

***Caridina clinata*, a new species of freshwater shrimp
(Crustacea: Decapoda: Atyidae) from northern Vietnam**

Yixiong Cai, Nguyen Xuan Quynh, and Peter K. L. Ng

(YC, PKLN) Department of Biological Sciences, National University of Singapore,
Lower Kent Ridge Road, Singapore 119260, Singapore; (NXQ)
Department of Invertebrate Zoology,
National University of Hanoi, 90, Nguyen Trai Road, Thanh Xuan, Hanoi, Vietnam

Abstract.—*Caridina clinata*, a new species of atyid shrimp, is described from northern Vietnam. The new species is characterised by a short, sloping rostrum which reaches to or slightly exceeds the distal margin of the basal antennular segment, the shape of the sexual appendages, and its large egg size.

Eight species and subspecies of freshwater shrimps of the family Atyidae have been previously reported from Vietnam: *Caridina vietnamensis* Dang, 1967, *C. subnilotica* Dang, 1975, *C. acuticaudata* Dang, 1975, *C. flavilineata* Dang, 1975, *C. serrata* Stimpson, 1860, *C. serrata cucphuongensis* Dang, 1980, *C. tonkinensis* Bouvier, 1919, and *C. cantonensis* Yu, 1938 (Dang 1967, 1975, 1980). Cai (1996) subsequently synonymized *Caridina vietnamensis* with *Neocaridina palmata palmata* (Shen, 1948). Recently, a revision of the *Caridina serrata* species group (Cai & Ng 1999) indicated that the specimens illustrated as "*C. serrata serrata*" by Dang (1980) probably represent an undescribed species and *C. serrata cucphuongensis* should be elevated to specific rank. *Caridina tonkinensis* and *C. cantonensis* have been shown to have a wide Chinese, Indo-Chinese and/or Southeast Asian distribution (Johnson 1961; Ng & Choy 1990a, 1990b; Cai & Ng, 1999). As a result of those studies, only four species: *C. subnilotica*, *C. acuticaudata*, *C. flavilineata* and *C. cucphuongensis* are known to be endemic to Vietnam.

Recently, we had an opportunity to examine several lots of specimens of *Caridina* collected from northern Vietnam. These specimens proved to belong to an unde-

scribed species. Specimens are deposited in the Zoological Reference Collection of the Raffles Museum, National University of Singapore (ZRC); Zoological Museum of Hanoi University, Vietnam (ZMHU); Institute of Zoology, Academia Sinica, Beijing, China (IZAS); National Museum of Natural History, Leiden, The Netherlands (RMNH); National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA (USNM); and Muséum National d'Histoire Naturelle, Paris, France (MNHN). The abbreviation cl is used for carapace length, measured from the post-orbital margin to the posterior margin of the carapace.

Caridina clinata, new species
(Figs. 1, 2)

Material examined.—Holotype: male, cl 3.3 mm (ZRC 1998.550), ditch, Cuc Phuong National Park, Ninh Binh Province, northern Vietnam, 16 Sep 1997. Paratypes: 3 males, cl 3.0–3.4 mm, 7 females, cl 3.7–4.2 mm (ZRC 1998.551–560), 2 males, cl 3.0–3.2 mm, 2 females, cl 4.0–4.1 mm (IZAS), 1 male, cl 3.4 mm, 2 females, cl 3.4–3.6 mm (ZMHU), 1 male, cl 2.8 mm, 2 females, cl 3.2–4.0 mm (RMNH), 1 male, cl 2.8 mm, 2 females, cl 3.8–3.9 mm (USNM), same data as holotype. None-

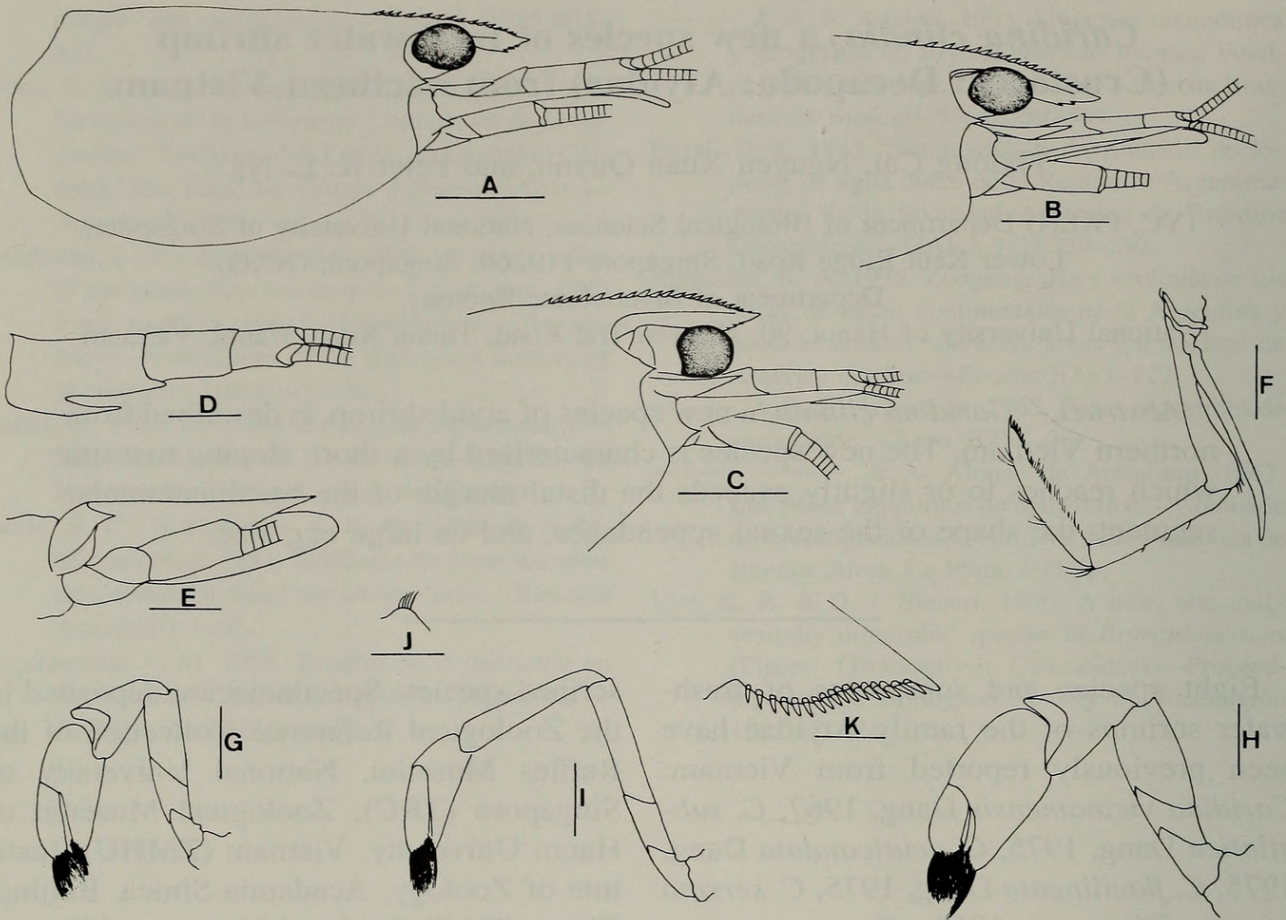


Fig. 1. *Caridina clinata*, new species, paratypes. A, cephalothorax; lateral view, male, cl 3.2 mm (ZRC 1998.551); B, anterior portion of cephalothorax, lateral view, female, cl 4.0 mm (ZRC 1998.552); C, anterior portion of cephalothorax, lateral view, female, cl 4.2 mm (ZRC 1998.553); D, right antennular peduncle; E, right scaphocerite; F, right third maxilliped; G, right first pereiopod of male; H, right first pereiopod of female; I, right second pereiopod; J, preanal carina, lateral view; K, uropodal diaeresis. Scales: A, B, C = 1 mm; D, E, F, G, H, I, J = 0.5 mm. K = 0.1 mm.

types: 1 ovigerous female, cl 4.2 mm (ZRC), approximately 8.7 km from Nho Quan on Phu Ly to Cucphuong Road, Ba Dien district, Ninh Binh Province, northern Vietnam, coll. H. H. Ng & D. C. J. Yeo (from fisherman), 16 Sep 1997.

Description.—Rostrum (Fig. 1A–C) short, reaching to or slightly exceeding distal margin of basal antennular segment, not reaching as far as middle of second segment, sloping ventrad anteriorly; armed dorsally with 13–21 (mode 14–16) teeth, including 3–5 (mode 4) teeth on carapace posterior to orbital margin; armed ventrally with 2–5 (mode 2–3) teeth. Suborbital angle acute, completely fused with antennal spine; pterygostomian margin rounded.

Abdomen with sixth somite 0.4 times as long as carapace, 1.5 times as long as fifth

somite, slightly shorter than telson. Telson (Fig. 2A) (not including marginal spines) slightly longer than sixth somite, tapering posteriorly, lacking posteromedian projection; 1 pair of dorso-lateral spines near distal end, 5 pairs of spiniform setae on distal margin, lateral pair subequal to or slightly shorter than intermediate pairs; preanal angle rounded, symmetrical lacking spine.

Eyes well developed. Antennular peduncle (Fig. 1D) 0.6 times length of carapace; basal segment slightly shorter than half length of peduncle; second segment distinctively longer than third. Stylocerite not reaching distal margin of basal antennular segment. Scaphocerite (Fig. 1E) ovate, reaching beyond distal end of antennular peduncle; 3.4 times as long as broad. Branchial formula as for genus. Epipods present on

first 4 pereiopods. Third maxilliped (Fig. 1F) reaching slightly beyond distal end of antennular peduncle, ending in single terminal claw; exopod reaching to fourth of penultimate segment; ultimate segment as long as penultimate.

First pereiopod (Fig. 1G, H) short, robust, reaching slightly beyond distal margin of basal antennular segment; chela about 2.3 times as long as broad in male (Fig. 1G), 2.0 times in female (Fig. 1H); fingers as long as palm in male, 0.7 times as long as palm in female; carpus 1.5 times as long as high in male, 1.2 times as long as palm in female; merus slightly shorter than palm; merus 2.3 times in female and 1.3 times in male as long as broad. Second pereiopod (Fig. 1I) long, slender, reaching end of antennular peduncle; chela about 2.5 times as long as broad, fingers about 1.6 times as long as palm; carpus slightly longer than chela, about 4.7 times as long as high. Third pereiopod (Fig. 2B) reaching slightly beyond end of antennular peduncle; dactylus (Fig. 2C) terminating in 2 spines, bearing 5 spines on posterior margin; propodus 9 times as long as broad, about 3.6 times as long as dactylus, with numerous spinules on posterior margin. Fifth pereiopod (Fig. 1D) reaching slightly beyond distal margin of second antennular segment; dactylus (Fig. 1E) ending in curved claw, with row of 45–49 closely spaced spinules; propodus slender, 10 times as long as broad, about 3.3 times as long as dactylus (including terminal claw), with numerous spinules on posterior margin.

Endopod of male first pleopod (Fig. 2F) 2.8 times as long as broad, half as long as exopod, rounded distally; with appendix interna exceeding terminal margin of endopod by 0.3 its length; endopod with long plumose setae on outer and distal margins, with short simple setae on inner margin.

Appendix masculina of male second pleopod (Fig. 2G) extending to proximal 0.6 length of endopod, with some short spinules on outer surface and some long spi-

nules on distal surface; appendix interna about 0.8 length of appendix masculina.

Uropodal diaeresis with 14–17 spinules.

Eggs large, ranging in dimensions from 0.60–0.75 to 1.10–1.15 mm.

Habitat.—This new species was found in a ditch with a sandy substratum and clear flowing water from the forest. Other decapods found in the ditch are the potamid crabs *Potamiscus cuphuongense* Dang, 1975 and *Potamiscus kimboiense* (Dang, 1975) (D. C. J. Yeo, pers. comm.). The latter species was originally placed in the genus *Ranguna* Bott, 1966, but is now regarded as a junior subjective synonym of *Potamiscus* Alcock, 1909 (Ng & Naiyanetr 1993).

Color (from a color photograph taken several hours after preservation in 10% formalin).—Body yellowish to grey and dark grey. There is one transverse black stripe which is irregularly broken at the lateral posterior margin of the carapace. Some irregular black spots are present on the ventrolateral parts of the carapace. The ventrolateral portion of the abdominal tergal pleura are mottled with black spots adjacent to the articular knobs at the posterior bases of the pleura. Black transverse stripes are present at the posteroventral ends of the first four pleura. The dorsum of the third abdominal somite has a black transverse stripe. The antenna, antennule and telson are yellowish to orange, and the pereiopods are translucent to yellowish.

Etymology.—The new species is named as 'clinata', Latin, meaning "sloping", alluding to the shape of rostrum.

Remarks.—*Caridina clinata* new species, is most similar to *C. flavilineata* from Namha, northern Vietnam, in the rostral formula and egg size. It differs from the latter, however, by the form of the rostrum which is short and sloping (vs. long and straight); the dactylus of fifth pereiopod has 45 to 49 denticulate spinules (vs. 20–30); the endopod of the male first pleopod reaching to half the length of the exopod (vs. 1/3 in *C. flavilineata*); the appendix masculina of the

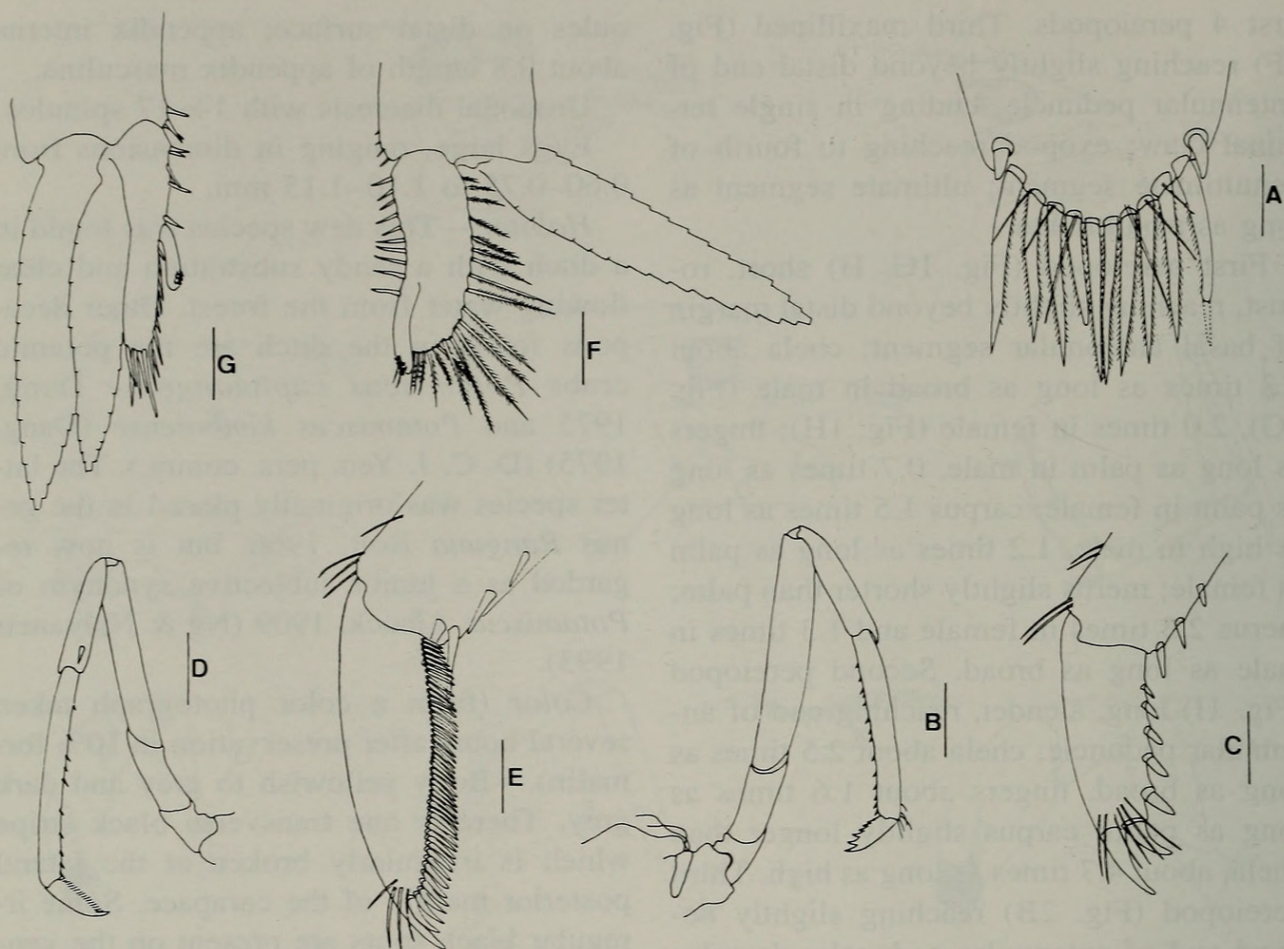


Fig. 2. *Caridina clinata*, new species, paratype, male, cl 3.2 mm (ZRC 1998.551). A, distal portion of telson; B, right third pereiopod; C, dactylus of right third pereiopod; D, right fifth pereiopod; E, dactylus of right fifth pereiopod; F, left male first pleopod; G, left male second pleopod. Scales. A, C, E, F, G = 0.2 mm, B, D = 0.5 mm.

male second pleopod reaching to $2/3$ the length of the endopod (vs. reaching to half the length); and the appendix interna of the male second pleopod is $2/5$ as long as the appendix masculina (vs. more than half the length) (cf. Dang 1975:70, fig. 5, Dang 1980:412, fig. 235). Dang (1980) had described *C. cucphuongensis* from the same area as *C. clinata*, although we did not manage to obtain fresh specimens from there. *Caridina clinata*, can easily be separated from *C. cucphuongensis* by the form of the rostrum and rostral formula [(2-5)13-21/2-5 vs. (1-3)5-9/0-2 in *C. cucphuongensis*]; the short stylocerite which does not reach the end of the basal segment of the antennular peduncle (vs. reaches beyond); and the symmetrical shape of the preanal carina (vs. asymmetrical) (cf. Dang 1980).

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