



A new species of *Pseudocoutierea* Holthuis from the Caribbean coast of Panama (Crustacea, Decapoda, Palaemonidae), with a key to the genus

S. DE GRAVE

Oxford University Museum of Natural History, Parks Road, Oxford OX1 3PW, U.K, sammy.degrave@oum.ox.ac.uk

Abstract

A new species of pontoniid shrimp, *Pseudocoutierea dotae* sp. nov. is described from Bocas Province (Caribbean coast of Panama), on the basis of a single specimen encountered on a whip-coral, *Stichopathes lutkeni*. The new species is closely related to the eastern Atlantic species, *P. wirtzi*, with which it shares the presence of a post-hepatic tubercle. A key to the genus is presented.

Key words: Crustacea, Decapoda, Palaemonidae, *Pseudocoutierea*, new species, Panama

Introduction

The genus *Pseudocoutierea* Holthuis, 1951, until now comprises five species. The East Pacific *P. elegans* Holthuis, 1951 has been recorded from the Santa Barbara Channel (California) southwards to Peru, including the Malpelo and Galapagos Islands (Martin & Zimmerman, 1997; Wicksten & Hendrickx, 2003) and occurs on the gorgonians *Muricea californica* Aurivillius (Martin & Zimmerman, 1997) and *Lophogorgia chilensis* Verrill (Wicksten pers. comm. in d'Udekem d'Acoz, 2001). Three species are known from the Caribbean. *Pseudocoutierea antillensis* Chace, 1972 has been recorded from the Saba Bank (Chace, 1972), Curaçao (Criales, 1980), Colombia (Criales, 1984), off the Bahamas (Lemaitre, 1984), Guana Island (British Virgin islands, Spotte et al., 1995), the Turks & Caicos Islands (Spotte & Bubucis, 1996) and now Honduras (see Material examined); the species is known to occur on several gorgonian species: *Eunicea tourneforti* (H. Milne Edwards & Haime), *E. calyculata* (Ellis & Solander), *E. fusca* (Duchassaing & Michelotti), *Plexaura* sp., and *Pseudopterogorgia americana* (Gmelin). Both *Pseudocoutierea conchae* Criales, 1981 and *P. edentata* Criales, 1981, are only known from the Santa Marta region of Columbia, occurring on the gorgonians *Leptogorgia virgulata* (Lamarck) and *Ellisella barbadensis* (Duchassaing & Michelotti), as well as the antipatharian *Stichopathes gracilis* (Gray) (Criales, 1981; 1984). Finally, the eastern Atlantic species, *P. wirtzi* d'Udekem d'Acoz, 2001 is known from São Tiago island (Cape Verde), occurring on the gorgonian *Leptogorgia gaini* Stiasny and the antipatharian *Stichopathes lutkeni* (d'Udekem d'Acoz, 2001).

A single example of an undescribed species was discovered in 2005 on an antipatharian host during fieldwork in Bocas del Toro (Caribbean Panama). The new species is morphologically very close to *P. wirtzi*, with which it shares the presence of a blunt protuberance on the post-hepatic region, and is herein described. The single specimen has been deposited in the Natural History Museum (London) (NHM).

Family Palaemonidae Rafinesque, 1815
Subfamily Pontoniinae Kingsley, 1878
Genus *Pseudocoutierea* Holthuis, 1951
***Pseudocoutierea dotae* sp. nov. (Figs. 1-5)**

Material examined. Holotype, non-ovigerous female (post-orbital carapace length (pocl) 2.4 mm), from *Stichopathes lutkeni* Brook (Anthozoa, Antipatharia); Hospital Point, Cayo Solarte, Bocas Province, Panama, 09°20.016'N 082°13.133'W, -15 m depth; collected by S. De Grave & M. Salazar, 06/08/2005 (NHM 2006.1930)

Comparative material examined. *Pseudocoutierea wirtzi* d'Udekem d'Acoz, 2001; 8 specimens (paratypes, pocl 1.9-2.5 mm), São Tiago Island, Cape Verde Islands, on *Leptogorgia gaini* Stiasny, 20-30 m depth, collected by P. Wirtz, December 1998 (KBIN IG.28546); ovigerous female (pocl 4 mm), male (pocl 3.4 mm), São Tiago Island, Cape Verde Islands, on *Stichopathes lutkeni*, 20-30 m depth, collected by P. Wirtz, February 2000 (KBIN IG.28871). *Pseudocoutierea antillensis* Chace, 1972; 2 specimens (pocl 1.1, 1.3 mm), Pelican Point, Cayos Grande, Cayos Cochinos, Honduras, from *Pseudopterogorgia americana* (Gmelin), 4.6-16.7 m depth, collected by M. Dowell & D. Livingston, 01/07/2003 (OUMNH ZC.2204-17-004).

Description. Carapace broad, depressed (Fig. 1A), well-developed antennal spine present (Fig 1A, C), immediately below this spine is a acuminate lobe, giving the antennal spine a bifid appearance in lateral view (Fig. 1C); blunt hepatic protuberance present (Fig. 1A, B, C); pterygostomial sinus well developed (Fig. 1C); carina present between the middle of the pterygostomial sinus and the post-hepatic protuberance, extending beyond protuberance (Fig. 1A, C); orbital ridge well-developed.

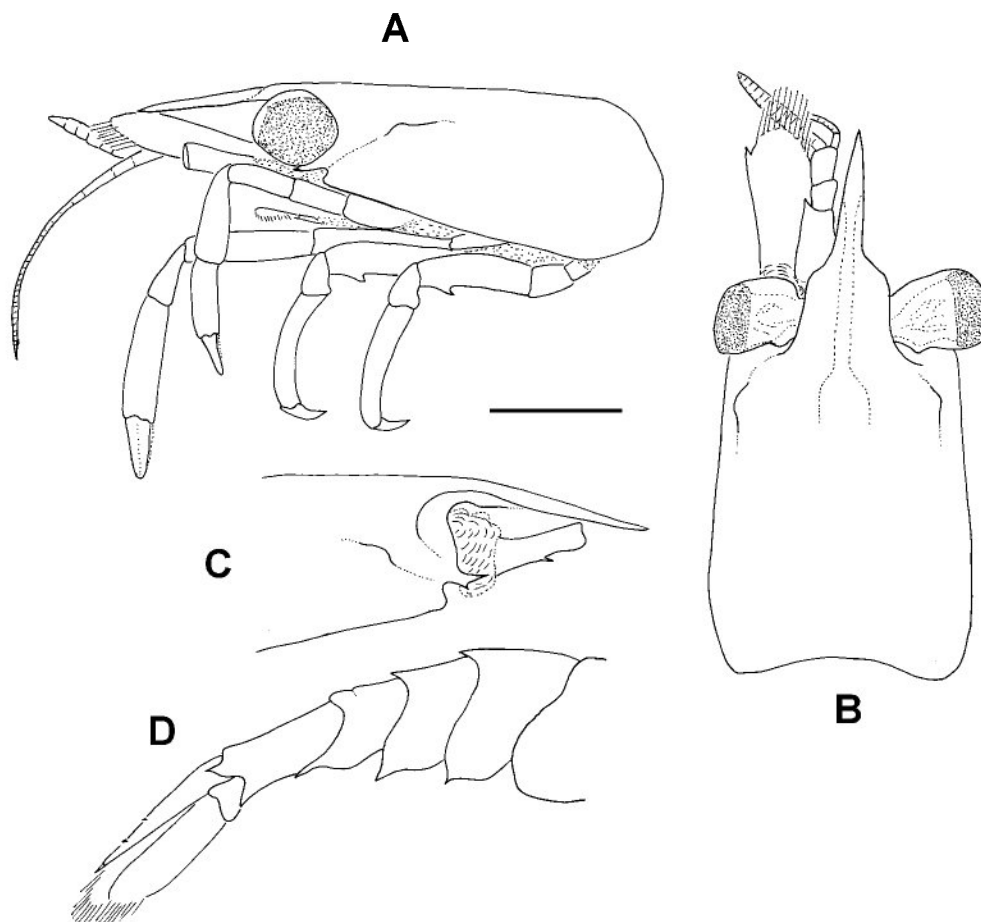


FIGURE 1. *Pseudocoutierea dotae* sp. nov. A frontal region (lateral); B frontal region (dorsal); C frontal part of carapace (eye removed); D abdomen. Scale bar indicates 1.0 mm.

Rostrum apically inclined, unarmed, tip acute, reaching to end of antennal scale (Fig. 1A, B); proximal half expanded to form a relatively broad supra-orbital eave (Fig 1B), frontal margin of supra-orbital eave gently curving; longitudinal carina present on supra-orbital eave, continuing distally past supra-orbital eave and expanding onto carapace up to the level of the post-hepatic protuberance (Fig. 1B).

First thoracic sternite with a low transverse ridge, median boss present; second thoracic sternite with well-developed transverse ridge, with broad median notch; other sternites unadorned.

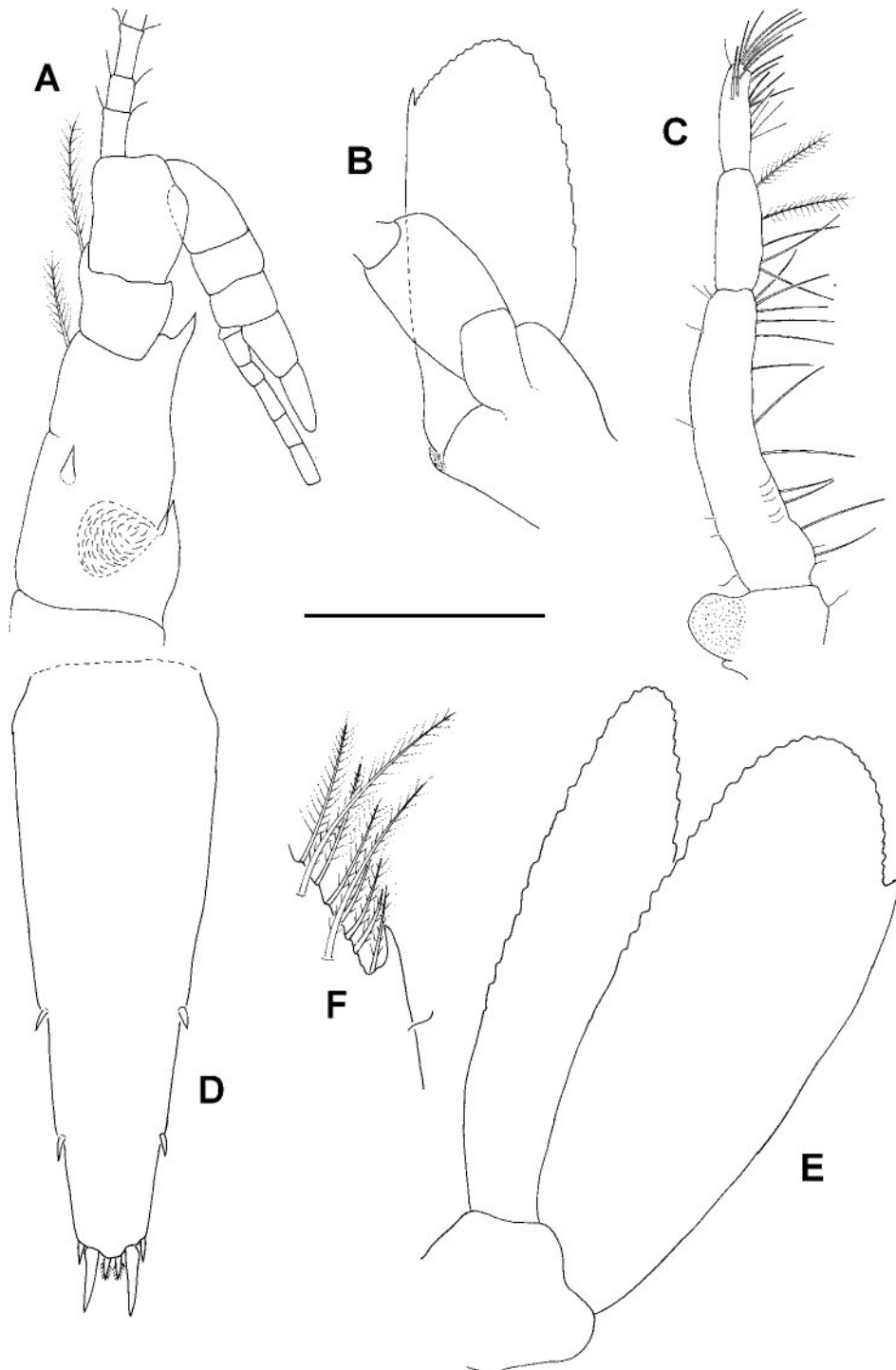


FIGURE 2. *Pseudocoutierea dotae* sp. nov. A antennule; B antennal peduncle and scale; C third maxilliped; D telson; E uropod; F: detail. Scale bar indicates 0.37 mm (A-C), 0.5 mm (D-E) or 0.25 mm (F).

Pleura of third to fifth pleonite with postero-ventral acuminate tooth (Fig. 1D), more developed on fifth pleonite; pleura of third and fourth pleonite dorsally acuminate (Fig. 1D). Sixth pleonite 1.6 times as long as fifth, 0.75 times as long as telson; dorsolateral lobe of sixth pleonite well developed, acuminate (Fig. 1D).

Telson nearly three times as long as wide (Fig. 2D), tip convex; two pairs of dorsolateral spines, situated at 0.6 and 0.8 of telson length respectively; telson tip with 3 pairs of robust spines, outer pair and mesial pair about 0.35 times as long as intermediate spines, mesial spines setose.

Eyestalks large, broad, cornea not broader than unpigmented part.

Antennular peduncle robust (Fig. 2A); stylocerite short; lateral margin of first segment sinuous, distolateral tooth well developed, reaching to about 0.75 of second segment, pronounced tooth present on ventral side (Fig. 1C, 2A); third segment about 1.8 times as long as second segment. Outer antennular flagellum fused for 3 segments, free part of accessory flagellum well developed, consisting of two segments, 0.7 times as long as fused part (Fig. 2A)

Scaphocerite overreaching antennular peduncle, broad (Fig. 2B), 2.5 times as long as wide, outer margin straight, distolateral tooth falling far short of distal margin.

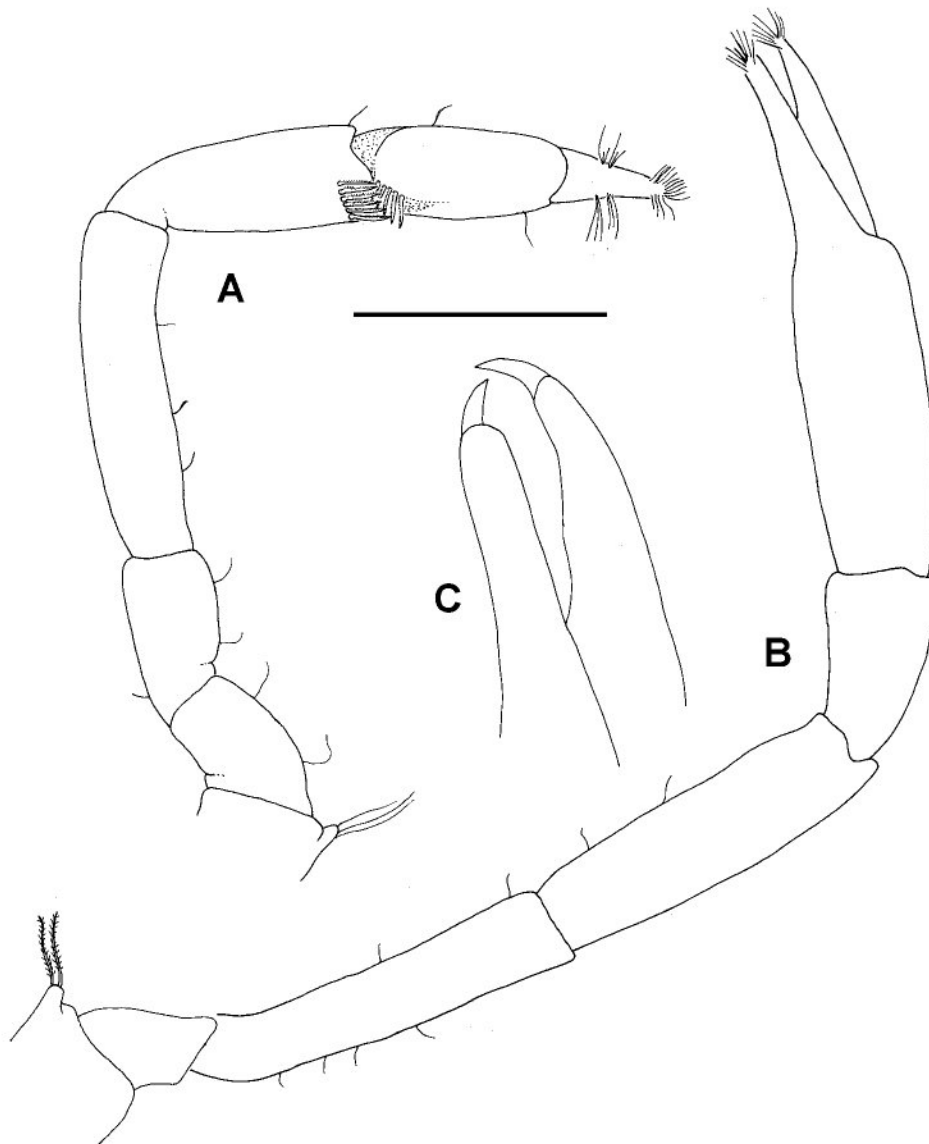


FIGURE 3. *Pseudocoutierea dotae* sp. nov. A right first pereiopod; B left second pereiopod; C tip of second pereiopod (setae removed). Scale bar indicates 0.5 mm (A, B) or 0.25 mm (C).

Mouthparts (except third maxilliped) not dissected. Third maxilliped short (Fig. 2C), reaching to end of basicerite; exopod absent; lateral plate well developed, rounded, small bilobed arthrobranch present; basis fused with ischiomerus (antepenultimate segment); antepenultimate segment about 2.5 as long as penultimate segment, ultimate segment about 0.8 times as long as penultimate, tip furnished with numerous long setae (Fig. 2C).

First pereiopod robust, over-reaching scaphocerite by 0.2 of its length (Fig. 1A); basis and ischium near equal in length (Fig. 3A); merus curved, about 2.3 times as long as ischium; carpus about 0.8 times as long as merus. Chelae robust, fingers about half as long as palm, palm about 0.45 times as wide as long.

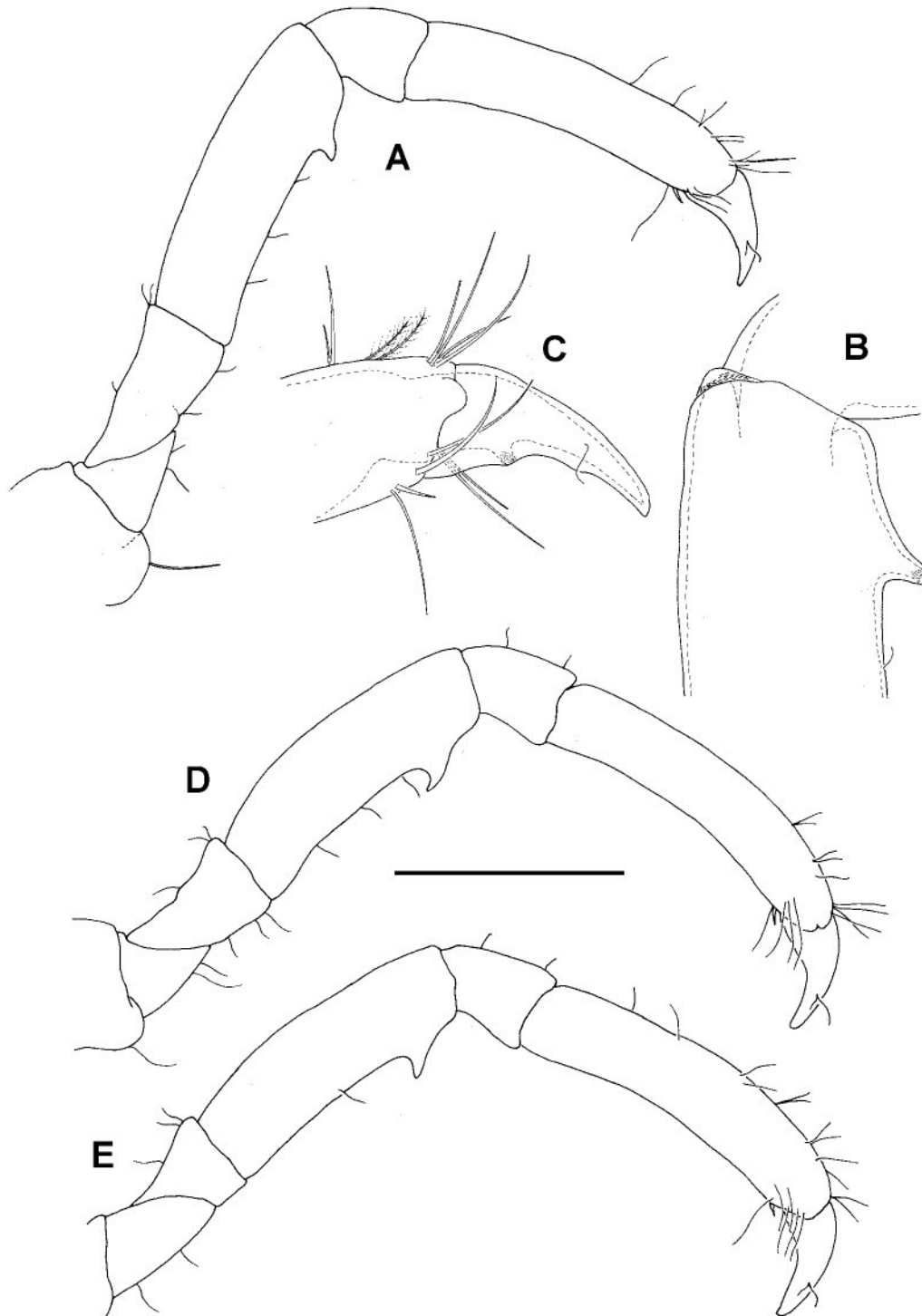


FIGURE 4. *Pseudocoutierea dotae* sp. nov. A third pereiopod; B distal part of merus; C dactylus; D fourth pereiopod; E fifth pereiopod. Scale bar indicates 0.5 mm (A, D-E) or 0.18 mm (B-C).

Left second pereopod robust (right one missing), carpus reaching not reaching end of scaphocerite (Fig. 1A); ischium about 1.1 times as long as merus (Fig. 3B); carpus about 0.6 times as long as merus; chelae robust, fingers about 0.7 times as long as palm, both movable and immovable finger with single, terminal, curved tooth (Fig. 3C)

Third pereopod robust (Fig. 4A); merus slightly curved, nearly twice as long as ischium, hook shaped protuberance present on distal part of flexor margin (Fig. 4B); carpus 0.3 times as long as merus; propodus as long as merus, single spine on infero-distal, together with three simple setae (Fig. 4C); dactylus short (Fig. 4C), stout, curved.

Fourth (Fig. 4D) and fifth (Fig. 4E) pereopods similar to third pereopod in form, length and proportions.

Uropods over-reaching telson (Fig. 1D), exopod and endopod equal in length (Fig. 2E); distolateral tooth of exopod well-developed, without movable spine between blade and distolateral tooth(Fig. 2E).

Colour description. Body generally transparent (Fig. 5); white transverse band on carapace (V-shaped in dorsal view); proximal white transverse band on first pleonite; distal white transverse band on third, fifth and sixth pleonite; eyestalks and cornea white, connected with white transverse band; scattered yellow chromatophores on first and second pereopods, scaphocerite and tailfan.



FIGURE 5. *Pseudocoutierea dotae* sp. nov. Colour pattern of live animal. Photograph by Leslie Harris.

Derivation of name. In memory of Ms Dorothea “Dot” Pelham, long-term staff member of the Oxford University Museum of Natural History, the name is a genitive.

Habitat. The single specimen was obtained from a colony of *Stichopathes lutkeni* (Anthozoa, Antipatharia) at a depth of 15m.

Discussion

Pseudocoutierea dotae sp. nov. is closely related to the Eastern Atlantic species, *P. wirtzi*, with which it shares the following characters: presence of a post-hepatic protuberance, presence of a single spine on the infero-distal margin of the propodus (also present in *P. elegans*, see Holthuis, 1951), and a similar shape (partly, see below) in the meral protuberance on the ambulatory pereopods. In the new species the first pereopod is very robust (Fig. 3A), with the chelae being 3 times as long as wide. In contrast *P. wirtzi* has a much more slender first pereopod with the chela being 6-7 times as long as wide (d’Udekem d’Acoz, 2001, Fig. 9A). In addition, the distal and proximolateral slope of the supra-orbital eaves in both species is very different (compare Fig. 1B with Fig. 3 in d’Udekem d’Acoz, 2001). Further differences are in the shape of the scaphocerite, the lack of a movable spine between the blade and distolateral tooth of the uropodal exopod (present in *P. wirtzi*), as well as the development of the postero-ventral tooth on the third pleonite, being acuminate in *P. dotae* sp. nov. and more rounded in *P. wirtzi*. The colour pattern of both species is generally transparent, but the white transverse bands of *P. dotae* sp. nov. are absent in *P. wirtzi*, with the exception of the white band connecting both eyestalks (see colour photos of *P. wirtzi* in Wirtz & Debelius, 2003).

The presence of the post-hepatic protuberance at once separates *P. dotae* sp. nov. from the other three western Atlantic species (*P. antillensis*, *P. conchae*, *P. edentata*), as well as the Eastern Pacific *P. elegans*. From *P. antillensis*, it can be further separated by the development of the supra-orbital eave (anterolaterally acuminate in *P. antillensis*, convex in *P. dotae* sp. nov.) and the presence of a postero-ventral tooth on the third pleonite in *P. dotae* sp. nov. (versus absent in *P. antillensis*). The new species can be separated from *P. conchae*, by the anterolateral margin of the supra-orbital eave being relatively acuminate in *P. conchae*, but convex in *P. dotae* sp. nov., as well as the relative length of the fingers in relation to the palm of the first pereopod (Criales, 1981, Fig. 8). Although the shape of the supra-orbital eaves and the third pleonite are very similar in *P. dotae* sp. nov. and *P. edentata*, the presence of a post-hepatic protuberance in *P. dotae* sp. nov. easily separates both species. Further differences between these two species are in the presence of a well-developed protuberance on the dactyls of the ambulatory pereopods in *P. edentata*, this being virtually absent in *P. dotae* sp. nov., as well as in the shape of the scaphocerite.

d’Udekem d’Acoz (2001) records two specimens of *P. wirtzi* from the same antipatharian host as *P. dotae* sp. nov., with Wirtz & d’Udekem d’Acoz (2001) stating that these specimens were from two different host specimens, both at 20 m depth. As several amphi-Atlantic shrimp species occur in the Cape Verde Islands, these specimens were re-examined. Although they are much larger than the material of *P. wirtzi* from *Lepetogorgia gaini* (considered the normal host of this species by Wirtz & d’Udekem d’Acoz, 2001), they are morphologically indistinguishable and in view of the slender first pereopod are indeed *P. wirtzi*. It is therefore assumed that *P. dotae* sp. nov. and *P. wirtzi* constitute amphi-Atlantic sister species occurring on the same host species.

d’Udekem d’Acoz (2001) also drew attention to the peculiar nature of the subdistal swelling on the merus of the ambulatory pereopods in *P. wirtzi*, this comprising of a well-calcified distal, hook-like part and a poorly calcified proximal part. In *P. dotae* sp. nov., only a hook-like protuberance was noticeable. As the specimen spend some months in formalin it may be possible that the poorly calcified part was dissolved and that the true structure of this protuberance resembles more what is found in *P. wirtzi*. However, all relevant margins of the merus and the protuberance were smooth and there was no evidence of degraded tissue. Thus

the hook-like shape may be the true appearance, providing a further difference between the new species and all other described species in the genus. The merus of the specimens of *P. antillensis* from Honduras (OUMNH ZC.2204-17-004) only exhibit a poorly developed protuberance, which is in accordance with the description in Chace (1972), and which appears very similar to the drawings of this protuberance in Holthuis (1951) and Criales (1981) for the other species of the genus. Thus, the poorly calcified part aside, the hook-like protuberance is also a unique feature within the genus for both *P. wirtzi* and *P. dotae* sp. nov., again highlighting their close systematic position.

Key to the genus *Pseudocouiereia* Holthuis, 1951.

- 1 Post-hepatic protuberance present2
- Post-hepatic protuberance absent.....3
- 2 First pereopod gracile, chelae 6-7 times as long as wide *P. wirtzi* (Cape Verde)
- First pereopod robust, chelae 3 times as long as wide..... *P. dotae* sp. nov. (Caribbean coast of Panama)
- 3 Supra-orbital eaves antero-laterally acuminate.....4
- Supra-orbital eaves antero-laterally convex *P. edentata* (Colombia)
- 4 Pleura of third pleonite postero-laterally acuminate.....5
- Pleura of third pleonite postero-laterally rounded *P. antillensis* (Caribbean)
- 5 Tooth of third pleonite distally placed, propodus of third pereopod with infero-distal spine
..... *P. elegans* (East Pacific)
- Tooth of third pleonite medially placed, propodus of third pereopod without infero-distal spine.....
..... *P. conchae* (Colombia)

Acknowledgements

Dr. Rachel Colin (Smithsonian Tropical Research Institute, Panama), Director of the Bocas del Toro Research Station is gratefully acknowledged for the opportunity to participate in the Third Taxonomy Workshop (1-13 August 2005). Maricela Salazar assisted with all underwater collecting; Leslie Harris (Natural History Museum of Los Angeles County, Los Angeles, USA) kindly allowed use of the colour photograph; Prof. K. Wouters (Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels, Belgium) kindly made the material of *P. wirtzi* available.

References

- Chace, F.A.Jr. (1972) The shrimps of the Smithsonian-Bredin Caribbean expeditions with a summary of the West Indian shallow-water species (Crustacea: Decapoda: Natantia). *Smithsonian Contributions to Zoology*, 98, 1–179.
- Criales, M.M. (1980) Commensal carideans shrimps of Octocorallia and Antipatharia in Curaçao and Bonaire with description of a new species of *Neopontonides*. *Studies on the Fauna of Curaçao and other Caribbean Islands*, 188, 68–85.
- Criales, M.M. (1981) Two new species of *Pseudocouiereia* (Decapoda Natantia, Palaemonidae) from the Colombian Caribbean. *Crustaceana*, 41, 167–181.
- Criales, M.M. (1984) Shrimps associated with coelenterates, echinoderms, and molluscs in the Santa Marta Region, Colombia. *Journal of Crustacean Biology*, 4, 307–317.
- d’Udekem d’Acoz, C. (2001) Description of *Pseudocouiereia wirtzi* sp. nov., a new cnidarian associated pontonine shrimp from Cape Verde Islands, with decalcified meral swellings in walking legs (Crustacea, Decapoda, Caridea). *Bulletin de l’Institut Royal des Sciences Naturelles de Belgique*, 70, 69–90 (volume for the year 2000).
- Holthuis, L.B. (1951) A general revision of the Palaemonidae (Crustacea Decapoda Natantia) of the Americas, I: The

- subfamilies Euryrhynchinae and Pontoniinae. *Allan Hancock Foundation Occasional Paper*, 1–332.
- Lemaitre, R. (1984) Decapod crustaceans from Cay Sal Bank, Bahamas, with notes on their zoogeographic affinities. *Journal of Crustacean Biology*, 4, 425–447.
- Martin, J.W. & Zimmerman, T.L. (1997) Order Decapoda. In: Blake, J.A. & Scott, P.V. (Eds.) *Taxonomic atlas of the benthic fauna of the Santa Maria Basin and western Santa Barbara Channel, 10*. Santa Barbara Museum of Natural History, Santa Barbara, 49–122.
- Spotte, S. & Bubucis, P.M. (1996) Diversity and abundance of caridean shrimps associated with the slimy sea plume *Pseudoptero-gorgia americana* at Pine Cay, Turks and Caicos Islands, British West Indies. *Marine Ecology Progress Series*, 133, 299–302.
- Spotte, S., Bubucis, P.M. & Overstreet, R.M. (1995) Caridean shrimps associated with the slimy sea plume (*Pseudoptero-gorgia americana*) in midsummer at Guana Island, British Virgin Islands, West Indies. *Journal of Crustacean Biology*, 15, 291–300.
- Wicksten, M.K & Hendrickx, M. E. (2003) An updated checklist of benthic marine and brackish water shrimps (Decapoda: Penaeoidea, Stenopodidea, Caridea) from the Eastern Tropical Atlantic. In: Hendrickx, M.E. (Ed.) *Contributions to the Study of East Pacific Crustaceans 2*. Instituto de Ciencias del Mar y Limnología, UNAM, Mexico City, 49–76.
- Wirtz, P. & Debelius, H. (2003) *Mediterranean and Atlantic Invertebrate Guide*. Conchbooks, Hackenheim, 305 pp.
- Wirtz, P. & d'Udekem d'Acoz (2001) Decapoda from Antipatharia, Gorgonaria and Bivalvia at the Cape Verde Islands. *Helgolander Marine Research*, 55, 112–115.