

***Lebbeus laurentae*: a replacement name for *Lebbeus carinatus* de Saint Laurent, 1984 (Decapoda: Caridea: Hippolytidae) and a redescription of the species**

Mary K. Wicksten

Department of Biology, Texas A&M University, College Station, Texas 77843-3258, U.S.A.,
e-mail: Wicksten@mail.bio.tamu.edu

Abstract.—*Lebbeus carinatus* de Saint Laurent, 1984, is a junior homonym of *L. carinatus* Zarenkov, 1976. Both are deep-sea Pacific species, differing in the dorsal carina of the carapace and epipods of the pereopods. I provide a replacement name for *L. carinatus* de Saint Laurent, illustrations, and a more complete description.

In 1984, Michèle de Saint Laurent described a new species of hippolytid shrimp, *Lebbeus carinatus*, based on specimens taken in the eastern Pacific. She apparently was unaware that the name already had been applied by Zarenkov (1976) to a species of *Lebbeus* taken off Chile. The original diagnosis by de Saint Laurent was extremely brief, barely more than one paragraph, without details on the antennae, mouthparts, pereopods or abdominal somites. There were no illustrations, nor was a holotype designated.

Confusion as to what constitutes *Lebbeus carinatus* was resolved in part by a redescription of *L. carinatus* Zarenkov by Fransen (1997). I obtained the type material of *L. carinatus* de Saint Laurent, three specimens in battered condition, from the Museum National d'Histoire Naturelle (MNHN) in Paris. The mandibles, maxillae and maxillipeds of one of the specimens had already been dissected out.

In this paper, I redescribe the species of de Saint Laurent, provide illustrations, and compare the species with other deep-sea species of *Lebbeus* of the eastern Pacific. The format of the description follows that of Fransen (1997). Terminol-

ogy for the cleaning structures of the pereopods follows Bauer (1978). Carapace lengths (CL) are given in millimeters. Because all of the specimens had legs that had become detached or broken, I used all three specimens in preparation of the illustrations. The appendix interna is illustrated as seen by light microscopy.

***Lebbeus laurentae*, nomen novum**
Figs. 1–4

Lebbeus carinatus de Saint Laurent
1984:356.

Material examined.—Syntypes: female, CL 19.4, female CL 13.5, male CL 12.0 (broken). Northeastern Pacific, 12°49'N, 103°57'W, 6–30 Mar 1984, 2630 m, submersible vehicle *Cyana*, campaign BIO-CYARISE, site Parigo/Pogosud, catalog number MNHN Na14973.

Description.—Rostrum shorter than to barely exceeding first segment of antennular peduncle, more or less straight, females with two or three teeth on carapace and two or three dorsal teeth on rostrum proper, two or three apical and ventral teeth; male with one tooth on carapace and two dorsal teeth on rostrum proper; with acute distal end and one subapical ventral tooth (Fig. 2A–C). Carapace with pronounced

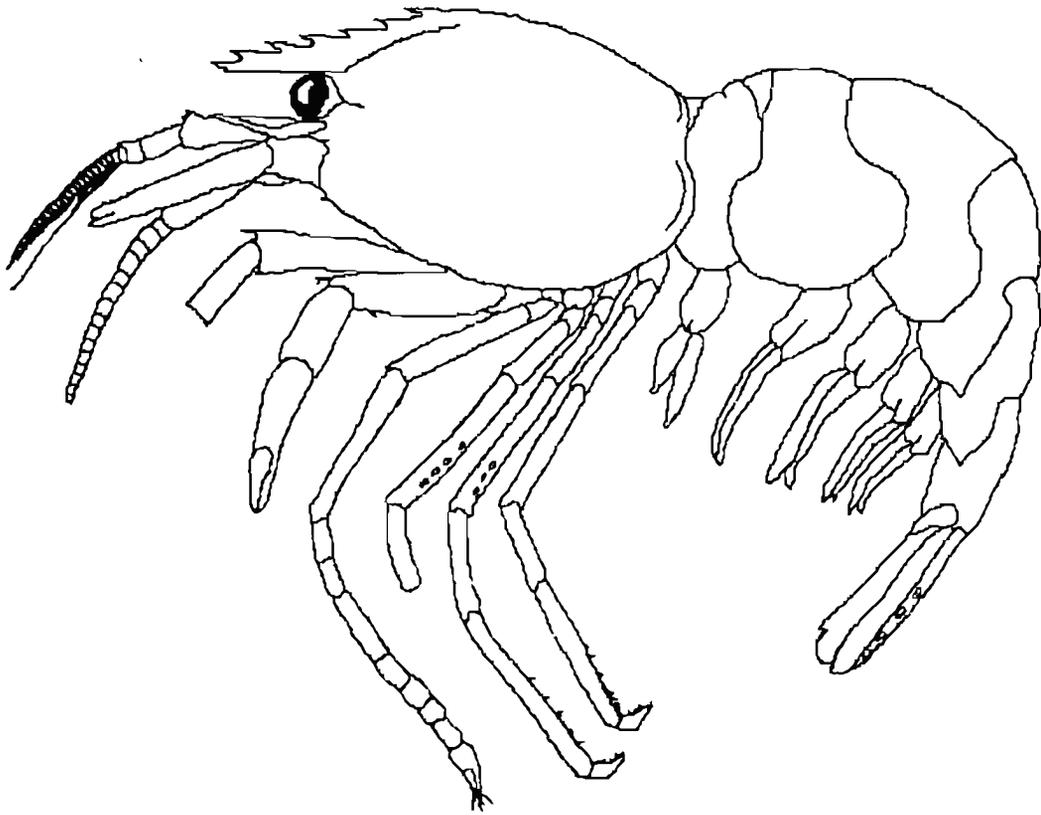


Fig. 1. *Lebbeus laurentae*, syntype female. CL 19.4. Scale = 10 mm.

dorsal carina in anterior half near dorsal teeth. Prominent supraorbital tooth continuing into supraorbital ridge. Orbit deeply incised posteriorly, infraorbital angle produced. Antennal tooth prominent. Anterolateral angle of carapace rounded, with sharp pterygostomial tooth (Fig. 1).

Abdominal somites dorsally rounded. Ventrodistal margin of pleura of somites 1-3 broadly rounded, that of somite 4 rounded but with acute ventral tooth, that of somite 5 elongated into sharp, triangular projection, somite 6 nearly as long as fifth. Telson with four pair dorsolateral spines, its length approximately 2.9 times its width, tapering from

articulation with abdominal somite 6 to distal margin; distal margin triangular, with 3-5 pairs of spines on each side: outermost short, next long and acute, mesial short and least robust (Figs. 1, 2D, E).

Eyes globular, short, pigmented.

Antennular peduncle shorter than scaphocerite. Length of first segment about half of length of scaphocerite, distal margin with three acute teeth, small ventromesial tooth also present in two of the three specimens. Stylocerite acute, not reaching to end of first segment. Length of second segment less than half as long as that of first, with acute dorsal tooth; length of third segment about half

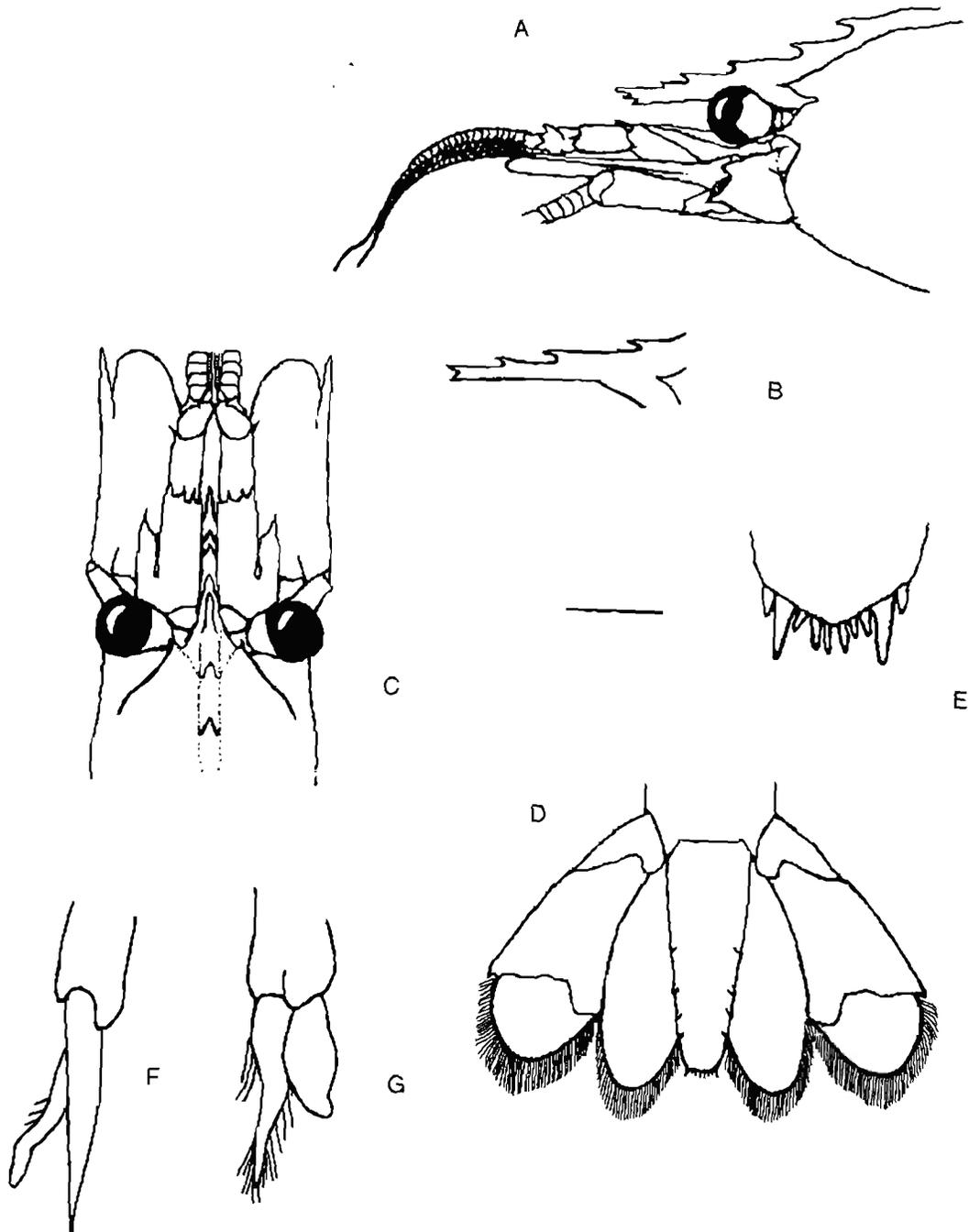


Fig. 2. *Lebbens laurentae*, syntype female. CL 13.5. A, Frontal region of body in lateral view. B, Syntype male, rostrum. C-E, G, Syntype female. C, Frontal region in dorsal view. D, Telson and uropods. E, Detail of end of telson. G, First pleopod. F, Syntype male, first pleopod. Scales: A-C, F = 4 mm; D = 1 mm.

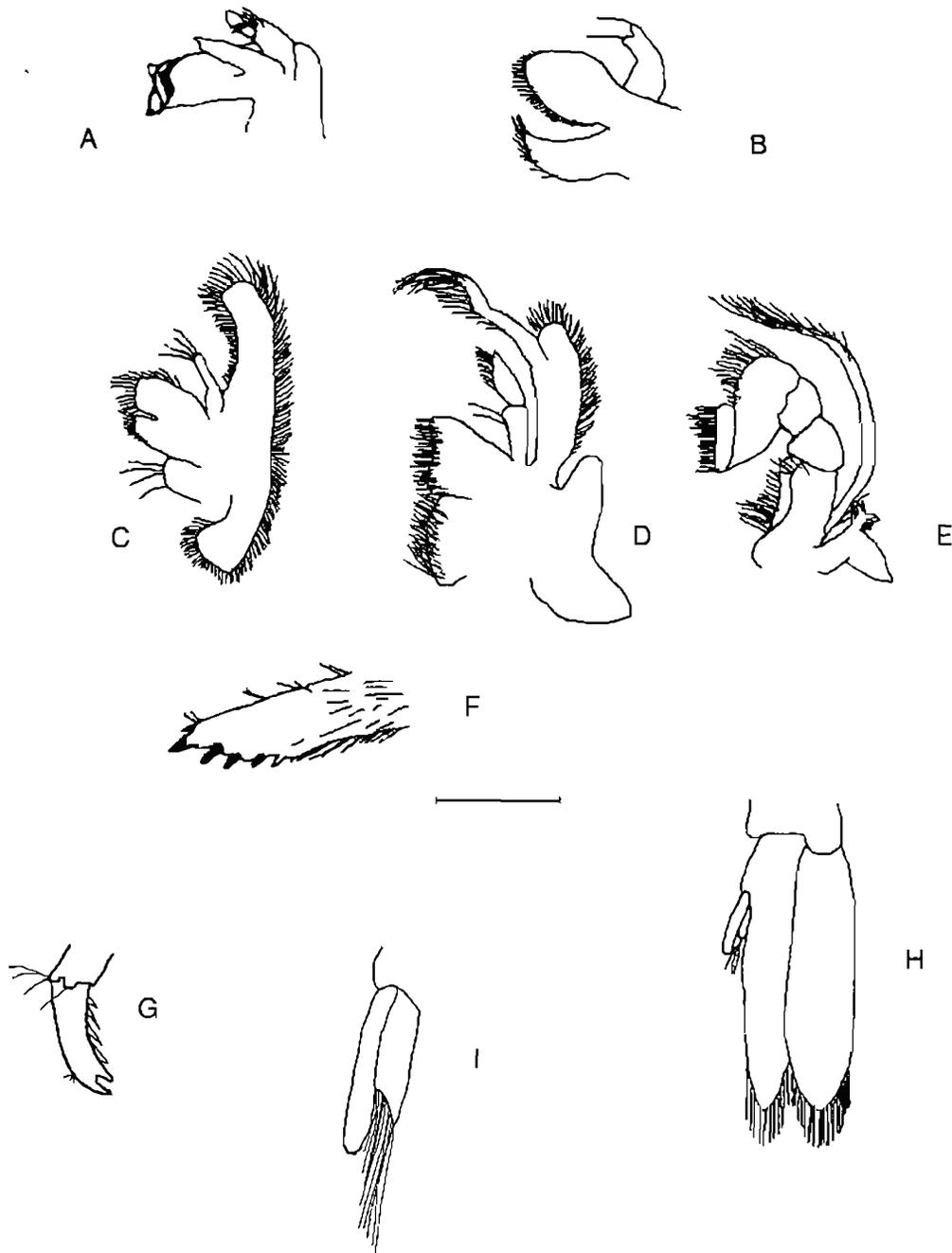


Fig. 3. *Lebbeus laurentae*, syntype female, CL 13.5. A, Mandible. B, First maxilla. C, Second maxilla. D, First maxilliped. E, Second maxilliped. F, Detail of end of third maxilliped. G, Dactyl of third pereopod. H, Second pleopod of syntype male. I, Detail of appendix interna and appendix masculina. Scales: A–G = 2 mm; H = 5 mm; I = 2 mm.

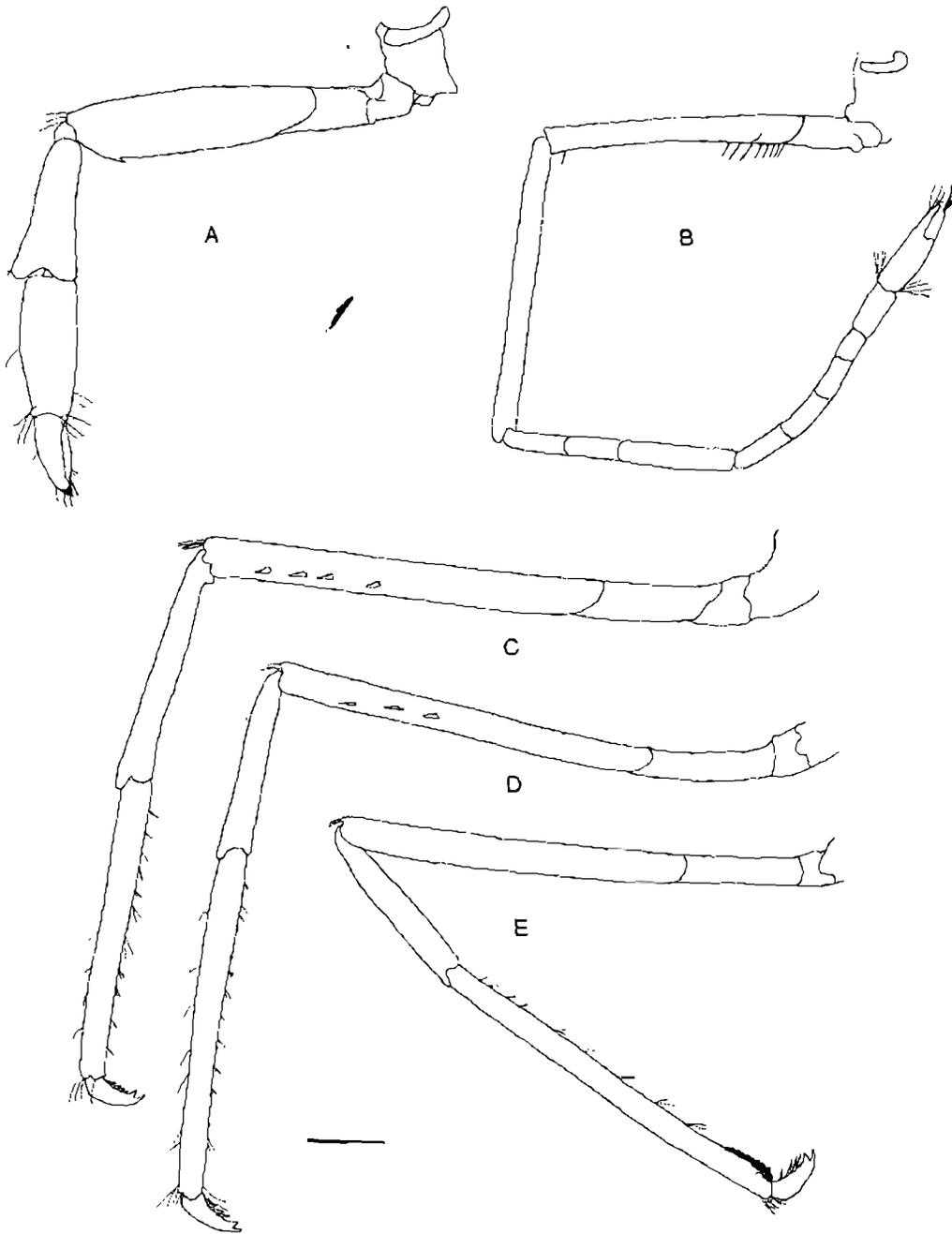


Fig. 4. *Lebbeus laurentae*, syntype female. CL 13.5. A. First pereopod. B. Second pereopod. C. Third pereopod. D. Fourth pereopod. E. Fifth pereopod. Scale = 2 mm.

that of second segment, with dorsal tooth. Inner flagellum slender, outer flagellum thickened and densely set with aesthetascs (Fig. 2A, C).

Antennal peduncle reaching distal half of scaphocerite. Basicerite with strong basal tooth. Scaphocerite about three times as long as wide, lateral tooth about

as long as lamina, slightly wider at proximal than at distal end (Fig. 2A, C).

Right mandible with molar process having one central tooth and no lateral teeth, fringed with setae. Incisor process ending in acute point and lower lobe. Palp with two segments (Fig. 3A).

First maxilla with upper and lower endites well developed, upper endite with spines, palp unsegmented, bilobed and ending in long setae (Fig. 3B).

Second maxilla with bilobed upper endite fringed with setae, lower endite smaller, palp well developed, with distal setae, scaphognathite well developed, with rounded posterior lobe (Fig. 3C).

First maxilliped with well-developed endites bearing fringe of setae; palp two-segmented, basal segment somewhat rectangular, distal segment ovate; exopod with caridean lobe, epipod large, bilobed (Fig. 3D).

Second maxilliped with ultimate and penultimate segments densely fringed with stiff setae. Exopod flagellate, epipod triangular, with podobranch (Fig. 3E).

Third maxilliped elongate, reaching well beyond scaphocerite in specimens that are not broken; basal segment short, with epipod and without exopod; antepenultimate segment longer, ultimate segment longer than antepenultimate segment, strongly setose, with six darkly pigmented subterminal and terminal spines (Fig. 3F).

Branchial formula:

	Maxillipeds			Pereopods				
	1	2	3	1	2	3	4	5
Arthrobranchs	-	-	-	-	-	-	-	-
Pleurobranchs	-	-	-	+	+	+	+	+
Podobranchs	-	+	-	-	-	-	-	-
Epipods	+	+	+	+	+	-	-	-
Exopods	+	+	+	+	+	-	-	-

First pereopod with epipod, robust, short. Chelae simple, length of fingers about 0.5 times length of palm and dark-tipped, cutting edges entire, tuft of setae

at end of fingers. Carpus with length subequal to length of palm, with mesial setiferous cleaning notch. Length of merus 1.7 times length of carpus, with small tooth on ventrodistal surface. Ischium short (Fig. 4A).

Second pereopod elongate, with epipod. Chela simple, longer than seventh carpal article, length of fingers slightly more than half that of palm, with simple margins and ending in tufts of setae. Carpus with seven articles with ratio from most proximal to most distal as follows: 5:5:10:5:4:2.5:4. Length of merus 0.6 times length of carpus and slightly longer in length than ischium. Ischium with series of eight setae along proximal ventral surface (Fig. 4B).

Third pereopod elongate, without epipod. Dactyl bifid, with four spines on flexor margin (Fig. 3G). Propodus with 9-13 spinules, occurring singly or in pairs (some broken in these specimens) along flexor margin; its length nearly six times that of length of dactyl. Carpus shorter than propodus. Merus with three or four spines. Ischium shorter than merus (Fig. 4C). Fourth and fifth pereopods similar to third but shorter, without epipods. Fourth pereopod with one to three meral spines, fifth without meral spines but with setal grooming brush along flexor margin just proximal to articulation with dactyl (Fig. 4D, E).

First pleopods shorter than other pleopods, sexually dimorphic. Male first pleopod with endopod short and more slender than in female, with three spines on mesial surface (pleopod twisted in specimen) (Fig. 2F). Female first pleopod with oval endopod, shorter than exopod (Fig. 2G). Endopod of second pleopod with appendix interna in both sexes. Appendix masculina of male short, its length about 0.75 times length of appendix interna, ending in tuft of long setae. Appendix interna with faint terminal granulations, barely visible at 500 X magnification (Fig. 3H, I).

Remarks.—The original diagnosis of this species by de Saint Laurent erred in stating that there were six, not seven, carpal articles in the second pereopod. It also stated that the rostrum bore six dorsal teeth. In fact, there are two or three dorsal teeth on the rostrum proper and one to three teeth on the carapace posterior to the rostrum. The placement of epipods on the first and second pereopods (given as epipods on thoracic segments 2–5) is correct.

Lebbeus laurentae resembles *L. carinatus* Zarenkov in the size and shape of the rostrum. The dorsal carina of the carapace is much more pronounced in *L. laurentae*. *Lebbeus laurentae* bears epipods on the first and second pereopods, not first, second, and third pereopods, as does *L. carinatus*.

Seven species of *Lebbeus* have been reported from depths of 500 m or more in the eastern Pacific. There are very few specimens of any of these species, most of them collected decades ago. *Lebbeus vicinus* (Rathbun, 1902) has epipods only on the first pereopods. This species, with a geographic range from the Aleutian Islands to the Gulf of California, has a rostrum that is as long as the antennular peduncle, with two or three dorsal teeth on the carapace, one to six dorsal teeth on the rostrum proper and three or four ventral teeth (Wicksten & Méndez 1982, Wicksten 1990). *Lebbeus carinatus*, *L. bidentatus* Zarenkov, 1976 and *L. washingtonianus* (Rathbun, 1902) bear epipods on the first, second and third pereopods. *Lebbeus bidentatus*, known from a single specimen taken off Chile, has the most elongate rostrum, extending at least to the second segment of the antennular peduncle. Although broken in the type material, it has at least two teeth on the carapace posterior to the eye, two dorsal teeth on the rostrum proper and three ventral teeth. The stylocerite barely reaches beyond the end of the first segment of the antennular peduncle,

which is longer than the scaphocerite. *Lebbeus carinatus* also is known from a single specimen taken off Chile. Its rostrum reaches the distal end of the first segment of the antennular peduncle and bears four dorsal teeth: two on the carapace and two on the rostrum proper, and a series of four small distal ventral teeth. In *L. carinatus*, the stylocerite reaches the end of the first segment of the antennular peduncle and the antennular peduncle is shorter than the scaphocerite. *Lebbeus washingtonianus* ranges from the Queen Charlotte Islands, British Columbia, Canada to the Guaymas Basin, western Mexico (Wicksten & Hendrickx 2003). In *L. washingtonianus* there may be three to seven dorsal rostral teeth: two on the carapace and one to five on the rostrum proper, and two or three ventral teeth (Butler 1980). In *L. washingtonianus*, the stylocerite is shorter than the first segment of the antennular peduncle. The antennular peduncle is almost as long as the scaphocerite.

Lebbeus laurentae, *L. scrippsi* Wicksten & Méndez, 1982, *L. splendidus* Wicksten & Méndez, 1982, and *L. polaris* (Sabine, 1821) have epipods on the first and second but not the third pereopods. *Lebbeus scrippsi* has been found from the southern Gulf of California to off Arica, Chile (Wicksten & Hendrickx 2003). Like *L. scrippsi*, *L. laurentae* has a rostrum that does not exceed the first segment of the antennular peduncle. In *L. laurentae*, the rostrum has one or two dorsal teeth on the carapace and two or three on the rostrum proper, and two or three small apical and subapical ventral teeth. *Lebbeus scrippsi* has one dorsal tooth on the carapace and one to four teeth on the rostrum proper, and two or three ventral rostral teeth proximal to the acute apex. In *L. laurentae*, the dactyls of the third to fifth pereopods are short and bear spines on the flexor margin, while those of *L. scrippsi* are slender, elongate and bear tiny spinules.

Lebbeus splendidus, collected off Peru, has an up-curved rostrum, longer than the entire antennular peduncle, with two dorsal teeth on the carapace and two or three teeth on the rostrum, the distal half of which does not bear teeth, and five to nine ventral teeth. *Lebbeus polaris* is a circum-Arctic species that ranges as far south as British Columbia. It also has a rostrum that is longer than the antennular peduncle but it is more or less straight. The number of rostral teeth is variable. In some specimens, there are no dorsal rostrum teeth at all. Usually there are two or three dorsal teeth on the carapace and one to five on the rostrum proper that has an acute apex and one to five ventral teeth proximal to the apex (Williams 1984, Wicksten 1990).

Acknowledgments

I am grateful to Charles Fransen of the Nationaal Natuurhistorisch Museum in Leiden for comments on *L. carinatus*, and Regis Cleva, Museum National d'Histoire Naturelle, for loaning me the specimens of *L. laurentae*. Kara Rosch, Texas A&M University, aided in preparation of the figures.

Literature Cited

- Bauer, R. T. 1978. Antifouling adaptations of caridean shrimps: cleaning of the antennal flagellum and general body grooming.—*Marine Biology* 49:69–82.
- Butler, T. H. 1980. Shrimps of the Pacific coast of Canada.—*Canadian Bulletin of Fisheries and Aquatic Sciences* 202:1–280.
- de Saint Laurent, M. 1984. Crustacés Décapodes d'un site hydrothermal actif de la dorsale du Pacifique oriental (13° Nord), en provenance de la campagne française Biocytherm.—*Comptes Rendus des Séances de l'Académie des Sciences, Série III* 299(9):355–360.
- Fransen, C. H. J. M. 1997. *Lebbeus africanus* spec. nov., a new shrimp (Crustacea, Decapoda, Caridea, Hippolytidae) from Mauritanian waters, with redescription of four other species in the genus.—*Zoologische Mededeelingen Leiden* 71:231–260.
- Rathbun, M. J. 1902. Descriptions of new decapod crustaceans from the west coast of North America.—*Proceedings of the United States National Museum* 24(1272):885–905.
- Wicksten, M. K. 1990. Key to the hippolytid shrimp of the eastern Pacific Ocean.—*Fishery Bulletin (U.S.)* 88(3):587–598.
- , & M. E. Hendrickx. 2003. An updated checklist of benthic marine and brackish water shrimps (Decapoda: Penaeoidea, Stenopodidea, Caridea) from the Eastern Tropical Pacific. Pp. 49–76 in M. E. Hendrickx, ed., *Contributions to the study of east Pacific crustaceans, Vol. 2*. Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México, Mazatlán, México.
- , & G. M. Méndez. 1982. New records and new species of the genus *Lebbeus* (Caridea: Hippolytidae) in the eastern Pacific Ocean.—*Bulletin of the Southern California Academy of Sciences* 81:106–120.
- Williams, A. B. 1984. Shrimps, lobsters, and crabs of the Atlantic coast of the eastern United States, Maine to Florida. Smithsonian Institution Press, Washington, D.C., 550 pp.
- Zarenkov, N. A. 1976. On the fauna of decapods of the waters adjacent to South America.—*Biologiya Morya* 5:8–18. (In Russian).

Associate Editor: Christopher B. Boyko.