

# Deepwater Carcinoplacine Crabs of the Genus *Mathildella* (Crustacea, Decapoda, Brachyura), with Description of a New Species from the Kyushu-Palau Submarine Ridge, Southwestern Japan

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**Abstract** All of three known species of the genus *Mathildella* Guinot et Richer de Forges, 1981, of the family Goneplacidae, *M. serrata* (Sakai, 1974) from Japan, Taiwan and the Philippines in the North Pacific, *M. maxima* Guinot et Richer de Forges, 1981 hitherto known from the Tuamotu Islands, New Caledonia and the Loyalty Islands in the South Pacific, and *M. rubra* Ng et Ho, 2003 from the Philippines are recorded based on the collections of the National Science Museum, Tokyo (NSMT). The biogeographical distribution of *M. maxima* is extended northwards to the North Pacific. A new species named *M. kyushupalauensis* is described from the Kyushu-Palau submarine ridge, southwestern Japan, as a fourth species in the genus. It differs from the known species in the confluent first and second anterolateral teeth of the carapace and the first male pleopod weakly curving and tapering toward the small terminal orifice.

**Key words:** Goneplacidae, *Mathildella*, new species, Kyushu-Palau submarine ridge, Japan.

## Introduction

Recently, Ng and Ho (2003) described a new species of the genus *Mathildella* Guinot et Richer de Forges, 1981, from Balicasag Island, Bohol, Philippines. Following the key to two known and one new species made by them, we re-identified the specimens in the collections of the National Science Museum, Tokyo (NSMT). The comparative study of them revealed that the specimens from the Kyushu-Palau submarine ridge recorded as *Neopilumnoplax serratus* Sakai by Takeda (1980) were close to, but distinct from the three known species. In the present paper they are to be described as a new species, and also *M. maxima* Guinot et Richer de Forges originally reported from some localities in the South Pacific was recorded from Japan for the first time since the original description in 1981.

## Family Goneplacidae

Genus *Mathildella* Guinot et Richer de Forges, 1981

*Mathildella* Guinot & Richer de Forges, 1980b [1981b]: 230. (Type species: *Mathildella maxima* Richer de Forges, 1981)

*Remarks.* This genus was distinguished from the genus *Neopilumnoplax* Serène, 1969 (in Guinot, 1969) by Guinot and Richer de Forges (1980b [1981b]) based on some features such as the absence of the dorsal transverse ridges on the carapace, the isolated first two anterolateral teeth of the carapace, the simple endostomial ridge, the relation of the male genital opening to the abdomen. Although all of these characters are not always considered to be generic, three known and one new species are very close to each other, differentiating into a genus distinct from *Neopilumnoplax*.

Guinot and Richer de Forges (1980b [1981b]) established the genus *Mathildella* on a new species, *M. maxima* from the Tuamotu Islands, New Caledonia and the Loyalty Islands in the South Pacific and *Neopilumnoplax serrata* Sakai, 1974, which was reported from Japan and subsequently recorded from Taiwan and the Philippines by Ng and Chan (2000) and Ng and Ho (2003) respectively. In the present paper, a fourth species is to be described from the Kyushu-Palau submarine ridge, southwestern Japan. The genus *Mathildella* consists of four species from the depths of the Pacific.

*Mathildella kyushupalauensis* sp. nov.

(Figs. 1–3)

*Neopilumnoplax serratus*: Takeda, 1980: 281. — Baba, in Baba *et al.*, 1986: 231, 316, fig. 175.

*Type specimens.* Komahashi seamount, Kyushu-Palau submarine ridge, 520 m deep, holotype, ♂ (cb 30.5 mm × cl 23.7 mm), NSMT-Cr 6420, paratypes, 1 ♂ (cb 24.2 × cl 18.8 mm), 6 ♀ (cb 15.3 × cl 12.2 mm — cb 23.6 × cl 18.1 mm), NSMT-Cr 16111, coll. by O. Tabeta, recorded by Takeda (1980) as *Neopilumnoplax serratus* Sakai.

*Diagnosis.* Typical *Mathildella* species, close to three known species in its general appearance. First anterolateral tooth (=external orbital angle) and second anterolateral tooth largely confluent, with a very shallow marginal depression; third anterolateral tooth broad, directed forward, deeply isolated from second tooth, slightly beyond anterolateral curvature of carapace; fourth anterolateral tooth isolated from third tooth by a V-shaped notch, subacute at its tip; fifth (=last) anterolateral tooth demarcated with a small indentation, but sometimes obsolete. Chelipeds unequal in both sexes. Pigmentation of immovable finger extending onto palm to distal one third of its lower margin. First male pleopods of both sides not strongly sinuous ventrally and laterally along distal halves, with a small terminal orifice.

*Description.* General contour of carapace

rounded quadrilateral, with truncated frontal and serrated anterolateral margins, being 1.25–1.30 times (1.28 in holotype) wider than long; dorsal surface flattish, glabrous, with anterior part covered with microscopic granules; gastric and cardiac regions feebly convex, with a longitudinal linear furrow bifurcated between both protogastric regions; epigastric cristae low, not sharp; cardiac region transverse, with its posterior median part convex posteriorly as anterior part of intestinal region; a shallow depression between gastric and cardiac regions, with a small linear scar at each side; a small region behind cardiac region shallowly depressed in front of posterior margin of carapace. Front cut into two truncated, crested margins by distinct median cleft, with longitudinal linear depression from median cleft of front. Supraorbital margin sinuous, with distinct median fissure, its innermost part (=supraorbital tooth) being not angulated, separated from front by distinct bump. Infraorbital margin serrated, deeply excavated as a whole, with sharp inner tooth.

Anterolateral margin weakly diverging posteriorly, armed with five serrated teeth including external orbital tooth; first and second teeth low, more or less lobate, almost confluent, margins almost entire, gently sinuous margins without distinct cleft; third tooth largest, triangular, its tip gently curving anteriorly, with outer margin convex, being deeply separated from second tooth; fourth tooth low, not dentate, separated from third tooth by small V-shaped notch; fifth tooth very small, barely discernible, sometimes vestigial. Posterolateral margin weakly convex, convergent, longer than anterolateral margin. Posterior margin almost straight.

Chelipeds distinctly unequal in both sexes, especially in male; in holotype, right (=small) chela missing; merus comparatively short, shaved off for its whole inner surface, with only distal part exceeding margin of carapace; carpus with two short teeth on inner distal margin, outer part of dorsal surface with shallow longitudinal depression; larger palm inflated, smooth, rather short, unarmed; fingers shorter than palm,

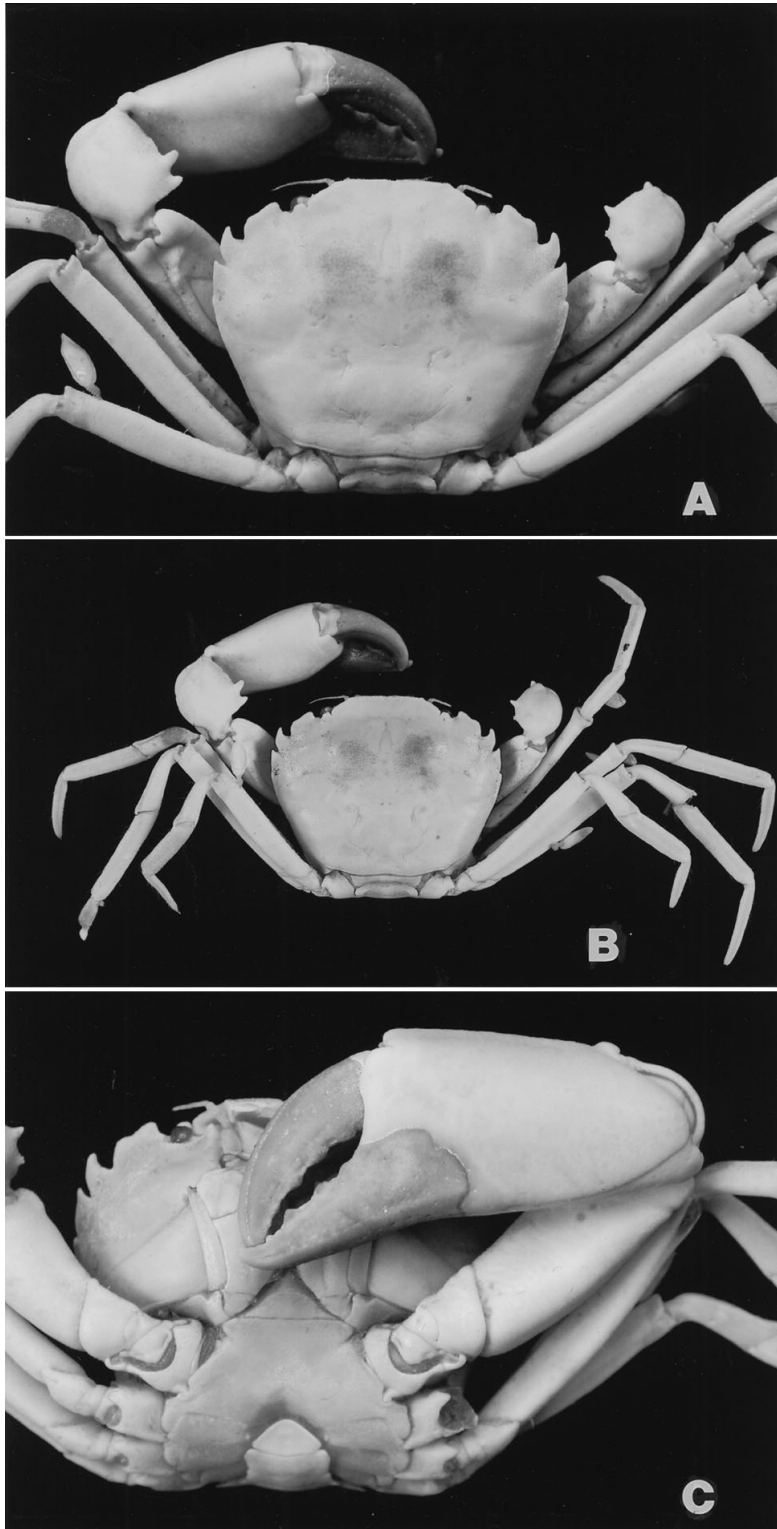


Fig. 1. *Mathildella kyushupalauensis* sp. nov. A–C, holotype male (NSMT-Cr 6420), cb 30.5×cl 23.7 mm.

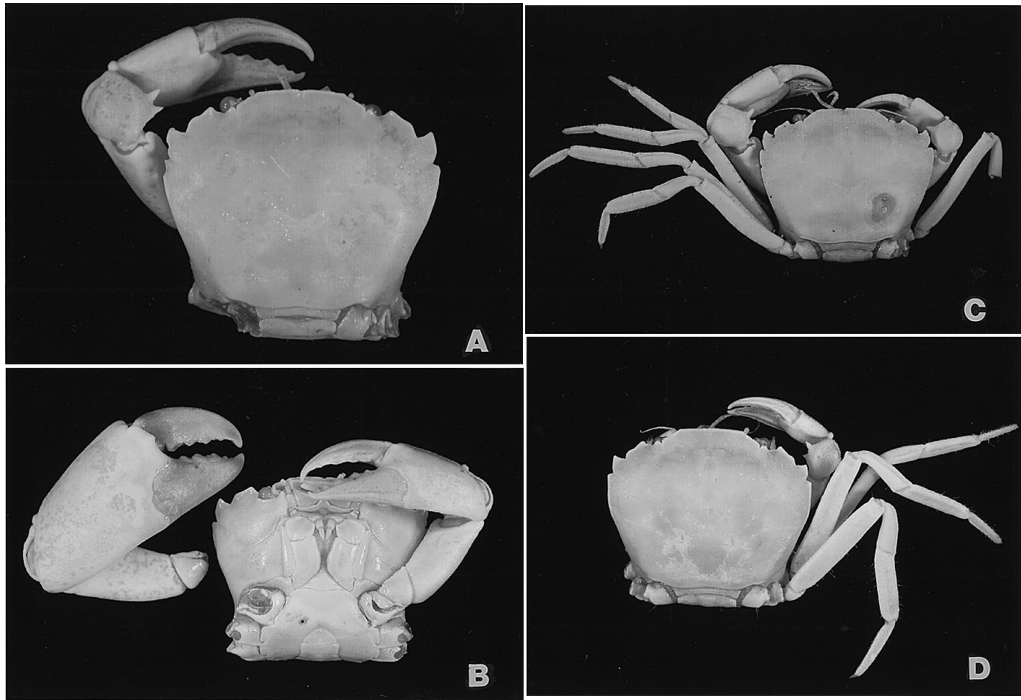


Fig. 2. *Mathildella kyushupalauensis* sp. nov., paratypes (NSMT-Cr 16111). A, B, male, cb 24.2×cl 18.8 mm; C, female, cb 23.6×cl 18.1 mm; D, female, cb 22.7×cl 17.8 mm.

toothed, with longitudinal shallow sulcus on outer surface of each finger; fingers dark-colored throughout length, pigmentation extending backward onto lower distal portion of palm; smaller chela not much different from larger one, with fingers not gaped, outer surface of palm punctate, dorsal margin of movable finger ridged, and cutting edges toothed distinctly.

Ambulatory legs slender, strongly depressed, smooth, with scattered setae; dactyli of first three pairs lanceolate, gently curved, last dactylus subspatulate, weakly curving upward.

Male abdomen seven-segmented, first segment trapezoidal, each lateral edge reaching to base of coxa of fifth ambulatory leg, having medial transverse carina; second segment subrectangular, lateral margins weakly convex; third segment broad, subrectangular, with lateral margins triangularly produced; third to fifth segments barely movable, although transverse sutures distinct; sixth segment rectangular, broader than long, with lateral margins weakly concave; seventh (=terminal)

segment semicircular along distal and lateral margins.

First male pleopod as figured; distal half is weakly convex ventrally, tapering toward distal small orifice. Second male pleopod filiform as usual.

*Variations.* The first and second anterolateral teeth are almost completely fused, with a very shallow depression in all the specimens examined, but the third tooth is considerably variable, viz., narrow and curved like in the holotype, and wide and triangular in some paratypes. The fifth tooth is typically indicated by a small notch, but in some paratypes the notch is almost vestigial or completely disappeared, so that the fifth tooth is not formed at all.

*Remarks.* It is noted at present that the specimens examined, one male and four females in the type-series, are those reported by Takeda (1980) as *Neopilumnoplax serratus* Sakai, and that *N. serratus* reported from the Kyushu-Palau submarine ridge by Baba (1986) is without doubt iden-

tical with this new species.

In the description of *Mathildella rubra*, Ng and Ho (2003) noted that the most important criterion is the armature of the anterolateral margin, and that the first two anterolateral teeth are clearly demarcated in *M. serrata* (Sakai) from Japan, Taiwan and the Philippines and *M. maxima* Guinot et Richer de Forges from the South Pacific. Based on this character, the new species is readily distinguished from *M. serrata* and *M. maxima*.

In all the specimens examined at present and also in the figures given by the original author (Sakai, 1974) and subsequent authors (Sakai, 1976, 1978; Guinot & Richer de Forges, 1980b[1981b]; Ikeda, 1998; Ng & Chan, 2000), there is no doubt that the serrated sharp anterolateral teeth are characteristic for *M. serrata*. Takeda (1980) and also Baba (1986) mentioned the discrepancies between the specimens from the Kyushu-Palau submarine ridge and the specimens from the other localities in Japan; in their specimens the first two anterolateral teeth are almost completely fused, and also there is no distinct notch between the frontal margin and the supraorbital tooth. The Kyushu-Palau submarine ridge specimens were now referred to the new species, and therefore this character is useful to distinguish the new species from the congeners, together with the first and second anterolateral teeth.

The male first pleopod of *M. serrata* was figured by Sakai (1978: figs. 14, 15), those of *M. serrata* and *M. maxima* by Guinot and Richer de Forges (1980b [1981b]: fig. 8A, A1, C, C1), and that of *M. rubra* by Ng and Ho (2003: fig. 4D, E). In the present paper the male first pleopod of the new species is figured (fig. 3B, C). In *M. serrata* their distal halves of the shafts of both sides are subparallel to each other, each with a small distal orifice, while in the other three species the shafts are medially convex ventrally and curving outwards toward tips. The distal orifice is large and rounded, with recurved margin in *M. maxima*, and elongated, also with recurved margin in *M. rubra*. In the new species,

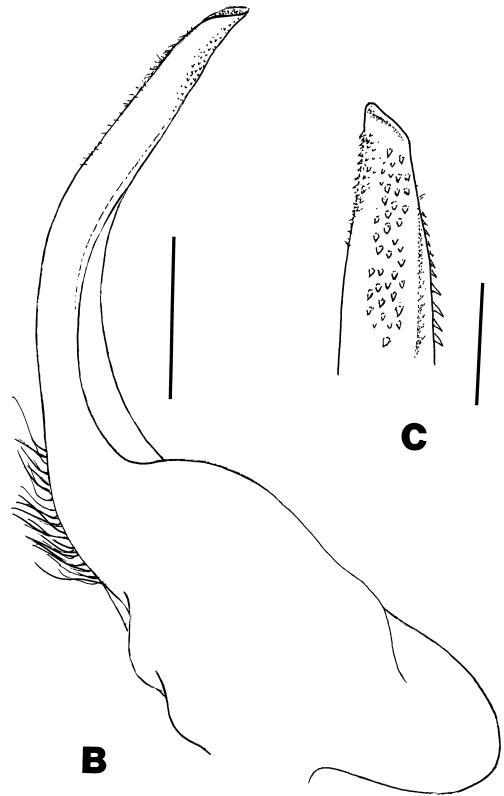


Fig. 3. *Mathildella kyushupalauensis* sp. nov., holotype male (NSMT-Cr 6420). A, first pleopods *in situ*; B, left pleopod in abdominal view; C, tip of left pleopod in sternal view. Scales: B=0.5 mm; C=1 mm.

however, the distal orifice is small, and its margin is not recurved somewhat like that of *M. serrata*.

The ambulatory legs are slender in all the species of *Mathildella*, and it may be rather difficult to show their proportional difference. However, in the original description of *M. rubra* Ng and Ho (2003) mentioned the proportionately shorter ambulatory legs (particularly the fourth merus and dactylus) as one of the distinguishing characters. The last pair of the new species is surely slenderer than that of *M. rubra* and close to those of *M. serrata* and *M. maxima*.

*Distribution.* Known only from the type locality, the Kyushu-Palau submarine ridge, 520 m deep.

***Mathildella maxima*** Guinot et Richer de Forges, 1981  
(Fig. 4A)

*Mathildella maxima* Guinot & Richer de Forges, 1980a [1981a], pl. 3 (2, 2a). — 1980b [1981b], p. 231, figs. 4(B), 5(C), 6(A), 7(E), 8(A, A<sub>1</sub>, B).

*Material examined.* South and southeast off Ken-zaki, Sagami Bay (35°03.85'N, 139°44.45'E — 35°05.61'N, 139°44.98'E), 180–330 m deep, 1 ♂ (cb 42.4 × cl 31.8 mm), (NSMT-Cr 15893), 7 ♂ (cl 21.4 × cb 28.6 mm — cl 31.7 × cb 42.8 mm), 10 ♀ (cl 17.8 × cb 23.4 mm — cl 26.8 × cb 34.3 mm), 2 ovig. ♀ (cl 25.3 × cb 34.8 mm, cl 26.8 × cb 34.3 mm), coll. by H. Watabe.

South of Goto Is., northwest of Kyushu, Japan, RV *Soyo-Maru* stn 435, 324 m deep, 1 ♂ (cb 14.4 × cl 11.2 mm), (NSMT-Cr 6901), July 18, 1929, probably recorded by Yokoya (1933) as *Pilumnoplax glaberrima* Ortmann.

*Remarks.* This species is extremely close to *M. serrata* (Sakai) in the general formation of the carapace, chelipeds and ambulatory legs. In the typical specimens of *M. serrata*, the first and second anterolateral teeth are completely isolated from each other, their tips are acute, and the second is distinctly larger than the first and slightly smaller than the third, with appearance of sharp serration as a whole, but in some specimens the

second tooth is obtuse at its tip, subequal to, or rather smaller than, the first tooth, and distinctly smaller than the third, with appearance of broken serration. In *M. maxima* they are isolated from each other at their distal halves, with a small notch, but sometimes the separation is quite incomplete and indicated only by a small depression or shallow bight on the margin, somewhat similar to the armature of *M. kyushupalauensis*. Considering such variation, this species may be seemingly close to *M. serrata* on one hand, but to *M. kyushupalauensis* on the other hand, and even conspecific with *M. serrata*. The validity of this species should be confirmed on a long series of various sizes of the specimens.

In all the males examined, however, the terminal orifice of the first male pleopod is large and rounded, with recurved margins, as represented in the original description (Guinot & Richer de Forges, 1980b [1981b]: fig. 8A, A<sub>1</sub>), neither elongated as in *M. rubra* (Ng & Ho, 2003: fig. 4D, E) nor small as in *M. serrata* (Guinot & Richer de Forges, 1980b [1981b]: fig. 8C, C<sub>1</sub>) and *M. kyushupalauensis* (present paper: fig. 3B, C).

*Distribution.* Originally reported from Mururoa Atoll in the Tuamotu Islands, 350 m deep, Lifou Island in the Royalty Islands, 300–400 m deep, and New Caledonia, 465–495 m deep.

***Mathildella rubra*** Ng et Ho, 2003  
(Fig. 4B)

*Mathildella rubra* Ng & Ho, 2003, p. 334, figs. 1–3, 4 (A–G).

*Material examined.* Balicasag I., Bohol, Philippines, ca. 200 m deep, 1 ♂ infested by a bopyrid (cb 23.4 mm × cl 18.3 mm), (NSMT-Cr 16113), Feb. 28, 2002, coll. by T. Kase *et al.*; Same locality, 2 ♂ (cb 28.0 × cl 22.4 mm; cb 25.3 × cl 20.4 mm), (NSMT-Cr 15368), Feb. 2003, coll. by M. Takeda & H. Komatsu.

*Remarks.* The specimens at hand from Balicasag Island are readily identified with *Mathildella rubra* Ng et Ho described on many specimens from the same locality. In this species the dorsal surface of the carapace is more flat-

tened, the anterolateral teeth are less prominent and not exceeded the general outline of the carapace. The first two anterolateral teeth are mostly fused and demarcated only by a shallow notch or cleft.

As rightly mentioned in the original description, the depth of the cleft separating the first two anterolateral teeth is never deep enough to show two distinct teeth as in *M. serrata* and *M. maxima*, but it is noted at present that the cleft appears to be a small notch differing from the shallow depression in the new species. The original authors mentioned in the other part that in the smaller specimens the first two teeth are almost confluent rather than distinctly separated. At present, it may be pointed with hesitation that this type of the anterolateral armature is not referable to the developmental or individual variations, but really to the character of the new species.

The male first pleopod is stout, convex ventrally at about distal one third somewhat like that of *M. maxima*, but the terminal orifice is distinctly elongated.

*Distribution.* Philippines. Obtained with tangle nets for shell fishing at 200–300 m deep.

### *Mathildella serrata* (Sakai, 1974)

(Fig. 4C)

*Pilumnoplax americana*: Parisi, 1918, p. 91. — Yokoya, 1933, p. 191.

*Neopilumnoplax serratus* Sakai, 1974, p. 93. — Sakai, 1976, p. 333, pl. 88 (4); 1978, (pp. 8, 31), figs. 14, 15.

*Mathildella serrata*: Guinot & Richer de Forges, 1980a [1981a], pl. 3 (3, 3a, 3b). — 1980b [1981b], p. 232, figs. 7(D), 8(C, C<sub>1</sub>), D. — Ikeda, 1998, p. 140, pl. 60. — Ng & Chan, 2000, p. 150, figs. 1, 2. — Ng & Ho 2003, (p. 341), figs. 4 (H–J), 5.

*Material examined.* Hyotanase, submarine bank off Izu Is., central Honshu, Japan, RV *Soyo-Maru* stn 25, 115–200 m deep, 1 ♂ infested by *Thompsonia* sp. (cb 17.8×cl 14.1 mm), (NSMT-Cr 6898), Jul. 10, 1969, coll. by T. Okutani.

Toyama Bay, Japan Sea coast of central Honshu, Japan, RV *Tansei-Maru* KT-75-06 cruise, stn 30, 1 ♂ (cb 14.0×cl 10.6 mm), (NSMT-Cr 6545), 1975, coll. by C. Oguro *et al.*; Off Sakaigawa,

Toyama Bay, from *Dendrophyllia japonica*, 1 ♂ (cb 13.0×cl 10.3 mm), (NSMT-Cr 6544), Jan. 16, 1975, coll. by N. Horii; Off Uotsu Toyama Bay, from *D. japonica*, 1 ♂ (cb 20.0×cl 15.5 mm), (NSMT-Cr 7824), date unknown, coll. by N. Horii.

Balicasag I., Bohol, Philippines, 80–150 m deep, 1 ♀ (cb 30.1×cl 23.9 mm), (NSMT-Cr 15369), Mar. 6–10, 1999, coll. by T. Kase *et al.*

*Remarks.* In the typical form, all the five anterolateral teeth of the carapace are deeply isolated from each other and distinctly serrated. However, the armature is not always constant; some of the teeth are small and obtuse at the tips, or rather triangular in dorsal view; the teeth of both sides are sometimes different in shape and size; the first two teeth may be not completely isolated from each other, the second tooth being obtusely rounded and not much different from the first tooth. Due to these individual variations, some specimens are seemingly close to *M. maxima* Guinot et Richer de Forges.

Guinot and Richer de Forges (1980b [1981b]) examined the paratype male of *Neopilumnoplax serratus* which was referred to the genus *Mathildella* erected by them, and compared with the new species, *M. maxima* from the South Pacific. As for its paratype designation of *N. serratus*, there leaves a certain nomenclatural problem, even if there is a label of the paratype with the specimen, because the published original and subsequent descriptions are based only on the holotype specimen without mention of the additional specimen. Also, there is no mention about the male specimen in the subsequent description and notes (Sakai, 1976, 1978). However, their notes, line drawings of the male pleopods and photographs are safely available for comparison, because the specimen was identified by the original author himself and considered to be the typical form as *M. serrata*.

In the specimens examined, the first two anterolateral teeth are always distinctly isolated from each other by a deep U-shaped sinus, being the most important external character to distinguish *M. serrata* from the congeners. The second

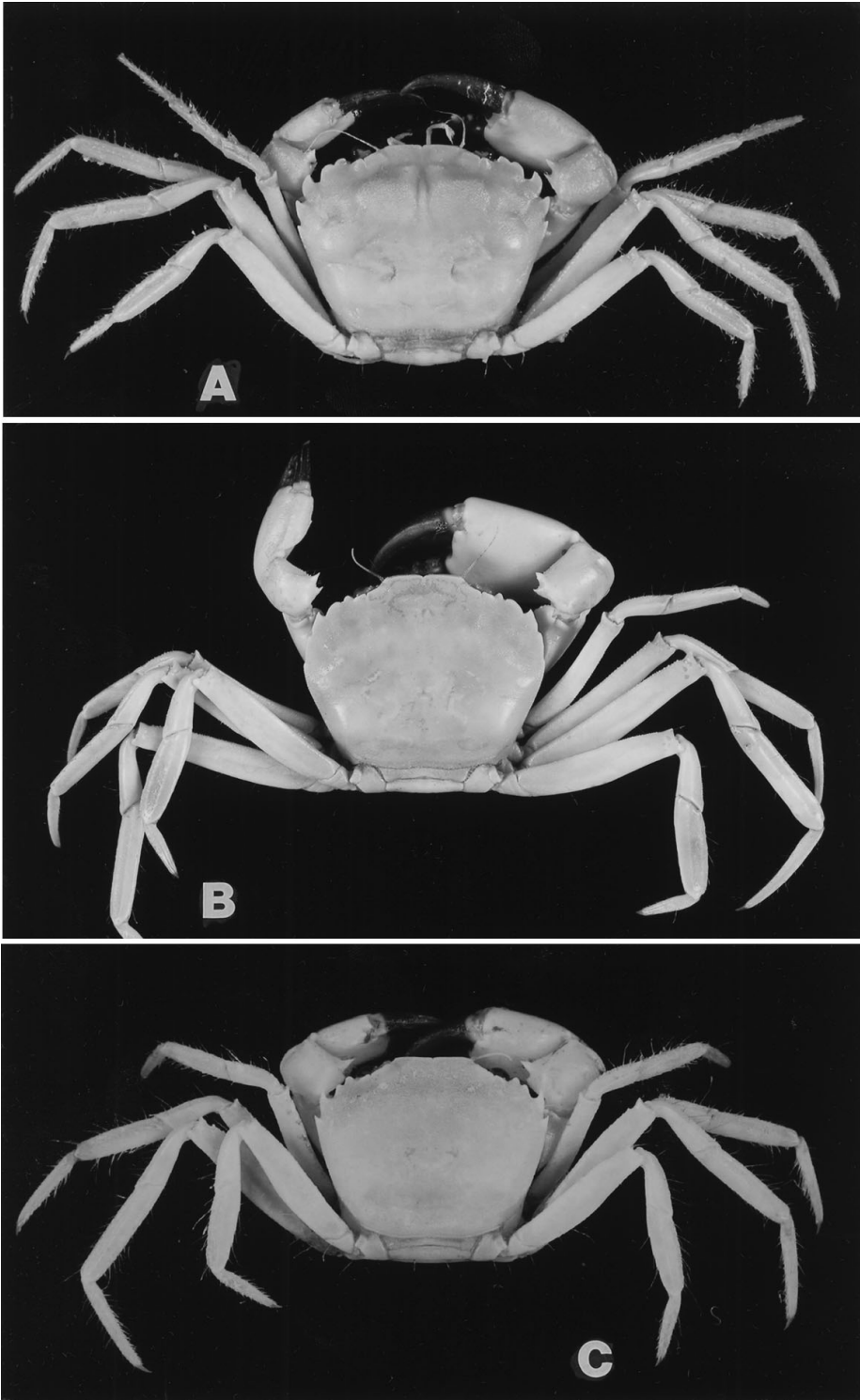


Fig. 4. Three species of *Mathildella*. A, *M. maxima* Guinot & Richer de Forges, female from Tokyo Bay, cb 36.1×cl 27.1 mm; B, *M. rubra* Ng & Ho, male (NSMT-Cr 16113) from the Philippines, cb 25.4×cl 19.7 mm; C, *M. serrata* (Sakai), female (NSMT-Cr 6544) from Toyama Bay, cb 13.0×cl 10.3 mm.



tooth is, however, remarkably variable in the size and sharpness; in some specimens it is hardly or only slightly larger than the first tooth, differing from the figures and photographs given by Sakai (1976) and Guinot and Richer de Forges (1980a [1981a]) and being rather closer to the figure and photograph given by Ng and Ho (2003).

The male first pleopod was figured by Sakai (1978) and Guinot and Richer de Forges (1980b [1981b]). The figures of the former author is quite schematic, with the details not depicted, but those of the latter authors are excellent and accurate. As already mentioned elsewhere, the shaft is nearly straight, not strongly curved as in the congeners, for its most part, with a small terminal orifice, so that the first pleopods of both sides are almost parallel to each other in the ventral view.

**Distribution.** Japan, Taiwan and Philippines. Its bathymetric range was mentioned by Sakai (1976) as 15–60 m, and otherwise by Yokoya (1933) as 165–199 m, Ikeda (1998) as 200–280 m, Ng & Chan (2000) as 400 m, and Ng & Ho (2003) as 200–300 m. Among the specimens at hand, there are two males associated with madreporarian coral, *Dendrophyllia japonica* Rehberg, from Toyama Bay in the Sea of Japan, south of the type locality, Oga Peninsula, Akita Prefecture. This host coral is common in the Sea of Japan, ranging from ca. 100 to 300 m deep.

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