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# TWO NEW SPECIES OF ATYID SHRIMPS FROM SOUTHERN CHINA (CRUSTACEA: DECAPODA: CARIDEA)

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***ABSTRACT.*** - Two new species of atyid shrimp, *Caridina dentifrons*, from Guizhou, and *C. breviata*, from Guangdong, southern China, are described. *Caridina dentifrons* closely resembles *C. cavaleriei* Bouvier, 1919, but can be separated from the latter species by the form of the rostrum, the structure of the first pereiopod, telson and sexual appendages. *Caridina breviata* is similar to *C. serrata* Stimpson, 1860, and *C. cantonensis* Yu, 1938, but can be differentiated from those species by the structure of the rostrum, stylocerite, pereiopods, and sexual appendages.

***KEY WORDS.*** - Freshwater shrimps, Atyidae, China, *Caridina*, new species.

## INTRODUCTION

Recently, we had an opportunity to examine several lots of *Caridina* specimens collected from various localities in southern China. Among them, two new species were found. These two new taxa are described and illustrated in detail here.

Types are deposited in the Institute of Zoology, Academia Sinica, Beijing (IZAS), Beijing Natural History Museum (BNHM), Beijing, P. R. China, Muséum National d'Historie Naturelle, Paris (MNHN), and the Zoological Reference Collection, the Raffles Museum of Biodiversity Research, National University of Singapore (ZRC). The abbreviation cl is used for carapace length (measured from postorbital margin to the posterior margin of carapace). Rostral formula citation follows that by Chace and Bruce (1993).

## TAXONOMY

### FAMILY ATYIDAE
### Genus *Caridina* H. Milne Edwards, 1837

### *Caridina dentifrons*, new species
(Figs. 1 - 3)

***Materials examined.*** - Holotype: male, cl 4.6mm (IZAS), Baijin village, Huishui County, Guizhou Province, southern China, coll. 16 May 1983.

Paratypes: 1 male, cl 4.6 mm (MNHN-Na-13285), 2 males, cl 4.7 mm, 1 female cl 5.2 mm, (ZRC1997.593), 2 males, cl 4.3 mm, 1 ovigerous female, cl 5.4 mm (IZAS), same data as holotype.

***Description.*** - Rostrum long, straight or slightly curved downwards, reaching mostly to end of second segment of antennular peduncle, rarely beyond it, but never beyond end of third segment of antennular peduncle; tip slightly directed upwards, rostral formula: (7-10 + 12-15)/ 4-8. Inferior orbital angle of carapace fused with antennal spine. Pterygostomian margin broadly rounded, slightly produced forwards.

Telson ending in small median projection, 6-7 pairs of dorsal spinules, 1 pair of dorso-lateral spines near distal margin; lateral pair of distal spines longer than intermediate pairs. Pre-anal carina rounded, without spine.

Eyes well developed. Antennular peduncle slender, 0.4 times as long as carapace; stylocerite not reaching end of basal segment of antennular peduncle. Scaphocerite 3.5 times as long as wide.

Mouthparts as figured (Fig. 2). Palp of first maxilliped ending broadly triangular. Third maxilliped reaching end of first segment of antennular peduncle, ultimate segment longer than penultimate segment.

First pereiopod reaching to end of basal segment of antennular peduncle; chela 2.2 times as long as broad,

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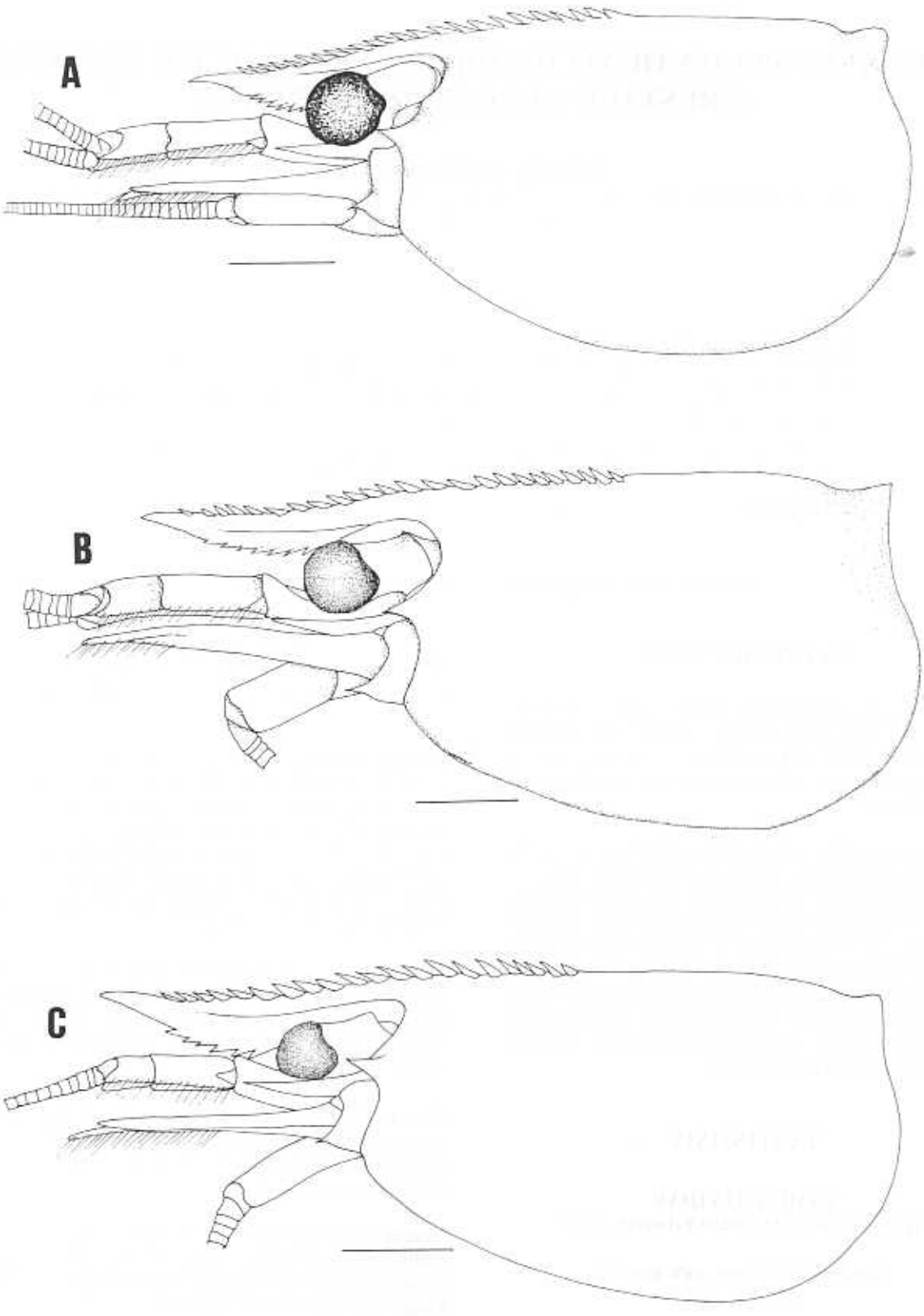


Fig.1. *Caridina dentifrons*, new species, cephalothorax. A) holotype, male, cl 4.6 mm (IZAS); B) paratype, male, cl 4.7 mm (ZRC.1997.593), ; C) paratype, female, cl 5.2mm (ZRC.1997.593). Scales: A, B, C=1 mm.

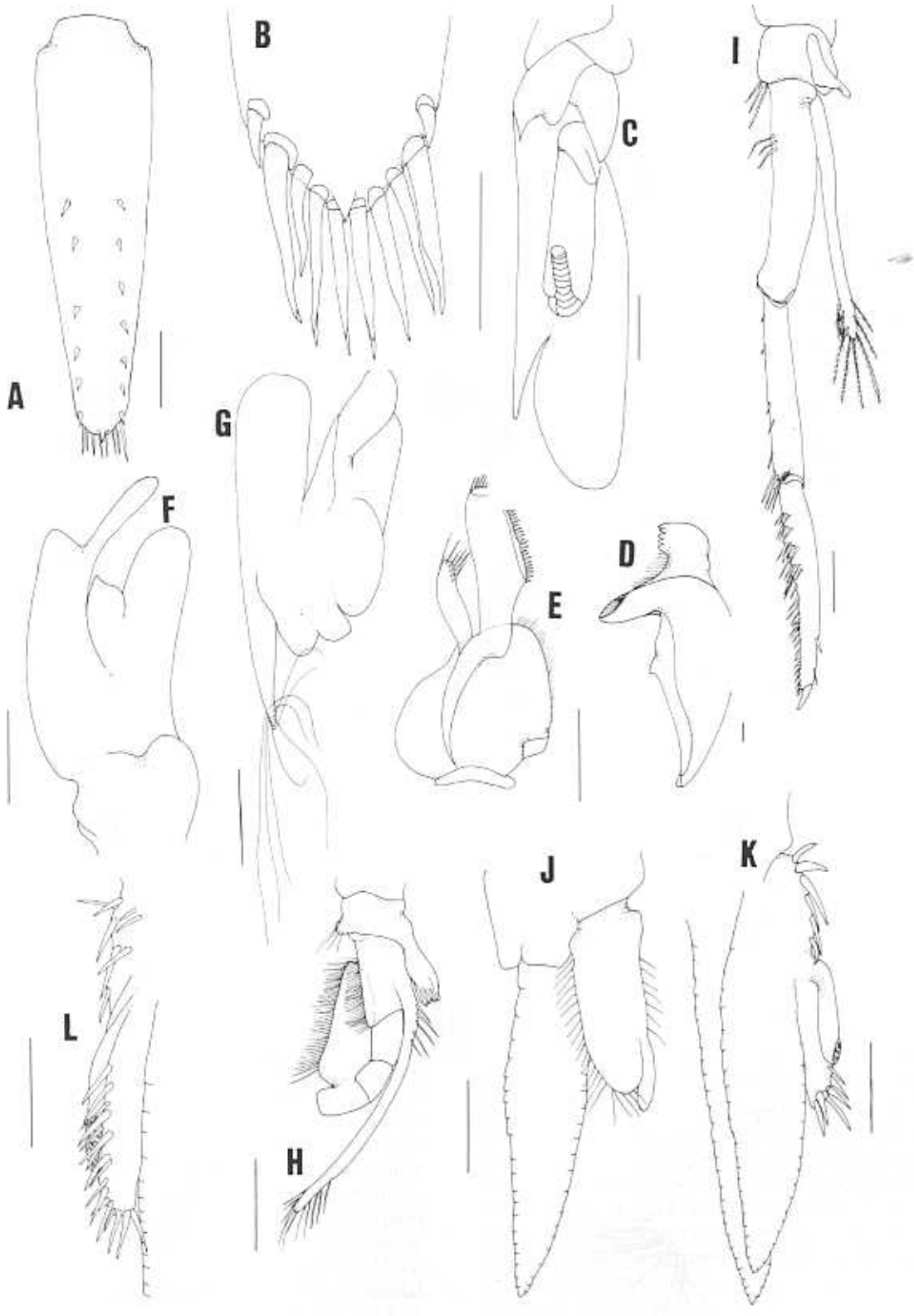


Fig. 2. *Caridina dentifrons*, new species, paratype, male, cl 4.7 mm (ZRC.1997.593). A) telson; B) distal portion of telson C) scaphognathite; D) mandible; E) maxillula; F) maxilla; G) first maxilliped; H) second maxilliped; I) third maxilliped; J) first pereiopod; K) second pereiopod L) endopod and appendix masculina of second pleopod. Scales: A, C - L=0.5 mm; B=0.5 mm.

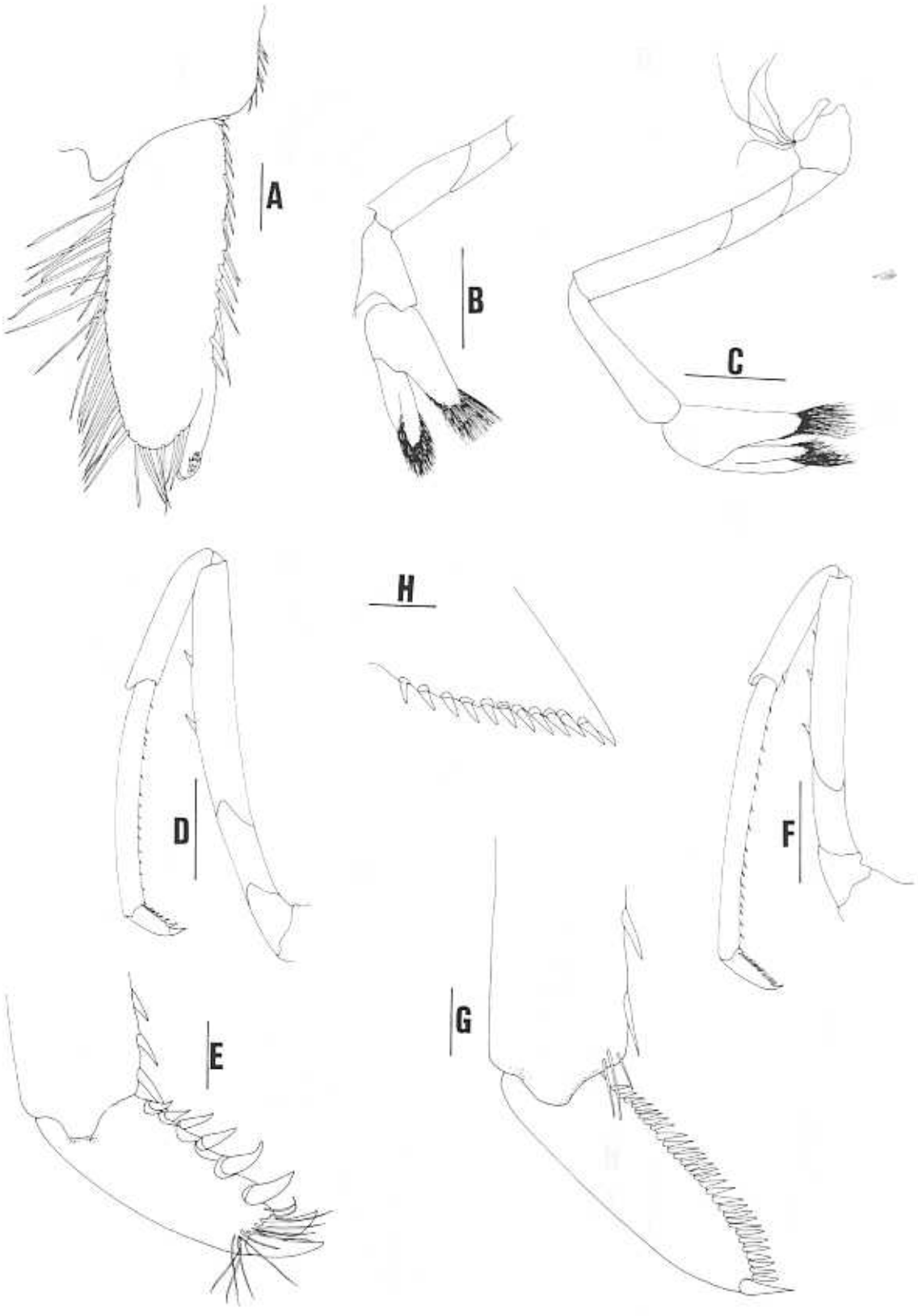


Fig. 3. *Caridina dentifrons*, new species, paratype, male, cl 4.7 mm (ZRC.1997.593). A) endopod and appendix interna of male first pleopod; B) first periopod; C) second pereiopod; D) third pereiopod E) dactylus of third periopod; F) fifth pereiopod; G) dactylus of fifth pereiopod; H) uropodal diaeresis. Scales: A, E, G, H = 0.2 mm; B, C, D, F=1 mm.

fingers longer than palm; carpus longer than palm, 1.8 times as long as high. Second pereiopod slender, reaching to end of second segment of antennular peduncle; chela 2.6 times as long as broad, fingers longer than palm; carpus 1.2 times length of chela, 4.7 times as long as high; merus as long as or slightly shorter than chela. Dactylus of third pereiopod reaching to end of scaphocerite, ending in 2 claws, with 6 accessory spines at flexor margin; propodus 8.6 times as long as broad, 5.9 times as long as dactylus (terminal spine included), 9.4 times as long as broad, numerous spines on posterior margin; merus 5.2 times as long as wide. Fourth pereiopod reaching to end of scaphocerite, similar to third pereiopod. Fifth pereiopod reaching to end of antennular peduncle; dactylus stout, 29-31 spinules on flexor margin; propodus slender, 14 times as long as broad.

Endopod of first male pleopod oval, 2.7 times as long as broad, inner margin slightly concave, outer margin straight, simple setae longer on exterior margin, longest along anterior margin. Appendix interna on distal one-quarter, extending outwards, reaching slightly beyond distal margin of endopod. Appendix masculina of male second pleopod reaching to 0.6 times endopod length, inner margin densely lined with long spinules; appendix interna at 0.2 length of appendix masculina, extending to distal 0.6 length of appendix masculina.

Uropodal diaeresis with 10-12 spinules.

Egg size 1.20-1.25 x 0.70-0.75 mm in diameter.

***Etymology.*** - The species name is a combination of the Latin *dentis* for tooth, and *frons*, forehead, alluding the numerous pre-orbital dorsal teeth on its rostrum. It is used as a noun in apposition.

***Remarks.*** - *Caridina dentifrons*, new species, is very similar to *C. cavaleriei* Bouvier, 1919, also described from Guizhou (Gan-chouen-fou, Kouy Tcheou). Comparing the new species with the holotype of *C. cavaleriei* (MNHN-Na-689), the original description (Bouvier, 1919) and the figures (Bouvier 1925), *C. dentifrons* can be easily distinguished from the latter by having more teeth on the carapace (7-10 vs. 5); by the relatively shorter rostrum which usually reaches to the end of the second segment of the antennular peduncle, rarely beyond it, but never beyond the end of antennular peduncle (vs. reaches beyond end of antennular peduncle in *C. cavaleriei* ); the short antennular peduncle (ratio against carapace 0.40 vs. 0.50 ); the fewer number of spines in the dactylus of the fifth pereiopod (29-31 vs. 50-60); the fewer number of teeth on the uropodal diaeresis (10-12 vs. 16-18); the larger egg size (1.2-1.25 x 0.70-0.75 mm vs. 1.05-1.10 x 0.88mm); and the telson ending in a median projection (vs. no such projection in *C. cavaleriei* ).

Bouvier (1919) named *Caridina cavalerii*, after P. Cavalerie (Bouvier, 1919:333). Subsequently, he (Bouvier, 1925:237) changed the name to *C. cavaleriei* without explanation. Since the original description has clearly stated the name was after P. Cavalerie, we accept the name *Caridina cavaleriei* as a correction for the original misspelling.

### *Caridina breviata*, new species

(Figs. 4-6)

***Materials examined.*** - Holotype: male, cl 3.8 mm (IZAS), Zhapu village, Yangjiang County, Guangdong Province, southern China. Leg. Yang Siliang & Sun Xiumin, coll. 9 Nov.1987.

Paratype: 1 male, cl 3.8 mm1 ovigerous female, cl 4.6 mm (IZAS); 1 male, cl 3.6 mm, 1 female, cl 4.0 mm (BNHM); 2 males, cl 3.6-3.8 mm, 1 female, cl 3.8 mm, 1 ovigerous female, cl 4.0 mm (ZRC.1998. 922-925), same data as holotype.

***Description.*** - Rostrum short, straight, never reaching beyond end of basal segment of antennular peduncle; tip directed slightly downwards, rostral formula: (0-2 + 0-8)/0, teeth large, inferior orbital angle of carapace fused with antennal spine, pterygostomian margin rounded, slightly produced forwards.

Telson ending in median projection; 4 pairs of dorsal spinules, 1 pair of dorso-lateral spines near distal end, 3-4 pairs of spines on distal margin, lateral pair longer than sub-lateral pair, subequal in length to intermediate pairs. Pre-anal carina rounded, without spine.

Eyes well developed. Antennular peduncle stout, short, 0.4 times as long as carapace; stylocerite reaching to or slightly beyond end of basal segment of antennular peduncle. Scaphocerite 2.7 times as long as broad. Mouthparts as figured (Fig. 5). Third maxilliped reaching to end of basal segment of antennular peduncle, ultimate segment as long as penultimate segment.

First pereiopod reaching to end of basal segment of antennular peduncle; chela 2.3 times as long as broad, fingers as long as palm, carpus longer than palm, 1.7 times as long as high. Second pereiopod slender, reaching beyond end of scaphocerite; chela 2.6 times as long as broad, fingers 1.9 times as long as palm, carpus 1.3 times longer than chela, 5.4 times as long as high, merus as long as chela. Third pereiopod reaching to end of scaphocerite; dactylus ending in 2 claws, 3 accessory spines at posterior margin, propodus 3.6 times as long as dactylus (terminal spine included), 9.4 times as long as broad, numerous spines on posterior margin, merus 5.2 times as long as wide. Fourth pereiopod reaching beyond basal segment of antennular peduncle, similar to third pereiopod in form. Fifth pereiopod reaching end of antennular peduncle, dactylus stout, 35-40 spinules on flexor margin, propodus slender, 13.0 times as long as broad, 5.0 times as long as dactylus (terminal spine included), strong spine present on distal end, measuring

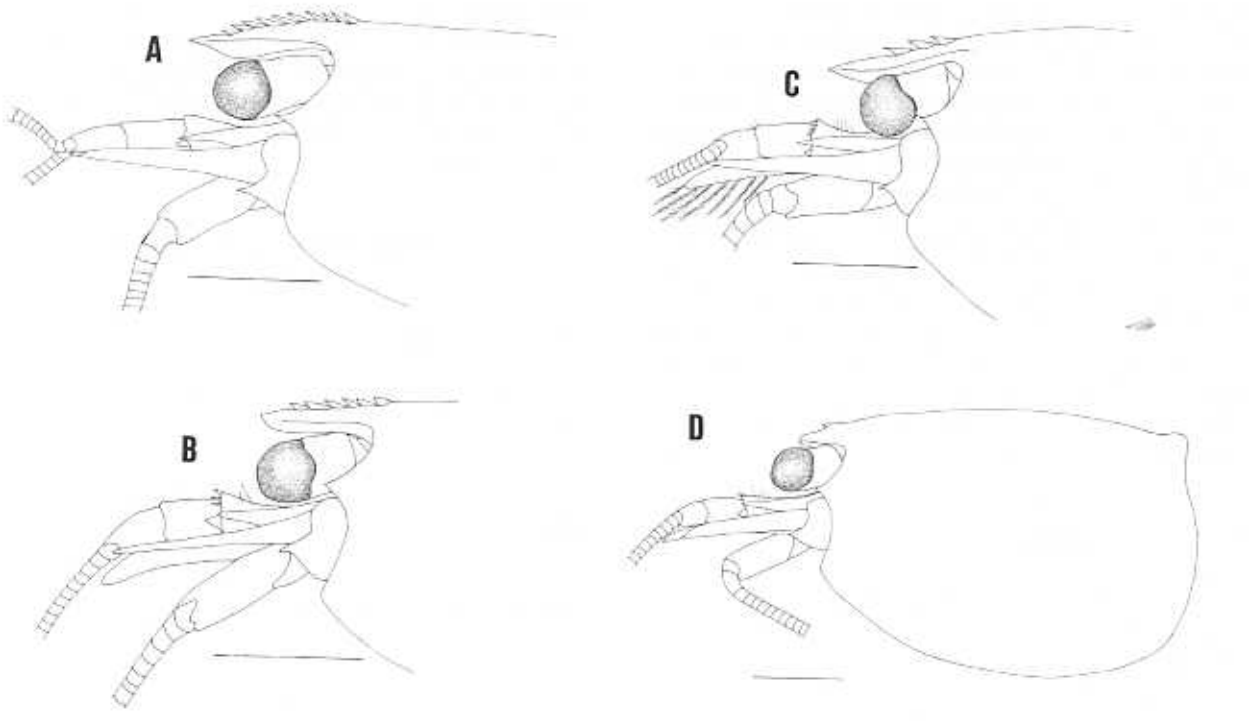


Fig. 4. *Caridina breviata*, new species, anterior region of cephalothorax. A) holotype, male, cl 3.8 mm (IZAS); B) paratype, male, cl 3.6 mm (ZRC.1998.922); C) paratype, female, cl 4.0 mm, (ZRC.1998.923); D) paratype, female, cl 4.6 mm (IZAS). Scales: A - D=1 mm.

0.3 times as long as dactylus.

Endopod of first male pleopod sub-triangular, 2.1 times as long as wide, inner margin slightly concave, outer margin slightly convex, slightly curved inwards, simple setae longer on exterior margin, longest along anterior margin. Appendix interna on ditsal one-fifth, extending outwards, reaching distinctly beyond distal margin of endopod. Appendix masculina of male second pleopod reaching to distal half endopod length, inner margin densely lined with long spines; appendix interna short, stout, extending to distal one quarter of appendix masculina.

Uropodial diaeresis with 16-20 spinules.

Eggs 0.53-0.56 x 0.80-0.95 mm in diameter.

***Etymology.*** - The specie name uses the Latin, *brevis*, short, in allusion of the short and narrow rostrum of the new species.

***Remarks.*** - *Caridina breviata*, new species, is very similar to *C. serrata* Stimpson, 1860 and *C. cantonensis* Yu, 1938 (*C. serrata* species group, fide Cai & Ng, 1999) by the presence of dorsal teeth on the carapace, endopod of male first pleopod with a distinctive appendix interna and ovigerous females having large-sized eggs. However, it lacks the characteristic long stylocerite which distinctly extends beyond the end of the basal segment of the antennular peduncle in members of the *C. serrata* species group.

There are other characters which differentiate *C. breviata* from *C. serrata* (fide Cai & Ng, 1999) viz. a) rostral formula of (0-3 + 3-7)/0 vs (0-5 + 5-12) / (0-6) in *C. serrata*; b) scaphocerite 2.7 times as long as broad (vs. 3.0 in *C. serrata*); c) chela of first pereiopod 2.3 times as long as broad (vs. 2.0 in *C. serrata*); d) carpus of first pereiopod 1.7 times as long as broad (vs. 1.3 in *C. serrata*); e) fingers of second pereiopod 1.9 times as long as palm (vs. 1.5 in *C. serrata*); f) propodus of third pereiopod 3.6 times as long as dactylus (vs. 4.0 in *C. serrata*), 9.4 times as long as broad (vs. 7.0 in *C. serrata*) and its merus 5.2 times as long as wide (vs. 4.5 times in *C. serrata*; g) the shape of the endopod of the male first pleopod (sub-triangular vs. rectangular in *C. serrata*); and j) endopod of male first pleopod 2.1 times as long as broad (vs. 2.5 times in *C. serrata*).

*Caridina breviata* can also be separated from *C. cantonensis* Yu, 1938 (fide Cai & Ng, 1999) by the following characters viz. a) the shorter rostrum (never reaches the end of the basal segment of antennular peduncle vs. distinctly beyond); b) rostral formula: (0-3 + 3-7)/0 vs. (2-7 + 6-15)/(2-6) in *C. cantonensis*; c) short

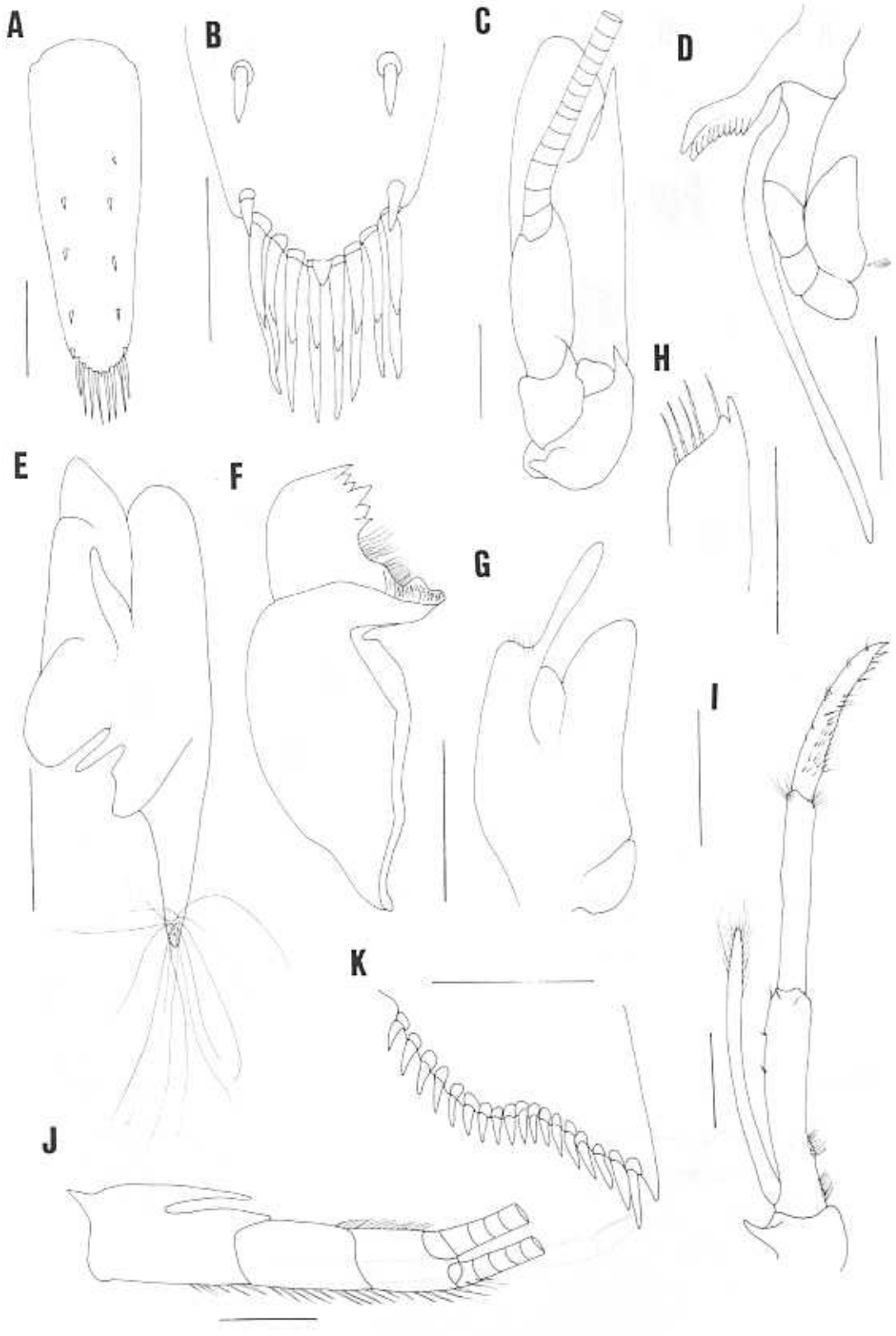


Fig. 5. *Caridina breviata*, new species (paratype, male, cl. 3.8 mm, IZAS. ; A) telson; B) distal portion of telson C) scaphognathite; D) second maxilliped; E) maxilla; F) mandible; G) first maxilliped; H) endopod tip of first maxilliped; I) third maxilliped; J) antennular peduncle; K) uropodal diaeresis. Scales: A, C, D, E, G, I, J=1 mm; B=0.5 mm.

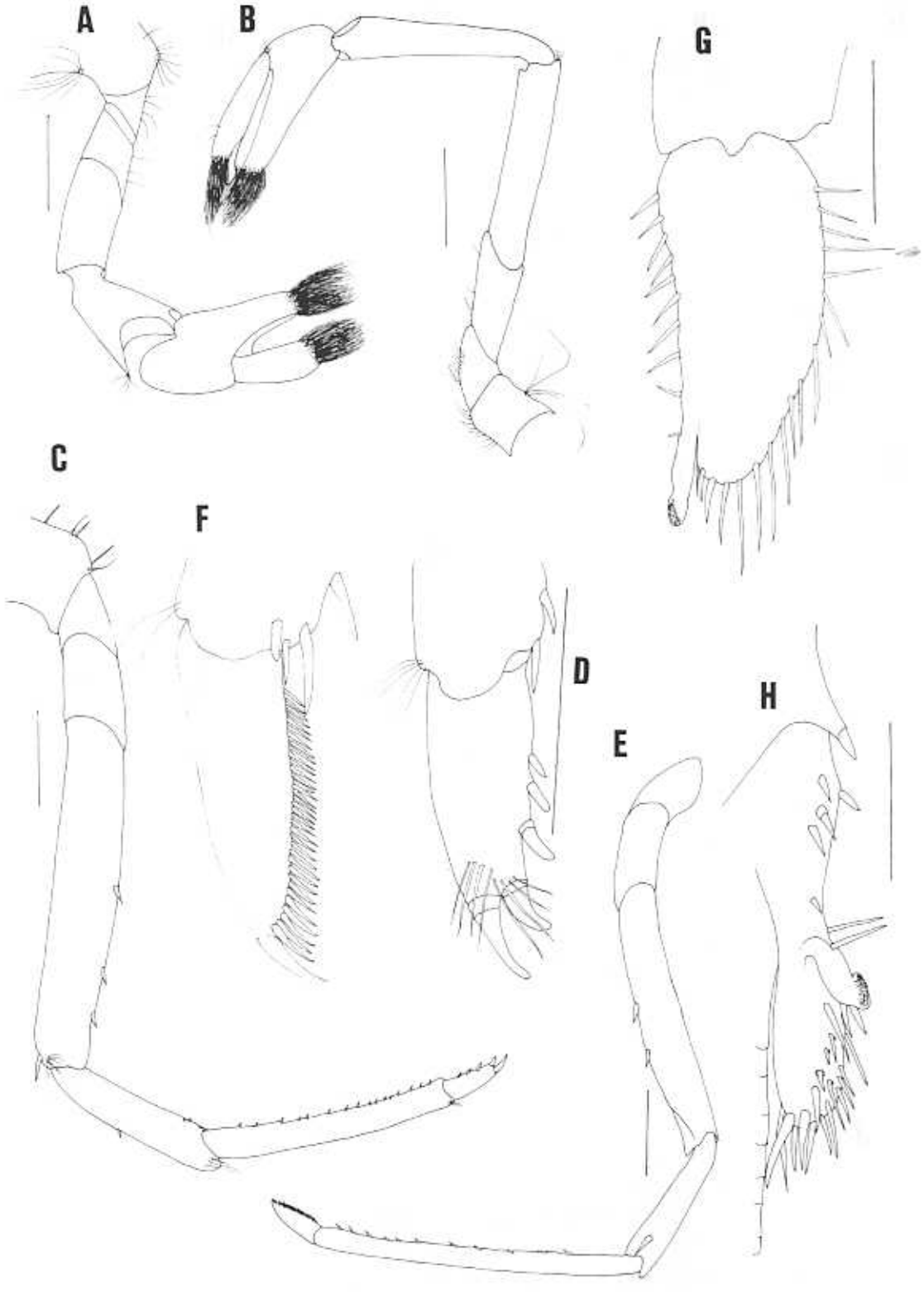


Fig. 6. *Caridina breviata*, new species (paratype, male, cl. 3.8 mm, IZAS. A) first pereiopod; B) second pereiopod; C) third pereiopod; D) dactylus of third pereiopod; distal portion of first pereiopod; E) fifth pereiopod; F) dactylus of fifth pereiopod; G) endopod and appendix interna of first pleopod; H) endopod and appendix masculina of second pleopod. A - C=1 mm; D - F=0.5 mm.

antennular peduncle (0.4 times as long as carapace vs. 0.7 times in *C. cantonensis*); d) short stylocerite (reaching to or slightly beyond end of basal segment of antennular peduncle vs. reaching to middle of second segment of antennular peduncle in *C. cantonensis*); e) scaphocerite 2.7 times as long as broad (vs. 3.3 times in *C. cantonensis*); f) carpus of first pereiopod 1.7 times as long as broad (vs. 1.4 times in *C. cantonensis* ).

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