



The alpheid shrimp genus *Leslibetaeus* Anker, Poddoubtchenko & Wehrtmann, 2006 in the Western Atlantic, with description of a new species from Tobago (Crustacea, Decapoda)

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Abstract

A miniature alpheid shrimp, *Leslibetaeus caribbaeus* n. sp., is described on the basis of a single female specimen collected in Sandy Bay, Tobago, in 1992. The new species is closely related to *L. coibita* Anker, Poddoubtchenko & Wehrtmann, 2006 from the Pacific coast of Panama, the type species and the only other known species of *Leslibetaeus* Anker, Poddoubtchenko & Wehrtmann, 2006, differing from it in several morphological characters. With the discovery of *L. caribbaeus* n. sp., *Leslibetaeus* becomes a genus with transisthmian (= amphi-American) distribution. In addition, *L. coibita* is reported for the first time since original description and its range is extended by 400 km southwards. The generic diagnosis of *Leslibetaeus* is slightly emended.

Key words: Decapoda, Caridea, Alpheidae, shrimp, new species, *Leslibetaeus*. Caribbean, Atlantic Ocean

Introduction

The alpheid fauna of the Western Atlantic is currently comprised of 18 genera: 14 of them are found mainly in tropical and subtropical marine waters of the Gulf of Mexico, Florida, Caribbean Sea, and Brazil (e.g. Chace 1972; Holthuis, 1973; Felder & Manning 1986; Martínez-Iglesias & Carvacho 1991; Christoffersen 1998; Anker & Felder 2005; Felder & Anker 2007; Anker 2007), while the remaining four genera are confined to cool waters of the South-Western Atlantic (Boschi 1966), anchialine caves and cenotes (Kensley 1988; Anker & Iliffe 2000), or freshwater caves on the eastern (Atlantic-connected) slope of Sierra Madre de Oaxaca, Mexico (Hobbs 1983).

The genus *Leslibetaeus* Anker, Poddoubtchenko & Wehrtmann, 2006 was previously known only from the Eastern Pacific, more precisely from Coiba Archipelago on the Pacific coast of Panama, the type locality of *Leslibetaeus coibita* Anker, Poddoubtchenko & Wehrtmann, 2006, which until now was the only species in this genus (Anker *et al.* 2006). *Leslibetaeus* can be separated from all other American genera of the family Alpheidae by the unique combination of the rounded frontal margin of the carapace, completely concealing the eyes in dorsal view; the symmetrical, equal, robust chelipeds, with simple chelae, thick spiniform setae on the dorsal margin of the ischium and comb-like setal rows on the mesial face of the carpus; and the absence of an articulated flap on the sixth abdominal somite.

In April 1992, Dr. Richard Heard (Gulf Coast Research Laboratory) collected several alpheid shrimps in Sandy Bay, Tobago, Republic of Trinidad and Tobago. Among them was a single alpheid specimen, an ovigerous female of very small size (approximately 8 mm in total length) labelled “unknown”, expressing the collector’s doubts on its generic position. This specimen was deposited in the collections of the National Museum of Natural History, Smithsonian Institution, Washington DC, U.S.A. (USNM), where it was examined by the author in August 2009. Surprisingly, Dr. Heard’s specimen from Tobago represented a species of *Leslibetaeus*, a genus previously unknown from the Western Atlantic. A direct comparison between the specimen from Tobago and a specimen of *L. coibita* collected by the author on the Pacific coast of Panama in 2007, revealed them to be different species. Therefore, a new species of *Leslibetaeus* is described below based on the single specimen from Tobago. In addition, *L. coibita* is reported for the first time since its original description and its range is extended by 400 km southwards. The generic diagnosis of *Leslibetaeus* is slightly emended based on new materials.

The holotype of the new species remains in the USNM; the specimen of *L. coibita* is deposited in the collections of the Oxford University Museum of Natural History, Oxford, U.K. (OUMNH). Carapace length (CL in mm) was measured from the anterior to the posterior margin of the carapace.

Taxonomy

Family Alpheidae Rafinesque, 1815

Genus *Leslibetaeus* Anker, Poddoubtchenko & Wehrmann, 2006

Leslibetaeus caribbaeus n. sp.

(Figs 1, 2)

Type material. Holotype: ovigerous female (CL 3.35 mm), USNM 401035, Trinidad & Tobago, Tobago Island, Sandy Bay, sta. 5, sand, depth 1 m, coll. R. Heard, 7 April 1992.

Description. Body moderately elongate, not particularly compressed. Carapace glabrous except for minute scarce setae. Frontal margin of carapace evenly rounded, without rostrum or orbital teeth (Fig. 1A). Pterygostomial angle rounded (Fig. 1B); posterior margin with well-developed cardiac notch.

Abdominal somites with pleura rounded posteroventrally; sixth somite without articulated flap. Telson broad, tapering distally, at least 1.7 times as long as greatest width, with convex lateral margins; proximal width at least four times width of posterior margin; dorsal surface with two pairs of very small submarginal spiniform setae, situated at about 0.5 and 0.7 telson length, respectively; posterior margin short, straight, with two pairs of spiniform setae at each posterolateral angle, lateral spiniform setae being less than 0.3 length of mesial spiniform setae, and two long, non-plumose median setae between mesial spiniform setae (Fig. 1H); anal tubercles not distinct.

Eyestalks completely concealed in dorsal view; anterior portion visible in lateral view (Fig. 1A, B), anteromesial margin rounded, without tubercle; cornea moderately well developed, in lateral position. Epistomial sclerite with small acute projection.

Antennular peduncle somewhat flattened dorso-ventrally, not particularly elongate; first article with stylocerite somewhat apressed, almost reaching distal margin of first article, tip acute, slightly curved mesially (Fig. 1A), ventromesial carina without distinct tooth; second article longer than visible portion of first article and longer than third article, about 1.3 times as long as wide; lateral flagellum with secondary ramus represented by a small knob furnished with long aesthetascs (Fig. 1B), proximal fused portion composed of at least five articles. Antenna with basicerite relatively stout, distoventral margin bearing subacute tooth (Fig. 1B); scaphocerite ovate-subrectangular, short, reaching beyond half-length of carapocerite and to distal margin of second article of antennular peduncle; lateral margin somewhat convex, with small setae; blade broad, with convex anterior margin, latter overreached by strong, sharp distolateral tooth (Fig. 1C).

Mouthparts not dissected, typical for family in external observation. Third maxilliped elongate, slender; coxa with rounded lateral plate; antepenultimate article slightly flattened, subtriangular in cross section; penultimate article about twice as long as wide, with stout spiniform seta on distodorsal margin; ultimate article tapering distally, with rows of serrulate setae and two spiniform setae on dorsal margin (including strong subdistal one), ending in corneous, subacute tip (Fig. 1D); exopod reaching to 0.75 length of antepenultimate article; arthrobranch well developed.

Chelipeds equal in size, symmetrical in shape, carried extended, robust (Fig. 1E); ischium stout, dorsal margin produced distodorsally, with two robust, curved spiniform setae; merus stout, smooth, flattened ventrally, more than three times as long as wide, with blunt distomesial and distolateral margins; carpus cup-shaped, somewhat constricted dorsally, distal margin broadly rounded, without deep emargination laterally (Fig. 1E); mesial face with comb-like setae, their disposition as illustrated (Fig. 1F); chela short, moderately swollen; palm smooth, somewhat compressed, flattened mesially; linea impressa and adhesive discs absent; fingers about 0.6 length of palm, almost not gaping when closed; cutting edges straight except for small shift at about mid-length of fingers (Fig. 1G), tips simple, crossing when chela closed.

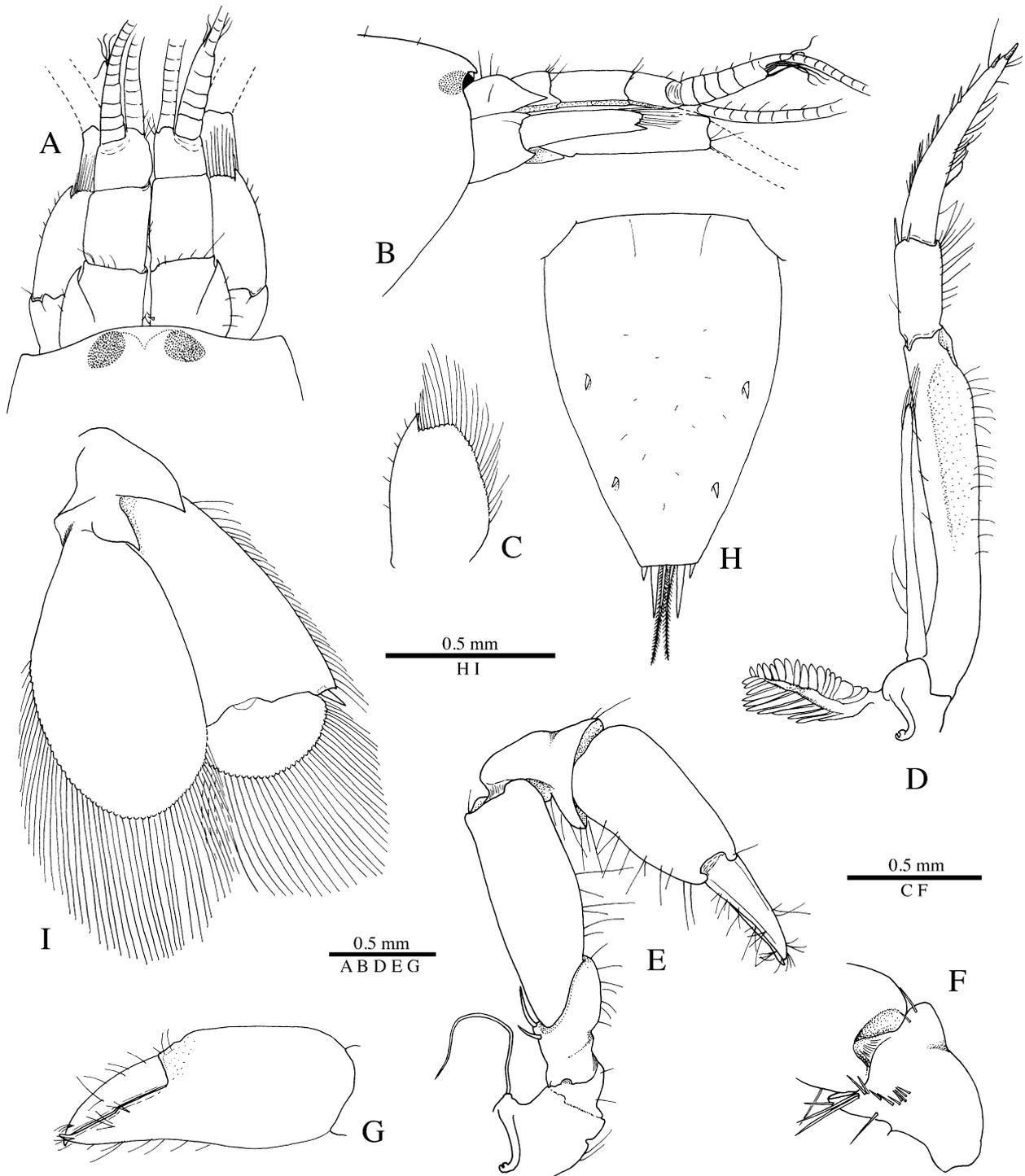


FIGURE 1. *Leslibetaeus caribbaeus* n. sp., holotype, ovigerous female (CL 3.35 mm) from Sandy Bay, Tobago (USNM 401035), A, frontal region, dorsal; B, same, lateral; C, antennal scaphocerite, dorsal; D, third maxilliped, lateral [arthrobranch detached, drawn in its typical position]; E, right cheliped, lateral; F, same, carpus, mesial; G, same, chela, mesial; H, telson, dorsal; I, uropod, dorsal.

Both second pereopods missing in the holotype. Third pereopod with ischium, merus, carpus and propodus compressed; ischium about three times as long as wide, with short spiniform seta on ventrolateral surface, near ventral margin; merus somewhat broadened, with slightly convex dorsal and ventral margins, about four times as long as wide; carpus much shorter and narrower than merus, with stiff seta on distoventral surface; propodus longer than carpus, with at least five slender spiniform setae on ventral margin in addition to a pair of stouter distoventral

spiniform setae adjacent to dactylus (Fig. 2A); dactylus simple, conical, slightly curved, about 0.3 propodus length, slightly emarginate proximally, furnished with a tuft of setae at about 0.7 dactylar length (Fig. 2B). Fourth pereopod very similar to third; propodus with six spiniform setae in addition to a pair of stouter distoventral spiniform setae adjacent to dactylus (Fig. 2C). Fifth pereopod distinctly more slender than third and fourth, less compressed; ischium without spiniform seta on ventrolateral surface, with slender spiniform seta on distodorsal margin; merus almost five times as long as wide, smooth; carpus much shorter than merus, without distoventral seta; propodus with at least four slender spiniform setae along ventral margin in addition to pair of stouter spiniform setae adjacent to dactylus, distolateral surface with rows of elongate setae forming a dense brush (propodal brush); dactylus similar to that of third or fourth pereopods, except for being longer and more slender (Fig. 2D, E).

Uropods slightly exceeding telson; lateral lobe of protopod distally acute; endopod and exopod subequal in length, without specific features; exopod with diaeresis somewhat sinuous, with broad, feebly projecting tooth in its lateral half, ending in small acute distolateral tooth adjacent to robust distolateral spiniform seta (Fig. 1I).

Gill/exopod formula typical for genus (Anker *et al.* 2006). Colour in life not recorded.

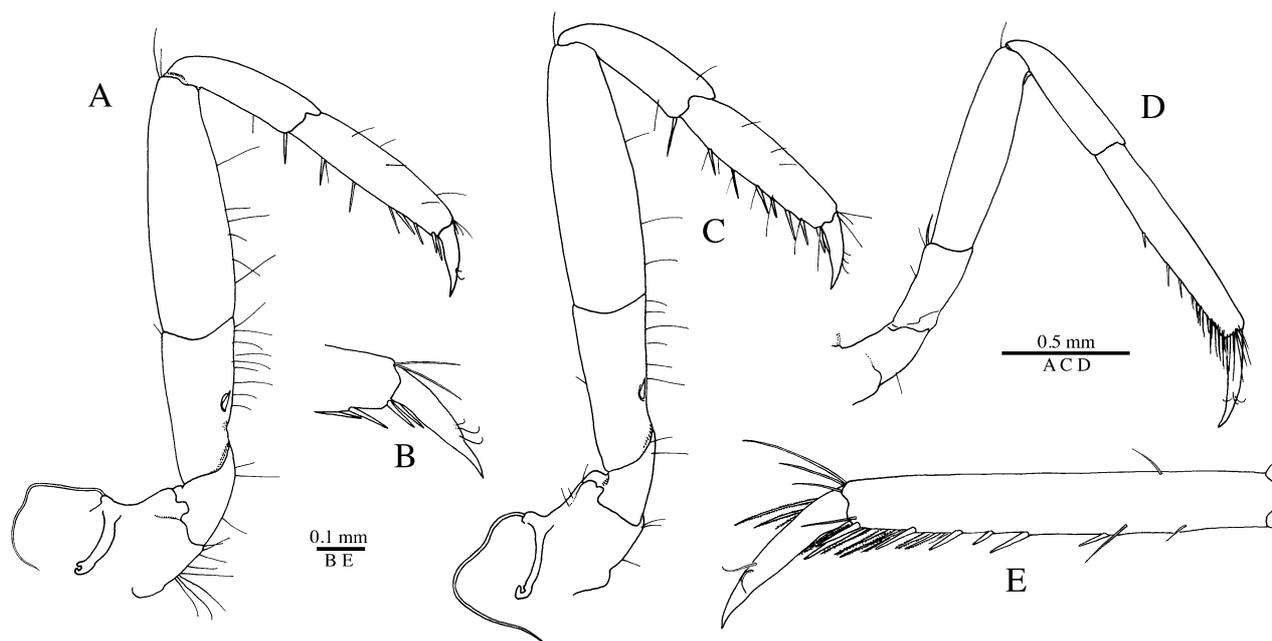


FIGURE 2. *Leslibetaeus caribbaeus* n. sp., holotype, ovigerous female (CL 3.35 mm) from Sandy Bay, Tobago (USNM 401035): A, third pereopod, lateral; B, same, dactylus; C, fourth pereopod, lateral; D, fifth pereopod, lateral; E, same, propodus and dactylus, mesial.

Etymology. The name refers to the Caribbean Sea, which embraces the island of Tobago, the type locality of the new species.

Habitat. Field notes indicated only that the specimen was found in sand at a depth of 1 m; it was most probably extracted with a suction pump or by sieving sediments (R. Heard, pers. comm.).

Type locality. Sandy Bay, Tobago.

Distribution. Presently known only from the type locality.

Remarks. *Leslibetaeus caribbaeus* n. sp. is closely related to the Eastern Pacific *L. coibita* (see below), differing from it only in the proportions of the third and fourth pereopods and in two features on the chelipeds. In *L. caribbaeus* n. sp., the ischium is almost three times as long as wide and the merus about four times as long as wide (Fig. 2A), whereas in *L. coibita*, both ischium and merus are stouter (= broader), the ischium being only twice as long as wide and the merus 3.5 times as long as wide (Fig. 3C). In *L. caribbaeus* n. sp., the cheliped carpus is evenly cup-shaped, with distal margin being broadly rounded in lateral view (Fig. 1E), whereas in *L. coibita*, the distal margin of the cheliped carpus is deeply emarginated in lateral view (Anker *et al.* 2006, fig. 4a). The disposition of comb-like rows of setae on the mesial face of the cheliped carpus is somewhat different between the two species (compare Fig. 1F and Anker *et al.* 2006: fig. 4d). Finally, in *L. caribbaeus* n. sp., the cutting edges of the cheliped fingers are only mildly “lane-shifted” at about mid-length of finger length (Fig. 1G), whereas in *L. coibita*,

this shift is much more distinct (Anker *et al.* 2006: fig. 4j). The chelipeds of *L. coibita* appear to be generally slightly stouter than in the Caribbean species. In addition, in *L. caribbaeus* **n. sp.**, the antennal scaphocerite reaches to the distal margin of the second article of antennular peduncle (Fig. 1A); in *L. coibita*, the scaphocerite clearly falls short of this margin (Anker *et al.* 2006: fig. 2a). Another possible difference between the two transisthmian species may lie in the relative size and number of eggs (embryos), and therefore, in their larval development. The holotype of *L. caribbaeus* **n. sp.** carries a dozen or so relatively small eggs, with diameter ~0.2–0.3 mm. In contrast, only one large egg, with a diameter of almost 0.5 mm, was attached to the posterior pleopods in the specimen of *L. coibita* from Taboga (Fig. 3B), suggesting a more advanced larval development in the Pacific species [although some eggs were probably lost before the specimen has been photographed].

***Leslibetaeus coibita* Anker, Poddoubtchenko & Wehrtmann, 2006**

(Fig. 3)

Leslibetaeus coibita Anker, Poddoubtchenko & Wehrtmann 2006: 30, figs. 1–5.

Material examined. 1 ovigerous female (CL 3.35 mm), OUMNH.ZC. 2010-01-004, Panama, Pacific coast, Taboga Island, intertidal, under rocks, coll. A. Anker, field collection number 07-038, 19 February 2007.

Description. See Anker *et al.* (2006).

Colour pattern. Semitransparent with clusters of red chromatophores on antennal and antennular peduncles and abdominal somites; ovaries and eggs yellow (Fig. 3A, B); generally very similar to the colour pattern illustrated for the type specimen (Anker *et al.* 2006: fig. 5).

Habitat. The Taboga specimen was found in the rocky intertidal close to coral heads (*Pocillopora*), under a large rock in sticky sand. It was extracted from a relatively narrow tunnel with lined walls, possibly a burrow of a polychaete or another burrowing invertebrate.

Type locality. Coibita, Coiba Archipelago, Pacific coast of Panama.

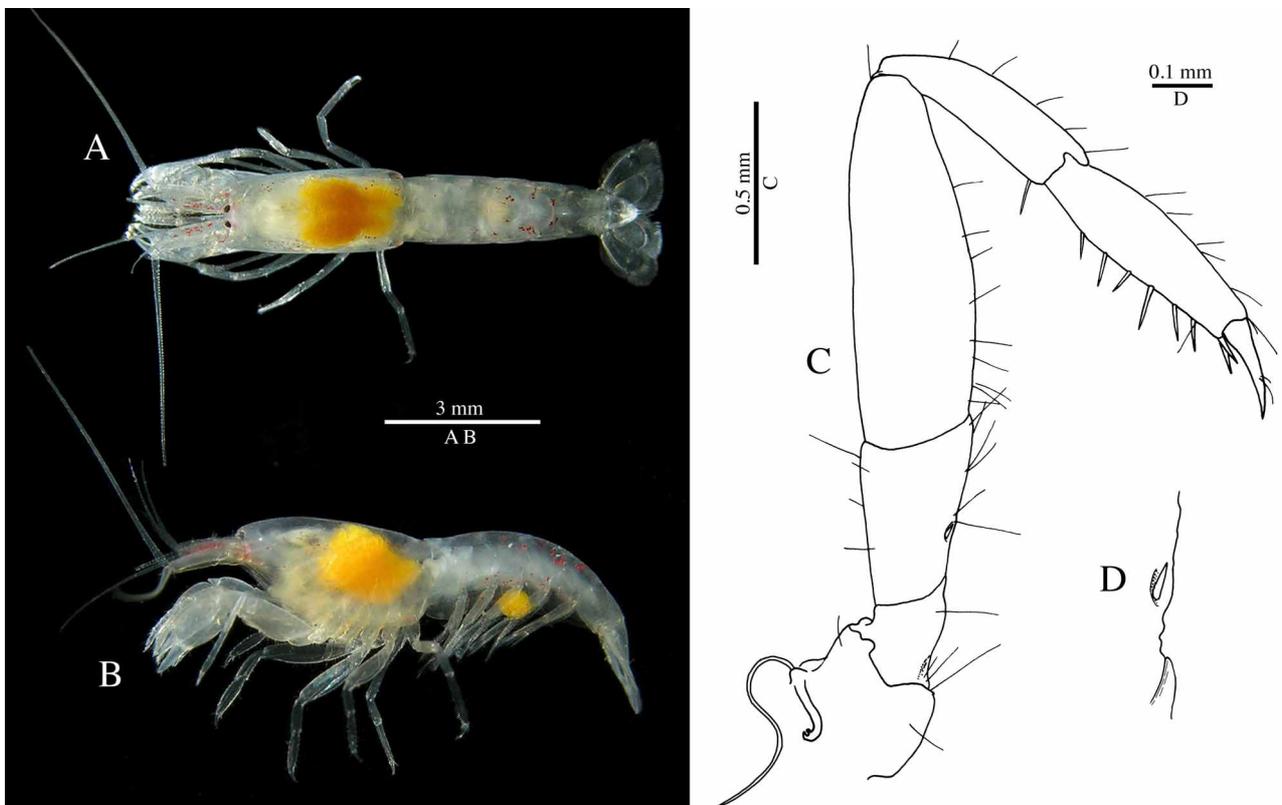


FIGURE 3. *Leslibetaeus coibita* Anker, Poddoubtchenko & Wehrtmann, 2006, ovigerous female (CL 3.35 mm) from Taboga Island, Pacific coast of Panama (OUMNH.ZC. 2010-01-004): A, B, general view and colour pattern, dorsal and lateral; C, third pereiopod, lateral; D, same, detail of small spiniform seta on ischium.

Distribution. Presently known only from two localities, the islands of Coibita and Taboga, both on the Pacific coast of Panama. The present record extends the range of *L. coibita* by about 400 km southwards.

Remarks. The Taboga specimen agrees with the type specimens of *L. coibita* from Coiba in all aspects, except for the presence of a small spiniform seta on the ischium of the third pereopod (compare Fig. 3C, D and Anker *et al.* 2006: fig. 3o). This spiniform seta may have been overlooked by Anker *et al.* (2006) or alternatively, its presence may be variable in *L. coibita*. In either case, the presence of this structure in the specimen of *L. coibita* from Taboga and in the holotype of *L. caribbaeus* n. sp. requires a slight emendation of the original generic diagnosis (see below). The previously unknown fifth pereopod of *L. coibita* (missing on both sides in the holotype and paratype) is very similar to that of *L. caribbaeus* n. sp. (see text above and Fig. 2D, E).

Emendation of the generic diagnosis of *Leslibetaeus*. The original statement “Third pereopod with ischium lacking spine; merus unarmed; carpus with distoventral spine; propodus with slender spines on ventral margin; dactylus simple” (Anker *et al.* 2006: 29) should be replaced by the following sentence: Third pereopod with ischium usually bearing small spiniform seta on ventrolateral surface; merus unarmed; carpus with distoventral spiniform seta; propodus with slender spiniform setae on ventral margin; dactylus conical, simple.

Note that in Anker *et al.* (2006), the term “spine” was used for the same structure here referred to as spiniform seta.

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