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A new snapping shrimp (Caridea, Alpheidae) from the Pacific coast of Colombia

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Abstract: *Alpheus wickstenae* sp. n. is described and distinguished from the six morphologically most similar species by a combination of characters. It is provisionally situated within the Edwardsii Group of *Alpheus*.

An apparently common shallow-water species of snapping shrimp has been collected by one of us (G.E.R.) over the last five years in the Colombian sector of the Eastern Pacific. It represents a new species, to be characterized below.

Alpheus wickstenae sp.n.
(Figs. 1-3)

Alpheus cf. *A. armillatus* H. Milne Edwards: Ramos and Caicedo (in preparation): fig. 5.

Holotype and type locality. Male, 35.1 mm total length (Collection of the Allan Hancock Foundation, University of Southern California, AHF 852). Rampa de los Suecos, Bahía Málaga, Pacific coast of Colombia (3°59' N, 77°20'W).

Paratypes. Male, 25.2 mm, ovigerous female, 35.4 mm (AHF 853). Rampa de los Suecos, Bahía Málaga. Male, 36.6 mm, female, 30.8 mm (Coleçao de Crustacea da Universidade Federal da Paraíba, UFPB 4329), male, 34.3 mm (UFPB 4330), male, 23.4 mm, female, 23.9 mm (Colección de Referencia de la Sección de Biología Marina de la Universidad del Valle, CRBMUV 85201). Isla Curichiche, Bahía Málaga (4°00'N, 77°19'W).

Male, 22.2 mm, 2 females, 25.5, 28.4 mm (CRBMUV 85202). Isla el Aguante, Bahía Málaga (4°04'N, 77°16'W).

Other material. One ovigerous female (UFPB 4296). Rampa de los Suecos, Bahía Málaga.

Two specimens (UFPB 4294), 6 specimens (CRBMUV 81123). Isla Curichiche, Bahía Málaga.

Ten specimens (2 ovigerous females) (UFPB 4331), 15 specimens (4 ovigerous females) (CRBMUV 8 6051). Bahía Aguacate (6°52'N, 77°41'W).

Diagnosis. Rostrum slender and dorsally rounded in front of eyes, broadening abruptly into dorsally flattened area just behind eyes, with borders slightly overhanging adrostral furrows. Ocular hoods unarmed. Adrostral furrows very deep and clearly delimited posteriorly. Rudimentary pleurobranch present at base of third maxilliped. Large chela strongly compressed. Proximal shoulder on large chela overhanging dorsal notch. Ventral notch deep, oblique. Small chela not sexually dimorphic, without "balaeniceps" –shaped dactylus. Merus of first cheliped unarmed, without sharp distal tooth at inferointernal margin. Carpus of second pereiopod with first article longer than second article. Movable spine absent from ischium of fifth pereiopod, but present on ischium of third and fourth pereiopods. Merus of third and fourth pereiopods without inferodistal tooth. Propodus of third and fourth pereiopods with two unmatched rows of spines. Dactylus of third to fifth pereiopods conical,

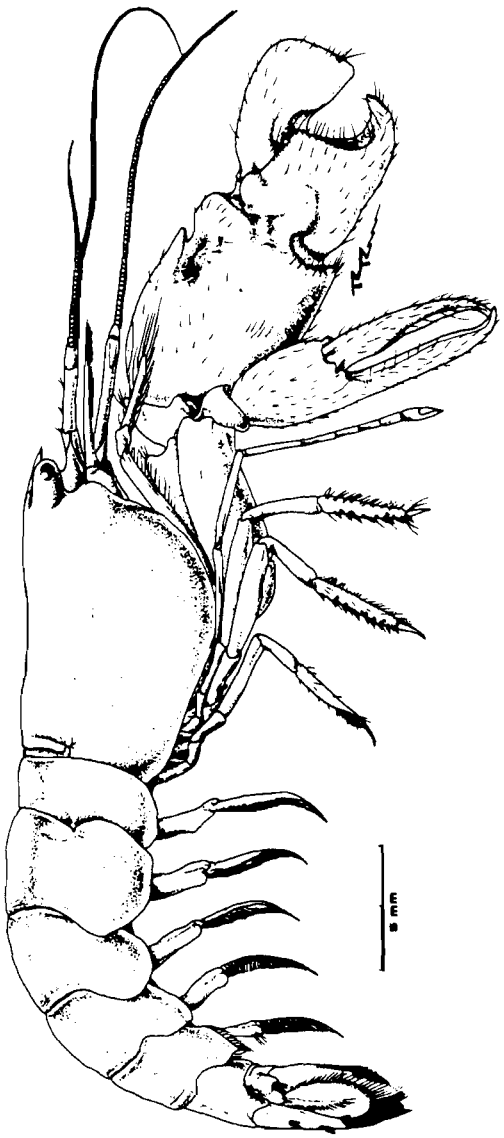

Fig. 1. *Alpheus wickstenae* sp.n. Holotype, male. Body in lateral view.

not subspatulate nor biunguiculate. Outer uropod with only one distolateral tooth flanking movable spine, mesial lobe being low and rounded. Posterior margin of telson and of inner uropod with row of spinules, that of outer uropod unarmed.

Description. Rostrum slender, acute, reaching the middle of first article of antennular peduncle; dorsally rounded in front of eyes, broadening abruptly into dorsally flattened triangular area just behind eyes, with borders slightly overhanging adrostral furrows. Orbital hoods rounded laterally, without teeth. Adrostral furrows very deep and clearly delimited posteriorly. Antennular peduncle slender, with second article 3.1 times as long as broad. Third article 0.3 times length of second. Stylocerite broad, with spiniform tip, reaching to end of first article of antennular peduncle. Scaphocerite with outer margin slightly concave, with lateral tooth reaching about to end of antennular peduncle and distinctly overreaching squamous portion. Basicerite with small ventrolateral tooth, shorter than stylocerite. Carpocerite slightly longer than antennular peduncle.

Third maxilliped reaches near to end of antennular peduncle. Ratio of articles of endopod 10: 3: 7. Inferodistal margin of antepenultimate article with rounded tooth; ultimate article with tip bearing brush of long hairs. Rudimentary pleurobranch present at base of third maxilliped, hidden below the much larger arthrobranch.

Large chela 2.3 times as long as broad, with fingers occupying the distal 0.4. Superior notch deep, well defined, with proximal shoulder rounded and distinctly overhanging notch; distal shoulder strong and abrupt. Lateral palmar depression well defined, quadrangular, extending to *linea impressa*. Medial palmar depression irregular, reaching beyond half the length of palm. Inferior shoulder heavy, rounded and strongly projected. Inferior notch deep, well marked, oblique. Inferolateral depression deep, well defined, continuing along lateral face of palm for 0.3 of total height. Inferomedial depression broad and well defined, forming an U-shaped groove which extends along medial face of palm for 0.4 of total height. Plunger of dactylus large and heavy. Merus 2.4 times as long as broad, superodistal margin projected, inferointernal margin rounded distally.

Small chela not sexually dimorphic, 2.5 times as long as broad, with fingers 1.4 times as long as palm. Both fingers curved and with acute tips, which cross when closed. Palm without sculpturing, with rounded tooth on medial side of dactylar articulation. Merus similar to that of large chela.

Ratio of carpal articles of second pereiopod 10: 8: 3: 3: 4.

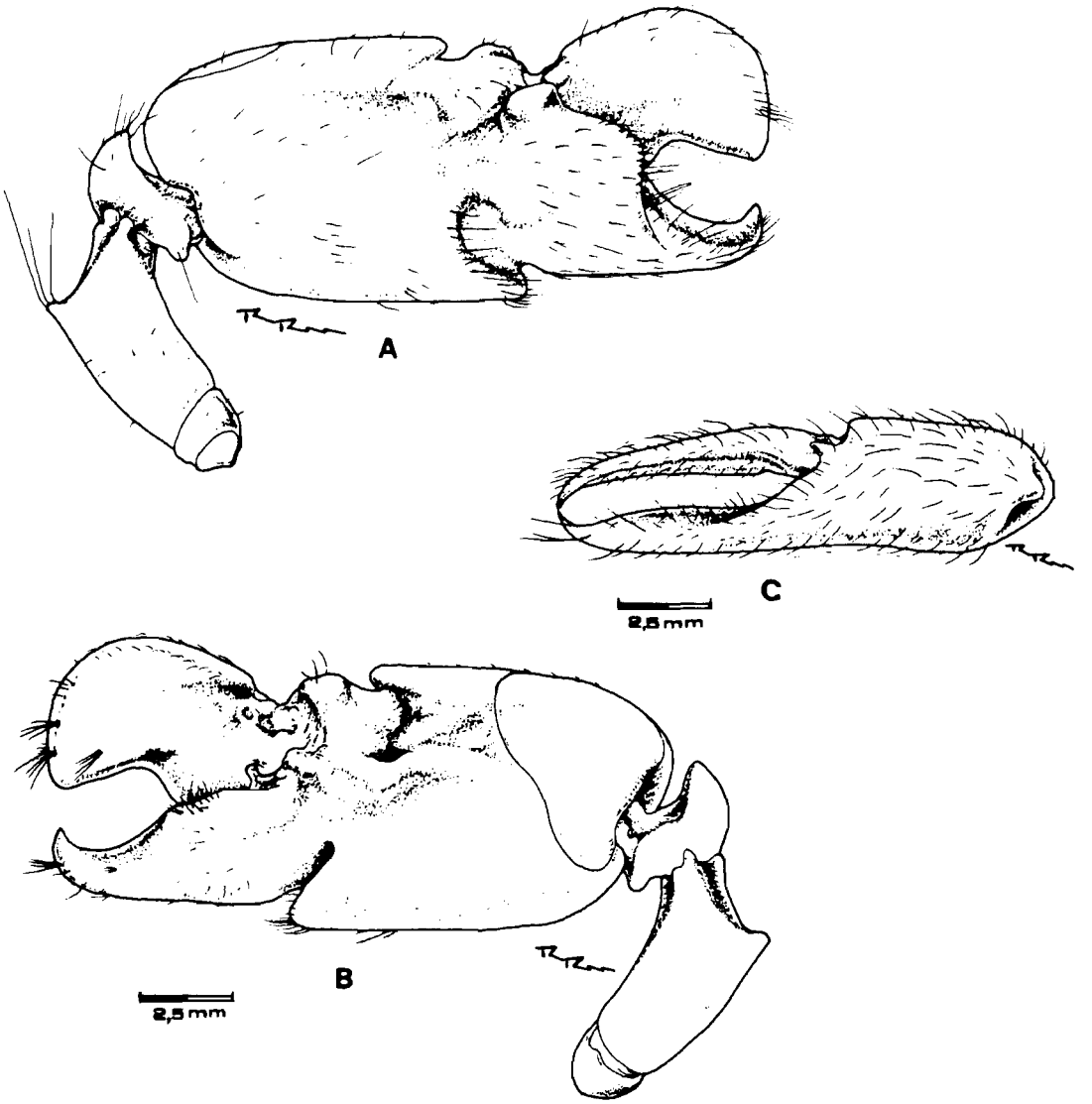

Fig. 2. *Alpheus wickstenae* sp. n. Holotype. A, major cheliped, medial face; B, major cheliped, lateral face; C, small chela, medial face.

Third pereiopod with movable spine on ischium. Merus unarmed, 4.2 times as long as broad. Carpus 0.6 times as long as merus, superodistal margin projecting as a rounded tooth. Propodus 0.7 times as long as merus, bearing on its inferior margin a distal pair of spines and 12-15 unequal spines arranged in two unmatched rows. Dactylus simple, conical, 0.3 times as long as propodus.

Fourth pereiopod similar to third. Fifth pereiopod shorter and more slender than third and fourth. Ischium unarmed. Propodus with single row of 8-10 spines along ventral margin and with transversal rows of short setae in distal third. Dactylus slender and curved.

Second pleopod of male with *appendix masculina* 0.5 times as long as *appendix interna* and provided with numerous stiff setae.

Telson 2.8 times as long as breadth of posterior margin; spines on dorsal surface heavy, much larger than posterolateral spines; posterior margin broadly arcuate, with row of dorsal spinules between dorsolateral spines. Inner uropod with similar row of dorsal spinules along posterior margin. Outer uropod unarmed along posterior margin; distolateral spine flank-

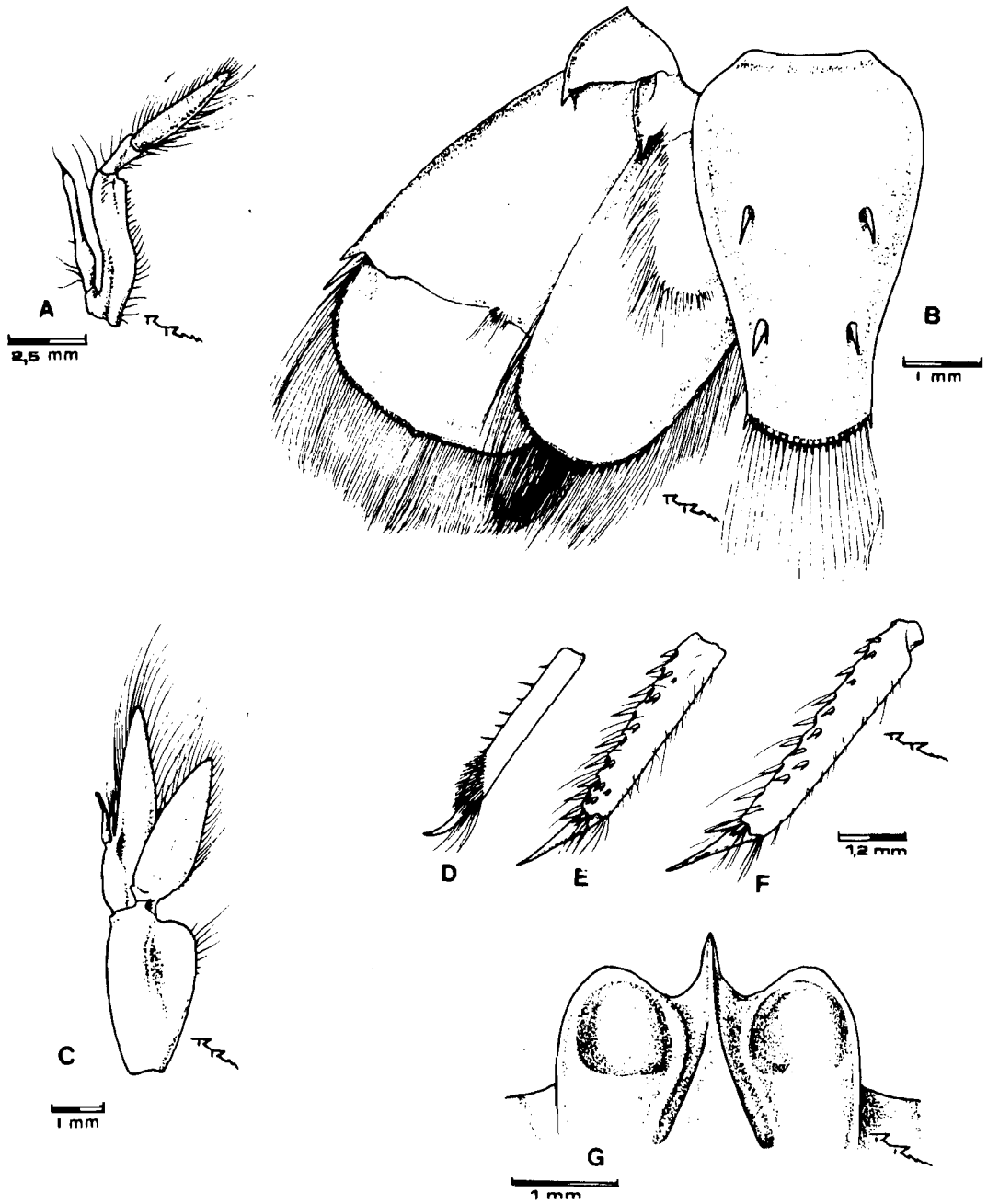

Fig. 3. *Alpheus wickstenae* sp. n. Holotype. A, third maxilliped; B, telson and uropods; C, second pleopod; D, E, F, propodus and dactylus of fifth pereiopod, fourth pereiopod and third pereiopod; G, rostral region in dorsal view.

ed by sharp lateral tooth and a rounded mesial lobe, which is very broad and merges gradually with the almost straight transversal suture.

Color in life. Corneas black. Dorsal side of cephalothorax blue-greenish. Branchial region translucent. Abdomen with blue color more pronounced on dorsal side and green color more pronounced on pleurae. Telson green. Outer and inner uropods bluish. Antennal peduncles, pereiopods and pleopods with red chromatophores. Chelae olive-green, with blue chroma-

TABLE 1

Diagnostic characters for distinguishing A. wickstenae *sp.n. from its morphologically most similar species*

	A. armillatus	*A. viridari*	*A. tasmanicus*	*A. heronicus*	*A. californiensis*	*A. galapagensis*	*A. wickstenae*
Rostrum forming wide flattened area just behind eyes	+	–	–	–	+	–	+
Adrostral furrows very deep and clearly delimited posteriorly	+	–	–	–	+	+	+
Proximal shoulder overhangs dorsal notch of large chela	–	–	–	+	–	–	+
Merus of first cheliped with sharp distoventral tooth	+	+	–	–	+	–	–

tophores (notes on living specimens from Bahía Aguacate).

Habitat. The specimens from Bahía Málaga are intertidal, living under rocks and in burrows in mud flats (in Isla El Aguante), with *Sicyonia disdorsalis* Burkenroad, *Salmoneus serratidigitus* (Coutière), *Alpheus* sp. (new species being described by M. K. Wicksten), and some gobiid fishes, in salinities of 20-26°/oo and temperatures of 28-30°C. In Bahía Aguacate they are also intertidal, living in sand burrows under rocks with the oyster *Ostrea iridescens* Gray, in salinities of 33°/oo.

Remarks. Snapping shrimps are classified under the genera *Amphibetaeus* Coutière, *Synalpheus* Bate, *Alpheus* Fabricius, *Racilius* Paulson, *Pomagnathus* Chace, and *Metalpheus* Coutière. They collectively represent an unnamed monophyletic taxon, defined by the unique plunger-and-socket mechanism of the major chela. *Alpheus* is clearly non-monophyletic, because the representatives of at least *Racilius, Pomagnathus* and *Metalpheus* descend from the latest common ancestor of the remaining 218 recognizable species and subspecies of *Alpheus;* in other words, the members of these genera are most closely related to species presently classified in the Sulcatus Group of *Alpheus.* The remaining informal subgeneric groups of *Alpheus* proposed by Coutière (1899, 1905) also reflect arbitrary grades of snapping-shrimp organization, and for this reason remain unsatisfactory in our present system.

A. wickstenae sp.n. belongs to the apparently monophyletic assemblage Brevirostris Group + Macrocheles Group + Edwardsii Group, because of the strongly compressed major chela, belongs to the possibly monophyletic assemblage Macrocheles Group + Edwardsii Group, because of the ventral notch on the palm of the major chela, and may be excluded from the Macrocheles Group because the major chela is not twisted. This leaves us with 75 species and subspecies presently accepted within the Edwardsii Group of *Alpheus.* Within this unwieldy assemblage the new species appears morphologically most similar to a small group of six species which have lost all traces of orbital teeth, the secondary unguis on the dactylus of the third to fifth pereiopods, the distal tooth on the merus of the third and fourth pereiopods, the marginal spinules from the outer uropod, the mesial tooth flanking the distolateral spine on the outer uropod, and the setiferous crests from the dactylus of the small chela: *Alpheus armillatus* H. Milne Edwards and *A. viridari* (Armstrong), from the Western Atlantic, *A. tasmanicus* Banner and Banner, and

A. heronicus Banner and Banner, from the Western Pacific, *A. californiensis* Holmes and *A. galapagensis* Sivertsen, from the Eastern Pacific. The combination of characters used to separate *A. wickstenae* from these species is shown in Table 1.

The new species is named in honor of Mary K. Wicksten, of the Texas A & M University, who has greatly assisted the junior author.

ACKNOWLEDGMENTS

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RESUMEN

Se describe *Alpheus wickstenae* sp.n. y se provee su diagnosis para distinguirla de las restantes 218 especies y subespecies hasta ahora reconocidas del género *Alpheus*. Se le sitúa provisionalmente dentro del grupo Edwardsii del género *Alpheus* y se separa de seis especies morfológicamente muy similares.

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