To Dr. F.A. Chace,
With compliments
Cai Yixiong

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ATYID SHRIMPS (CRUSTACEA: DECAPODA: CARIDEA) FROM THE CHISHUI REGION OF GUIZHOU PROVINCE, SOUTHERN CHINA

Yixiong Cai and **Senlin Yuan**

ABSTRACT. - Nine species of atyid shrimps are reported from the Chishui region of Guizhou Province, China, viz. one species of *Neocaridina* (*N. palmata* (Shen, 1948)), and eight new species of *Caridina* (*C. hongyanensis*, *C. elliptica*, *C. chishuiensis*, *C. euryphylla*, *C. angustifolia*, *C. medifolia*, *C. paracornuta*, and *C. sumatianica*). The new taxa are described and illustrated in detail.

INTRODUCTION

To date, nine species of Atyidae have been recorded from Guizhou province in China (Yu,1938; Liang & Yan, 1986; Liang, 1993; Cai, 1996). Of these, only *Neocardina palmata* (Shen, 1948) is known to occur in the Chishui region (Cai, 1996). As part of the transition zone from Guizhou Plateau to Sichuan Basin, Chishui city and its adjacent regions are at the north edge of the Guizhou Province. The area possesses a complex water system in which a number of small streams at altitudes from 221 to 1844 metres above sea level converge into the mainstreams of two tributaries (Chishui and Xishui) of the Yangtze River (Fig. 1).

During the years 1988, 1989 and 1992, faunal and ecological investigations of atyid shrimps of Chishui city and its adjacent regions were carried out. Specimens from more than 100 localities were collected. A total of nine species of atyid shrimps were obtained, viz. one species of *Neocaridina* and eight new species of *Caridina*. The present paper provides descriptions and/or discussions of all these taxa. A key to the known species of atyid shrimps from this region is presented. All specimens were collected by the second author and are deposited in the Institute of Zoology, Academia Sinica, Beijing. Measurements of the carapace length include the rostrum and all the figures of the new species are drawn from holotypes.

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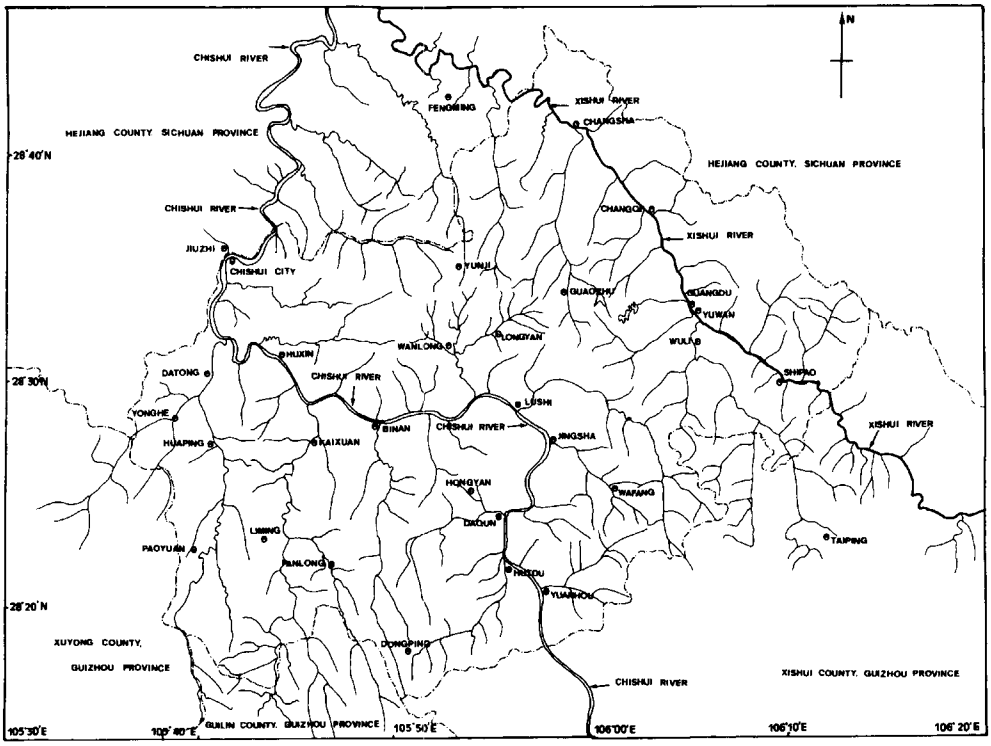

Fig. 1. Map of Chishui region with main collecting sites.

DESCRIPTIVE PART

Neocaridina palmata (Shen, 1948)

Caridina palmata Shen, 1948: 119, pl. 7.
Neocaridina palmata - Dai et al., 1993: 834, fig. 1; Cai 1996: 129.

Material examined. - 9 females, Chishui river at Chishui city, elevation 250m, pH 6.5, 18°C, coll. 29 Apr.1989. — 6 males, 4 females, Longyan village, elevation 360m, pH 7.0, 18°C, coll. 27 Oct.1988. — 12 males 8 females, Yuanhou town, elevation 340m, pH 6.0, 28°C, coll. 28 Jul.1992. — 8 males 5 females, Xinyi village near Yuanhou town, elevation 700m, pH 6.5, 12°C, coll. 17 Nov.1992. — 2 males, 5 females, Shatuogou, Hutou village, elevation 450m, pH 7.0, 15°C, coll. 8 Nov.1988. — 3 males, 8 females, Fengming village, Hejiang county, Sichuan province, elevation 200m, pH 6.0, 10°C, coll. 15 Oct.1988. — 1 male, 10 females, Huilong village, near Baoyuan village, elevation 600, pH 6.5, 18°C, coll. 20 Oct.1988. — 1 male, 15 females, Laoyangou, Nihe village, near Panlong village, elevation 1200m, pH 7.0, 12°C, coll. 15 Nov.1988. — 15 females, Dongping village, elevation 850m, pH 6.5, 15°C, coll. 1 Nov.1988. — 3 males, 5 females, Xiaojin village, near Daqun town, elevation 400m, pH 7.0, 16°C, coll. 7 Nov.1988. — 2 males, 4 females, Hongyan village, elevation 400m, pH 7.0, 16°C, coll. 7 Nov.1988. — 6 females, Dongping village, elevation 800m, pH 7.0, 2°C, coll. 1 Jan.1989. — 6 males, 17 females, Nanni village, near Binan town, elevation 260m, pH 6.5, 23°C, coll. 13 Jul.1992. — 1 male, 6 females, Nanpin village, near Daqun town, elevation 500m, pH 6.5, 10°C, coll. 16 Dec.1988. — 10 males, 12 females, Nanpin village, elevation 550m, pH 6.5, 21°C, coll. 25 Jul.1992. — 1 male, 15 females, Yunji village, elevation 850m; pH 7.0, 16°C, coll. 27 Oct.1988. — 3 males, 6 females, Wuli village, elevation 350m, pH 6.5, 5°C, coll. 20 Dec.1988. — 8 males, 6 females, Changqi village, elevation 300m, pH 6.0, 15°C, coll. 11 Nov. 1992. — 2 males, 5 females, Taiping village, Xishui county, elevation 800m, pH 7.0, 5°C, coll. 9 Apr.1989. — 5 females, Jiuzhi village, Hejiang county, elevation 250m, pH 7.0, 10°C, coll. 16 Apr.1989.

Remarks. - *Neocaridina palmata* is a widely distributed species in southern China and

is also the most common atyid in our investigations. Descriptions and figures of the species have been given by Shen (1948) and Dai et al. (1993), and some of its subspecies have been discussed by Cai (1996). The present specimens possess the typical characters of the species, viz. the endopod of the male first pleopod being palmate, the appendix masculina of the second pleopod is enlarged, thickened and covered with dense setae, the appendix interna reaches or reaches just before the end of the appendix masculina.

The present specimens were collected from rivers, mountain streams and field channels at the altitudes from 200m to 1200m.

Distribution. - Zhejiang, Anhui, Hubei, Sichuan, Fujian, Jiangxi, Hunan, Guizhou, Yunnan, Guangdong and Guangxi provinces in China.

Caridina hongyanensis, new species
(Figs. 2-4)

Material examined. - Holotype: male, 19.0 mm; Yantanggou stream near Hongyan village, coll. 26 Jul.1992.

Paratype - 1 male, 20.5 mm, same data as holotype.

Description. - Rostrum short, extending to 0.75 length of basal segment of antennular peduncle, only armed ventrally with 3 or 4 indistinct serrations close to tip.

Carapace length 4.3 times as long as rostrum. Lower orbital angle indistinct, most of which fused to sharp antennal spine below orbital angle. Pterygostomian margin of carapace broadly rounded, sligthly produced forward.

Sixth abdominal somite 1.6 times as long as fifth, 1.2 times as long as telson, 0.5 as long as carapace. Posterolateral angle of sixth somite triangular, bluntly pointed.

Telson tapers gradually towards posterior, with sharp triangular median point, 3 dorsal spinules on left, 5 on right in distal half, 1 pair on outer margin of posterior end. Posterior margin slightly convex with single row of 9 spines. Lateral pair longest, strongest. Spines with very short hairs except outer margin of lateral pair.

Eyes well developed. Antennular peduncle slender; stylocerite reaches about 0.8 length of basal segment of antennular peduncle; anterolateral angle of basal segment sharp, and reaches about to 0.25 length of second segment. Length of second segment slightly less than half of basal segment. Third segment shorter than second. Antennal peduncle reaches end of second segment of antennular peduncle, distinct tooth near base of scaphocerite. Scaphocerite length 3 times its width, reaches end of antennular peduncle, oval, a sharp final tooth on outer margin.

Branchial formula normal, epipodites on first 4 pairs of pereiopods.

Incisor process of mandible ends in 5 irregular teeth, molar process truncated without tooth, region between 2 processes lined with 2 rows of setae, those near molar process more dense. Lower lacinia of maxillula broadly rounded, upper lacinia elongated, numerous distinctive teeth on its inner margin, palp slender. Upper, lower endites of maxilla subdivided.

Palp small. Scaphognathite tapers posteriorly, some long curved setae at posterior end. Palp of first maxilliped broad, ends in blunt triangle. Second maxilliped typical. Third maxilliped with exopod reaching end of antennular peduncle. Last segment slightly shorter than penultimate segment, ends in single terminal claw.

First pereiopod short and robust, almost reaches end of basal segment of antennular peduncle, chela about twice as long as broad, fingers slightly longer than palm, carpus about as long as merus, 0.7 length of chela, about 1.4 times as long as high. Second pereiopod more slender than first, reaching about end of second segment of antennular peduncle, chela 2.4 times as long as high. Fingers 1.4 times as long as palm, carpus long and slender, as long as chela, 4 times as long as high, merus as long as or slightly longer than carpus, distinctively longer than ischium. Third pereiopod reaches beyond antennular peduncle, dactylus terminates in a strong spine with 6 spinules in descending length and size, behind strong spine at inner margin, propodus 10 times as long as broad, 5.4 times as long as dactylus. Fourth pereiopod reaches to end of antennular peduncle and its structures very similar to those of third. Both propodus and dactylus of fifth pereiopod absent.

Endopod of first male pleopod sub-triangular, appendix interna on distal half, dense setae around its margin, measures 3.2 times as long as broad, 0.7 length of exopod. Appendix interna short. Appendix masculina of second pleopod stronger than appendix interna with strong spinules on inner margin, about 0.65 length of endopod.

Uropod diaeresis with 17 strong spinules.

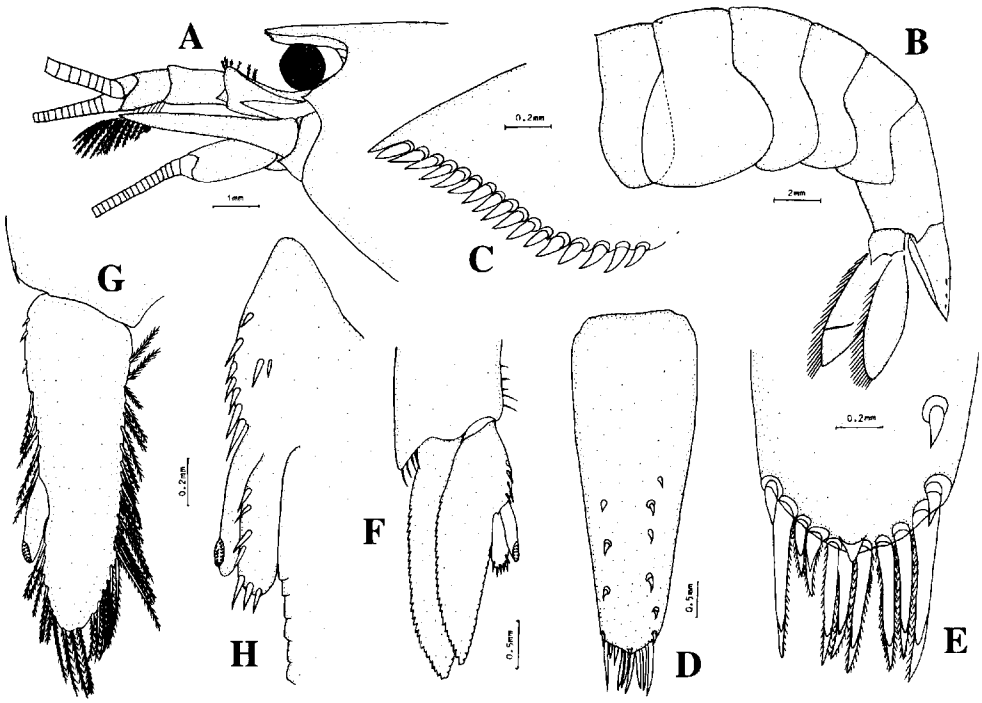

Fig. 2. *Caridina hongyanensis*, new species. A. anterior portion of cephalothorax, B. abdominal somites and telson, C. uropodal diaeresis, D. telson, E. posterior portion of the telson, F. second pleopod, G. endopod and appendix interna of first pleopod, H. appendix masculina and appendix interna of second pleopod.

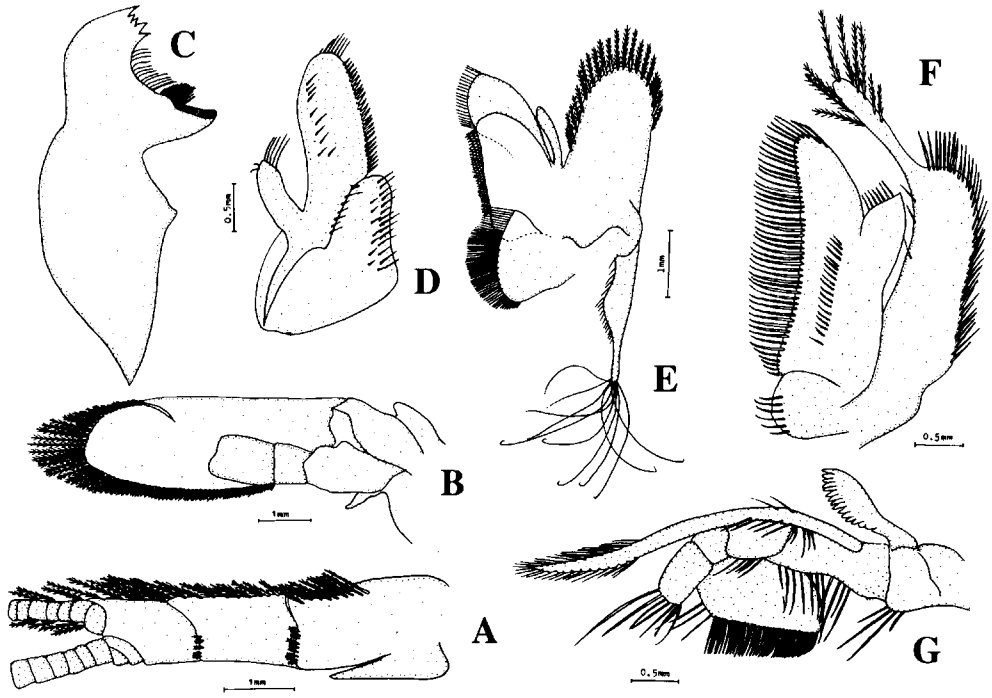

Fig. 3. *Caridina hongyanensis*, new species. A. antennular peduncle, B. scaphognathite, C. mandible, D. maxillula, E. maxilla, F. first maxilliped, G. second maxilliped.

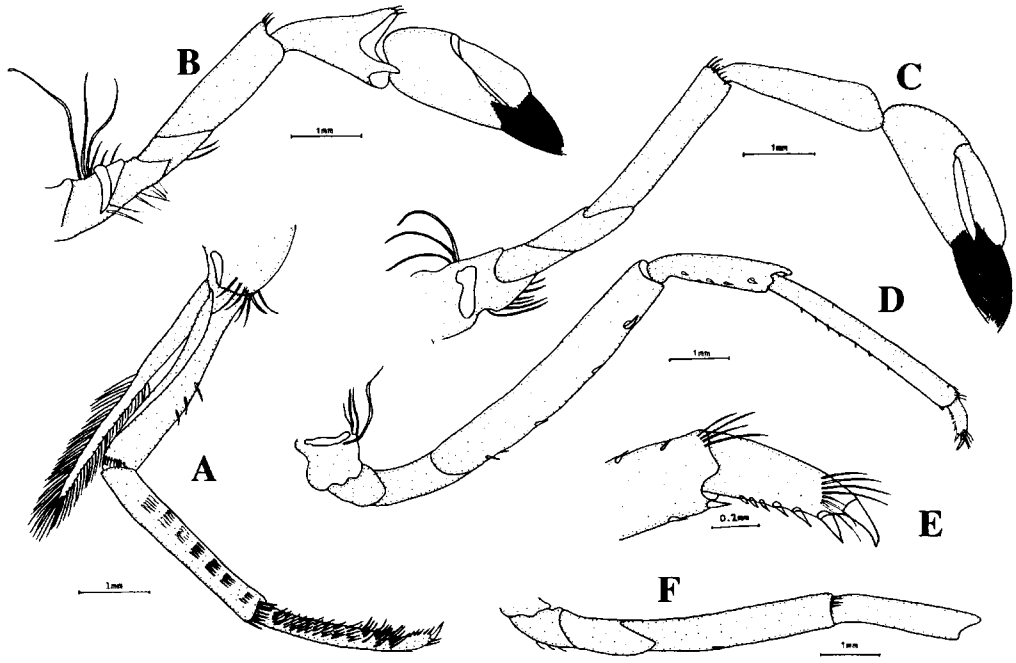

Fig. 4. *Caridina hongyanensis*, new species. A. third maxilliped, B. first pereiopod, C. second pereiopod, D. third pereiopod, E. dactylus of third pereiopod, F. fifth pereiopod.

Etymology. - The species is named after its type locality.

Remarks. - *Caridina hongyanensis*, new species, is very similar to *C. sakishimensis* Fujino & Shokita, 1975, in its short rostrum and sub-triangular male endopod. It can be distinguished immediately from *C. sakishimensis*, however, by its unarmed upper margin of the rostrum, the proportionately much shorter appendix interna of the endopod and the uropod diaeresis possessing 17 spinules (vs. with 4 to 6 dorsal rostral teeth, longer appendix interna and 22 spinules on the uropod diaeresis). *Caridina sakishimensis* is known only from the Ryukyu Islands in Japan thus far.

Habitat. - The new species was collected from a slow flowing stream named Yantanggou, at an elevation of 500 m, near Hongyan village. They were found among the fine roots of floating grass with *Neocaridina palmata*. The stream, which is surrounded by forest, is about 0.5m in width and has a sandy bottom. The clear water has an average temperature of 29°C and pH 6.5.

Caridina elliptica, new species
(Figs. 5-7)

Material examined. - Holotype: male, 18.5 mm, stream near Panlong town. coll. 20 Oct.1988.

Description. - Rostrum short, slender, reaching to about end of basal segment of antennular peduncle. Only 1 very small tooth on dorsal margin, located distally at 0.3 length of rostrum.

Carapace 4.2 times as long as rostrum. Antennal spine is blunt angle fused with lower orbital angle. Pterygostomian margin of carapace broadly rounded, produced slightly forward.

Sixth abdominal somite 1.2 times as long as fifth, about 0.9 times length of telson, 0.4 times length of carapace.

Telson tapers gradually towards posterior end, without triangular median point. Distal half of telson with 5 dorsal spinules on left side, 4 on right side including last subterminal pair. Posterior margin convex with 4 pairs of spines. Outer pair long, very strong; others short with median pair shortest.

Eyes well developed. Antennular peduncle about half length of carapace. Slender basal segment 2.5 times as long as second. Third segment shorter than second. Sharp stylocerite reaches beyond middle of basal segment of antennular peduncle. Oval scaphocerite has sharp final tooth on outer margin, which reaches beyond second segment of antennular peduncle. Distinct tooth present near base of scaphocerite.

Mouth parts normal (figs. 6, 7). Third maxilliped with exopod reaching to end of antennular peduncle, ultimate segment slightly longer than penultimate segment, terminating in a claw.

Short, robust first pereiopod reaches to middle of second segment of antennular peduncle. Chela robust, about twice as long as broad. Finger slightly longer than palm. Carpus about as long as merus, 0.7 times length of chela, 1.7 times as long as high. Slender second pereiopod reaches to end of second segment of antennular peduncle. Chela 2.5 times as long as broad. Finger 1.7 times as long as palm. Long, slender carpus 4.7 times as long as high, slightly

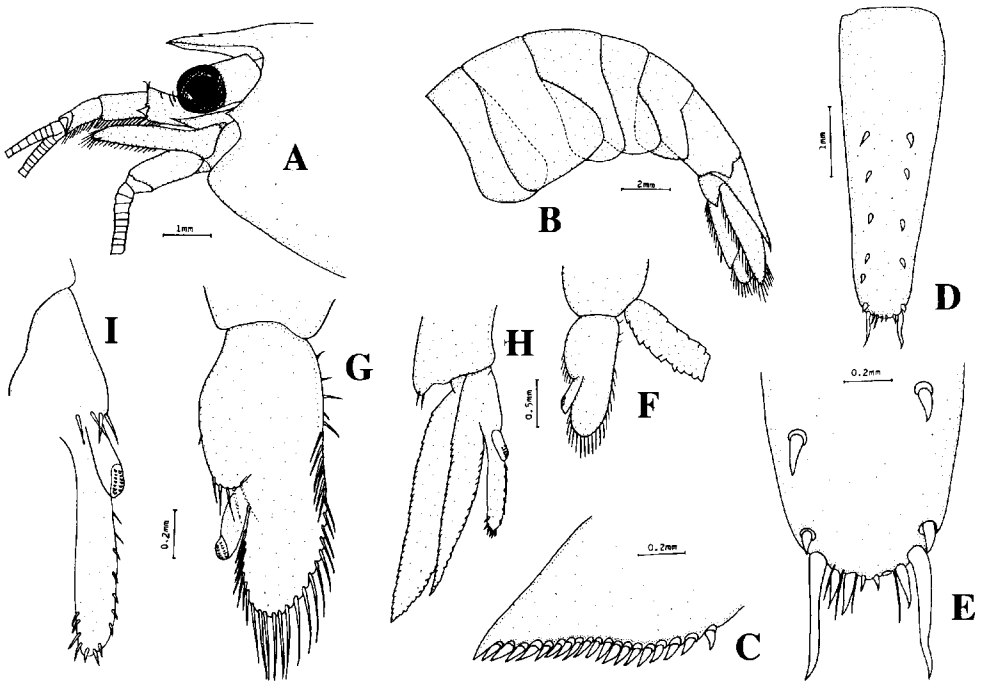

Fig. 5. *Caridina elliptica*, new species. A. anterior portion of cephalothorax, B. abdominal somites and telson, C. uropodal diaeresis, D. telson, E. posterior portion of the telson, F. first pleopod, G. endopod and appendix interna of first pleopod, H. second pleopod, I. appendix masculina and appendix interna of second pleopod.

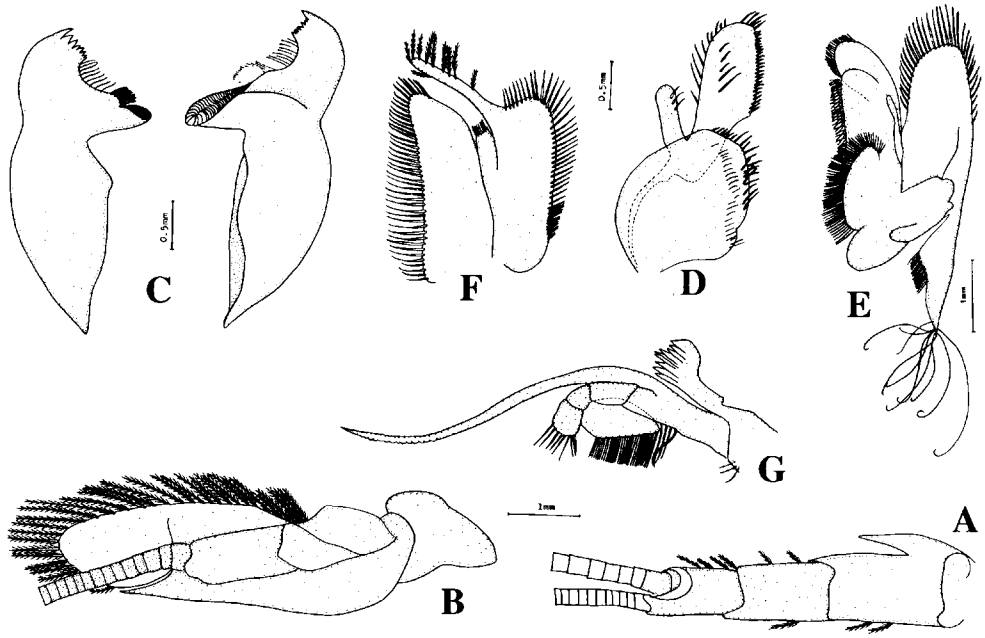

Fig. 6. *Caridina elliptica*, new species. A. antennular peduncle, B. scaphognathite, C. mandible, D. maxillula, E. maxilla, F. first maxilliped, G. second maxilliped.

longer than chela. Merus as long as carpus, distinctively longer than ischium. Third pereiopod reaches to end of antennular peduncle. Dactylus ends in a strong claw. 8 spinules present, each shortening and narrowing in descending order behind claw on posterior margin. Propodus 10 times as long as broad, 4 times as long as dactylus. Fifth pereiopod reaches end of second segment of antennular peduncle. Slender dactylus ends in a strong claw. 84 comb-like spinules present on rest of posterior margin. Carpus half length of propodus. Propodus 10 times as long as broad, 2.5 times as long as dactylus. Merus slightly shorter than propodus. Ischium less than half length of propodus.

Oval-shaped endopod of first pleopod with appendix interna at base of distal half, about 2.5 times as long as broad. Dense spinules present, longer in distal end, shorter in lateral end. Appendix interna short. Elongate appendix masculina of second pleopod about 0.7 times length of endopod, short appendix interna with short spinules on inner and distal margin.

Uropod has 19 strong spinules in diaeresis.

Habitat. - The new species was collected in a stream, about 0.2 to 0.4m in width and about 0.2m in depth with sandy bottom, at an elevation of 500m, near the Panlong town. The water is clear with a temperature of 18°C, pH at 6.5.

Etymology. - The name is derived from the Greek root "ellipt-", named after the elliptical shape of the endopod of the first pleopod in male.

Remarks. - *Caridina elliptica*, new species, most resembles *C. spinipoda* Liang et al., 1990 from Mianzu, Sichuan province, China, in the shape of the endopod of male first pleopod,

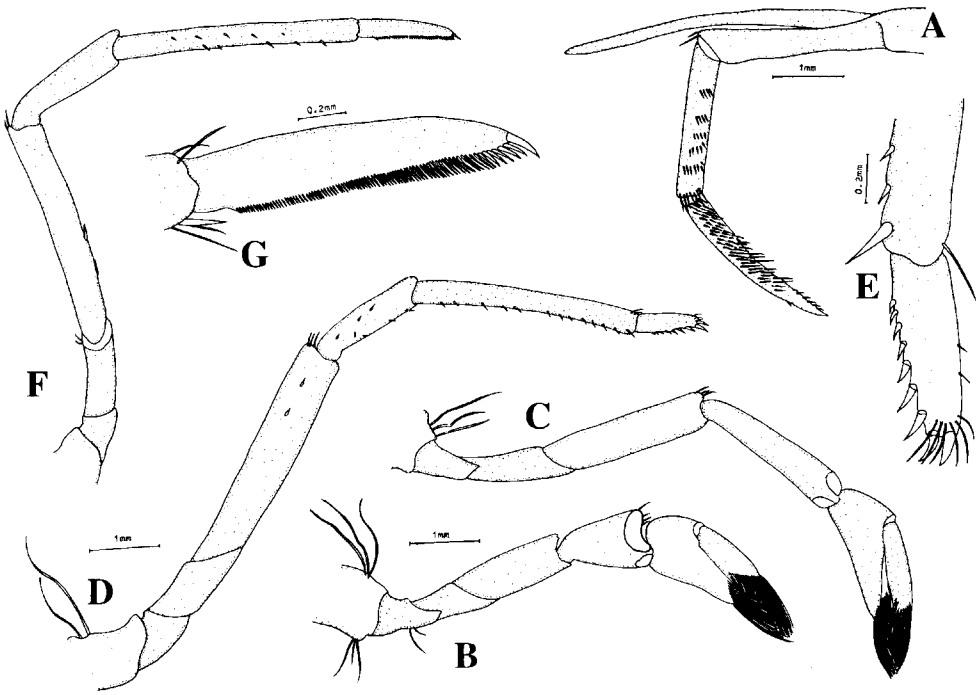

Fig. 7. *Caridina elliptica*, new species. A. third maxilliped, B. first pereiopod, C. second pereiopod, D. third pereiopod, E. dactylus of third pereiopod. F. fifth pereiopod, G. dactylus of fifth pereiopod.

appendix masculina of male second pleopod and the shape of distal portion of the telson. It can be distinguished from the latter by the shape of the rostrum which has only one small short tooth on upper margin and does not reach the end of the basal antennular segment (vs. with 7 to 9 dorsal and 0 to 1 ventral teeth, and reaches to or beyond the tip of the basal antennular segment), and by the number of teeth on uropod diaeresis (19 vs. 15 to 17), the relatively shorter appendix interna, and fewer spinules on the proximal 1/3 of the appendix masculina of the 2nd pleopod.

Caridina chishuiensis, new species
(Figs. 8-10)

Material examined. - Holotype: male, 25 mm, stream near Binan village, coll. 1 Nov.1988.

Paratypes - 7 females, 19 to 25 mm, same data as holotype. — 1 male, 20 mm, 5 females, 19 to 21 mm, another stream near holotype location, same day. — 1 female (ovigerous), 28 mm, Liming village, coll. 11 Jul.1992.

Others - 11 females, Yonghe village, elevation 280m, 20°C, pH 7.0, coll. 18 Oct.1988. — 3 males 5 females, Panlong village, elevation 800m, 18°C, pH 6.5, coll. 20 Oct.1988. — 1 male, 1 female, Pintang village near Changsha village, elevation 450m, 15°C, pH 6.5, coll. 26 Oct.1988. — 18 males, 17 females, Binan village, elevation 850m, 15°C, pH 6.5, coll. 1 Nov.1988. — 4 males, 4 females, Hongyan village 800m, 7°C, pH 7.0, coll. 16 Dec.1988. — 7 females, Wuli village, elevation 350m, 5°C, pH 6.5, coll. 20 Dec.1988. — 12 females, Yuwan village, elevation 350m, 5°C, pH 6.5, coll. 20 Dec.1988. — 2 females, Liming village, elevation 800m, 24°C, pH 6.0, coll. 11 Jul.1992. — 8 males, 6 females, Jinsha village, elevation 400m, 28°C, pH 6.5, coll. 21 Jul.1992. — 1 female, Daqun town, elevation 350, 28°C, pH 6.5, coll. 22 Jul.1992. — 12 males, 12 females, Lusi village,elevation 400m, 28°C, pH 6.0, coll. 11 Aug.1992. — 5 males, 5 females, Tuangshan village, near Gaozhu village elevation 850m, 26°C, pH 6.0, 12 Aug.1992. — 5 males 5 females, Qinniang village, near Guozhu village, elevation 800m, 27°C, pH 6.5, coll. 12 Aug.1992. — 4 males, 2 females, Gaofeng village, near Changsha village elevation 600m, 26°C, pH 6.5, coll. 13 Aug.1992. — 6 males, 2 females, Changhong village, near Changsha village, elevation 350m, 28°C, pH 6.0, coll. coll. 15 Aug.1992.

Description. - Rostrum narrows abruptly ending in broad apex, reaches middle or almost to end of second segment of antennular peduncle. Laterally straight, armed dorsally with 10 to 28 (commonly 18 to 22) spines with 5 to 9 on carapace, occupies about 0.25 length of carapace. 5 to 8 teeth (most commonly 7) on ventral border. Spines on carapace usually slightly more widely spaced than those on upper margin of rostrum.

Carapace length about 1.8 times as long as rostrum. Lower orbital angle indistinct, almost fused to sharp antennal spine. Pterygostomian margin of carapace rounded or bluntly angled without spine.

Sixth abdominal somite as long as telson, about 1.7 times as long as fifth, about 0.6 times as long as carapace.

Telson bears 5 or 6 pairs dorsal spinules tapers gradually toward posterior without triangular median point. Posterior margin convex with 4 pairs of spines. Lateral pair longest, strongest, 2 intermediate pairs about equal size. Submedian pair minute, about 0.25 as long as lateral pair. Both intermediate spines and inner margins of lateral spines with very short hairs.

Eyes well developed. Antennular peduncle about 0.8 times as long as carapace. Basal segment of antennular peduncle reaching beyond middle of rostrum, sligtly longer than half

antennular peduncle, anterolateral angle sharp reaching 0.2 length of second segment. Sharp stylocerite reaches to 0.8 length of basal segment of antennular peduncle. Antennal peduncle reaches to end of basal antennular segment, single tooth near base of scaphocerite. Oval scaphocerite slightly longer than antennular peduncle, final sharp tooth reaching end of antennular peduncle on outer margin, about 3 times as long as broad in width.

Mouth parts normal (Figs. 9, 10). Third maxilliped with a terminal claw reaching end of antennular peduncle, ultimate segment slightly shorter than penultimate segment.

First pereiopod short and robust, reaches middle of basal segment of antennular peduncle, chela about 1.6 to 2.2 times as long as high, 1.4 to 2.0 times as long as carpus, finger 1.3 to 2.0 times longer than palm, carpus about 1.3 to 1.8 times (male) and 1.1 times (female) as long as high, as long as merus. Second pereiopod reaches end of second segment of antennular peduncle, chela 2.1 to 3.0 times as long as high, finger 1.4 to 2.0 times longer than palm, carpus as long as chela and about 3.5 to 4.5 times as long as high. Third pereiopod reaches end of antennular peduncle, dactylus ends in 2 claws, bearing 4 to 5 spines on posterior surface, propodus with numerous small spinules on posterior surface, about 10 times as long as high, 6 times as long as dactylus, carpus with strong movable spine on distal outer surface, about 5 times as long as high, about half as long as propodus, merus bearing 4 strong movable spines at outer surface, about 2 times as long as carpus. Fifth pereiopod reaches end of second segment of antennular peduncle, dactylus ends in curved claw-like tip, about 53 to 60 comb-like spinules on posterior margin, propodus 10 times as long as broad, 6 times as long as dactylus, propodus with several small spinules on posterior surface, carpus about half length of propodus, bears a strong movable spine on distal outer surface, merus much

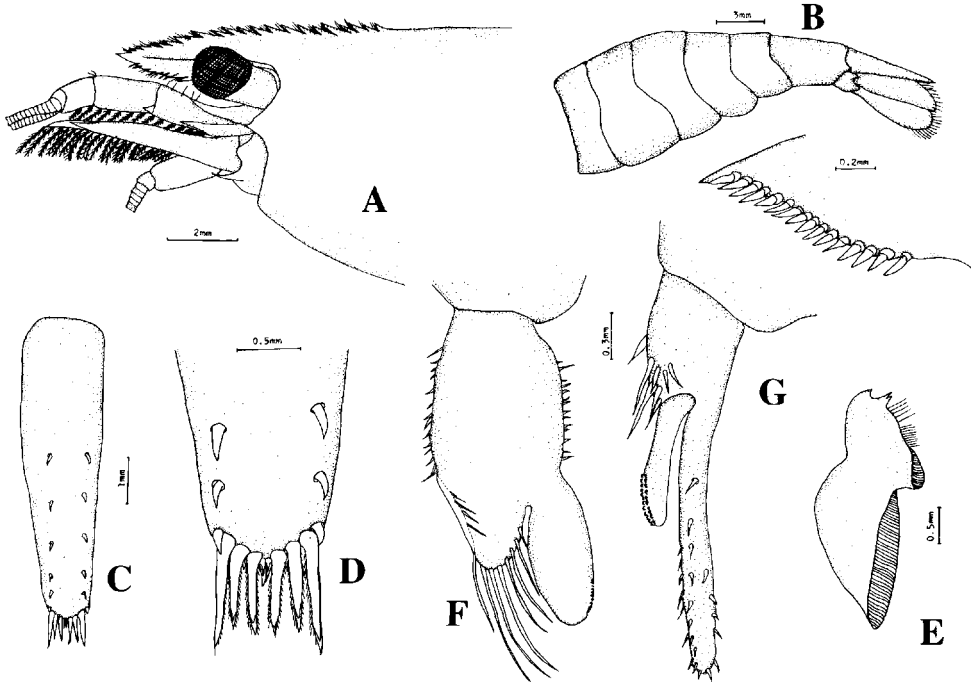

Fig. 8. *Caridina chishuiensis*, new species. A. anterior portion of cephalothorax, B. abdominal somites and telson, C. telson, D. posterior portion of the telson, E. mandible, F. endopod and appendix interna of first pleopod, G. appendix masculina and appendix interna of second pleopod.

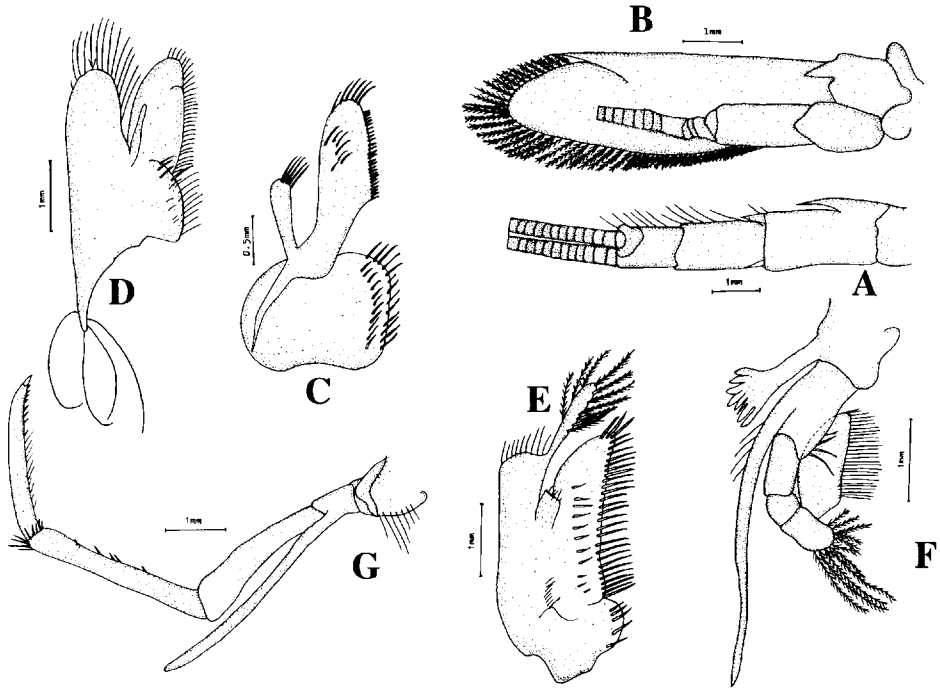

Fig. 9. *Caridina chishuiensis*, new species. A. antennular peduncle, B. scaphognathite, C. maxillula, D. maxilla, E. first maxilliped, F. second maxilliped, G. third maxilliped.

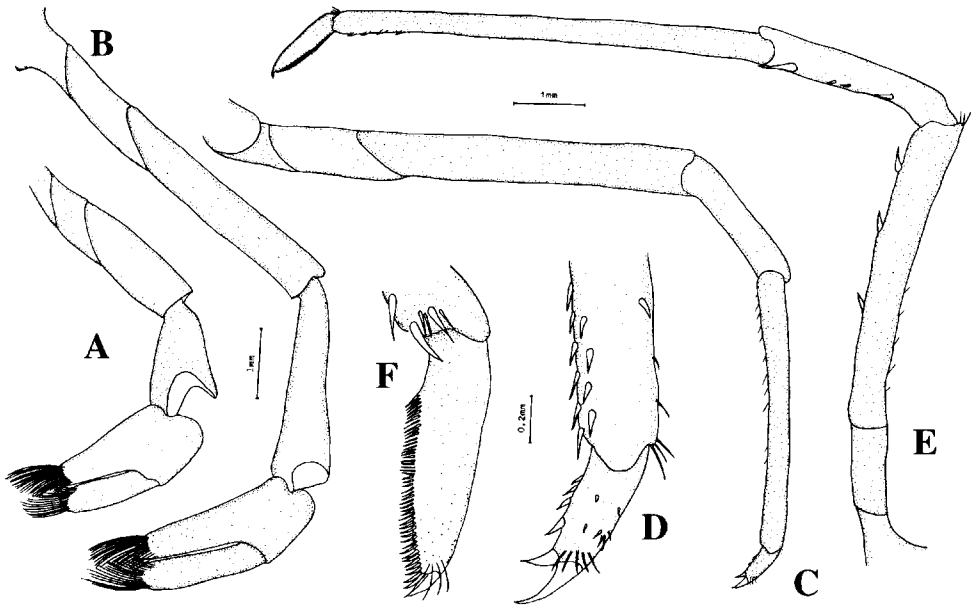

Fig. 10. *Caridina chishuiensis*, new species. A. first pereiopod, B. second pereiopod, C. third pereiopod, D. dactylus of third pereiopod, E. fifth pereiopod, F. dactylus of fifth pereiopod.

longer and stronger than carpus, 1.8 times as long as carpus, 3 strong movable spines on distal outer surface.

Endopod of first pleopod (male) leaf-like lamella narrows at distal end, strong appendix interna at base on distal half, 1.7 to 2.0 times as long as broad, about 0.4 times length of exopod. Appendix interna leaf-like but narrower than endopod, about 2.5 to 3.0 times as long as broad, length about equal to width of endopod. Appendix masculina of second pleopod in male long, slender, slightly curved outside at distal half, about 0.5 times length of endopod with several strong spinules on distal half surface. Appendix interna 0.3 as long as appendix masculina, slightly curved outside at distal end.

Uropod with 13 to 17 spinules on diaeresis.

Number of eggs on paratype ovigerous female 64, egg size 0.95 to 1.05 x 0.72 to 0.87 mm.

Etymology. - The species is named after its type locality.

Remarks. - *Caridina chishuiensis*, new species, is very closely related to the *C. babaultioides* Yu, 1938, from Yen-Tsing in Yunnan Province, China, in the shape of the rostrum, endopod of the male first pleopod, masculina appendix of the male second pleopod and telson. The difference lies mainly in the rounded or blunt shape of the pterygostomian margin of the carapace which lacks a spine (vs. blunt with a small tooth), and the number of ventral teeth is 5 to 8 (mode 7) (vs. 2 to 6, mode 3 to 4).

Habitat. - The new species is widely distributed in Chishui region. Numerous specimens were collected in mountain streams, field channels and ponds at the altitude between 300 and 850 m.

Caridina euryphylla , new species
(Figs. 11-13)

Material examined. - Holotype: male, 25 mm, Qintan village, near Dongping village, coll. 1 Nov.1988.

Paratypes: 1 male, 26mm, 2 females, 23 to 27.5 mm, same data as holotype. 2 males, 22 to 24 mm, 2 females (ovigerous), Liming village, coll. 11 Jun.1992.

Others. - 7 males, 8 females, Qintan village, elevation 850m, 15°C, pH 6.5, coll. 1 Nov.1988. — 1 male, Hongyan village, elevation 800m, 7.0°C, pH 7.0, coll. 16 Dec.1988. — 12 males, 10 females, Qintan village, elevation 800m, 17°C, pH 6.5, coll. 4 Jun.1992. — 20 males, 20 females, Liming village, elevation 800m, 24°C, pH 6.0, coll. 11 Jul.1992. — 20 males, 20 females, Panlong village, elevation 800m, 21°C, pH 6.0, coll. 12 Jun.1992;

Description. - Rostrum tapers gradually to slender apex, reaching middle or end of, occasionally beyond end of third segment of antennular peduncle. Laterally straight or slightly curved downward in distal region bearing 21 to 26 (commonly 24 to 26) dorsal spines, 6 to 9 on carapace, occupying about 0.25 length, 6 to 9 ventral teeth.

Carapace 1.3 to 1.5 times length of rostrum. Sharp antennal spine fuses with lower indistinctive orbital angle, pterygostomian margin of carapace rounded or blunt angle without spine.

Sixth abdominal somite about 1.7 times as long as fifth, slightly shorter than telson, about 0.6 times as long as carapace.

Telson similar to last species (as in Fig. 13).

Eyes well developed. Antennular peduncle about 0.8 length of carapace. Basal segment reaches middle of rostrum, about half length of antennular peduncle. Anterolateral angle of basal segment reaches 0.2 length of second segment of antennular peduncle. Stylocerite sharp, reaching to 0.8 length of basal antennular segment. Antennal peduncle reaches slightly beyond end of basal antennular segment, bearing a tooth near base of scaphocerite. Scaphocerite with sharp final tooth reaching middle of third antennular peduncle on outer margin, about 3 times as long as broad in widest, reaching end of antennular peduncle.

Mouth parts normal (Fig. 11). Third maxilliped reaches end of antennular peduncle, ultimate segment as long as penultimate segment, ending with a terminal claw.

First pereiopod short and robust, reaches end of basal segment of antennular peduncle, chela about 2.0 to 2.5 times as long as high, 1.6 to 1.8 times length of carpus, finger about 1.1 to 1.6 times length of palm, carpus about 1.4 to 1.6 times (male), 1.2 times (female) as long as high, as long as merus. Second pereiopod reaches middle of third segment of antennular peduncle, chela about 2.4 to 2.6 times as long as high, finger 1.4 to 1.6 times length of palm, carpus as long as chela, 3.8 to 4.5 times as long as high. Third pereiopod reaches beyond tip of antennular peduncle, dactylus about 0.17 length of propodus ending in 2 distinct claws, bearing 3 spinules on posterior margin, propodus about 10 times as long as broad and 6 times length of dactylus, with several small spinules on posterior surface, carpus with single strong movable spine on distal of outer surface, slightly more than half length of propodus, 5 times as long as broad, merus strong, about 2 times length of carpus bearing 4 strong movable spines on outer surface. Fifth pereiopod reaches to tip of antennular peduncle, dactylus ends in curved claw-like tip carrying single row of 46 to 56 closely packed comb-like spinules on posterior margin, propodus about 11 times as long as broad, 5 times length of dactylus with numerous small spinules on posterior surface, carpus about half length of propodus, 2 movable spines on posterior margin, merus much longer and stronger than carpus, 3 movable spines on posterior margin.

Endopod of first pleopod (male) leaf-like lamella, narrows distally with strong appendix interna at distal half, length 1.6 to 1.7 (mode 1.6) times its width, about 0.4 length of exopod. Appendix interna leaf-like but narrower, length about 2.5 to 3.0 times width, about equal to width of endopod. Appendix masculina of second pleopod (male) stick-like and slender, curved outward at distal half, about 0.67 length of endopod, bearing numerous strong spinules at distal half. Appendix interna slightly shorter than 0.33 length of appendix masculina.

Uropod with 15 to 18 spinules on diaeresis.

Number of eggs on ovigerous female 47 to 79, egg size 1.05 to 1.2 x 0.70 to 0.73 mm.

Etymology. - The name is derived from the Greek "eurys" for broad or wide, and "phyllon", Latinised to "phylla" for leaf; alluding to the broadened leaf-like endopod of the male first pleopod.

Remarks. - *Caridina euryphylla*, new species, most resemble *C. phyllopoda* Huang, 1984,

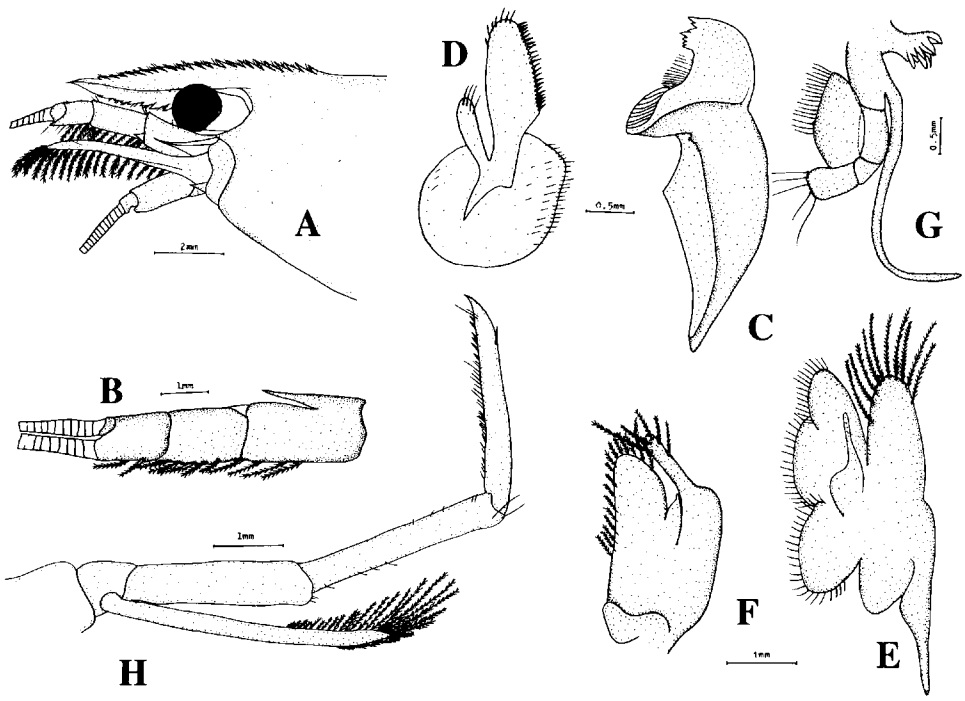

Fig. 11. *Caridina euryphylla*, new species. A. anterior portion of cephalothorax, B. antennular peduncle, C. mandible, D. maxillula, E. maxilla, F. first maxilliped, G. second maxilliped, H. third maxilliped.

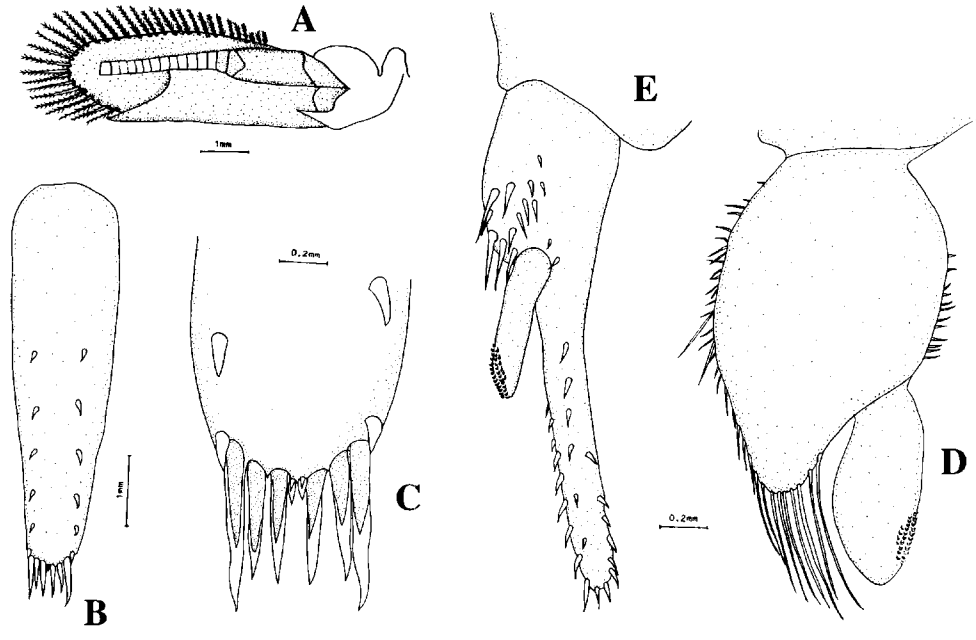

Fig. 12. *Caridina euryphylla*, new species. A. scaphognathite, B. telson, C. posterior portion of the telson, D. endopod and appendix interna of first pleopod, E. appendix masculina and appendix interna of second pleopod.

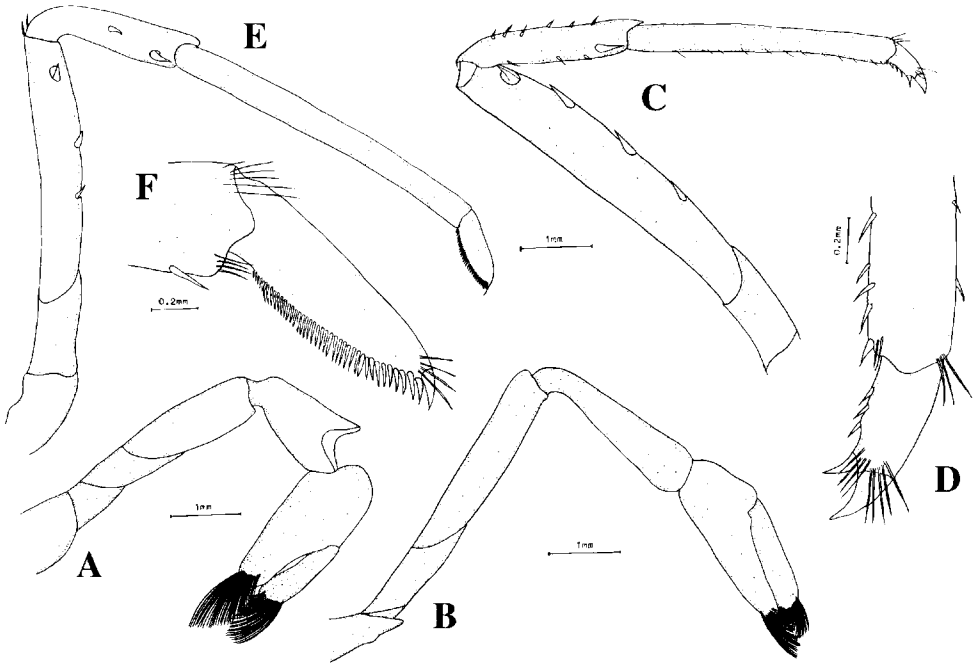

Fig. 13. *Caridina euryphylla*, new species. A. first pereiopod, B. second pereiopod, C. third pereiopod, D. dactylus of third pereiopod, E. fifth pereiopod, F. dactylus of fifth pereiopod.

from Chengdu, Sichuan province and *C. chishuiensis*, new species, in the shape of the endopod of male first pleopod and appendix masculina of the male second pleopod and shape of distal partion of the telson. It can be distinguished from *C. phyllopoda* by the shape of the rostrum, which is slender and reaches approximately to the end of the antennular peduncle (vs. reaching only to the end of the basal segment of the antennular peduncle), the dorsal margin being armed with 21 to 26 spines (mode 24 to 26), and the ventral margin having 6 to 9 ventral teeth (vs. with 17 to 22 dorsal spines and 3 to 4 ventral teeth), and the pterygostomian margin of the carapace is round and blunt, without a spine (vs. armed with a spine). It can also be distinguished from *C. chishuiensis* by the shape of the rostrum and the smaller length to width ratio of the male first pleopod endopod (1.6 to 1.7 times vs. 1.7 to 2.0 times).

Habitat. - The new species was obtained in mountain streams, at an elevation of about 800 m. The water is clear with a depth of about 0.2 to 0.5 m. Water temperature was about 5 °C and the pH was 7.0.

Caridina angustifolia, new species
(Figs. 14-15)

Material examined. - Holotype: male, 21 mm, Wafang stream near Jinsha village, coll. 19 Nov.1988.

Paratypes - 5 males, 21 to 25 mm, 7 females, 19 to 24 mm, same data as holotype.

Description. - Posterior half of rostrum straight, slightly curved upward at anterior,

reaching beyond end of second segment of antennular peduncle (sometimes reaches beyond end of antennular peduncle) bearing 17 to 24 dorsal (commonly 22 to 23) spines, 6 to 9 on carapace, occupying about 0.25 length of carapace, 5 to 9 ventral teeth.

Carapace about 1.6 times as long as rostrum. Lower orbital angle indistinct, almost fused by sharp antennal spine. Pterygostomian margin of carapace with an acute angle and sharp spine.

Sixth somite about 1.6 times as long as fifth but slightly shorter than telson, about 0.7 times length of carapace.

Telson similar to previous species but bearing 4 to 6 pairs of dorsal spinules.

Eyes well developed. Antennular peduncle about 0.6 times as long as carapace. Antennular peduncle basal segment slightly longer than its half. Anterolateral angle sharp reaching 0.2 length of second segment. Sharp stylocerite reaches 0.8 length of basal segment of antennular peduncle. Antennal peduncle reaches slightly beyond end of basal segment of antennular peduncle, single tooth near base of the scaphocerite. Scaphocerite oval, a sharp final tooth goes slightly beyond end of antennular peduncle on outer margin, more than 3 times as long as broad in widest, reaching far beyond end of antennular peduncle.

Mouth parts normal (Figs. 14, 15). Third maxilliped's exopod reaching middle of third segment of antennular peduncle. Ultimate segment slightly shorter than penultimate segment with a terminating claw.

First pereiopod short and robust, reaches middle of basal segment of antennular peduncle, chela about 2.0 to 2.4 times as long as broad, 1.5 to 1.7 times length of carpus, fingers 1.0 to 1.4 times longer than palm, carpus about 1.4 to 1.8 times as long as high, as long as merus. Second pereiopod reaches end of second segment of antennular peduncle, chela about 2.4 to 2.8 times as long as broad, fingers 1.3 to 1.8 times longer than palm, slender carpus about 3.5 to 4. 5 times as long as high, length about equal to chela. Third pereiopod reaching beyond end of antennular peduncle, dactylus ends in 2 claws bears 4 or 5 small spines on posterior margin, propodus about 10 times as long as broad, 5 times as long as dactylus, numerous small spinules on posterior surface, carpus has single strong movable spine on distal end of outer surface, slightly more than half length of propodus, about 4 times as long as broad, merus strong, about 2.5 times as long as carpus, bearing 4 strong movable spines on posterior surface. Fifth pereiopod reaches to middle of second segment of antennular peduncle, dactylus ends in curved claw-like tip with single row of 26 to 45 (commonly 35 to 40) closely packed comb-like spinules on posterior margin, propodus with numerous small spinules on posterior margin, about 11 times as long as broad, 4 times as long as dactylus, carpus about half length of propodus, bearing a strong movable spine on distal end, merus 1.7 times as long as carpus with 3 strong movable spines on distal portion of posterior surface.

Endopod of first pleopod (male) leaf-like lamella narrows distally, strong appendix interna at distal half, 2.0 to 2.2 (most commomly 2.0) times as long as broad, about half length of exopod. Appendix interna leaf-like, narrower, about 2.5 to 3.0 time as long as broad, about equal to width of endopod. Appendix masculina of second pleopod (male) stick-like and slender, slightly curved outward at distal half, about 0.7 length of endopod, numerous strong spinules on surface of distal end. Appendix interna slightly curved outward at distal end.

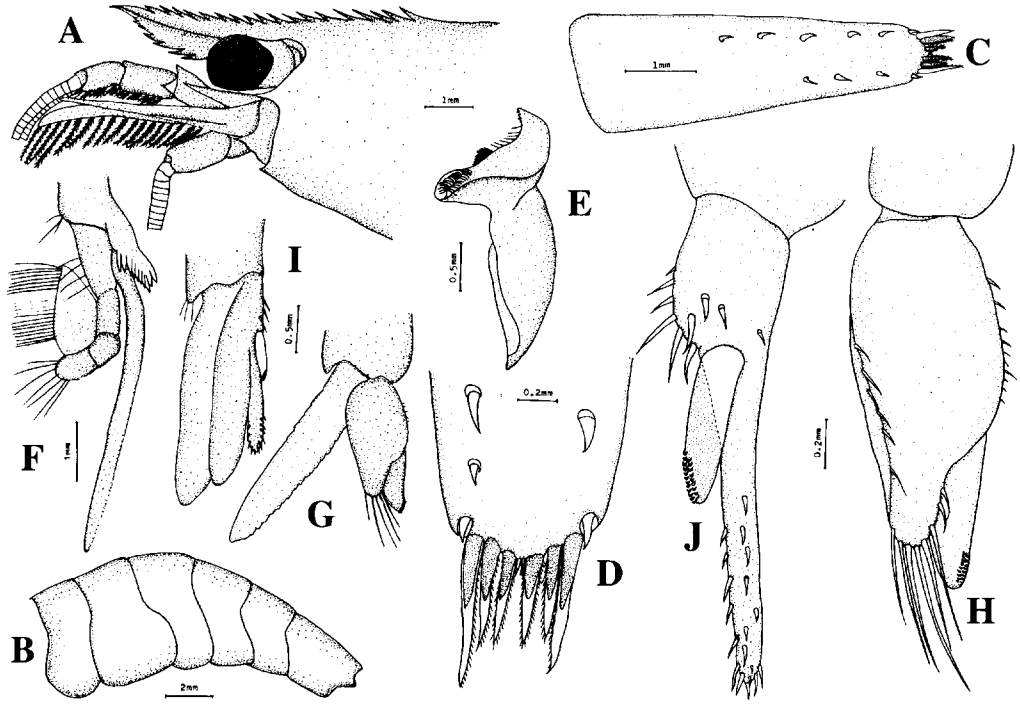

Fig. 14. *Caridina angustifolia*, new species. A. anterior portion of cephalothorax, B. abdominal somites, C. telson, D. posterior portion of the telson, E. mandible, F. second maxilliped, G. first pleopod, H. endopod and appendix interna of first pleopod, I. second pleopod, J. appendix masculina and appendix interna of second pleopod.

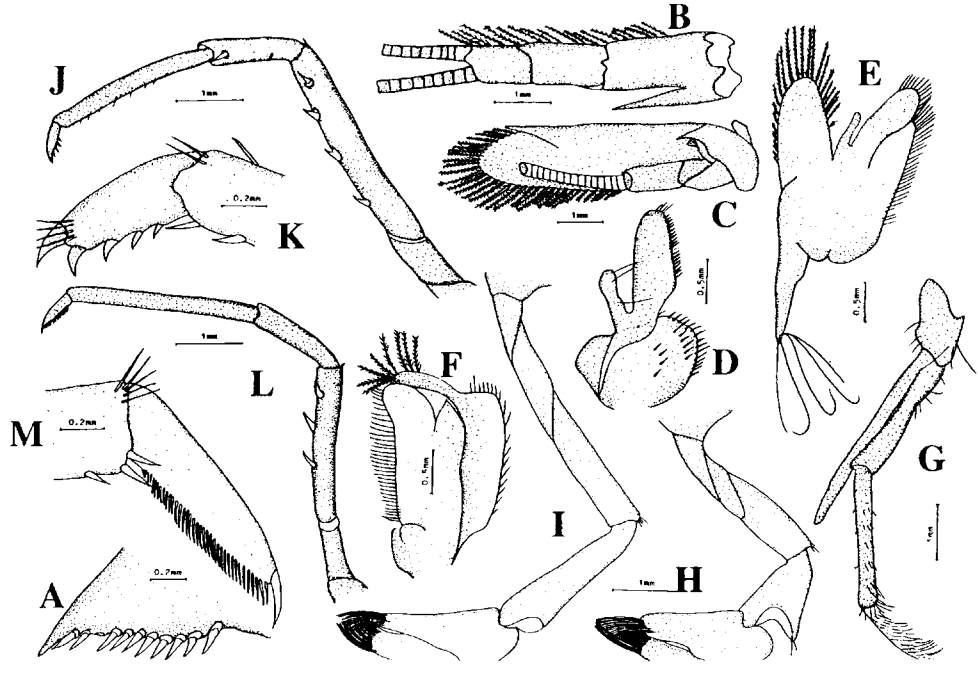

Fig. 15. *Caridina angustifolia*, new species. A. uropod diaeresis, B. antennular peduncle, C. scaphognathite, D. maxillula, E. maxilla, F. first maxilliped, G. third maxilliped, H. first pereiopod, I. second pereiopod, J. third pereiopod, K. dactylus of third pereiopod, L. fifth pereiopod, M. dactylus of fifth pereiopod.

Uropod with 10 to 13 spinules on diaeresis.

Etymology. - The name is derived from the Latin "angusta" for narrow and "folia" for leaf, with reference to the shape of the endopod of the first pleopod in male.

Remarks. - *Caridina angustifolia*, new species, resembles *C. phyllopoda* Huang, 1984, and *C. euryphlla*, new species, in the shapes of the endopod of the male first pleopod, appendix masculina of the male second pleopod and distal portion of the telson. It can be distinguished from *C. phyllopoda* by the shape of the rostrum, which reaches approximately to the end of the antennular peduncle and is slightly curved upward at the distal region (vs. reaching only to the end of the basal segment of the antennular peduncle), and the first pleopod endopod being relatively narrower, measuring about 2.0 to 2.2 times as long as broad (vs. about 1.6 times as long as broad). It can be distinguished from *C. euryphlla* by the shape of the rostrum (the posterior half is straight and slightly curved upward at the anterior vs. tapering gradually to a slender apex), the presence of a distinct spine on the pterygostomian (vs. absent) and the length to width ratio of the first pleopod endopod (2.0 to 2.2 times vs. 1.7 to 2.0 times).

Habitat. - The new species was collected (at only one particular location) in a mountain stream at an elevation of 450 m. The water which flows slowly, is clear with a depth of about 0.5 to 1.0 m. The temperature was 10°C and the pH was 7.0.

Caridina medifolia, new species

(Figs. 16-18)

Material examined. - Holotype: male, 20 mm, Xiaojin village near Daqun town, coll. 7 Nov.1988.

Paratypes - 4 males, 20 to 23 mm, 1 female, 23 mm, same data as holotype. — 1 female, 24 mm, ovigerous, Jinsha village, Chishui county, coll. 21 Jul.1992.

Others. - 4 males, 6 females, Chishui city, elevation 250m, 21°C,pH 6. 5, coll. 2 Oct.1988. — 2 males, 6 females, Baoyuan village, elevation 380m, 20 °C, pH 6.0, coll. 19 Oct.1988. — 1 male, 11 females, Liming village, elevation 800m, 18°C, pH 6.5, coll. 19 Oct.1988. — 2 males, 2 females, Panlong village, elevation 800m, 18°C, pH 6.5, coll. 19 Oct.1988. 2 males, 7 females, Yunji village, elevation 850 m, 15°C, pH 6.5, coll. 27 Oct.1988. — 3 males, 10 females, Xiaojin village, elevation 400m, 16°C, pH 7.0, coll. 7 Nov.1988. — 10 males, 10 females, Laodong village, near Huaping village, elevation 380m, 19°C, pH 6.5, coll. 6 Jul.1992. — 2 males, 2 females, Yonghe village, elevation 280m, 18°C, pH 6.5, coll. 9 Jul.1992. — 8 males, 6 females, Qianhua village, near Kaixuan village, elevation 500m, 21°C, pH 6.5, coll. 15 Jul.1992. — 1 female, Jingsha village, elevation 400m, 28°C, pH 6.5, coll. 21 Jul.1992. — 4 males, 5 females, Xinyi village, elevation 500m, 16°C, pH 6.5, coll. 16 Nov.1992. —5 males, 5 females, Xinyi village, elevation 600m, 15°C, pH 6.5, coll. 17 Nov.1992. — 5 males, 5 females, Xinyi village, elevation 700m, 16°C, pH 6.5, coll. 17 Nov.1992. — 10 males, 12 females, Xinyi village, elevation 750m, 21°C, pH 6.5, coll. 18 Nov.1992.

Description. - Rostrum extremely short, reaching only about 0.75 length of basal segment of antennular peduncle, extends to end of eye, 0 to 6 (commonly 0 or 1) dorsal spines, 0 to 2 indistinct ventral serrations close to tip.

Length of carapace about 1.6 times as long as rostrum. Lower orbital angle blunt, fused perfectly to indistinctive antennal spine. Pterygostomian margin of carapace rounded. Sixth somite measures about 1.5 times as long as fifth, slightly shorter than telson, about half length of carapace.

Telson similar to previous species.

Eyes well developed. Length of antennular peduncle about 0.6 times as long as carapace. Anterolateral angle of basal segment of antennular peduncle sharp, reaching 0.25 length of second segment of antennular peduncle. Stylocerite rather sharp reaching 0.8 length of basal segment of antennular peduncle. Antennal peduncle reaches beyond middle of second segment of antennular peduncle. Scaphocerite with a sharp final tooth reaching end of antennular peduncle, measuring more than 3.5 times as long as broad in widest, tip reaches beyond end of antennular peduncle.

Mouth parts normal (Fig. 17). Third maxilliped exopod reaches end of antennular peduncle, ultimate segment slightly longer than penultimate segment, terminating in a claw.

First pereiopod short and robust, reaching end of basal segment of antennular peduncle, chela measures about 2.3 times as long as broad, about 1.4 times length of carpus, fingers 1.3 times longer than palm, carpus about 1.7 times as long as high, about as long as merus. Second pereiopod reaches end of second segment of antennular peduncle, chela about 3 times as long as broad, fingers about 1.6 times as long as its palm, carpus slender, about 4.7 times as long as high, equal to length of chela, merus about as long as carpus. Third pereiopod reaches beyond end of antennular peduncle, dactylus ends in 2 claws, with 5 or 6 (commonly 5) small spines on posterior margin, propodus about 10 times as long as broad, 4.5 times length of dactylus, numerous small spinules on posterior surface, carpus with strong movable spine on distal end of outer surface, slightly more than half length of propodus, about 4 times as long as broad, merus strong, about 2.3 times as long as carpus, 3 or 4 strong movable spines on posterior surface. Fifth pereiopod reaches end of second segment of antennular peduncle, dactylus ends in curved claw-like tip, single row of 42 to 60 closely packed comb-like spinules on posterior margin, propodus about 12 times as long as broad, 3 times length of dactylus with numerous small spinules on posterior surface, carpus about half length of propodus, strong movable spine on surface at distal region, merus longer and stronger than carpus, 1.7 times as long as carpus, bears 3 strong movable spines on outer surface.

Endopod of first pleopod (male) leaf-like lamella that narrows in distal region, strong appendix interna at distal half, 1.7 to 2.1 times as long as broad, about half length of exopod. Appendix interna leaf-like, narrower than endopod, about 2.5 to 3.0 time as long as broad, length about equals to width of endopod. Appendix masculina of second pleopod (male) stick-like, slightly curved outward at distal half, about half length of endopod with numerous strong spinules on its distal half. Appendix interna reaches 0.67 length of appendix masculina, slightly curved outward at distal region.

Uropod with 14 to 18 spinules on diaeresis.

Number of eggs on paratype ovigerous female 28, eggs quite large, size 1.25 to 1.45 x 0.86 to 1.00 mm.

Etymology. - The name is derived from the Latin "med" for medius and "folia" for leaf, with reference to the leaf-like in shape and intermediate length to breadth ratio of the endopod of the male first pleopod.

Remarks. - *Caridina medifolia*, new species, resembles *C. phyllopoda* Huang, 1984, *C. chishuiensis*, new species, *C. euryphlla*, new species, and *C. angustifolia*, new species, in

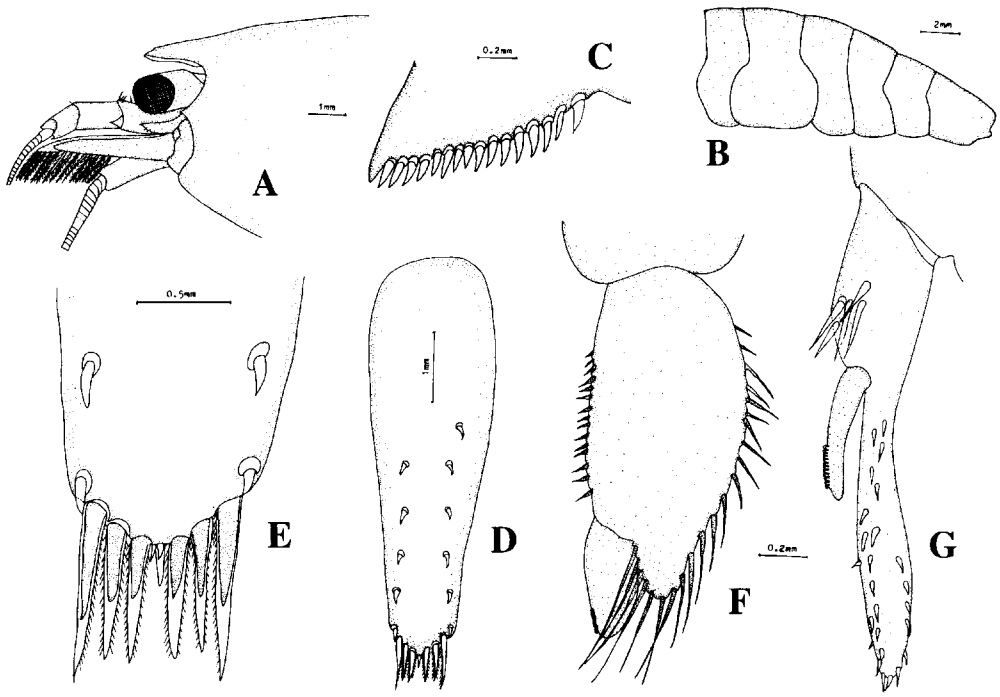

Fig. 16. *Caridina medifolia*, new species. A. anterior portion of cephalothorax, B. abdominal somites, C. uropodal diaeresis, D. telson, E. posterior portion of the telson, F. endopod and appendix interna of first pleopod, G. appendix masculina and appendix interna of second pleopod.

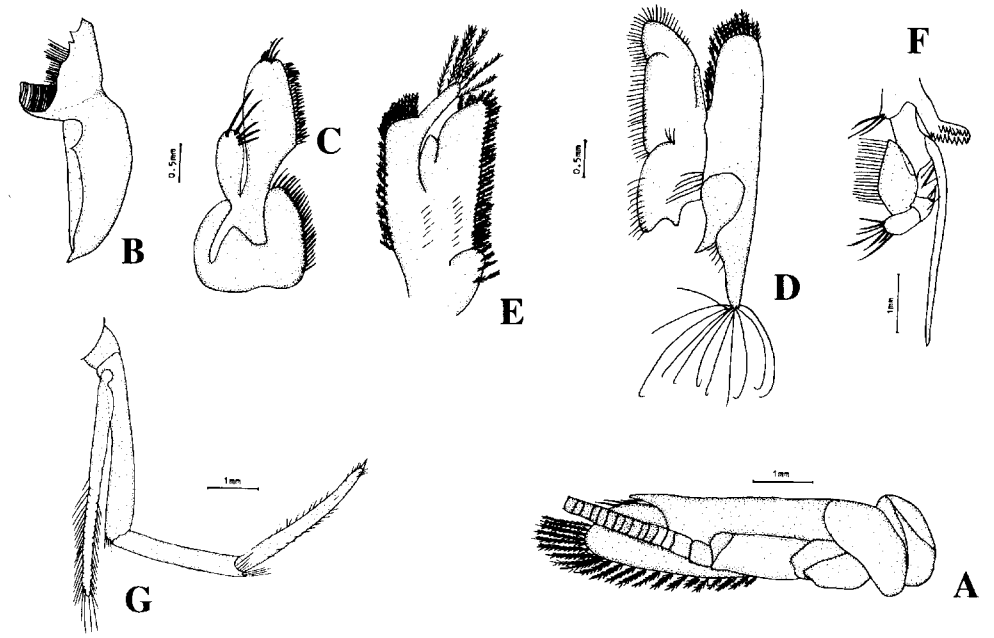

Fig. 17. *Caridina medifolia*, new species. A. scaphognathite, B. mandible, C. maxillula, D. maxilla, E. first maxilliped, F. second maxilliped, G. third maxilliped.

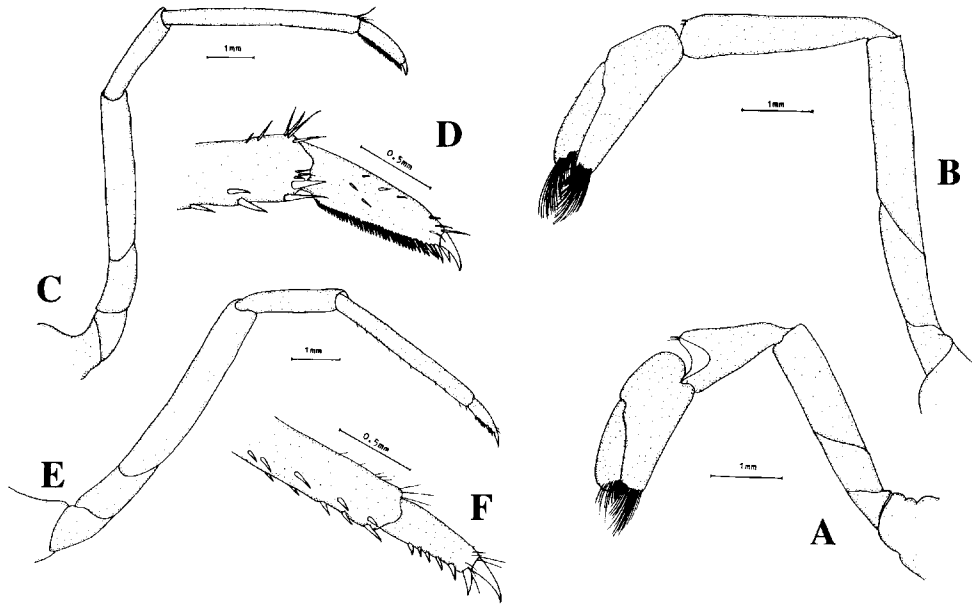

Fig. 18. *Caridina medifolia*, new species. A. first pereiopod, B. second pereiopod, C. third pereiopod, D. dactylus of third pereiopod, E. fifth pereiopod, F. dactylus of fifth pereiopod.

the shape of the endopod of male first pleopod, appendix masculina of the male second pleopod and shape of the distal part of the telson. It can be distinguished from these species by the shape of the rostrum, which is short, reaching only to 0.75 times the length of the basal segment of antennular peduncle (vs. reaching to or far beyond the end of the basal segment), unarmed or with 1 to 6 dorsal spines (mode 0 to 1), and none or 1 to 2 indistinct ventral serrations close to the tip (vs. with 17 to 22 dorsal spines and 3 to 4 ventral teeth on *C. phyllopoda*, 10 to 28 dorsal spines and 5 to 9 ventral teeth on *C. chishuiensis*, 21 to 26 dorsal spines and 6 to 9 teeth on *C. euryphylla*, 17 to 24 dorsal spines and 5 to 9 ventral teeth on *C. angustifolia*); and the egg size measuring 1.25 to 1.45 by 0.86 to 1.00 mm (vs. 0.95 to 1.05 by 0.72 to 0.87 in *C. chishuiensis*, 1.05 to 1.2 by 0.70 to 0.73 in *C. euryphylla*).

Habitat. - This new species is widely distributed in the investigated region. Numerous specimens were obtained in mountain streams and field channels between the altitudes of 250 and 700 m.

Caridina paracornuta, new species
(Figs. 19-21)

Material examined. - Holotype: male, 24 mm, Chuanfengao stream, Hongyan village, coll. 16 Dec.1988.

Paratypes - 6 males 6 females, 24 to 26 mm, coll. 16 Dec.1988. — 2 females (ovigerous), 26 to 30 mm, coll. 28 May.1992.

Others - 7 males, 12 females, Hongyan village, elevation 800m, 5°C, pH 7.0, coll. 16 Dec.1988. — 10 males, 18 females, Hongyan village, elevation 800m, 18°C, pH 7.0, coll. 28 May.1992.

Description. - Rostrum very short with sharp end, 0 to 7 indistinct ventral teeth close to tip, reaching only slightly beyond eye, occasionally reaches end of antennular peduncle.

Length of carapace 4 times length of rostrum. Antennal spine sharp fused to lower orbital angle. Pterygostomian margin of carapace rounded.

Sixth somite about half length of carapace, nearly twice length of fifth, equal to length of telson.

Telson with triangular median point, about half length of carapace, slightly shorter than antennular peduncle, 5 or 6 pairs dorsal spinules. Posterior margin of telson convex, lined with 4 pairs of spines, lateral longest, outer shorter, 2 intermediates nearly equal in length.

Eyes well developed. Antennular peduncle about 0.7 length of carapace, basal segment longest, about twice length of second. Third slender and shorter than second. Stylocerite rather sharp, reaching to 0.75 length of basal segment. Anterolateral angle of basal segment sharp reaching 0.25 length of second segment. Antennal peduncle reaches slightly beyond middle of second segment of antennular peduncle with sharp tooth near base of scaphocerite. Scaphocerite reaches distinctively beyond end of antennular peduncle, sharp tooth on outer margin near distal end, about 3 times as long as broad.

Mouth parts normal (Fig. 20). Third maxilliped with an exopod reaches beyond end of antennular peduncle, ultimate segment about as long as penultimate segment ends in a terminal claw.

First pereiopod short, robust, reaches middle of second segment of antennular peduncle,chela twice as long as broad, fingers slightly longer than palm, carpus about 1.4 times as long as high, deep excavation in anterior end, 0.7 length of chela, ischium short, about half length of merus. Second pereiopod reaches beyond end of antennular peduncle, chela 2.8 times as long as broad, fingers twice longer than palm, carpus slender without excavation, about 4 times as long as high and is about as long as chela, merus slightly shorter than carpus, ischium about 0.33 length of merus. Third pereiopod reaches end of antennular peduncle, dactylus ending in 2 claws, 5 to 7 spines on posterior margin, propodus about 9 times as long as broad, 3 times length of dactylus, with numerous small spinules on posterior surface, carpus with strong movable spine on distal outer surface, slightly longer than half length of propodus, about 4 times as long as broad. Merus about twice length of carpus, bears 3 strong movable spines on outer surface. Fourth pereiopod reaches end of second segment of antennular peduncle, similar to third. Fifth pereiopod reaches to end of antennular peduncle, dactylus about 0.2 length of propodus, ending in a curved claw-like tip, a row of 40 to 48 closely packed comb-like spinules on posterior margin, propodus with numerous small spinules on posterior surface, carpus about 0.33 length of propodus, a strong movable spine on distal outer surface. Merus longer, stronger than carpus, 3 strong movable spines on outer distal surface, ischium shortest.

Endopod of first pleopod (male) sub-rectangular, rounded end, inner margin slightly concave in middle, a horned projection on proximal region, about 2.5 times as long as broad, about half length of exopod. Appendix interna on distal half of endopod, slanted, shorter than width of endopod. Appendix musculina of second pleopod (male) short, about half length of endopod, bearing numerous strong spinules on inner distal surface. Appendix interna of second pleopod at middle of appendix masculina, reaches about to 0.9 times length of appendix masculina.

Uropod with 14 to 17 spinules on diaeresis.

Number of eggs on one paratype ovigerous female 20, eggs quite large, size 1.25 to 1.48 x 0.82 to 0.88 mm.

Etymology. - The name for the new species is derived from the *C. cornuta* Liang & Yan, 1986, after the shape of its endopod of the first pleopod in male which is provided with a horned projection on the proximal region, and with the prefix "para" for near, in reference to the close relationship of the two species.

Remarks. - *Caridina paracornuta*, new species, is most similar to *C. cornuta* Liang & Yan, 1986 from Zhijin, western Guizhou, in the shape of the endopod of male first pleopod. It can be distinguished by the shape of the rostrum, which is short, reaches to 0.8 the length of basal segment of the antennular peduncle, occasionally reaching the end of it, being unarmed or with 1 to 7 dorsal spines, unarmed or with 1 to 5 indistinct ventral teeth close to the tip (vs. reaching beyond the middle of the third segment, with 16 to 24 dorsal spines and 7 to 10 ventral teeth), and the telson possessing a triangular median point; and the eggs being smaller in size (1.25 to 1.48 by 0.82 to 0.88 mm vs. 1.58 to 1.71 by 1.06 to 1.20 mm).

Habitat. - Numerous specimens were collected from mountain streams which measured about 0.5m in width with sandy bottoms at Chuanfengao, a site at an elevation of 800 m near Hongyan village. The water is clear and about 0.2 to 0.5 m in depth, with a temperature being about 5°C and a pH of about 7.0.

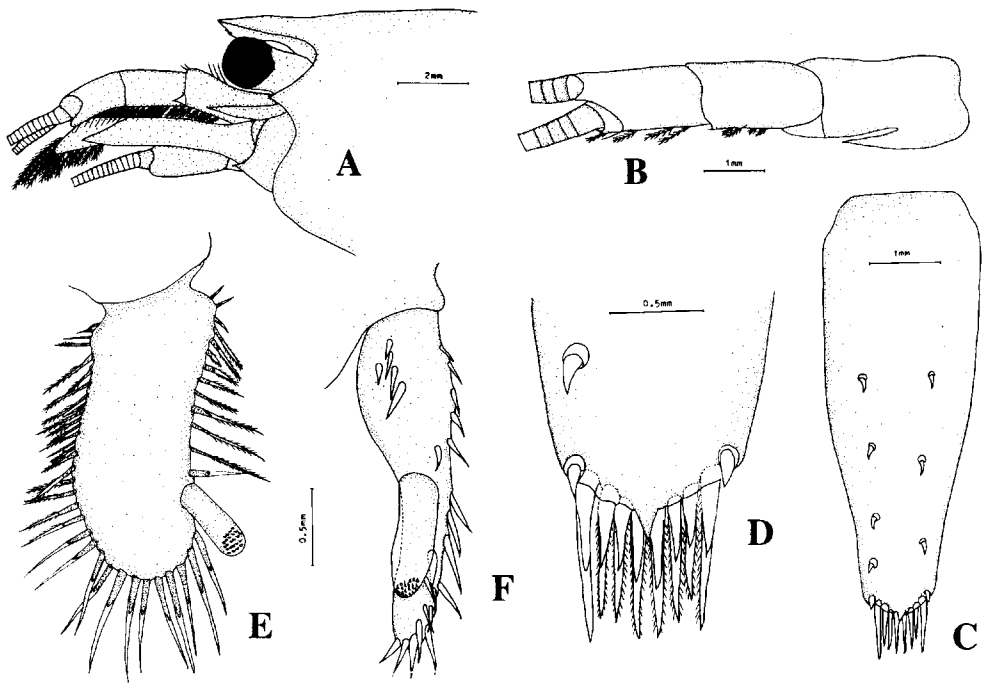

Fig. 19. *Caridina paracornuta*, new species. A. anterior portion of cephalothorax, B. antennular peduncle, C. telson, D. posterior portion of the telson, E. endopod and appendix interna of male first pleopod, F. appendix masculina and appendix interna of male second pleopod.

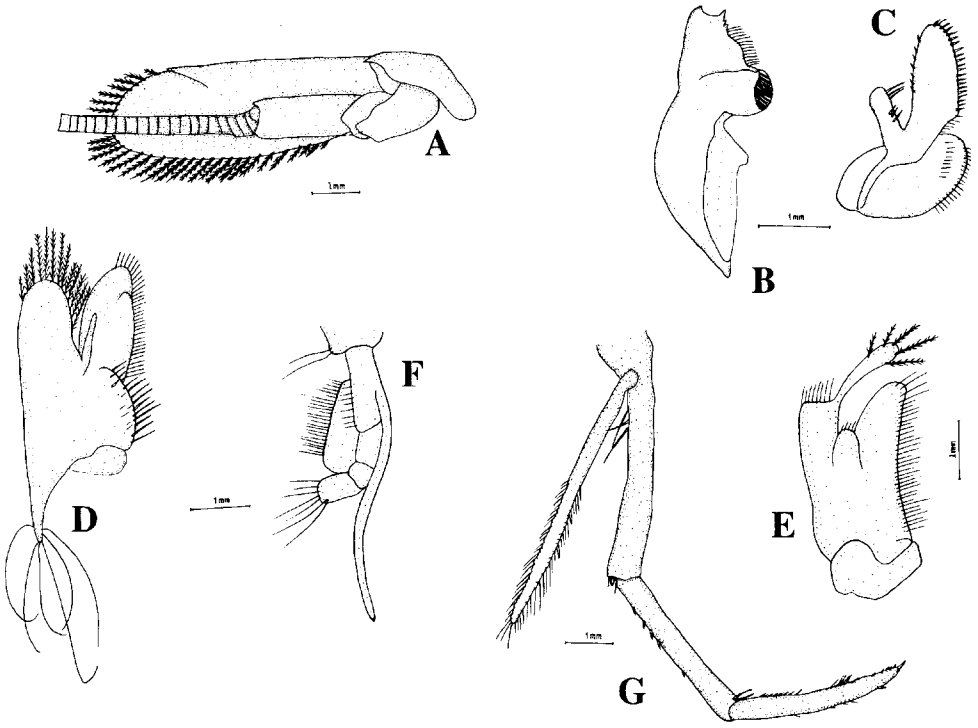

Fig. 20. *Caridina paracornata*, new species. A. scaphognathite, B. mandible, C. maxillula, D. maxilla, E. first maxilliped, F. second maxilliped, G. third maxilliped.

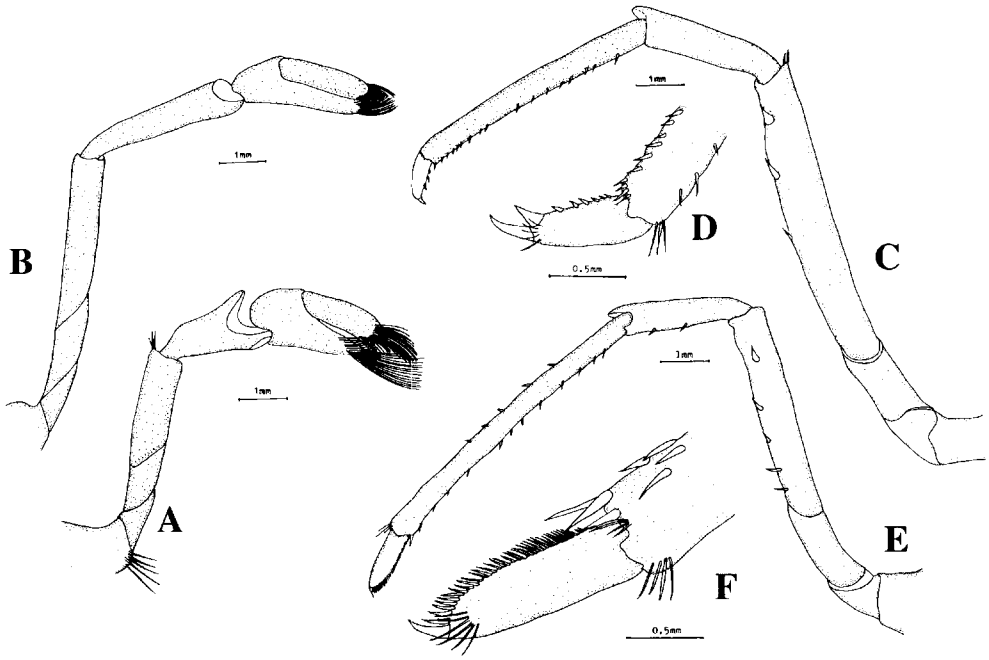

Fig. 21. *Caridina paracornuta*, new species. A. first pereiopod, B. second pereiopod, C. third pereiopod, D. dactylus of third pereiopod, E. fifth pereiopod, F. dactylus of fifth pereiopod.

***Caridina sumatianica*, new species**
(Figs. 22-23)

Material examined. - Holotype: male, 21 mm, Sumatian stream, near Hongyan village, coll. 26 Jul.1992.

Paratypes - 3 males, 19 to 22.5 mm, 7 females, 20 to 26 mm, coll. 26 Jul.1992.

Description. - Rostrum short, reaching to 0.8 length or occasionally to end of basal segment of antennular peduncle, only armed ventrally with 2 to 4 indistinct teeth close to tip.

Length of carapace 4 times as long as rostrum. Antennal spine fused with lower orbital angle. Pterygostomian margin of carapace rounded.

Sixth somite about 0.45 length of carapace, 1.6 times as long as fifth, as long as telson.

Telson tapers gradually towards posterior with triangular median point, about half length of carapace, slightly shorter than antennular peduncle, bearing 5 to 6 pairs of dorsal spinules. Posterior margin of telson convex, 4 pairs of spines, lateral pair longest, outer shortest, 2 intermediates nearly equal in length.

Eyes well developed. Antennular peduncle about 0.6 length of carapace. Basal segment longer than others, about twice as long as second segment. Third segment more slender, shorter than second. Stylocerite sharp, reaching 0.75 length of basal segment. Anterolateral angle of basal segment sharp, reaching 0.25 length of second segment. Antennal peduncle reaches to end of second segment of antennular peduncle. Scaphocerite reaches beyond end of antennular peduncle, sharp tooth on outer margin near distal end, 3 times as long as broad.

Mouth parts normal (Figs. 22, 23). Third maxilliped with an exopod reaches beyond end of antennular peduncle, ultimate segment slightly shorter than penultimate segment, terminal claw.

First pereiopod short and robust, reaches middle of basal segment of antennular peduncle, chela 2.2 times as long as broad, fingers 1.5 times as long as palm, carpus about 1.6 times as long as high, deep excavated anterior, 0.7 times length of chela. Second pereiopod reaches end of second segment of antennular peduncle, chela 2.6 times as long as broad, fingers 1.8 times longer than palm, carpus slender without excavation, about 4 times as long as high, about equal to length of chela. Third pereiopod reaches beyond end of antennular peduncle, dactylus terminates in 2 claws, 4 to 5 spines on posterior surface, propodus about 10 times as long as broad, 5 times as long as dactylus, with numerous small spinules on posterior surface, carpus with strong movable spines on outer distal surface, slightly longer than half length of propodus, about 4 times as long as broad, merus strong, about twice length of carpus, bearing 3 strong movable spines on outer surface. Fourth pereiopod reaches to end of second segment of antennular peduncle, similar to third. Fifth reaches to end of second segment of antennular peduncle, dactylus about 0.25 length of propodus ends in curved claw-like tip, single row of about 45 to 48 closely packed comb-like spinules on posterior margin, propodus with numerous small spinules on posterior surface, carpus longer than 0.33 length of propodus, bearing strong movable spine on outer distal surface, merus longer and stronger than carpus, bearing 3 strong movable spines on outer surface.

Endopod of first pleopod (male) sub-rectangular, rounded at distal end, about 2.5 times

as long as broad, half length of exopod. Appendix interna situated on distal half of endopod, straight, reaches beyond distal margin of endopod, length about equal to width of endopod. Appendix masculina of second pleopod (male) short, small, half length of endopod, numerous strong spinules on inner distal surface. Appendix interna reaches 0.9 length of appendix masculina.

Uropod with 16 or 17 spinules on diaeresis.

Etymology. - The name is derived from its type locality.

Remarks. - *Caridina sumatianica*, new species, most resembles *C. guizhouensis* Liang & Yan, 1986, and *C. paracornuta*, new species, in the shape of the endopod of first pleopod in male. It can be distinguished from *C. guizhouensis* by the shape of the rostrum, which is short, reaching to the 0.8 length of and occasionally to the end of the basal segment of the antennular peduncle (vs. reaching beyond the end of basal segment), unarmed dorsally (vs. with 2 to 22 dorsal spines), and the appendix interna of the male second pleopod being thicker and stronger. It can be distinguished from *C. paracornuta* by its straight inner margin of the endopod of first male pleopod endopod (vs. medially concave), and the lack of a projection on the proximal region (vs. with a horned projection on proximal region).

Habitat. - Numerous specimens were collected from a mountain stream which is about 0.5m in width with sandy bottom at an elevation of 550 m near Hongyan village. The water is clear and about 0.2 to 0.5 m in depth, with a temperature of about 29°C and a pH at 6.5.

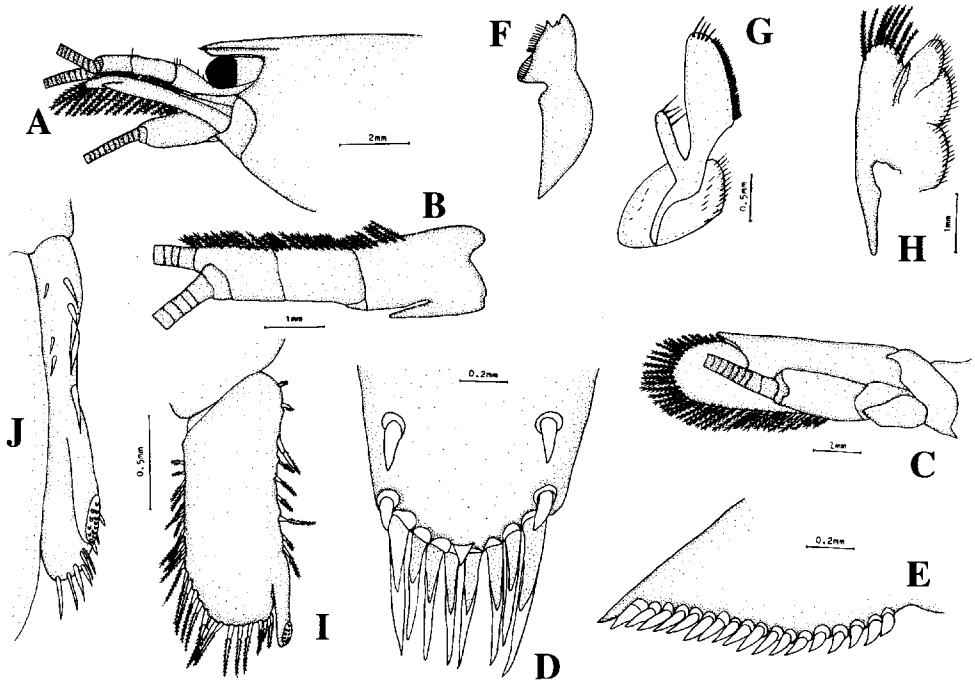

Fig. 22. *Caridina sumatianica*, new species. A. anterior portion of cephalothorax, B. antennular peduncle, C. scaphognathite, D. posterior portion of the telson, E. uropod diaeresis, F. mandible, G. maxillula, H. maxilla, I. endopod and appendix interna of first pleopod, J. appendix masculina and appendix interna of second pleopod.

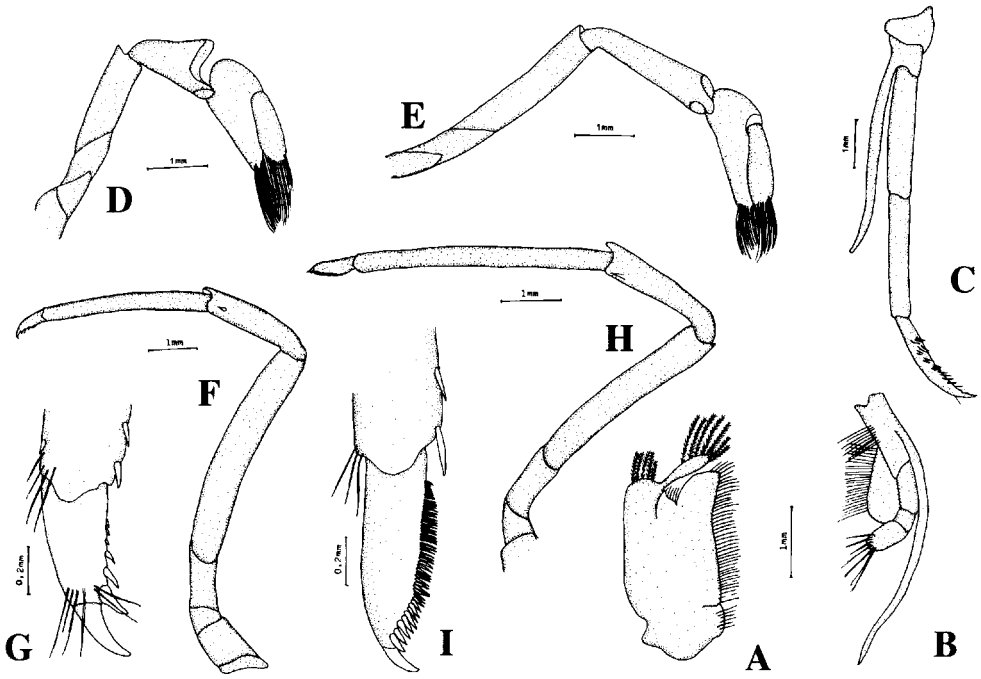

Fig. 23. *Caridina sumatianica*, new species. A. first maxilliped, B. second maxilliped, C. third maxilliped, D. first pereiopod, E. second pereiopod, F. third pereiopod, G. dactylus of third pereiopod, H. fifth pereiopod, I. dactylus of fifth pereiopod.

KEY TO THE ATYID SHRIMPS FROM CHISUI REGION

1. Endopod of first pleopod in male swollen 2
- Endopod of first pleopod in male not swollen 6

2. Endopod swollen at distal half, inverted palm-shaped, bearing numerous saw-toothed shaped spinules in dorsal surface near distal portion ..... *Neocaridina palmata* (Shen, 1948)
- Endopod distinctly swollen, resembles leaf-like lamella 3

3. Rostrum extremely short, reaching about 0.75 length basal segment of antennular peduncle ..... *Caridina medifolia*, new species
- Rostrum reaches beyond end of basal segment of antennular peduncle 4

4. Rostrum reaches to mid-point or almost to end of second segment of antennular peduncle ..... *C. chishuiensis*, new species
- Rostrum reaches beyond tip of second segment of antennular peduncle 5

5. Rostrum tapers gradually to slender apex, ratio of length to width of first male pleopod endopod 1.6 to 1.7 ..... *C. euryphylla*, new species
- Rostrum straight at posterior half, slightly curved upward at anterior end, ratio of length to width of male first pleopod endopod 2.0 to 2.2 ..... *C. angustifolia*, new species

6. Endopod of male first pleopod sub-rectangular in shape 7
- Endopod of male first pleopod oval or sub-triangular in shape 8

7. Inner margin of endopod slightly concave medially, with horned projection on proximal region ..... *C. paracornuta*, new species
- Inner margin of endopod straight, without projection on proximal region ..... *C. sumatianica*, new species

8. Endopod of male first pleopod oval ..... *C. elliptica*, new species
- Endopod of male first pleopod sub-triangular ..... *C. hongyanensis*, new species

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