



## Suborders Apseudomorpha Sieg, 1980 and Neotanaidomorpha Sieg, 1980\*

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### Abstract

The tanaidacean material from the Kurile-Kamchatka Trench and Japan Trench included four apseudomorphan species and two new neotanaidomorphan species of the genus *Neotanais*. The apseudomorpha comprised a new species of *Fageapseudes*, herein moved to the subfamily Leviapseudinae, and three species of *Carpoapseudes*, two newly described here, the third too damaged to attribute to a species. *Fageapseudes brachyomos* n.sp. is characterized by a second pereonite wider than long; *Carpoapseudes spinigena* n.sp. is the second species of the genus to show lateral spiniform apophyses on the cephalon anterior to the branchial chambers; *C. varindex* n.sp. has a unique combination of elongate triangular rostrum with only slight basal shoulders, a ten-articled antennular flagellum, an “auricular” expansion on the proximo-ventral margin of the male cheliped propodus and a distal constriction on the male cheliped dactylus. *Neotanais oyashio* n.sp. is close to *N. barfoedi*, but is distinct in its pleotelson morphology, its pleopod setation and the shape of the male cheliped carpus, *inter alia*. *Neotanais kuroshio* n.sp. has a unique combination of only five dorsal setae on the cheliped carpus, a cheliped dactylus longer than the fixed finger, no ventral pleonite spurs, and a uropod exopod only half the length of the proximal endopod segment.

**Key words:** Japan, deep-sea, Apseudomorpha, Neotanaidomorpha, *Fageapseudes*, *Carpoapseudes*, *Neotanais*

### Introduction

The tanaidacean material included four apseudomorphan species, of which three are described herein, and two new neotanaidomorphan species of the genus *Neotanais*, both described herein. The apseudomorpha comprised a new species of *Fageapseudes*, herein moved to the subfamily Leviapseudinae, and three species of *Carpoapseudes*, two newly described here, the third too damaged to attribute to a species.

The previous history of tanaidacean recording in Japanese waters is reviewed by Larsen & Shimomura (2006, 2007), who added two new species of apseudomorph to bring the known list of Japanese apseudomorpha to ten and a number of tanaidomorphan species. These authors also discussed the hydrographic context of the waters around Japan.

Three species of *Neotanais* have been described previously from the Japanese region of the north-western Pacific, *N. insignis* Kudinova-Pasternak, 1978, from the Marianas Trench at 8215–8225 metres depth, *N. wolffi* Kudinova-Pasternak, 1966, from the Japanese Pacific at 6126–6207 metres and *N. tuberculatus* Kudinova-Pasternak, 1970, from east of the Japanese Trench at 4320–7295 metres. The present material is compared with these. All neotanaidomorpha have been recorded from deep water (> 200 metres mostly > 1000 metres).

Surprisingly, there have been, to date, no species of *Carpoapseudes* described from the northwest Pacific Ocean; the novelty of the present material is therefore, perhaps, not surprising. *Carpoapseudes* is also a genus characteristically found in deep waters (> 300 metres), although there is a dubious record of *C. austroafricanus* (Barnard, 1940) at 35 metres in the Red Sea (Makkaveeva 1971).

The genus *Fageapseudes* is a rarer genus, largely, but less obligately, deep-sea in distribution. The two described species of *Fageapseudes* are *F. retusifrons* (Richardson, 1912) from the western Mediterranean at depths of between 8 and 740 metres and *F. bicornis* (Kudinova-Pasternak, 1973) from the Sea of Okhotsk at > 3300 metres.

Morphological terminology used herein follows that of Bamber (2005). The higher taxonomy is largely based on Guțu & Sieg (1999).

## Systematics

**Suborder Apseudomorpha Sieg, 1980**

**Superfamily Apseudoidea Leach 1814**

**Family Apseudidae Leach, 1814**

**Subfamily Leviapseudinae Sieg 1980**

**Genus *Fageapseudes* Băcescu & Guțu, 1971**

***Fageapseudes brachyomos* n.sp.**

Figures 1–3

**Material examined.** **Holotype**, male (KMNH IvR 500.151), station XR-12, 41°37.67' – 41°37.08'N 146°54.19'–146°52.72'E, 5473–5484 metres, 4 m ORE beam trawl, 23 September 2001. **Paratypes:** 1 female (KMNH IvR 500.152), station TD-8, 39°15.54'–39°17.01'N 144°45.37'–144°42.46'E, 5733–5762 metres, 4 m ORE beam trawl, 29 September 2001 (dissected).

**Diagnosis.** Characteristic of the genus, but second pereonite 1.5 times as wide as long with stout, blunt anterolateral spine-like apophyses, antennule with accessory flagellum of four segments and main flagellum of 13 (female) or 14 (male) segments, first pereopod carpus longer than merus, pleopod basis naked, uropod exopod of nine segments, endopod of about 18 segments.

**Etymology.** Named derived from the Greek, *brachy* – short, and *omos* – shoulder (noun in apposition), referring to the truncated pereonite 2 in comparison with other species of the genus.

### **Description of male.**

**Body** (Fig. 1A), dorsoventrally flattened, elongate, holotype 9.6 mm long (anterior tip of cephalon to posterior of pleotelson), 11 times as long as wide, narrower posteriorly.

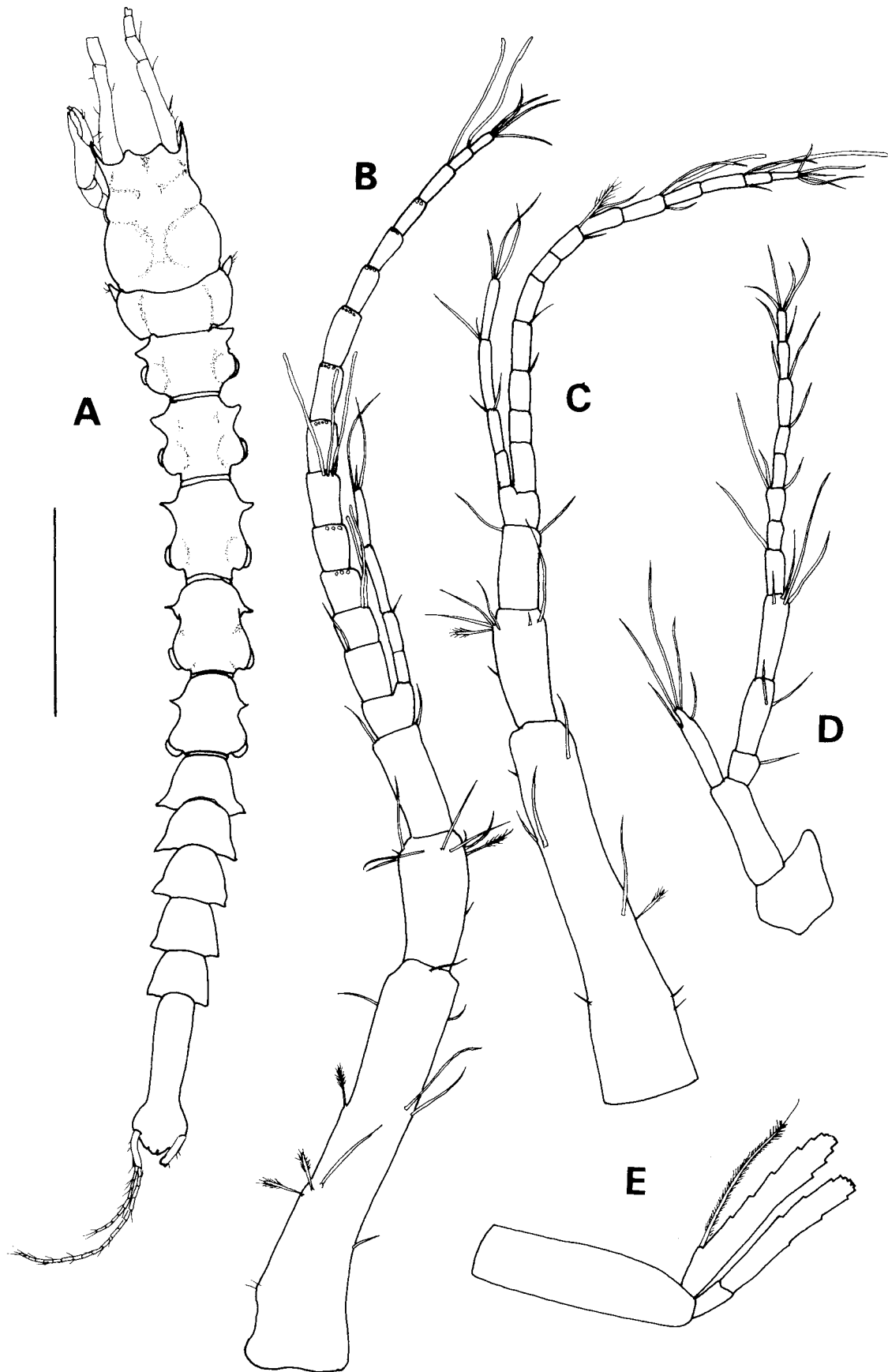
**Cephalothorax.** Subrectangular, 1.25 times as long as wide, naked, anterior margin centrally concave without rostrum. Eyes absent; eyelobes modified to prominent spine-like apophyses directed anteriorly and around bases of antennules.

**Pereonites.** Pereonite 1 shortest, about one-third as long as cephalothorax, lateral margins uniformly convex. Pereonite 2 half as long again as pereonite 1. Pereonites 3 and 6 subequal, twice as long as pereonite 1. Pereonites 4 and 5 equal, 1.2 times as long as pereonite 3 (all pereonites respectively 2.7, 1.5, 1.1, 0.8, 0.8 and 1.0 times as wide as long). Pereonites 2 to 6 with anterolateral spine-like apophyses, blunt on pereonites 2 and 3, and expanded postero-laterally at attachment of coxae. Blunt ventral hyposphenia present on pereonites 1 to 5. Pereonite 6 with mid-ventral penial tubercle.

**Pleon.** As long as pereonites 2 to 6 together, of five free subequal bell-shaped pleonites bearing pleopods. Pleonites dorsally convex, as wide as long, laterally expanded posteriorly.

**Pleotelson** long and slender, laterally expanded at attachment of uropods, as long as last three pleonites, three times as long as wide.

**Antennule** (Fig. 1B). Peduncle 4-articled. Proximal article elongate, nearly six times as long as wide, setose as figured. Second article 0.3 times as long as article 1, with distal crown of setae. Third article just shorter than article 2, fourth article one-third as long as third article, naked. Main flagellum of 14 segments, articles 2 to 13 bearing 2, 3, 3, 3, 4, 4, 3, 3, 3, 2, 1 and 1 aesthetascs respectively. Accessory flagellum of four segments.



**FIGURE 1.** *Fageapseudes brachyomos* n.sp. A, holotype male, dorsal; B, male antennule (most aesthetascs shown only by their bases); C, female antennule; D, antenna; E, third pleopod (most setae of rami not shown). Scale line = 2 mm for A, 0.5 mm for B to E.

*Antenna* (Fig. 1D). Inner process on proximal peduncle article with smooth margin. Article 2 naked, bearing elongate squama with five simple marginal setae. Peduncle article 3 as long as wide, with one seta. Articles 4 and 5 subequal, three times as long as article 3. Flagellum of eight segments.

*Mouthparts*. Labrum rounded, simple, distally setose; small epistome present. Right mandible (Fig. 2A) with strong, crenulated pars incisive, setiferous lobe with five, mainly bifurcate setae, pars molaris slender, blunt with fine marginal setae; mandibular palp of three articles, proximal article just longer than wide with single medial seta, article 2 three times as long as article 1 with two denticulate and five simple setae, article 3 half length of article 2 with eight inner setae and two longer distal setae, proximal of which is denticulate. Left mandible (Fig. 2B) as right but with crenulate lacinia mobilis; article 1 of palp with two setae. Maxillule (Fig. 2C) inner endite with rounded inner apophysis and finely setose margins, with five variously compound distal setae; outer endite with ten distal spines and two subdistal setae; palp of two articles, distally with five setae. Maxilla (Fig. 2D) outer lobe of outer endite with two medially setulated setae on outer margin; inner lobe of movable endite with simple setae; outer lobe of inner endite with two simple, one setulated, and five multifurcate spiniform setae; inner lobe of fixed endite with rostral row of 21 setae. Labium (Fig. 2E) with serrated outer margin and setulose inner margin, palp with fine lateral setules and three simple distal setae. Maxilliped (Fig. 2F). Basis with small inner distal seta; palp article 1 with small seta on outer margin, long distal seta and field of fine setules on inner margin; palp article 2 longer than wide, with rows of numerous short setae on inner margin; outer margin with two simple setae distally; palp article 3 as long as wide, with two stout and four finer simple setae along inner margin; palp article 4 with five distal setae. Endite with compound (“leaf-like”) inner caudo-distal seta. Epignath large, cup-shaped, with inner lobe and laterally setose distal seta (Fig. 2G).

*Cheliped* (Fig. 2H). Slender. Basis 2.4 times as long as wide, dorsally only with small distal seta, ventrally with stout subdistal spine. Exopodite present, 3-articled, second article naked, short, distal article with three plumose setae. Merus elongate with ventrodiscal group of setae and small spine. Carpus slender, 3.5 times as long as wide, with four simple setae along ventral margin. Chela slender, ventral margin with two distal setae; three setae near articulation of fixed finger; cutting edge of fixed finger with small, rounded proximal apophysis and row of setules. Dactylus with sparse marginal setae but no apophyses on cutting edge.

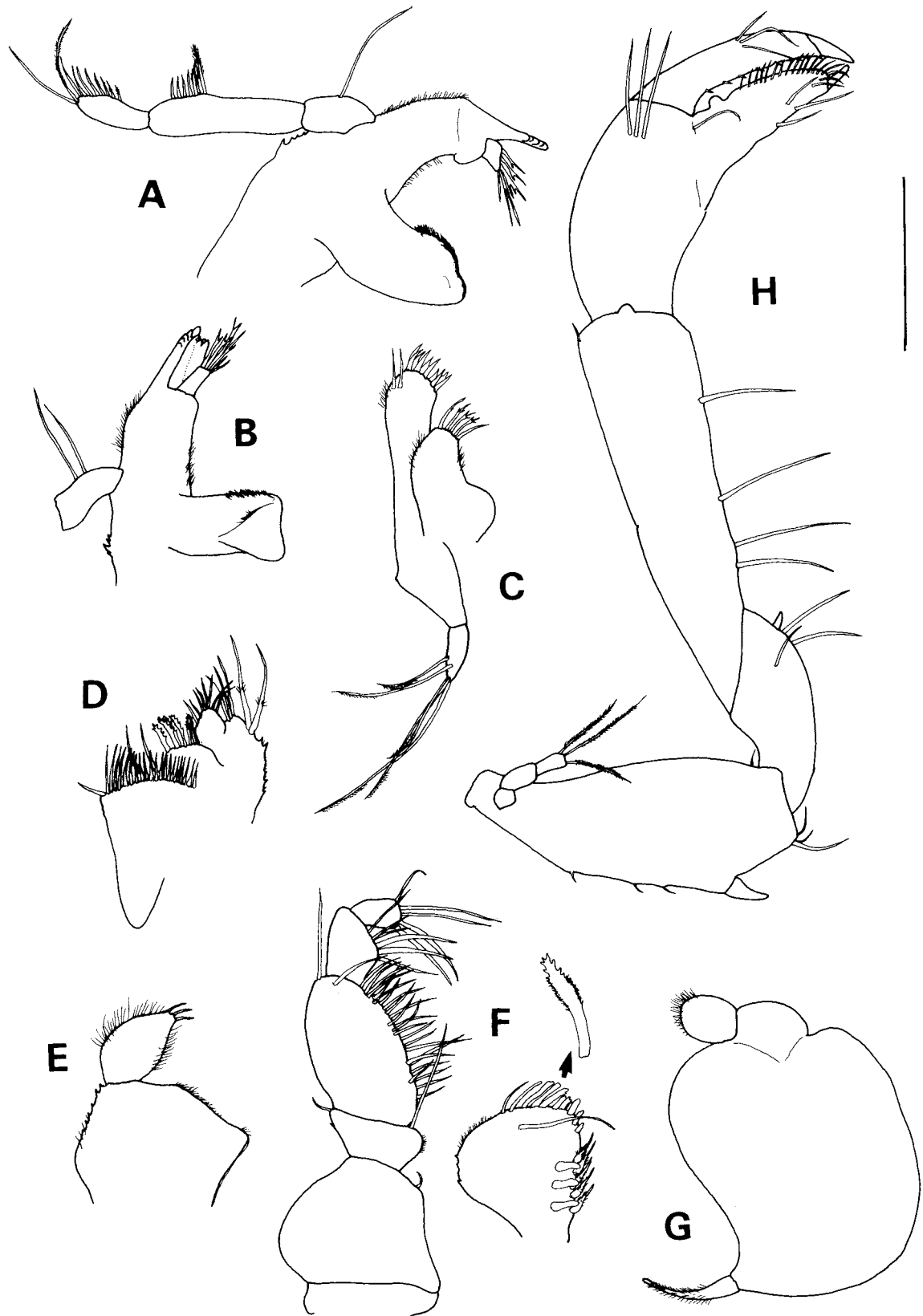
*Pereopod 1* (Fig. 3B). With pronounced, setose spine-like apophysis on coxa. Basis stout, 3.8 times as long as wide with small ventrodiscal spine. Exopodite present, 3-articled, article 2 naked, article 3 with two distal plumose setae. Ischium with single simple ventrodiscal seta. Merus widening distally, with three ventral setae, one stout ventrodiscal spine, three subdistal inner setae and four dorsodistal simple setae. Carpus longer than merus, compact, less than twice as long as wide, with dense row of dorsal marginal setae, one dorsodistal blunt spine and two ventral blunt spines interspersed with fine setae. Propodus shorter than merus and 1.4 times as long as wide, with two dorsal spines in distal half and five ventral blunt spines interspersed with single setae. Dactylus stout, with three mid-dorsal fine setae and four ventral denticulations; unguis short.

*Pereopod 2* (Fig. 3C). More slender than pereopod 1. Basis four times as long as wide with three ventrodiscal setae. Merus half as long as carpus, widening distally, with tuft of dorsodistal setae and one ventrodiscal slender spine. Carpus elongate, with tuft of dorsodistal setae, ventrally with marginal setae and slender subdistal spine. Propodus two-thirds as long as carpus, with three slender spines ventrally and tuft of dorsodistal setae. Dactylus slender with three mid-dorsal fine setae and ventral denticulation; unguis slender, pointed.

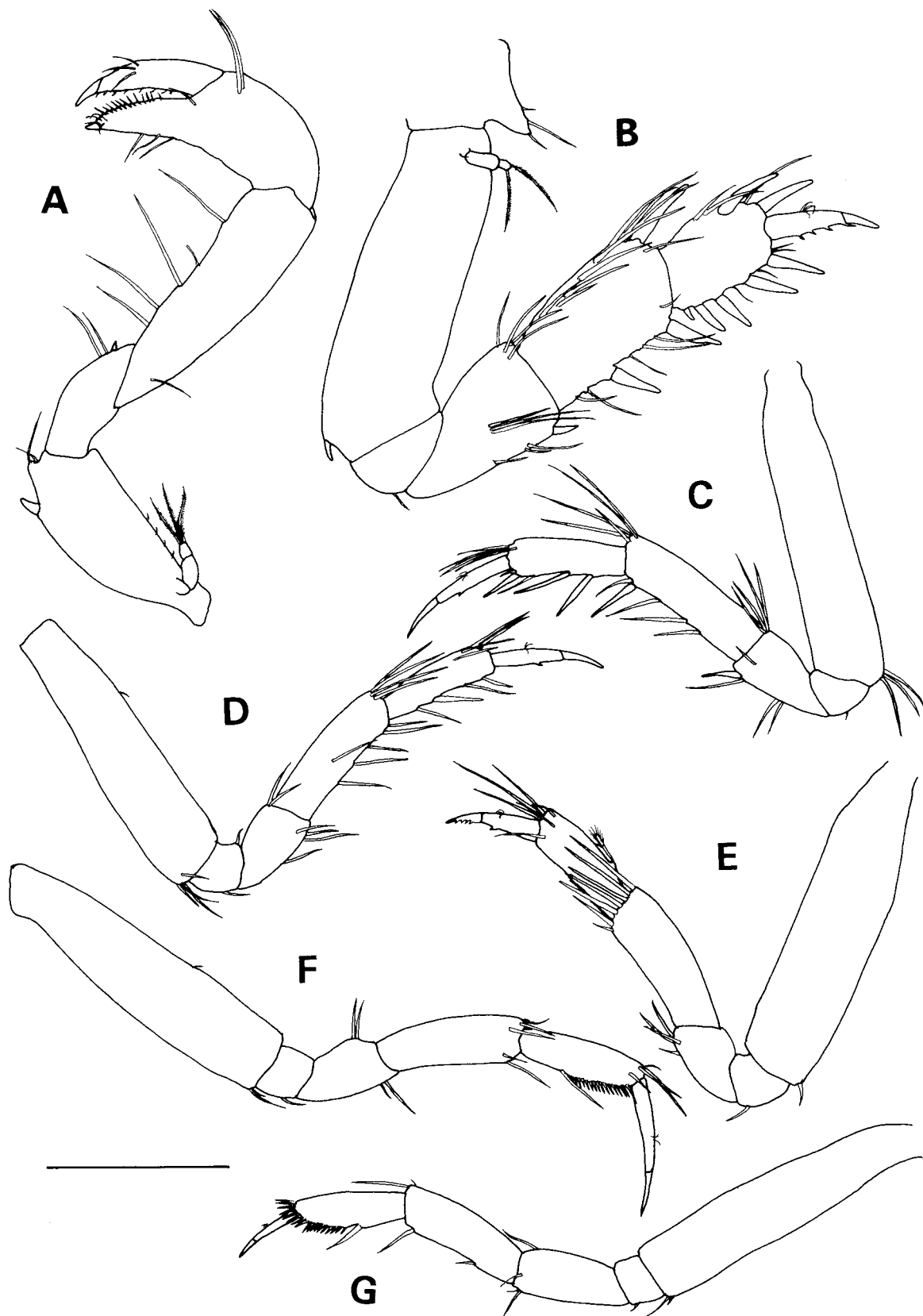
*Pereopod 3* (Fig. 3D). Similar to pereopod 2 but merus without spine. Carpus with only one ventral spine.

*Pereopod 4* (Fig. 3E). Similar to pereopod 2 but merus dorso-distally naked. Carpus with distal crown of about 12 setae more than half as long as propodus. Dactylus compact, unguis with four ventral denticulations.

*Pereopod 5* (Fig. 3F). Merus more than half length of carpus. Propodus just shorter than carpus, with ventral row of short leaf-like spines in distal two-thirds. Dactylus and unguis slender, together as long as propodus.



**FIGURE 2.** *Fageapseudes brachyomus* n.sp., A, right mandible; B, left mandible (distal palp articles not shown); C, maxillule; D, maxilla; E, labium; F, maxilliped with endite and detail of inner caudo-distal seta; G, epignath; H, male cheliped. Scale line = 0.3 mm.



**FIGURE 3.** *Fageapseudes brachyomus* n.sp. A, female cheliped; B to G, pereopods 1 to 6 respectively. Scale line = 0.6 mm.

*Pereopod 6* (Fig. 3G). Sparsely setose; propodus distally with row of leaf-like spines surrounding medial and distal part of article. Dactylus and unguis two-thirds as long as propodus.

*Pleopods* (Fig. 1E). All alike. Basis elongate, naked. Endopod just shorter than exopod with proximal articulation; both rami slender, respectively with 11 and 13 plumose setae. Outer proximal seta on exopod sub-distally with robust setules, distally naked.

*Uropod* (Fig. 1A). biramous, both rami filiform, multi-segmented. Basis with two setae distally. Exopod half as long as endopod, with nine segments. Endopod elongate, as long as fifth pleonite and pleotelson together, with about 18 segments.

**Distinctions of female.** Generally as male.

*Pereonites* with sharply pointed hyposphenia.

*Antennule* (Fig. 1C) main flagellum of 13 segments with single aesthetascs on segments 9 and 11 only.

*Cheliped* (Fig. 3A) proportionately smaller, without proximal apophysis on fixed finger. *Pleopods* absent.

**Remarks.** There were two described species of *Fageapseudes*, *F. retusifrons* (Richardson, 1912) from the western Mediterranean, and *F. bicornis* (Kudinova-Pasternak, 1973) from the Sea of Okhotsk. The proximity of the latter species (56°10' to 58°16'N) suggested that the present material may be conspecific. However, there are a large number of morphological differences (vide Băcescu & Guțu 1971; Kudinova-Pasternak 1973) which suggest *F. brachyomos* n.sp. is specifically distinct rather than an example of geographical variation.

Most conspicuously, the anterior pereonites of both of the other species have slender, pointed anterolateral apophyses, those of *F. brachyomos* being stouter and blunter, and pereonite 2 longer than wide (much wider than long in *F. brachyomos*). The antennular and antennal flagella both have more segments in *F. brachyomos* (main flagellum 13 to 14, accessory flagellum four, antennal flagellum eight) than either *F. bicornis* (eight, two and six respectively) or *F. retusifrons* (ten, two and seven respectively). With the additional complement in the male of numerous aesthetascs on the antennule, and the large penial tubercle, this difference might be related to greater maturity of the present specimen: yet both of the other species show more marked dimorphism of the male cheliped, with a stouter and more robust chela bearing a larger tooth-like apophysis proximally on the fixed finger. Both of the previous species have the carpus of pereopod 1 shorter than the merus (longer in *F. brachyomos*) and a reduced pleopod in the female (absent in *F. brachyomos*). The uropod of the present species also has more segments (exopod nine, endopod 18) than either *F. bicornis* (5, 8) or *F. retusifrons* (five, 12). There are also a number of differences in setation between *F. brachyomos* and *F. bicornis*, notably in the mouthparts and pleopod basis.

The presence of a compound (“leaf-like”) inner caudo-distal seta on the maxilliped endite (Fig. 2F) suggests that this genus should be in the Leviapseudinae rather than the Apseudinae, and indeed the morphology of the pleonites and pleotelson are consistent with species of that subfamily.

### Genus *Carpoapseudes* Lang 1968

#### *Carpoapseudes spinigena* n.sp.

Figures 4–6

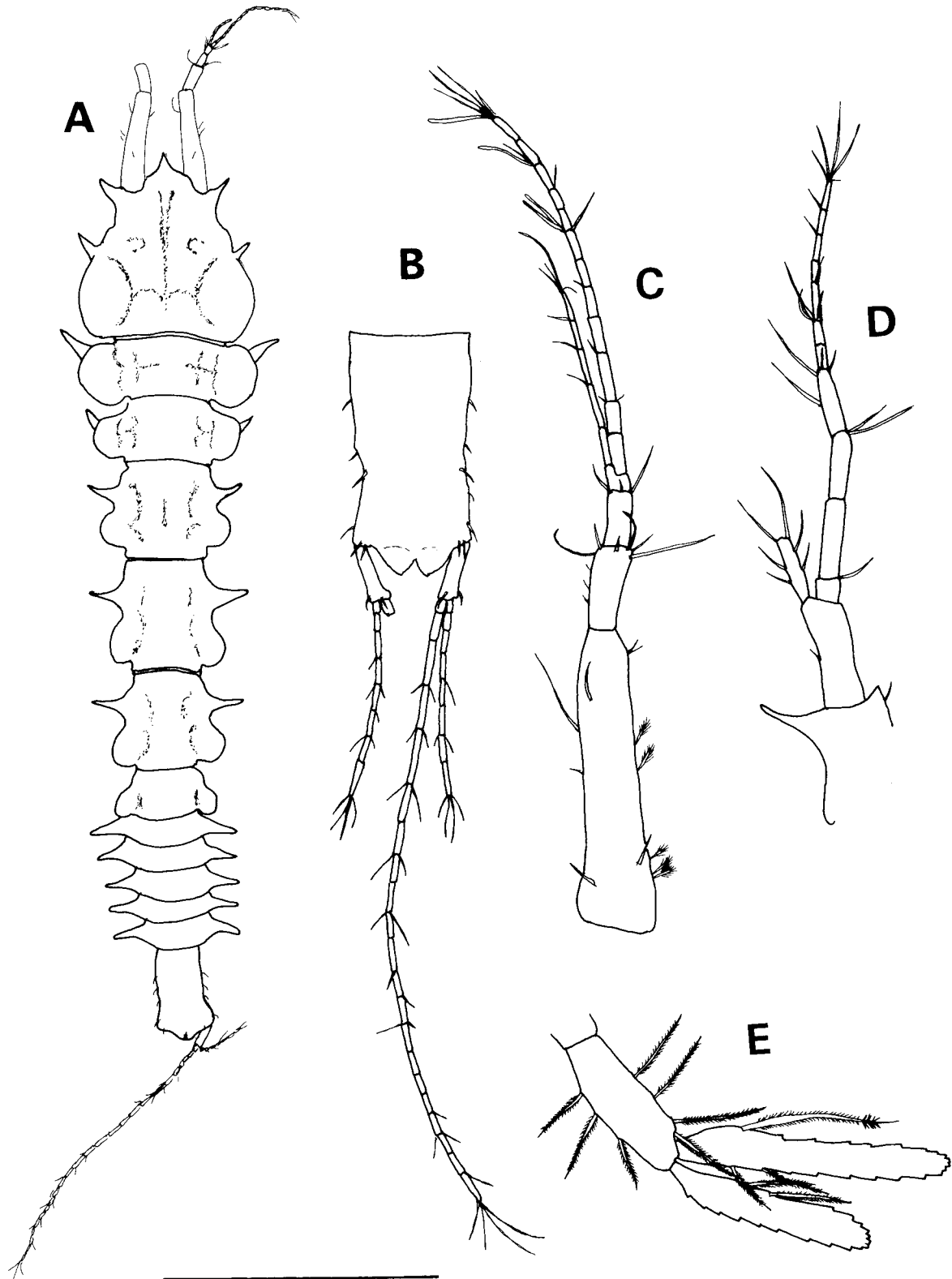
**Material examined.** **Holotype**, female (KMNH IvR 500.153), station XR-2(1), 42°27.52'–42°26.85'N 144°15.47'–144°12.98'E, 974–965 metres, 3 m ORE beam trawl, 15 September 2001. **Paratypes:** 1 brooding female, 2 females with oostegites, 7 females without oostegites, 6 males (KMNH IvR 500.154), 1 female with oostegites (dissected, KMNH IvR 500.155), same locality.

**Diagnosis.** Typical *Carpoapseudes* but with lateral spiniform apophyses at anterior margin of branchial chambers. Cephalothorax with conspicuous pointed rostrum with “shoulders” at its base, as long as ocular spiniform apophyses; pleotelson less than half length of whole pleon, 6.2 times as long as wide. No proximal auricular expansion on the propodus of the male cheliped.

**Etymology.** From the Latin, meaning “spine-cheek” (noun in apposition), owing to this species having lateral spiniform apophyses on the anterior margin of the branchial chamber.

**Description of female**

*Body* (Fig. 4A). Dorsoventrally flattened, elongate, holotype 9.8 mm long (tip of rostrum to posterior of pleotelson), 6 times as long as wide, narrower posteriorly.



**FIGURE 4.** *Carpoapseudes spinigena* n.sp. A, holotype, dorsal; B, pleotelson and uropods; C, antennule; D, antenna; E, pleopod. Scale line = 3 mm for A, 1 mm for B to E.



*Cephalothorax*. Sub-triangular, as long as wide, anterior margin with conspicuous pointed rostrum with “shoulders” at base. Eyes absent; eyelobes modified to prominent spine-like apophyses directed antero-laterally; lateral spiniform apophyses at anterior margin of branchial chambers.

*Pereonites*. Pereonites 1 and 2 subequal, about one-third as long as cephalothorax, lateral margins uniformly convex. Pereonites 3, 4 and 5 subequal (4 longest), 1.5 times as long as pereonite 1, with anterolateral spine-like apophyses and expanded postero-laterally at attachment of coxae. Pereonite 6 shortest, 0.8 times as long as pereonite 1, trapezium-shaped, without lateral apophyses (all pereonites respectively 2.8, 2.4, 1.3, 1.0, 1.1 and 2.1 times as wide as long). Ventral hyposphenia present on pereonites 2, 3 and 5.

*Pleon* twice as long as pereonite 4, of five free subequal pleonites bearing pleopods. Pleonites dorsally convex, more than twice as wide as long, laterally expanded by spiniform apophyses.

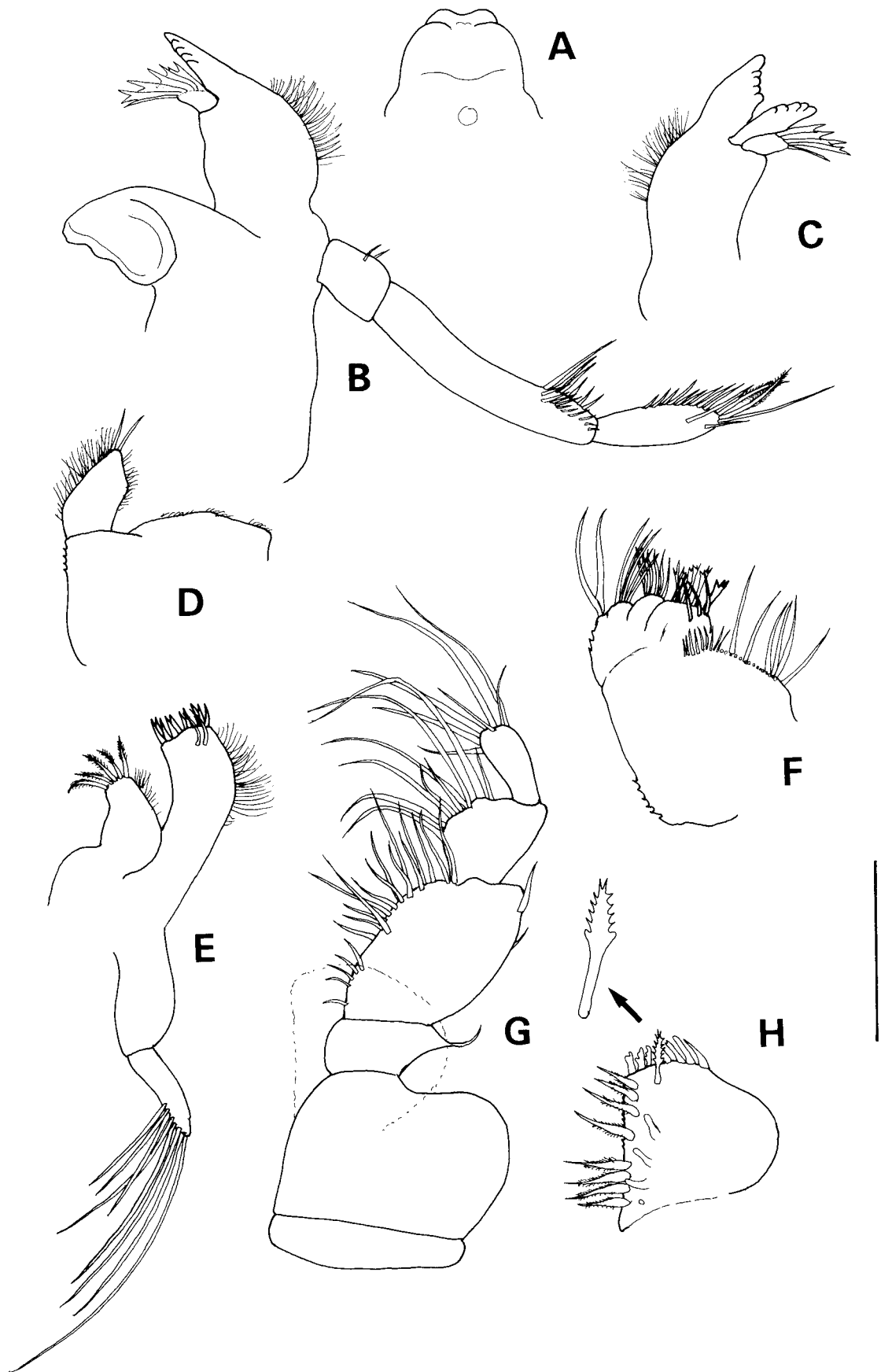
*Pleotelson* (Fig. 4B) long and slender, 0.4 times as long as whole pleon, 6.2 times as long as wide, with sparse lateral setae.

*Antennule* (Fig. 4C). Peduncle 4-articled. Proximal article elongate, 4.7 times as long as wide, setose as figured. Second article 0.3 times as long as article 1, with distal crown of longer and shorter setae. Third article two-thirds length of second, fourth article one-third as long as third, naked. Main flagellum of 12 segments, articles 7, 10 and 12 bearing two, one and one aesthetascs respectively. Accessory flagellum of five segments.

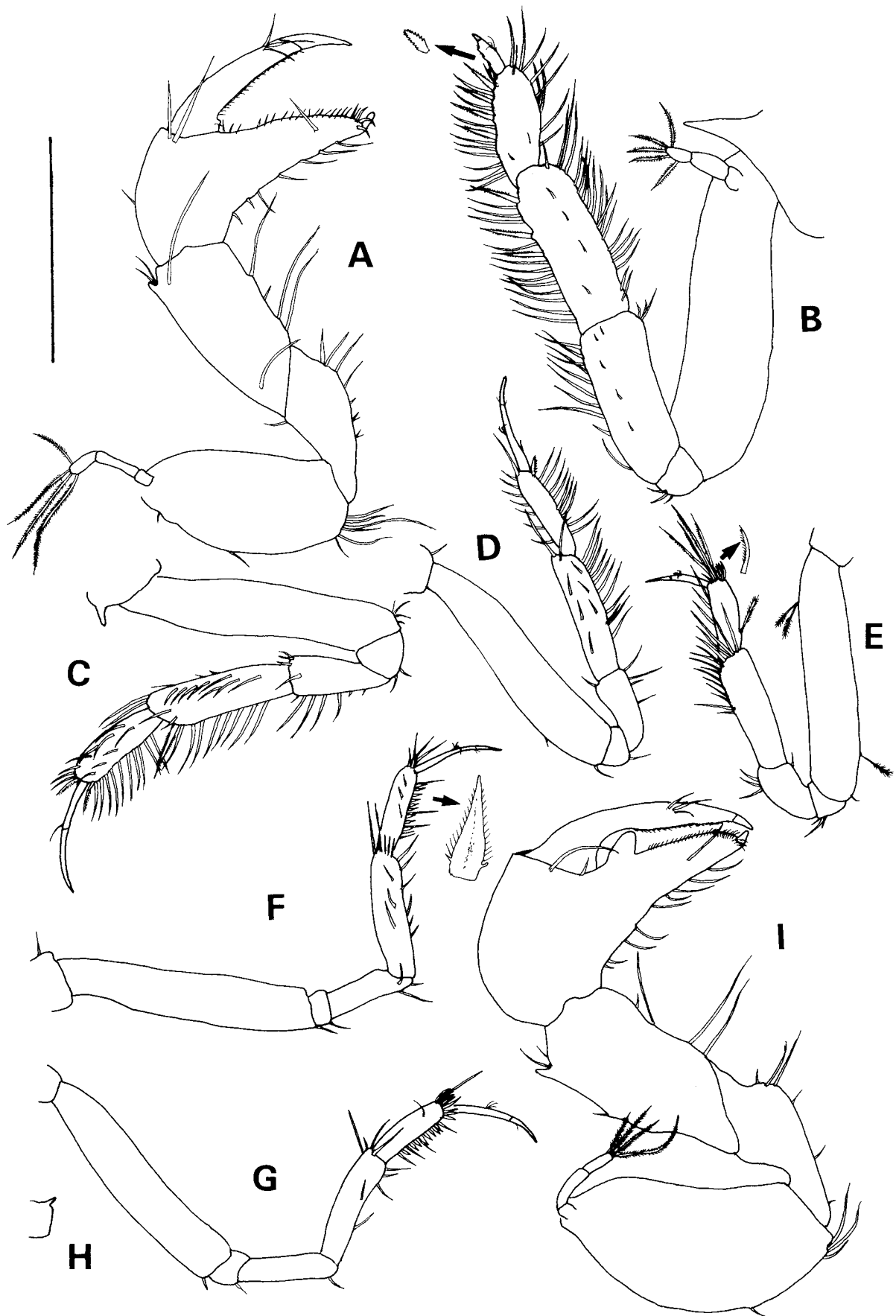
*Antenna* (Fig. 4D). Proximal peduncle article with outer spiniform apophysis. Article 2 bearing elongate squama with six simple marginal setae. Peduncle article 3 as long as wide, with one seta. Articles 4 slightly longer than article 5 and three times as long as article 3. Flagellum of eight segments.

*Mouthparts*. Labrum (Fig. 5A) rounded simple, distally naked; stout, sharp epistome present. Right mandible (Fig. 5B) with outer margin finely setose, bearing strong, crenulated pars incisive, setiferous lobe with six mainly bifurcate setae, pars molaris robust, blunt; mandibular palp of three articles, proximal article just longer than wide with two small medial setae, article 2 3.4 times as long as article 1 with two parallel rows of six longer and ten shorter simple setae in distal third; article 3 half length of article 2 with nine inner simple setae, two ventral subdistal simple setae, and three longer distal setae, inner two of which are finely denticulate. Left mandible (Fig. 5C) as right but with crenulate lacinia mobilis. Maxillule (Fig. 5E) inner endite with finely setose outer margin and five finely setulate distal setae; outer endite with ten distal spines and two subdistal setae, outer margin finely setose; palp of two stout articles, distally with eight setae. Maxilla (Fig. 5F) with serrations on outer margin; outer lobe of moveable endite with two simple setae on outer margin; inner lobe of movable endite with simple setae; outer lobe of fixed endite with two simple, two bifurcate, and five trifurcate spiniform setae and three inner subdistal spines; inner lobe of fixed endite with rostral row of 24 setae guarding six longer setae. Labium (Fig. 5D) with distally-serrated outer margin and setulose distal margin, palp with fine lateral setules and two simple distal setae. Maxilliped (Fig. 5G). Basis naked; palp article 1 with single seta on outer margin; palp article 2 longer than wide, with rows of numerous short setae on inner margin, outer margin with two simple setae sub-distally; palp article 3 as long as wide, with three shorter and six longer simple setae along expanded inner margin; palp article 4 with seven distal setae. Endite (Fig. 5H) with compound (“leaf-like”) inner caudo-distal seta and stout, spatulate, distal spines. Epignath large, cup-shaped, with inner lobe and distal seta.

*Cheliped* (Fig. 6A). Not slender. Basis twice as long as wide, dorsally naked, ventrally with tiny proximal seta, mid-ventral seta and tuft of six distal setae. Exopodite present, 3-articled, second article naked, attenuate, distal article with four plumose setae. Merus elongate, narrowing proximally, with single dorsodistal seta and ventral row of setae, often paired. Carpus twice as long as wide, with four simple setae along ventral margin, proximal and distal simple setae just below dorsal margin, and subdistal dorsal apophysis with paired adjacent setae. Chela fingers longer than palm, ventral margin with seven setae; two setae near articulation of fixed finger; cutting edge of fixed finger with row of fine setules interspersing squared “teeth”, but no apophyses, distal claw rounded. Dactylus with fine setae but no apophyses on cutting edge, distal claw pointed.



**FIGURE 5.** *Carpoapseudes spinigena* n.sp., A, labrum; B, right mandible; C left mandible (palp not shown); D, labium; E, maxillule; F, maxilla (most setae of rostral row shown only by their bases); G, maxilliped; H, maxilliped endite, with detail of inner caudo-distal seta. Scale line = 0.3 mm.



**FIGURE 6.** *Carpoapseudes spinigena* n.sp., A, female cheliped; B, pereopod 1, with detail of distal propodal compound spine; C to G, pereopods 2 to 6 respectively; H, coxa of pereopod 6 of male; I, cheliped of male. Scale line = 1 mm.

*Pereopod 1* (Fig. 6B). With pronounced spine-like apophysis on coxa. Basis stout, 3.5 times as long as wide, naked. Exopodite present, 3-articled, article 2 naked, article 3 with five distal plumose setae. Ischium with three simple ventrodorsal setae. Merus half as long as basis, with rows of ten ventral setae and five fine outer mesial setae, and three dorsodorsal simple setae. Carpus slightly longer than merus, three times as long as wide, with dense rows of dorsal and ventral marginal setae, ventrally with three finely pectinate spines in distal half, and four mesial setae. Propodus shorter than merus, with dense row of dorsal marginal setae, ventral marginal setae interspersed with four finely pectinate spines in distal half, distally with short, bilaterally-denticulate compound spine. Dactylus stout, with three mid-dorsal fine setae and three ventral denticulations; unguis short.

*Pereopod 2* (Fig. 6C). More slender than pereopod 1. Coxa with small spiniform apophysis. Basis 4.5 times as long as wide with tuft of ventrodorsal setae. Merus 0.6 times as long as carpus, with elongate ventral setae in distal half. Carpus elongate, with rows of ventral and mesial setae, longer paired dorsodorsal setae and ventrodorsal pectinate spine. Propodus two-thirds as long as carpus, similarly setose but with ventrodorsal pectinate spine. Dactylus slender with fine distal seta, unguis slender, as long as dactylus, the two together longer than propodus.

*Pereopod 3* (Fig. 6D) similar to pereopod 2, but propodus with ventrodorsal bilaterally-denticulate compound spine. Unguis shorter than dactylus.

*Pereopod 4* (Fig. 6E). Similar to pereopod 2 but basis with plumose sensory setae. Merus proximally naked. Carpus with ventrodorsal to distal crown of about 16 setae more than half as long as propodus. Propodus with mid-dorsal plumose sensory seta, dorsodorsal tuft of five short and four long finely denticulate setae. Dactylus plus claw shorter than propodus and shorter than longest dorsodorsal propodal setae.

*Pereopod 5* (Fig. 6F). Coxa without apophyses. Merus more than half length of carpus. Propodus just shorter than carpus, with ventral row of 16 short leaf-like, bilaterally-setulose spines. Dactylus and unguis slender, together as long as propodus.

*Pereopod 6* (Fig. 6G) similar to pereopod 5, but 14 ventral leaf-like propodal spines extending to a further 13 around distal margin of article.

*Pleopods* (Fig. 4E). All alike. Basis elongate, with four dorsal and three ventral plumose setae. Endopod shorter than exopod without proximal articulation; both rami slender, with 21 plumose setae. Outer proximal seta on exopod sub-distally with robust setules, distally naked.

*Uropod* (Fig. 4B). Biramous, both rami filiform, multi-segmented. Basis with two setae distally. Exopod less than half as long as endopod, with eight segments. Endopod elongate, three times as long as pleotelson, with 21 segments.

**Distinctions of male.** Generally as female.

*Pereonites* with sharply pointed hyposphenia, blunt penial tubercle on pereonite 6.

*Antennule* main flagellum of 17 segments, with no aesthetascs on segments 1, 2, 16 and 17, two on segments 5 and 6, and with single aesthetascs on remaining segments.

*Cheliped* (Fig. 6I) proportionately larger, without lateral carpal setae, with rounded proximal apophysis on fixed finger.

*Pereopods.* Coxae of pereopods 5 and 6 each with small, spiniform apophysis (Fig. 6H).

**Remarks.** The only other species of *Carpoapseudes* which have lateral spiniform apophyses on the anterior margin of the branchial chamber are *C. auritocheles* Kudinova-Pasternak, 1975, and *C. caraspinosus* Dojiri & Sieg, 1997. However, the apophyses in *C. auritocheles* are behind the midline of the cephalon, and this species also has a slender rostrum longer than the ocular apophyses, a pleotelson longer than four pleonites together, a more slender pereopod 1 dactylus, a proximal auricular expansion on the propodus of the male cheliped, and a number of differences in the mouthpart morphology (Kudinova-Pasternak 1975). Although poorly described and figured, it is apparent that *C. caraspinosus* shows a number of similarities to *C. spinigena* n.sp., including the coxal spiniform apophysis on pereopod 2, and the subdistal dorsal apophysis on the cheliped carpus; however, it

has anterior spiniform apophyses on pereonite 6, unlike the present species, as well as more numerous segments in the flagella of the antennule, a more slender cheliped and pereopod 1, the latter having the merus as long as or slightly longer than the carpus (shorter in *C. spinigena*).

Although Guțu (1996) includes a lack of lateral spiniform apophyses on the cephalon in his generic diagnosis for *Carpoapseudes*, the trapezoid sixth pereonite and the pereopod carpus being longer than the merus are characteristic of this genus and not of *Leviapseudes*, the only other genus in this subfamily.

### ***Carpoapseudes varindex* n.sp.**

Figures 7–9

**Material examined.** **Holotype**, female (KMNH IvR 500.156), station XR5, 42°23.83'–42°22.06'N 145°31.06'–145°27.70'E, 3145–3265 metres, 4 m ORE beam trawl, 16 September 2001. **Paratype**: 1 male, cephalon only (KMNH IvR 500.157), same locality.

**Diagnosis.** Typical *Carpoapseudes*, rostrum triangular, longer than eyelobe apophyses, with slight proximal shoulders; antennal flagellum of eight segments, antennular main flagellum of 25 to 26 segments, accessory flagellum (male) of nine segments; pereonite 6 without anterolateral spiniform apophyses. Male with auricular expansion on proximo-ventral margin of cheliped propodus, and dactylus with dorsodistal constriction at insertion of setae.

**Etymology.** From the Latin *varus* – bent, and *index* – forefinger (noun in apposition), with reference to the constriction on the dactylus of the cheliped of the male.

#### **Description of female.**

**Body** (Fig. 7). Dorsoventrally flattened, elongate, holotype 11.3 mm long (anterior tip of cephalon to posterior of pleotelson), seven times as long as wide, narrower posteriorly.

**Cephalothorax.** Sub-triangular, 0.9 times as long as wide, naked, anterior margin with rostrum, damaged in holotype (see male, below). Eyes absent; eyelobes modified to prominent spine-like apophyses directed antero-laterally.

**Pereonites.** Pereonite 1 shortest, about one-third as long as cephalothorax, lateral margins uniformly convex. Pereonite 2 one-tenth as long again as pereonite 1 with slight anterolateral spiniform apophyses. Pereonites 3 to 5 with anterolateral spine-like apophyses, and expanded postero-laterally at attachment of coxae. Pereonite 3 1.5 times as long as pereonite 2. Pereonite 4 longest, 1.5 times as long as pereonite 3. Pereonite 5 0.8 times as long as pereonite 4. Pereonite 6 trapezoid, without lateral apophyses, as long as pereonite 2 (all pereonites respectively 3.2, 2.3, 1.4, 0.8, 0.9 and 1.8 times as wide as long). Ventral hyposphenia present on all pereonites.

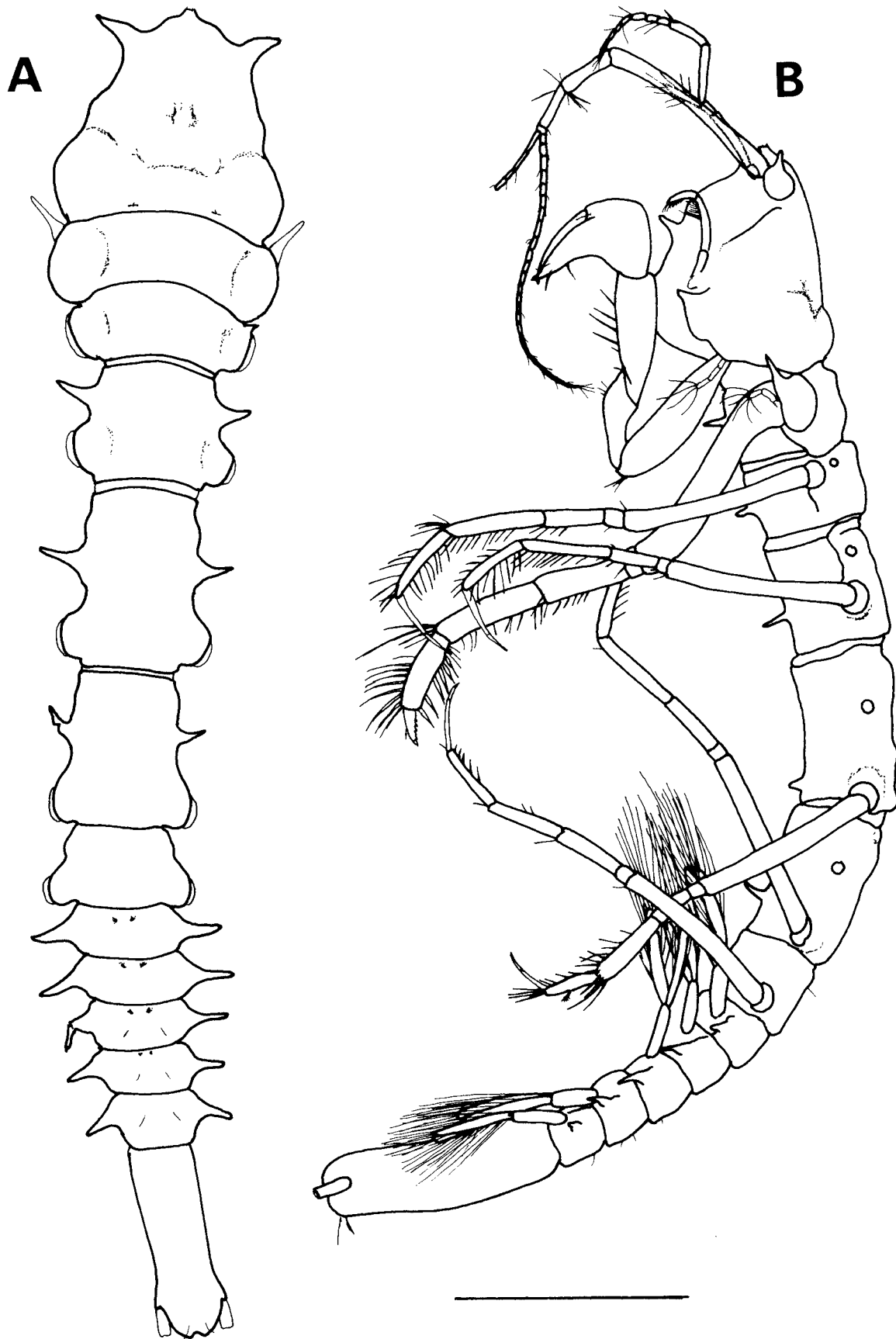
**Pleon.** Just longer than pereonites 4 to 6 together, of five free subequal pleonites bearing pleopods. Pleonites 2.4 times as wide as long, laterally bearing spine-like apophyses.

**Pleotelson.** Long and slender, as long as last four pleonites together, 2.4 times as long as wide.

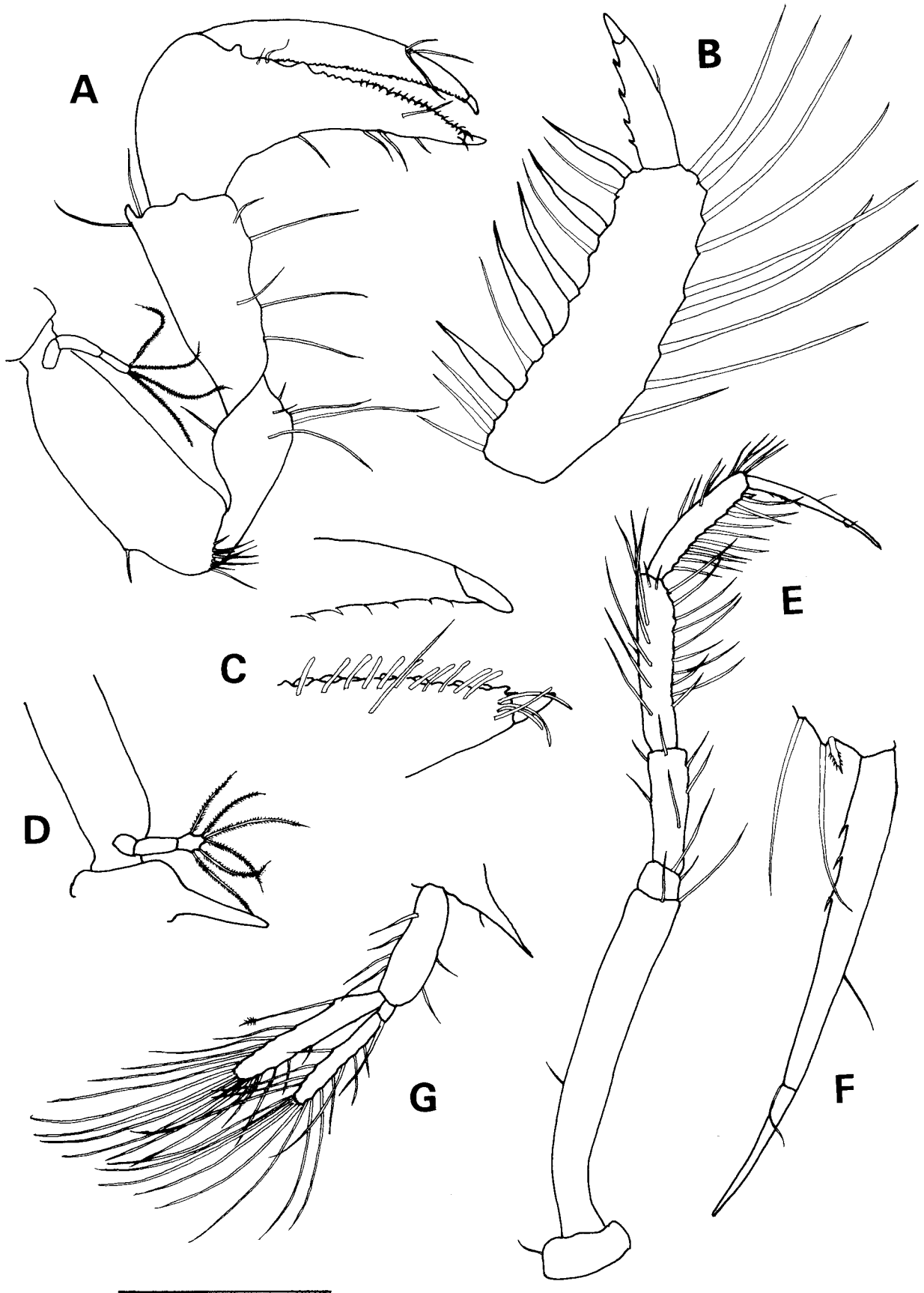
**Antennule** (Fig. 7B). Peduncle 4-articled. Proximal article elongate, about ten times as long as wide. Second article 0.3 times as long as article 1 with distal crown of six setae. Third article just shorter than article 2. Fourth article 0.2 times as long as third article, naked. Main flagellum of 25 segments, articles 21 and 23 bearing single aesthetascs. Accessory flagellum incomplete.

**Antenna** (Fig. 7B). Proximal peduncle article without inner process. Article 2 naked, bearing elongate squama eight simple marginal setae. Peduncle article 3 as long as wide. Article 4 as long as article 1 and 1.5 times as long as article 5. Flagellum of eight segments.

**Mouthparts** not dissected. Small, naked epistome present. Mandibular palp of three articles, proximal article more than twice as long as wide, article 2 twice as long as article 1 with eight inner setae in the distal third, proximal seta longer than remainder, article 3 half length of article 2 with ten inner setae and two longer distal setae.



**FIGURE 7.** *Carpoapseudes varindex* n.sp. A, holotype, dorsal; B, holotype, lateral. Scale line = 2 mm.



**FIGURE 8.** *Carpoapseudes varindex* n.sp., A, female cheliped; B, distal articles of pereopod 1; C, detail of tips of chela fingers; D, coxa, proximal part of basis and exopodite of pereopod 1; E, pereopod 2; F, dactylus and unguis of pereopod 2; G, pleopod (plumose nature of setae not shown). Scale line = 1 mm for A, D, E and G, 0.3 mm for B, C and F.

*Cheliped* (Fig. 8A). Basis twice as long as wide, ventrally with fine spine just distal of midpoint and distal tuft of eight setae. Exopodite present, 3-articled, second article naked, distal article with four plumose setae. Merus elongate with dorsal subdistal seta and ventral subdistal group of three longer and two shorter setae. Carpus 1.5 times as long as wide, expanding distally, with five simple setae along ventral margin, dorsodistal blunt apophysis with two adjacent simple setae. Chela slender, fingers longer than palm, ventral margin with four setae; two small setae near articulation of fixed finger; cutting edge of fixed finger with small, rounded proximal apophysis and row of setules and plate-like teeth (Fig. 8C). Dactylus with sparse marginal setae but no apophyses on cutting edge (Fig. 8C), shorter than fixed finger.

*Pereopod 1* (Fig. 7B; 8B, D). With pronounced spine-like apophysis on coxa (Fig. 7, 8D). Basis slender, 6.5 times as long as wide without proximal apophyses or spine. Exopodite present (Fig. 8D), 3-articled, article 2 naked, article 3 with six distal plumose setae. Ischium with single simple ventrodistal seta. Merus with row of five ventral setae in distal half. Carpus longer than merus, with ventral row of marginal setae and dorsodistal tuft of four setae, longest of these as long as propodus. Propodus (Fig. 8B) shorter than merus and 3.4 times as long as wide, with nine slender dorsal setae and six ventral slender setae interspersed with five stouter spines. Dactylus short, less than half length of propodus, with mid-dorsal fine seta and four ventral denticulations; unguis short.

*Pereopod 2* (Fig. 8E, F). More slender. Basis eight times as long as wide with one mid-dorsal and two ventrodistal setae. Merus 0.7 times as long as carpus, not widening distally. Carpus elongate, with ventral and dorsomedial rows of marginal setae. Propodus 0.8 times as long as carpus, with row of ventral marginal setae, sparser mid-dorsal marginal setae and dorsodistal tuft of five setae; single small ventrodistal compound spine. Dactylus slender with one mid-dorsal and one ventrodistal fine seta and three proximo-ventral denticulations; unguis slender, pointed, less than half length of dactylus, the two together longer than propodus.

*Pereopods 3 to 6* (Fig. 7B). Similar to pereopod 2, although pereopod 4 with denser tuft of dorsodistal setae on carpus. Pereopods 5 and 6 less setose.

*Pleopods* (Fig. 8G). All alike. Basis elongate with four outer and two inner plumose setae. Endopod shorter than exopod with proximal articulation; both rami slender, respectively with 17 and 16 plumose setae. Outer proximal seta on exopod sub-distally with robust setules, distally naked.

*Uropods*. Missing.

**Description of male** (only cephalothorax and associated appendages present: Fig. 9).

*Carapace*. Rostrum triangular, longer than eyelobe apophyses, with slight proximal shoulders.

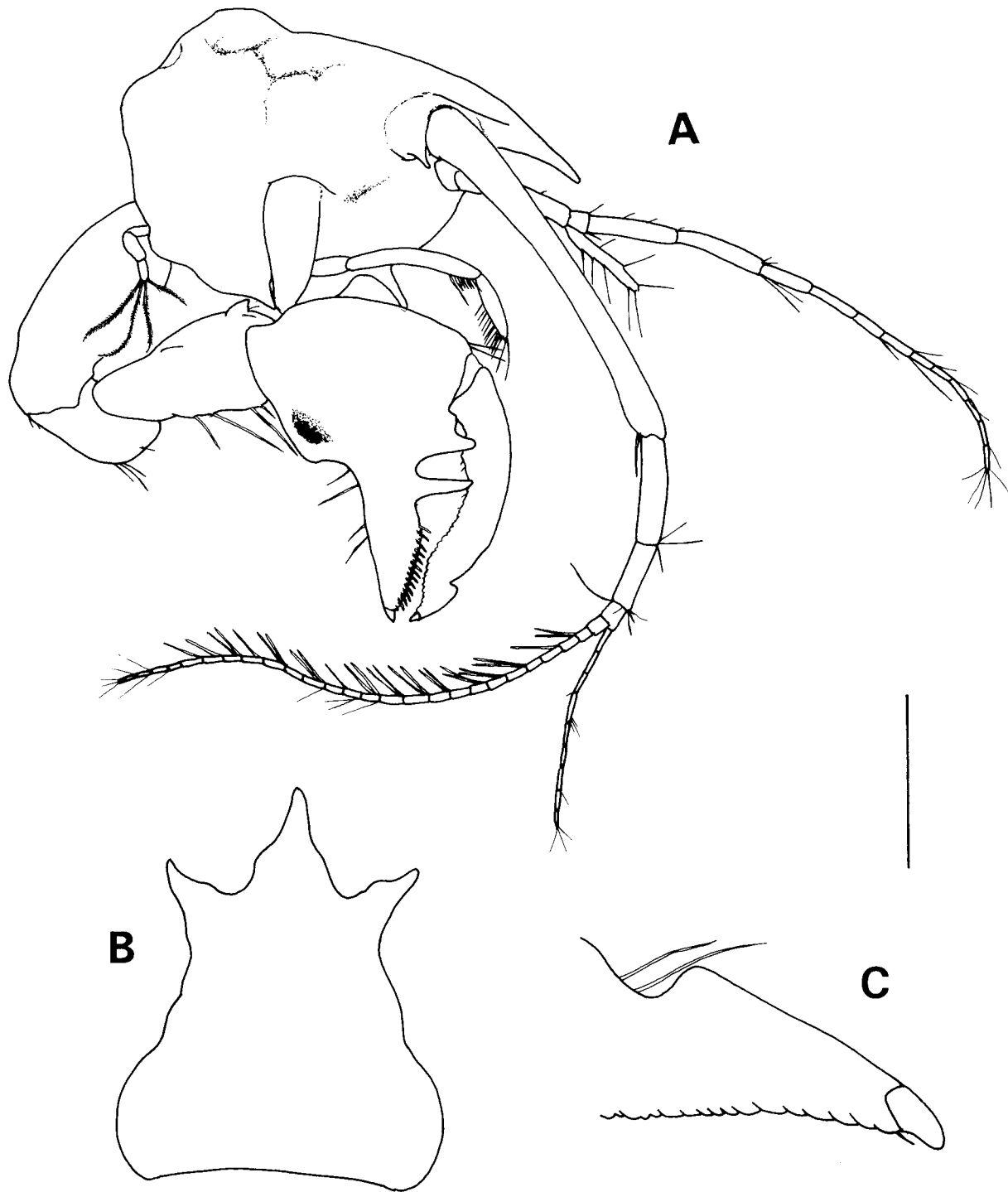
*Antennule* main flagellum of 26 segments, most with paired aesthetascs. Accessory flagellum of nine segments.

*Antenna* with ten-segmented flagellum.

*Cheliped* showing sexual dimorphism; chela fingers little longer than palm. Propodus with auricular expansion on proximo-ventral margin; fixed finger with two prominent proximal tooth-like apophyses on cutting edge. Dactylus with dorsodistal constriction at insertion of setae (Fig. 9C).

**Remarks.** The conformation of the rostrum (in the male), the antennular and antennal flagella and squama, and the pereonite proportions of the present species are all consistent with the description of *C. serratispinosus* by Lang (1968). His detailed description related to the male; alas the present male lacks a body and all legs. Unlike Lang's species, however, the rostrum has only slight proximal "shoulders", and the cheliped does have an "auricular" expansion on the proximo-ventral margin of the cheliped propodus, as described for *C. kudinovae* by Băcescu (1981), who states that this feature may be present in other species for which the fully mature male is undescribed; it is also found in *C. auritochelae* Kudinova-Pasternak, 1975, and *C. simplicirostris* (Norman & Stebbing, 1886). The present species is neither of these last two, as *C. auritochelae* has lateral spiniform apophyses on the anterior margin of the branchial chamber, while, uniquely, *C. simplicirostris* has a long and slender rostral spine, little wider at its base than apically (Norman & Stebbing 1886, Pl. 18, Fig. ID).





**FIGURE 9.** *Carpoapseudes varindex* n.sp. A, male cephalothorax and appendages, lateral; B, outline of cephalon, ventral; C, distal detail of dactylus of cheliped. Scale line = 1 mm for A, B, 0.2 mm for C.

*Carpoapseudes varindex* n.sp. may be distinguished from *C. kudinovae*, a species from the northeast Atlantic to which *C. varindex* appears closest, in the proportions of pereonites 2 and 3, the lack of anterolateral spiniform apophyses on pereonite 6, the fewer segments in the antennal flagellum and antennular accessory flagellum, fewer setae on the antennal squama, the constriction on the dactylus of the male cheliped, the lack of proximal apophysis on the pereopod 1 exopodite, and in particular the length and setation of the pleopod basis.

According to the key of Guțu (1996), the present species would key out to *C. romanae* Băcescu, 1987, owing to the relatively short antennal flagellum (ten segments), but that species has a quite different truncate, although pointed, rostrum (Băcescu 1987, Fig. 5A).

***Carpoapseudes* sp. indet.**

**Material examined.** 1 female? without cephalothorax, station KCO, 42°10.79' – 42°11.14'N 144°11.04' – 144°11.61'E, 1172–1219 metres, 3 m ORE beam trawl, 18 September 2001.

**Remarks.** Apparently a typical *Carpoapseudes* with a conspicuous spiniform apophysis on the coxa of pereopod 1, a smaller apophysis on the coxa of pereopod 2, and pereopod 1 with carpus much longer than merus. The distribution of hyposphenia is similar to that of the previous species, but the pereonites are more compact, with pereonites 4 and 5 wider than long. The bases of the cheliped and pereopod 1 are without proximal apophyses. In the absence of a cephalon, and thus of the rostrum (if any), antennae and antennules, this specimen cannot be resolved further.

**Suborder Neotanaidomorpha Sieg, 1980**

**Family Neotanaidae Lang, 1956**

**Genus *Neotanais* Beddard, 1886**

The genus *Neotanais* is confined to deep waters, and generally conservative in morphology. The sex-ratio is highly biased towards females; males, commonly larger, show sexual dimorphism in the proportions of the cephalon and the shape of the cheliped. The main features which have been used to distinguish species are the proportions of the cephalon, pereonites and pleotelson, the conformation of the ventral keel of the pleon, the number of dorsal carpal setae on the cheliped, the relative lengths of the fingers of the chela, the proportions of the proximal article and relative lengths of the distal articles of the antennule, the relative length of the uropod exopod, the proximal setation of the pleopod, and the adult size. Mouthparts are generally regarded to have no taxonomic significance (and are unknown for many species). Similarly, the pereopods are generally uniform, differing at the specific level in the details of setation.

Larsen (1999) produced a practical identification key to the females of the species then known, since when Larsen and Błażewicz-Paszkowycz (2003) and Larsen and Hansknecht (2003) have described a further four species, bringing the total described before this study to thirty-six species.

***Neotanais oyashio* n.sp.**

Figures 10–12

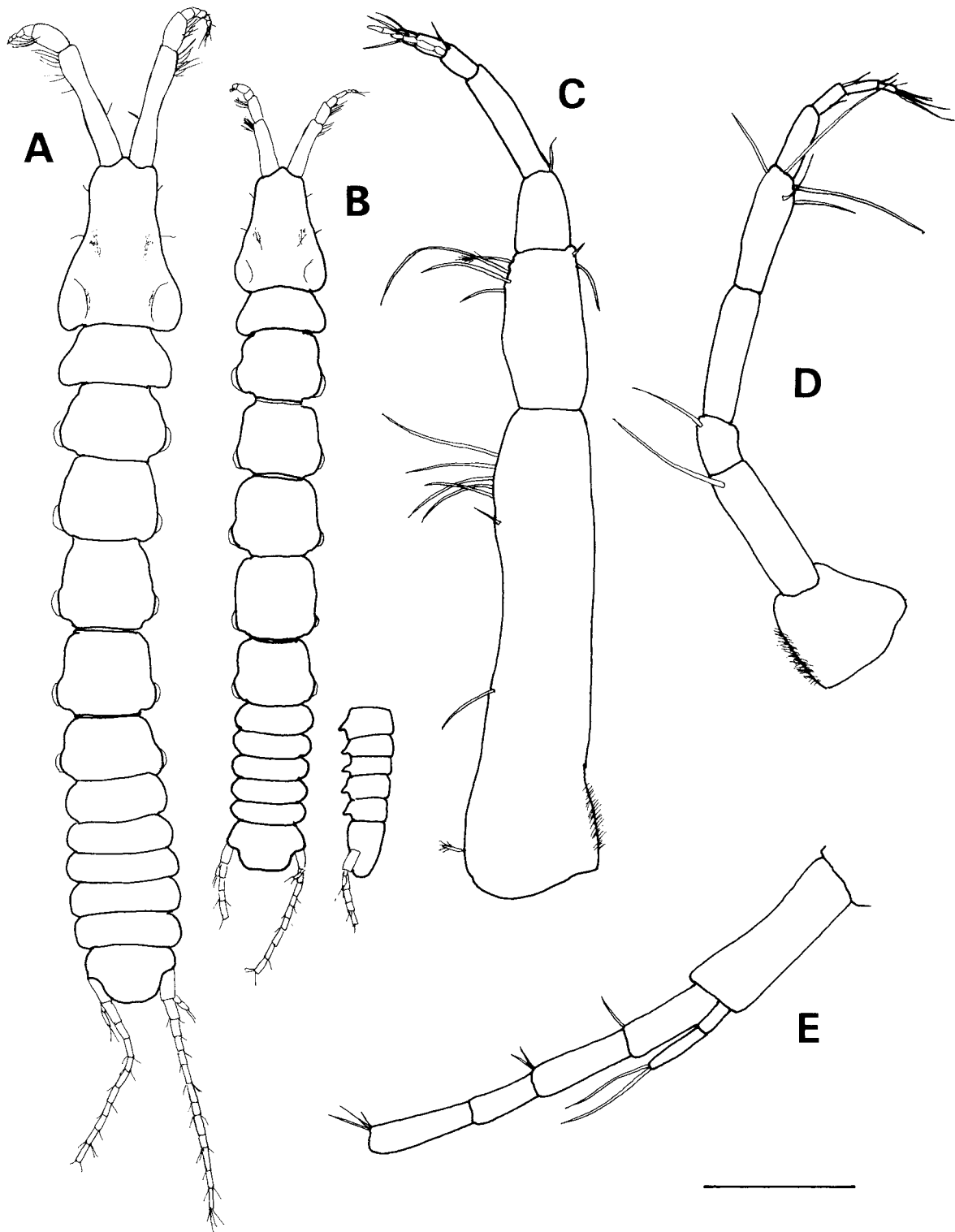
**Material examined.** Holotype, female (KMNH IvR 500.158), station TD8, 39°15.54'–39°17.01'N 144°45.37'–144°42.46'E, 5762–5733 metres, 4 m ORE beam trawl, 29 September 2001. Allotype. 1 male (KMNH IvR 500.159), same locality. Paratypes: 1 female without cephalothorax (KMNH IvR 500.160), same locality.

**Diagnosis.** Typical smaller *Neotanais*, with cheliped dactylus shorter than fixed finger, cephalon about 1.5 times as long as wide, elongate 4th to 6th pereonites, ventral spurs on pleon keel and around 11 dorsal setae on cheliped carpus; pleotelson one-quarter length of whole pleon, 1.7 times as wide as long, uropods attached just anterior of midpoint. Pleopod basis with three dorsal and three ventral plumose setae, endopod proximal article with four ventral plumose setae.

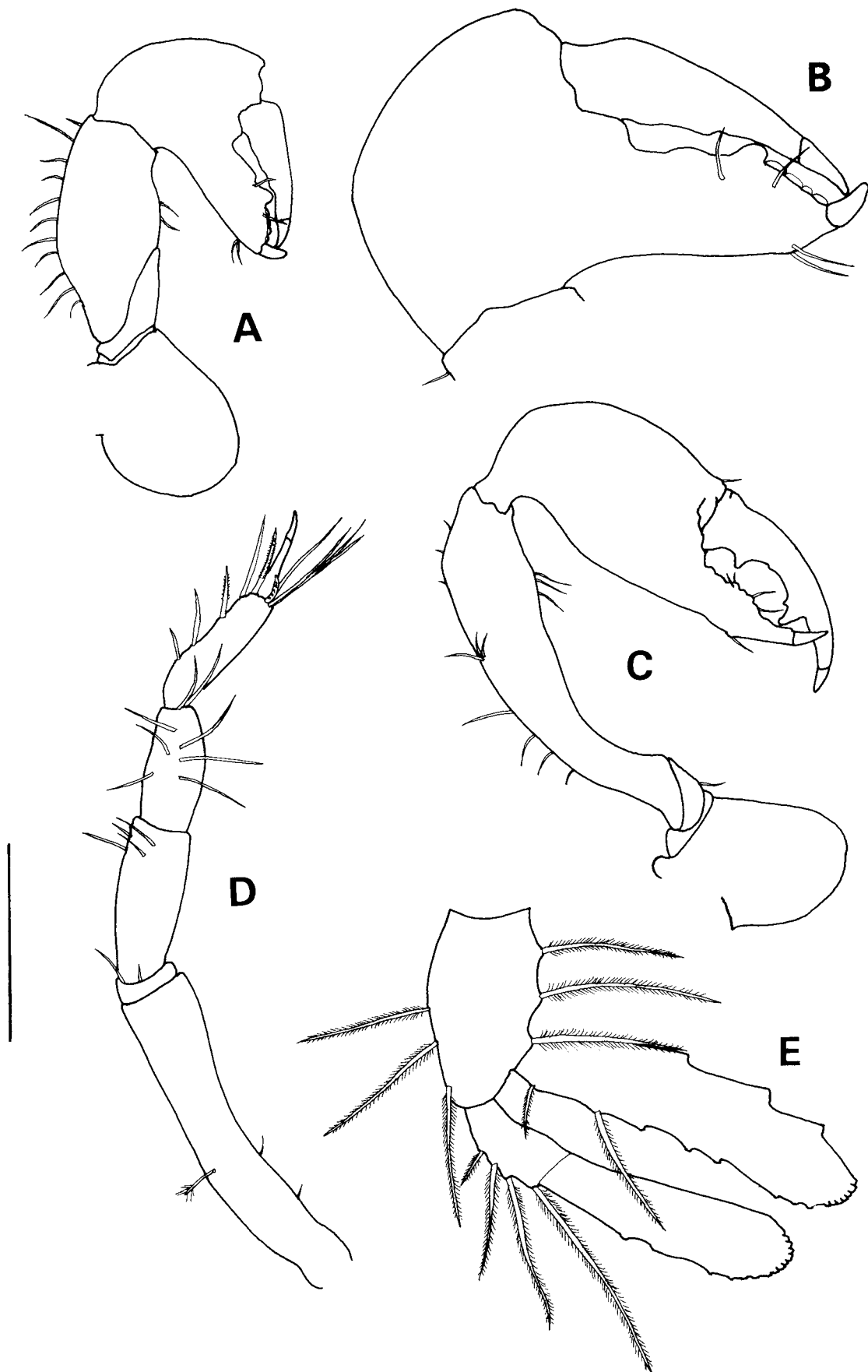
**Etymology.** Named after the Oyashio Current which flows down to the north of Japan (noun in apposition).

**Description of female.**

*Body* (Fig. 10B). Elongate, holotype 9.3 mm long (tip of rostrum to posterior of pleotelson), 8.2 times as long as wide, narrower posteriorly.



**FIGURE 10.** *Neotanais oyashio* n.sp. A, male allotype, dorsal; B, female holotype, dorsal, with lateral outline of pleon; C, antennule; D, antenna; E, proximal articles of uropod. Scale line = 2 mm for A and B, 0.3 mm for C, D and E.



**FIGURE 11.** *Neotanais oyashio* n.sp. A, female cheliped; B, detail of chela; C, male cheliped; D, pereopod 1; E, pleopod. Scale line = 1 mm for A, 0.5 mm for B and C, 2 mm for D, 0.25 mm for E.

*Cephalothorax*. Sub-triangular, 1.46 times as long as wide, anterior margin with conspicuous rounded rostrum, with single mid-lateral and anterolateral setae on each side. Eyes and eyelobes absent.

*Pereonites*. Pereonite 1 shortest, one-third as long as cephalothorax, lateral margins uniformly convex. Pereonites 2, 3, 4 and 5 progressively slightly longer. Pereonite 5 longest and twice as long as pereonite 1, each expanded postero-laterally at attachment of coxae. Pereonite 6 as long as pereonite 2, expanded postero-laterally at attachment of coxae (all pereonites respectively 2.3, 1.3, 1.2, 1.1, 0.9 and 1.2 times as wide as long).

*Pleon*. Twice as long as pereonite 5, of five free subequal pleonites bearing pleopods. Pleonites dorsally convex, 3.5 times as wide as long, ventral keel with conspicuous posteriorly-directed spiniform apophyses (“spurs”).

*Pleotelson*. About 0.25 times as long as whole pleon, 1.7 times as wide as long, uropods attached just anterior of midpoint.

*Antennule* (Fig. 10C). Proximal peduncle article elongate, 4.35 times as long as wide, dense field of fine setules on proximal inner margin. Fourth article just longer than third, and 1.25 times as long as flagellum.

*Antenna* (Fig. 10D). Proximal peduncle article with inner field of fine setules. Fourth article just longer than fifth, sixth article half length of fourth.

*Mouthparts* not examined.

*Cheliped* (Fig. 11A). Carpus twice as long as wide, with 11 simple setae along dorsal margin, and two mid-ventral setae. Chela (Fig. 11B) fingers longer than palm; cutting edge of fixed finger with central rounded apophysis and four flattened “teeth” proximal to this, distal claw rounded. Dactylus shorter than fixed finger, with no apophyses on cutting edge, distal claw more slender.

*Pereopod 1* (Fig. 11D). Basis with only two short dorsal setae and one mid-ventral plumose sensory seta. Carpus shorter than merus. Propodus with four slender ventral spines, single slender ventrodorsal denticulate spine, four dorsodorsal setae and adjacent short, hooked spine with rounded lateral denticles. Dactylus plus unguis 0.7 times as long as propodus.

*Pereopods 2 and 3* (Fig. 12 A, B). Generally similar to pereopod 1, but with basis proportionately shorter and carpus longer than merus.

*Pereopods 4 and 5* (Fig. 12 C, D). Similar to pereopods 2 and 3, but unguis proportionately longer and arising from crown of distal denticles on dactylus; no distal hooked spine on propodus.

*Pereopod 6* (Fig. 12E). As pereopods 4 and 5, but propodus dorso-distally with five short bidenticulate spines.

*Pleopods* (Fig. 11E). All alike. Basis elongate, 1.6 times as long as wide, with three dorsal and three ventral plumose setae. Endopod shorter than exopod with proximal articulation bearing four ventral plumose setae.

*Uropod* (Fig. 10B; 10E). Biramous. Basis naked; exopod 0.95 times as long as proximal endopod segments; endopod elongate, broken, with at least nine segments.

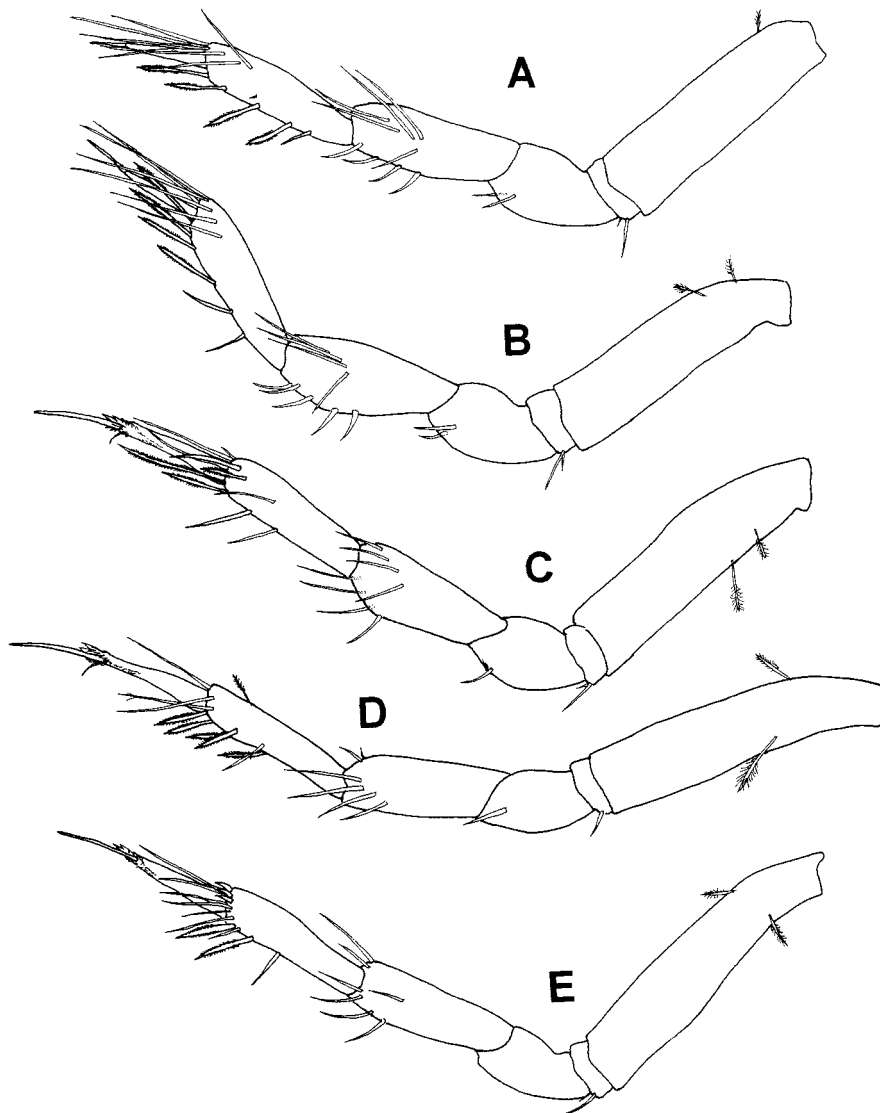
**Distinctions of male.** Larger than female, allotype (Fig. 10A) length 11.5 mm.

*Cheliped* (Fig. 11C) showing typical dimorphism, carpus slender but not S-shaped proximally, dorsal margin with ten setae including mid-dorsal tuft of three setae. Chela elongate, palm longer than fingers; fixed finger with irregular denticulation on cutting edge. Dactylus longer than fixed finger, cutting edge with large proximal and subdistal tooth-like apophyses.

*Uropod* exopod proportions as female, endopod of 12 segments, as long as pleon.

**Remarks.** The only described species of *Neotanais* with the cheliped dactylus shorter than the fixed finger, a cephalon about 1.5 times as long as wide, elongate 4th to 6th pereonites, ventral “spurs” on the pleon keel and around ten dorsal setae (nine) on the cheliped carpus is *N. barfodei* Wolff, 1956, to which the present species keys out in the identification key of Larsen (1999). However, that species has a proportionately shorter pleotelson with uropod insertion posterior to the mid point (at 0.62 times as long as pleotelson), only two ven-

tral pleopod basis setae, and only three setae on the proximal article of the pleopod endopod; *N. barfodei* is a much larger species at maturity (body length 16 mm). The male of *N. barfodei* has the proximal end of the cheliped carpus S-shaped.



**FIGURE 12.** *Neotanais oyashio* n.sp. A to E, pereopods 2 to 6 respectively. Scale line = 0.5 mm.

Of the three species previously recorded from waters in the vicinity of Japan (see above), *N. insignis* is immediately distinguished from *N. oyashio* n.sp. by its having the uropod insertion at the posterior of the pleotelson; *N. tuberculatus* (at 22 mm body length a much larger species) has the uropod insertion posterior to the midpoint of the pleotelson, fewer proximal pleopod setae, pereonite 4 longer than wide, and the uropod exopod longer than the proximal endopod segment; *N. wolffi* also has the uropod insertion posterior to the midpoint of the pleotelson, the uropod exopod longer than the proximal endopod segment, the fourth antennule peduncle article shorter than the flagellum, and a rugose (as well as setulose) proximal antennal article.

*Neotanais kuroshio* n.sp.

Figures 13–15

**Material examined.** Holotype, large female (KMNH IvR 500.161), station TD8, 39°15.54'–39°17.01'N 144°45.37'–144°42.46'E, 5762–5733 metres, 4 m ORE beam trawl, 29 September 2001. Paratypes: 1 smaller female, paratype, 2 damaged females (KMNH IvR 500.162), same locality.

**Diagnosis.** Typical larger *Neotanais*, with only five dorsal setae on the cheliped carpus, cheliped dactylus longer than the fixed finger, and uropod exopod only half length of the proximal endopod segment; no spurs on ventral keel of pleon; pleotelson 1.8 times as wide as long, uropods attached posterior of midpoint; pleopod basis with two dorsal and one ventral plumose setae, endopod proximal article with four ventral plumose setae.

**Etymology.** Named after the Kuroshio Current, which flows from the south up the western side of Japan (noun in apposition).

**Description of female.**

**Body** (Fig. 13A). Elongate, holotype 22 mm long (tip of rostrum to posterior of pleotelson), 7.8 times as long as wide.

**Cephalothorax.** Sub-triangular, 1.2 times as long as wide, anterior margin with conspicuous rounded rostrum, with single mid-lateral and anterolateral setae on each side. Eyes and eyelobes absent.

**Pereonites.** Pereonite 1 shortest, 0.4 times as long as cephalothorax, lateral margins uniformly convex. Pereonites 2 to 6 subequal. Pereonite 4 longest and 1.5 times as long as pereonite 1. Pereonites 2 and 3 slightly expanded postero-laterally at attachment of coxae (all pereonites respectively 2.2, 1.5, 1.4, 1.3, 1.4 and 1.6 times as wide as long).

**Pleon.** 2.2 times as long as pereonite 4, of five free subequal pleonites bearing pleopods. Pleonites dorsally convex, five times as wide as long, ventral keel without apophyses (“spurs”) (Fig. 13B).

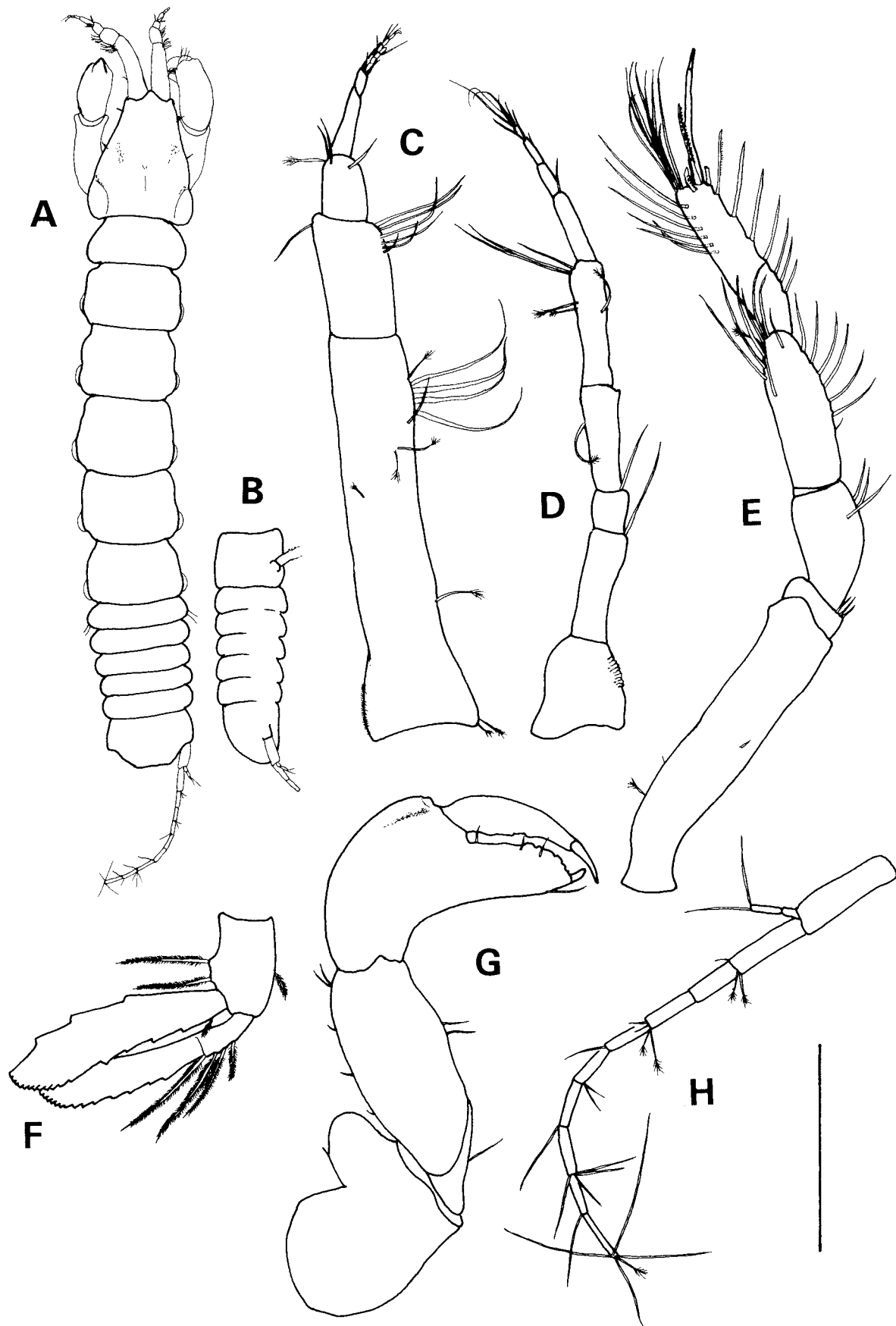
**Pleotelson.** 0.3 times as long as whole pleon, 1.8 times as wide as long, uropods attached posterior of midpoint (at 0.61 as long as pleotelson).

**Antennule** (Fig. 13C). Proximal peduncle article elongate, 5.4 times as long as wide, with fine setules on proximal inner margin. Fourth article longer than third, and twice as long as flagellum.

**Antenna** (Fig. 13D). Proximal peduncle article with rugosity on inner face. Fourth and fifth articles subequal, sixth article 0.7 times as long as fourth.

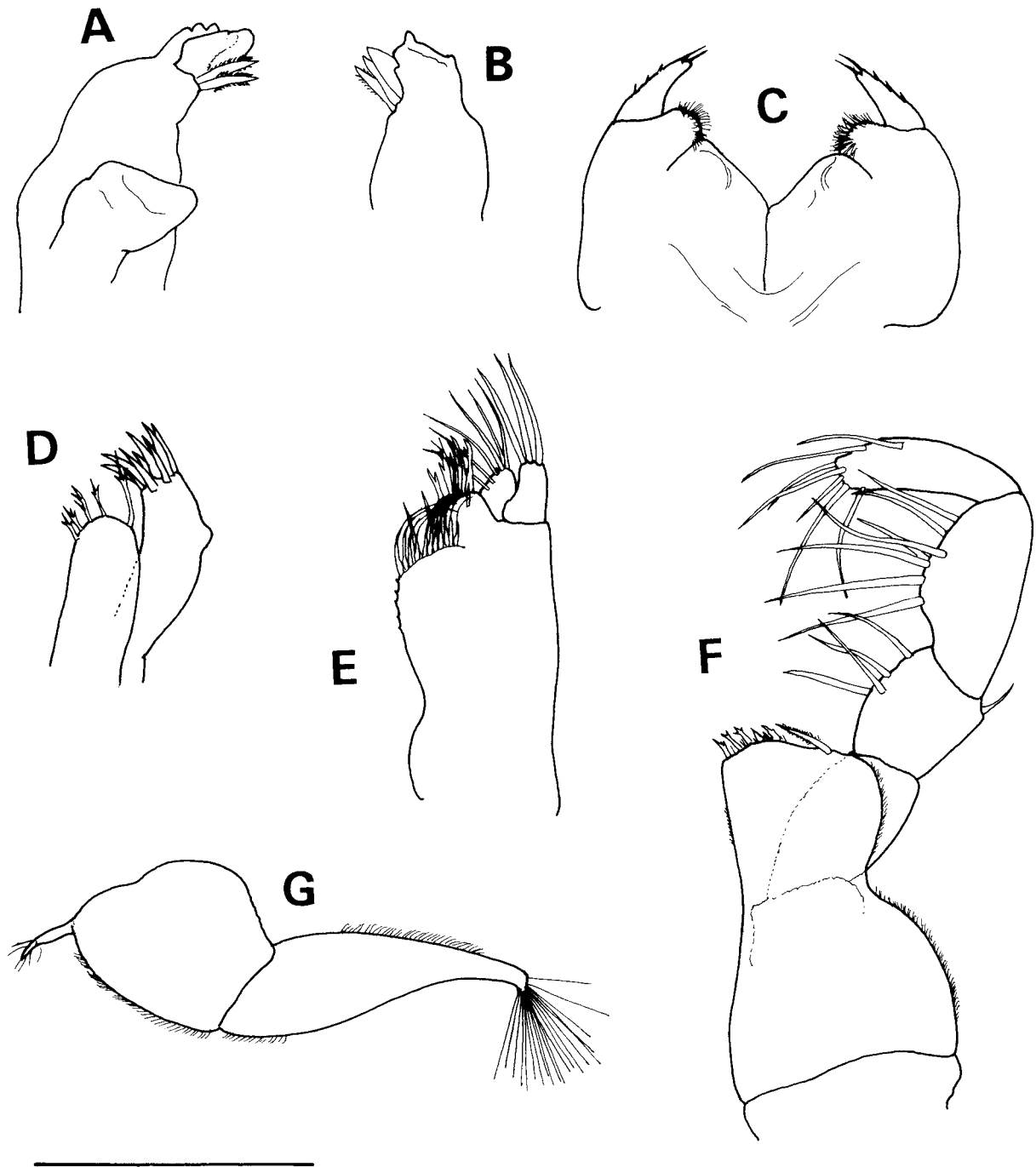
**Mouthparts.** Labrum not seen. Left mandible (Fig. 14A) with blunt, simple pars molaris; pars incisiva with five rounded denticulations, lacinia mobilis a thin plate wider distally and exceeding tip of pars incisiva; setal row of two stout finely-setulose setae. Right mandible (Fig. 14B) without lacinia mobilis, pars incisiva with thin, straight cutting edge, setal row with two stout finely-setulose setae and wider plate-like distal spine. Labium (Fig. 14C) typical of the genus, palps with two distal spines on rounded papillae. Maxillule (Fig. 14D) margins naked, outer endite with nine distal spines, inner endite with one long and four shorter setulose distal setae. Maxilla (Fig. 14E) with simple setae on lobes of moveable endite, outer lobe of fixed endite with three bifurcate, one pinnate and three simple distal spines and inner subdistal seta, rostral row of inner lobe with eleven curved setae. Maxilliped (Fig. 14F) basis and proximal palp article naked; second palp article with simple outer distal setae, three finely-setulose inner marginal setae and single simple sub-marginal seta; third article with six marginal and one sub-marginal simple setae, fourth article with simple subdistal and distal setae dorsally, three ventrodistal simple setae, and five stouter finely-setulose setae. Endite with finely setulose outer margin, distally with three inner pinnate spines, two adjacent simple spines and outer setulose seta. Epignath (Fig. 14G) of two articles, marginally setulose, distally with about twenty fine setae.

**Cheliped** (Fig. 13G). Carpus twice as long as wide, with five simple setae along dorsal margin, and two mid-ventral setae. Chela fingers shorter than palm; cutting edge of fixed finger with five rounded “teeth”, distal claw blunt. Dactylus longer than fixed finger, with no apophyses on cutting edge, distal claw slender.



**FIGURE 13.** *Neotanais kuroshio* n.sp., A, female holotype, dorsal; B, outline of pleon, lateral; C, antennule; D, antenna; E, pereopod 2; F, pleopod; G, cheliped; H, uropod. Scale line = 6 mm for A and B, 1 mm for C to F, 2 mm for G and H.



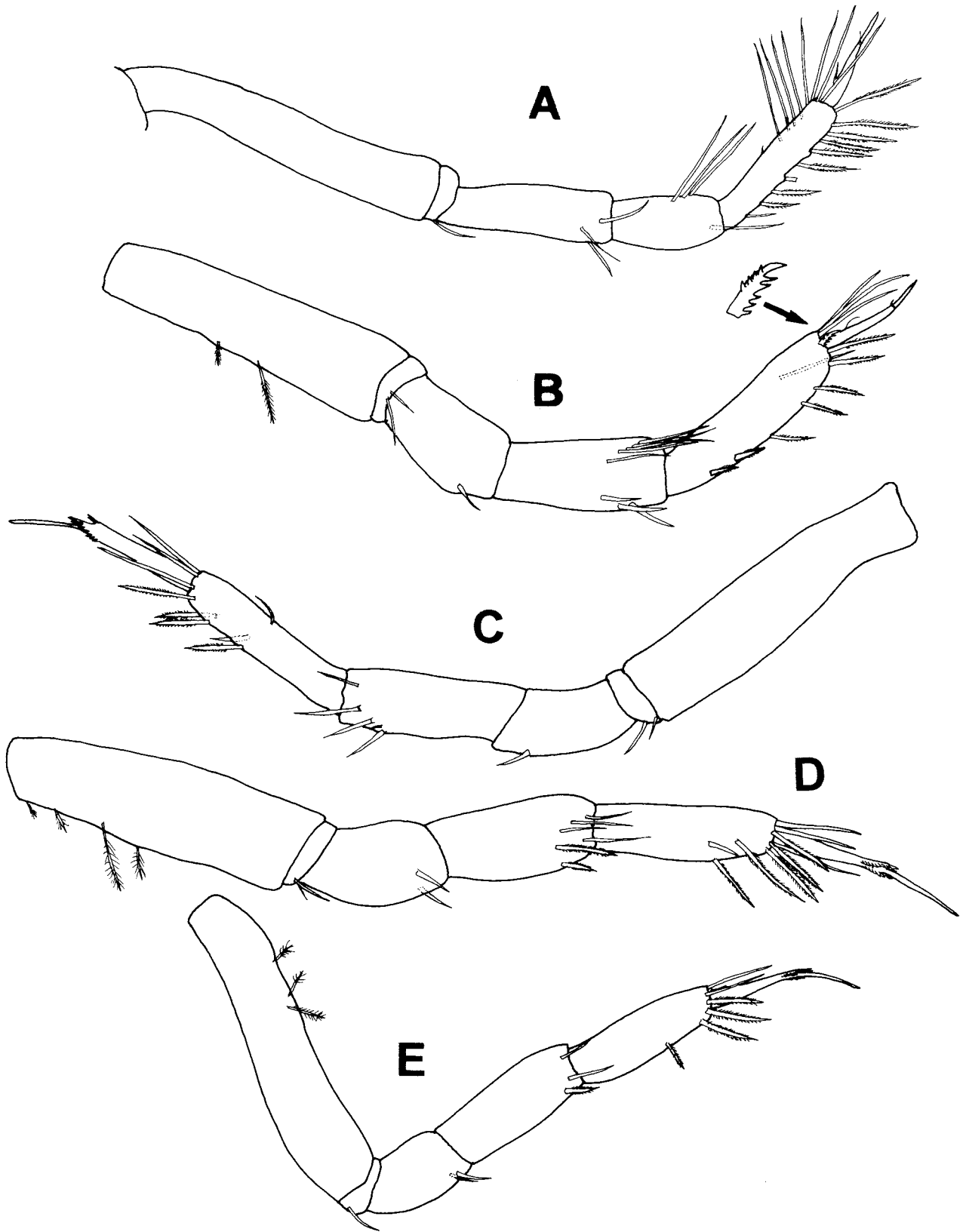


**FIGURE 14.** *Neotanais kuroshio* n.sp., A, left mandible; B, right mandible, distal; C, labium; D, maxillule; E, maxilla; F, maxilliped; G, epignath. Scale line = 0.3 mm.

*Pereopod 1* (15A). Basis naked. Merus 1.24 times as long as carpus. Propodus with nine slender bidenticulate ventral spines, eight dorsal setae in distal half. Dactylus with slender unguis half length of propodus.

*Pereopod 2* (Fig. 13E). Basis almost naked, with one proximo-dorsal plumose sensory seta. Carpus longer than merus. Propodus with eight slender ventral setae, single slender ventrodiscal denticulate spine, six dorsal marginal setae in the distal half, eight dorsodistal setae and adjacent short, hooked spine with lateral denticles. Dactylus plus unguis 0.8 times as long as propodus.

*Pereopod 3* (Fig. 15B). Similar to pereopod 2 but with only one subdistal dorsal propodal seta.



**FIGURE 15** *Neotanis kuroshio* n.sp. A, pereopod 1; B to E, pereopods 3 to 6 respectively. Scale line = 0.4 mm.

*Pereopods 4 to 6* (Fig. 15 C to E). Similar to pereopod 3 but with fewer propodal setae, unguis proportionately longer and arising from crown of distal denticles on dactylus; no distal hooked spine on propodus.

*Pleopods* (Fig. 13F). All alike. Basis compact, 1.45 times as long as wide, with two dorsal and one small ventral plumose setae. Endopod shorter than exopod with proximal articulation bearing four ventral plumose setae.

*Uropod* (Fig. 13H). Biramous. Basis naked. Exopod 0.5 times as long as proximal endopod segments. Endopod 0.9 times as long as pleon, with nine segments.

Male unknown.

**Remarks.** With only five dorsal setae on the cheliped carpus (four in the undamaged paratype), a cheliped dactylus longer than the fixed finger, and a uropod exopod only half the length of the proximal endopod segment, *Neotanais kuroshio* n.sp. is closest to *N. peculiaris* Lang, 1968, *N. giganteus* Hansen, 1913 and possibly *N. hessleri* Gardiner, 1975, although this last is known only from a manca, so is difficult to interpret. Both of the first two species have a more elongate cephalothorax and ventral pleon spurs; *N. peculiaris* has a proportionately longer 6th pereonite and pleotelson, with a more anterior uropod insertion on the pleotelson, only two pleopod endopod article 1 setae, and a characteristic flange on the proximal article of the antenna; *N. giganteus* has six setae on article 1 of the pleopod endopod and an antennular flagellum only one-quarter as long as the distal peduncle article. *N. hessleri* (from 5340 metres in the south Pacific) has a proportionately longer pleotelson (1.3 times as wide as long) and a uropod exopod only 0.3 times as long as the proximal endopod segment.

Of the three species previously recorded from waters in the vicinity of Japan, the characteristic distinction of *N. insignis* is as described above, *N. tuberculatus* has ventral pleon spurs, and *N. wolfii* has a uropod exopod exceeding the length of the proximal endopod segment, *inter alia*. The key of Larsen (1999) would identify the present species as *N. vemae* Gardiner, 1975, but that species also has a uropod exopod exceeding the length of the proximal endopod segment and far fewer setae on the proximal pleopod articles. *N. kuroshio* is distinct from the sympatric *N. oyoshio* (see above) in having no ventral apophyses on the pleonites, fewer dorsal setae on the cheliped carpus, the cheliped dactylus longer than the fixed finger, and the fourth antennule article twice as long as the flagellum, *inter alia*.

The variation between the large holotype female and the smaller paratype female (body length 6.5 mm) is informative. The characters of the trunk, pleotelson, uropod and pleopods are consistent, as are most of those of the cheliped, although the larger specimen has five dorsal carpal setae (four in the paratype). In the smaller paratype, the fourth antennal article is conspicuously shorter than the fifth, the proximal antennule peduncle article is less slender (4.6 times as long as wide), the fourth peduncle article is the same length as the third, and only 1.3 times as long as the flagellum, these antennular characters having been used by Gardiner (1975) as valuable for specific distinction within the genus.

#### *Neotanais* sp. indet.

**Material examined.** 5 mancae, station TD8, 39°15.54'–39°17.01'N 144°45.37'–144°42.46'E, 5762–5733 metres, 4 m ORE beam trawl, 29 September 2001.

**Remarks.** These specimens are all juvenile, damaged and/or fragmented, and thus unattributable to a species, although probably representatives of one or both of the two species newly described above, having been taken in the same samples.

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