NOTES ON SOME INDO-PACIFIC PONTONIINAE. XVII. *EUPONTONIA NOCTALBATA* GEN. NOV., SP. NOV., A NEW PONTONIINID SHRIMP FROM MAHÉ, THE SEYCHELLE ISLANDS

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During the course of a survey of the pontoniid shrimp fauna of the island of Mahé in the Seychelle Islands, carried out in 1966, a single specimen of an unusual pontoniinid shrimp was obtained. Subsequent examination of the specimen showed that it could not be satisfactorily referred to any of the described genera of the Pontoniinae and a new genus is now erected for this species. The specimen obtained was found, upon dissection, to possess a mandibular palp, a feature lacking in the vast majority of pontoniinid genera, and also to lack a hepatic spine. Only a single genus, *Vir* Holthuis, 1952, shares these characteristics. Numerous specimens of *Vir orientalis* (De Man) were also obtained in the Seychelle Islands, where they were invariably found in pocilloporine corals (Bruce, in press). *Vir* presents a number of adaptations to its coral habitat, that are not found in the specimen reported upon, which closely resembles, in its general form, some of the free-living species of the Pontoniinae. The new species is at present also considered to be free-living.

Eupontonia gen. nov.

Definition of genus. — Small sized pontoniinid shrimps, probably free-living. Body normal in shape, slightly compressed. Rostrum moderately developed, compressed, dorsally and ventrally dentate. Carapace smooth. Inferior orbital angle feebly developed, orbit well developed with marginal supra-orbital spine. Antennal spine present, hepatic spine absent. Abdomen smooth, first five pleura without acute posterior angles. Telson broad, tapering, with three pairs of terminal spines. Eyes short and stout, cornea globular. Antennular basal segment moderately broad with broad stylocerite and an acute disto-lateral tooth; intermediate and distal segments short. Upper and lower flagella well developed; upper flagellum biramous with rami fused proximally. Scaphocerite short and broad with stout disto-lateral tooth. Epistome unarmed. Mandible with palp; molar process stout with strong teeth, incisor process normal. Maxillula with bilobed palp and slender laciniae. Maxilla with tapering palp and bifid endite. Scaphognathite narrow. All maxillipeds with setose epipods. First maxilliped with setose palp, coxal and basal endite

clearly separated, caridean lobe small, epipod large and simple. Second maxilliped normal; epipod simple, without podobranch. Third maxilliped slender, ischiomeral and basal segments distinct; epipod and rudimentary arthrobranch present, pleurobranch absent. First pereiopods slender, fingers of chela simple, coxa without medial process. Second pereiopods well developed, similar, subequal, slender. Ambulatory pereiopods slender with simple dactyls. Fourth thoracic sternite with slender median process. Pleopods normal. Uropods normal with large mobile distal spine.

Type species. — *Eupontonia noctalbata* sp. nov.

Systematic position of genus. — The morphological characteristics of major importance in assessing the systematic position of the genus *Eupontonia* within the subfamily Pontoniinae are the presence of the mandibular palp, the absence of a hepatic spine and the presence of a slender median finger-like process on the fourth thoracic sternite. The only genera in which a mandibular palp is found are *Palaemonella* Dana, 1852, and *Vir* Holthuis, 1952 (see Holthuis, 1955). Numerous species have lost the hepatic spine in connection with adaptions to specialized commensal habits and the majority of genera have likewise lost the median fourth thoracic sternal spine. Some of the genera that have retained a mandibular palp have retained the median fourth thoracic sternal spine, whereas the genera that have lost the median fourth thoracic sternal spine have invariably also lost the mandibular palp. Of the genera that retain the mandibular palp, *Eupontonia* is most closely related to the genus *Vir* Holthuis, 1952. The two genera are compared in the following table.

	Eupontonia gen. nov.	*Vir* Holthuis, 1952
1.	Body form slightly compressed.	Body form feebly depressed.
2.	Rostral midrib well developed.	Rostral midrib obsolescent.
3.	Orbit well developed deep, partly covering; eyes.	Orbit feebly developed, shallow, eyes completely exposed.
4.	Eyestalk very short and stout, length sub-equal to width, cornea narrower than stalk.	Eyestalk elongated, length twice width, cornea as wide as stalk.
5.	Mandibular palp two-segmented, setose.	Mandibular palp one-segmented, non-setose.
6.	Molar process of mandible robust, strongly toothed.	Molar process of mandible feeble, weakly toothed.
7.	Exopods of maxilliped slender, feebly setose.	Exopods of maxilliped broad, strongly setose.
8.	First pereiopods without numerous rows of cleaning setae on proximal ventral aspect of chela.	First pereiopods with numerous rows of cleaning setae on proximal ventral aspect of chela.
9.	Second pereiopods slender, carpus distinctly longer than palm, fingers sub-equal to palm.	Second pereiopods relatively stout, carpus about half length of palm, fingers about half length of palm.
10.	Ambulatory pereiopods slender, with spinulate propods, and slender, feebly curved dactyls, about two fifths of length of propod.	Ambulatory pereiopods stout, with setose, non-spinulate propods and short, stout, strongly hooked dactyls, about one fifth of length of propod.

Most of the differences noted above between *Eupontonia* and *Vir* are compatible with the hypothesis that *Eupontonia* is an active, free-living predatory shrimp,

most closely related to other predatory pontoniinids such as the free-living species of *Palaemonella* Dana or the '*grandis* group' of *Periclimenes* Costa, such as *P. grandis* (Stimpson) and *P. elegans* (Paulson) and the numerous other species of *Periclimenes* that possess a median sternal spine on the fourth thoracic segment, such as *P. seychellensis* Borradaile. In the free-living species of *Periclimenes* the carpus of the second pereiopod is generally as long or longer than the palm of the chela, whereas in the commensal species the carpus is usually not greater than half the length of the palm and frequently much shorter. In this case, *Eupontonia* resembles the free-living predators and *Vir* the commensal species, however the subspherical eyes and well developed orbits are features that are more generally found in commensal shrimps. In view of the feeble dentition of the fingers of the second pereiopod it seems most probable that the species is a micro-predator. In *Vir*, as in other pontoniinid genera associated with corals, such as *Coralliocaris* and *Jocaste*, the proximal ventral region of the palm of the chela of the first pereiopod bears numerous transverse rows of long, distally curved setae, which are probably associated either with feeding or cleaning the shrimps from the mucus secreted by the host. These are absent in *Eupontonia.*

Eupontonia noctalbata sp. nov. (figs. 1-5)

1 ovigerous female, Anse Etoile, Mahé, Seychelle Islands, 04°35'12"S 55°27'48"E; coral reef flats, 0.3 m; 21 June 1966; coll. A. J. Bruce, Stn. 32 (112.1).

Description. — A small-sized shrimp of generally slender body form, with the thoracic region slightly compressed.

Carapace smooth. Rostrum well developed, short, lamina compressed, slender, straight, with well developed midrib, not exceeding the antennular peduncle and equal to about 0.4 of the post-orbital carapace length. The dorsal margin bears five

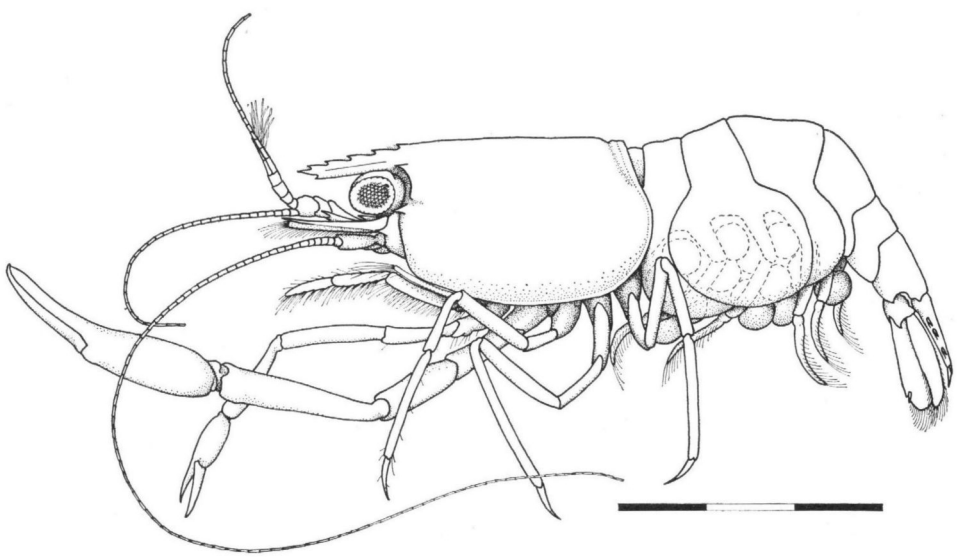

Fig. 1. *Eupontonia noctalbata* gen. nov., sp. nov. Holotype, female, lateral view. Scale in mm.

small subequal acute teeth. The first tooth is situated on the anterior region of the carapace and the intervals separating teeth decrease slightly anteriorly. A single small acute tooth is present at four-fifths of the ventral margin of the rostrum. The tip of the rostrum is acute and the ventral margin proximally to the ventral tooth, is straight. The orbit is well developed and deep, partly covering the posterior part of the eyestalk. The dorsal margin of the orbit is continuous with the rostral midrib and bears a large broadly triangular marginal supra-orbital spine. The inferior lateral margin of the orbital rim is separated by a small longitudinal groove from the antennal spine. The inferior orbital angle is feebly produced and bluntly rounded. The antennal spine is well developed, slender and acute, submarginal, arising just above the level of the inferior orbital angle. The hepatic spine is quite absent. The antero-lateral angle of the carapace is bluntly obtuse and the posterior margin of the branchiostegite is broadly rounded.

The abdominal segments are smooth. The third abdominal segment is not posteriorly produced in the dorsal midline. The fifth segment is about 0.6 of the length of the sixth segment, which is 1.4 times longer than deep. The posterior lateral angle is slightly produced and the posterior ventral angle is acute. The pleura of the first three segments are broadly rounded. The fourth and fifth pleura are bluntly posteriorly produced. The telson is broad, with straight tapering sides, about 1.0 times the length of the sixth abdominal segments, and 0.7 times longer than its greatest width. Three pairs of stout dorsal spines, rather asymmetrically opposed, are present submarginally. The posterior margin is acute and with a small median process. Three pairs of terminal spines are present. The lateral spines are small and slender, distinctly smaller than the dorsal spines. The intermediate spines are long and stout, about 3.5 times longer than the lateral spines. The submedian spines are long, slender and non-setose, about 0.6 times the length of the intermediate spines. The dorsal aspect of the tip of the telson also bears a pair of simple setae.

The cornea is less than hemispherical and slightly oblique. The eyestalk is very short and stout, slightly compressed and distinctly broader than the cornea, giving the eye a globular form in dorsal view. A small accessory pigment spot is present on the dorsal margin of the cornea.

The antennular peduncle slightly exceeds the tip of the rostrum. The basal segment is broad, about 1.4 times longer than wide. The antero-lateral margin is strongly produced and bears a large acute disto-lateral tooth. The lateral border is slightly sinuous and the stylocerite, which exceeds the middle of the medial border of the segment, is also broad and acutely pointed distally, with a few setae along its lateral border. A large acute spine is present ventrally on the medial border at two-thirds of the length. The statocyst is well developed and contains a discoid statolith. The intermediate and distal segments are subequal, short and broad, and equal to about two-thirds of the medial length of the basal segment. The lateral border of the intermediate segment is produced into a small feebly setose lobe. The upper flagellum is biramous with the three proximal segments of each ramus

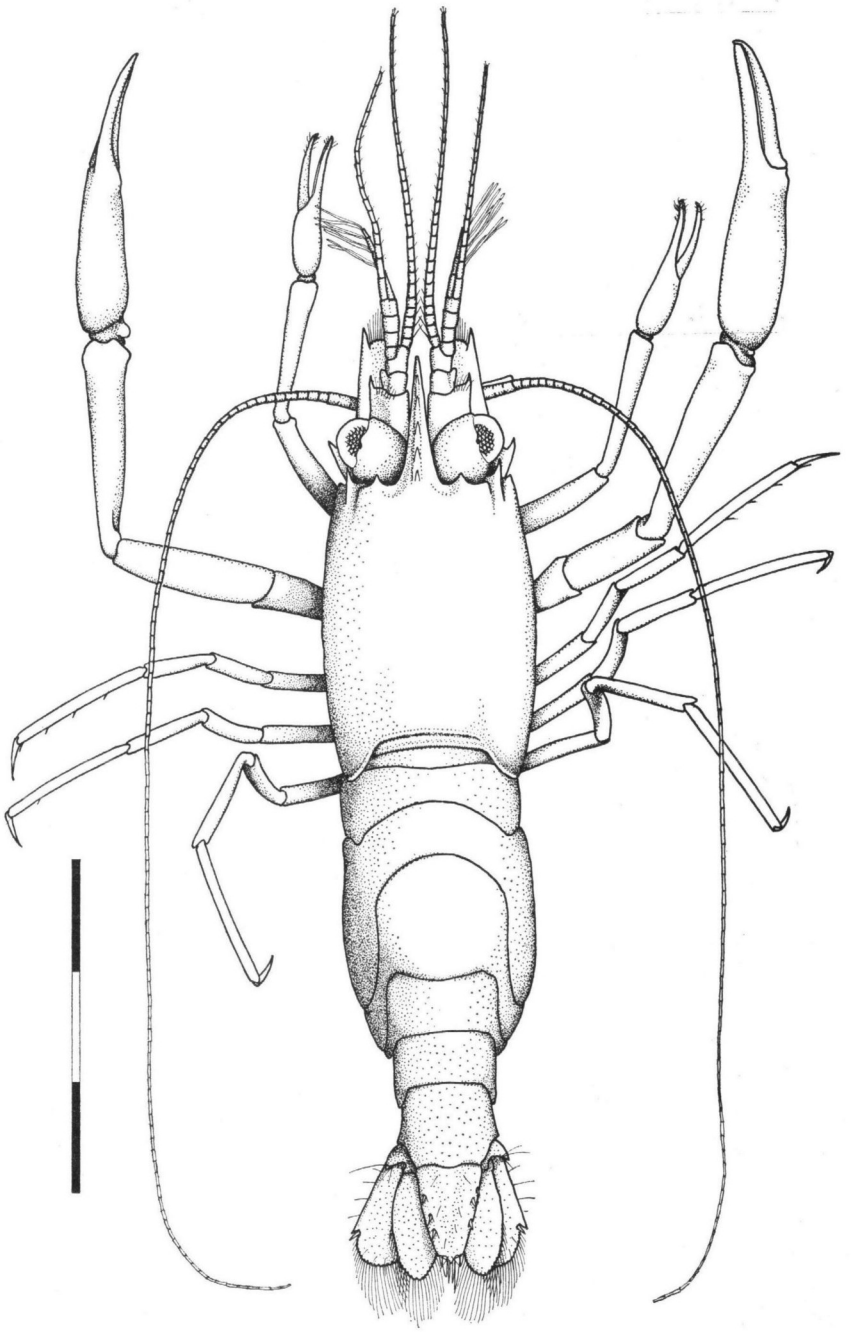

Fig. 2. *Eupontonia noctalbata* gen. nov., sp. nov. Holotype, female, dorsal view. Scale in mm.

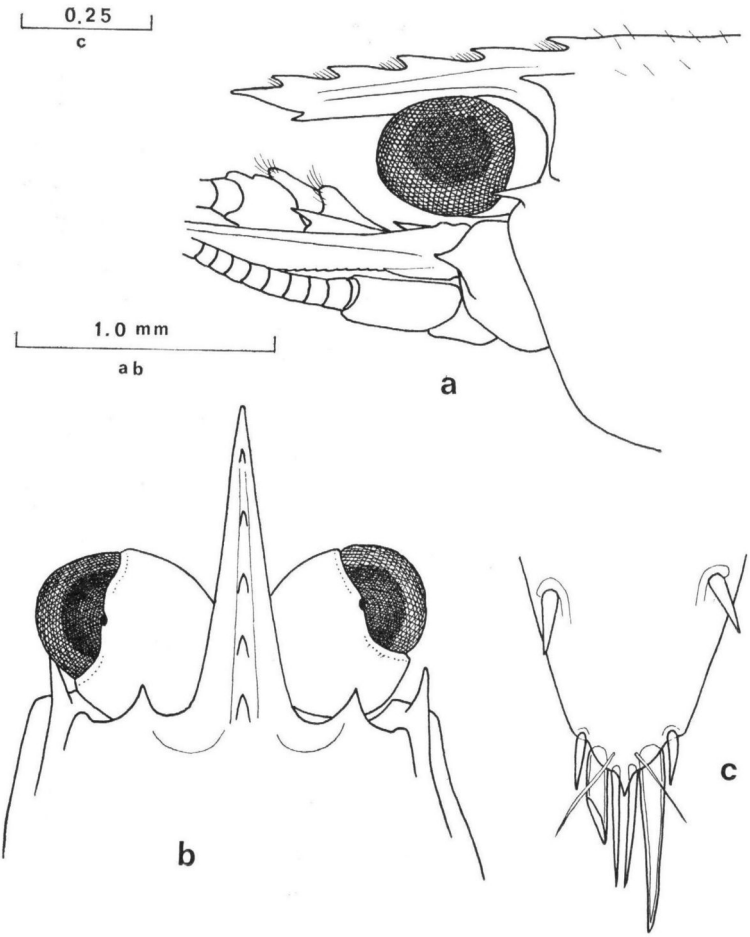

Fig. 3. *Eupontonia noctalbata* gen. nov., sp. nov. Holotype, female. a, anterior carapace and rostrum, eyes and bases of antennae; b, anterior carapace, rostrum and eyes; c, tip of telson.

fused. The shorter free ramus consists of four slender segments and bears five groups of aesthetascs. The longer free ramus is slender and is about 0.8 times the postorbital carapace length, consisting of eighteen segments. The lower flagellum is also long and slender, 1.3 times the post-orbital carapace length and consisting of twenty-nine segments. Some long setae project medially from the proximal segments.

The antenna is well developed. The basicerite is stout with a large acute disto-lateral spine. The carpocerite is slender and does not exceed the basal segment of the antennule. The flagellum is long and slender, about four times the post-orbital carapace length. The scaphocerite is short and broad. The anterior margin of the lamella distinctly exceeds the antennular peduncle. The lateral border is strongly concave and bears a very large stout spine distally, which far exceeds the anterior

margin of the lamella. The lamella is less than three times longer than broad, tapering only slightly anteriorly and broadly truncated distally.

The epistome is unarmed. The labrum shows no special features.

The mandible is robust with a small two-segmented palp. The distal segment

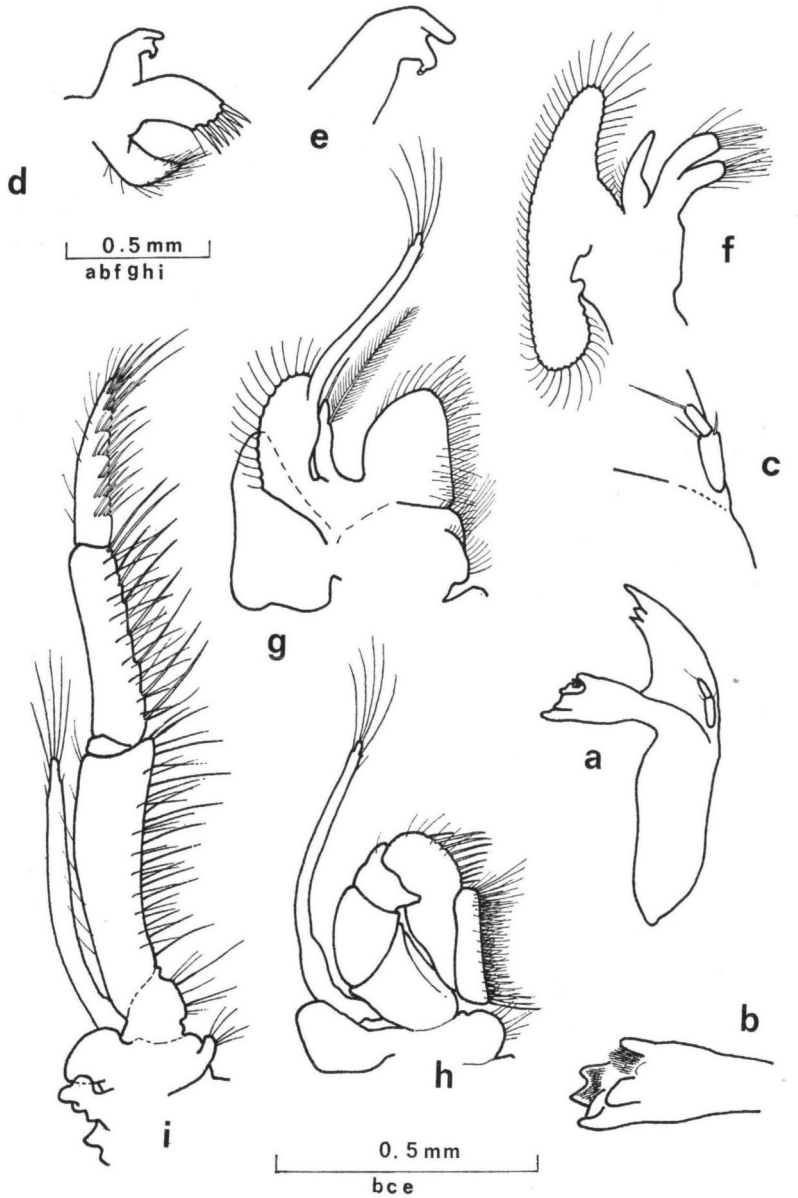

Fig. 4. *Eupontonia noctalbata* gen. nov., sp. nov. Holotype, female. a, mandible; b, molar process; c, mandibular palp; d, maxillula; e, palp of maxillula; f, maxilla; g, first maxilliped; h, second maxilliped; i, third maxilliped.

bears a single long terminal seta and is about two-thirds of the length of the proximal segment, which is stouter and bears two short distal spines. The molar process is stout and provided with stout marginal teeth with a tuft of setae anteriorly. The incisor process is also robust with three acute teeth distally. The lateral tooth is larger and more elongated than the two medial teeth. The maxillula has a narrow upper lacinia armed distally with seven simple spines. The lower lacinia is broad and acute distally with numerous simple setae. The palp is distinctly bilobed with the lower lobe recurved and non-setose. The maxilla has an elongated palp, broad basally and slender distally, with numerous setae along the proximal half of the lateral border. The distal endite is large and deeply bilobed, each subequal lobe with numerous fine setae distally. The proximal endite is absent, its position marked by a long low eminence along the proximal medial border. The scaphocerite is elongated and narrow, especially anteriorly. The first maxilliped has a slender palp with a short simple terminal seta and a long plumose subterminal seta on the medial border. The basal endite is large and broad, sparsely setose along its anterior border, with a dense fringe of shorter setae along the medial margin. The coxal endite is large and separated by a deep notch from the basal endite, with numerous long simple setae medially. The exopod is slender with four plumose setae distally and a small caridean lobe proximally. The epipod is large and simple, acutely produced anteriorly. The second maxilliped has a narrow terminal segment with a dense fringe of simple setae along the medial border. The penultimate segment is enlarged antero-medially where it bears several stout, simple spines. The coxa is angularly produced medially. The exopod is slender with four plumose setae distally. The epipod is lobular and without a podobranch. The third maxilliped is robust and reaches to the anterior margin of the scaphocerite. The antepenultimate segment is a little more than four times longer than broad and distinctly bowed, with the disto-medial angle slightly produced. The medial border bears numerous slender simple setae and the lateral border is also sparsely setose. The penultimate segment is more slender and about two-thirds of the length of the antepenultimate segment with long slender, simple setae along the medial border. The terminal segment is about 0.8 times the length of the penultimate segment, with transverse rows of short spines of increasing length anteriorly, along its ventro-medial surface. The basis is distinct from the ischiomerus and bears a relatively stouter exopod with more numerous plumose distal setae. The coxa bears a small setose medial process and a small rounded epipod laterally. A rudimentary arthrobranch is present but there is no pleurobranch.

The first pereiopod is slender and exceeds the scaphocerite by the length of the chela and carpus. The palm of the chela is subcylindrical, tapering very slightly distally. The fingers are slender with entire sublateral cutting edges and slightly hooked tips distally, equal to about 1.3 times the length of the palm. The carpus, which expands slightly distally, and the merus are also slender, subequal and approximately equal to the length of the chela. The ischium is three quarters of the length of the merus. The coxa lacks a medial setose lobe.

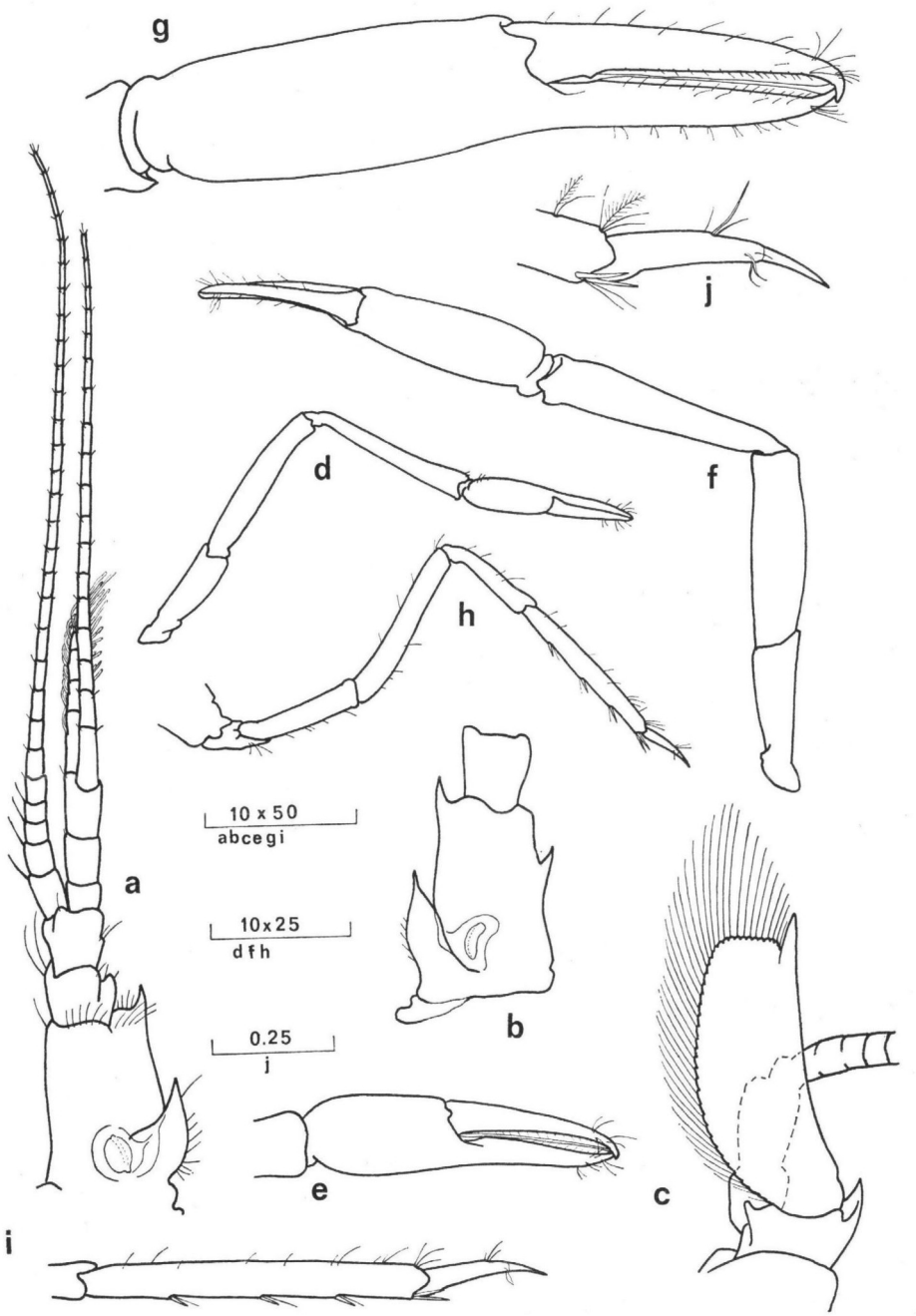

Fig. 5. *Eupontonia noctalbata* gen. nov., sp. nov. Holotype, female. a, antennule; b, basal segment of antennular peduncle, ventro-lateral view; c, scaphocerite; d, first pereiopod; e, chela of first pereiopod; f, major second pereiopod; g, chela of major second pereiopod; h, third pereiopod; i, propodus and dactylus of third pereiopod; j, dactylus of third pereiopod.

The second pereiopods are well developed, slender and similar, and subequal with the left slightly smaller than the right. In the major second pereiopod the palm is subcylindrical and the fingers are slender with slightly hooked tips. The fingers are about five-sixths of the length of the palm. The dactylus bears a very small acute tooth proximally but the cutting edges are otherwise entire. A small dactylar fossa is present. The carpus is about three quarters of the length of the chela, increasing in size slightly distally and distally excavated with a feebly developed tooth ventro-medially. The merus is three quarters of the length of the carpus, with the disto-ventral extremity subrectangular and lacking any distinct spine. The ischium is four-fifths of the length of the merus and is unarmed. The coxa is without any median process. The minor second pereiopod is generally similar but less robust.

The ambulatory pereiopods are long and slender. The third pereiopod exceeds the scaphocerite by the length of the dactylus, which is long and slender, about six times longer than wide, and gently curved, with a distinct unguis distally. The middle of the anterior margin bears one long seta and short setae are present laterally near the origin of the unguis. The propodus is slender, ten times longer than broad with a pair of spines at the disto-ventral extremity and with three single spines along the posterior border. Some plumose setae are present on the dorsal border distally. The carpus is almost two-thirds of the length of the propodus, slightly broadened distally and unarmed. The merus is subequal to the propodus and without spines. The ischium is just greater than two-thirds of the length of the merus and is also unarmed. The fourth and fifth pereiopods are similar but the propodus of the fourth is 1.3, and the fifth is 1.1 times the length of the third.

The branchial formula is:

	Maxillipeds			Pereiopods				
	I	II	III	I	II	III	IV	V
Pleurobranch	—	—	—	1	1	1	1	1
Arthrobranch	—	—	r	—	—	—	—	—
Podobranch	—	—	—	—	—	—	—	—
Mastigobranch	1	1	1	—	—	—	—	—
Exopod	1	1	1	—	—	—	—	—

The pleopods have not been removed but show no obvious special features. The uropods are typical with the lateral border of the exopod ending in a triangular tooth with a large mobile spine medially. The endopod slightly exceeds the exopod and both rami extend beyond the tip of the telson. The disto-lateral process of the basipod is acutely pointed.

Measurements. — Post-orbital carapace length, 2.60 mm; total carapace length, 3.75 mm; chela of major second pereiopod, 2.80 mm; chela of minor second pereiopod, 2.60 mm; major diameter of ova, 0.45 mm.

Colour. — When first caught the specimen was almost completely transparent

with a whitish cornea. The small thoracic ovary was pale green with three pairs of white chromatophores on its posterior dorsal surface. The eyestalk has a pair of minute dorsal red dots with a further three or four anteriorly. A few feeble reddish streaks run posteriorly from the antennal spine.

The specimen was kept alive overnight and during darkness was found to have the whole body and the second pereiopods broadly covered with contiguous white chromatophores giving a uniformly whitish appearance.

The ova are pale green.

Type. — The single specimen, the ovigerous female holotype, is deposited in the collections of the Rijksmuseum van Natuurlijke Historie, Leiden, reg. no. Crust. D. 25626.

Habitat. — The specimen was discovered when a colony of the coral *Galaxea fascicularis* (L.) was removed from shallow water for examination. The exact position of the shrimp in relation to the coral was not noted but it was apparently not associated with the corallites.

Remarks. — *Eupontonia noctalbata* is considered to be a free-living species with few specializations, phylogenetically close to the origin of the pontoniinid stock. Its closest relationship appears to be with other primitive free-living predatory species. These can be typified by *Periclimenes elegans* (Paulson), which is an active carnivore, readily able to consume other carideans of up to half its own size, or *Palaemonella rotumana* (Borradaile), a micro-predator, which feeds readily on copepods and very small or newly hatched amphipods and isopods. The predatory forms, as far as is known, are generally transparent in life or with relatively few and inconspicuous chromatophores. They are also generally slender species, with elongated appendages, and long slender simple dactyls on the ambulatory appendages. A further resemblance is found in the stout mandible in *Eupontonia noctalbata* with a robust molar process bearing strong teeth and the well developed teeth on the incisor process, which closely resembles that of *P. elegans*, apart from the presence of the palp. In the Pontoniinae there is a general tendency towards the reduction of the mandibular processes and their dentition in the commensal forms. In view of the feeble dentition on the fingers of the second pereiopods, it is considered that *E. noctalbata* will also be, like *P. rotumana*, a micro-predator.

The dorsal telson spines are markedly asymmetrical in their arrangement and are considered to be abnormal. It is probable that only two pairs of dorsal spines are present in normal individuals, as in the vast majority of pontoniinid shrimps.

The shrimp briefly described and illustrated by Nobili (1906) as *Periclimenes brevinaris* has a similar general morphology to *E. noctalbata*, although it lacks supra-orbital spines and the mandible is without a palp. In a partial re-description of this species (Bruce, 1967), the specimens were tentatively referred to the genus *Philarius*. An important feature in which *P. brevinaris* differs from *E. noctalbata*, as well as from *Philarius gerlachei* (Nobili) and *P. imperialis* (Kubo), is the absence of a median spine on the fourth thoracic sternite. Unfortunately the only known specimen of *P. brevinaris* is in such a poor state that a full assessment of

the relationship of the two species will have to await the discovery of further material.

ACKNOWLEDGMENTS

I am grateful to the Nuffield Foundation for a grant to carry out a study of the pontoniinid shrimp fauna of the Seychelle Islands in 1966.

RÉSUMÉ

Un seul spécimen de crevette pontoniide non décrite a été récolté à Mahé, dans les Îles Seychelles. L'espèce est décrite et un nouveau genre, *Eupontonia,* créé pour l'inclure. L'espèce, *E. noctalbata,* semble occuper une position phylogénétique primitive et être un micro-prédateur, vivant librement. Elle est très proche des genres *Vir* Holthuis et *Philarius* Holthuis, mais peut être reconnue par cette combinaison de caractères: présence d'un palpe mandibulaire et absence d'épine hépatique et de processus médian sur le quatrième sternite thoracique. Un changement nocturne prononcé de la couleur du corps, passant de la transparence au blanc, est noté.

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Received for publication 27 October 1969.