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Family Nototanaidae Sieg, 1976 and Typhlotanaidae Sieg, 1984

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Abstract

The deep-water tanaidaceans of the family Typhlotanaidae Sieg, 1984 were examined. In the material seven species were recognized. Three of them *Typhlotanais compactus* Kudinova-Pasternak, 1966, *Torquella angularis* (Kudinova-Pasternak, 1966), and *Peraeospinosus magnificus* (Kudinova-Pasternak, 1970) were already known to science. Four others were undescribed, but because only one of them, *Larsenotanais kamchatikus* n. sp, was represented by more than one specimen, is described in this paper. Additionally, redescriptions of the poorly known *T. angularis* and *T. compactus,* supplement this paper.

Key words: Tanaidacea, Typhlotanaidae, *Torquella*, *Larsenotanais, Typhlotanais*, Kurile-Kamchatka Trench, Japan Trench, abyssal.

Introduction

The family Nototanaidae was erected by Sieg (1976), who removed the genera therein from the family Paratanaidae Lang, 1949 based on the main characters of fusion of the dactylus and unguis in last three pair of pereopods, gradual reduction of the mouthparts in the males, and a reduced number of oostegites in females. Originally five genera were included in the family: *Metatanais* Shiino, 1952; *Nototanais* Richardson, 1906; *Tanaissus*, Norman & Scott, 1906; *Teleotanais* Lang, 1956, and *Androtanais* Sieg, 1976. The poorly defined and numerous genus *Typhlotanais* G.O. Sars 1882 was reclassified by Sieg to the other, newly created family Leptognathiidae Sieg, 1976 emphasizing it's polyphyletic. This genus remained in the Leptognathiidae for the next ten years, although in a separate subfamily Typhlotanaidinae Sieg, 1984 (Sieg 1984, 1986a). This subfamily has been raised to the status of family two years later (Sieg 1986b), to include not only *Typhlotanais*, but also *Typhlotanaoides* Sieg, 1983; *Meromonakantha* Sieg, 1986b; *Peraeospinosus* Sieg, 1986a, and *Dimorphognathia* Sieg, 1986a.

Typhlotanaidae was synonymized with Nototanaidae by Larsen & Wilson (2002). According to their definition Nototanaidae were tanaids which have: three-articled antennule and six-articled antenna, they lack medial spiniform setae in the labium, they have regularly developed pereonite 1 and a marsupium formed of four pairs of oostegites, they lack articulated setae on pleonites, they are without a coxa on pereopods 4–6, and have the dactylus fused with unguis on these same pereopods. The authors included eleven genera in their redefined Nototanaidae *sensu* Larsen & Wilson, 2002, but their system has not been accepted by some authors (Błażewicz-Paszkowycz 2005; Bamber 2005) as well as in the present paper, where system proposed by Sieg is retained.

The life-history of typhlotanaids discovery north-west Pacific has come from work of Kudinova-Pasternak (1966, 1970, 1973, 1978). Studying tanaidaceans collected from a series of expeditions, she recognized eleven species: *Meromonakantha setosa* (Kudinova-Pasternak, 1966), *P. magnificus* (Kudinova-Pasternak,

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1970), *Peraeospinosus rectus* (Kudinova-Pasternak, 1966), *Torquella angularis* (Kudinova-Pasternak, 1966), *Torquella elegans* (Kudinova-Pasternak, 1978), *Torquella grandis* (Hansen, 1913), *Typhlamia mucronata* (Hansen, 1913), *Typhlotanais compactus* Kudinova-Pasternak, 1966, *T. kussakini* Kudinova-Pasternak, 1970, and *T. longicephala* Kudinova-Pasternak, 1970 (Fig. 10).

The present study is based on the collection of twenty five typhlotanaid specimens found in four samples. In the material seven species, representing exclusively family Typhlotanaidae (Sieg, 1984), were identified. Three of them, *Typhlotanais compactus, Torquella angularis,* and *Peraeospinosus magnificus* were already known to science while four others were undescribed. Only one of those species, *Larsenotanais kamchatikus* n. sp., was represented in the material by more than one specimen, and is described below.

Key to females of nototanaids and typhlotanaids of Kamchatka's abyssal

1 Antennule shorter than carapace ..... *Meromonakantha setosa*
Antennule longer than carapace 2
2 Uropods rami subequal 3
Uropod exopod shorter than endopod 4
3. Pereonites 2–4 longer than wide; pereopod 6 propodus distal setae subequal ..*Peraeospinosus magnificus*
Pereonite 2–4 as long as wide; pereopod 6 propodus with one long and two short setae distally ..... *Peraeospinosus rectus*
4. Antennule twice as long as carapace, antennule and antennae with long setae (at least as long as half of whole appendage); pereopod 1 carpus with long seta (longer than half length of propodus) ..... *Typhlamia mucronata*
Antennule less than twice as long as carapace; pereopod 1 carpus with short seta (less than half the length of propodus) 5
5. Carapace as long as combined length of pereonites 1, 2 and half length of pereonite 3 ..... *Typhlotanais longicephala*
Carapace never longer than pereonite 1 and 2 combined length 6
6. Pereonite 1 anterior edge deeply concave ('collar-shape') 7
Pereonite 1 regular shape 9
7 Pereopod 1 carpus with six simple setae of similar length ..... *Torquella elegans*
Pereopod 1 carpus with rod setae 8
8 Pereopods 2 and 3 propodus with long dorsal seta reaches beyond unguis ..... *T. angularis*
Pereopods 2 and 3 propodus with dorsal seta shorter than dactylus ..... *T. grandis*
9 Pereopod 6 propodus distal setae reach beyond end of unguis ..... *Typhlotanais kussakini*
Pereopod 6 propodus distal setae shorter than dactylus 10
10 Uropod rami with one article; pereopods 4–6 prickly tubercles not surrounded by spines ..... *Larsenotanais kamchatikus*
Uropod rami with two articles; pereopods 4–6 prickly tubercles surrounded by spines ..... *Typhlotanais compactus*

Systematics
Family: Typhlotanaidae Sieg, 1984
Genus: *Peraeospinosus* Sieg, 1986a

***Peraeospinosus magnificus* (Kudinova-Pasternak, 1970)**

Typhlotanais magnificus nomen nudum: Kudinova-Pasternak (1969): 1737–1738.

Typhlotanais magnificus: Kudinova-Pasternak (1970): 349–351; (1973): 153; (1993): 141–142; Błażewicz-Paszkowycz (2005): 3848, 3851, 3857–3861, 3884, 3898.

Material examined. 1 female without oostegites, body length 8.5 mm, station TD-4, 39°27.08'–39°29.15'N–143°37.79'–143°38.52'E, depth 3272–3146 metres, 4m ORE BT, 26 September 2001.

Remarks: *Peraeospinosus magnificus* has been described by Kudinova-Pasternak (1970) from the Kurile-Kamchatka Trench. The present survey brings the second record of the species, this time from the Japan Trench. The species has been further collected in other localities of Indian Ocean, North Pacific (off Japan, Alaska), South Atlantic and in the West Antarctic (Fig. 10).

Genus: *Torquella* (Błażewicz-Paszkowycz, 2007)

Diagnosis (after Błażewicz-Paszkowycz, 2007): Body elongate, at least eight to nine times as long as wide. Pleon short, less than 20 % of total body length. Pereonite 1 anterior edge highly concave. Mandible molar process with well calcified and serrated edge, occasionally with teeth. Maxilliped basis with seta at least as long as three-quarters of endites; endite distal margin with two tubercles and usually one seta. Cheliped basis posterior margin separated from pereonite 1 by gap. Chela slim, little longer than cheliped carpus. Pereopods 2 and 3 with spiniform setae on carpus, usually with long ventral seta on propodus and occasionally with rod setae on merus or carpus. Pereopods 4–6 unguis simple, with row of spines ventrally; prickly tubercles large (half as long as carpus), surrounded by row of spines. Uropods rami two-articled; exopod usually reaching three-quarters of endopod; exopod distal article twice as long as proximal article.

Male: Unknown.

Type species: *Typhlotanais longisetosus* Kudinova-Pasternak, 1990.

Species included: ***Torquella angularis*** (Kudinova-Pasternak, 1966); *T. elegans* (Kudinova-Pasternak, 1978); *T. grandis* (Hansen, 1913); *T. longisetosa* (Kudinova-Pasternak, 1990); *T. parangularis* (Kudinova-Pasternak, 1975); T. *rotundirostris* (Lang, 1970); ***T. magdalensis*** (Larsen & Shimimura, 2007), *T. eltaninae* Błażewicz-Paszkowycz, 2007; *T. galatheae* Błażewicz-Paszkowycz, 2007.

Torquella angularis (Kudinova-Pasternak, 1966)

Figures 1–3

Typhlotanais sp. A: Belyaev (1966): 88.
Typhlotanais angularis: Kudinova-Pasternak (1966): 529–531; Kudinova-Pasternak (1968): 73; Lang (1970): 270, 287; Shiino (1970): 98; Morino (1971): 354; Kudinova-Pasternak (1975): 213; Kudinova-Pasternak (1978): 127.
Torquella angularis Błażewicz-Paszkowycz (2007).

Material examined. 9 females (1 dissected on slides), station XR-12, 41º37.67'–41º37.08'N 146º54.19'–146º52.72'E, 5473–5484 metres, 4 m ORE beam trawl, 23 September 2001.

Diagnosis. Carapace round, as long as wide. Pereonite 3 longer than wide. Chela three times longer than wide. Antennule article 3 about twice as long as article 2. Pereopod 1 merus and carpus shorter than basis, merus with short (rod) seta, carpus with three short and three rod setae, propodus with one long simple seta ventrally; pereopods 4–5 propodus distal seta reach half of dactylus.

Complementary description of female

Body (Fig. 1). Length 7.3 mm, eight to nine times as long as wide.

Carapace. Almost as long as wide, smooth, 15% of body length, rounded laterally, rostrum small, acute.

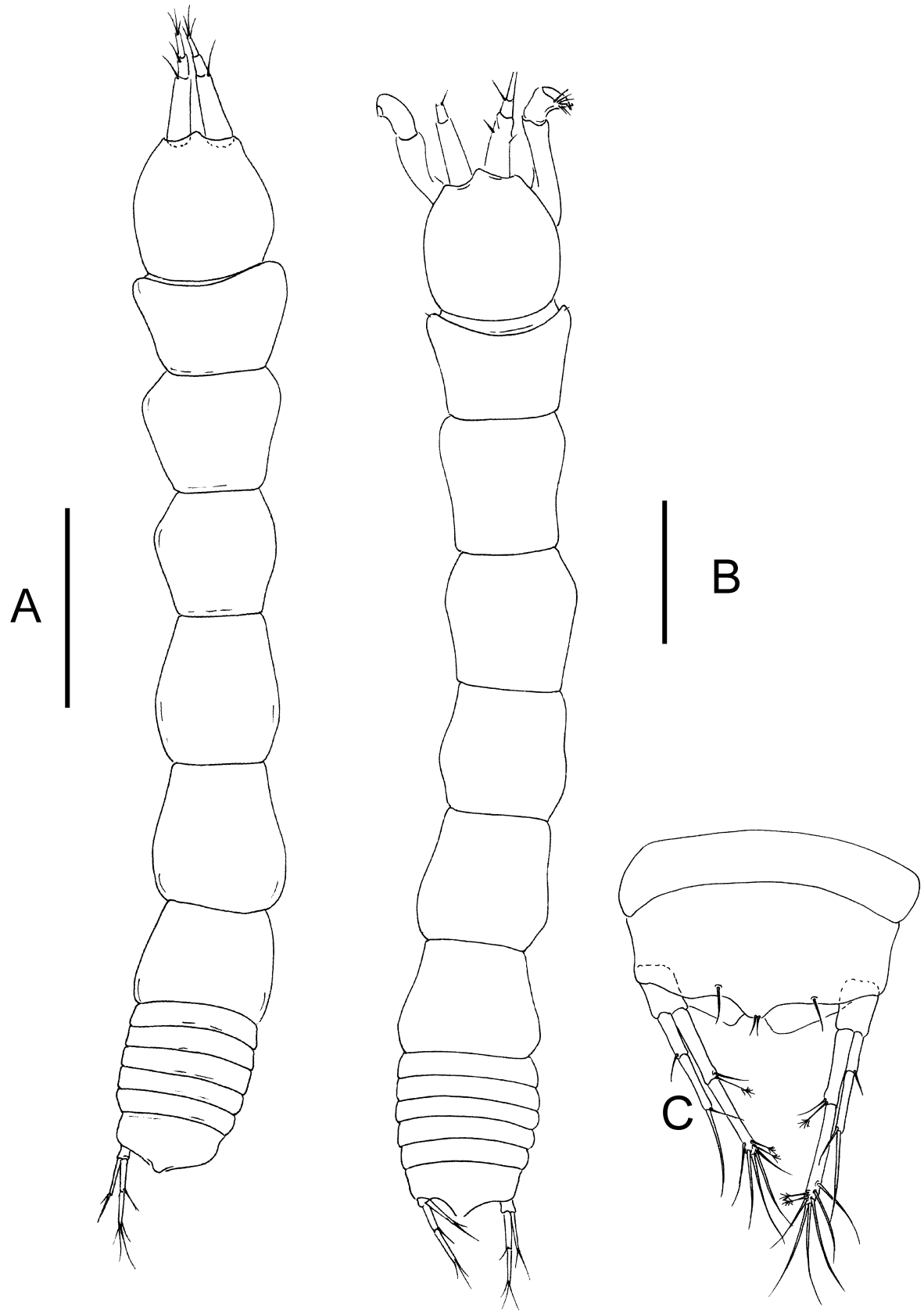

FIGURE 1. *Torquella angularis,* A, adult female, dorsal view, body length 5.24 mm (specimen dissected); B, adult female, dorsal view, body length 7.5 mm; C, Uropod. Scale A, B = 1 mm; C = 0.1 mm.

Pereonites. Pereonite 1 about 1.8 times as wide as long, latero-proximal corners expanded forward. Pereonites 2, 3 and 5 of similar size, little longer than wide. Pereonite 6 1.3 times as wide as long.

Pleon. 15% of body length, pleonites 1–5 similar in size.

Pleotelson. Rectangular.

Antennule (Fig. 2A). Article 1 slim, three times as long as wide, with two long simple and pinnate setae in two groups medially and distally on inner margin and two simple setae medially on outer margin. Article 2 with two setae distally. Article 3 almost twice as long as article 2 with six setae distally.

Antenna (Fig. 2B). Article 2 twice as long as article 3, naked. Article 3 with one seta. Article 4 about 2.6 times as long as article 5, with two simple and four pinnate setae distally. Article 5, with one simple seta distally. Article 6 very short, with seven terminal setae.

Mouthparts. Labrum lost during dissection. Mandibles (Figs C, D) massive; molar process well developed, edges supported with tubercle-like structures; *lacinia mobilis* well developed. Maxillule (Fig. 2E) inner endite with eight apical spiniform setae; palp lost during dissection. Maxilla (Fig. 2E) triangle shape. Labium (Fig. 2F) bilobed, outer lobe and outer corner of inner lobe setose. Maxilliped (Fig. 2H) bases fused, with simple setae reaching over half of endites; endite armed with seta in distolateral margin and two tubercles distally; palp article 1 naked; article 2 wedge-shaped, with one strong and two simple setae on inner margin and one seta on outer margin; article 3 with three long setae and one short simple seta on inner margin; article 4 with five strong setae distally and one short seta on outer margin. Epignath (Fig. 2G) tip rounded.

Cheliped (Fig. 3A). Basis 1.3 times as long as wide, with one seta dorso-distally. Merus wedge-shaped with one seta ventrally. Carpus about twice as long as broad, with two dorsal setae and with two long and one short setae ventrally. Propodus and fixed finger as long as carpus, about three times as long as wide, with one seta near insertion of dactylus. Fixed finger with three setae on inner margin and with two setae ventrally. Dactylus with proximal seta dorsally.

Pereopod 1 (Fig. 3B). Of walking type. Coxa present. Basis as long as merus, carpus and half of propodus combined, with two minute and one pinnate setae dorsally. Ischium short, with minute seta. Merus as long as carpus, with one rod seta disto-ventrally. Carpus with three short simple and three rod setae distally. Propodus 1.5 times as long as carpus, with one long seta ventrally and three setae dorsally (serrated, rod and spiniform). Dactylus with long seta; unguis 1.5 longer than dactylus.

Pereopod 2 (Fig. 3C). Of walking type. Coxa with one seta. Basis with two simple and one pinnate seta dorsally, as long as merus, carpus and propodus combined. Ischium with one seta. Merus subequal to carpus, with one simple and two spiniform setae distally (one robust). Carpus with two simple, two spiniform setae and two rod setae distally. Propodus as long as merus and carpus combined, with spiniform seta ventrally and with one spiniform and one long (reaching over unguis) setae dorsally; merus, carpus, and propodus with numerous microtrichiae. Dactylus with one seta; unguis 1.5 times as long as dactylus.

Pereopod 3 (Fig. 3D). Similar to pereopod 2, but merus with one spiniform seta. Carpus with two spiniform and one simple setae distally. Ventral side of merus and carpus with some spines.

Pereopod 4 (Fig. 3E). Of clinging type. Basis with twice as long as wide, with one pinnate seta ventrally and one short seta dorsally. Ischium with two setae ventrally. Merus with two spiniform setae and strong spines ventrally. Carpus with one setae disto-dorsally, two hooks distally and prickly tubercles surrounded by a few strong spines. Propodus over seven times as long as wide, with one pinnate seta dorsally, two strong spiniform ventro-distal setae and with distal seta shorter than dactylus. Propodus twice as long as dactylus and unguis combined. Unguis distally simple, with row spines on ventral margin.

Pereopod 5. Similar to pereopod 4.

Pereopod 6 (Fig. 3F). Similar to pereopod 4, but propodus with three setae distally.

Pleopods (Fig. 3G). Exopod little shorter than endopod, with row of ten setae on outer margin and one seta on inner margin. Endopod with row of fifteen plumose setae on outer margin; clear gap between the most proximal and other setae in both rami.

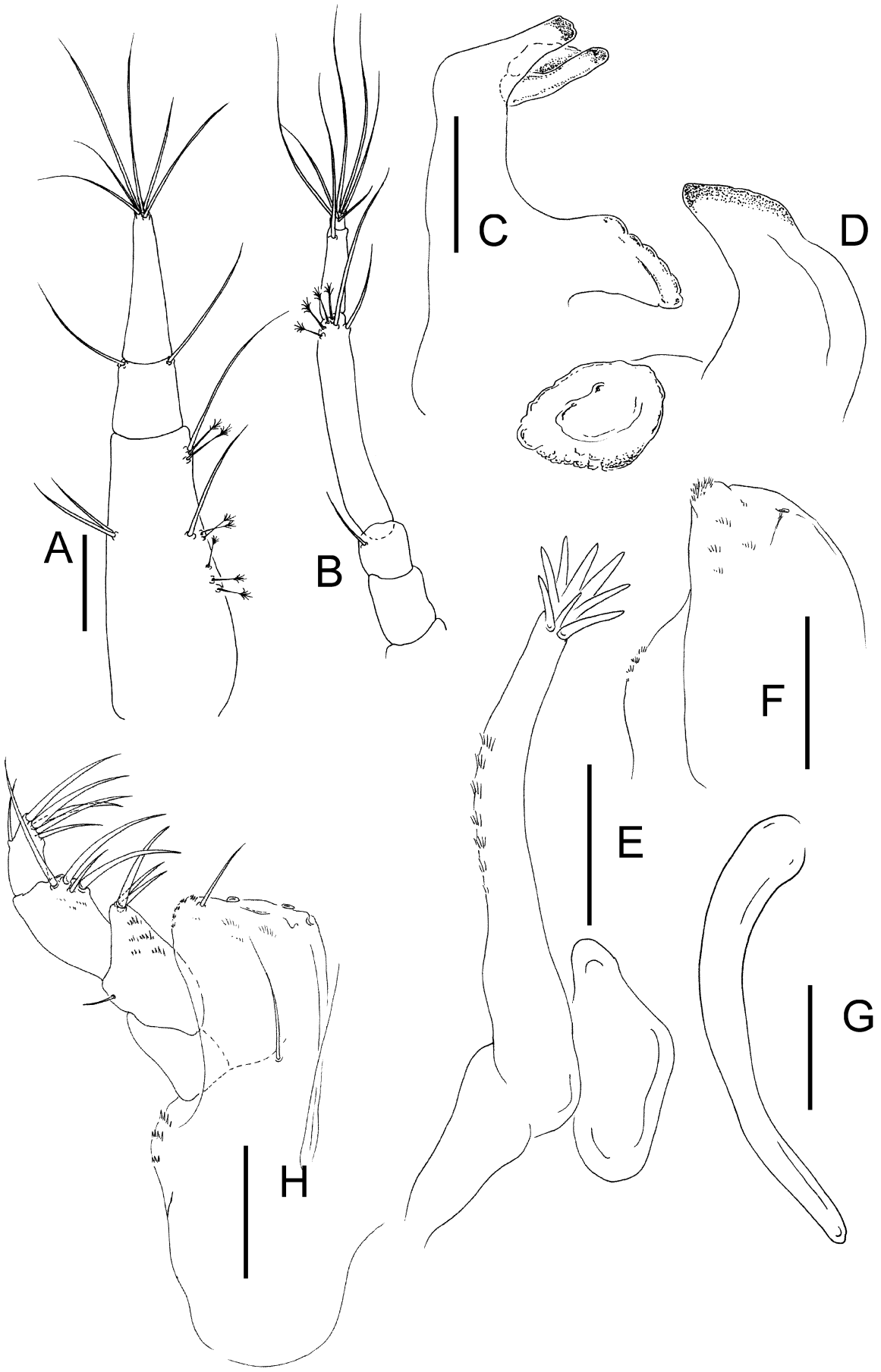

FIGURE 2. *Torquella angularis*, female, body length 4.8 mm. A, Antennule; B, Antenna; C, Left mandible; D, Right mandible; E, Maxillule and maxilla; F, Labium; G, epignath; H, maxilliped. Scale = 0.1 mm.

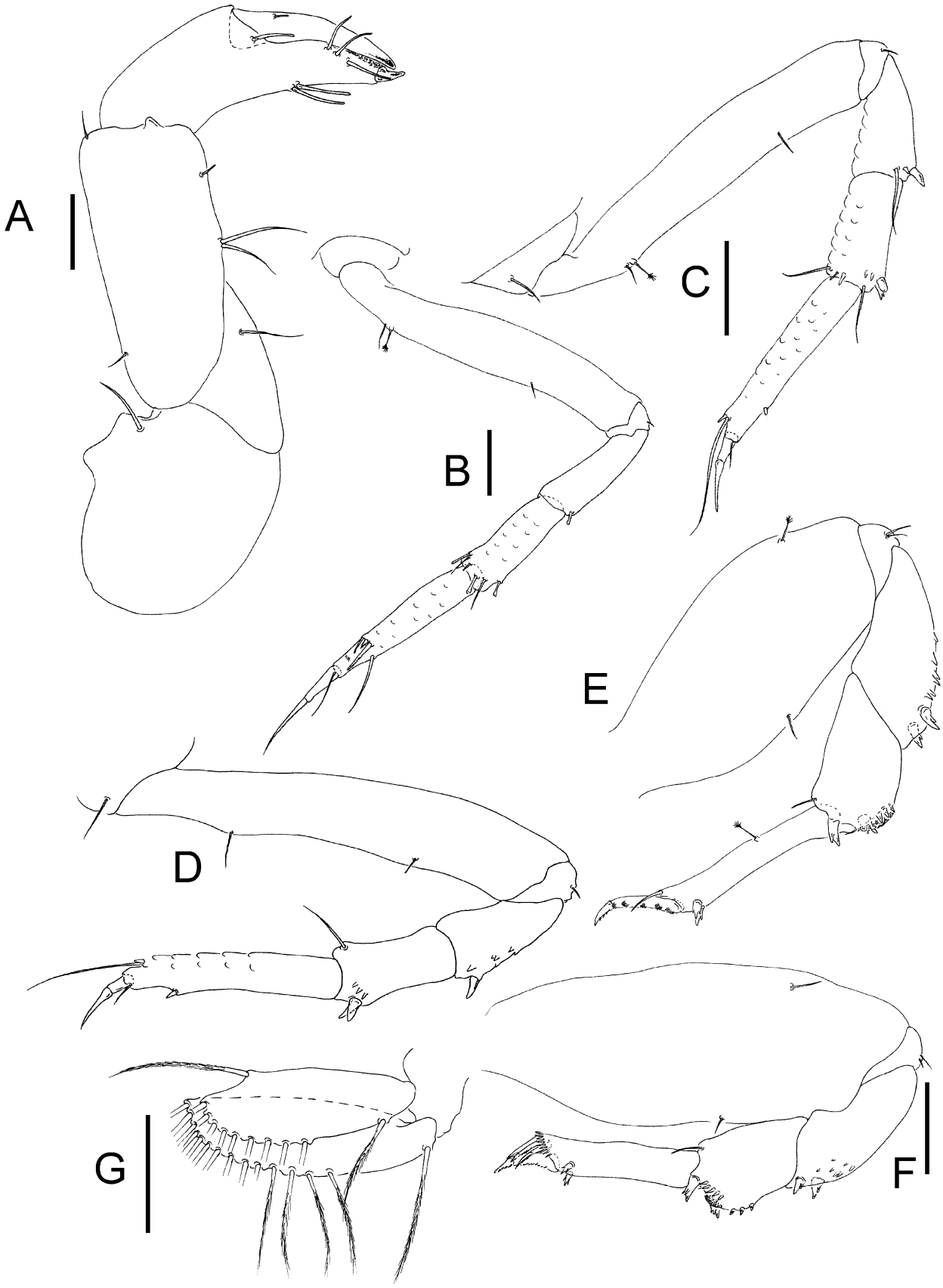

FIGURE 3. *Torquella angularis*, female, body length 4.8 mm. A, Cheliped; B, Pereopod 1; C, Pereopod 2; D, Pereopod 3; E, Pereopod 4; F, Pereopod 6; G, Pleopod. Scale = 0.1 mm.

Uropod (Fig. 1C). Endopod with two articles, proximal article little shorter than distal with one simple and one pinnate setae distally; proximal article with two pinnate and six simple setae distally. Exopod with two articles reaches beyond over endopod proximal article; proximal article with one seta distally, distal article with two setae distally.

Remarks: *Torquella angularis* was described by Kudinova-Pasternak (1966) based only on one female and two mancae but the poor condition of the holotype excluded any redescription, pending this study. Finding eight females in the close vicinity of the type locality has made it possible to present a complementary description and to define characters distinguishing the species from the other members of the genus.

Torquellids can be distinguished by the setation of the merus, carpus and propodus of first two pair of pereopods, the spination in the carpus of pereopods 4–6, and setation of propodus of pereopods 4–6. For example, *T. parangularis* has only one simple seta dorsally on the carpus of pereopods 2 and 3 while most *Torquella* species, including *T. angularis*, have at least one spiniform seta there. One long distal seta on the propodus of pereopod 6 distinguishes *T. eltaninae* from *T. angularis* and other members of the genus as well. The propodus of pereopod 2 in *T. angularis* bears one spiniform and one long, simple seta dorsally. *T. elegans* and *T. galatheae* have two long setae there. The first species has also six long setae on the carpus of pereopod 2 which is a unique character among members of *Torquella*. The former species, *T. galatheae,* has relatively short ventral seta on the propodus of pereopod 1 which is relatively long in *T. angularis* (reaching end of unguis). *T. magdalensis* has a long seta ventrally on the propodus of pereopod 2 and 3 in contrast to *T. angularis* and most torquellids. Finally, the North Atlantic species *T. grandis* has only one seta on the propodus of pereopod 2 but the carpus of pereopods 4–6 is supported in numerous small spines, which are strong and sparsely distributed in *T. angularis*.

T. angularis and the Antarctic species *T. longisetosa* show most similarity in their pereopod setation. Minute differences are in the length of the rod setae in the carpus of pereopod 1. One of those seta is relatively long (reach 0.3 of propodus length) in *T. longisetosa* while all three rod setae are short in *T. angularis*. Furthermore, the pereonite 5 of *T. longisetosa* is clearly longer than pereonite 4 and has a relatively short propodus in pereopods 2 and 3 which is only four times longer than wide. In *T. angularis* pereonites 4 and 5 are subequal, while the pereopod 2 propodus is six times longer than wide.

Distribution: *Torquella angularis* is known from the type locality: 40°19.7'N, 175°45.3'E (*Vitjaz* Station 4074, depth 6065 metres) and from station XR-12 of the KH01-2 program at a slightly shallower depth (5473–5484 metres).

Genus: *Typhlotanais sensu lato*

***Typhlotanais compactus* Kudinova-Pasternak, 1966**
Figures 4–6

Material examined. 5 females, station XR-12, 41º37.67'–41º37.08'N 146º54.19'–146º52.72'E, 5473–5484 metres, 4 m ORE beam trawl, 26 September 2001. 2 females, station TD-4, 39°27.08'–39°29.15'N 143°37.79'–143°38.52'E, 3272–3146 metres, 26 September 2001.

Diagnosis. Body six to seven times as long as wide. Pereonites lateral edges rounded in dorsal view, all wider than long. Antennule longer than carapace; article 3 three times as long as article 2. Antenna article 4 seven times as long as wide. Cheliped carpus 2.5 times as long as wide; with two minute setae dorsally. Pereopods 1–3 with moderate size spur; pereopods 2–3 carpus and propodus with spiniform setae disto-ventrally; pereopods 2 and 3 merus without spiniform seta; pereopods 4–6 with prickly tubercles surrounded by row of spines; pereopods 4 and 5 with distal seta shorter than dactylus. Uropod endopod with two articles, proximal article as long exopod, with ten setae in distal half.

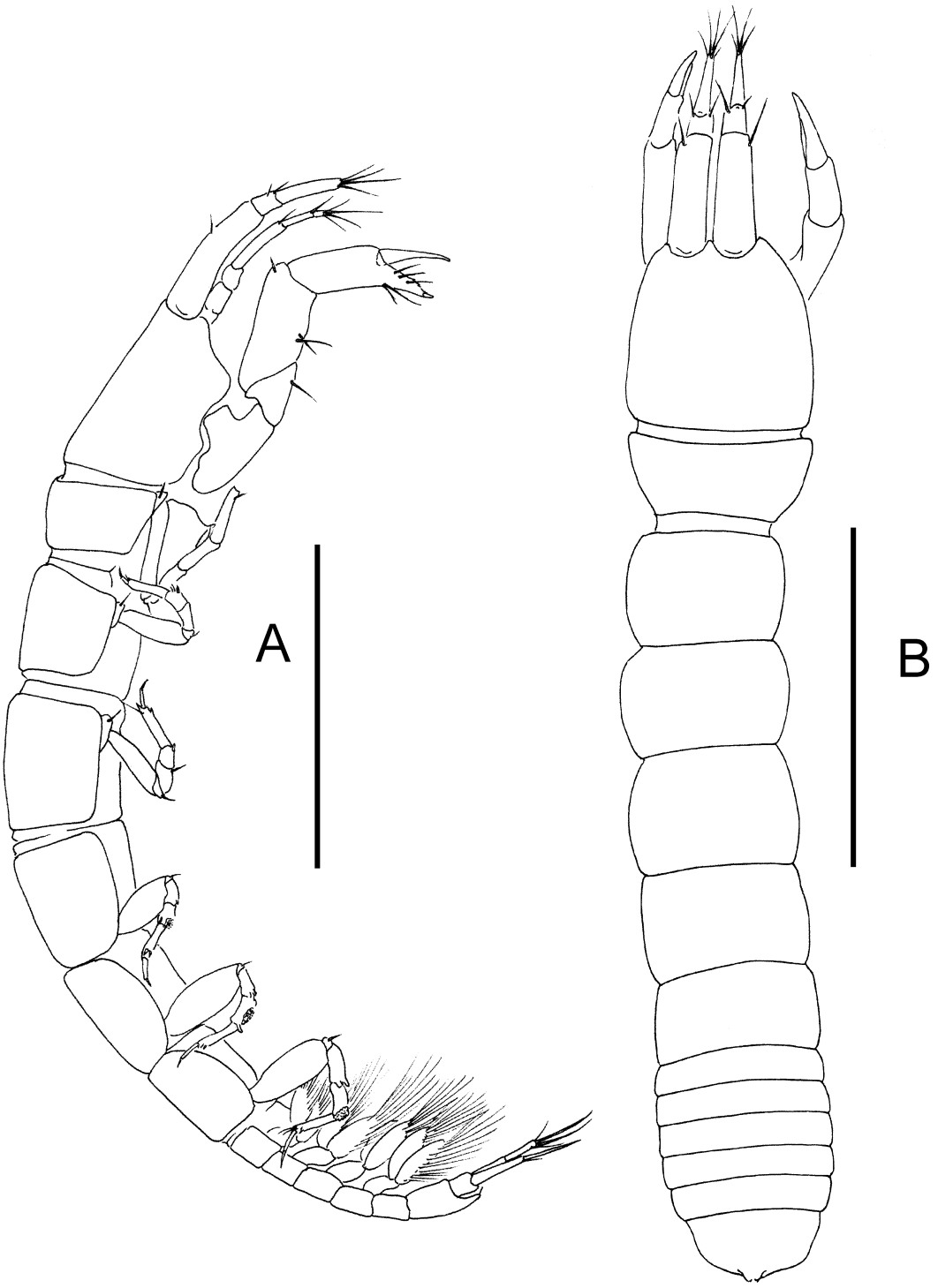

FIGURE 4. *Typhlotanais compactus*, adult female, A, lateral view; B, dorsal view. Scale = 1 mm.

Complementary description of female

Body (Figs 4A,B). 3.1 mm, 6.6 times as long as wide.

Carapace. As long as wide, little shorter than pereonites 1 and 2 combined; lateral margins slightly rounded; rostrum slightly pointed.

Pereonites. Smooth, all wider than long. Pereonite 1 shortest, over twice as wide as long, half as long as pereonite 3. Pereonite 2 little shorter than pereonite 3 and subequal to pereonite 6. Pereonites 2, 4 and 5 subequal.

Pleon 1.3 times as long as carapace. Pleonites similar in size.

Pleotelson. Rounded.

Antennule (Fig. 5A). Article 1 short, 2.5 times as long as wide, with one simple and two pinnate setae at middle of outer margin, one long and one pinnate seta distally, and with row of four short setae on inner margin. Article 2 with one long and two short setae distally. Article 3 almost four times as long as article 2, with apical spur and five setae distally.

Antenna (Fig. 5B). Article 2 about as long as wide, article 2 and 3 with strong microtrichias. Article 4 seven times as long as wide, with two long and three pinnate setae distally. Article 5 with one simple seta distally. Article 6 very short, with six terminal setae.

Mouthparts. Labrum lost during dissection. Mandibles (Figs 5C,D) molar well developed, longer than incisor with irregular edges; incisor blunt; *lacinia mobilis* well developed, serrated. Maxillule (Fig. 5E) endite with eight apical spiniform setae, palp (Fig. 5E') with two terminal setae. Labium both lobes (Fig. 5G) poorly setose distally. Maxilliped (Fig. 5I) basis 1.5 times as long as wide, with seta little shorter than endites; endite with two simple setae and two tubercles distally; palp article 1 unarmed; article 2 wedge-shaped, with three setae on inner margin and one seta on outer margin; article 3 trapezoidal, with four weakly serrated setae on inner margin; article 4 slender, with one simple seta on outer margin and five setae distally. Epignath (Fig. 5H) curved, simple distally.

Cheliped (Fig. 6A). Basis slightly rounded, almost twice as long as wide. Merus wedge shaped, with one seta ventrally. Carpus with two simple and one short setae ventrally, and two minute setae dorsally; propodus as long as carpus, with seta on inner and outer side near cheliped insertion. Fixed finger (propodus projection) tipped by strong spine, with three setae on well calcified inner margin and two setae ventrally. Dactylus slightly curved, with one short seta proximally on dorsal margin.

Pereopod 1 (Fig. 6B). Slender (walking type). Coxa with small spur. Basis five times as long as wide, subequal to carpus and propodus combined, with three setae dorsally and one seta ventrally. Ischium short, with one seta. Merus subequal to carpus, with two simple setae distally. Carpus with five setae distally. Propodus 1.4 times as long as carpus, with three setae sub-distally on dorsal margin. Dactylus half as long as unguis with one seta; both 0.8 times as long as propodus.

Pereopod 2 (Fig. 6C). Slender (walking type). Coxa with small spur. Basis 3.5 times as long as wide, with three setae dorsally and two ventrally. Ischium with simple seta. Merus as long as carpus, with one robust and three simple setae distally. Carpus with four simple setae and one spiniform distally; both merus and carpus with calcified microtrichiae ventrally. Propodus 1.7 as long as carpus, with spiniform seta ventrally and two setae dorsally. Dactylus half as long as unguis, with one simple seta.

Pereopod 3 (Fig. 6D). Similar to pereopod 2, but merus with two robust setae.

Pereopod 4 (Fig. 6E). Clinging type. Basis robust, twice as long as wide, with two pinnate setae ventrally and two minute dorsally. Ischium with two setae. Merus with one short and one spiniform seta ventrally. Carpus with spine distally and with prickly tubercles surrounded by row of minute spines, one seta disto-dorsally. Propodus with two spiniform setae ventrally and with one dorso-distal seta, about as long as half of dactylus. Dactylus half as long as propodus and four times as long as unguis; unguis bifurcated distally.

Pereopod 5 (Fig. 6F). Similar to pereopod 4.

Pereopod 6 (Fig. 6G). Similar to pereopod 5, but propodus with three dorso-distal setae.

Pleopod (Fig. 6H). Basal article naked. Exopod with one seta on inner margin and thirteen plumose setae on outer margin. Endopod with twenty one plumose setae on outer margin; clear gap between proximal seta and other setae in both rami.

Uropod (Fig. 6I). Basal article 1.7 as long as wide. Exopod 2-articled, as long as endopod proximal article, proximal article with minute setae distally, proximal article with one strong seta and one regular seta distally. Endopod 2-articled, proximal article three times as long as distal article, with five setae on outer and five setae on inner margin; distal article with four setae distally.

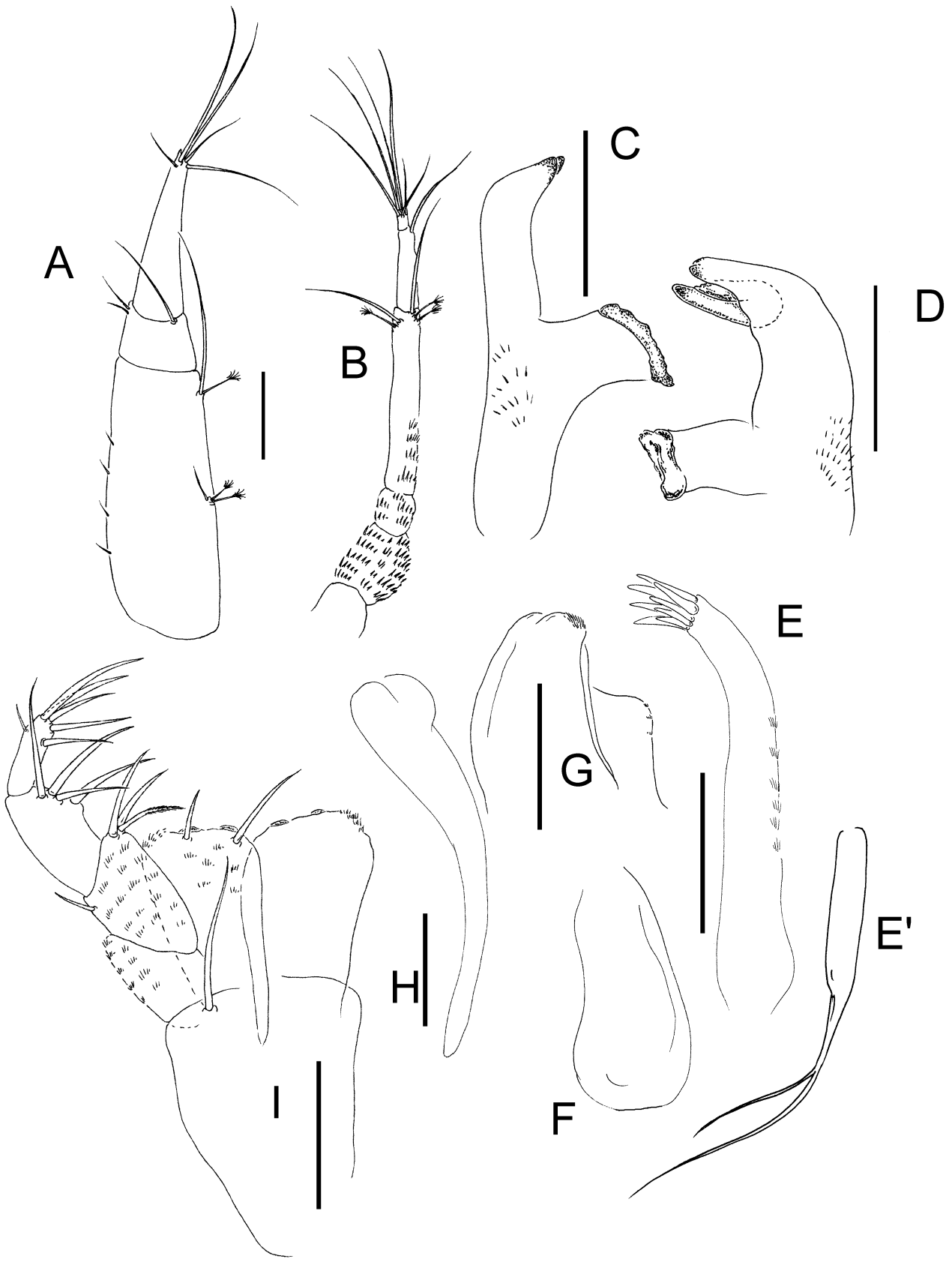

FIGURE 5. *Typhlotanais compactus*, female A, Antennule; B, Antenna; C, Right mandible; D, Left mandible; E, Maxillule; E', Maxillule palp; F, Maxilla G, Labium; H, epignath; I, Maxilliped. Scale = 0.1 mm.

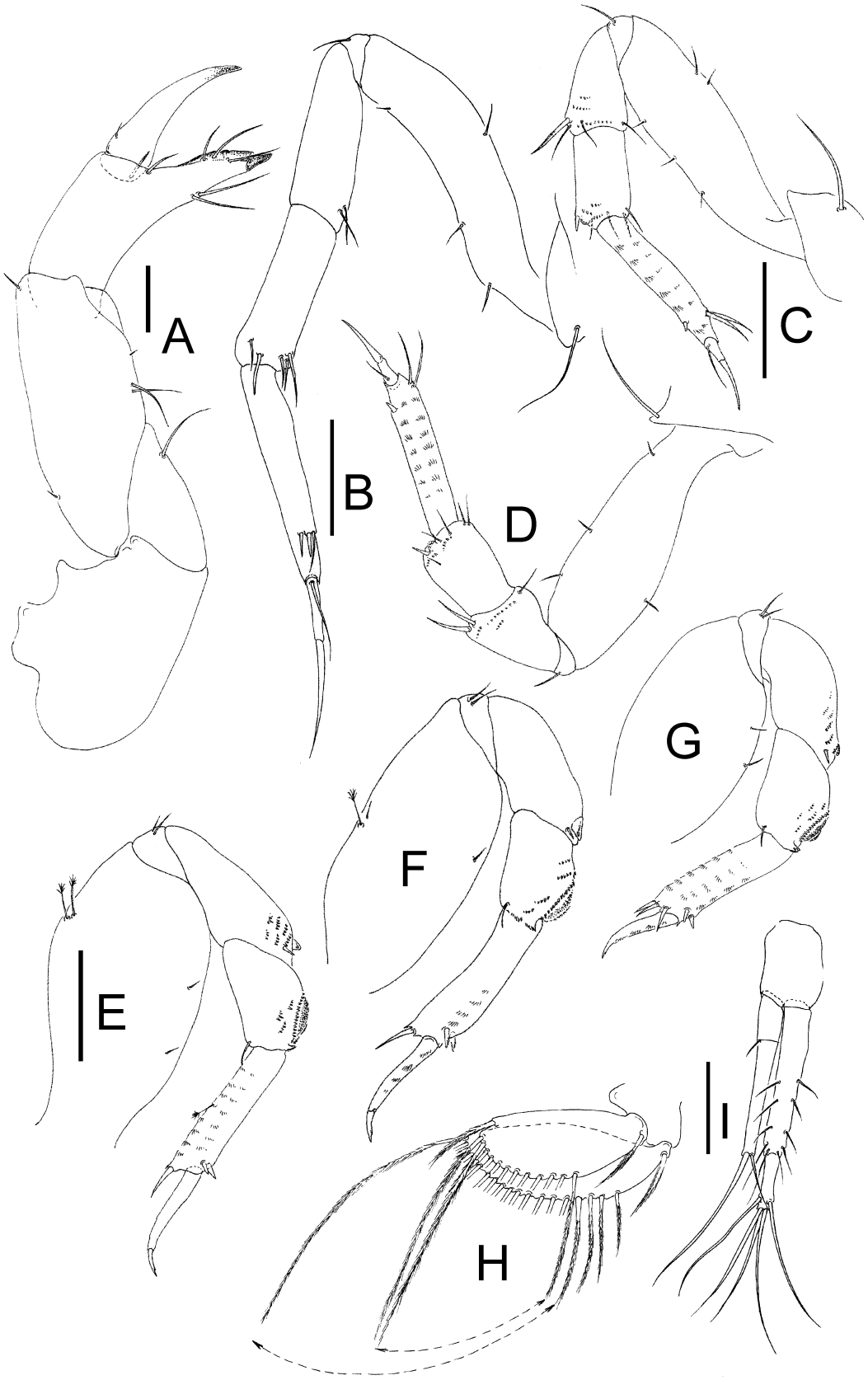

FIGURE 6. *Typhlotanais compactus*, female A, Cheliped; B, Pereopod 1; C, Pereopod 2; D, Pereopod 3; E, Pereopod 4; F, Pereopod 5; G, Pereopod 6; H, Pleopod; I, Uropod. Scale = 0.1 mm.

Remarks: *Typhlotanais compactus* Kudinova-Pasternak, 1966 can be distinguished from other described typhlotanaids by the unusual proximal article of the uropod endopod: this is almost three times as long as the distal article and also bears five simple setae on the outer and inner margin .

T. compactus displays a set of characters which inhibit its classification to any of the presently distinguished typhlotanaid genera. It lacks long seta in the propodus of pereopods 4 and 5 as in *Peraeospinosus*; has short pereonite 1 unlike in *Pulcherella*; has normally developed pereonite 1 in contrast to *Torquella*; and has much shorter antennule than *Typhlamia*. *T. compactus* also cannot be classified in any of the morpho-groups distinguished by Błażewicz-Paszkowycz (2007). It lacks two spines on the pleotelson as have members of the '*spinicauda*' group, lacks large prickly tubercles as members of the '*mixtus*' group, and lacks corrugation on pereonites 1–3 as present in the members of the '*plicatus group*'. The new species has a short seta on the propodus of pereopod 4–6, distinguishing it from members of the '*cornutus*' group and its body is much longer (over six times as long as wide) than in the '*eximus*' and '*penicillatus*' groups. Finally, because the new species has prickly tubercles surrounded by row of spines it certainly does not belong to *Typhlotanais sensu stricto*. Consequently, it is proposed to retain it at *Typhlotanais sensu lato* until a reasonable classification of *Typhlotanais* can be established.

Distribution: *Typhlotanais compactus* has been found at three localities by Kudinova-Pasternak in the North Pacific: 40°19.7'N, 175°45.3'E at the depth 6065 metres (Kudinova-Pasternak 1966), 44°06.7'N, 155°54'E at the depth range from 4895–6135 metres (Kudinova-Pasternak 1970), and 53°25.7'N, 163°28'E at the depth 4260 metres (Kudinova-Pasternak 1973) (Fig. 10).

Genus *Larsenotanais* Błażewicz-Paszkowycz, 2007

Diagnosis (after Błażewicz-Paszkowycz, 2007). Body long, more than five times as long as wide, all pereonites rounded laterally in dorsal view, wider than long, pereonite 1 shortest. Antennule less than twice as long as carapace; article 1 with at least five setae along article. Mandible molar with regular tubercles and teeth distally. Maxilliped basis with seta longer than endites; endites with two tubercles and two setae distally. Cheliped basis reaches the edge of pereonite 1. Pereopods 1–3 basis without acute projection; pereopod 1 merus without spiniform seta; pereopods 2 and 3 carpus and propodus with spiniform seta; pereopods 4–6 carpus with moderate prickly tubercles (less than half of carpus length), unguis simple, propodus distal setae shorter than dactylus. Both rami of pleopods with proximal seta separated from others by gap. Uropod rami 1-articled.

Species included: *Larsenotanais amabilis* Błażewicz-Paszkowycz, 2007; ***L. kamchatikus*** n.sp.

***Larsenotanais kamchatikus* n.sp.**
Figures 7–9

Material examined. Holotype, female (KMNH IvR 500.192), station XR-5, 42°23.83–42°22.06'N 145°31.06'–145°27.70'E, 3145–3265 metres, 16 September 2001. **Paratypes**: 2 females (1 dissected on slides; KMNH IvR 500.193), same locality.

Diagnosis. Body six times as long as wide; pereonite 1 shortest, half as long as pereonite 2, pereonites 2–5 subequal.

Etymology. The name is given from the type locality**.**

Description: Non-ovigerous female

Body (Figs 7A,B). 6.5 times as long as wide.

Carapace. As long as wide, tapering proximally.

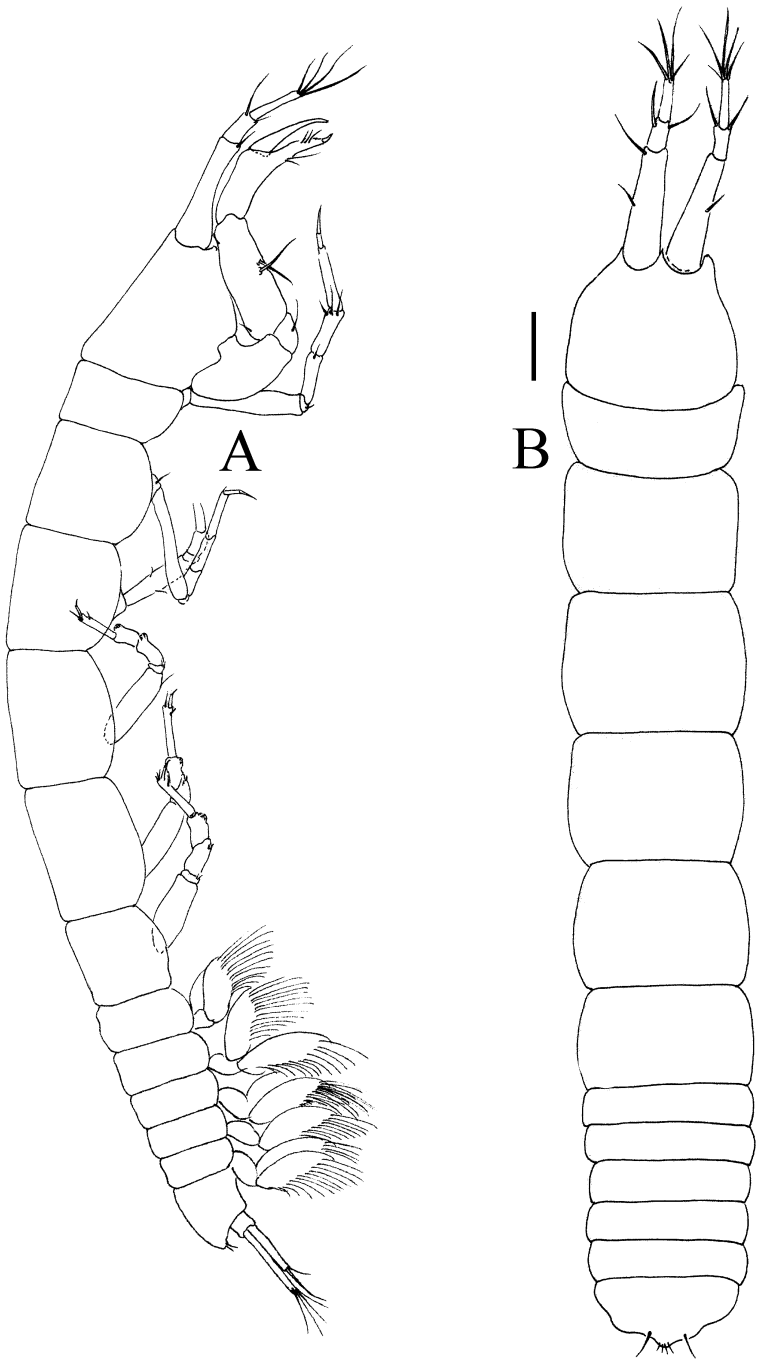

FIGURE 7. *Larsenotanais kamchatikus*, adult female, A, lateral view; B, dorsal view. Scale = 0.1 mm.

Pereonites. Pereonite 2 almost twice as long as as pereonite 1. Pereonites 2–5 subequal, 1.5 as wide as long. Pereonite 6 little shorter than pereonite 5, 1.7 times as wide as long.

Pleon. 1.7 times as long as carapace.

Pleotelson. Gently rounded; caudal projection well developed, with two setae.

Antennule (Fig. 8A). Article 1 about three times as long as wide, 1.3 times as long as article 2 and 3 combined, with five simple setae on inner margin, outer margin with three groups of pinnate setae, and with one simple seta just reaching tip of article 3. Article 2 0.7 times as long as article 3, with two simple seta distally. Article 3 with four long and two short setae terminally.

Antenna (Fig. 8B). Articles 2 and 3 subequal, each with short seta. Article 4 with fusion line at middle, six as long as wide, with two long, one short and two pinnate setae distally and sub-distally. Article 5 half as long as article 4, with one simple seta distally. Article 6 with four long and one short terminal setae.

Mouthparts. Labrum lost during dissection. Mandibles (Fig. 8C, D) molar well developed with regular tubercles and teeth on distal edges; *lacinia mobilis* well developed, serrated; right mandible (Fig. 8D) with strong tooth and serrated upper margin. Maxillule (Fig. 8E) inner endite with seven terminal setae; palp lost during dissection. Maxilla lost during dissection. Labium (Fig. 8F) with few setae on outer corner of inner lobe; outer lobe with small setae. Maxilliped (Fig. 8G) bases with simple seta exceeding over endite; each endite armed with two setae and two tubercles on distal margin; palp article 1 naked; article 2 wedge-shaped, with three setae (two serrated) on inner margin and one short, simple seta on outer margin; article 3 trapezoidal, with four setae on inner margin; article 4 with one simple seta on outer margin and five terminal setae. Epignath not observed.

Cheliped (Fig. 9A). Basis 1.8 times as long as wide with one seta disto-dorsally. Merus wedge-shaped with seta ventrally. Carpus three times as long as wide, with two simple and one minute setae ventrally and two setae dorsally. Chela little longer than carpus, almost four times as long as wide, with two seta near cheliped insertion (on inner and on outer side). Fixed finger with three setae on inner margin and two simple setae ventrally. Dactylus almost straight.

Pereopod 1 (Fig. 9B). Of walking type. Coxa with seta. Basis as long as merus, carpus and half of propodus combined, with two setae dorsally and one seta ventrally along article. Ischium with one simple seta. Merus slightly longer than carpus, with two setae distally. Carpus little shorter than merus, with three short setae distally. Propodus 1.5 as long as carpus with two setae dorsally and one ventral seta sub-distally; unguis twice as long as dactylus. Unguis and dactylus combined 0.8 as long as propodus.

Pereopod 2 (Fig. 9C). Of walking type. Basis little half as long as merus, carpus and propodus combined, with two simple and one pinnate setae dorsally; ischium with one seta. Merus as long as carpus, with three setae distally. Carpus as long as merus, with two simple setae, two minute and one spiniform setae distally. Propodus with two subdistal setae dorsally (one longer than unguis) and one minute spiniform seta ventrally. Dactylus shorter than unguis, both half as long as propodus.

Pereopod 3 (Fig. 9D). Similar to pereopod 2.

Pereopod 4 (Fig. 9E). Of clinging type. Basis wide, 2.5 as long as wide, with one simple seta proximally and one pinnate seta disto-ventrally. Ischium with two setae. Merus subequal to carpus, with two subdistal spiniform setae ventrally. Carpus with hooks distally, one sensory seta dorsally, and with rounded, small (less than half as long as article) prickly tubercles ventrally. Propodus six times as long as wide, with two spiniform setae ventrally and with one seta shorter than dactylus proximally. Dactylus tipped by simple unguis; dactylus and unguis 0.7 times as long as propodus.

Pereopod 5 (Fig. 9F). Similar to pereopod 5.

Pereopod 6 (Fig. 9G). Similar to pereopod 5, but propodus with three terminal setae, as long as half of dactylus.

Pleopods (Fig. 9H). All pleopods similar. Exopod outer margin with sixteen plumose setae, inner margin with one plumose seta. Endopod armed with eleven plumose setae on outer margin; both rami with gap between proximal seta and others.

Uropod (Fig. 9I). Basal article about 0.3 as long as endopod; both rami uniarticulated. Endopod 1.3 times as long as exopod, with one pinnate and one simple setae at middle and with five setae terminally. Exopod with one short seta on outer margin and with one short and one long setae terminally.

Remarks: The new species is highly similar to *Larsenotanais amabilis* described by Błażewicz-Paszkowycz (2007) from the West Antarctic. If it were not pereonites 2 and 3, which are short in *L. amabilis* and almost square in *L. kamchatikus*, these two species might have been considered to be conspecific. The disjunct distribution of the species supports the belief that we dealing with two separate but congeneric species.

Distribution: Species known only from type locality.

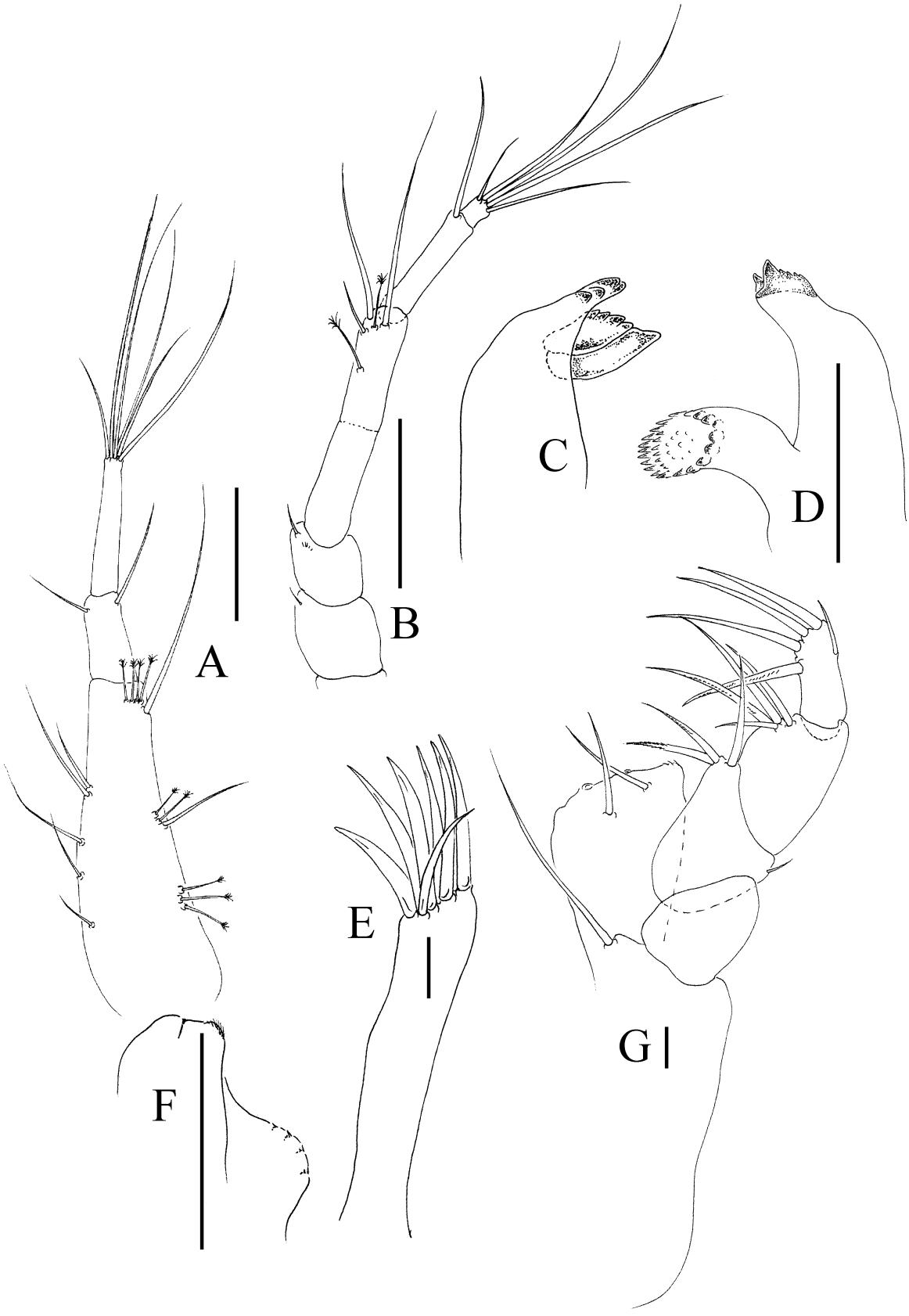

FIGURE 8. *Larsenotanais kamchatikus*, female A, Antennule; B, Antenna; C, Left mandible; D, Right mandible; E, Maxillule; F, Labium; G, Maxilliped. Scale = 0.1 mm.

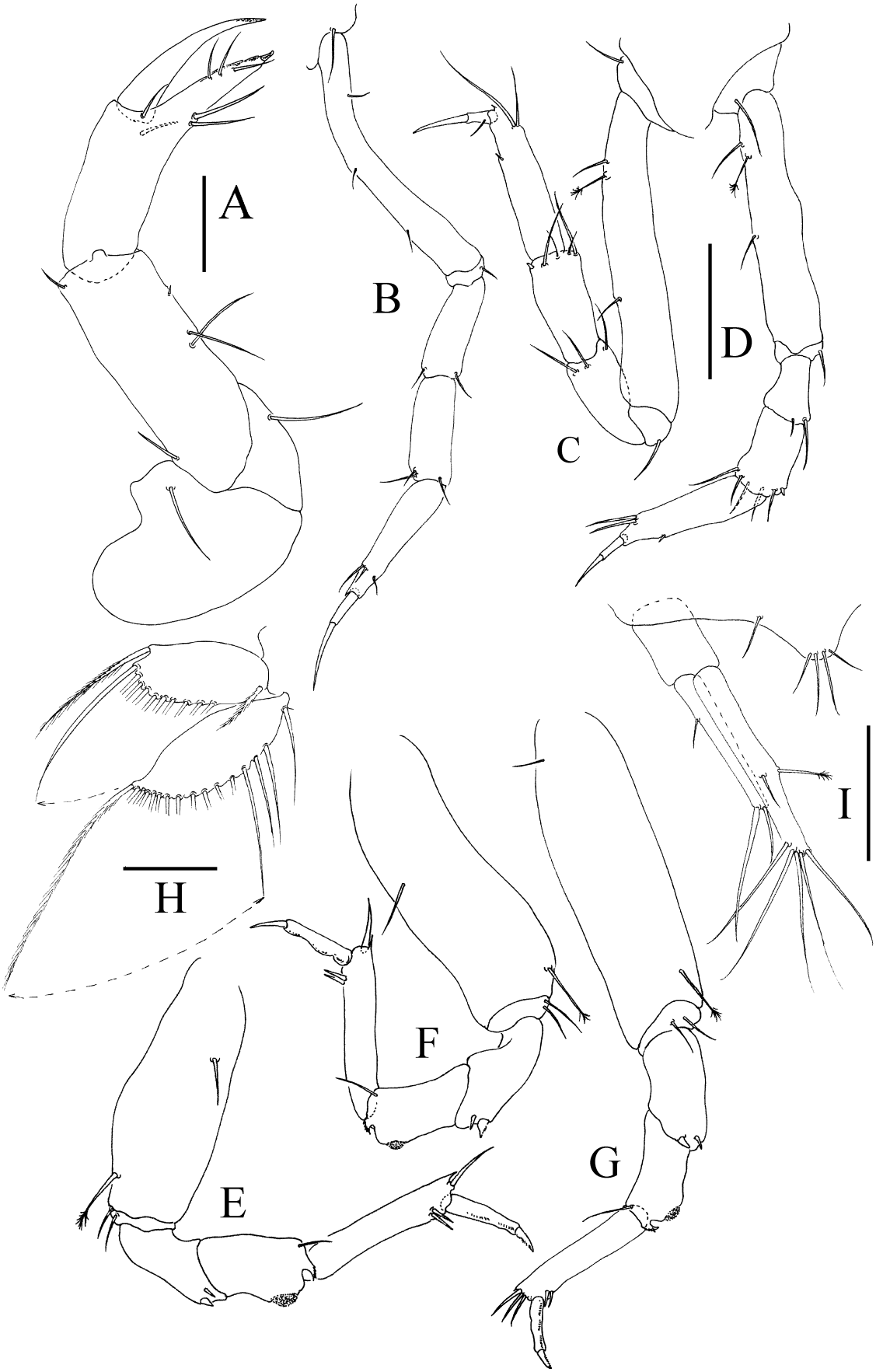

FIGURE 9. *Larsenotanais kamchatikus*, female A, Cheliped; B, Pereopod 1; C, Pereopod 2; D, Pereopod 3; E, Pereopod 4; F, Pereopod 5; G, Pereopod 6; H, Pleopod; I, Uropod. Scale = 0.1 mm.

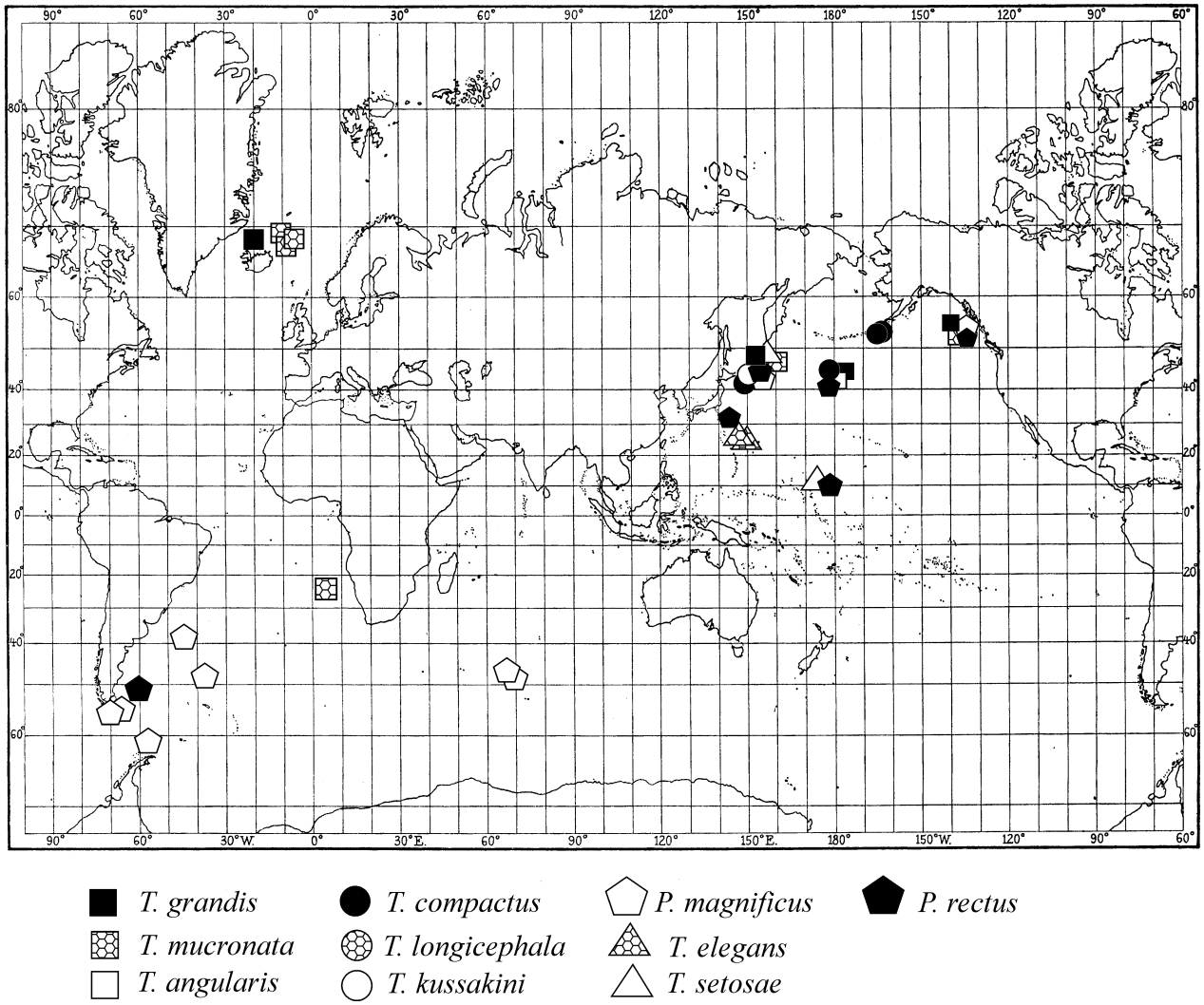

FIGURE 10. Distribution of abyssal nototanaids and typhlotanaids from Kurile-Kamchatka region based on literature data (Hansen, 1913, Kudinova-Pasternak 1966, 1970, 1973, 1976, 1978) and present study.

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