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On two species of the family Xanthidae (Crustacea, Brachyura) from southern Japan[1]

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The present paper deals with a new and an unrecorded crabs of the family Xanthidae from the north of Kyushu and the Amami Group, the Ryukyu Islands. The specimens from the north of Kyushu, which represent a new species, resemble to *Nanocassiope granulipes* (Sakai) in the general formation of the carapace. However, on account of bearing the different type of the first male pleopod, the new species is referable to the genus *Microcassiope* Guinot, which was recently erected on two species from the East Atlantic and the East Pacific. The other species, *Paraxanthias parvus* (Borradaile), has hitherto been known only by the original description based on the materials from Rotuma Island in the South Pacific. The present materials, two females, are safely referable to the species, but the inclusion to the genus *Paraxanthias* Odhner is still now somewhat questionable. Though unfortunately the first male pleopod is not available, in the present paper the species is referred to *Paraxanthias* due to bearing the close resembrance to *P. notatus* (Dana) rather than to the species of the genus *Paraliomera* Rathbun.

All the specimens examined are preserved in the Zoological Laboratory, Kyushu University (ZLKU).

[1] Contributions from the Zoological Laboratory, Faculty of Agriculture, Kyushu University, No. 414.

Genus *Paraxanthias* Odhner, 1925

Odhner, 1925, p. 85; Rathbun, 1930, p. 465; Sakai, 1939, p. 469; Forest and Guinot, 1961, pp. 76-78; Guinot, 1964, p. 30.

Diagnosis. Carapace broad, suboval and moderately convex in both directions; dorsal areolae smooth and well defined by shallow but distinct rather wide furrows. Front almost transverse and only slightly sinuate, or obliquely cut out, with a median sinus; each of lateral angles not strongly produced, but distinctly separated from supraorbital angle. Supraorbital border bears two closed fissures, and infraorbital border also with a fissure just below less prominent external orbital angle. Basal antennal segment broad but short, and its inner angle just touched with short ventral prolongation of front. Anterolateral border of carapace with four thick, sometimes spiniform teeth behind external orbital angle.

Chelipeds quite unequal and unlike each other in both sexes; carpus and palm rugose with granules, granulated prominences and furrows; in smaller cheliped granules usually spiniform. Ambulatory legs rather stout, hairy and spiny. Male abdomen with third to fifth segments fused. First male pleopod without long hairs.

Type-species: *Xanthodes notatus* Dana, 1852.

Remarks. The genus *Paraxanthias* is not quite distinct from the genus *Xanthias* Rathbun, 1897. Though in the typical species of both genera the formation of the front and chelipeds may be rather different from each other, it is less important for the definite distinction of both genera. In the species of *Xanthias* the frontal lobes are rather strongly turned downwards and convex near the median sinus, and the chelipeds are subequal or only slightly unequal in both sexes, being alike each other. On the other hand, in the typical species of *Paraxanthias* the front is subtruncated, and the chelipeds are quite unequal and different from each other. It is otherwise remarked that in some species at present referred to *Paraxanthias* the ambulatory legs are notably spiny unlike in the species of *Xanthias*, in which they are devoid of spines. As discussed by Forest and Guinot (1961), therefore, both genera are distinguished based on the different type of the first male pleopods. In the species of *Paraxanthias* the first male pleopod bears no long hairs unlike in the species of *Xanthias*.

Paraxanthias parvus (Borradaile, 1900)

(Fig. 1)

Xanthias parvus Borradaile, 1900, p. 582, pl. 41, figs. 5-5b—Rotuma I.
Paraxanthias parvus, Odhner, 1925, p. 85 (in discussion).

Paraliomera parva, Rathbun, 1930, p. 466 (in discussion).
Paraliomera ? parva, Guinot, 1964, p. 32 (in list).

Description. The carapace is more or less transversely oval in its outline, being weakly convex anteriorly and nearly level from side to side; the dorsal surface is almost naked and smooth to the unaided eye, and well divided into areolae by shallow but distinct rather wide furrows; the areolae are, however, covered with thick microscopical granules, being not convex; the front is almost transverse or only slightly produced and convex near the median V-shaped sinus, and bordered with minute rounded granules; of the dorsal areolae, 1, 2 and 3M and an areola behind the external orbital angle (1, 2 and 3L) are prominent; 2M is incompletely subdivided anteriorly by a short, shallow longitudinal furrow; the posterior end of 1M is elongate, and in reality the separation from the inner part of 2M is indistinct; at the antero-inner angle of the outer part of 2M is a longish seta or hair; the anterior process of 3M is narrow and ends at the middle way of 1M.

The inner part of the supraorbital border is rather thick, its inner angle being rounded and deeply separated from the outer angle of the front; two supraorbital fissures are closed, but traceable by the shallow depressions; the true external orbital angle is not produced at all, just at which is a third closed fissure; beneath the fissure the external angle of the infraorbital border is produced and visible from above; the infraorbital border is weakly concave throughout the length, and its inner angle is thereby slightly raised, but not angulated. The antennal basal segment is rather wide but short; its inner angle is just touched with the short ventral prolongation of the front, and the outer angle is raised to the level of the inner infraorbital angle; the antennal flagellum is rather stout and only slightly longer than the major diameter of the orbit, being provided with microscopical secondary setae.

The anterolateral border of the carapace is armed with four stout teeth behind the external orbital angle; the first tooth is only a rounded prominence, being separated indistinctly from the external orbital angle and by a shallow bight from the external angle of the infraorbital border just below the external orbital angle; the last three teeth are subequal, and obtuse at the tips but apparently sharper than the first tooth; they are somewhat directed obliquely upwards and separated each other by a dorsal deep depression. The posterolateral border is strongly convergent and directed downwards, so that its dorsal surface is deeply sunken. The true posterior border of the carapace is as wide as the front.

The chelipeds are heavy, unequal and unlike each other. In both specimens examined the right one is much larger than the other. In each cheliped the merus is short and stout; the upper border of the

larger merus is strongly crested and distally armed with two or three rounded granules, while in the smaller cheliped the upper border of the merus is also crested and armed with two or three sharp spines, of which the distal one just behind the interruption is the longest.

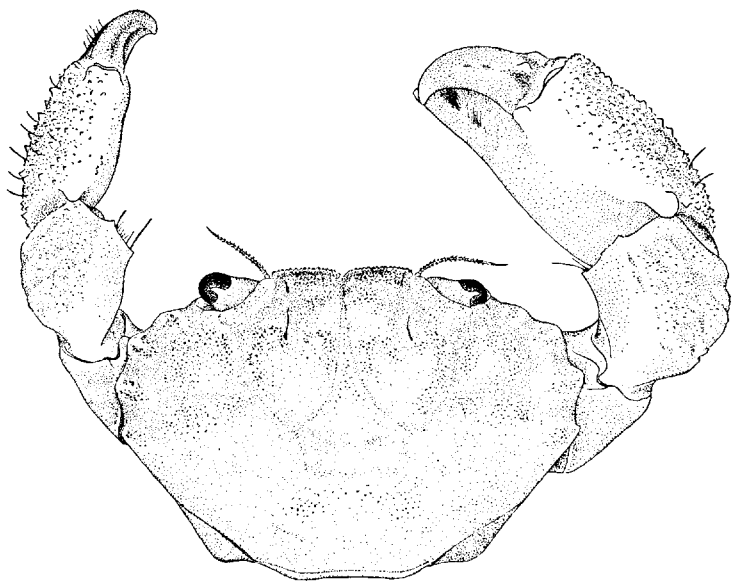

Fig. 1. *Paraxanthias parvus* (Borradaile), ♀ (No. 13420 2). Carapace with chelipeds, ×7.8.

The carpi of both chelipeds are alike each other in spite of the different size; the outher surface is very rugose with depressions and granulated prominences; two transverse furrows along the distal margin and at the middle are rather deep, but the prominences are not strongly convex; otherwise, the minute granules on the prominences are not sharp, but almost worn out in their appearances. The palm of the larger chela is very swollen and extremely roughened by the blunt granules and granulated prominences of various size; at the surface near the lower border the granules become indistinct, diminishing the size; at the middle surface the larger granules are indistinctly beaded to form two or three longitudinal series. The palm of the smaller chela is slender and about half height of the larger palm, tapering only slightly; its outer surface is also roughened by conical large granules and minute ones, and provided with several longish, sparse hairs; at the middle surface the larger granules are beaded to form three or four rather distinct transverse series. The fingers of the larger chela are stout and about half the length of the larger palm; each of the cutting edges bears several blunt teeth, the tips of the

fingers being blunt; at each of the inner surfaces are two tufts of hairs, of which the distal one on the immovable finger is the most prominent. The smaller fingers are slender and also about half the length of the smaller palm, being sharply toothed on the cutting edges; the inner surfaces are also provided with hairs which are not distinctly tufted.

The ambulatory legs are comparatively stout. The greater part of the merus is naked only with a fringe of hairs along the upper border; only in the merus of the last ambulatory leg the fringe of hairs is restricted to the distal part of the upper border; each of the upper borders is armed with a row of conical granules, which is not disguised by the fringe of hairs. The carpus, propodus and dactylus are densely covered with short felt-like hairs, in which several long hairs are implanted; in addition, the upper borders and surfaces of the carpus and propodus are armed with rather sparse conical granules, of which those on the upper surface of the carpus are distinctly beaded to form a longitudinal row; the dactylus is much narrower than the propodus, and armed also with several sharp, more or less elongate granules on the upper surface and with thick yellow, semitransparent spinules on the upper border near the terminal claw.

In life the carapace is dark purple with white interregional furrows and also with white *moiré* blotches. The chelipeds are of the same colour as the carapace with some prominent white spots on the outer surface of the palm; the fingers are black with white tips and teeth. The ambulatory legs are much light-coloured.

Material examined.

Sena, Yoron I., Ryukyu Is., 2♀♀, ZLKU No. 13420, Jul. 9, 1968, Y. Miya and T. Fujino leg.

Measurements.

Two ♀♀ (No. 13420): Length of carapace, 5.4 and 4.9 mm; breadth of carapace with lateral teeth, 8.4 and 7.6 mm.

Remarks. The present specimens are generally agreeable with the following short original description given by Borradaile (1900).

"A *Xanthias* with the carapace minutely granular, clearly delimited into the areas characteristic of the genus; the antero-lateral edge on each side with four teeth, of which the first two are very low and blunt and the last two somewhat sharper; the front fairly straight, rather deeply notched in the middle line, and separated at its outer ends by shallow notches from the swollen orbital rims; chelipeds unequal, unlike, the larger with the hand more swollen and the fingers less gaping than the smaller, the wrist in both irregularly and coarsely rugose; the hand covered above and outside with fairly sharp conical tubercles, smooth

below and inside; the cutting edges of the fingers close set with bluntish rounded teeth, which in the large hand almost entirely fill up the gap between the fingers, but in the smaller leave a space towards the base of the fingers, the outside of the fingers grooved; the walking-legs stout, with a strong fringe of hairs on the upper edge, the last three joints hairy on the outside, the dactylopodite rather longer than the propodite and ending in a long, slender, curved claw."

In the original description the armatures of the ambulatory legs are not mentioned at all, but in the present specimens the ambulatory legs are strongly armed with spiniform granules. The anterolateral border of the carapace is, otherwise, described as that the first two teeth are very low and blunt and the last two are sharper, and is figured as that all the teeth are rounded only with shallow depressions. In the present specimens, however, only the first tooth is low and the following three are equal and more or less sharper than the first.

The systematic status of the present species leads to a dispute. Rathbun (1930) established a genus *Paraliomera* for two species from the Atlantic coast of America and inserted the present species into the genus with slight question. The present species is, however, generically distinct from the species of *Paraliomera*, and transferred back to the present genus due to the distinct areolation of the dorsal surface and to bearing the distinct anterolateral teeth of the carapace. The nearest kin of the present species is *Paraxanthias notatus* (Dana) in which, however, the size is much more larger, the last two anterolateral teeth are spiniform even in the large specimens, and the ambulatory legs are devoid of felt-like hairs. Some additional small differences between the two species are apparently enumerated. It is, however, noted that the examination of the first male pleopod is very desirable for confirmation of the systematic status. As remarked elsewhere, if the first male pleopod of the present species bears subterminal long hairs, the present species should be transferred to the genus *Xanthias* in spite of its resembrance of the external characters to *Paraxanthias notatus*.

Distribution. This species has previously been known only from Rotuma Island in the South Pacific.

Genus *Microcassiope* Guinot, 1967

Guinot, 1967, p. 358.

Diagnosis. Carapace transversely oval and rather strongly convex antero-posteriorly; dorsal areolae well separated and ornamented with transverse, more or less undulating rows of granules. Front narrow, convex and distinctly double-rimmed; frontal lateral lobule strongly produced and separated shallowly from frontal two borders and deeply

from supraorbital angle. Four anterolateral teeth rather obtuse, but sometimes conical. Chelipeds distinctly unequal and markedly roughened by granules and granulated prominences. First male pleopod slender and provided with some recurved, short stout setae near its tip.

Type-species: *Xanthodes rufopunctatus* A. Milne Edwards, 1869.

Remarks. The present genus is closely allied to *Nanocassiope* Guinot in the general formation of the carapace and chelipeds. It is remarkable that in the present genus the front is bordered with two crest-like granulated ridges and the frontal lobules are distinctly demarcated. The most important generic differences are founded on the types of the first male pleopods of the species of both genera. In the species of the present genus the first male pleopod is slender and provided with some short, recurved stout setae near the tip, while in the species of *Nanocassiope* it is very stout and bears some long undulating stout setae.

The occurrence of the species of *Microcassiope* in the Indo-Pacific waters is new.

Microcassiope orientalis sp. nov.

(Figs. 2, 3)

Description of holotype. The carapace is transversely oval and moderately convex fore and aft as well as from side to side; the dorsal surface is well divided into areolae by rather deep, wide smooth furrows; the areolae are provided with scattered brush-like hairs, and covered with granules, most of which are beaded to form short, more or less undulating transverse or oblique rows; a frontal region and an areola 1M are small but rather convex, and 2M is the most prominent, being indistinctly incised from the middle of the anterior border by a longitudinal shallow furrow continuous with the furrow of the outside of 1M; just near the incision are some longish brush-like hairs; an anterolateral areola behind the external orbital angle, which represents 1, 2 and 3L, is indistinctly subdivided into three; 3M is also very indistinctly subdivided into three by the transverse incision from each of the lateral angles and by the longitudinal one from the middle of the posterior border; the anterior process of 3M ends at the middle way of 1M; the areolae 4, 5 and 6L are distinct, but 4L is small and placed near the third anterolateral tooth; at the posterolateral surface of the carapace, an oblique furrow is prominent and continuous with a transverse furrow behind the areola 3M; along the posterior border of the carapace is a transverse prominence that is interrupted in the middle.

The front is double-rimmed, bearing a median, large V-shaped

sinus; in dorsal view the lower border is visible only near the median sinus beyond the upper border which may represent the areola 1F; both borders are most produced near the median sinus and furnished with a row of rounded granules, being continuous laterally through the depression with the strongly protruded lateral lobule of the front; the lobule is somewhat distinctly curved downwards and separated from the supraorbital angle by a very deep notch. The eyestalk is very stout and armed with several granules just near the cornea and at the proximal part. The supraorbital border is somewhat raised and prominently granulated most at its inner part; there are two depressions, but they are not deep; just below the external orbital angle which is weakly produced, a notch is present, and the lateral angle of the infraorbital border is angulated. The subhepatic region is prominently granulated and hairy.

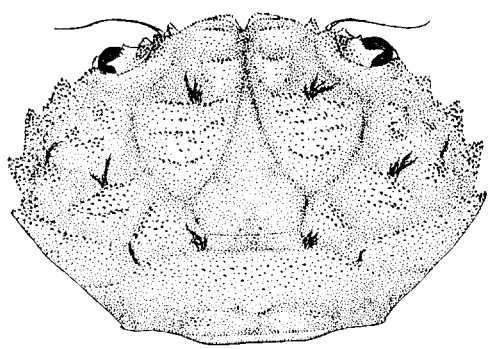

Fig. 2. *Microcassiope orientalis* sp. nov., ♂ (No. 7634 1). Carapace, × 8.3.

The anterolateral border of the carapace is armed with four teeth excluding the external orbital angle; the teeth are subacute at the tips, directing obliquely forwards and somewhat upwards; the posterior tooth is more strongly directed obliquely outwards than the preceding one; the first is slightly smaller than the last three subequal teeth. The posterolateral border is strongly convergent and near the posterior end it is directed downwards; its dorsal surface is granulated and most strongly sunken near the posterior border of the carapace.

The chelipeds are massive and slightly unequal but alike each other, the left one being the larger. The merus is short and as large as the carpus; its inner surface is wholly excavated and concealed beneath the carapace, being fringed with brush-like hairs and minute granules without spine. The outer surface of the carpus is extremely roughened by the conical thick granules, depressions and granulated prominences; in the smaller carpus the prominences are much pronounced than in the larger carpus, and more or less tuberculated; the inner angle is

armed with a granulated tubarcular tooth. The palm is also roughened by the granulated prominences somewhat like in the carpus, and provided with scattered brush-like hairs; along the outer upper surface is a longitudinal furrow, and at the middle surface are two which are, however, very obscure and only traceable due to the indistinct rows of granules; at the surface near the lower border the granules become indistinct, diminishing the size; the blackish brown colour of the immovable finger is fairly extended on to the palm towards the upper border and along the lower border. The cutting edge bears three or four rather blunt teeth of different size; the tip of each finger is blunt, but in reality its inner surface is considerably excavated.

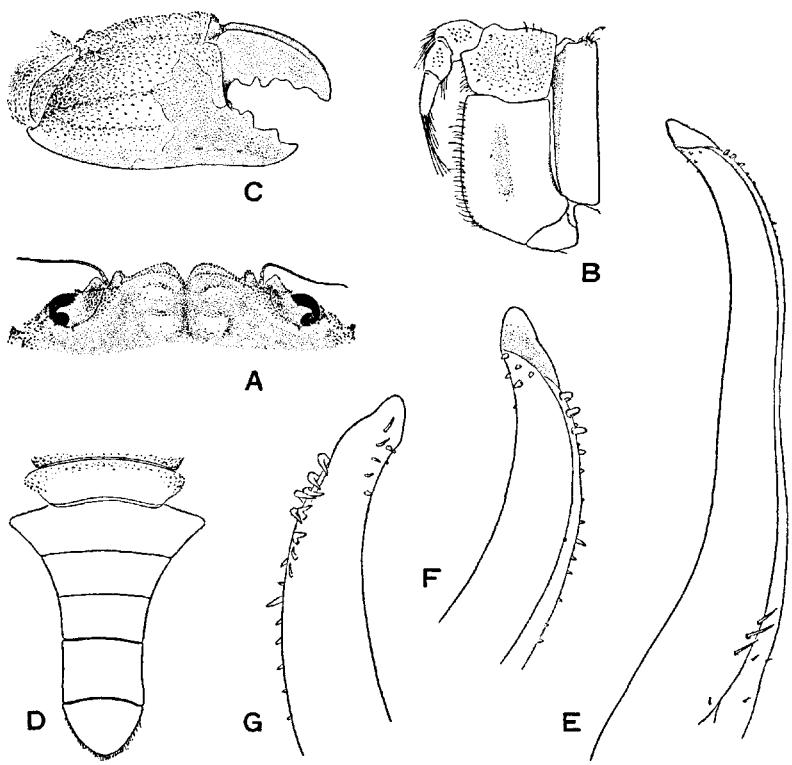

Fig. 3. *Microcassiope orientalis* sp. nov., ♂ (No. 7634-1). A. Fronto-orbital region, slightly tilted posteriorly, ×7.5; B. Left third maxilliped, ×15; C. Right chela, ×6.3; D. Abdomen, ×12.5; E. Right first pleopod in abdominal view, ×60; F, G. Distal part of the same in abdominal and sternal view, ×100.

The ambulatory legs are hairy and armed with sharp granules. The merus is bordered with a row of sharp granules on the upper

border; the subterminal depression of the upper border is fairly distinct. The carpus and propodus is also granulated on and near the upper borders; in the carpus a row of granules on the upper surface along the upper border is more or less ridge-like. The upper border of the dactylus is armed with small but spiniform granules; in each datylus of the last two ambulatory legs a subterminal spine on the lower border is prominent.

Description of paratypes. In the specimens (No. 7634) the ornamentation of the carapace is very well agreeable with that of the holotype, but in two males (No. 611) and one female (No. 10071) the granulated ridges on the areolae and anterolateral teeth are somewhat worn out in the appearance. Especially it is noted that in a female (No. 10071) the anterolateral teeth are blunt and the front is bordered with markedly worn out granules. In the female chelipeds the blackish colour of the immovable finger is not extended on to the palm. In all the paratypic specimens the formation of the chelipeds, ambulatory legs and also the first male pleopods is almost identical with that of the holotype.

Material examined.

Off Sone, Munakata-Oshima Islet, Fukuoko Pref., 10 m ceep, 1 ♂ (holotype), ZLKU No. 8678, Jul. 3, 1957, Y. Motomatsu leg.; Same data as holotype, 3 ♂♂, 2 ♀♀ (paratypes), ZLKU No. 7634.

Okino-shima Islet, Fukuoka Pref., 2 ♂♂ (paratypes), ZLKU No. 611, May 19-29, 1933, H. Ohshima. H. Ikeda and K. Yasumoto leg.; Katsusaki, Okino-shima Islet, 1 ♀ (paratype), ZLKU No. 10071, Mar. 25, 1963, K. Sakai leg.

Measurements.

Holotype. ♂ (No. 8678): Length of carapace, 4.8 mm; breadth of carapace with lateral teeth, 7.0 mm; breadth of front with lateral lobules, 2.4 mm; fronto-orbital breadth, 4.4 mm.

Paratypes. ♂ (No. 7634-1): Length of carapace, 5.2 mm; breadth of carapace with lateral teeth, 7.7 mm; breadth of front with lateral lobules, 2.6 mm; fronto-orbital breadth, 4.8 mm. ♂ (No. 611-1): Length of carapace, 4.6 mm; breadth of carapace with lateral teeth, 6.6 mm; breadth of front with lateral lobules, 2.3 mm; fronto-orbital breadth, 4.3 mm. ♀ (No. 10071): Length of carapace, 4.5 mm; breadth of carapace with lateral teeth, 6.5 mm; breadth of front with lateral lobules, 2.1 mm; fronto-orbital breadth, 4.4 mm.

Remarks. The present species is closely allied to *Microcassiope rufopunctata* (A. Milne Edwards) from the East Atlantic, which is well

figured by Monod (1956) as *Micropanope*. In the present new species from the West Pacific, the areolation of the dorsal surface is somewhat different from that of the Atlantic species, especially with respect to the areola 1M and those on the anterolateral, posterolateral and posterior surfaces. In addition, the anterolateral teeth of the present new species are distinctly dentate and apparently much sharper than those of *M. rufopunctata*. The first male pleopod of the present new species bears also some recurved stout setae near the distal end like that of *M. rufopunctata*, but the formation of the tip is much simpler than in that of *M. rufopunctata*.

On the other hand, the general appearance of the present new species is similar to that of *Nanocassiope granulipes* (Sakai) from the Japanese waters and South Africa. In *N. granulipes* the dorsal surface of the carapace is divided into regions, fairly well, but much less distinctly than in the present new species, being covered with thick, minute granules that are not beaded to transverse series; of the anterolateral teeth the fourth or the last one is much smaller than the precedings; in the male chelae the black colour is not extended on to the palm; the first male pleopod is very short and stout, bearing some undulating stout setae instead of recurved setae of the present new species. The present new species is generically distinct from *N. granulipes* on account of bearing quite different type of the first male pleopods.

The present new species also comes near to *Xanthias cumatodes* (MacGilchrist) which is included into the genus for a matter of convenience. The species should be transferred to *Microcassiope* or *Nanocassiope* or the kindred genus after the examination of the first male pleopod. In the species the dorsal areolae are also ornamented with many transverse rows of granules like in the present new species, but the areola 2M is subdivided and its inner areolet is continuous with 1M; the outer surface of the palm shows three parallel longitudinal furrows; the last anterolateral tooth is much smaller than the precedings; the upper border of each merus of the ambulatory legs is furnished with a central and a subdistal hump, which make it saddle-shaped.

Literature

Borradaile, L. A., 1900. On some crustaceans from the South Pacific. Part IV. The crabs. Proc. zool. Soc. London, 1900: 568-596, pls. 40-42.

Dana, J. D., 1852. Crustacea. United States Exploring Expedition, during the years 1838, 1839, 1840, 1841, 1842, under the command of Charles Wilkes, U.S.N. 13: 1-685.

Forest, J. and D. Guinot, 1961. Crustacés décapodes brachyoures de Tahiti et des Tuamotu. Expédition française sur les récifs coralliens de la Nouvelle-Calédonie. Volume préliminaire: i-xi, 1-195, pls. 1-18.

Guinot, D., 1964. Crustacés décapodes brachyoures (Xanthidae) des campagnes de la Calypso en Mer Rouge (1952), dans le Golfe Persique et a l'île Aldabra (1954). Mém. Mus. Nat. Hist nat., Paris, sér. A, Zool., 32: 1-108, pls. 1-12.

Guinot, D., 1967. Recherches préliminaires sur les groupements naturels chez les crustacés décapodes brachyoures. II. Les anciens genres *Micropanope* Stimpson et *Medaeus* Dana. Bull. Mus. Nat. Hist. nat., Paris, sér. 2, 39: 345-374.

MacGilchrist, A. C., 1905. Natural history notes from the R.I.M.S. "Investigator," Capt. T. H. Heming, R.N. (retired), commanding. Ser. III, No. 6. An account of the new and some of the rarer decapod Crustacea obtained during the surveying seasons 1901-1904. Ann. Mag. nat. Hist., ser. 7, 15: 233-268.

Monod, Th., 1956. Hippidea et Brachyura ouest-africains. Mém. I.F.A.N., 45: 1-674.

Odhner, T., 1925. Monographierte Gattungen der Krabbenfamilie Xanthidae. I. Göteborgs K. Vet. och Vit.-Samh. Handl., ser. 4, 29: 1-92, pls. 1-5.

Rathbun, M. J., 1897. A revision of the nomenclature of the Brachyura. Proc. biol. Soc. Wash., 11: 153-167.

Rathbun, M. J., 1930. The cancroid crabs of America. Bull. U. S. Nat. Mus., 152: i-xvi, 1-593, pls. 1-230.

Sakai, T., 1939. Studies on the crabs of Japan. IV. Brachygnatha, Brachyncha. Tokyo, 365-741, pls. 42-111.