

***GLOBOPILUMNUS FRAGARIA*, A NEW SPECIES OF ERIPHIID CRAB (CRUSTACEA: DECAPODA: BRACHYURA: XANTHOIDEA) FROM THE SOUTH CHINA SEA, WITH A KEY TO THE GENUS *GLOBOPILUMNUS* BALSS, 1933**

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ABSTRACT. - A new species of reef crab of the genus *Globopilumnus* Balss, 1933, is described from the Nansha Islands in the South China Sea. The new species, *G. fragaria*, is the ninth in the genus, and its affinities with allied taxa is discussed. A key to the genus is also provided.

KEYWORDS. - Taxonomy, new species, *Globopilumnus*, Eriphiidae, South China Sea.

INTRODUCTION

The genus *Globopilumnus* Balss, 1933, is currently represented by eight species, viz. *G. globosus* (Dana, 1852) (type species by original designation), *G. actumnoides* (A. Milne Edwards, 1873), *G. kiiensis* Takeda & Nagai, 1983, *G. laciniatus* (Sakai, 1980), *G. calmani* Balss, 1933, *G. africanus* (A. Milne Edwards, 1867), *G. stridulans* (Monod, 1956), and *G. xantusii* (Stimpson, 1860). Of these, two species, *G. africanus* and *G. stridulans* are West African in distribution, while *G. xantusii* is known only from the western Pacific coast of tropical America. Only *G. africanus*, *G. stridulans* and *G. xantusii* are known to stridulate (see Guinot-Dumortier & Dumortier, 1960; Garth, 1968). The other five species, *G. globosus*, *G. actumnoides*, *G. calmani*, *G. kiiensis* and *G. laciniatus* have an Indo-West Pacific distribution.

The taxonomy of *G. globosus* and *G. autumnoides* has been well treated by Guinot-Dumortier (1959) and there is no need to elaborate here (see Guinot-Dumortier (1959) for complete synonymy). *Globopilumnus kiiensis* was described from Japan by Takeda & Nagai (1983) who also provided a key to the genus up to that time (but excluding *G. xantusii*). Garth & Kim (1983) described *Globopilumnus multituberous* from the Philippines and Japan, and Ng & Tan (1985) recorded the species from Australia, but Ng (1992) noted that *Pilumnus laciniatus* Sakai, 1980, was a senior synonym.

As part of our ongoing studies of the xanthoid fauna of the South China Sea, we recently examined specimens of an undescribed species of *Globopilumnus*. The present note serves to diagnose this new species, here named *G. fragaria*, provide comparisons with related taxa, as well as to provide a key to all nine species in the genus. The genus *Globopilumnus* is referred to the family Eriphiidae MacLeay, 1838, following the classification proposed by Guinot (1978) (as Menippidae). It has been noted by Ng (1998) that Menippidae Ortmann, 1893 (as used by Guinot, 1978; Serène, 1984), as well as Oziidae Dana, 1851 (as used by Holthuis, 1993), are both junior synonyms of Eriphiidae MacLeay, 1838.

The abbreviations G1 and G2 are utilised for the male first and second pleopods respectively. Measurements provided are for the carapace length and width respectively. Specimens are deposited in the Institute of Zoology, Academia Sinica (AS), Beijing; and the Zoological Reference Collection (ZRC), School of Biological Sciences, National University of Singapore.

DESCRIPTIVE PART

Genus *Globopilumnus* Balss, 1933

Globopilumnus fragaria, new species (Figs. 1, 2)

Material examined. - Holotype - male (5.5 by 7.5 mm) (AS), Sanjiao Reef, Nansha (= Spratly) Islands 10°10'N 115°20'E, coll. Y.-X. Cai, 4 Apr. 1994.

Paratypes - 1 male (6.0 by 7.7 mm), 1 female (4.1 by 5.8 mm) (ZRC), 1 female (3.8 by 5.4 mm) (AS), same data as holotype.

Diagnosis. - Carapace slightly broader than long, appearing almost squarish; regions not clearly discernible; dorsal surface slightly convex transversely and longitudinally, anterior half with scattered, rounded red granules, especially near margins, dorsal surface otherwise smooth except for slightly raised base of setae; dorsal surface covered by short, stiff, simple setae which does not completely obscure surface, granules or margins. Frontal margin with distinct median cleft; lateral lobule very low. Supraorbital margin lined with fine granules, with 1 small median cleft, and 1 very small (sometimes indistinct) cleft near the external orbital tooth. Infraorbital margin with 2-3 sharp granules, rest of margin lined with small, rounded granules. External orbital tooth with a small, sharp granule; anterolateral margin distinctly convex, with 3 evenly spaced small, relatively sharp granules, margin otherwise uneven but not distinctly granulated or serrated. Posterolateral margin gently concave to almost straight, very gently converging towards posterior margin of carapace. Pterygostomial and suborbital regions with scattered small granules; subhepatic region unarmed. Outer surface of chelipeds with numerous, evenly spaced, rounded red granules; covered with stiff setae which does not completely obscure surfaces or margins; dactylus and pollex with shallow

submarginal sulcus on outer surface; proximal one-third of dactylus with several granules; granule on inner distal angle of carpus sharp. Proximal ventral margin of merus of ambulatory legs with 2-3 granules; margins of other segments uneven to smooth, unarmed. G1 gently sinuous, distal part not strongly curved, tip subtruncate, not flared. G2 with long distal segment which is about half length of elongate basal segment.

Variation. - The diagnostic characters of this species are independent of sex, even though the holotype male is larger than the two paratype females. The larger paratype male is somewhat damaged but most of its characters are still clearly discernible. Compared to the holotype, the distal part of the G1 of the paratype male has relatively more setae and the tip is somewhat more angular in shape.

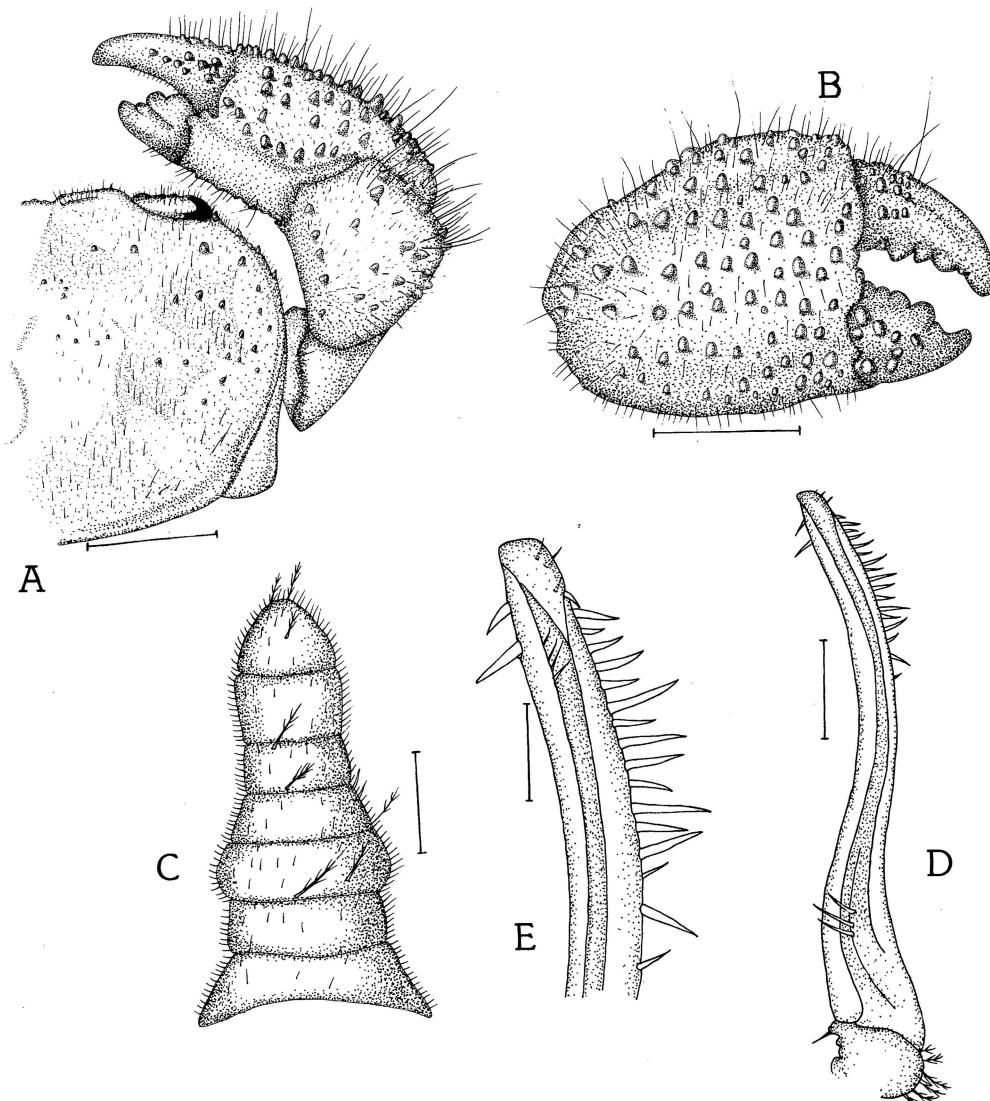


Fig. 1. *Globopilumnus fragaria*, new species. Holotype male (5.5 by 7.5 mm) (AS). A, right side of carapace; B, right chela; C, abdomen; D, left G1 (ventral view); E, distal part of left G1 (ventral view). Scales: A, B = 2.0 mm, C = 1.0 mm, D = 0.2 mm, E = 0.1 mm.

Colour. - In 70% alcohol, the carapace has a pattern of reddish-brown and beige. The background colour of the legs and chelipeds is reddish-brown. The anterolateral granules and characteristic rounded granules on the carapace, ambulatory legs and chelipeds are bright red.

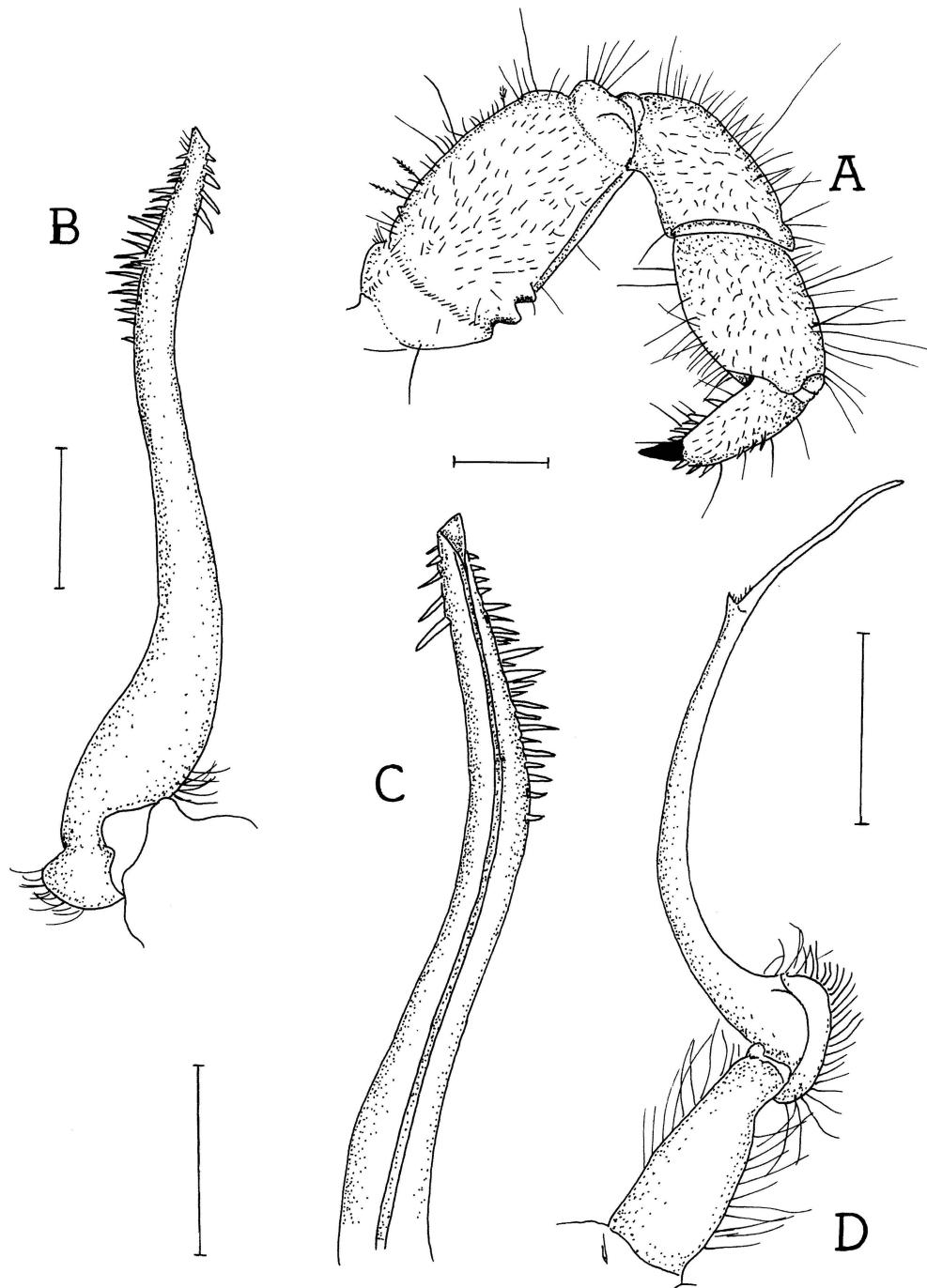


Fig. 2. *Globopilumnus fragaria*, new species. Paratype male (6.0 by 7.7 mm) (ZRC). A, right fourth ambulatory leg; B, left G1 (ventral view); C, distal part of left G1 (ventral view); D, G2. Scales: A = 1.0 mm, B-D = 0.2 mm.

Etymology. - The name is derived from the Latin for strawberry, alluding to the numerous red granules on the chelipeds of the crab. Used as a noun in apposition.

Taxonomic remarks. - *Globopilumnus fragaria*, new species, is unusual in that the anterolateral margin bears only three small granuliform teeth, the margin otherwise appearing almost entire. Its general carapace features allies it with *G. globosus* but this species has between four to five anterolateral teeth. In addition, the granules on the outer surface of the chela are more numerous and densely packed whilst in *G. fragaria*, they are more evenly spaced. The granules on the carapace and chelipeds in *G. fragaria* are also bright red, in contrast to the dull brown ones of *G. globosus*. The fingers of the chela of *G. actumnoides* are also relatively shorter and stouter than those of *G. fragaria* (cf. Guinot-Dumortier, 1959). Most striking are their very different gonopodal structures. In *G. actumnoides*, the distal part of the G1 is flared and the distal segment of the G2 is distinctly longer than the basal segment. In *G. fragaria*, the distal part of the G1 is straight and the distal segment of the G2 is distinctly shorter than the basal segment. The form of the gonopod of *G. fragaria* is in fact, closest to *G. actumnoides*. The tip of the G1 of *G. fragaria*, however, has more and longer setae compared to that of *G. actumnoides*. The carapaces of the two species also differ markedly, with that of *G. actumnoides* having more and stronger teeth (6-7). In addition, each ambulatory propodus of *G. actumnoides* is armed with a distal spine, which is absent in *G. fragaria* (cf. Guinot-Dumortier, 1959).

The carapace of *G. fragaria* is also superficially similar to the pilumnid *Actumnus elegans* (De Man, 1888). Their gonopods of course, are very different, with the G1 of *A. elegans* being more slender and the G2 very short and sigmoid-shaped as in all members of the Pilumnidae. Externally, *G. fragaria* differs from *A. elegans* in having a less granulated and serrated anterolateral margin, with the three anterolateral teeth small but distinct (cf. Takeda & Miyake, 1969). In addition, there are also several small, rounded granules on the anterolateral regions absent on *A. elegans*. Also very distinct are the uniformly and regularly arranged large, rounded red granules on the outer surface of the chelae and carpus of the chelipeds. In *A. elegans*, the granules (many of which are sharp) are unevenly sized, irregularly arranged and brown in colour.

KEY TO THE GENUS *GLOBOPILUMNUS*

1. Stridulating granules present on meri of both cheliped and ambulatory legs 2
 - Stridulating granules absent 5

2. Anterolateral margin with 5 distinct, long, strong spiniform teeth, the last being largest; stridulatory granules usually present on first and second ambulatory meri *G. calmani* (Red Sea, Persian Gulf, Aldabra, South China Sea)
 - Anterolateral margin with 5 or more small teeth or granules; stridulatory granules only on first ambulatory merus or on first to third ambulatory meri 3

3. Carapace covered with dense setae; stridulatory granules present only on first ambulatory merus *G. africanus* (West Africa)
 - Carapace covered with scattered setae; stridulatory granules present on first to third ambulatory meri 4

4. Merus of the cheliped with about 55 granules ... *G. xantusii* (tropical Pacific coast of America)
 - Merus of the cheliped with about 20 granules *G. stridulans* (West Africa)

5. Distal spine present on propodus of first to third ambulatory leg
 .. *G. autumnoides* (New Caledonia, Australia, Samoa, Gilbert Islands, New Guinea, Japan) 6

- Propodus of ambulatory legs unarmed 6

6. Carapace covered with very dense, short setae which completely obscures outline and surface. 7

- Carapace covered with scattered, relatively stiff setae which never completely obscures margin or surface; anterolateral margin with at least 3 teeth or granules 8

7. Pubescence on carapace very soft, velvet-like; anterolateral margin with 2 small teeth, one of which distinctly smaller; posterolateral margins sharply convergent towards posterior carapace margin *G. kiiensis* (Japan) 8

- Pubescence on carapace very coarse; at least some teeth on anterolateral margin lined with smaller accessory granules *G. laciniatus* (Japan, Philippines, Australia)

8. Anterolateral margin with 4-5 small granules; posterolateral margin distinctly converging towards posterior carapace margin; granules on outer surface of chela densely arranged; tip of G1 flared; distal segment of G2 longer than half length of elongate basal segment *G. globosus* (Japan, Tahiti, Hawaii)

- Anterolateral margin with 3 small granules; posterolateral margin gently converging; granules on outer surface of chela well spaced; distal part of G1 not flared; tip of G2 about half length of elongate basal segment *G. fragaria* (South China Sea)

ACKNOWLEDGEMENTS

The authors are grateful to members of the Multidisciplinary Oceanographic Expedition to the Nansha Islands, and especially to Mr. Cai Yi Xiong, for making the collections. Thanks are also due to the Chinese Academy of Sciences for the opportunity to carry out this study. This study has also been partially supported by grant RP 970360 to the third author from the National University of Singapore.

LITERATURE CITED

Balss, H., 1933. Beiträge zur Kenntnis der Gattung *Pilumnus* (Crustacea Dekapoda) und verwandter Gattungen. *Capita Zool.*, **4**(3): 1-47, pls. 1-7.

Dana, J. D., 1851. On the Classification of the Cancroidea; III. Zoology. Scientific Intelligence. *Amer. J. Sci. Arts.*, (2)**12**(34): 121-131.

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.*, Philadelphia, **13**: 1-685.

Garth, J. S., 1968. *Globopilumnus xantusii* (Stimpson), n. comb., a stridulating crab from the west coast of tropical America, with remarks on discontinuous distribution of some West American and West African genera of Brachyrhynchous crabs. *Crustaceana*, **15**: 312-318.

Garth, J. S. & H. S. Kim, 1983. Crabs of the family Xanthidae (Crustacea: Brachyura) from the Philippine Islands and adjacent waters based largely on collections of the U.S. Fish Commission steamer *Albatross* in 1908-1909. *J. Nat. Hist.*, **17**: 663-729.

Guinot, D., 1978. Principes d'une classification évolutive des Crustacés Décapodes Brachyoures. *Bull. biol. Fr. Belg.*, n.s., **112**(3): 211-292.

Guinot-Dumortier, D., 1959. Les espèces indo-pacifiques du genre *Globopilumnus* (Crustacea Brachyura Xanthidae). *Mém. Inst. Scient. Madagascar*, (F)**3**: 97-118.

Guinot-Dumortier, D. & B. Dumortier, 1960. La stridulation chez les crabes. *Crustaceana*, **1**: 117-155.

Holthuis, L. B., 1993. The non-Japanese new species established by W. de Haan in the Crustacea volume of *Fauna Japonica* (1833-1850). In: *Ph. F. von Siebold and natural history of Japan. Crustacea*. Ed. T. Yamaguchi. Carcinol. Soc. Japan, Tokyo, pp. 599-642.

MacLeay, W. S., 1838. On the Brachyurous Decapod Crustacea. Brought from the Cape by Dr. Smith. In: A. Smith, *Illustrations of the Zoology of South Africa; consisting chiefly of figures and descriptions of the objects of natural history collected during an expedition into the interior of South Africa, in the years 1834, 1835, and 1836; fitted out by 'The Cape of Good Hope Association for Exploring Central Africa' together with a summary of African Zoology, and an inquiry into the geographical ranges of species in that quarter of the globe, Published under the Authority of the Lords Commissioners of Her Majesty's Treasury, Invertebratae* (London: Smith, Elder & Co.), [1849], pp. 53-71, pls. 2, 3.

Man, J. G. De, 1887-1888. Report on the podophthalmous Crustacea of the Mergui Archipelago, collected for the trustees of the Indian Museum, Calcutta, by Dr. John Anderson, F.R.S., Superintendent of the Museum. Part I-V. *J. Linn. Soc. Lond., Zool.*, **22**: 1-312, pls. 1-19.

Milne Edwards, A., 1867. Description de quelques espèces nouvelles de Crustacés Brachyures. *Ann. Soc. entomol. France*, (4)7: 263-288.

Milne Edwards, A., 1873. Recherches sur la faune carcinologique de la Nouvelle-Calédonie. Part 2. *Nouv. Arch. Mus. Natn. Hist. Nat.*, **9**: 155-332, pls. 4-18.

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

Ng, P. K. L., 1992. The Indo-Pacific Pilumnidae VIII. *Pilumnus laciniatus* Sakai, 1980 - a senior synonym of *Globopilumnus multituberosus* Garth & Kim, 1983 (Crustacea: Decapoda: Brachyura). *Crustaceana*, **63**(2): 221-222.

Ng, P. K. L., 1998. Crabs. In: *FAO Species Identification Guide for fishery purposes. The Living marine Resources of the Western Central Pacific*. Volume 1. K. E. Carpenter & N. Volker (editors), Food and Agriculture Organisation, Rome, in press.

Ng, P. K. L. & L. W. H. Tan, 1985. *Globopilumnus multituberosus* Garth & Kim, 1983 - A new record for Australia (Decapoda: Crustacea: Menippidae). *Rec. Austr. Mus.*, **36**(3/4): 127-129.

Ortmann, A., 1893. Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen. *Zool. Jb. (Syst.)*, **7**: 411-495, pl. 17.

Sakai, T., 1980. On new and rare crabs taken from Japanese and central Pacific waters. *Res. Crust.*, Tokyo, **10**: 73-84, pl. 5.

Sérène, R., 1984. Crustacés Décapodes Brachyoures de l'Océan Indien occidental et de la Mer Rouge, Xanthoidea: Xanthidae et Trapeziidae. Avec un addendum par Crosnier A.: Carpiliidae et Menippidae, *Faune Tropicale*, no. XXIV:1-349, figs A-C + 1-243, pls 1-48.

Stimpson, W., 1860. Notes on some North American Crustacea in the Museum of the Smithsonian Institution. No. II. *Ann. Lyc. Nat. Hist. Soc. New York*, **7**: 176-246, pls. 2, 5.

Takeda, M. & S. Miyake, 1969. Pilumnid crabs of the family Xanthidae from the West Pacific. I. Twenty-one species of four genera, with descriptions of four new species. *Occ. Pap. Zool. Lab., Fac. Agric., Kyushu Univ.*, **2**(7): 93-156.

Takeda, M., & S. Nagai, 1983. Description of a new crab from Kushimoto, the Kii Peninsula, southwest Japan. *Bull. Natn. Sci. Mus.*, Tokyo, (A)(Zool.), **9**(2): 45-49.