is derived from a dorsal integumental extension, which can be interpreted as convergent
732   evolution in *B. heipi* and the *S. arenicola*/*S. kliei* group based on the significant differences in the

733   sexual dimorphism of P2 and P5. Indeed, several fundamental discrepancies between them can
734   be readily noticed. In male P2–P3, the exopodal segments are strongly modified in the *S.*
735   *arenicola*/*S. kliei* group as in other genera (see the remarks on *Huysicaris* gen. nov.), whereas *B.*
736   *heipi* does not exhibit such sexual dimorphism. Male P5 of *B. heipi* is characterized by the
737   modification of seta *a* or *b* into a spine bearing a crenate tip and a distal setule, of seta *c* or *d* into
738   a stout spine bearing a distal setule in females, and of seta *b* or *c* (second innermost) into a stout
739   spine in males (see *Huys & Conroy-Dalton, 2006b*: Figs. 36–37). In the insufficient original
740   illustration of *S. arenicola* by *Wilson (1932)*, male P5 exhibits seven setae, which is the
741   maximum number of setae and is known only in *Evansula* T. Scott, 1906, and seta *a* (innermost)
742   is modified into a stout spine. A similar modification in male P5 was present in the original
743   description of *S. kliei*, although seta *a* is fused to the segment basally (see *Kunz, 1938*: Abb. 12,
744   Fig. 8). Indeed, two different types of modified spines are present in the same genus, *i.e.*, it is
745   defined in the female of *S. minor* s. str. and *S. figaroloensis* sp. nov. *vs.* fused in *S. gracilis*, *S.*
746   *intermedia*, and *S. marcida* sp. nov. The homologous position of the spine in *S. arenicola* and *S.*
747   *kliei* could support *Huys & Conroy-Dalton*'s *(1993)* review and their isolated taxonomic position
748   within *Stenocaris*. Both species can be distinguished from *Stenocaris* in the extreme elongation
749   of the penultimate somite as in *Boreopontia* and the *Navalonia* clade; the lack of caudal seta I;
750   the second antennulary segment being not elongated in both sexes; P1 ENP2 with only two
751   (sub)distal setae; and both males P5 separate (*vs.* medially confluent in *Stenocaris*; see below).
752   Considering these characteristics and the generic discriminant, we propose a new genus
753   *Huysicaris* gen. nov. to accommodate *H. arenicola* (Wilson, 1932) comb. nov. and *H. kliei*
754   (Kunz, 1938) comb. nov. to move toward the monophyly of *Stenocaris*.
755
756   Genus *Huysicaris* gen. nov.
757   urn:lsid:zoobank.org:act:18ADF050-EF12-4198-86EA-1DE3C2BA1C83
758
759   Type species.—*Huysicaris kliei* (Kunz, 1938) comb. nov. [by original designation]
760   Other species.—*H. arenicola* (Wilson, 1932) comb. nov.
761   Diagnosis.—Cylindropsyllidae. Body vermiform, without separation between prosome and
762   urosome; penultimate somite extremely elongated; anal operculum wide. Rostrum triangular,
763   defined at base. Caudal rami as long as broad or slightly longer, with a recurved spinous process
764   on dorsal margin; inner margin bulbous; with six setae, seta I lost. Antennule elongate, 7-
765   segmented in ♀, with aesthetasc on segments 4 and 7; haplocer and 8(?)-segmented in ♂.
766   Antenna with allobasis; exopod small, 1-segmented, with 2 distal setae. Mandible, maxillule, and
767   maxilla unknown. Maxillipedal syncoxa with 1 subdistal seta; endopod represented by claw, with
768   or without an accompanying small seta. P1 exopod 3-segmented; EXP2 and EXP3 lacking inner
769   element. P1 endopod 2-segmented; ENP1 with 1 inner seta, ENP2 with 2 distal setae. P2 basis
770   with hook-like process anteriorly. P2–P4 exopods 3-segmented; P4 exopod extremely elongated,
771   P4 EXP3 shortest; P2–P3 exopods strongly modified (stout and bending inwardly) in ♂; inner
772   distal seta on P2 EXP3 modified into a claw in ♂. P2–P3 endopods 1-segmented and P4 endopod

773 2-segmented; P3 ENP1 with long and stout apophysis in ♂. Setal armature formula of P1–P4 as
774 in Table 2.
775   P5 forming single plate, with 1 spinose process and 6(?) setae in ♀; in ♂ with very long
776 basal seta and 5–6 setae, of which the innermost seta modified into stout spine (fused to plate
777 basally in *H. kliei* comb. nov.).
778 P6 ♀ unknown; in ♂, represented by opercula, each bearing 1 short and 2 long setae.
779
780 Etymology.—The generic name is dedicated to Dr. Rony Huys (National History Museum,
781 London), in recognition of his numerous contributions to harpacticoid diversity and taxonomy
782 including the family Cylindropsyllidae. It is formed by Dr. Rony Huys' family name and the
783 third declension of the Greek feminine noun cāridis, cāris, sea-crab, or shrimp. It is in the
784 nominative singular, gender feminine.
785 Notes.—Due to incomplete original descriptions of *H. arenicola* comb. nov. and *H. kliei* comb.
786 nov., some characters of the generic diagnosis remain undefined.
787
788 Remarks.—*Huys & Conroy-Dalton (1993)* pointed out the different sexual dimorphism in P2
789 and P3 of *H. arenicola* comb. nov. and *H. kliei* comb. nov. Incomplete descriptions and vague
790 illustrations by *Wilson (1932)* and *Kunz (1938)* hamper detection of (aut)apomorphies for this
791 new genus and determination of its taxonomic position. However, in accordance with *Kunz*'s
792 *(1938)* figures, male P3 of *H. kliei* comb. nov. displays two uncommon characteristics: (1) EXP3
793 is recurved subdistally and inwardly, and has only one distal and two outer elements; and (2) the
794 endopod is probably three-segmented, with a stout recurved apophysis on ENP2 reaching the
795 distal end of EXP3. The former is regarded here as an autapomorphy for *Huysicaris* gen. nov.
796 because it is not expressed in any cylindropsyllid genera; unfortunately, *Wilson (1932)* did not
797 provide information on male P3 of *H. arenicola* comb. nov. In the family, the three-segmented
798 condition of male P3 endopod is retained in *Evansula*, which occupies a basal position in the
799 family (*cf. Huys & Conroy-Dalton, 2006b*). Although *Huysicaris* gen. nov. might retain this
800 plesiomorphic condition, the presence of an unusual spinous process on male P2 basis in the both
801 species (see *Wilson, 1932*: Plate 17f; *Kunz, 1938*: Abb. 12, Fig. 6) strongly indicates the new
802 genus has a close relationship with all other cylindropsyllid genera (except for *Evansula*)
803 representing this significant characteristic as a synapomorphy.
804   Another taxonomic problem with *Stenocaris* is that autapomorphies have not been
805 defined. Removal of four species—*H. arenicola* comb. nov., *H. kliei* comb. nov., *V. baltica*
806 comb. nov., *V. pygmaea* comb. nov.—from *Stenocaris* might justify its generic concept and
807 determine its autapomorphies within the Cylindropsyllidae. The sexual dimorphic features of
808 male P2 and P3 are the primary characters used to reconstruct the phylogenetic relationships
809 among cylindropsyllid genera, *i.e.*, the presence of a minute or recurved apophysis on P2 basis, a
810 modified distal spine on P2 EXP3, fusion of P2 EXP2 and EXP3, and a recurved or minute
811 apophysis on male P3 endopod (*Moura & Pottek, 1998*; *Huys & Conroy-Dalton, 2006b*). Based
812 on the latter feature and the one-segmented endopods in female P2–P3, *Moura & Pottek (1998)*

813   presumed that *Stenocaris* is nested in the *Navalonia* clade. However, *Huys & Conroy-Dalton*
814   *(2006a)* demonstrated that the *Navalonia* clade can be characterized by allometric growth of
815   male P3 endopod. Within the genus, males of *S. gracilis*, *S. intermedia*, and *S. marcida* sp. nov.
816   lack an apophysis on male P3 ENP1, although it is present in both *S. minor* s. str. and *S.*
817   *figaroloensis* sp. nov. Despite this discrepancy, the fifth legs of five *Stenocaris* species (*S.*
818   *gracilis*, *S. intermedia*, *S. marcida* sp. nov., *S. minor* s. str. and *S. figaroloensis* sp. nov.) are
819   fused medially (*vs.* separated in all other genera; *cf. Huys & Conroy-Dalton*, *2006b*: Fig. 37), and
820   it is regarded as the most distinct autapomorphy for *Stenocaris*.
821

Conclusions

823   We describe a new marine harpacticoid, *Stenocaris marcida* sp. nov., from the subtidal
824   sediments off Dok-do Island in the East Sea of South Korea, and report on the occurrence of *S.*
825   *intermedia* Itô, 1972 based on specimens collected from subtidal sediments of Ulleung-do Island
826   in South Korean waters and from the coast of Primorsky in Russian waters. Our detailed
827   morphological comparison of all *Stenocaris* species and their taxonomic records provides insight
828   into the generic concept and confirms that the nature of the fifth leg, caudal rami, and sexual
829   dimorphic features of the second and third legs can be used to define the generic boundary of
830   *Stenocairs*. The monophyly of the genus is supported by a significant synapomorphy, the
831   confluent condition of the fifth legs in males, and the genus is comprised of *S. gracilis* Sars,
832   1909, *S. minor* (T. Scott, 1892), *S. intermedia*, *S. figaroloensis* sp. nov., and *S. marcida* sp. nov.
833   Based on this taxonomic review, other *Stenocaris* species were transferred to the genus
834   *Vermicaris* Kornev & Chertoprud, 2008 or to the new genus *Huysicaris* gen. nov. as *V. baltica*
835   (Arlt, 1983) comb. nov., *V. pygmaea* (Noodt, 1955) comb. nov., *H. arenicola* (Wilson, 1932)
836   comb. nov., and *H. kliei* (Kunz, 1938) comb. nov. Further studies on the *S. minor* species
837   complex will enhance understanding of the diversity of cryptic species and the phylogenic
838   relationships among cylindropsyllid harpacticoids.
839

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979

980 **Figure legends**

981

982 **Figure 1. Map of the sampling stations of *Stenocaris marcida* sp. nov. (filled triangle, ▲)**
983 **and *S. intermedia* Itô, 1972 (filled circle, ●).**

984 **Figure 2. *Stenocaris marcida* sp. nov., female, holotype MABIK CR00252790 (A–C) and**
985 **paratype MABIK CR00252792 (D). (**A) Habitus, dorsal; (B) Habitus, lateral; (C)
986 Urosome, ventral; (D) Caudal ramus, lateral. Scale bars are given in μm.

987 **Figure 3. *Stenocaris marcida* sp. nov., female, holotype MABIK CR00252790 (A, B).** (A)
988 Rostrum and antennule; (B) P1. Scale bars are given in μm.

989 **Figure 4. *Stenocaris marcida* sp. nov., female, holotype MABIK CR00252790 (A–F) and**
990 **paratype MABIK CR00252792 (G).** (A) Antenna; (B) Mandible; (C) Maxillule; (D)
991 Maxilla; (E) Maxilliped; (F) P5; (G) Genital field. Arrowhead indicates a delicate setal
992 element. Scale bars are given in μm.

993 **Figure 5. *Stenocaris marcida* sp. nov., female, holotype MABIK CR00252790 (A–C), male,**
994 **allotype MABIK CR00252791 (D).** (A) P2; (B) P3; (C) P4; (D) P5. Scale bars are given in
995 μm.

996 **Figure 6. *Stenocaris marcida* sp. nov., male, allotype MABIK CR00252791.** (A) Habitus,
997 dorsal; (B) Antennule. Scale bars are given in μm.

998 **Figure 7. *Stenocaris marcida* sp. nov., male, allotype MABIK CR00252791.** (A) Urosome,
999 ventral; (B) P2; (C) P3. Scale bars are given in μm.

1000 **Figure 8. *Stenocaris intermedia* Itô, 1972, female, (A, B) and male (C) from Korean waters.**
1001 (A) Habitus, dorsal; (B) Urosome, ventral; (C) Habitus, dorsal. Scale bars are given in μm.

1002 **Figure 9. *Stenocaris intermedia* Itô, 1972, female (A, B) and male (C) from Korean waters.**
1003 (A) Antennule; (B) Antenna; (C) Antennule. Arrowhead indicates a delicate setal element.
1004 Scale bars are given in μm.

1005 **Figure 10. *Stenocaris intermedia* Itô, 1972, female from Korean waters.** (A) Mandible; (B)
1006 Mandibular ganathobase; (C) Maxillule; (D) Maxilla; (E) Maxilliped; (F) P5; (G) Genital
1007 field, ventral; (H) Genital field, lateral. Scale bars are given in μm.

1008 **Figure 11. *Stenocaris intermedia* Itô, 1972, females from Korean (A–D) and Russian (E)**
1009 **waters.** (A) P2; (B) P3; (C) P4; (D) P5; (E) P5. Arrowheads indicate delicate and setule-like
1010 elements. Scale bars are given in μm.

1011 **Figure 12. *Stenocaris intermedia* Itô, 1972, male from Korean waters.** (A) Urosome, ventral;
1012 (B) Caudal ramus, lateral; (C) P2; (D) P3; (E) P5; (F) P6. Scale bars are given in μm.

Figure 1

Map of the sampling stations of *Stenocaris marcida* sp. nov. (filled triangle, ▲) and *S. intermedia* Itô, 1972 (filled circle, ●).

Figure 2

Stenocaris marcida sp. nov., female, holotype (A–C) and paratype 1 (D).

(A) Habitus, dorsal; (B) Habitus, lateral; (C) Urosome, ventral; (D) Caudal ramus, lateral. Scale bars are given in μm.

A

C

B

D

100

A, B

100

100

VII

VI

II

IV

V

III

I

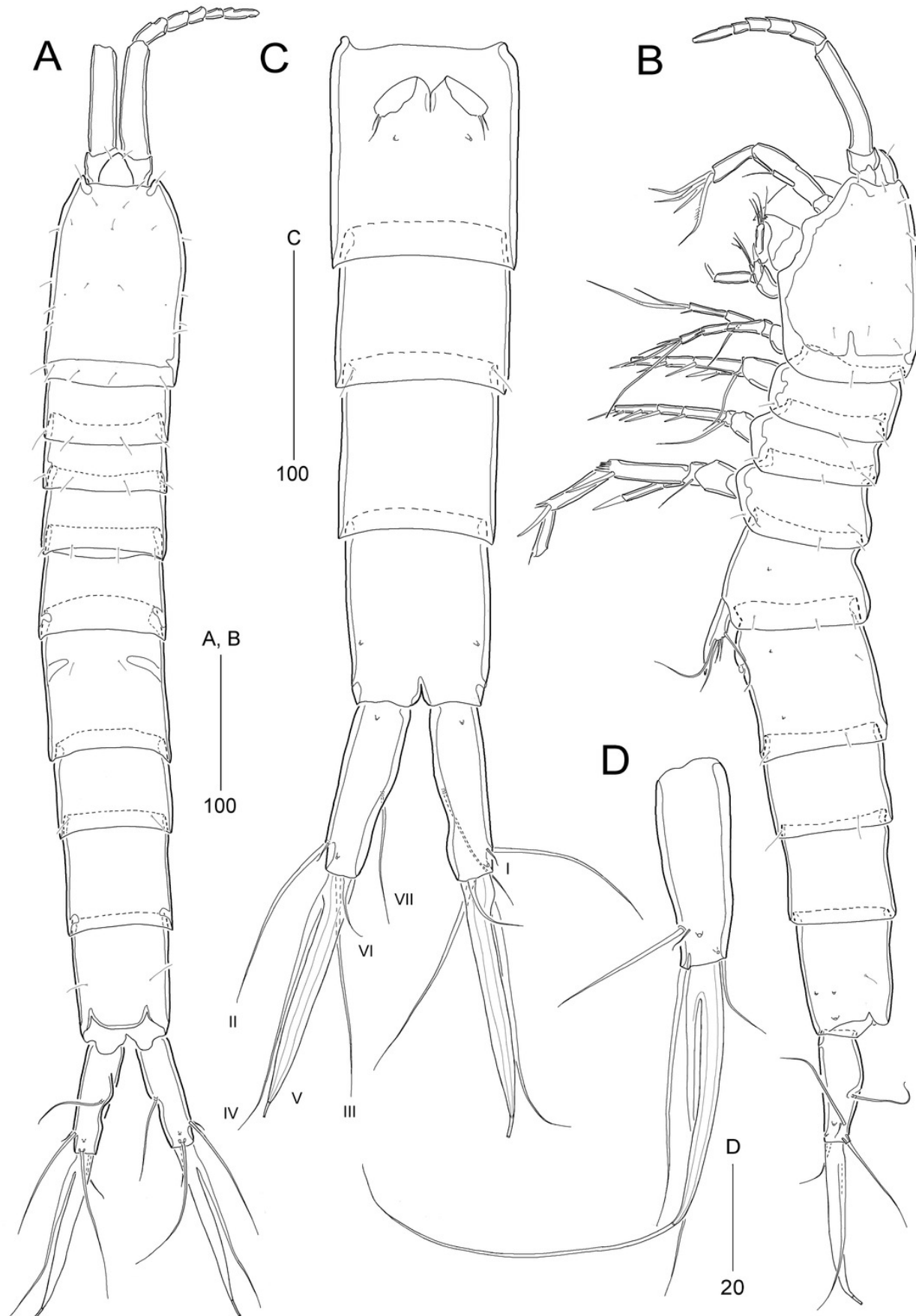



Figure 3

Stenocaris marcida sp. nov., female, holotype (A, B).

(A) Rostrum and antennule; (B) P1. Scale bars are given in μm.

A

B

A

B

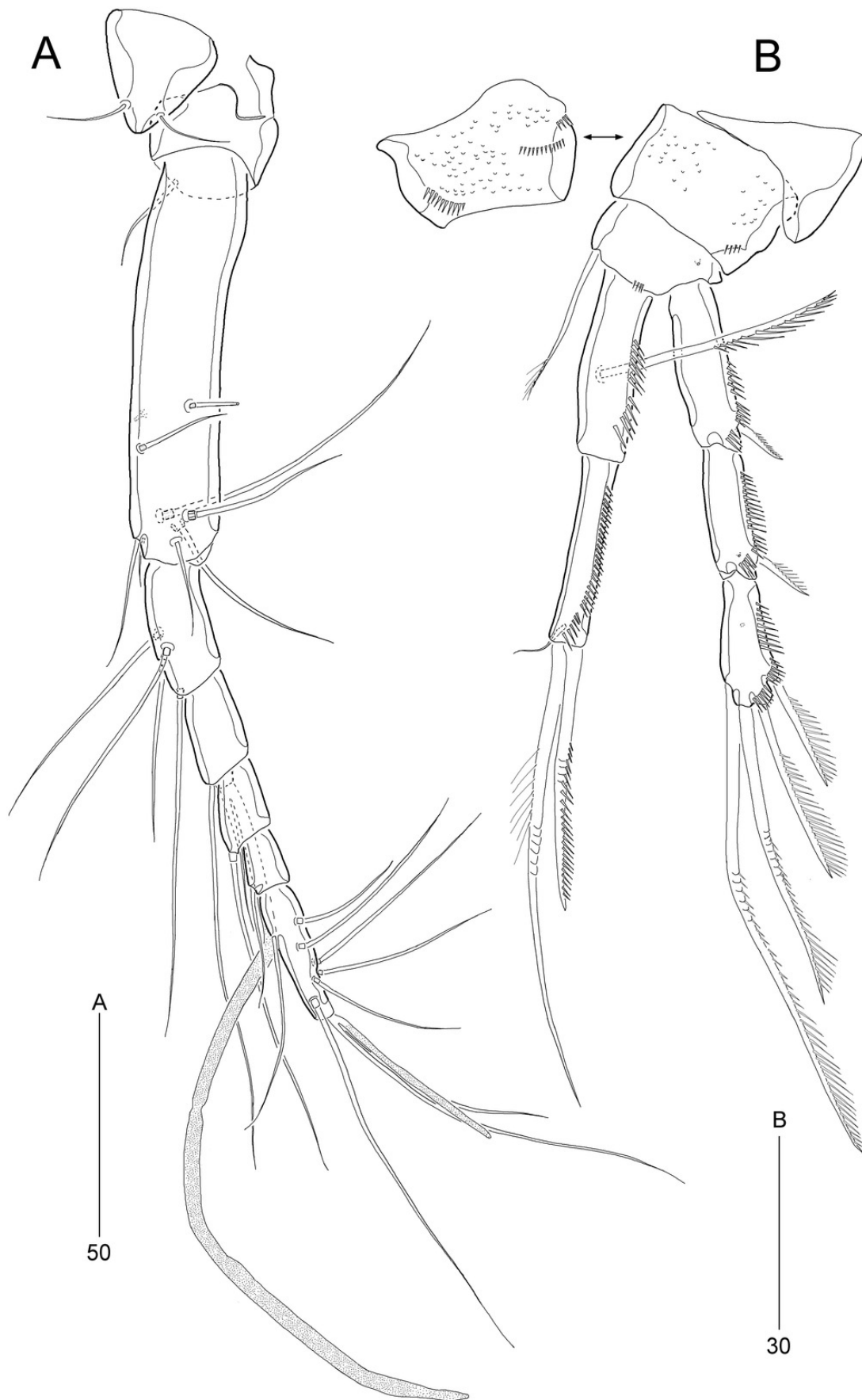



Figure 4

Stenocaris marcida sp. nov., female, holotype (A–F) and paratype 1 (G).

(A) Antenna; (B) Mandible; (C) Maxillule; (D) Maxilla; (E) Maxilliped; (F) P5; (G) Genital field. Scale bars are given in μm.

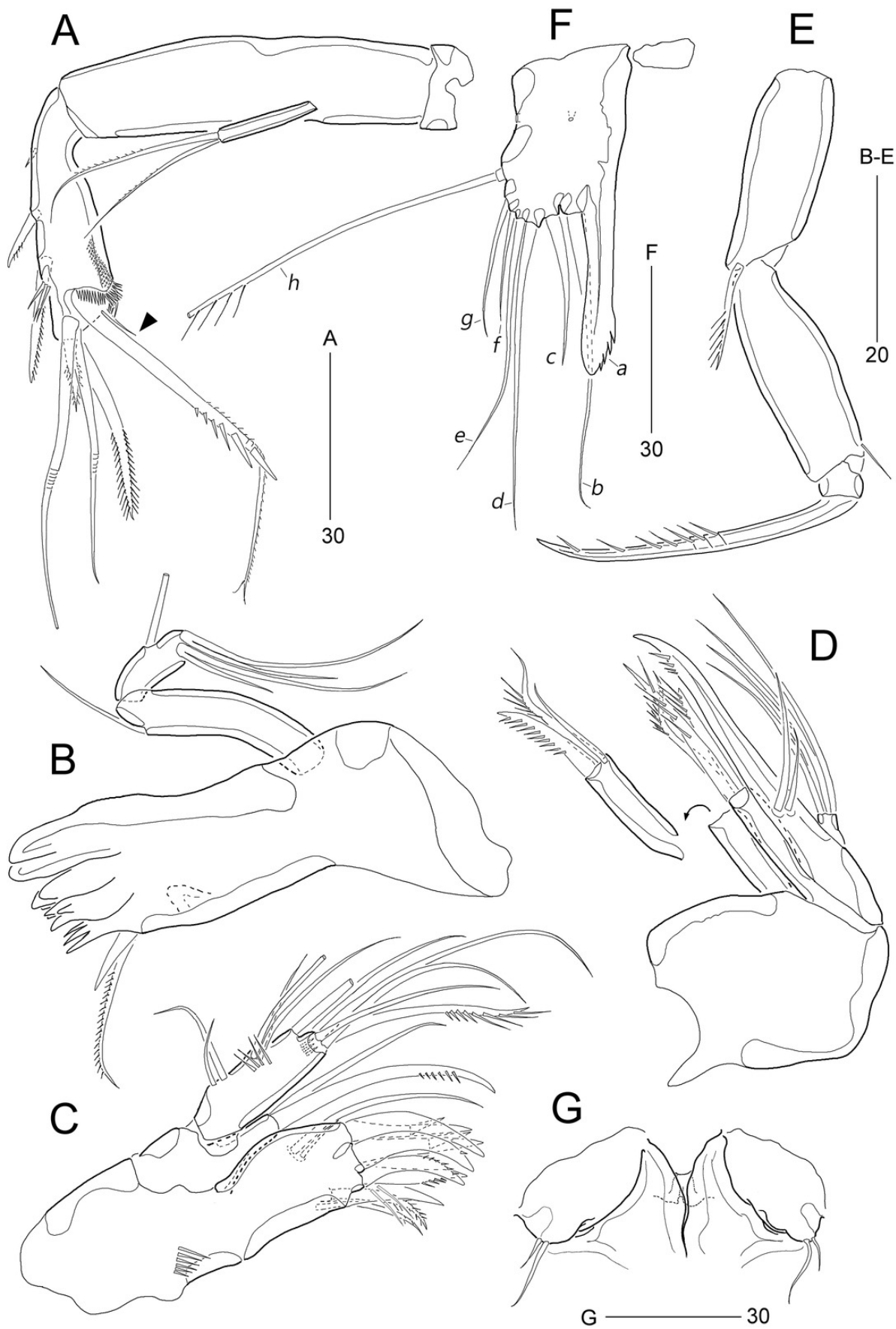



Figure 5

Stenocaris marcida sp. nov., female, holotype (A–C), male, allotype (D).

(A) P2; (B) P3; (C) P4; (D) P5. Scale bars are given in μm.

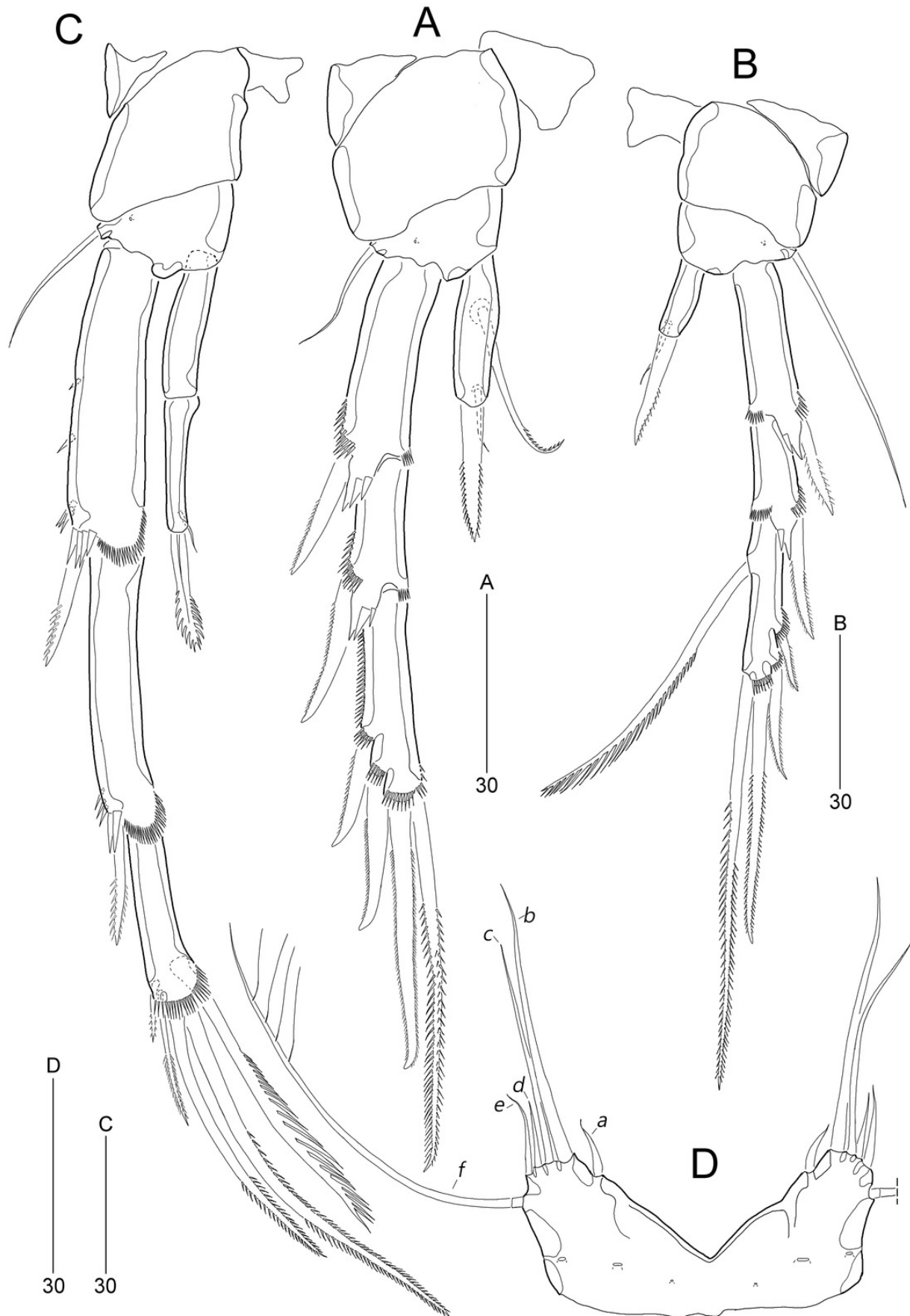



Figure 6

Stenocaris marcida sp. nov., male, allotype.

(A) Habitus, dorsal; (B) Antennule. Scale bars are given in μm.

B

A

A

100

B

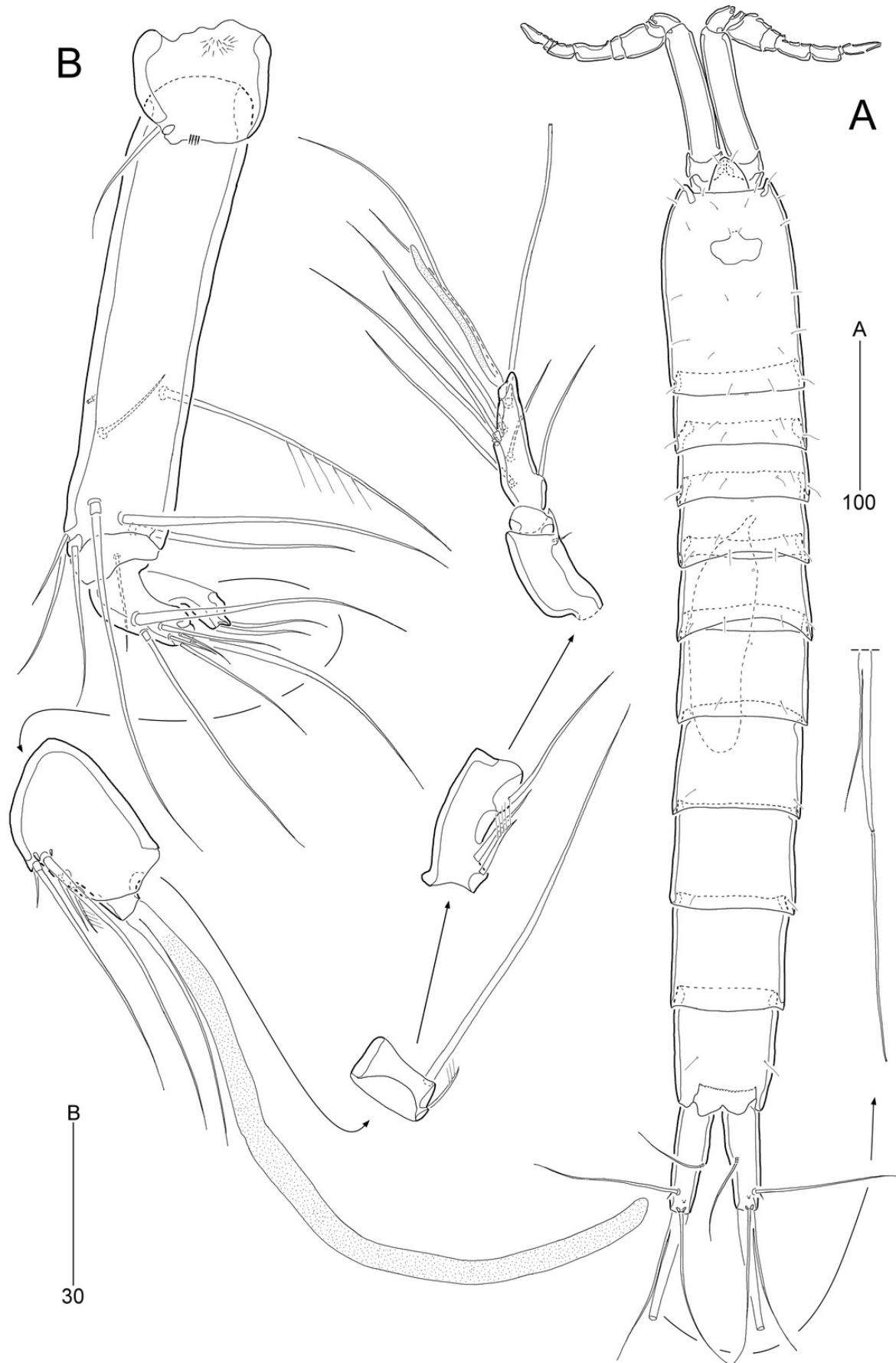



Figure 7

Stenocaris marcida sp. nov., male, allotype.

(A) Urosome, ventral; (B) P2; (C) P3. Scale bars are given in μm.

B

C

A

A
100

B, C

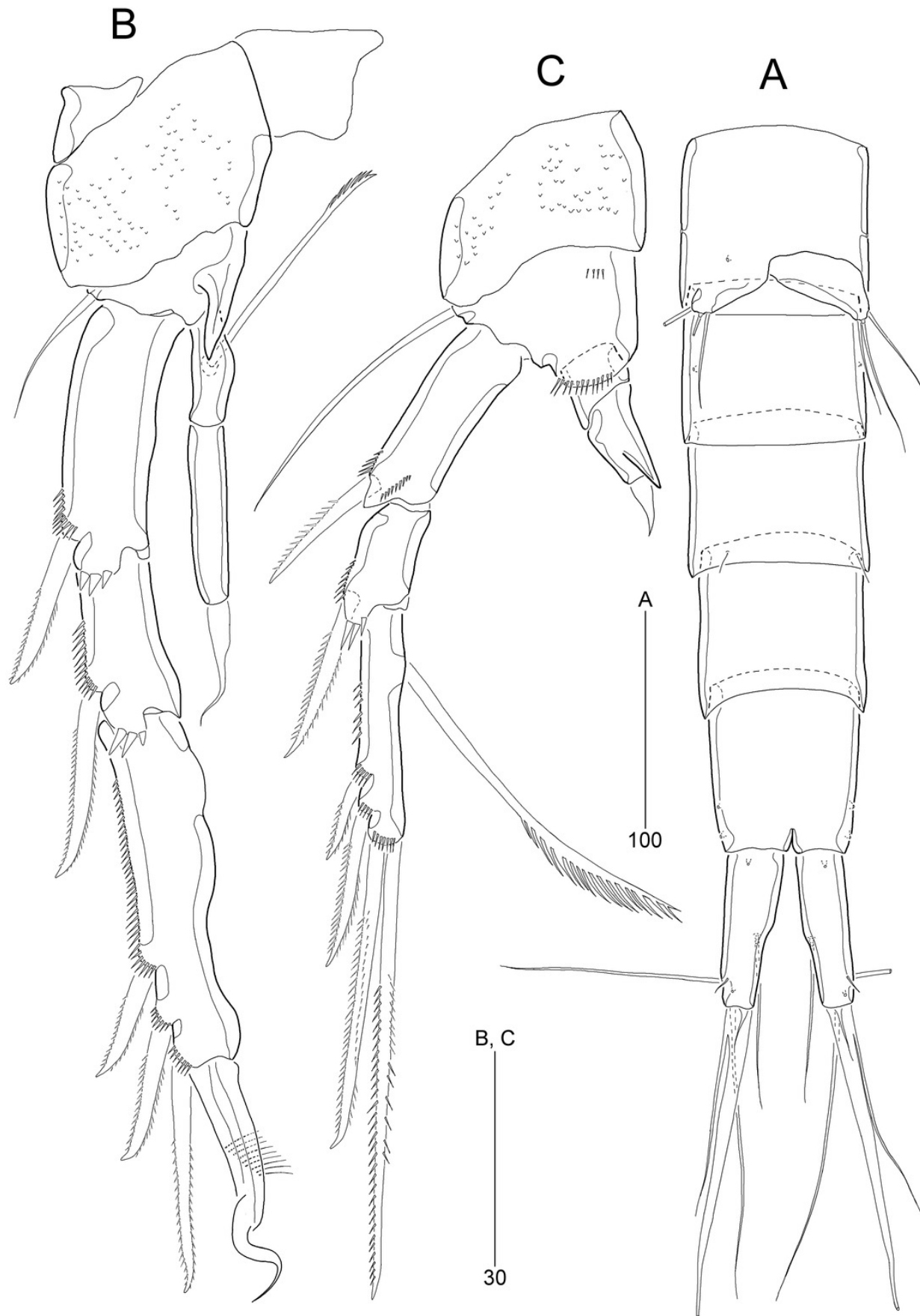



Figure 8

Stenocaris intermedia Itô, 1972, female (A, B) and male (C) from Korean waters.

(A) Habitus, dorsal; (B) Urosome, ventral; (C) Habitus, dorsal. Scale bars are given in μm.

A

C

B

B
100

A
100

C
100

I
II
VII
VI
IV
III
V

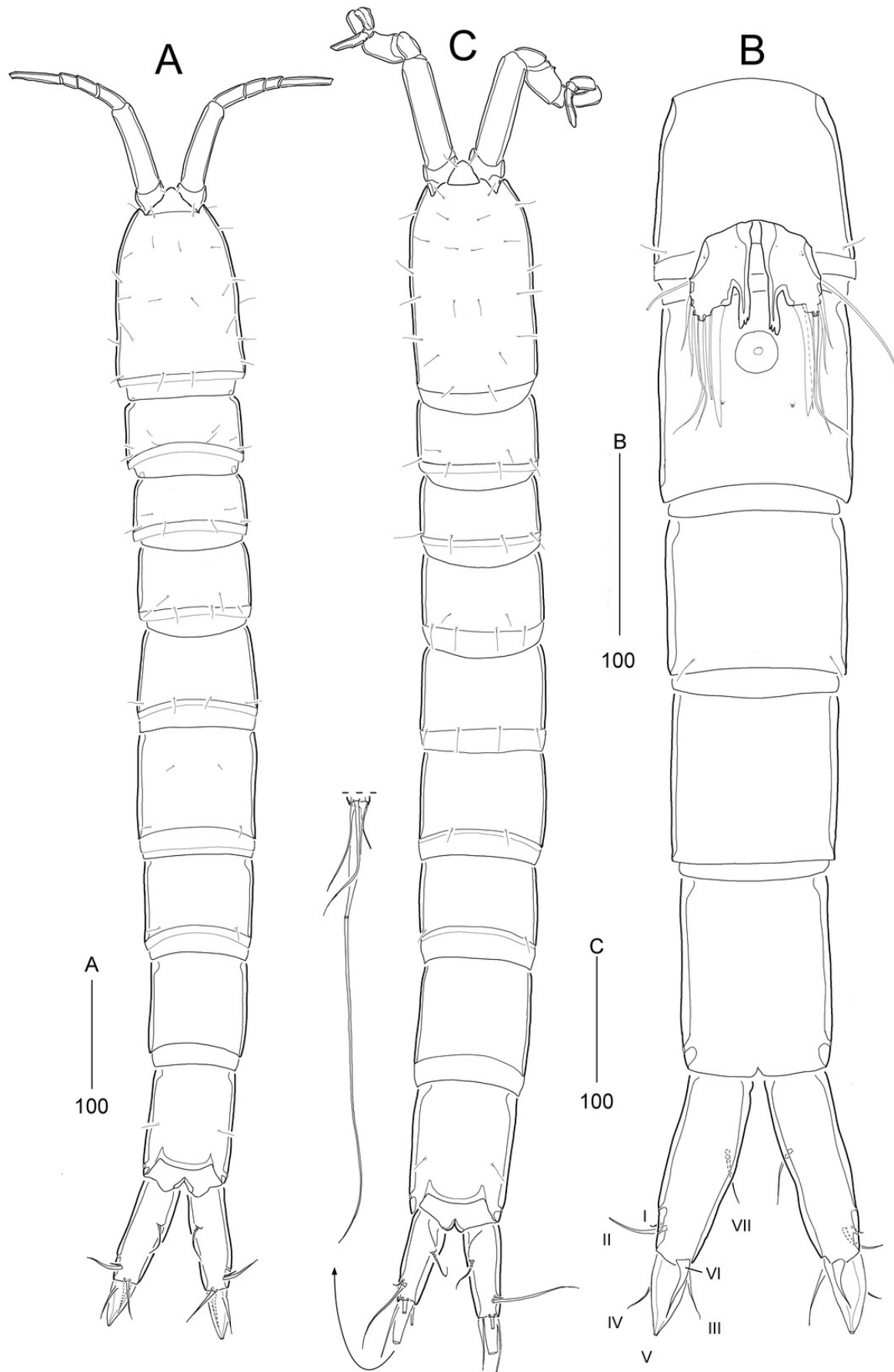



Figure 9

Stenocaris intermedia Itô, 1972, female (A, B) and male (C) from Korean waters.

(A) Antennule; (B) Antenna; (C) Antennule. Scale bars are given in μm.

A

C

B

| A | ——————— | 50 |
| B, C | ——————— | 50 |

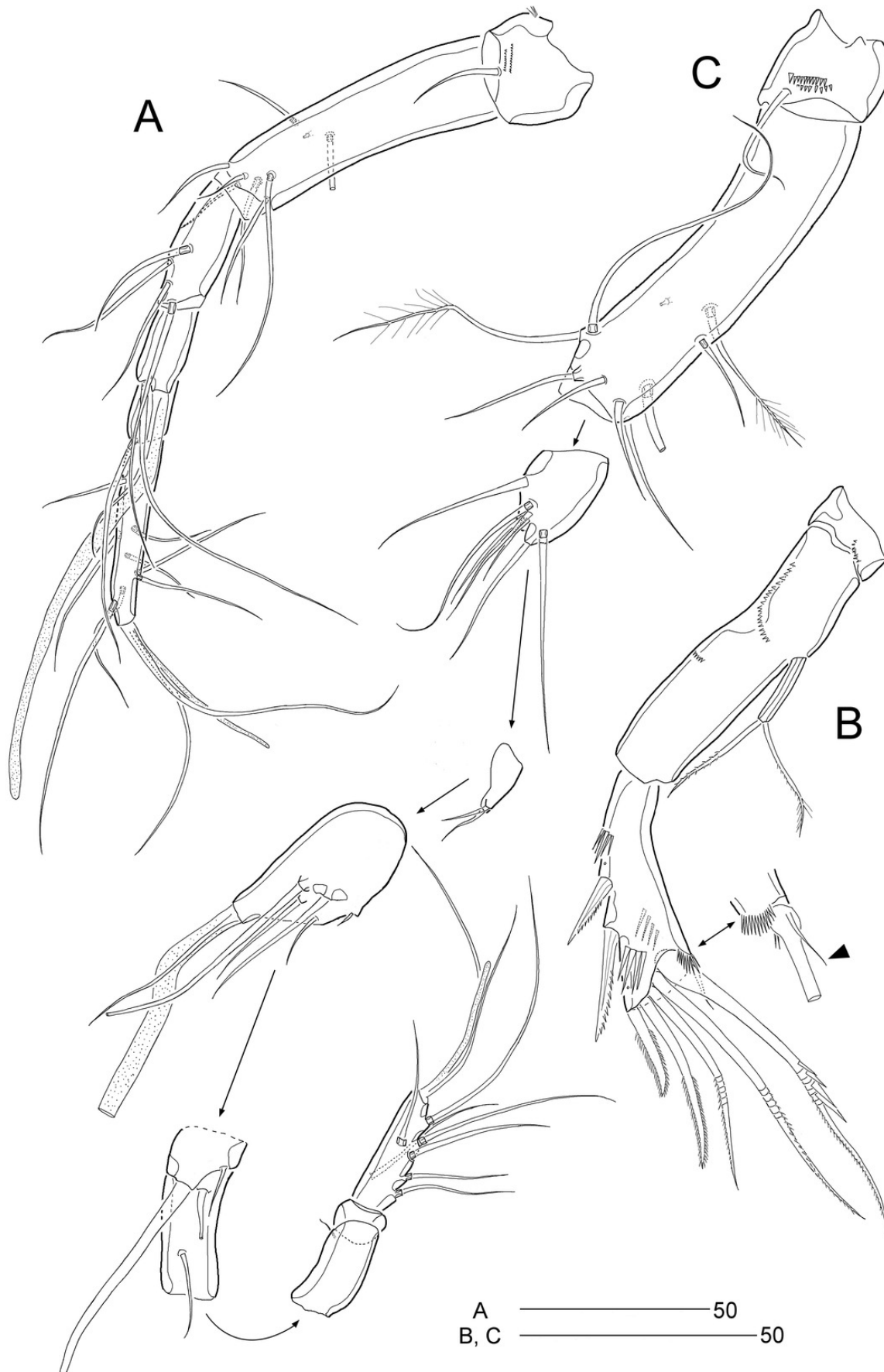



Figure 10

Stenocaris intermedia Itô, 1972, female from Korean waters.

(A) Mandible; (B) Mandibular ganathobase; (C) Maxillule; (D) Maxilla; (E) Maxilliped; (F) P5;

(G) Genital field, ventral; (H) Genital field, lateral. Scale bars are given in μm.

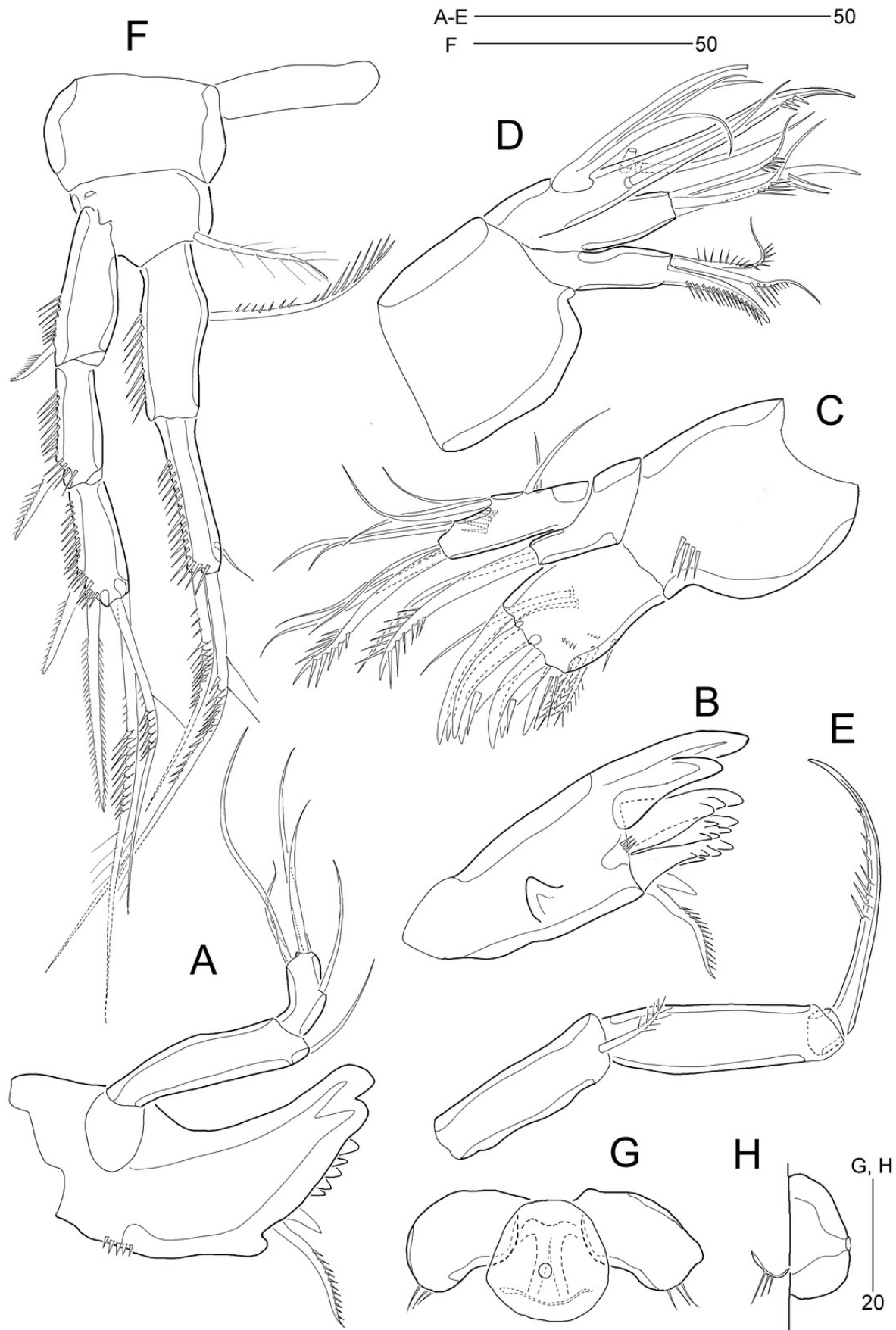



Figure 11

Stenocaris intermedia Itô, 1972, females from Korean (A–D) and Russian (E) waters.

(A) P2; (B) P3; (C) P4; (D) P5; (E) P5. Arrowheads indicate delicate and setule-like elements. Scale bars are given in μm.

C

B

A

A-D

d

e

c

b

f

g

a

h

D

E

E ——— 20

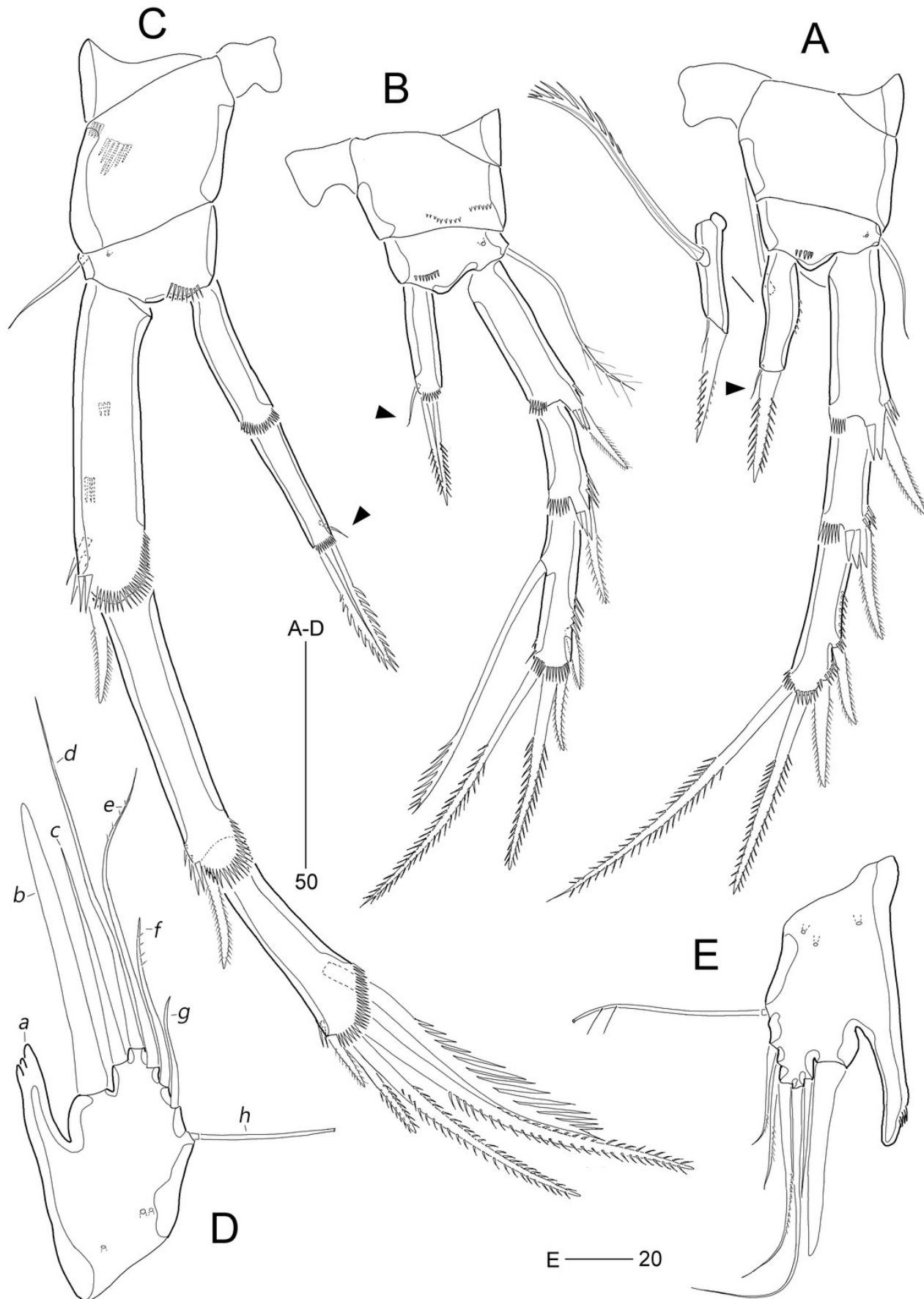



Figure 12

Stenocaris intermedia Itô, 1972, male from Korean waters.

(A) Urosome, ventral; (B) Caudal ramus, lateral; (C) P2; (D) P3; (E) P5; (F) P6. Scale bars are given in μm.

E

A

f

e — a
d —

c —
b

E, F —— 10

C

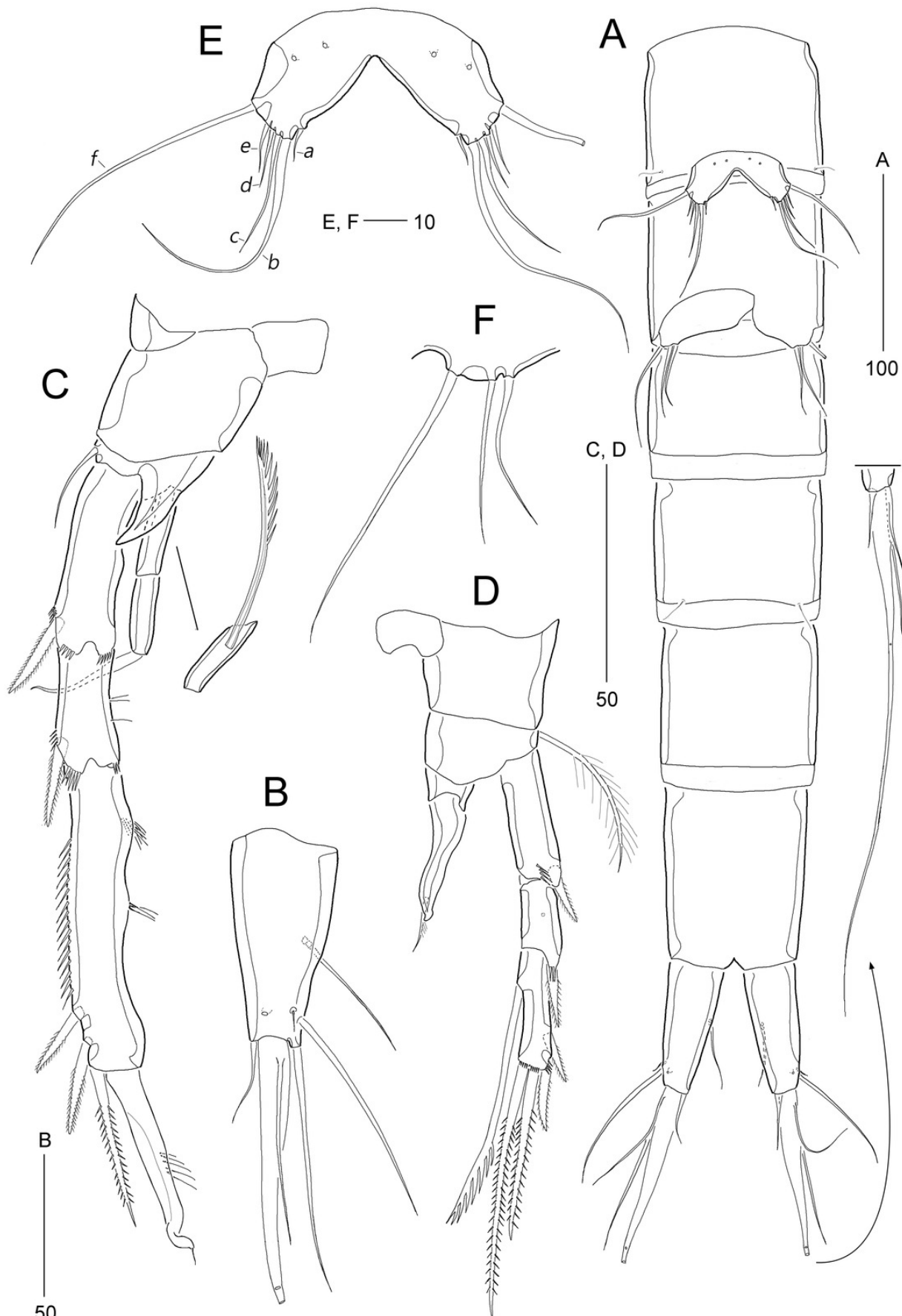
F

C, D

D

B

100

B

Armature formula of P1–P4 in the genus *Stenocaris* Sars, 1909

1   Table 1. Armature formula of P1–P4 in the genus *Stenocaris* Sars, 1909

	exopod	endopod
P1	0.0.112	1.120
P2	0.0.022 [0.0.022 in ♂]	11–20 [1.010 in ♂]
P3	0.0.122	01–20 [0.apo10 or apo.010 in ♂]
P4	0.0.121–2	0.0–110

Armature formula of P1–P4 in the genus *Huysicaris* gen. nov.

1   Table 2. Armature formula of P1–P4 in the genus *Huysicaris* gen. nov.

	exopod	endopod
P1	0.0.021–2	1.011
P2	0.0.022 [0.0.011–2 in ♂]	110 [01–20 in ♂]
P3	0.0.122 [0.0.012 in ♂]	0.010 [apo.?]
P4	0.0.0–121–2	0.0–110