

Paranthurid isopods from French Polynesian coral reefs, including descriptions of six new species (Crustacea : Peracarida).

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Abstract : Nine species of paranthurid isopods in eight genera are recorded from coral reefs in the Society Archipelago (Bora Bora, Moorea), French Polynesia. Six new species in the genera *Apanthuroides*, *Bourbonanthura*, *Colanthura*, *Expanathura*, *Minyanthura* and *Paranthura* are described. The genera *Bourbonanthura* and *Minyanthura* are first recorded from the Pacific Ocean.

Résumé : Neuf espèces d'Isopodes paranthurides de huit genres sont recensées à partir des récifs coralliens de l'Archipel de la Société (Bora Bora, Moorea) en Polynésie française. Six nouvelles espèces des genres *Apanthuroides*, *Bourbonanthura*, *Colanthura*, *Expanathura* et *Minyanthura* sont décrites. Les genres *Bourbonanthura* et *Minyanthura* sont, pour la première fois, recensés dans l'Océan Pacifique.

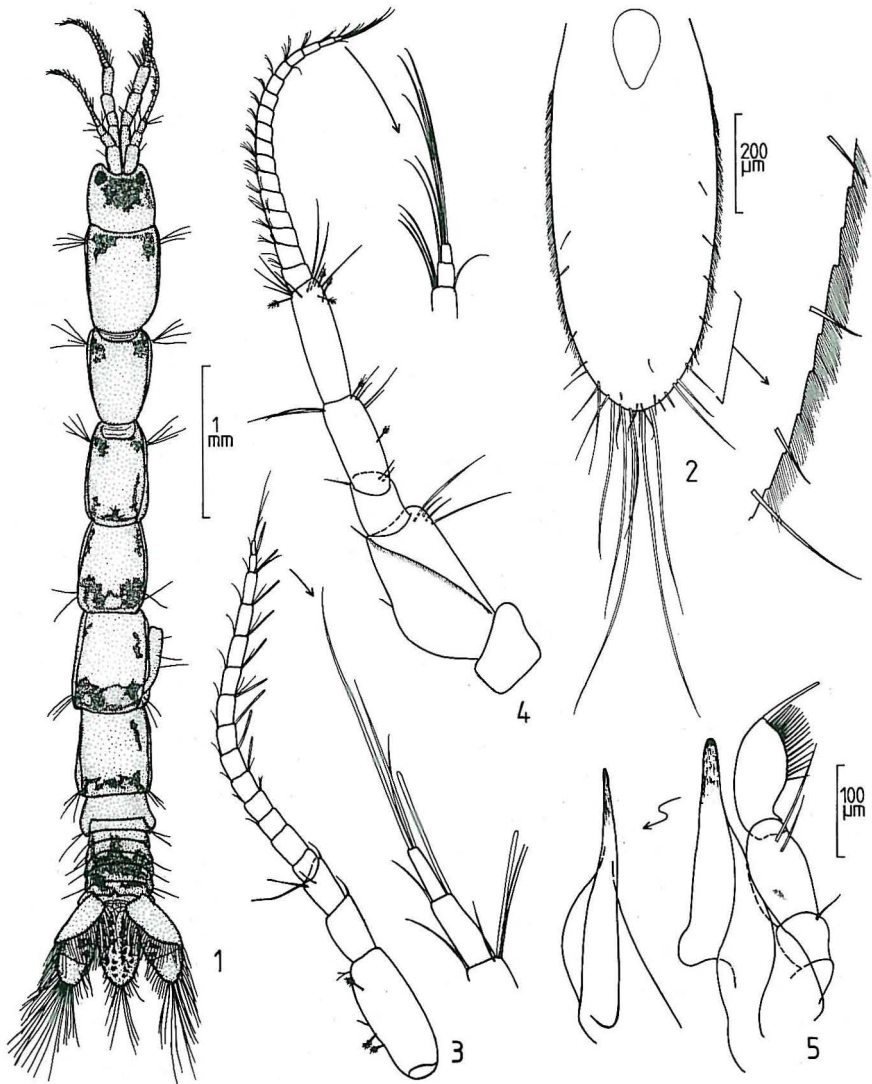
INTRODUCTION

The paucity in exploring coral reef inhabiting isopods in the tropical Pacific is no better emphasized than by the present material collected in the Society Archipelago, French Polynesia. The field work was conducted by the author in February-March 1988 over a period of almost eight weeks on the islands Bora Bora and Moorea. Samples of dead coral substrate and algal vegetation were taken at different locations of various coral reefs. The present contribution reports on the paranthurid isopods collected, except for the genus *Anthomuda* Schultz, 1979, which has been treated elsewhere (Müller, 1990c). Detailed descriptions are provided for 9 species out of 8 genera. Six species proved to be new to science.

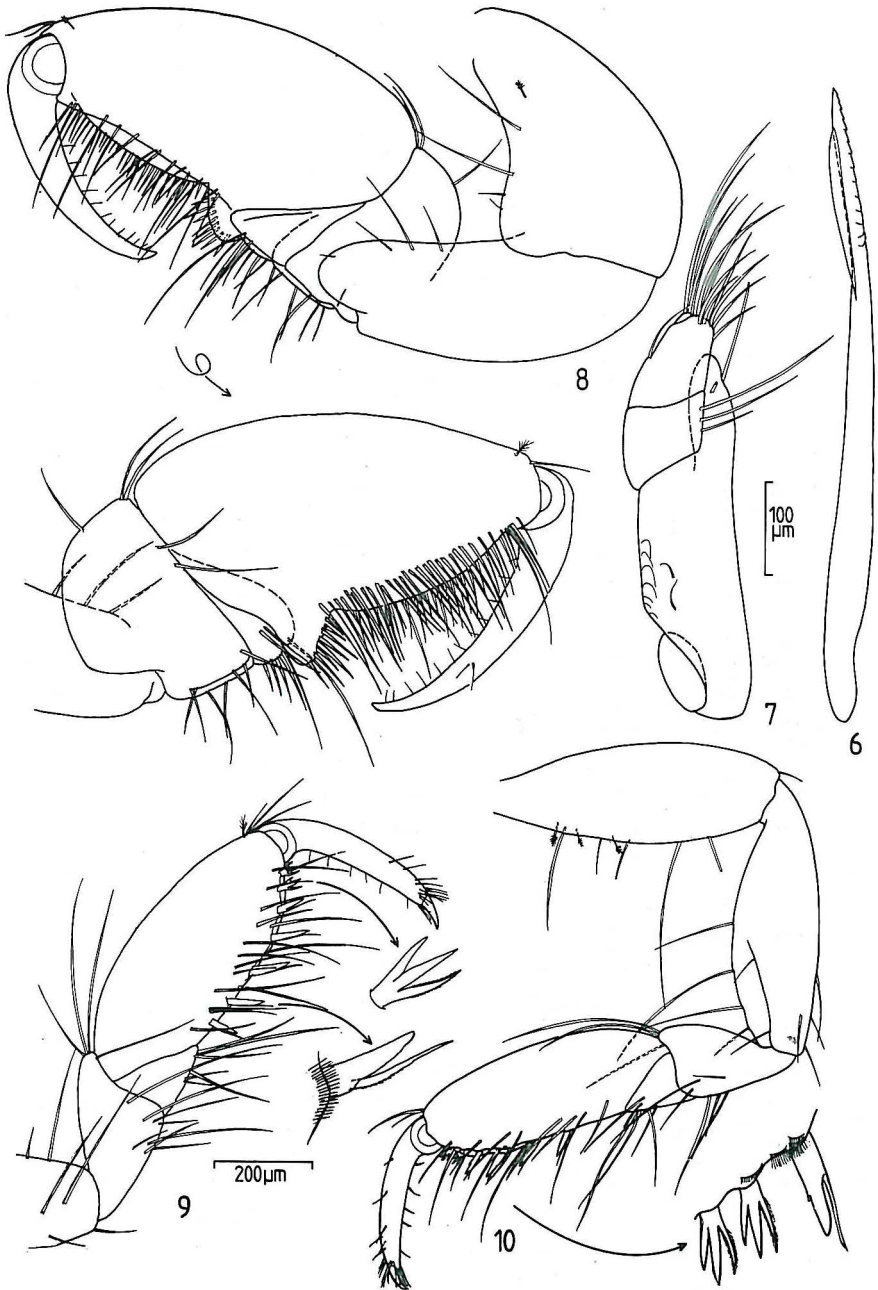
This is the final paper of a series reporting on the anthuridean isopods of my 1988 field-work in French Polynesia (Müller 1990c ; 1990d ; 1992).

For a detailed characterization of most sampling locations see Galzin & Pointier (1985) and Pirazzoli (1985).

The specimens are deposited in the Muséum National d'Histoire Naturelle, Paris, France (MNHN) and in the Senckenberg Museum, Frankfurt, Germany (SMF).



Figs. 1-5 : *Accalathura setosa* Kensley, 1984, immature adult : 1. dorsal view ; 2. telson ; 3. antenna 1 ; 4. antenna 2 ; 5. mandible, endite viewed from different angles.



Figs. 6-10 : *Accalathura setosa* Kensley, 1984, immature adult : 6. maxilla ; 7. maxilliped ; 8. pereopod 1, viewed from different angles ; 9. distal pereopod 2 ; 10. pereopod 3.

SYSTEMATIC ACCOUNT

Paranthuridae

Accalathura Barnard, 1925*Accalathura setosa* Kensley, 1984 (Figs. 1-17)

Accalathura setosa Kensley, 1984 : 10-13, figs. 7-8 ; Müller, 1991 ; 758-760, figs. 84-93.

Material : 1 immature adult (SMF), Moorea ; near Maharepa, about 2,6 km west of airport ; dead corals on barrier reef, 0,5 m, March 1988.

Description, immature adult : body slender, 10.5 times longer than wide. Total length 5.5 mm. Dorsum of body with several rather irregular pigment patches. Cephalon with small, darkly pigmented anterolateral eyes. Body proportions : C<1>2<3>4<5>6>7. Pleonites free and subequal in length. Tongueshaped telson with large proximal statocyst ; lateral margins with fringe of setules and shallow serrulations ; dorsolateral surface of telson with few short setae in distal two-thirds ; several short and long setae in possibly characteristic arrangement at distal, rounded margin of telson.

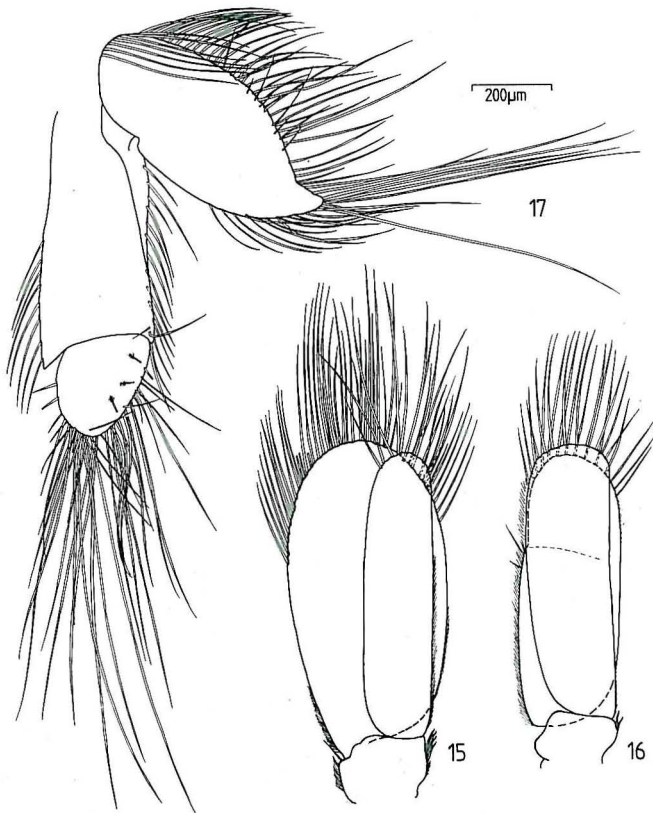
Antenna 1 with 3-articulate peduncle ; proximal article longest, 1.3 times longer than 2nd and 3rd together ; flagellum 14-articulate ; flagellar articles 5-13 each bearing small aesthetasc and few simple setae. Antenna 2 with 5-articulate peduncle ; 2nd article much larger than other peduncular articles, grooved to accomodate peduncle of first antenna ; articles 3-5 increasing in length distally ; flagellum shorter than peduncle, of 18 setose articles. Mandible styletto-like, with robust 3-articulate palp ; proximal palp-article shortest, with simple distal seta ; distal two articles broad and subequal in length ; 2nd article with 2 slender distal setae, distal one with row of 17 short setae in distal two-thirds and a long terminal spine. Maxilla spine-shaped ; distal third of medial margin with 14 indentations and outer margin with narrow lamella. Maxilliped with large, distally rounded endite, which reaches to midlength of 2nd palp article ; endite with 2 setae in distal half ; palp 3-articulate, with two large proximal articles and a tiny distal one ; proximal article with 3 slender setae at medial margin ; 2nd article longest, bearing 9 curved setae at mediobasal margin and a single seta at midlength of outer margin ; terminal article with 2 long setae.

Propodus of pereopod 1 expanded, posterior margin with robust, roughly triangular spinose hump ; palm of propodus distinctly convex, with many short setae ; moreover, mesial surface near posterior margin with 32 curved slender setae ; dactylus slender and well curved, posterior margin with row of 12 short setae. Propodus of pereopod 2 elongate-oval ; posterior margin convex, bearing 6 compound spines (distal 2 compound spines branched). Propodus of third pereopod more slender than in 2nd pereopod, with similar arrangement of compound spines (6 in total, the distal 2 branched). Carpus of pereopods 1-3 triangular, lacking free anterior margin. Pereopods 4-7 similar in shape, size and spination ; posterior margin of rectangular propodus with 4-6 compound spines, rectangular carpus with 3-4 posterior compound spines.

Symphodite of pleopod 1 with 4 retinacula ; endopodite relatively slender, lateral margins almost parallel, subequal in length to operculiform exopodite ; endopodite with 8, exopodi-



Figs. 11-14 : *Accalathura setosa* Kensley, 1984, immature adult : 11. pereopod 4 ; 12. pereopod 5 ; 13. pereopod 6 ; 14. pereopod 7.



Figs. 15-17 : *Accalathura setosa* Kensley, 1984, immature adult : 15. pleopod 1 ; 16. pleopod 2 ; 17. uropod.

te with 49 distal, plumose marginal setae. Sympodite of pleopod 2 with 2 retinacula ; both rami subequal in length, lateral margins almost parallel ; endopodite with 9, exopodite with 14 distal, plumose marginal setae ; exopodite indistinctly biarticulate.

Symphodite of uropod 2.5 times length of endopodite, with several lateral setae ; endopodite oval, in distal half with many marginal setae of different length ; moreover, outer dorsal surface with 3 feathered sensory setae ; exopodite 2.7 times length of endopodite, with subacute apex and distinct concavity at outer distal margin ; exopodite with numerous plumose, slender marginal setae. All plumose setae of pleopods and uropod drawn as simple setae.

Remarks : morphologically and in size the present immature adult specimen does not differ markedly from the material of *Accalathura setosa* recorded from Belize (Kensley, 1984 : 10-13, figs. 7-8) and Martinique (Müller, 1991 : 758-760, figs. 84-93) in the Caribbean. The few minor differences concern the number of setae and spines on the appendages and the more compact pigmentation on the segments of the Polynesian material.

Anyhow, as there are very few pantropical species of isopods known, the present record from French Polynesia requires confirmation, when males are available for comparison with the Caribbean material.

Distribution : Moorea, Society Islands ; Belize and Martinique in the Caribbean.

Apanthuroides Menzies & Glynn, 1968

Apanthuroides coralliophilus n. sp. (Figs. 18-49)

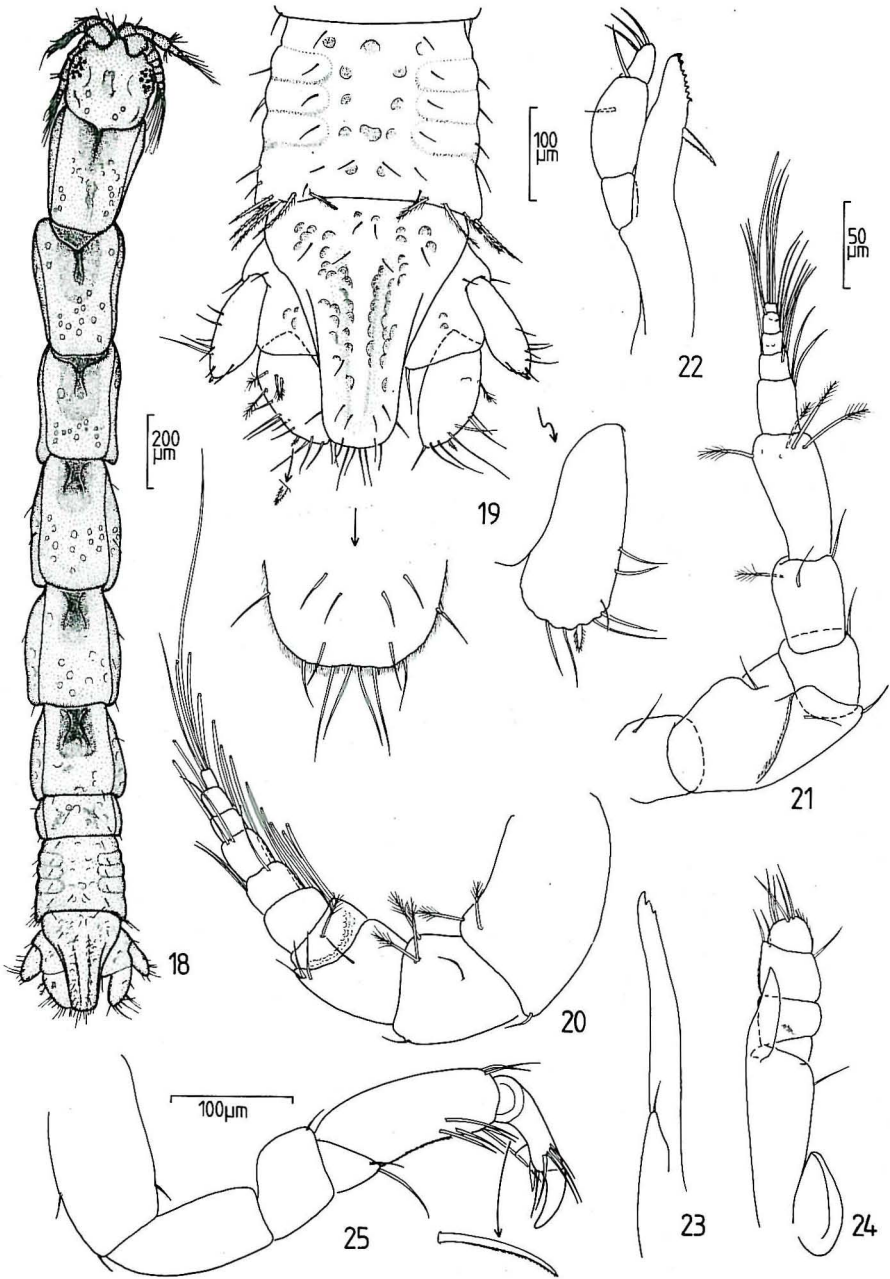
Holotype : ♂ (SMF), Moorea ; Temae, the Islet Reef, northeast of airport ; dead corals near beach, about 2 m, 31 March 1988.

Paratypes : all specimens from Moorea ; 5 ♂♂ (SMF) ; northeast of airport, dead corals in channel near beach, about 2 m, 31 March 1988. 5 ♂♂, 4 manca (MNHN) ; crest of barrier reef near Maharepa, dead corals, 0.5 m, III 1988. 1 ♂ (SMF) ; coral slope of Tiahura fringing reef, dead corals, 1-2 m, 22/23 March 1988. 2 ♂♂, 1 ♀ 1 immature adult, 1 postmanca, deposited as follows : 1 ♂, 1 ♀, 1 immature adult (MNHN), 1 ♂ (SMF) ; crest of Tiahura barrier reef, dead corals, 0.5-1 m, 25 March 1988. 1 ♂, 1 preparatory ♂ (MNHN) ; outer reef-flat of fringing reef near Afareaitu, dead corals, 0-0.5 m, 29 March 1988. 1 ♂, 1 manca (SMF) ; coral slope of fringing reef near Afareaitu, dead corals, 1-2 m, 26 March 1988.

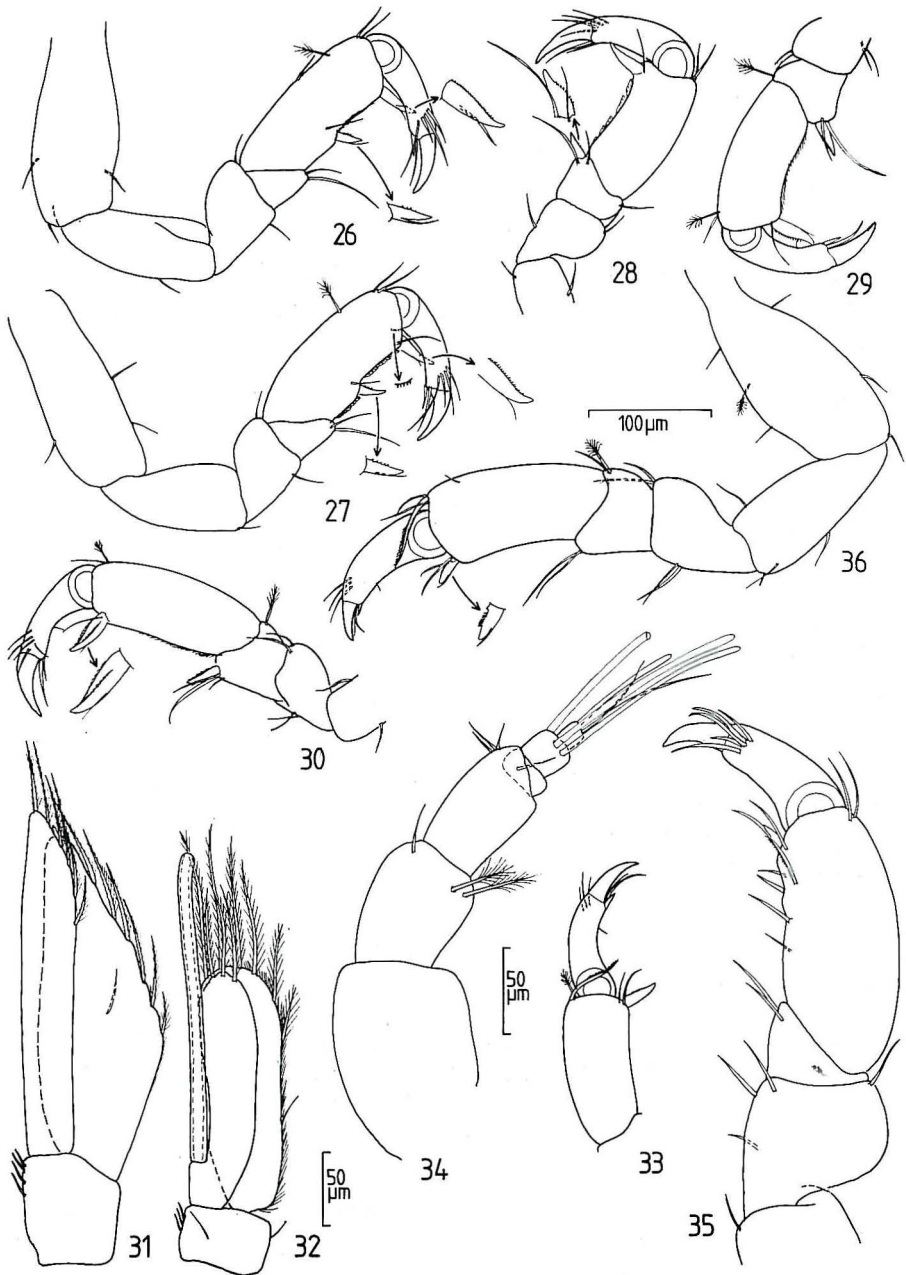
Derivatio nominis : the specific name refers to the preferred habit of the new species, dead coral substrate.

Description, ♂ : body slender, 10.5 times longer than wide. Total length 2.3-3.3 mm. Middorsal part of cephalon and anterodorsal part of pereonites 1-6 with short excavation ; moreover, dorsum of all body segments with several pits in irregular arrangement. No distinct pigmentation recognizable, except for a brownish colouration around the segment excavations in some specimens. Dorsolateral eyes relatively large, with well pigmented ommatidia. Body proportions : C<1<2>3<4>5>6>7. Pleonites fused, segmentations indicated by dorsolateral furrows ; fused pleonite section as long as wide, posterolateral margin with some plumose setae. Telson with rounded posterolateral margins and blunt distal margin, no statocyst apparent ; mediodorsal ridge of telson with few setae on either side ; distal telsonic setation characteristic, as figured.

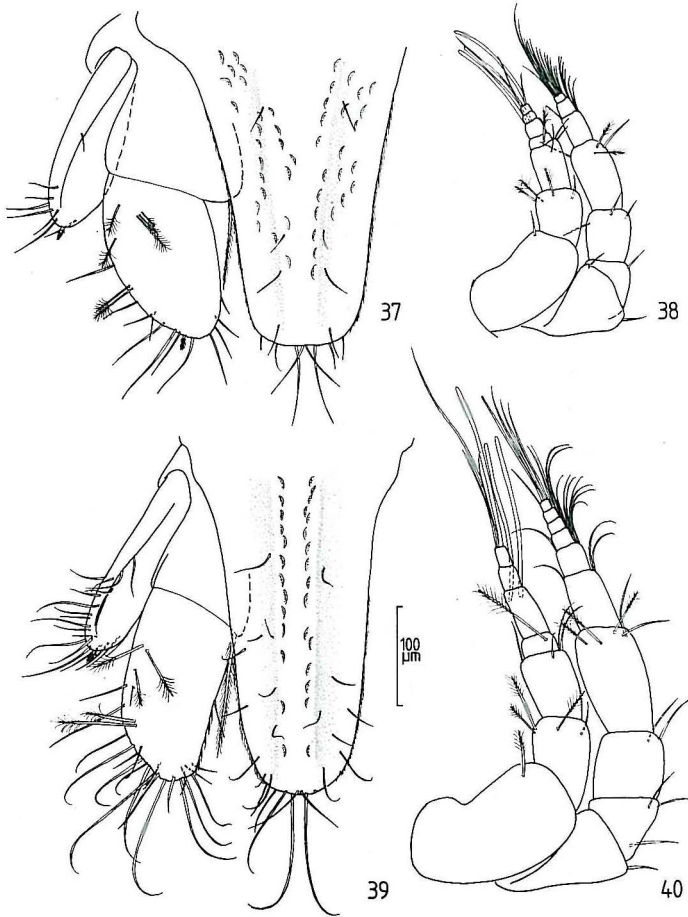
Antenna 1, peduncle 3-articulate ; articles decreasing in size distally, proximal one as long as articles two and three together ; flagellum 7-articulate ; proximal flagellar article widest, aesthetascs much more numerous than on remaining articles. Peduncle of 2nd antenna 5-articulate ; 2nd article largest, grooved to accommodate peduncle of antenna 1 ; articles 3-5 increasing in size from proximal to distal ; flagellum of 5 setose articles. Mandible slender, incisor of 2 tooth-shaped cusps, not well separated from 6-dentate lamina dentata ; molar spine-shaped, with fringe of setules ; mandibular palp of 3 articles, slightly reaching beyond distal margin of incisor ; 2nd article much larger than remaining articles, with 2 setae in distal half ; terminal article with row of 3 setae in distal half. Maxilla slender, with 3-cuspidate apical part. Maxilliped with large and acute, blade-like endite reaching to midlength of 3rd palp article ; palp 4-articulate, with semicircular distal article ; penultimate article bearing 3, distal one 5 setae.



Figs. 18-25 : *Apanthuoides coralliophilus* n. sp., ♂, holotype : 18. dorsal view ; 19. pleon ; 20. antenna 1 ; 21. antenna 2 ; 22. mandible ; 23. maxilla ; 24. maxilliped ; 25. pereopod 1.

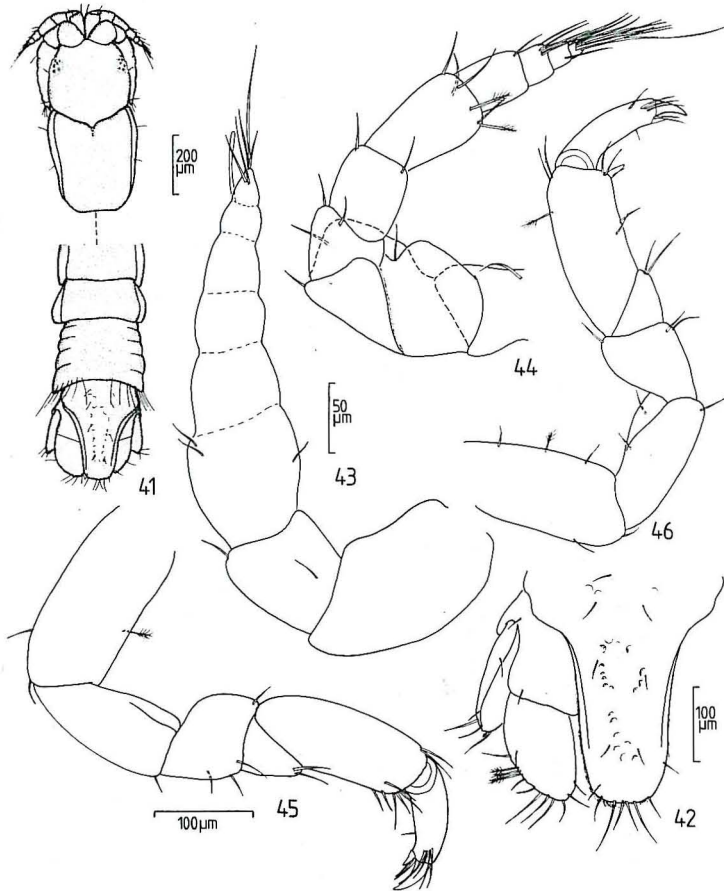


Figs. 26-36: *Apanthuroides coralliophilus* n. sp. - ♂, holotype : 26. pereopod ; 27. pereopod 3 ; 28. pereopod 4 ; 29. pereopod 5 ; 30. pereopod 6 ; 31. pleopod 1 ; 32. pleopod 2. - ♂, paratype : 33. propodus and dactylus of pereopod 7. - ♀, paratype : 34. antenna 1 ; 35. pereopod 1 ; 36. pereopod 7.



Figs. 37-38 : *Apanthuroides coralliophilus* n. sp., immature adult, paratype : 37. telson and left uropod ; 38. antennae.
 Figs. 39-40 : *Apanthuroides fijiensis* Kensley, 1979, immature adult, holotype : 39. telson and left uropod ; 40. antennae.

Pereopods rather similar amongst one another. Pereopod 1 mainly differing from remaining pereopods by the lack of strong compound spine at posterodistal propodal margin ; in contrast to posterior pereopods, propodus of pereopod 1 with 5 posterodistal, fringed slender spines ; unguis about $1/3$ length of dactylus. Propodus of pereopods 2-3 with 2 posterior denticulate compound spines, of pereopods 4-6 with single posterodistal, denticulate or fringed compound spine ; carpus of pereopods 1-3 triangular, lacking free anterior margin ; carpus of pereopods 4-6 trapezoid, with fringed or denticulate, posterodistal compound



Figs. 41-46 : *Apanthuroides coralliophilus* n. sp., preparatory ♂ (= postmanca), paratype : 41. anterior and posterior part of body, dorsal view ; 42. telson and left uropod ; 43. antenna 1 ; 44. antenna 2 ; 45. pereopod 1 ; 46. pereopod 2.

spine. Seventh pereopods present in few males only ; most specimens become mature at the manca stage, without any trace of 7th pereopods. When present, pereopod 7 quite similar to pereopod 6.

Symphonite of pleopod 1 with 4 retinacula ; endopodite slightly longer and about 0.4 times width of operculiform exopodite ; endopodite with 6, exopodite with 7 distal, plumose marginal setae. Symphonite of pleopod 2 with 3 retinacula, endo- and exopodite subequal in length ; copulatory stylet slender, distally rounded, articulating at about proximal fifth of endopodite, extending beyond distal margin of endopodite with 2/5 of entire length ;

rounded distal margin of endopodite bearing 3, of exopodite bearing 6 plumose setae. Uropodal endopodite ovate, subequal in length to sympodite and exopodite; endopodite with few simple marginal setae and 7 dorsal feathered sensory setae; distal margin of endopodite with short, plumose sensory spine; exopodite roughly ovate, with few simple marginal setae and short distal, plumose sensory spine.

♀ : in habitus quite similar to ♂, total length 3.6 mm. Antenna 1 with 3-articulate flagellum; penultimate article with 3 aesthetascs, distal one with single aesthetasc. Pereopod 1 differing from ♂ by the presence of a posterodistal compound spine on the propodus and shorter propodal spines; carpus with very short, free anterior margin. Pereopod 7 present and well developed; anterodistal margin of propodus with a slender fringed spine.

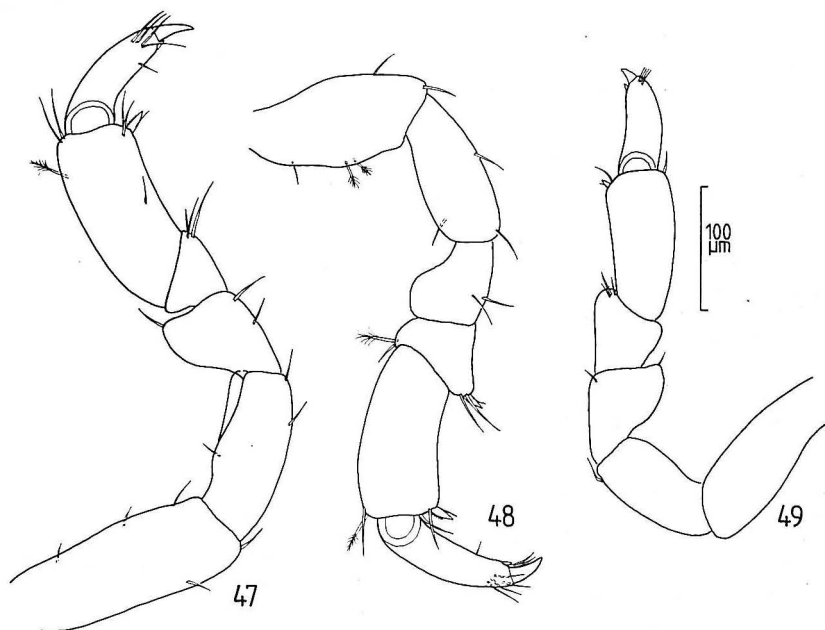
Preparatory ♂ : in habitus and setation of distal telsonic margin similar to mature specimens, pits on dorsum of body inconspicuous. Total length 2.9 mm.

Antenna 1 with two well separated proximal articles and 6 distal articles with incomplete suture line; subapical part of antenna 1 with 5 simple setae and a short aesthetasc. Antenna 2 slightly more robust than in mature ♂, with 4 setose flagellar articles. Posterodistal margin of pereopod 1 without compound spine, only 6 short setae present. Propodus of pereopods 2-7 with posterodistal compound spine.

Remarks : *Apanthuroides coralliophilus* n. sp. is closely allied with *A. fijiensis* (Kensley, 1979) from Viti Levu, Fiji Islands. Because the latter is incompletely characterized, it became necessary to examine the (partly dissected) immature adult holotype (USNM 172275). Though being quite similar in habitus, some distinct differences reveal that the material from French Polynesia is not conspecific with *fijiensis*. To allow a better distinction of both species, the holotype of *A. fijiensis* was compared with an immature adult of *coralliophilus*. Comparison of the mouthparts must be made from the original description, these appendages were removed from the holotype of *fijiensis*. The maxillipedal endite of *fijiensis* appears to be narrowly rounded distally and the palp 3-articulate, while *coralliophilus* has an acute endite and 4-articulate palp. The second flagellar article of antenna 1 is much longer in *fijiensis*, being twice longer than wide. In *coralliophilus* the second flagellar article of antenna 1 is as long as wide. The flagellum of antenna 2 is 3-articulate in the immature adult of *coralliophilus*, 6-articulate in *fijiensis* (figs. 38, 40). The shape of the telson is a reliable feature to distinguish both species. In *fijiensis* it is more slender, with a broadly rounded distal margin. *A. coralliophilus* has a more robust telson with blunt distal margin and rounded posterolateral margins. Moreover, the number and relative lengths of the distal telsonic setae differ in both species. The lateral margins of the uropodal endopodite of *fijiensis* are subparallel in the proximal two-thirds, whereas they are distinctly convex in *coralliophilus*. Generally, the distal setae of the uropodal rami (figs. 37, 39) and rami of the first pleopods of *fijiensis* are more numerous and partly longer than in *coralliophilus*.

Most specimens of the new species were found in areas with at least moderate wave exposition, associated with dead coral substrate.

Distribution : Moorea, Society Islands.



Figs. 47-49 : *Apanthuroides coralliophilus* n. sp., preparatory ♂, paratype : 47. pereopod 3 ; 48. pereopod 4 ; 49. pereopod 7.

Bourbonanthura Müller, 1990

Emended diagnosis : this hitherto monotypic genus was defined by Müller (1990a : 376) as being eyeless. All specimens of the new species from the Society Islands have feebly developed eyes. Males were not known up to now in this genus. They are characterized by a rather long antennular flagellum bearing whorls of aesthetascs and by a long, slender copulatory stylet at the endopodite of pleopod 2. The exopodite of pleopod 1 is large and operculiform, covering the slender endopodite.

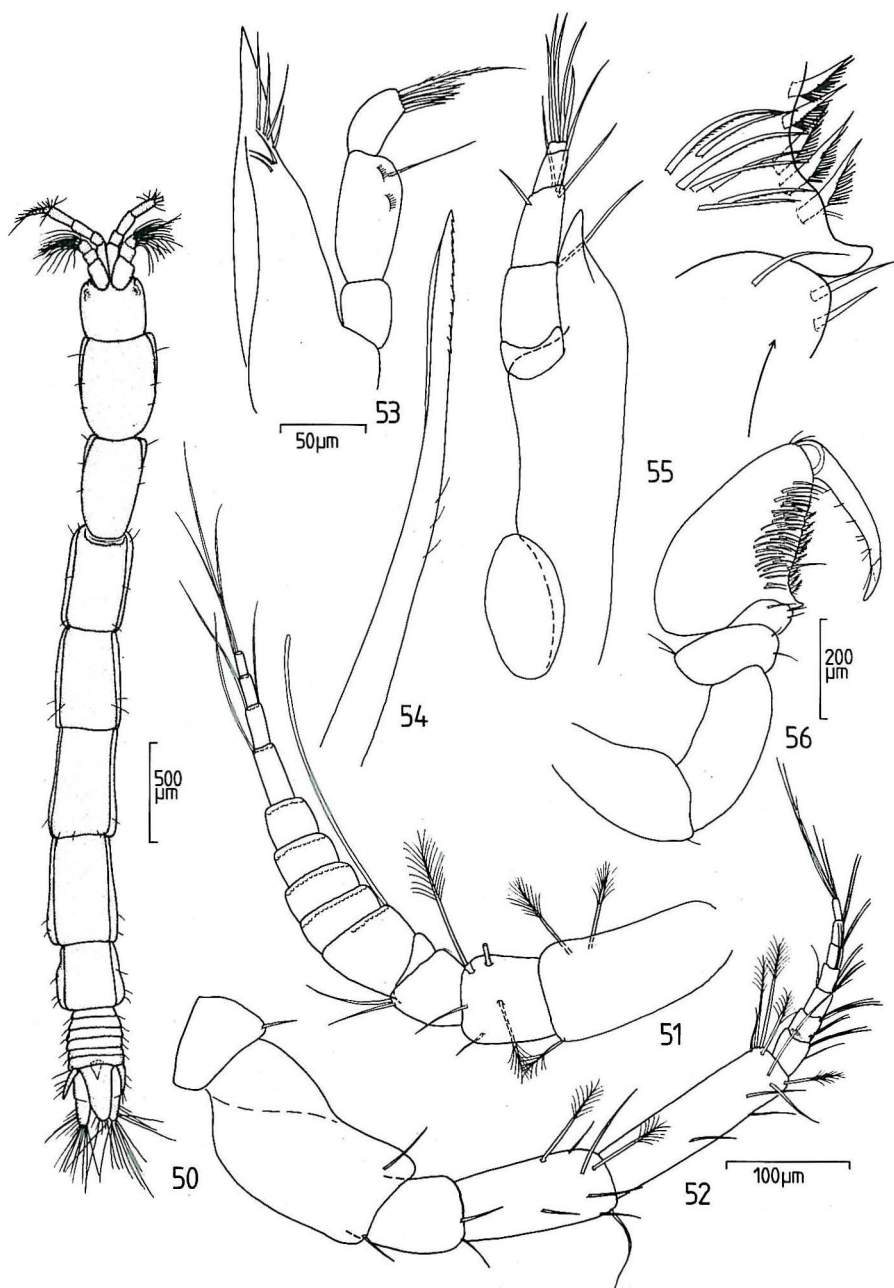
Bourbonanthura vaitapensis n. sp. (Figs. 50-71)

Holotype : ♂ (SMF), Bora Bora ; fringing reef near Vaitape ; dead corals covered with sponges and algae, 0.5-1 m, 27 February - 6 March 1988.

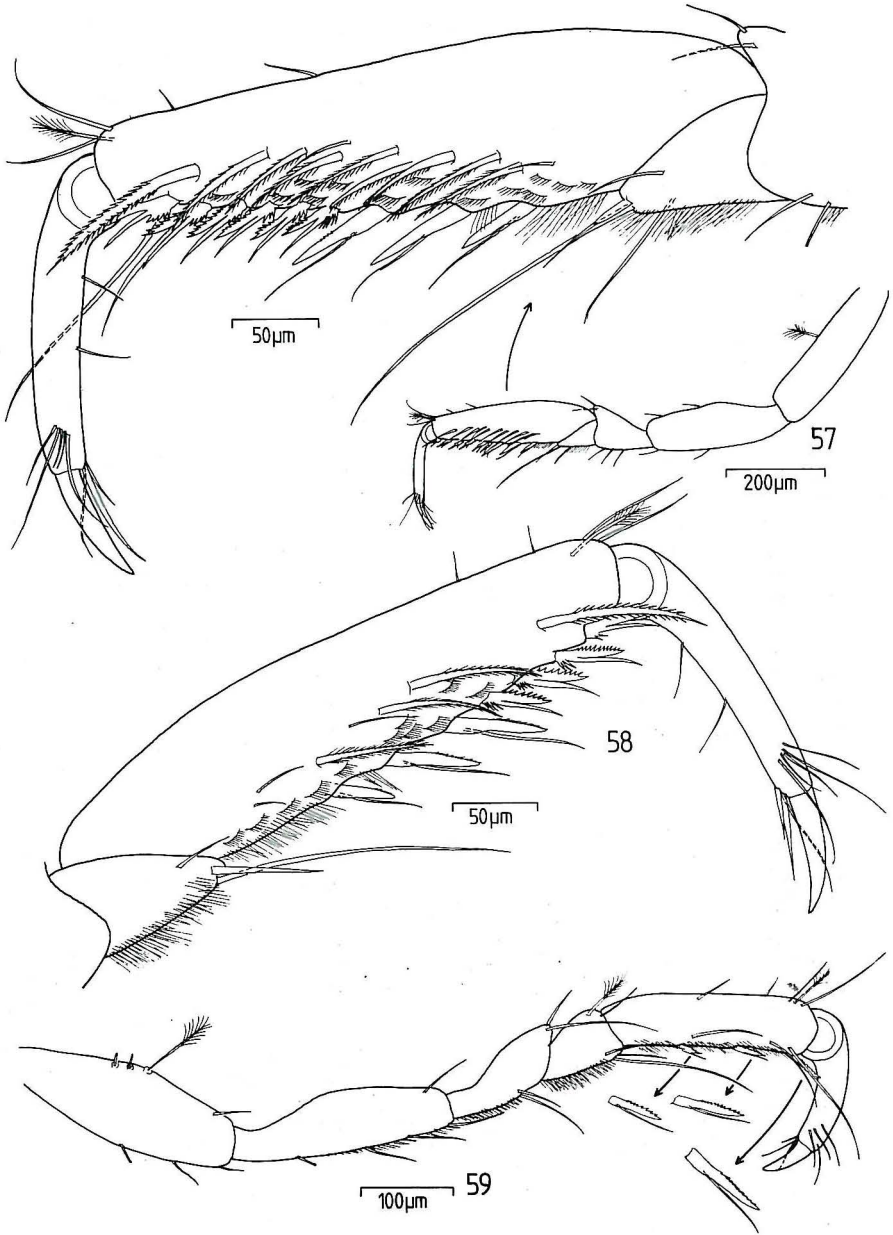
Paratype : 1 postmanca (SMF) ; collected together with holotype.

Derivatio nominis : the specific name refers to the type locality, the village Vaitape in Bora Bora.

Description, ♂ : body slender and colourless, with few lateral setae, 11 times longer than wide. Total length 4.2 mm. Cephalon as long as wide ; anterodorsal eyes very small, each apparently composed of 2 feebly pigmented ommatidia. Body proportions : C<1 = 2 = 3 = 4 = 5 =



Figs. 50-56: *Bourbonanthura vaiapensis* n. sp., ♂ holotype: 50. dorsal view; 51. antenna 1; 52. antenna 2; 53. mandible; 54. maxilla; 55. maxilliped; 56. pereopod 1.



Figs. 57-59: *Bourbonanthura vaiapensis* n. sp., ♂ holotype : 57. pereopod 2 ; 58. distal part of pereopod 3 ; 59. pereopod 4.

6>7. Pleonites free and subequal in length. Telson slender, about 3 times longer than wide, with large proximal statocyst ; telson with lateral fringe of setules in distal half and 6 long distal setae in groups of 3, separated by pair of short setae.

Antenna 1 with 3-articulate peduncle, proximal article 1.4 times length of articles 2 and 3 together ; flagellum of 10 articles ; first flagellar article shortest and much wider than long ; articles 2-6 broad, with distal whorl of filiform aesthetascs ; distal four articles much more slender than remaining flagellar articles, with few aesthetascs and simple setae. Antenna 2-peduncle of 5 articles ; article 2 slightly shorter than 5th, robust, grooved to accomodate peduncle of antenna 1 ; peduncular articles 3-5 increasing in length distally ; flagellum slightly shorter than 5th peduncular article, of 7 setose articles. Mandible with acute, distally spine-shaped endite, bearing 7 subapical setae ; palp of 3 articles, 2nd article largest, with single distal seta ; terminal palp article with 6 distal, fringed slender spines. Maxilla spine-shaped ; distal third of medial margin with 12 indentations and outer margin with narrow lamella. Maxilliped with large, distally curved, blade-like endite reaching to distal half of third palp article ; palp 5-articulate ; proximal article much wider than long ; articles 2-3 longest, subequal in length, 2nd with single distal seta, third with 4 distal setae ; tiny terminal article with 5 distal setae, 1/3 length of penultimate article.

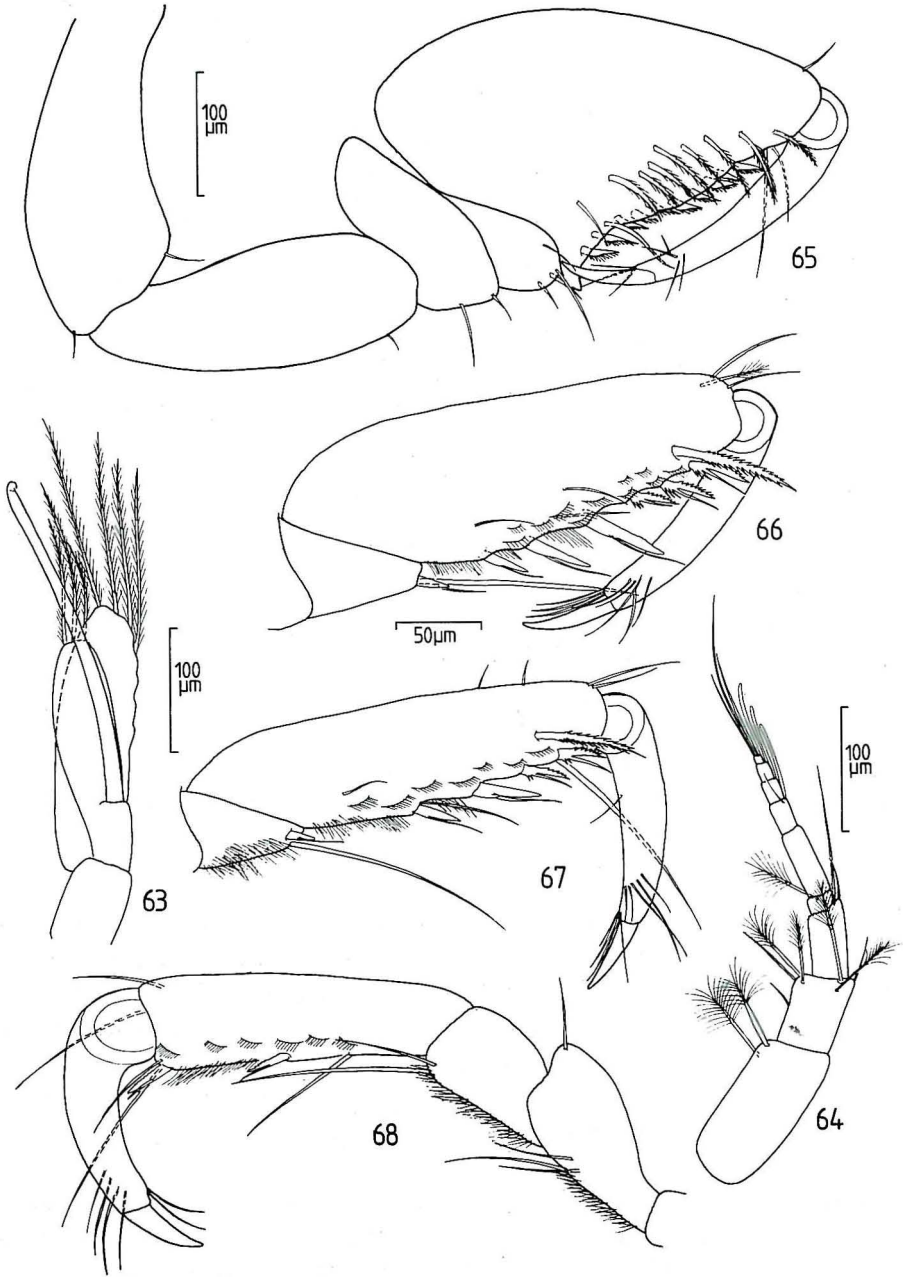
Pereopod 1 robust and subchelate, palm of propodus almost straight, with strong proximal, tooth-shaped tubercle ; palm with row of 9 combed compound spines ; mesial surface of propodus with 38 curved, slender and sparsely fringed spines ; unguis 1/3 length of slender dactylus ; carpus rounded, posterodistal margin with 3 short simple setae. Pereopods 2-7 much more slender than pereopod 1. Pereopods 2-3 differ from posterior pereopods by an elongate-ovate, proximally more robust propodus bearing much more spines. Posterior margin of propodus of pereopod 2 with 9 compound spines of different shape ; mesial surface of propodus with row of 9 curved slender spines, the distal one denticulate, others fringed ; spines less numerous on propodus of pereopod 3, 7 at posterior margin and 4 at mesial surface. Pereopods 4-7 quite similar amongst one another, with rectangular propodus bearing 3-4 denticulate compound spines at posterior margin ; carpus of pereopods 2-3 triangular, lacking free anterior margin ; carpus of pereopod 2 with posterodistal compound spine ; carpus of pereopods 4-7 trapezoid.

Operculiform exopodite of first pleopod 1.2 times length of narrow endopodite ; endopodite with 3, exopodite with 7 distal, plumose marginal setae. Pleopod 2, endopodite 4/5 length of exopodite ; copulatory stylet very slender, slightly curved and distally narrowly rounded, articulating in distal proximal third of endopodite, reaching beyond distal margin of endopodite for half of its length. Uropodal sympodite large, 2.3 times longer than wide ; endopodite ovate, 0.6 times length of sympodite, relatively slender, with many very long setae along outer and distal margin ; dorsal surface of endopodite with 8 feathered sensory setae, distal margin with a plumose sensory spine ; uropodal exopodite acute and spine-shaped, 0.8 times length of sympodite, with some setae in distal half.

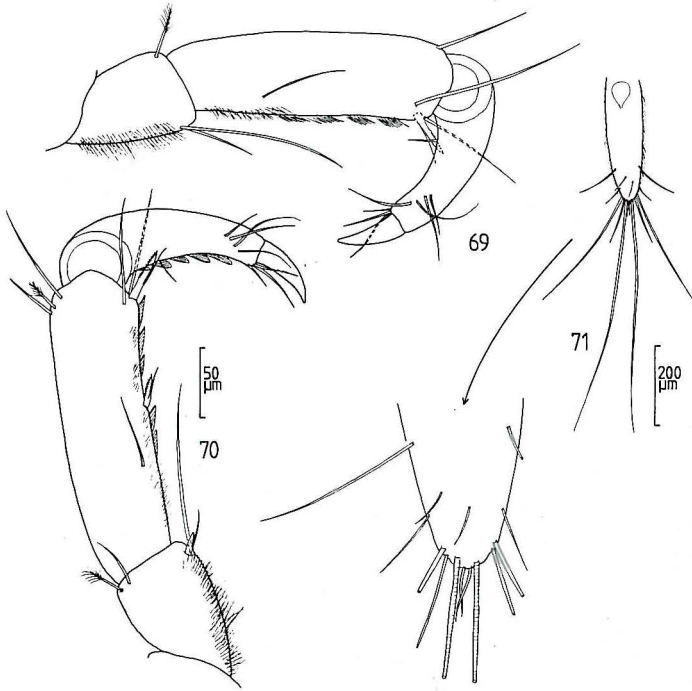
Postmanca : in habitus resembling ♂, total length 3.1 mm. Antenna 1 with 6-articulate flagellum ; 2nd article most slender, longer than articles 3 and 4 together ; articles 3-5 each



Figs. 60-62 : *Bourbonanthura vaitapensis*, ♂ holotype : 60. pereopod 6 ; 61. telson and left uropod ; 62. pleopod 1.



Figs. 63-68 : *Bourbonanthura waitapensis* n. s.p. - ♂ holotype : 63. pleopod 2. - Postmanca, paratype : 64. antenna 1 ; 65. pereopod 1 ; 66. distal part of pereopod 2 ; 67. distal part of pereopod 3 ; 68. distal part of pereopod 4.



Figs. 69-71 : *Bourbonanthura vaiapensis* n. s.p., postmanca, paratype : 69. distal part of pereopod 5 ; 70. distal part of pereopod 6 ; 71. telson.

with single aesthetasc. Palm of propodus of pereopod 1 with 10 combed compound spines ; mesial surface with row of 8 slender fringed spines. Posterior margin of propodus of pereopod 2 with 6, of pereopod 3-propodus with 4 compound spines of different shapes ; propodus of both pereopod 2 and 3 with slender denticulate spine at mesial surface near distal margin. Pereopods 4-6 similar among one another ; rectangular propodus with 1-2 compound spines at posterior margin ; moreover, pereopod 6 with fringe of scales along posterior margin of dactylus and propodus. Arrangement of setae at distal margin of telson similar to σ .

Remarks : *Bourbonanthura vaiapensis* n. sp. is easily distinguishable from the only other member of the genus, *B. littoralis* Müller, 1990 from La Réunion in the tropical southern Indian Ocean by the presence of eyes. Other features are difficult to compare, because *B. littoralis* is known only from the immature adult holotype and immature adults are not available for *B. vaiapensis*. However, it becomes obvious that the immature adult of *B. littoralis* lack the row of many slender spines at the mesial surface of the propodus of pereopod

pod 2 and 3 and the posterior propodal spines on these appendages are less numerous, compared with both ♂ and postmanca of the new species.

Distribution : Bora Bora, Society Islands.

Colanthura Richardson, 1902

Colanthura tenuis Richardson, 1902 (Figs. 72-89)

Colanthura tenuis Richardson, 1902 : 287-288, pl. 38, figs. 23-28 ; Müller, 1990b : 181-185, figs. 1-18 [literature].

Material : 8 ♀♀ (7 ov.), 7 immature adults, deposited as follows : 4 ov. ♀♀, 3 immature adults (MNHN), 4 ♀♀ (3 ov.), 4 immature adults (SMF), Bora Bora ; barrier reef near Motu tapu, dead corals, 1-1.5 m, March 1988.

Description, ♀ : body relatively slender, 10 times longer than wide. Almost all segments entirely covered by dark brown pigmentation. Total length 2.7-3.4 mm. Cephalon with small, darkly pigmented anterolateral eyes. Body proportions : $C_1/2 = 3/4/5/6/7$. Reduced pereonite 7 distinctly shorter than each pleonite. Pleonites free and subequal in length. Tongueshaped telson with slightly convex lateral and rounded distal margin, distal telsonic margin bearing some slender simple setae, dorsodistal surface some short simple setae in irregular arrangement.

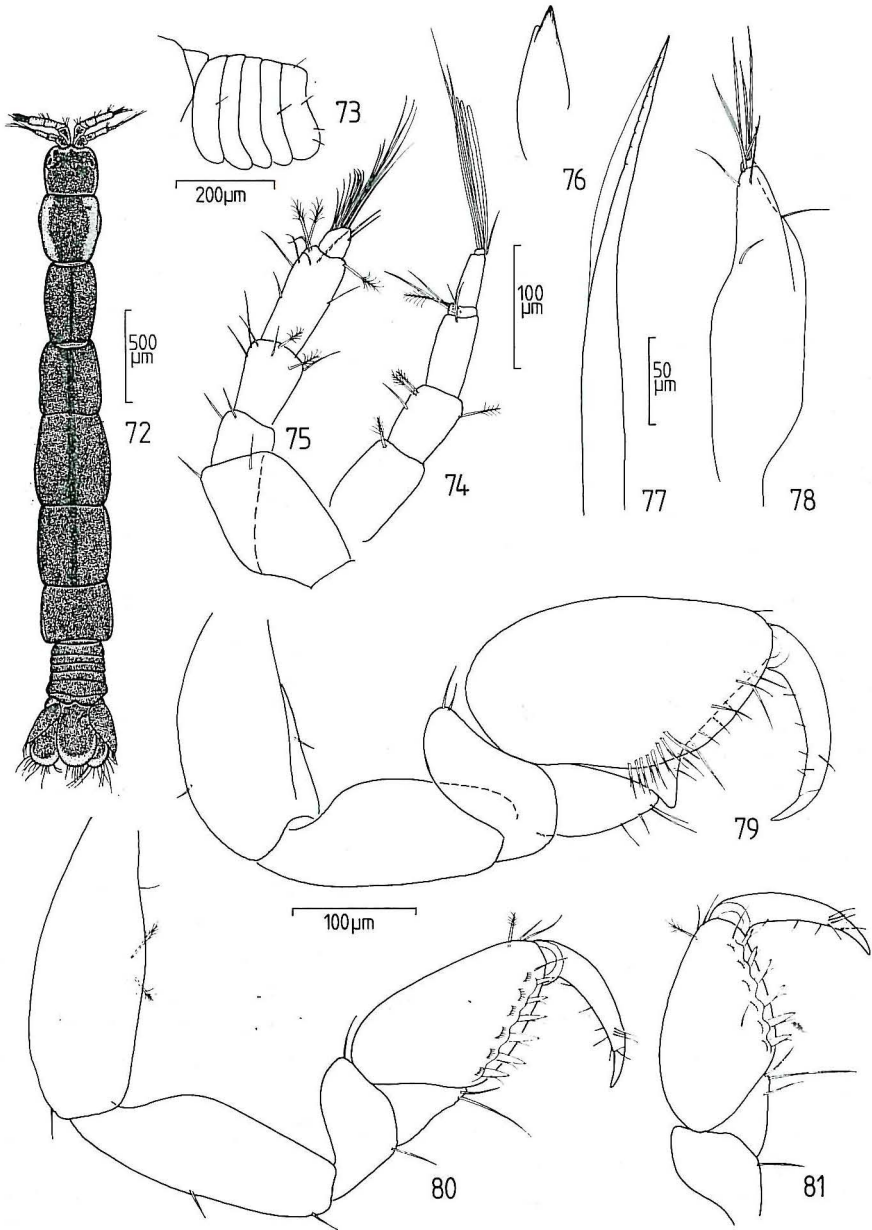
Antenna 1 with 3-articulate peduncle ; proximal article widest, slightly longer than third ; flagellum 3-articulate, with slender 2nd and tiny distal article bearing 3 aesthetascs. Five articulate peduncle of antenna 2 with large, grooved second article ; uniaarticulate flagellum bearing many distal simple setae. Endite of mandible conical, acute ; no trace of palp observed. Spine-shaped maxilla 1 with 10 distal indentations and a narrow lamella. Maxilliped biarticulate ; large proximal article narrowing in distal half, bearing 6 simple setae ; tiny distal article provided with 3 simple setae.

Pereopods 1-3 subchelate ; propodus of first pereopod more expanded than in pereopods 2-3 ; proximal part of posterior propodal margin with strong triangular tubercle and 8 slender compound spines on mesial surface adjacent to tubercle ; evenly rounded inner and straight outer palmar margin bearing few simple setae. Pereopods 2-3 more slender than pereopod 1, both quite similar amongst one another, bearing row of 6 strong compound spines on posterior propodal margin. Carpus of pereopods 1-3 triangular, lacking free anterior margin. Pereopods 4-6 ambulatory, with rectangular propodus and carpus ; posterior margin of both propodus and carpus with 2 compound spines, respectively.

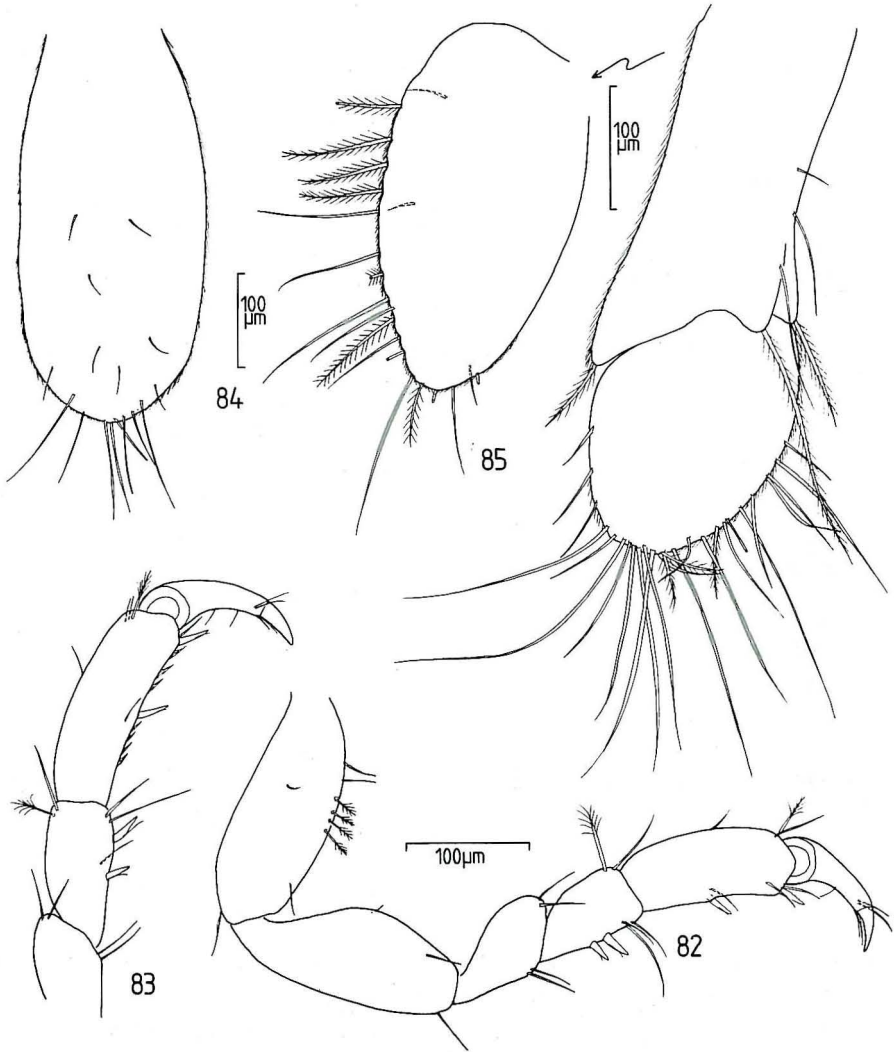
Endopodite of uropod ovate, 2/3 of length of sympodite ; margin of endopodite bearing several simple setae and few distal plumose setae ; uropodal exopodite ovate, though more slender than endopodite and narrower in distal half ; outer and distal margin of exopodite bearing some simple and plumose setae.

Immature adult : spines on appendages generally less numerous than in females. In small immature adults only cephalon and pleon pigmented. Total length 1.8-3.1 mm.

Remarks : the samples from Polynesia differ from the material of *C. tenuis* I redescribed from Colombia some time ago only in some minor features. Specimens from Polynesia are



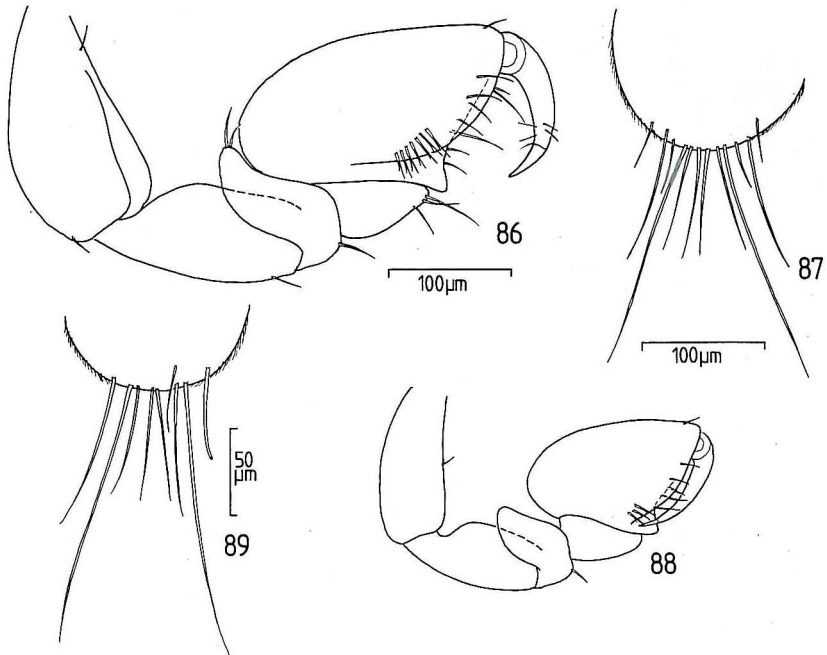
Figs. 72-81 : *Colanthura tenuis* Richardson, 1902, ♀ : 72. dorsal view ; 73. pleonites, lateral view ; 74. antenna 1 ; 75. antenna 2 ; 76. mandible ; 77. maxilla 1 ; 78. maxilliped ; 79. pereopod 1 ; 80. pereopod 2 ; 81. distal part of pereopod 3.



Figs. 82-85 : *Colanthurus tenuis* Richardson, 1902, ♀ : 82. pereopod 4 ; 83. distal part of pereopod 6 ; 84. telson ; 85. uropod.

generally smaller in size, females have a total length of 2.7-3.4 mm (Colombia : 3.5-4.9 mm). Some differences in Polynesian specimens are a slightly shorter first pereonite and the number of spines on the propodus of the pereopods and the shape of the uropodal exopodite, which is slightly narrower in its distal third. The spination of the propodus of pereopod 1 is generally less numerous in immature specimens. Drawings of the material from Moorea are provided to show the considerable agreement with Colombian specimens (Müller, 1990b) and the few differences apparent.

Distribution : Bermuda, Caribbean coast of Colombia, Society Islands.



Figs. 86-89 : *Colanthurus tenuis* Richardson, 1902 - large immature adult : 86. pereopod 1 ; 87. distal margin of telson - Small immature adult : 88. pereopod 1 ; 89. distal margin of telson.

Colanthurus gauguini n. sp. (Figs 90-114)

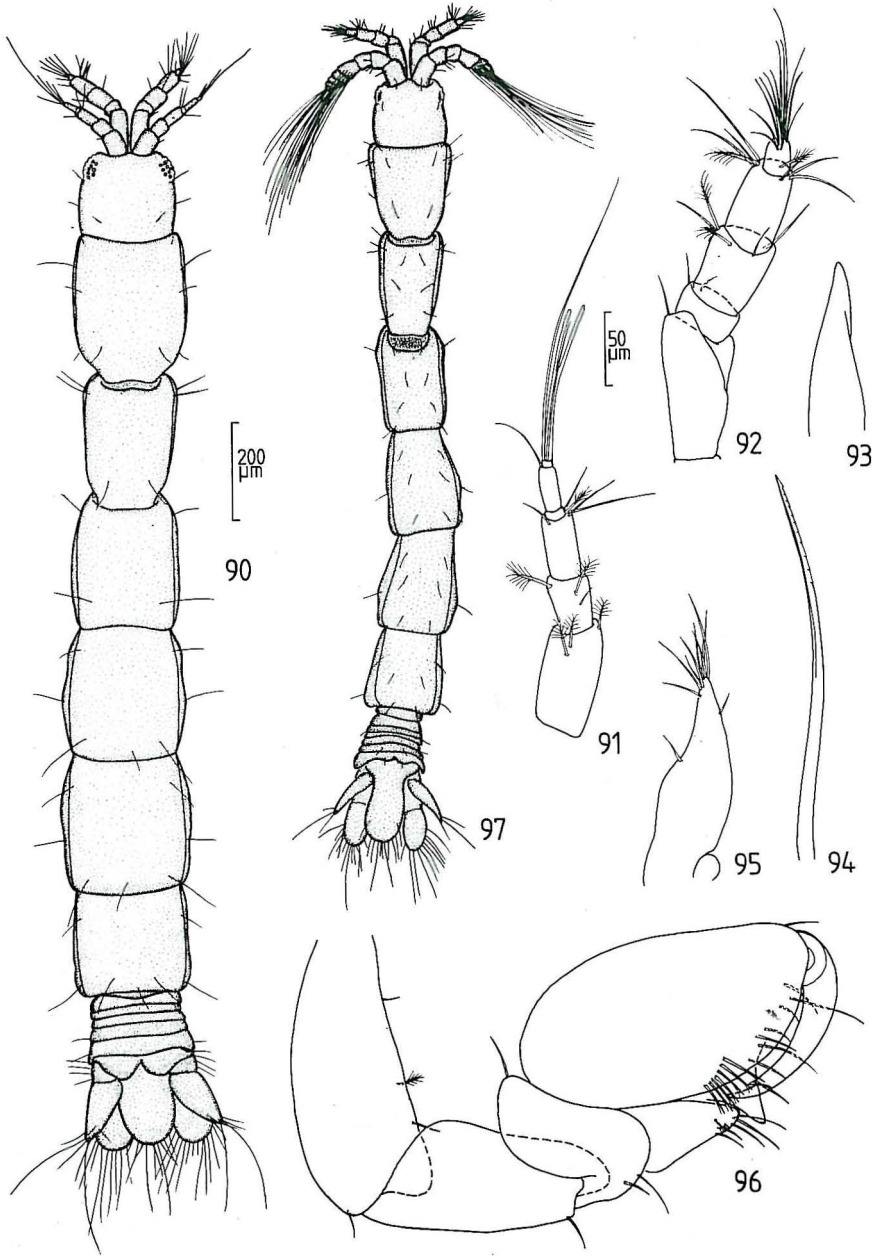
Holotype : ovigerous ♀ (SMF), Moorea ; near Maharepa, about 2.6 km west of airport ; crest of barrier reef, dead corals, 0.5 m, March 1988.

Paratypes : all specimens from Moorea ; 1 ♂ (SMF), collected together with holotype. 1 ♂ (SMF) ; dead corals on Tiahura barrier reef, 0.5-1 m, 25 March 1988. 2 ♂♂. 7 ♀♀ (3 ov.), 2 immature adults (1 preparatory ♂) (MNHN) ; exposed fringing reef near Afareaitu ; dead corals on coral slope, 1-2 m, 26 March 1988.

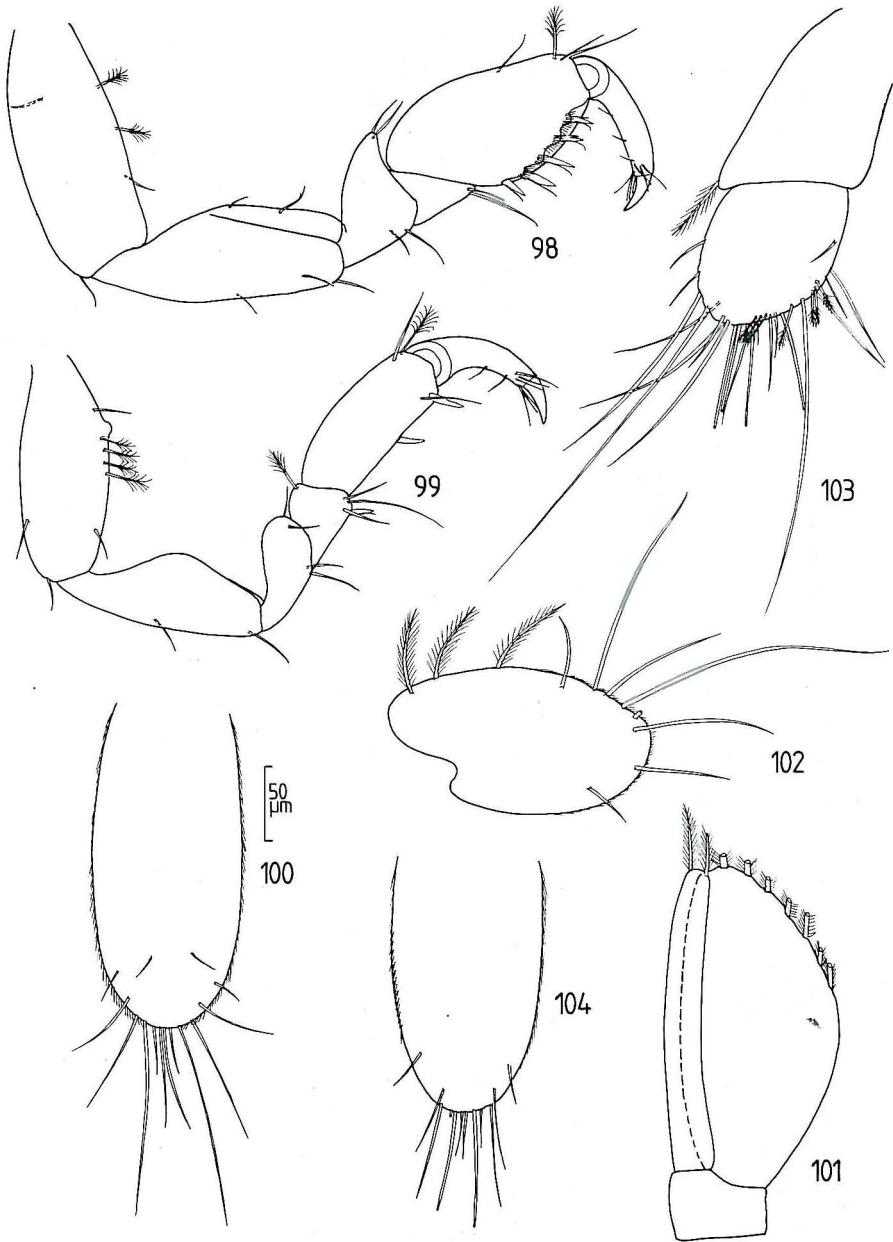
Derivatio nominis : the species is named for the artist Paul Gauguin, who was one of the earliest French impressionists, living for several years in French Polynesia.

Description, ovigerous ♀ : body relatively slender, colourless, segments bearing few dorsal and lateral setae ; body 8.7 times longer than wide. Total length 2.2-2.6 mm. Cephalon with rather small, weakly pigmented anterolateral eyes. Body proportions : $C < 1 > 2 = 3 = 4 = 5 > 6 > 7$. Reduced pereonite 7 narrower and shorter than free pleonites. Telson tongue-shaped, 2.1 times wider than long ; rounded distal margin bearing several setae in characteristic arrangement.

Antenna 1 with 3-articulate peduncle ; first article longest and widest ; 2nd article shortest, third slightly longer ; flagellum of antenna 1 of 3 articles, 2nd article longest ; terminal



Figs. 90-97: *Colanthurus gauguini* n. sp. - ovigerous ♀, holotype : 90. dorsal view ; 91. antenna 1 ; 92. antenna 2 ; 93. mandible ; 94. maxilla ; 95. maxilliped ; 96. pereopod 1 - ♂ paratype ; 97. dorsal view.



Figs. 98-104 : *Colanthurus gauquini* n. sp. - ovigerous ♀, holotype : 98. pereopod 2 ; 99. pereopod 4 ; 100. telson ; 101. pleopod 1 ; 102. uropodal exopodite ; 103. uropodal sympodite and endopodite - ♀, paratype ; 104. telson.

article with 2 aesthetascs and 2 simple setae, respectively. Peduncle of 2nd antenna 5-articulate ; 2nd article largest, grooved to accomodate peduncle of antenna 1 ; articles 3-5 increasing in length distally ; flagellum uniaarticulate, with whorl of distal setae. Mandible with conical endite, no trace of palp observed. Styletto-like maxilla with 11 distal indentations and inconspicuous lamella along outer margin. Maxilliped uniaarticulate, of triangular shape in distal half, bearing 10 simple setae, 8 of them near apex. Telson tongue-shaped, twice longer than wide, with setulose margin ; distal margin broadly rounded, bearing several simple setae in characteristic arrangement as figured.

Pereopods 1-3 subchelate. Expanded propodus of pereopod 1 with large, proximal triangular tubercle at posterior margin ; mesial surface beside this tubercle with row of 7 slender compound spines. Pereopod 2 quite similar to pereopod 3, ovate propodus with row of 5 compound spines at posterior margin. Ambulatory pereopods 4-6 similar amongst one another ; posterior margin of rectangular, lacking free anterior margin ; carpus of pereopods 4-6 trapezoid, bearing posterodistal compound spine.

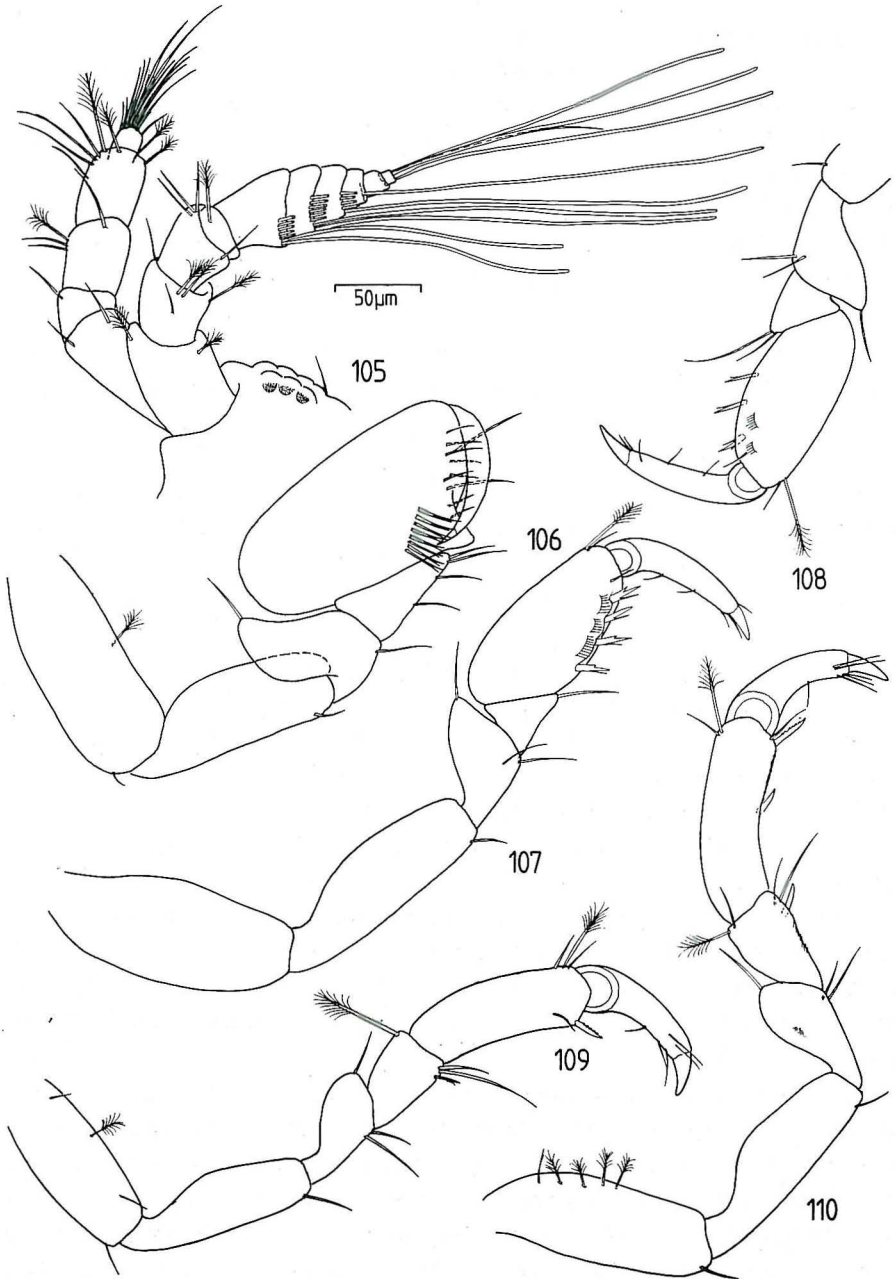
Operculiforme exopodite and narrow endopodite of first pleopod subequal in length ; endopodite with 2, exopodite with 7 distal, plumose marginal setae. Uropodal endopodite broadly ovate, subequal in length to sympodite ; distal half of endopodite with several slender simple setae and 7 feathered sensory setae on dorsal surface near outer distal margin ; exopodite ovate, proximal margin bearing 8 simple setae, outer proximal margin 3 plumose setae.

♂ : resembling ♀ in general habitus, total length 1.7 mm. Antenna 1, flagellum 7-articulated ; articles 2-7 with several filiform aesthetascs decreasing in number distally, most numerous on expanded articles 2-4. Propodus of pereopod 1 with 8 slender compound spines beside proximal tubercle at posterior margin. Posterior margin of pereopod 2 with row of 4, of pereopod 3 with row of 3 compound spines. Propodus of pereopods 4-5 with denticulate posterodistal compound spine, propodus of pereopod 6 with 2 posterior compound spines. Operculiform exopodite of first pleopod 1.2 times length of narrow endopodite ; endopodite with 3, exopodite with 7 distal, plumose marginal setae ; rami of pleopod 2 subequal in length ; appendix masculina articulating near inner base of endopodite, slightly broadening distally with hook-shaped apex ; appendix masculina extending beyond distal margin of ramus for 1/3 of entire length ; distal margin of endopodite with 3, of exopodite with 4 plumose setae. Uropodal exopodite with narrowly rounded distal part.

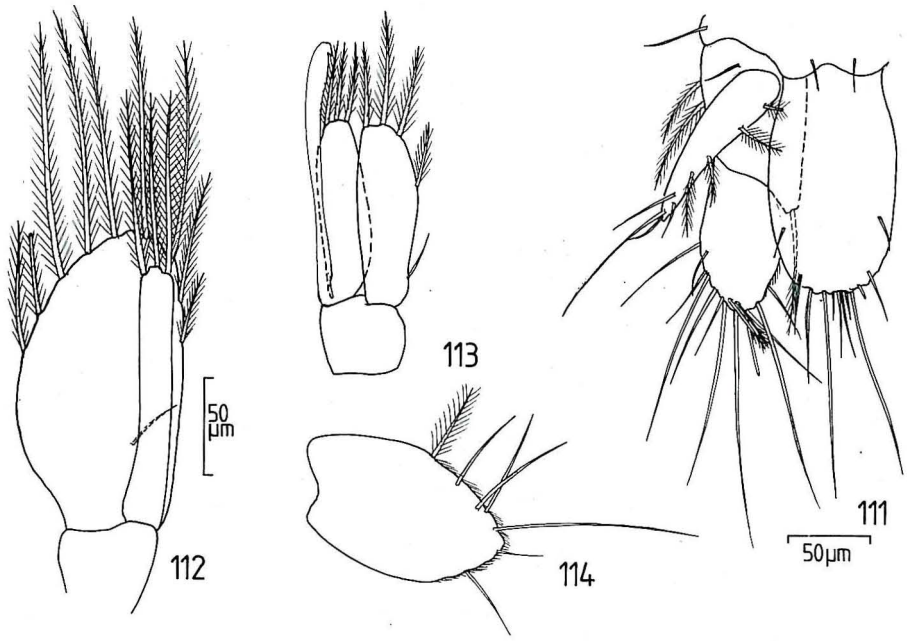
Immature adult : in all features quite similar to ♀. Total length 1.2-1.9 mm.

Remarks : this species shows close affinities to the incompletely characterized *Colanthurus bruscai* Poore, 1984 from California, the Pacific coast of Costa Rica and Mexico. Both species are best distinguished through the longer pereonite 6 in *gauguini* n. sp. In *C. bruscai* the 6th pereonite is 1.6 times longer than wide (in *gauguini*, as long as wide in the ♀, longer than wide in the ♂). The distal telsonic margin appears to be more broadly rounded in the new species. Nothing is said on the colouration of *C. bruscai*, which might also serve to distinguish both species.

Distribution : Moorea, Society Islands.



Figs. 105-110: *Colanthurus gauguini* n. sp., ♂, paratype : 105. anterolateral part of cephalon and antennae ; 106. pereopod 1 ; 107. pereopod 2 ; 108. distal pereopod 3 ; 109. pereopod 4 ; 110. pereopod 6.



Figs. 111-114 : *Colanthurus gauguini* n. sp., ♂, paratype : 111. telson and left uropod ; 112. pleopod 1 ; 113. pleopod 2 ; 114. uropodal exopodite.

Expanathura Wägele, 1981

Expanathura mooreae n. sp. (Figs. 115-136)

Holotype : ♀ (SMF), Moorea ; near Maharepa, about 2.6 km west of airport ; crest of barrier reef, dead corals, 0.5 m, March 1988.

Paratypes : Bora Bora - 12 ♂♂, 5 ♀♀ (1 ov., 4 larvigerous), 41 immature adults, 9 postmancas, 4 mancas (MNHN) ; fringing reef near Vaitape, dead corals covered with sponges and algae, 0.5-1 m, 27 February - 6 March 1988. Moorea - 13 ♂♂, 8 ♀♀ (1 ov.), 30 immature adults, 6 postmancas, 3 mancas (SMF) ; collected together with holotype. 1 ♂, 1 immature adult (SMF) ; coral slope of Tiahura fringing reef, dead corals, 1-2 m, 22/23 March 1988. 5 ♂♂, 2 ♀♀ (1 ov.), 16 immature adults (3 preparatory ♂), 2 postmancas, 2 mancas (MNHN) ; crest of Tiahura barrier reef, dead corals, 0.5-1 m, 25 March 1988. 3 ♂♂, 8 ♀♀ (1 ov., 3 larvigerous), 27 immature adults (2 preparatory ♂), 4 postmancas, 2 mancas (MNHN) ; coral slope of fringing reef near Afareaitu, dead corals, 1-2 m, 26 March 1988. 3 ♂♂, 3 ♀♀ (2 ov.), 19 immature adults, 12 postmancas, 13 mancas (SMF) ; Temae, the Islet Reef, northeast of airport ; dead corals in channel near beach, 2 m, 31 March 1988.

Derivatio nominis : the specific name refers to the type locality, the island Moorea.

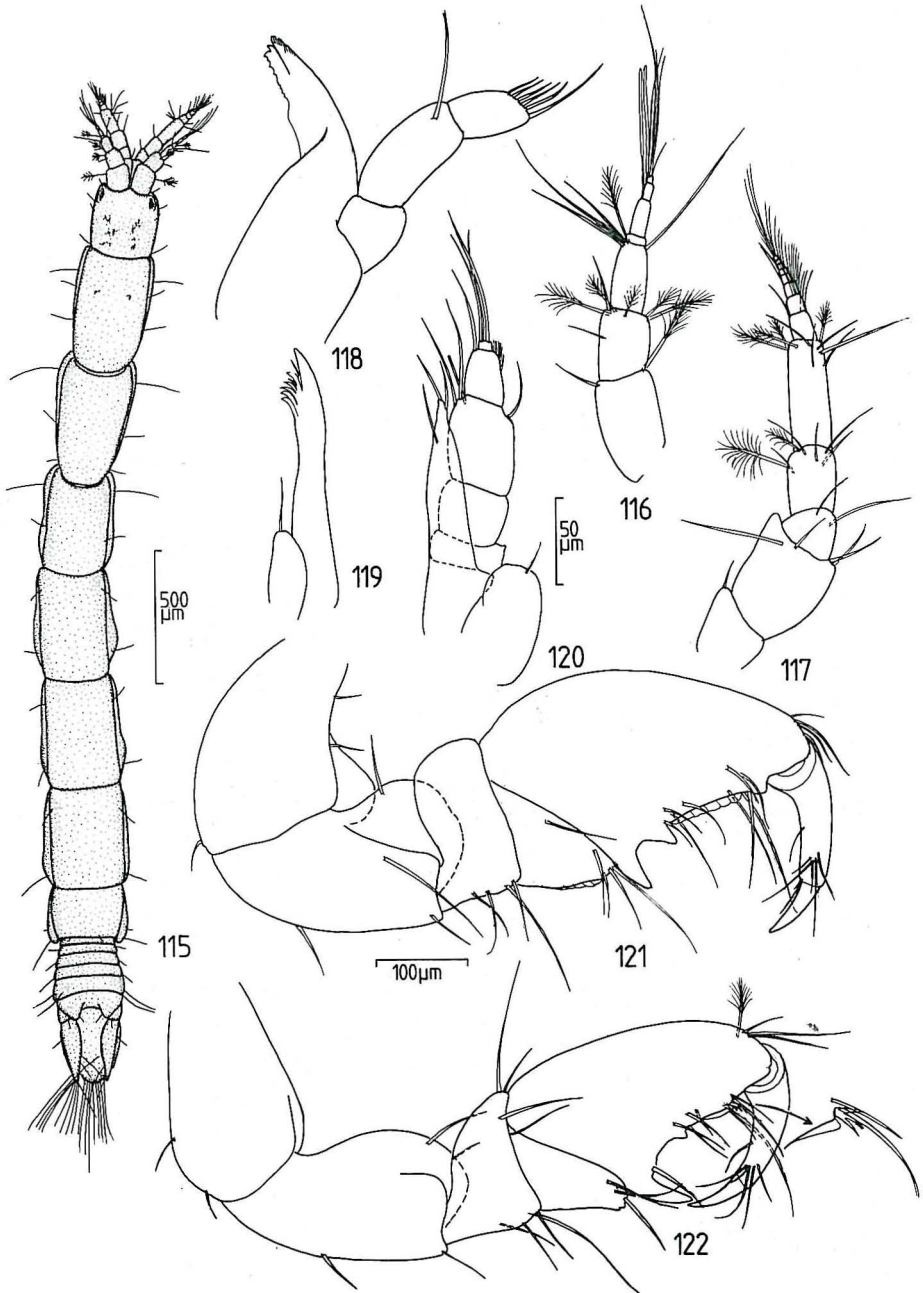
Description, ♀ : body slender, almost 12 times longer than wide, segments with few slender lateral setae ; colourless, except for few indistinct brownish pigment spots on dorsum of cephalon and first pereonite. Total length 3.4-4.1 mm. Cephalon with well-pigmented, relatively small anterolateral eyes. Body proportions : $C < 1 < 2 > 3 = 4 = 5 > 6 > 7$. Pleonites free, somewhat increasing in length posteriorly, together longer than pereonite 7. Telson slender, 2.3 times longer than wide ; convex lateral margins distinctly serrate in distal half ; rounded distal margin with several, partly very long setae in rather constant arrangement.

Antenna 1 with 3-articulate peduncle, articles slightly decreasing in length distally ; 2nd article of 4-articulate flagellum longest and most slender, articles 2 and 3 each with aesthetasc. Peduncle of 2nd antenna 5-articulate ; broad 2nd article subequal in length to slender article 5 ; flagellum slightly shorter than 5th peduncular article, of 8 setose articles. Incisor of mandible 3-cuspidate, lamina dentata with 9 partly indistinct indentations ; 2nd article of 3-articulate palp longest ; 2nd article with slender distal seta, terminal article with row of 6 distal setae. Maxilla relatively slender, distally 7-toothed ; penultimate and terminal tooth separated by a short seta. Endite of maxilliped long and slender, almost reaching to distal margin of 3rd palp article, narrow distal part bearing 3 setae ; palp 5-articulate ; 3rd article longest and widest, bearing 4 distal setae ; penultimate article with single mediolateral seta ; tiny terminal article with 3 distal setae.

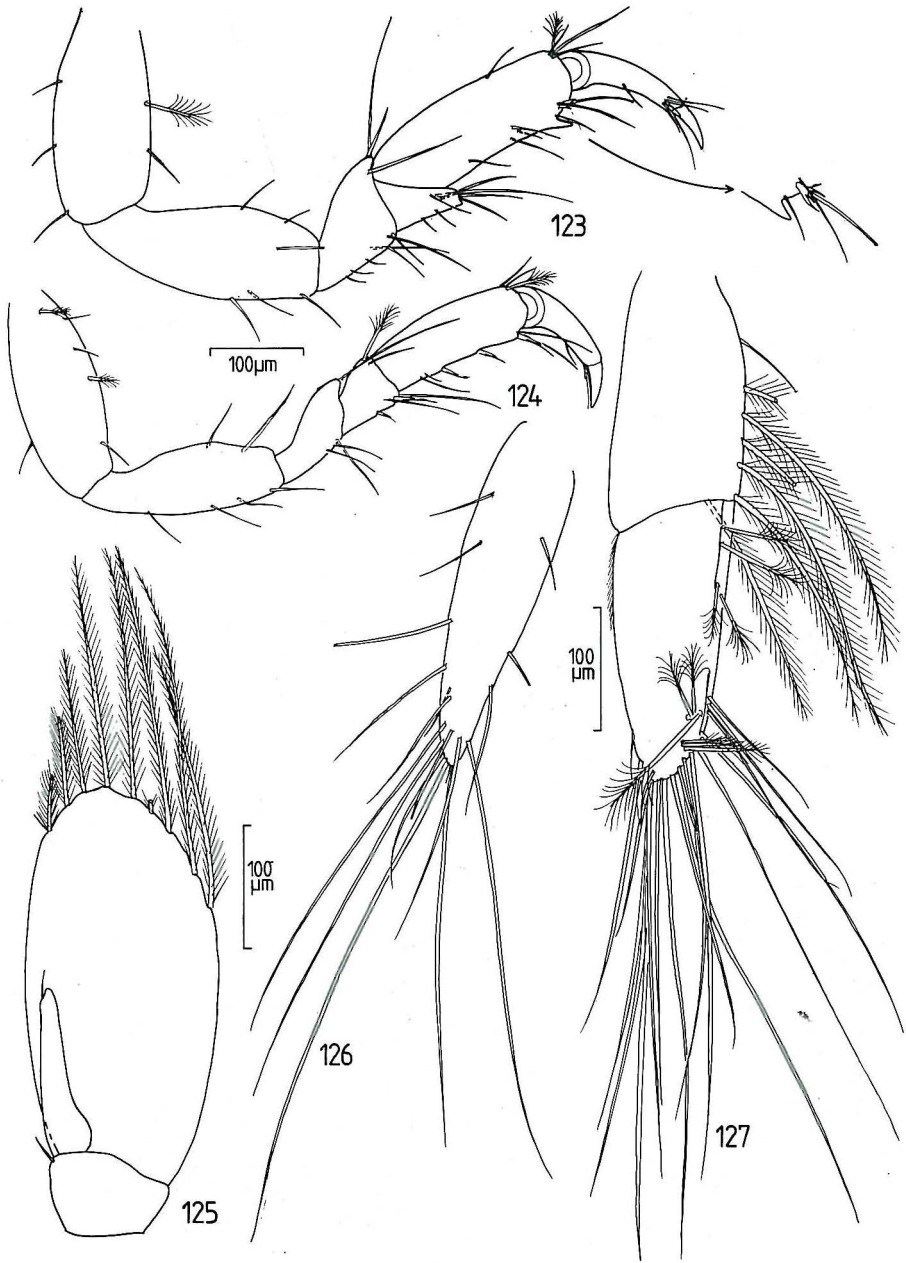
Posterior margin of expanded propodus of pereopod 1 with a strong proximal tooth-shaped tubercle, a somewhat smaller tooth adjacent to it and a small distal tubercle ; the two latter tubercles separated by fringe of scales and some slender setae ; dactylus twice length of unguis. Pereopod 2 similar to pereopod 1 ; posterior margin of propodus with a strong proximal tooth-shaped tubercle and a small tubercle at about mid-length ; distal half of posterior margin with some slender setae, a short lamella and a small, denticulate compound spine. Third pereopod much more slender than pereopods 1-2 ; rectangular propodus with posterodistal tooth-shaped tubercle and small, denticulate compound spine. Pereopods 4-7 similar among one another, posterior margin of rectangular propodus with row of 3 compound spines. Carpus of pereopods 1-3 triangular, lacking free anterior margin ; carpus of pereopods 4-7 trapezoid, posterior margin bearing 2 compound spines. Operculiform exopodite of pleopod 1 bearing 9 distal, plumose marginal setae ; endopodite narrow, less than half length of exopodite, with single subapical simple seta. Uropodal endopodite subequal in length to sympodite, elongate-ovate ; distal margin of endopodite bearing several long simple setae, dorsal surface near outer margin with 8 feathered sensorial setae ; exopodite very slender, 4 times longer than wide, bearing several long simple setae near subacute apex.

♂ : in habitus resembling ♀, eyes much larger. Total length 2.6-2.9 mm. Denticulations of telsonic margin more distinct than in ♀, otherwise quite similar in shape and arrangement of setae.

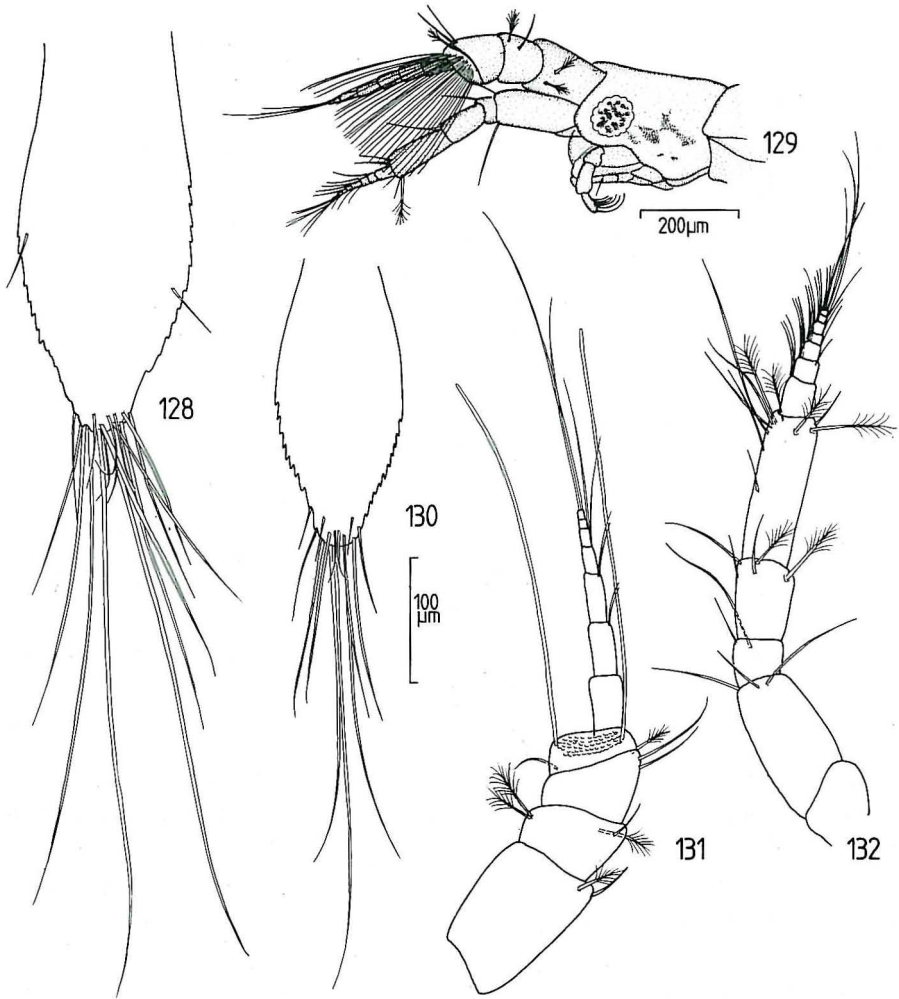
Distal two peduncular articles of antenna 1 much more robust than in ♀ ; proximal article longer than articles 2 and 3 together ; articles 2 and 3 wider than long ; flagellum 8-articulate ; proximal article much wider than long, bearing whorl of numerous filiform aes-



Figs. 115-122 : *Expanathura mooreae* n. sp., ♀, holotype : 115. dorsal view ; 116. antenna 1 ; 117. antenna 2 ; 118. mandible ; 119. maxilla ; 120. maxilliped ; 121. pereopod 1 ; 122. pereopod 2..



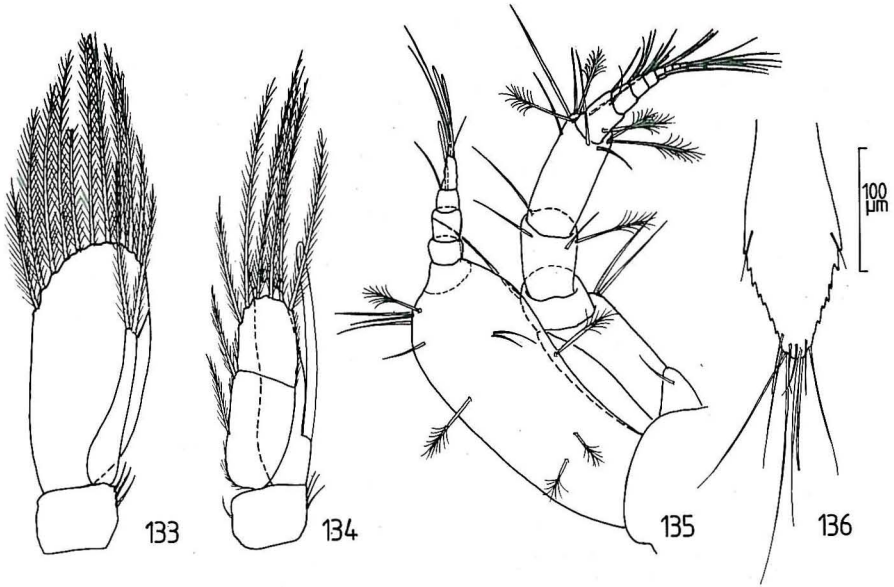
Figs. 123-127 : *Expanathura mooreae* n. sp., ♀ holotype : 123. pereopod 3 ; 124. pereopod 4 ; 125. pleopod 1 ; 126. uropodal exopodite ; 127. uropodal sympodite and endopodite.



Figs. 128-132 : *Expanathura mooreae* n. sp. - ♀, holotype : 128. telson - ♂, paratype : 129. cephalon and antennae, lateral view ; 130. telson ; 131. antenna 1 ; 132. antenna 2.

thetasc : distal articles slender, bearing few simple setae. Second article of antenna 2 more slender than in ♀ ; flagellum of 7 setose articles.

Operculiform exopodite of pleopod 1 with 9 distal, plumose marginal setae ; narrow endopodite 2/3 length of exopodite, with 2-3 terminal plumose setae and a short simple seta. Exopodite of 2nd pleopod biarticulate, bearing 8 plumose marginal setae ; endopodite slightly longer, with 4 distal, plumose marginal setae ; slender appendix masculina with narrowly rounded apex, articulating in proximal fourth of endopodite and extending beyond ramus with 1/5 of entire length.



Figs. 133-136 : *Expanathura mooreae* n. sp. - ♂, paratype : 133. pleopod 1 ; 134. pleopod 2 - Preparatory ♂, paratype : 135. antennae - Manca, paratype : 136. telson.

Preparatory ♂ : in general habitus similar to ♂. Total length 2.4 mm. Antenna 1 with very large, expanded proximal article and 5 small distal articles ; these distal articles together 0.4 times length of proximal one ; article 4 with single aesthetasc, article 5 with 2 aesthetascs. Antenna 2 not markedly differing from ♂, flagellum with 8 setose articles.

Immature adult : in general features similar to ♀. Total length 2.9-3.8 mm.

Postmanca and manca : in general habitus resembling ♀, total length 2.1 and 1.3-1.8 mm, respectively. Posterolateral telsonic margin also distinctly denticulate, distal setae less numerous than in mature stages.

Remarks : the new species is most similar to *Expanathura ardea* (Poore & Kensley, 1981) which has been recorded from the Australian Great Barrier reef and the Houtman Abrolhos Islands (Poore & Kensley, 1981 : 507 ; Kensley & Poore, 1982 : 633). The ♂ of this species is unknown and the drawings given for the ♀ in the original description do not serve to characterize this species well. A comparison of the habitus of *E. ardea* and *mooreae* cannot be made in detail, because it has not been figured in the former. Anyhow, the distinguishing features of the two species are distinct according to the original description of *E. ardea*. The maxillipedal endite of this species is more robust in its distal half. The endopodite of the first pleopod is more robust in *ardea*, triangular and twice longer than wide, bearing 2 terminal setae. In *mooreae* the endopodite is narrow, 3.8 times longer than wide and tipped with a short simple seta. The palm of the propodus of pereopod 1 of *E. ardea*

lacks the small distal tubercle present in the new species. Moreover, the uropodal exopodite is more robust in the Australian species (2.5 times longer than wide), than in *mooreae* (4 times longer than wide).

Almost all specimens of the new species were found on reef locations with at least moderate wave exposition, associated with dead coral substrate. *E. mooreae* n. sp. was rather common in the area investigated.

Distribution : Bora Bora and Moorea, Society Islands.

Minyanthura Kensley, 1982

Minyanthura pacifica n. sp. (Figs. 137-177)

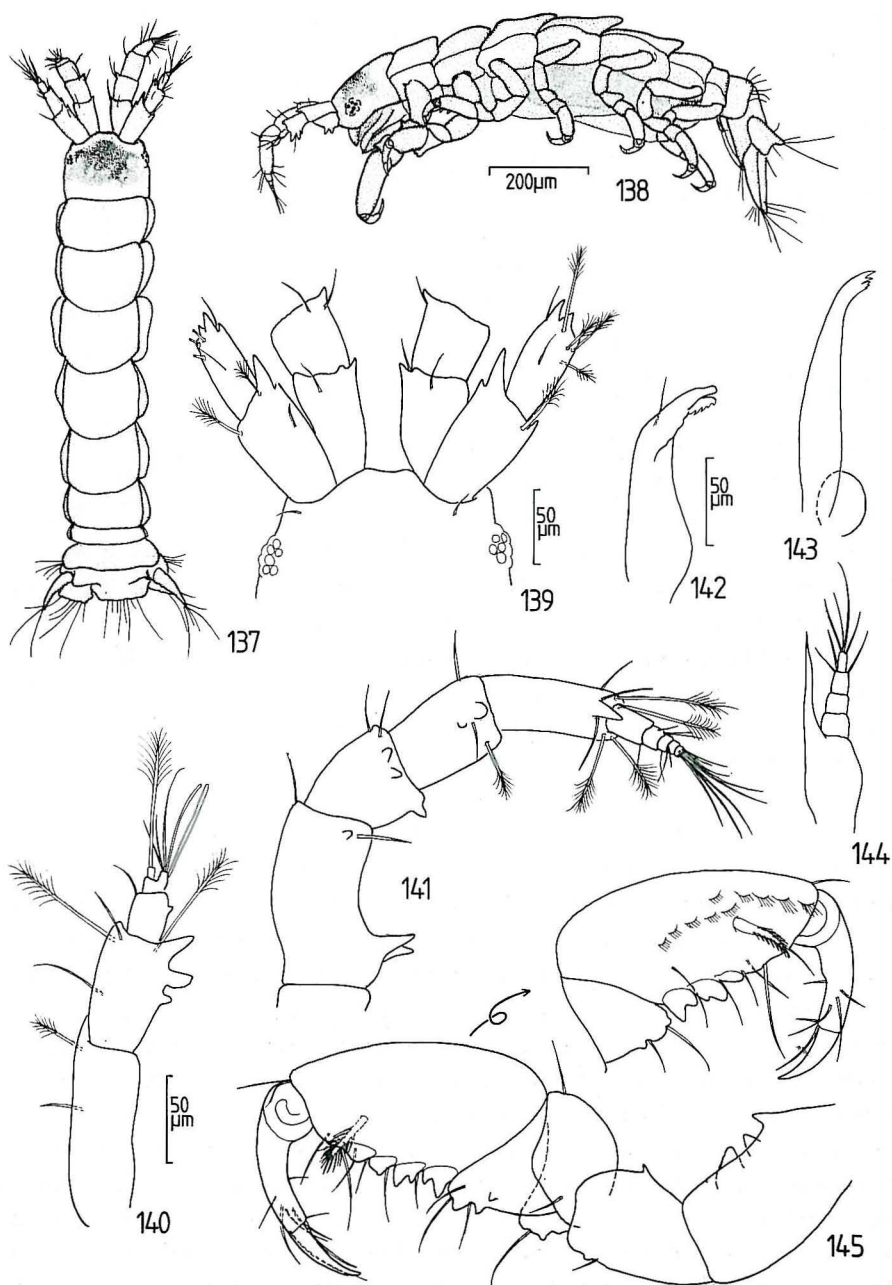
Holotype : ovigerous ♀ (SMF), Moorea ; near Maharepa, about 2.6 km west of airport ; crest of barrier reef, dead corals, 0.5 m, March 1988.

Paratypes : Bora Bora - 1 ♂, 1 ♀, 3 manca (MNHN) ; fringing reef near Vaitape, dead corals covered with sponges and algae, 0.5-1 m, 27 February - 6 March 1988. Moorea - 5 ♀♀ (2 ov.), 1 immature adult, 2 manca (SMF) ; collected together with holotype. 1 ♀ (ov.), 1 postmanca, 1 manca (MNHN) ; crest of Tiahura barrier reef, dead corals, 0.5-1 m, 25 March 1988. 1 ♂, 1 immature adult (MNHN) ; fringing reef near Afareaitu, outer reef-flat, dead corals, intertidal - 0.5 m, 29 March 1988. 3 ♀♀, 2 immature adults, 3 postmanca (SMF) ; coral slope of fringing reef near Afareaitu, dead corals, 1-2 m, 26 March 1988. 1 ♂, 1 immature adult, 2 postmanca (1 preparatory ♂) (MNHN) ; Temae, the Islet Reef, northeast of airport ; dead corals in channel near beach, 2 m, 31 March 1988.

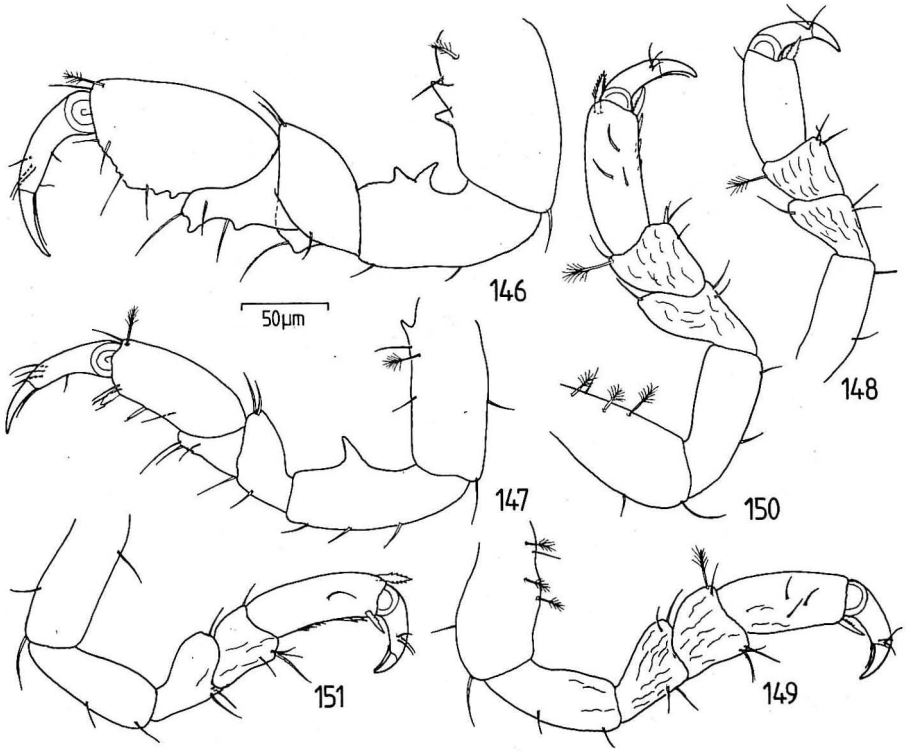
Derivatio nominis : the specific name refers to the geographic area of the type locality, the Pacific Ocean.

Description, ♀ : Body relatively robust, 5 times longer than wide. Total length 0.9-1.0 mm. Cephalon with brownish middorsal pigment patch, other segments colourless. Cephalon 1.3 times wider than long, with small, well pigmented anterolateral eyes. Body proportions : C>1<2<3 = 4 >5>6>7. Pleonites fused. Telson 1.4 times longer than wide, slightly narrowing distally ; posterolateral margins broadly rounded ; distal margin almost blunt, with characteristic arrangement of setae.

Antenna 1 with 3-articulate peduncle ; proximal article longest ; 2nd article with 3 strong tooth-shaped tubercles in distal half of ventral margin and two tooth-shaped tubercles at mediodistal margin, the distal one being longest ; 3rd article with only a small denticle at ventrodistal margin ; flagellum uniarticulate, bearing a long feathered sensory seta, 2 aesthetascs and 3 simple setae. Peduncle of 2nd antenna 5-articulate ; 2nd article longest and widest, somewhat curved, with pair of large, tooth-shaped tubercles in proximal half of ventral margin ; moreover, inner distal margin with small denticle ; articles 3 and 4 subequal in length, each with pair of denticles at mediodistal margin ; moreover, 3rd article with denticle at ventrodistal margin ; 5th article slender, with strong tooth-shaped tubercle at mediodistal margin ; flagellum shorter than 5th peduncular article, of 5 setose articles. Mandible slender, medially curved in distal 3rd, no trace of palp observed ; incisor appa-



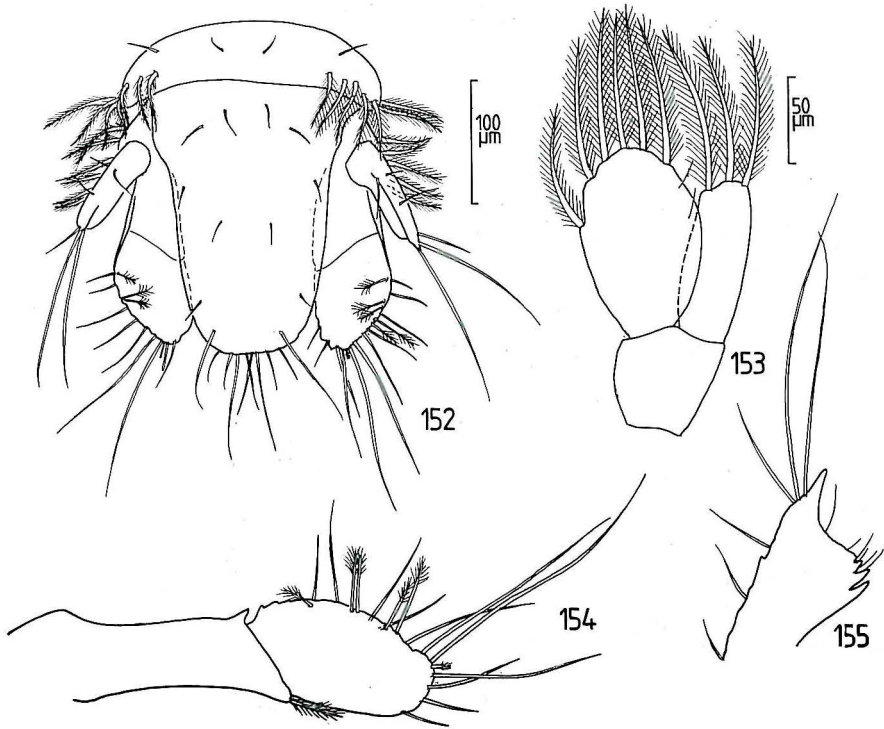
Figs. 137-145: *Minyathura pacifica* n. sp., ovigerous ♀, holotype: 137. dorsal view; 138. lateral view; 139. anterior part of cephalon and proximal articles of antennae; 140. antenna 1; 141. antenna 2; 142. mandible; 143. maxilla; 144. maxilliped; 145. pereopod 1, viewed from different angles.



Figs. 146-151 : *Minyanthura pacifica* n. sp., ovigerous ♀, holotype : 146. pereopod 2 ; 147. pereopod 3 ; 148. distal pereopod 4 ; 149. pereopod 5 ; 150. pereopod 6 ; 151. pereopod 7.

rently unicuspidate, lamina dentata with 4 indentations ; outer proximal margin of incisor bearing a simple seta. Maxilla slender, distally 5-toothed. Maxilliped with slender, acute endite well extending beyond distal margin of terminal palp article ; palp 4-articulate, articles subequal in length ; 3rd article with 3, terminal one with 4 distal setae.

Unguis of first pereopod 0.6 times length of dactylus. Pereopod 1 robust ; propodus expanded, bearing 4 tooth-shaped tubercles at posterior margin ; 2 proximal tubercles largest and bicuspidate ; mesial surface of propodus with some scales and strong pectinate spine ; carpus triangular, lacking free anterior margin, with 2 tooth-shaped tubercles at posterodistal margin and adjacent denticle ; ischium with inconspicuous rounded tubercle at posterior margin ; ischium also with similar tubercle at posterodistal margin and denticle at midlength of anterior margin ; basis with 3 strong, tooth-shaped tubercles at anterior margin. Second pereopod similar to first one, propodus less expanded ; posterior margin of propodus convex, with 3 inconspicuous tubercles ; triangular carpus with 2 posterior tubercles and merus with single posterior tubercle ; both ischium and basis with pair of tooth-shaped tubercles at anterior margin. Pereopod 3 more slender than pereopods 1 and 2 ;

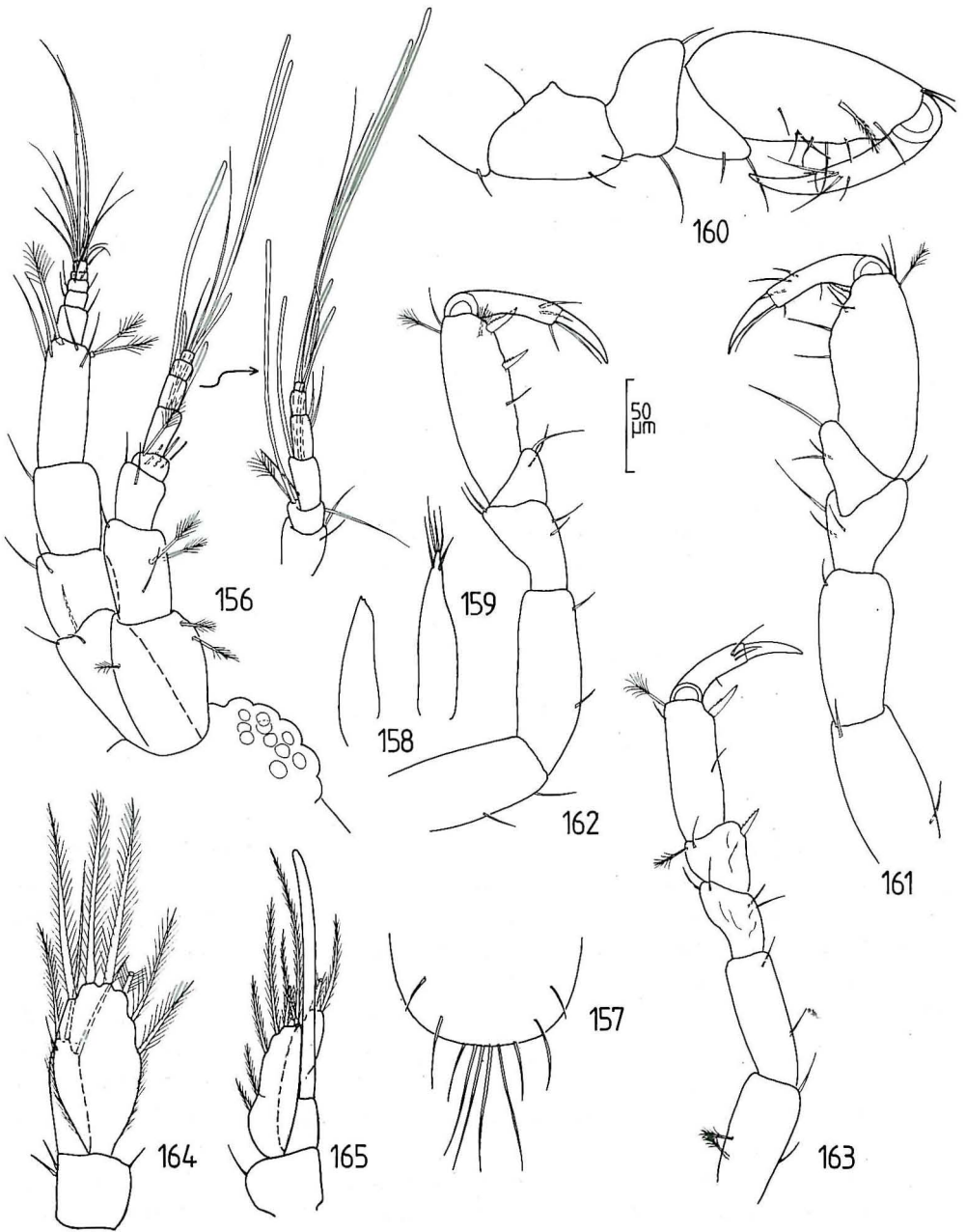


Figs. 152-155 : *Minyanthura pacifica* n. sp., ovigerous ♀, holotype : 152. telson and uropods ; 153. pleopod 1 ; 154. uropodal sympodite and endopodite ; 155. uropodal exopodite.

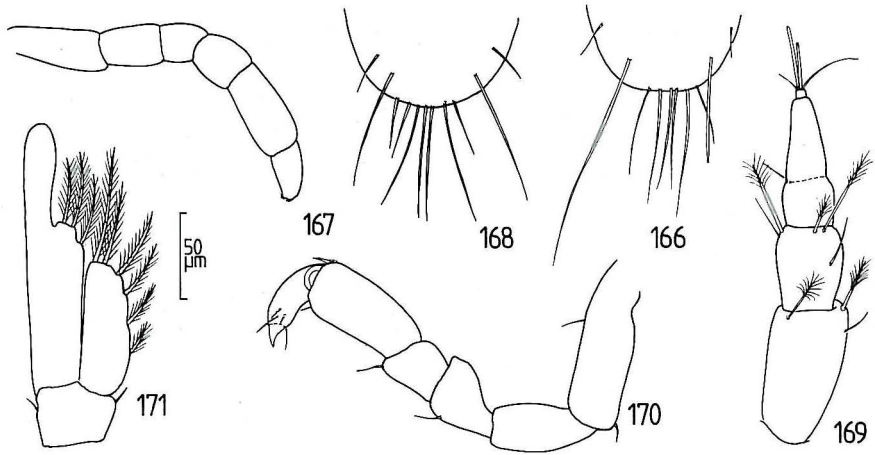
propodus rectangular, bearing 2 posterior compound spines, one at midlength, the other distally ; carpus triangular, lacking free anterior margin ; ischium and basis each with a tooth-shaped tubercle at anterior margin, larger at ischium. Pereopods 4-7 with rectangular propodus and trapezoid carpus, fine ridges present on medial surface of carpus and merus. Propodus of pereopods 4 and 5 each with posterodistal denticulate compound spine ; propodus of pereopods 6 and 7 each with an anterodistal and posterodistal denticulate compound spine.

Exopodite of first pleopod ovate, slightly longer than rectangular endopodite ; distal margin of endopodite with 3, of exopodite with 6 plumose setae. Uropodal sympodite 1.4 times length of ovate endopodite, with small tooth at outer distal margin ; endopodite bearing several simple setae at outer and distal margin, a small distal, feathered sensory spine and 5 feathered sensorial setae near outer margin ; exopodite distally produced into narrow triangular lobe bearing 3 slender simple setae ; mediolateral margin of exopodite with 3 strong indentations.

♂ : similar in habitus to ♀, with distinctly larger anterolateral eyes. Total length 0.8-0.9 mm. As a character of this genus, the ♂ has the pleonites free, in contrast to the ♀ with fused pleonites.



Figs. 156-165: *Minyanthura pacifica* n. sp., ♂, paratype: 156. anterolateral part of cephalon and antennae; 157. distal part of telson; 158. mandible; 159. maxilliped; 160. distal pereopod 1; 161. pereopod 2; 162. pereopod 3; 163. pereopod 4; 164. pleopod 1; 165. pleopod 2.



Figs. 166-171 : *Minyanthura pacifica* n. sp. - Postmanca, preparatory ♀, paratype : 166. distal margin of telson ; 167. pereopod 7 - Postmanca, preparatory ♀, paratype ; 168. distal margin of telson ; 169. antenna 1 ; 170. pereopod 7 ; 171. pleopod 2.

Flagellum of first antenna 4-articulate, proximal article wider than long ; each article with some filiform aesthetascs. Mouthparts reduced : mandible a slender lobe with two inconspicuous terminal denticles ; no trace of maxilla observed ; maxilliped a slender lobe, elongate-triangular in distal third, bearing 5 distal setae.

Pereopods more slender than in ♀, lacking distinct tubercles. Propodus of pereopod 1 with slender fringed spine at mesial surface ; elongate ovate propodus of second pereopod with posterodistal denticulate compound spine ; propodus of third pereopod almost rectangular, with 2 posterior denticulate compound spines ; pereopods 4-7 similar amongst one another, both propodus and carpus with a posterodistal denticulate compound spine.

Endopodite of first pleopod narrow, 2/3 length of ovate exopodite ; distal margin of endopodite with 3, of exopodite with 6 plumose setae. Both rami of second pleopod elongate ovate, endopodite slightly longer than exopodite ; appendix masculina long, slender and distally rounded, articulating in distal proximal third of endopodite and extending beyond distal margin of ramus for 2/3 of its entire length ; endopodite with 3, exopodite with 6 plumose marginal setae.

Preparatory ♂ (= postmanca II) : similar in size and habitus to ♂ : first antenna 5-articulate, suture line between third and fourth article incomplete ; tiny terminal article bearing 2 aesthetascs and simple setae, respectively. Pereopod 7 incompletely developed and smaller than remaining pereopods, no spination present and no distinct suture line between unguis and dactylus. Incompletely developed appendix masculina present as slender, rounded lobe at mediobasal margin of endopodite of pleopod 2 ; this endopodite with 3 plu-

mose setae at outer distal margin ; exopodite of pleopod 2 bearing 6 plumose marginal setae at outer and distal margin.

Immature adult : in general features similar to ♀. Total length 0.9 mm.

Postmanca : two postmanca stages which do not differ markedly in size (total length 0.9 mm) were observed. Postmanca I with 7th pereopod present as a simple 6-articulated appendage without any setae and spines (Fig. 167) and postmanca II (as described for the preparatory ♂ above) with following articles distinguishable : dactylus, propodus, carpus, merus, ischium and basis, but without characteristic spination of mature specimens and incomplete suture line between unguis and dactylus.

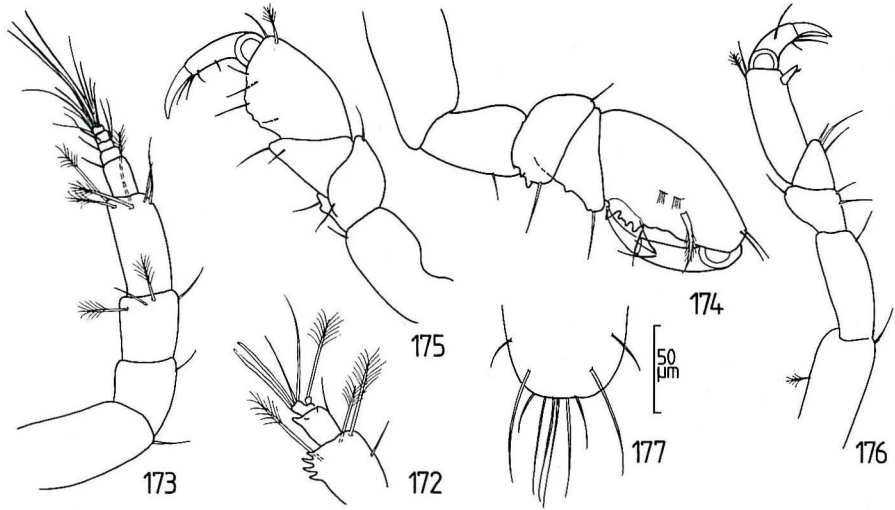
Manca : in habitus similar to ♀, total length 0.7 mm. Second article of antenna 1 with 4 ventrodiscal teeth, penultimate article with single ventrodiscal tooth. No teeth observed on peduncular articles of antenna 2. Tubercles on pereopods less pronounced than in mature ♀, distinctly developed only at posterior margin of propodus, carpus and merus of first pereopod. Rectangular propodus of third pereopod with a non-denticulate compound spine at posterodistal margin.

Remarks : two species were assigned to this genus up to now : *Minyanthura corallicola* Kensley, 1982, known from several places in the Caribbean (cf. Müller, 1991 : 764) and *M. firingae* Müller, 1990 from La Réunion in the southern Indian Ocean. The third species discovered in French Polynesia is the first record for this possibly pantropical shallow-water genus from the Pacific Ocean. While *M. firingae* is known only from the ♂ (Müller, 1990a : 380-384, figs. 93-107), both sexes were described for *M. corallicola* (Müller, 1990b : 186, figs. 19-35, ♀ ; 1991 : 760-764, ♂).

Females of *M. corallicola* are best distinguishable from the new species by their size, measuring 1.4-1.7 mm, in contrast to 0.9-1.0 mm in *pacifica* n. sp. Other distinguishing features of the females are the 5-articulate maxillipedal palp and the shorter maxillipedal endite of *M. corallicola*, which reaches only to the midlength of the 4th palp article. In the new species the palp is 4-articulate and the endite extends well beyond the terminal article. Moreover, the posterior tooth-shaped tubercles at propodus and carpus of the second pereopod are much stronger in *corallicola*. Males of both species are easily distinguishable by the small and slightly narrower endopodite of the first pleopod in *M. pacifica*, which measures 2/3 of the length and half the width of the exopodite. In males of *corallicola* both rami are subequal in length. The same feature can be used to separate males of *M. firingae* and *pacifica*. In the former the first pleopod is even slightly longer than the exopodite, which shows a distinct transverse suture line at midlength. Males of both *M. corallicola* and *firingae* are further distinguishable by the presence of tooth-shaped tubercles at the posterior margin of propodus and carpus of pereopod 1. These tubercles are lacking in males of the new species.

All specimens of *M. pacifica* were found associated with dead corals, in areas with moderate or strong wave exposition.

Distribution : Bora Bora and Moorea, Society Islands.



Figs. 172-177 : *Minyanthura pacifica* n. sp., manca, paratype : 172. three distal articles of antenna 1 ; 173. antenna 2 ; 174. pereopod 1 ; 175. pereopod 2 ; 176. pereopod 3 ; 177. distal margin of telson.

Panathura Barnard, 1925

Panathura collaris Kensley, 1979 (Figs. 172-202)

1979 *Panathura collaris* Kensley, 1979 : 823-827, figs. 7-9.

Material : all specimens from Moorea - 1 ♂, 8 ♀♀ (3 ov.), 24 immature adults, 5 post-mancas, 8 mancass (SMF) ; Temae, the Islet Reef, northeast of airport, dead corals in channel near beach, 2 m, 31 March 1988. 6 ♂♂, 6 ♀♀ (3 ov.), 18 immature adults, 9 postmancas, 10 mancass (SMF) ; Temae reef, coral rocks on beach, lower intertidal, 21 March 1988. 1 manca (SMF) ; Temae Reef, from *Sargassum*, lower intertidal, 27 March 1988. 14 ♂♂, 27 ♀♀ (12 ov.), 54 immature adults, 15 mancass (MNHN) ; near Maharepa, about 2.6 km west of airport ; crest of barrier reef, dead corals, 0.5 m, March 1988. 1 ♂, 1 manca (MNHN) ; barrier reef near Maharepa, from *Sargassum*, 0-0.5 m, 15 March 1988. 1 ♂, 2 ♀♀, 1 immature adult, 1 manca (SMF) ; coral slope of Tiahura fringing reef, dead corals, 1-2 m, 22/23 March 1988. 7 ♂♂, 7 ♀♀ (6 ov.), 14 immature adults (1 preparatory ♂), 1 manca (SMF) ; crest of Tiahura barrier reef, dead corals, 0.5-1 m, 25 March 1988. 7 ♂♂, 7 ♀♀ (2 ov.), 19 immature adults, 5 postmancas, 8 mancass (SMF) ; fringing reef near Afareaitu ; dead corals on outer reef flat, 0-0.5 m, 29 March 1988. 31 ♂♂, 72 ♀♀ (18 ov., 15 larvigerous), 133 immature adults, 18 postmancas, 4 mancass (MNHN) ; coral slope of fringing reef near Afareaitu, dead corals, 1-2 m, 26 March 1988.

Description, ♀ : body relatively slender, colourless except for u-shaped brown pigment stripe on dorsum of cephalon. Total length 1.9 mm. Cephalon as long as wide, with well-

pigmented anterolateral eyes of moderate size. Body proportions : $C < 1 > 2 < 3 = 4 = 5 = 6 > 7$. Pleonites free, proximal 4 pleonites as long as 5th (measured at midline of body). Telson tongue-shaped, widening distally, with broadly rounded distal margin bearing row of 12 simple setae in characteristic arrangement.

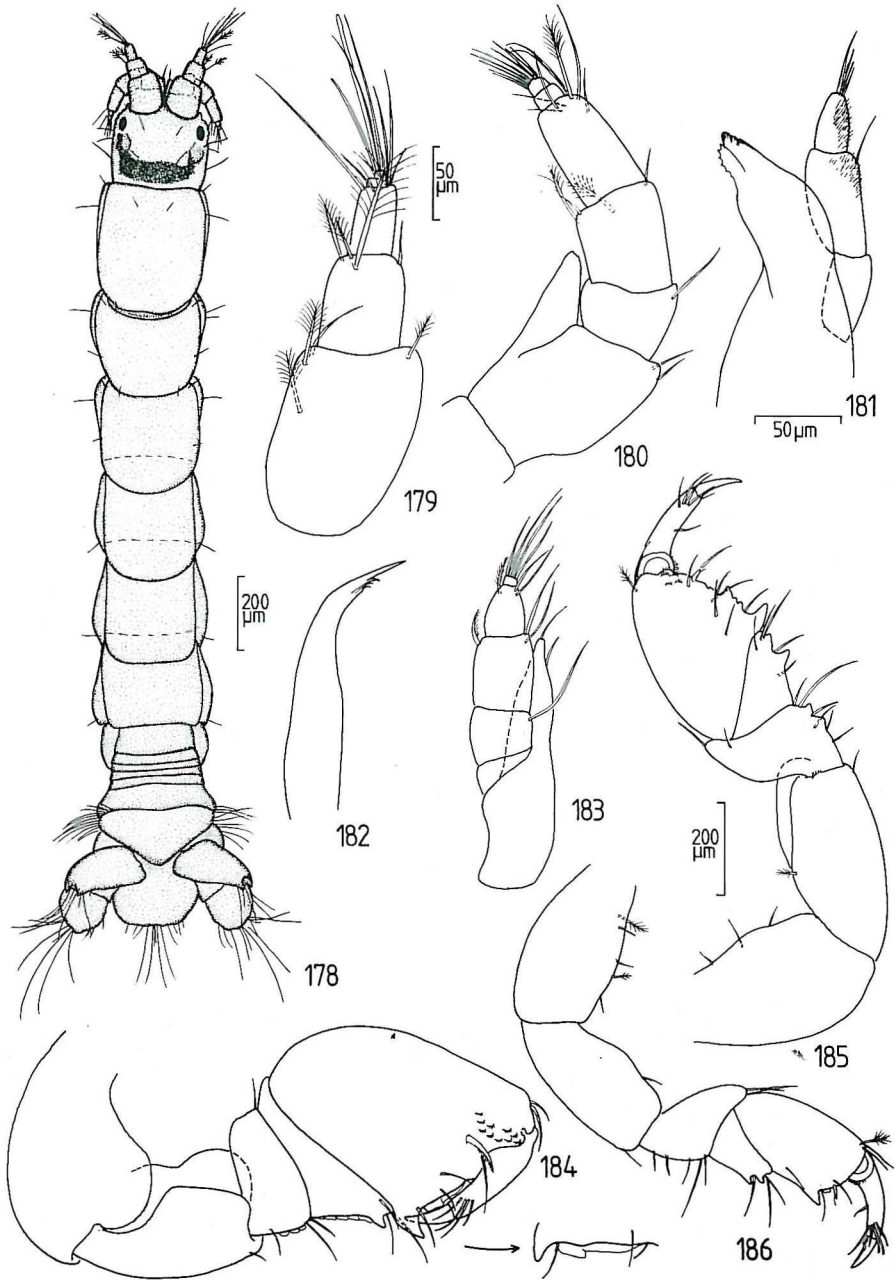
Peduncle of antenna 1 robust, first large article slightly longer than articles 2 and 3 together ; biarticulate flagellum very short, distal article bearing aesthetasc. Antenna 2, peduncle 5-articulate, 2nd article largest and distally grooved, with triangular process at inner distal margin ; flagellum very short, biarticulate. Incisor of mandible 3-cuspidate, lamina dentata with 6 indentations ; palp of 3 articles, with 2nd article largest, bearing simple distal seta ; terminal article with 4 distal setae. Maxilla very slender in distal part, with 1 stronger distal and 3 smaller teeth. Maxilliped with long, in its distal third tapering endite, almost reaching to distal margin of 3rd palp article ; endite with 1 subapical and 1 terminal seta ; palp of 5 articles, 3rd article largest ; articles 3 and 4 each with short, curved fringed seta at outer distal margin ; tiny terminal article tipped with 4 simple setae.

Pereopod 1 very robust, with greatly expanded propodus ; unguis about half length of dactylus ; posterior margin with strong tooth-shaped tubercle and almost straight palm with short lamella ; mesial surface of propodus near articulation of dactylus with curved fringed spine. Carpus with short free anterior margin and posterodistal tooth-shaped tubercle ; posterior margin of carpus and merus with fringe of scales. Pereopod 2 generally less robust than pereopod 1 ; posterior margin of ovate propodus with strong proximal tooth and 3 much smaller teeth, distal margin with small compound spine. Pereopod 3 distinctly narrower than pereopod 2, posterior margin of propodus with strong tooth-shaped tubercle at mid-length and a small, distal compound spine. Carpus of pereopods 2 and 3 triangular, lacking free anterior margin. Ambulatory pereopods 4-7 similar in size and shape ; posterior margin of rectangular propodus bearing 3 compound spines in pereopods 4-6, 5 compound spines in pereopod 7 ; moreover, anterodistal margin of propodus of pereopod 7 with 2 fringed compound spines. First pleopod with ovate, operculiform exopodite and almost rectangular endopodite ; distal margin of endopodite with 7, of exopodite with 18 plumose setae. Ovate uropodal endopodite 2/3 length of sympodite, with some long simple setae at outer and distal margin ; 5 feathered sensory setae present on dorsal surface near outer margin ; uropodal exopodite with characteristic non-setose, broadly rounded outer lobe ; distal margin of exopodite distinctly concave, with some inner distal simple setae.

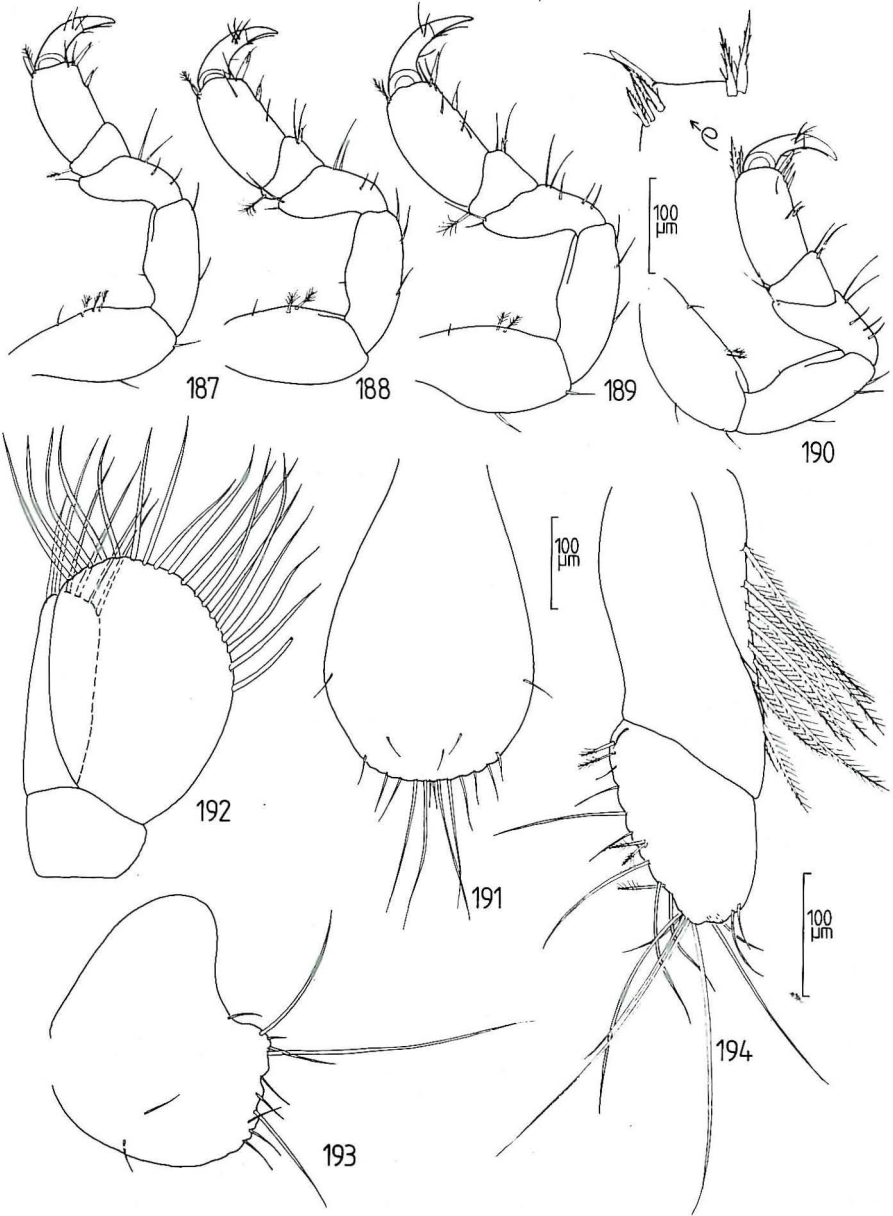
♂ : in habitus and size similar to ♀, with much larger, darkly pigmented eyes. Total length 1.9-2.0 mm. Arrangement of distal telsonic setae quite similar to ♀.

Distal peduncular article of antenna 1 wider than in ♀ ; flagellum 6-articulate ; proximal flagellar article enlarged, wider than long, bearing whorl of many filiform aesthetascs ; remaining flagellar articles much smaller. Articles of antenna 2 slightly narrower than in ♀. Pereopods similar to ♀.

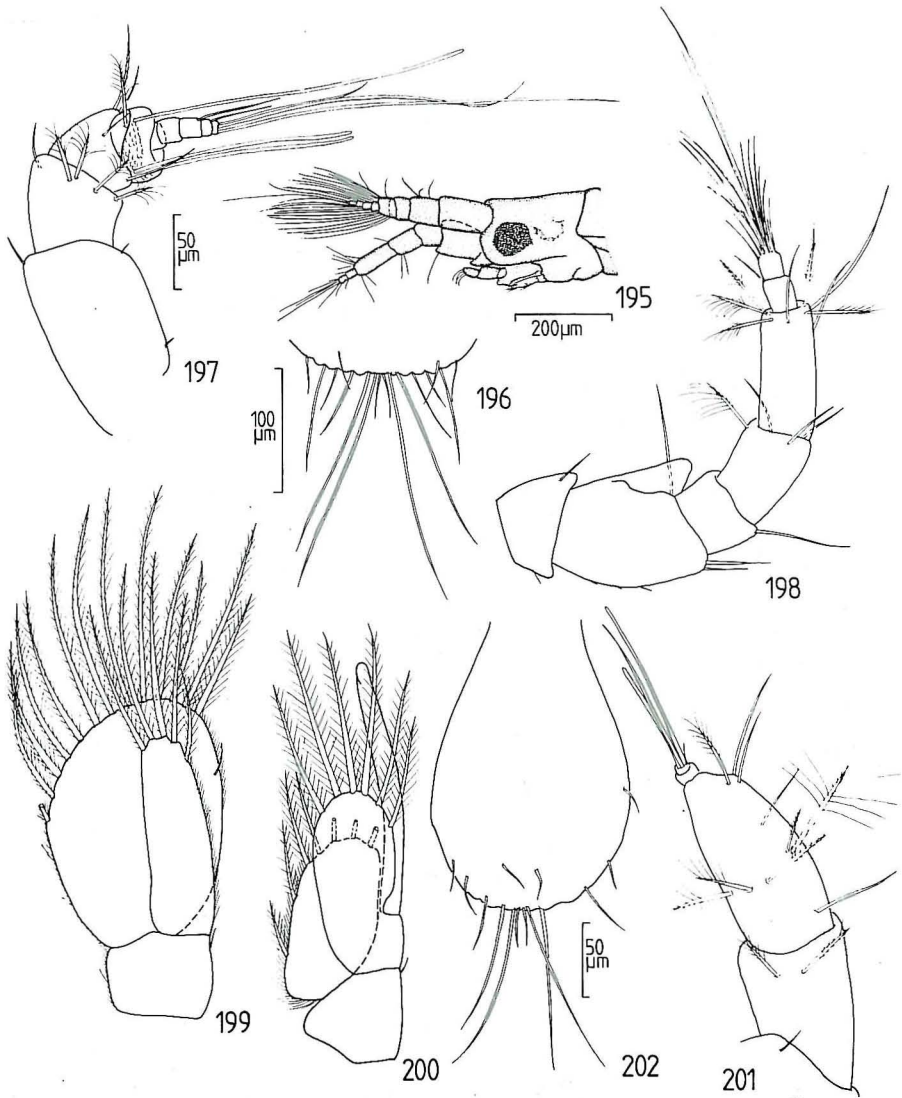
Outline of rami in first pleopod similar to ♀ ; distal margin of endopodite with 5, of exopodite with 13 plumose setae. Elongate-ovate rami of second pleopod subequal in length ; slender appendix masculina with rounded distal margin, articulating in proximal third of



Figs. 178-186: *Panathura collaris* Kensley, 1979, ovigerous ♀: 178. dorsal view ; 179. antenna 1 ; 180. antenna 2 ; 181. mandible ; 182. maxilla ; 183. maxilliped ; 184. pereopod 1 ; 185. pereopod 2 ; 186. pereopod 3.



Figs. 187-194 : *Panathura collaris* Kensley, 1979, ovigerous ♀: 187. pereopod 4 ; 188. pereopod 5 ; 189. pereopod 6 ; 190. pereopod 7 ; 191. telson ; 192. pleopod 1 ; 193. uropodal exopodite ; 194. uropodal sympodite and endopodite, dorsolateral view.



Figs. 195-202: *Panathura collaris* Kensley, 1979 - ♂ paratype: 195. cephalon and antennae, lateral view; 196. distal margin of telson; 197. antenna 1; 198. antenna 2; 199. pleopod 1; 200. pleopod 2 - Preparatory ♂; 201. antenna 1 - Manca; 202. telson.

endopodite, extending beyond distal margin of ramus for half of entire length; distal margin of endopodite with 6, of exopodite with 7 plumose setae.

Preparatory ♂: in habitus and size similar to mature ♂. Antenna 1 with inflated third article bearing 6 feathered sensory setae; distal 2 articles very small, each bearing aesthetasc.

Immature adult : in general features similar to ♀ : total length 1.3-2.0 mm.

Postmanca and manca : in general features similar to ♀. Total length 1.5 mm and 1.1 mm, respectively. Telsonic setation quite similar to ♀.

Remarks : two male and three immature adult paratype specimens (USNM 172277) from the Cook Islands were available for examination of this incompletely characterized species. I see almost no differences between this material and specimens from French Polynesia, so far the features could be compared without dissection of the paratype material from the Cook Islands. These specimens agree amongst one another, except for some minor differences in the morphology of the second male pleopod. In the original description the male from the Cook Islands is shown to have a biarticulated exopodite and a somewhat shorter appendix masculina. Both endopodite and exopodite of this appendage appear to be more slender than in the material from the Society Islands (cf. Kensley, 1979 : 823-827, figs. 7-9).

In Moorea *P. collaris* was the most common species of all Anthuridea collected, often found associated with dead corals in locations with strong wave exposition.

Distribution : Cook Islands ; Moorea, Society Islands.

Paranthura Bate & Westwood, 1868

Paranthura societensis n. sp. (Figs. 203-224)

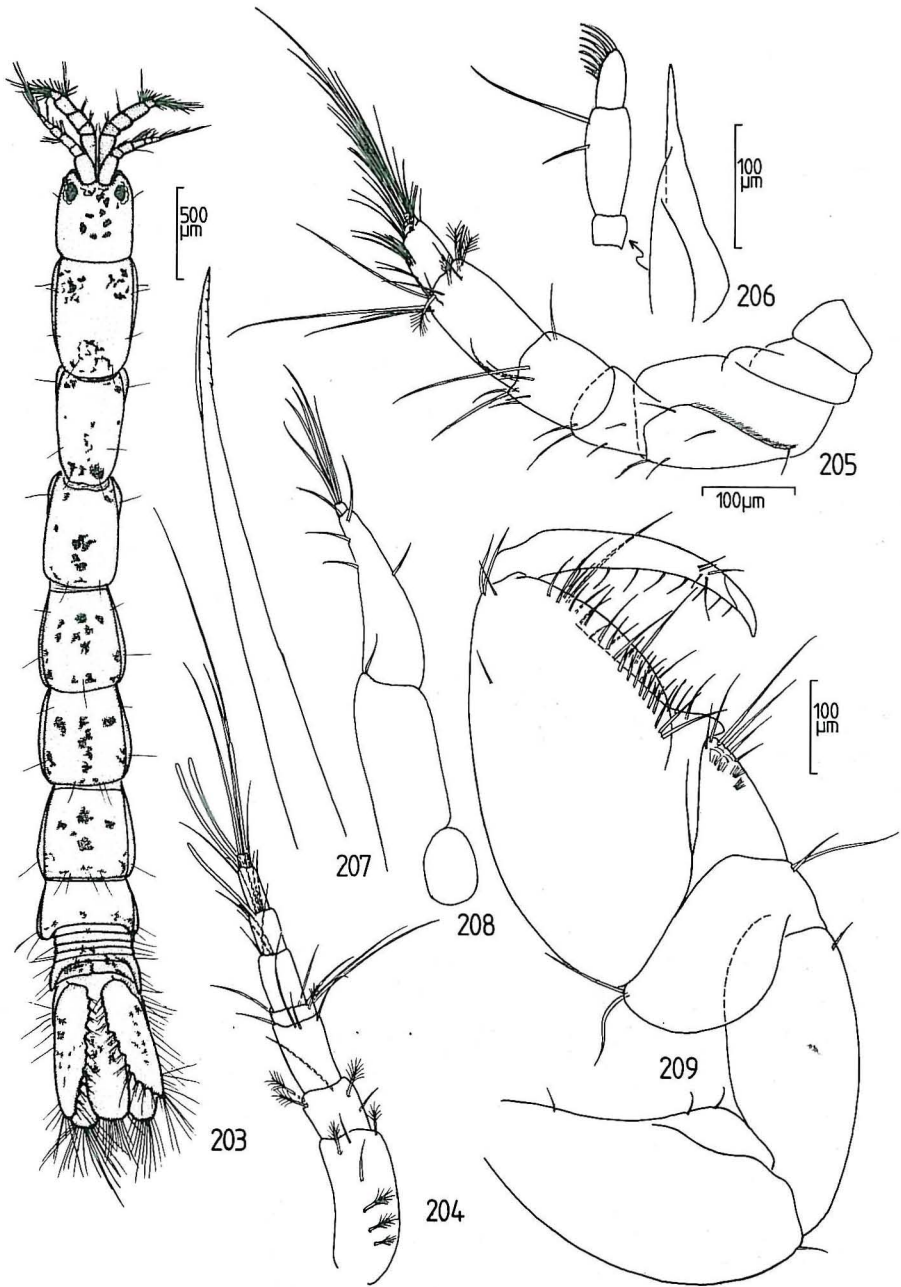
Holotype : Immature adult (SMF), Moorea ; barrier reef near Maharepa, about 2.6 km west of airport ; dead corals on reef-flat, 0.5 m, March 1988.

Paratypes : Bora Bora - 1 immature adult (MNHN) ; fringing reef near Vaitape ; dead corals covered with sponges and algae, 0.5-1 m, 27 February - 6 March 1988. Moorea - 1 ♂ paratype (SMF), collected together with holotype. 2 immature adults (MNHN) ; Temae, the Islet Reef, northeast of airport ; coral rocks on beach, lower intertidal, 21 March 1988.

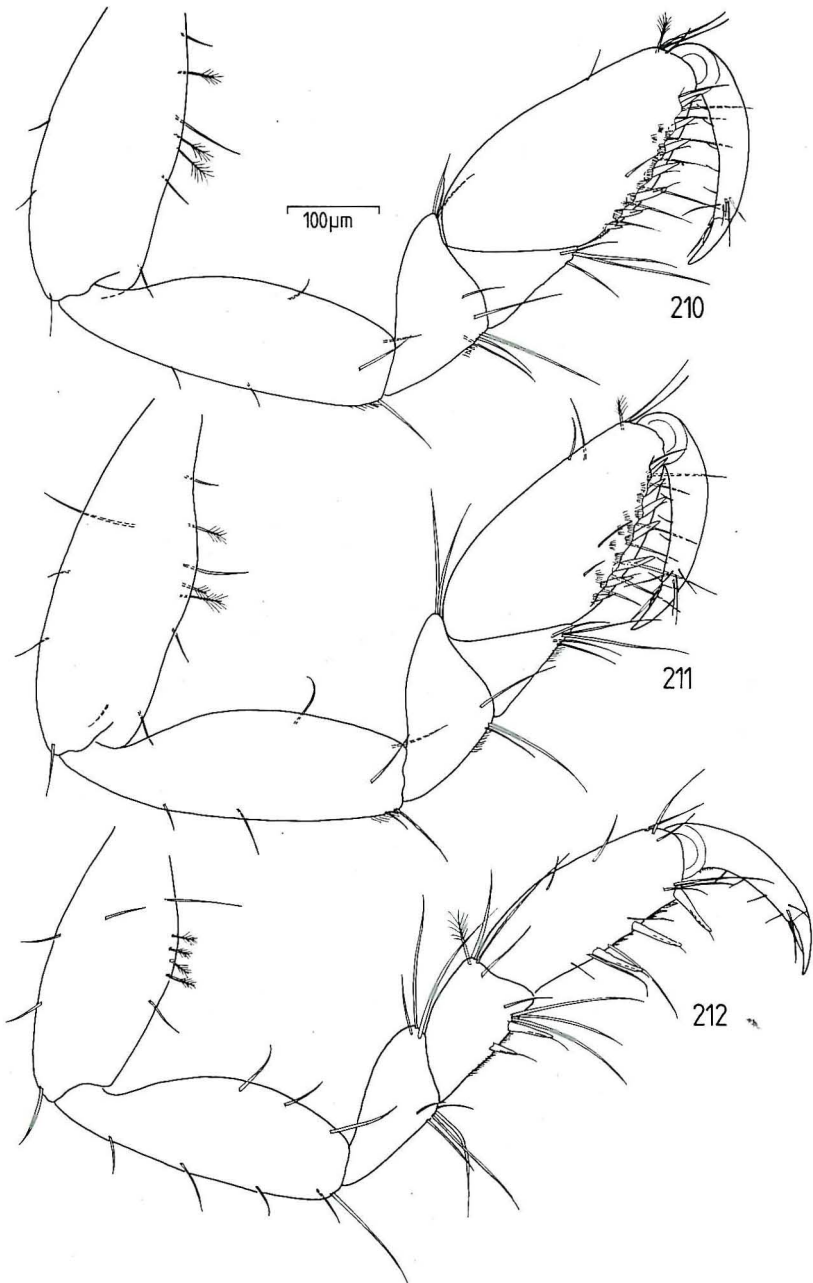
Derivatio nominis : the specific name refers to the geographic area of the type locality, the Society Islands.

Description, immature adult : body relatively slender, 9.4 times longer than wide. Total length 5.2 mm. All segments dorsally with some small brownish pigment patches and few indistinct reticulations. Cephalon 1.2 times longer than wide ; well pigmentet-eyes of moderate size, situated dorsolaterally in anterior half of cephalon. Body proportions : C<1 = 2 = 3>4>5>6>7. Pleonites free ; 5th pleonite somewhat longer than subequal pleonites 1-4. Telson 3 times longer than wide, almost rectangular with subparallel lateral margins, rounded posterolateral margins and almost blunt distal margin ; lateral telsonic margin with several sparsely fringed setae ; distal margin with less than 15 simple setae ; dorsodistal surface of telson bearing few short simple setae.

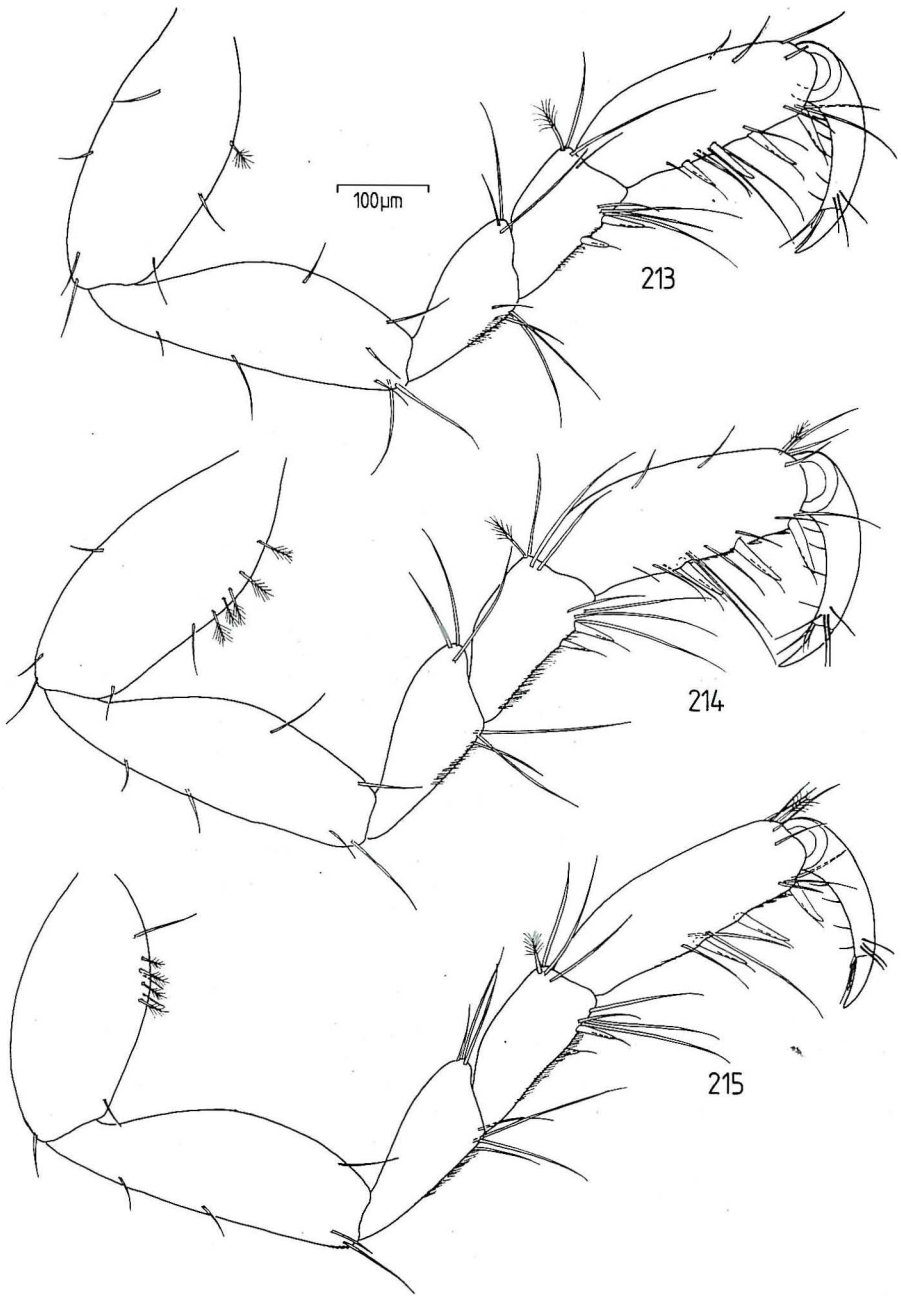
Peduncle of 1st antenna 3-articulate ; proximal article 1.2 times length of 2 distal peduncular articles together ; 5-articulate flagellum with broad proximal article ; 3rd article bearing 1, 4th with 3 distal aesthetascs. Antenna 2 with large 5-articulate peduncle ; 2nd article longest and widest, grooved to accomodate peduncle of antenna 1 ; articles 3-5 increasing



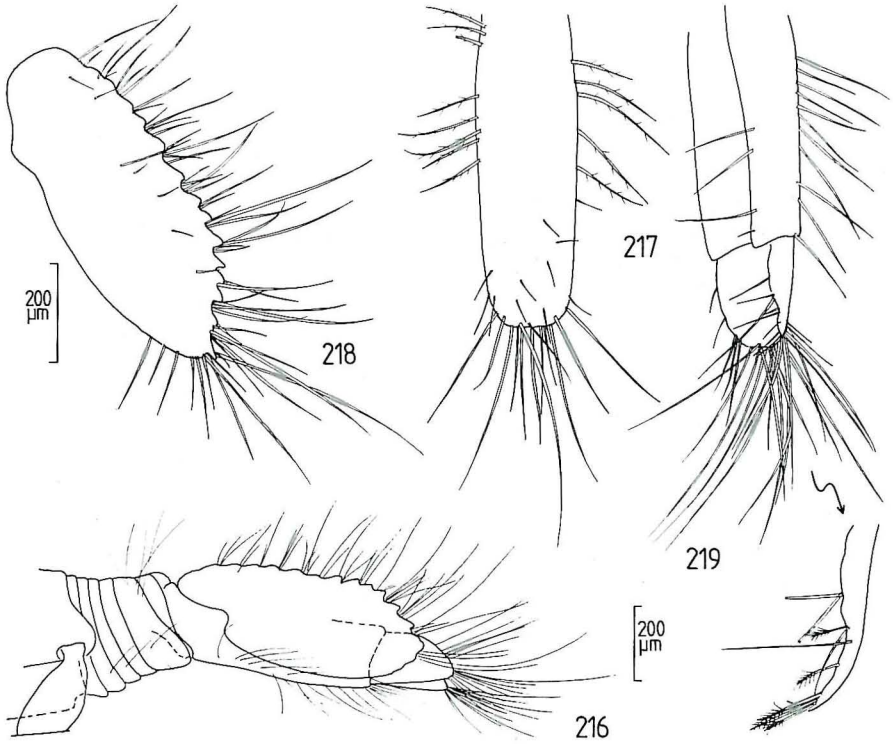
Figs. 203-209 : *Paranthura societensis* n. sp., immature adult, holotype : 203. dorsal view ; 204. antenna 1 ; 205. antenna 2 ; 206. mandible ; 207. maxilla ; 208. maxilliped ; 209. pereopod I.



Figs. 210-212 : *Paranthura societensis* n. sp., immature adult, holotype : 210. pereopod 2 ; 211. pereopod 3 ; 212. pereopod 4.



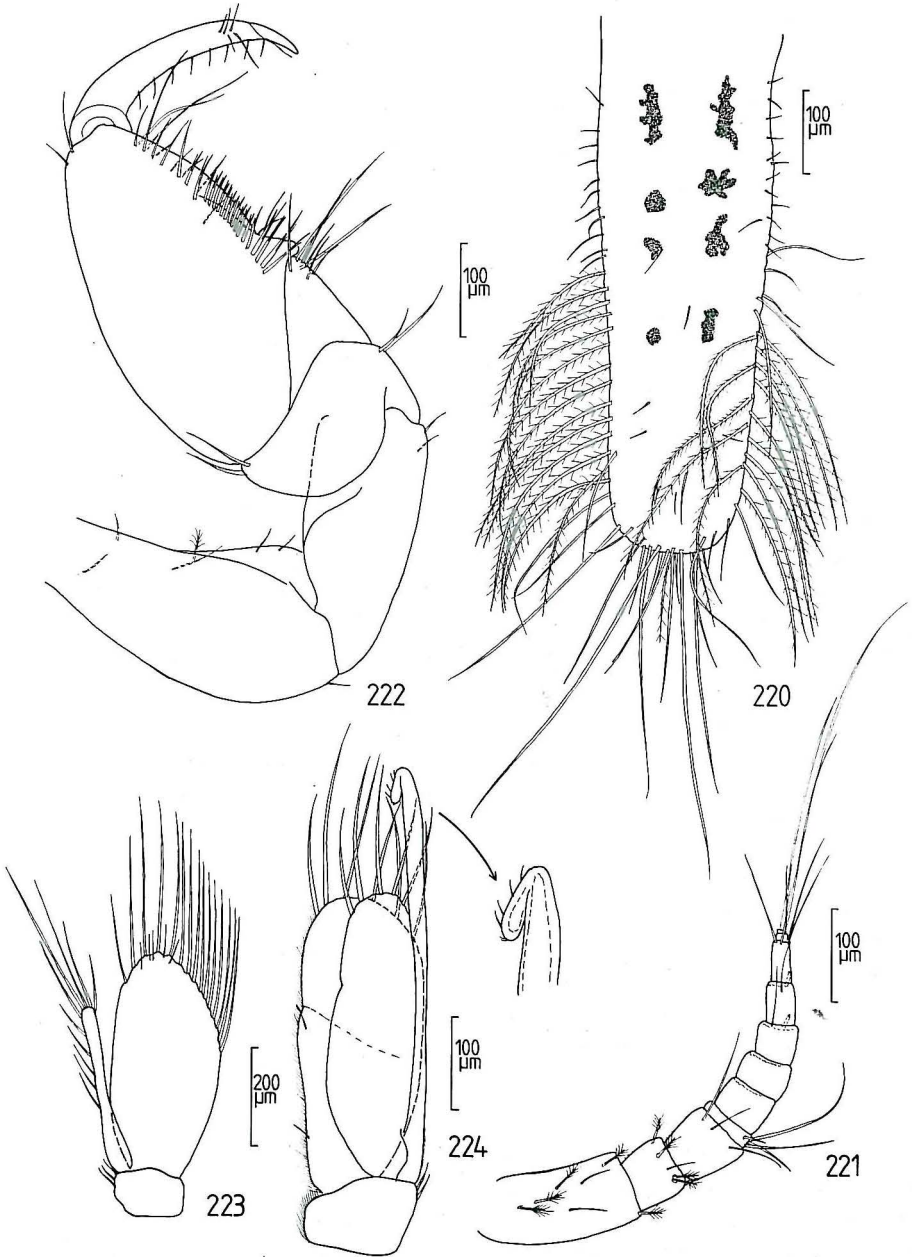
Figs. 213-215 : *Paranthura societensis* n. sp., immature adult, holotype : 213. pereopod 5 ; 214. pereopod 6 ; 215. pereopod 7.



Figs. 216-219: *Paranthura societensis* n. sp., immature adult, holotype : 216. pleon, lateral view ; 217. telson ; 218. uropodal exopodite ; 219. uropodal endopodite and sympodite, endopodite viewed from different angles.

in length distally ; flagellum with a robust proximal article and what appears to be few tiny, setose distal articles. Mandible with styletto-like, distally very slender, acute endite ; 2nd article of 3-articulate palp longer than first and third article together ; 2nd article with 2, 3rd with 8 setae in distal half. Spine-shaped maxilla very long and acute, with 9 distal indentations and a narrow lamella. Maxilliped 3-articulate, with somewhat curved, in distal half narrow article and tiny distal article ; number of distal setae on articles according to formula 1 : 5 : 5.

Pereopod 1 very robust and subchelate, with greatly expanded ovate propodus ; posterior margin proximally with triangular, slightly posteriad directed tubercle ; inner, evenly convex palmar margin proximally with 7 small, slender compound spines and 3 simple setae ; outer palmar margin straight, bearing several slender setae of different lengths ; dactylus slender and somewhat curved, 4 times length of unguis ; triangular carpus lacking free anterior margin, posterodistally with 6 simple setae and some scales. Pereopods 2-3 also subchelate, propodus less expanded than in pereopod 1 ; dactylus of both appendages only



Figs. 220-224 : *Paranthura societensis* n. sp., ♂, paratype : 220. telson ; 221. antenna 1 ; 222. pereopod 1 ; 223. pleopod 1 ; 224. pleopod 2.

2.7 times length of unguis ; propodal palm of 2nd and 3rd pereopods with 7 non-denticulate compound spines accompanied by several spinulose scales ; carpus of both pereopod 2 and 3 triangular and lacking free anterior margin. Pereopods 4-7 ambulatory, relatively robust ; posterior margin of rectangular propodus bearing 3 slender compound spines in pereopods 4, 6 and 7, 4 compound spines in pereopod 5 ; carpus elongate-trapezoid, in each of pereopods 4-7 with 2 posterodistal compound spines and some simple setae.

Uropodal sympodite 2.2 times length of ovate endopodite ; distal margin of endopodite bearing many simple setae and outer distal margin provided with 5 feathered sensorial setae ; uropodal exopodite elongate-ovate, outer margin with strong denticulation and several simple setae situated between denticulations ; apex of exopodite acute.

♂ : in habitus similar to immature adult, total length 4.9 mm. Lateral margin of telson with several short simple setae in anterior half and many long, sparsely fringed setae in posterior half ; distal setation of telson similar to immature adult.

Antenna 1 with 8-articulate flagellum ; articles 2-5 bearing whorl of filiform aesthetascs ; tiny distal article bearing 3 long simple setae.

Operculiform exopodite of first pleopod 1.3 times length of narrow endopodite ; exopodite bearing 15, endopodite 10 plumose marginal setae (drawn as simple setae) ; rami of second pleopod elongate-ovate and subequal in length ; slender appendix masculina articulating at base of endopodite, extending beyond ramus for 30 % of entire length ; apical part of appendix masculina recurved, bearing few short setae ; apex of appendix masculina rounded.

Remarks : *P. societensis* n. sp. shows close affinities to two other species from the tropical Pacific : *Paranthura bellicauda* Miller & Menzies, 1952 from Hawaii and *P. polynesica* Kensley, 1979 from the Cook Islands. Material of the former was not available for comparison, but one immature adult paratype of *P. polynesica* could be examined (USNM 172287).

The differences between *P. societensis* and *bellicauda* are difficult to ascertain, because the description of the latter is quite insufficient. The new species is somewhat smaller than the 6 mm long ? Female *bellicauda* (5.2 mm in the immature adult), and the pleonite section is distinctly shorter. In *bellicauda* the 5 free pleonites measure together 2/3 of the length of the 7th pereonite, in *societensis* they are together as long as the 7th pereonite. The female of the Hawaiian species has a 6-articulate flagellum of antenna 1, whereas the immature adult of the new species has a 5-articulate flagellum. The differences appear to be best pronounced in the morphology of the telson. The telson of *bellicauda* seems to be somewhat widening distally, with a convex, distally finely serrate lateral margin. The distal margin of the telson has a "slight median concavity and a fringe of about 54 marginal setae" (Miller & Menzies, 1952 : 11). In the new species the lateral margins are almost parallel, the posterolateral margins are not serrate, there is no trace of a distal concavity and the number of distal setae is very much lower (below 15).

The comparison with *P. polynesica* reveals the following differences : the body of this species is covered with relatively large, dentritic chromatophores. In *societensis* the arrangement of chromatophores is similar, but they are much smaller and not dentritic. The flagellum of antenna 1 is 4-articulate in the immature adult *P. polynesica*, 5-articulate (and therefore longer) in the immature adult *societensis*. A striking feature which serves best to

distinguish both species, is the fusion of pleonites in *polynesica* and the number of spines and setae on the pereopods. In the new species the pleonites are free and the pereopods are distinctly more setose and spinose (cf. Kensley, 1979 : 833-836, figs. 14-15).

Distribution : Bora Bora and Moorea, Society Islands.

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The present study has been mainly carried out at the Antenne Muséum in Moorea (director : Dr René Galzin) and the Centre de Biologie et d'Écologie Tropicale et Méditerranéenne in Perpignan, France (director : Dr Bernard Salvat). My thanks are due to Drs Salvat and Galzin for their help to organize the fieldwork and for making available the laboratory facilities of their institutes. I am also grateful to Dr Thomas E. Bowman, United States National Museum, Smithsonian Institution (USNM), Washington, for the loan of type material of *Apanthuroides fijiensis*, *Panathura collaris* and *Paranthura polynesica*.

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