STUDIES ON THE FAUNA OF CURAÇAO AND OTHER CARIBBEAN ISLANDS: No. 188

COMMENSAL CARIDEAN SHRIMPS OF OCTOCORALLIA AND ANTIPATHARIA IN CURAÇAO AND BONAIRE

with description of a new species of Neopontonides

by

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Observations by means of diurnal and nocturnal SCUBA dives performed in various bays of Curaçao and Bonaire provided five new records of shrimps in association with Octocorallia. Also a new species, *Neopontonides principis*, commensal of the antipatharian *Stichopathes gracilis*, is described. This shrimp was found living on the same host both day and night. – The five other shrimps were found only during night dives and were living on five species of octocorals of the genera *Eunicea* and *Plexaura*. *Pseudocoutierea antillensis* was the only species for which it was possible to verify endo-commensalism. The other, ecto-commensal, shrimps were: *Periclimenes iridescens*, *Periclimenes rathbunae*, *Synalpheus* sp. and *Processa fimbriata*, the latter two being new records of the family Alpheidae and Processidae in association with these Anthozoa for the Atlantic.

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INTRODUCTION

It is well known that many tropical marine shrimps live in close association with the larger members of a variety of marine phyla, although the precise status of the association in most cases is not established (BALSS 1957).

The association between shrimps and other marine invertebrates in the Caribbean region has been little studied. At present following species are known to associate with Octocorallia and Antipatharia in this region: *Pseudocoutierea antillensis* Chace, 1972; two as yet undescribed species of *Pseudocoutierea* (Criales in press), *Neopontonides beaufortensis* (Borradaile) and undescribed species of *Pseudocoutierea* and *Neopontonides* (R. HEARD, pers. comm.). All these belong to the subfamily Pontoniinae. The hippolytid shrimps *Tozeuma carolinensis*, and species of the genus *Hippolyte* have been observed on octocorals (VOSS 1956, CHAÇE 1972).

Further observations on the association between shrimps and species of Octocorallia and Antipatharia in the Caribbean region are described in this paper. Data are presented on the habitat of each shrimp species and on the type of association between shrimps and their respective host.

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METHODS AND LOCALITIES

Field observations were made by means of diurnal and nocturnal SCUBA diving (Table 7). The material was collected by cutting branches of anthozoan colonies on which shrimps were seen. During this operation the shrimps generally stayed in place on the branches. The material was further observed in aquaria.

Twenty nocturnal dives (9–11 p.m.) were made during June to August 1977 near Piscadera bay, at depths between 3 and 20 m. Of these dives 10 were made approximately 1 km east of the Caribbean Marine Biological Institute (CARMABI) and 10 at the same distance west of it. Thirty diurnal dives were made from April to August 1977 at depths between 10 and 35 m in various bays of Curaçao and Bonaire.

Lengths of shrimps given in this paper are total lengths, measured from apex of rostrum to posterior end of telson.

TABLE 7

INDICES OF ABUNDANCE OF SHRIMPS ON OCTOCORALLIA AND ANTIPATHARIA off Curaçao and Bonaire (April–August 1977)

++ common + scarce — absent

HOSTS / SPECIES	*Eunicea tourne-forti*	*Eunicea calycu-lata*	*Eunicea fusca*	*Plexaura homo-malla*	*Plexaura* sp.	*Sticho-pathes gracilis*
Neopontonides principis	—	—	—	—	—	++
Neopontonides beaufortensis	+	—	—	—	—	—
Pseudocoutierea antillensis	++	++	++	—	+	—
Periclimenes iridescens	++	+	+	+	++	++
Periclimenes rathbunae	+	—	—	—	—	—
Periclimenes pauper	+	—	—	—	—	—
Synalpheus sp.	—	—	+	—	—	—
Processa fimbriata	++	++	—	—	—	—

LOCALITIES WHERE DIVING ACTIVITIES WERE REALIZED
(April – August 1977)

Curaçao

PISCADERA BAY

Diurnal dives: April 25, 27, 30; May 10, 15, 20; June 9, 16, 28; July 5, 16. Some places with abundant corals, octocorals and antipatharians; other localities sandy with *Thalassia*. – Two specimens of *Neopontonides principis* on the antipatharian *Stichopathes gracilis* (Gray), 18 m deep. Nocturnal dives: June 3, 6, 7, 12, 20, 22, 26; July 7, 14, 19, 22, 25, 27; August 8, 10, 15, 19, 25, 27, 29. Ten dives to the east of CARMABI ("East site") and 10 to the west ("West site"). The East site had a rocky bottom, with abundant octocorals and antipatharians; the West site had a sandy bottom with much less coral growth, although the species composition did not differ. – Seven paratypes of *N. principis*, all from the East site, about 20 m deep.

CORNELIS BAY

May 5; June 9, 30. Northeast of the Princess Isles Hotel. – Six specimens of *N. principis* on *Stichopathes gracilis*, between 15 and 25 m.

PORTO MARIE BAY

July 24. To the northwest, in front of Playa Hunku. – Three paratypes of *N. principis* on *S. gracilis*. The only place in northwestern Curaçao where these shrimps were observed.

OOSTPUNT

July 3; August 28. Northeast of Awa di Oostpunt; rocky beach in tidal zone. – Twelve N. *principis* on *S. gracilis*, at 18 m depth, largest of all samples.

PLAYA KALKI: May 3, 27; NW. Reef slope. SAN JUAN BAY: June 1,14; NW. Reef flat. JAN THIEL BAY: May 12, June 5; NE. Outside pier of swimming pool, about 30 m. BOCA SANTU PRETU: June 1, 24; NE. Reef flat. SANTA MARTHA BAY: June 11, NW. Reef slope. CARACAS BAY: July 10, August 12; NE – No *N. principis* observed.

Bonaire

KLEIN BONAIRE

August 2. Sandy beach; between 10 and 20 m a great diversity of corals and antipatharians. – Twelve *N. principis*, about 15 m deep.

PLAYA FRANS

August 3. NW Washington National Park; abundant *Thalassia* and antipatharians between 10 and 25 m. – Three specimens of *N. principis* on *S. gracilis* at 25 m.

BENGÈ

August 4. NW Washington National Park; rocky beach of tidal zone. – Two *N. principis* on *Stichopathes* at about 20 m depth.

PALAEMONIDAE

Pseudocoutierea antillensis Chace, 1972

This was the most abundant shrimp found on the hosts *Eunicea tourneforti* (Milne Edwards & Haime), *Eunicea calyculata* (Ellis & Solander), *Eunicea fusca* (Duchassaing & Michelotti), and *Plexaura* sp. (Tables 7 and 8), between 3 and 13 m depth. The length of the shrimps ranged from 6.3 mm to 9.0 mm (ovigerous ♀ and ♂). The colour varied between reddish and light brown. Of the specimens collected 78% were ovigerous females.

In the aquarium these shrimps stayed quietly on the branches of the gorgonids, firmly attached to the host by their pereiopods. However, after the host had been removed, they moved around actively and showed agonistic behaviour, attacking each other with the large chelae of the second pair of pereiopods. Attacks on shrimps of other species were not observed. When a piece of gorgonid was re-introduced, the shrimps

TABLE 8

NUMBERS OF SHRIMPS FOUND ON OCTOCORAL SPECIES OF *Eunicea* AND *Plexaura*

during night diving at the two sampling sites near Piscadera bay, Curaçao (June–August 1977)

		"East site"	"West site"
Neopontonides principis	♀	5	0
	♂	1	1
Neopontonides beaufortensis	♀	1	0
	♂	0	1
Pseudocoutierea antillensis	♀	45	5
	♂	7	0
Periclimenes iridescens	♀	17	0
	♂	5	0
Periclimenes rathbunae	♀	1	0
Periclimenes pauper	♀	1	0
Synalpheus sp.	♂	1	0
Processa fimbriata	♀	0	27
	♂	0	5
Total		84	39
Number of dives		10	10

immediately swam toward it and attached themselves. Frequently, these shrimps moulted shortly after capture, particularly the males.

On several occasions the number of shrimps on a branch of octocoral in an aquarium increased considerably overnight, for example from an initial count of 5 specimens to 25. This suggests that shrimps were originally hiding inside the polyps of the host and emerged later. The reverse was also observed; perhaps in these instances they entered polyps and were unable to emerge as the gorgonid died. These hypotheses were tested by dissecting polyps: shrimps were indeed found inside.

Pseudocoutierea antillensis has been previously reported on the basis of only one incomplete gorgonid which was collected on the 13 m deep Saba Bank (CHACE 1972). In the present work it was the most abundant shrimp found on gorgonids. This species was the only one for which it was possible to verify the shrimps can live *within* the polyps.

Periclimenes iridescens Lebour, 1949

The species was found on all the identified hosts (Table 7) at the east side of Piscadera bay, but curiously enough not at the west side (Table 8). The total length varied between 8.6 mm (juv. ♂) and 16.6 mm (ovig. ♀). The colour was translucent orange. Ovigerous females constituted 50% of the specimens.

In the aquarium these shrimps lived with *Stichopathes gracilis* for more than two weeks and never abandoned it, attached to the host with the last three pereiopods, taking mucus and particles with the chelae of the first two pairs of pereiopods. The shrimps also groomed themselves often with the first two pairs of pereiopods and the third pair of maxillipeds. The specimens found on octocorals showed a different behavior: when these were placed in the aquarium with a branch of the host they swam around freely and only occasionally returned to the host.

This species never showed agonistic behavior. On several occasions some of the shrimps moulted during the night immediately after capture.

The length of the carpus of the first pereiopods was more than twice the length of the palm. The chelae of the second pereiopods were more developed in the males than in the females.

Periclimenes iridescens is reported for the first time as a commensal of both Octocorallia and Antipatharia. It is also the first time that sexual dimorphism has been observed.

The species shows a notable taxonomic differentiation, which might point to the existence of two species. However, the comparative length of the carpus of the first and second pereiopods alone does not justify this assumption: there are characters that vary with sex and age, and as a result of autotomy (CHACE, pers. com.).

Periclimenes rathbunae Schmitt, 1924

One adult ♀ of 20 mm length was found on the gorgonid *Eunicea tourneforti* (Tables 7 and 8). The colour was transparent with red dots, and two longitudinal white stripes on the anterior part of the abdomen, converging in the third somite. The shrimp moulted immediately after capture.

Periclimenes rathbunae has been reported in association with several anemones (HOLTHUIS 1951, CHACE 1972), but not with octocorals. CHACE (pers. com.) is of the opinion that our current concept of this species might be based on more than one taxon.

Periclimenes pauper Holthuis, 1951

A single juvenile ♀ of 9 mm in length was found on *Eunicea tourneforti*. The animal was yellow in colour. In the aquarium it remained closely attached to the host with all its pereiopods, with mucus and pieces of the host adhering to its body surface.

Neopontonides beaufortensis (Borradaile, 1920)

One ♂ of 12.5 mm long and one juvenile ♀ of 6 mm were collected on *Eunicea tourneforti* (Tables 7 and 8). The colour was yellowish brown.

HOLTHUIS (1951) reported this species living associated with *Leptogorgia* sp. PATTON (1972) described its behaviour on *Leptogorgia virgulata* (Lam.).

Neopontonides principis sp. n.

Material: 12 adult ovigerous females, 5 juvenile females and 12 adult males. This material was collected from June to August 1977, in various bays of Curaçao and Bonaire at depths between 15 m and 20 m. – Holotype: Adult ovigerous female, T.L. 10.5 mm, L.C. 4.5 mm, collected by M.M. Criales at Awa di Oostpunt, Curaçao, 3.VII.1977, at a depth of 18 m; Rijksmuseum van Natuurlijke Historie, Leiden, RMNH, No Crust. D32017. – Paratypes: 6 adult ovig. ♀, T.L. 9.3–13.3 mm, 5 juv. ♀, T.L. 6.3–9.3 mm and 5 adult ♂, T.L. 8.6–14.6 mm; M.M. Criales coll.; INVEMAR, Santa Marta, No. Crust. D 451.

Derivation of name: From the "Princess Isles Hotel", Curaçao, where the new species was observed for the first time.

Description: The rostrum is slender, unarmed, nearly horizontal and laterally compressed (Fig. 25a). In profile it is slightly concave in the proximal part (Fig. 25b). Usually it reaches the middle of the second segment of the antennular peduncle, but sometimes it extends as far as the end. The basal portion has lateral expansions on both sides which partially cover the eyestalk. These expansions continue on the carapace as ridges, closely approaching the edges of the carapace. The carapace is subcylindrical and armed only with a strong antennal spine, which has a small concave sinus at its base. Immediately posterior to the sinus there is a narrow, rounded lobe with a ridge that extends posterodorsally on the carapace to a point near the lateral expansions of the rostrum. Below this lobe the carapace has the anterolateral margin emarginate and ends in a pronounced broad lobe (Fig. 25b).

The eyes are well developed. The cornea is hemispherical and of the same length as the stalk. The eyestalks are large, reaching almost the end of the rostrum.

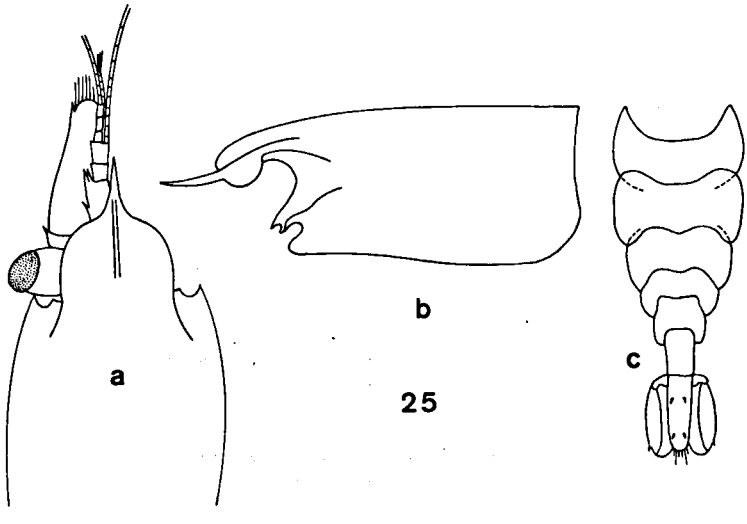

Fig. 25. *Neopontonides principis* sp. n. — a, anterior region of the carapace in dorsal view; b, carapace in lateral view; c, second to sixth abdominal somites. (a – b × 10 c × 5)

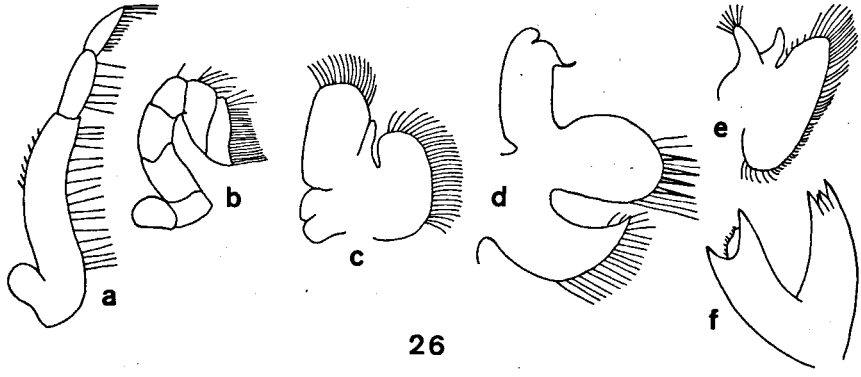

Fig. 26. *Neopontonides principis* sp. n. — a, right third maxilliped; b, right second maxilliped; c, right first maxilliped; d, first maxilla; e, second maxilla; f, mandible. (a–c and e × 16, d and f × 40)

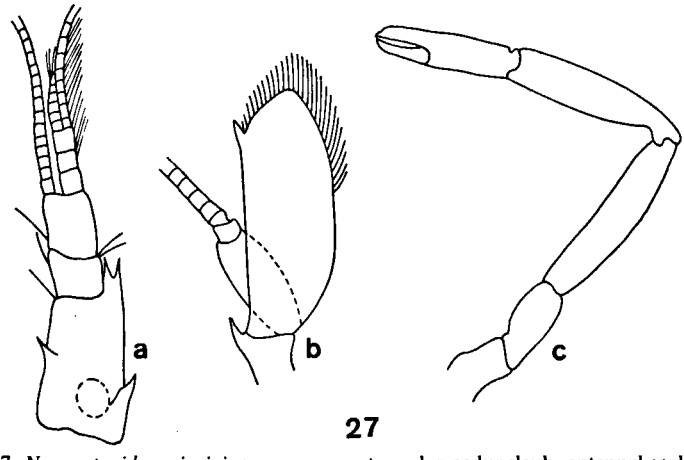

Fig. 27. *Neopontonides principis* sp. n. — a, antennular peduncle; b, antennal scale; c. first right pereiopod. (a and c × 16, b × 20)

All the pleurae of the abdomen are rounded. The fifth pleura is the smallest. The sixth somite is more than twice as long as the fifth and shorter than the telson, excluding the terminal spine of the latter (Fig. 25c).

The basal segment of the antennular peduncle has a strong pointed stylocerite. The outer margin of the basal segment ends in two strong anterolateral spines, the inner one being slightly longer than the outer one. The inner margin of this segment bears a slender spine in the middle (Fig. 27a). The third segment is approximately twice as long as the second one. The upper flagellum is biramous and has the proximal three segments of the rami fused. The lower flagellum is well developed and filiform.

The antennal scale overreaches the antennular peduncle and it is less than three times

longer than broad. The outer margin is concave and ends in a strong tooth (Fig. 27b). The antennal peduncle reaches about the middle of the scaphocerite. The basal segment has a strong ventrolateral tooth.

The mouth parts are shown in Figs. 26d-f. The mandible (Fig. 26f) is without a palp. The incisor process is armed with four teeth. The molar process is well developed and ends in two acute knobs. The second maxilla bears a long and bilobed palp (Fig. 26e). The upper lobe is small and rounded. The lower lobe has a simple seta. The upper lacinia is broad with four terminal spines. The lower lacinia is slender with long slender setae distally. The maxilla (Fig. 26d) bears a distinct non-setose palp. The scaphognatite is well developed. The first maxilliped is without an exopod (Fig. 26c). A small non-setose palp is present. The basal endite is broad and well developed. The second maxilliped (Fig. 26b) is of normal shape; carpus, merus and ischio-basis do not show any unusual features. The coxa bears a small medial protuberance, with a rounded epipod laterally. The exopod is absent. The third maxilliped is without an exopod (Fig. 26a). The coxa is produced medially and bears a small epipod laterally.

The first pereiopods overreach the antennal scale with the end of the chela (Fig. 27c). The fingers are unarmed and are as long as the palm. The carpus is longer than the palm and has almost the same length as the merus. The second pereiopods are similar in shape but unequal in length, the right one being longer. The major second leg reaches beyond the antennal scale with the dactylus or part of the palm (Fig. 28a). The dactylus bears two teeth, situated on the cutting edge. The palm is swollen and more than twice as long as the carpus, and the ischium is as long as the merus. The minor cheliped overreaches the antennal scale by more than half the palm (Fig. 28b). The fingers are unarmed and slender. The propodus notably overreaches the end of the dactylus. The proportion between the fingers and the palm is the same as that in the right pereiopod. The carpus is $\frac{1}{3}$ the length of the palm; the merus and ischium are slightly more than two times as long as the carpus.

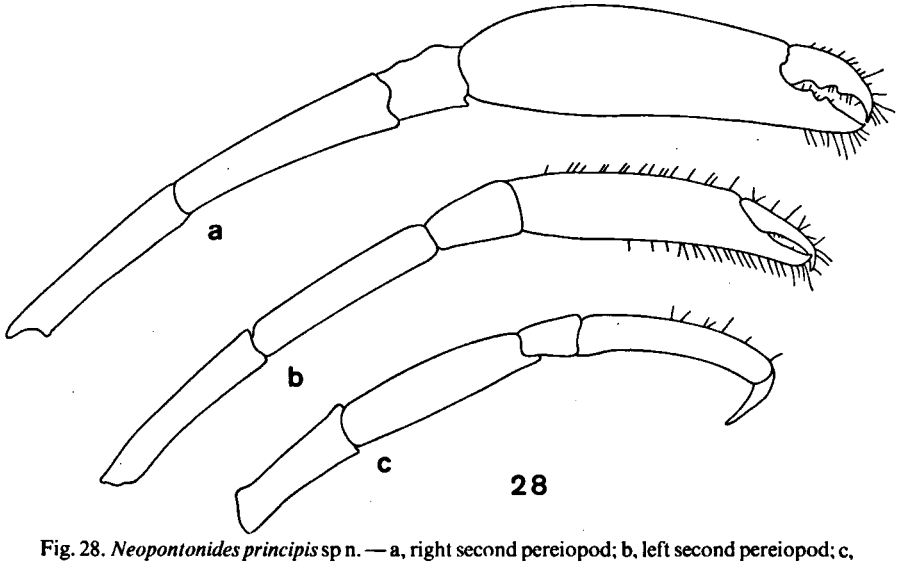

Fig. 28. *Neopontonides principis* sp n. — a, right second pereiopod; b, left second pereiopod; c, right third pereiopod. (a–c × 16)

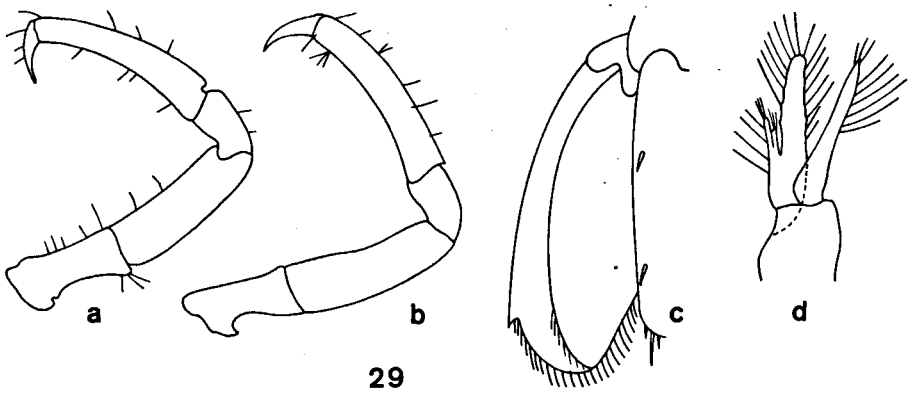

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Fig. 29. *Neopontonides principis* sp. n. — a, right first pereiopod; b, right fifth pereiopod; c, telson and uropod; d, second pleopod of the male. (a–c × 16, d × 20)

The last three pereiopods are similar in size and shape. The third pereiopods reach with the dactylus to the end of the antennal scale. The dactylus is sharply curved and simple (Fig. 28c). The propodus is more than thrice the length of the dactylus. The carpus is short and approximately $\frac{1}{3}$ the length of the propodus which in turn is longer than the merus. The fourth pereiopod reaches the antennal scale with the dactylus (Fig. 29a). The propodus has a notch on the posterior part of the outer margin. The fifth pereiopods reach the antennal scale only in the basal part with the tip of the dactylus (Fig. 29b).

The telson has two pairs of dorsal spines. The anterior pair is placed near the center of the telson, the posterior pair is placed about $\frac{1}{4}$ the length of the telson from its posterior margin (Fig. 29c). Of the three posterior terminal pairs of spines, the intermediate is twice as long as the outer pair. The outer pair is smaller than the inner. The exopod of the uropod has a distolateral tooth on the outer margin.

The first pleopod of the male has a normal shape. On the second pleopods of the male the appendix masculina is shorter then the appendix interna (Fig. 29d).

Colour: This species is well camouflaged, showing exactly the green colour of the host. The juveniles showed a different colour from that of the adults: transverse white and brown stripes.

Habitat: The shrimps were found on the coral reefs of Curaçao and Bonaire, on the antipatharian *Stichopathes gracilis* Gray, between 15 and 25 m deep.

Behaviour: *Neopontonides principis* is difficult to separate from its antipatharian host, because the specimens are well attached with their pereiopods, excellently adapted to that purpose. Juveniles, however, seem

to be less dependent on the host, since they abandoned *Stichopathes* when the author tried to capture them.

When the adults were separated from their host, the green mimetic colour turned into orange. One to six shrimps were found on the same branch. Most specimens occupied the distal and middle parts, while the juveniles were generally living on the basal portion of the antipatharian.

Aquarium observations showed that the shrimps remain most of the time on the same host, feeding with their first and second pairs of pereiopods taking particles such as mucus, spicules or other material. In one case three shrimps which were kept with their host, ate one third of the antipatharian. The animals never left their host, but when taken off, they could survive a long time attached to a piece of alga, coral, or the aquarium wall.

Neopontonides principis seems to be an obligate commensal, found during night and day dives, from juveniles to ovigerous females. It is the first record of a commensal shrimp on *Stichopathes gracilis.*

Taxonomically the species is very close to the genus *Pontonides* from the Indo-Pacific region on account of the following characteristics: Exopods absent from the first maxillipeds, and rostrum without teeth. However, certain peculiar features – *e.g.* the maxilla bearing the inner laciniae, the maxillar endites and the absence of arthrobranchs on the third maxillipeds – point to the genus *Neopontonides.*

In general *Neopontonides principis* n. sp. is very similar to *Neopontonides beaufortensis* Borradaille, which is the only representative of the genus in the eastern American waters. The most distinctive characteristics which separate these two species are the following:

N. beaufortensis	*N. principis*
1. Rostrum with 0–5 dorsal teeth.	1. Rostrum without teeth.
2. The sixth abdominal segment is as long as the telson.	2. The sixth abdominal segment is shorter than the telson.
3. The anterior dorsal pair of spines of the telson is placed in the posterior half on the lateral margin. The posterior pair lies midway between the anterior pair and the posterior margin of the telson.	3. The anterior dorsal pair of spines of the telson is placed near the center of the telson. The posterior pair is placed about ¼ the length of the telson from its posterior margin.

4. The basal segment of the antennular peduncle ends in one strong anterolateral spine.	4. The basal segment of the antennular peduncle ends in two strong anterolateral spines.
5. A small exterior spine is present near the base of the scaphocerite.	5. An strong exterior spine is present near the base of the scaphocerite.
6. The tooth at the outer margin of the uropodal exopod is provided with a movable spine at its inner side.	6. The uropodal exopod without a movable spine.
7. The species has been reported living with Octocorallia.	7. The species was found only with Antipatharia.

ALPHEIDAE

Synalpheus sp.

One juvenile female of 0.5 mm was found on *Eunicea fusca* (Tables 7–8). The colour of the body was yellow and the major chela orange, red and black. The shrimp was well attached to the host with the major chela.

This is the first report of an association with octocorals for the family Alpheidae in the Caribbean Sea.

PROCESSIDAE

Processa fimbriata Manning & Chace, 1971

The association with octocorals constitutes a new host record for this family. The shrimps were found on *Eunicea tourneforti* and *Eunicea calyculata* (Tables 7–8). Their lengths ranged from 11 mm, juvenile female, to 17.3 mm, ovigerous female. The colour generally was orange at night, and translucent during the day. Of the specimens collected, 40% were ovigerous females. This species never showed agonistic behavior. Since these shrimps are nocturnal, they showed a negative reaction to light: when exposed to underwater flashlight they escaped quickly burying into the

sand, which made capture difficult. Observation in an aquarium showed that these shrimps for long times on end remained eating the particles of the gorgonid using their pereiopods. One male specimen was found parasitized on the right branchial chamber by an isopod (Bopyroidea).

The Atlantic *Processa fimbriata* has been reported in association with some sponges (MANNING & CHACE 1971). HAYASHI (1975) in a revision of the Indo West Pacific Processidae, does not mention any species in association with Coelenterata.

GENERAL REMARKS

On the east side of the CARMABI (Table 8, East site) the most abundant shrimps were *Pseudocoutierea antillensis* and *Periclimenes iridescens.* The number of shrimps collected was approximately twice the number found on the west side; also the number of species was larger. However, *Processa fimbriata* was never observed in this locality. On the west side the dives were less deep. Perhaps because of the less abundant growth of octocorals and antipatharians only few species were found; the only abundant one, *Processa fimbriata,* amounting 82% of the total shrimp fauna. The sandy bottom could be one of the reasons for their abundance. *Periclimenes iridescens* was the only species living on octocorals *and* antipatharians (Table 7).

In these two sites near Piscadera bay (Table 8) all the material was collected during nocturnal dives. During the diurnal dives the association shrimp – octocoral was never observed.

On the antipatharian *Stichopathes gracilis* the shrimp *Neopontonides principis* was found in each of the places indicated in Table 9. Apart from this commensal shrimp, another species observed during the day on *Stichopathes gracilis* was *Periclimenes iridescens,* in Bengé, Bonaire. Diurnal dives in Bonaire were performed for three days, and in every place visited, *Neopontonides principis* was observed. In comparison with Curaçao, where during four months diurnal dives were made, the number of specimens of *Neopontonides principis* obtained in Bonaire is very high (Table 9).

During the night dives, mainly shrimps associated with octocorals were

TABLE 9

NUMBER OF SHRIMPS FOUND ON THE ANTIPATHARIAN *Stichopathes gracilis* at sampling stations of Curaçao and Bonaire (April–August 1977)

At Piscadera bay diurnal and nocturnal dives were made; at the other stations diving took place during daytime only.

		Curaçao					Bonaire		
		Piscadera bay		Cornelis bay	Porto Marie bay	Oostpunt	Klein Bonaire	Playa Frans	Bengé
		night	day						
Neopontonides principis	♀	5	2	6	2	8	8	2	2
	♂	2	0	0	2	4	3	1	0
Periclimenes iridescens	♀	14	0	0	0	0	0	0	3
	♂	4	0	0	0	0	0	0	0
Number of dives		20	10	3	1	2	1	1	1

observed (Table 7). On *Stichopathes gracilis* the shrimp *Periclimenes iridescens* was collected on several occasions; *Neopontonides principis* was observed only two times (Table 9).

In *Neopontonides principis, Pseudocoutierea antillensis, Periclimenes iridescens* and *Processa fimbriata* more than 50% of the material examined consisted of ovigerous females.

In *Periclimenes iridescens* and *Periclimenes rathbunae* moulting was observed immediately after capture. This may indicate that they were on the octocoral to protect their soft body, while it is also known that change of water temperature is an important stimulus for moulting.

In the aquarium the most dependent commensals, *Neopontonides principis* and *Pseudocoutierea antillensis*, took their food from the antipatharian.

Pseudocoutierea antillensis was the only species showing agonistic behaviour when deprived of octocorals. The same has been observed in two as yet undescribed species of *Pseudocoutierea* (CRIALES in press), which are also commensals of octocorals.

Many of the commensal shrimps are very small, which might be considered to be an adaptation to their niches. In the present work the minimum length was 6.3 mm in *Pseudocoutierea antillensis*, and the maximum length 17.3 mm in *Processa fimbriata*. It is to be noted that the former is strongly dependent on Octocorallia, whereas the latter is not.

The body of the commensal shrimps most dependent on their hosts, *Neopontonides principis* and *Pseudocoutierea antillensis*, appeared to be more or less compressed. BRUCE (1967a) has also reported morphological modifications, particularly in the Pontoniinae. In addition to this, many shrimps show an adaptive colour pattern related to their host, a feature that has been observed in the majority of commensal shrimps with octocorals and antipatharians. The same was reported by BRUCE (1967a) in shrimps living with alcyonarians.

In the night dives, species of Pontoniinae represented 73%, Processidae 26%, and Alpheidae 1%. During day dives the two species found were Pontoniinae. These results confirm once more the strong commensalism in the marine species of the subfamily Pontoniinae (see BRUCE 1972b, 1976a, b, 1977; HOLTHUIS 1951; PATTON 1972).

Although the octocorallian fauna is rather diversified in Curaçao and Bonaire, the commensal shrimps were found only on *Eunicea* and *Plexaura*.

At present five species of commensal shrimps from the Atlantic have been described in association with Octocorals; so far, there are no reports on associations with antipatharians for this region. BRUCE (1976a) mentions that the incidence of commensalism at generic level amounts 59% in the Indo – West Pacific, 50% in the East Pacific and only 41% in the Atlantic. As the high figure for the Indo-West Pacific is probably associated with the general extent of coral reef development, a higher percentage for the Caribbean is to be expected.

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