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Description of *Harperalpheus pequegnatae*, new genus, new species, from the Gulf of Mexico and Atlantic coast of the southeastern USA (Crustacea, Decapoda, Alpheidae)

Abstract A new genus, *Harperalpheus*, gen. nov., is established for *H. pequegnatae*, sp. nov., on the basis of specimens collected from sandy subtidal sediments off Galveston, Texas, and Sapelo Island, Georgia, USA. The holotype female, the largest and most intact specimen of the type series, is ovigerous and bears an appendix masculina on the second pleopod. The new genus is characterised by conspicuous, robust, equal sized chelipeds, which distinguish it from other known sympatric alpheid genera that lack an articulated posteroventral plate on the sixth abdominal pleuron. Additional distinguishing features of *Harperalpheus*, gen. nov., are the sharply produced pterygostomial angle of the carapace, orbital hoods concealing the eyes in dorsal view and lacking extracorneal teeth, the distinct rostrum having a posteriorly extended ventrorostral keel, and the third maxilliped bearing a uniquely bilobed lateral plate on the coxa and lacking an arthrobranch. While this new species is not readily allied to any presently known alpheid genus, it appears to have some affinities with *Coutieralpheus* Anker and Felder, 2005, *Salmoneus* Holthuis, 1955, and *Parabetaeus* Coutière, 1896.

Key words Crustacea, Decapoda, Alpheidae, new genus, new species, Atlantic

Introduction

In the course of collecting and studying infaunal decapods along the Atlantic coast of Florida, one of us (DLF) and the late Raymond B. Manning found a few specimens of alpheid shrimp with equal sized, symmetrical chelipeds. As materials of these forms were very limited, and additional specimens were not found despite concerted collecting efforts, every attempt was made over a period of years to secure additional representatives from existing collections and regional crustacean workers prior to the publication of formal descriptions. In response to our search for such material, Linda H. Pequegnat generously provided a series of possibly related specimens from the western Gulf of Mexico, which had been collected in shallow subtidal sediments from off Galveston, Texas, during the course of ecological studies by Donald E. Harper, Jr. None of those specimens was ultimately found to be a congener of the material originally discovered on the Atlantic coast of Florida and recently described as *Coutieralpheus setirostris* Anker and Felder, 2005 (Anker & Felder, 2005). However, it was ultimately concluded that they represented the same species as did a single, incomplete, undescribed specimen in our holdings from shallow subtidal sediments off the coast of Sapelo Island, Georgia. Thus the present material constitutes the type series for description of yet another new genus and species of alpheid shrimp from the western Atlantic, one of six alpheid genera in this region with enlarged, equal and symmetrical chelae (in addition to *Coutieralpheus* Anker and Felder, 2005, *Parabetaeus* Coutière, 1896, *Alpheopsis* Coutière, 1896, *Mohocaris* Holthuis, 1973 and *Bermudacaris* Anker and Iliffe, 2000).

Twelve alpheid genera were listed recently by Anker and Felder (2005) as groups that included infaunal taxa. Their description of *Coutieralpheus* and the present report brings that number to 14. The great majority of the infaunal species assigned to these genera are known or suspected to be obligate or facultative symbionts of other burrowing crustaceans, varied large fossorial or tubicolous worms, or burrow-constructing fish. While such relationships are relatively easy to infer when collections are made intertidally and targeted to individual burrows, they are much more difficult to document from subtidal samples taken by grabs or corers. In the present case,

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all samples were simply sieved from sandy sediments that contained varied amounts of mud, without notation of host associations or other microhabitat preferences. It is also very difficult to infer function for unique morphological structures, such as the odd terminal apparatus of the third maxilliped of the herewith described form.

Materials and methods

The holotype and all but one (Sapelo Island, Georgia) of the paratypes were taken from off Galveston, Texas by D. E. Harper, Jr., and C. A. Henry in 1975 and 1976. With one exception those collections were made from shallow sublittoral (depth 10–13 m) mud and sand sediments at a dredged materials disposal site and were obtained with a spade corer. An additional collection was obtained from silty sand substrates of slightly deeper waters (depth 21 m) of the nearby Buccaneer Gas and Oil Field with a diver-operated Ekman grab sampler. Sediments were subsequently sieved to remove infaunal specimens, which were initially fixed in 10% buffered formalin solution and then preserved for archival in 70% ethanol.

All drawings were made with the aid of a camera lucida and most were based on the holotype specimen. An alcohol-based solution of Chlorazole Black E stain (Sigma Chemical Company®) was used to enhance visibility of fine sutures and articulations in the integument prior to illustration. Carapace length (CL) and the total length (TL) were measured in ±0.1 mm with a calibrated ocular micrometer. Measurements were made along the dorsomedial line from the rostral tip to the posterior margin of the carapace (CL) and the telson (TL), respectively. The type specimens are deposited in the collections of the National Museum of Natural History, Smithsonian Institution, Washington DC, USA (USNM) and the Nationaal Natuurhistorisch Museum, Leiden, Netherlands (RMNH).

Taxonomic description

Classification here conforms to that proposed for Recent Crustacea by Martin and Davis (2001).

Subphylum Crustacea Brünnich, 1772

Class Malacostraca Latreille, 1802

Order Decapoda Latreille, 1802

Suborder Pleocyemata Burkenroad, 1963

Superfamily Alpheoidea Rafinesque 1815

Family Alpheidae Rafinesque, 1815

Genus *Harperalpheus*, gen. nov

Species *Harperalpheus pequegnatae*, sp. nov

***Harperalpheus*, new genus**

Diagnosis

Carapace glabrous, with finely marked anterolateral suture; branchiostegal margin of carapace without pronounced ventral lip; frontal region lacking orbital teeth, with rostrum acute, broad basally, narrowly triangular distally, bearing strong median ventral carina; pterygostomial angle acute to subacute, strongly produced anteriorly. Eyes completely concealed in dorsal and lateral view, eyestalk without anteromesial process or tubercle. Antennular peduncle robust, first segment with ventromesial tooth, length of first and second segments subequal; stylocerite reaching to or beyond midlength of second segment; lateral antennular flagellum biramous. Mandible with two-segmented palp, distal segment articulated subterminally on proximal segment; incisor process bearing triangular distal teeth; molar process with lamellae and setae on multilobed surface. First maxilliped with moderately expanded caridean lobe. Second maxilliped with epipod broadened distally. Third maxilliped pediform; coxa bearing elongate lateral plate, bilobed distally; terminal segment with pair of subterminal spines, subterminal tuft of elongated setae; tip forming nipple bearing terminal spine or pore (socket for missing spine?). First pereiopods (chelipeds) enlarged, equal in size, symmetrical in shape, robust, carried extended or loosely flexed below thorax; ischium unarmed; merus robust, flexor surface flattened or shallowly depressed; carpus short, robust, cup-shaped, mesially with short parallel comb-like rows of setae; chela subcylindrical, with palm smooth, linea impressa and adhesive discs absent; cutting edges of fingers armed with irregular teeth, snapping mechanism absent. Second pereiopod with five-segmented carpus. Third pereiopod with ischium and merus each with ventrolateral spine; carpus with distoventral spinule; propodus with multiple spinules on ventral margin; dactylus simple. Fifth pereiopod with ischium with or without ventrolateral spine; merus with ventrolateral spine; propodus with multiple ventral spinules and well developed row of ventrolateral setae on distal half. Abdomen with fifth somite posterolateral corner angular, subacute; sixth somite without articulated plate at posterolateral angle. Female and male second pleopod bearing both appendix interna and appendix masculina. Uropodal exopod bearing single or double distolateral spine originating beneath produced lobe, diaeresis poorly marked, restricted to distal extreme. Telson with two pairs of dorsal spines and two pairs of posterolateral spines, posterior margin rounded; anal tubercles absent; preanal plate acutely produced posteriorly. Gill formula: 5 pleurobranchs (P1-5), 0 podobranchs, 0 arthrobranchs, 2 lobed epipods (Mxp1-2), 5 strap-like epipods = mastigobranchs (Mxp3, P1-4), 5 sets of setobranchs (P1-5), 3 exopods (Mxp1-3).

Type species

Harperalpheus pequegnatae, new species, by monotypy and present designation.

Etymology

The new genus is named for Donald E. Harper, Jr., who collected most of the specimens and brought them to the attention of Linda H. Pequegnat, who in turn furnished them to DLF. Dr Harper is herewith recognised not only as the collector, but also for his many contributions to studies of benthic marine invertebrates of the northwestern Gulf of Mexico. The genus name is a combination of D. Harper's last

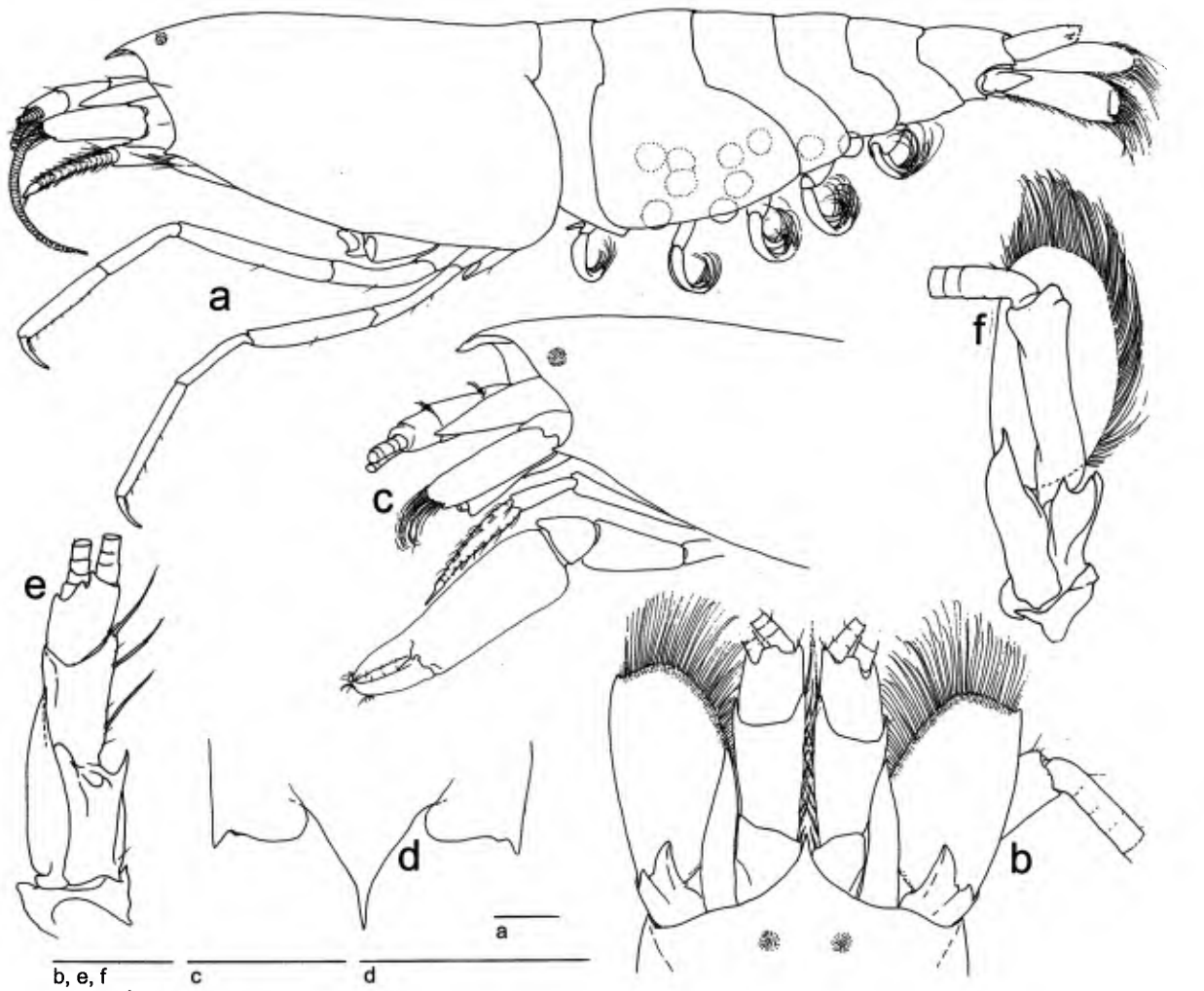

Figure 1 *Harperalpheus pequegnatae*, gen. nov., sp. nov., holotype female (USNM 1091099): a – habitus, left side; b – anterior carapace, antennal and antennular peduncles, dorsal view; d – sixth abdominal somite preanal plate, ventral view; e – right antennular peduncle, ventral view; f – right antennal peduncle, ventral view. Paratype male (USNM 134715): c – anterior carapace and left anterior appendages, left side. Scale bars = 1 mm.

name and *Alpheus*, the type genus of the family Alpheidae. Gender masculine.

Relationships

See remarks under *Harperalpheus pequegnatae*, sp. nov.

Harperalpheus pequegnatae, new species

(Figs 1–4)

Material examined

Holotype: Northwestern Gulf of Mexico, dredged material disposal site, southeast of Galveston Island, Texas, USA, near 29° 18.5′N, 94° 40.0′W, about 5 km offshore, spade corer, sandy bottom, depth 11.5-12 m, pilot study station 16-2, 17 April 1975, collected by D. Harper, 1 female, CL 7.8, TL 17.2, USNM 1091099.

Paratypes: Northwestern Gulf of Mexico, same locality, methods and collector as holotype, mud bottom, depth 10.5–11 m, station 14-III-E, 24 November 1975, 1 male CL 3.5, TL 7.9, USNM 1091101; same locality and methods as holotype, depth 10 m, station UID-5–5, 23 November 1975, collected by C. Henry, 1 male, CL 3.3 , TL 7.7, USNM 1091102; same locality, methods and collector as holotype, sandy bottom, depth 10.5–11 m, station 15-I-E, 18 September 1975 1 juvenile male, CL 2.1, TL 5.2, USNM 1091103; same locality, methods and collector as for holotype, bottom sandy, mud bottom, depth 10.5–11 m, station 2-III-C, 21 July 1975, 1 female, CL 3.5, TL 8.1, USNM 1091104; same locality, methods and collector as holotype, mud bottom, depth 10.5–11 m, station 27-III-E, 17 September 1975, 1 male, CL 2.6 , TL 6.2, RMNH D51702. Northwestern Gulf of Mexico, Buccaneer Gas and Oil Field about 50 m from Platform 288-A, south-southeast of Galveston, Texas, USA, 28° 53.5′N, 94° 40.75′W, silty-sand bottom, diver-operated Ekman grab, depth 21 m, station NMFS 5-A C, 15 October 1976, 1 unsexed juvenile, CL 1.7 , TL 4.1, USNM 1091105. Western North Atlantic Ocean, east of Sapelo Island, Georgia, USA, about 4 km offshore, depth 6–8 m, sand-mud bottom, May 1970, collected by K. Smith, 1 male, CL 3.0, TL 7.7, USNM 134715.

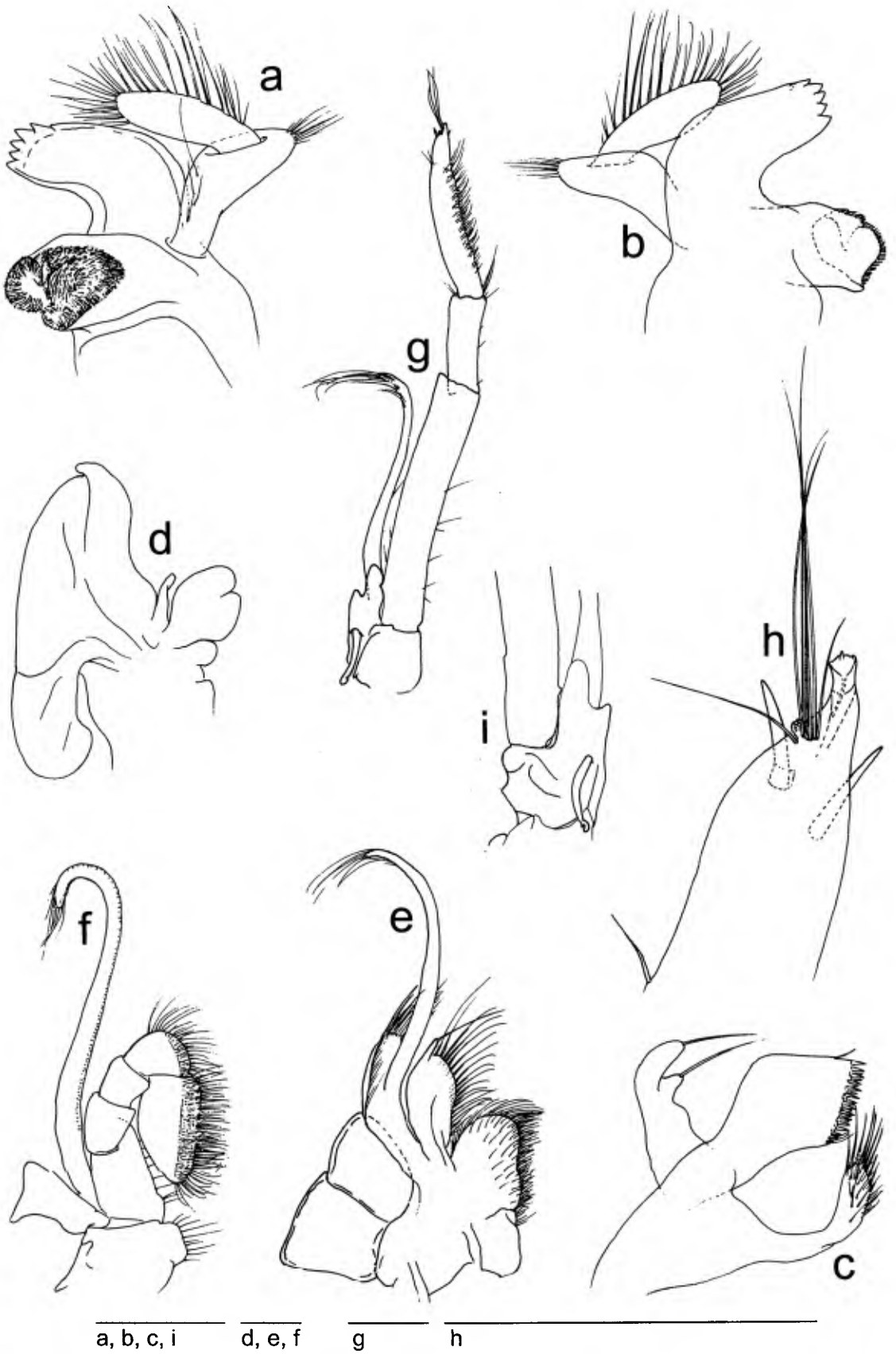

Figure 2 *Harperalpheus pequegnatae*, gen. nov., sp. nov., holotype female (USNM 1091099): a – right mandible, mesial view; b – right mandibe, lateral view; c – right first maxilla, lateral view; d – right second maxilla, lateral view; e – right first maxilliped, lateral view; f – right second maxilliped, lateral view; g – right third maxilliped, lateral view; h – right third maxilliped, terminal apparatus; i – left third maxilliped, basal articles, lateral view. Scale bars = 0.5 mm.

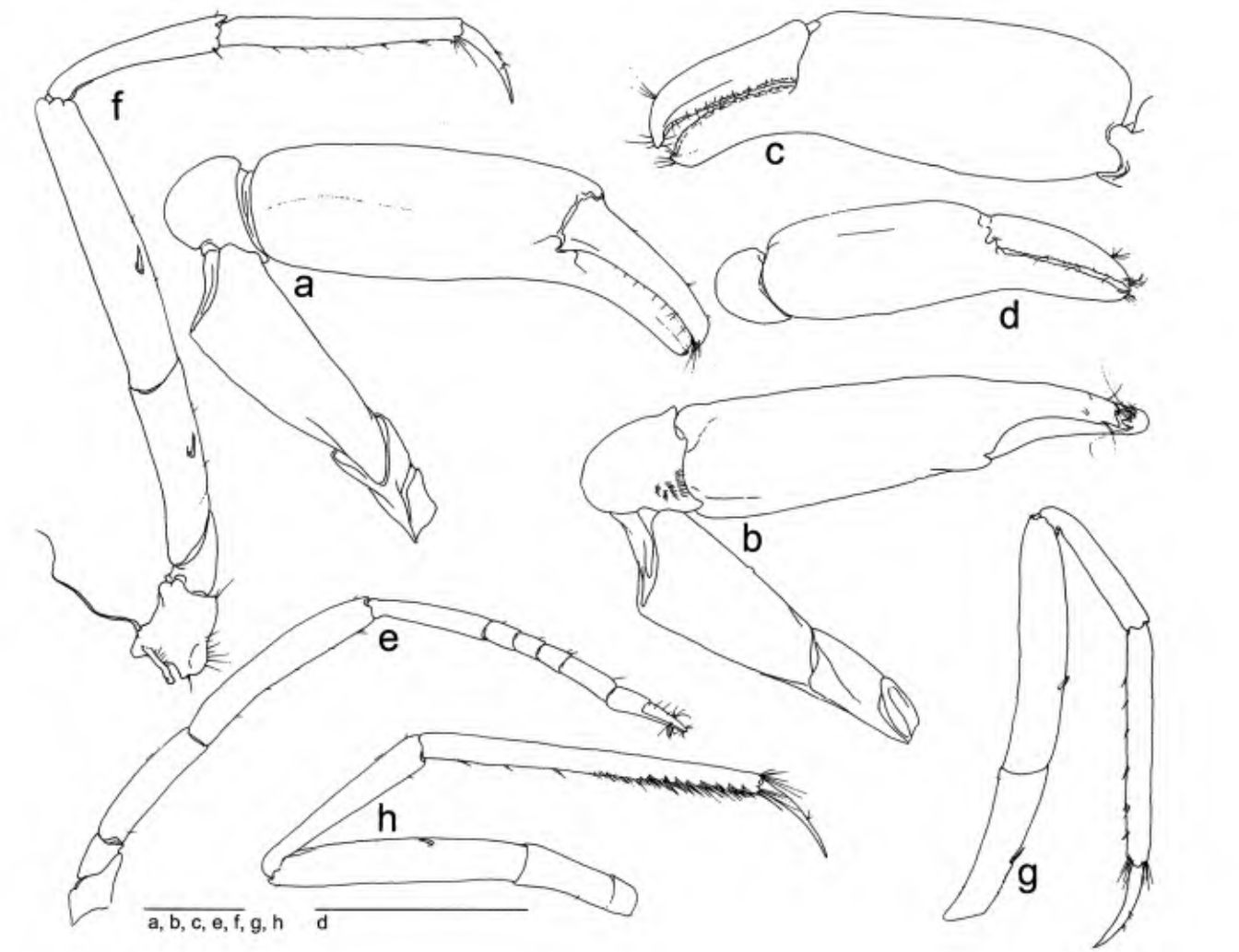

Figure 3 *Harperalpheus pequegnatae*, gen. nov., sp. nov., holotype female (USNM 1091099): a – left first pereiopod, dorsomesial view; b – right first pereiopod, ventromesial view; c – chela of right first pereiopod, dorsal (= flexor) view; e – right second pereiopod, lateral view; f – right third pereiopod, lateral view; g – right fourth pereiopod, lateral view; h – right fifth pereiopod, lateral view. Paratype male (USNM 134715): d – chela of left first pereiopod, ventrolateral view. Scale bars = 1 mm.

Description

Cephalothorax and anterior abdomen relatively stout (Fig. 1a), weakly compressed laterally; carapace and abdomen glabrous. Carapace with weak suture proximal to base of antenna, sometimes obsolescent, anterior hood concealing eyes in dorsal view, lacking orbital teeth (Fig. 1a–c). Rostrum bearing ventral median carina, lacking dorsal carina, broad basally, becoming narrowly triangular distally, tip acute, simple (Fig. 1a–c). Pterygostomial angle acutely produced toward anterior (Fig. 1a, b). Cardiac notch well developed (Fig. 1a). Eyes completely covered by carapace, not visible in dorsal or lateral view, without anteromesial process or tubercle, cornea inconspicuous (Fig. 1a–c). Ocellar beak not conspicuous. Epistomial sclerite with median carina forming raised, rounded keel posteriorly, laterally forming broad lobes, anteriorly terminating the in obtuse median tip.

Antennular peduncle stout (Fig. 1b, e), second article subequal in length to first, longer than third; stylocerite acute, elongate, reaching to or beyond midlength of second segment (Fig. 1a–c, e); ventromesial carina with sharp tooth (Fig. 1e); lateral flagellum biramous, short ramus minute, originating at end of segment 2 or 3 from flagellum base, forming very short knob bearing a tuft of long aesthetascs. Antenna with basicerite stout, with small acute ventrolateral tooth (Fig. 1f) and rounded distal lobe (Fig. 1b); scaphocerite broadly oval, anterior margin of blade convex, slightly protruding beyond distolateral tooth (Fig. 1b, c), latter small, triangular; carpocerite stout, subcylindrical, not reaching distal margin of scaphocerite (Fig. 1f).

Mandible with incisor process bearing six teeth, most proximal and third from distal the largest (Fig. 2b); molar process lamellae and setae on multilobed surface; two-segmented palp with distal segment articulated subterminally on proximal segment, distalmost end of subterminal segment bearing a tuft of setae. Maxillule with palp bilobed, dorsal and ventral lobes each bearing one robust seta (Fig. 2c). Maxilla with scaphognathite broadly expanded, incised distally, endopod (palp) small, not segmented (Fig. 2d). First maxilliped with caridean lobe on exopod broadly expanded, weakly cupped; endopod (palp) expanded, furnished with long setae, distally

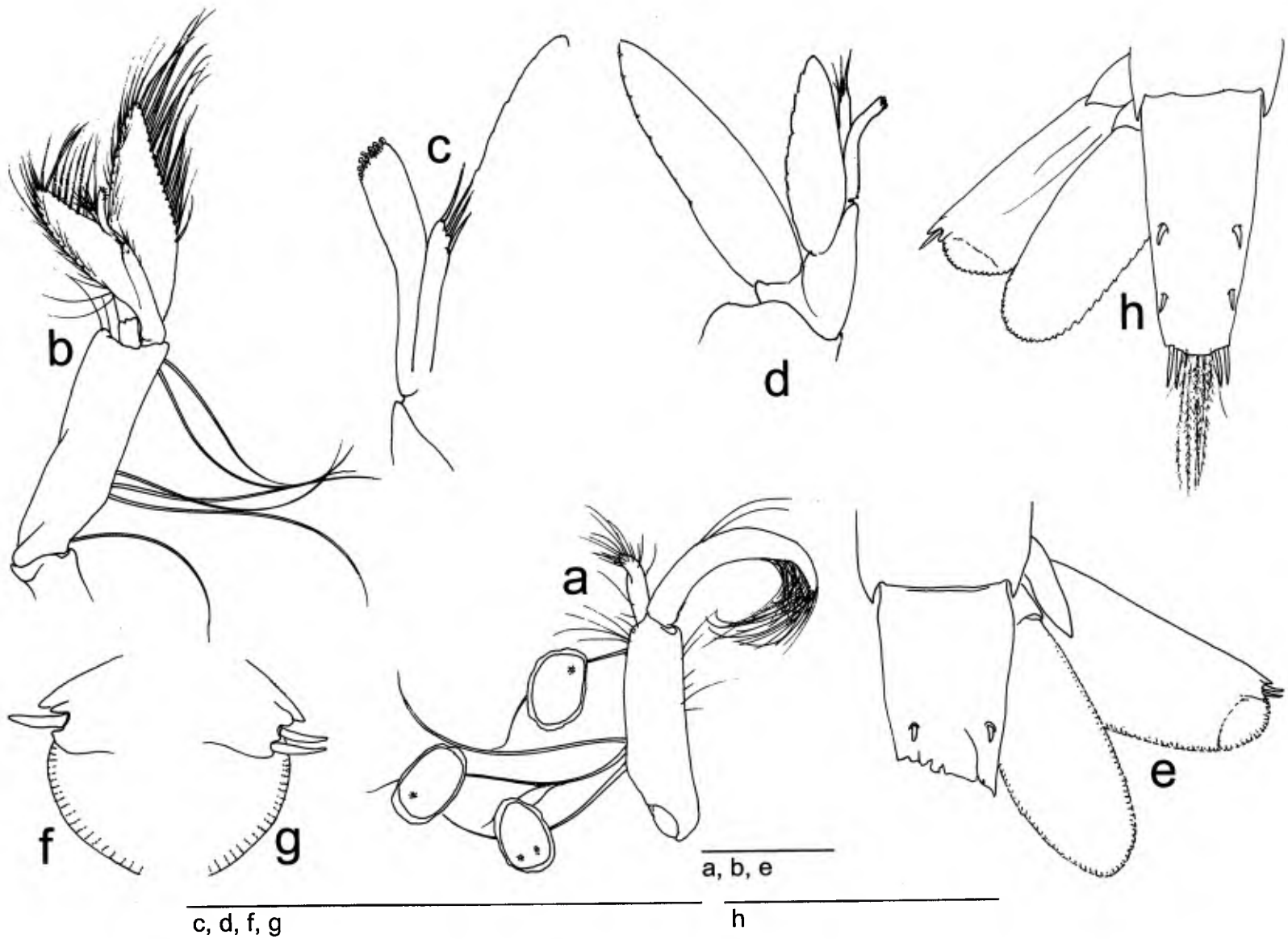

Figure 4 *Harperalpheus pequegnatae*, gen. nov., sp. nov., holotype female (USNM 1091099): a – right first pleopod, anterior view; b – right second pleopod, posterior view; c – right second pleopod appendix interna and appendix masculina, anterior view, marginal setation not shown; e – telson and right uropods, dorsal view, marginal setation not shown; f – subterminal spination, exopod of left uropod, dorsal view, marginal setation not shown. Paratype male (USNM 134715): d – right second pleopod, posterior view, marginal setation not shown. Scale bars = 1 mm.

with small, narrow lobe, bearing one stiff seta (Fig. 2e). Second maxilliped with epipod broadened distally, forming a narrow, proximally directed lobe subterminally (Fig. 2f). Third maxilliped generally pediform, stout distally, lateral plate elongated, bilobed distally; terminal segment of endopod slightly inflated, tip armed with two subterminal spines and subterminal tuft of long setae, tip forming a narrowed nipple terminated in articulated terminal spine, or (when spine absent) a pore or socket; arthrobranch absent.

First pereiopods (chelipeds) equal in size and symmetrical in shape, robust and carried extended or loosely flexed below cephalothorax (Fig. 1c); ischium short, unarmed (Fig. 3a, b); merus stout, subtriangular in cross-section, widening distally, unarmed (Fig. 3a, b); carpus stout, cup-shaped, with three to four rows of setae mesially (Fig. 3a–d); palm subcylindrical, smooth, less than twice length of fingers, subrectangular in outline and cross-section, flexor (mesial) surface flattened or slightly depressed proximally (Fig. 3a–d); fingers bent slightly ventromesially from axis of palm, not gaping when closed, tips curved, but not strongly crossing (Fig. 3b, c); distal cutting edge and tip of dactylus fitting into opposing distal furrow and bifid tip of pollex (Fig. 3a, b); cutting edges of pollex and dactylus with numerous low teeth and irregular lines or small clumps of short setae; both fingers bearing short hooked setae subterminally (Fig. 3a, c, d); finger armature of left and right cheliped not differing markedly.

Second pereiopod slender; ischium exceeding 1/2 length of merus; carpus with five articles with ratio approximately: 4 : 1 : 1 : 1 : 2; chela simple, fingers distinctly longer than palm, bearing a few long, hooked setae subterminally (Fig. 3e). Third pereiopod larger than second or fourth, proximal articles distinctly more robust than distal; ischium exceeding half length of merus, bearing one spine on ventrolateral margin; merus armed with one spine on ventrolateral margin; carpus exceeding half length of merus, with one small distoventral spiniform seta; propodus about 1.3 times as long as carpus, ventral (inferior) margin with three to six small spiniform setae, distalmost among a few short setae proximally to dactylus; dactylus simple, relatively slender, subconical, curved, subequal to or less than half length of propodus (Fig. 3f). Fourth pereiopod (Fig. 3g) similar to third. Fifth pereiopod with proximal articles distinctly less robust than in third and fourth pereiopods; ischium with or without ventrolateral spine, exceeding half length of merus; merus about 1.3 times length of carpus, armed with one spine on ventrolateral margin; carpus unarmed, with a few minute setae; propodus about 1.7 times length of carpus, ventrally with regularly spaced spiniform setae distally concealed by eight-nine transverse rows of mostly short bristles, longest becoming stiff, almost spiniform distally, concealing articulation with dactylus; dactylus very slender, about half to 1/3 length of propodus (Fig. 3h).

First to fourth abdominal somites with posterolateral angles of pleura rounded to weakly angular, fifth somite with subacute posterolateral angle, sixth somite lacking articulated plate at posterolateral angle (Fig. 1a); preanal plate posteriorly produced, forming acute posteriorly directed spine (Fig. 1d). First pleopod with diminutive endopod, no more than 1/3 length of exopod (Fig. 4a). Second pleopod of both male and female with appendix interna and appendix masculina (Fig. 4b–d); female appendix masculina markedly shorter than appendix interna (Fig. 4b, c); male appendix masculina subequal in length to appendix interna, reaching well into distal 3/4 of endopod, distally bearing four to five slender spiniform setae (Fig. 4d). Telson tapering, roughly twice as broad anteriorly as posteriorly, proximal width slightly less than half length; dorsal surface with two pairs of spines positioned well dorsal of lateral margin, anterior pair near mid-length and posterior pair near 3/4 length of telson (Fig. 4e, h); posterior margin broadly rounded, bearing two pairs of strong, elongated posterolateral spines, pairs near equal in length (Fig. 4h). Uropods not markedly elongated, flexed endopod slightly exceeding telson (Fig. 4h), subequal in length to exopod when both extended; lateral lobe of sympodite distally forming single acute tooth (Fig. 4h); exopod with diaeresis restricted to distal 1/7 of ramus, forming weakly arched suture between distomesial margin and lateral tooth (Fig. 4e); lateral spine stout, elongate, sometimes doubled, originating from thickened, elevated pedestal (Fig. 4e–h). Gill formula as given for genus.

Colour pattern

Unknown.

Size

For the known specimens, the carapace length ranges from 1.7 mm in what appears to be an immature unsexed paratype to 7.8 mm in the mature, ovigerous female holotype. While much smaller than the female holotype, the largest male paratype (CL 3.5) appears to be sexually mature. Total length in these specimens ranges from 4.1–17.2 mm. Egg size on the ovigerous female holotype ranges from 0.52–0.70 mm.

Habitat

Most specimens are known from the type locality in shallow subtidal waters (10.5–11 m depths) off Galveston, Texas, but the overall depth range for collections varied from 6 m off Sapelo Island, Geogria, to 21 m in the Buccaneer Oil and Gas Field off of Galveston, Texas. Substrates varied from sand to mud at the type locality, were reported as silty sand in the Buccaneer Oil and Gas Field (see Harper et al., 1981), and were noted to be sand-mud off of Sapelo Island. The type locality off Galveston was a dredged materials disposal site designated by the US Army Corps of Engineers, and the collections there were made in the course of pilot and subsequent studies of disposal impacts, in which mud and sandy substrate biota were compared (Harper, 1997). Specimens of *Harperalpheus pequegnatae* sp. nov. were recovered during the sieving of sediment samples from this area, but it is reasonable to expect that they were associated with some burrowing host, given typical habits of related genera. During the pilot studies, large numbers of the echiuran worm *Thalassema hartmani* Fisher, 1947, along with specimens of its commensal clam *Paramya subovata* (Conrad, 1845), were found to occur in the area at high densities (D. Harper, personal communication; Henry, 1976). Echiurans are well known to host commensal alpheids from several genera (Anker et al., 2005). While no direct

evidence establishes this echiuran with certainty as the host for *Harperalpheus pequegnatae* sp. nov., it or any of several large polychaetes that occur in the area are the most probable candidates for consideration.

Etymology

This new species is named in recognition of Linda H. Pequegnat for her contributions to studies of decapod crustaceans in the Gulf of Mexico, as well as for her generous support of those colleagues who have shared her interests. Dr Pequegnat first recognised these animals as a potential new genus, and generously made them available to DLF for study.

Variation

For all of the smaller paratype specimens in which pereiopods are intact, including in the small male from off Georgia, the dactyls of the third to fifth pereiopods are relatively longer and narrower than are those of the larger female holotype. Where intact, the fifth pereiopod in these smaller specimens also appears to have a ventrolateral spine on the ischium, while it is lacking in the holotype. Both of these features may relate to maturation or intraspecific variation.

In the holotype female (CL 7.8) and a small paratype male (CL 3.4 mm) from off Galveston, Texas, the robust terminal segment of the third maxilliped endopod narrows to what appears as a small pore or nipple. In the small paratype male (CL 3.0) from off Georgia and in a small paratype female (CL 3.5 mm) from off Galveston, the pore at the terminus of this nipple is instead occupied (plugged) by a tightly articulated terminal spine. Thus, what appears to be a pore observed in some specimens could instead be the socket for a missing spiniform seta. Variation in this character does not appear related to sex or maturation.

Distribution

Presently known from shallow (depth 6–21 m) subtidal sand, silty sand, and mud substrates from off Galveston, Texas, in the northwestern Gulf of Mexico, and off Sapelo Island Georgia, on the Atlantic coast of the southeastern USA.

Remarks

Harperalpheus gen. nov. is unique among known alpheid genera in the following combination of characters: Enlarged, symmetrical chelipeds, with carpus bearing comb-like setae mesially, without snapping mechanism on fingers; frontal margin with rostrum and ventrorostral keel, without orbital teeth; sixth abdominal somite without articulated posterolateral plate; third maxilliped without arthrobranch, with a peculiar bilobed lateral plate; mandible with distal segment of the palp articulated subterminally on the proximal segment; preanal plate of the sixth abdominal somite acutely produced posteriorly; basicerite of antenna produced dorsally into a rounded lobe; and ischium and merus of the third and fourth pereiopod each armed with a ventral spine.

Five alpheid genera with equal or subequal chelipeds have representatives in the western Atlantic: *Coutieralpheus*, *Parabetaeus*, *Alpheopsis*, *Mohocaris* and *Bermudacaris*. Among these genera only *Mohocaris* and *Bermudacaris* are characterised by the absence of an articulated posterolateral plate on the sixth abdominal somite, however, these genera differ greatly from *Harperalpheus*, gen. nov. by the shape of the chelipeds, the frontal region and numerous other features. *Coutieralpheus*, *Parabetaeus* and *Alpheopsis* have an articulated posterolateral plate on the sixth abdominal somite but also, in contrast to *Harperalpheus* gen. nov., bear a well developed arthrobranch on the third maxilliped and lack a ventrorostral keel (see Chace, 1972; Nomura & Anker, 2001; Anker & Felder, 2005). The recently described *Coutieralpheus* additionally lacks the strongly produced pterygostromial angle characteristic of *Harperalpheus* gen. nov., bears a unique rostral setation that is absent in *Harperalpheus* gen. nov., and has a rounded posterior lobe on the preanal plate instead of the acute spine found in *Harperalpheus* gen. nov. (cf. Anker & Felder, 2005). *Parabetaeus*, a pantropical genus formerly reported from the western Atlantic as *Neoalpheopsis* Banner, 1953 (e.g., Chace, 1972; see Nomura & Anker, 2001 for synonymy) can be furthermore distinguished from *Harperalpheus*, gen. nov. by the non-bilobed lateral plate on the coxa of the third maxilliped and the cheliped carpus lacking mesial comb-like rows of setae, features found in both *Harperalpheus* gen. nov. and *Coutieralpheus*.

Among other known alpheid genera, worldwide, none appear to be a particularly good candidate for a close phylogenetic relationship to *Harperalpheus* gen. nov. *Deioneus* Dworschak, Anker & Abed-Navandi, 2000, described recently from the Cape Verde Islands (Dworschak *et al.*, 2000), is similar to *Harperalpheus* gen. nov. in general habitus as well as in having an elongated stylocerite on the antennular peduncle, an elongated lateral plate on the third maxilliped, an expanded caridean lobe on the first maxilliped, and an elongated epipod on the second maxilliped. However, *Deioneus* has differently shaped, asymmetrical chelipeds without mesial rows of setae on the carpus, and bears an articulated posterolateral plate on the sixth abdominal somite, a well developed arthrobranch on the third maxilliped, an unarmed merus and ischium on the third and fourth pereiopods, and small extracorneal teeth on the orbital hoods, all in contrast to *Harperalpheus* gen. nov.

Despite the presence of equal chelipeds in *Harperalpheus* gen. nov., and strikingly unequal chelipeds in the alpheid genus *Salmoneus* Holthuis, 1955, several other characters suggest possible affinities between these taxa. Both genera lack an articulated posterolateral plate on the sixth abdominal somite and have an elongate stylocerite on the antennular peduncle. Perhaps most provocative, specimens of *Salmoneus*, including ovigerous females, always have a well-developed appendix masculina (Carvacho, 1989; Anker, 2003), as also seen in our specimens of *Harperalpheus* gen. nov. However, in contrast to *Harperalpheus* gen. nov., all species of *Salmoneus* bear extracorneal teeth on the frontal margin of the carapace, lack mesial rows of setae on the cheliped carpi, have a well-developed multi-segmented secondary ramus on the lateral antennular flagellum, and have a posteriorly truncate or notched telson.

Other genera characterised by the equal or subequal chelipeds and the absence of an articulated plate on the sixth abdominal somite, e.g. *Thuylamea* Xuan, 2001 and *Metabetaeus*

Borradaile, 1898, differ from *Harperalpheus*, gen. nov. by the shape of the chelipeds and numerous other features (see Banner & Banner, 1960; Xuan, 2001), and are thus not closely related to the new genus. For the time we defer further comment on the phylogenetic placement of *Harperalpheus*, gen. nov., pending full character analysis and results from ongoing comparative molecular studies among alpheid genera. As one of many alpheid genera known or suspected to live in association with other burrowing marine invertebrates (Anker & Felder, 2005), its superficial resemblance to other alpheid genera may reflect convergences related to life style rather than close phylogenetic proximity to any other known genus of the family.

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