

A New Species of the Family Bythograeidae (Crustacea, Decapoda,
Brachyura) from the Hydrothermal Vents along Volcanic
Front of the Philippine Sea Plate

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Abstract A new bythograeid crab named *Austinograea yunohana* is described on the specimens from some hydrothermal vents along volcanic front of the eastern edge of the Philippine Sea Plate, off central Japan, as the ninth of the family Bythograeidae Williams, 1980, and the third of the genus *Austinograea* Hessler et Martin, 1989. The new species is most closely related to *A. alayseae* Guinot from the South Pacific, but remarkably different in having the filiform second male pleopod nearly as long as the first.

Key words: Bythograeidae, new species, *Austinograea*, Northwest Pacific, central Japan.

Introduction

Since the description of *Bythograea thermydron* Williams, 1980 from the hydrothermal vents on the Galapagos Rift as the representative of new genus, new family and new superfamily, seven species referred to three genera were added to the family Bythograeidae. They are *Bythograea microps* and *Cyanograea praedator* described by de Saint Laurent (1984) from the East Pacific, *B. mesatlantica* Williams, 1988 from the Central Atlantic which was later designated as the type species of the genus *Segonzacia* erected by Guinot (1989), *B. intermedia* de Saint Laurent, 1988 from the East Pacific, *Austinograea williamsi* Hessler et Martin, 1989 from the West Pacific, *A. alayseae* Guinot, 1990 from the South Pacific, and *B. laubieri* Guinot et Segonzac, 1997 from the East Pacific. These species inhabiting the active hydrothermal vent sites are characteristic in having the whitish carapace, with the degenerate

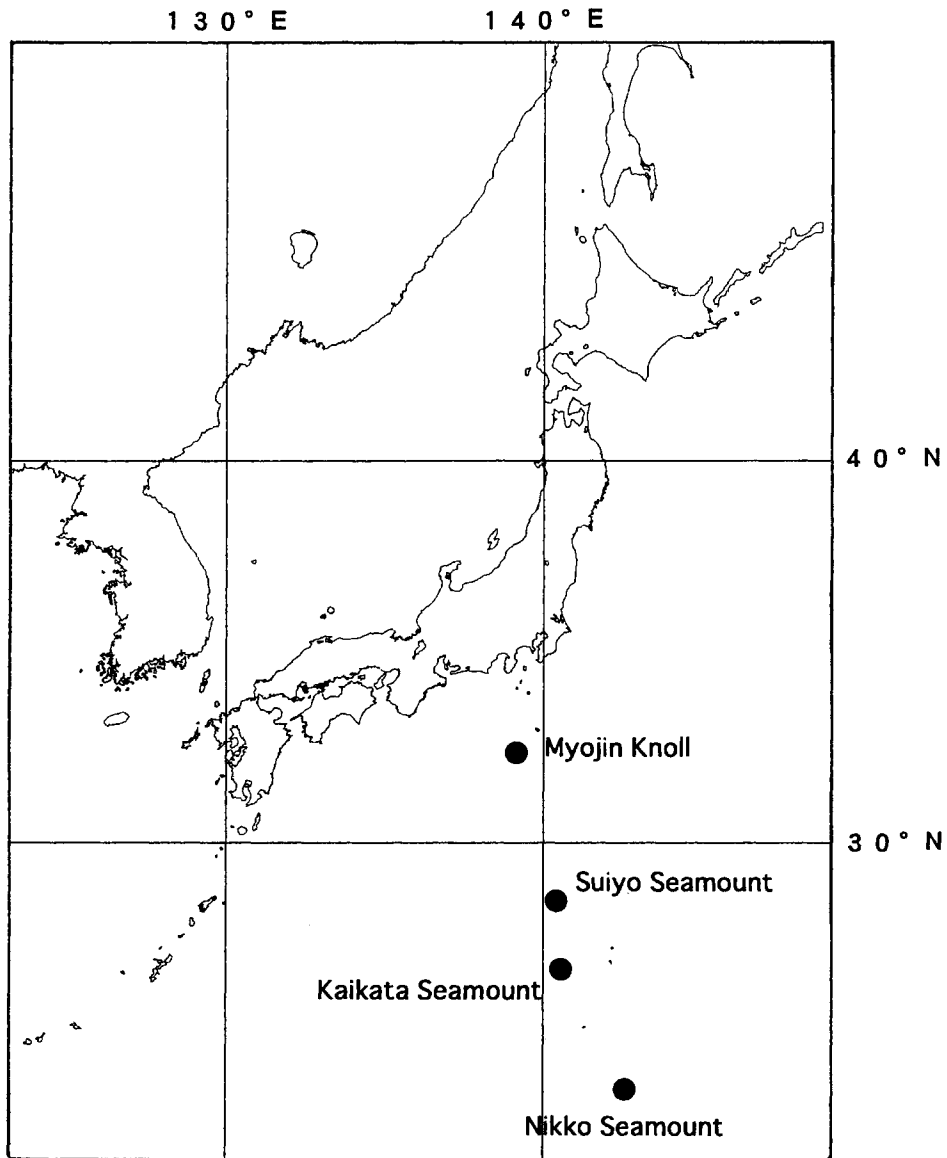


Fig. 1. Map showing the localities of *Austinograea yunohana* sp. nov., along the volcanic front of the Philippine Sea Plate.

eyes and eyestalks to variable degrees.

During a long series of deep-sea surveys at the hydrothermal vents along volcanic front of eastern edge of the Philippine Sea Plate, off central Japan (Fig. 1), by a deep-tow TV system and the manned submersibles *Shinkai 2000* and *Shinkai 6500* of

the Japan Marine Science Technology Center (JAMSTEC), the bythograeid crabs living in high densities were commonly observed (Fig. 5B), and then captured for taxonomic and biological studies. In this paper, these crabs are to be described as the representatives of a new species of the genus *Austinograea* erected by Hessler and Martin (1989).

The holotype, allotype and some representative paratypes, and also some young specimens are preserved in the National Science Museum, Tokyo (NSMT), and one of the paratype females is retained by the Japan Marine Science and Technology Center (JAMSTEC). Otherwise, some paratypes will be sent to the Natural History Museum, London (NHML), the Muséum National d'Histoire Naturelle, Paris (MNHN), the Nationaal Natuurhistorisch Museum, Leiden (NNML), the Nature-Museum und Forschungsinstitut Senckenberg, Frankfurt a.M. (NMFS), and the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM).

Description

Austinograea yunohana sp. nov.

(Figs. 2-5)

Type material. **Myojin Knoll**—*Shinkai 2000* dive #1007 (32°06.19'N, 139°52.04'E, 1,263 m deep), 2♂♂ (paratype, MNHN, 38.0×24.9 mm; holotype, NSMT-Cr 13655, 41.9×26.9 mm), May 5, 1998. **Suiyo Seamount**—*Shinkai 2000* dive #626 (28°34.50'N, 140°38.50'E, 1,380 m deep), 2♀♀ (paratype, JAMSTEC, 38.3×25.2 mm; allotype, NSMT-Cr 13656, 50.5×32.5 mm), July 11, 1992. **Kaikata Seamount**—*Kaiyo* cruise DK88-3-IZU (26°42.60'N, 141°04.60'E, 420–450 m deep), 2♂♂ (paratypes, NSMT-Cr 13657, 20.6×13.6 mm; 27.0×17.5 mm), 2♀♀ (paratypes, NSMT-Cr 13658, 31.5×20.5 mm; NNML, 34.4×22.4 mm), Aug. 31, 1988, by a small dredge hanging on deep-tow TV system; *Shinkai 2000* dive #1014 (26°42.35'N, 141°04.67'E), 448 m deep; 2♂♂ (paratypes, USNM, 28.0×18.8 mm; NSMT-Cr 13659, 33.8×21.9 mm), May 18, 1998. **Nikko Seamount**—*Shinkai 6500* dive #144 (23°04.70'N, 142°19.90'E, 433–762 m deep), 1♂ (paratype, NMFS, 32.5×21.2 mm), 2♀♀ (paratypes, NSMT-Cr 13660, 31.6×20.6 mm; NHML, 37.4×25.2 mm), Sept. 19, 1992.

Additional material. Kaikata Seamount, 11♂♂ (5.4×4.0 mm—17.3×11.7 mm), 1♀ (12.4×8.6 mm) (NSMT-Cr 13661), data same as *Kaiyo* cruise DK88-3-IZU.

Description of holotype (Male: Figs. 2, 4G-I). Carapace 41.9 mm in breadth (cb), 26.9 mm in length (cl). Carapace elliptical, with ratio of length to breadth (cl/cb) being 0.64, weakly and evenly curving downward to frontorbital margin, nearly flat toward lateral margins of both sides; each posterolateral part weakly concave along margin; dorsal surface of carapace smooth and shining to naked eye, without hairs or setae, but microscopically roughened with numerous minute punctae for its

most part and with obtuse scaly granules along frontorbital and anterolateral margins; regions ill-defined, only with a median, longitudinal bifurcating furrow subdividing gastric regions into proto- and mesogastric subregions; branchial and cardiac regions hardly traceable.

Front nearly truncated, not protruded from general outline of carapace, about a quarter as wide as carapace; frontal margin separated into two weakly convex lobes, studded with pearly granules, having a small median lobule instead of notch; lateral part of each lobe not produced, confluent with supraorbital margin without interruption. Supraorbital margin shallowly concave in dorsal view, distinct along its inner oblique part, faded out laterally toward anterolateral margin of carapace, without external angle.

Orbit shallow, widely open, with small eyestalk fixed at its bottom; anterior part of orbital floor nearly vertical from supraorbital margin, posterior part flattened, twice as long as anterior part, inclined to pterygostomial region. Eyestalk immovable, thickened distally, with distal part truncated together with unpigmented cornea; its ventral surface truncated so as to be flattened against antennal basal segments.

Third maxilliped covered with small dispersed depressions filled with setae; ischium twice as long as merus, twice as wide as exopod with a longitudinal furrow along its inner margin; small area of proximal part of coxa exposed as part of sternal surface, coxal lateral projection being entirely inserted into gill chamber; distal half of inner margin of merus shallowly concave; propodus and dactylus with brush-like fringe of dense setae along their inner margins; propodus about two thirds as long as slender club-shaped dactylus.

Anterolateral margin of carapace strongly arched, sharply edged throughout its whole length, without distinct interruptions or depressions. Posterolateral margin rather strongly convergent, shallowly but distinctly concave for its main part; its posterior part strongly concave just above coxa of last ambulatory leg. True posterior margin of carapace as long as frontal margin, shallowly concave along first abdominal segment.

Both chelipeds heavy, long, slightly different in size and shape, with the right being larger; merus elongated, beyond anterolateral margin of carapace by its distal half; upper surface shallowly excavated for its most part, with anterior margin thickened and fringed with pearly granules of good size; posterior margin thickened along its proximal half, rounded along distal half and extended onto upper surface to make an appearance of swollen skin; distal end of anterior margin distinctly angulated; carpus comparatively large, rounded as a whole, without inner angle; carpus and palm seemingly smooth, with microscopical pits and depressions; palm strongly inflated at basal part of its inner surface in both chelipeds; top of each inflation angulated toward base of palm, with cluster of some granules; outer surface of palm smooth and regularly convex; fingers strong, one and half as long as palm in smaller chela, slightly longer than palm in larger chela, with dark-colored distal halves; both fingers of

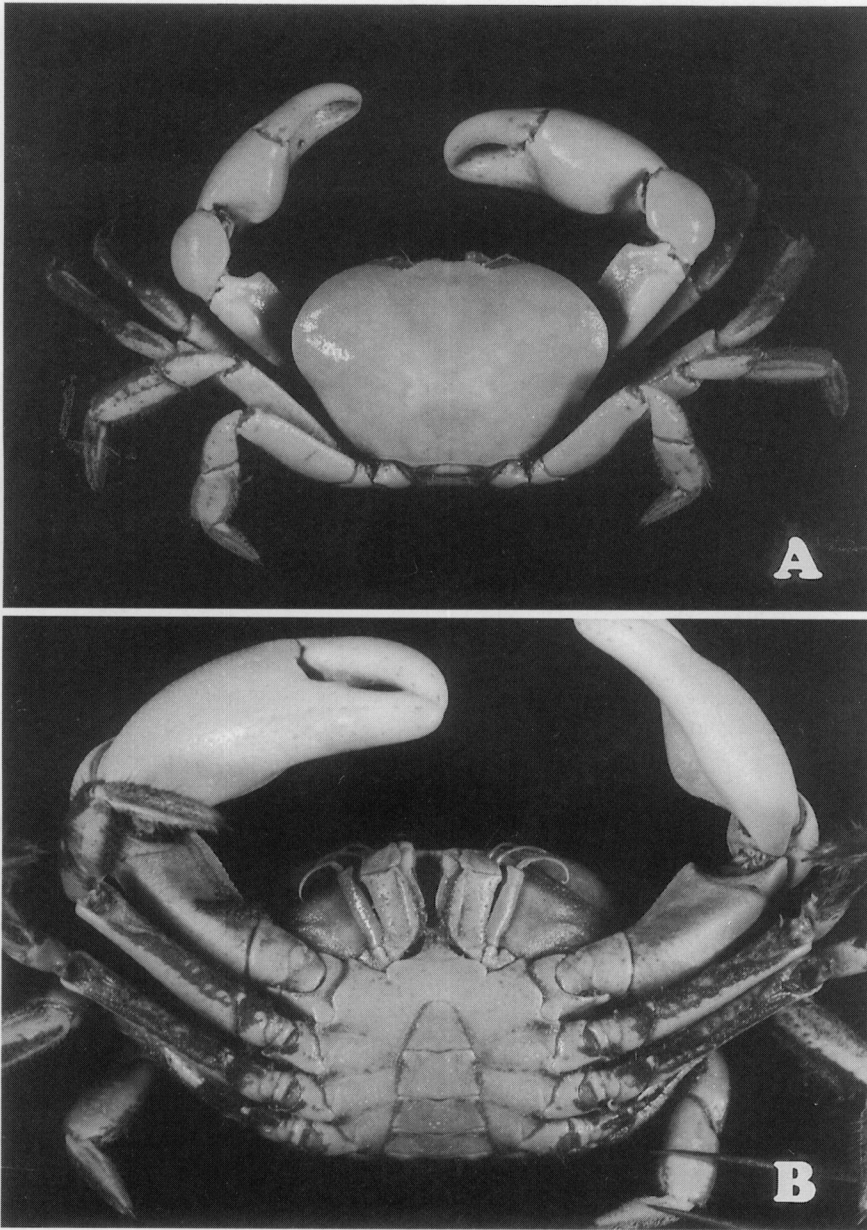


Fig. 2. *Austinograea yunohana* sp. nov., ♂ from Myojin Knoll (holotype, NSMT-Cr 13655; 41.9×26.9 mm) in dorsal (A) and ventral (B) views.