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Two new species of *Tanaopsis* (Tanaidacea: Tanaopsidae) from Admiralty Bay (Antarctica), with an identification key

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ABSTRACT - Two new species of family Tanaopsidae, genus *Tanaopsis*, from Admiralty Bay (Antarctica) are herein described. *Tanaopsis brevicorpus* sp. nov. displays antennule article 1 about 1.5 times as long as wide, carapace as long as first three pereonites, both rami of uropod biarticulate with fusion line, and pleotelson short, more than twice longer than wide. *Tanaopsis bamberi* sp. nov. resembles other Antarctic species *T. kerguelenensis* in its habitus, antennule long and uropod uniarticulate. However, the new species can be distinguished from it by a combination of characters that includes maxilliped basis with long seta arising from tubercles; inner margin of cheliped fixed finger with three smooth sub-terminal spines; uropod subequal to pleotelson in length, and uropodal endopod about twice as long as exopod.

Key words: Crustacea, Peracarida, Tanaidomorpha, Southern Ocean, King George Island.

Introduction

The monotypic family Tanaopsidae Błażewicz-Paszkowycz and Bamber, 2012 is characterized mainly by the pleon being laterally convex and wider than pereon, and the cheliped fixed finger having a bifid terminal spine. The systematics of the genus *Tanaopsis* Sars, 1899 is confused. The genus was first described in the family Tanaidae Dana, 1849, then transferred to Paratanaidae Lang, 1949 by Lang (1949) and later relocated to Leptognathiidae Sieg, 1976 by Sieg (1976). The Paratanaoidea phylogeny performed by Larsen and Wilson (2002), and then revised by Bird and Larsen (2009), placed *Tanaopsis* as genus *incertae sedis* mainly due to the cheliped fixed finger with bifid terminal spine and coxa of pereopod-1 with a developed spur, which do not allow its inclusion in other family (Błażewicz-Paszkowycz and Bamber, 2012). Currently the genus includes 14 described species (Anderson, 2013) and it is distributed through shallow waters to bathyal and even abyssal depths, usually in muddy-sand or mud (Bird and Bamber, 2000).

Błażewicz-Paszkowycz and Bamber (2012) pointed if *Tanaopsis* itself is monophyletic, stating that appears to be two groups of species: one with a pointed mandibular molar process and biarticulate uropod rami [*Tanaopsis antarctica* Lang, 1967; *T. cadieni* Sieg and Dojiri, 1991; *T. canaipa* Bamber, 2008; *T. curtus* Kudinova-Pasternak, 1984; *T. gallardoi* (Shiino, 1970); *T. oios* Błażewicz-Paszkowycz and Bamber, 2012 and *T. profunda* Lang, 1967] and the other without a mandibular molar process and with uniarticulate uropod rami (*T. boonwurrungi* Błażewicz-Paszkowycz and Bamber, 2012; *T. chotkarakde* Bird and Bamber, 2000; *T. kerguelenensis* Shiino, 1978 and *T. rawhitia* Bird, 2011). *Tanaopsis laticaudatus* (Sars, 1882) would fit in the first group as it has two segmented uropod rami, although it is described as being without a mandibular molar (Sars, 1899; Błażewicz-Paszkowycz and Bamber, 2012).

This work is based on Antarctic species of *Tanaopsis* and, herein, we describe two new species (*T. bamberi* sp. nov. and *T. brevicorpus* sp. nov.) and, additionally, an identification key to all species of the genus, based on female characters is given.

Material and Methods

Specimens were collected from about 50-500 m depth in Admiralty Bay (South Shetland Islands, Antarctic), during the austral summer of 2005 and 2010 (Tab. 1). The sediment was collected using a box corer, washed in a mesh size of 0.5 mm, fixed in 4% borax buffered formalin and subsequently preserved in 70% alcohol.

Table 1. Study area and their sites and geographic coordinates containing *Tanaopsis bamberi* sp. nov. and *Tanaopsis brevicorpus* sp. nov. BP: Botany Point.

Depth (m)	Site	Replicate samples	Sampling date	Latitude (S)	Longitude (W)
55.7	BP #1	R1	29/Jan/05	62°05'44.3"	58°20'57.6"
58.2	BP #1	R2	03/Feb/05	62°05'44.1"	58°20'58.1"
58.6	BP #2	R1	09/Feb/05	62°05'47.6"	58°20'31.0"
58.6	BP #2	R2	05/Dec/04	62°05'47.3"	58°20'31.4"
64.3	BP	R3	26/Jan/04	62°05'42.1"	58°20'44.5"
120	#1	–	07/Dec/09	62°05'54.0"	58°25'46.9"
125	#2	–	07/Dec/09	62°06'20.5"	58°26'46.6"
117	#3	–	10/Dec/09	62°05'39.6"	58°21'13.8"
500.8	#1	–	02/Dec/09	62°09'52.4"	58°23'43.5"
400	#3	–	02/Dec/09	62°11'24.8"	58°19'43.0"

Dissections were made in glycerin using chemically-sharpened tungsten wire needles. Body length was measured from the tip of the cephalothorax to the apex of the pleotelson. Terminology follows Larsen (2003). Three specimens from each new species collected in Admiralty Bay were dissected and habitus and appendage drawings were made from one dissected specimen from each one, excepted the labium of *T. brevicorpus* sp. nov., which was recovered from another specimen dissected.

The type materials and the other specimens are deposited at the collection in the National Museum, Universidade Federal do Rio de Janeiro, Brazil (MNRJ).

Results and Discussion

Family Tanaopsidae Błażewicz-Paszkowycz and Bamber, 2012

Genus *Tanaopsis* Sars, 1899

Tanaopsis bamberi sp. nov.
(Figs. 1-2)

Material examined. Holotype. One adult non-ovigerous female, length 4.6 mm (MNRJ 25509); station Botany Point 1 R1; 62°05'44.3"S 58°20'57.6"W; 55.7 m; 29 January 2005. Paratype. One adult non-ovigerous female, length 4.5 mm, dissected (MNRJ 23402); same locality as holotype. Two adult non-ovigerous females (MNRJ 23402); station Botany Point; same locality as holotype. One adult non-ovigerous female (MNRJ 24441); station #3, 62°05'39.6"S 58°21'13.8"W; 117 m, 10 December 2009. One adult non-ovigerous female, length 4.1 mm, dissected (MNRJ 24442); #3, 62°11'24.8"S 58°19'43.0"W; 400 m; 2 December 2009.

Diagnosis: Female. Antennule elongated, first and second articles 2.7 and 1.6 times as long as wide, respectively. Antenna with six articles, second and third articles with simple setae, seta on second article longer than on third article. Inner distal margin of cheliped fixed finger with three smooth spines. Uropodal exopod and endopod uniarticulate and endopod long with 2.5 times as long as exopod.

Etymology: The name is dedicated to the late Dr. Roger Bamber in recognition of his great contribution to tanaidacean knowledge.

Description: Female paratype, 4.5 mm (dissected).

Body (Fig. 1A) about six times as long as wide. Cephalothorax subtriangular, 1.1 times as wide as long, shorter than first three pereonites combined; with one lateral simple medial seta in each side; rostrum rounded. Pereonites. All pereonites wider than long, with slightly rounded corners. Pereonite 1 shortest, about 0.32 as long as carapace. Pereonite 3 longer than pereonites 2 and 6 and shorter than pereonite 5. Pereonite 4 longest. Pleonite 5 longest. Pleotelson longer than two last pleonites combined (about 35% length of pleon), with two pairs of simple and one pair of plumose terminal setae; apex pointed.

Antennule (Fig. 1B) about as long as cephalothorax. Article 1 narrow, about 2.75 times as long as wide, inner proximal margin with one simple seta, one distal inner simple seta and four plumose and one outer simple seta. Article 2 about

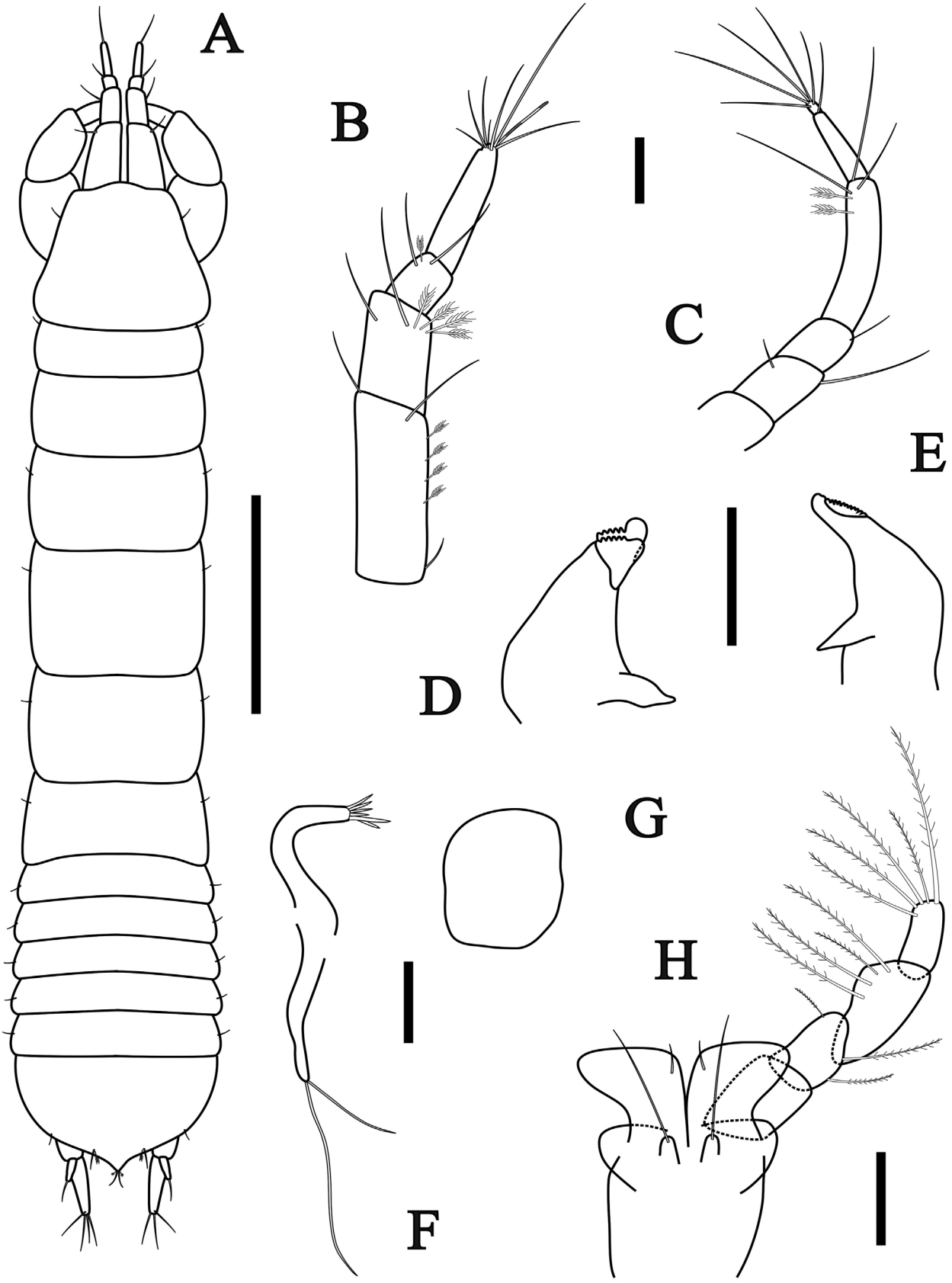

Figure 1. *Tanaopsis bamberi* sp. nov., female paratype, length 4.5 mm, MNRJ 23402. A, dorsal view; B, antennule; C, antenna; D, left mandible; E, right mandible; F, maxillule; G, maxilla; H, maxilliped. Scale bars: A = 1 mm; B-H = 0.1 mm.

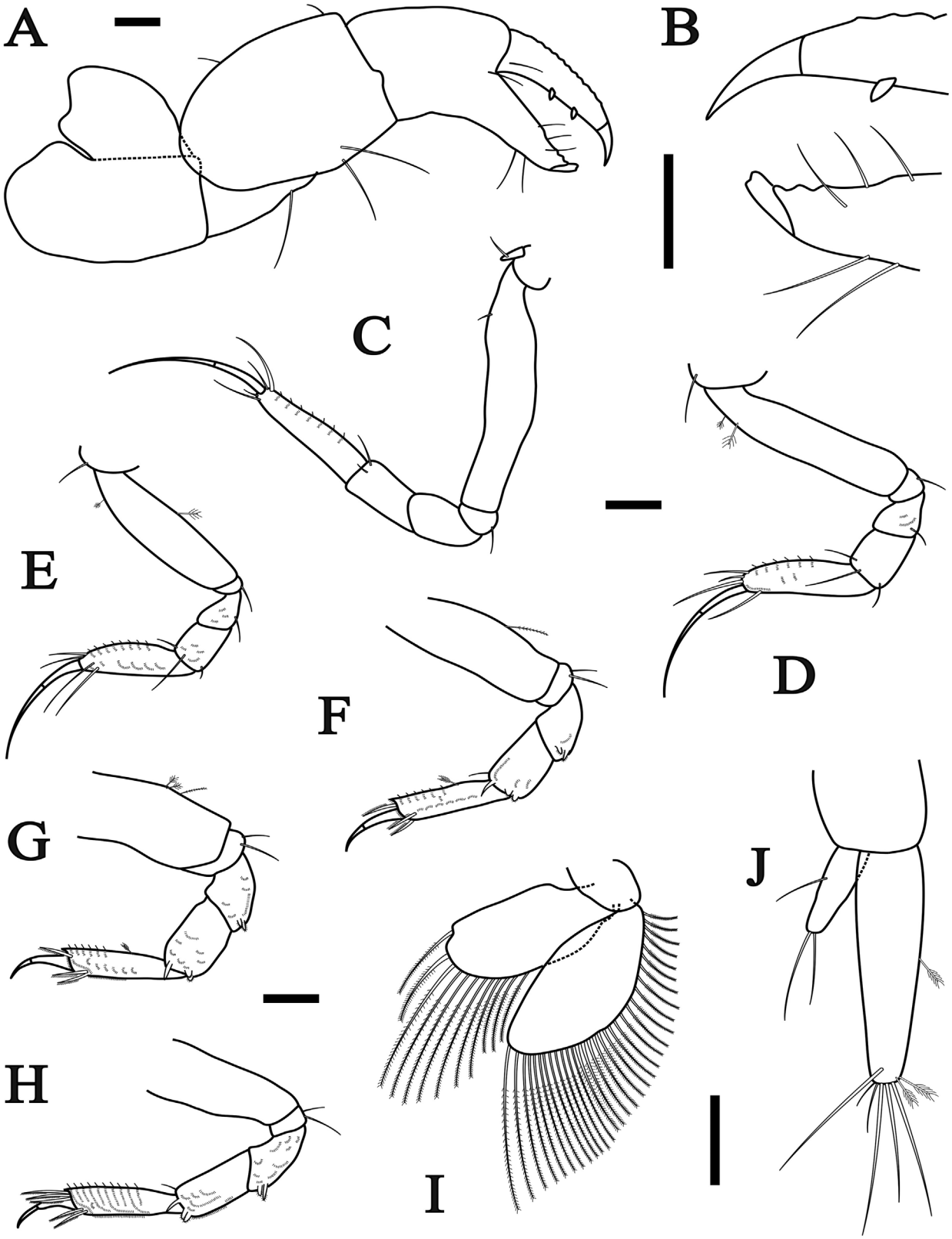

Figure 2. *Tanaopsis bamberi* sp. nov., female paratype, length 4.5 mm, MNRJ 23402. A, cheliped, with B, detail of cheliped fixed finger; C, pereopod 1; D, pereopod 2; E, pereopod 3; F, pereopod 4; G, pereopod 5; H, pereopod 6; I, pleopod; J, uropod. Scale bars = 0.1 mm.

1.6 times as long as wide, with four inner distal plumose and two simple setae. Article 3 shortest, as long as wide, with two outer distal simple and one plumose seta. Article 4 slender, about 3.8 times as long as wide, with one aesthetasc and seven simple terminal setae.

Antenna (Fig. 1C) about 0.9 times as long as antennule. Article 1 broader than following articles, naked. Article 2 longer than article 3, about 1.3 times as long as wide, with one inner distal simple seta and one outer distal long simple seta. Article 3 as long as wide, with one outer distal simple seta. Article 4 narrow and longest, about 4.5 times as long as wide and 1.3 times longer than the last two articles together, with two subdistal plumose setae and three distal simple setae. Article 5 about 3.5 times as long as wide, longer than article 2, with one distal simple seta. Article 6 minute, with six terminal setae.

Mouthparts. Labrum not recovered. Mandibles (Fig. 1D, E) molar with distal margin crenulated and molar thin and tapering. Left mandible (Fig. 1D) incisor with rounded and inflated tip; *lacinia mobilis* well-developed, crenulated. Right mandible (Fig. 1E) incisor not bifurcated. Labium not recovered. Maxillule (Fig. 1F) endite bent at right-angle, with six simple apical setae, one significantly more robust than the others; palp with two distal long setae. Maxilla (Fig. 1G) rectangular. Maxilliped (Fig. 1H). Basis fused, with two long simple setae arising from tubercles on distal margin; endite not fused, each with one short simple seta distally; palp article 1 naked; article 2 with two inner and one outer plumose setae; article 3 trapezoidal, with four inner plumose setae; article 4 slender than the others, with five plumose terminal setae. Epignath not recovered.

Cheliped (Fig. 2A, B). Basis about 1.7 times as long as wide, shorter than carpus, attached to cephalothorax via large sclerite. Merus triangular, with one long simple seta ventrally. Carpus about 1.3 times as long as wide, no carpal shield, with two long simple ventral setae and two minute setae dorsally. Propodus about 1.8 times as long as wide, with one simple seta near dactylus insertion. Fixed finger having delicate bifid terminal spine, with three inner and two outer simple setae and inner margin with three smooth sub-terminal spines. Dactylus slightly longer than fixed finger, with weak crenulations on dorsal margin and with two spines ventrally.

Pereopod 1 (Fig. 2C). Coxa with prominent spur with simple seta. Basis long (about 5.6 times as long as wide), with one minute seta dorsally. Ischium with one ventral simple seta. Merus apparently naked, 1.1 times as long as wide. Carpus slightly longer than merus, with two simple setae distally. Propodus as long as merus and carpus combined, with four simple terminal setae and dorsal microtrichia. Dactylus more than half as long as unguis, combined longer than propodus.

Pereopod 2 (Fig. 2D). As pereopod 1 except coxa without prominent spur. Basis 4.75 times as long as wide, with two minute plumose setae dorsally. Merus as long as wide, with one distal simple seta. Carpus with three setae distally. Propodus shorter than merus and carpus combined, with row of microtrichia along outer margin.

Pereopod 3 (Fig. 2E). As pereopod 2 except basis 3.75 times as long as wide, with one ventral and one plumose seta dorsally. Propodus with row of microtrichia along outer margin.

Pereopod 4 (Fig. 2F). Stouter than pereopods 1-3. Coxa absent. Basis about 2.7 times as long as wide, with one plumose seta ventrally. Ischium short, with two simple setae ventrally. Merus 1.3 times as long as wide, with two long feathery distal spines. Carpus longer than merus, with one pointed and two round feathery spines and one distal simple seta. Propodus shorter than merus and carpus combined, with one plumose seta dorsally, three serrated spiniform terminal setae and row of microtrichia along outer margin. Dactylus 1.2 times as long as unguis.

Pereopod 5 (Fig. 2G). As pereopod 4 except basis 1.9 times as long as wide, with three plumose setae ventrally. Carpus with one pointed and two round feathery spines distally. Dactylus 1.5 times as long as unguis.

Pereopod 6 (Fig. 2H). As pereopod 4 except basis 2.3 times as long as wide, naked. Merus 1.5 times as long as wide. Propodus tipped by five serrated spiniform setae.

Pleopods (Fig. 2I). Well-developed. All pleopods similar in structure, with unequal rami. Basal article short, as long as wide. Endopod subrectangular with all setae distal, with one outer and eleven plumose inner setae. Exopod subovate with 32 plumose setae on entire outer margin; no gaps between the most proximal and the other setae.

Uropod (Fig. 2J). Shorter than pleotelson. Basal article shorter than exopod, naked. Exopod uniarticulate, 0.4 times length of endopod, with one long simple seta medially and two apically. Endopod uniarticulate, with one medial plumose seta and two plumose and six simple terminal setae.

Remarks: The main differences between the species of *Tanaopsis* are shown in Tab. 2. *Tanaopsis bamberi* sp. nov. resembles *T. boonwurrungi* and *T. canaipa* recorded from Australia and *T. kerguelenensis* from Antarctica, particularly in these species having antennule long (article 1 more than twice as long as wide), pleotelson long and uropod endopod more than 2.5 times longer than exopod. However, *T. bamberi* sp. nov. has more stout body (4.9 times); maxilliped basis with seta longer than endite and arising from tubercles; maxilliped endite with seta short and subdistal and inner margin of cheliped fixed finger with three smooth sub-terminal spines.

Also, *T. bamberi* sp. nov. is distinct from *T. antarctica*, *T. chotkarakde*, *T. graciloides* (Lilljeborg, 1864), *T. oios*, *T. profunda*, *T. rawhitia* and *T. rugaris* Błażewicz-Paszkowycz *et al.,* 2013 by the antennule article 2 rectangular and longest (about 2.7 times as long as wide) and the uropod endopod without segmentation or fusion line. The new species distinguish from *T. cadieni*, *T. gallardoi* and *T. laticaudatus* by the maxilliped endite having a short subdistal seta instead of being absent and the uropod endopod and exopod uniarticulate instead of biarticulate.

Moreover, *T. curtus* has carapace 1.1 times as long as the first three pereonites (*T. bamberi* has carapace 0.7 times as long as pereonites 1-3) and has maxilliped basis seta absent. Finally, *T. bamberi* sp. nov. is immediately distinguished from all of these taxa, except *T. boonwurrungi* and *T. kerguelenensis*, by its antennule article 1 and article 2 longest (about 2.75 and 1.6 times as long as wide, respectively) and both rami of uropod uniarticulate, without a fusion line.

Bathymetric distribution: 55.7-400 m.

***Tanaopsis brevicorpus* sp. nov.**
(Figs. 3-6)

Material examined. Holotype. One adult non-ovigerous female, length 3.1 mm (MNRJ 25508); station #2, 62°6'20.5"S 58°26'46.6"W; 125 m; 7 December 2009. Paratype. One male, length 3.2 mm (MNRJ 25192); station Botany Point R3, 62°05'42.1"S 58°20'44.5"W; 64.3 m; 26 January 2004. Three adults non-ovigerous female (MNRJ 23401); length 2.8 mm (dissected); length 3.1 mm; length 3.9 mm (only mouthparts dissected); station #2, 62°6'20.5"S 58°26'46.6"W; 125 m; 7 December 2009. Ten adult non-ovigerous females and five manca (MNRJ 23401); same locality. One adult non-ovigerous female (MNRJ 23397); station Botany Point 1 R1, 62°05'44.3"S 58°20'57.6"W; 55.7 m; 29 January 2005. One adult non-ovigerous female (MNRJ 23398); station Botany Point 1 R2, 62°05'44.1"S 58°20'58.1"W; 58.2 m; 3 February 2005. Seven adult non-ovigerous female (MNRJ 23399); station Botany Point 2 R1, 62°05'47.6"S 58°20'31.0"W; 58.6 m; 9 February 2005. Eight adult non-ovigerous female (MNRJ 23403); station Botany Point 2 R2; 62°05'47.3"S 58°20'31.4"W; 58.6 m; 5 December 2004. Eleven adult non-ovigerous females and two mancas (MNRJ 23400); station #1, 62°05'54.0"S 58°25'46,9"W; 120 m; 7 December 2009. One juvenile (MNRJ 24440); station #1, 62°09'52.4"S 58°23'43.5°W; 500.8 m; 2 December 2009.

Diagnosis. Female. Antennule first article 1.4 times as long as wide. Antenna with six articles, second and third articles with long spiniform setae subequal in length. Carapace as long as first three pereonites combined. Inner margin of cheliped fixed finger with one large sub-terminal spine. Both rami of uropod biarticulate (with fusion line) and endopod 2.1 times as long as exopod.

Etymology. Named after the body stout of the new species, with the lowest proportion length/width among *Tanaopsis* species (4.1 times).

Description. Female paratype, 2.8 mm (dissected).

Body (Fig. 3A, B). Body about four times as long as wide. Cephalothorax triangular, 1.1 times as wide as long, as long as first three pereonites combined; with one lateral simple medial seta in each side; rostrum rounded; eyelobes absent. Pereonites. All pereonites with slightly rounded corners and with one seta in each lateral margin. Pereonite 1 shortest, about 0.25 as long as carapace. Pereonite 3 as long as pereonites 2 and

6. Pereonite 5 longer than pereonite 3. Pereonite 4 longest. Pleon longer than 30% of body length. All pleonites with one lateral simple seta each. Pleonite 6 longest. Pleotelson about two last pleonites combined (about 30% length of pleon), with four pairs of terminal simple setae. Apex pointed.

Antennule (Fig. 3C). About 0.9 times as long as cephalothorax. Article 1 longest but as short as the rest of antennule, about 1.45 times as long as wide, inner distal margin with six plumose and one long simple setae and one outer distal simple seta. Article 2 half length of article 1, about 1.1 times as long as wide, with three inner distal plumose and two simple setae and one outer distal simple seta. Article 3 shortest, as long as wide, with one outer distal plumose and two simple setae. Article 4 slender, about 3.2 times as long as wide, with one aesthetasc and eight simple terminal setae.

Antenna (Fig. 3D). About 0.9 times as long as antennule, with six articles. Article 1 broader than following articles, naked. Article 2 as long as article 3, about 1.3 times, with one outer distal long simple seta. Article 3 square, with one outer distal long simple seta. Article 4 longest, about 4.2 times as long as wide, and 1.3 times as long

Table 2. List of mainly diagnostic characters of all described species of *Tanaopsis* Sars, 1899 (based on female morphology). Abbreviations: A1 = antennule; art. = article; mnd. = mandibule; mxp. = maxilliped; pereon. = pereonite; prop. = length/width; endop. = endopod; exop. = exopod. * Form of spiniform process on inner margin of cheliped fixed finger; ? Information not shown in articles cited.

Species	*Tanaopsis bamberi* n. sp.	*T. brevicorpus* n. sp.	*T. antarctica* Lang, 1967	*T. boonwurrungi* Błażewicz-Paszkowycz and Bamber, 2012	*T. cadieni* Sieg and Dojiri, 1991	*T. canaipa* Bamber, 2008	*T. chotkarakde* Bird and Bamber, 2000	*T. curtus* Kudinova-Pasternak, 1984
Type locality	Admiralty Bay (Antarctica)	Admiralty Bay (Antarctica)	South Georgia Island (Antarctica)	Western Port (Australia)	Santa Catalina Island (California)	Moreton Bay (Australia)	Tai Tam Bay (Hong Kong)	Sea of Japan
Body prop.	4.9x	4.1x	?	8.7x	5.5x	8.75x	6.7x	4.5x
Prop. A1 to carapace	As long as	0.9x	?	0.85x	0.8x	0.6x	0.8x	?
Prop. of A1 1st art.	2.75x	1.45x	1.3x	2.1x	1.5x	2.0x	1.8x	2.1x
Prop. of A1 2nd art.	1.6x	1.1x	1.0x	1.0x	1.15x	1.2x	1.4x	1.0x
Mnd. molar	Pointed	Pointed	Pointed	Without molar	Pointed	Pointed	Without molar	Pointed
Mxp. basis seta	Longer than endite, arising from tubercles	Longer than endite	Longer than endite	Shorter than endite	Much longer than endite	Shorter than endite	Longer than endite	Absent
Mxp. endite seta	Short; subdistal	Short, arising from tubercles; subdistal	Short, on distal margin	Absent	Absent	Short, on distal margin	Short, on distal margin	?
Prop. carapace/ pereon. 1-3	0.7x	As long as	?	0.5x	0.7x	0.75x	0.6x	1.15x
Pereon. 1-6 width/length.	3.5; 2.1; 1.85; 1.3; 1.56; 2.4x	4.6; 3.4; 2.9; 1.9; 2.13; 3.6x	?	2.3; 1.4; 1.0; 0.8; 0.9; 1.2x	3.8; 2.6; 1.6; 1.3; 1.3; 1.6x	2.2; 1.5; 1.5; 0.9; 0.9; 1.2x	3.2; 1.3; 1.5; 1.2; 1.5; 1.5x	5.4; 3.3; 2.4; 1.9; 1.8; 3.5x
Cheliped spine*	3 smooth spines	1 large spine	2 spines (1 large; 1 small)	2 spines	1 large spine	2 spines	2 spines	?
Pleotelson	1.7x	2.35x	2.0x	1.7x	1.4x	1.75x	1.9x	1.9x
Prop. uropod/ pleotelson	0.85x	0.8x	0.8x	0.7x	0.8x	0.6x	0.75x	?
Uropod endopod	Uniarticulate	Biarticulate (fusion line)	Biarticulate	Uniarticulate	Biarticulate (fusion line)	Biarticulate	Biarticulate (fusion line)	Biarticulate
Uropod exopod	Uniarticulate	Biarticulate (fusion line)	Biarticulate	Uniarticulate	Biarticulate	Biarticulate	Uniarticulate	Biarticulate
Uropod endop./exop.	2.55x	2.1x	2.1x	2.5x	1.8x	2.6x	2.3x	?

Table 2. (Cont.)

Species	*T. gallardoi* (Shiino, 1970)	*T. graciloides* (Lilljeborg, 1864)	*T. kerguelenensis* Shiino, 1978	*T. laticaudatus* (Sars, 1882)	*T. oios Błażewicz-Paszkowycz* and Bamber, 2012	*T. profunda* Lang, 1967	*T. rawhitia* Bird, 2011	*T. rugaris* Błażewicz-Paszkowycz *et al*.., 2013
Type locality	Chile Bay (Antarctica)	Fjord Gullmar (Sweden)	Kerguelen Islands (Antarctica)	Norway and Naples (Mediterranean)	Bass Strait (Australia)	Panama Basin	Armer's Bay (New Zealand)	Sea of Japan
Body prop.	5.2x	7.2x	5.7x	6.0x	?	?	7.5x	?
Prop. A1 to carapace	As long as	0.8x	As long as	0.9x	?	?	0.95x	0.9x
Prop. of A1 1st art.	1.8x	2.1x	2.6x	1.75x	1.9x	1.7x	1.5x	1.9x
Prop. of A1 2nd art.	1.1x	1.2x	1.9x	1.2x	1.25x	1.3x	1.1x	1.0x
Mnd. molar	Pointed	Without molar	Without mnd.	Without molar	Without mnd.	Pointed	Pointed	Without mnd.
Mxp. basis seta	Much longer than endite	Longer than endite	Absent	Longer than endite	Longer than endite	Much shorter than endite	Much longer than endite	?
Mxp. endite seta	Absent	Short, on distal margin	Short; subdistal	Absent	Short; subdistal	Short; subdistal	Short, on distal margin	?
Prop. carapace/ pereon. 1-3	0.6x	0.7x	0.8x	0.75x	?	?	0.6x	0.5x
Pereon. 1-6 prop.	2.9; 2.55; 1.9; 1.5; 1.5; 2.3x	2.8; 2.2; 1.3; 1.2; 1.1; 1.4x	3.1; 1.8; 2.1; 1.6; 1.9; 2.2x	3.6; 2.4; 1.5; 1.25; 1.2; 1.5x	?	?	3.2; 1.7; 1.5; 1.1; 1.0; 1.55x	?
Cheliped spine*	1 large spine	2 spines (1 large; 1 small)	2 spines	1 large spine	2 spines	2 spines (1 large; 1 small)	2 spines	2 spines
Pleotelson	2.1x	1.8x	1.45x	1.7x	?	2.3x	1.9x	?
Prop. uropod/ pleotelson	0.9x	0.6x	0.5x	0.7x	?	1.0x	0.9x	0.6x
Uropod endopod	Biarticulate	Biarticulate	Uniarticulate	Biarticulate	Biarticulate	Biarticulate	Biarticulate (fusion line)	Biarticulate (fusion line)
Uropod exopod	Biarticulate	Biarticulate	Uniarticulate	Biarticulate	Biarticulate	Biarticulate	Uniarticulate	Biarticulate
Uropod endop./exop.	2.1x	2.0x	3.5x	2.0x	1.9x	2.3x	1.85x	2.2x

as the last two articles, one medial and five distal plumose setae and three distal simple setae. Article 5 three times as long as wide, longer than article 3, with one single distal seta as long as fourth article. Article 6 minute, with six simple terminal setae.

Mouthparts. Labrum not recovered. Labium (Fig. 3E) with outer distal process, with few setules. Mandibles (Fig. 3F, G) with distal margins crenulated and molar thin and tapering. Left mandible (Fig. 3F) incisor with rounded and bloated tip; *lacinia mobilis* well-developed, with crenulations. Right mandible (Fig. 3G) incisor not bifurcated, weakly calcified. Maxillule (Fig. 4A, B) endite with several fine setules on lateral margins, six apical pinnate setae; palp with two distal simple setae. Maxilla (Fig. 4C) triangular, naked. Maxilliped (Fig. 4D) basis partly fused, with two long simple setae on distal margin; endite not fused, with two short simple setae arising from tubercles; palp article 1 naked; article 2 with two inner and one outer simple setae and two medial rows of minute setules; article 3 trapezoidal, with four inner simple setae and two distal rows of minute setules; article 4 slender than the others, with six simple terminal setae and four distal rows of minute setae. Epignath not recovered.

Cheliped (Fig. 4E, F). Basis about 1.6 times as long as wide, as long as carpus, attached to cephalothorax via large sclerite, with dorsodistal simple seta. Merus triangular, with one long simple seta ventrally. Carpus about 1.3 times as long as wide, no carpal shield, with two long simple ventral setae and two minute setae dorsally. Propodus two times as long as wide, with five simple setae and two groups of minute setae near dactylus insertion. Fixed finger having delicate bifid terminal spine, with three inner and two outer simple setae and inner margin with one

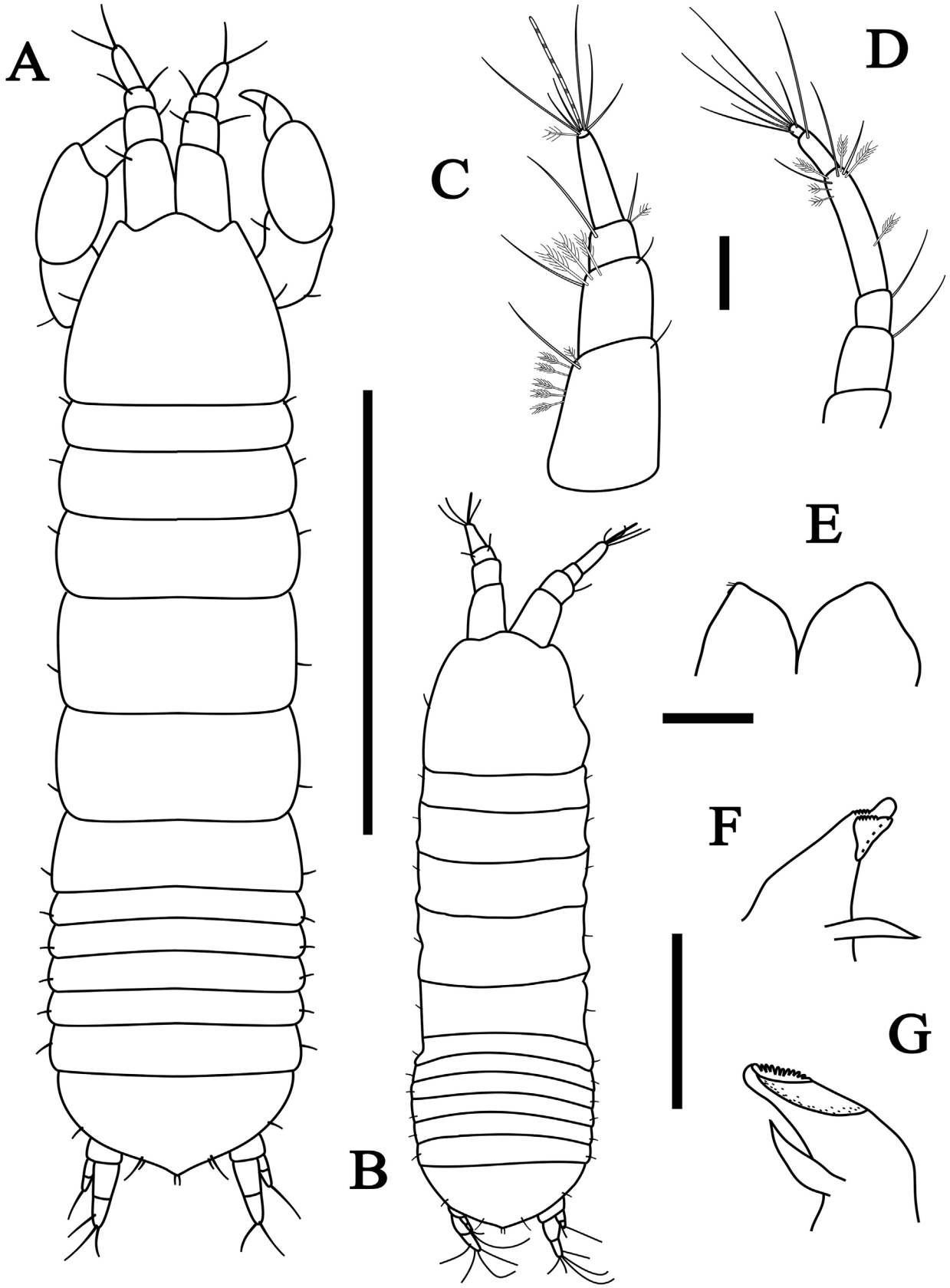

Figure 3. *Tanaopsis brevicorpus* sp. nov., female paratype, length 2.8 mm, MNRJ 23401. A, female dorsal view; B, manca dorsal view, length 1.3 mm; C, antennule, D, antenna, E, labium, F, left mandible, G, right mandible. Scale bars: A-B = 1 mm; C-G = 0.1 mm.

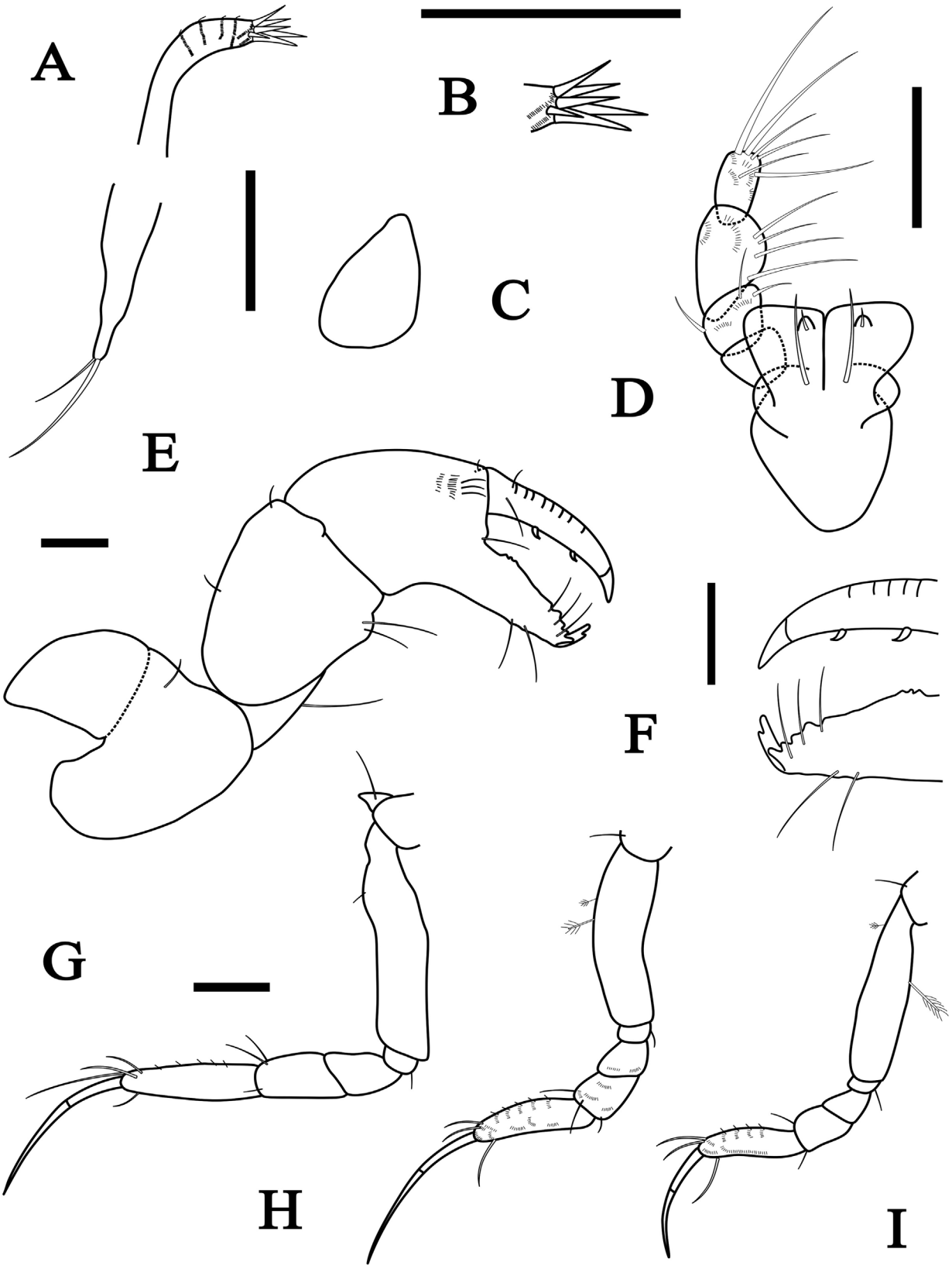

Figure 4. *Tanaopsis brevicorpus* sp. nov., female paratype, length 2.8 mm, MNRJ 23401. A, maxillule, with B, detail of maxillule; C, maxilla; D, maxilliped; E, cheliped, with, F, detail of cheliped fixed finger; G, pereopod 1; H, pereopod 2; I, pereopod 3. Scale bars = 0.1 mm.

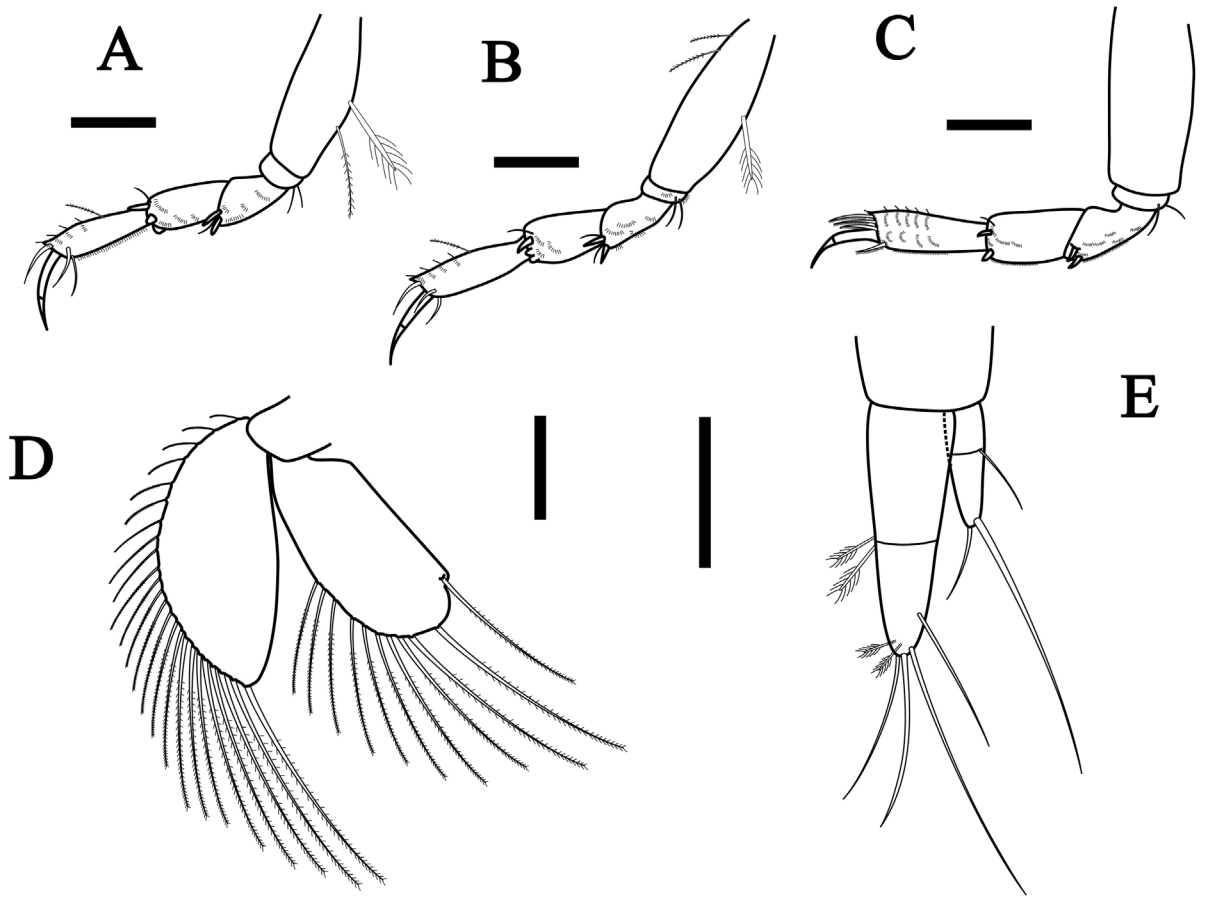

Figure 5. *Tanaopsis brevicorpus* sp. nov., female paratype, length 2.8, mm, MNRJ 23401. A, pereopod 4; B, pereopod 5; C, pereopod 6; D, pleopod; E, uropod. Scale bars = 0.1 mm.

large sub-terminal spine. Dactylus as long as fixed finger, with crests on outer margin, two simple setae and two spines ventrally.

Pereopod 1 (Fig. 4G). Coxa present, with prominent spur with long simple seta. Basis long (about 4.7 times as long as wide), with one minute dorsal seta. Ischium short, with one ventral simple seta. Merus naked, 1.3 times as long as wide. Carpus longer than merus, with three simple setae distally. Propodus as long as merus and carpus combined, with row of minute setae along outer margin and four spiniform terminal setae. Dactylus half as long as unguis. Dactylus and unguis combined longer than propodus.

Pereopod 2 (Fig. 4H). As pereopod 1 except coxa without prominent spur. Basis 3.4 times as long as wide, with two plumose setae dorsally. Merus as long as wide, with medial rows of minute setules. Propodus longer than merus and carpus combined, with three spiniform terminal setae and medial rows of minute setules. Dactylus less than half as long as unguis.

Pereopod 3 (Fig. 4I). As pereopod 1 except coxa without prominent spur, basis 4.4 times as long as wide, with one inner and one outer plumose seta. Carpus with two distal simple setae.

Pereopod 4 (Fig. 5A). Shorter than pereopod 1-3. Coxa absent. Basis about 2.4 times as long as wide, with one long plumose seta ventrally. Ischium short, with two simple setae ventrally. Merus 1.3 times as long as wide, with medial rows of minute setules and two pointed processes and one simple seta distally. Carpus longer than merus, with one pointed process, two tubercles and one simple seta distally. Propodus shorter than merus and carpus combined, with one long plumose seta dorsally, three spiniform terminal setae and row of minute setae along outer and inner margins. Dactylus about two times as long as unguis.

Pereopod 5 (Fig. 5B). As pereopod 4 except basis 3 times as long as wide, with two inner and one outer plumose setae. Merus twice as long as

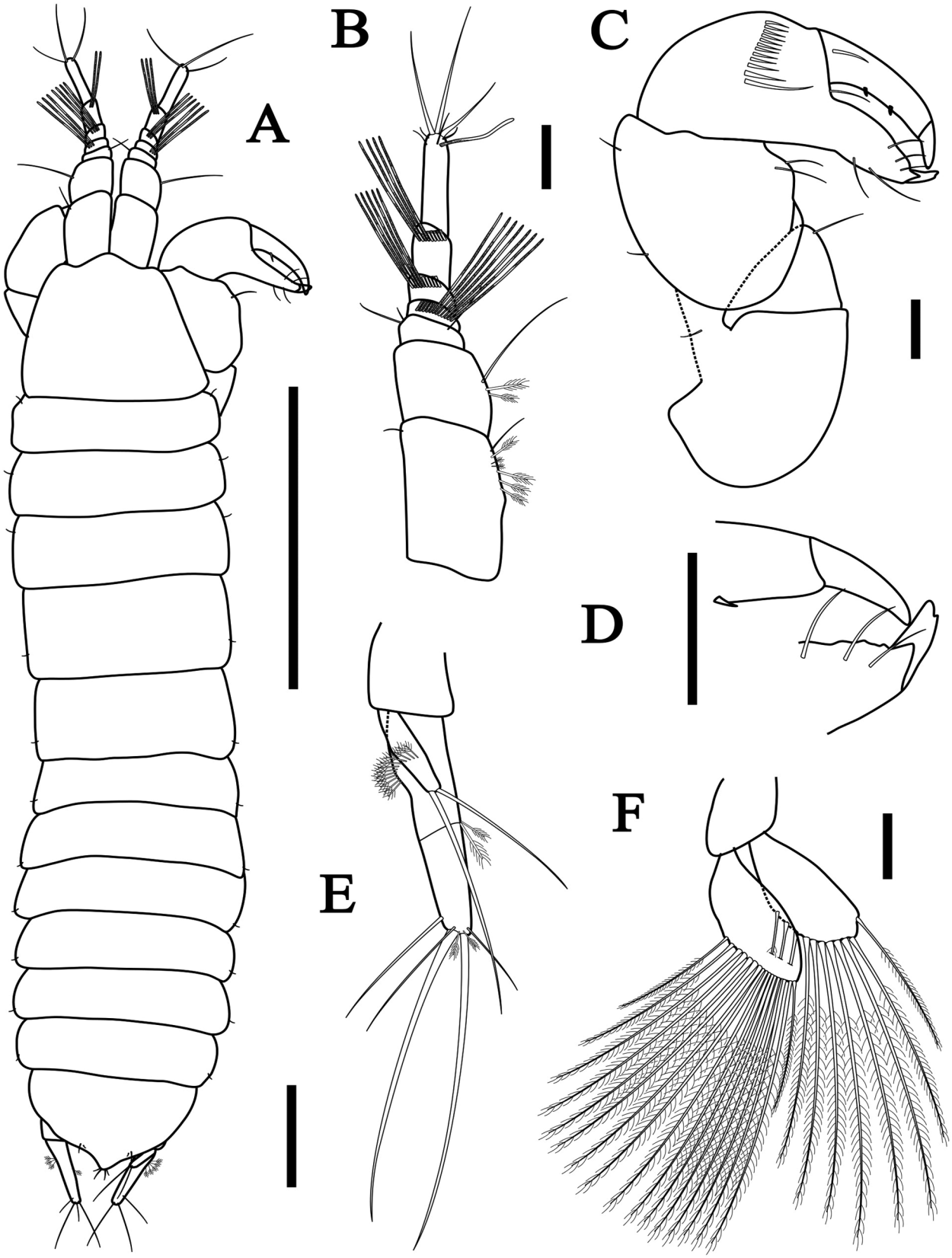

Figure 6. *Tanaopsis brevicorpus* sp. nov., male paratype, length 3.2 mm, MNRJ 25192. A, dorsal view; B, antennules; C, cheliped, with D, detail of cheliped fixed finger; E, uropod; F, pleopod. Scale bars: A = 1 mm; B-F = 0.1 mm.

wide, with two simple setae distally. Dactylus about as long as unguis.

Pereopod 6 (Fig. 5C). As pereopod 4 except basis 2.1 times as long as wide, naked. Merus with two pointed processes distally. Carpus with two pointed processes and one simple setae distally. Propodus tipped by five serrated spiniform setae. Dactylus as long as unguis.

Pleopods (Fig. 5D). Well-developed. All pleopods similar in structure, with unequal rami. Basal article short, 1.1 times as wide as long. Endopod subrectangular with all setae distal, with one outer and ten plumose inner setae. Exopod sub-ovate with 24 plumose setae on entire posterior margin; no gaps between the most proximal and other setae.

Uropod (Fig. 5E). Shorter than pleotelson. Basal article shorter than exopod, naked. Exopod biarticulate (with fusion line), half of endopod, with one simple medial seta and two long setae apically. Endopod biarticulate (with fusion line), with two plumose setae medially, one simple subdistal seta and tipped by two plumose and three long simple terminal setae.

Manca paratype 1.3 mm (Fig. 3B). Smaller than female and similar in morphology. Antennule, antenna and uropod have the same number of article as adults and cheliped has the same structure (even the tip of fixed finger) as full developed females, been the only difference between them: pereonites and pleotelson slightly wider than in adults.

Male paratype, 3.2 mm. Not dissected. Sexual dimorphism present. Feeding male. Body (Fig. 6A) about 5.5 times as long as wide. Cephalothorax triangular, 1.2 times as wide as long; rostrum rounded; eyelobes absent. Pereon. Pereonites lesser than female; pereonite 1 shortest, about 0.3 as long as carapace. Pereonite 4 longest, 2.0 times as wide as long. Pleon. Pleonites developed about 30% of body length. Antennule (Fig. 6B) 4.75 times as long as wide, as long as cephalothorax, with seven articles; article 1 longest, inner distal margin with six plumose and one long simple setae and one outer distal simple seta; article 2 half length of article 1, with two inner medial plumose and one long simple setae; article 3 short, with one inner and two outer distal simple setae; articles 4-6 densely packed with aesthetascs; article 7 slender, with one aesthetasc, four short and three long simple terminal setae. Maxilliped developed, not recovered. Cheliped (Fig. 6C, D) same as in female. Uropod (Fig. 6E) exopod uniarticulate, less than half of endopod, with two long setae on the tip. Endopod biarticulate (with fusion line), with twelve plumose setae proximally, two plumose setae medially and tipped by two plumose and five simple terminal setae. Pleopods (Fig. 6F) well-developed. Endopod with one outer and ten plumose inner setae. Exopod with 17 plumose inner setae; no gaps between the most proximal and other setae.

Remarks. Tanaopsis is a morphologically conservative genus (Bird and Bamber, 2000), being reported variations only by Lang (1967) in pleon shape of *T. graciloides* females. Thus, the few variations found in species are considered for this to be new for science.

Tanaopsis brevicorpus sp. nov. resembles *T. antarctica*, *T. cadieni*, *T. chotkarakde*, *T. laticaudatus* and *T. profunda*, however differs from these species by having carapace about as long as first three pereonites; pleotelson short (2.35 times as long as wide); proportions of uropod and pleotelson (0.85 times) and exopod of uropod with fusion line.

The new species is distinct from *T. boonwurrungi*, *T. canaipa*, *T. graciloides*, *T. kerguelenensis*, *T. oios*, *T. rawhitia* and *T. rugaris* by maxilliped endite with short seta and arising from tubercles; inner margin of cheliped fixed finger with one large spine; pleotelson short and uropod both rami with fusion line. *Tanaopsis curtus* has the carapace longer than pereonites 1-3 (1.15 times) and maxilliped basis seta absent. Furthermore, in comparison with *T. gallardoi*, *T. brevicorpus* sp. nov. has less slender antennule article 2, maxilla triangular instead of with two lobes, both rami of uropod having fusion line (semi-fused articles) and uropod about half length of pleotelson in place of subequal.

Bathymetric distribution. 55-500 m.

Sieg and Dojiri (1991) gave a key to the species then known. In this key were included *T. laticaudatus* as a synonym of *T. graciloides* and excluded *T. gallardoi* (before as *Leptognathia gallardoi*). A key to all species of the genus *Tanaopsis* up to now (16 species including *T. bamberi* sp. nov. and *T. brevicorpus* sp. nov.) is given.

Key to species of *Tanaopsis* Sars, 1899 (females only)

1. Uropod exopod uniarticulate 2

- Uropod exopod biarticulate 6

2. Uropod endopod uniarticulate 3

- Uropod endopod biarticulate 5

3. Pereonites 4 and 5 longer than wide; uropod exopod shorter than half length of endopod 4

- Pereonites 4 and 5 wider than long; uropod exopod distinctly shorter than first endopod article..... *Tanaopsis kerguelenensis* Shiino, 1978

4. Body slender, more than eight times as long as wide; presence of small distal article on the antennule (minute article); species from Australia ..... *Tanaopsis boonwurrungi* Błażewicz-Paszkowycz & Bamber, 2012

- Body stout, about five times as long as wide; antennule without small distal article (minute article); species from Antarctica ..... *Tanaopsis bamberi* sp. nov.

5. Pereonite 5 as long as wide; antenna article 2 square, about as long as wide; uropod exopod longer than half length of endopod; presence of small distal article on the antennule (minute article); species from New Zealand..... *Tanaopsis rawhitia* Bird, 2011

- Pereonite 5 wider than long; antenna article 2 rectangular, longer than wide; uropod exopod shorter than half length of endopod; pereopod 1 much larger than other pereopods; species from Hong Kong ..... *Tanaopsis chotkarakde* Bird & Bamber, 2000

6. Uropod endopod with distinct articles 7

- Uropod endopod with fusion line (semi-fused) 14

7. Pointed mandibular molar process 8

- Mandible without molar process (or mandible unknown) 12

8. Maxilliped basis with seta 9

- Maxilliped basis seta absent; very compact pereonites; carapace longer than pereonites 1-3 combined; species from Japan ..... *Tanaopsis curtus* Kudinova-Pasternak, 1984

9. Maxilliped basis seta shorter than endite 10

- Maxilliped basis seta exceeding endite distal margin 11

10. Antennule article 1 twice as long as wide; inner margin of cheliped fixed finger with two sub-terminal spines of same size (inner bifurcate claw and outer trifurcate claw); pleotelson less than twice as long as wide; uropod about half length of pleotelson; species from Australia ..... *Tanaopsis canaipa* Bamber, 2008

- Antennule article 1 less than twice as long as wide; inner margin of cheliped fixed finger with two sub-terminal spines of different sizes; pleotelson more than twice as long as wide; uropod as long as pleotelson; maxilliped basis seta distinctly shorter than endite (seta extends to about half of endite); species from Panama Basin ..... *Tanaopsis profunda* Lang, 1967

11. Maxilliped endite with short seta; inner margin of cheliped fixed finger with two sub-terminal spines ..... *Tanaopsis antarctica* Lang, 1967

- Maxilliped endite without seta; inner margin of cheliped fixed finger with one large spine; maxilliped basis seta very long, almost reaching palp article 3 ..... *Tanaopsis gallardoi* (Shiino, 1970)

12. Two sub-terminal spines on inner margin of cheliped fixed finger..... 13

- One large sub-terminal spine on inner margin of cheliped fixed finger; species from Norway and Mediterranean ..... *Tanaopsis laticaudatus* (Sars, 1882)

13. Spines on inner margin of cheliped fixed finger of same size; maxilliped endite with one subdistal short seta; species from Australia ..... *Tanaopsis oios* Błażewicz-Paszkowycz & Bamber, 2012

- Spines on inner margin of cheliped fixed finger of different sizes (1 large and 1 small); maxilliped endite with one distal short seta; species from Sweden ..... *Tanaopsis graciloides* (Lilljeborg, 1864)

14. Inner margin of cheliped fixed finger with one large sub-terminal spine; antennule without minute article; antenna article 4 without fusion line 15

- Inner margin of cheliped fixed finger with two spines; uropod exopod as long as first endopod article; presence of a small distal article on the antennule (minute article); antenna article 4 with fusion line; cheliped dactylus rugosity not restricted to the distal half of it; species from Japan ..... *Tanaopsis rugaris* Błażewicz-Paszkowycz *et al.*, 2013

15. Uropod exopod large, longer than first endopod article; maxilliped endite seta absent; pleotelson about 1.5 times longer than wide; species from California ..... *Tanaopsis cadieni* Sieg & Dojiri, 1991

- Uropod exopod as long as first endopod article; maxilliped endite seta short, arising from tubercles; pleotelson more than twice longer than wide ..... *Tanaopsis brevicorpus* sp. nov.

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