

# Reef lobsters *Enoplometopus* A. Milne Edwards, 1862 from French Polynesia, with a brief revision of the genus (Crustacea, Decapoda, Enoplometopidae)

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## ABSTRACT

Three reef lobsters of the genus *Enoplometopus* A. Milne Edwards, 1862 are recorded around the French Polynesian islands at depths of 80-300 m: *E. crosnieri* Chan & Yu, 1998, *E. gracilipes* de Saint Laurent, 1988 and *E. holthuisi* Gordon, 1968. A complete description and illustrations are provided for the first time for *E. gracilipes*. Four other species, deposited in the collections of the Muséum national d'Histoire naturelle, Paris, have also been re-examined: *E. antillensis* Lütken, 1865, *E. occidentalis* (Randall, 1840), *E. callistus* Intès & Le Loeuff, 1970, and *E. debelius* Holthuis, 1983. A brief revision of the genus is proposed. The subgenera *Enoplometopus* A. Milne Edwards, 1862 and *Hoplometopus* Holthuis, 1983 are not considered as valid taxa. An updated key to the 11 species of the genus is proposed based on the position of spines on the carapace, aspect of the chela (narrow or wide), aspect of upper and lower faces of palm, position (or absence) of spines on outer margin of dactyl of chela, aspect of abdominal pleura, presence or absence of spines on posterior margin of sixth abdominal tergite, position of spines on telson and coloration.

## KEY WORDS

Crustacea,  
Decapoda,  
Enoplometopidae,  
*Enoplometopus*,  
lobster,  
reef,  
French Polynesia.

## RÉSUMÉ

*Langoustes récifales* *Enoplometopus* A. Milne Edwards, 1862 de Polynésie française, avec une brève révision du genre (Crustacea, Decapoda, Enoplometopidae). Trois langoustes récifales du genre *Enoplometopus* A. Milne Edwards, 1862 sont reconnues autour des îles de Polynésie française, entre 80 et 300 m de profondeur : *E. crosnieri* Chan & Yu, 1998, *E. gracilipes* de Saint Laurent, 1988, et *E. holthuisi* Gordon, 1968. Une description complète et des illustrations sont données pour la première fois pour *E. gracilipes*. Quatre autres espèces des collections du Muséum national d'Histoire naturelle, Paris, ont également été réexaminées : *E. antillensis* Lütken, 1865, *E. occidentalis* (Randall, 1840), *E. callistus* Intès & Le Loeuff, 1970, et *E. debelius* Holthuis, 1983. Une brève révision du genre est proposée. Les sous-genres *Enoplometopus* A. Milne Edwards, 1862 et *Hoplometopus* Holthuis, 1983 ne sont pas considérés comme des taxa valides. Une clé de détermination à jour est proposée pour les 11 espèces du genre, basée sur la disposition des épines de la carapace, l'aspect de la pince (étroite ou large), l'aspect des faces dorsale et ventrale de la paume, la disposition (ou l'absence) des épines sur le bord externe du dactyle de la pince, l'aspect des pleurites abdominaux, la présence ou l'absence d'épines sur le bord postérieur du sixième tergite abdominal, la disposition des épines sur le telson et la coloration.

## MOTS CLÉS

Crustacea,  
Decapoda,  
Enoplometopidae,  
*Enoplometopus*,  
langouste,  
récif,  
Polynésie française.

## INTRODUCTION

This work is a new contribution to the studies of the crustacean collections made during the scientific expeditions of the Fishing research vessel *Marara* in French Polynesia (Poupin & Bénard 1996). Among the decapods there was a set of small and colorful reef lobsters of the genus *Enoplometopus*. This genus was created in 1862 by A. Milne Edwards for *Enoplometopus pictus* described from the West Indian Ocean. Although traditionally placed within the Nephropidae Dana, 1852, it was included for some years within the Axiidae Huxley, 1879 (Holthuis 1974) until de Saint Laurent (1988) created for it the new family Enoplometopidae. At present 11 species are known in the genus: two from the Atlantic, *E. antillensis* Lütken, 1865 and *E. callistus* Intès & Le Loeuff, 1970; and nine from the Indo-west Pacific, *E. chacei* Kensley & Child, 1986, *E. crosnieri* Chan & Yu, 1998, *E. daumi* Holthuis, 1983, *E. debelius* Holthuis, 1983, *E. gracilipes* de Saint Laurent, 1988, *E. holthuisi* Gordon, 1968, *E. occidentalis* (Randall,

1840), *E. pictus* A. Milne Edwards, 1862, and *E. voigtmanni* Türkay, 1989.

The specimens collected around the French Polynesian islands are referable to three different species. The first one, *Enoplometopus crosnieri*, originally described from Taiwan, is represented by 10 specimens. The second one, *E. gracilipes*, formerly known only by a short diagnose made by de Saint Laurent (1988), is represented by 15 specimens that are used herein to fully describe and illustrate the species. The third one is represented by a single specimen attributed to *E. holthuisi* Gordon, 1968, despite the unusual shape of its chelae.

In order to elaborate an up-to-date key of determination for the 11 species of the genus, all the *Enoplometopus* lobsters deposited in the Muséum national d'Histoire naturelle, Paris, have been re-examined. They are: *E. antillensis*, *E. callistus*, *E. debelius*, and *E. occidentalis*. Additionally, remarks are made for *E. pictus*.

## ABBREVIATIONS

bl body length, from tip of rostrum to posterior margin of telson;

- cl carapace length, from postorbital margin to posterior margin of carapace;  
 CP beam trawl;  
 coll. collector of specimens;  
 det. determiner;  
 Frv Fishing research vessel;  
 MNHN Muséum national d'Histoire naturelle, Paris;  
 NTM Northern Territory Museum, Darwin;  
 ovig. ovigerous;  
 P2, P3 second and third pereopods;  
 stn station;  
 ZMA Zoölogisch Museum, Amsterdam.

## MATERIAL AND METHODS

The 26 Polynesian lobsters were collected during the scientific expeditions of the Frv *Marara* within the Exclusive Economic Zone of French Polynesia, between 1987 and 1997. Full details about the fishing operations and the devices used are given in Poupin *et al.* (1990). Out of about 500 fishing stations carried out between 22-1050 m (Poupin & Bénard 1996), *Enoplometopus* lobsters were found only in one tenth of them, between 80-300 m, always on hard rocky bottoms. A single specimen, of which only remains of chelae have been collected, was caught around the Marquesas Islands during the 1997 MUSORSTOM 9 cruise (Richer de Forges *et al.* 1999). Specimens from other localities were found in MNHN.

The designation of the spines on the carapace follows the work by Holthuis (1946), as illustrated on Figure 1. Elaboration of the key has been facilitated by using the DELTA and INTKEY programs (Dallwitz *et al.* 1993, 1995).

## SYSTEMATICS

- Order DECAPODA Latreille, 1802  
 Suborder PLEOCYEMATA Burkenroad, 1963  
 Infraorder ASTACIDEA Latreille, 1802  
 Superfamily ENOPLOMETOPOIDEA  
 de Saint Laurent, 1988  
 Family ENOPLOMETOPIDAE  
 de Saint Laurent, 1988

Genus *Enoplometopus* A. Milne Edwards, 1862

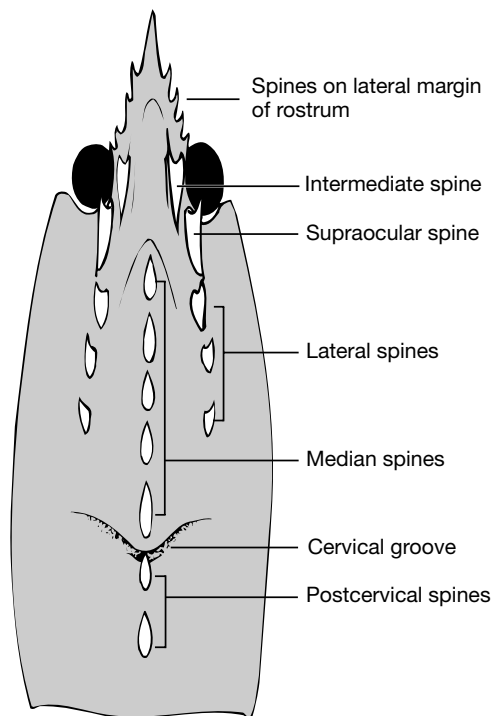


FIG. 1. — Designation of spines on the carapace of *Enoplometopus* A. Milne Edwards, 1862, adapted from Holthuis (1946).

## FRENCH POLYNESIAN SPECIES

*Enoplometopus crosnieri* Chan & Yu, 1998  
 (Figs 2; 3)

*Enoplometopus crosnieri* Chan & Yu, 1998: 184 (type locality: Keelung, northern Taiwan).

*Enoplometopus* sp. nov. — Poupin *et al.* 1990: 16 (French Polynesia). — Poupin 1996a: 12 (Hiva Oa, Ua Pou; 100-120 m); 1996b: 8; 1998: 37 (checklists).

**MATERIAL EXAMINED.** — **French Polynesia.** Marquesas Islands, Ua Pou, Frv *Marara*, stn 288, 9°20.5'S, 140°02.0'W, trap 120 m, 28.VIII.1990, 1 ♂ cl 45 mm, bl 131 mm, 4 ♀♀ ovig. cl 35-43 mm, bl 106-128 mm (MNHN As 570), 2 ♂♂ cl 40-47 mm, bl 120-142 mm, 2 ♀♀ ovig. cl 41-46 mm, bl 124-134 mm (MNHN As 571). — Hiva Oa, MUSORSTOM 9, Frv *Alis*, stn CP 1227, 9°44.2'S, 138°52.5'W, 84-85 m, 30.VIII.1997, remains of chelae only (MNHN As 616). — Hiva Oa, Frv *Marara*, stn 193, 9°49.7'S, 139°09.1'W, 9.IX.1989, trap 100 m, 1 ♂ cl 39 mm, bl 116 mm (MNHN As 560).

**Australia.** Timor Sea, near Darwin, coll. NT Fisheries, 10°18'S, 129°52'E, trap 91.5 m, 10.X.1992, 1 ♂ cl 40 mm, bl 118 mm (NTM Cr009567).

**DISTRIBUTION.** — West and central Pacific: Taiwan (Keelung), Australia (Timor sea), French Polynesia (Marquesas Islands: Hiva Oa, Ua Pou). Depths: 84–120 m. On hard bottoms.

#### SHORT DESCRIPTION

Lateral margin of rostrum with two spines. Carapace armed with six median, one postcervical, one intermediate, one supraocular, and two lateral spines (Fig. 3A). Chela broad and compressed 3.0–3.7 times as long as wide (average 3.3), furnished with long setae on margins. Upper and lower faces with several rows of tubercles. Outer margin of palm and fixed finger with 16–20 spines, upwardly directed. Inner margin of palm with five or six main spines and secondary smaller spines at bases. Dactyl 0.5 times as long as chela, with inwardly curved tips; cutting edge with five or eight larger teeth, forwardly directed, and smaller denticulations in between; outer margin with seven to nine spines (Fig. 3C).

Second pereopod circular in cross section, with small distal pincer. Merus and carpus with or without distoventral spine. Distal margin of propodus with a ventral process bearing a row of small corneous spines on its upper margin and two mobile spines, distally (Fig. 3D). Dactyl 0.3 times as long as propodus, with strong distal claw; outer face with two spines; inner face with one spine; lower margin with row of tiny spines. Third and fourth pereopods shorter than P2, with terminal pincers reduced. Fifth pereopod the shortest, without terminal pincer.

Pleura of abdominal somites II–IV and VI bluntly pointed; pleuron of somite V rounded (Fig. 3B). Male first pleopod subrectangular, fitted in V-shaped hollow formed by thoracic sternite VII; distal margin straight, without distal indentation (Fig. 3F). Telson with one lateral spine and three distolateral spines, inner pair longest (Fig. 3E).

#### Coloration (Fig. 2)

Ground color of body orange red. Lateral face of carapace with large white circle in distal half, and

two white oblique lines, posteriorly. Ambulatory legs orange with narrow white bands on basis, ischia and meri, uniformly yellow orange on carpi, propodi and dactyls. Abdomen with red blotches and white spots as illustrated in Figure 2.

#### REMARKS

Although there are usually six median spines in *Enoplometopus crosnieri*, it has been observed that the anteriormost spine was reduced to a granule on five specimens examined out of 11 (see Fig. 3A). The posteriormost median spine is situated on the cervical groove, as also observed in *E. callistus*. To avoid misidentification when using a key, it must not be counted as a “postcervical” spine (see Remarks under *E. callistus*). The tubercles situated on the upper face of the palm of the chela can be greatly reduced in the smallest specimens (cl < 40 mm), the aspect of the upper face of chela being then almost smooth whereas it is typically tuberculate in larger specimens.

Within the six *Enoplometopus* species that have a large chela with tubercles on the upper face, and abdominal pleura II–V rounded or bluntly pointed (*E. chacei*, *E. crosnieri*, *E. daumi*, *E. debelius*, *E. occidentalis*, *E. pictus*), only *E. crosnieri* possesses a large white circle on the lateral face of the carapace and it is therefore easy to recognize in living specimens. It can be morphologically recognized by the armament of the carapace, with two lateral, one intermediate, and six median spines, whereas the five other species have three lateral, two intermediate, and four or five median spines. *Enoplometopus crosnieri* also differs from *E. chacei*, *E. daumi*, *E. debelius*, and *E. occidentalis* by the aspect of the outer margin of dactyl of chela, which has seven to nine spines along its whole length, whereas there are only two or three distal spines in the four other species.

#### *Enoplometopus gracilipes*

(de Saint Laurent, 1988)

(Figs 4; 5)

*Hoplometopus gracilipes* de Saint Laurent, 1988: 62 (type locality: Moruroa atoll, Tuamotu; paratype from Loyalty Islands).



FIG. 2. — *Enoplometopus crosnieri* Chan & Yu, 1998, ovig. ♀ cl 41 mm, Marquesas Islands (MNHN As 571); **A**, lateral view; **B**, dorsal view.

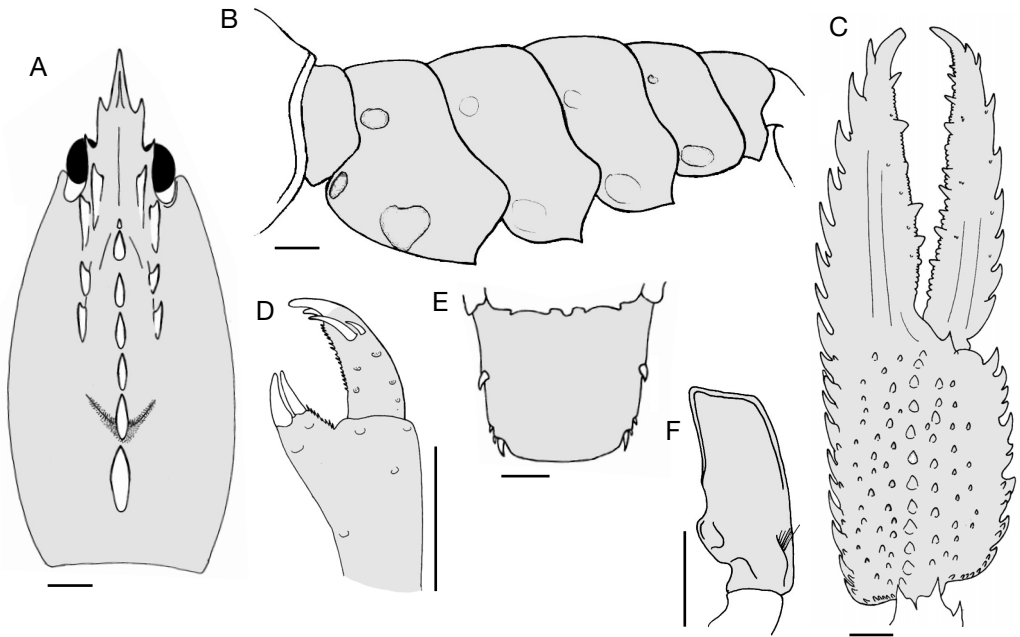


FIG. 3. — *Enoplometopus crosnieri* Chan & Yu, 1998, ovig. ♀ cl 41 mm, Marquesas Islands (MNHN As 571); **A**, carapace, dorsal view; **B**, abdomen, lateral view; **C**, left chela, dorsal view; **D**, dactyl and distal part of propodus of left second pereopod, outer view; **E**, posterior margin of tergite 6 and telson, dorsal view, ♂ cl 47 mm, Marquesas Islands (MNHN As 571), **F**, right first pleopod, outer view (setae omitted). Scale bars: 5 mm.

*Hoplometopus gracilipes* – Poupin *et al.* 1990: 16 (French Polynesia). — Poupin & Richer de Forges 1991: 211 (French Polynesia). — Poupin 1996a: 14 (French Polynesia); 1996b: 95 (checklist).

*Enoplometopus gracilipes* – Chan 1998: 998 (western Pacific). — Chan & Yu 1998: 190 (key).

?*Enoplometopus gracilipes* (provisional determination according to illustration only; see Remarks) – Anonymous 1973: unnumbered plate (Japan). — Miyake 1983: 106 (Japan).

**MATERIAL EXAMINED.** — **French Polynesia.** Australs Islands, Rurutu, Frv *Marara*, stn 147, 22°27.3'S, 151°23.1'W, trap 280 m, 9.III.1989, 5 ♂♂ cl 52-60 mm, bl 161-182 mm, 2 ♀♀ cl 50-54 mm, bl 154-160 mm (MNHN As 548, in two vials); stn 423, 22°29.3'S, 151°21.6'W, trap 80 m, 10.VIII.1991, 1 ♂ cl 40 mm, bl 117 mm, 1 ♀ cl 42 mm, bl 121 mm (MNHN As 626). — Tuamotu Islands, Moruroa, Frv *Marara*, stn unknown, trap 250-300 m, 1987, 1 ♂ holotype cl 53 mm, bl 160 mm (MNHN As 544); Frv *Marara*, stn 210, 21°46.9'S, 138°55.4'W, trap 210 m, 30.XI.1989, 3 ♂♂ cl 46-53 mm, bl 139-159 mm (MNHN As 622); stn 207, 21°46.8'S, 138°52.1'W, trap 200 m, 28.XI.1989, 1 ♂ cl 43 mm, bl 134 mm (MNHN As 623).

**New Caledonia.** Loyalty Islands, stn PR1-R3, trap 200 m, VI.1977, coll. A. Intès, 1 ♂ paratype cl 44 mm, bl 133 mm (MNHN As 531).

**DISTRIBUTION.** — West and central Pacific: ?Japan, New Caledonia (Loyalty Islands), French Polynesia (Austral Islands: Rimatara, Rurutu, Tubai; Society Islands: Bora Bora, Tahiti, Tupai; Tuamotu Islands: Fangataufa, Moruroa). Depths: 80-300 m, usually deeper than 100 m. On hard bottoms.

#### DESCRIPTION

Rostrum slightly overreaching spine of scaphocerite, triangular in dorsal view, dorsally depressed, with four spines on lateral margin. Carapace bearing fine tomentum on gastric area, armed with five median, two postcervical, one intermediate, one supraocular, and three lateral spines; lateral face with one branchiostegal plus two to four additional small spines (Fig. 5A).

Antennular peduncle with basal segment as long as median and distal segments together; distal segment with two terminal flagella, inner longer than outer. Basal segment of antennal peduncle



FIG. 4. — *Enoplometopus gracilipes* de Saint Laurent, 1988, Tuamotu Islands, Moruroa atoll, 200 m; **A**, lateral view; **B**, dorsal view.

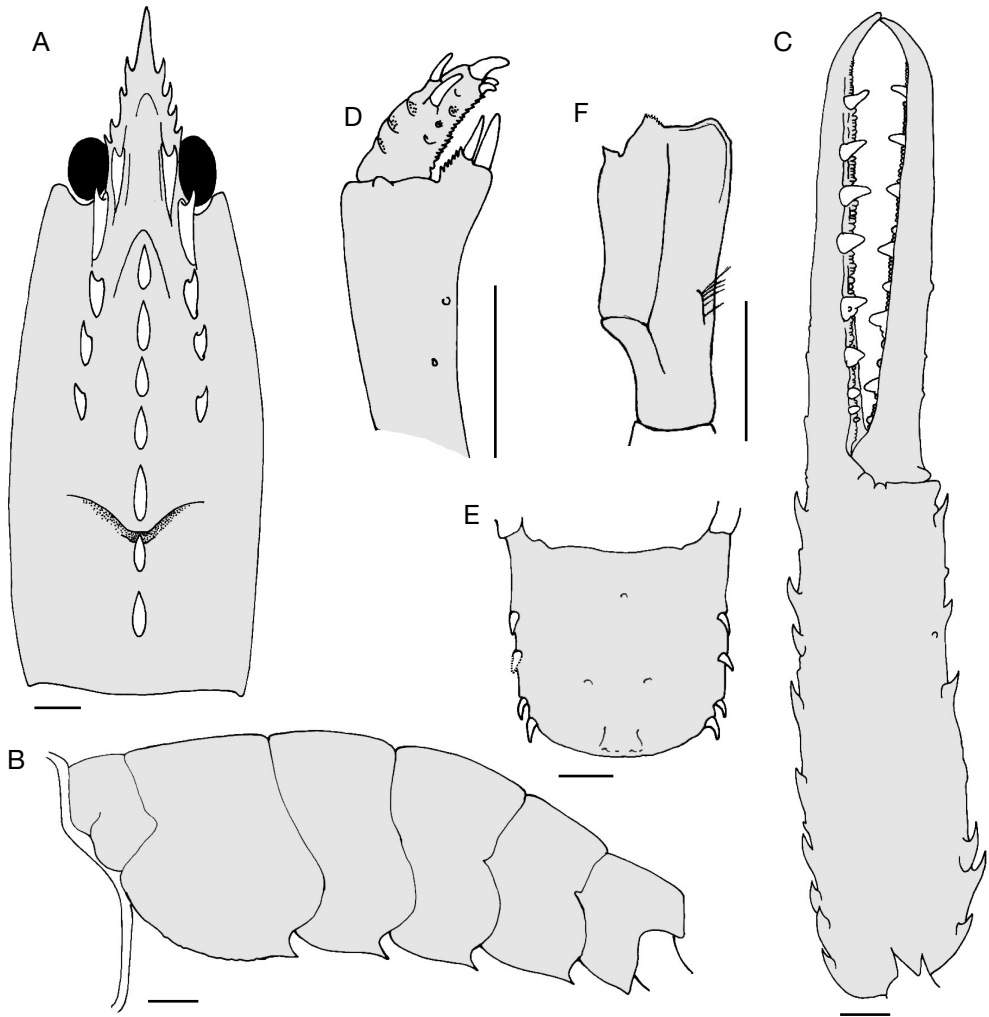


FIG. 5. — *Enoplometopus gracilipes* de Saint Laurent, 1988, holotype ♂ cl 53 mm, Tuamotu Islands (MNHN As 544); **A**, carapace, dorsal view; **B**, abdomen, lateral view; **C**, left chela, dorsal view; **D**, dactyl and distal part of propodus of right second pereopod, outer view; **E**, posterior margin of tergite 6 and telson, dorsal view; **F**, right first pleopod, outer view (setae omitted). Scale bars: 5 mm.

with antennal gland on ventral face and seven or eight spines on anterior margin, inner and outer ones large; second segment with one distolateral spine; third segment with rounded distal process armed with one subdistal spine (occasionally missing); fourth and fifth segments subequal and unarmed; flagellum long, overreaching tip of chelipeds. Outer margin of antennal scaphocerite straight with one strong distal spine; inner margin distally curved, furnished with plumose setae;

upper face with deep groove, parallel to outer margin.

Third maxilliped almost reaching to distal margin of carpus of cheliped. Basis with one distoventral spine. Ischium triangular in cross section, with one strong distodorsal spine; ventral outer margin furnished with long setae and armed with one or two distal spines; ventral inner margin with comblike *crista dentata* made of about 20 spines of irregular size; merus triangular in cross



section, with one distodorsal spine; ventral outer margin with three to six spines on distal two thirds, increasing in size anteriorly; ventral inner margin with setae. Carpus with one distolateral spine. Propodus and dactyl with ventral faces flattened, bearing long setae on margins.

Cheliped much longer than ambulatory legs. Ischium compressed, with one distodorsal spine; ventral margin with five to seven spines, increasing in size anteriorly. Merus compressed; dorsal margin with main row of six or seven spines and short row of two or three outer spines, distally; anterior margin with two dorsal spines, one spine on inner and outer articular condyles, and one ventral spine; ventral face with eight or nine spines on outer margin and six or seven spines on inner margin; Carpus with four spines on dorsal face; anterior margin with four dorsal spines, one or two small outer spines, one strong inner spine and one strong ventral spine. Chela very long, 5.6-7.6 times as long as wide (average 6.5); palm ovate in cross section, smooth on upper and lower faces; outer margin with nine to 12 spines; inner margin with six to nine spines. Fingers long and slender, 0.5 times as long as chela, with sharp, inwardly curved tips; cutting edges straight, with six to eight main teeth and minute denticulation in between; outer margins unarmed, with few sparse setae (Fig. 5C).

Second pereopod slender, subchelate, reaching to proximal fourth of chela, rounded in cross section; upper and lower margins with few long setae. Merus with one distolateral spine. Carpus 0.4 times as long as merus, armed with one distoventral spine. Propodus as long as merus, with distoventral process bearing five to eight tiny spines on upper margin, and two mobile spines distally. Dactyl short, 0.20 times as long as propodus, terminated by strong distal claw; lower margin armed with 25-30 tiny spines plus two subdistal corneous spines; distodorsal margin with one mobile spine; distal outer face with one mobile spine (Fig. 5D). Third pereopod with one distoventral spine on merus. Carpus unarmed. Propodus with distoventral process reduced, bearing two or three tiny spines on dorsal margin and two mobile spines distally. Dactyl with strong

terminal claw, three or four mobile spines disposed on outer and inner faces; ventral margin with 10-13 tiny spines and one corneous spine distally. Fourth pereopod similar to P3; distoventral process of propodus reduced, with three or four mobile spines distally. Pereopod 5 shortest, without terminal pincer. Merus and carpus without spines. Propodus with six to eight small spines at distoventral angle. Dactyl with five or six mobile spines disposed on inner and outer faces; proximal half with ventral process armed with row of minute spines.

Thoracic sternite V of male with two anterior and two posterior spines; lateral margin with zero or one spine. Sternite VI with two anterior and two posterior spines; anterolateral margin with three to six tubercles or spines; posterolateral margin with zero or one spine. Sternite VII as a deep V-shaped hollow, with two anterior spines or granules and two stronger posterior spines, forwardly curved; anterolateral margin with three or four spines or tubercles; posterolateral margin with one or two spines or tubercles. In female, seminal receptacle on sternite VII with median slit covered by transverse setae.

Abdomen smooth, with few long setae on tergites V-VI. Pleuron of abdominal somite I narrow, overlapped by pleuron of somite II. Pleura of somites II-V with sharp tooth, posteriorly curved (Fig. 5B). Pleuron of somite VI with blunt tooth. Posterior margin of tergite VI unarmed (Fig. 5E). Male first pleopod as an uniramous rigid blade, indented distally as illustrated on Figure 5E. Second pleopod biramous; endopod with two appendices (*interna* and *masculina*). Pleopods 3-5 biramous; endopod and exopod leaflike, furnished with long setae on margins. Female first pleopod uniramous, long and slender. Pleopods 2-5 biramous; endopod and exopod similar to male pleopods 3-5, except for rounded basal process furnished with few long setae on inner margin of endopod.

Basal segment of uropod segment with two dorsal spines and one ventral spine on distal margin; endopod with one distolateral spine; exopod with spiny diaeresis on distal fourth; lateral edge of diaeresis with one dorsal fixed spine and one

ventral mobile spine. Telson subrectangular, slightly longer than wide; lateral margin with two spines of similar size; distolateral angle with two spines, inner one longer (Fig. 5E).

#### Coloration (Fig. 4)

Ground color of body pale orange with tip of spines white. Carapace, abdomen, and telson with numerous dark orange patches, grouped by sets of two to four. Cheliped pale orange with faint darker bands. Ambulatory legs with alternated white and orange bands.

#### REMARKS

In 16 specimens examined a few unusual armaments have been observed. The lateral margin of rostrum can have three to five spines, instead of the usual four. There are two intermediate spines on the carapace, instead of one, in a female cl 42 mm (MNHN As 626). The distoventral spine of carpus of second pereopod was absent on the smallest specimen examined (male cl 40 mm). Spines were also occasionally missing on inner and outer faces of dactyls of ambulatory legs.

*Enoplometopus gracilipes* is morphologically related to *E. holthuisi* Gordon, 1968 and *E. voigtmanni* Türkay, 1989. The three species have in common the same disposition of spines on the carapace, a similar shape of pleura of abdominal somites II-V, and a similar long and slender chela, smooth on the upper and lower faces of palm, with fingers as long as the palm. *Enoplometopus gracilipes* is at once distinguished from the two other species by its coloration, being the only one with spots on the carapace whereas the lateral face of the carapace has a large white circle in *E. holthuisi*, and a network of streaks in *E. voigtmanni*. In the absence of coloration *E. gracilipes* can be distinguished by examination of the posterior margin of the sixth abdominal tergite, which has no spines, while it has two short lateral spines in the two other species (cf. Fig. 5E with Fig. 7E). Although shape of male first pleopod is still not known in *E. voigtmanni*, it is also obviously different between *E. gracilipes* and *E. holthuisi* (cf. Fig. 5F with Fig. 7F). Finally, *E. gracilipes* is a deep-water species, mostly collected at depths greater than 100 m,

while *E. holthuisi* and *E. voigtmanni* are only known at depths less than 100 m.

Illustrations of an undetermined specimen have been published in two Japanese books (Anonymous 1973; Miyake 1983). According to its coloration, this unique specimen could reasonably belong to *E. gracilipes*. However, this provisional determination must be confirmed when more specimens are available from Japan.

#### *Enoplometopus holthuisi* Gordon, 1968 (Figs 6; 7)

*Enoplometopus holthuisi* Gordon, 1968: 90 (type locality: Banda Islands, Moluccas, Indonesia).

*Enoplometopus holthuisi* – Intès & Le Loeuff 1970: 1442 (text). — Burukovsky 1983: 153 (key). — Daum 1982: 265 (Philippines; *pro parte*, only illustration p. 265). — Türkay 1989: 228 (Hawaii). — Bonvallot *et al.* 1994: 144 (Tuamotu). — Poupin 1996b: 8 (checklist). — Chan 1998: 998, 1000 (western Pacific). — Chan & Yu 1998: 189 (key). — Debelius 1999: 204 (Hawaii).

*Enoplometopus (Hoplometopus) holthuisi* – Holthuis 1983: 297 (Marshall Islands; Hawaii).

*Hoplometopus holthuisi* – de Saint Laurent 1988: 61 (list). — Gosliner *et al.* 1996: 220 (Hawaii). — Hoover 1998: 241 (Hawaii).

*Enoplometopus antillensis* – Holthuis 1946: 79 (Moluccas) (non *Enoplometopus antillensis* Lütken, 1865, except for pl. V, fig. h and pl. VII, fig. b, drawn from type specimen of *E. antillensis*).

*Enoplometopus occidentalis* – George & George 1979: 78 (photograph) (non *Enoplometopus occidentalis* (Randall, 1840)).

*Hoplometopus* sp. nov. – Poupin 1996a: 14 (French Polynesia) (non sp. nov. = *E. holthuisi*, see Remarks).

Non *Enoplometopus holthuisi* – Daum 1982: 266 (illustrated specimen belongs to *E. voigtmanni*). — Allen & Steene 1994: 145 (photograph = *E. voigtmanni*).

**MATERIAL EXAMINED.** — **French Polynesia.** Austral Islands, Rurutu, Frv *Marara*, stn 423, 22°29.3'S, 151°21.6'W, trap 80 m, 10.VIII.1991, 1 ♂ cl 28 mm, bl 96 mm (MNHN As 624). — Society Islands, Tahiti, dry remains of chelae only with this label "*Hoplometopus gordonae* sp. nov." (MNHN As 625).

**Indonesia.** Banda Islands, V.1921, leg. E. Van der Velde, 1 ♀ holotype cl 33 mm, bl 105 mm, 1 ♂ paratype cl 30 mm, bl 93 mm (ZMA De 101.265).

**La Réunion.** 1973, coll. Y. Plessis, 1 ♂ cl 22.5 mm, bl 74.5 mm (MNHN As 271).



FIG. 6. — *Enoplometopus holthuisi* Gordon, 1968, ♂ cl 28 mm, Austral Islands (MNHN As 624); **A**, lateral view; **B**, dorsal view.

**DISTRIBUTION.** — West Indian Ocean to central Pacific: La Réunion, Indonesia (Banda Islands, Moluccas), Philippines, Marshall Islands (Enawetak atoll), Hawaii, French Polynesia (Austral Islands: Rurutu; Society Islands: Tahiti; Tuamotu Islands). Depths: 20-80 m. On hard bottoms.

**SHORT DESCRIPTION**

(SPECIMEN FROM FRENCH POLYNESIA)

Rostrum with three spines on lateral margin.

Carapace with five median, two postcervical, one intermediate, one supraocular, and three lateral

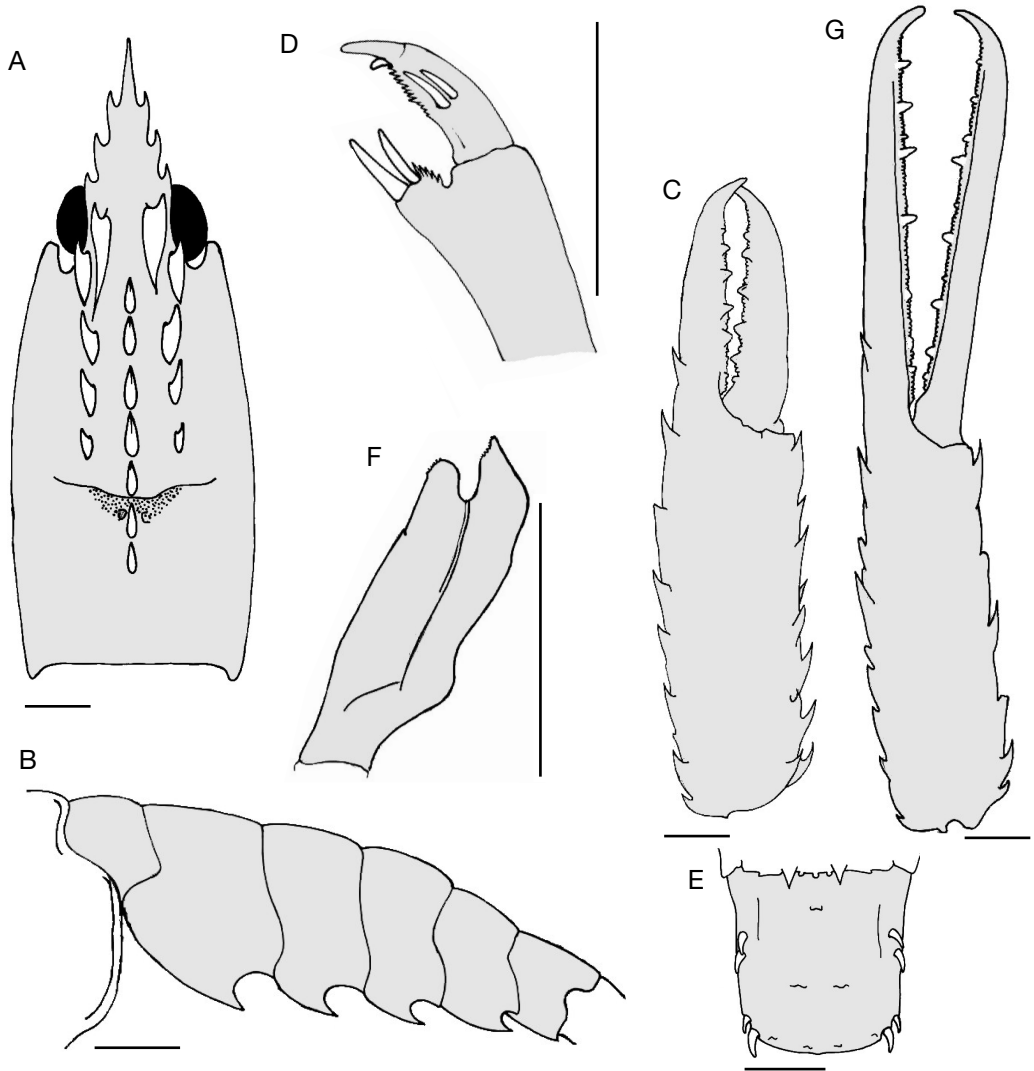


FIG. 7. — *Enoplometopus holthuisi* Gordon, 1968, ♂ cl 28 mm, Austral Islands (MNHN As 624); **A**, carapace, dorsal view; **B**, abdomen, lateral view; **C**, left chela, dorsal view; **D**, dactyl and distal part of propodus of left second pereopod, outer view; **E**, posterior margin of tergite 6 and telson, dorsal view; **F**, right first pleopod, outer view, ♀ holotype cl 33 mm, Banda Islands (ZMA De 101.265); **G**, left chela dorsal view (setae omitted). Scale bars: 5 mm.

spines (Fig. 7A). Chela 4.6 times as long as wide, palm ovate in cross section (Fig. 7C). Upper and lower faces of palm smooth; outer margin with eight spines; inner margin with two rows of five spines, converging distally. Fingers 0.4 times as long as chela, with sharp inward curved crossing tips; cutting edges denticulated with five or six larger teeth; outer edges smooth, furnished with

very long setae extending well beyond tip of fingers (see Remarks).

Second pereopod circular in cross section, reaching to proximal third of chela. Merus and carpus with distoventral spine. Propodus subequal to merus, furnished with few long setae; distoventral angle with process armed with five to eight tiny spines on upper margin, and two mobile spines,

distally (Fig. 7D). Dactyl short, 0.2 times as long as propodus. Pereopod 3 and 4 shorter than P2, with terminal pincers reduced. Pereopod 5 is the shortest and has no terminal pincer.

Pleura of abdominal somites II-V, each with sharp, posteriorly curved tooth; pleuron of somite VI with blunt tooth (Fig. 7B). Posterior margin of tergite VI with three median tubercles flanked by two short spines (Fig. 7E). Male first pleopod subrectangular with deep incision on distal margin (Fig. 7F). Telson with two lateral spines of similar size and two distolateral spines, inner one longer (Fig. 7E).

#### Coloration (Fig. 6)

Ground color of body orange with white at tip of spines. Lateral face of carapace with large white circle, on distal half, and wavy white lines on proximal half. Abdominal somites with white spots bordered by dark orange rings, as illustrated on Figure 6. Chela orange with faint reticulated lines on palm, and alternated dark and light orange bands on fingers. Ambulatory legs banded in white and orange on whole length.

#### REMARKS

Because of the particular shape of its chela that is distinct from typical *E. holthuisi*, the specimen trapped around the French Polynesian islands had been previously attributed to a new species (Poupin 1996a). In this work it has been compared carefully with the holotype of *E. holthuisi*, which confirms the distinctive shape of its chela (cf. Fig. 7C with Fig. 7G). It is less elongated, being 4.6 times as long as wide, vs 6.4 in holotype, and has shorter fingers, 0.4 times as long as chela, instead of 0.5 in holotype. Outer edges of the fingers are also furnished with very long setae (Fig. 6B), absent on the holotype and never observed on photographs of *E. holthuisi* consulted during this study. Despite these obvious differences, all other characters of the Polynesian specimen are those of *E. holthuisi*, particularly the shape of male first pleopod, a very distinctive character in this species. It thus seems that the peculiar shape of its chela must be attributed to its small size.

*Enoplometopus holthuisi* is related to *E. voigtmanni*. As denoted in the Remarks of *E. gracilipes*, the two species are easily separated by their coloration, in particular the lateral face of the carapace which has a large white circle, in *E. holthuisi*, and a network of streaks, in *E. voigtmanni*. They also differ by the shape of the spines on the abdominal pleura II-V, as illustrated in Türkay (1989: figs 1, 2b). When male first pleopod is known in *E. voigtmanni* it will be interesting to check if the two species can also be separated by the shape of this appendage. *Enoplometopus holthuisi* is also related to *E. gracilipes*, and the differences between the two species have been listed under *E. gracilipes*. It is interesting to point out that the single specimen of *E. holthuisi* caught during the fishing operations of the Frv *Marara* (stn 423, 80 m) was associated in the trap with *E. gracilipes*. *Enoplometopus holthuisi* is usually reported in shallow waters, between 20-50 m, while *E. gracilipes* is mostly caught at depths greater than 100 m. Therefore, it appears that these two species can co-occur at intermediate depths, between 50-100 m.

#### SPECIES IN MNHN COLLECTIONS

##### *Enoplometopus antillensis* Lütken, 1865

*Enoplometopus antillensis* Lütken, 1865: 265 (type locality: West Indies).

*Enoplometopus antillensis* – Holthuis 1946: 72 (type specimen). — Fausto Filho 1970: 55 (Brazil); 1976: 222 (Brazil). — Debelius 1986: 13 (photograph). — Wirtz *et al.* 1988: 170 (Cape Verde). — Manning & Camp 1989: 412 (Bermuda, East coast of Florida, Bahama, Panama, Netherlands West Indies, St Helena Island, Gulf of Guinea). — Scelzo & Rodriguez 1991: 226 (Venezuela). — González Pérez 1995: 134, 137 (Canary Islands). — Wirtz & Herrera 1995: 116 (Canary Islands). — Wirtz 1996: 368 (Canary Islands). — Chan & Yu 1998: 190 (key). — Debelius 1999: 45 (Canary Islands).

*Enoplometopus (Hoplometopus) antillensis* – Holthuis 1983: 282 (new subgenus).

*Hoplometopus antillensis* – de Saint Laurent 1988: 61 (list).

*Enoplometopus dentatus* Miers, 1880: 381 (St Helena). — Gordon 1968: 80 (St Helena). — Manning & Camp 1989: 412 (West Indies; St Helena).

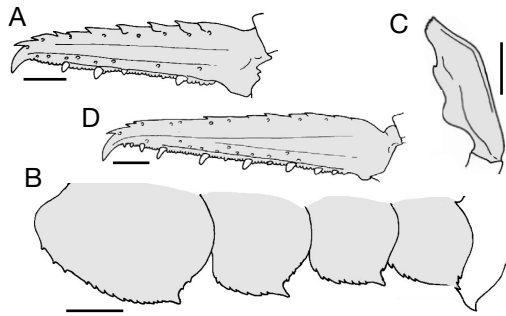


FIG. 8. — *Enoplometopus callistus* Intès & Le Loeuff, 1970, ♂ holotype cl 42 mm, Ghana (MNHN As 51); **A**, dactyl of left cheliped, dorsal view; **B**, margins of abdominal pleura II-VI, left side; **C**, right first pleopod, outer view, ♂ cl 45 mm, Ghana (MNHN AS 627); **D**, dactyl of left cheliped, dorsal view (setae omitted). Scale bars: 5 mm.

*Enoplometopus* sp. — Forest 1959: 22 (Gulf of Guinea).

Non *Enoplometopus antillensis* — Holthuis 1946: 79 (= *E. holthuisi* Gordon, 1968, except for pl. V, fig. h and pl. VII, fig. b, drawn from type specimen of *E. antillensis*).

A few additional references can be found in Manning & Camp (1989) and González Pérez (1995).

**MATERIAL EXAMINED.** — **West Atlantic.** Guadeloupe, Basse Terre, îlet du Gosier, trap 80 m, XI.2002, coll. D. Lamy, A. Crosnier det., 1 ♂ cl 37 mm, bl 97 mm (MNHN As 629).

**Central Atlantic.** Ascension Island, off Southwest Point near Rocked Launcher, under rocks, dive at night 12 m, V.1981, coll. McDowell, 1 ♂ cl 26.7 mm, bl 81.5 mm (MNHN As 558, leg. R. B. Manning).

**East Atlantic.** Gulf of Guinea, Annobon Island, Frv *Calypso*, stn 109, 1°25.10'S, 5°36.10'E, dive at 20 m, 5.VII.1956, 1 ♀ cl 20.0 mm, bl 62 mm (MNHN As 557).

**DISTRIBUTION.** — West Atlantic: Bermuda, east coast of Florida, Bahama (Grand Bahama Island), Netherlands West Indies (Bonaire), French West Indies (Guadeloupe), Panama (Golfo de Mesquites, Bahía de Almirante), Venezuela, Brazil (off northeast coast and off Rio Grande do Norte State). Central Atlantic: Ascension and St Helena islands, off Brazil 03°17'S, 29°57'W (larvae). East Atlantic: Madeira, Canary Islands (Gran Canaria, Hierro, Lanzarote, Tenerife), Gulf of Guinea (off Gabon and Annobon Island), Cape Verde (Sal). Deep distribution: 5-201 m, mainly between 15-30 m. On rocky bottoms.

**DIAGNOSIS.** — Lateral margin of rostrum with three or four spines. Carapace armed with five median, two postcervical, one intermediate, one supraocular, and three lateral spines. Chela broad and compressed, 3.6-

4.0 times as long as wide, upper and lower faces of palm smooth; outer margin of dactyl smooth. Second pereopod with dactyl 0.3 times as long as propodus; carpus and merus with distoventral spine. Pleura of abdominal somites II-V with smooth margins and sharp, posteriorly curved, median tooth. Male first pleopod with deep incision on distal margin. Telson with two lateral and two distolateral spines.

#### COLORATION

Ground color of body orange to red with white on spines. Lateral face of carapace with large white circle, surrounding median white spot, and white oblique lines posterior to circle; dorsal and posterolateral faces with minute red spots on lighter red background. Upper face of palm of chela with several orange red patches; fingers banded in white and orange red. Abdomen with white spots circled in dark orange or black. Ambulatory legs red orange with narrow white bands (González Pérez 1995).

#### REMARKS

This is the most common species found in the Atlantic and the only *Enoplometopus* lobster reported from the tropical west Atlantic. In the tropical east Atlantic it co-occurs with *E. callistus*. In central Atlantic Islands, St Helena and Ascension islands, it must be very common as the collector of the specimens examined herein indicates on the label: “[...] specimens from St Helena are larger and are often eaten there, mostly by fishermen as they get into their fish and lobster traps”.

#### *Enoplometopus callistus* Intès & Le Loeuff, 1970 (Fig. 8)

*Enoplometopus callistus* Intès & Le Loeuff, 1970: 1442 (type locality: Gulf of Guinea, Ghana, off Takoradi).

*Enoplometopus* (*Hoplometopus*) *callistus* — Holthuis 1983: 282 (new subgenus).

*Enoplometopus callistus* — González Pérez 1995: 136 (Canary Islands). — Wirtz & Herrera 1995: 116 (Canary Islands). — Wirtz 1996: 368 (Canary Islands; 20-200 m). — Chan & Yu 1998: 190 (key). — Debelius 1999: 44 (Canary Islands).

*Enoplometopus biafri* Burukovsky, 1972: 180 (Nigeria). — Burukovsky 1983: 153 (key). — Holthuis 1983: 281 (synonymy).

*Hoplometopus callistus* – de Saint Laurent 1988: 61 (list).

Some additional references can be found in González Pérez (1995).

**MATERIAL EXAMINED.** — **East Atlantic.** Gulf of Guinea: Ghana, off Takoradi, c. 5°30'N, 2°W, trawl 48 m, V.1968, coll. fishermen, 1 ♂ cl 42 mm, bl 128 mm (holotype, MNHN As 51). — ?Market, 18.XII.1967, 1 ♂ cl 45 mm, bl 140 mm, 1 ♀ cl 53.5 mm, bl 153 mm (MNHN As 627).

**DISTRIBUTION.** — East Atlantic: Gulf of Guinea (off Ghana, off Nigeria); Canary Islands (Gran Canaria, La Palma, Tenerife). Deep distribution: 30-200 m. On hard bottoms.

**DIAGNOSIS.** — Lateral margin of rostrum with three or four spines. Carapace with five median, one postcervical, one intermediate, one supraocular, and two lateral spines. Chela broad and compressed, 2.6-3.9 times as long as wide, upper and lower faces of palm smooth; outer margin of dactyl with nine or 10 spines disposed over entire length (see Remarks). Dactyl of second pereopod 0.3 times as long as propodus. Pleura of abdominal somites II-V finely denticulated and with sharp median tooth (Fig. 8B). Distal margin of male first pleopod with small denticulations, as illustrated on Figure 8C, without deep indentation. Telson with two lateral and two distolateral spines.

#### COLORATION

Carapace, abdomen and chelae pale orange with large orange red patches. Antennae white. Ambulatory legs orange with narrow white bands (González Pérez 1995; Wirtz 1996).

#### REMARKS

The arrangement of spines on the carapace, as indicated herein, differs slightly from the original description by Intès & Le Loeuf (1970). These authors indicate four median plus two postcervical spines, instead of five median plus one postcervical spine in this work. This is because they have considered as “postcervical” the posterior-most median spine that is in fact situated on the cervical groove, as observed also in *E. crosnieri*.

The arrangement of spines on the outer margin of dactyl of chela was first used by Bouvier (1915) who distinguished two states: 1) two to three spines disposed at tip only; or 2) spines disposed over the full length. Although state 2) clearly applies here for the type of *E. callistus*, it

has been observed that spines on the proximal two thirds are reduced to spiny scales in the two larger specimens examined (MNHN As 627), a variation that could be a source of misidentification if not taken into account (cf. Fig. 8A and Fig. 8D).

Marginal denticulation of pleura II-V is a new diagnostic character for the genus. It has also been observed in a juvenile of *E. holthuisi* (♂ cl 22.5 MNHN As 271) which has tiny denticles on pleura II-III only, and is also illustrated for a juvenile of *E. antillensis* in Manning & Camp (1989: 415, fig. 4D). Therefore, it seems to be a juvenile character that is retained in the adult stage of *E. callistus*.

#### *Enoplometopus debelius* Holthuis, 1983

*Enoplometopus (Enoplometopus) debelius* Holthuis, 1983: 283 (type locality: Hawaii; paratype from Indonesia).

*Enoplometopus debelius* – de Saint Laurent 1988: 61 (list). — Allen & Steene 1994: 145 (photograph). — Gosliner *et al.* 1996: 219 (Indonesia). — Chan 1998: 998, 999 (western Pacific). — Chan & Yu 1998: 190 (key). — Hoover 1998: 240 (Hawaii). — Debelius 1999: 200, 204 (Indonesia).

?*Enoplometopus occidentalis* – Kubo 1952: 97 (Japan) (not *Enoplometopus occidentalis* (Randall, 1840), probably *E. debelius*).

**MATERIAL EXAMINED.** — **New Caledonia.** Loyalty Islands, Ouvéa, “île haute”, dive at 11 m, 19.XI.1991, coll. J.-L. Menou, 1 ♀ juv. cl 12 mm, bl 38 mm (MNHN As 576).

**DISTRIBUTION.** — Indonesia; New Caledonia (Loyalty Islands); ?Japan (Kii peninsula); Hawaii. Depths: 11-25 m. On rocky bottoms.

**DIAGNOSIS.** — Lateral margin of rostrum with three spines. Carapace armed with four median, one postcervical, two intermediate, one supraocular, and three lateral spines. Chela broad and compressed, 3.0 times as long as wide; upper and lower faces of palm with scattered granules including median row of slightly larger granules. Outer margin of dactyl with two or three spines on distal part and unarmed or with low blunt tubercles on proximal part. Pleura of abdominal somites II-V rounded or bluntly pointed. Posterior margin of sixth abdominal tergite unarmed. Distal margin of male first pleopod straight, without deep indentation. Telson with one lateral and three distolateral spines, posteriormost spine largest.

## COLORATION

Carapace and abdomen whitish or very pale purple with numerous purplish red spots. Palm of chela purplish, with white at tip of spines; fingers banded in white and orange. Ambulatory legs orange with one or two narrow white bands, proximally only (Holthuis 1983).

*Enoplometopus occidentalis* (Randall, 1840)

*Nephrops occidentalis* Randall, 1840: 139 (type locality: probably Hawaii).

*Enoplometopus occidentalis* – Rathbun 1906: 900 (Hawaii). — Bouvier 1915: 182 [5] (Mauritius). — Holthuis 1946: 74 (Ambon). — Barnard 1950: 532 (Natal). — Gordon 1968: 95 (Mombasa). — Tinker 1965: 40 (Hawaii). — Healy & Yaldwyn 1970: 56 (Heron Island). — Crosnier 1977: 237 (La Réunion, Madagascar). — Daum 1982: 266 (Sydney Harbor). — Miyake 1982: 78, pl. 26 (Japan). — Debelius 1984: 36, 37 (photograph). — Fielding 1985: 86 (Hawaii). — Takeda 1986: 106 (Japan). — Fielding & Robinson 1987: 80 (Hawaii). — Nomura *et al.* 1988: 42 (Japan). — Chan & Yu 1993: 102 (Taiwan). — Allen & Steene 1994: 145 (photograph). — Debelius & Baensch 1994: 591 (photograph). — Colin & Arneson 1995: 225 (Hawaii). — Gosliner *et al.* 1996: 220, photograph 796 (Hawaii). — Chan 1998: 998, 1000 (western Pacific). — Hoover 1998: 241 (Hawaii). — Debelius 1999: 205 (Hawaii).

*Enoplometopus (Enoplometopus) occidentalis* – Holthuis 1983: 294 (Amirante Islands, Ambon, Hawaii). — Hayashi 1995: 338, pl. 91-1 (Japan).

*Enoplometopus pictus* – Miers 1880: 380 (Ambon). — De Man 1888: 486 (Ambon) [non *Enoplometopus pictus* A. Milne Edwards, 1862].

*Enoplometopus longirostris* De Man 1888: 488 (Ambon); De Man 1921: 94; 1922: 50 (Java Sea, Banda Sea). — Holthuis 1946: 84 (Celebes, Moluccas) [*E. longirostris* is a postlarval stage, possibly of *E. occidentalis*; cf. Holthuis 1983].

*Enoplometopus* sp. – Colin & Arneson 1995: 225 (Indonesia).

Non *Enoplometopus occidentalis* – Kubo 1952: 97 (= possibly *E. debelius* Holthuis, 1983). — George & George 1979: 78 (= *Enoplometopus holthuisi* Gordon, 1968).

Some additional references can be found in Barnard (1950) and Holthuis (1946, 1983).

MATERIAL EXAMINED. — West Indian Ocean. Madagascar, S of Madagascar, 26°05'S, 44°50'E, trawl 100 m, ?1970-1973, coll. R. Plante, det. A. Crosnier,

1 ♂ juvenile cl 13 mm, bl 41 mm (MNHN As 628). — La Réunion, 1973, coll. Y. Plessis, det. T. Monod, 1 ♂ cl 25 mm, bl 80 mm, 1 ♀ cl 20.5 mm, bl 63 mm, 1 ovig. ♀ cl 28 mm, bl 87 mm (MNHN As 272); trap ?350 m, II.1974, coll. P. Guezé, det. A. Crosnier, 1 ♂ cl 33.5 mm, bl 105 mm (MNHN As 555), net 100 m, I.VII.1973, 1 ♂ cl 39.5 mm, bl 121.5 mm (MNHN As 559). — Mauritius, Port Louis, 1910, coll. P. Carié, 1 ♂ cl 22.5 mm, bl 72 mm (MNHN As 52), 1913, coll. P. Carié, 1 ♂ cl 19 mm, bl 62 mm (dry, MNHN As 53), 1910, coll. P. Carié, 1 ♀ cl 32.5 mm, bl 102 mm (MNHN As 54).

West and central Pacific. Philippines, Manilla, 1980 “aquarium, ?Manille”, coll. C. Vadon, 1 ♂ cl 23 mm, bl 72.5 mm (MNHN As 557). — New Caledonia, Loyalty Islands, Ouvéa, “ilot Bagat”, dive 9-11 m, 18.XI.1991, coll. J.-L. Menou, 2 ♀♀ cl 14-16.5 mm, bl 44-52 mm (MNHN As 577); coral grounds, 21.III.1990, coll. Tirard, 1 ♀ cl 38 mm, bl 118 mm (MNHN As 566). — Hawaii, coll. Baillieu, 1 ♂ cl 43 mm, bl 130 mm (MNHN As 55).

DISTRIBUTION. — West Indian Ocean: South Africa (Natal), Kenya (Mombassa), Madagascar, La Réunion, Mauritius (Port Louis), Seychelles (Amirante Islands). Indonesia: Java sea, Celebes (Menado), Moluccas (Ambon, Banda, Ternate); East Australia: Great Barrier reef (Heron Island), Sydney harbor. West Pacific: Japan, Taiwan; Central Pacific: Hawaii Islands (Hawaii, Maui, Oahu). Deep distribution: 0-100 m. On hard bottoms.

DIAGNOSIS. — Rostrum with two to four spines on lateral margin. Carapace armed with five median (anteriormost blunt), one postcervical, two intermediate, one supraocular, and three or four lateral spines. Chela broad and compressed, 2.8-3.8 times as long as wide, upper and lower faces of palm with longitudinal rows of tubercles; outer margin of dactyl with two or three spines on distal part and unarmed or with low blunt tubercles on proximal part. Second pereopod with dactyl 0.3 times as long as propodus; carpus and merus with distoventral spine. Pleura of abdominal somites II-V rounded or bluntly pointed. Male first pereopod with distal margin straight. Telson with one lateral and three disolateral spines, distalmost spine the largest.

## COLORATION

Body orange red with white at tip of spines. Lateral face of carapace with median white spot circled in dark orange. Similar spots on dorsal and lateral faces of abdomen. Chela orange with tubercles darker; fingers banded in light and dark orange. Ambulatory legs orange with narrow white or pale orange bands (Debelius 1984; Chan & Yu 1993; Debelius & Baensch 1994; Hoover 1998).



## REMARKS

*Enoplometopus occidentalis* is the most common species found in the Indo-west Pacific. Several variations have been observed within the 14 specimens examined. Lateral margin of rostrum is usually armed with two or three spines but can have up to four spines on each margin on some specimens ( $\delta$  cl 13 mm, MNHN As 628;  $\delta$  cl 23 mm, MNHN As 557). The armament of outer margin of dactyl of chela varies according to the size; it usually consists of two to three spines on distal part only, but on two large specimens ( $\delta$  cl 33.5 mm, MNHN As 555;  $\delta$  cl 39.5 mm, MNHN As 559) the spines are also present on proximal part. Although upper and lower faces of the palm are typically tuberculated, the tubercles are absent in the smallest specimen ( $\delta$  cl 13 mm, MNHN As 628).

*Enoplometopus pictus* A. Milne Edwards, 1862

*Enoplometopus pictus* A. Milne Edwards, 1862: F-15, pl. 19 (type locality: "île Bourbon" = La Réunion).

*Enoplometopus pictus* – Bouvier 1915: 182 [5] (type specimen). — Ward 1942: 61 (Mauritius). — Holthuis 1946: 79 (text). — de Saint Laurent 1988: 61 (list). — Chan & Yu 1998: 190 (key).

Non *Enoplometopus pictus* – Miers 1880: 380 (= *E. occidentalis* (Randall, 1840)).

Some additional references can be found in Holthuis (1946).

MATERIAL EXAMINED. — West Indian Ocean. La Réunion, coll. E. Maillard, 1  $\delta$  holotype cl 40 mm (dry and broken, with some legs and telson preserved in alcohol, MNHN As 182).

DISTRIBUTION. — West Indian Ocean: La Réunion and perhaps Mauritius where Ward (1942) records the species with this indication: "The modern interpretation of this species makes it a synonym of *E. occidentalis* (Randall) from the Hawaiian Islands, but until I can compare the Mauritian example with one from Hawaii I prefer only to refer to A. Milne Edward's original description and figure". Vertical distribution unknown.

DIAGNOSIS. — Rostrum with three or four spines on lateral margin. Carapace with five median, two intermediate, one supraocular, and three lateral spines; postcervical spines absent. Chela broad and compressed; upper and lower face of palm with many tubercles arranged in longitudinal lines, those of medi-

an line larger; outer margin of dactyl with spines disposed over full length. Dactyl of second pereopod short, less than 0.3 times as long as propodus. Pleura of abdominal somites II-V rounded or bluntly pointed. Lateral margin of telson with one median and three distal spines.

## COLORATION

Ground color of body purplish, with tip of tail-fan bluish; carapace and abdomen with white spots circled by blue (A. Milne Edwards 1862; Bouvier 1915).

## REMARKS

The status of *Enoplometopus pictus* still remains unclear. The species was formerly considered as a junior synonym of *E. occidentalis* (Randall, 1840) until Bouvier (1915) clearly indicated the differences between the two species. The most conclusive characters used by Bouvier are the absence of the postcervical spine and the presence of white spots circled by blue in *E. pictus*, whereas there is one postcervical spine and no blue coloration in *E. occidentalis*. Other characters used by Bouvier are: 1) aspect of outer margin of dactyl of chela, armed on its whole length in *E. pictus*, distally only in *E. occidentalis*; 2) aspect of upper face of palm of chela, with tubercles larger in *E. pictus* than in *E. occidentalis*; and 3) distoventral spine on the carpus of ambulatory legs, absent in *E. pictus*, present in *E. occidentalis*. However, on the basis of the variation observed for that study (see Remarks under *E. callistus*, *E. crosnieri*, *E. gracilipes* and *E. occidentalis*) these three characters are less convincing for the species distinction. Therefore, it appears that the status of *E. pictus* still needs to be confirmed by capture of more specimens from the western Indian Ocean.

## CONCLUSION

Three *Enoplometopus* species are recognized in French Polynesia: *Enoplometopus crosnieri*, *E. gracilipes* and *E. holthuisi*. *Enoplometopus crosnieri* has been caught only around the Marquesas Islands, between 84-120 m. *Enoplometopus holthuisi* and *E. gracilipes* coexist around the Austral,

TABLE 1. — Definition of the subgenera *Enoplometopus* A. Milne Edwards, 1862 and *Hoplometopus* Holthuis, 1983, according to Holthuis (1983).

| Character                              | <i>Enoplometopus</i>       | <i>Hoplometopus</i> |
|--|----------------------------|---------------------|
| a - Intermediate spine                 | 2                          | 1                   |
| b - Postcervical spine                 | 1                          | 2                   |
| c - Abdominal pleurites II-V           | rounded or bluntly pointed | with a sharp spine  |
| d - Spines on lateral margin of telson | 1                          | 2                   |

Society and Tuamotu islands but at different depths, 20-80 m in *E. holthuisi* and usually below 100 m in *E. gracilipes*. Due to the difficulty of collecting these nocturnal and very timid lobsters, so far little is known about the regional fauna. It is therefore probable that further collections will demonstrate that other species, like *E. occidentalis* which is widespread in the Indo-west Pacific, also occur around the Polynesian Islands.

Thanks to the collections deposited in the MNHN, it has been possible to re-examine almost all the species of the genus. These observations, combined with original descriptions of the three species that have not been re-examined (*E. chacei*, *E. daumi* and *E. voigtmanni*), have been used to elaborate an up-to-date key for all the species of the genus.

Holthuis (1983) has divided the genus *Enoplometopus* in two subgenera, *Hoplometopus* and *Enoplometopus* s.s. depending on the characters listed in Table 1. These taxa are used by Kensley & Child (1986) for *Enoplometopus* (*Enoplometopus*) *chacei*, and by Türkay (1989) for *E. (Enoplometopus)* *voigtmanni*, while de Saint Laurent (1988) has elevated these subgenera to a generic level for the description of *Hoplometopus gracilipes*. By contrast, Chan & Yu (1998) do not accept the Holthuis' classification for the description of *E. crosnieri*, because the character "a" of this species is that of the subgenus *Hoplometopus*, whereas the characters "b, c, d" are those of the subgenus *Enoplometopus* (Table 1). The observations realized

herein on *E. callistus* reinforce the conclusion of these authors, as the character "b" of *E. callistus* is that of the subgenus *Enoplometopus*, while it typically belongs to the subgenus *Hoplometopus* by the characters "a, c, d". It thus appears that Holthuis subgenera are now valid only for characters c and d of Table 1. They have been used here at the beginning of the key to the species, in addition to the aspect of the upper and lower faces of the palm, smooth or tuberculated. These three characters are easy to examine and, therefore, have the advantage of splitting the genus in two groups of a similar size. However, for the time being, without any phylogenetic analysis and due to the limited number of species in the genus, it does not seem justified to give them a subgeneric or generic level.

Other new important diagnostic characters recognized in this work are: the shape of the chela, either narrow (five to six times longer than wide) or broad (three times longer than wide); the aspect of margins of abdominal pleura II-V, smooth or denticulated; and the shape of male first pleopod, with or without a deep indentation on distal margin. A deep indentation has been observed in only three species, *E. antillensis*, *E. gracilipes* and *E. holthuisi*, but the shape of male first pleopod still remains unknown in *E. daumi*, *E. pictus*, and *E. voigtmanni*. Therefore, this character has not been included in the key although it could prove to be useful in the future to separate species such as *E. daumi*/*E. chacei*, confidently separated only by their coloration.

#### KEY TO THE SPECIES OF *ENOPLOMETOPUS* A. MILNE EDWARDS, 1862

1. Upper and lower faces of chela with tubercles (sometimes indistinct in juveniles). Pleura of abdominal somites II-V, each rounded or bluntly pointed. Telson with only one lateral spine..... 2

- Upper and lower faces of chela smooth. Pleura of abdominal somites II-V, each with sharp, posteriorly curved median tooth. Telson with two lateral spines ..... 7
- 2. Dactyl of cheliped with spines over full length of outer margin ..... 3
- Dactyl of cheliped with only two or three spines on distal part of outer margin (sometimes with a few proximal spines)..... 4
- 3. Carapace with two intermediate spines and three lateral spines; postcervical spine absent ..... *Enoplometopus pictus*
- Carapace with one intermediate spine and two lateral spines; postcervical spine present ..... *Enoplometopus crosnieri*
- 4. Carapace with an indistinct postcervical spine ..... 5
- Carapace with a marked postcervical spine ..... 6
- 5. Lateral face of carapace with vertical streaks (lateral margin of rostrum with three spines) ..... *Enoplometopus daumi*
- Lateral face of carapace without vertical streaks (lateral margin of rostrum with two spines) ..... *Enoplometopus chacei*
- 6. Carapace armed with five median spines ..... *Enoplometopus occidentalis*
- Carapace armed with four median spines ..... *Enoplometopus debelius*
- 7. Carapace with two postcervical spines; dactyl of chela without spines on outer margin; margins of abdominal pleura II-V smooth in adults ..... 8
- Carapace with one postcervical spine; dactyl of chela with spines along entire outer margin or restricted to distal portion of outer margin; margins of abdominal pleura II-V finely denticulated in adults ..... *Enoplometopus callistus*
- 8. Chela five to six times longer than wide ..... 9
- Chela three times longer than wide ..... *Enoplometopus antillensis*
- 9. Posterior margin of sixth abdominal tergite without spines; carapace with spots .....  
..... *Enoplometopus gracilipes*
- Posterior margin of sixth abdominal tergite with two short spines; lateral face of carapace with large white circle or with network of streaks ..... 10
- 10. Spines of abdominal pleura long, those of pleura IV-V reaching to posterior margins of pleura; lateral face of carapace with a large white ring; palm of chela without bands ..... *Enoplometopus holthuisi*
- Spines of abdominal pleura short, those of pleura IV-V not reaching to posterior margins of pleura; lateral face of carapace with a network of streaks; palm of chela with bands ..... *Enoplometopus voigtmanni*

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