

# Decapoda from the Miocene Kumano Group, Wakayama Prefecture, Japan

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## Abstract

One axiidean, one anomuran, and four brachyurans are recorded from the early Miocene Kumano Group of Wakayama Prefecture, central Japan. Among these, *Trypaea mizunamiensis* Karasawa, Lithodidae?, *Tymolus ingens* Takeda and Tomida, and *Macrocheira* sp. aff. *M. kaempferi* de Haan are newly recorded from the Kumano Group. Additionally, the status of *Macrocheira ginzanensis* Imaizumi is briefly discussed.

*Key words:* Decapoda, Axiidea, Anomura, Brachyura, Miocene, Kumano Group, Japan

## Introduction

The Setouchi Miocene Series (upper Lower–lower Middle Miocene) of the Setouchi Geologic Province, southwest Honshu contains rich decapod faunas (i.e., Karasawa, 1993; 1997). However, decapods have been extremely rare from the deposits of the upper Lower to lower Middle Miocene Nankai Geologic Province of southwest Honshu. The hitherto known records from the Nankai Geologic Province were only represented by two species from the Kumano Group (Karasawa, 1993) and *Ponotus shirahamensis* Karasawa and Ohara, 2009, from the Tanabe Group (Karasawa and Ohara, 2009).

The purpose of this paper is to record six species of decapods collected from the Kumano Group distributed in Wakayama Prefecture. Decapods were collected from four localities (Fig. 1). The Kumano Group distributed in the studied area is divided into three, Shimosato, Shikiya, and Mitsuno formations, in ascending order (Hisatomi, 1984; Honda *et al.*, 1998). Decapods occurred in the Shimosato and Shikiya formations. Honda *et al.* (1998) showed that the geologic age of the Shimosato Formation is early Miocene and that of the Shikiya Formation is latest early Miocene–earliest Middle Miocene, based upon the molluscan faunas.

The specimens described here are deposited in the Wakayama Prefectural Museum of Natural History (WMNH-Ge) and the Mizunami Fossil Museum (MFM).

## Systematics

Infraorder Axiidea de Saint Laurent, 1979

Superfamily Callianassoidea Dana, 1852

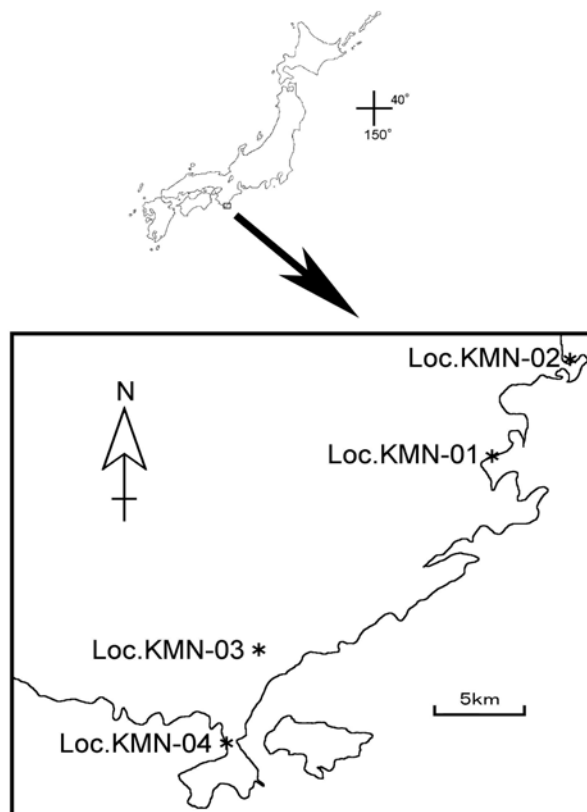


Fig. 1. Map showing the fossil-bearing locality. Loc. KMN-01: Beach of Nassa, Yukawa, Taiji-cho, Wakayama Prefecture; siltstone of the Shikiya Formation; Loc. KMN-02: Ukui, Nachikatsuura-cho, Wakayama Prefecture; sandstone of the Shimosato Formation; Loc. KMN-03: Kujinokawa, Kushimoto-cho, Wakayama Prefecture; calcareous siltstone of the Shikiya Formation; Loc. KMN-04: Suganohama, Kushimoto-cho, Wakayama Prefecture; calcareous sandstone of the Shikiya Formation.

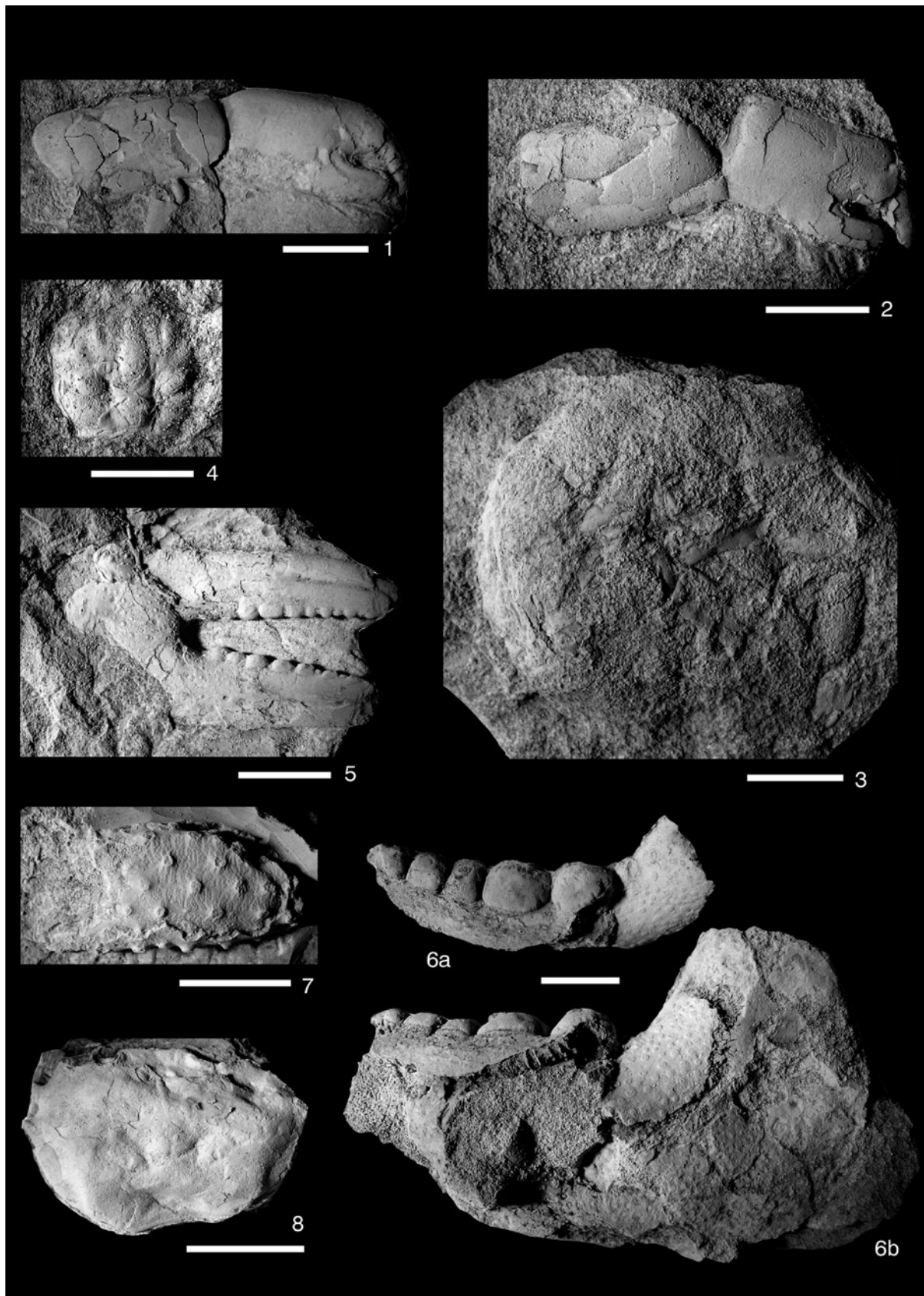


Fig. 2. 1–3. *Trypaea mizunamiensis* Karasawa, 1993. 1, right major cheliped, lateral view, WMNH-Ge-1120220063. 2, right major cheliped, lateral view, WMNH-Ge-1120220058. 3, right minor cheliped, some pereopods, and abdomen, lateral view, WMNH-Ge-1120220056. 4. *Tymolus ingens* Takeda and Tomida, 1984, carapace, dorsal view, WMNH-Ge-1120220041. 5, 6a, 6b. *Macrocheira* sp. aff. *M. kaempferi* de Haan, 1839, 5, right cheliped, lateral view, WMNH-Ge-1120220073. 6a, b, dactylus of left cheliped, WMNH-Ge-1120210108, 6a, dorsal view; 6b, lateral view. 7. *Lithodidae*?, propodus of right cheliped, lateral view, WMNH-Ge-1120210107. 8. *Carcinoplax antiqua* (Ristori, 1889), carapace, dorsal view, WMNH-Ge-1120220100. All scale bars=1 cm.

Family Callianassidae Dana, 1852  
 Subfamily Callianassinae Dana, 1852  
 Genus *Trypaea* Dana, 1852

***Trypaea mizunamiensis* Karasawa, 1993**

(Fig. 2.1–3)

*Trypaea mizunamiensis* Karasawa, 1993, p. 34, pl. 4, figs. 1, 2.

*Material examined:* WMNH-Ge-1120220053, 1120220056, 1120220058, and 1120220063 from KMN-02.

*Remarks:* *Trypaea mizunamiensis* was originally described from the lower Miocene Akeyo Formation of the Mizunami Group (Karasawa, 1993). The occurrence of *T. mizunamiensis* from the Kumano Group represents the second record of the species. The specimen (WMNH-Ge-1120220056) is well documented from the minor cheliped as well as pereopods and abdomen, unusual in the fossil records.

Infraorder Anomura MacLeay, 1838  
 Superfamily Lithodoidea Samouelle, 1819  
 Family Lithodidae Samouelle, 1819

**Lithodidae?**

(Fig. 2.7)

*Material examined:* WMNH-Ge-1120210107 from Loc. KMN-04.

*Remarks:* The present material is represented by a broken left propodus of the cheliped. This material may be compared with the propodus of cheliped of the lithodid genera, *Lithodes* Latreille, 1806, and *Paralomis* White, 1856. The specific identification of this species awaits the discovery of better material.

Infraorder Brachyura Linnaeus, 1758  
 Section Cyclodorippoida Ah Yong *et al.*, 2007  
 Superfamily Cyclodorippoidea Ortmann 1892  
 Family Cyclodorippidae Ortmann 1892  
 Subfamily Cyclodorippinae Ortmann 1892  
 Genus *Tymolus* Stimpson, 1858

***Tymolus ingens* Takeda and Tomida, 1984**

(Fig. 2.4)

*Tymolus ingens* Takeda and Tomida, 1984, p. 43, pl. 13, figs. 1–14.

*Material examined:* WMNH-Ge-1120220041 from Loc. KMN-02.

*Remarks:* The previous record of the species has been known from the early Miocene Mizunami and Tomikusa groups and the middle Miocene Chikubetsu and Ausinskaya formations (Kato *et al.*, 1994).

Section Eubrachyura de Saint Laurent, 1980  
 Superfamily Trichopeltarioidea Tavares and Creva, 2010  
 Family Trichopeltariidae Tavares and Creva, 2010  
 Genus *Trichopeltarion* A. Milne Edwards, 1880

***Trichopeltarion huziokai* (Imaizumi, 1951)**

(Fig. 3)

*Trachycarcinus huziokai* Imaizumi, 1951, p. 34, pl. 6, figs. 1–10.

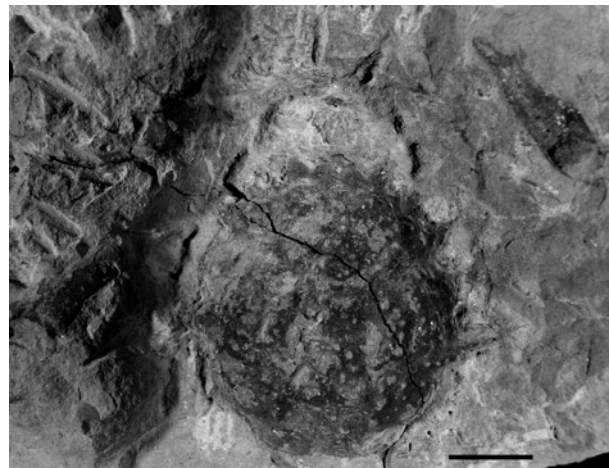


Fig. 3. *Trichopeltarion huziokai* (Imaizumi, 1951), dorsal view, MFM83241.

*Trichopeltarion huziokai* (Imaizumi, 1951); Schweitzer and Feldmann, 1999, p. 241, p. 241.

*Material examined:* MFM83241 from KMN-01.

*Remarks:* The species has been only recorded from Loc. KMN-01 (Karasawa, 1993).

Superfamily Majoidea Samouelle, 1819  
 Family Inachidae MacLeay, 1838  
 Genus *Macrocheira* de Haan, 1839

***Macrocheira* sp. aff. *M. kaempferi* de Haan, 1839**

(Fig. 2.5, 6a, 6b)

*Material examined:* WMNH-Ge-1120220073, WMNH-Ge-1120210108, from KMN-02.

*Remarks:* Two broken chelipeds were obtained. The Japanese Miocene *Macrocheira* comprises three, *Macrocheira yabei* (Imaizumi, 1957) and *M. sp.* from the lower Miocene Yonekawa Formation (Imaizumi, 1957; 1965) and *M. ginzanensis* Imaizumi, 1965, from the middle Miocene Ginzan Formation and Tomioka Group (Imaizumi, 1965; Kato, 2001). The present specimens are similar to the chelipeds of *M. ginzanensis* and the extant *M. kaempferi* de Haan, 1839. Imaizumi (1965) erected the new species, *M. ginzanensis*, based upon a single incomplete dactylus of the cheliped. He (p. 32) noted, “That is, the fossil finger is relatively broad, robust and thick compared with the left cheliped of a female specimen of *Macrocheira kaempferi*”. *Macrocheira ginzanensis* cannot be recognized as the separate species based upon examination of the original plate (Imaizumi, 1965, pl. IV). Careful examination of the type specimen and additional well-preserved specimens of *M. ginzanensis* needs to confirm identification of the species; however, the type specimen of *M. ginzanensis* has been lost (Kato, 2001). *Macrocheira yabei* was represented by juveniles (Imaizumi, 1965); therefore, the present specimens cannot be compared with those of *M. yabei*.

Superfamily Goneplacoidea MacLeay, 1838  
 Family Goneplacidae MacLeay, 1838  
 Subfamily Goneplacinae MacLeay, 1838  
 Genus *Carcinoplax* H. Milne Edwards, 1853

***Carcinoplax antiqua* (Ristori, 1889)**

(Fig. 2.8)

*Curtonotus antiquus* Ristori, 1889, p. 4.

*Carcinoplax antiqua* (Ristori); Glaessner, 1933, p. 17, pl. 4.

*Material examined*: WMNH-Ge-1120220100 from KMN-03; MFM83242 from Loc. KMN-01.

*Remarks*: The hitherto known occurrence of the species was reported from Loc. KMN-01 (Karasawa, 1993). An additional carapace occurred from Loc. KMN-03.

**Acknowledgment**

We thank Y. Sako (Kushimoto) for offering their specimens for our study.

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Manuscript accepted on October 6, 2011