

A New Giant Amphipod Belonging to a New Genus, *Megaceradocus*, Found in the Japan Sea

By

Hiroshi MUKAI

Ocean Research Institute, University of Tokyo, Nakano, Tokyo

(Communicated by Tadashige HABE)

Three specimens of a giant gammaridean amphipod were discovered in gut contents of a species of skate fish, *Bathyraja smirnovi* (SOLDATOV et PAVLENKO), family Rajidae, which was collected by a trawl net at station 40 of the fishery biological survey of R/V Kaiyo-Maru Japan Sea Cruise in the early summer of 1970 (OGATA *et al.*, 1973). These specimens belong to a new species of a new genus in the family Gammaridae, which will be described in the present paper.

I am thankful to Associate Professor M. OKIYAMA, Ocean Research Institute, University of Tokyo, who kindly gave me the valuable specimens. I wish to thank Dr. J. L. BARNARD, Smithsonian Institution, U. S. A., and Dr. M. HORIKOSHI, Ocean Research Institute, University of Tokyo, for reading the manuscript and Miss S. NAGASAWA, Ocean Research Institute, University of Tokyo, for her help in reading a Russian paper.

Megaceradocus gen. nov.

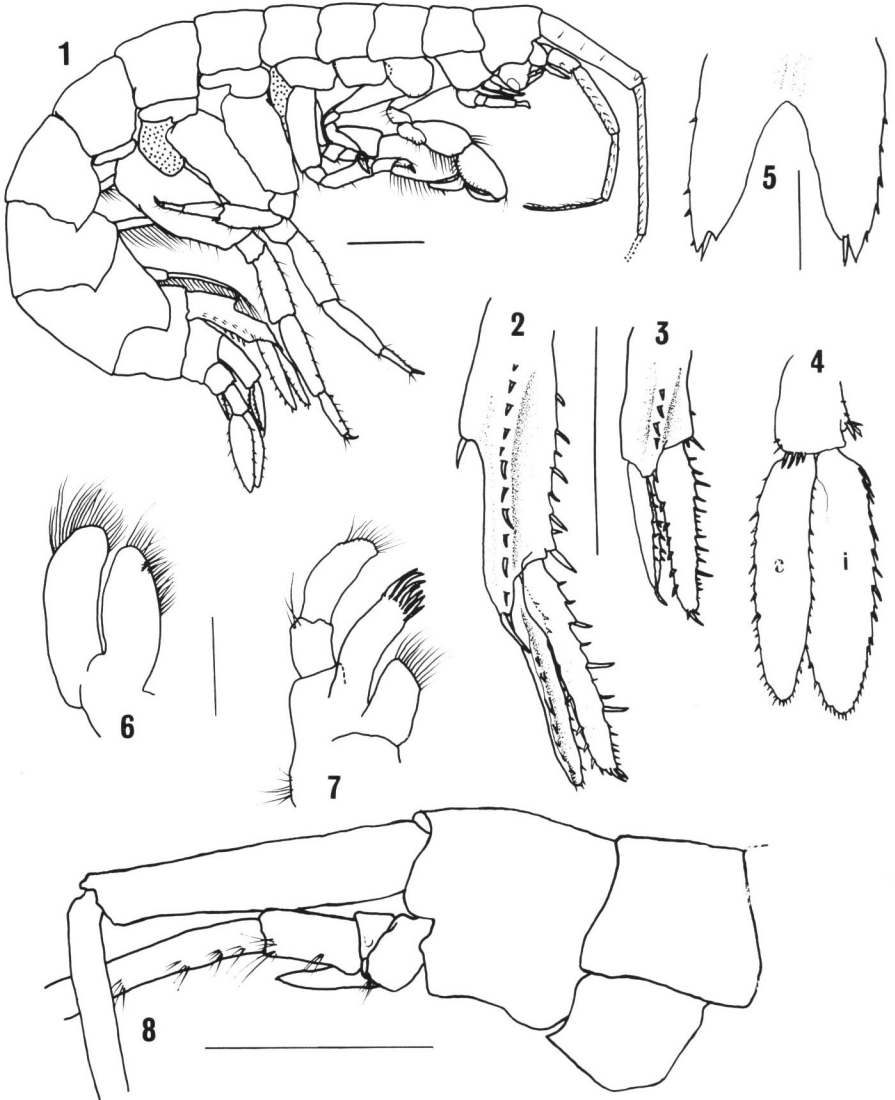
Diagnosis. Body very large, of normal form. Abdominal segments without any spines, not carinate nor serrate. Rostrum and eyes absent. Coxal plate I produced forward. Coxal plates III and IV shallower than I and II; plate IV not concave, V and VI bilobed, but fore lobe of plate VI vestigial. Antenna I longer than II. Accessory flagellum of antenna I well developed, having several joints.

Upper lip rounded. Lacinia mobilis and molar process of mandible stout and well developed. Palp of mandible 3-articulated; articles II and III subequal in length. Maxilla I with inner lobe bearing many setae and outer lobe armed with eleven long spines on apical margin; palp of maxilla I 2-articulated. Outer lobe of maxilliped fringed with marginal setae medially and distally; palp of maxilliped 5-articulated. Lower lip with inner lobes.

Gnathopod I (peraeopod I) smaller than II; both normal or subchelate weakly. Uropod I longer than II; inner and outer rami of uropods I and III subequally long, but inner ramus of uropod II longer than outer one; rami of uropod III with one article, large and paddle-like. Telson deeply and widely cleft.

Type-species. *Megaceradocus gigas* sp. nov.

Relationship. This genus fits the general diagnosis of *Ceradocus* COSTA in most characters, but it differs in 1) large and smooth body, 2) not carinate, 3) eyes absent, 4) third joint of palp of mandible subequal to second. *Megaceradocus* looks like



Figs. 1-8. *Megaceradocus gigas* sp. nov., holotype. — 1, Lateral view; 2, uropod I, o: outer ramus, i: inner ramus; 3, uropod II; 4, uropod III, o: outer ramus, i: inner ramus; 5, telson; 6, left maxilla II; 7, left maxilla I; 8, head in lateral view. Scales are 5 mm for Figs. 1, 2, 3, 4 and 8, and 1 mm for Figs. 5, 6 and 7.

Bathyceradocus PIRLOT, *Ceradocoides* NICHOLLS, *Ceradocopsis* SCHELLENBERG, *Metaceradocoides* BIRSTEIN et VINOGRADOV and *Metaceradocus* CHEVREUX in general features. It differs from *Bathyceradocus* and *Metaceradocus* in the uncarinate or spineless abdominal segments, and from *Ceradocoides*, *Ceradocopsis* and *Metaceradocoides* in having only one segment on the outer ramus of uropod III.

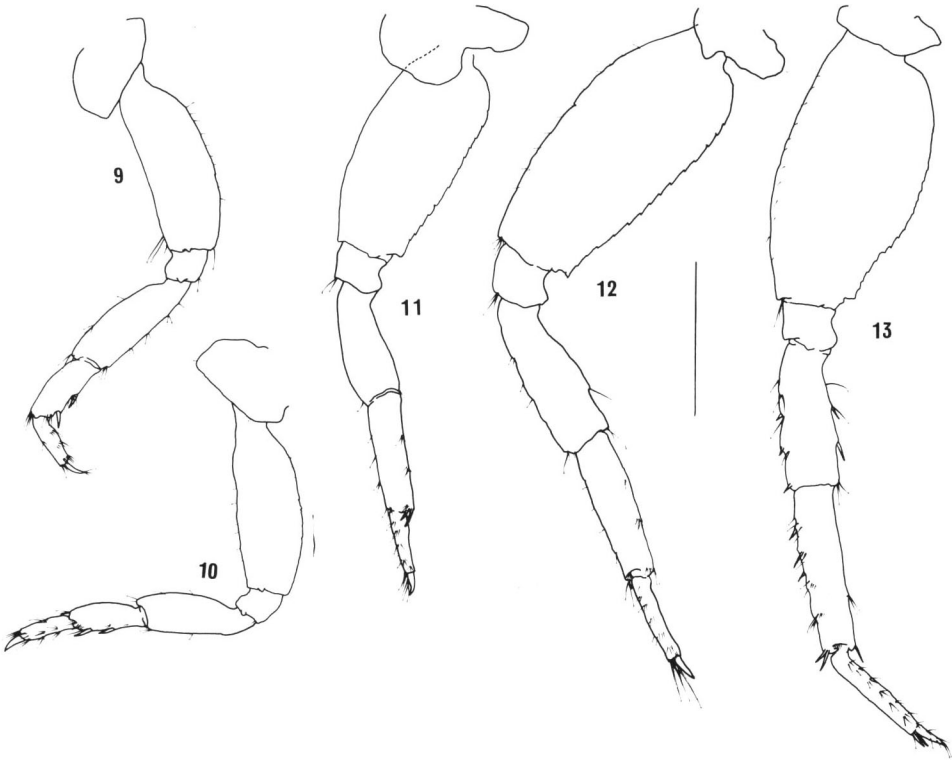
Remarks. The name of this genus attributes to the giant form of a *Ceradocus*-like organism.

Megaceradocus gigas sp. nov.

(Figs. 1-20)

Diagnosis. With the characters of the genus.

Description of holotype (Female). Body:— Length of body (head to telson) about 55 mm. Head without rostrum and eyes. Body segments not carinate and lacking any spines or processes. Epimera of three pleonites make a point behind. Urosomites I-III distinct, without spine or process. Coxal plate I projects forward;



Figs. 9-13. *Megaceradocus gigas* sp. nov., holotype. — 9, Left third pereopod; 10, left 4th pereopod; 11, left 5th pereopod; 12, left 6th pereopod; 13, left 7th pereopod. Scale 5 mm.

coxal plates I and II, and III and IV subequal in height, respectively; I, II higher than III, IV; coxal plate IV not emarginate behind, shallower than V; coxal plate V bilobed; in VI anterior lobe vestigial; coxal plate VII not bilobed.

Antenna:— A part of antenna I lost, but possibly longer than antenna II; its peduncle stout and long, subequal in length to antenna II. Flagellum of antenna I of three specimens broken; accessory flagellum well developed, 6-articulated. Antenna II stout like I. Gland cone of antenna II long, extending to near distal end of third article. Flagellum 17-articulated.

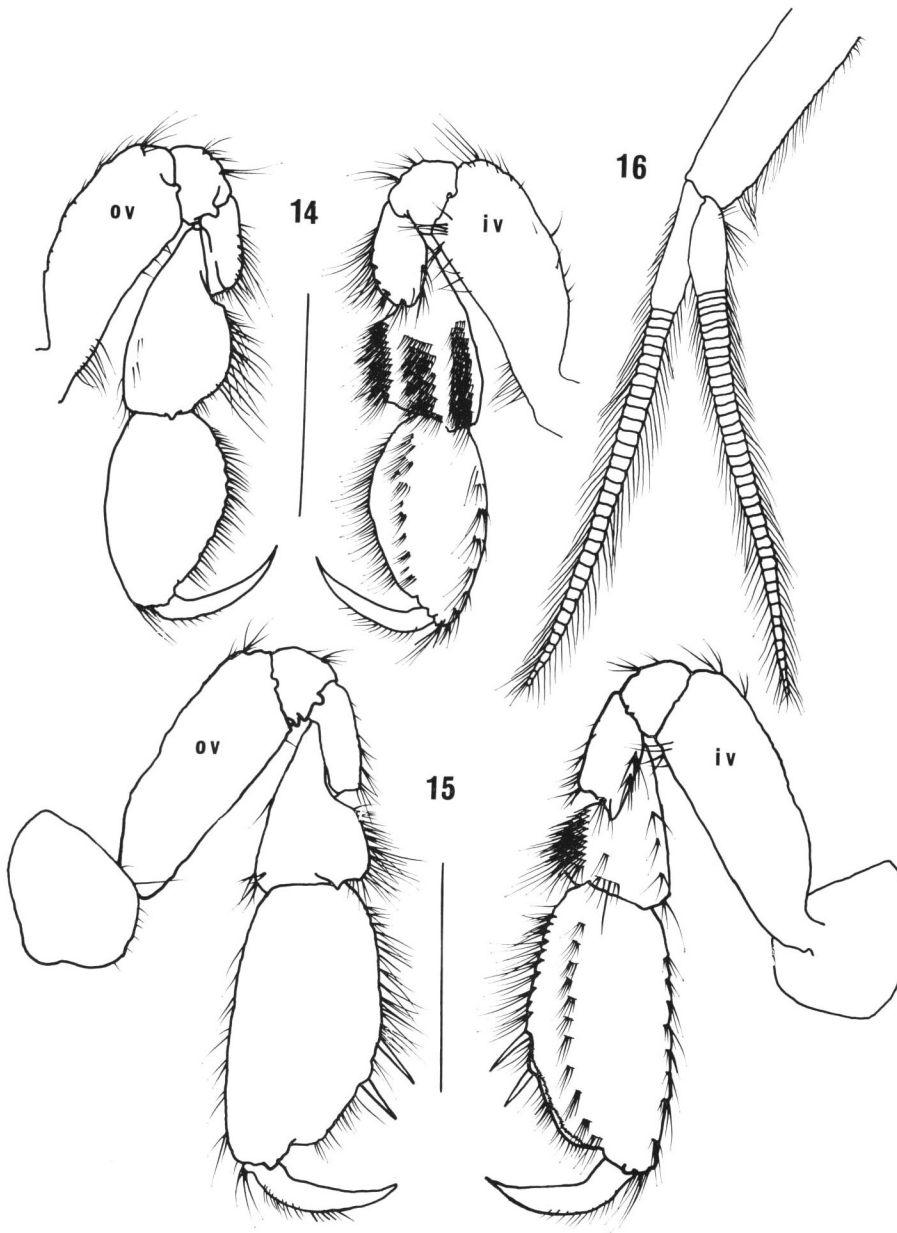
Oral parts:— Upper lip simple, rounded. Mandible robust and large, incisor denticulate. Accessory blades lined like teeth of comb. Palp of mandible 3-articulated; second and third articles subequal in length, first article with small setae medially, second article with dense setae inner-laterally but lacking in distal setae, third article with long apical setae. Lower lip with inner and outer lobes. Inner lobe of maxilla I with long marginal setae, outer lobe with eleven long branching spines, palp 2-articulated. Inner lobe of maxilla II with setae at apex. Inner lobe of maxilliped with setae and spines, outer lobe semicircular, palp 4-articulated, relatively robust, dactyl (article 4) with nail (spine).

Peraeopods:— Gnathopod II (peraeopod II) stronger and larger than I. Gnathopod I (peraeopod I) normal or weakly subchelate; inner side of carpus armed with three compact brushes of dense setae. Gnathopod II subchelate, robust; propod expanded, twice as long as dactylus, at proximal end of palm with two strong and long spines; inferior lateral setae of carpus very dense. Peraeopods III and IV shorter than VI and VII which are subequal in length respectively; peraeopod V intermediate. Peraeopods III and IV of the same form, with basis not expanded, inferior margin weakly denticulate; inferior margin of carpus with two spines; dactylus narrowly pointed, nail-like. Carpus of peraeopod V with two strong apical spines. Peraeopods VI and VII with basis slightly expanded, inferior margin of their basis weakly denticulate.

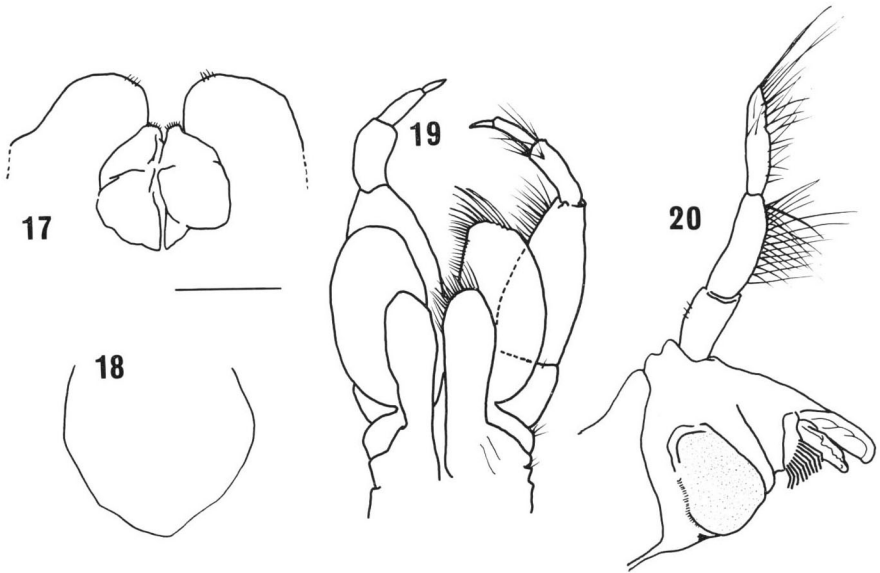
Pleopods:— Pleopod I normal, with peduncle bearing no spine, and outer and inner rami subequally long, with 36-articulate inner ramus and 41-articulate outer ramus in the holotype; each article with a pair of long swimming seta except for proximal and distal articles bearing many setae. Pleopods II and III substantially the same.

Uropods:— Uropod I stout and extending beyond uropod II; peduncle of uropod I with two strong outer spines medially and distally; peduncle extends outside of outer ramus; outer and inner rami subequal in length. Uropod II relatively small, but substantially the same in form as uropod I; outside of peduncle without lateral spine; inner ramus slightly longer than outer one. Uropod III with inner and outer rami consisting of only one flat and paddle-like segment respectively; apical spines very small; both rami subequal.

Telson:— Telson deeply and widely cleft, slightly asymmetrical; tip of each lobe notched, with a long spine.



Figs. 14–16. *Megaceradocus gigas* sp. nov., holotype. — 14, Left first gnathopod (1st pereopod), ov: outer view, iv: inner view; 15, left second gnathopod (2nd pereopod), ov: outer view, iv: inner view; 16, left first pleopod (swimming leg). Scales 5 mm.



Figs. 17–20. *Megaceradocus gigas* sp. nov., holotype. — 17, Lower lip; 18, upper lip; 19, maxilliped; 20, mandible. Scale 1 mm.

Materials. 1 ♀ holotype (body length 55 mm) and 2 ♀ paratypes (57 mm; ca. 40 mm, broken); Station 40 (36°52.8'N, 132°55.5'E); 14 June 1970; depth 245–255 m; muddy bottom; R/V Kaiyo-Maru Cruise of Fishery Agency of Japan; collected by Associate Professor M. OKIYAMA, Ocean Research Institute, University of Tokyo. The holotype and one of the paratypes (NSMT–Cr. 5678, 5679) are deposited in the National Science Museum (Nat. Hist.), Tokyo, for permanent preservation. The other paratype is deposited at Ocean Research Institute, University of Tokyo.

Literature

- BARNARD, J. L., 1969. The families and genera of marine gammaridean Amphipoda. *Bull. U. S. Natn. Mus.*, **271**: 1–535.
- BIRSTEIN, J. A., & M. E. VINOGRADOV, 1960. Pelagicheskie gammaridy tropicheskoi chasti Tixogo Okeana. *Trudy Inst. Okean., Akad. Nauk SSSR*, **34**: 165–241. (In Russian).
- *CHEVREUX, E., 1925. Amphipodes I: Gammariens. Voyage de la Goëlette Melita aux Canaries et au Sénégal (1889–1890). *Bull. Soc. zool. France*, **50**: 278–311.
- *COSTA, A., 1853. Relazione sulla memoria del Dotter ACHILLE COSTA, di ricerche su' crostacei anfipodi del regno di Napoli. *Rend. Soc. Reale Borbonica, Accad. Sci. Napoli*, **1**: 165–235, pls. 1–4.
- NICHOLLS, G. E., 1938. Amphipoda Gammaridea. *Australasian Antarctic Exped. 1911–14, Sci. Rept.*, (C), **2**: 1–145.
- OGATA, T., M. OKIYAMA & Y. TANINO, 1973. Diagnoses of the animal populations in the depths of the Japan Sea, chiefly based on the trawling experiments by the R/V Kaiyo-Maru. *Bull. Japan*

Sea Reg. Fish. Res. Lab., **24**: 21–51. (In Japanese.)

PIRLOT, J. M., 1934. Les Amphipodes de l'expédition du Siboga. Deuxième partie: Les Amphipodes Gammarides. II. Les Amphipodes de la mer profonde. *Siboga-Exped., Mon.*, **33d**: 167–235.

SCHELLENBERG, A., 1926. Die Gammariden der deutschen Südpolar-Expedition 1901–1903. *Dtsch. Südpolar-Exped.*, **18**: 235–414.

STEBBING, T. R. R., 1906. Amphipoda I: Gammaridae. *Das Tierreich*, (21): 1–806.

(* Not seen).

