

## A Giant Amphipod Crustacea from the Miocene Morozaki Group in the Chita Peninsula, Central Japan

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**Abstract** An amphipod crustacean species is recorded from the Miocene Morozaki Group in the Chita Peninsula, central Japan. It is closely related to the recent giant species, *Megaceradocus gigas* MUKAI, hitherto known from the Sea of Japan.

### Introduction

Recently, several members of the Tokai Fossil Society collected many fine-conditioned fossils of shells, fishes, crustaceans and echinoderms at Iwaya agricultural land, Minamichita-cho in the Chita Peninsula, Aichi Prefecture, central Japan.

In the southern part of the Chita Peninsula, a thick sequence of the Miocene Morozaki Group is distributed, and some attempts to subdivide the Group into smaller stratigraphic units were made on the basis of key beds and lithological differences SHIKAMA & KASE, 1976; SHIBATA, 1977). At present, the Morozaki Group is subdivided into the Himaka, Toyohama, Yamami and Utsumi Formations in ascending order.

The crustacean fossils were collected from the lower to the middle layer of the Yamami Formation and preliminarily reported by TAKEDA *et al.* (1986). Most of them are referred to the Decapoda, and only one species to the Amphipoda. In this paper the amphipod species is recorded, being close to *Megaceradocus gigas* MUKAI, 1979, which was originally described on the specimens found in gut contents of a skate fish from the Sea of Japan.

### Description

Family Gammaridae

Genus *Megaceradocus* MUKAI, 1979

*Megaceradocus* cfr. *gigas* MUKAI, 1979

(Fig. 1)

Cf. *Megaceradocus gigas* MUKAI, 1979, p. 177, figs. 1–20.

*Megaceradocus* sp., TAKEDA *et al.*, 1986, p. 14, pl. 1 figs. 3, 4.



Fig. 1. *Megaceradocus* cfr. *gigas* MUKAI. A fossil specimen from the Miocene Morozaki Group (42 mm in body length).

*Material examined.* Two exs. (♀♀ ?) embedded in psammitic and argillaceous tuff; Yamami Formation, Miocene Morozaki Group, Iwaya, Aichi Pref., Chita Penin., central Japan; coll. by Messrs. Masayuki UMEMOTO and Mitsuo KUWAYAMA. One specimen is 42 mm in body length, and another specimen is folded and broken, without anterior half.

*Description.* Head having no rostrum and eyes. Body not carinate, without spines. Postero-ventral margin of epimera of pleonites pointed. Urosomites I-III distinct. Coxal plates I, II well agree with those of the holotype; III-V slightly lower than I, II, but higher than those of recent species. Coxal plates V, VI bilobed.

Flagella of antennae I and II missing. Peduncle of antenna I 3-segmented; 1st shorter than 2nd; 3rd shortest.

Gnathopod I normal and subchelated. Gnathopod II not complete in the fossils. Distal segments from ischiopodites in pereopods III-VII were lost. Basipodites of pereopods III, IV equal to each other in size and shape; those of pereopods IV-VII progressively increase in size.

Uropods I, II robust. Rami of uropod III large, subequal to each other, denticulated; distal end may be dully pointed.

*Remarks.* Fossil amphipod crustaceans are rare, and according to valuable contributions of HESSLER (1969) and HURLEY (1973), only 14 species of 6 genera are without doubt attributed to the Amphipoda. Modern systematics of the recent species based on the increased knowledge (cf. BARNARD, 1969) lead to split the genera, and thus it is difficult to decide the systematic position of the fossil specimens in which the distinctive generic criteria are not exposed.

This fossil species is really close to the recent giant species, *Megaceradocus gigas*



Fig. 2. *Megaceradocus gigas* MUKAI. One of paratypes found in gut contents of *Bathyraja smirnovi* (SOLDATOV et PAVLENKO) from the Sea of Japan (57 mm in body length).

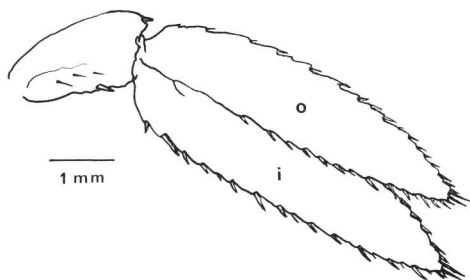


Fig. 3. *Megaceradocus gigas* MUKAI. Outer (o) and inner (i) rami of uropod III of a specimen found in gut contents of *Sebastolobus macrochir* (GÜNTHER) from off Choshi, Chiba Prefecture (43 mm in body length).

MUKAI, in its size and general formation of the body. In the fossil species, however, the coxal plates III-V seem to be wider than those of the recent species.

Although *M. gigas* was originally reported from the Sea of Japan, recently we had a chance to examine a female specimen obtained from gut contents of sebastid fish, *Sebastolobus macrochir* (GÜNTHER) from off Choshi, Chiba Prefecture, central Japan (35°40'–50°N, 141°16'–18°E, ca. 300–600 m deep). This specimen with 43 mm in body length is now preserved in the Ocean Research Institute, University of Tokyo. In both of the holotype and the paratypes of *M. gigas*, the antenna I had been lost. This specimen has the complete antennae I and II; antenna I about twice the length of antenna II; flagellum 50-articulated and subequal in length to peduncle. Both rami of the uropod III is pointed as in Fig. 3, slightly differing from the original

description in which the rami are illustrated to be rather rounded at their tips.

### Geological Notes and Associated Forms

Iwaya agricultural land, Minamichita-cho, Aichi Prefecture, where the crustacean fossils including the amphipod species were found, is referred to the middle to the lower horizon of the Yamami Formation. Its columnar section is shown in Fig. 4. Sandstone layers in mudstone layers are usually thin, but sometimes more than 1 m thick. This thick tuffaceous sandstone layers in the Yamami Formation are numbered in the series of Y, and four layers from Y-1 to Y-4 are distinguished at Iwaya agricultural land. It is the Y-4 layer that various crustacean fossils such as the deep-sea squat lobsters of *Munida* and *Munidopsis* and the primitive crabs allied to *Dicranodromia* were found. The amphipod species recorded in the present paper was collected from the mudstone layer between Y-3 and Y-4. Tuffaceous sandstone layers (Y-1 — Y-4), which yielded the rich crustacean fossils, are characterized by the presence of pieces of carbonized wood associated with abundant echinoderm and fish fossils and by the absence of shells. According to YAMAOKA (1985), on the contrary, mudstone layers, in which the amphipod species and *Callianassa* were found, were associated with some species of benthic shells such as *Acilana tokunagai*, *Malletia inermis*, *Periploma mitsuganoense*, *Tectonatica ichishiana* and *Pandorella* sp., and the

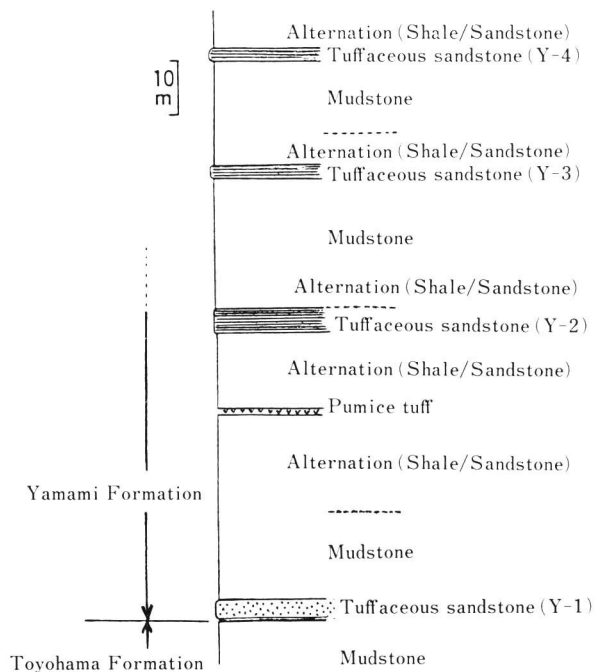


Fig. 4. Columnar section of the Morozaki Group exposed at Iwaya agricultural land.

pelagic shells such as *Euclio balantium* and *Vaginella depressa*. It is noted that the *Acilana* assemblage is the most dominant throughout the whole Morozaki Group in the Chita Peninsula.

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