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TWO NEW SPECIES OF *PSEUDOCOUTIEREA* (DECAPODA NATANTIA, PALAEMONIDAE) FROM THE COLOMBIAN CARIBBEAN

BY

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INTRODUCTION

The genus *Pseudocoutierea* Holthuis, 1951, belongs to the subfamily Pontoniinae which contains many species that are ecto-commensals of other invertebrates. The only two species of *Pseudocoutierea* hitherto described are *P. elegans* Holthuis, 1951, from the Eastern Pacific region and *P. antillensis* Chace, 1972, from the Atlantic. Two additional new species from the eastern Gulf of Mexico are being described by R. Heard (pers. com.).

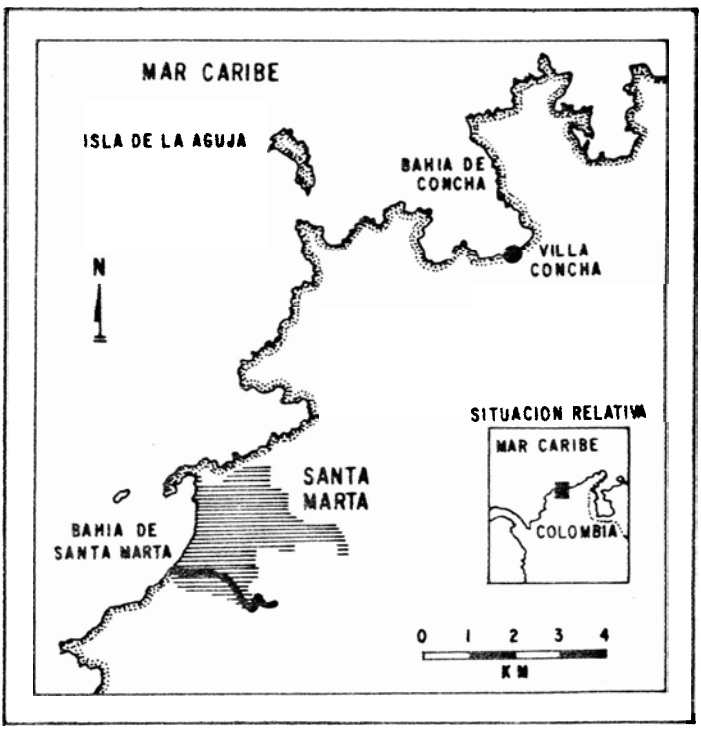

Fig. 1. Map showing the locations where the shrimps were found.

The present paper describes two new species, *Pseudocoutierea edentata* and *Pseudocoutierea conchae*, found on the octocorallian *Leptogorgia virgulata* (Lamarck, 1815) in depths between 13 and 30 m near Santa Marta, Colombia and in bays to the east of that town (fig. 1).

Pseudocoutierea edentata new species (figs. 2-5)

Rostrum long, reaching the bifurcation of the upper antennular flagellum, unarmed dorsally and ventrally. It forms a high carina flanked at each side by the supraorbital lobes (figs. 2A, B). In profile it is concave in the orbital region and curved slightly upwards in the distal part, especially in juvenile specimens (fig. 2B). Near the base, it suddenly expands forming on both sides a wing-like expansion with rounded margins and without supraocular teeth. These expansions continue as short but pronounced ridges on the carapace. The rostrum continues on the carapace as a longitudinal ridge, which is shorter than the lateral expansions. The anterior margin of the carapace bears ventrally to the orbital angle a distinct antennal spine, which overreaches the base of the antennal peduncle, and arising from the anterior margin considerably ventral to the obscure lower orbital angle. A broad and rounded lobe immediately ventral to the antennal spine gives this spine a bifid appearance in lateral view (fig. 2B). From the antennal spine a distinct ridge runs posterodorsally terminating near the lower end of the lateral expansions of the rostrum. The anterolateral

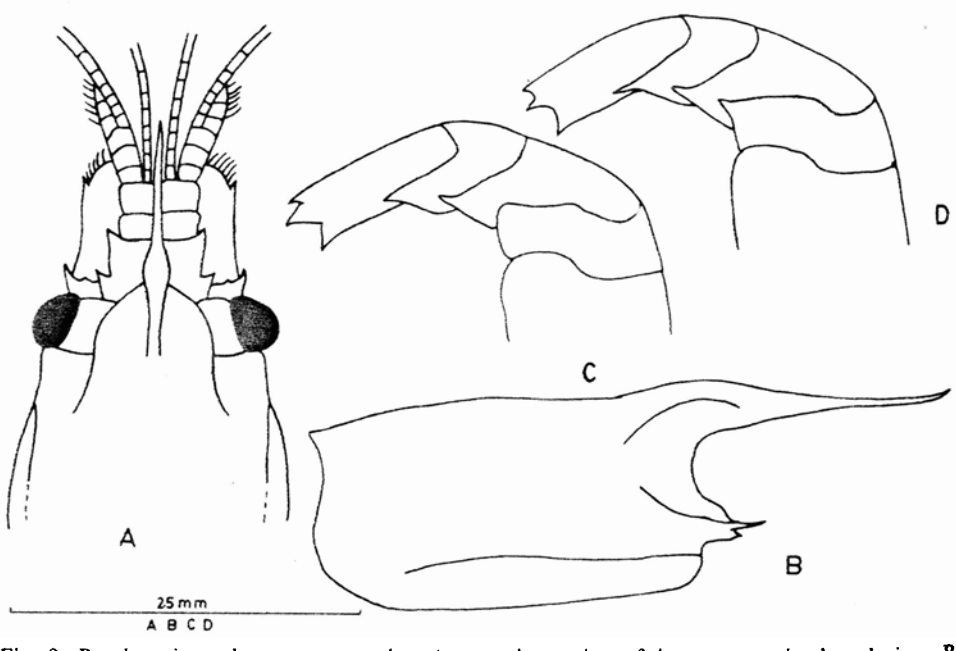

Fig. 2. *Pseudocoutierea edentata* new species. A, anterior region of the carapace in dorsal view; B, carapace in lateral view; C, second to sixth abdominal somites of young male, lateral view; D, second to sixth abdominal somites of the adult female, lateral view.

margin of the carapace has a strongly concave sinus immediately below the antennal spine, but is otherwise rounded. A distinct longitudinal ridge runs over the lateral side of the carapace near the lateral margin, beginning at the concave sinus and terminating near the posterior margin of the carapace.

The pleura of the fourth and fifth abdominal somites end in a slender point in all the specimens. The pleuron of the third somite ends in a distinct point in the adult female (fig. 2D); those in the young males are always rounded (fig. 2C).

The eyes are well developed and reach about to the end of the basal segment of antennular peduncle. The cornea is slightly broader than the eyestalk (fig. 2A).

The antennular peduncle (fig. 3A) has a short and acute stylocerite; it is broadest at its base. In the middle of the inner ventral margin of the basal segment there is a blunt spine directed distally (fig. 3B). A sharp outer distolateral spine is present on this basal segment; this spine extends as far as the middle of the second segment. The third segment is only slightly longer than the second. The upper antennular flagellum has the two rami fused for three long segments and the small free ramus consists of three segments. The lower antennular flagellum is well developed and filiform.

The antennal scale slightly overreaches the antennular peduncle and is more than twice as long as wide (fig. 3C). The lateral margin is nearly straight. The distal tooth does not reach beyond the lamella. The antennal peduncle reaches beyond the middle of the scaphocerite. The basal segment has a strong ventrolateral tooth.

The mouth parts are as figured. The mandible (fig. 3E) has the incisor process armed with two apical teeth and two subapical denticles. The molar process is well developed with two strong terminal teeth and one acute tooth in the middle. The first maxilla bears a distinctly bilobed palp, the subacute lower lobe bears a simple seta (fig. 3F). The upper lacinia is rounded, with seven stout spines distally. The lower lacinia terminates in a point and has long setae. The second maxilla bears a distinct non-setose palp. The scaphognathite is approximately three times as long as broad (fig. 3G). The endite is cleft, the two lobes bear a few setae. The first maxilliped has a non-setose palp; the basal endite is fused with the coxal endite (fig. 3H), the exopod has a flagellum with a few terminal setae. The exopodite of the second maxilliped is well developed and reaches as far as the basal segment of the carpus (fig. 3J); the coxa is produced medially and bears an epipod laterally. The third maxilliped has a normal shape (fig. 3I), without exopod and reaches as far as the middle of the antennal scale. The coxa bears a pronounced epipod laterally.

The first pereiopod (fig. 4A) overreaches the antennal scale with the articulation between propodus and carpus; the fingers are unarmed with terminal bristles and are shorter than the palm; the carpus is somewhat longer than the chela and shorter than the merus. The second pereiopods are unequal

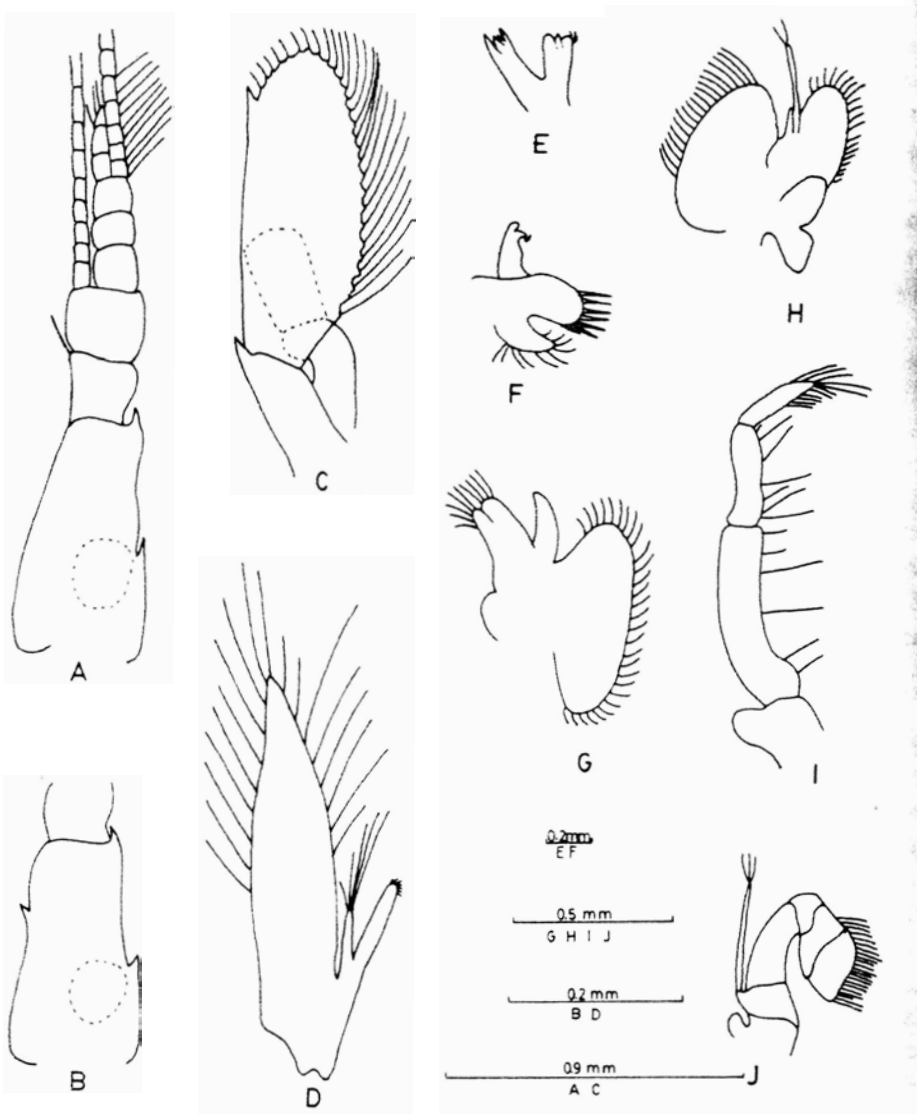

Fig. 3. *Pseudocoutierea edentata* new species. A, antennular peduncle; B, first segment of antennular peduncle in mesial view; C, antennal scale; D, second pleopod of male; E, mandible; F, first maxilla; G, second maxilla; H, right first maxilliped; I, third maxilliped; J, right second maxilliped.

in size and shape, the right being more robust and longer than the left (fig. 4C). The major cheliped overreaches the antennal scale with less than half the length of the palm; the finger is two-fifths as long as the palm (fig. 4D), the dactyl has a large basal tooth fitting into a depression in the fixed finger, which is visible only when the finger is open; the carpus is slightly curved, somewhat more than one-fifth but less than one-fourth as long as the palm; the merus is nearly three times as long as the carpus and the ischium is shorter than the

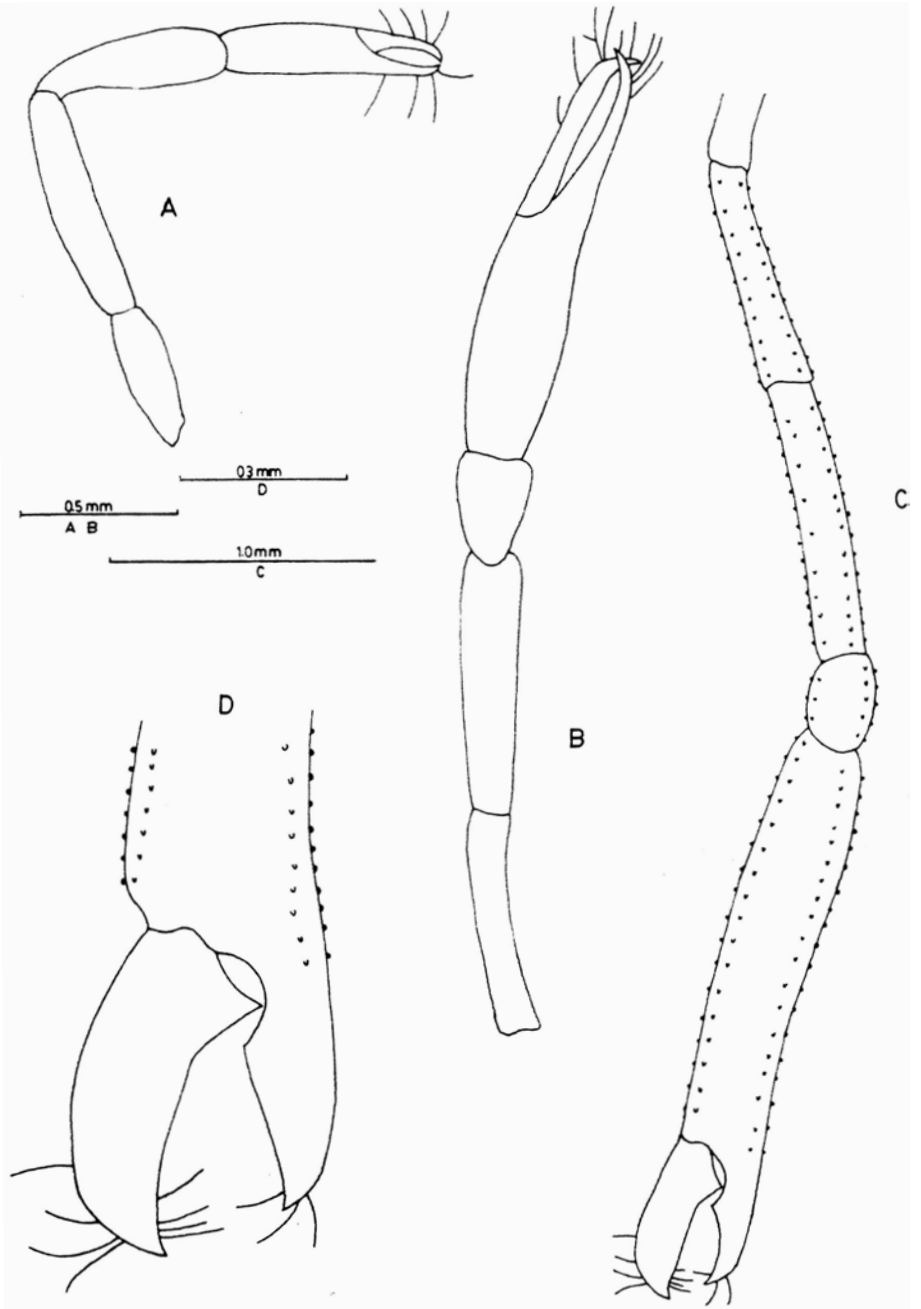

Fig. 4. *Pseudocoutierea edentata* new species. A, right first pereiopod; B, left second pereiopod; C, right second pereiopod; D, fingers of right second pereiopod.

merus. Tubercles are present on the surface of the entire pereiopod. The minor cheliped overreaches the antennal scale with half the palm. The fingers do not have teeth and are slightly shorter than the palm (fig. 4B); the carpus is short, less than half as long as the palm; the merus is twice as long as the carpus and somewhat longer than the ischium. The third pereiopod (fig. 5A) overreaches the antennal scale with the end of the dactyl. The dactyl has an obtuse protuberance on the basal segment of the flexor margin and terminates in a point (fig. 5B), the propodus is curved and less than three times as long as the car-

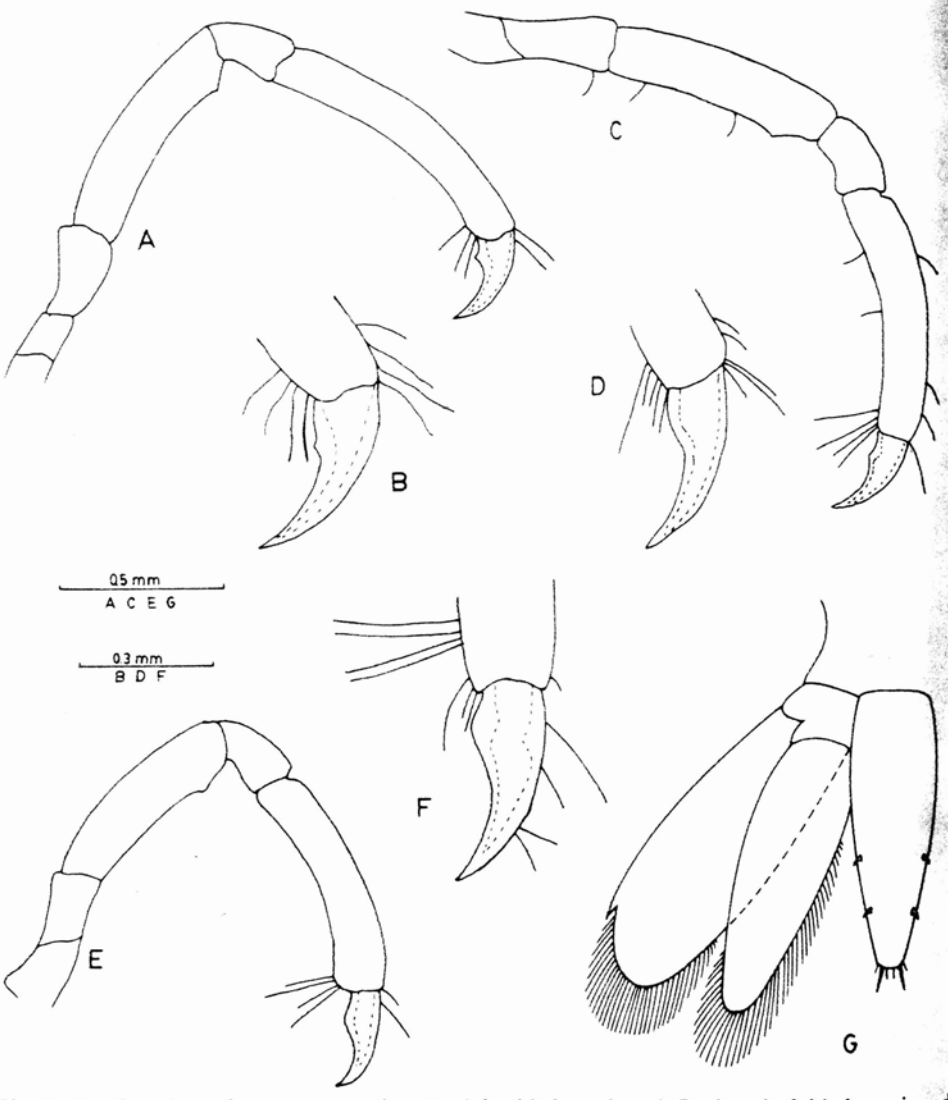

Fig. 5. *Pseudocoutierea edentata* new species. A, right third pereiopod; B, dactyl of third pereiopod; C, right fourth pereiopod; D, dactyl of fourth pereiopod; E, right fifth pereiopod; F, dactyl of fifth pereiopod; G, telson and uropods.

pus, the merus is somewhat shorter than the propodus and has a triangular prominence near the distal end of the flexor margin; the ischium is approximately half as long as the merus. The fourth and fifth pereiopods do not overreach the antennal scale. They resemble the third in shape but the carpus and ischium are slightly shorter, and the protuberances of the dactyls are more pronounced (figs. 5C, D, E, F).

The telson has two pairs of dorsolateral spines (fig. 5G), the anterior pair is situated slightly behind the middle of the telson, the posterior pair is halfway between the first pair and the distal margin of the telson. There are three pairs of terminal spines, of which the intermediate pair is twice as long as the other two. The lateral branch of the uropod has a distolateral tooth on the blade.

The first pleopod of both sexes has the endopod with a broad and blunt lobe in the distal part of the inner margin. The second pleopod of the males has the appendix masculina much shorter than the appendix interna (fig. 3D).

Measurements. — Total length (T.L.) is measured from the apex of the rostrum to the posterior end of the telson; carapace length (C.L.) from the apex of the rostrum to the midposterodorsal margin.

Holotype: Because the three large adult specimens were incomplete, a smaller juvenile specimen was chosen as the holotype. It has T.L. 8.0 mm, C.L. 3.3 mm, and was collected by I. Caycedo on 17 April 1977 in Bahía Concha, Colombia (11°18'N 74° 10'W) at a depth of 18 m. The holotype is in the Zoölogisch Museum, Amsterdam (cat. nr. ZMA De 103.238). Paratypes: 2 adult ovigerous females collected by B. Werding on 15 February, 1977; they have T.L. 11.3-12.0 mm, C.L. 4.4-5.0 mm. Eight juveniles were collected by I. Caycedo and Ma. M. Criales: 3 females, T.L. 8.0-9.0 mm, C.L. 3.3-5.0 mm; 5 males T.L. 8.3-9.3 mm, C.L. 3.3-5.2 mm. All the paratypes were obtained in Santa Marta Bay (11°20'N 74°05'W) and at present are in INVEMAR, Santa Marta (Cr. Nr. 452), 1 paratype is in the Amsterdam Museum (no. ZMA De 32591).

Colour. — These shrimps have a great potential for mimicry and their colour depends on their position on the coenenchyme of the Octocorallia. They were living on purple, yellow and white Octocorallia.

Habitat. — These shrimps were found in very turbid water at depths 13 to 30 m, living on the Octocorallia *Leptogorgia virgulata* (Lamarck).

Behaviour. — In the field the shrimps were observed to remain almost exclusively within the two canals located on each side of the stem of the octocorallian, occasionally maneuvering between the polyps when crossing from one canal to the other.

Aquarium observations revealed that these shrimps do leave the octocorallian and walk and swim around elsewhere. Later, they returned to their original places on the octocoral. The shrimps were also seen to move back and forth between two octocoral colonies of the same species. One hour after the catch the shrimps began to show agonistic intraspecific behavior.

Pseudocoutierea conchae new species (figs. 6-9)

Rostrum long, reaching beyond the end of the antennular peduncle, unarmed dorsally and ventrally. It forms a high carina flanked at each side by a supraorbital lobe (fig. 6A dorsal view). In profile it is concave in the orbital region and curved slightly upwards in the distal part (fig. 6B). Near the base, it suddenly expands forming on both sides a wing-like expansion which ends anteriorly in a sharp supraocular tooth and partially covers the eyestalk. These expansions continue as short but pronounced ridges on the carapace. The rostrum continues on the carapace as a longitudinal ridge, which is shorter than the lateral expansions.

The anterior margin of the carapace bears ventrally to the lower orbital angle a distinct antennal spine, which overreaches the base of the antennal peduncle, arising from anterior margin considerably ventral to the obscure orbital angle. A broad and rounded lobe immediately ventral to antennal spine gives this spine a bifid appearance in lateral view (fig. 6B). From the antennal spine a distinct ridge runs posterodorsally terminating near the lower end of the lateral expansion of the rostrum. The anterolateral margin of the carapace has a strongly concave sinus immediately below the antennal spine, but is

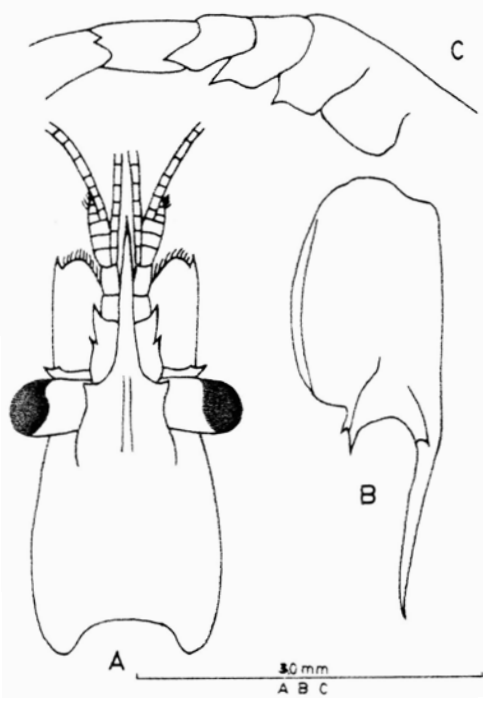

Fig. 6. *Pseudocoutierea conchae* new species. A, carapace in dorsal view; B, carapace in lateral view; C, second to sixth abdominal somites, lateral view.

otherwise rounded. A distinct longitudinal ridge runs over the side of the carapace near the lateral margin, beginning at the concave sinus and terminating near the posterior margin of the carapace.

The pleura of the third, fourth and fifth abdominal somites end in a slender point in both sexes, adult and young (fig. 6C). The sixth somite is more than twice as long as the fifth and little shorter than the telson, excluding the terminal spines of the latter.

The eyes are well developed and reach about to the end of the basal segment of antennular peduncle. The cornea is slightly broader than the eyestalk (fig. 6A).

The antennular peduncle has a short and sharp stylocerite; it is broadest at its base. In the middle of the inner ventral margin of the basal segment there is a strong spine directed distally (fig. 7A). A sharp outer distolateral spine is present on this basal segment; this spine extends about to the distal fourth of the second segment. The third segment is longer than the second. The upper antennular flagellum has the two rami fused for three segments. The lower antennular flagellum is well developed and filiform.

The antennal scale slightly overreaches the antennular peduncle and is a little more than twice as long as broad. The lateral margin is nearly straight (fig. 7B). The distal tooth does not reach beyond the lamella. The antennal peduncle reaches beyond the middle of the scaphocerite. The basal segment has a strong ventrolateral tooth.

The mouth parts are as figured. The mandible (fig. 7D) has an incisor process armed with two apical teeth and five subapical denticles. The molar process is well developed with two strong terminal teeth and a protuberance on the inner side. The first maxilla bears a distinctly bilobed palp, the subacute lower lobe bears a simple seta. The upper lacinia is narrow, with six spines distally (fig. 7E); the lower lacinia has few seta distally. The first maxilla bears a distinct palp (fig. 7F), the scaphognathite is approximately three times as long as broad; the endite is cleft, though not very deeply, the two lobes bear a few setae. The first maxilliped has a palp with a single setae (fig. 7G); the basal endite is well developed and fused with the coxal endite; the exopod has a flagellum with a few terminal setae. The exopodite of the second maxilliped is well developed (fig. 7H), it has a rounded tip and reaches as far as the basal segment of the carpus. The third maxilliped is normal in shape, it has no exopod and reaches as far as the middle of the antennal scale (fig. 7I).

The first pereiopod overreaches the antennal scale sometimes with the basal part of the palm or with the articulation between propodus and carpus; the fingers are unarmed, they have terminal bristles and are as long as or shorter than the palm; the carpus is about twice as long as the chela and shorter than the merus (fig. 8A). The second pereiopods are unequal in size and shape, the right being more robust and longer than the left. The major cheliped overreaches the antennal scale with the proximal part of the carpus (fig. 8C); the

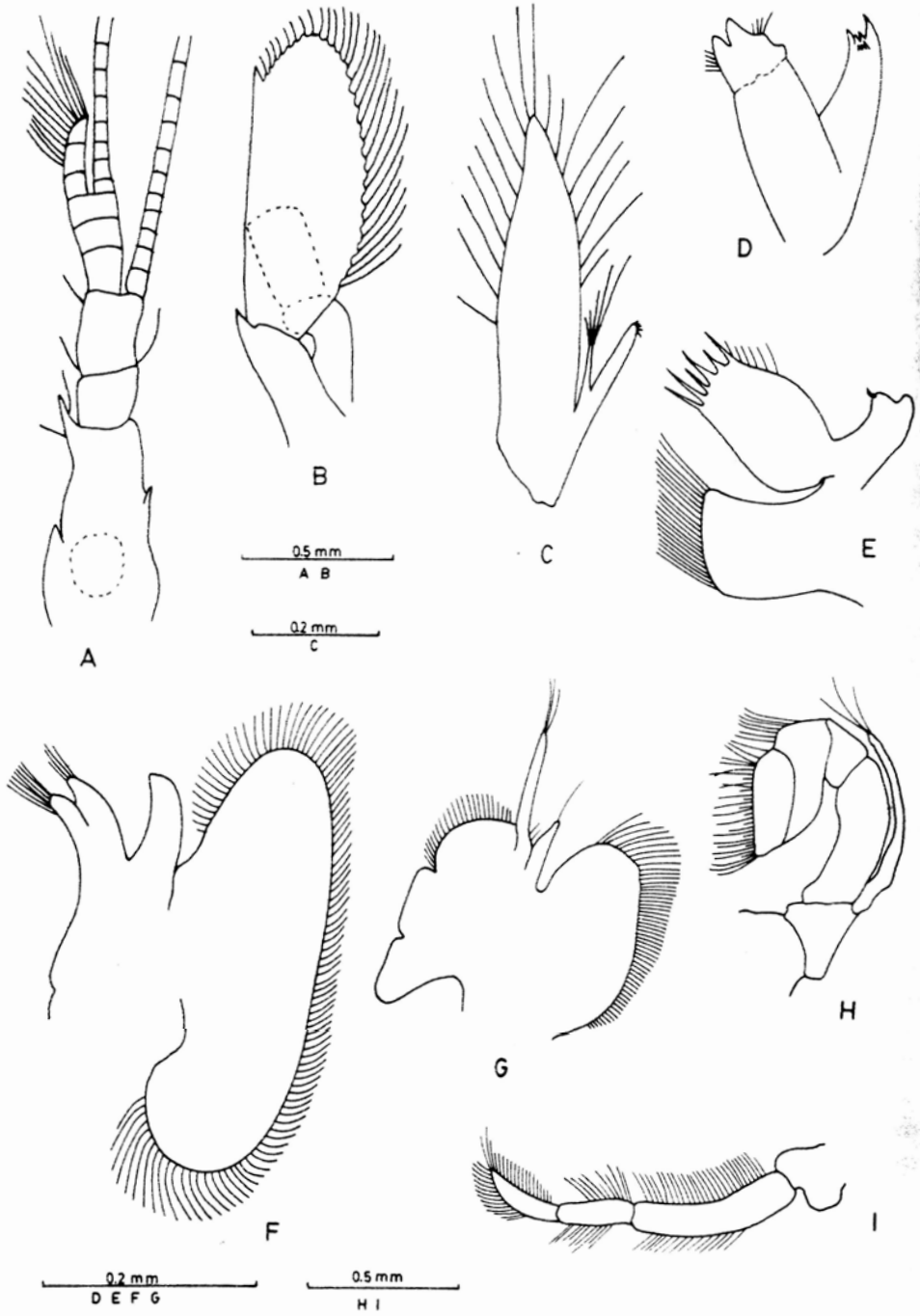

Fig. 7. *Pseudocoutierea conchae* new species. A, antennula in mesial view; B, antennal scale; C, second pleopod of male; D, mandible; E, first maxilla; F, second maxilla; G, right first maxilliped; H, right second maxilliped; I, third maxilliped.

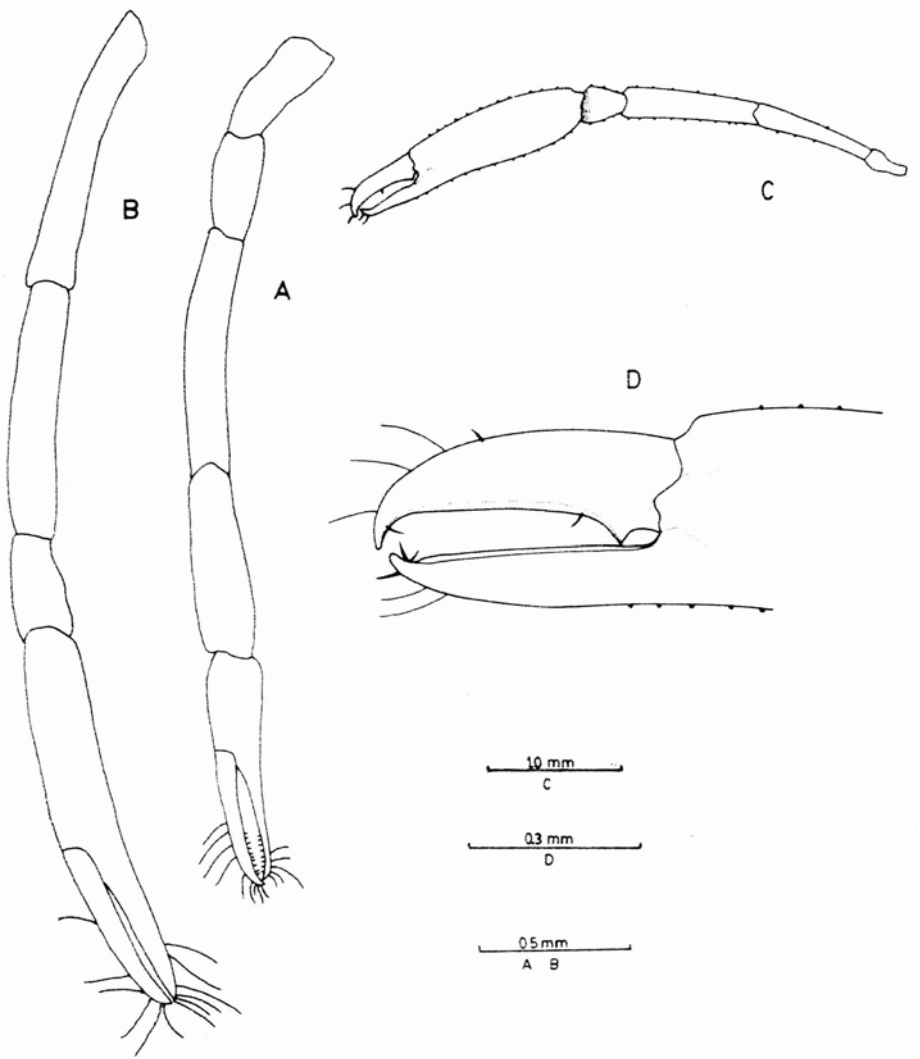

Fig. 8. *Pseudocoutierea conchae* new species. A, right first pereiopod; B, left second pereiopod; C, right second pereiopod; D, fingers of right second pereiopod.

fingers are less than half as long as the palm; the dactyl has a large basal tooth fitting into a depression in the fixed finger, which is visible only when the finger is open (fig. 8D); the palm is elongate and somewhat cylindrical with several tubercles; such tubercles are also visible on carpus, merus and ischium; the carpus is less than one-fourth as long as the palm; the merus is nearly three times as long as the carpus and the ischium is shorter than the merus. The minor cheliped of the second pair of pereiopods overreaches the antennal scale with the distal half of the palm; the fingers do not have teeth (fig. 8B); the carpus is short, less than half as long as the palm; the merus is slightly more than twice as long as the carpus, and somewhat longer than the ischium. The third

pereiopod overreaches the antennal scale with the end of the dactyl. The dactyl is simple and has an obtuse protuberance in the basal part of the flexor margin and terminates in a point (fig. 9A, B); the propodus is curved and is more than twice as long as the dactyl; the carpus is less than half as long as the propodus; the merus is somewhat shorter than the propodus and has an obtuse triangular protuberance in the distal part of the flexor margin; the ischium is more than half as long as the merus. The fourth pereiopod reaches the middle of the antennal scale with the end of the dactyl. The fifth pereiopod does not reach the end of the antennal scale. The fourth and fifth pereiopods resemble the third in shape, but the carpus and ischium are slightly shorter, and the protuberance of the dactyls is more pronounced (fig. 9C, D, E, F).

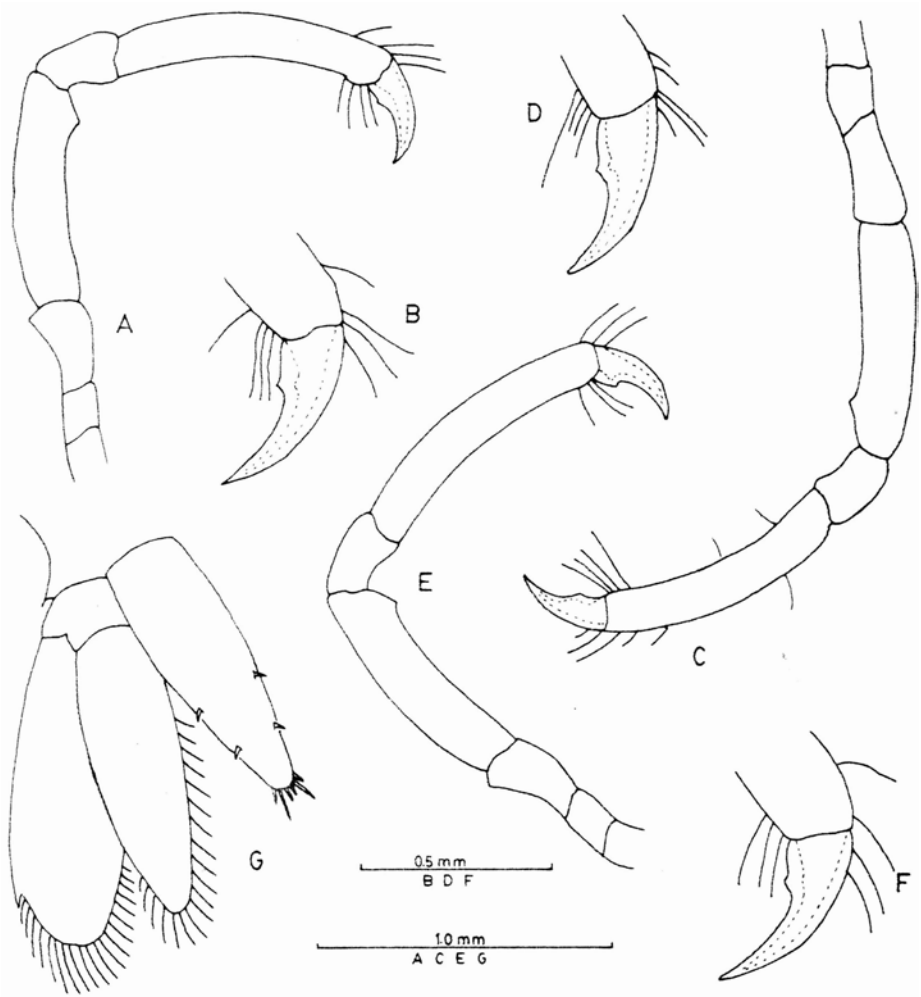

Fig. 9. *Pseudocoutierea conchae* new species. A, right third pereiopod; B, dactyl of third pereiopod; C, right fourth pereiopod; D, dactyl of fourth pereiopod; E, right fifth pereiopod; F, dactyl of fifth pereiopod; G, telson and uropods.

The telson has two pairs of dorso-lateral spines, the anterior pair is situated behind the middle of the telson, the posterior pair is halfway between the first pair and the distal margin of the telson. There are three pairs of terminal spines, of which the intermediate is twice as long as the other two pairs (fig. 9G). The lateral branch of the uropod has a distolateral tooth on the blade, but without a distinct movable spine.

The first pleopod of both sexes has the endopod with a broad lobe at the distal part of the inner margin. The second pleopod of the males has the appendix masculina much shorter than the appendix interna (fig. 7C).

The measurements were made as in the preceding species. Holotype: Adult male, T.L. 10.6 mm, C.L. 4.6 mm collected by B. Werding, February 15, 1977, in Bahía Concha, Colombia, 11°18'N 74°10'W, at a depth of 15 m; Zoölogisch Museum, Amsterdam (cat. nr. ZMA De 103.237). Paratypes: 1 male, T.L. 9.4 mm and 1 female, T.L. 8.8 mm, collected by I. Caycedo in Bahía Concha and Santa Marta, respectively; one specimen is preserved in INVEMAR, Santa Marta (Cr. Nr. 453), the other paratype in Zoölogisch Museum, Amsterdam (cat. nr. ZMA De 32592).

Habitat. — These shrimps were found in very turbid water on muddy-sand bottom, living on the octocorallian *Leptogorgia virgulata*. The shrimps remained almost exclusively within the two canals on the stem of octocorallian, occasionally maneuvering between the polyps when crossing from one canal to the other.

Colour. — The colour is variable: yellow, purple, blue, because these shrimps adapt themselves exactly to the colour of the octocorallian.

Distribution. — Known from the bays east of Santa Marta, Colombia.

REMARKS

The principal characters in which these two species differ from the description of the genus *Pseudocoutierea* Holthuis, 1951, are the following: The exopods on the second pair of maxillipeds are well developed; the uropodal exopods do not have a movable spine in any of the specimens examined. This latter character agrees, however, with the description of *P. antillensis* Chace, 1972. The exopod of the first maxilliped has a caridean lobe and a flagellum.

P. edentata n. sp. also differs from all other *Pseudocoutierea* species described, in that the wing-like expansions of the rostrum do not end anteriorly in a sharp supraocular tooth, but have a rounded margin. In this respect *P. edentata* resembles the genera *Lipkebe* and *Neopontonides*.

The pleuron of the third abdominal somite of *P. edentata* shows a feature which appears to be the reverse of that in *P. antillensis* and *P. elegans*: in *P. edentata*, namely, the pleuron ends in a slender point in adults and ovigerous females only. In young females this point is small, and in young males the margin of the pleuron is rounded (adult males were not examined). In *P. conchae* n. sp. this pleuron ends in a slender point in adults and in young

specimens of both sexes. On the other hand *P. antillensis* has the pleuron of the third somite rounded and entire (Chace, 1972), but Holthuis (1951) mentions a sharp tooth in the posterior half of the pleuron of specimens of *P. elegans*, apparently in males.

P. edentata and *P. conchae* have a blunt spine on the ventral surface of the basal antennular segment, which is also present in *P. antillensis* but absent in *P. elegans*.

Both juveniles and adults of *P. edentata* and *P. conchae* were found on the octocoral *Leptogorgia virgulata*. This shrimp appears to be associated with the octocoral during the entire post-larval period of its life.

At present the genus *Pseudocoutierea* is placed among the genera of the subfamily Pontoniinae which lack exopods on the second and third maxillipeds (Chace, 1969). The two species described in this paper have, however, exopods on the second maxillipeds. This feature is here regarded as an instance of the "rather wide range of presumably generic characters" (Chace, 1969) found in the aforementioned group of genera, and adds an important distinction between *Pseudocoutierea* and the two genera *Lipkebe* and *Coutierea* which it resembles superficially.

Several animal species have been listed as symbionts of the octocorallian *Leptogorgia virgulata*, including the shrimp *Neopontonides beaufortensis* (Borradaile) (Patton, 1972). The present is the first record of the genus *Pseudocoutierea* as symbiont on this octocorallian.

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RESUMEN

Se describen dos nuevas especies de camarones de la familia Palaemonidae, *Pseudocoutierea edentata* y *Pseudocoutierea conchae* encontradas en las bahías de Concha y Santa Marta, Caribe Colombiano. Estos camarones son ectocomensales de la octocoralia *Leptogorgia virgulata* (Lamarck), la cual presenta varios colores y los camarones tienen la capacidad de adaptar su color al del huesped. En estas dos especies se encuentran características diferenciables de las otras dos especies de *Pseudocoutierea*, siendo la principal, la presencia de exopoditos sobre el segundo par de maxilípedos, la cual no era conocida para el género.

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