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Decapod Crustacea from the Ryukyu Group (Pleistocene) of Okinawa-jima, Japan

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Abstract

Decapod crustaceans are recorded from the Naha Formation (Pleistocene), Ryukyu Group of Okinawa-jima, Japan. They are assigned to four extant species, *Neocallichirus* sp. (Callianassidae), *Podophthalmus vigil* (Fabricius, 1798) (Portunidae), *Myra fugax* (Fabricius, 1798) (Leucosiidae) and *Macrophthalmus* (*Euplax*) *latreillei* (Desmarest, 1822) (Ocypodidae), and one extinct, *Macrophthalmus* (*Euplax*) *granulosus* de Man, 1904. Of these, *M.* (*E.*) *granulosus* is first recognised from Japan. *M. fugax* extends its stratigraphic range to the Pleistocene age. *M.* (*E.*) *granulosus* is considered to be a valid taxon and not the junior synonym of *Macrophthalmus* (*Euplax*) *latreillei* (Desmarest, 1822).

Key words: Crustacea, Decapoda, Thalassinidea, Brachyura, Pleistocene, Naha Formation, Okinawa-jima, Japan.

Introduction

Fossil decapod crustaceans are rarely known from the Ryukyu Islands, Japan. Oshiro & Shokita (1980) first described *Ranina ranina* (Linnaeus, 1758) from the Ryukyu Group (Pleistocene) of Okinawa-jima, and subsequently Karasawa (1993) has recorded four species, *Scylla serrata* (Forskål, 1775), *Thalamita* sp. and *Carcinoplax prisca* Imaizumi, 1961, from the Maja Formation (Pliocene) of Kume-jima, and *Macrophthalmus* (*Euplax*) *leptophthalmus* (H. Milne Edwards, 1852) from the Nakoji Formation (Lower Pleistocene) of Okinawa-jima.

The junior authors collected sixteen specimens of fossil decapod crustaceans from the gravel Member of the Naha Formation, Ryukyu Group exposed at Oyashi (Tako-yama), Yomitan-son, Nakagami-gun, Okinawa Prefecture (Fig. 1). At Tako-yama, the outcrop consists of gravel, gray sand and clay in ascending order. Fossil decapods are included in gray clay. These deposits are valley or basin-fill deposits

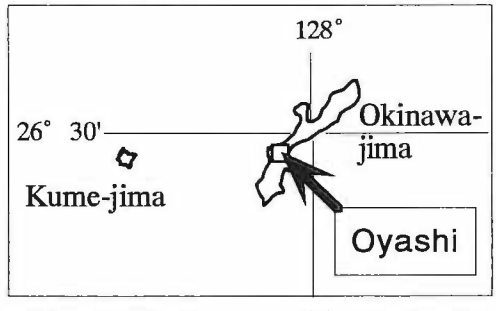


Fig. 1. Map showing the decapod-bearing locality.

of the Pleistocene age.

The purpose of this paper is to describe decapods from the Naha Formation. All the species are first recognised from Pleistocene deposits of the Ryukyu Islands. Specimens are housed in the Mizunami Fossil Museum.

Systematic Palaeontology

Infraorder Thalassinidea Latreille, 1831
Superfamily Callianassoidea Dana, 1852
Family Callianassidae Dana, 1852
Subfamily Callichirinae Manning & Felder, 1991

Genus *Neocallichirus* Sakai, 1988



Fig. 2. *Neocallichirus* sp. × 1.2. a, lateral view of carpus of right major cheliped; b, lateral view of propodus of right major cheliped.

Neocallichirus sp.
(Figs. 2a, b)

Calliax sp., Karasawa & Tanaka, 1994, p. 12, figs. 2-1-12.

Discussion: Two large propodi and a carpus of the major cheliped were obtained. Karasawa & Tanaka (1994) considered that the present species is most similar to the Recent Japanese species, *Calliax sakaii* de Saint Laurent, 1979, and subsequently the species appears to be assigned to *Neocallichirus* Sakai, 1988 by having unequal, dissimilar chelipeds without a meral hock. The Japanese *Neocallichirus* is represented by a single Recent species, *Neocallichirus indicus* (de Man, 1905) from Tonaki Island, Ryukyu Islands (Sakai, 1988). A large sized cheliped, and a smooth ventral margin of the palm of the major cheliped readily distinguish the present species from *N. indicus*. The carpus of the major cheliped in *N.* sp. is slightly broader than long, whereas that in *N. indicus* is much broader than long.

N. sp. is common in Middle Pleistocene Atsumi Group of Aichi Prefecture (Karasawa & Tanaka, 1994) and their remains are found in the Seto Inland Sea (Karasawa & Goda, *in prep.*).

Infraorder Brachyura Latreille, 1803
Section Heterotremata Guinot, 1977
Superfamily Portunoidea Rafinesque, 1815
Family Portunidae Rafinesque, 1815
Subfamily Podophthalminae Miers, 1886

Genus *Podophthalmus* Lamarck, 1801

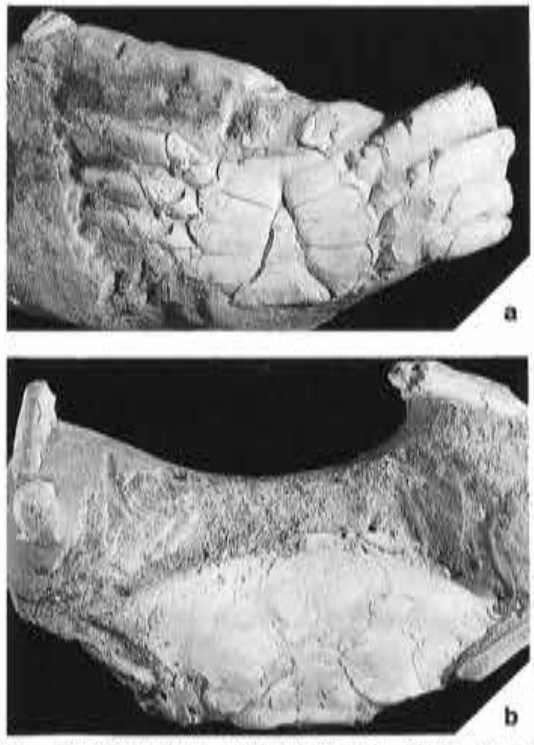


Fig. 3. *Podophthalmus vigil* (Fabricius, 1798). × 1.2. a, ventral; b, dorsal view.

Podophthalmus vigil (Fabricius, 1798)
(Figs. 3a, b)

Portunus vigil Fabricius, 1798, p. 368.
Podophthalmus spinosus Lamarck, 1801, p. 152.
Podophthalmus vigil (Fabricius); Leach, 1815, p. 149, pl. 108.

Material: Five specimens.

Remarks: This living species is abundant in the Pleistocene - Holocene deposits of the West Pacific region (Glaessner, 1929).

Superfamily Leucosioidea Samouelle, 1818
Family Leucosiidae Samouelle, 1818

Genus *Myra* Leach, 1817



Fig. 4. *Myra fugax* (Fabricius, 1798). × 1.2, dorsal view.

Myra fugax (Fabricius, 1798)
(Fig. 4)

Leucosia fugax Fabricius, 1798, p. 351.
Myra fugax (Fabricius); Leach, 1817, p. 24.

Material: Two carapaces.

Section Thracotremata Guinot, 1977
Superfamily Ocypodoidea Rafinesque, 1815
Family Ocypodidae Rafinesque, 1815
Subfamily Macropthalminae Dana, 1851

Genus *Macrophthalmus* Latreille *in* Desmarest, 1823
Subgenus *Euplax* H. Milne Edwards, 1852

Macrophthalmus (*Euplax*) *granulosus* de Man, 1904
(Figs. 5-2–6)

Macrophthalmus granulosus de Man, 1904, p. 266, pl. 10, fig. 5.

Material: Three specimens.

Description: The carapace is subrectangular in outline and about 1.3 times wider than long with the widest part between the 3rd anterolateral teeth. The dorsal surface is covered with coarse granules on the elevated regions with deep circumgastric and circumcardiac grooves. The narrow front is deflexed with a straight anterior margin and a deep median furrow. The finely granulated, upper orbital margin is curved and slopes strongly backwards. The outer orbital angle is broadly triangular in outline with granulated margins; it is directed outwards and forwards. The 2nd anterolateral tooth is smaller than the former; a broad U-shaped notch separates it from the outer orbital angle. The 3rd anterolateral tooth is smallest and is separated from the former by a shallow notch.

The palm of the male cheliped is short, high and about equal to the dactylus length; the dorsal margin is finely granulated. The fixed finger is about equal to the palm length and finely granular in the occludent margin. The dactylus bears a crenelated tooth near the middle on the occludent margin.

The lateral margins of the 6th and 5th abdominal somites are nearly straight and convergent anteriorly.

Discussion: The present species was first described from the Pleistocene ? of Celebes by de Man (1904). Although Branes (1966; 1977), Karasawa & Matsuoka (1991) and Karasawa & Inoue (1992) showed that *M. granulosus* was the junior synonym of *Macrophthalmus latreillei* (Desmarest, 1922). *M. granulosus* should be separated from *M. latreillei* as a valid taxon. *M. granulosus* differs from *M. latreillei* in having a narrow carapace with three anterolateral teeth, a short, high propodus of the male major cheliped, and straight lateral margins of the 6th and 4th abdominal somites of the male.

A depressed, densely granulated dorsal carapace with a narrow front readily distinguishes *M. granulosus* from *Macrophthalmus* (*Euplax*) *leptophthalmus* (H. Milne Edwards, 1852). The carapace of *M. leptophthalmus* is much narrower than that of *M. granulosus*. There is, in a narrow carapace with three anterolateral teeth and short, high propodi of male chelipeds, a greater similarity between *M. granulosus* and the third species of the subgenus, *Macrophthalmus* (*Euplax*) *barnesi* Serène, 1971 (= *Macrophthalmus* (*Venitus*) sp. nov., Barnes, 1971) from the tropical

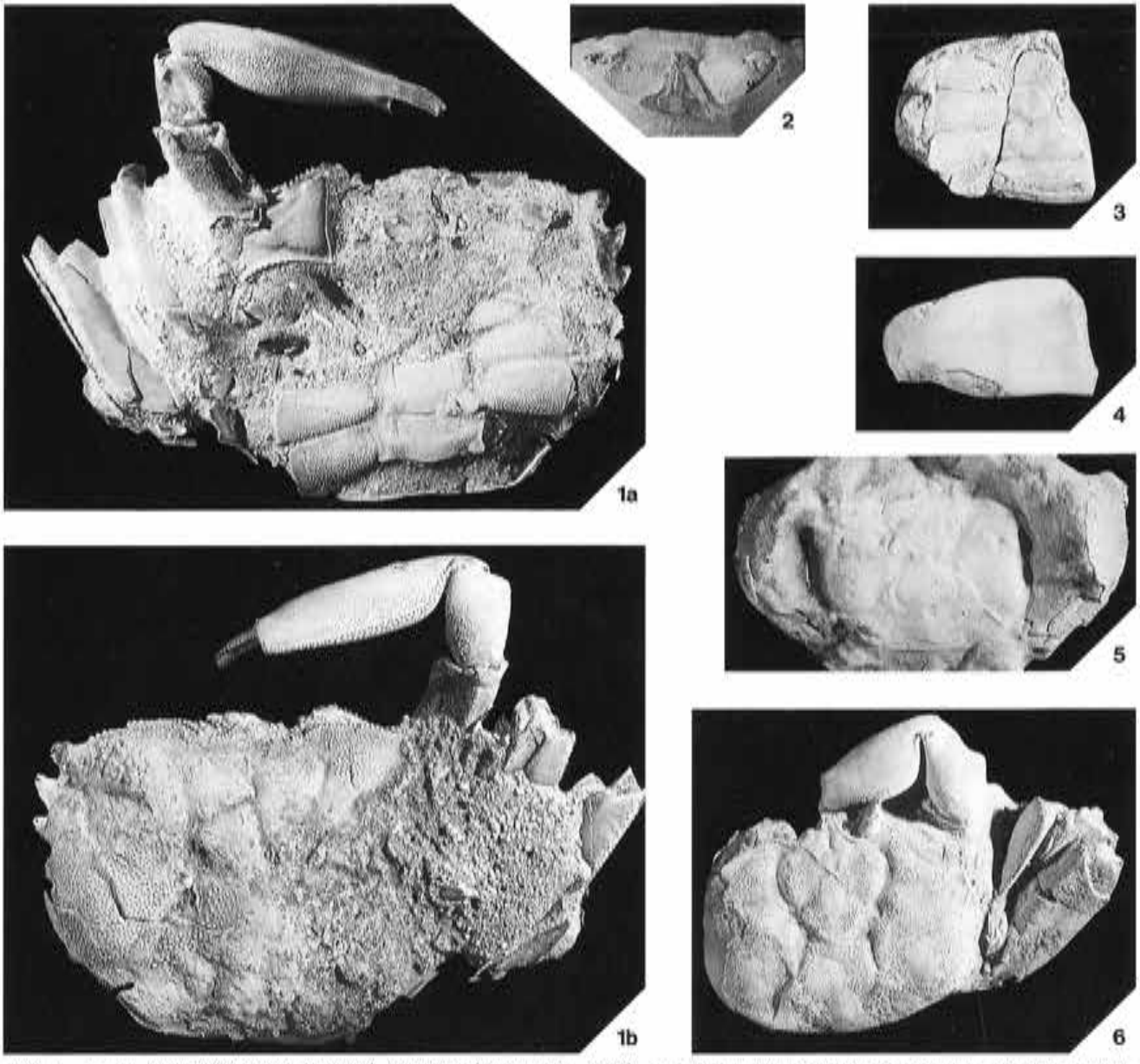


Fig. 5, 1a, b, *Macrophthalmus* (*Euplax*) *latreillei* (Desmarest, 1882). × 1.0. 1a, ventral view of carapace. 1b, dorsal view of carapace; 2-6, *Macrophthalmus* (*Euplax*) *granulosus* de Man, 1904. × 1.5, 2, lateral view of chelipeds; 3, ventral view; 4, lateral view of propodus of right major cheliped; 5, 6, dorsal view of carapace.

West Pacific, but more completely preserved specimens are need to make sufficient comparison *M. granulosus* and *M. barnesi*.

Macrophthalmus (*Euplax*) *latreillei* (Desmarest, 1822)
(Figs. 5-1a, b)

Goneplax latreillei Desmarest, 1822, p. 99, pl. 9, figs. 1-4.

Macrophthalmus latreillei (Desmarest); H. Milne Edwards, 1837, p. 66.

Macrophthalmus (*Venitus*) *latreillei* (Desmarest); Barnes, 1967, p. 32, pl. 3c, fig. 11 (full synonym list).

Macrophthalmus (*Venitus*) *vietnamensis* Serène, 1971, p. 918, pl. 6, figs. C, D.

Macrophthalmus officinalus Hu & Tao, 1979, p. 152, pl. 2, figs. 1-13, pl. 4, fig. 14.

Macrophthalmus (*Euplax*) *latreillei* (Desmarest); Morris & Collins, 1991, p. 32.

Material: Three specimens.

Remarks: This species are common in the Pleistocene-Holocene deposits of the West Pacific region (Glaesner, 1929; Karasawa & Inoue, 1992 etc.).

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沖縄島の更新統琉球層群産十脚甲殻類

柄沢宏明・野原朝秀・下地恒昌

要　　旨

沖縄県沖縄島の中頭郡読谷村親志の更新統琉球層群那覇層より4属5種の十脚甲殻類化石を報告する．これらの十脚類化石は，4種の現生種，*Neocallichirus* sp. (Callianassidae)，*Podophthalmus vigil* (Fabricius, 1798) (Portunidae)，*Myra fugax* (Fabricius, 1798) (Leucosiidae)，*Macrophthalmus* (*Euplax*) *latreillei* (Desmarest, 1822) (Ocypodidae) と絶滅種 *Macrophthalmus* (*Euplax*) *granulosus* de Man, 1904に同定される．*M. fugax* の産出は，更新世までこの種の生存期間が遡ることを示す．*M.* (*E.*) *granulosus* は，側縁に3歯を刻む幅の狭い背甲・短い鉗脚掌節・雄腹部第3・5節側縁の特徴により *M.* (*E.*) *latreillei* から識別され，*M.* (*E.*) *latreillei* の新参シノニムではなく有効なタクソンであると考えられる．