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1938 Studies on Chinese *Caridina* with descriptions of five new species

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## STUDIES ON CHINESE CARIDINA WITH DESCRIPTIONS OF FIVE NEW SPECIES

By SHOU CHIE YÜ

(With 16 Figures in the Text)

The shrimps of this group, as preserved in the collection of the Fan Memorial Institute of Biology, contain the representatives of the following ten different species:

- Caridina denticulata* DE HAAN
- Caridina nilotica gracilipes* DE MAN
- Caridina lanceifrons* YÜ
- Caridina cavalerei* BOUVIER
- Caridina gregoriana* KEMP
- Caridina cantonensis* sp. nov.
- Caridina pingi* sp. nov.
- Caridina pingioides* sp. nov.
- Caridina babaultioides* sp. nov.
- Caridina yunnanensis* sp. nov.

Five of them prove to be new to science. The structures of the secondary sexual appendages of the male of all the species described below, except *Caridina cavalerei* BOUVIER which has no male representatives in the collection, are very distinct and quite constant. For the classifications of the shrimps of the genus *Caridina*, in the opinion of the present writer, strong emphasis should be given to the secondary sexual appendages which are more significant than any other characters.

**Caridina denticulata** DE HAAN

*Caridina denticulata* DE HAAN, 1849, Fauna Japonica; Crust., p. 186, pl. xlvi, fig. 8.  
*Caridina denticulata sinensis* KEMP, 1918, Mem. Asiat. Soc. Bengal, vol. vi, p. 287, figs.

*Caridina dividi* BOUVIER, 1904, Bull. Mus. Nat. Hist. Paris, p. 134.

The rostrum extends more or less beyond the extremity of the second segment of the antennular peduncles. In lateral view, it is straight and sword shaped. The dorsal border bears most commonly from 14 to 20 compact teeth, of them 2 or 3 are often placed on the carapace just behind the posterior limit of the orbit; its distal portion of the dorsal border is free from teeth. The lower border of the rostrum, which is not dilated before the eyes and curved as usual towards its tip, bears frequently from 2 to 5 teeth; the antero-lateral angles are furnished with a pterygostomian spine.

The carpus of the first leg is deeply excavated anteriorly and its length is about one half time as long as its distal breadth. The palm extend hardly backwards behind the carpopropodal articulation; the fingers are only a trifle longer than the palm and nearly as long as the carpus.

The carpus of the second leg is 4 times or more as long as its distal breadth. The chela is nearly as long as the carpus and about three times as long as wide; the palm is three-fifth as long as the fingers.

The propodus of the third leg is about 7 times as long as its maximum distal breadth and two and half times as long as the dactylus. The latter is about 3.5-4 times as long as wide and bears on its posterior border frequently 7-8 spinules.

The propodus of the fifth leg is about ten times as long as its breadth and about 2.5 times as long as the dactylus which is hardly 5 times as long as wide and bears a series of 58 to 70 spinules.

The sexual endopod of the first pleopod of the male is greatly

dilated into a wide and thin cupule, concave in the back and covered in the front with numerus spinules; no setæ are observed on the all-rounded borders. The diameter of the cupule is a little more than 3 times as long as its basal handle.

The appendix masculina of the second pleopod of the male reaches nearly to the half length of the endopod; its general shape is subovate; it is three times as long as wide at its distal portion and covered with many stout spines. The appendix interna which is a slender stick and about 6-7 times as long as wide reaches to two thirds the length of the appendix masculina.

The telson bears generally 5 pairs of dorsal spinules, and its apex which is terminated in a triangular spine is furnished, between the spinules at the postero-lateral corners, with 5 pairs of coarse and equi-lengthed setae.

Full grown female reaches a length of about 30 mm. from the tip of rostrum to the end of telson.

The above descriptive notes are based upon numerous specimens obtained from various localities in this country.

#### **Caridina nilotica gracilipes DE MAN**

*Caridina nilotica gracilipes* DE MAN, 1908. Rec. Ind. Mus., p. 290, pl. xx, fig. 7.

The rostrum (Fig. 1, a) extends beyond the extremity of the terminal segment of the antennular peduncle by its distal one-fourth. In lateral view, it is slightly bended downwards at its proximal portion and turned up again towards its distal half. The proximal half to two-thirds of its dorsal border bears from 16 to 22 (most commonly 18-20) compact teeth, of them the first or second is often placed on the carapace just behind the posterior limit of the orbit; the distal third to half of the dorsal border is free from teeth and the tip is almost always bifid (rarely trifid). The lower border of the rostrum, which is dilated

at the portion just before the eyes and narrowed gradually towards its tip, bears from 10 to 18 (most commonly 13-16) teeth; the last tooth

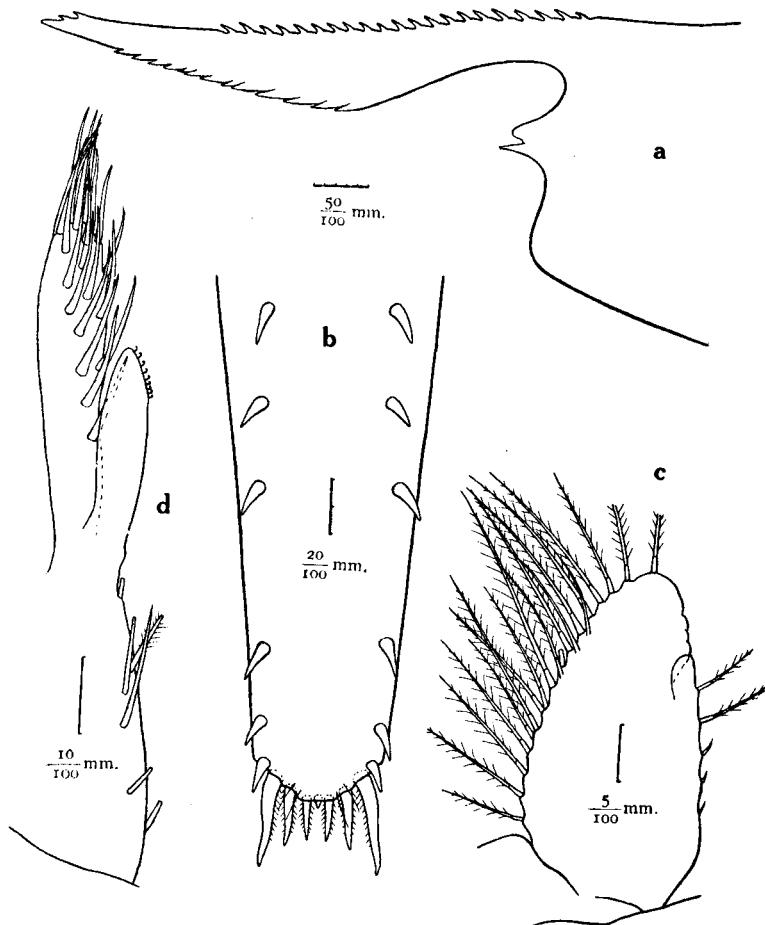


Fig. I. *Caridina nilotica gracilipes* DE MAN (a, b, ♀; c, d, ♂)

is frequently somewhat remote from the tip. The antero-lateral angles are bluntly rounded, and without pterygostomian spine.

The carpus of the first leg (Fig. 2, e.) is moderately excavated anteriorly and its length is about two times as long as its distal breadth. The palm extend hardly backwards behind the carpopropodal articulation; the fingers are longer than the palm and shorter than the carpus.

The carpus of the second leg (Fig. 2, f.) is about 5 times as long as its distal breadth. The chela is about eight-ninths as long as the carpus and three times as long as wide; the palm is three-fifths as long as the fingers.

The propodus of the third leg (Fig. 2, g.) is about 11 times as long as wide and hardly 5 times as long as the dactylus. The dactylus is about 3 times as long as wide and bears frequently 7 or 8 spinules.

The propodus of the fifth leg (Fig. 2, i.) is about 15 times as long as its proximal breadth and 3 times as long as the dactylus which is about 5 times as long as wide and bears a series of 47 to 55 spinules.

The sexual endopod (Fig. 1, c.) of the first pleopod of the male is a cone-shaped lamella; it is very small and only one-fourth as long as the exopod; its length is about two times its maximum proximal width which is as long as the longest setæ on its outer border. Inner-lateral appendix is very short and rudimentary, occurring at about the beginning of the distal fourth of the inner border of the endopod.

The appendix masculina (Fig. 1, d.) of the second pleopod of the male which reaches about the half length of the endopod is very narrow and rod-shaped; it is about 5 times as long as wide and covered with many long and stout spines on its surface. The appendix interna, (Fig. 1, d.) which projects out from the base of the appendix masculina and bears retinacles, reaches to the five-eighth of the length of the appendix masculina and is nearly as wide as.

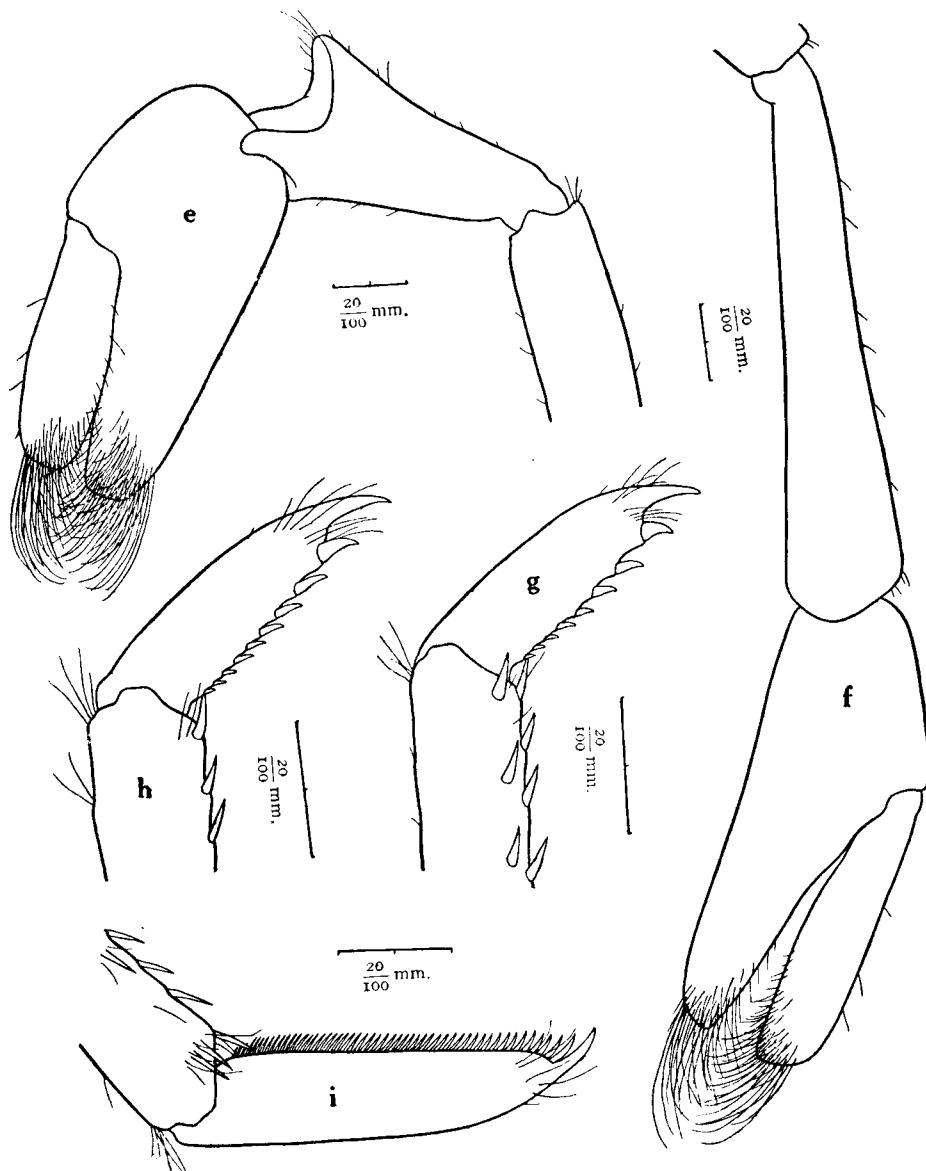


Fig. 2. *Caridina nilotica gracilipes* DE MAN (♀)

The telson (Fig. 1, b.) bears 5 or 6 pairs of dorsal spinules and its broadly rounded apex is furnished, between the spinules at the postero-lateral corners, with 3 pairs of stout setæ, of which the outermost pair is rather long and coarse; there is a short spine existed on the very end of the apex between the middle pair of setæ.

Full grown female reaches a length of about 30 mm. from the tip of rostrum to the end of telson. The eggs are not seen. The foregoing notes are based upon numerous specimens obtained from Hainan at Hai-hiu-sche near the light house. The specimens obtained from Chefoo and Amoy are also examined.

#### ***Caridina lanceifrons* YÜ**

*Caridina lanceifrons* YÜ, 1936, Chinese Jour. Zool., vol. II, p. 89, figs.

The rostrum (YÜ, 1936, p. 88, fig. 4.) extends a little beyond the extremity of the terminal segment of the antennular peduncle; in lateral view it is a little narrow and straight, and in the form of a lance. The dorsal border bears 15-19 teeth, 3-5 of them are placed on the carapace behind the posterior limit of the orbit. A short portion near the distal end of the dorsal border of the rostrum is free from teeth. The lower border of the rostrum is almost straight and bears 2-4 teeth. The last tooth is very remote from the tip and placed very often under the penultimate or antipenultimate tooth of the dorsal border. The antero-lateral angles are bluntly rounded and without pterygostomian spine.

The carpus of the first leg (Fig. 3, f.) is rather deeply excavated anteriorly, and its distal breadth is about five-eights its length. The palm does not extend far backwards behind the carpopropodal articulation; the fingers are about two-fifths longer than the palm and slightly shorter than the carpus.

The carpus of the second leg (Fig. 3, g.) is 5-6 times as long as its distal breadth. The chela is about one-fourth shorter than the

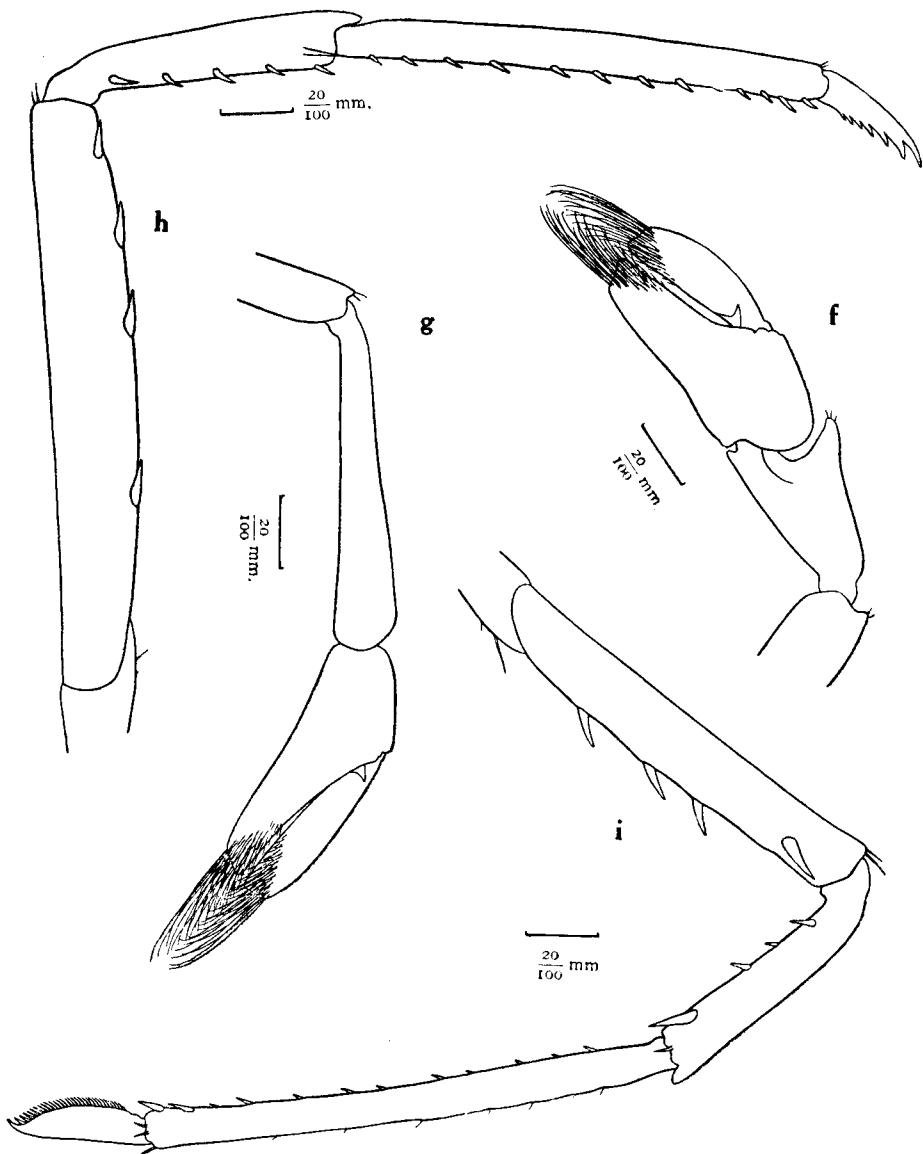


Fig 3. *Caridina lanecifrons* YÜ (♂)

carpus and 2.5 times as long as wide, the palm is only one half as long as the fingers.

The propodus of the third leg (Fig. 3, h.) is about 11 times as long as its width and 3.5 to 4 times the length of the dactylus. The dactylus is about 4 times as long as its proximal broad and bears 6 spinules.

The propodus of the fifth leg (Fig. 3, i.) is a little longer and slender; it is about 11-12 times as long as wide and 4 times as long as the dactylus. The dactylus is about 4 times as long as wide and bears a series of 30 spinules.

The sexual endopod (YÜ, 1936, p. 89, fig. 6.) of the first pleopod of the male is a small lamella, with its anterior border much narrowed and acutely rounded. It is almost 2.5 times as long as wide at its base. The setæ along the inner border are somewhat shorter than those along the outer border and both increase in length gradually from base upwards, those on the acute distal border are as long as the longest setæ of the outer border. The antero-lateral appendix which projects out from the anterior part of the inner side of the lamella passes over the acute distal border of the latter by its half length and reaches only to the half way of the length of the distal setæ. It is broad and about three times as long as wide; its oblique end is provided with sexual retinacles.

The appendix masculina (YÜ, 1936, p. 90, fig. 7.) of the second pleopod of the male is small and much narrowed; it is rod-shaped and about 6 times as long as wide; its surface is covered, probably upon its inner side, with long and slender spines. The appendix interna which is covered with retinacles on its oblique end is only slightly narrower than the appendix masculina and reaches a little beyond the half length of the same.

The telson (YÜ, 1936, p. 89, fig. 5.) bears 6 pairs of dorsal spinules and the apex, which is broadly rounded, is furnished with 4

pairs of rather stout setæ between the pair of terminal spinules at the postero-lateral corners. Of the four pairs of setæ, the middle pair is the shortest, and the outermost pair is the longest.

Full grown female reaches a length of about 20 mm. The eggs vary from .736 to .839 mm. in length and from .56 to .606 mm. in breadth.

This species was described briefly by the present writer in 1936, from seventeen specimens collected from Hoihow (in salt water), Hainan. The above notes are taken from the same materials after a detailed study on the characters of the species.

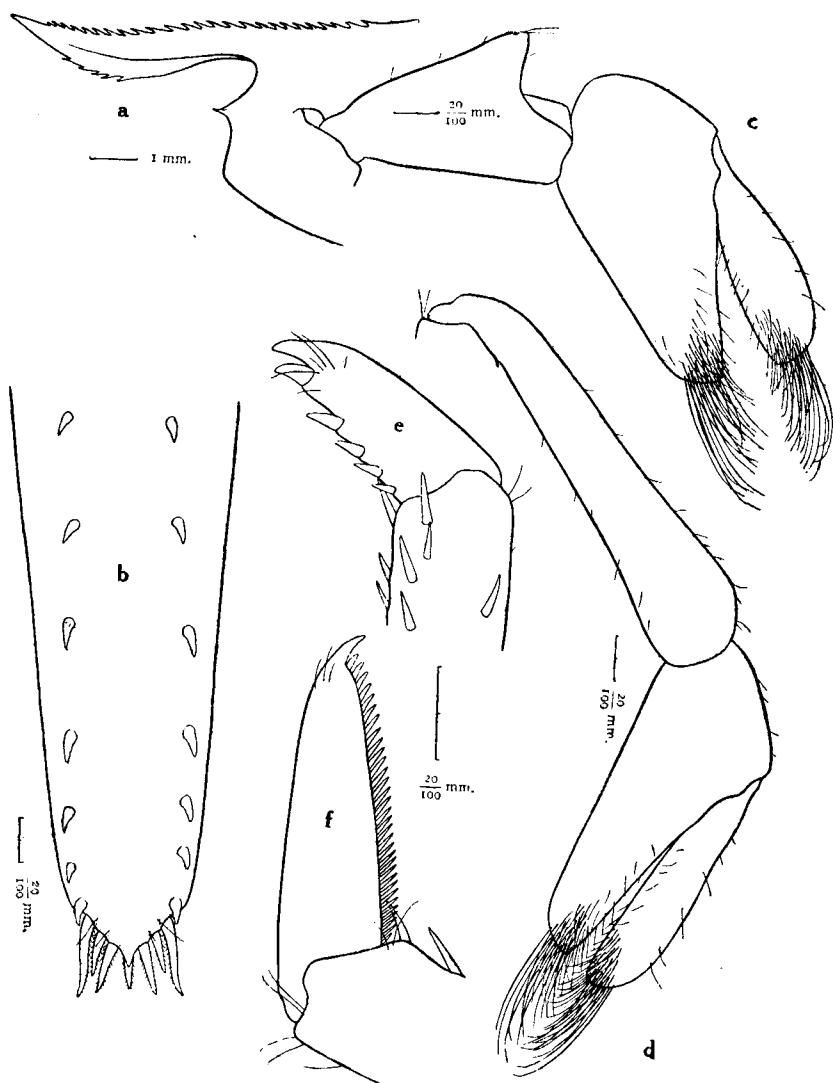
**Caridina cavaleriei** BOUVIER.

*Caridina cavaleriei* BOUVIER, 1919, Bull. Mus. Hist. Nat. Paris, p. 332, figs.

The rostrum (Fig. 4, a.) extends to the extremity of the terminal segment of the antennular peduncle. In lateral view it is slightly double curved; its dorsal border bears from 24 to 29 very compact teeth, 8-10 of them are placed often on the carapace just above the posterior limit of the orbit. The free distal portion of the dorsal border is about equal to the distance of four or five distal teeth. The lower border of the rostrum bears from 4 to 11 teeth. The last tooth is placed frequently below the antipenultimate one of the dorsal border. The anterolateral angles is abrupt enough, and without pterygostomian spine.

The first leg (Fig. 4, c.) extend beyond the ends of the eyes by their fingers. The carpus is deeply excavated anteriorly and its length is about one time and one-third as long as its distal breadth. The palm extend a little backwards behind the carpopropodal articulation; the fingers are nearly two times as long as the palm and hardly longer than the carpus.

The second leg (Fig. 4, d.) pass over the ends of the eyes by their chelæ and reach hardly beyond the distal extremity of the second segment of the antennular pedoncle. The carpus is about from 4 to 4.5

Fig. 4. *Caridina cavalerei* BOUVIER (♀)

times as long as its distal breadth. The chela is about one-fifth shorter than the carpus and two and half times as long as wide, the palm is from one half to two-thirds as long as the fingers.

The third legs (Fig. 4, e.) are very stout; its propodus is about 5 times the length of the dactylus which is only two times as long as wide and bears frequently 5 or 6 spinules.

The fifth legs (Fig. 4, f.) are as stout as the third and fourth; its propodus is about 5 times the length of the dactylus which is only three times as long as wide and bears a series of about 31-36 spinules.

The telson (Fig. 4, b.) bears 6 pairs of dorsal spinules and the apex which is angulate and terminated in a spine-shaped end is furnished, between the pair of terminal spinules at the postero-lateral corners with 3 or 4 pairs of stout setæ.

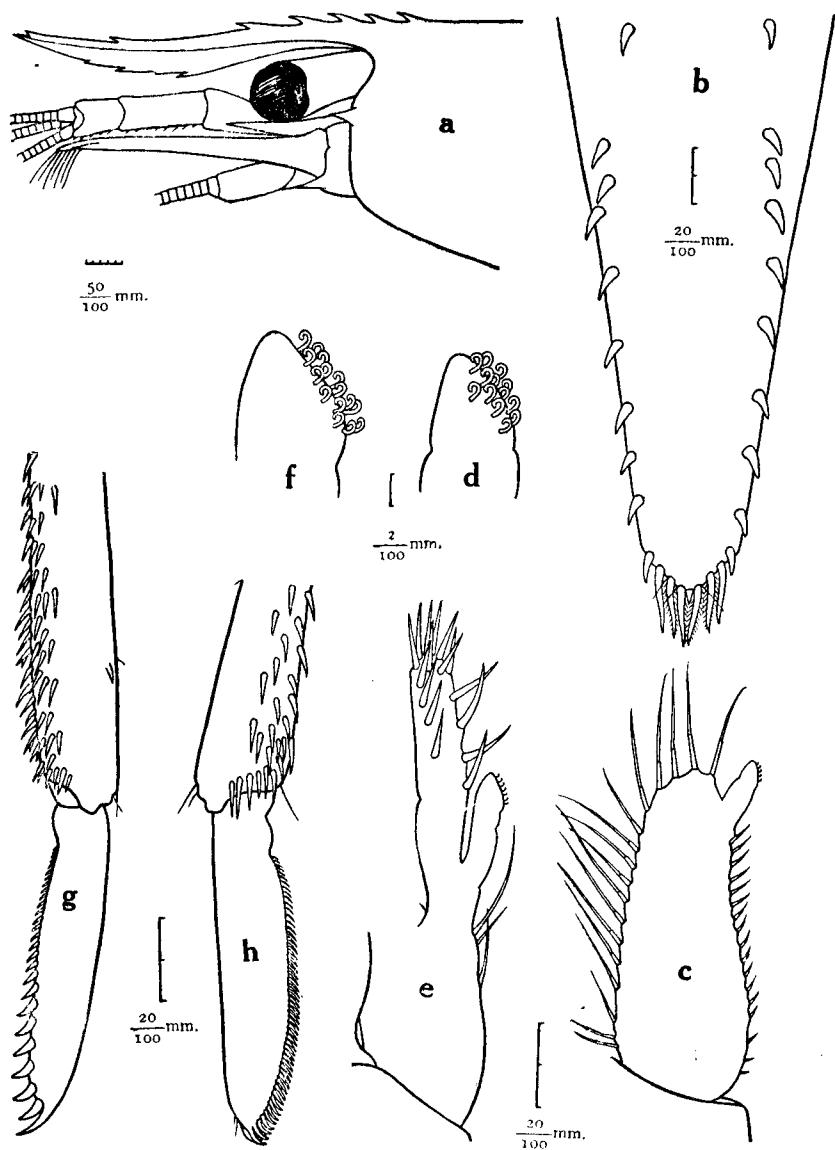
Full grown female reaches a length of about 35 mm. from the tip of rostrum to the end of telson. The eggs vary from 1.165 to 1.26 mm. in length and from .7 to .84 mm. in breadth.

The above notes are based on ten females specimens obtained from Kweichow. The males of this species are still unkown up to the present.

#### **Caridina gregoriana KEMP.**

*Caridina gregoriana* KEMP, 1924, Jour. Asiat. Soc. Beng. vol. xix No. 9, p. 437,  
figs.

The rostrum (Fig. 5, a, Fig. 6, i.) extends to or beyond the extremity of the terminal segment of the antennular peduncle; occasionally it reaches only to end of the second segment of the latter. In lateral view it is slightly bended downwards at its proximal portion and turned up again in its distal half. The proximal portion of its dorsal border bears from 3 to 12 teeth of them 2-6 are often placed on the carapace just behind the posterior limit of the orbit; the distal half

Fig. 5. *Caridina gregoriana* KEMP (♂)

to two-thirds of the dorsal border is free from teeth (rarely furnished with a single medium tooth) and the tip is often bifid (occasionally trifid or free from teeth). The lower border of the rostrum, which is more or less dilated before the eyes and curved gradually towards its tip, bear from 1 to 8 (most commonly 3-4) teeth; the antero-lateral angles are bluntly rounded, and without pterygostomian spine.

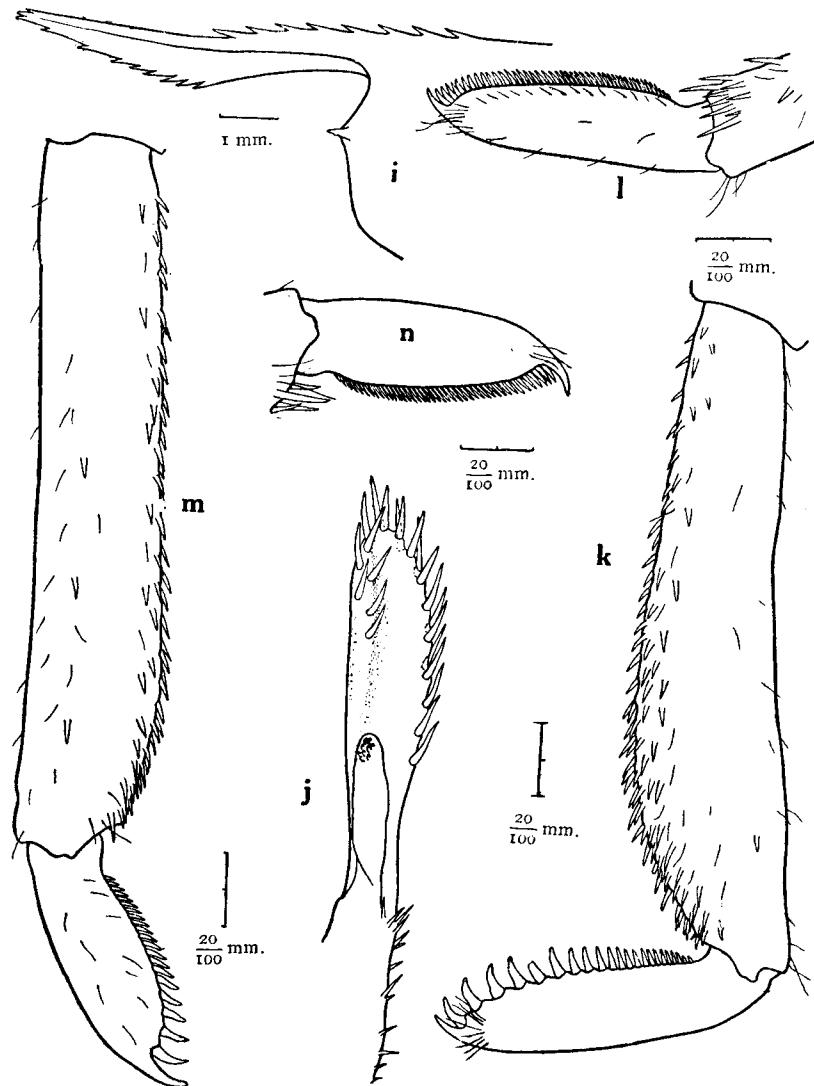
The carpus of the first leg is deeply excavated anteriorly and its length is slightly longer than its distal breadth. The palm extend a little backwards behind the carpopropodal articulation; the fingers are longer than the palm and nearly as long as the carpus.

The carpus of the second leg is about 3.5-4 times as long as its distal breadth. The chela is about as long as the carpus and almost three times as long as wide; the palm is five-eights as long as the fingers.

The propodus of the third leg (Fig. 5, g; Fig. 6, k, m.) is about 5 to 8 times as long as its maximum breadth in the male and 7 to 9 times as long as its distal breadth in the female; it is about two to two and half times as long as the dactylus in both sex. The dactylus is about 4-5 times as long as wide and bears frequently on its posterior border 17-26 spinules. The peculiar propodal dilatation which the third and fourth legs of males undergo is very variable in different individuals.

The propodus of the fifth leg (Fig. 5, h; Fig. 6, l, n.) is about 8-11 times as long as its breadth and two to three and half times as long as the dactylus. The latter is about 3-5 times as long as wide and bears a series of 45 to 53 spinules.

The sexual endopod (Fig. 5, c, d.) of the first pleopod of the male is a lamella with its basal portion wider than its distal portion; its distal border is rounded; its inner border is concave; it is about 2.5 times or more as long as wide at its base. The inner-lateral appendix which projects out from its anterolateral corner of the inner border reaches beyond the distal border of the endopod by its half length; it

Fig. 6. *Caridina gregoriana* KEMP (♂)

is two times as long as wide and about one-sixth as long as the endopod. The setae on the distal border of the latter pass over the extremity of the appendix by two-thirds its length.

The appendix masculinca (Fig. 5, e, f; Fig. 6, j.) of the second pleopod of the male reaches about to two-thirds the length of the endopod; it is about 5 times as long as wide and covered with many stout spines. Its distal portion is either narrow or gradually widened. The appendix interna which projects out from the proximal portion of the appendix masculina reaches to the half length of the appendix masculina.

The telson (Fig. 5, b.) bears 6 to 9 pairs of dorsal spinules, and its acutely rounded apex is furnished, between the spinules at the postero-lateral corners, with 3 pairs of coarse and equilengthed setæ; between the middle pair of setæ there is a single short spine articulated on the very end of the apex.

Full grown female reaches a length of about 37 mm. from the tip of rostrum to the end of telson.

The above notes are based upon numerous specimens obtained from several localities in Yunnan.

#### **Caridina Cantonensis, sp. nov.**

The rostrum (Fig. 7, a.) extends within the extremity of the terminal segment (usually just beyond the end of the second segment) of the antennular peduncle; it is stout and straight in lateral view. The horizontal dorsal border bears frequently from 14 to 20 (most commonly 14-15) compact teeth, 5 or 6 of them are placed on the carapace behind the posterior limit of the orbit. The distal portion of the dorsal border of the rostrum is free of teeth. The lower portion of the rostral blade is not dilated and bears from 4 to 6 teeth. The last tooth is somewhat and remote from the tip. The antero-lateral angles is acutely rounded and without pterygostomian spine.

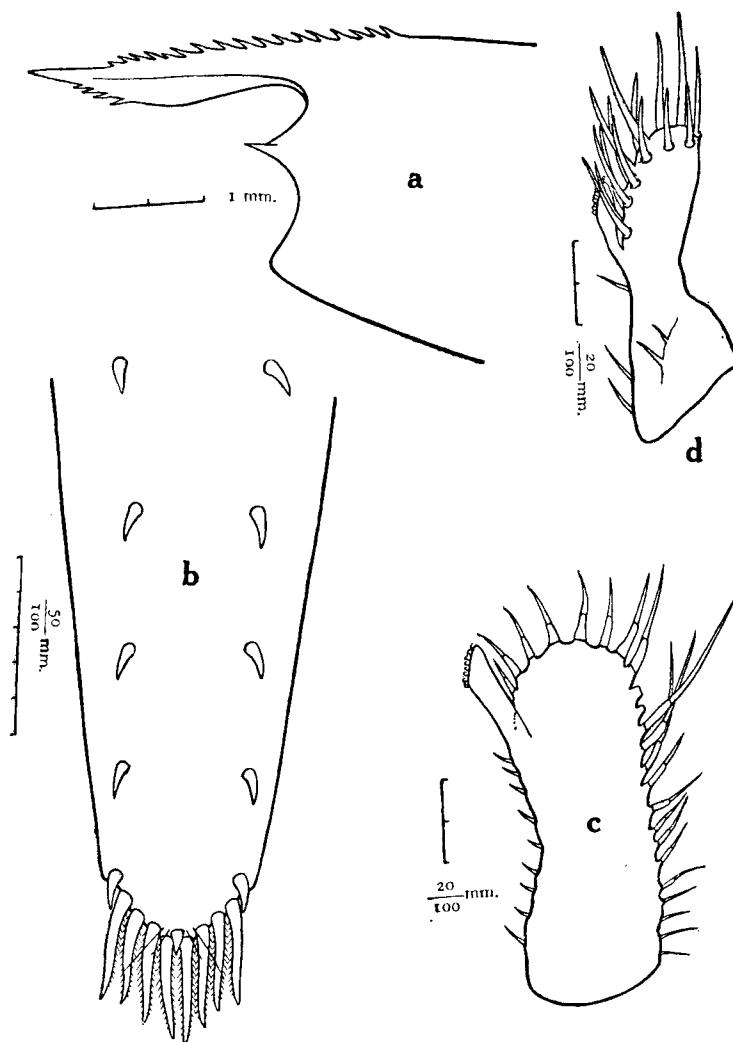


Fig. 7. *Caridina cantonensis* sp. nov. (♂)

The first legs (Fig. 8, e.) extend at most beyond the end of the eye by their fingers. The carpus is rather deeply excavated anteriorly and its length hardly pass over its distal breadth. The palm does not extend far backwards behind the carpopropodal articulation; the fingers are scarcely longer than the palm and hardly shorter than the carpus.

The second legs (Fig. 8, f.) reach about to the tip of the rostrum in males; in females they are slightly longer, reaching the extremity of the antennular peduncle. The carpus is a little more than 4 times as long as its distal breadth. The chela is one fifth shorter than the carpus and is about 2.5 times as long as wide, the palm is two-thirds as long as the fingers.

In males the third legs (Fig. 8, g.) reach about to the extremity of the antennular peduncle. The propodus is from 4 to 4.5 times the length of the dactylus which is rather stout and bears 5 or 6 spinules. The third legs in the females are similar in structures with those of the males but somewhat longer, reaching about to the end of the antennal scale. The fourth legs (Fig. 8, h.) of both sex are similar to the third, but the propodus is slightly longer; both dactyli bear 6 or 7 spinules.

In both sexes the fifth legs (Fig. 8, i.) reach nearly to the end of the third antennular segment. The porpodus is from 4 to 4.2 times as long as the dactylus which bears a series of 38 to 45 spinules.

The sexual endopod (Fig. 7, c.) of the first pleopod of the male is a rectangular lamella with its inner border concave; it is about three times as long as wide at its apex. The setae along all the borders are not equal in length, those on the inner border are very short, and those along the outer border are much longer and gradually increase in length from base upwards, whereas those on the distal border are shorter than the longest but longer than the shortest of the setæ of the outer border. The antero-lateral appendix which projects out near the antero-lateral angle of the inner side of the lamella reaches hardly

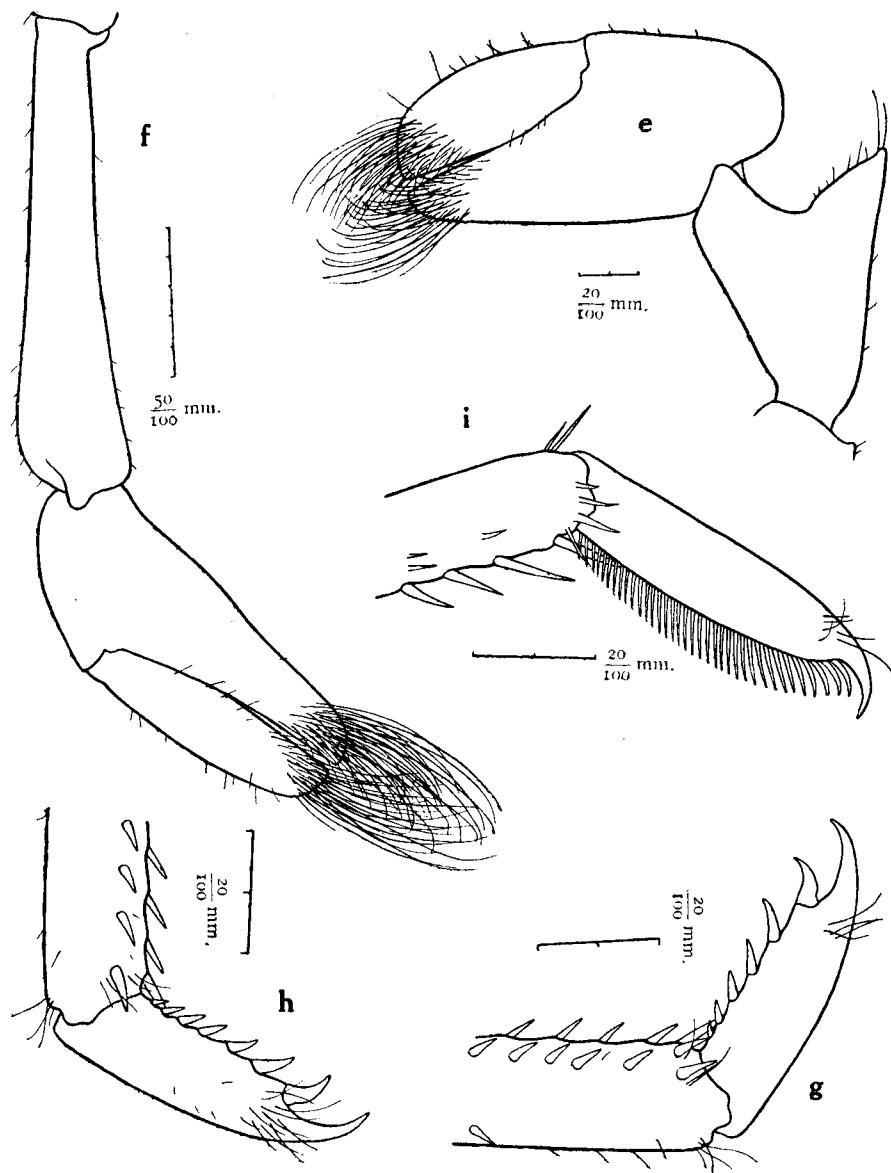


Fig. 8. *Caridina cantonensis* sp. nov. (♂)

to the same height of the adjuscent setæ of the distal border of the same. It is narrow and about three times as long as wide; its oblique end is furnished with sexual retinacles.

The appendix masculina (Fig. 7, d.) of the second pleopod of the male is much widened and somewhat plumped; it is about 2 times as long as wide; there are many long and stout thorns covering its surface. The appendix interna is very narrow and reaches to the half length of the appendix masculina; its distal portion is also covered with retinacles.

The telson (Fig. 7, b.) bears from 4 to 5 pairs of dorsal spinules and the apex, which is broadly rounded, is furnished with a single median short spinule and 4 pairs of rather stout setæ between the spinules at the postero-lateral corners.

Full grown female reaches a length of about 26 mm. The eggs vary from 1.02 to 1.08 mm. in length, and from .576 to .64 mm. in breadth.

This species is described from a large number of specimens collected by Dr. H. F. Hsü from a mountain stream at Canton in the winter of 1936. A number of specimens have been selected as types.

***Caridina pingi* sp. nov.**

The rostrum (Fig. 9, a.) may extends to the extremity of the second segment of the antennular peduncle. In lateral view, it is very narrow and hardly bended downwards; its dorsal border bears from 11 to 16 (most commonly 12-15) compact teeth of them the first or second is often placed on the carapace just above the posterior limit of the orbit; the portion near the tip of the dorsal border is free from teeth. The lower border of the rostrum bears anteriorly from 2 to 5 (most commonly 2-3) teeth; the last tooth is frequently placed just below the last one of the dorsal border. The antero-lateral angles are bluntly rounded, and provided with a small pterygostomian spine.

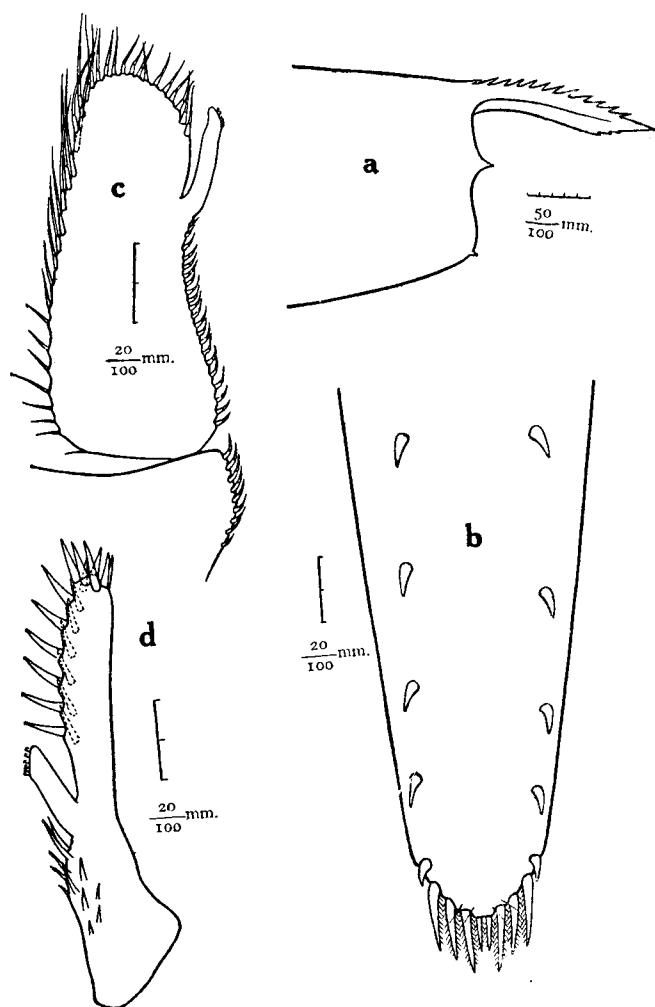


Fig. 9. *Caridina pingi* sp. nov. (♂)

The first legs (Fig. 10, e,) extend slightly beyond the end of the eye. The carpus is a little excavated anteriorly and its length is about two times as long as its distal breadth. The palm extend hardly backwards behind the carpopropodal articulation; the fingers are a little longer than the palm and almost one-fourth shorter than the carpus.

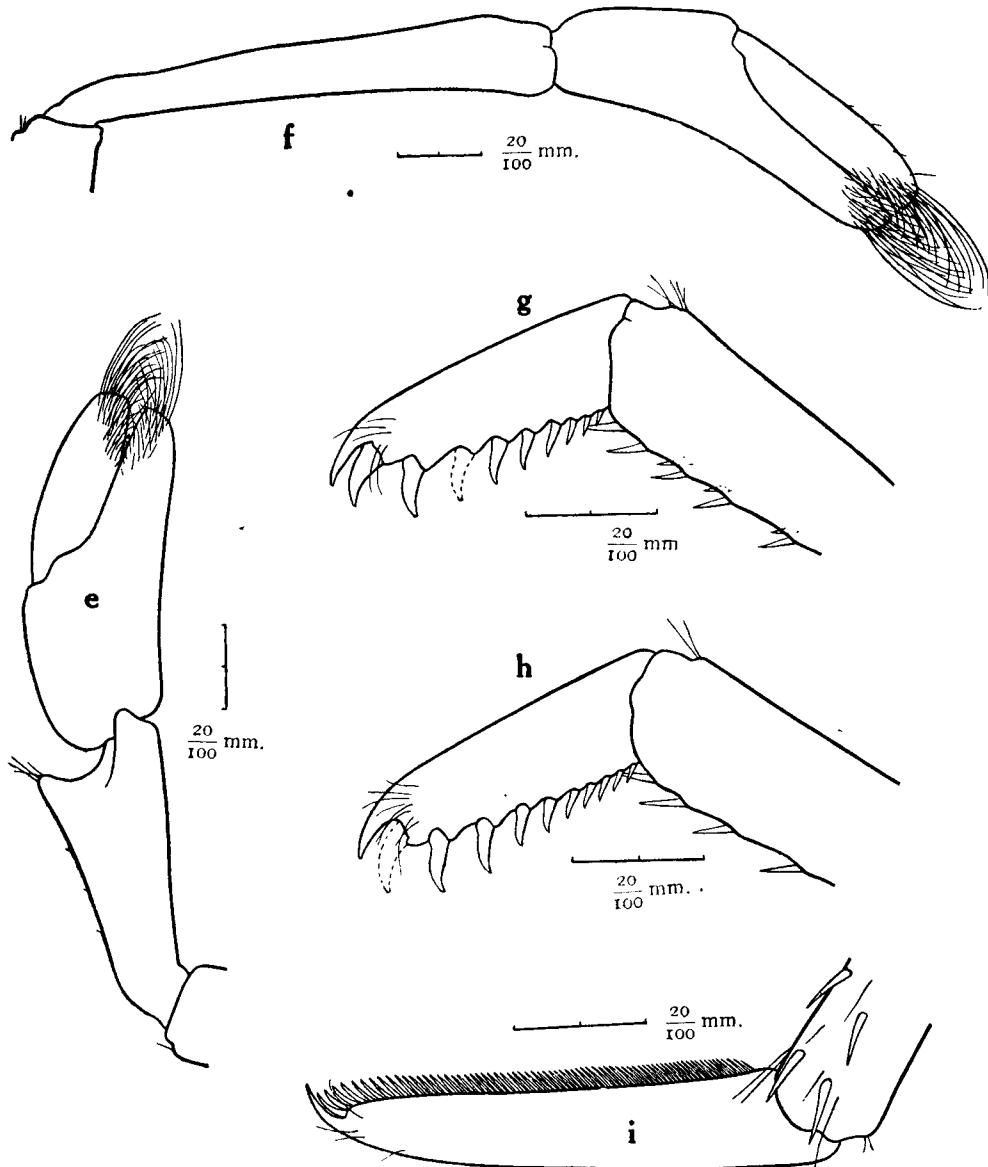
The second legs (Fig. 10, f.) reach about to the distal extremity of the second segment of the antennular pedoncle. The carpus is about from 5-6 times as long as its distal breadth. The chela is about one-fourth shorter than the carpus and more than three times as long as wide; the palm is three-fourth as long as the fingers.

The third and fourth legs (Fig. 10, g, h.) are similar in structures in both sex. The propodus is about 3.5 times the length of the dactylus. The dactylus is stout and bears frequently 7 or 8 (occasionally 9 or 10) spinules.

In both sexes the fifth legs (Fig. 10, i.) are as stout as the third and fourth. The propodus is about from 2.5 to 3 times the length of the dactylus. The dactylus bears a series of 57 to 73 spinules.

The sexual endopod (Fig. 9, c.) of the first pleopod of the male is a subrectangular lamella with its basal portion wider than its distal portion; its inner border is concave; its length is about 3.5 times its maximum distal width and almost 2.5 times its maximum proximal width. A narrow appendix with little numerous sexual retinacles on the oblique end are projected out from the beginning of the anterior third of the inner border of the endopod and reaches within the distal end of the same. The setæ on the inner border of the endopod are very short but those along the outer border are more long and increase in length gradually from base upwards, and those on the distal border are as long as those on the lower portion of the outer border.

The appendix masculina (Fig. 9, d.) of the second pleopod of the male is very narrow and somewhat plumped; it is a little more than 4 times as long as wide; there are many stout spines covering its surface.

Fig. 10. *Caridium pingi* sp. nov. (♂)

The appendix interna which projects out from the base of the appendix masculina and bears also retinacles reaches only to the one-third of the length of the appendix masculina and is half time as wide as.

The telson (Fig. 9, b.) bears 4 pairs of dorsal spinules and the broadly rounded apex is furnished, between the pair of terminal spinules at the posterolateral corners, with 4 or 5 pairs of setæ, of which the middle pair is very small.

Full grown females reach a length of about 18 mm. from the tip of rostrum to the end of telson. The eggs vary from .852 to to .99 mm. in length and from .568 to .71 mm. in breadth.

The above specific description is based on five males and six females obtained from Amoy, Fukien, and are now registered as types. Specimens of both sexes obtained from Chingwangtao, Hopei, are also examined.

**Caridina pingioides** sp. nov,

The rostrum (Fig. 11, a.) extends a little beyond the extremity of the first segment of the antennular peduncle; in lateral view it is very narrow and slightly bended downwards. The dorsal border bears 11-17 teeth and the second or third (occasionally the first) of them is often placed on the carapace just above the orbital border. A short portion near the distal end of the dorsal border of the rostrum is free from teeth. The lower border of the rostrum bears 0-4 teeth, the last of them is remote from the tip and placed very often under the ultimate tooth of the dorsal border. The antero-lateral angles are furnished with a pterygostomian spine.

The carpus of the first leg (Fig. 11, c.) is deeply excavated anteriorly, and its distal breadth is about three-fifths its length. The palm does not extend far backwards behind the caropropodal articulation; and the fingers are hardly longer than the palm and a little shorter than the carpus.

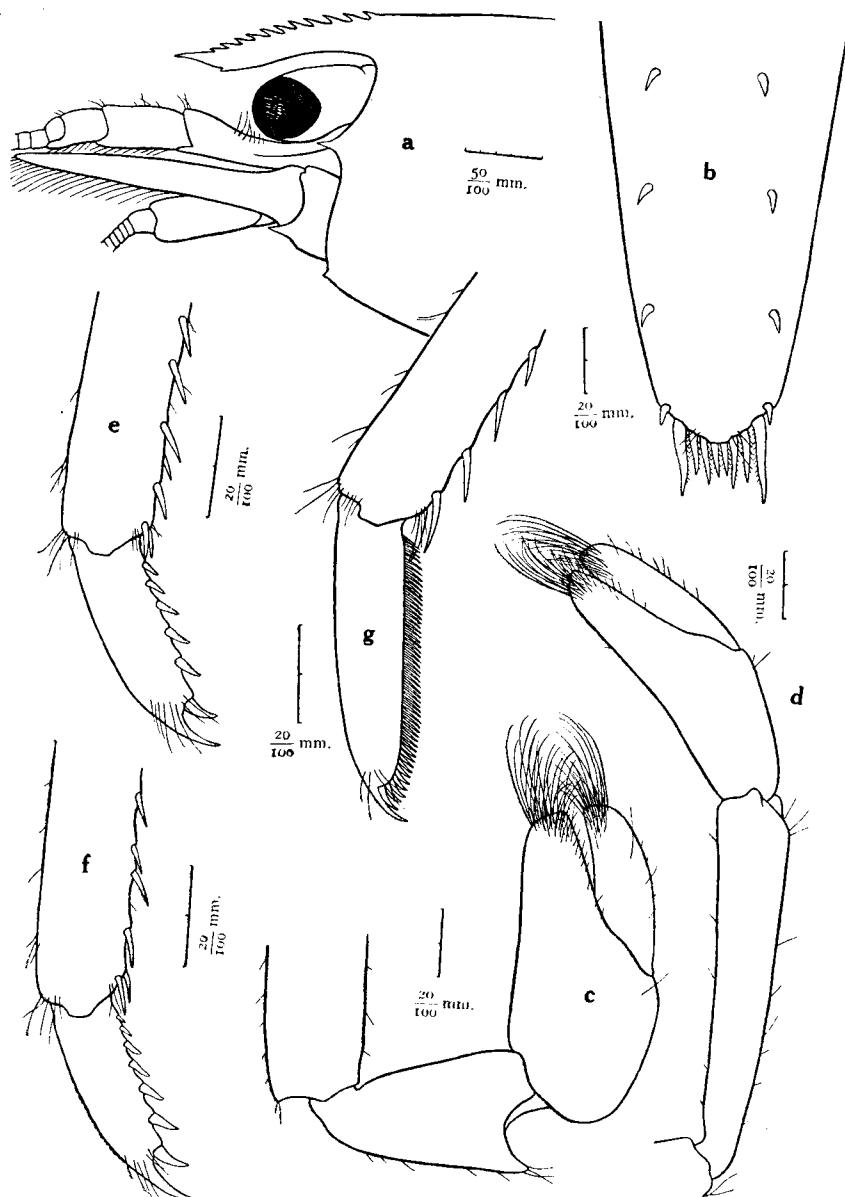


Fig. II. *Caridina pingiodes* sp. nov. (a, c-g, ♀; b, ♂)

The carpus of the second leg (Fig. II, d.) is about 5 times as long as its distal breadth. The chela is about one-fifth shorter than the carpus and 3 times as long as wide, and the palm is nearly one-fifth shorter than the fingers.

The propodus of the third leg is about 3 times the length of the dactylus (Fig. II, e.). The dactylus is 3-3.5 as long as wide and bears most frequently 6 spinules.

The propodus of the fifth leg is about 2.5 times as long as the dactylus (Fig. II, g.). The dactylus is about 4 times as long as wide and bears a series of 50-58 spinules.

The sexual endopod (Fig. I2, h.) of the first pleopod of the male is a small lamella. Its anterior end is much narrowed and acutely rounded. It is two times as long as wide at its basal portion. The setæ along the outer border are much longer than those along the inner border and increase in length gradually from base upwards. The setæ on the acute distal border are as long as the longest ones of the outer border. The antero-lateral appendix which projects out from the anterior one-fourth of the inner side of the lamella extends hardly beyond the acute distal border (anterior end) of the same. It is narrow and about five times as long as wide; its oblique end is provided with sexual retinacles.

The appendix masculina (Fig. I2, i.) of the second pleopod of the male is small and narrowed; it is rod-shaped and about 4 times as long as wide; its inner surface and its top are covered with stout spines. The appendix interna which is covered with retinacles on its oblique end is only one-third narrower than the appendix masculina and reaches almost to the half length of the same.

The telson (Fig. II, b.) bears 3 pairs of dorsal spinules and the apex, which is broadly rounded, is furnished with 4 pairs of rather short and stout setæ between the pair of terminal spinules at its

postero-lateral corners. Of the four pairs of setæ the outermost pair is the longest and stoutest.

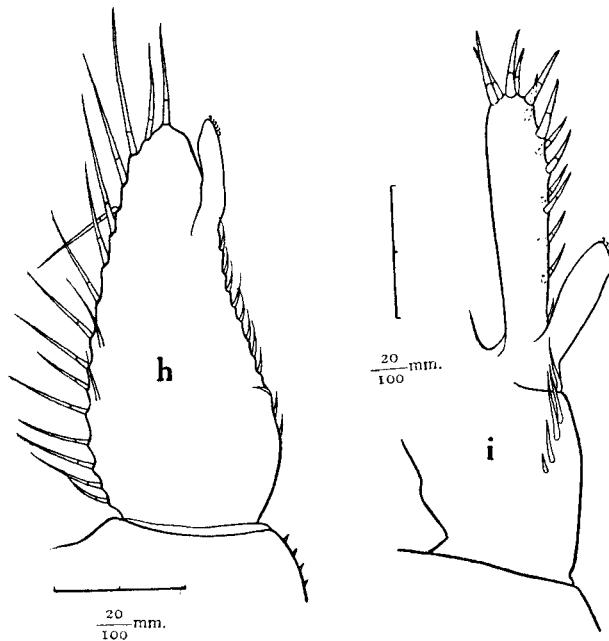


Fig. 12. *Caridina pingiodes* sp. nov. (♂)

The largest female reaches a length of about 19 mm. This species is described from sixteen specimens (1♂, 15♀) whose locality being unknown to the writer. The male has lost its carapace and five pair of thoracic legs and all the females are without eggs. A male and a female have been registered as types.

***Caridina babaultioides* sp. nov.**

The rostrum (Fig. 13, a.) extends usually to the middle or at most to the extremity of the second segment of the antennular peduncle. In lateral view it is straight; its dorsal border bears from 13 to 21 (most

commonly 17-20) compact teeth of them five to eight are often placed on the carapace behind the posterior limit of the orbit; the teeth on the carapace are often a little more widely spaced than those before the carapace and all are articulated; the end portion, near the tip, of the dorsal border is free of teeth. The lower border of the rostrum bears anteriorly from 2 to 6 (most commonly 3-4) teeth; the last tooth is frequently placed below the last one of the dorsal border. The antero-lateral angles are provided with a small pterigostomian spine.

The carpus of the first leg (Fig. 13, c.) is deeply excavated anteriorly and its length is about one time and one-third as long as its distal breadth. The palm which extend a little backwards behind the carpopropodal articulation is about as long as wide, the fingers are about one time and one-third as long as the palm and as long as the carpus.

The carpus of the second leg (Fig. 13, d.) is hardly 4 times as long as its distal breadth. The chela is almost as long as the carpus and hardly three times as long as wide; the palm is about three-fifth as long as the fingers.

The propodus of the third leg is about 4 times the length of the dactylus and 9-10 times as long as wide; the dactylus is stout and bears frequently 5 (occasionally 6) spinules.

The propodus of the fifth leg (Fig. 13, e.) is about 14 times as long as wide and from 3.5 to 3.8 times the length of the dactylus; the dactylus bears a series of 40 to 56 spinules.

The sexual endopod (Fig. 14, f.) of the first of pleopod of the male is a suboval-shaped lamella with its anterior portion slightly narrowed; it is about one time and four-fifth as long as wide. An elliptical appendix (Fig. 14, g.) with numerous sexual retinacles on its anterior end is projected out from the beginning of the distal three-seventh of the inner border of the endopod; it is 3 times as long as wide and reaches a little beyond the distal end of the same. The setæ on the

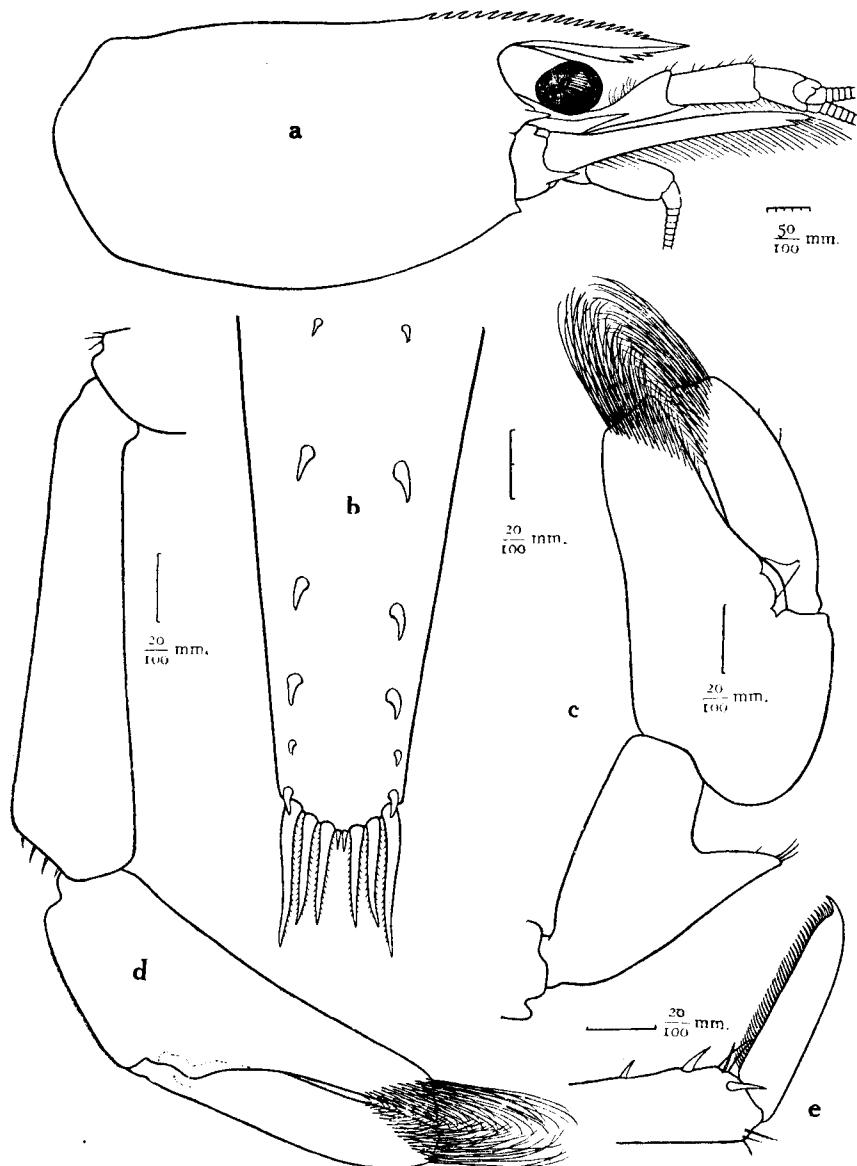


Fig. 13. *Caridina babaultioides* sp. nov. (♂)

anterior border of the endopod are much longer than those along the outer and inner borders.

The appendix masculina (Fig. 14, j.) of the second pleopod of the male is very narrow and stick-like; it is about 9 times as long as wide; there are several rows of short and stout spines covering its surface. The appendix interna (Fig. 14, k.) which projects out from the base of the appendix masculina and bears thick retinacles reaches about to one-third the length of the appendix masculina.

The telson (Fig. 13, b.) bears commonly 5 pairs of dorsal spinules and the broadly rounded apex is furnished commonly, between the spinules at the postero-lateral corners with 4 pairs of setæ, of which the middle pair is extraordinarily small and the outermost pair is longer than the other two pairs.

Full grown females reach a length of about 32 mm. from the tip of rostrum to the end of telson. The eggs vary from 1.03 to 1.17 mm. in length and from .653 to .75 mm. in breadth.

Numerous specimens were obtained in a small mountain stream, at an altitude of about 910 m., at Shui-tuan-pa near Yen-tsing city, Yunnan province. Two males and two females are used for the specific description and have been registered as types. The two male specimens obtained from Chengtu, Szechuan province, are also examined.

#### **Caridina yunnanensis** sp. nov.

The rostrum (Fig. 15, a.) usually reaches to the extremity of the second segment of the antennular peduncle. In lateral view it is narrow and straight. It bears dorsally from 9 to 17 teeth, most frequently 9 to 11, and from 5 to 7 of them (most commonly 5) are placed on the carapace behind the posterior limit of the orbit. The teeth before the carapace are generally a little more widely spaced than those on the carapace and all are articulated. The distal tooth is a little remote from the tip and never give it a bifid appearance. The lower

portion of the rostral blade is not well developed and bears from 2 to 8 teeth, usually 3, in the anterior one-third. The first tooth of them is placed very often under the last one of the dorsal border.

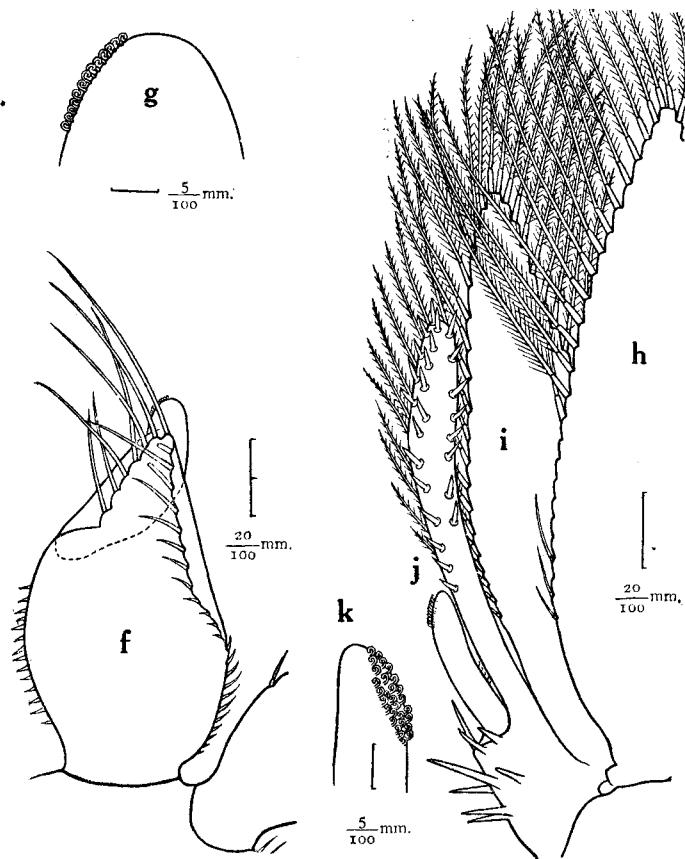
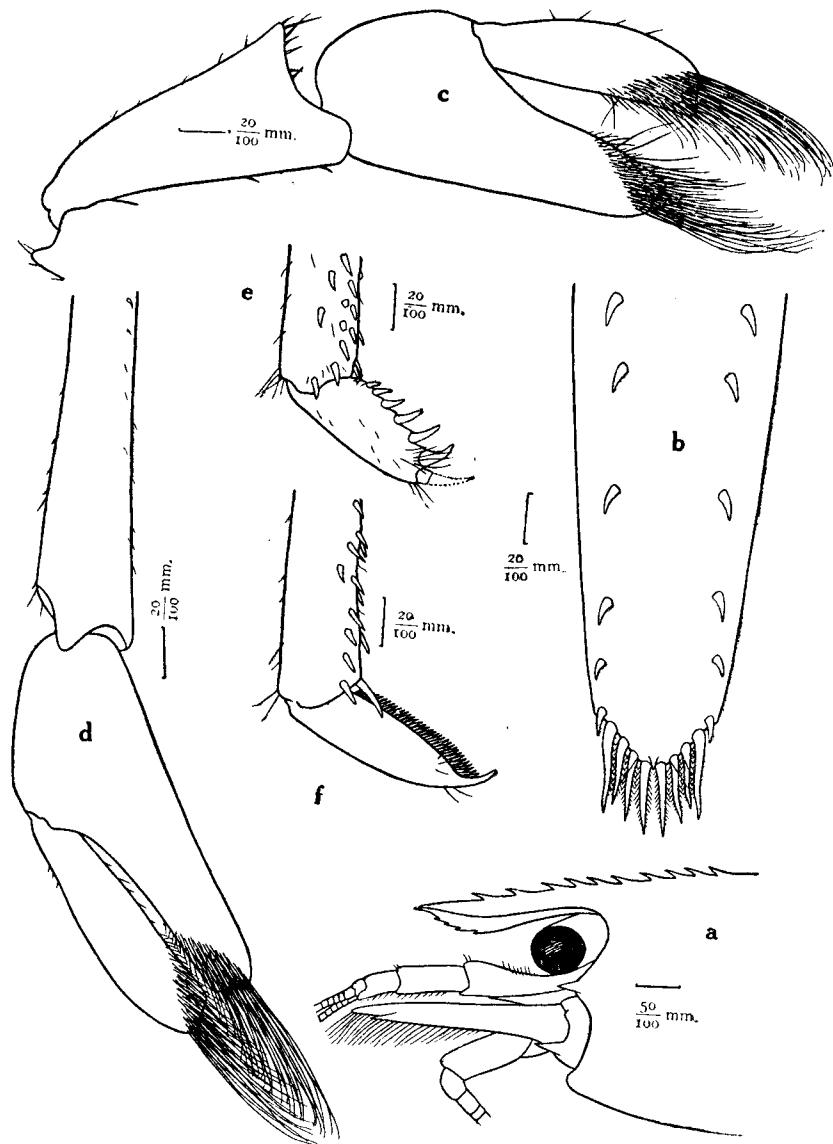


Fig. 14. *Caridina babaultioides* sp. nov. (♂)

The carpus of the first leg (Fig. 15, c.) is a little excavated anteriorly and its length is about 2 times its distal breadth. The palm does not extend far backwards behind the carpopropodal articulation;

Fig. 15. *Caridina yunnanensis* sp. nov. (♂)

the fingers are almost one times and a half as long as the palm and hardly one-fourth shorter than the carpus.

The carpus of the second leg (Fig. 15, d.) is about 5 times as long as its distal breadth. The chela is a little shorter than the carpus and is about 3 times as long as wide. The fingers are one time and one-third as long as the palm.

The propodus of the third leg is from 4 to 4.5 times the length of the dactylus (Fig. 15, e.) and from 9 to 10 times as long as wide; The dactylus is rather stout, about 3.5 times as long as wide, and bears 6 or 7 spinules. The fourth legs are similar to the third ones in its structures.

The propodus of the fifth leg is from 4 to 4.5 times the length of the dactylus (Fig. 15, f.) and about 12 times as long as wide. The dactylus bears a series of 34 to 39 spinules.

The sexual endopod (Fig. 16, g.) of the first pleopod of the male is a subelliptical lamella with its basal portion a little wider than its distal portion which decreases in width insensibly until to the anterior convex border; its length is about 3 times its basal width and 4 times as long as wide at the root of the inner appendix. The latter with sexual retinacles on its end and projected out from the anterior third of the inner border of the lamella reaches a little beyond the anterior convex border. The setæ on the outer and inner border of the lamella are similar and increase in length gradually from base upwards, but those on the anterior convex border are more short.

The appendix masculina (Fig. 16, h.) of the second pleopod of the male is narrow and shaped like a fleshy plate; there are strong spine-like setæ along all its borders; it is 4 times or more as long as wide. The appendix interna reaches to the half length of the appendix masculina.

The telson (Fig. 15, b.) bears 5 pairs of dorsal spinules and the apex, which is acutely rounded in outline and terminated in a spine,

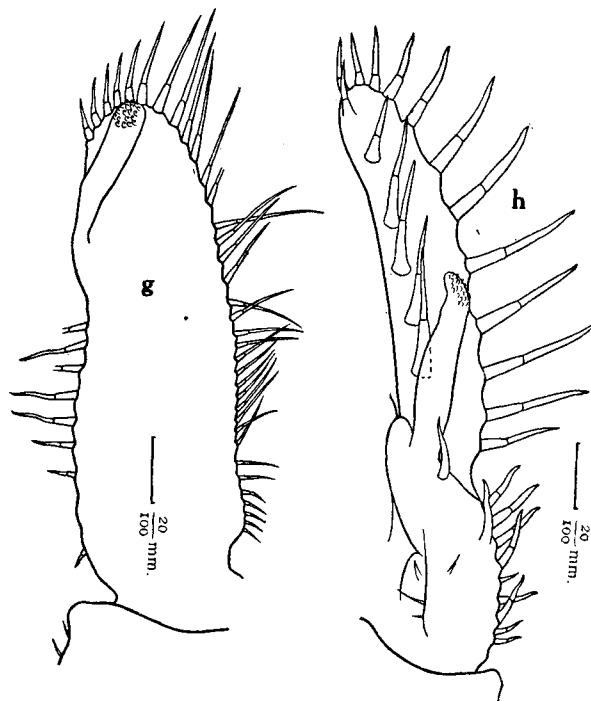


Fig. 16. *Caridina yunnanensis* sp. nov. (♂)

is furnished with four pairs of rather long setæ between the spinules at the posterolateral corners.

The largest female reaches a length of about 23 mm. The eggs are not seen.

This species is described from two males and seven females collected from a mountain stream at Hsün-tien in Yunnan province. All of them have been registered as types.

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## 中國米蝦之研究及其新種之描述

喻兆琦

米蝦科之標本，保存於靜生生物調查所中者，有下列之十種。

齒米蝦 *Caridina denticulata* DE HAAN

纖尼羅米蝦 *Caridina nilotica gracilipes* DE MAN

劍米蝦 *Caridina lanceifrons* YÜ

卡氏米蝦 *Caridina cavalerei* BOUVIER

葛氏米蝦 *Caridina gregoriana* KEMP

廣東米蝦 *Caridina cantonensis* sp. nov.

秉氏米蝦 *Caridina pingi* sp. nov.

擬秉氏米蝦 *Caridina pingioides* sp. nov.

擬巴氏米蝦 *Caridina babaultioides* sp. nov.

雲南米蝦 *Caridina yunnanensis* sp. nov.

其中五種，證明為科學上之新發現。以下所述者，除卡氏米蝦未有雄者外，其餘諸種雄個體之後天性肢，皆有顯異而不變之構造。依著者愚見，米蝦之分類，應倚重之，蓋較任何性質為有意義也。