

# BULLETIN

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## TWO NEW SPECIES OF *GNATHIA* LEACH FROM CORAL REEFS AT MOOREA, SOCIETY ISLANDS, WITH REDESCRIPTION OF *GNATHIA MARGARITARUM* MONOD, 1926 FROM PANAMA PACIFIC (ISOPODA: CYMOTHOIDEA: GNATHIIDAE)

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### ABSTRACT

*Gnathia cooki* n. sp. and *Gnathia galzini* n. sp. from fringing reefs at Moorea, Society Islands are described, *Gnathia margaritarum* Monod, 1926 from Panamá Pacific is redescribed. Its affinities to the other members of the genus are discussed.

### INTRODUCTION

The benthic fauna of the smaller invertebrate groups of the tropical Pacific Ocean has barely been investigated and we are still a long way from even a superficial overview.

During February-March 1988 the author carried out 6 weeks of collecting at Moorea, Society Islands, from a variety of habitats, ranging from the intertidal to depths of about 2 m. Two species of Gnathiidae were found which are new to science.

This is the first contribution to this isopod family of the Society Islands.

### MATERIAL AND METHODS

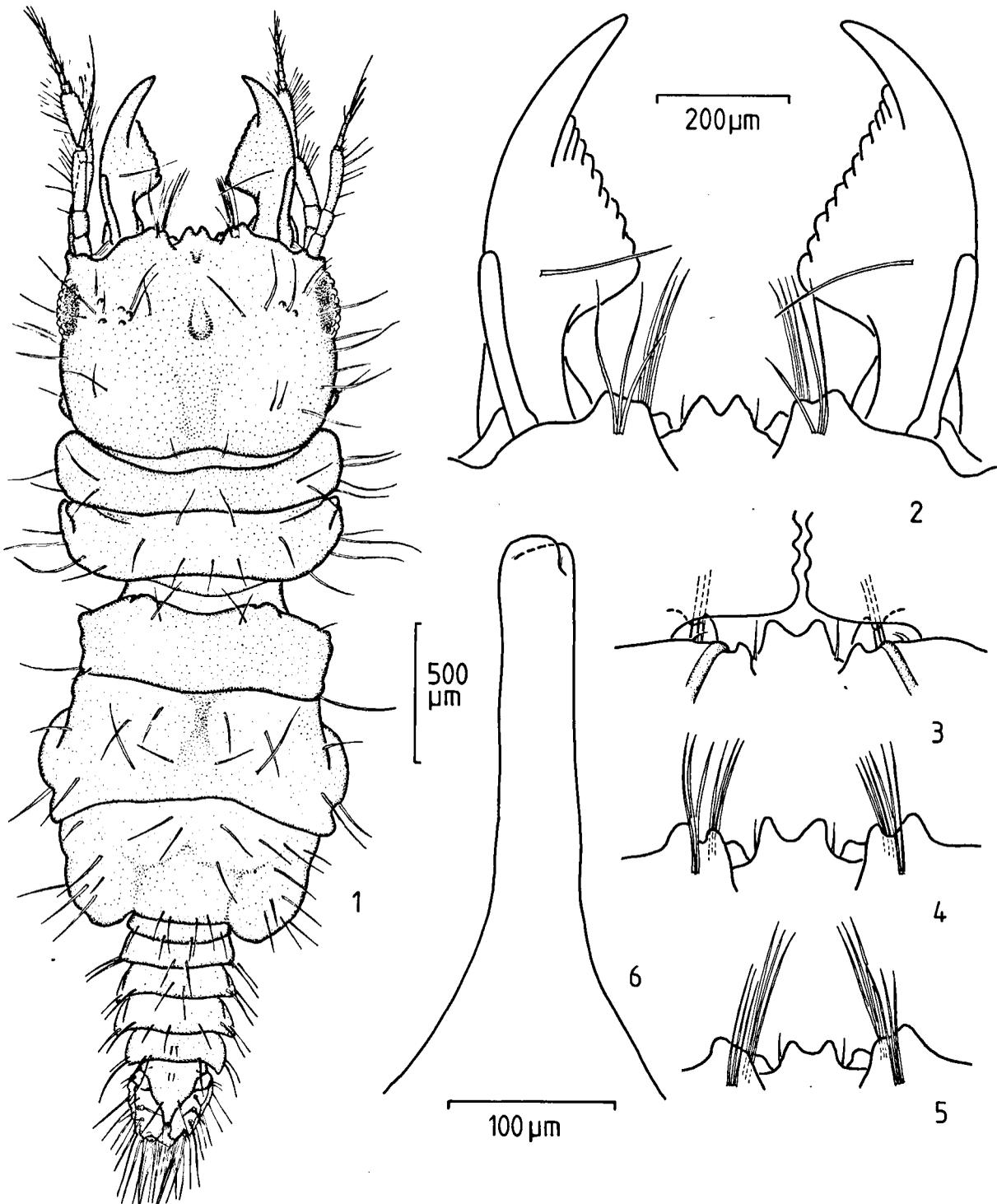
The material from Moorea was obtained by hand while skin diving, or while wading in very shallow water. The substratum was collected and transported to the laboratory in plastic barrels. After storing in 5% formalin/sea water for some hours, the samples have been washed with fresh

water over a 0.5 mm sieve and preserved in 70% ethanol.

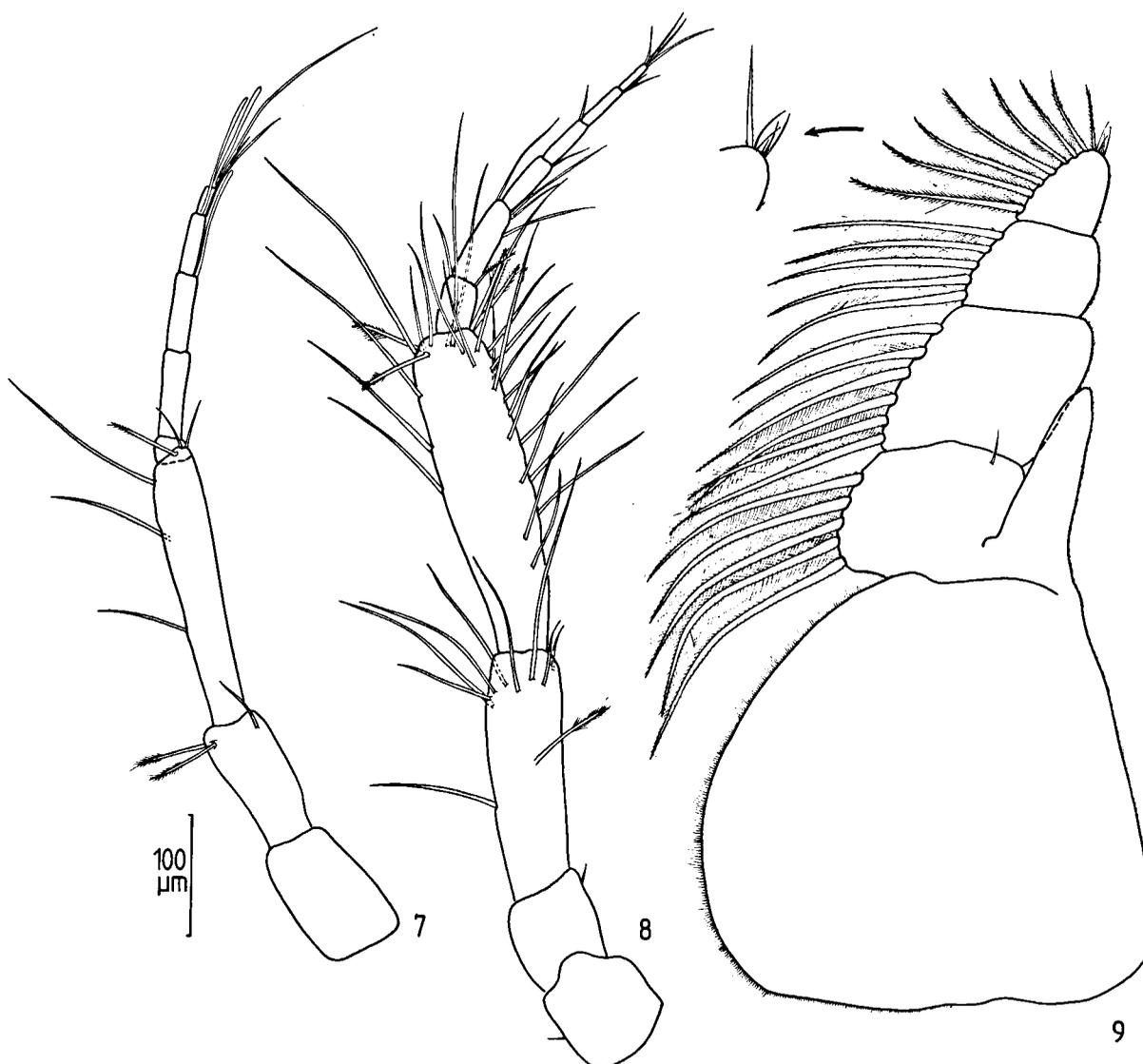
Specimens are deposited in the Senckenberg-Museum, Frankfurt a.M., Germany (SMF), Zoölogisch Museum, Amsterdam, The Netherlands (ZMA), Zoologisk Museum, Copenhagen (ZMC) and the Muséum National d'Histoire Naturelle, Paris, France (MNHN).

### ACKNOWLEDGMENTS

The research was carried out at the marine biological station Antenne Museum (Ecole Pratique des Hautes Etudes, E.P.H.E.) at Moorea, French Polynesia and the Laboratoire Biologie Marine et Malacologie, Université de Perpignan, France (director: Dr. Bernard Salvat). My thanks are due to Dr. B. Salvat for making it possible to use the facilities of the institutes in Moorea and Perpignan, also Dr. René Galzin for organizing the field work at Moorea. Dr. Torben Wolff of the Zoologisk Museum, Copenhagen made available the type material of *Gnathia coralliophila* Monod,



Figs. 1-6. *Gnathia cooki* n. sp., ♂ (Figs. 1-2 holotype, 3-16 paratype): 1, dorsal view; 2, frons and mandibles enlarged; 3 frons of other specimen, ventral view; 4, frons of fig. 3 specimen, dorsal view; 5, frons of another specimen, dorsal view; 6, penis.



Figs. 7-9. *Gnathia cooki* n. sp., ♂: 7, antenna 1; 8, antenna 2; 9, maxilliped.

1926 and *Gnathia margaritarum* Monod, 1926 for comparison. Mrs. Terry McLeary kindly revised the English text. This study was partly financed through a grant of the Hessische Graduiertenförderung (HGFöN).

***Gnathia cooki* n. sp.**  
figs. 1-16

**Holotype**

♂ (SMF 17675), Moorea, Society Islands; Cook's Bay, about 50 m south of R. Gump South Pacific Research

Station; crest of fringing reef near slope, from dead corals in 1 m, 25 March 1988.

**Paratypes**

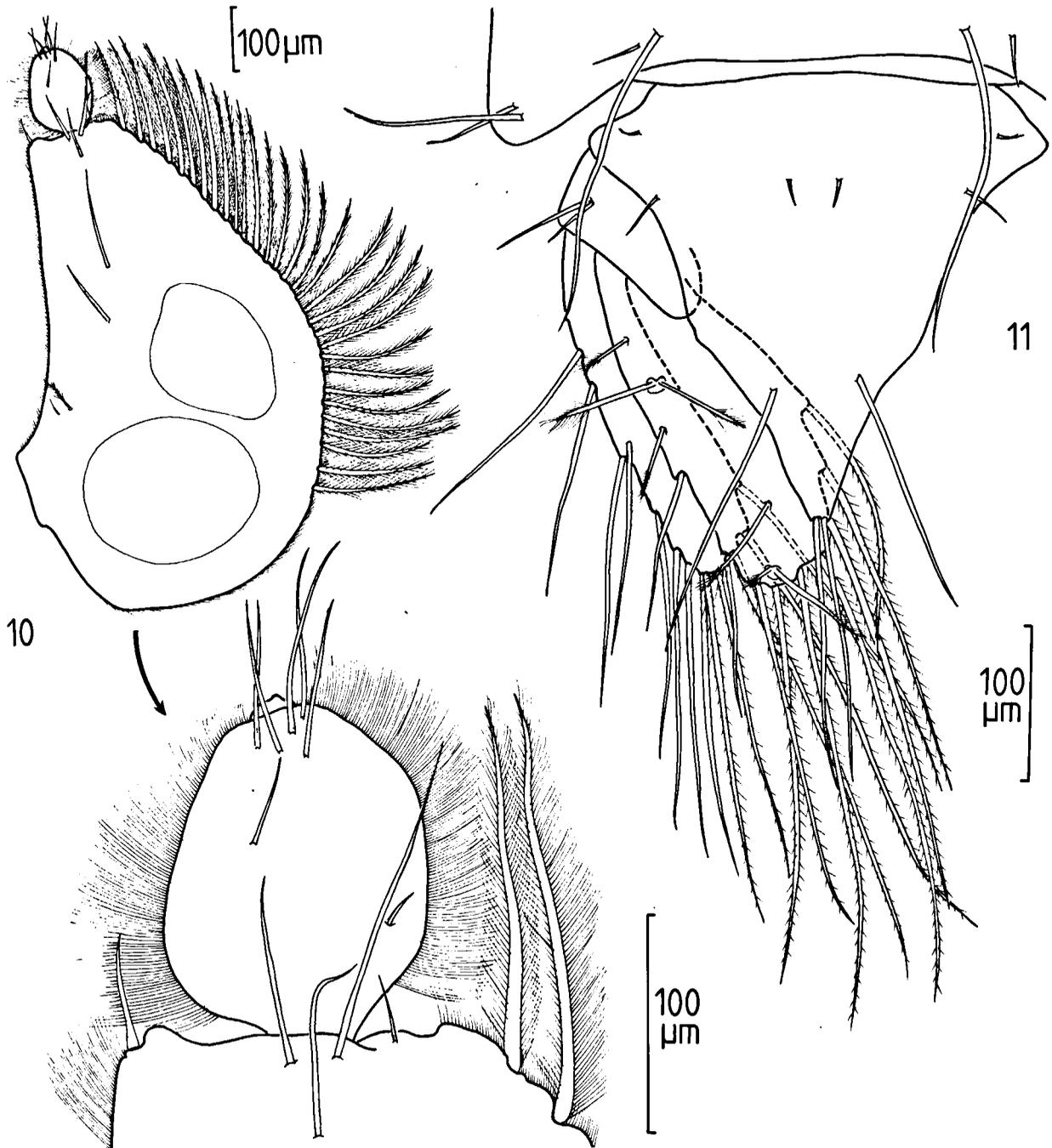
13 ♂♂ (5 ♂♂ SMF 17676, 3 ♂♂ ZMA, 3 ♂♂ MNHN, 2 ♂♂ ZMC), together with holotype.

**Diagnosis, ♂**

Characterized through the shape and setation of the projections at the frontal border of the cephalon.

**Description, ♂**

Total length 3.7 mm (holotype, frontal border of head



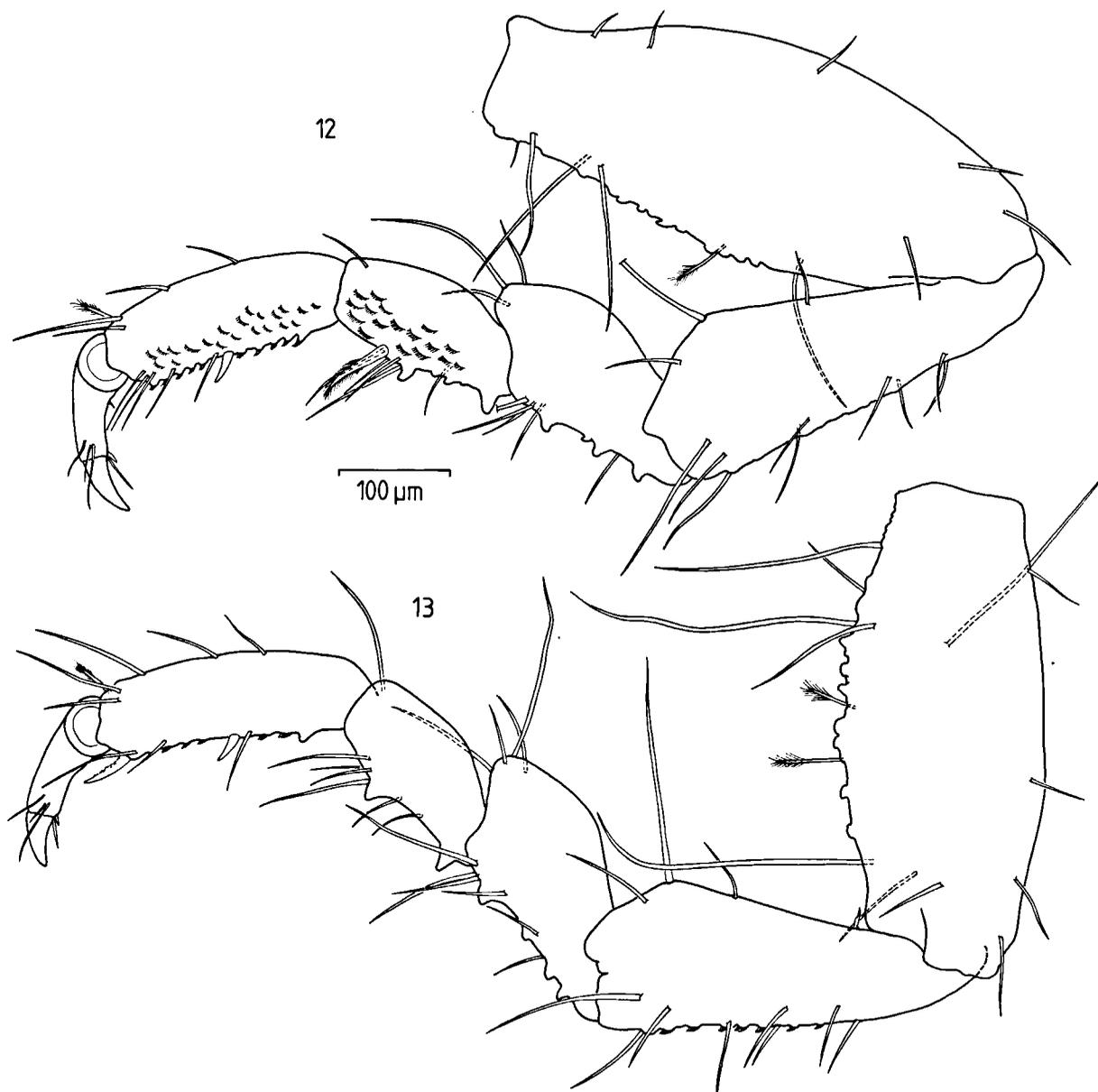
Figs. 10-11. *Gnathia cooki* n. sp., ♂: 10, pylopod; 11, tail fan.

to tip of telson), maximum width 1.1 mm (across pereonite 5).

Cephalon with some paraocular shallow tubercles, some specimens additionally with minute granules on dorsal surface of head; frontal margin with medially notched medifrontal process, somewhat variable in shape, bearing a short simple seta at both sides of its base; shallow inferior frontolateral processes without any setae; superior frontolateral processes blunt, somewhat variable in shape, with 3 long simple setae

on dorsal and ventral surface, respectively. Antero-medial surface of cephalon with shallow dorsal sulcus. Eyes large, with several small ocellae, well pigmented; cephalon dorsally and laterally with some simple setae of variable length.

Pereonite 1 very short, smooth, with lateral margins barely visible, medially with two short simple setae, pereonites 2-6 smooth, with several simple setae of variable length, all segments well defined; pereonite 7 very short, hidden beneath posterior margin of pereon-



Figs. 12-13. *Gnathia cooki* n. sp., ♂: 12, pereopod 1; 13, pereopod 2.

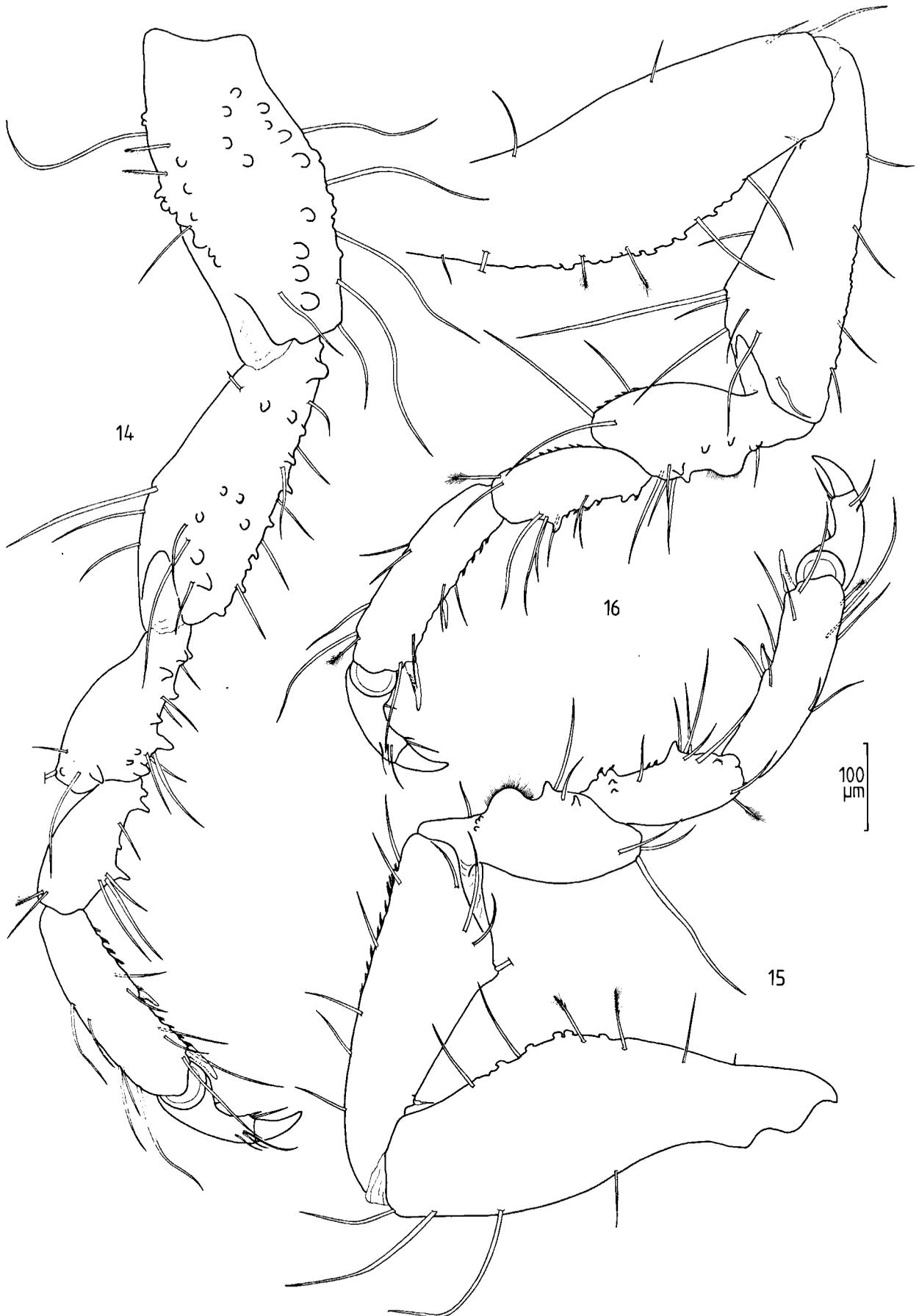
nite 6, with four simple setae; in some specimens pereonites 1-4 indurate.

Pleon straight with pleonites subequal in length, bearing short simple setae on lateral and posterior margins. Telson triangular, as long as wide, lateral margins smooth, sinuous.

Antenna 1, with 3 peduncle segments, third about the length of first and second together; flagellum of 5 segments with first very short, as long as wide; terminal three segments with aesthetasc. Antenna 2, peduncle 4-segmented, first and second segment of nearly equal length, as long as wide; third and fourth

segment elongate, with several long simple setae and some feathered sensory setae; flagellum of 6 segments.

Mandibles shorter than length of cephalon, with simple seta at inner dorsal margin; mandibular blade with shallowly rounded teeth. Maxilliped of 5 segments; large basal segment with elongate lobe at inner distal corner, just reaching distal half of third segment; 4 distal segments bearing finely fringed setae at ectal margin; second segment moreover with 1, terminal segment with 5 short simple setae distally. Pylopod of 3 segments; broad basal segment bearing



Figs. 14-16. *Gnathia cooki* n. sp., ♂: 14, pereopod 3; 15, pereopod 4; 16, pereopod 5.

finely fringed setae at convex medial margin, moreover with 1 feathered sensory seta and 8 simple setae on ventral surface near ectal and distal margin; second segment small, oval, with 7 simple setae of variable length, five of these setae near its tip; third segment greatly reduced, minute.

Pereopods 1-5 relatively long and with tubercles; pereopod 1 with strong feathered spine at ventrolateral margin of carpus; merus of pereopods 4 and 5 ventrally with conspicuous large tubercle, bearing numerous fine hairs.

Penis long and robust, basally broadened.

Uropodal exopod narrower than but subequal in length to endopod; endopod with 7 feathered sensory setae at dorsal surface.

#### Affinities

*Gnathia cooki* n. sp. seems to be closely allied to *Gnathia margaritarum* Monod, 1926 from Panamá Pacific, being very similar in its general habitus to this species.

However, the more strongly developed tubercles also on pereonites 1-3, the somewhat different shape of the mediofrontal projections of the head, the shorter telson and the presence of sparsely fringed setae covering body and pereopods of *G. margaritarum*, distinguish this species well from *G. cooki*. Because the original description of *G. margaritarum* (Monod, 1926: 435) omits several important details to characterize this species well it was found to be necessary to redescribe it in this paper.

#### Etymology

The new species is named for the Pacific explorer James Cook. It is also a noun in apposition taken from the type locality, Cook's Bay.

#### Distribution

Moorea, Society Islands.

#### *Gnathia galzini* n. sp.

figs. 17-29.

#### Holotype

♂ (SMF 17673), Moorea, Society Islands; near Afareaitu,

crest of exposed fringing reef; intertidal - 0.5 m, from dead corals, 29 March 1988.

#### Paratypes

2 ♂♂ (1♂ ZMA, 1♂ ZMC, same locality; dead corals, 0.5-1m, 25 March 1988. 1 ♂ (MNHN), together with holotype. 3 ♂♂ (2 ♂♂ SMF 17674, 1 ♂ ZMA), 2.6 km west of airport, near Maharepa, crest of barrier reef; dead corals, 0.5 m, March 1988.

#### Diagnosis. ♂

Characterized through its small size, the broadly convex and serrate frons, superior frontolateral processes with 1 ventral and dorsal simple seta, irregular pigment patches scattered on the dorsal surface of the whole body and the pleon, which is more or less downcurved.

#### Description, ♂

Total length 1.6 mm (holotype, frontal border of head to posterior margin of pleonite 5), maximum width 0.6 mm (across pereonite 5).

Cephalon with several tubercles on dorsal surface; frons broadly convex, serrate; shallow superior frontolateral processes with 1 dorsal and 1 ventral simple seta; anterior- and posteromedian surface of cephalon shallowly excavated; supraocular lobe multiply divided. Eyes relatively small with small ocellae, well pigmented. Cephalon dorsally and ventrally with several long, simple setae.

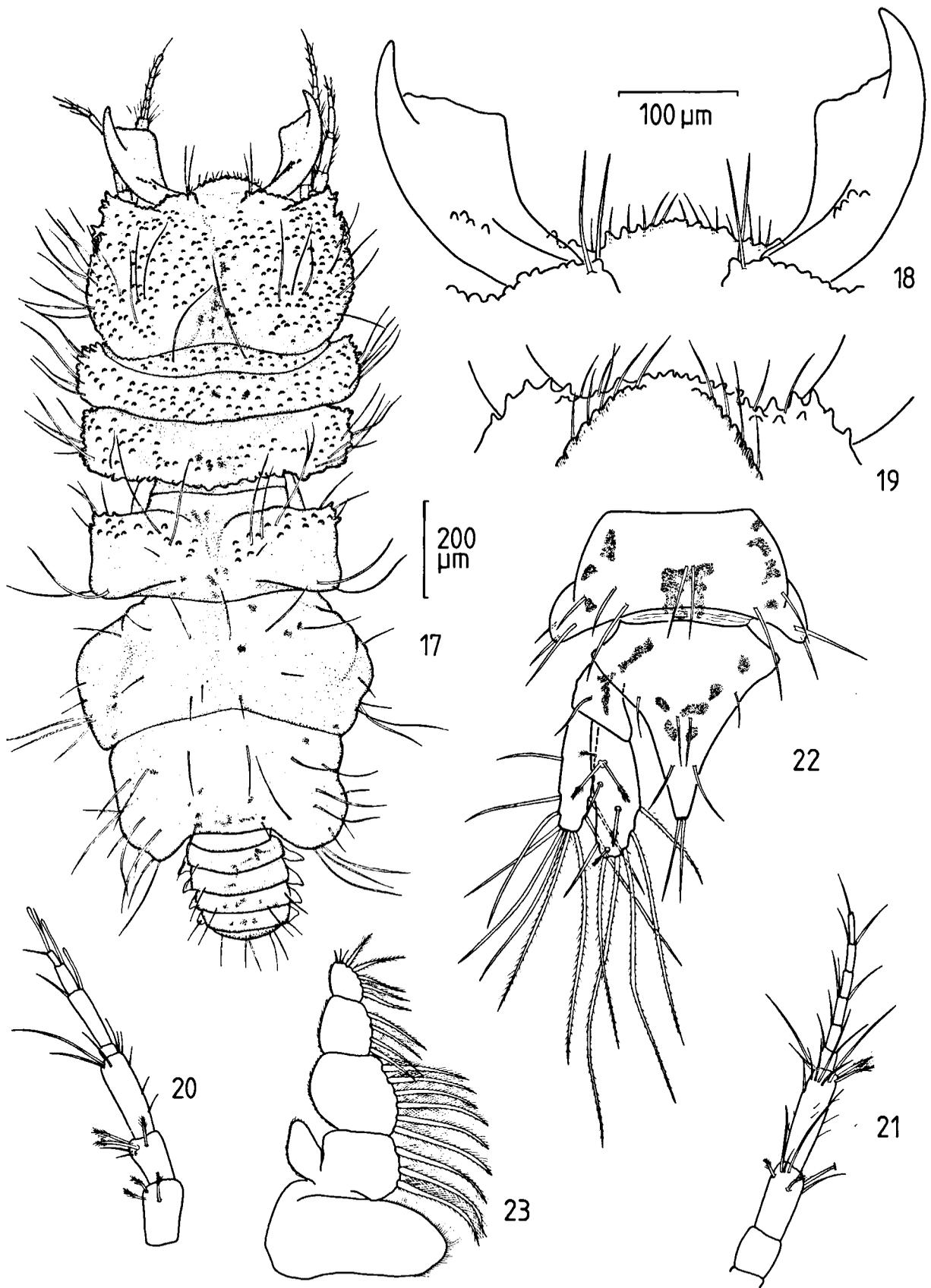
Pereonite 1 very short, with small tubercles and two long simple setae, lateral margins barely visible; pereonites 2-4 with several tubercles, pereonites 2-6 moreover with several long, simple setae; all segments well defined; pereonite 7 very short, hidden beneath posterior margin of pereonite 6.

Pleon more or less downcurved with pleonites subequal in length, bearing short simple setae on lateral and posterior margins.

Telson elongate-triangular with lateral margins concave, smooth.

Dorsal surface of whole body with irregular pigment patches.

Antenna 1, with 3 peduncle segments, third elongate; flagellum of 4 segments with first segment very short, wider than long, three terminal segments with aesthetasc. Antenna 2, peduncle 4-segmented; third



Figs. 17-23. *Gnathia galzini* n. sp., ♂ (all figs. holotype): 17, dorsal view; 18, frons, dorsal view; 19, frons, ventral view; 20, antenna 1; 21, antenna 2; 22, tail fan; 23, maxilliped.

and fourth segment longest, distally with several long, simple setae and some feathered sensory setae; flagellum of 6 segments.

Mandibles shorter than length of cephalon, basal half of inner dorsal margins with some shallow tubercles; mandibular blade smooth. Maxilliped of 5 segments; large basal segment two times wider than long with lobe at inner distal corner reaching basal half of third segment; 4 distal segments bearing finely fringed setae at ectal margin; terminal segment moreover with 3 short simple setae distally. Pylopod of 2 segments; broad basal segment bearing finely fringed setae at convex medial margin, moreover 3 simple and 1 feathered sensory setae on ventral surface near ectal and distal margin; second segment small, oval, distally with 2 minute simple setae.

Pereopods moderately slender, with simple setae of variable length and few, mostly elongate-toothlike tubercles, more conspicuously at carpus of pereopod 1 with strong leaflike and fringed spines.

Uropodal exopod narrower than but subequal in length to endopod; endopod with 6 feathered sensory setae at dorsal surface.

#### Affinities

*G. galzini* may be closely allied to *G. coralliophila* Monod, 1926 from Malaysia. However, the latter has the body covered with much shorter simple setae, the supraocular lobes are not divided and the eyes are much larger. Other distinguishing characters of both species are the shape and setation of maxilliped and pylopod.

*G. coralliophila* will be redescribed in a separate paper dealing with Malaysian Gnathiidae (Müller, in prep.).

#### Etymology

This species is named after Dr. René Galzin for his valuable help organizing my field work in French Polynesia.

#### Distribution

Moorea, Society Islands.

#### *Gnathia margaritarum* Monod, 1926 figs. 30-42.

Because of its similarity to *G. cooki* n. sp. and in order to show the differences of both species in more detail than it could be done with the original description, *G. margaritarum* is redescribed below. All material of the species deposited in the Copenhagen Zoological Museum was available for reexamination and a lectotype is designated. However, no females and Präniza-larvae have been included in this study because no evidence could be found that these specimens determined by Monod truly belong to the male *G. margaritarum*.

#### Lectotype

♂ (ZMC), Gulf of Panamá, Pontadora, Isla de las Perlas, 14-18 m; 28 January 1916, Th. Mortensen coll.

#### Paralectotypes

15 ♂♂ (ZMC), together with lectotype. 1 ♂ (ZMC), Gulf of Panamá, San José, Islas de las Perlas, 48 m; 26 January 1916, Th. Mortensen coll.

#### Diagnosis, ♂

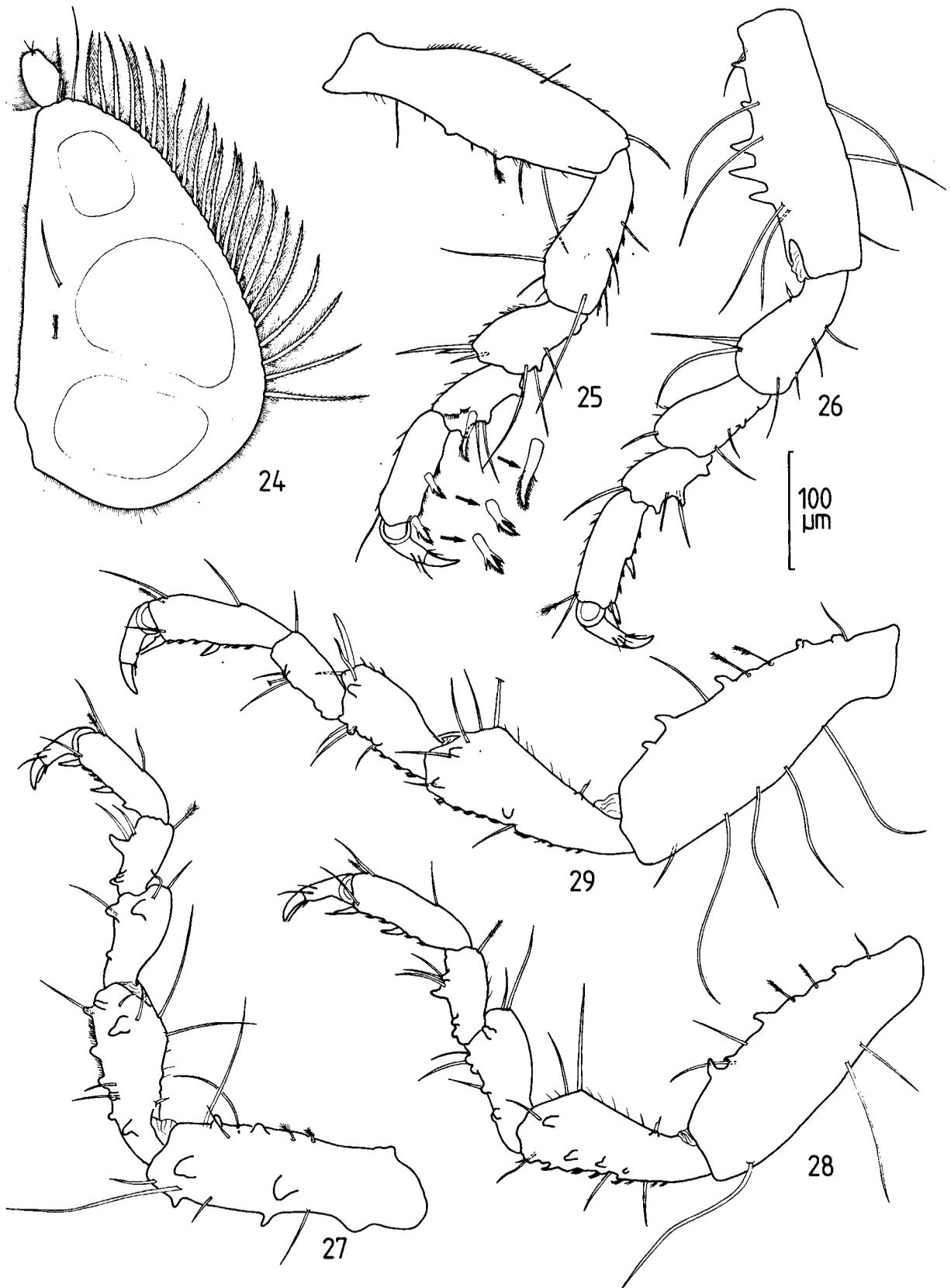
*G. margaritarum* is well characterized by the shape and setation of the frontal border of the cephalon.

#### Description, ♂

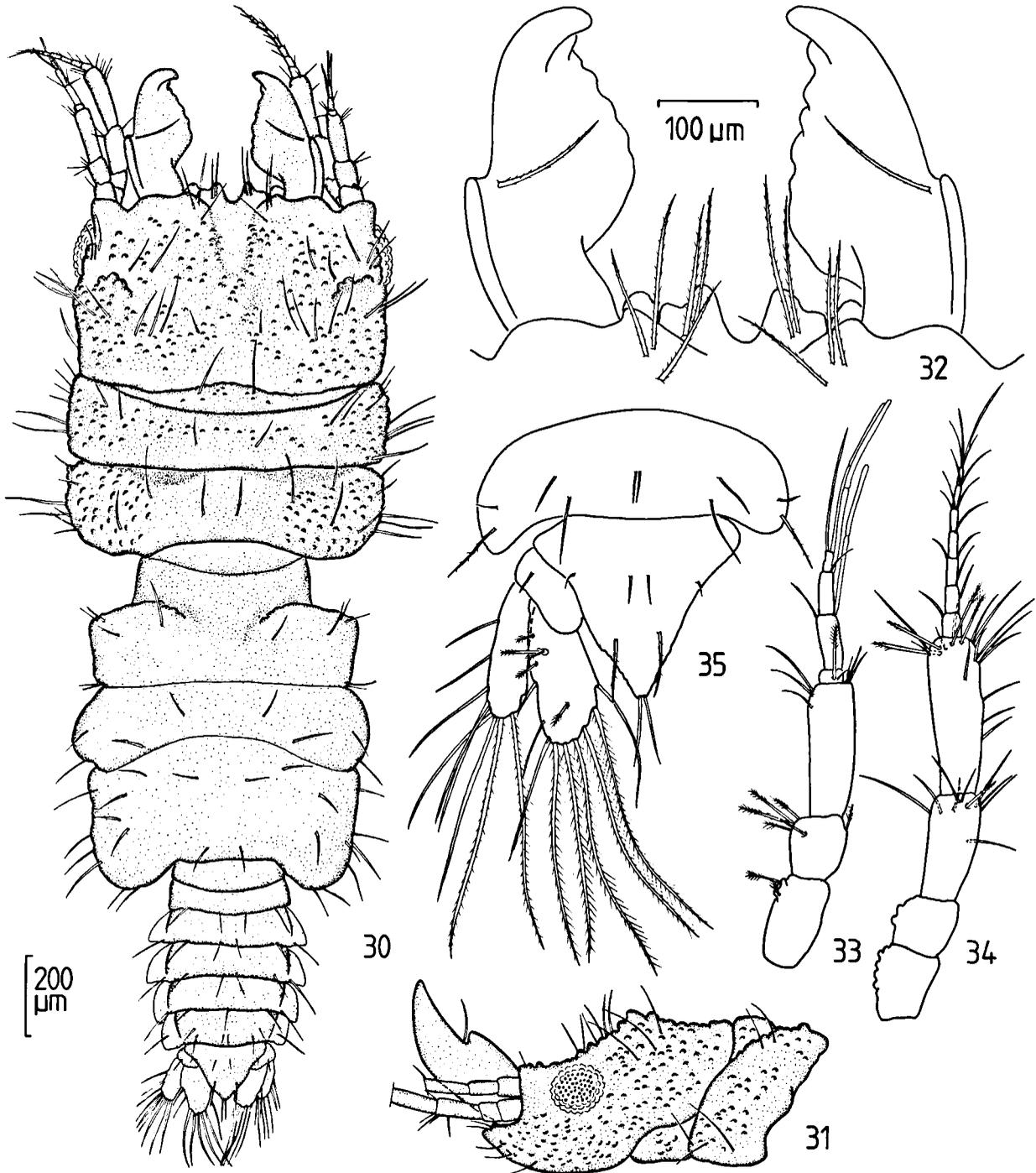
Total length 2.3 mm (Paralectotype, frontal border of head to tip of telson), maximum width 0.8 mm (across pereonite 3).

Dorsal surface of cephalon granular, with more strongly developed paraocular tubercles; frons with medially strongly notched mediofrontal process, each lobe with 2 sparsely fringed setae on dorsal surface; shallowly rounded inferior frontolateral processes without setae; shallow superior frontolateral processes with 3 sparsely fringed setae near its base; anteromedian surface of cephalon with shallow dorsal sulcus. Eyes large with several small ocellae; pigmentation barely visible, probably lost through the long time of preservation. Cephalon dorsally and laterally with some sparsely fringed setae of variable length.

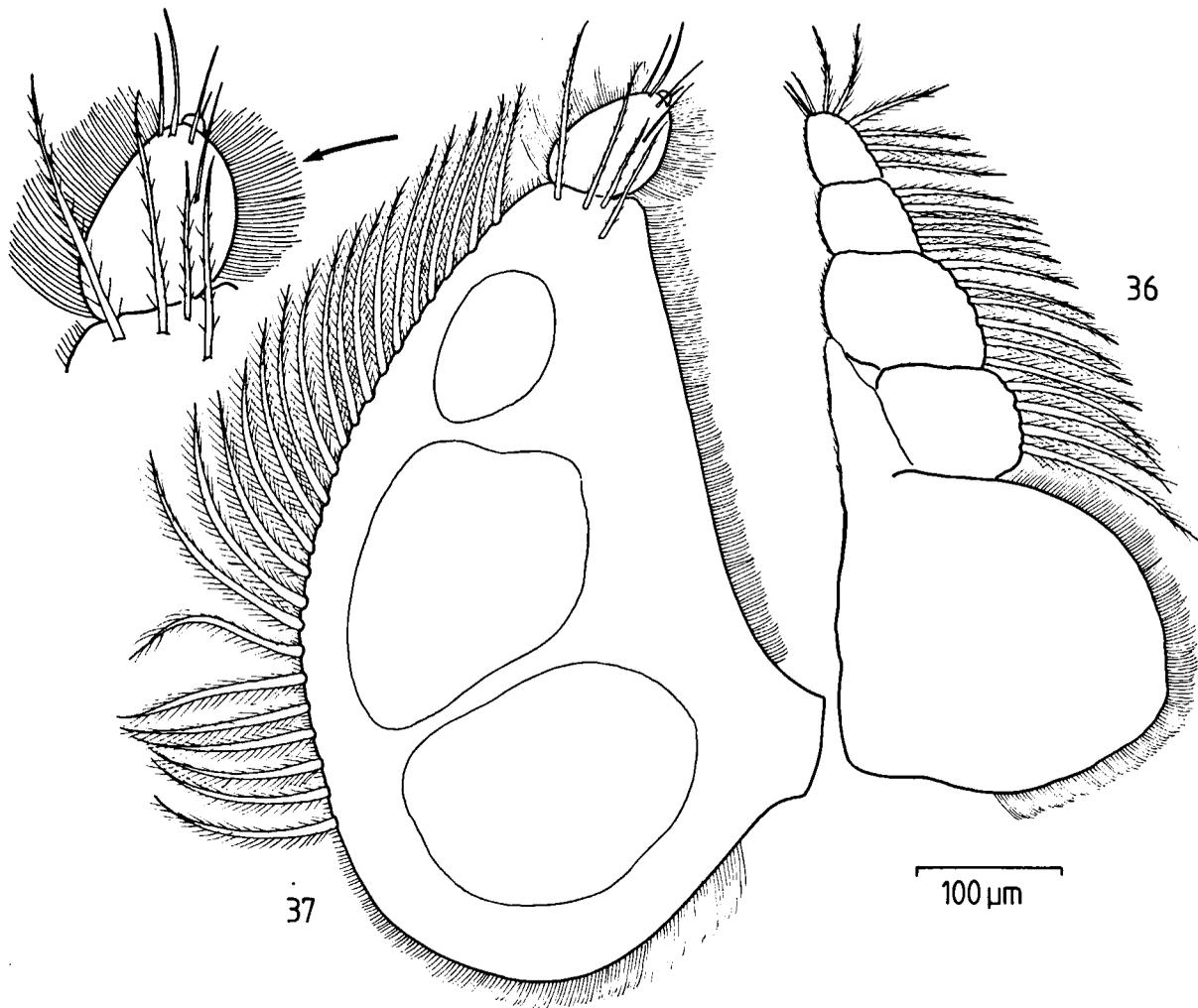
Pereonite 1 very short, granular, lateral margins not visible in dorsal view, with two setae; pereonites 2-3



Figs. 24-29. *Gnathia galzini* n. sp. ♂: 24, pylopod; 25, pereopod 1; 26, pereopod 2; 27, pereopod 3; 28, pereopod 4; 29, pereopod 5.



Figs. 30-35. *Gnathia margaritarum* Monod, 1926, ♂ (all figs. paralectotype): 30, dorsal view; 31, head and pereonites 1-2 in lateral view; 32, frons and mandibles, dorsal view; 33, antenna 1; 34, antenna 2; 35, tail fan.



Figs. 36-37. *Gnathia margaritarum* Monod, 1926, ♂: 36, maxilliped; 37, pylopod.

granular, lateral margins in particular; fourth pereonite only with anteromedian margin sparsely granular; pereonites 2-6 subequal in length, all segments well defined, with several setae of variable length; pereonite 7 very short, hidden beneath posterior margin of pereonite 6, without setae.

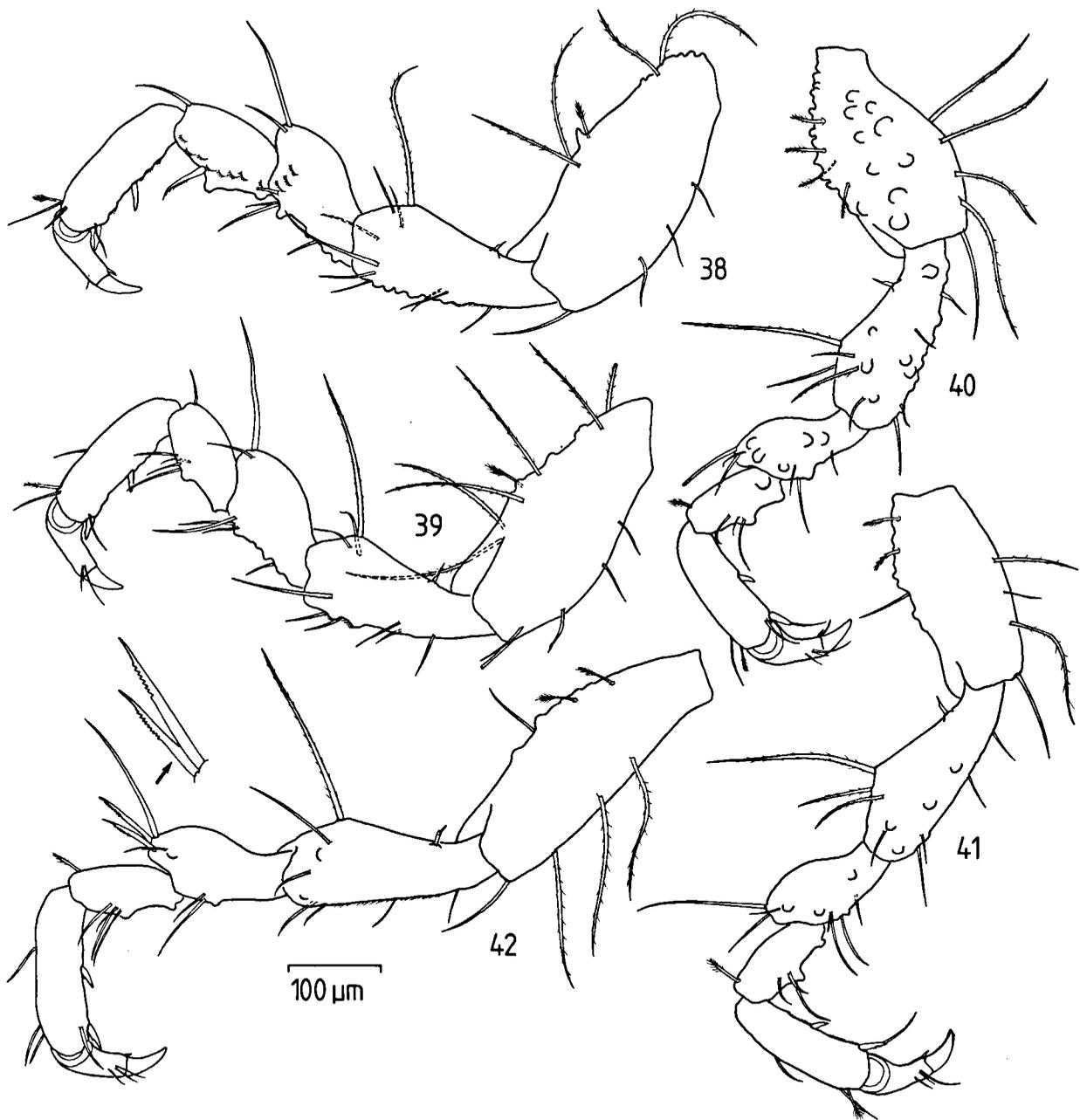
Pleon straight with pleonites subequal in length, bearing short, partly sparsely fringed setae on lateral and posterior margins.

Telson triangular, slightly wider than long, lateral margins sinuous with distal third shallowly serrate.

Antenna 1, with 3 peduncle segments, second shortest, third longest; flagellum of 4 segments, first very short, wider than long; distal three segments with aesthetasc. Antenna 2 with 4-segmented peduncle; first and second segment short, lateral margins

granular; segments 3 and 4 elongate, fourth longest, with several simple setae and some feathered sensory setae; flagellum of 7 segments.

Mandibles shorter than length of cephalon, with sparsely fringed seta at inner dorsal margin; mandibular blade with some shallowly rounded teeth. Maxilliped of 5 segments, with elongate-triangular lobe at inner distal corner, reaching basal half of third segment; 4 distal segments bearing finely fringed setae at ectal margin, terminal segment moreover with 3 short, simple setae distally. Pylopod of 3 segments; broad basal segment bearing finely fringed setae at convex medial margin, moreover ventral surface with 4 sparsely fringed setae near its distal margin; second segment small, oval, with 4 simple setae; third segment greatly reduced, with minute simple seta.



Figs. 38-42. *Gnathia margaritarum* Monod, 1926, ♂: 38, pereopod 1; 39, pereopod 2; 40, pereopod 3; 41, pereopod 4; 42, pereopod 5.

Pereopods robust, with several simple and sparsely fringed setae; pereopods 3-4 with several lateral tubercles, in particular; merus of pereopod 5 with 2 conspicuous strong setae having the distal half serrate.

Uropodal exopod narrower than but subequal in length to endopod; endopod with 6 feathered sensory setae at dorsal surface.

#### Affinities

*G. margaritarum* resembles closely *G. cooki* n. sp. (see chapter affinities of this species) and *Gnathia beethoveni* Paul & Menzies, 1971 from the Caribbean coast of Colombia and Venezuela (Müller, 1988). It can be distinguished from the latter through the shape of the projections of the frons, its smooth surface and the lack of sparsely fringed setae on head,

pereonites and pereopods.

#### Distribution

Pacific coast of Panamá.

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