

A new alpheid shrimp (Crustacea: Decapoda: Alpheidae) from South Vietnam

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A new alpheid shrimp, *Thuylamea camelus* gen. nov. & spec. nov., from Dong Hoa, a coastal community of Can Gio district, and northwest of Vung Tau (Cap St. Jacques), Vietnam, is described and illustrated. The new genus appears not to be closely related to any of the previously described genera. It has the postero-dorsal margin of the carapace armed with two high and short crests which are slightly outward inclined and directed backward, and between these crests with a low but distinct conical spine, and an elevated conical boss in the anterior median area slightly behind the anterior margin of the first abdominal somite.

Introduction

Some alpheid shrimps were collected from a coastal fishery community about 20 km northwest of Cap St. Jacques (Vietnam). They proved to belong to an undescribed genus of alpheid shrimps, which is described below. For identification of the shrimps, Coutière (1899), Tiwari (1963), Banner & Banner (1966), Chace (1988), and Chace & Kensley (1992) were used.

The total length (tl) is measured from the tip of the rostrum to the end of the telson in the fully stretched animal, the carapace length (cl) refers to the postorbital carapace length.

Descriptions

Thuylamea gen. nov.

Type species: *Thuylamea camelus* spec. nov.

Etymology.— *Thuylamea* refers to the name of the author's son (Thuy Lâm). Gender: masculine.

Diagnosis.— Small alpheid shrimp with a subcylindrical, elongated body. Carapace smooth, with rostrum greatly reduced, no supraorbital spines, no ocular hood, pterygostomian angle rounded, cardiac notch well accentuated; dorsal surface with a faint disk-shaped depression extending from posterior end of rostrum to gastric region; postero-dorsal margin of carapace armed with 2-submedian slightly outward and backward directed crests which are very high, short and with a bluntly rounded top. Abdomen smooth; anteromedian part of tergum of first abdominal somite with an elevated conical elevation; pleura of fifth somite angular, ending in an acute point, no articulated plate at the postero-lateral angle of the sixth abdominal somite. Antennule with a long stylocerite, and two antennular flagella placed at the same level. Antenna with basicerite armed with an inner distolateral strong spine, scaphocerite well developed. Cornea of eye pigmented, partly or not concealed by carapace in dor-

sal view. Mandible with two-segmented palp, molar process well developed, incisor process expanded, multidentate. Maxillula with bilobed palp. Maxilla normal, with palp simple, basal endite bilobed, coxal endite simple, lanceolate. First maxilliped with two-segmented palp, basal and coxal endites separated, exopod with long flagellum, caridean lobe elongate rounded distally, epipod large, leaf-like. Second maxilliped with normal endopod, dactylar segment narrow, exopod well developed, epipod large. Third maxilliped normal, with epipod hook-like, penultimate segment triangular in cross-section, without setobranchs.

First pereopods robust, similar, usually subequal; movable finger laminar, somewhat twisted, basal portion triangular in cross-section; fixed finger slender, tapering into curved acute claw; cheliped carried with dactylus dorso-laterally; coxa with epipod hook-like and 2 setobranchs. Second pereopod filiform; fingers slightly longer than palm; carpus with 5 articles; coxa with epipod and 2 setobranchs. Ambulatory pereopods moderately robust; dactyli simple; third and fourth pereopod respectively with epipod and 2 setobranchs. Fifth pereopod with 2 setobranchs and without epipod; outer disto-lateral half of lower margin of propodus with dense transverse rows of setae.

Diaeresis without spine. Telson with two pairs of dorsal spines; distal margin rounded, both lateral margins ending in 2 spinules.

Biology.— Free living in brackish water, at a depth of about 5-9 m.

Systematic position.— The new genus is most remarkable by the following features: (a) the armature of the postero-dorsal margin of the carapace with two submedian outward inclined crests, (b) the dorso-median hump in the anterior part of the tergum of the first abdominal somite, (c) the similar first pereopods and the serrulated cutting-edges of the fingers, (d), the basal part of the shorter ramus of the outer antennular flagellum, which encloses the base of the longer ramus. This combination separates *Thuyllamea* from all other known alpheid genera.

Thuyllamea camelus spec. nov.

(figs 1-22)

Material.— Holotype, ♂ (RMNH D 48595) Donghoa, a coastal community of the Can Gio district, 21 km northwest of Vung Tau (Cap St Jacques), Vietnam, 10°20'N 106°52'E, in an estuarine area formed by the confluence of two large rivers, and taken with conical set nets at a depth of 5-9 m from a sandy and partly mud bottom, 1 iv.1998 (tl. 37 mm). Paratypes: 5 ♂♂ (4 ♂♂, in the collection of the author; 1 ♂ RMNH D 48594), topotypic, 17.iv.1999 (tl. 31-39 mm).

Description.— In dorsal view rostrum (fig. 2) very short, broadly triangular, with a rather acute tip and without a carina. In old males it overreaches the anterior margin of the cornea, in young males shorter.

Carapace (figs. 2, 3, 4) smooth; in young males not concealing the eyes, but in adult males covering larger part of eyes; no ocular hoods. Antennal region smooth; pterygostomian angle not produced, obtuse. Cardiac notch very distinct. Postero-dorsal margin armed with 2 submedian slightly outward inclined and backward directed crests. Crests short and high, with upper and posterior margins rounded and with some setae; with a conical spine in middle of interspace between crests. Dorsal sur-

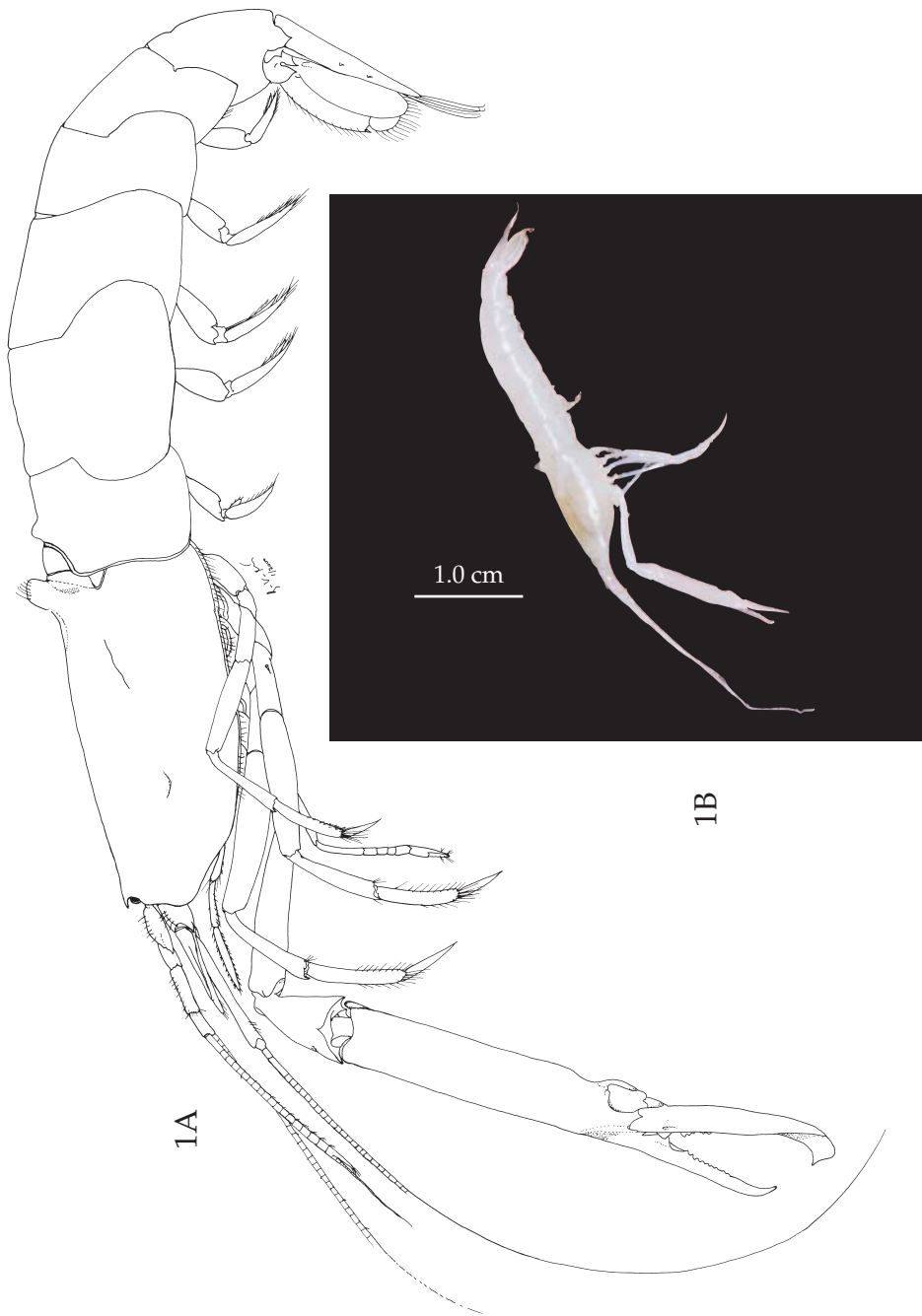


Fig. 1A + B, *Thuylamia camelus* gen. nov. & spec. nov., ♂, cl.: 10.5 mm. Lateral view of male specimen.

face with a faint horizontal disk-shaped depression extending from posterior end of rostrum to gastric region. No supraocular spines. In old specimens with a faint and thin irregular carina at upper margin of branchial region and a short and shallow obtuse V-shaped depression at hepatic region. Ventral margin of carapace with some plumose setae.

Abdomen (figs. 1, 4) with pleura normal. Pleura of first abdominal somite cover small part of postero-lateral corners of carapace. No articulated plate at postero-lateral angle of sixth abdominal somite. Behind anterior margin of first abdominal tergum with an elevated conical-shaped elevation medially. Fifth abdominal pleura angular and ending in an acute point. In old males anterior or distal fifth of tergum of second and sixth abdominal somites depressed dorso-medially. Sixth somite (fig. 22) about 1.1 times length of fifth somite, its postero-lateral angle acute.

Telson (figs. 20, 20') exceeds distal end of uropodal endopod by 0.15 of its length, and about 1.3 times as long as sixth somite, and 2.6 times longer than wide; its lateral margins slightly sinuous, and ending in a pair of small movable spines. Dorsal spines of telson small, implanted near lateral margins, its anterior pair at about 0.38 of the length of telson, and its posterior pair at about 0.61. Posterior margin of the telson broadly rounded with about 24 long plumose setae and numerous long slender simple setae dorsally. Anal tubercles well developed.

Antennule (figs. 5, 5', 5'') with peduncle moderately robust and about 0.43 of carapace length, exceeding scaphocerite but not reaching beyond end of carapocerite; proximal segment about twice as long as wide, disto-dorsal margin sinuous (or finely dentate), with a strong inner antero-lateral spine on lower margin (fig. 5'). Stylocerite long and acute, reaching distally almost to lower part of the anterior margin of segment. Intermediate segment somewhat depressed and about as long as proximal segment, 1.8 to 2.4 times longer than wide. Distal segment subrectangular, depressed and about half as long as intermediate segment. Outer flagellum biramous, fused basal part consisting of about 19 segments, and about as long as antennular peduncle; shorter ramus (fig. 5'') with 4-6 faint segments and 8-10 aesthetascs apically, its inner surface somewhat concave and enclosing basal part of longer ramus. Longer ramus slender, filiform, consisting of about 36 segments and about 2.8 mm long (about 3.5 times as long as shorter ramus). Basal width of unbranched portion of outer flagellum 1.2 times longer than that of inner flagellum.

Antenna (figs. 6, 6') with basicerite stout, with broad and acute outer ventro-lateral tooth and a distinct inner dorso-lateral tooth at distal margin; carapocerite slender exceeding distal margin of scaphocerite by one-third of its length, cylindrical, slightly compressed, about 5.4 times longer than wide; flagellum long, slender; proximal segments not thickened. Scaphocerite reaches about to end of basal third of distal segment of antennular peduncle, and 3 times longer than wide, elongate suboval, its lateral margin slightly convex with a somewhat inward directed acute distal tooth not exceeding the broadly rounded anterior margin of lamella.

Eye (fig. 5) reduced, cornea small, oblique, well pigmented. Rostrum of young male not reaching beyond eyes and orbital margin of carapace leaves cornea of eyes exposed in dorsal view. Eyes of old males not beyond rostrum, and mostly covered by carapace.

Body not strongly laterally compressed.

Mandible (figs. 7, 7') with palp two-segmented, molar process well developed, obliquely truncate distally, with marginal and median setae, incisor process well developed, expanded, with 5 acute teeth.

Maxillula (figs. 8, 8') with bilobed palp, upper lobe with 2 apical and 2 subapical plumose setae, lower lobe with a single long simple apical seta (fig. 8'); upper lacinia with numerous short spines, lower lacinia with several long spines distally.

Maxilla (figs. 9, 9') with slender tapering palp, with two terminal setae; distal endite well developed, deeply bilobed, densely setose medially; proximal endite with single lobe, lanceolate (fig. 9') with one apical and five subapical plumose setae; scaphognathite well developed, 3 times longer than central width, posterior lobe large, rounded, anterior lobe elongate, distally rounded, with median margin somewhat sinuous.

First maxilliped (fig. 10) with two-segmented palp; basal endite with medial margin concave, with numerous setae, twice as long as wide, rounded distally; coxal endite medially bicarinate, dorsal carina with tuft of setae, ventral carina sparsely setose medially; exopod with well developed flagellum, with numerous plumose setae distally, caridean lobe moderate, with numerous marginal plumose setae, epipod large leaf-like.

Second maxilliped (fig. 11) with dactylar segment narrow, medial margin with numerous spiniform setae, propodal segment elongate rounded distally, distomedial border with numerous spines, carpus short; ischiomerus short, basis long, stout; coxa with large epipod; exopod well developed, with long flagellum having numerous plumose setae distally.

Third maxilliped (figs. 12, 12', 12'', 12''') normal, reaching to end of basal two-thirds of second segment of antennular peduncle; exopod slightly overreaching end of basal segment; antepenultimate segment about 4.7 to 5.1 times longer than wide; penultimate segment triangular in cross-section, 3.75 times longer than wide, with longitudinal row of setae on outer lateral margin; ultimate segment somewhat depressed, 7 times as long as broad, with the apex slightly acute, upper oblique face densely setose, basipodite with epipod hook-shaped (fig. 12''').

Thoracic sternite narrow. In male transverse lamina between bases of first pereopods with a small median notch. Thoracic sternite at bases of third and fourth pereopods, with an arrow-pointed process formed by convergence of two semi-circular cup-shaped plates.

First pereopods (figs. 13, 13') mostly similar in shape, usually subequal in size, and overreaching end of scaphocerite by entire carpus (in longer leg) or half the carpus (in shorter leg). Cheliped with dactylus dorso-laterally. Chelae robust, one slightly longer than other chela, about 1.7 times carapace length; palm subcylindrical depressed, with a depressed saddle-shaped notch in distal third of lower face, its surface rough with tiny corneous tubercles. Chela about 4.2 times longer than wide; its movable finger stout, about 0.7 times as long as palm and laminar, about 3.7 times as long as wide, somewhat twisted, triangular in cross-section basally, more flattened in rest of its length; ending in a small tooth placed slightly below broadly rounded tip, resembling a bird's head. Cutting-edge finely serrulate with one or two strong acute teeth in proximal half. Fixed finger slender, tapering to a curved strong apical claw; its cutting-edge finely dentate, and armed with one or two strong proximal teeth; car-

pus is short, conical, about 1.17 times as long as wide medially; merus slender, about 4 times as long as wide medially, and widened distally; basis obliquely articulated with ischium, unarmed; coxa robust with 2 setobranths and a hook-like epipod; its inner postero-lateral proximal margin with a prominent blunt tooth.

Second pereopod (figs. 14, 14') thin and slender, its fingers slightly longer than palm; carpus with 5 articles; coxa with 2 setobranths and a hook-shaped epipod. Ambulatory pereopods moderately robust. Third pereopod (figs. 15, 15') exceeds antennular peduncle by half (in young males) to 4/5 of the length of its propodus (in old males); dactylus slender, simple, curved, and slightly more than half to 2/3 length of propodus, its distal two-thirds longitudinally slightly concave ventrally; dorsal surface convex with two longitudinal sublateral rows of short setae, without a clearly demarcated unguis; propodus somewhat curved and about 0.3 times as long as carapace length, 5.8 times longer than wide, unarmed; its distal margin with some long slender setae dorsally; its dorsal surface roughly carinate, medially with a row of long setae; outer and inner lower surfaces each with a row of long slender setae; carpus slightly longer than propodus, 5 times longer than its distal width, and carinate dorso-medially; merus 1.6- 1.7 times longer than propodus, 5.3 times longer than wide, and slightly swollen medially; ischium about 0.4 times as long as merus, 2.6 times as long as wide distally, and slightly tapering proximally, with a single conspicuous external mobile spine at one-third of its length; basis normal; coxa robust, with 2 setobranths dorsally and a hook-like epipod laterally. Fourth pereopod (fig. 16) exceeding antennular peduncle by half to four-fifths of length of dactyl; its shape similar to that of third pereopod. Fifth pereopod (figs. 17, 17') reaching with tip of dactyl to distal end of first segment of antennular peduncle; more slender and shorter than preceding legs, dactylus about 0.6 times as long as propodus; propodus 4.4-6.3 times longer than wide, and about 0.2 times as long as carapace; upper part of its distal margin with long slender setae which reach to 4/5th of length of dactyl; outer distal part of lower margin with several dense transverse rows of setae (fig. 17'); inner side of lower margin with a row of long slender setae; carpus carinate dorsally; merus slightly longer than carpus, and 4 times longer than wide; ischium unarmed; basis normal; coxa with 2 setobranths, but no epipod.

First abdominal sternite of male armed with an acute spine between first pair of pleopods.

Pleopods normal. Endopod of first male pleopod (figs. 18, 18') slender, swollen near base, 4.3 times longer than wide, elongate with about 17 plumose setae distally and laterally, about 7 plumose setae medially, apical plumose seta longest, about 5/6 of the endopod length. Endopod of second male pleopod (figs. 19, 19'), 7.3 times longer than wide, appendix masculina slender with about 15 long spines, appendix interna reaching beyond middle of appendix masculina, with few distal cincinnuli.

Uropods (figs. 21, 21') with protopod bearing acute disto-dorsal lobe; exopod 1.73 times longer than wide, lateral margin convex with submarginal setal fringe, disto-lateral margin with mobile spine; diaeresis (fig. 21') without teeth, distal lamella large, broadly rounded with long plumose setae; endopodite about 2 times longer than wide.

Colour.— Freshly collected specimens are milky opaque white with gastric region partly light yellow.

Size.— Total length of males 31-39 mm. Carapace length of males 9.5-11 mm.

Habitat.— The species seems to be restricted to the estuarine areas of large rivers at a depth of about 5-9 m and to flat, sandy and partly muddy bottoms. The average tidal amplitude varies annually around 4 m, and semi-diurnally. The salinity of the water may drop temporarily to 16-18 ‰ namely during the period of heavy rains (from June to September). The species was found together with the penaeid shrimps *Solenocera crassicornis* (H. Milne Edwards, 1837), *Parapenaeopsis sculptilis* (Heller, 1862), *P. hardwickii* (Miers, 1878), *Penaeus silasi* Muthu & Motoh, 1979, *P. merguiensis* de Man, 1888, *Metapenaeus brevicornis* (H. Milne Edwards, 1837), *M. ensis* (de Haan, 1844) and *M. lysianassa* (de Man, 1888), with the sergestid shrimps *Acetes indicus* H. Milne Edwards, 1830 and *A. japonicus* Kishinouye, 1905, the palaemonid carideans *Macrobrachium equidens* (Dana, 1852), *Macrobrachium* spec., *Exopalaemon vietnamicus* Nguyen Van Xuân, 1992, *Palaemon curvirostris* Nguyen Van Xuân, 1992, *Palaemon sewelli* (Kemp, 1925), with two distinct colour morphs (Nguyen Van Xuân, 2000), *Periclimenes grandis* (Stimpson, 1860), the pasipheid *Leptochela* (*Leptochela*) *gracilis* Stimpson, 1860, the alpheids *Alpheus crassimanus* Heller, 1865, *Alpheus* spec., the hippolytid shrimps *Lysmata vittata* (Stimpson, 1860), *Latreutes anoplonyx* Kemp, 1914, and *Mimocaris heterocarpoides* (Nobili, 1903), the stomatopod *Chlorodopsis scorpio* (Latreille, 1825) and the horseshoe crabs *Tachypleus gigas* (O.F. Müller, 1785) and *Carcinoscorpius rotundicauda* (Latreille, 1802) as well as numerous species of brackish water fishes like *Plotosius canius* Hamilton, 1822, *Lates calcarifer* (Bloch, 1790), *Scatophagus argus* (Linnaeus, 1766), *Mugil* species, and the fire worm *Chloeia flava* (Pallas, 1766).

Economic importance.— This is a rare species without any economic value at the moment.

Distribution.— The species seems to be restricted to river estuaries and the flat and shallow sandy coast and mud nearby. This species has not been found in shrimp pond culture in mangroves.

Etymology: from camelus (Latin for “camel”), referring to the double protuberance on the back of the animal.

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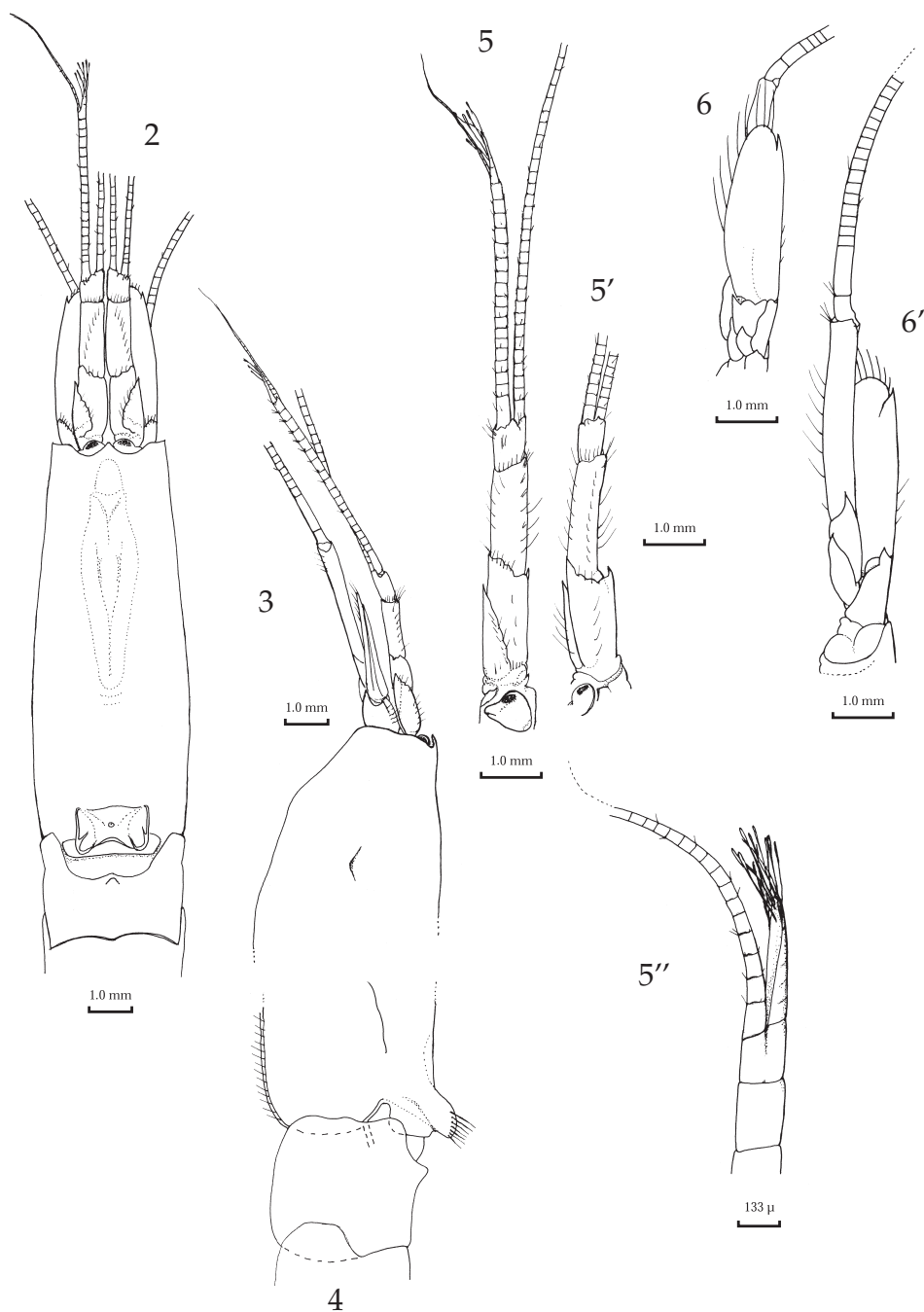
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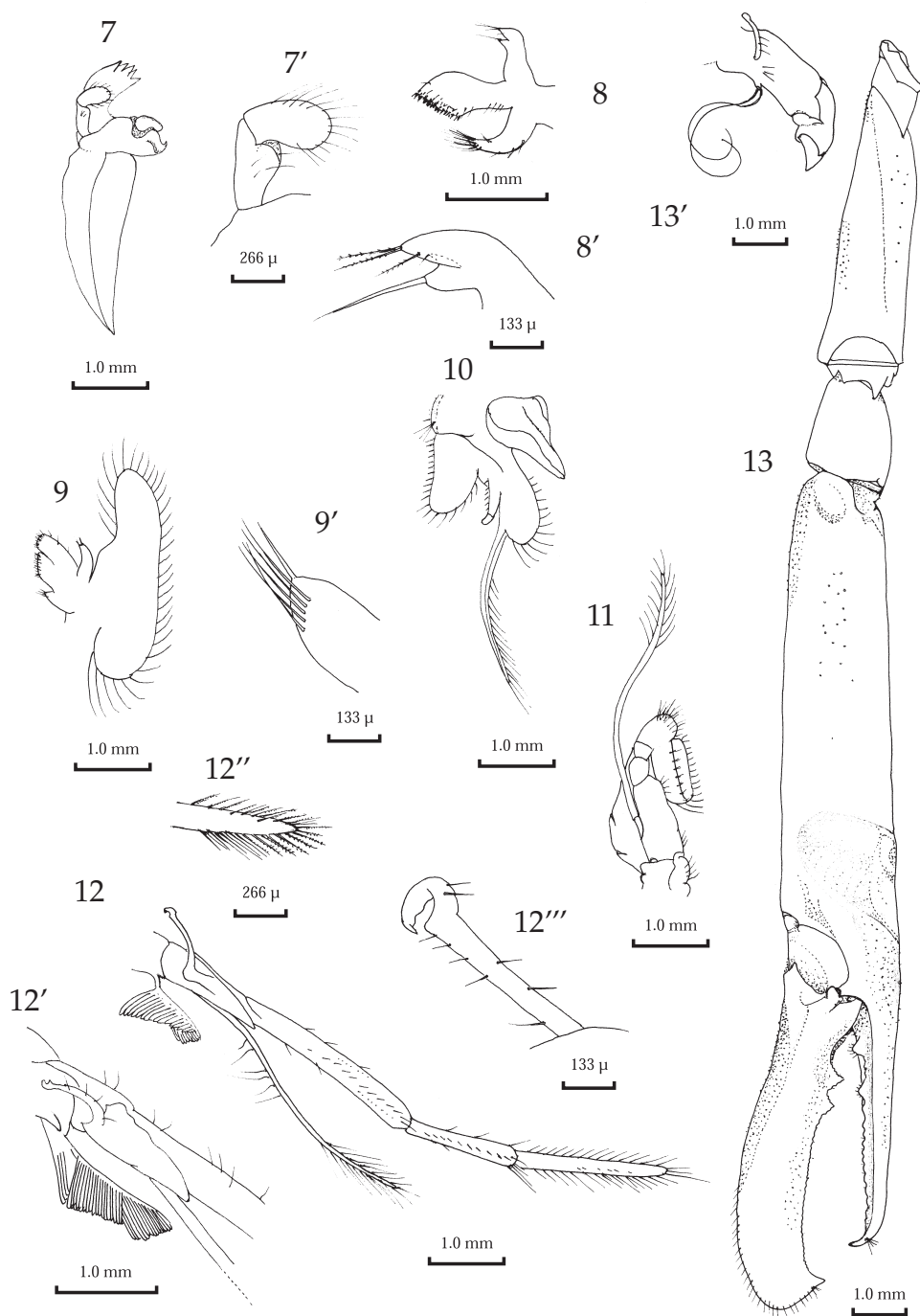
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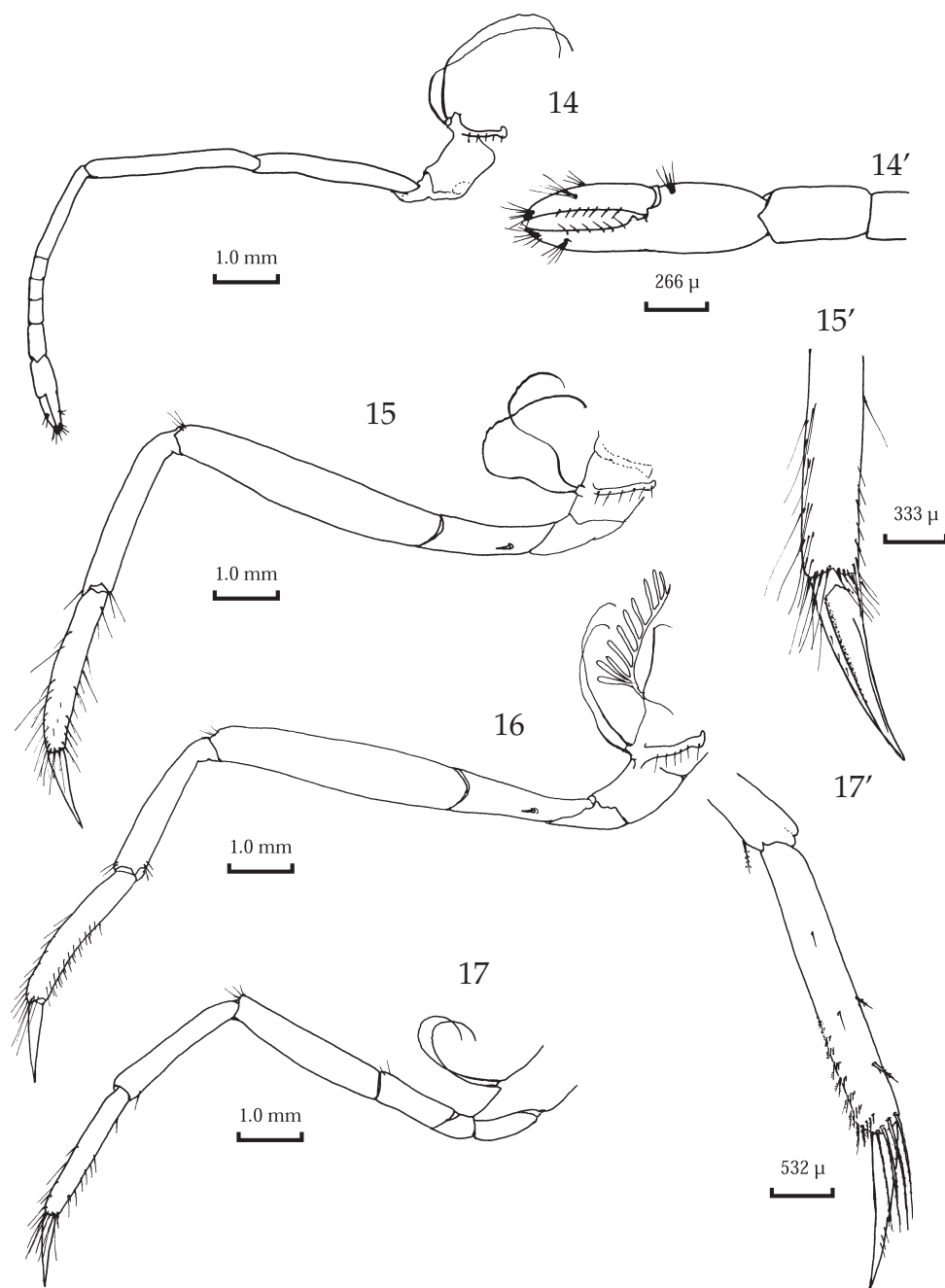
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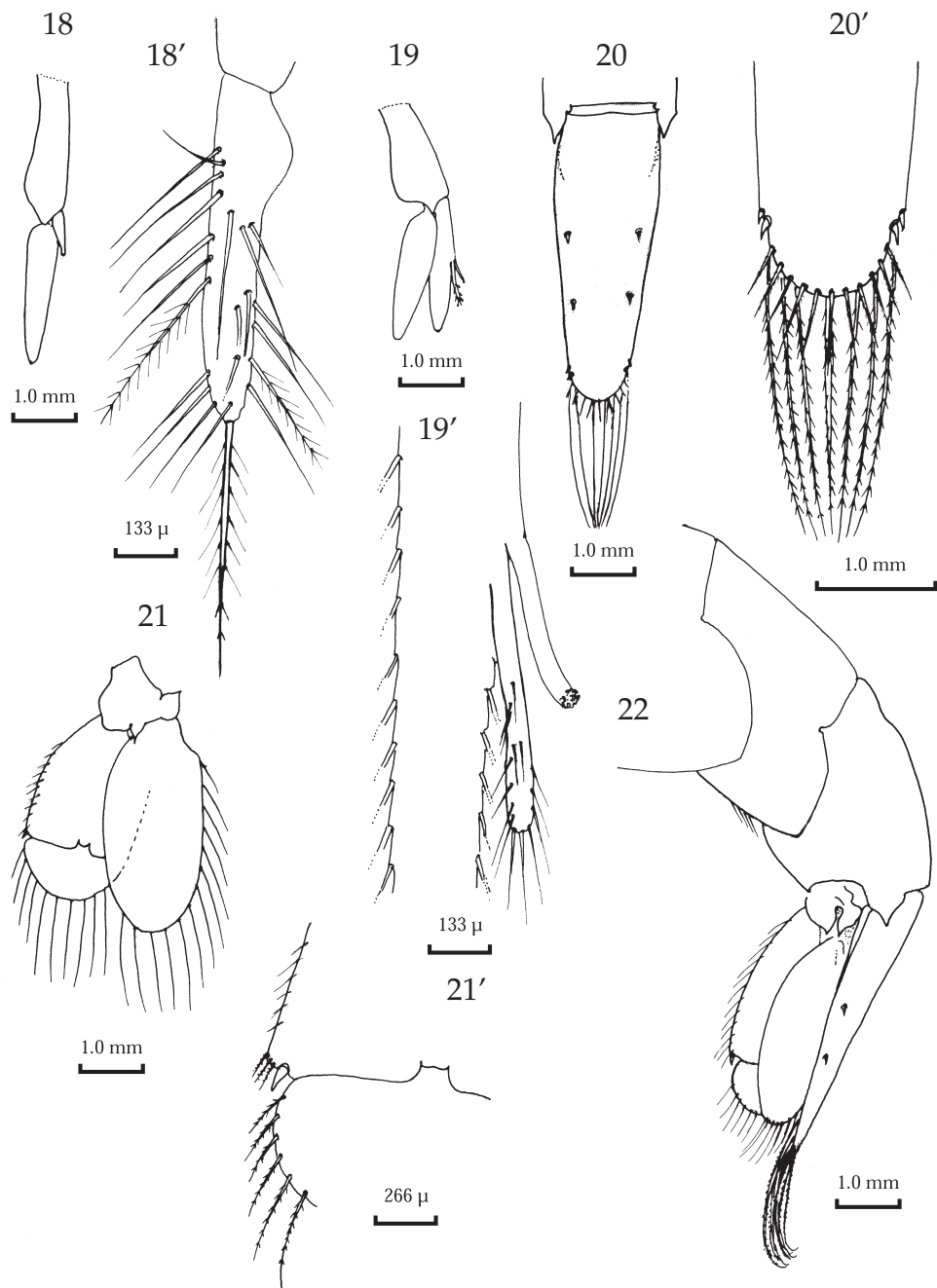
Figs 2-6', *Thuyllamea camelus* gen. nov. & spec. nov., ♂, cl.: 10.5 mm. 2, anterior part and carapace in dorsal view; 3, anterior part of carapace in lateral view; 4, posterior part of carapace and first abdominal somite in lateral view; 5, antennule and eye in dorsal view; 5', antennular peduncle in upper lateral view; 5'', distal end of outer flagellum; 6, antenna in upper view; 6', antenna in lower view.



Figs 7-13', *Thuyllamea camelus* gen. nov. & spec. nov., ♂, cl.: 10.5 mm. 7, mandible; 7', mandibular palp; 8, maxillula; 8', palp of maxillula; 9, maxilla; 9', coxal endite of maxilla; 10, first maxilliped; 11, second maxilliped; 12, third maxilliped; 12', proximal end of third maxilliped; 12'', distal end of ultimate segment of third maxilliped; 12''', epipod; 13, first pereopod; 13', proximal end of first pereopod.



Figs 14-17', *Thuyllamea camelus* gen. nov. & spec. nov., ♂, cl.: 10.5 mm. 14, second pereiopod; 14', chela of second pereiopod; 15, third pereiopod; 15', lower face of propodus and dactyl of third pereiopod; 16, fourth pereiopod; 17, fifth pereiopod; 17', outer distal part of fifth pereiopod.



Figs 18-22, *Thuylamea camelus* gen. nov. & spec. nov., ♂, cl.: 10.5 mm. 18, first male pleopod; 18', endopod of first male pleopod; 19, second male pleopod; 19', appendix interna and masculina; 20, telson; 20', posterior end of telson; 21, uropods, exopod and endopod; 21', uropod, diaeresis of exopod in dorsal view; 22, distal end of abdomen in lateral view.