

Eugonatonotus chacei sp. nov., second species of the genus (Crustacea, Decapoda, Eugonatonotidae)¹

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Abstract. The Indo-West-Pacific material previously identified as *Eugonatonotus crassus* (A. Milne Edwards, 1881) is found to be distinct from the typical form in the tropical Western Atlantic by bearing an extra pair of spines at the fifth abdominal tergite. The new form, named *E. chacei* sp. nov., is described and a holotype selected from Taiwanese material. The morphological differences between the two species are listed and discussed and their coloration is illustrated.

Résumé. -- Les spécimens provenant du Pacifique occidental, identifiés jusqu'à maintenant à *Eugonatonotus crassus* (A. Milne Edwards, 1881), seule espèce connue du genre, décrite de l'Atlantique occidentale, se révèlent appartenir à une espèce nouvelle, *E. chacei*, se distinguant essentiellement de la précédente par la présence d'une paire d'épines supplémentaire sur le cinquième somite abdominal. Cette espèce nouvelle est décrite et un holotype est choisi parmi le matériel provenant de Taiwan. Les caractères distinctifs des deux espèces sont présentés, les colorations décrites et comparées.

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INTRODUCTION

The caridean family Eugonatonotidae Chace, 1937 has long been represented by a single extant species *Eugonatonotus crassus* (A. Milne Edwards, 1881). The species has been recorded in the Western Atlantic (eg. A. MILNE EDWARDS, 1881, 1883; BOONE, 1927; CHACE, 1936; PEQUEGNAT, 1970; ABELE & KIM, 1986) and the Western Pacific (eg. CHACE, 1936; KUBO, 1937; MIYAKE, 1982; KING, 1982, 1984; HAYASHI, 1986).

In our recent report on the Taiwanese *E. crassus*, it was remarked that the Pacific population appears to be somewhat different from the Atlantic population by possessing an extra pair of dorsolateral posterior spines on abdominal tergite V (CHAN & YU, 1988). This remark received an immediate response from Dr. CROSNIER of the Muséum national d'Histoire naturelle, Paris, who had also noticed this difference in his numerous Western Pacific samples. Nevertheless, we lacked sufficient Atlantic material to make a more extensive comparison.

A subsequent visit to several European museums by the first author found that many Atlantic specimens of the species are deposited at the Rijksmuseum van Natuurlijke Historie,

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Leiden. With kind help from Prof. HOLTHUIS and Dr. FRANSEN of the Rijksmuseum van Natuurlijke Historie and Dr. CROSNIER of the Muséum national d'Histoire naturelle, we were able to examine a series of *E. crassus* specimens from both the Atlantic and Pacific. It was found that the Pacific material constantly differs from the Atlantic material by bearing an additional pair of spines on abdominal somite V. Several other differences were also noticed between the two forms and it is concluded that the Pacific population should be treated as a distinct species. Thus, two extant species are now represented in the family Eugonatonotidae, with one of them distributed in the Western Atlantic, the other in the Western Pacific and the Eastern Indian Ocean. The Indo-Pacific form is described in detail and the differences between the two species are discussed. Color illustrations of the two species are also provided.

MATERIALS AND METHODS

Specimens labelled "NTOU" are deposited in the Fisheries Department of the National Taiwan Ocean University, Taiwan, R.O.C.; "MNHN" in the Muséum national d'Histoire naturelle, Paris; "RMNH" in the Rijksmuseum van Natuurlijke Historie, Leiden; "USNM" in the National Museum of Natural History, Washington D.C.; "NTM" in the Northern Territory Museum, Darwin. The stated measurement is carapace length which was measured from the post-orbital margin to the posterior margin of the dorsal carapace.

SYSTEMATIC ACCOUNT

Eugonatonotus chacei sp. nov.

(Fig. 1a-h; pl. 1A)

Gonatonotus crassus: CHACE, 1936: 24 (*p.p.*). — KUBO, 1937: 94, figs 1-3; 1971: 606, fig. 938 (*non* A. Milne Edwards, 1881).
Eugonatonotus crassus: MIYAKE, 1982: 25, pl. 9-2. — KING, 1982: 14; 1984: 178, fig. 4-Ec. — HAYASHI, 1986: 99, color photo 59. — KENSLEY *et al.*, 1987: 304. — CHAN & YU, 1988: 259, figs 1-2, pl. 1 (*non* A. Milne Edwards, 1881).

MATERIAL EXAMINED

Taiwan: Tong-Kong, Ping-Tong County, 2 Dec. 1984: 2 ♂ 26.5 and 27 mm, paratypes (NTOU); 23 Mar. 1985: 1 ♀ 22 mm, paratype (NTOU). — Su-Ao, I-Lan County, 17 Mar. 1985: 1 ♀ 20 mm (NTOU); 20 Apr. 1985: 1 ♀ 22.5 mm (NTOU); 2 May 1985: 1 ♂ 21 mm, paratype (NTOU); 10 Mar. 1990: 1 ovigerous ♀ 35 mm, paratype (NTOU). — Ta-Shi, I-Lan County, 16 Apr. 1988: 1 ♀ 33 mm (NTOU); 14 May 1988: 2 ♂ 22 and 23 mm, 1 ♀ 23.5 mm (NTOU); 4 Jun. 1988: 1 ♂ holotype 32 mm, 1 ♀ 30.5 mm (NTOU); 1 Mar. 1990: 2 ♂ 22 and 27 mm, 2 ♀ 22 and 29.5 mm, paratypes (MNHN, NTOU exchange).

Philippines: MUSORSTOM 2: stn CP 15, 13°55.1' N, 120°28.4' E, 330 m, 21 Nov. 1980: 2 ♀ 33.5 and 36 mm (MNHN); stn 31, 13°40.5' N, 120°53.7' E, 204-230 m, 24 Nov. 1980: 1 spec. 17.5 mm (MNHN). — MUSORSTOM 3: stn CP 119, 11°59.7' N, 121°12.7' E, 320-337 m, 3 Jun. 1985: 1 spec. 17.5 mm (MNHN); stn CP 125, 11°57.7' N, 121°28.5' E, 388-404 m, 4 Jun. 1985: 2 spec. 17 and 23.5 mm (MNHN); stn CP 133, 11°57.8' N, 121°52.3' E, 334-390 m, 5 Jun. 1985: 1 spec. 17 mm (MNHN).

Australia : N.W. Shelf : R.V. "Soela", 18°06' S, 118°06' E, 340 m, 28 Feb. 1983 : 3 spec. (NTM) ; R.V. "Soela", stn NWS-7, 18°33.2' S, 117°30.9' E, 392-400 m, 25 Apr. 1983 : 1 ♂ 30 mm, 1 ♀ 20 mm (NTM) ; stn NWS-27, T/1, 360 m, 27 Jan. 1984 : 1 ♂ 25 mm, 2 ♀ 23.5 and 31 mm, paratypes (NTM) ; stn NWS-32, T/6, 402-408 m, 28 Jan. 1984 : 1 ♀ 21.5 mm (NTM). -- Timor Sea : "Endeavour Pearl", stn Shot 3, 9°46' S, 130°14' E, 270-300 m, 15 Sep. 1987 : 1 ♀ 29 mm (NTM) ; NT Fisheries, 9°46' S, 129°54' E, 298 m, 22 Sep. 1987 : 2 ♀ 34 and 40 mm (NTM). Arafura Sea : "Nobel Pearl", 9°46' S, 130°00' E, 244-300 m, Nov.-Dec. 1987 : 4 ♂ 23-35 mm, 2 ♀ both 29 mm, 3 ovigerous ♀ 30.5-35 mm (NTM) ; same station : 1 ♂ 33 mm, 1 ovigerous ♀ 40 mm (NTOU, NTM exchange).

Chesterfield Islands : MUSORSTOM 5 : stn DW 355, 19°36.43' S, 158°43.41' E, 580 m, 18 Oct. 1986 : 1 spec. 20 mm (MNHN). CORAIL 2 : stn CP 17, 20°48.14' S, 160°57.14' E, 500 m, 21 Jul. 1988 : 1 spec. 20.5 mm (MNHN).

New Caledonia : BIOCAL : stn CP 67, 24°55.44' S, 168°21.55' E, 500-510 m, 3 Sep. 1985 : 15 spec. 19 to 41.5 mm, paratypes (MNHN-Na 12628). MUSORSTOM 4 : stn 167, 18°35.8' S, 163°06.4' E, 575 m, 16 Sep. 1985 : 1 spec. 20.5 mm (MNHN) ; stn 179, 18°56.6' S, 163°13.7' E, 480 m, 18 Sep. 1985 : 1 spec. 20 mm (MNHN) ; stn 194, 18°52.8' S, 163°21.7' E, 550 m, 19 Sep. 1985 : 4 spec. 20.5 to 29 mm, paratypes (MNHN-Na 12629) ; stn 214, 22°53.8' S, 167°13.9' E, 425-440 m, 28 Sep. 1985 : 4 spec. 20.5 to 23 mm (MNHN) ; stn 216, 22°59.5' S, 167°22.0' E, 490-515 m, 29 Sep. 1985 : 2 spec. 20.5 and 22 mm (MNHN).

SMIB 2 : stn DW 5, 22°56.3' S, 167°14.4' E, 410 m, 17 Sep. 1986 : 1 spec. 27 mm (MNHN) ; stn DW 9, 22°5.9' S, 167°15.4' E, 500 m, 18 Sep. 1986 : 2 spec. 19.5 and 20.5 mm (MNHN). CHALCAL 2 : stn CC 1, 24°54.96' S, 168°21.91' E, 500-550 m, 28 Oct. 1986 : 1 ♂ 29 mm, 1 ovigerous ♀ 39.5 mm, 2 ♀ 21 and 38.5 mm (MNHN) ; stn CC 2, 24°55.48' S, 168°21.29' E, 500-610 m, 28 Oct. 1986 : 9 spec. 19 to 38 mm, paratypes (USNM, MNHN exchange) ; stn CP 25, 23°38.6' S, 167°43.12' E, 418 m, 30 Oct. 1986 : 2 ♂ 21 and 32.5 mm, 9 ♀ 19.5-26.5 mm (MNHN). SMIB 3 : stn CP 4, 24°54.9' S, 168°21.5' E, 530 m, 20 May 1987 : 2 spec. 20 and 22.5 mm (MNHN) ; stn DW 12, 23°38' S, 167°42' E, 470 m, 22 May 1987 : 3 spec. 19.5 to 20 mm (MNHN) ; stn DW 13, 23°37.5' S, 167°41.5' E, 448 m, 22 May 1987 : 5 spec. 19 to 27 mm (MNHN) ; stn DW 14, 23°40.1' S, 167°59.7' E, 246 m, 22 May 1987 : 1 spec. 18 mm (MNHN).

Loyalty Islands : MUSORSTOM 6 : stn CC 470, 21°04.4' S, 167°33.2' E, 560 m, 21 Feb. 1989 : 1 spec. 31 mm (MNHN) ; stn DW 483, 21°19.8' S, 167°47.8' E, 600 m, 23 Feb. 1989 : 1 spec. 35.5 mm (MNHN).

Tonga : Nuku'ulofa, 470 m, Jul. 1981 : 1 ♀ 31 mm (RMNH).

TYPES : Holotype : 1 ♂ 32 mm, 4 Jun. 1988, Ta-Shi, I-Lan County, north-eastern Taiwan (NTOU). Paratypes : see material examined.

DESCRIPTION

Body robust and shell hard. Rostrum, broad and with strong lateral carinae, curved strongly upwards and usually far overreaching scaphocerite. Rostrum proper, usually with at least anterior 3/10 of dorsal border unarmed, provided with 7-9 dorsal (posterior one sometimes just at level of post-orbital margin) and 7-8 ventral teeth. Dorsal rostral carina forming crest above orbit and extending to posterior margin of carapace. Post-rostral carina armed with 1 large fixed and 10-12 small movable teeth. Eye large and subspherical, with distinct ocellus. Orbital margin concave but with subdorsal region tuberculate. Antennal and branchiostegal spines well-developed and of similar size. Tip of antennal spine extending to about tip of upper basicerite spine. Carapace with two strong lateral carinae extending from antennal and branchiostegal spines almost to posterior border of carapace. Two other weaker longitudinal carinae also present near ventral carapace. Stylocerite long and sharp, extending almost to distolateral tooth of scaphocerite. Scaphocerite broad and with distolateral tooth far from distal margin of blade. Ventral basicerite spine long and stout, extending to about distal end of antennular segment I.

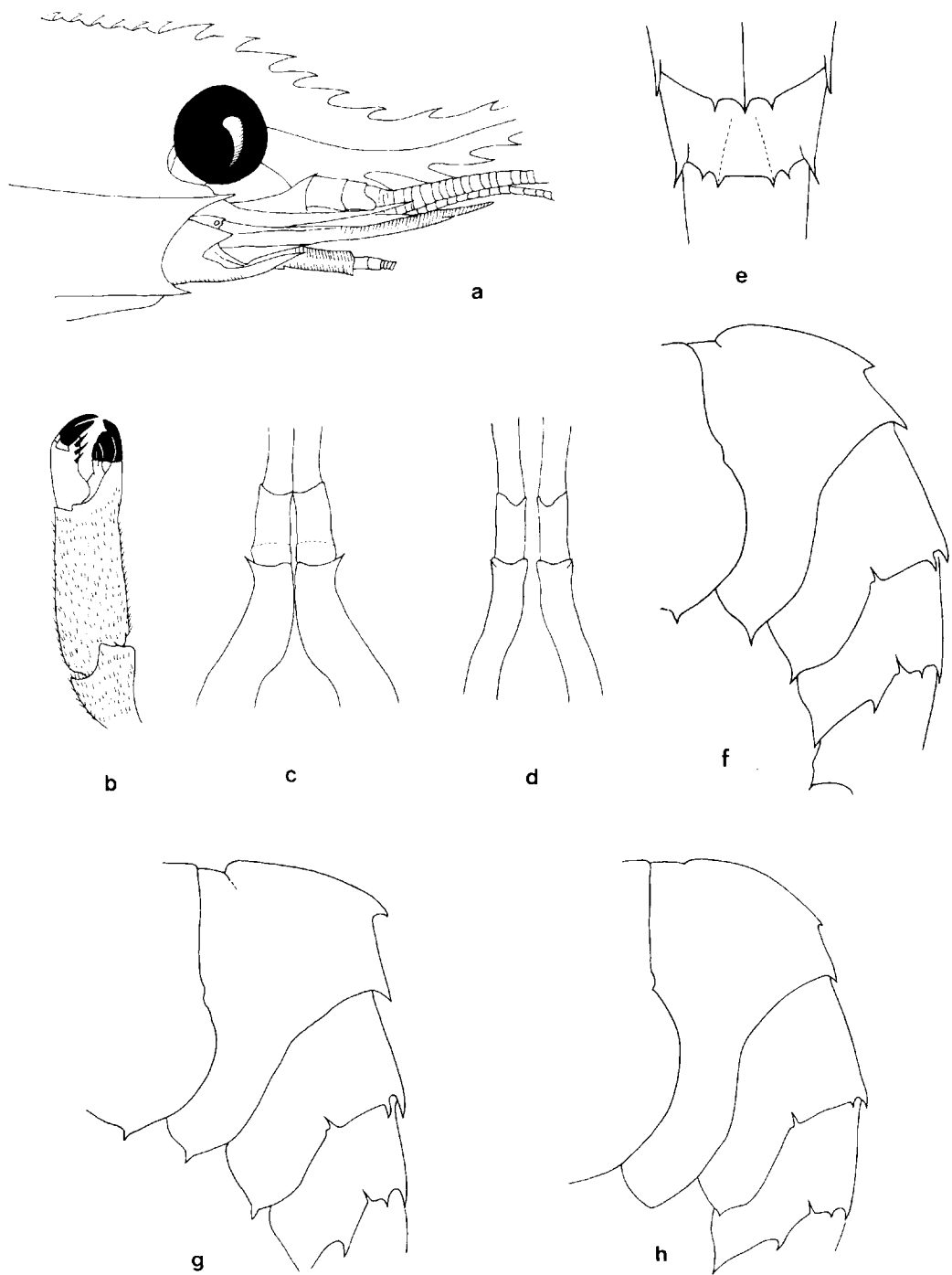


FIG. 1. — *Eugonatonotus chacei* sp. nov. : (a) anterior carapace ; (b) right chela I ; (c & d) ventral view of distal segments of maxilliped III ; (e) dorsal view of abdominal tergites IV and V ; (f-h) lateral view of abdominal somites III to V. a, b, c, e, f : holotype ♂ 32 mm cl. (NTOU). d : paratype ♂ 21 mm cl., Su-Ao, Taiwan (NTOU). g : ♂ 29 mm cl., New Caledonia, Chalcal 2, stn CC 1 (MNIIN). h : ovigerous ♀, 40 mm cl. Arafura Sea (NTOU, NTM exchange).

Maxilliped III with well-developed epipod and long exopod ; terminal segment heavily setose and armed with circular row of horny black spines at tip ; distal end of segment III (ischium) provided with large lateral spine (followed by row of small movable spinules) in large specimens (ie. > 22 mm cl.). Pereiopods short, robust and setose, none reaching distal end of scaphocerite. Anterior 4 pereiopods with well-developed epipods ; thin exopods present on all pereiopods, that of II somewhat reduced. Chelae I and II densely covered with short setae, particularly on palm of I ; fingers bearing peg-like processes on tips and with many additional spinules. Posterior 3 pereiopods armed with row of strong spines and spinules along ventral margins of various segments. Tips of fingers and dactyli horny black.

Dorsal surfaces of abdominal somites I and II rounded. Anterior 2/3 of non-articulated surface of III dorsally humped and terminating posteriorly in small spine ; posterior margin of dorsal carina bifurcated and produced into two small spines, more or less as long as pleural denticle. IV carinate medially, posterior margin armed with 1 central (similar in size with those of preceding somite) and two slightly smaller submedian spines. Dorsal surface of V subtriangularly flattened but with lateral ridges of triangular surface somewhat eroded and terminating as 2 sharp spines posteriorly ; pair of smaller spines present between submedian spine and lateral incision of tergite ; posterior margin of pleuron below lateral incision armed with another large spine (ie. altogether 6 spines present on posterior margin of somite V excluding ventral pleural denticle). VI with dorsal surface rounded and provided with pair of large spines posteriorly. Abdominal pleura usually armed with ventral denticle (but that of I sometimes absent or rudimentary). Telson distally pointed, armed with 2 pairs of dorsolateral and 2 pairs of terminal spines (outer pair small and easily lost). Eggs spherical and numerous, about 1 mm in diameter.

Coloration : Body rose-lilac to purplish, forming pale colored spots and patches. Margins and carinae of body dull red or orange. Posterior carapace somewhat whitish. Eyes black brown with golden reflections. Tip of rostrum, thoracic and abdominal appendages orange to red. Tips of maxilliped III, fingers and dactyli black. Tail-fan evenly pale colored and similar to abdomen. Antennal and antennular flagella orange-red. Eggs brown. Juveniles generally yellowish brown and with irregular markings on body.

TYPE-LOCALITY : Taiwan.

DISTRIBUTION : Western Pacific and Eastern Indian Ocean. It has been recorded in Japan, Taiwan, Philippines, Flores Sea (Y. HANAMURA, *pers. comm.*), north-western and eastern Australia, Chesterfield Islands, New Caledonia, Loyalty Islands and Tonga ; in depths of 100-610 m.

REMARKS

E. chacei closely resembles *E. crassus* from the Western Atlantic. Besides the possession of an extra pair of dorsolateral posterior spines on abdominal tergite V, the major differences between *E. chacei* and *E. crassus* are listed in Table 1. In *E. chacei*, the distal spine on the ischium of maxilliped III is large and well-separated from the main segment in specimens larger than 22 mm cl. (fig. 1c), but in smaller specimens, the ischial spine is rather small and not well separated from the main segment (fig. 1d). Nevertheless, this spine is minute or absent in *E. crassus* of all sizes (fig. 2c).

The mouth parts of the present species generally resemble the figures provided by KUBO (1937, *Gonatonotus crassus*). However, a rudimentary incisor process is present on the mandible in KUBO's (1937) figure 2A but there is no trace of such a process on the mandible of our material (ie. similar to that of *E. crassus*, see THOMPSON, 1966, fig. 1). KUBO's material no longer exists, but Dr. HAYASHI kindly helped us by examining the mandible of a male (31 mm cl.) from Suruga Bay and also could not find any incisor process in the Japanese specimen. Therefore there is little doubt that KUBO's (1937) illustration of the mandible was inaccurate and the Japanese population should belong to the same species as those studied here (also see coloration and descriptions of MIYAKE, 1982, and HAYASHI, 1986). Similar to KUBO's female (1937, fig. 1B), the rostrum of some of our small specimens are also rather short and only just exceeding the scaphocerite. Moreover, the palms of chela I in these small specimens are not so densely covered with short setae as in the other specimens. Both of these variations are probably juvenile characteristics of the species.

There are also some variation in the height of the dorsal hump of abdominal somite III. Although it is generally higher in small individuals, a few specimens (largest one 29 mm cl.) from New Caledonia have the abdominal hump very high and even "triangular" in appearance (fig. 1g). On the other hand, the hump is generally lower in large individuals but in some specimens (smallest one 34.5 mm) from the Arafura Sea it is very low and with the posterior submedian spines rather short (fig. 1h). However, no other differences are found between these specimens and those with typical humps (which often occur the same station as the atypical forms) and intermediate forms can be found. Nevertheless, it is of interest that these particularly high and low humped specimens have so far only been found in the above two localities.

TABLE 1. Major differences between *Eugonatonotus crassus* (A. Milne Edwards, 1881) and *E. chacei* sp. nov.

	<i>E. crassus</i>	<i>E. chacei</i> sp. nov.
Dorsal rostrum	No more than anterior 1/5 unarmed	At least anterior 3/10 unarmed
Ventral rostral teeth	8-9	7-8
Antennal spine	Overreaching dorsal basicerite spine	Extending to about tip of dorsal basicerite spine
Ventral basicerite spine	Maximally reaching to distal end of antennular segment II	Maximally reaching to middle of antennular segment II
Ischial spine on maxilliped III	Minute or absent	Large and distinct in specimen > 22 mm cl.
Chelae	Sparsely setose	Heavily setose, particularly palm of I
Submedian spines on abdominal tergite III	More elongated than pleural denticle	More or less as long as pleural denticle
Lateral ridges of subtriangular dorsum on abdominal tergite V	Markedly carinate	Somewhat eroded
Number of dorsolateral posterior spines on abdominal tergite V	2	4

E. chacei appears to be only distributed in the Western Pacific and the Eastern Indian Ocean. There is no *Eugonatonotus* found in the extensive samples from Madagascar and La Réunion deposited at the Muséum national d'Histoire naturelle. It is interesting that these two closely similar species (ie. *E. chacei* and *E. crassus*) have such a wide geographical separation.

ETYMOLOGY : The species is named after Prof. F. A. CHACE, Jr. for his generous help with our caridean studies. In this work particularly he urged us to describe the present new species even though we learned from later correspondence that he had been aware for 15 years that the Pacific *Eugonatonotus* is probably distinct from its Atlantic counterpart.

***Eugonatonotus crassus* (A. Milne Edwards, 1881)**

(Fig. 2a-e ; pl. 1B)

Gonatonotus crassus A. Milne Edwards, 1881 : 10 (type-locality : Grenada, Antilles); 1883 : 34, fig. not. num. — DE MAN, 1920 : 47. — SCHMITT, 1926 : 377. — BOONE, 1927 : 106, figs 22-23. — CHACE, 1936 : 24 (p.p.).

Gonatonotus crassus var. *longirostris* A. Milne Edwards, 1881 : 34, fig. not. num.

Eugonatonotus crassus : HOLTHUIS, 1955 : 39, fig. 18. — THOMPSON, 1966 : 131, figs 1-2. — PEQUEGNAT, 1970 : 63. — ABELE & KIM, 1986 : 13, 147, fig. a.

[Not] *Gonatonotus crassus* : CHACE, 1936 : 24 (p.p.). — KUBO, 1937 : 94, figs 1-3; 1971 : 606, fig. 938 (= *E. chacei* sp. nov.).

[Not] *Eugonatonotus crassus* : MIYAKE, 1982 : 25, pl. 9-2. — KING, 1982 : 14; 1984 : 178, fig. 4-Ec. — HAYASHI, 1986 : 99, color photo 59. — KENSLEY *et al.*, 1986 : 304. — CHAN & YU, 1988 : 259, figs 1-2, pl. 1 (= *E. chacei* sp. nov.).

MATERIAL EXAMINED

Grenada : U.S. Coast Survey, C. P. PATTERSON Supt., Caribbean Islands Exploration, U.S.C.S. S. "Blake" stn 249, coll. Alex AGASSIZ, 262 fathoms : 1 ♀ 16 mm (labelled "type"), 1 ♀ 21 mm (labelled "variété", San Key, 29 brasses) (MNHN).

Antilles : La Guadeloupe, 400-450 m, 1985 : 1 ♀ 38 mm (MNHN); S. Guadeloupe, R.V. "Pilsbury", stn 936, 16°02.5' N-16°04.2' N, 61°23.1' W-61°22.6' W, 16 Jul. 1969 : 1 ♂ 30 mm (RMNH); Porto Rico : 1 spec. 33.5 mm (MNHN).

E. Nicaragua : R.V. "Pilsbury", stn 1356, 14°53.9' N, 81°23.2' W, 162-205 m, 31 Jan. 1971 : 1 ♂ 26 mm, 3 ♀ 20 to 28.5 mm (RMHN).

E. Mexico (Yucatan Strait) : R.V. "Gerda" : stn 889, 20°55' N, 86°18' W, 10 Sep. 1967 : 1 ♂ 30 mm, 3 ovigerous ♀ 31.5 to 39 mm, 2 ♀ 15 and 32 mm (RMNH); stn 893, 10 Sep. 1967 : 2 ♀ 15 and 16 mm (RMNH).

Florida : R.V. "Gerda" : stn 135, 24°29' N-24°30' N, 80°53' W-80°50' W, 220 m, 21 Jun. 1963 : 1 ♂ 16 mm, 5 ♀ 17 to 21 mm (RMNH); stn 169, 27°01' N-27°04' N, 79°21.5' W-79°21' W, 522-567 m, 29 Jun. 1963 : 1 ♀ 19 mm (RMNH); stn 179, 27°41' N-27°51' N, 79°11' W-79°14' W, 549-567 m, 1 Jul. 1963 : 2 ♀ 26 and 31 mm (RMNH); stn 452, 25°02' N-25°05' N, 80°12' W-80°09' W, 185 m, 22 Jan. 1965 : 1 ♂ 16 mm (RMNH); stn 509, 26°07' N-26°08' N, 79°11' W, 311-329 m, 2 Mar. 1965 : 2 ♀ 18 and 19 mm (RMNH); stn 663, 27°30' N-27°34' N, 79°22' W, 569-576 m, 17 Jul. 1965 : 1 ♀ 15 mm (RMNH); stn 837, 24°29' N, 80°59' W, 188-198 m, 11 Jul. 1967 : 1 ♀ 18 mm (RMNH); stn 863, 24°19' N, 81°07' W, 29 Aug. 1967 : 1 ♀ 17 mm (RMNH).

DESCRIPTION

Generally very similar to *E. chacei* but differs in several characters : Rostral crest slightly less elevated and usually with no more than anterior 1/5 of dorsal rostrum unarmed, ventral

rostrum bearing 8-9 teeth. Antennal spine conspicuously larger than branchiostegal spine and overreaching tip of dorsal basicerite spine. Ventral basicerite spine generally more elongated and maximally reaching to distal end of antennular segment II. Ischial spine on maxilliped III minute or absent. Pereiopods slightly more slender and with setae on chelae I and II rather sparse. Abdomen with dorsal hump more elevated and spines more robust and elongated, with submedian spines at III distinctly longer than corresponding pleural denticle. Abdominal tergite V with lateral ridges of subtriangular dorsum strongly carinate but posterior margin above lateral incisions only armed with 1 pair of dorsolateral spines.

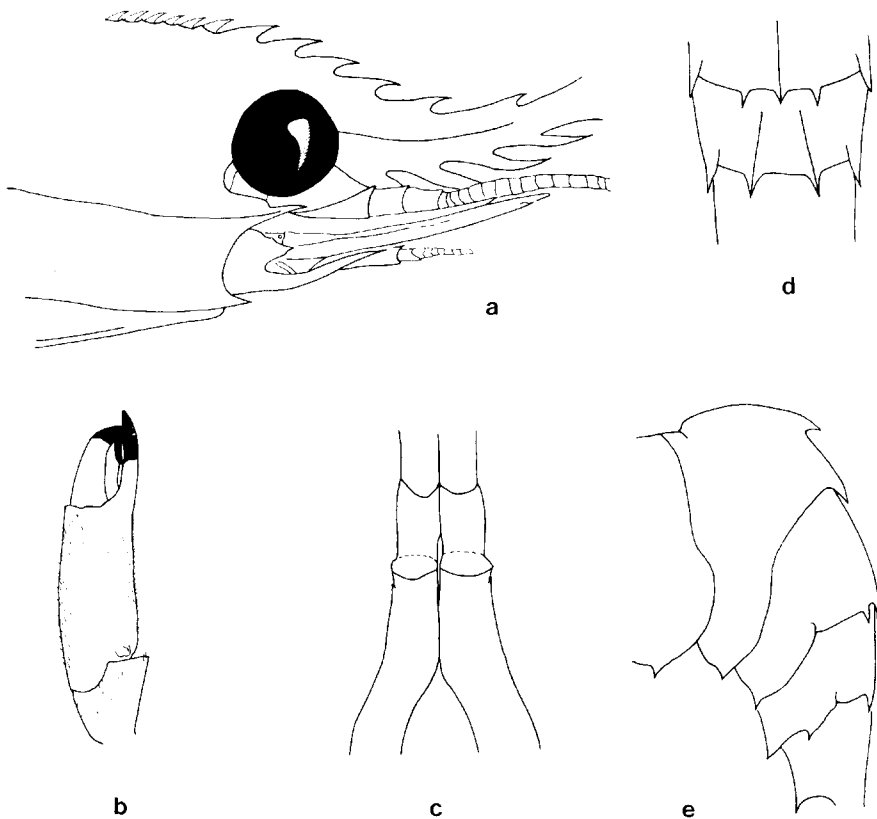


FIG. 2. — *Eugonatonotus crassus* (A. Milne Edwards, 1881) : (a) anterior carapace ; (b) right chela I ; (c) ventral view of distal segments of maxilliped III ; (d) dorsal view of abdominal tergites IV and V ; (e) lateral view of abdominal somites III to V. a-d : ♂ 30 mm cl., southern Guadeloupe, Antilles (RMNH). e : ♂ 23 mm cl., eastern Nicaragua (RMNH).

Coloration : Body rose-red with irregular white markings. Eyes black brown and with golden reflections. Pereiopods and pleopods red, with tips of fingers and dactyli black. Tail-fan proximally red while distal half whitish.

DISTRIBUTION : Tropical Western Atlantic : Gulf of Mexico and Caribbean, in depths of 162-576 m (the label of 53 m for the “variété” is probably incorrect).

REMARKS

The types of *E. crassus* and *E. crassus* var. *longirostris* are still well preserved in the Muséum national d'Histoire naturelle. They appear very similar to the figures provided by A. MILNE EDWARDS (1883). The smaller female (ie. type of *E. crassus*) has some mouth parts dissected. As in the other 29 Western Atlantic specimens examined in this study, both of them lack the extra pair of dorsolateral posterior spines on abdominal tergite V. In the figure of the type of *E. crassus* (A. Milne Edwards, 1883), there are 3 instead of 2 spines (including the median spine) at the lateral side of the posterior margin of abdominal tergite IV. That additional spine is actually a minute tubercle at the posterior margin and incorrectly illustrated as a spine.

As for *E. chacei*, the length and curvature of the rostrum in *E. crassus* seems to be rather variable (to some degree varying with size and sex). It is unwarranted to treat the long rostrum material as a variety and the name *Gonatonotus crassus* var. *longirostris* should be treated as a synonym of *E. crassus*.

E. crassus appears to be restricted to the tropical Western Atlantic. No material of this species is found in the numerous western African samples deposited at the Muséum national d'Histoire naturelle and Rijksmuseum van Natuurlijke Historie. Interestingly, both *E. crassus* and *E. chacei* have a similar "coral-reef" coloration pattern. Although generally the colorations of the two species are similar to those illustrated in Plate I, sometimes large variations are found in both of their patterns (photos provided by Dr. CROSNIER and Prof. CHACE, *pers. comm.*).

Acknowledgments

Grateful acknowledgment is extended to Prof. L. B. HOLTHUIS of the Rijksmuseum van Natuurlijke Historie and Dr. A. CROSNIER of the Muséum national d'Histoire naturelle in discussing the distribution of the two species and providing much valuable information, particularly Prof. L. B. HOLTHUIS for lending us the color slide of *E. crassus*; Prof. F. A. CHACE, Jr. of the National Museum of Natural History, Washington D.C. for reviewing the manuscript and giving valuable suggestions. We would also like to thank Dr. C. H. M. FRANSEN, the present curator of the Crustacean section of the Rijksmuseum van Natuurlijke Historie, for allowing the first author to examine their collection and to borrow some specimens; Dr. A. J. BRUCE of the Northern Territory Museum, Darwin for furnishing us with the material from N.W. Australia for the present study; Dr. K. I. HAYASHI of the Shimonoseki University of Fisheries for examining the mandible of a Japanese specimen for us; Dr. Y. HANAMURA of Enkai Chosa Kaihatsu for providing us the sketch of a specimen from the Flores Sea; the Ministère des Affaires Étrangères, France, for providing a short-term research grant to the first author to study in the Muséum national d'Histoire naturelle; and Mr. J. Y. SHY of our laboratory for inking the figures.

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Plate 1.

(A) *Eugonatonotus chacei* sp. nov. Holotype male 32 mm cl. Taiwan (NTOU).

(B) *Eugonatonotus crassus* (A. Milne-Edwards, 1881). 28.5 mm cl. female, R. V. "Pilsbury" stn 1356, eastern Nicaragua (RMNH).