

**A REVISION OF FRESHWATER CRABS OF THE GENUS
NANHAIPOTAMON BOTT, 1968 FROM CHINA
(CRUSTACEA: DECAPODA: BRACHYURA: POTAMIDAE)**

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ABSTRACT. - The taxonomy of the potamid freshwater crab genus *Nanhaipotamon* Bott, 1968, s. str. is revised. Eleven species are recognised, all from China, of which nine are here described as new, viz. *Nanhaipotamon jongchuense*, *N. nanriense*, *N. huaanense*, *N. pingyuanense*, *N. wenzhouense*, *N. hepingense*, *N. guangdongense* and *N. pinghense* and *N. aculatum*.

KEY WORDS. - China, *Nanhaipotamon*, new species, Brachyura, Potamidae, taxonomy.

INTRODUCTION

The terrestrial potamid freshwater crab genus *Nanhaipotamon* Bott, 1968, was established (as a subgenus of *Isolapotamon* Bott, 1968) for three taxa, *N. formosanum formosanum* (Parisi, 1916) (type species) (Taiwan), *N. formosanum globosum* (Parisi, 1916) (Ryukyu Islands and Hong Kong), and *N. balssi* Bott, 1968 (Philippines) (see Bott, 1970). Minei (1973) subsequently described another species, *N. yaeyamense* from the Ryukyu Islands. Dai et al. (1979) added another new species, *N. angulatum*, from Fujian Province in China. Dai & Chen (1979) then described *N. obtusum*, also from Fujian Province, and reported *N. formosanum formosanum* from this area. Dai & Chen (1987) reviewed the Chinese *Nanhaipotamon* and described two new species, *N. ramipodum* and *N. planopodum* (both from Fujian Province). They also recognised one of Shen's (1940a, b) species as a subspecies of *N. formosanum*, *N. f. hongkongense* (Hong Kong).

The definition of the genus *Nanhaipotamon*, however, has since been substantially revised. Ng & Takeda (1992) transferred *N. balssi* to a new genus (*Mindoron*), while Ng & Shokita (1995) referred *N. yaeyamense* to *Ryukyum* Ng & Shokita, 1995. Four of the Chinese species (*N. angulatum*, *N. obtusum*, *N. ramipodum* and *N. planopodum*) were also moved to a new genus *Huananpotamon* by Dai & Ng (1994). Currently, only four species of the potamid genus *Nanhaipotamon* Bott, 1968, are recognised, all from China (Parisi, 1916; Shen, 1940;

Dai & Chen, 1978; Ng & Dudgeon, 1992). Collections from Heping (Guangdong Province), Wenzhou (Zhejiang Province), Putian and Huaan (Fujian Province) in China have also revealed the presence of nine other species, all new to science.

The present paper serves to review and figure the extant species of *Nanhaipotamon* s. str. as well as to describe the new ones. Specimens are deposited in the Institute of Zoology, Academia Sinica (AS), Beijing; Zoological Reference Collection (ZRC), School of Biological Sciences, National University of Singapore; and Munich Museum (MMü), Germany.

TAXONOMY

Genus *Nanhaipotamon* Bott, 1968

Isolapotamon (*Nanhaipotamon*) Bott, 1968: 124 (part).

Nanhaipotamon, Bott, 1970: 95 (part); Dai & Chen, 1989: 35 (part); Ng & Dudgeon, 1992: 742.

Diagnosis. - Carapace convex fore and aft, branchial region swollen. Postfrontal lobe blunt, postorbital crest prominent, surface smooth. Antero-lateral border carinated, epibranchial tooth prominent, angular. Exopod of third maxilliped with short flagellum. Male abdomen triangular. Interruption between sutures of sternites 4/5, 5/6, 6/7 narrow, median longitudinal suture of sternites 7 and 8 moderately long. Male first pleopod relatively stout, terminal segment equal to or shorter than 1/2 of subterminal segment, dorsal lobe expended triangular. Male second pleopod groove at median side, gonopodal opens distally. Female genital pores opens inwards and downwards.

Type species. - *Potamon* (*Geothelphusa*) *formosana* Parisi, 1916, by original designation.

Distribution. - Guangdong, Fujian and Zhejiang provinces, and Taiwan.

KEY TO SPECIES

1. Male first pleopod with terminal segment relatively shorter, subterminal segment less than 2.4 times length of terminal segment 2
- Male first pleopod with terminal segment relatively longer, subterminal segment equal to or greater than 2.4 times length of terminal segment 3
2. Terminal segment of male first pleopod with inner-terminal angle globose, outer-distal angle comparatively stout *N. pingyuanense*
- Terminal segment of male first pleopod with inner-distal angle angular in shape, with rounded tip, outer-distal angle slender *N. huaanense*
3. Male first pleopod with terminal segment moderately long, subterminal segment 2.4-2.7 length of terminal segment 4
- Male first pleopod with terminal segment relatively shorter, subterminal segment about 3 times length of terminal segment 9
4. Male first pleopod with terminal segment about 2.1 times as long as broad, inner-distal angle with median part sloped inwards and downwards *N. wenzhouense*
- Male first pleopod with terminal segment less than 2 times as long as broad, shape of inner-distal angle not as above 5

5. Terminal segment of male first pleopod with inner-distal angle near median position, directed inwards and downwards *N. nanriense*
- Terminal segment of male first pleopod with inner-distal angle produced inwards and upwards 6
6. Terminal segment of male first pleopod with inner-distal angle narrow, distal margin convex ..
..... *N. guangdongense*
- Terminal segment of male first pleopod with inner-distal angle rounded, lobe on distal end rounded, distal margin inconspicuously convex 7
7. Terminal segment of male first pleopod with inner-distal angle produced, distal margin conspicuously concave *N. pinghense*
- Terminal segment of male first pleopod with inner-distal angle squarish or rounded, distal margin slightly concave 8
8. Terminal segment of male first pleopod with inner-distal angle appearing as a squarish lobe, not strongly expanded, distal margin slightly concave *N. yongchuense*
- Terminal segment of male first pleopod with inner-distal angle appearing as a rounded lobe, distinctly produced, distal margin slightly concave *N. hepingense*
9. Terminal segment of male first pleopod with inner-distal angle very acute *N. aculatum*
- Terminal segment of male first pleopod with inner-distal angle rounded, not acute 10
10. Terminal segment of male first pleopod with inner-distal angle obtusely rounded, median part sloped inwards and downwards *N. formosanum*
- Terminal segment of male first pleopod with inner-distal angle appearing as a rounded lobe, directed inwards and upwards *N. hongkongense*

***Nanhaipotamon formosanum* (Parisi, 1916)**

(Pl. I: 1; Fig. 1)

Potamon (*Geothelphusa*) *formosana* Parisi, 1916: 156, Pl. 8, fig. 16, Pl. 9, fig. 1.

Potamon (*Geothelphusa*) *formosanum*, Balss, 1937: 168, fig. 32.

Isolapotamon (*Nanhaipotamon*) *formosanum formosanum*, Bott, 1968: 124, fig. 9.

Nanhaipotmon formosanum formosanum, Bott, 1970: 195, fig. 8

Material examined. - 1 male, 1 female (AS), Bain-Her, Taiwan, 7 Aug.1991.

Description. - Carapace strongly convex fore and aft, surface smooth, cervical groove shallow, conspicuously defined. H-shaped groove between gastric and cardiac regions narrow and shallow, but defined. Postorbital crest sharp, connected with epibranchial teeth. Front deflexed, anterior margin emarginated medianly. Dorsal orbital ridged, exorbital acutely triangular in shape. Epibranchial tooth angular, antero-lateral margin ridged, with distinct granules in anterior portion, and smooth in posterior portion. Third maxilliped with merus about 1.1 times as broad as long, with ischium about 1.4 times as long as broad, exopod reaching to proximal 1/4 of merus, with a short flagellum.

Chelipeds strongly unequal, dorsal surface of carpus with a longitudinal depression, with rugae on inner border, inner-distal angle with acute spine, with pro tubercle at base; larger manus about 1.3 times as long as high, slightly shorter than movable finger, almost no gap between fingers. Ambulatory legs slender, last leg with propodus about 2.1 times as long as broad, slightly shorter than dactylus.

Male abdomen triangular, sixth segment about 2.1 times as broad as long; telson about 1.2 times as broad as long. Median longitudinal groove of thoracic sternum somewhat deep, interruption between sutures of sternites 4/5, 5/6, 6/7 narrow, median longitudinal suture of sternites 7 and 8 moderately long.

Male first pleopod reaching beyond tubercle of abdominal lock, almost reaching to suture of sternites 4/5. Subterminal segment about 3.7 times as long as terminal segment, terminal segment triangular, about 1.8 times as long as broad, distal margin sloped downwards, inner-distal angle situated medially of inner border. Male second pleopod with subdistal segment about 1.8 times as long as distal segment.

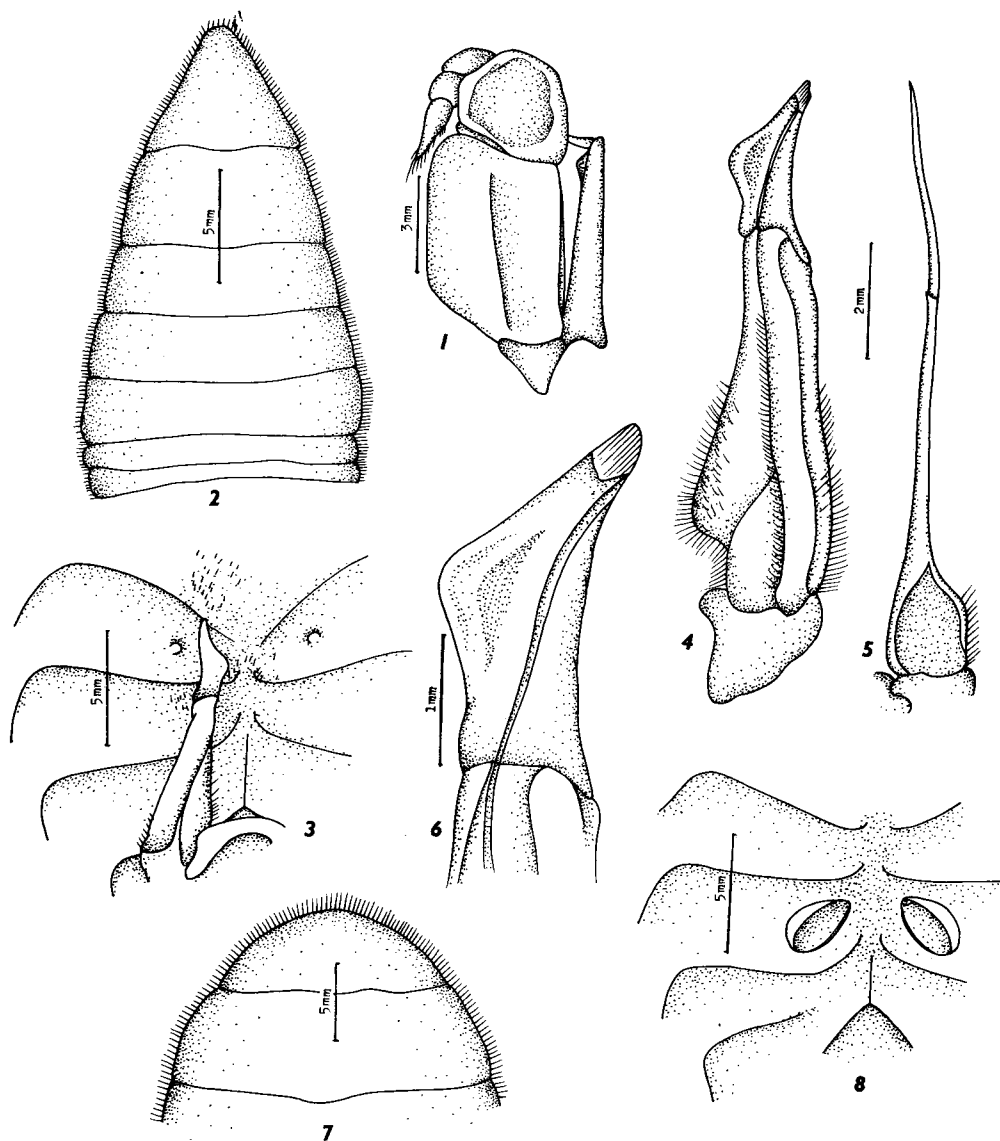


Fig. 1. *Nanhaipotamon formosanum* (Parisi). 1-6, male; 7-8, female. 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male second pleopod; 6. Male first pleopod, distal segment; 7. Female abdomen; 8. Female genital pore.

Female abdomen with the sixth segment about 3 times as broad as long; telson about 2.7 times as broad as long. Median longitudinal groove of thoracic sternum slightly depressed, interruption between sutures of sternites 4/5, 5/6, 6/7 narrow, genital pore ovate.

Carapace length of male: 30.5 mm, breadth 36.8 mm; female: length 30 mm, breadth 35.9 mm.

Habitat. - Lives in the holes along the banks of streams under an altitude of 500 meters above sea level.

Distribution. - Known only from western Taiwan.

Remarks. - Froggia & Grippa (1986) reported on the types of *N. formosanum* in the Museo Civico di Storia Naturale in Milano with a photograph of a syntype male specimen and its first pleopods. From the photographs, it would appear that the terminal border of the male first pleopod terminal segment of the syntopic specimen is considerably concave. The terminal border of the male first pleopod of the specimens which I have examined is, however, relatively straight. It must be noted that the pleopods photographed in Froggia & Grippa (1986) were not placed flat on the surface and the pleopod were distinctly elevated from the surface on which they were placed on. The orientation of the male first pleopod is very important for the identification at the specific level and might explain the considerable differences observed in the photographs of Froggia & Grippa (1986) and those depicted here. In the absence of more materials, the specimens examined from Taiwan are here identified as *N. formosanum* for the moment.

***Nanhaipotamon yongchuense*, new species**

(Pl. I: 2; Fig. 2)

Nanhaipotamon formosanum, Dai & Chen, 1979: 244, Fig. 1:1-3 (nec *Potamon* (*Geothelphusa*) *formosana* Parisi, 1916).

Material examined. - Holotype, 1 male (AS)(FJ7793182A), Fujian Province, Yongchu (43.7°N, 125.2°E), 29 Jun. 1977.

Paratypes - Allotype, 1 female (AS)(FJ7793182B), 4 males, 2 females, 7 juvs., same data as holotype.

Description. - Carapace distinctly convex fore and aft, surface smooth, finely pitted. Cervical groove indistinct, H-shaped groove between gastric and cardiac regions narrow, shallow. Postfrontal lobe bluntly rounded, postorbital crest blunt medially, sharp laterally, connected with epibranchial tooth. Front slightly deflexed, emarginated medially. Dorsal orbital border ridged, exorbital angle acutely triangular, separated from epibranchial tooth by deep notch. Epibranchial tooth angular. Antero-lateral border carinated in anterior portion, lined with indistinct blunt granules, but in some individuals smooth, ridged in posterior portion, turning backwards. Branchial region swollen. Third maxilliped with merus pentagonal, about 1.2 times as broad as long, with ischium about 1.5 times as long as broad, exopod reaching to proximal 1/4 of merus, with a short flagellum.

Chelipeds strongly unequal, dorsal surface of carpus with fine granules and rugae, inner-distal angle with stout spine, with spinule at base; larger manus pitted, about 1.2 times as

long as high, about 1.1 times as long as movable finger, with short setae under lens, last leg with propodus about 1.9 times as long as broad, shorter than dactylus.

Male abdomen triangular, sixth segment about 1.2 times as broad as long. Interruption between sutures of sternites 4/5, 5/6, 6/7, narrow, median longitudinal suture of sternites 7 and 8 moderately long.

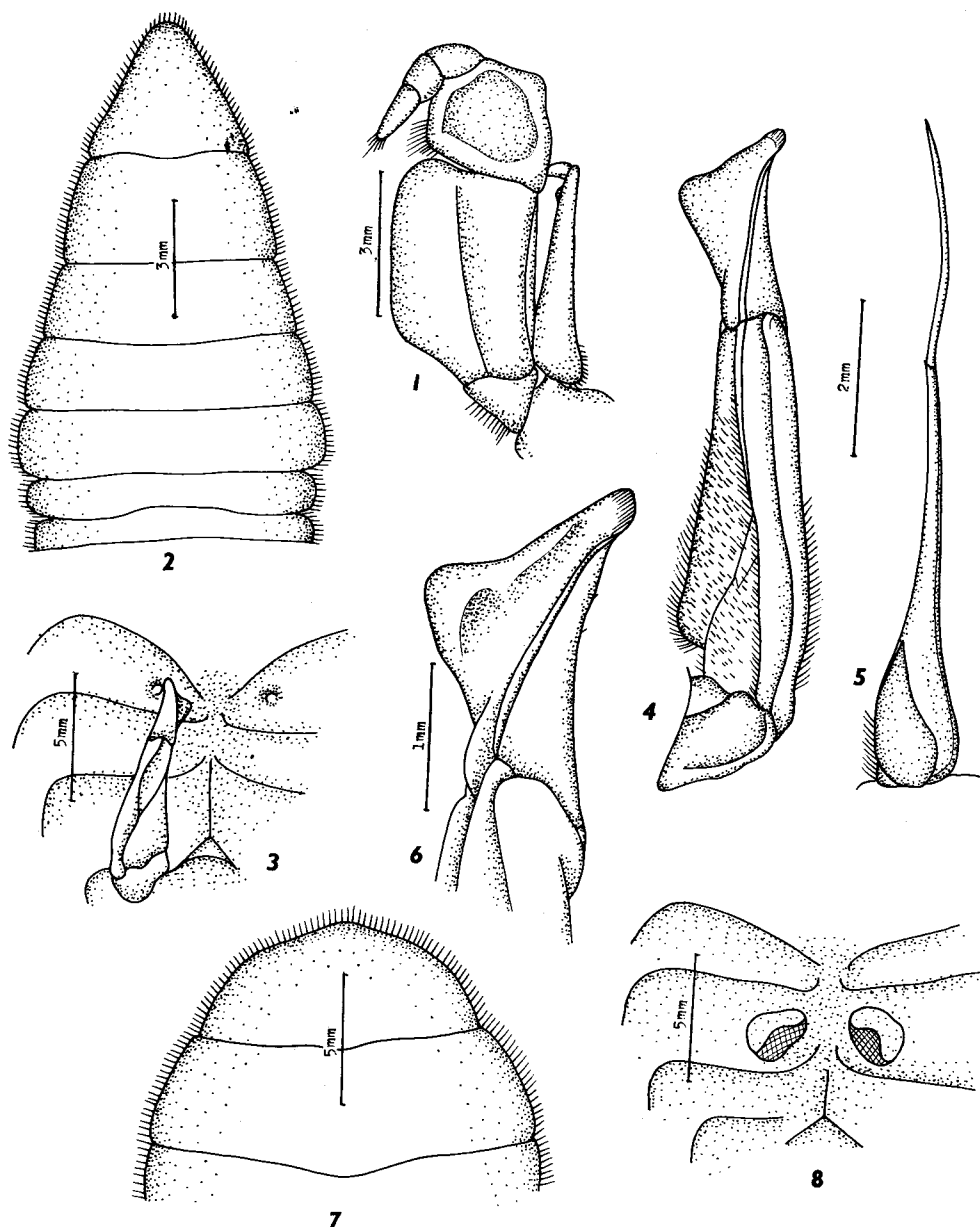


Fig. 2. *Nanhaipotamon yongchuense*, new species. 1-6, holotype male (FJ7793182A), carapace length 22.8 mm, breadth 28 mm; 7-8, allotype female, carapace length 25 mm, breadth 30.7 mm (FJ7793182B) 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male second pleopod; 6. Male first pleopod, distal segment; 7. Female abdomen; 8. Female genital pore.

Male first pleopod reaching slightly beyond abdominal lock tubercle, subdistal segment about 2.4 times as long as distal segment, which is about 1.8 times as long as broad, inner distal angle prominently rounded to squarish, outer-distal angle horn-like. Male second pleopod with subdistal segment about 1.9 times as long as distal segment.

Female abdomen broadly ovate, sixth segment about 3 times as broad as long, telson about 2.3 times as broad as long. Genital pore squarish to ovate, opens inwards and downwards.

Carapace length of male 22.6 mm, breadth 28 mm; of female, length 25 mm, breadth 30.7 mm.

Remarks. - This new species is close to *N. formosanum* (Parisi, 1916). The differences between them are as follow:

Characters	<i>N. formosanum</i>	<i>N. yongchuense</i> , new species
Male first pleopod: proportion of the subdistal and distal segments	3.7:1	2.4:1
Male first pleopod: distal margin of distal segment	slopes downwards to 1/2 length of outer-lateral border	slopes downwards to 1/5 length of outer-lateral border

***Nanhaipotamon nanriense*, new species**

(Pl. I: 3; Fig. 3)

Material examined. - Holotype, male (AS)(FK759381A), Nanri Is. (25.2°N, 119.5°E), Putian County, Fujian Province, 13 Nov.1975.

Paratypes - Allotype: 1 female (AS)(FK759361B), 1 male, 1 female, same data as holotype.

Description. - Carapace convex fore and aft, surface smooth with fine pits. Cervical groove broad, shallow, visible. H-shaped groove between gastric and cardiac regions narrow, distinct. Postfrontal lobe blunt, postorbital crest sharp, connected with epibranchial tooth. Epibranchial teeth squarish to angular, antero-lateral border carinated, with comparatively distinct granular teeth, last part turning backwards. Front slightly deflexed, emarginated medially, dorsal orbital border ridged, orbital angle triangular, lateral margin arched. Third maxilliped with merus about 1.1 times as broad as long, with ischium about 1.5 times as long as broad, exopod almost reaching proximal 1/3 of merus, with a slender, short flagellum.

Cheliped distinctly unequal, carpus surface covered with finely squamous granules, inner-distal angle with stout spine and tubercular spinule at base; larger manus about 1.4 times as long as high, slightly longer than movable finger, almost no gap between fingers. Ambulatory legs slender, last leg with propodus about 1.9 times as long as broad, shorter than dactylus.

Male abdomen triangular, sixth segment about 2 times as broad as long; telson about 1.1 times as broad as long. Median longitudinal groove of thoracic sternum relatively deep, interruption between sutures of sternites 4/5, 5/6, 6/7 narrow, median longitudinal suture of sternites 7 and 8 relatively short.

Male first pleopod almost reaching tubercle of abdominal lock, subterminal segment about 2.6 times as long as terminal segment, which is about 1.8 times as long as broad. Male second pleopod with subdistal segment about 1.9 times as long as distal segment.

Female immature, abdomen broadly triangular. Genital pore nearly oval, opens inner-downwards.

Carapace length of male 28.8 mm, breadth 22.2 mm; of female, length 17.3 mm, breadth 20.5 mm.

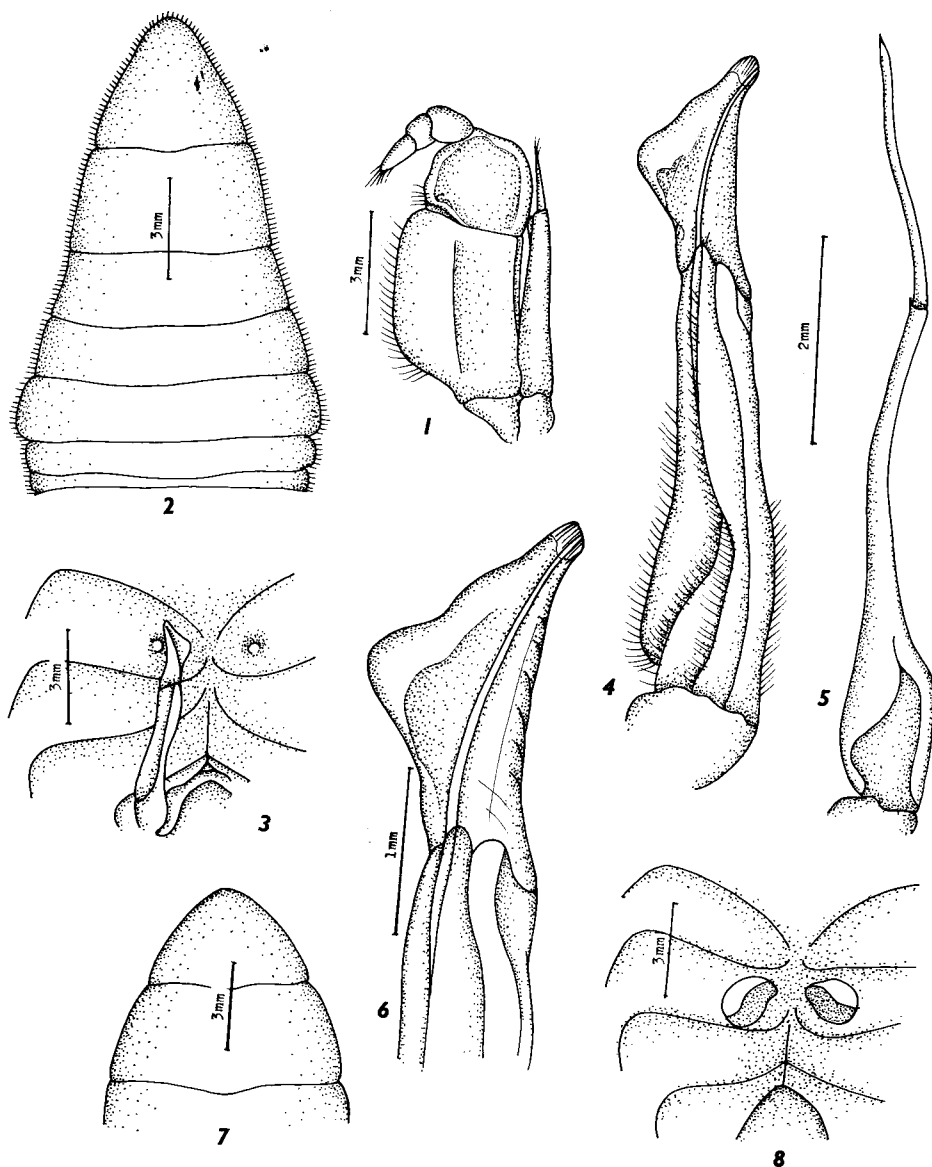


Fig. 3. *Nanhaipotamon nanriense*, new species. 1-6, holotype male, carapace length 28.8 mm, breadth 22.2 mm (FJ759318IA); 7-8, allotype female, carapace length 17.3 mm, breadth 20.5 mm (FJ759318IB). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male second pleopod; 6. Male first pleopod, distal segment; 7. Female abdomen; 8. Female genital pore.

Remarks. - This new species is similar to *N. formosanum* (Parisi, 1916), but the differences between them are shown below:

Characters	<i>N. formosanum</i>	<i>N. nariense</i> , new species
Exorbital teeth	gently sloping	sharply sloping
Male first pleopod: Portion of the subdistal and distal segments	3.7:1	2.6:1
Male first pleopod: Portion of length and breadth of distal segment	1.8:1	1.6:1

***Nanhaipotamon huaanense*, new species**
(Pl. I:4 ; Fig. 4)

Material examined. - Holotype, male (AS)(FJ8493180A), Gaoan (24.8°N, 117.4°E), Huaan, Fujian Province, 15 Jun.1984.

Paratypes - Allotype: 1 female (AS)(FJ8493180B), 1 male, same data as holotype.

Description. - Carapace convex fore and aft, surface smooth. Cervical groove shallow indistinct, H-shaped groove between gastric and cardiac regions narrow and shallow, but visible. Postfrontal lobe blunt, slightly convex, postorbital crest prominent, slightly blunt, connected with epibranchial tooth. Front slightly deflexed, emarginated medially. Dorsal orbital border ridged. Exorbital angle triangular. Antero-lateral border ridged, smooth, lined with indistinctly granular teeth. Third maxilliped with merus as long as broad, with ischium about 1.5 times as long as broad, exopod reaching to proximal 1/3 of merus, with slender, short flagellum.

Chelipeds strongly unequal, merus prismatic in cross-section; carpus smooth, inner-distal angle with a bifurcated spine and basal spinule; larger manus about 1.4 times as long as high, slightly shorter than movable finger, with a narrow gap between fingers. Ambulatory legs slender, last leg with propodus about 2.2 times as long as broad, distinctly shorter than dactylus.

Male abdomen triangular, sixth segment about 2.2 time as broad as long, telson about 1.3 times as broad as long. Median longitudinal groove of thoracic sternum slightly deep, interruption between sutures of sternites 4/5, 5/6, 6/7 narrow, median longitudinal suture of sternites 7 and 8 comparatively short.

Male first pleopod reaching abdominal lock tubercle, subterminal segment about 2.4 times as long as terminal segment, which about 1.8 times as long as broad, distal border distinctly sloped downwards. Male second pleopod with subdistal segment about 1.6 times as long as distal segment.

Female abdomen ovately rounded, sixth segment about 3.1 times as broad as long, telson semicircular, about 2.4 times as broad as long. Genital pore shaped like a helmet, opens inwards and downwards.

Carapace length of male, 21.5 mm, breadth 26.7 mm; of female, length 21.2 mm, breadth 26 mm.

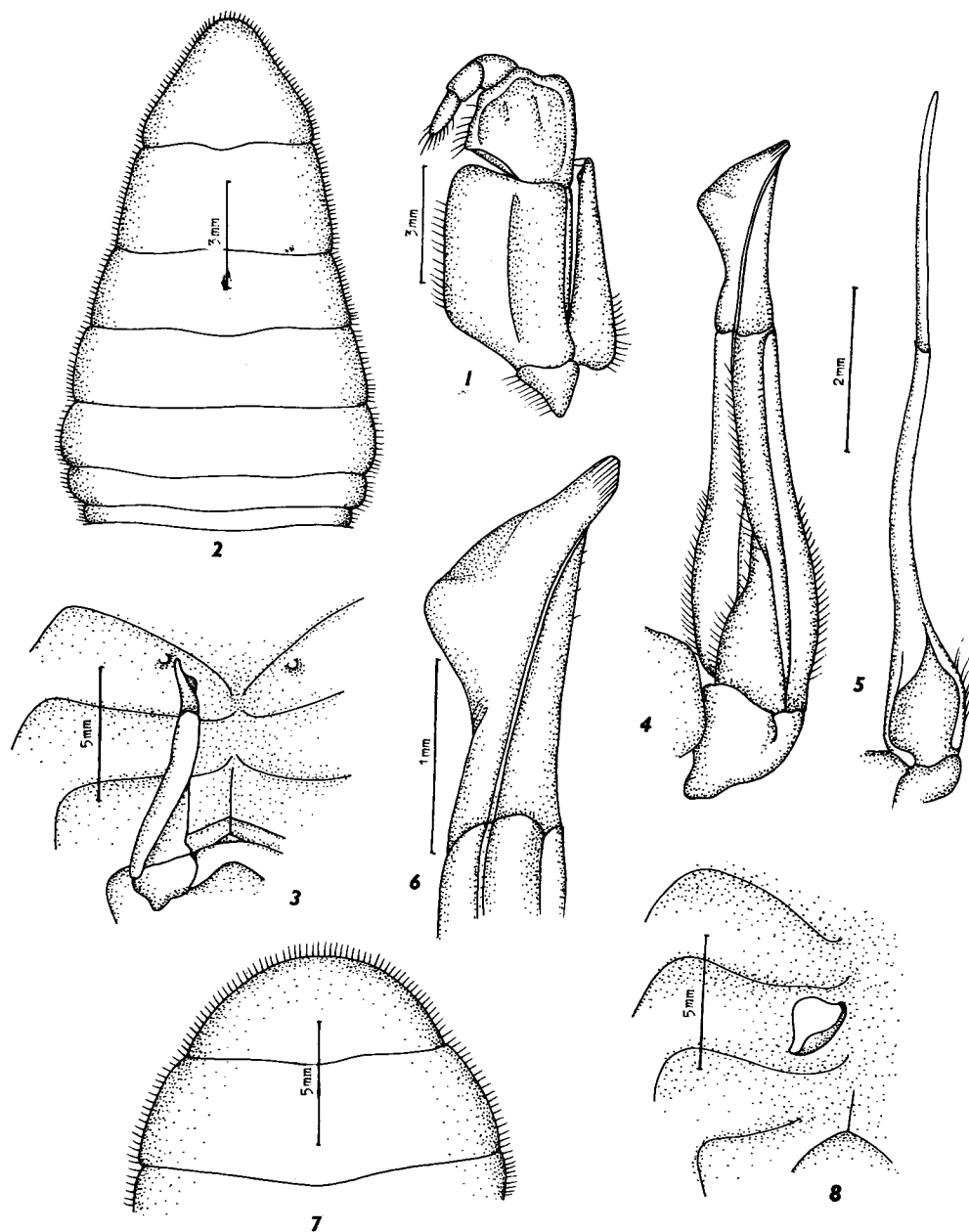


Fig. 4. *Nanhaipotamon huaanense*, new species. 1-6, holotype male, carapace length 21.5 mm, breadth 26.7 mm (FJ8493180A); 7-8, allotype female, carapace length 21.2 mm, breadth 25 mm (FJ8493180B). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male second pleopod; 6. Male first pleopod, distal segment; 7. Female abdomen; 8. Female genital pore.

Remarks. - This new species is close to *N. nanriense*, new species. The differences between them are listed below:

Characters	<i>N. nanriense</i> , new species	<i>N. huaanense</i> , new species
Exorbital teeth	steep	slightly sloping
End of anterolateral border of carapace	distinctly turning backwards	weakly turning backwards
Male first pleopod: proportion of the subdistal and distal segments	2.6:1	2.4:1
Male first pleopod: proportion of length of distal segment	1.6:1	1.8:1
Male first pleopod: \downarrow inner-distal angle of distal segment	rounded	rectangular

***Nanhaipotamon pingyuanense*, new species**

(Pl. I: 5; Fig. 5)

Material examined. - Holotype, male (AS)(GD8391118A), upper reaches of streams, under stone or in muddy hole; Pingyuan (24.5°N, 115.8°E), Guangdong Province, Sep.1983.

Paratypes - Allotype: 1 female (AS)(GD8391118B), same data as holotype. — 1 male (juv.), 2 females (2 juv.) (AS), Meixian, Guangdong Province, 1983.

Description. - Carapace convex fore and aft, surface finely pitted, epibranchial region with fine granules, cervical groove shallow, slightly visible, H-shaped groove between gastric and cardiac regions narrow, distinct, clear anteriorly. Front slightly deflexed, emarginated medially. Postfrontal lobes slightly prominent, postorbital crest rather sharp. Dorsal orbital border ridged, smooth, exorbital angle triangular. Epibranchial tooth angular, antero-lateral border ridged lined with 17-18 blunt granules. Third maxilliped with merus as long as broad, ischium about 1.6 times as long as broad, reaching proximal one third of merus, with a flagellum.

Chelipeds clearly unequal, carpus slightly depressed dorsally, inner border with granules, inner-distal angle with short spine, with smaller spine at base; larger manus glabrous, about 1.3 times as long as high, almost as long as movable finger, gap very narrow between fingers. Ambulatory legs slender, with propodus about 2 times as long as broad, conspicuously shorter than dactylus.

Male abdomen triangular, sixth segment about 2.3 times as broad as long; telson about 1.2 times as broad as long. Median longitudinal groove of thoracic sternum slightly deep, interruption between sutures of sternites 4/5, 5/6, 6/7 very narrow.

Male first pleopod almost reaching beyond tubercle of abdominal lock, subterminal segment about 2.2 times as long as terminal segment, which is comparatively slender, inner border concave, inner-distal angle convex, distal margin almost straight. Male second pleopod with subdistal segment about 1.7 times as long as distal segment.

Female abdomen rounded to oval, sixth segment about 3.2 times as broad as long; telson about 2 times as broad as long, distal margin shaped medially like a papilla. Genital pore elongated, obliquely squarish.

Carapace length of male 17.6 mm, breadth 21.1 mm; of female, length 16.8 mm, breadth 20 mm.

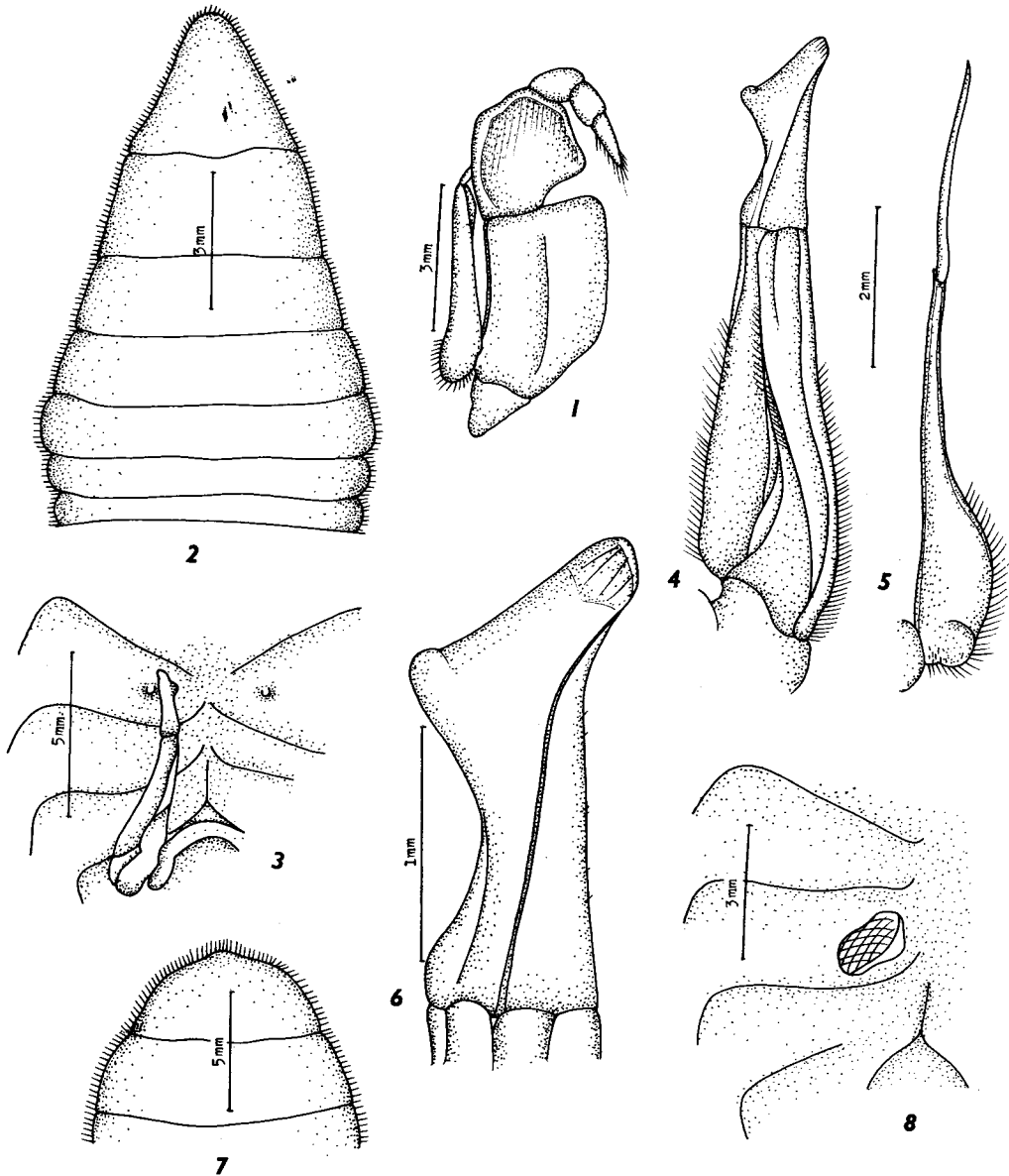


Fig. 5. *Nanhaipotamon pingyuanense*, new species. 1-6, holotype male, carapace length 17.8 mm, breadth 21.1 mm (GD8391118A); 7-8, allotype female, carapace length 16.8 mm, breadth 20 mm (GD8391118B). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male second pleopod; 6. Male first pleopod, distal segment; 7. Female abdomen; 8. Female genital pore.

Remarks. - This new species is related to *N. huaanense*, new species. The differences between them are listed belows:

Characters	<i>N. huaanense</i> , new species	<i>N. pingyuanense</i> , new species
Exorbital teeth	angular in shape	slightly acute in shape
Anterolateral border of carapace	with distinctly granular teeth	with flattish blunt granular teeth
Male first pleopod: outer distal angle	slender	bluntly broad
Male first pleopod: inner-distal angle of distal segment	Squarish-rounded	prominently rounded

***Nanhaipotamon wenzhouense*, new species**
(Pl. I: 6; Fig. 6)

Material examined. - Holotype, 1 male (AS)(ZJ7993174A), Wenzhou (28.0°N, 120°E), Zhejiang Province, 1979.

Paratype - Allotype 1 female (AS)(ZJ7993174B), same data as holotype.

Description. - Carapace swollen, convex fore and aft, surface smooth, covered with fine pits. Cervical groove shallow, H-shaped groove between gastric and cardiac regions with posterior portion deeper. Postfrontal lobes narrow, postorbital crest connected with epibranchial teeth, postorbital region concave. Front deflexed, anterior border emarginated medially, dorsal orbital border ridged. Exorbital angle steeply triangular, epibranchial tooth roundly angular, antero-lateral border carinated, branchial region swollen. Third maxilliped with merus about as long as broad, with ischium about 1.6 times as long as broad, exopod almost reaching to proximal 1/3 of merus, with short flagellum.

Chelipeds clearly unequal, carpus with acute spine on inner-distal angle, with tubercle at base; larger manus about 1.3 times as long as high, slightly shorter than movable finger, with broad gap between fingers when closed. Ambulatory legs slender, last leg with propodus about 3.1 times as long as broad.

Male abdomen triangular, sixth segment about 2.3 times as broad as long; telson about 1.2 times as broad as long. Median longitudinal groove of thoracic sternum deeper, interruption between sutures of sternites 4/5, 5/6, 6/7, narrow, median longitudinal suture of sternites 7 and 8 slightly short.

Male first pleopod almost reaching tubercle of abdominal lock, subterminal segment about 2.4 times as long as terminal segment, which is about 2.1 times as long as broad, inner-distal angle sloping downwards, outer-distal angle slender, horn-shaped. Male second pleopod with subdistal segment about 1.4 times as long as distal segment.

Female abdomen ovately rounded, sixth segment about 3 times as broad as long, telson about 2.2 times as broad as long. Genital pore oval, with inner portion narrow, outer portion broad.

Carapace length of male 29.1 mm, breadth 36.1 mm; of female, length 23.1 mm, breadth 29.2 mm.

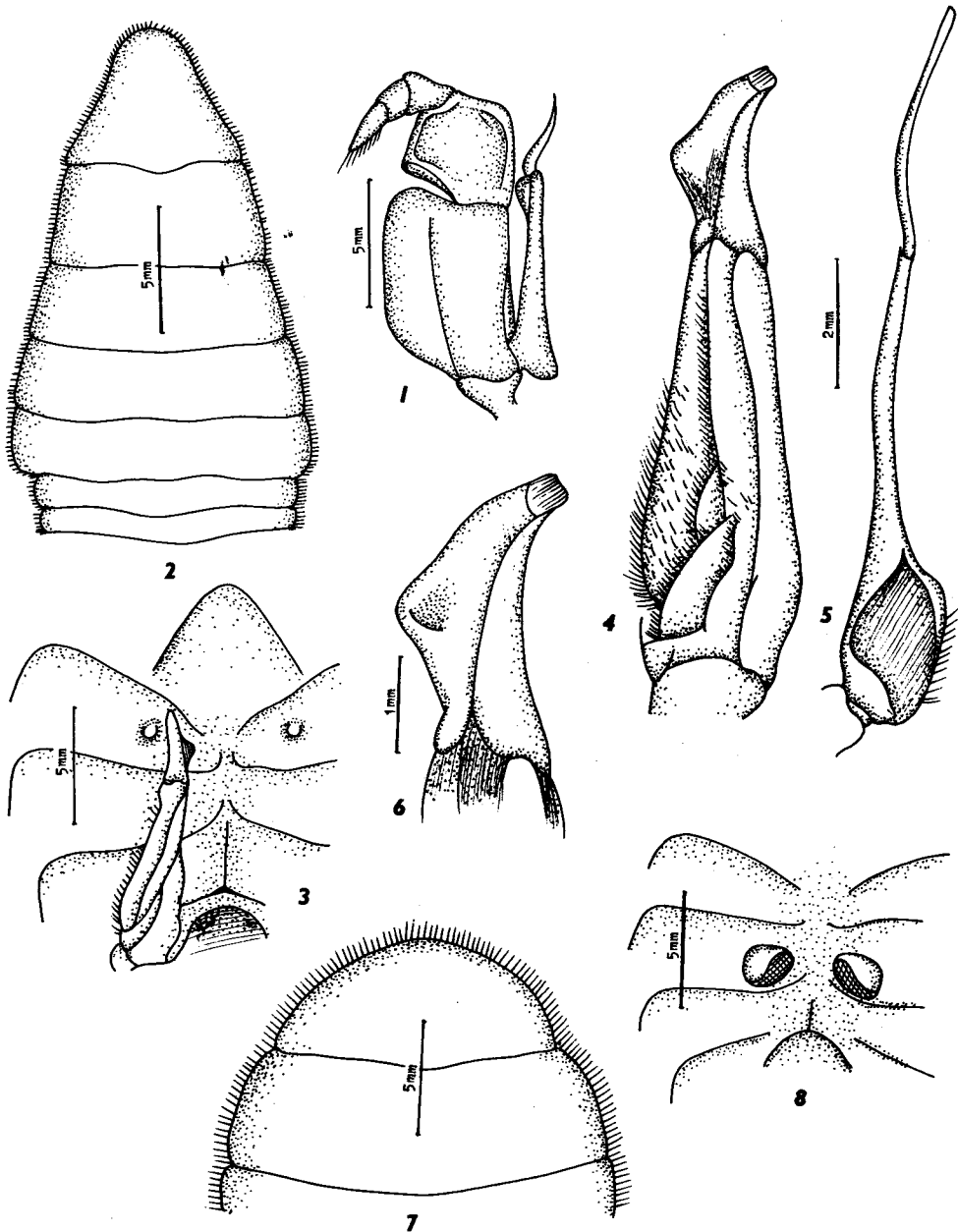
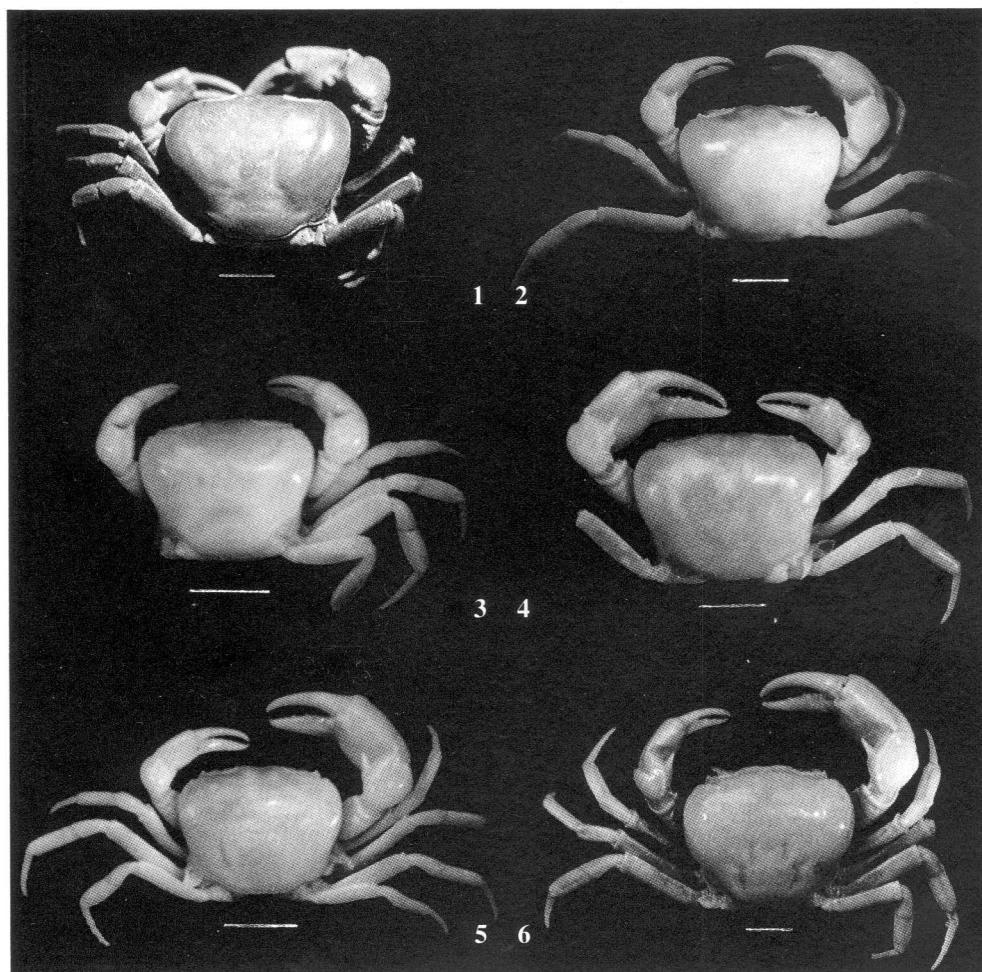


Fig. 6. *Nanhaipotamon wenzhouense*, new species. 1-6, holotype male, carapace length 29.1 mm, breadth 35.1 mm (ZJ7993174A); 7-8, allotype female, carapace length 23.1 mm, breadth 29.2 mm (ZJ7993174B). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male second pleopod; 6. Male first pleopod, distal segment; 7. Female abdomen; 8. Female genital pore.

Remarks. - This new species is close to *N. nanriense*, new species. The differences between them are listed below:

Characters	<i>N. nanriense</i> , new species	<i>N. wenzhouense</i> , new species
Anterolateral border of carapace	with distinctly granular teeth	nearly smooth
Male first pleopod: proportion of the length of subdistal and distal segment	2.6:1	2.4:1
Male first pleopod: proportion of the length and breath of the distal segment	1.6:1	2.1:1
Male first pleopod: Inner-distal angle of the distal segment	prominent, globular	flattish and in a lower position
Male abdomen: proportion of the breath and length of sixth segment	2.3:1	2:1



Pl. I. 1. *Nanhaipotamon formosanum*; 2. *Nanhaipotamon yongchuense*; 3. *Nanhaipotamon nanriense*; 4. *Nanhaipotamon huaanense*; 5. *Nanhaipotamon pingyuanense*; 6. *Nanhaipotamon wenzhouense*. The scale bar represents 10 mm.

***Nanhaipotamon hongkongense* (Shen, 1940)**

(Pl. II: 1; Fig. 7)

Potamon (Potamon) hongkongensis Shen, 1940a: 213, 229 (nomen nudum); Shen, 1940b: 2 5 6 , figs. 1-5.

Potamon globosum, Pretzmann, 1963: 257 (nec *Potamon (Geothelphusa) globosa* Parisi, 1916).

Nanhaipotamon formosanum globosum, Bott, 1968: 125 (nec *Potamon (Geothelphusa) globosa* Parisi, 1916).

Nanhaipotamon formosanum hongkongense, Dai & Chen, 1987: 30.

Nanhaipotamon hongkongense, Ng & Dudgeon, 1992: 744 Figs. 1, 2, 3A.

Material examined. - 1 male, 1 female (ZRC 1991.1782-1783), Tai Po Kau, New Territories, Hongkong (Forest Reserve), coll. P. Ng, Jun.1991.

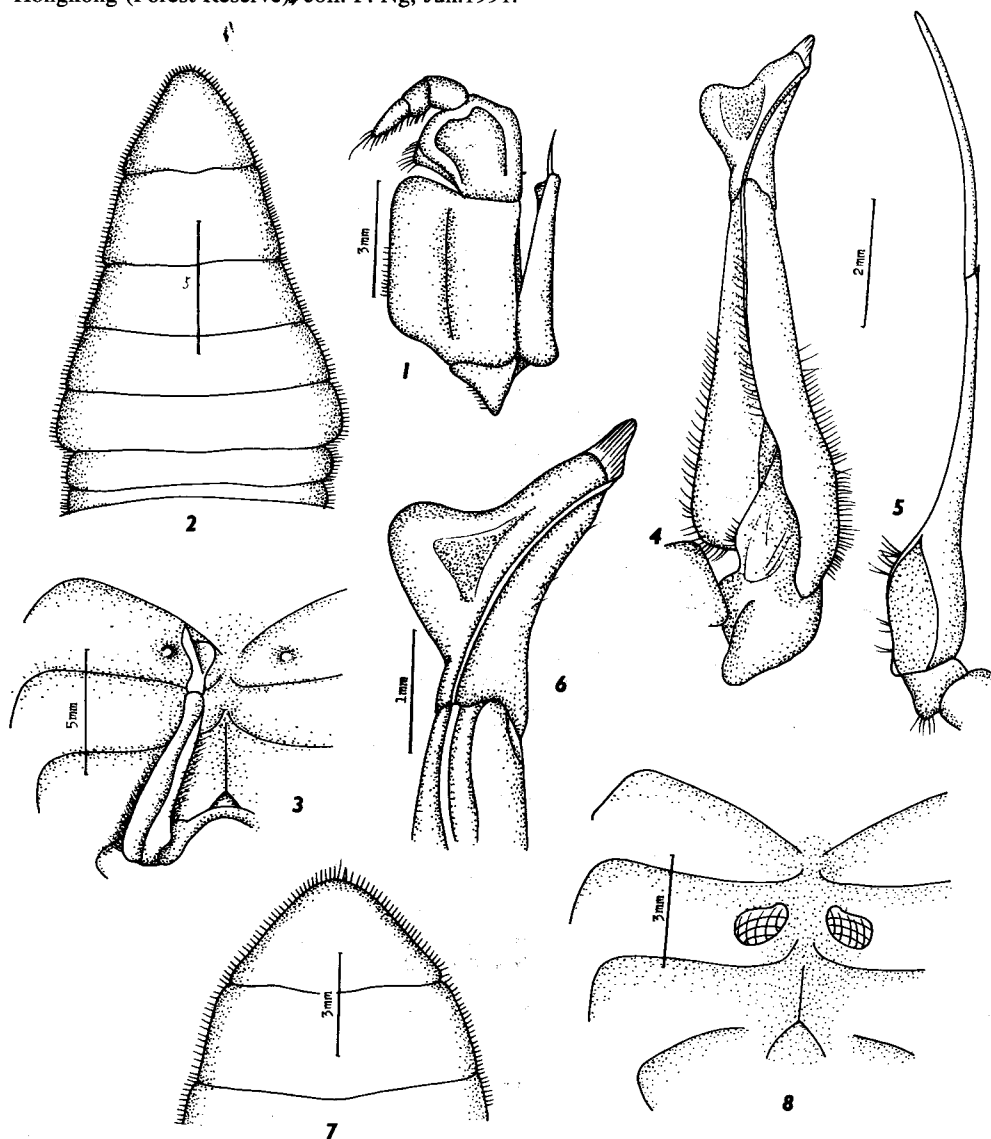


Fig. 7. *Nanhaipotamon hongkongense* (Shen, 1940). 1-6, male, carapace length 25.1 mm, breadth 31.4 mm; 7-8, female, carapace length 17.7 mm, breadth 21.9 mm. 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male second pleopod; 6. Male first pleopod, distal segment; 7. Female abdomen; 8. Female genital pore.

Description. - Carapace convex fore and aft, surface smooth, cervical groove shallow, deflex, H-shaped groove narrow, shallow. Postfrontal lobes blunt, postorbital crest prominent, connected with epibranchial tooth. Front deflexed, anterior border emarginated medially. Dorsal orbital border ridged, exorbital angle triangular. Epibranchial tooth angular, antero-lateral border ridged, lined with inconspicuous granules. Third maxilliped with merus about as broad as long, with ischium about 1.3 times as long as broad, exopod almost reaching proximal 1/3 of merus, with short flagellum.

Chelipeds clearly unequal, carpus with shallow depression on dorsal surface medially, inner-distal angle with stout spine, with tubercle at base; larger manus about 1.3 times as long as high, slightly longer than movable finger, inner border of fingers with blunt teeth, with almost no gap when closed. Ambulatory legs slender, last leg with propodus about 2.2 times as long as broad, shorter than dactylus.

Male abdomen triangular, sixth segment about 1.9 times as broad as long; telson about 1.3 times as broad as long. Median longitudinal groove of thoracic sternum deep, interruption between sutures of sternites 4/5, 5/6, 6/7 narrow, median longitudinal suture of sternites 7 and 8 moderately long.

Male first pleopod almost reaching tubercle of abdominal lock, subterminal segment about 4 times as long as terminal segment which is about 1.1 times as long as broad, distal margin slightly arched along outer border, concave along inner border, inner-distal angle prominent. Male second pleopod with subdistal segment about 1.5 times as long as distal segment.

Female immature, abdomen ovate, sixth segment about 2.6 times as broad as long; telson bluntly, triangular, about 1.9 times as broad as long. Genital pore oval.

Carapace length of male 25.1 mm, breadth 31.4 mm; of female, length 17.7 mm, breadth 21.9 mm.

Distribution. - Hongkong.

Remarks. - This species was redescribed and figured in detail by Ng & Dudgeon (1992) and there is no need to elaborate on it here. They noted that the types were lost but did not designate replacements. Since a second similar looking species from the genus is recognised here from Hong Kong (*N. aculatum*, new species), it would be in the interest of stability to designate a neotype for *N. hongkongense*. The male specimens figured by Ng & Dudgeon (1992) from the New Territories in Hong Kong, ZRC 1991.1776 (28.2 by 23.6 mm) is hereby designated as the neotype of *N. hongkongense*.

***Nanhaipotamon hepingense*, new species**

(Pl. II: 2; Fig. 8)

Material examined. - Holotype, male (AS)(GD659III9), Heping (24.4°N, 114.9°E), Guangdong Province, 7 May 1965.

Description. - Carapace more convex fore and aft, surface glabrous, only with fine pits. Cervical groove broad, shallow, depressed posteriorly, H-shaped groove short, inconspicuous

anteriorly, comparatively deep posteriorly. Postfrontal lobes slightly prominent, postorbital crest bluntly rounded, postorbital region concave. Front deflexed, anterior border slightly emarginated medially. Dorsal orbital border ridged, exorbital angle almost at right angles. Antero-lateral border ridged, with 4-5 granular teeth one-third anteriorly, with blunt elongated granules along posterior two-thirds. Third maxilliped with merus about 1.2 times as long as broad, exopod almost reaching to proximal 1/4 of merus, with flagellum.

Chelipeds clearly unequal, carpus with shallow groove dorsally, inner-distal angle with acute spine, with smaller one at base; larger manus glabrous, about 1.3 times as long as high, movable finger about 1.1 times as long as manus; with small gap between fingers. Ambulatory legs smooth, last leg with propodus about 2 times as long as broad, conspicuously shorter than dactylus.

Male abdomen triangular, sixth segment about 2.3 times as broad as long; telson about 1.3 times as broad as long. Median longitudinal groove of thoracic sternum moderately deep, interruption between sutures of sternites 4/5, 5/6, 6/7 narrow.

Male first pleopod almost reaching to suture of sternites 4/5, with subterminal segment about 2.7 times as long as terminal segment, which triangular, inner-distal angle rounded, lobiform, distal margin slightly arched outwards and laterally. Male second pleopod with subdistal segment about 1.3 times as long as distal segment.

Carapace length of male 23.7 mm, breadth 28.3 mm.

Remarks. - This new species is close to *N. yongchuense*, new species. The differences between the two of them are as follow:

Characters	<i>N. yongchuense</i> , new species	<i>N. hepingense</i> , new species
End of anterolateral border of carapace	slightly turning dorsally	distinctly turning dorsally
Cervical groove	shallow	with depression
Male first pleopod: proportion of the length of subdistal and distal segment	2.4:1	2.7:1
Male first pleopod: proportion of the length and breadth of distal segment	1.8:1	1.4:1
Male first pleopod: Inner-distal angle of the distal segment	squarish-rounded, not very expanded	rounded, expanded
Male abdomen: proportion of the breadth and length of sixth segment	2:1	2.3:1

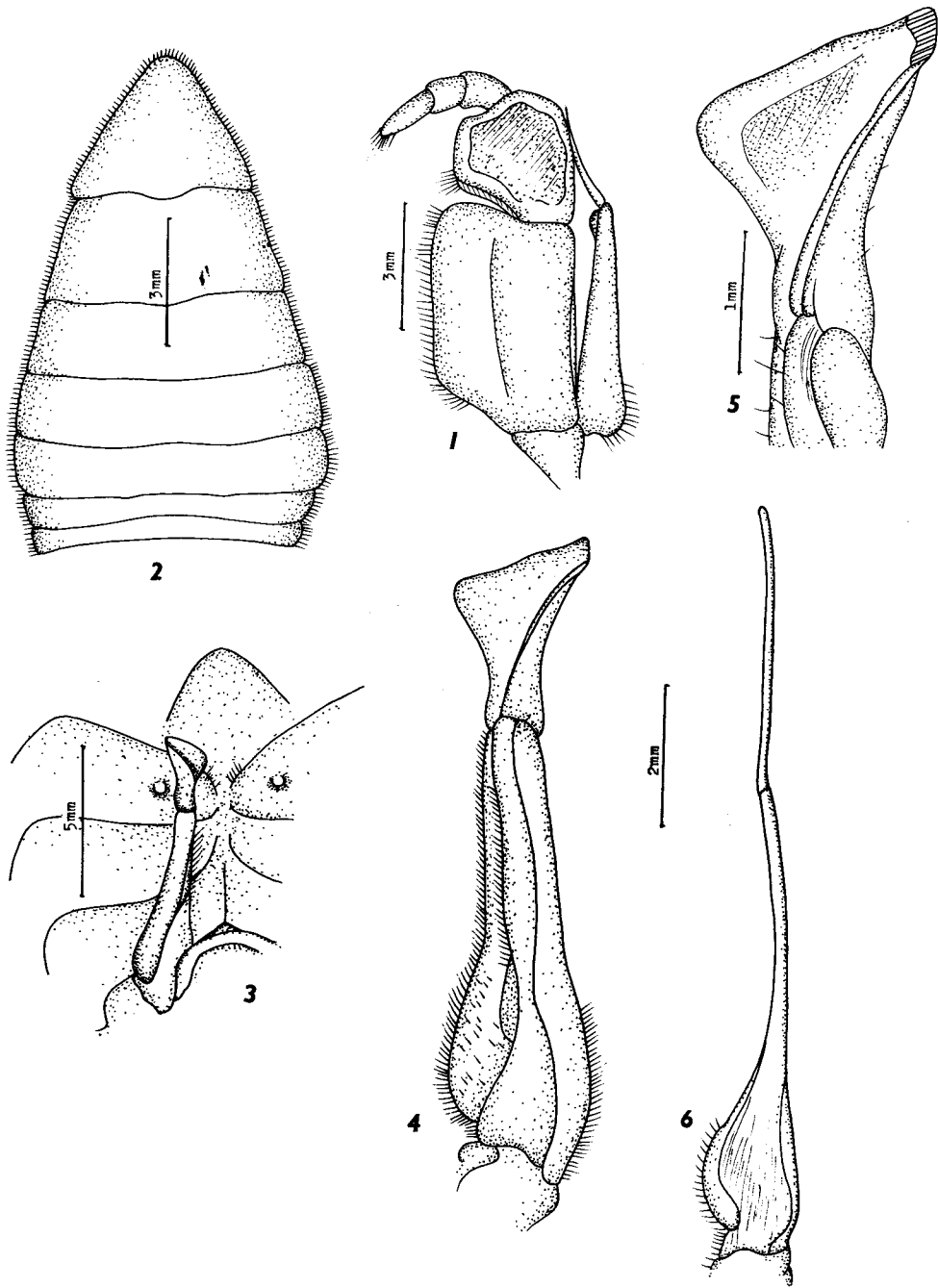


Fig. 8. *Nanhaipotamon hepingense*, new species. 1-6, holotype male, carapace length 23.7 mm, breadth 28.3 mm (GD6591119). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male first pleopod, distal segment; 6. Male second pleopod.

Nanhaipotamon guangdongense, new species

(Pl. II: 3; Fig. 9)

Material examined. - Holotype, male (AS)(GD0091120), Guangdong Province.

Description. - Carapace convex fore and aft, rather thick, surface glabrous. Cervical groove shallow but visible, H-shaped groove narrow, shallow but conspicuous. Postfrontal lobes comparatively broad, slightly prominent, postorbital crest prominent inwards and laterally, sharp outwards and laterally. Front deflexed, anterior border slightly emarginated medially, dorsal orbital border ridged, smooth, exorbital tooth triangular. Epibranchial tooth angular, antero-lateral border shorter than postero-lateral border, with 6-7 serrated teeth anteriorly, last portion smooth, turning backwards. Third maxilliped with merus as long as broad, ischium about 1.3 times as long as broad, exopod almost reaching proximal 1/2 of merus, with slender flagellum.

Chelipeds conspicuously unequal, carpus slightly depressed medially, inner-lateral border with tubercles, inner-distal angle with conical spine, with 3-4 tubercles at base; larger manus 1.3 times as long as high, almost as long as movable finger, no gape between fingers when closed. Ambulatory legs slender, smooth, last leg with propodus about 2 times as long as broad, slightly shorter than dactylus.

Male abdomen triangular, sixth segment about 2 times as broad as long; telson about 1.3 times as broad as long. Median longitudinal groove of thoracic sternum comparatively deep, interruption between sutures of sternites 4/5, 5/6, 6/7 narrow.

Male first pleopod almost reaching tubercle of abdominal lock, subterminal segment about 2.7 times as long as terminal segment, which is triangular distally, inner border slightly concave at proximal 1/3, inner-distal angle rounded, distinctly arched outwards and laterally. Male second pleopod with subdistal segment about 1.8 times as long as distal segment.

Carapace length of male 26.4 mm, breadth 33.2 mm.

Remarks. - This new species is comparatively close to *N. hepingense*, new species. The main differences separating them are listed below:

Characters	<i>N. hepingense</i> , new species	<i>N. guangdongense</i> , new species
Exorbital angle	Steep	Slope
Cervical groove	Depressed	Shallow, narrow
Male first pleopod: proportion of the length and breath of distal segment	1.4:1	1.6:1
Male first pleopod: inner-distal angle of the distal segments	Rounded	Bluntly angular
Male abdomen: proportion of the breath and length of sixth segment	2.3:1	2:1

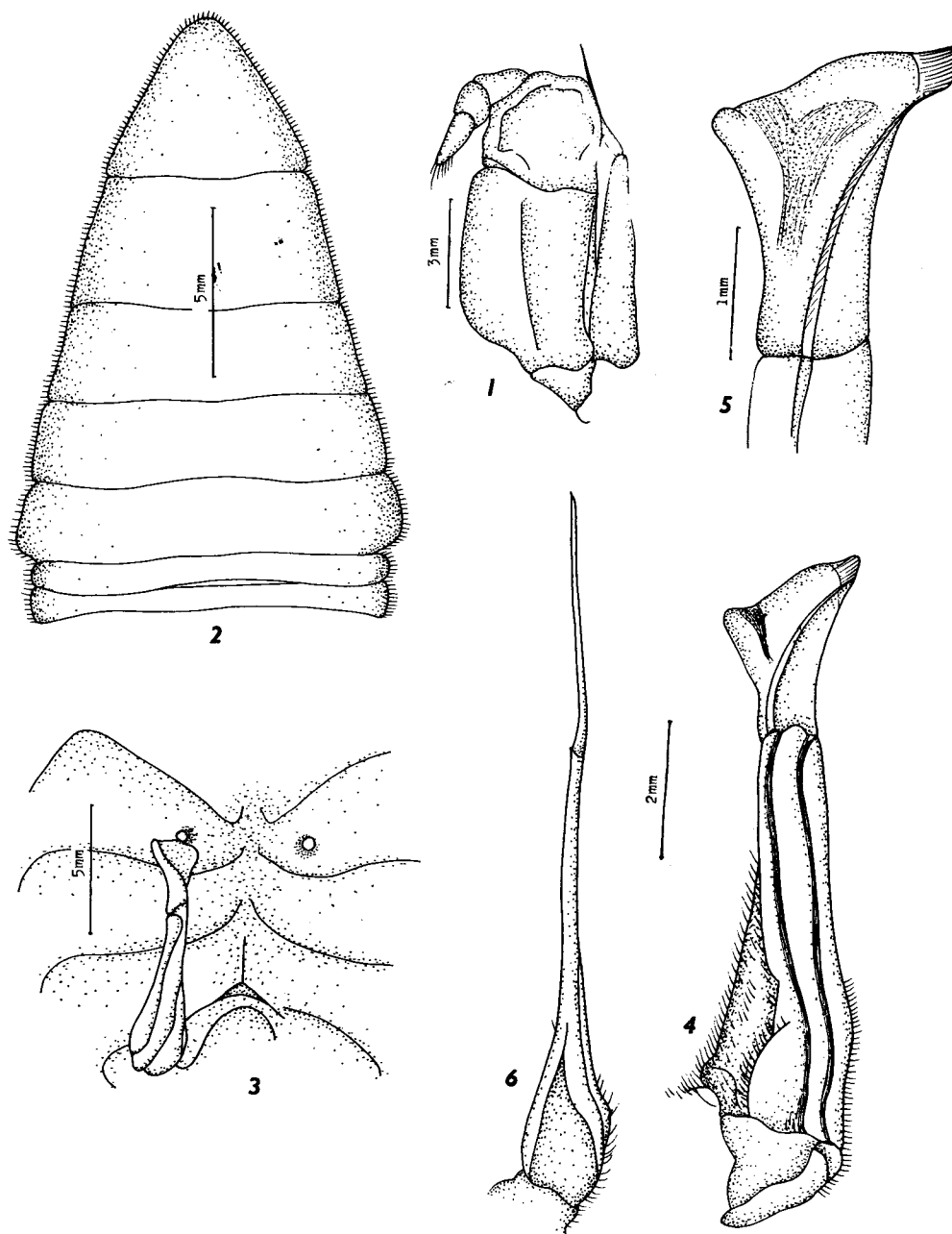


Fig. 9. *Nanhaipotamon guangdongense*, new species. 1-6, holotype male, carapace length 26.4 mm, breadth 33.2 mm. (GD0091120). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male first pleopod, distal segment; 6. Male second pleopod.

Nanhaipotamon pinghense, new species

(Pl. II: 4; Fig. 10)

Material examined. - Holotype, male (AS)(GD659193184), Heping (24.4°N, 114.9°E), 7 May 1963.

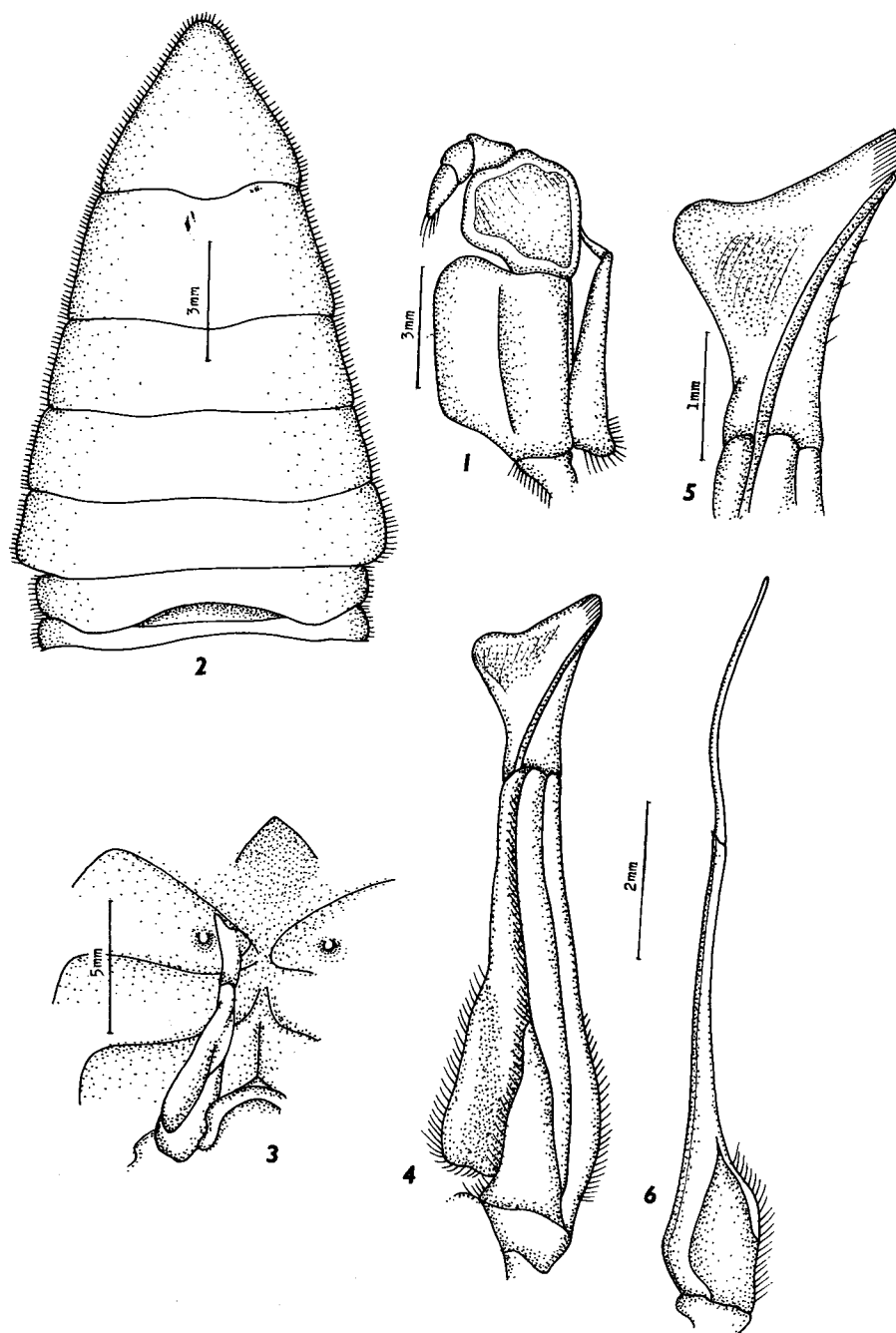


Fig. 10. *Nanhaipotamon pinghense*, new species. 1-6, holotype male, carapace length 23.3 mm, 27 mm (GD6593184). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male first pleopod, distal segment; 6. Male second pleopod.

Description. - Carapace convex fore and aft, surface glabrous with fine pits. Cervical groove with depression, H-shaped groove between gastric and cardiac regions with anterior part depressed laterally posterior part deeper. Postfrontal lobe convex, postorbital crest rounded, postorbital region depressed. Dorsal orbital border ridged, smooth, exorbital angle triangular, lateral borders smooth. Epibranchial tooth roundly lobed, not very produced. Antero-lateral border ridged, shorter than poster-lateral border, last part turning backwards, with distinct fine granules. Third maxilliped with merus as broad as long, with ischium about 1.2 times as long as broad, exopod almost reaching proximal 1/3 of merus, with flagellum.

Chelipeds clearly unequal, carpus with dorsal surface longitudinally grooved medially, inner-distal with acute spine, small spine at base; larger manus slightly swollen, glabrous, about 1.3 times as long as broad, equal to movable finger in length, inner border of fingers with angular tooth, gap small when closed. Ambulatory legs slender, smooth, last leg with propodus about 2 times as long as broad, conspicuously shorter than dactylus.

Male abdomen triangular, sixth segment about 2.1 times as broad as long; telson narrowly triangular, about 1.1 times as broad as long. Median longitudinal groove of thoracic sternum deep, interruption between sutures of sternites 4/5, 5/6, 6/7 very narrow, median longitudinal suture of sternites of 7 and 8 moderately long.

Male first pleopod almost reaching tubercle abdominal lock, subterminal segment about 2.5 times as long as terminal segment, which about 1.3 times as long as broad, inner-distal angle rounded and heel-like, distal border nearly straight outwards and laterally. Male second pleopod with subdistal segment about 1.7 times as long as distal segment.

Carapace length of male 23.3 mm, breadth 27 mm.

Remarks. - This new species is close to *N. hepingense*, new species, and *N. hongkongense* (Shen, 1940). The differences between them are listed below:

Characters	<i>N. hepingense</i> , new species	<i>N. hongkongense</i>	<i>N. pinghense</i> , new species
Epibranchial tooth	angular	angular	roundly lobed, not prominently toothed
Male first pleopod: proportion of the length of subdistal and distal segment	2.7:1	1.4:1	2.5:1
Male first pleopod: inner-distal angle of distal segment	slightly convex	slightly convex medially	nearly straight
Male abdomen: proportion of breadth and length of sixth segment	2.3:1	1.9:1	2.1:1
Male abdomen: proportion of breadth and length of telson	1.3:1	1.3:1	1.1:1

***Nanhaipotamon aculatum* new species**

(Pl. II: 5; Fig. 11)

Material examined. - Holotype male (MMü 1225/1), mountain stream, Hongkong.

Description. - Carapace not strongly convex, branchial region swollen. Surface glabrous. Cervical groove shallow, inconspicuous, H-shaped groove between gastric and cardiac regions indistinct. Postfrontal lobes slightly prominent. Postorbital crest moderately keeled connected with epibranchial tooth. Frontal border with shallow median emargination. Exorbital tooth subacute. Epibranchial tooth lobe-like. Antero-lateral border faintly crested, last part curving dorsally backwards. Suborbital region marked by curved crest, inner half with few granules. Surface with fine granules. Third maxilliped with merus about 1.1 times as broad as long, ischium about 1.4 times as long as broad, exopod about reaching proximal 1/3 of merus, with slender, short flagellum.

Chelipeds strongly unequal, carpus with upper surface slightly concave, inner border with large spine and smaller one at base; larger manus about 1.3 times as long as high, about 1.2 times as long as movable finger; with narrow gap between fingers when closed. Ambulatory legs slender.

Male abdomen triangular, sixth segment about 1.9 times as broad as long; telson about 1.3 times as broad as long. Median longitudinal groove of thoracic sternum narrow, median longitudinal suture of sternites 7 and 8 long.

Male first pleopod almost reaching tubercle of abdominal lock, subterminal segment about 3 times as long as terminal segment, inner-distal angle produced as rounded lobe. Male second pleopod with subdistal segment about 1.8 times as long as distal segment.

Carapace length of male 27.7 mm, breadth 33.6 mm.

Etymology. - Named after the acute projection on the inner-distal angle of the male first pleopod distal segment.

Distribution. - Hongkong.

Remarks. - When Bott (1968) erected the subgenus *Nanhaipotamon*, he placed *Potamon* (*Geothelphusa*) *globosa* Parisi, 1916, in it. Among the specimens that Bott (1968) had examined was a specimen from Hongkong in the Munich Museum. Bott (1968) apparently illustrated the male first pleopod of this specimen and subsequently pictured a purported paratype from the Munich Museum, but from Okinawa, Japan, later (see Bott, 1970). However, Frogliia & Grippa (1986) pointed out that Bott's (1968) drawing was clearly not the same as the syntypic material of Parisi which they have examined and photographed. The male first pleopod as illustrated by Bott (1968) is however, identical to that of *Nanhaipotamon aculatum* (see Fig. 11). It would then appear that the illustration of the male first pleopod of *N. globosum* by Bott was from a specimen from Hongkong in the Munich Museum. In any case, these Munich Museum are not *N. globosum* s. str. and is new. This species thus represents the second *Nanhaipotamon* to be described from Hongkong after *N. hongkonense*.

The male first pleopod of the *N. globosum* syntypes as depicted by Frogliia & Grippa (1986) seems to indicate that its affinities lies with *Hainanpotamon* Dai, 1995 (pers. comm.

P. K. L. Ng). In view of these facts, *Nanhaipotamon globosum* is tentatively transferred out of *Nanhaipotamon* until further evidence can be culled from the examination of the type specimens.

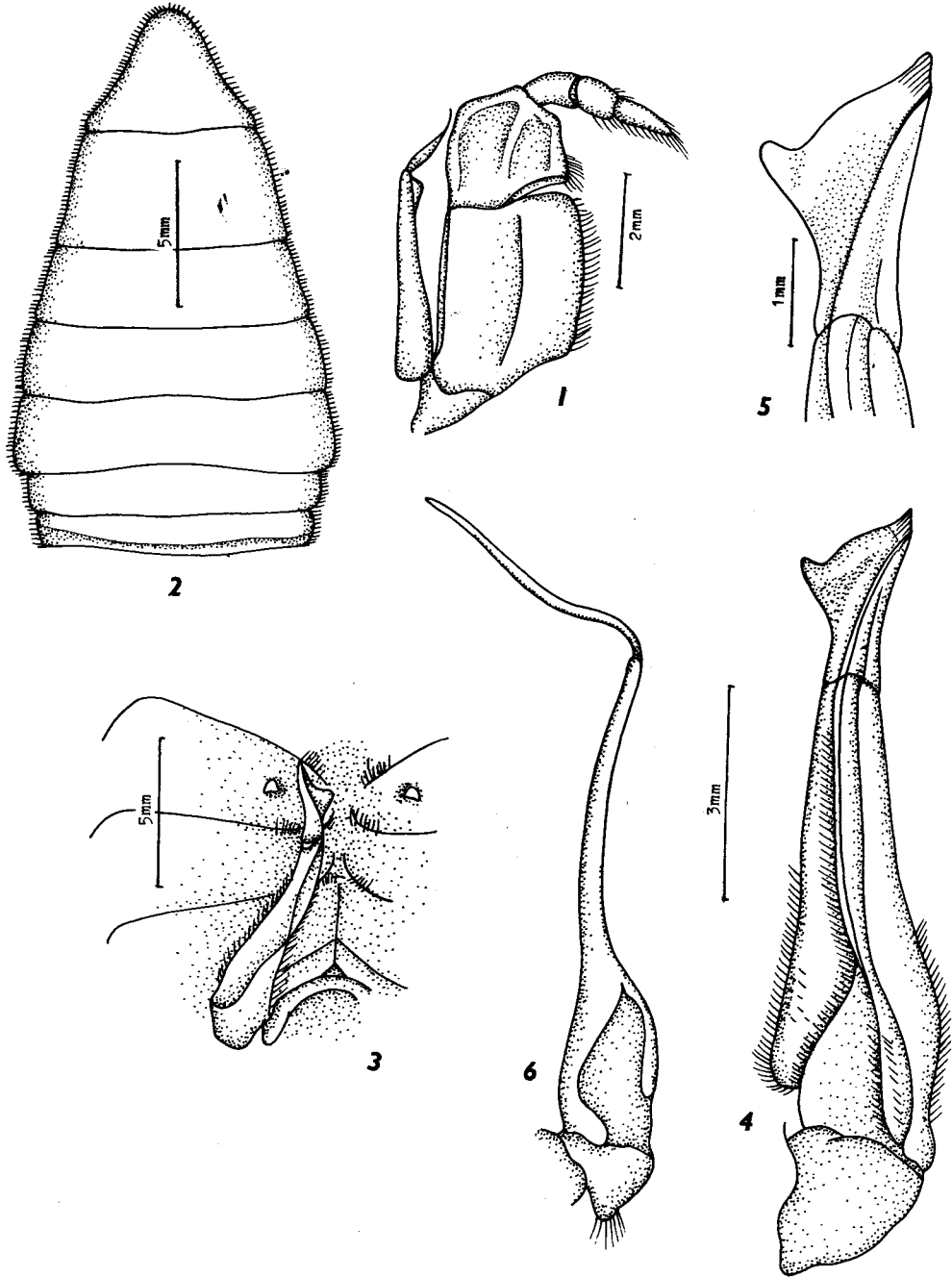
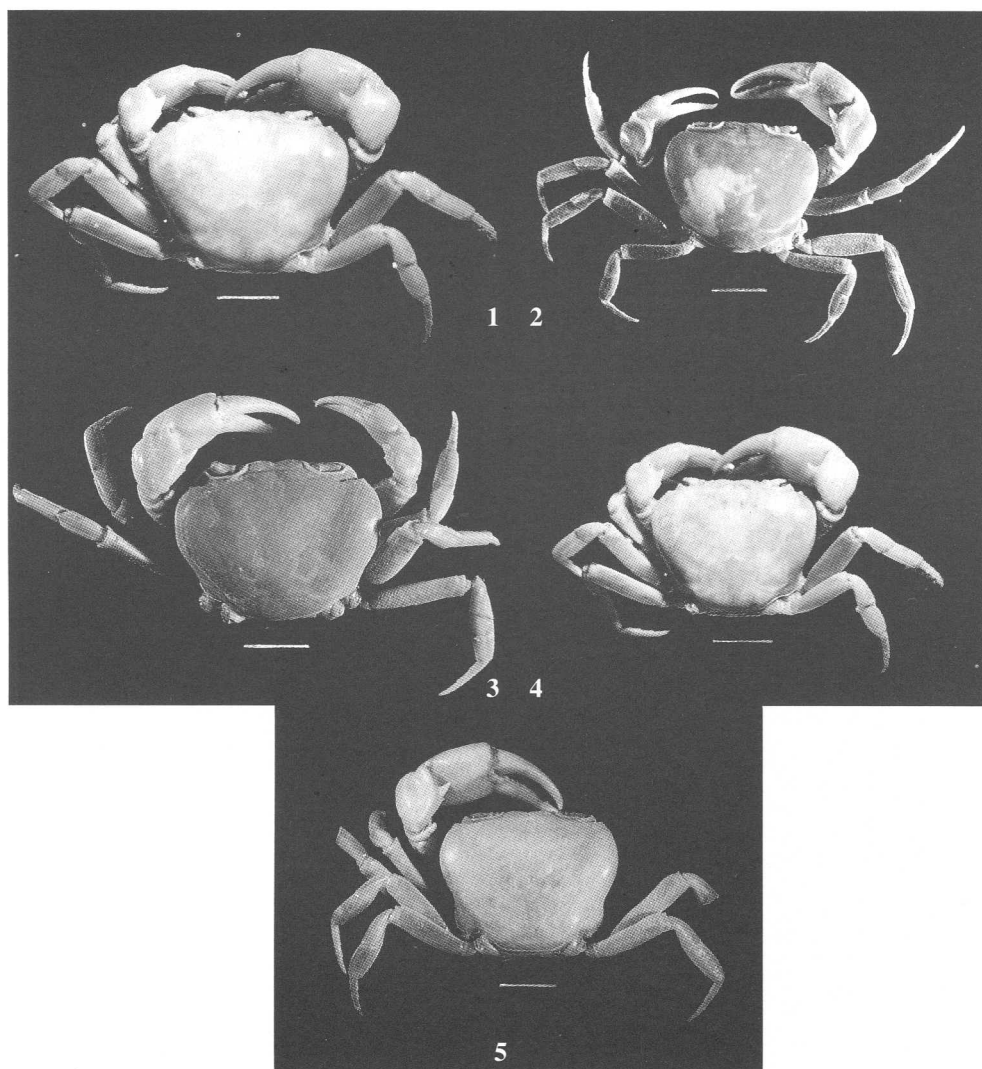


Fig. 11. *Nanhaipotamon aculatum*, new species. 1-6, holotype male, carapace length 27.7 mm, breadth 33.6 mm (MMü 1225/1). 1. Third maxilliped; 2. Male abdomen; 3. Male first pleopod, in situ; 4. Male first pleopod; 5. Male first pleopod, distal segment; 6. Male second pleopod.



Pl. II. 1. *Nanhaipotamon hongkongense*; 2. *Nanhaipotamon hepingense*; 3. *Nanhaipotamon guangdongense*; 4. *Nanhaipotamon pinghense*; 5. *Nanhaipotamon aculatum*. The scale bar represents 10 mm.

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LITERATURE CITED

Balss, H., 1937. Potamoniden (Decapoda Brachyura) der Philippinen und des Malayischen Archipels. *Int. Rev. Hydrobiol. Hydrogr.*, **34**(3-5): 143-187.

- Bott, R., 1968. Potamiden aus Süd-Asien (Crustacea, Decapoda). *Senckenbergiana biol.*, **49**(2): 119-130, Figs. 1-19.
- Bott, R., 1970. Die Süßwasserkrabben von Europa, Asien, Australien und ihre Stammengeschichte. Eine Revision der Potamoidea und Parathelphusoidea (Crustacea, Decapoda). *Abhand. Sencken. Naturfor. Ges.*, Frankfurt, **526**: 1-338, pls. 1-58.
- Dai A. Y. & G. X. Chen, 1979. On the freshwater crabs from Fujian Province. *Acta Zool. Sinica*, **25**(3): 243-249 (in Chinese, with English summary).
- Dai A. Y. & G. X. Chen, 1980. A study on the genus *Nanhaipotamon*. *Acta Zootax. Sinica*, **12**(1): 30-35, 2 pls. (in Chinese, with English summary).
- Dai, A.-Y. & P. K. L. Ng, 1994. Establishment of a new genus of freshwater crab, *Huananpotamon* (Crustacea: Decapoda: Brachyura: Potamidae) from China. *Raffles Bull. Zool.*, **42**(3): 657-661.
- Minei, H., 1973. Potamoid crabs of the Ryukyu Islands, with descriptions of five new species (Crustacea, Decapoda, Potamoidea). *J. Fac. Agr., Kyushu Univ.*, **17**: 203-226.
- Ng, P. K. L. & D. Dudgeon, 1992. The Potamidae and Parathelphusidae (Crustacea: Decapoda: Brachyura) of Hong Kong. *Invert. Taxon.*, **6**: 741-768, Figs. 1-13.
- Ng, P. K. L. Ng & S. Shokita, 1995. *Ryukyum*, a new genus of terrestrial crab from the Ryukyu Islands (Brachyura: Potamidae). *Crust. Res.*, Japan, **24**: 1-7.
- Ng, P. K. L. & M. Takeda, 1992. The freshwater crab fauna (Crustacea, Brachyura) of the Philippines. I. The family Potamidae Ortmann, 1896. *Bull. Natn. Sci. Mus.*, Tokyo, (A)**18**(4): 149-166.
- Parisi, B., 1916. I. Decapodi Giapponesi del Museo di Milano. IV. Cyclometopa. *Atti. Soc. ital. Sci. nat.*, **55**: 153-190.
- Pretzmann, G., 1963. Über einige sud- und ostasiatische. Potamoniden. *Ann. Naturhistor. Mus. Wien*, **66**: 301-371, 4 pls.
- Shen, J. R., 1940a. The brachyuran fauna of Hong Kong. *J. Hong Kong Fish. Res. Stn.*, **1**: 211-242.
- Shen, J. R., 1940b. Four new species of Brachyura from Chinese seas. *J. Hong Kong Fisheries Res. Station*, **1**: 255-262.

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