



## ***Macrobrachium pentazona*, a new freshwater palaemonid prawn (Decapoda: Caridea: Palaemoindae) from Guangdong Province, China**

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### **Abstract**

*Macrobrachium pentazona*, a new freshwater palaemonid prawn is described and is illustrated on the base of three specimens collected from a Bei Jiang river, near Qingyuan City, Guangdong Province, southern China. It can be distinguished from its congeners by a combination of characters that include the rostral formula; the segmental ratios and spination, the arrangement of teeth on the cutting edge of the fingers of the second pereopod; the segmental ratios of third pereopod; the wide scaphocerite; the small uropodal diaeresis spine; and with a regular striking colour pattern.

**Key words:** Decapoda, Palaemonidae, *Macrobrachium*, Guangdong Province, China

### **Introduction**

The genus *Macrobrachium* from Guangdong Province includes 11 species that have been reported: *Macrobrachium asperulum* (Von Martens, 1868), *M. equidens* (Dana, 1852), *M. fukienense* Liang & Yan, 1980, *M. hainanense* (Parisi, 1919), *M. nipponense* (De Haan, 1849), and *M. superbum* (Heller, 1862) (see Holthuis, 1950; Liu, 1957; Liu *et al.*, 1990; Zhang & Sun, 1981; Li *et al.*, 2007). Guo & He (2008) recently reported another new species, *M. heterorhynchos* and four new record species, *M. formosense* Bate, 1868, *M. inflatum* Liang & Yan, 1985, *M. maculatum* Liang & Yan, 1980 and *M. meridionalis* Liang & Yan, 1983 from Guangdong Province.

A small collection of the genus *Macrobrachium* was made from Guangdong Province. When checking this collection, we found one new species of *Macrobrachium*, which is described and illustrated in the present paper. The relationship between the new species and closely related species is discussed. With the addition of this new species, it brings the total number of species from the genus *Macrobrachium* known in Guangdong Province to 12.

### **Material and methods**

The specimens examined in the present study were collected by hutch net (mesh size 0.8 mm) and then preserved in 75% alcohol before dissection. The drawings were made with the aid of drawing tube mounted on an Olympus BX-41 compound microscope.

The following abbreviations are used throughout the text: tl, total length of body (measured from the

rostral tip to the posterior margin of the telson); cl, carapace length (measured from the postorbital margin to the posterior margin of the carapace); rl, rostral length (measured from the rostral tip to the postorbital margin). All measurements are in millimeters. Specimens are deposited in the collections of the Foshan Science and Technology College (FSTC).

## Taxonomy

### Family Palaemonidae Rafinesque, 1815

#### Genus *Macrobrachium* Bate, 1868

##### *Macrobrachium pentazona*, sp. nov.

(Figs. 1–3)

**Material examined.** Holotype: Adult male (FSTC, 06–03–28–01), tl: 68.0 mm, cl: 15.7 mm, rl: 15.2 mm; Beijiang river, near Qingyuan City (ca. 23°42'N, 113°01' E), 28 March 2006.

Paratypes: 1 male (FSTC, 06–03–28–02), tl: 60.3 mm, cl: 16.4 mm, rl: 10.0 mm; 1 female (FSTC, 06–03–28–03), tl: 71.8 mm, cl: 16.7 mm, rl: 16.6 mm; data same as holotype.

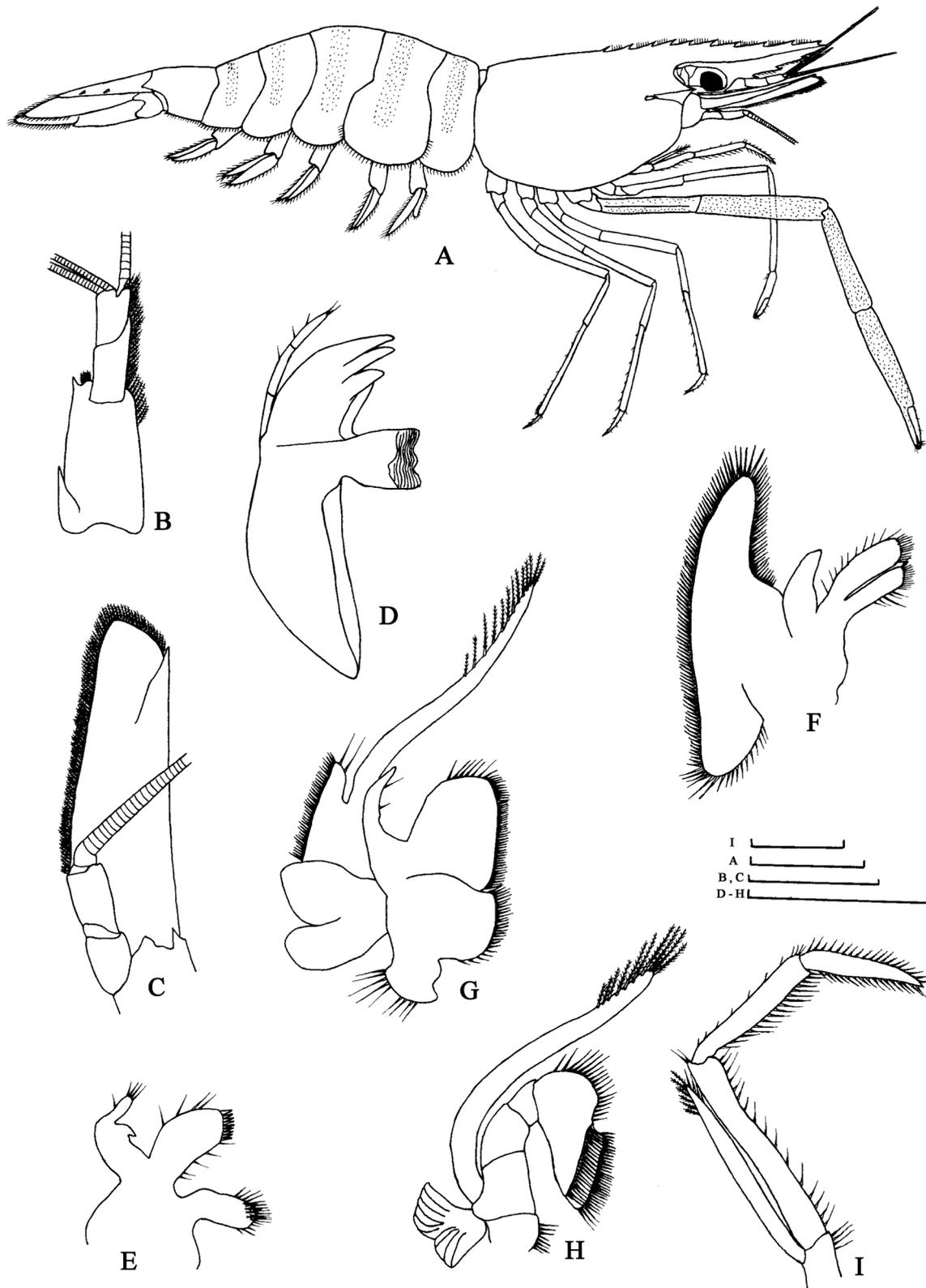
**Description.** Rostrum (Figs. 1A, 3C) straight, upper margin slightly convex over the eyes, extending beyond the scaphocerite, rl is about the same length of cl; provided with 10–12 dorsal rostral teeth, of which 3–4 teeth are placed behind the orbit; dorsal teeth unequally spaced, usually with wider gaps near posterior than others; with 3–4 ventral rostral teeth.

Carapace (Figs. 1A, 3C) glabrous, entirely smooth; antennal spine well developed; hepatic spine much smaller than the antennal spine, lies in the same line with the latter.

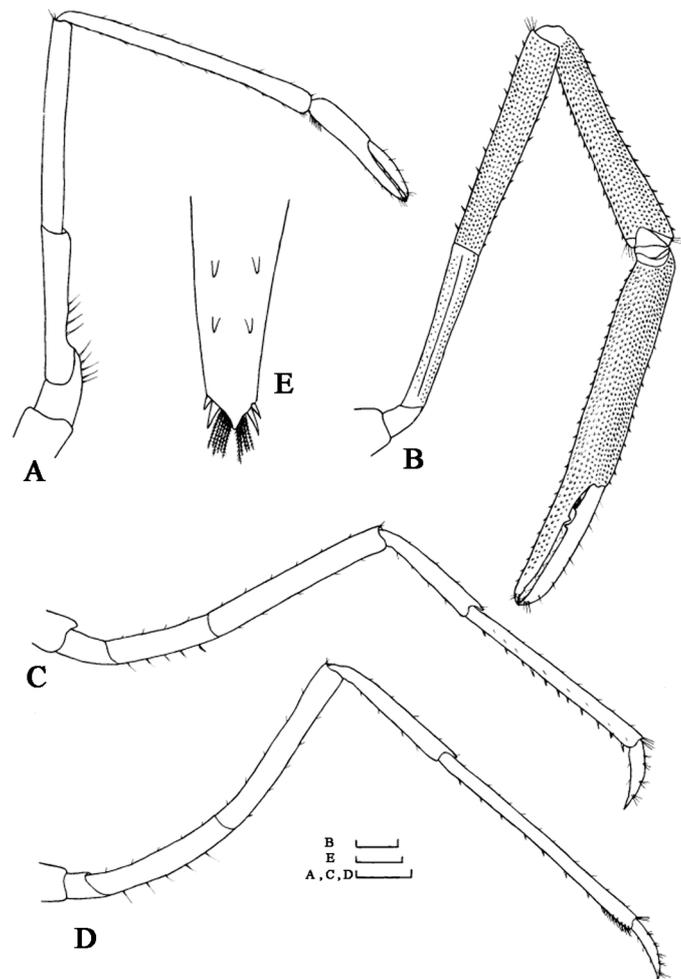
Antennule (Fig. 1A, B) with sharp stylocerite, reaching about 0.45 times of basal segment of antennular peduncle; anterior margin of basal segment distinctly convex, basilateral spine slender, reaching beyond half of second segment of peduncle; second segment about 0.35 times as long as basal segment, about same length of distal segment. All segments with submarginal plumose setae. Antenna (Fig. 1A, C) with scaphocerite, rectangular, 3.0 times as long as wide; outer margin almost straight, ending in a strong spine, overreached by broad lamella.

Mandible (Fig. 1D) with three-segmented palp; incisor process with 3 sharp teeth; molar process stout, distally excavated, with blunt teeth and ridges. Maxillula (Fig. 1E) with bilobed palp, upper lobe stout, slightly longer than lower lobe, setose distally, lower lobe hooked; upper lacinia broadly elongated, distal margin with row of strong spines, lower lacinia as long as upper lacinia, densely setose distally. Maxilla (Fig. 1F) with simple palp; basal endite deeply bilobed, upper and lower lobes with numerous simple setae distally; scaphognathite broad, about 3.4 times as long as wide. First maxilliped (Fig. 1G) subcylindrical, with distally tapering distal palp, reaching beyond end of caridean lobe, basipodal and coxal endites distinct; exopod with large caridean lobe, flagellum with numerous plumose setae distally, epipod deeply bilobed, oval. Second maxilliped (Fig. 1H) with normal endopod, last segment fused with penultimate for its entire length; exopod well developed, flagellum with plumose setae distally, epipod simple, with well-developed podobranch. Third maxilliped (Fig. 1I) with robust endopod, ischiomerus with row of long simple setae on inner margin; carpus about 0.67 times length of ischiomerus, with row of long, simple setae on inner margin and sparse row of simple setae on outer margin; distal segment about 0.85 times penultimate segment, with rows of long, simple setae on inner and outer margins; exopod reaches to about end of ischiomerus, with plumose setae distally; two arthrobranchs, one rudimentary and obscured by the larger.

First pereopod (Figs. 1A, 2A) slender, end of carpus reaching beyond scaphocerite; carpus 1.7–1.9 times as long as chela; palm of male slightly shorter than finger, but palm of female slightly longer than finger. Second pereopod (Fig. s. 1A, 2B) shorter than body length in both adult male and female, similar in shape and



**FIGURE 1.** *Macrobrachium pentazona* new species: A. entire animal, lateral view, holotype, male, cl: 15.7 mm (FSTC, 06-03-28-01); B. antennular peduncle; C. scaphocerite; D. mandible; E. maxillula; F. maxilla; G. first maxilliped; H. second maxilliped; I. third maxilliped. B-I: paratype, female, cl: 16.7 mm (FSTC, 06-03-28-03). Scale: A = 10 mm, B-C = 5 mm, D-H = 3 mm, I = 2.5 mm.



**FIGURE 2.** *Macrobrachium pentazona* new species, holotype, male, cl: 15.7 mm (FSTC, 06-03-28-01): A. first pereiopod; B. second pereiopod; C. third pereiopod; D. fifth pereiopod; E. posterior portion of telson. Scale: A-D = 2 mm, E = 1 mm.

size; 1/5 carpus reaching beyond the scaphocerite; finger 0.39–0.57 times as long as palm, distinctly shorter than ischium, cutting edge of fixed finger bears two teeth in proximal part, basal tooth with 3 denticles, moveable finger with 2 proximal teeth; palm about 5.2–5.3 times as long as broad; carpus 5.3–5.8 times as long as wide, 1.1 times as long as palm, 1.1–1.2 times as long as merus; merus 1.3–1.4 times as long as ischium; all segments covered with numerous microspinules. Third pereiopod (Figs. 1A, 2C) reaching beyond end of antennular peduncle; posterior margin of propodus with row of spinules, 2.7–2.8 times as long as dactylus, about 1.6–1.7 times as long as carpus, carpus about 0.51–0.68 times as long as merus, dactylus about 5.0–6.0 times as long as wide. Fourth pereiopod (Fig. 1A) reaching end of antennular peduncle; posterior margin of propodus with row of spinules, 2.5–3.0 times as long as dactylus, 1.7–2.2 times as long as carpus; carpus about 0.49–0.69 times as long as merus, dactylus about 5.7–7.2 times as long as wide. Fifth pereiopod (Figs. 1A, 2D) reaching beyond tip of scaphocerite; propodus 3.8–5.9 times as long as dactylus, posterior margin with row of spinules, 5–10 oblique rows of setae on distal posterior margin, 1.8–2.0 times as long as carpus; carpus about 0.53–0.76 times as long as merus, dactylus about 5.6–6.2 times as long as wide.

First pleopod of male with endopod about half as long as exopod, concave at inner margin, top bluntly rounded, without appendix interna. Second pleopod with well developed appendix masculina, 0.73 times of endopod, about twice as long as appendix interna, bearing numerous stiff setae.



**FIGURE 3.** *Macrobrachium pentazona* new species, living specimen, holotype, male, cl 15.7 mm (FSTC, 06-03-28-01). A. entire animal, dorsal view; B. entire animal, lateral view; C. cephalothorax, lateral view.

Abdomen (Figs. 1A, 3A, 3B) glabrous, smooth; pleura of first three somites broadly rounded, pleura of somites 4 and 5 rounded with almost rectangular posterolateral angle; sixth somite 1.3–1.5 times as long as

fifth somite, about 0.56–0.65 times as long as telson. Telson (Figs. 1A, 2E, 3A, 3B) smooth, about 0.54–0.57 times of cl, longer than sixth abdominal segment; dorsal surface with two pairs of stout movable spines; posterior margin tapers regularly to a sharp point, bears two pairs of posterior spines; numerous setae present between inner spines.

Uropodal diaeresis with a spine shorter than outer angle.

**Live colouration.** The living specimen (Fig. 3A, B) is light green, with a regular striking colour pattern of five yellow bands on posterior 1/3 of first to fifth abdominal somites, and the margin of the pleura has uniform darker edge. The posterior margin of tailfan is yellowish. The antennul scaphocerite, third maxilliped, first pereopod, and third to fifth pereopods are translucent pale grey. The fingers of second pereopods are yellowish, the rest of segments are dark.

**Etymology.** The species name is derived from *penta*, meaning five and *zona*, meaning band in reference to the abdomen with five yellow bands.

**Remarks.** *Macrobrachium pentazona*, superficially resembles *M. inflatum* Liang & Yan, 1985 in having long rostrum and similar rostral formula. However, it can be distinguished from *M. inflatum* by the relative ratios of various segments and form of the second pair pereopods in adult males, the shorter finger (0.39–0.47 times as long as palm versus as same length of palm in *M. inflatum*), the palm not inflated (versus inflated) and 5.3–5.8 times (versus 3.5–3.6 times) as long as broad, the merus is distinctly longer than the ischium (versus shorter than the ischium); and they showed entirely different body coloration.

*Macrobrachium pentazona* is also resembles *M. tratense* Cai, Naiyanetr & Ng, 2004. It can be distinguished from *M. tratense* by its rostrum with smaller number of ventral rostral teeth (3–4 versus 5–6); the second pereopod, which has the fingers distinctly shorter than the ischium (versus longer than the ischium), the cutting edge of fixed finger with two distinctly teeth (versus one or two indistinctly tooth), all segments covered with numerous microspinules (versus smooth); the third pereopod, which has the merus shorter than the propodus (versus the merus longer than the propodus); the antenna with wide scaphocerite (3.0 times as long as wide versus 3.3 times); and the small uropodal diaeresis spine (shorter than outer angle versus longer).

**Habitat.** The type material was collected from Beijiang river, near Qingyuan City, Guangdong Province (ca. 23°42'N, 113°01' E). It especially prefers vegetated edge main channel. The water is fresh with temperature 17°C and pH 7.0. The new species is found together with *Macrobrachium nipponense* (De Haan, 1849), *Caridina cantonensis* Yu, 1938, and *Neocaridina palmata* (Shen, 1948).

**Distribution.** Only known from the type locality in Guangdong Province, southern China.

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