

New Record of a Xanthid Crab *Alainodaeus nuku* Davie, 1997 (Crustacea: Decapoda: Brachyura) from Japanese Waters

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Abstract A xanthid crab *Alainodaeus nuku* Davie, 1997 is recorded from Japanese waters for the first time, making a significant northerly range extension from French Polynesia and the first record of the species from the northwestern Pacific. A brief description, including the coloration in life, and a taxonomic note are given.

Key words : *Alainodaeus nuku*, Izu Islands, Ogasawara Islands, Ryukyu Archipelago

The xanthid crab genus *Alainodaeus* Davie, 1993 is represented by five species known exclusively from the South and West Pacific, i.e., *A. akiaki* Davie, 1993 from French Polynesia (type species), *A. alis* Davie, 1997 from New Caledonia and Wallis Island, *A. filipinus* Mendoza and Ng, 2008 from the central Philippines, *A. nuku* Davie, 1997 from French Polynesia, and *A. rimatara* Davie, 1993 from various southwestern Pacific localities (Davie, 1993; 1997; Mendoza and Ng, 2008).

The present brief article reports the occurrence of *Alainodaeus nuku* from Japanese waters for the first time on the basis of specimens collected from the Izu-Ogasawara Arc and the Ryukyu Archipelago. It represents the significant range extension of the species from French Polynesia to Japan. A brief taxonomic note on the species is provided.

Specimens examined are deposited in the Natural History Museum and Institute, Chiba (CBM) Measurements provided are of the carapace length (cl) by the carapace width (cw). The terminology for the carapace regions follows Serène (1984).

Taxonomic Account

Family Xanthidae

Genus *Alainodaeus* Davie, 1993

Alainodaeus nuku Davie, 1997

(Figs. 1 – 3)

Alainodaeus nuku Davie, 1997: 350, fig. 5; Ng *et al.*, 2008: 198 (list); Poupin, 2010: 39 (list).

Material examined. **Izu Islands.** TRV “Shin'yo-maru”, 1996 research cruise, stn 7, Takase Bank, 34°26.80'N, 139°11.17'E, 87 – 93 m, dredge, coll. T. Komai, 1 male (7.2 × 10.1 mm), CBM-ZC 4640. Akino-hama, Izu-ohshima Island, 35 m, 1 May 2011, SCUBA diving, coll. H. Arima, 1 male (4.7 × 6.6 mm), CBM-ZC 10742; same locality, 35 m, 25 June 2011, 1 male (6.6 × 9.1 mm), CBM-ZC 11099; same locality, 30 m, 9 April 2012, SCUBA diving, coll. H. Arima, 1 male (7.9 × 11.1 mm), CBM-ZC 12092; same locality, 35 m, 19 May 2012, SCUBA diving, coll. H. Arima, 1 female (5.5 × 8.0 mm), CBM-ZC 12093.

Ogasawara Islands. TRV “Shin'yo-maru”, 1997 research cruise, stn 5, off Muko-jima Islands, 27°47.59'N, 142°04.00'E, 80 – 86 m, coral sand, 15 October 1997, dredge, coll. T. Komai, 1 male (5.8 × 8.2 mm), CBM-ZC 9008.

Ryukyu Archipelago. RV “Tansei-maru”, KT04-23, stn C1a, Tokara Islands, 29°46.2'N, 129°24.1'E, 103 – 115 m, 11 October 2004, dredge, coll. M. Shimomura, 2 males (5.4 × 7.5, 7.2 × 10.0 mm), CBM-ZC 12091; KT02-3, stn E-6, N of Yakabi Island, Kerama Islands,



Fig. 1. *Alaiodaesus nuku* Davie, 1997, male (7.9 x 11.1 mm), CBM-ZC 12092, entire animal in dorsal view, showing coloration in life.

Ryukyu Islands, 26°15.34'N, 127°15.98'E, 55 - 101 m, coral rocks and sand, 19 April 2002, dredge, coll. T. Komai, 1 male (4.7 × 6.6 mm), CBM-ZC 7617. TRV "Toyoshio-maru", 2001-6 cruise, stn 9, NW of Amami-ohshima Island, 28°52.54'N, 129°33.11'E, 145 m, 28 May 2001, 1 male (4.7 × 6.6 mm), CBM-ZC 12255.

Description of Japanese specimens. Carapace (Figs. 1, 2A) about 1.4 times broader than long; division of 2M unclear or faint; 3M and 1P clearly separated by wide transverse groove; division between 1P and 2P rather distinct, latter rugose. Each frontal lobe with slightly sinuous margin in dorsal view, lateral angle marked by tiny tubercle. Upper orbital margin (Fig. 2B) with 1 or 2 notches, middle notch always present, U-shaped, lateral notch sometimes indistinct; inner angle obsolescent or marked with tiny tubercle. First anterolateral tooth (external orbital tooth) not marked; second and third anterolateral teeth blunt to acute, fourth tooth always blunt; Epistome with deep median groove or hiatus on endostomal side (Fig. 2C).

Eyestalk (Figs. 2A, 2A) with small, scattered granules on dorsal surface.

Third maxilliped (Fig. 2D) with ischium lacking row of stiff setae on mesial margin; distolateral angle of merus rounded.

Chelipeds (Figs. 1, 3B - D) with carpi each bearing 1 tubercle or spine on inner surface; outer surface of palm of major cheliped granular dorsally, becoming smooth over ventral half, inner surface almost smooth, devoid of distinct spines or tubercles forming longitudinal row on midline or adjacent to upper surface.

Meri of ambulatory legs (second to fifth pereopods) (Fig. 3E, F) granulose on extensor (upper) margins; carpi each with 1 or 2 very low, lamellar convexities on extensor margin at least in second to fourth pereopods; propodi occasionally with few faint convexities on upper (extensor) margins. Ischium of fifth pereopod unarmed on extensor margin.

Thoracic sternites 3 and 4 separated by shallow

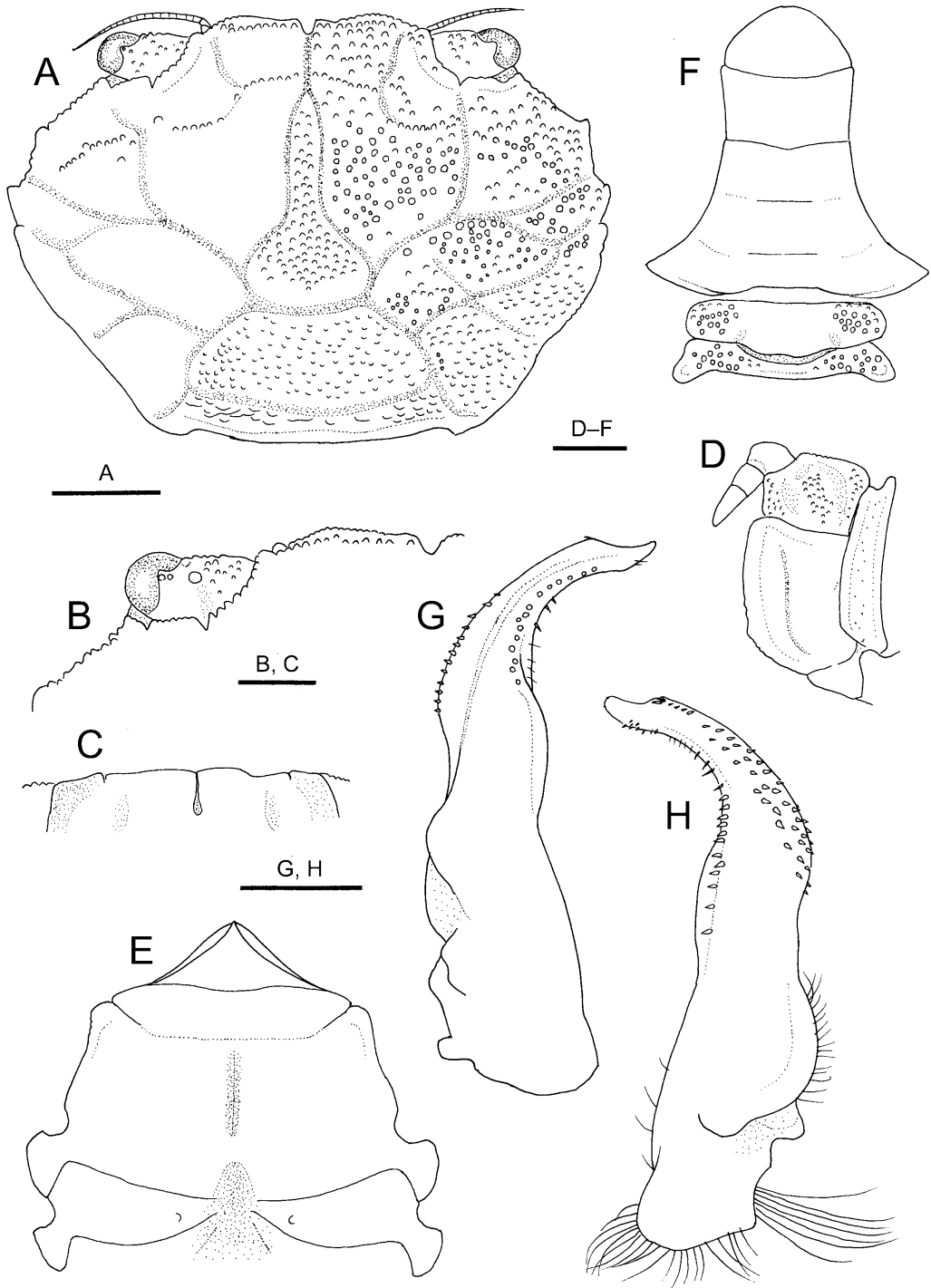


Fig. 2. *Alainodaeus niku* Davie, 1997, male (7.9 x 11.1 mm), CBM-ZC 12092. A, carapace, eyes and antennae, dorsal view (granules on left side omitted); B, anterior part of carapace and eye, left side, dorsal view (surface granules omitted); C, endostomal side of epistome; D, third maxilliped, outer view (setae on distal segments omitted); E, thoracic sternites 1 - 4, ventral view (surface granules omitted); F, abdomen and telson, external view; G, left first gonopod, ventral view (setae omitted); H, same, dorsal view. Scale bars: 2 mm for A; 1 mm for B - F; 0.5 mm for G, H.

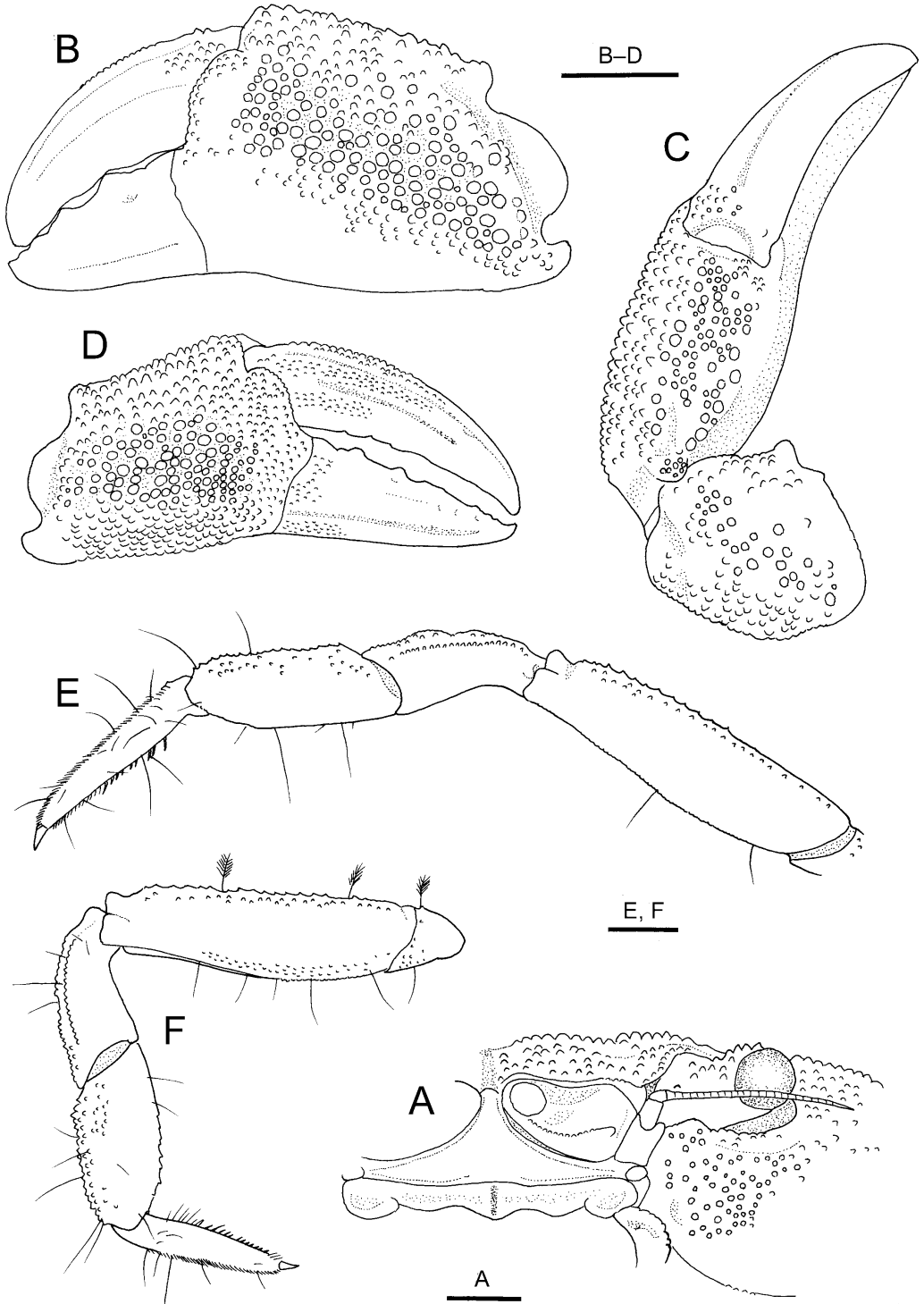


Fig. 3. *Alainodaeus nuku* Davie, 1997, male (7.9 x 11.1 mm), CBM-ZC 12092. A, anterior part of carapace and left cephalic appendages, anterior view (distal segments of antennule omitted); B, major left chela, outer view; C, chela and carpus of major left cheliped, dorsal view; D, minor right chela, outer view; E, left fourth pereopod (third ambulatory leg), outer (posterior) view; F, left fifth pereopod (fourth ambulatory leg), outer (posterior) view. Scale bars: 1 mm.

transverse groove (suture distinct only lateral parts) (Fig. 2E); sternite 4 elongate, with shallow median longitudinal groove.

Male abdomen (Fig. 2F) with lateral angles of somite 3 strongly produced laterally, acuminate; vestigial sutures between somites 3/4 and somites 4/5 seen as shallow grooves. Lateral margins of fused somites 3 – 5 concave. Somite 6 slightly broadened distally. Telson subsemicircular, 1.8 – 1.9 times wider than long.

Male first gonopod (Fig. 2G, H) relatively slender, curving laterally in distal one-third, gradually tapering, terminating in slender, somewhat spatulate terminal process; terminal process slightly recurved, rounded distally, bearing microscopic spinules on lateral side; lateral margin of main shaft with low, broadly rounded crest in medial part and rows of conical spinules dorsal to crest extending to midlength; mesial surface with numerous conical spinules in distal half, arranged in irregular longitudinal rows, in distal half, ventromesial margin with low, broadly rounded crest just proximal to midlength; dorsomesial margin with shallow concavity at about midlength, proximal convexity formed by low crest.

Coloration in life. Carapace generally orange, with scattered darker granules. Cornea brown. Chelipeds generally orange, inner surfaces whitish; fingers dark brown. Ambulatory legs obscurely banded with orange and white. See Fig. 6.

Distribution. Previously known from Marquesus and Austral Islands in French Polynesia, 100 – 400 m. The present material greatly extends the known geographical range of the species to Japan and the bathymetric range to 30 m. The apparent disjunctive distribution might only reflect that the taxonomic inventory in the Northwestern Pacific is still inadequate.

Remarks. The present specimens from Japanese waters agree generally with the original description of *Alainodaeus nuku* by Davie (1997) except for the presence of a shallow groove between thoracic sternites 3 and 4 and the presence of spinules on the lateral surface of the male first gonopod, extending from the terminal process to the midlength of the main part. At my request, Dr. J. C. Mendoza kindly informed me that there is actually a shallow groove between thoracic sternites 3/4 in the type specimens of *A. nuku*. The absence of lateral spinules of the male first gonopod in the original figure (Davie, 1997: Fig. 5i) is probably simply due to omission. The general shape of the male first gonopod of the Japanese specimens is identical with the type figure.

In the present series, variation is seen in the armature of the major chela. In the largest male specimen (CBM-ZC 12092, 7.9 × 11.1 mm), the proximal peeling tooth on the dactylus of the major chela is wanting (Fig. 8D), whereas in the other specimens, there is a well-developed proximal tooth on the major chela dactylus.

As Mendoza and Ng (2008) argued, *Alainodaeus nuku* is morphologically similar to *A. filipinus* and *A. rimatara*, but the absence of a row of spines on the inner surface of the palm adjacent to the superior margin immediately distinguishes *A. nuku* from the latter two congeners (Davie, 1997; Mendoza and Ng, 2008). Furthermore, the structure of the first gonopod is different among the three species. In particular, *A. nuku* is characteristic in having a shallow concavity in the proximal half of the mesial margin. In *A. filipinus* and *A. rimatara*, there is no such a concavity on the mesial margin of the first gonopod.

Alainodaeus nuku has been known only from the South Pacific prior to this study. The present specimens were collected from hard bottoms, where samplings are not easy, by means of dredging and SCUBA diving. The present finding suggests that the inventory of the marine fauna in the northwestern Pacific is far from complete, particularly in hard bottoms. There is no doubt that many species still await discovery in the area.

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日本初記録のダイダイオウギガニ (新称)
(甲殻亜門：十脚目：短尾下目：オウギガニ科)

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伊豆諸島, 小笠原諸島, 南西諸島から採集された標本に基づき, オウギガニ科 *Alainodaeus* 属 (新称: ダイダイオウギガニ属) の一種 *Alainodaeus nuku* Davie, 1997 (新称: ダイダイオウギガニ) を報告する. 本種は, 南太平洋のフランス領ポリネシア海域から知られていたが, 日本を含む西部北太平洋からの報告はなく, さらに *Alainodaeus* 属の日本からの初めての記録となる. 本研究で検討された標本は, 島嶼域周辺の岩礁域でのドレッジ調査や, スキューバダイビングで採集されたものであり, 調査が行き届かない海域・環境にはいまだに多くの未記録種が存在することが示唆される. なお, 和名は, 橙色の体色にちなんだ.

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