

***Amamiku*, a new genus for the true freshwater crab, *Candidiopotamon amamense* Minei, 1973 (Decapoda: Brachyura: Potamidae), from the Central Ryukyu Islands, Japan**

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ABSTRACT

Amamiku, a new genus, is established for *Candidiopotamon amamense* Minei, 1973. *Amamiku* is morphologically most closely related to *Candidiopotamon* Bott, 1967, but they can be differentiated by their male first pleopods. A key to the genera of the Japanese true freshwater crabs is also provided.

Key words: *Amamiku*, new genus, Potamidae, freshwater crabs, Ryukyu Islands, taxonomy

INTRODUCTION

Minei (1973) laid the foundations of the systematics of true freshwater crabs of the Ryukyu Islands. He described three species of *Candidiopotamon* Bott, 1967 from the Central Ryukyu Islands, *C. amamense* from Tokuno-Shima and Amami-Ohshima islands, *C. okinawense* from Okinawa Island, and *C. kumejimense* from Kume Island. Sakai (1976), however, mentioned that the male first gonopod of *C. amamense* apparently differed from that of *C. okinawense*. The present study reassesses the systematic position of *C. amamense*.

MATERIALS AND METHODS

The following abbreviations are used in the present study: CL, carapace length; CW, carapace width; G1, gonopod 1; G2, gonopod 2. The terminology follows that of Ng (1988) and Dai (1999). Measurements were conducted using a digital slide caliper (Mitsutoyo CD-20C) to nearest 0.1 mm.

Specimens are deposited in the Natural History Museum and Institute, Chiba, Japan (CBM-ZC); National Science Museum, Tokyo, Japan (NSMT); National Museum of Natural Science, Taichung, Taiwan (NMNS); Ryukyu University Museum, Fujukan, Okinawa, Japan (RUMF); Zoological Laboratory, Kyushu University, Fukuoka Japan (ZLKU) (ZLKU specimens have been transferred to the Kitakyushu Museum of Natural History and Human History, Fukuoka, Japan); and the Zoological Reference Collection, Raffles Museum, National University of Singapore, Singapore (ZRC). All materials examined are listed in appendix.

TAXONOMY

Family Potamidae Ortman, 1896

Amamiku, new genus

Candidipotamon— Sakai 1976: 562 (English text), 347 (Japanese text) (part); Yoshigou 1999: 23 (part).

Type species. *Candidipotamon amamense* Minei, 1973, by present designation.

Etymology. The generic name is derived from the name of the goddess “Amamiku”, who is credited with creating the Okinawa and Amami groups in Ryukyuan myth. Gender feminine.

Diagnosis. Carapace quadrate, dorsal surface flat, rough, postorbital crista interrupted to epibranchial tooth. Antenna reaching about proximal half of antennal basis when folded backward. Chelae almost symmetrical both males, females. G1 slender, simple, distal end beyond sternal knob in length at natural position; inner margin of terminal segment relatively long, outer margin simply curved outward, distal end with no accessory structure; outer margin of subterminal segment slightly concaved, distal inner margin angulated; synovial membrane elongate, lying distal part of dorsal side of subterminal segment. G2 slender, simple, flagellum short, distal end of flagellum reaching proximal inner margin of terminal segment of G1 at natural position, total length of G2 subequal to total length of G1.

Remarks. *Amamiku*, new genus, is closest to *Candidipotamon* Bott, 1967 by the appearance of the carapace (Fig. 1), but *Amamiku* can be distinguished from *Candidipot-*

amon by the shapes of their G1 (Fig. 2A–C). The distinguishing characters of the G1 are the shape of the distal end of the terminal segment (simple, with no accessory structure in *Amamiku* in contrast to bottle-necked in *Candidiopotamon*), the shape of the outer margin of the terminal segment (simply curved outward in *Amamiku* in contrast to inroading into the ventral surface in *Candidiopotamon*), the length of the inner margin of the terminal segment (long vs. short), and the shape of the outer side of the distal end of the subterminal segment (slightly rounded inward vs. distinctly rounded inward) (this study; Bott 1967; 1970; Dai 1999). Indeed, Bott (1967, 1970) designated the shape of the distal end of the G1 as one of the diagnostic characters of *Candidiopotamon*, and the difference from *Amamiku* in this character is distinct.

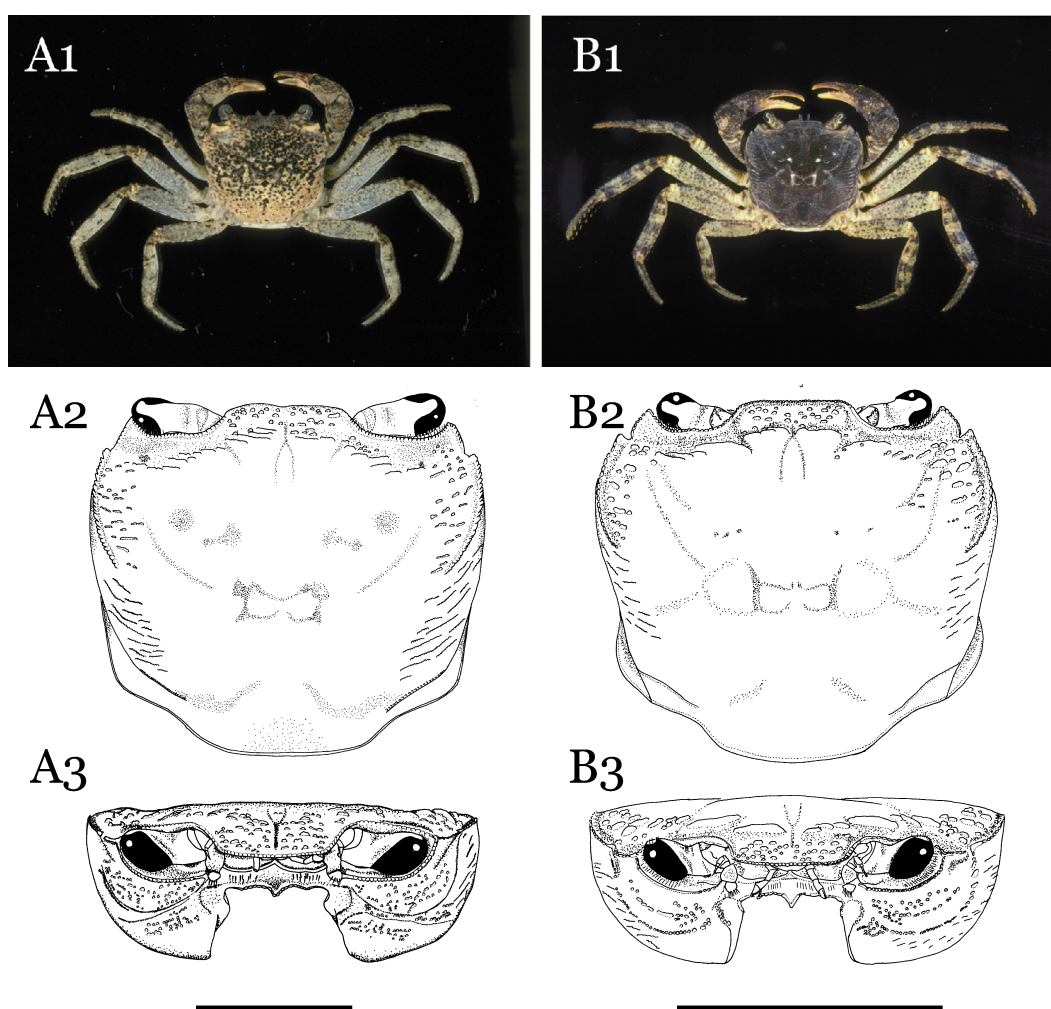


FIGURE 1. *Amamiku amamensis* (Minei, 1973) and *Candidiopotamon okinawense* Minei, 1973. A, *Amamiku amamensis* (Minei, 1973); B, *Candidiopotamon okinawense* Minei, 1973; 1, photograph; 2, dorsal view; 3, frontal view. A1, RUMF-ZC-99, male, CL 15.2 mm; A2, 3, ZLKUm. 1086, holotype, male, CL 21.9 mm; B1, RUMF-ZC-154, male, CL 30.6 mm; B2, 3, ZLKU m. 1104, holotype, male, CL 36.2 mm. Scales: 10 mm.

G1 of *Amamiku* is similar to that of *Ryukyum* Ng and Shokita, 1995, but the G1 of *Ryukyum* differs in having a bulb-like structure on the ventral side of the terminal segment, shorter inner margin of the terminal segment, and the smooth distal inner portion of the subterminal segment (this study; Ng and Shokita 1995).

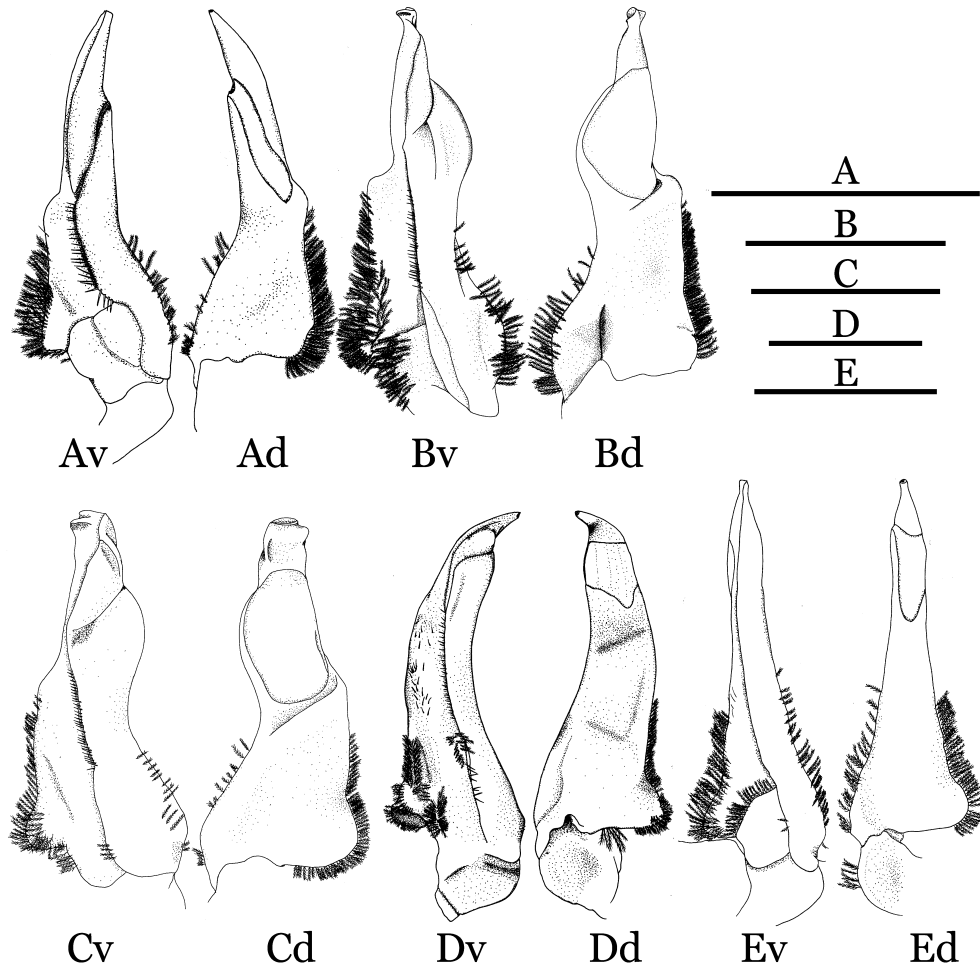


FIGURE 2. G1 of *Amamiku amamensis* (Minei, 1973) and four species of three East Asian genera. A, *Amamiku amamensis* (Minei, 1973) (ZLKU m. 1086, holotype, CL 21.9 mm); B, *Candidiopotamon rathbunae* (De Man, 1914) (RUMF-ZC-86, CL 37.0 mm); C, *Candidiopotamon okinawense* Minei, 1973 (ZLKU m.1104, holotype, CL 36.2 mm); D, *Ryukyum yaeyamense* (Minei, 1973) (ZLKU 13744, holotype, CL 36.2 mm); E, *Geothelphusa obtusipes* Stimpson, 1858 (NSMT-Cr-9558, CL 17.3 mm); d, dorsal view; v, ventral view. Scales: A–D, 5mm; E, 2.5 mm.

Geothelphusa Stimpson, 1858 is also close to *Amamiku* by the simple terminal segment of the G1 and the elongated synovial membrane (Fig. 2E). *Amamiku*, however, is clearly differentiated from *Geothelphusa* by the characters of the G1, viz. relatively long

terminal segment with oblique proximal margin (relatively short terminal segment with transverse proximal margin in *Geothelphusa*), the distinct groove lying from the proximal inner to distal outer margin of the ventral side of the subterminal segment (indistinct or shallow in *Geothelphusa*), and strongly tapered in general shape (gently tapered in *Geothelphusa*). *Geothelphusa* can be also differentiated from *Amamiku* by the generally indistinct epibranchial tooth of the carapace and indistinct postorbital crista (Shy, Ng & Yu 1994: 783).

Key to the genera of the Japanese true freshwater crabs

- 1 Epibranchial tooth of carapace faint *Geothelphusa* Stimpson, 1858
- Epibranchial tooth of carapace distinct 2
- 2 Carapace dorsally flat 3
- Carapace dorsally swollen 4
- 3 Terminal segment of G1 bottle-necked *Candidiopotamon* Bott, 1967
- Terminal segment of G1 simple, cultrate *Amamiku*, new genus
- 4 Inner margin of terminal segment of G1 simple *Ryukyum* Ng & Shokita, 1995
- Inner margin of terminal segment of G1 enlarged *Potamon globosum* Parisi, 1916

The generic placement of *Potamon globosum* remains unclear (see Ng & Dudgeon 1992). Rathbun (1905) and Balss (1914) recorded *Somanniathelphusa germaini* (Rathbun, 1902) from “Japon” as *Parathelphusa germaini* and *Oziothelphusa bouvieri* (Rathbun, 1904) from Nagasaki, Kyushu, Japan, respectively. Because the type localities of *Somanniathelphusa germaini* and *Oziothelphusa bouvieri* are too far from Japan (southern Vietnam and southern India, respectively), the distribution of these two species in Japan is doubtful. In the present key, these two species are excluded.

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Appendix

Material examined.

ZOOTAXA

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Amamiku amamensis (Minei, 1973)

Holotype: 1 male, CL 21.9 mm, ZLKU m. 1086, Ishikiridome, Akirigami River, Tokuno-Shima Island, Central Ryukyu Islands, Japan, coll. Hisakatsu Minei, 9 Oct. 1968.

Paratype: 1 male, CL 13.6 mm, ZLKU 9672, Youmisaki, Kasari Town, Amami-Ohshima Island, Central Ryukyu Islands, Japan, coll. Kazuo Koba, 20 Jul. 1955.

Others. Tokuno-Shima Island, Central Ryukyu Islands, Japan: 1 female, CL 15.4 mm, ZLKU m. 1067, Bane, Shikaura River, coll. Hisakatsu Minei, 26 Mar. 1970; 1 male, 2 females, CL 17.6–23.1, ZLKU m. 1070, Kedokina, coll. Hisakatsu Minei, 28 Mar. 1970; 1 male, CL 15.8 mm, ZLKU m. 1074, Tete, coll. Hisakatsu Minei, 29 Mar. 1970; 1 female, CL 15.8 mm, ZLKU m. 1082, Manatsu River, coll. Hisakatsu Minei, 14 Oct. 1968; 2 males, 3 females, CL 17.6–24.9 mm, ZLKU m. 1086, data same as holotype; 5 males, CL 19.1–25.8 mm, RUMF-ZC-90, Akirikami River, coll. Ryoko Segawa and Masashi Daumae, 22 Nov. 1997; 3 males, 2 females, CL 9.2–21.6 mm, RUMF-ZC-91, Kametoku River, coll. Ryoko Segawa, 5 Aug. 1999; 5 males, 1 female, CL 9.9–21.2 mm, RUMF-ZC-92, Akirikami River, coll. Shigemitsu Shokita, 18 Aug. 1983; 1 male, CL 14.9 mm, NSMT-Cr.-13620, Nango River, coll. M. Tomokuni, 19 Aug. 1958.

Amami-Ohshima Island, Central Ryukyu Islands, Japan: 2 males 2 females, CL 7.9–15.0 mm, ZLKU m. 1005, Asato River, coll. Masatsune Takeda, 9 Aug. 1966; 7 males, 3 females, CL 7.6–17.5 mm, ZLKU m. 1031, Ohmi River, coll. Hisakatsu Minei, 4 Oct. 1968; 9 males, 6 females, CL 7.9–18.6 mm, ZLKU m. 1032, Uragami River, coll. Hisakatsu Minei, 15 Oct. 1968; 7 males 3 females, CL 8.3–18.3 mm, ZLKU m. 1033, Manatsu River, coll. Hisakatsu Minei, 1 Oct. 1968; 8 males 1 female, CL 11.4–17.0 mm, ZLKU m. 1035, Kawauchi River, Yamato-Sumiyou Village, coll. Hisakatsu Minei, 13 Oct. 1968; 1 female, CL 13.2 mm, ZLKU 9673, Youmisaki, Kasari Town, coll. Kazuo Koba, 20 Jul. 1955; 5 males, 7 females, CL 9.0–20.3 mm, ZLKU C20006 (=m.1034), Manatsu River, coll. Hisakatsu Minei, 14 Oct. 1968; 4 males, 3 females, CL 12.6–19.5 mm, RUMF-ZC-93, Ariya River, coll. Ryoko Segawa, 3–4, Aug. 1999; 3 males, 1 female, CL 9.2–15.6 mm, RUMF-ZC-94, Yani River, coll. Shigemitsu Shokita, Takashi Nagai and Yoshihisa Fujita, 18 Aug. 1999; 1 female, CL 13.1 mm, RUMF-ZC-95, Akina River, coll. Shigemitsu Shokita, Takashi Nagai and Yoshihisa Fujita, 19 Aug. 1999; 1 male, 1 female, CL 16.5, 12.5 mm, RUMF-ZC-96, coll. Shigemitsu Shokita, Takashi Nagai and Yoshihisa Fujita, 20 Aug. 1999; 1 female, CL 10.1 mm, RUMF-ZC-97, Uragami River, coll. Ryoko Segawa, 4 Aug. 1999; 1 female, CL 21.2 mm, RUMF-ZC-98, coll. Shigemitsu Shokita, 23 Nov. 1984; 2 males, CL 11.4, 15.2 mm, RUMF-ZC-99, near Nazemata Bridge, Nakagachi River, coll. Tohru Naruse and Hsi-Te Shih, 13 Apr. 2002; 1 male, CL 15.1 mm, NSMT-Cr.-9527, Yakukachi River, coll. Masatsune Takeda, 17 Jul. 1988; 1 male, CL 14.6 mm, NSMT-Cr.-9540, Sumiyo River, coll. Masatsune Takeda, 17 Jul. 1988; 6 males, 3 females, CL 12.2–19.0 mm, NSMT-Cr.-9543, Kawauchi River, Uken Village, coll. Masatsune Takeda, 18 Jul. 1988; 1 female, CL 17.6 mm, NSMT-Cr.-10315, Kinsakubaru, coll. Masatsune Takeda, 15 Dec. 1988; 1 female, CL 16.3 mm, NSMT-Cr.-13619, Kinsakubaru, coll. Masatsune Takeda, 3 Nov. 1984; 4 males, 3 females, CL 9.9–19.4 mm, CBM-ZC 6844, Kawauchi River, Uken Village, coll. Shigemitsu Shokita, Takashi Nagai and Yoshihisa Fujita, 20 Aug. 1999.

Candidiopotamon rathbunae (De Man, 1914)

1 male, CL 32.4 mm, NMNS 3998-015, Hsinshan, Shuili, Nantou County, Taiwan, coll. Hung-Chang Liu, 7 Aug. 1991; 1 male, CL 37.0 mm, RUMF-ZC-86, Kuanyin Waterfall, Chiayi County, Taiwan, coll. Jhy-Yun Shy, 6 Dec. 1990.

Candidiopotamon okinawense Minei, 1973

1 male, CL 36.2 mm, ZLKU m.1104 (holotype), Fun River, Okinawa Island, Central Ryukyu Islands, Japan, coll. T. Tomori, R. Kochi, and H. Minei, 2 July 1972; 1 male, CL 30.6 mm, RUMF-ZC-154, Hiji River, Okinawa Island, Central Ryukyu Islands, Japan, coll. Tohru Naruse & Atsuko Yonamine, 17 Jan. 2004.

Ryukyum yaeyamense (Minei, 1973)

1 male, CL 36.2 mm, ZLKU 13744 (holotype), Mt. Omoto-dake, Ishigaki Island, Southern Ryukyu Islands, Japan, coll. T. Tamaki, 5 Sept. 1969.

Geothelphusa obtusipes Stimpson, 1858

1 male, CL 17.3 mm, NSMT-Cr.-9558, Kanyu River, Amami-Oshima Island, Central Ryukyu Islands, Japan, coll. Masatsune Takeda, Jul. 1988.