

## SOME PALAEMONID SHRIMPS (CRUSTACEA: DECAPODA) FROM NORTHERN SOUTH CHINA SEA, WITH DESCRIPTIONS OF TWO NEW SPECIES

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**ABSTRACT.** – Thirty-four palaemonid species from the northern area of South China Sea are reported in the present paper, including two new species, *Paranchistus liui*, new species, and *Periclimenes chacei*, new species, and eight other species are reported for the first time from South China Sea: *Leander tenuicornis* (Say, 1818), *Leandrites stenopus* Holthuis, 1950, *Palaemon debilis* Dana, 1852, *Urocaridella antonbruunii* (Bruce, 1967), *Kemponia platycheles* (Holthuis, 1952), *Paraclimenes franklini* (Bruce, 1990b), *Paranchistus spondylis* Suzuki, 1971, *Periclimenes hirsutus* Bruce, 1971.

**KEY WORDS.** – South China Sea, Crustacea, Decapoda, Palaemonidae, taxonomy.

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### INTRODUCTION

Until Bruce (1979a, 1982a), there had been few studies to the pontoniine shrimp fauna of South China Sea except Stimpson (1860), who reported one species from Hong Kong, Kemp (1922) reported a few pontoniine shrimps from Vietnam, Johnson (1961) reported numerous species from Singapore, and Yu (1936) reported 2 pontoniine shrimps from Hainan Island. Bruce reported 55 pontoniines from the South China Sea and adjacent waters (Bruce, 1979a) and 20 species from Hong Kong (Bruce, 1982a, 1990c); Chace & Bruce (1993) recorded 120 species from Philippines, Indonesia, and/or adjacent area; Li reported 20 species from Nansha Islands (Li, 1996, 1998), 29 species from Xisha Islands and adjacent waters (Li, 1997) and 30 species from Hainan Island (Li, 2001); Li & Liu (2002; 2003; 2004) reported 28 species collected by the Joint Chinese-German Marine Biology Expeditions to Hainan Island; Jeng (1998) recorded 10 species from Taiwan Island, in addition to species recorded by Holthuis (1952a), one by Fujino & Miyake (1972), 14 species being found on Taiwan Island. The present paper reports 18 pontoniine species from northern part of South China Sea,

including Hainan Island and the littoral area of Guangdong Province. Recently, Bruce (2003) reviewed 116 species of 31 genera of pontoniine species reported from South China Sea.

Among the caridean shrimp collections of the Marine Biological Museum, Chinese Academy of Sciences (MBMCAS), in the Institute of Oceanology, Chinese Academy of Sciences (IOCAS), many specimens belonging to the Palaemonidae were separated. The present paper reports the results of a systematic study of this material, thirty-four species are recorded, of which two are described as new species.

### SPECIES LIST

#### **Palaemoninae Rafinesque, 1815**

1. *Coutierella tonkinensis* Sollaund, 1914
2. *Exopalaemon orientis* (Holthuis, 1950)
3. *Leander tenuicornis* (Say, 1818)
4. *Leandrites stenopus* Holthuis, 1950

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5. *Leptocarpus potamiscus* (Kemp, 1917)
6. *Macrobrachium mammillocladus* (Thalwitzer, 1892)
7. *Palaemon debilis* Dana, 1852
8. *Palaemon pacificus* (Stimpson, 1860)
9. *Palaemon serrifer* (Stimpson, 1860)
10. *Palaemon sewelli* (Kemp, 1925)
11. *Urocaridella antonbruunii* (Bruce, 1967)
12. *Urocaridella urocaridella* (Holthuis, 1950)

**Pontoniinae Kingsley, 1878**

13. *Anchistus custos* (Forskål, 1775)
14. *Conchodytes biunguiculatus* (Paulson, 1875)
15. *Kemponia* cf. *andamanensis* (Kemp, 1922)
16. *Kemponia grandis* (Stimpson, 1860)
17. *Kemponia johnsoni* (Bruce, 1987a)
18. *Kemponia nilandensis* (Borradaile, 1915)
19. *Kemponia platycheles* (Holthuis, 1952a)
20. *Palaemonella rotumana* (Borradaile, 1898)
21. *Paraclimenes* cf. *franklini* (Bruce, 1990b)
22. *Paranchistus liui*, new species
23. *Paranchistus spondylis* Suzuki, 1971
24. *Periclimenaeus* cf. *hecate* Nobili, 1904
25. *Periclimenaeus rastrifer* Bruce, 1980
26. *Periclimenaeus rhodope* (Nobili, 1904)
27. *Periclimenella spinifera* (De Man, 1902)
28. *Periclimenes chacei*, new species
29. *Periclimenes hirsutus* Bruce, 1971a
30. *Periclimenes hongkongensis* Bruce, 1969a
31. *Periclimenes magnificus* Bruce, 1979b
32. *Periclimenes psamathe* (De Man, 1902)
33. *Periclimenes sinensis* Bruce, 1969a
34. *Periclimenes tosaensis* Kubo, 1951

**MATERIAL AND METHODS**

All the specimens examined in this study are deposited in the Marine Biological Museum, Chinese Academy of

Sciences (MBMCAS) in the Institute of Oceanology, Chinese Academy of Sciences, Qingdao, China (IOCAS), except for those indicated by “ZRC”, which are deposited in the Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore, and “SI”, in Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. The following abbreviations are used in the text: “CN” in “Material examined” under each species account, preliminary registration number of collection; AT: Agassiz trawl; BT: beam trawl; CL: postorbital carapace length; ovig: ovigerous; juv: juvenile; coll.: collector(s); st.: station. Beibu Bay is the new name for the Tonkin Gulf.

Restricted synonymies are listed, full synonyms can be found in the works of Kemp (1922, 1925), Holthuis (1950, 1952a, 1993), Chace & Bruce (1993), Müller (1993) and Li (2000). Subfamilies, genera and species are arranged in alphabetical order.

**SYSTEMATIC ACCOUNT**

PALAEMONIDAE RAFINESQUE, 1815

PALAEMONINAE RAFINESQUE, 1815

*Coutierella tonkinensis* Sollaud, 1914

(Fig. 1)

*Coutierella tonkinensis* Sollaud, 1914: 318-322, Figs. IIIB, IV; Bruce, 1989a: 177-186, Figs. 1-6; Holthuis, 1993: 104, Fig. 91. *Palaemonetes tonkinensis* - Kemp, 1925: 315-316.

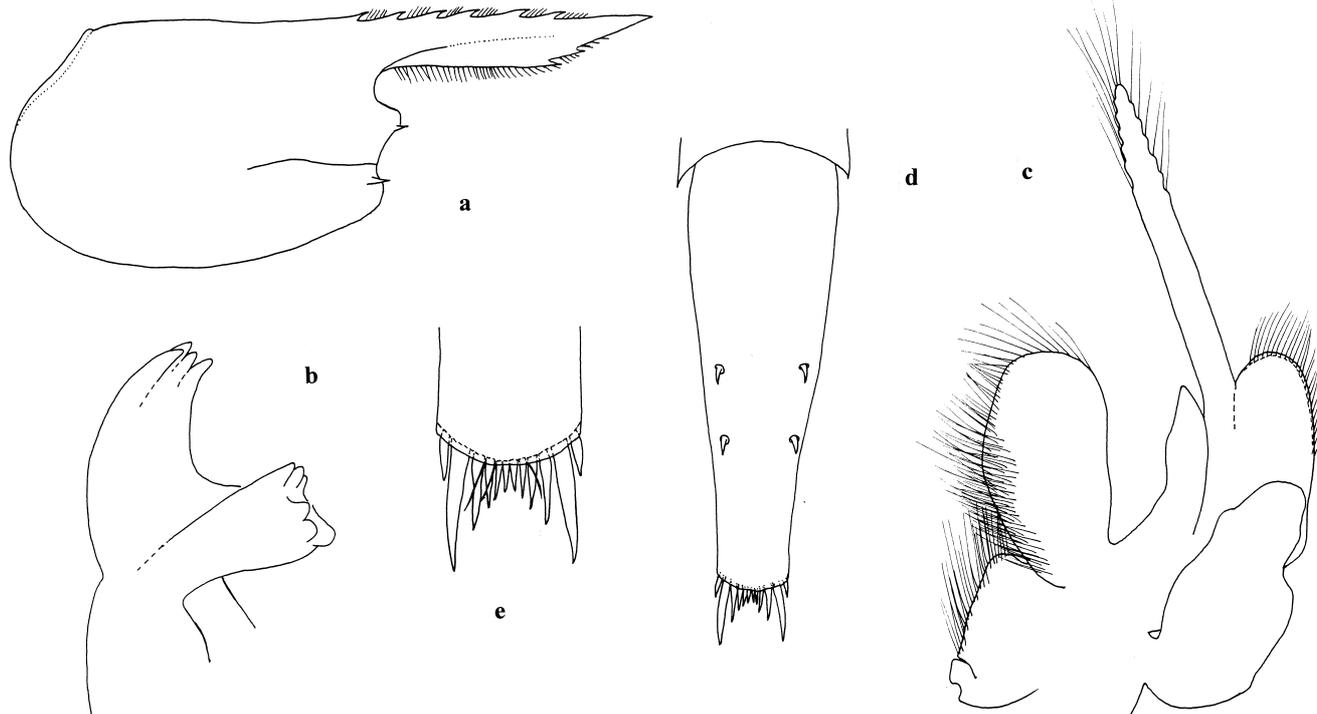


Fig. 1. *Coutierella tonkinensis* Sollaud, 1914. a, carapace and rostrum, lateral view; b, mandible; c, 1st maxilliped; d, telson; e, tip of telson.

*Palaemonetes (Palaemonetes) tonkinensis* - Holthuis, 1950: 10.  
*Palaemonetes tonkinensis tonkinensis* - Liu et al., 1990b: 249, Fig. 40.

**Material examined.** – 8 males, 3 females (IOCAS), 1 male, 1 female (ZRC), 1 male, 1 female (SI), Haikou, Hainan Is., fishery market, 18 Jan.1956; 1 male, 2 females (1 ovig), 3 juv.. (IOCAS), CN 90C-047A1, Haikou, algae culture field, coll. J. Y. Liu, 4 Nov.1990; 1 female, CN 92C-1065B, Wanquan River, Qionghai, Hainan Is., coll. X. Li, 2 Apr.1992.

**Diagnosis.** – Rostrum well developed, compressed, exceeding antennular peduncle, armed with 5-7/1-3 teeth; carapace with antennal and branchiostegal spines, branchiostegal suture distinct anteriorly; without supraorbital and hepatic spines; orbital notch distinct, anterior lateral margin of carapace concave, anterolateral angle slightly produced. Mandible robust, without palp, molar process stout, with several blunt marginal teeth, incisor process robust, with 4 teeth. First maxilliped with subcylindrical palp, separated by deep U-shaped notch from large, broad basal endite. First pereopods slender, extending to distal margin of scaphocerite, chela small. Second pereopods slender, subequal, similar, extending beyond scaphocerite by fingers. Endopod of first pleopod in male without appendix interna. Fourth thoracic sternite with slender medium process. Dactyls of ambulatory pereopods simple. Telson with 2 pairs of small dorsolateral spines, arising at 0.5, 0.67 of telson length respectively, posterior margin with 6 pairs of spines, lateral pair short, similar to dorsolateral spines, lateral second pair large, about 3 times as long as the lateral pair, submedian pairs more slender and shorter.

**Distribution.** – Red River, Vietnam and Hong Kong, fresh to brackish and salt water.

**Remarks.** – Sollaud (1914) established the genus *Coutierella*, but Kemp (1925) treated it as a junior synonym of the genus *Palaemonetes* and all authors since then followed Kemp until Bruce (1989a), who re-established it as a full genus based on its characteristic mouthparts and the apex of the telson. Only one species, *C. tonkinensis* was described in this genus, which is found only in the northern part of the South China Sea and adjacent freshwater habitats. It was previously recorded in Chinese waters from Hong Kong (Bruce, 1989a).

Liu et al. (1990b) described a subspecies from fresh water or estuaries of Fujian Province to the estuary of Zhujiang River (Pearl River), Guangdong Province, named *Palaemonetes tonkinensis guangdongensis* (= *Coutierella tonkinensis guangdongensis*). The main differences between *C. t. guangdongensis* and the nominal subspecies *C. t. tonkinensis* they described are: the former has a rostrum with 5-7 dorsal teeth (average 6.06 teeth based on their material), and telson with 3-4 pairs of posterior spines (average 4.0 pairs based on their material); the latter with rostrum with 7-9 dorsal marginal teeth and telson with 6-7 pairs of posterior spines. Bruce (1989a) reported on material from Hong Kong, at the estuary of the Zhujiang River, stating that the rostrum of the species has 5-7 dorsal teeth, and telson with posterior spinulation rather irregular and presenting the appearance of

abnormal variations. According to his illustrations of the posterior telson margin, the spines and spinules in total vary from 4 to 7 pairs. In our material from Hainan Island, 12 of which have the rostrum with 6 dorsal teeth, 7 with 7 teeth, 1 with 8 teeth, 1 juvenile with 5 teeth, the average is 6.5. Concerning the posterior spines of the telson, among the Haikou specimens collected in 1956, the males have 5-8 pairs, average 5.8, females have 6-8 pairs, average 6.7, the females usually have more spines than males; the female of 90C-1065B from Wanquan River (NE of Hainan Island) has 5 pairs of posterior telson spines; the telsons of male and females of 90C-047A from Haikou are damaged, one of a juvenile with 13 spines and spinules, another with 10. So, the average number of pairs of posterior telson spines is 6.2. According to Liu et al. (1990b), it is difficult to decide which subspecies our material, as the number of dorsal rostral teeth is similar to *C. t. guangdongensis* and that of posterior telson spines is similar to the typical subspecies. Bruce's (1989a) specimens are similar to *C. t. guangdongensis* in the number of dorsal rostral teeth but the number of posterior telson spines is more than in this subspecies. No specimen in our material from Hainan Island has plumose setae on the posterior telson margin, in Bruce's (1989a) specimens from Hong Kong and Sollaud's (1914) material, there are several plumose setae, and in Liu et al.'s (1990b) material of *Palaemonetes tonkinensis guangdongensis* from Guangdong Province, there are many these setae. There may be a series variation in the numbers of rostral teeth, posterior marginal spines or spinules and plumose setae of telson, in the species, from Viet Nam and Hainan Island, to Guangxi, Guangdong and Fujian. As such, the two subspecies may represent two extreme forms of variation in the same species, and it is possible that *Palaemonetes tonkinensis guangdongensis* might well be proven to be a junior synonym of *Coutierella tonkinensis*. However, until further samples and more intermediate forms between the two subspecies are collected to clearly show the extent of this variation, we prefer to deal with the two forms as two subspecies.

#### *Exopalaemon orientis* (Holthuis, 1950)

(Fig. 2)

*Leander longirostris japonicus* - Ortmann, 1890: 519, pl. 37: fig. 14. [not *Palaemon japonicus* De Haan, 1849 = *Macrobrachium japonicum* (De Haan, 1849)]

*Palaemon (Exopalaemon) orientis* Holthuis, 1950: 49; Liu, 1959: 36.

*Exopalaemon orientis* - Holthuis, 1980: 83; Liu et al., 1990b: 246, Fig. 38; Hayashi, 1999a: 392, Figs. 380g-m, 381.

**Material examined.** – 110 juv. (IOCAS), 3 juv. (SI), 2 juv. (ZRC), Haikou, Hainan Is., coll. J. Y. Liu, 18 Jan.1956; 28 juv., CN 56-K067B2, Haikou, Hainan Is., coll. J. Y. Liu, 28 Jan.1956.

**Diagnosis.** – Rostrum armed with 5-7 teeth on basal crest, 1 dorsal subterminal tooth, and 6-7 ventral teeth; carapace with antennal and branchiostegal spines, branchiostegal suture distinct. Third to sixth abdominal somites not sharply carinate in dorsal midline. Mandible with 3-segmented palp, incisor process with 4 teeth. First pereopods slender, chela about

0.75 length of carpus. Second pereiopods with carpus 0.6 as long as chela. Third pereiopods with dactyl about 0.75 as long as propodus, ventral margin of propodus with 4 spines. Fifth pereiopods with dactyl no more than half as long as propodus, with some setae, instead of a ventral spines.

**Distribution.** – Japan to South China Sea.

**Remarks.** – The present species is very close to *E. styliferus* (H. Milne Edwards, 1840). The latter can be distinguished from this species by having a rostrum with relatively more teeth, i.e., 1-3 dorsal subterminal teeth and 6-10 ventral teeth, and the 3rd pereiopod with the dactyl no more than half as long as propodus. *E. orientis* was previously recorded from Fujian, Taiwan and Guangdong in Chinese waters (Liu et al., 1990b).

***Leander tenuicornis* (Say, 1818)**  
(Fig. 3)

*Palaemon tenuicornis* Say, 1818: 249.

*Leander tenuicornis* - Holthuis, 1950: 26, Figs. 1, 2; 1952b: 155, pls. 41, 42; Chace & Bruce, 1993: 6; Bruce, 2002c: 80.

**Material examined.** – 1 male, 2 females (1 ovig), CN 75-K072B, Dadonghai, Sanya, Hainan Is., intertidal, with algae, coll. X. Ren, 17 Apr.1975.

**Diagnosis.** – Rostrum sexually dimorphic, expanded vertically in female. Basal antennular segment straight or

concave distally, lateral to 2nd segment; stylocerite distinctly over-reaching midlength of basal antennular segment. Second pereiopods without teeth on opposable margin of fixed finger.

**Distribution.** – Widespread throughout most tropical, subtropical and some temperate waters, from Red Sea and South Africa to Japan, Philippines, Indonesia, Caroline Islands, Australia, New Zealand, and the Atlantic Ocean from Newfoundland to Brazil, and Mediterranean. Associated with floating weed in the open sea and with attached plants in shallow water.

**Remarks.** – This is the first record of the present species from South China Sea. The Falkland Islands record (Kemp, 1925) has never been verified (Bruce, 2002c).

***Leandrites stenopus* Holthuis, 1950**  
(Figs. 4-6)

*Leandrites stenopus* Holthuis, 1950: 40, Fig. 6; Bruce, 2000: 83, Figs. 1-3.

**Material examined.** – 1 ovig female, CN N207B-34B, [17°45'N, 109°30'E], 97m, sandy mud, BT, coll. J. Y. Liu, 14 May.1960; 1 female, CN B92-B4-6, St. 4, 36m, BT, Sanya Bay, Hainan Is., coll. X. Li, 22 Mar.1992; 16 males, 30 females (11 ovig)(IOCAS), 1 male, 1 female (ZRC), CN B92-B11-71, St. 11, 30m, BT, Sanya Bay, Hainan Is., coll. X. Li, 23 Mar.1992; 1 male, Yezhu Is., N-side, 7m, Hainan, coll. V. Neumann, 22 Mar.1992; 1 female, CN X20B-1, [19°N, 108°E], 72m, mud, AT, coll. Z. Fan, 7 Dec.1959; 1 female,

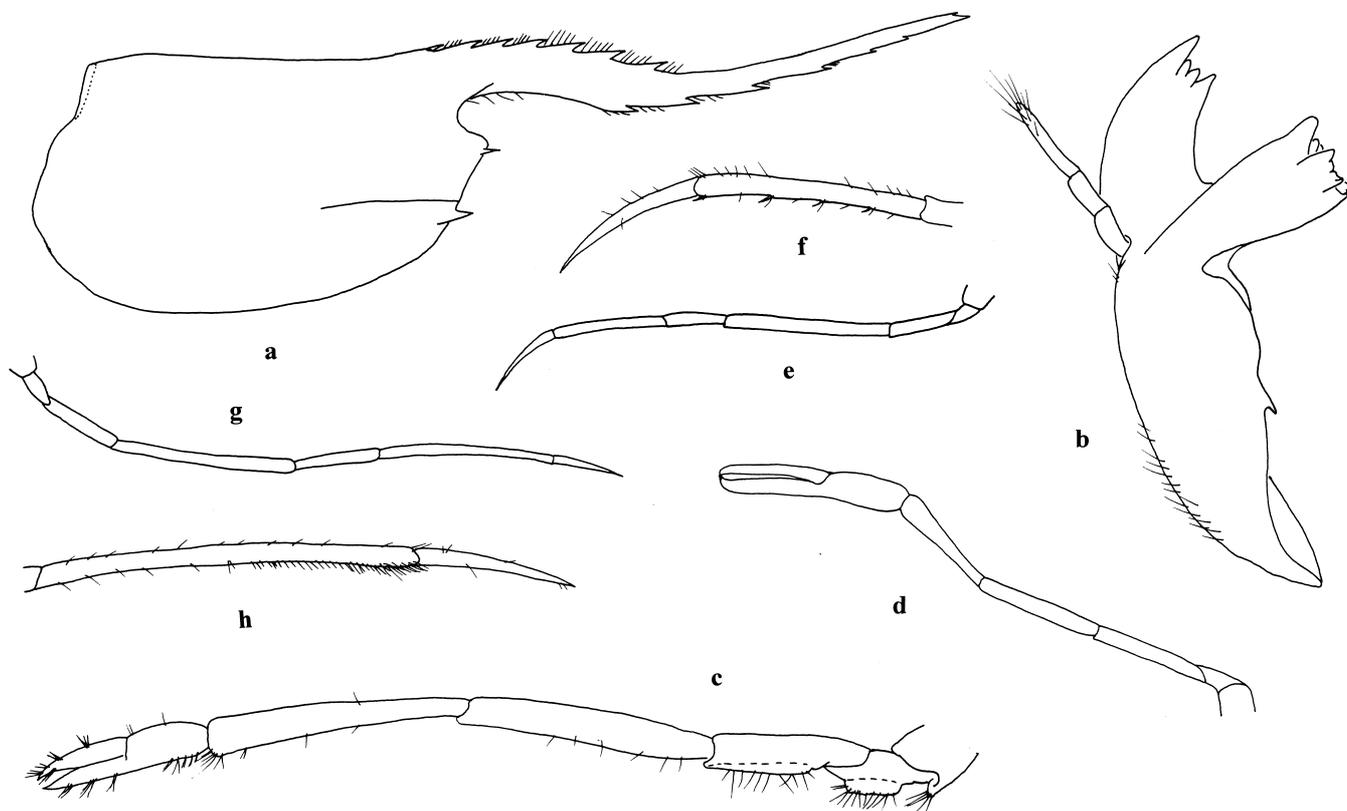


Fig. 2. *Exopalaemon orientis* Holthuis, 1950. a, carapace and rostrum, lateral view; b, mandible; c, 1st pereiopod; d, 2nd pereiopod; e, 3rd pereiopod; f, same, dactyl and propodus; g, 5th pereiopod; h, same, dactyl and propodus.

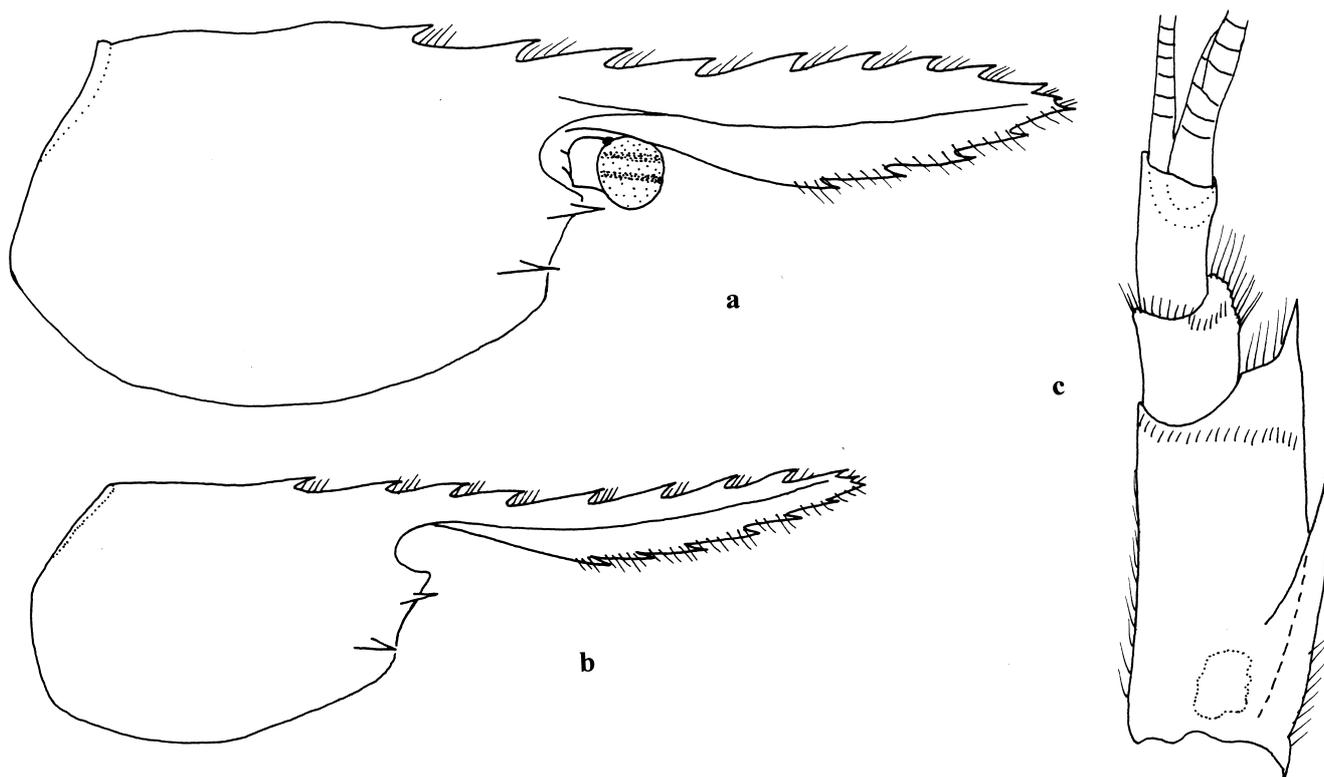


Fig. 3. *Leander tenuicornis* (Say, 1818). a, carapace and rostrum, lateral view, female; b, same, male; c, antennule.

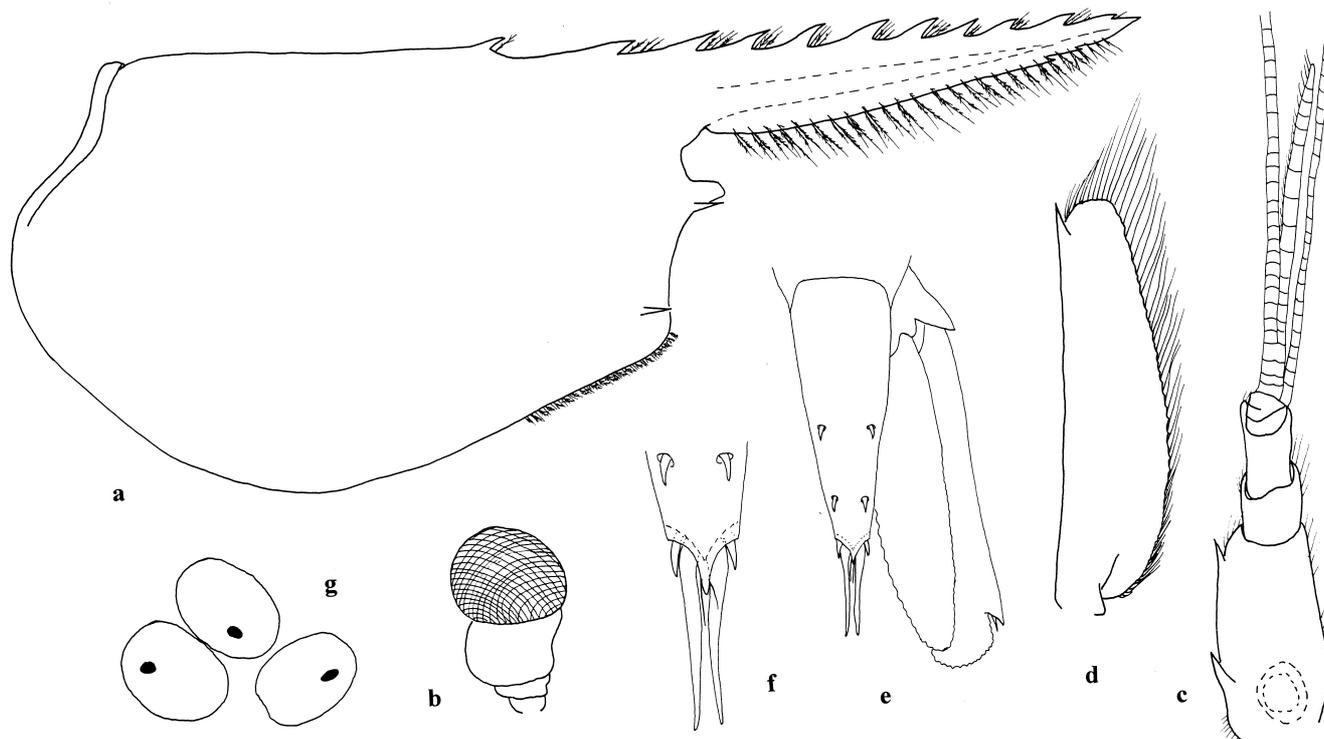


Fig. 4. *Leandrites stenopus* Holthuis, 1950. a, carapace and rostrum, lateral view; b, eye; c, antennule; d, scaphocerite; e, telson and uropod, dorsal view; f, tip of telson; g, eggs.

CN X183B-38, [18°30'N, 108°30'E], 29m, sandy mud, AT, coll. F. Sun, 9 Apr.1962; 1 female (ovig), CN 4-8, [20°45'N, 111°30'E], 51m, mud, BT, coll. Y. Wang, 25 Jan.1959; 1 female (ovig), CN S155B-26, [22°N, 115°30'E], 78m, mud, AT, coll. W. Zhang & S. Wu, 20 Dec.1959; 1 female, CN S144B-3, [21°30'N, 114°30'E], 77m, mud, AT, coll. W. Zhang & S. Wu, 10 Dec.1959; 1 female, CN Q268A-14, [20°N, 109°E], 30m, mud, AT, coll. W. Zhang, 4 Nov.1960; 1 male, CN R229B-25, [18°30'N, 108°E], 67m, sandy mud, AT, coll. F. Sun, 26 May.1960; 1 male, CN 19-52, [18°N, 108°30'E], 79m, muddy sand, BT, coll. Z. Fan, 28 Jan.1959; 2 females (1 ovig), CN K235B-9B, [18°30'N, 108°15'E], 53.4m, sandy mud, AT, coll. S. Shen, 11 Jul.1960; 1 female (ovig), CN L69B-38, [20°N, 111°15'E], soft mud, 52m, BT, coll. Xiutong Ma, 25 Apr.1959; 1 female, CN Q111B-20B, [22°N, 115°30'E], muddy sand, 78m, AT, coll. Yongliang Wang, 8 Jan.1960; 1 females, CN S155B-3B, [22°N, 115°30'E], muddy sand, 78m, AT, coll. Weiquan Zhang, 20 Dec.1959; 2 females (ovig), CN N148B-44, [18°N, 109°30'E], sandy mud, 74m, BT, coll. Jixing Liu, 11 Mar.1960; 1 male, 1 female (ovig), CN S143-27B, [21°15'N, 114°30'E], muddy sand, 83m, AT, coll. Weiquan Zhang, 10 Dec.1959; 1 female (ovig), CN N28B-21, [20°50'N, 110°45'E], sandy muc, 18m, AT, coll. Zhican Tang, 17 Apr.1959; 1 female, CN N99B-52B, [20°15'N, 111°E], sand, 33m, AT, coll. Li, 29 Oct.1959; 2 females (1 ovig), CN S140B-20, [21°15'N, 114°E], soft mud, 75m, AT, coll. Shaozeng Wu, 10 Dec.1959; 22; 1 male, CN N153B-30, [17°30'N, 109°E], sandy mud, 88m, BT, coll. Shoupeng Shen, 12 Mar.1960; 1 female, CN N186B-39, [20°50'N, 110°45'E], soft mud, 26m, BT, coll. Jixing Liu, 10 Apr.1960; 1 female (ovig), CN Q59B-9, [18°30'N, 108°15'E], soft mud, 59m, BT, coll. Fengshan Xu, 17 Apr.1959; 1 female, CN N138B-21B, [18°30'N, 110°15'E], soft mud, 51.3m, BT, coll. Shoupeng Shen, 9 Mar.1960; 1 male, CN L72B-22, [20°45'N, 111°E], soft mud, 32m, BT, coll. Xiutong Ma, 26 Apr.1959.

**Diagnosis.** – Rostrum straight, not over-reaching scaphocerite, armed with 2 + 9-10/2-5 teeth, posteriormost dorsal tooth widely separated from remainder, ventral teeth distributed on apical third. Carapace with antennal and branchiostegal spines. Scaphocerite with distolateral tooth reaching to, or slightly beyond distal margin of blade. Telson much shorter than uropod, posterior margin with acute median point. First pereopod with carpus about 1.5 times as long as chela. Second pereopod over-reaching scaphocerite by combined lengths of chela, carpus and most of merus; fingers twice as long as palm; carpus distinctly longer than chela. Ambulatory pereopods very long and slender, with propodus divided into 8-16 subsegments

**Description.** – Rostrum straight, not over-reaching scaphocerite, armed with 11 or 12 dorsal teeth, including 2 on carapace posterior to level of posterior margin of orbit, posteriormost tooth widely separated from remainder, and 2-5 ventral teeth, distributed on apical third; ventral margin straight or slightly convex at base; single row of plumose setae placed on the dorsal margin between teeth; ventral margin with longitudinal row of ventrally directed setae at each side, covering entire margin except tip. Carapace with antennal spine placed below lower orbital angle, the latter produced anteriorly as broadly rounded lobe; branchiostegal spine strong, placed some distance behind anterior margin of carapace, with tip slightly over-reaching this margin. Eyes large, with cornea as long as and distinctly broader than stalk. Antennule with stylocerite not reaching middle of basal

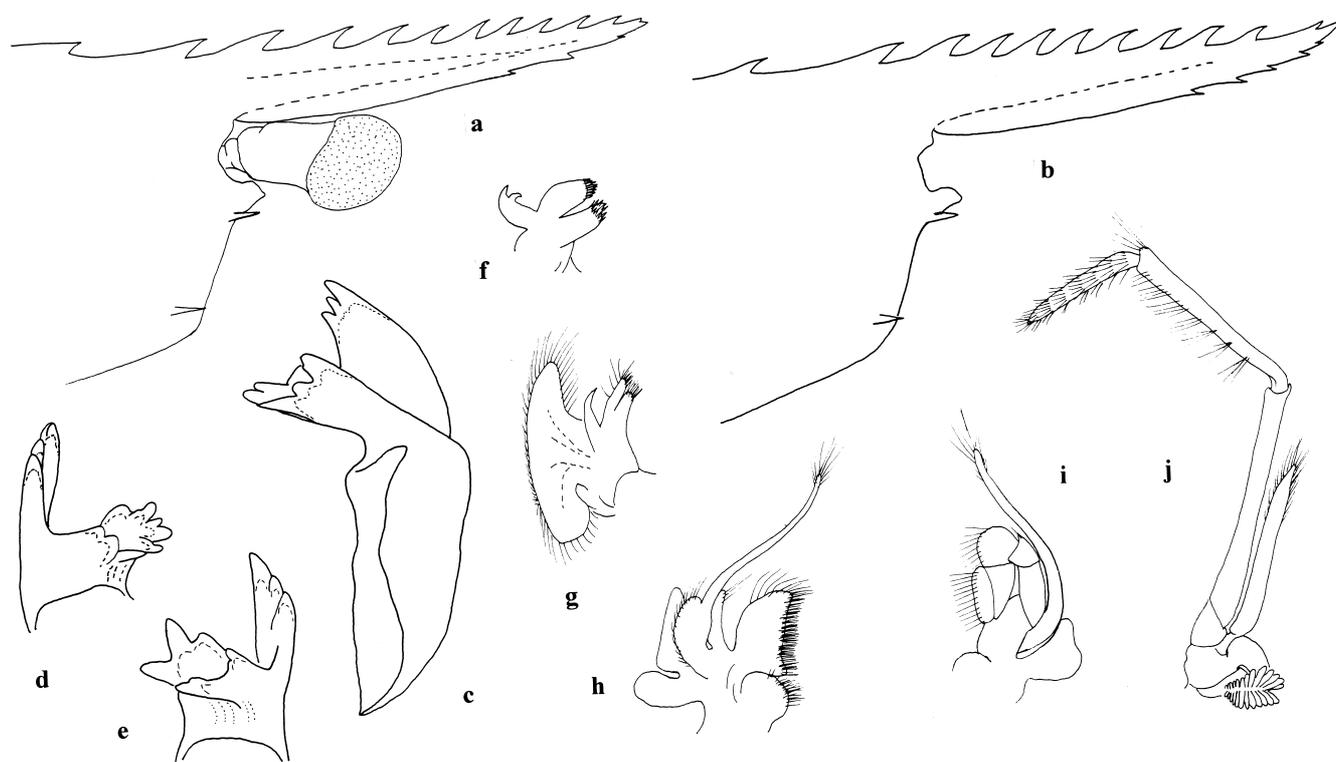


Fig. 5. *Leandrites stenopus* Holthuis, 1950. a, b, carapace and rostrum, lateral view; c-e, mandible, c, d, right, e, left; f, maxillula; g, maxilla; h, 1st maxilliped; i, 2nd maxilliped; j, 3rd maxilliped.

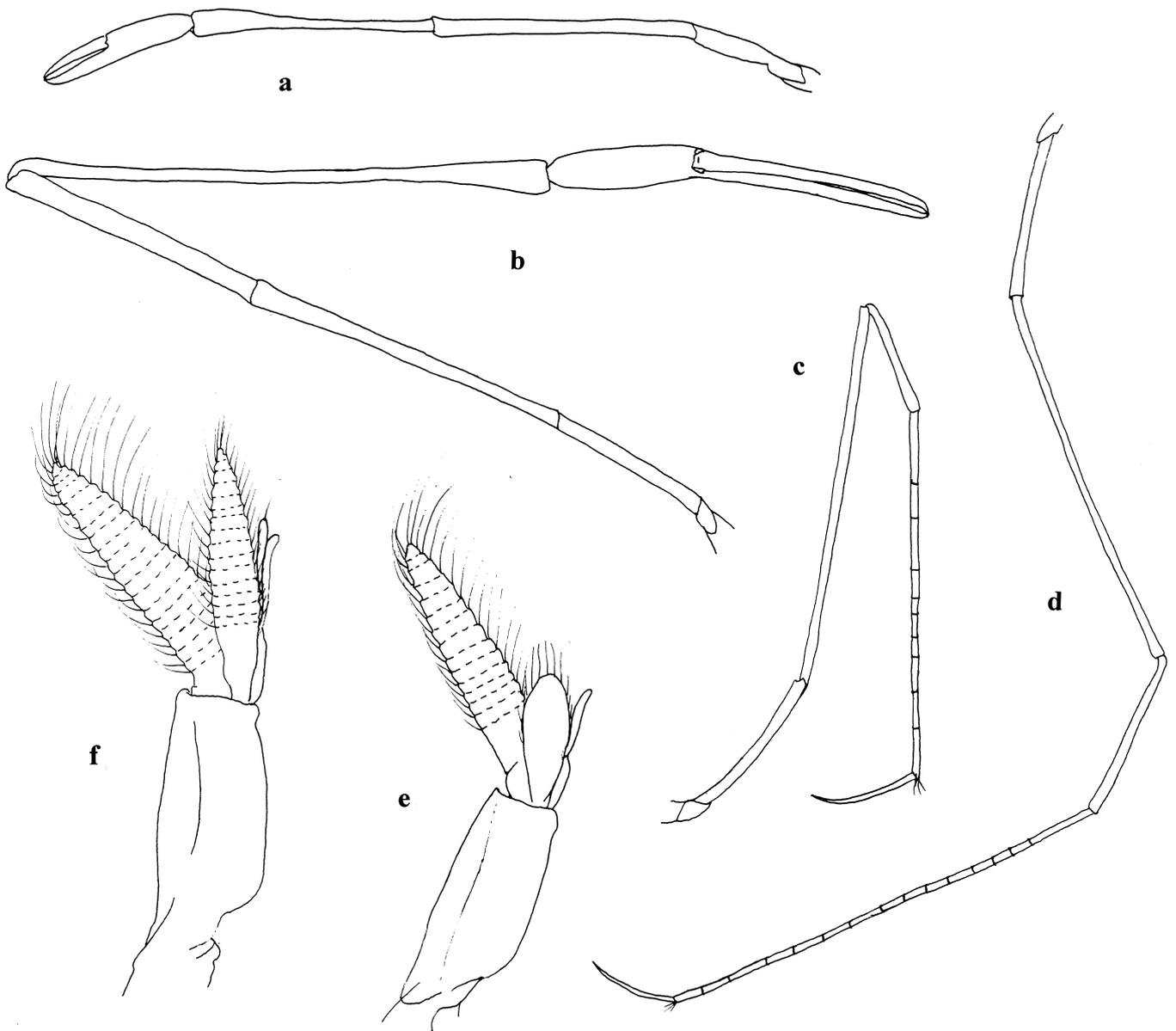


Fig. 6. *Leandrites stenopus* Holthuis, 1950. a, 1st pereiopod; b, 2nd pereiopod; c, 3rd pereiopod; d, 5th pereiopod; e, 1st pleopod, male; f, 2nd pleopod, male.

segment, anterior margin of this segment curved and produced anteriorly, distinctly over-reaching strong anterolateral spine; upper antennular flagellum with two rami fused for only about basal 0.2 of length (4 segments). Scaphocerite with outer margin slightly concave, distolateral tooth reaching to, or slightly beyond distal margin of blade. Telson much shorter than uropod; dorsal spines small, anterior pair situated at middle of telson length, posterior pair closer to posterior margin than to anterior pair; posterior margin with acute median point, outer pair of marginal spines small, as dorsal spines, inner pair robust and very long, about 0.33 to 0.4 of telson length. Uropods over-reaching tip of inner posterior marginal spines of telson, exopod with movable lateral spine. Mandible with 3 apical teeth on incisor process; molar process stout, with 6-7 blunt teeth on right and 4-5 on left. Maxillula with bilobed palp, lobes similar in size; upper lacinia oval, with spines along distal margin, lower lacinia with distal margin slightly produced, covered with setae on distal fourth. Maxilla with distally pointed palp lacking setae, shorter than endite; endite deeply bilobed, with numerous setae distally; scaphognathite moderately broad. First maxilliped with subcylindrical palp, with several setae on distolateral margin; basal endite densely covered with setae along lateral margin, coxal endite suboval; exopod with long flagellum and relatively small caridean lobe; epipod deeply bilobed, upper lobe subtriangular, lower elongate oval. Third maxilliped with slender endopod, flagellum of exopod reaching to 0.75 of ischiomerus of endopod. First pereopod slender, cutting edge of chela entire, carpus about 1.5 times as long as chela, broadest distally and narrow proximally. Second pereopod very slender, over-reaching scaphocerite by combined lengths of chela, carpus and most of merus; fingers very long and slender, about twice as long as palm, cutting edge entire; carpus distinctly longer than chela, unarmed; merus about

half as long as carpus, unarmed; ischium longer than merus but shorter than carpus; basis slightly shorter than merus. Ambulatory pereopods very long and slender, with propodus divided into 8-16 subsegments; third pereopod shorter than fourth and fifth. Both first and second pleopods with distinct appendix interna on endopod in male. Eggs relatively small.

**Distribution.** – Previously known from the type locality, Salt Madura off northeastern Java, 56 meters (Holthuis, 1950), and Lucinda, Queensland, 15 meters (Bruce, 2000). It is recorded here for the first time from northern South China Sea.

**Remarks.** – The mouthparts closely resemble those of *Leandrite celebensis* (De Man, 1881), but the first maxilliped (Fig. 5h) has the epipod deeply bilobed, as mentioned by Holthuis (1950). This poorly known species appears rare as it has been recorded very few times in the literature. Holthuis's (1950) type is a female, and Bruce (2000) described a male from Queensland. However, our material shows that it is common in northern South China Sea, also with extensive bathymetric range from 7 to 97 meters depth, which considerably expands its bathymetric range from 15-56m (Bruce, 2000; Holthuis, 1950).

***Leptocarpus potamiscus* (Kemp, 1917)**

(Fig. 7)

*Leander potamiscus* Kemp, 1917: 225, Fig. 7.

*Leptocarpus potamiscus* - Holthuis, 1950: 97; Liu et al., 1990b: 252-253, Fig. 42; Nguyen van Xuan, 1992: 23, Fig. 3.

**Material examined.** – 1 male, 1 female, CN 54-121B, Hengshan, Guangdong, coll. J. Y. Liu, 3 Nov. 1954.

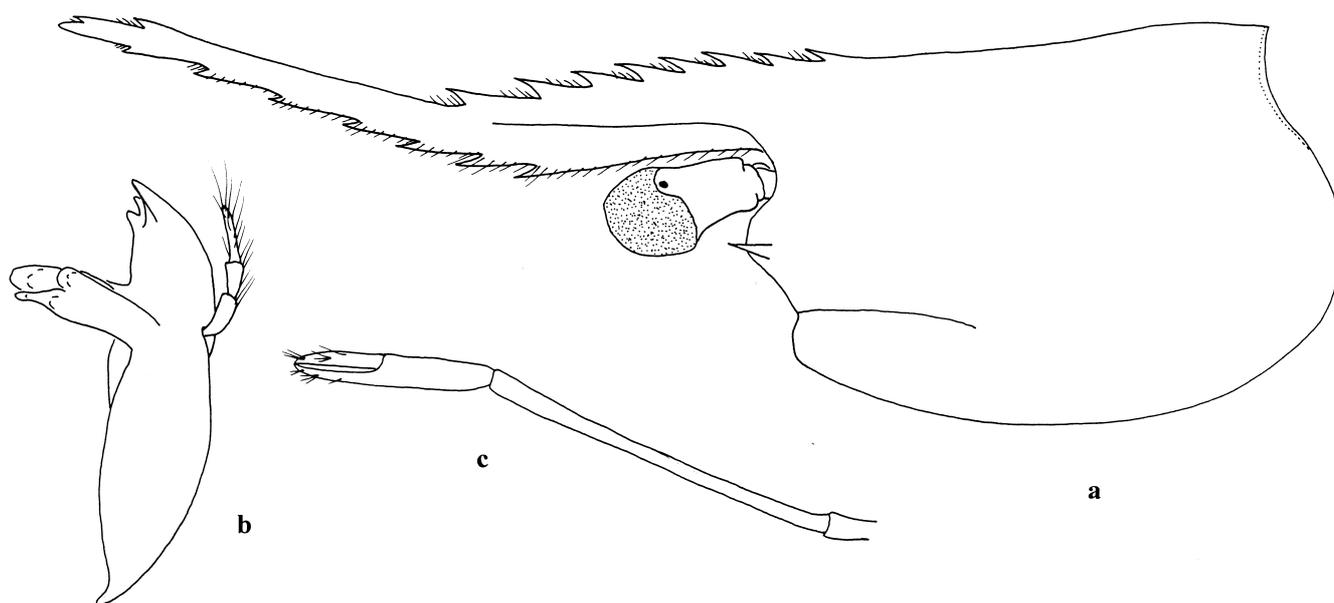


Fig. 7. *Leptocarpus potamiscus* (Kemp, 1917). a, carapace and rostrum; b, mandible, lateral view; c, 2nd pereopod.

**Diagnosis.** – Rostrum exceeding scaphocerite by more than 0.25 rostral length, armed ventrally with 6-10 teeth; mandible robust, with 3 segmented palp; second pereiopod with fingers obscurely excavate longitudinally, little more than 0.67 as long as palm; fifth pereiopod exceeding scaphocerite by length of dactyl and at least half of propodus.

**Distribution.** – India, Andaman Islands, China, Java, Malaya, Sumatra, and Thailand; fresh and brackish water.

**Remarks.** – The present specimens agree well with Kemp's description and figure. This species was previously recorded in Chinese waters from Haikang and Taishan, Guangdong (Liu et al., 1990b).

***Macrobrachium mammilodactylus* (Thallwitz, 1892)**

(Fig. 8)

*Palaemon* idae var. *mammilodactylus* Thallwitz, 1892: 15.

*Macrobrachium mammilodactylus* - Holthuis, 1950: 148, Fig. 34;

Liu et al., 1990a: 109, Fig. 7; Chace & Bruce, 1993: 33, Fig. 13.

**Material examined.** – 1 female, Haikou, Hainan Is., fishery market, 18 Jan. 1956; 2 males, 1 ovig female, CN 90C-245, Sanya, Hainan Is., fishery market, coll. H. Chen, 12 Nov. 1990; 7 males, 17 females (7 ovig) (IOCAS), 1 male, 1 female (ZRC), CN 92C-1065, Lingao, fishery market, coll. M. Türkay & X. Li, 2 Apr. 1992.

**Diagnosis.** – Rostrum well developed, with 2-3 + 9-13/2-5 teeth. Mandible stout, palp with 3 segments, covered with long setae, apical segment as long as other 2 segments combined; second pereiopods subequal and similar, chela slightly longer than carpus, palm subcylindrical, as long as carpus, fingers not densely pubescent, partially dentate on proximal opposing margins, palm and carpus covering with small tubercles. Uropod much longer than telson; telson with 2 pairs of posterior marginal spines and 1 pair of setae.

**Distribution.** – China, Indonesia, Philippines.

**Remarks.** – Rostrum variable in length, length ratio of second pereiopod segments variable with age. The large chela of the adult male with tubercles on both cutting edges of the dactyl distinguishes it from all closely related species.

***Palaemon debilis* Dana, 1852**

(Fig. 9)

*Palaemon debilis* Dana, 1852: 26; Holthuis, 1950: 66, Fig. 13; Chace & Bruce, 1993: 40.

**Material examined.** – 13 males, 11 females, 6 juv., Qinglan Harbor, Hainan Is., muddy sand, 27 Apr. 1980.

**Diagnosis.** – Rostrum strongly ascendant anteriorly, tapering almost imperceptibly to subapical dorsal tooth, with 6 dorsal

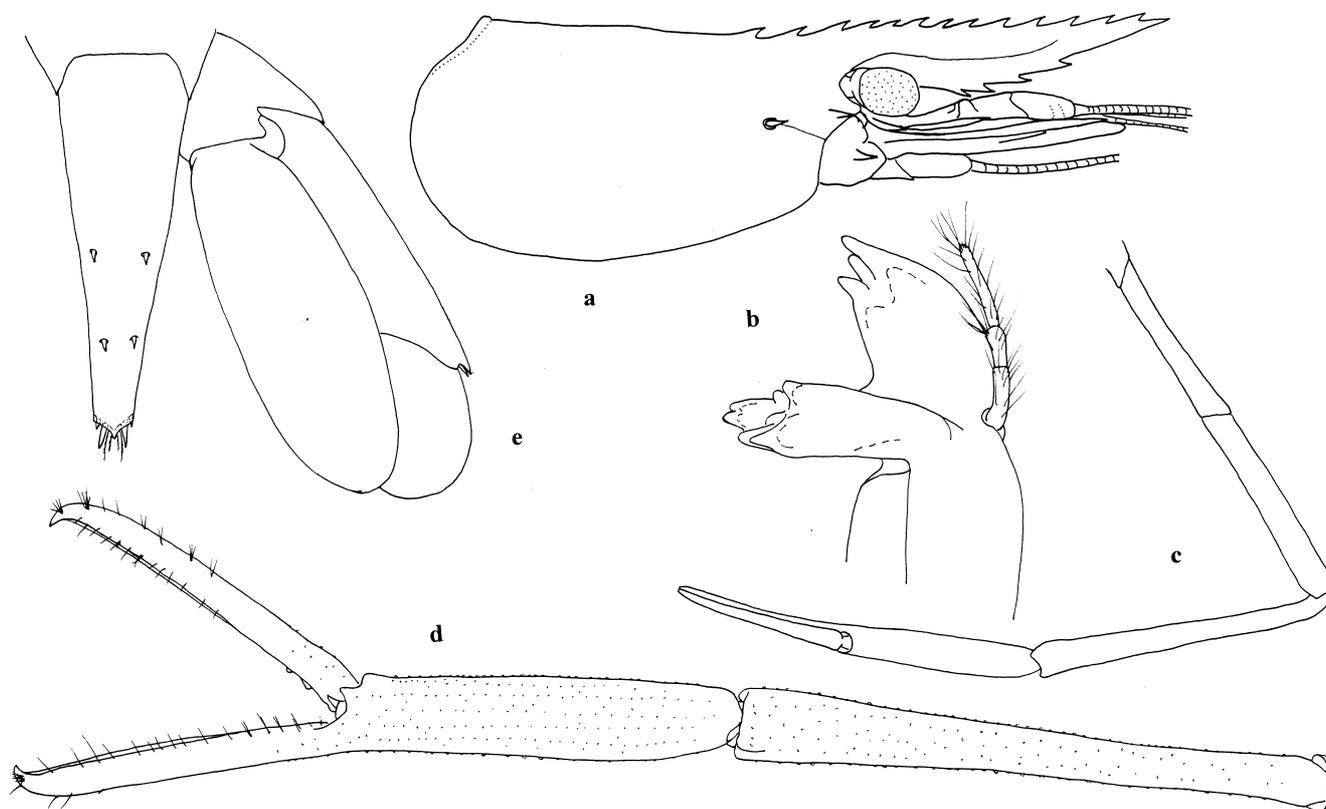


Fig. 8. *Macrobrachium mammilodactylus* (Thallwitz, 1892). a, carapace and anterior appendages, lateral view; b, mandible; c, 2nd pereiopod; d, same, chela and carpus; e, telson and uropod.

teeth on proximal part and 1 subapical tooth, and 3-10 ventral teeth. Antennule with distolateral spine of proximal segment not over-reaching adjacent convex distal margin of segment, free part of shorter ramus of dorsal antennular flagellum approximately equal to fused part. Mandible with 2 segmented palp, with long apical seta.

**Distribution.** – Previously reported from the Red Sea to South Africa, eastward to Great Barrier Reef, Hawaii, Tuamotu Islands, and Ryukyu Islands. Recorded here for the first time from South China Sea.

***Palaemon pacificus* (Stimpson, 1860)**

(Fig. 10)

*Leander pacificus* Stimpson, 1860: 40.

*Palaemon (Palaemon) pacificus* - Holthuis, 1950: 87, Fig. 19.

*Palaemon pacificus* - Liu et al., 1990b: 236, Fig. 29; Nguyen van Xuan, 1992: 43-47, Figs. 10, 11; Chace & Bruce, 1993: 41; Hayashi, 1999b: 525.

**Material examined.** – 1 male, CN 55-K275, Hele, Guangdong, coll. Y. Wang, 24 Apr.1955; 2 males, 3 ovig females, CN 56-K947, Weizhou Is., Beibu Bay, coll. J. Y. Liu, 23 Feb.1956; 1 female (ovig), Beiao, Hainan Is., 12 Jul.1957; 3 females, CN 90C-032, Qukou, Hainan Is., intertidal, coll. J. Y. Liu, 3 Nov.1990; 1 juv., CN 90C-047A3, Haikou, Hainan Is., algae culture field, coll. X. Ren, 4 Nov.1990; 17 males, 29 females (IOCAS), 1 male, 1 female (ZRC), 1 male, 1 female (SI), CN 90C-349, Meixia, Lingao, Hainan Is., intertidal, coll. J. Y. Liu, 2 Dec.1990; 1 female (ovig), CN 92C-009, Qukou, Hainan Is., coll. X. Li, 13 Mar.1992.

**Diagnosis.** – Rostrum usually ascending slightly in distal half, tapering gradually to subapical dorsal tooth, with 2-3 + 5-8 + 1/3-5 teeth. Antennule with distolateral spine of proximal segment distinctly over-reaching adjacent convex distal margin of segment, dorsal antennular flagellum with free part of shorter ramus 3-4 times as long as fused part. Mandible with 3 segmented palp covered with sparse long setae.

**Distribution.** – Red Sea, eastern Africa and South Africa to India, coast of southern China, Japan, Indonesia, New Caledonia and Hawaii; littoral.

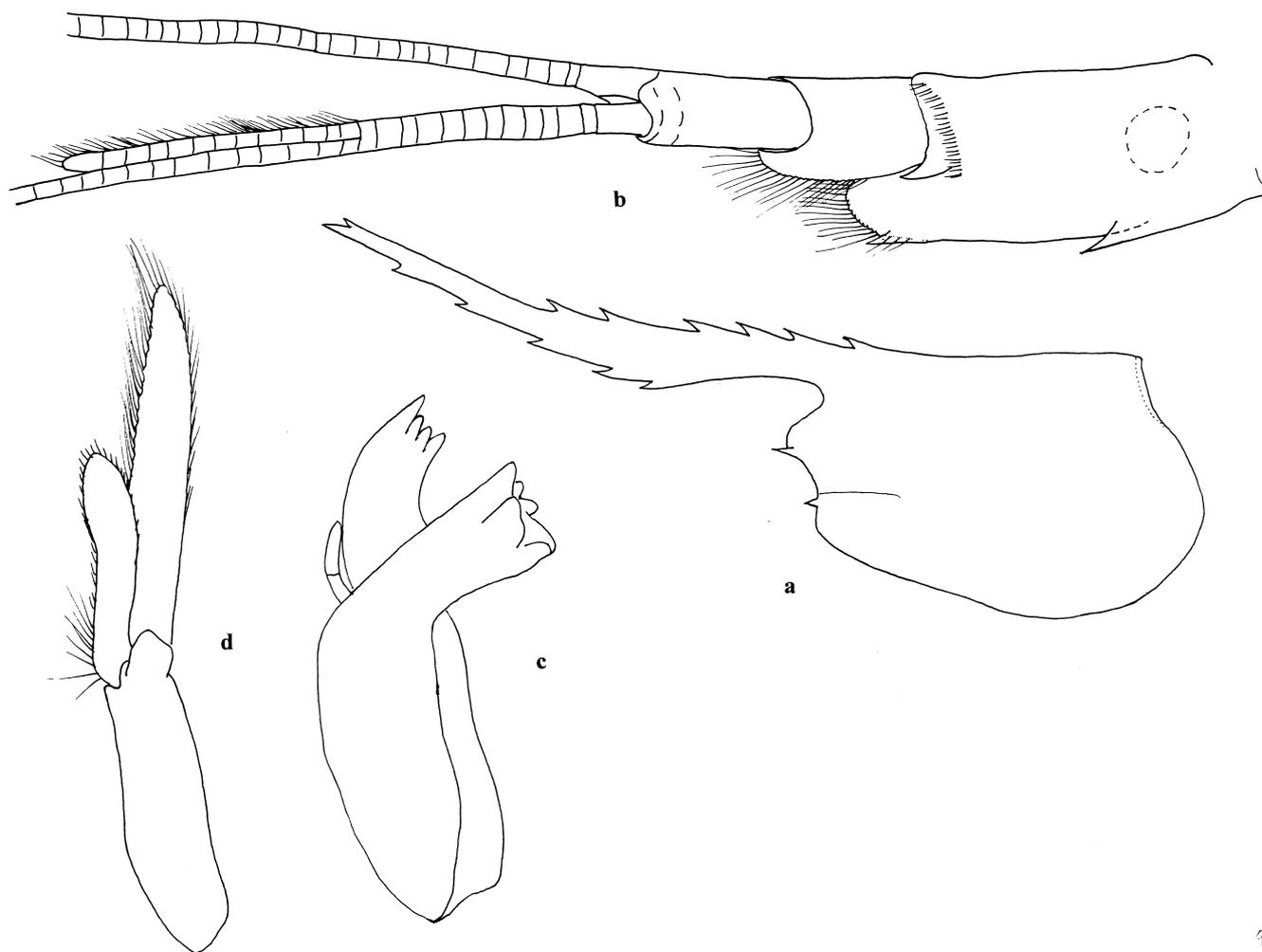


Fig. 9. *Palaemon debilis* Dana, 1852. a, carapace and rostrum, lateral view; b, antennule; c, mandible; d, 1st pleopod, male.

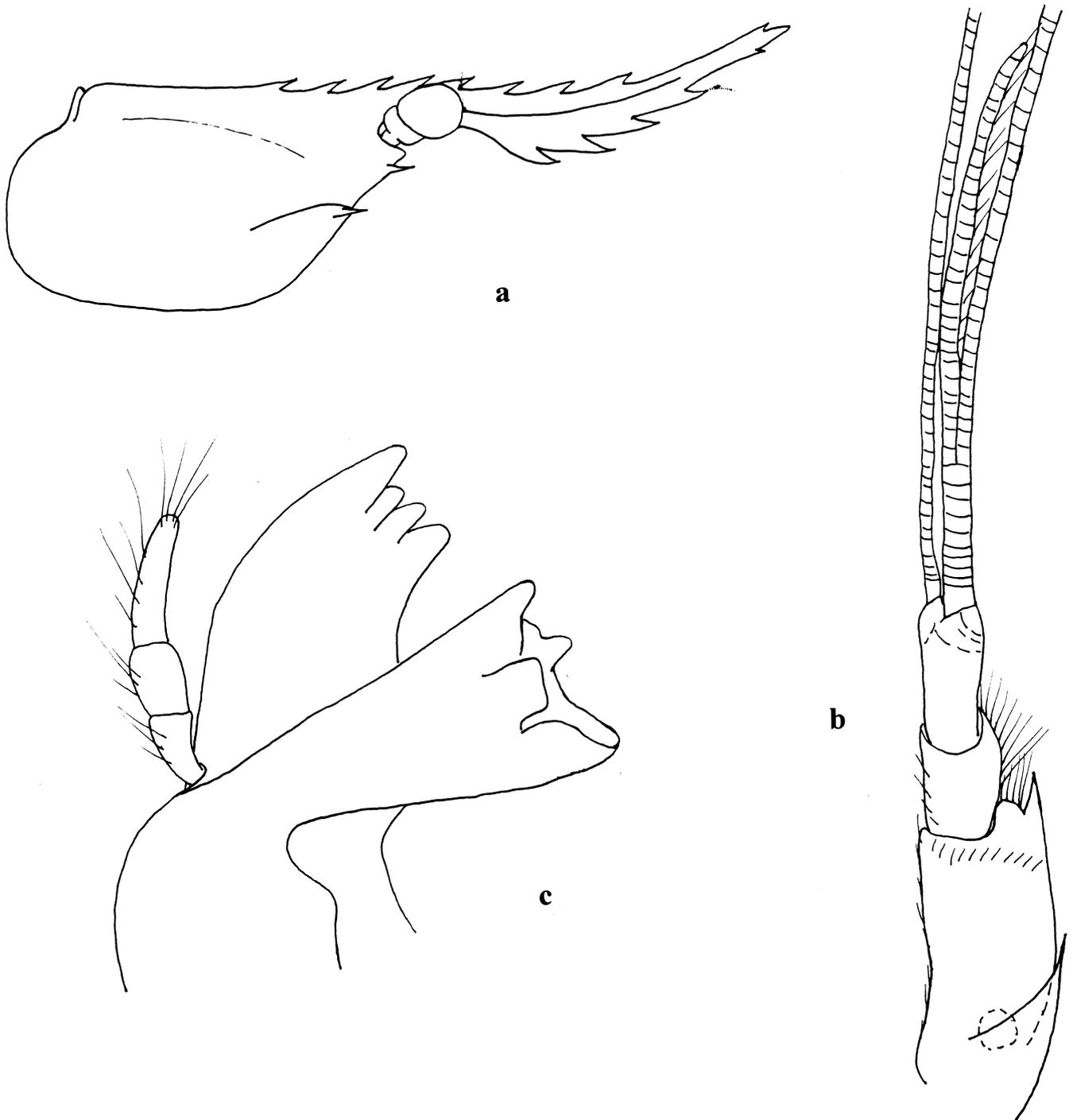


Fig. 10. *Palaemon pacificus* (Stimpson, 1860). a, carapace and rostrum, lateral view; b, antennule; c, mandible.

***Palaemon serrifer* (Stimpson, 1860)**

(Fig. 11)

*Leander serrifer* Stimpson, 1860: 41.

*Palaemon (Palaemon) serrifer* - Holthuis, 1950: 83, Fig. 18.

*Palaemon serrifer* - Liu et al., 1990b: 240, Fig. 33; Nguyen van Xuan, 1992: 39-43, Fig. 9; Chace & Bruce, 1993: 41; Davie et al., 1998: 96, photo; Hayashi, 1999b: 525.

**Material examined.** – 1 female, Wotou, Guangdong, intertidal, 23 Dec.1980; 1 male, 4 ovig females, CN 92C-1120, Meixia, Lingao, Hainan Is., intertidal, coll. X. Li, 8 Apr.1992; 1 juv., CN 92C-045, Xiaodonghai, Sanya, Hainan Is., 18 Mar.1992.

**Diagnosis.** – Rostrum usually nearly horizontal with margins tapering to sharp apex in anterior half, with 2-3 + 7-13/3-5 teeth. Antennule with distolateral spine of basal antennular

segment not over-reaching adjacent convex distal margin of segment, dorsal antennular flagellum with free part of short ramus 3 times as long as fused part. Mandible with well developed 3-segmented palp.

**Distribution.** – India, Burma, Taiwan to South East Asia, northern Australia, from the Kimberleys, Western Australia, to Moreton Bay, Queensland, Japan and Vladivostok, Russia; littoral marine waters.

**Remarks.** – This species is morphologically very close to *P. pacificus*. The size and number of the rostral teeth is variable and overlapping between the two species. The two species can only be distinguished by the shape of the rostrum and the basal antennular segment.

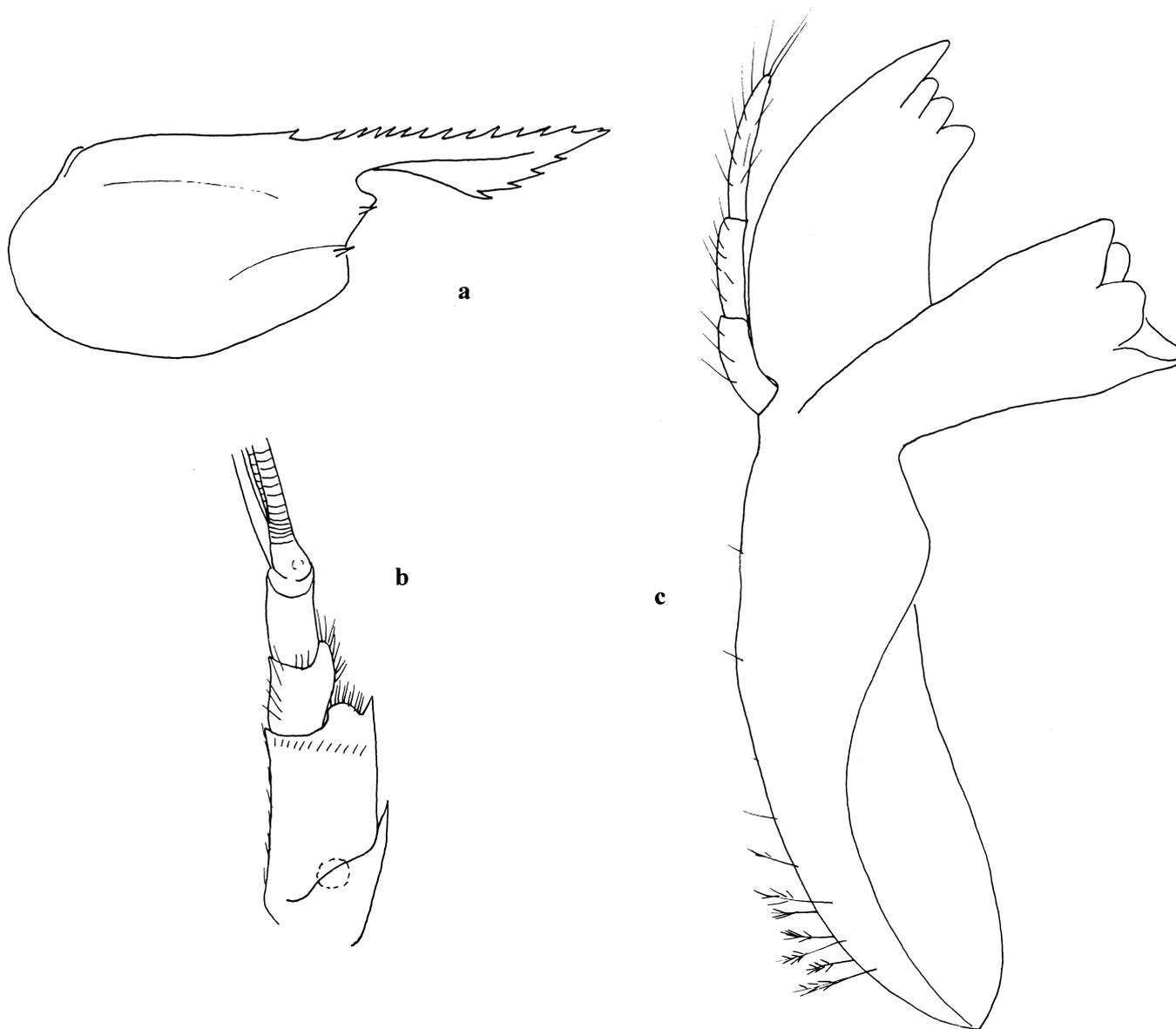


Fig. 11. *Palaemon serrifer* (Stimpson, 1860). a, carapace and rostrum, lateral view; b, antennule; c, mandible.

***Palaemon sewelli* (Kemp, 1925)**

(Fig. 12)

*Leander sewelli* Kemp, 1925: 299, Figs. 9, 10.*Palaemon (Palaemon) sewelli* - Holthuis, 1950: 8.*Palaemon sewelli* - Liu, Liang & Yan, 1990b: 240, Fig. 32.**Material examined.** - 1 female, CN 54-394-5A, Beibu Bay, off Hepu, Guangxi Province, coll. J. Y. Liu, 30 Dec.1954.**Diagnosis.** - Rostrum short and deep, dorsal margin straight, horizontal, with 3-5 + 8-14 (usually 4 + 10-12) + 0-2/3-5 teeth. Proximal segment of antennular peduncle with distolateral tooth reaching middle length of second segment; free part of shorter ramus of dorsal antennular flagellum longer than fused portion. Mandible with well developed 3-segmented palp.**Description.** - Rostrum short and deep, slightly shorter than carapace, dorsal margin straight, horizontal, with 3-5 + 8-14 (usually 4 + 10-12) teeth, excluding 0-2 small subapical teeth; ventral margin with 3-5 teeth. Carapace with branchiostegal spine, subequal with anteral spine in size, its tip slightly over-reaching the anterior margin of carapace, branchiostegal groove distinct. Abdomen smooth, length of sixth somite slightly less than 1.5 times as long as fifth, height subequal to length of fifth somite. Telson about as long as fifth and sixth abdominal somites together, with 2 pairs of small dorsolateral spines on posterior half of the length, posterior margin with pair of long intermedian spines and pair of short lateral spines. Proximal segment of antennular peduncle with distolateral tooth reaching middle length of second segment; free part of shorter ramus of upper antennular flagellum longer

than fused portion. Scaphocerite reaching to between rostral tip and distal end of antennular peduncle, distolateral tooth reaches about the end of lamella. Mandible with well developed 3-segmented palp. First pereopod reaching to about end of antennular peduncle, carpus slightly longer than chelae. Second pereopod over-reaching end of scaphocerite by 0.5 to 0.67 of palm; chela as long as 1.5 times of carpus, palm subequal to fingers in length, 3 times of its width; carpus 5 times as long as distal width; merus 7 times as long as width, 1.1-1.2 times of carpus. Ambulatory pereopods short and stout, with movable spines on posterior border; third pereopods over-reaching end of scaphocerite with dactyl, dactyl slightly longer than half propodus, as long as carpus; fifth pereopod with dactyl slightly longer than that of third pereopod, propodus 1.75 times as long as carpus, merus slightly longer than propodus, longer than 10 times width. The fresh specimens were covered with small red spots on lateral surfaces, the dorsal surface from carapace to middle of telson with a whitish stripe.

**Distribution.** - India, Burma, South China Sea. In shallow water, estuary or brackish waters.***Urocaridella antonbruunii* (Bruce, 1967)**

(Fig. 13)

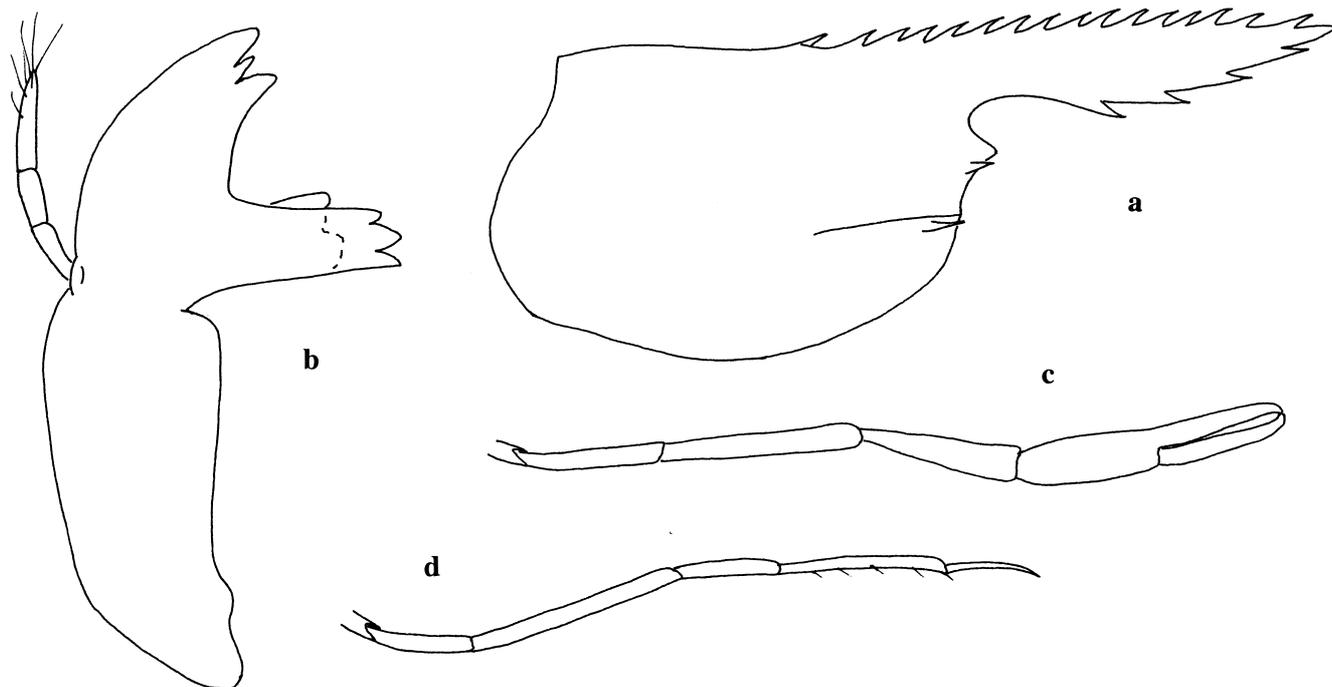
*Periclimenes antonbruunii* Bruce, 1967: 45-53, Figs. 19-22; 1971b: 10.*Leandrites cyrtorhynchus* Fujino & Miyake, 1969: 143-149, Figs. 1-3; Bruce, 1983a: 42.*Urocaridella antonbruunii* - Chace & Bruce, 1993: 42; Bruce & Coombes, 1995: 103; Jeng, 1998: 119, photo; Debelius, 1999: 173, photo.

Fig. 12. *Palaemon sewelli* (Kemp, 1925). a, carapace and rostrum, lateral view; b, left mandible; c, right 2nd pereopod; d, right 3rd pereopod.

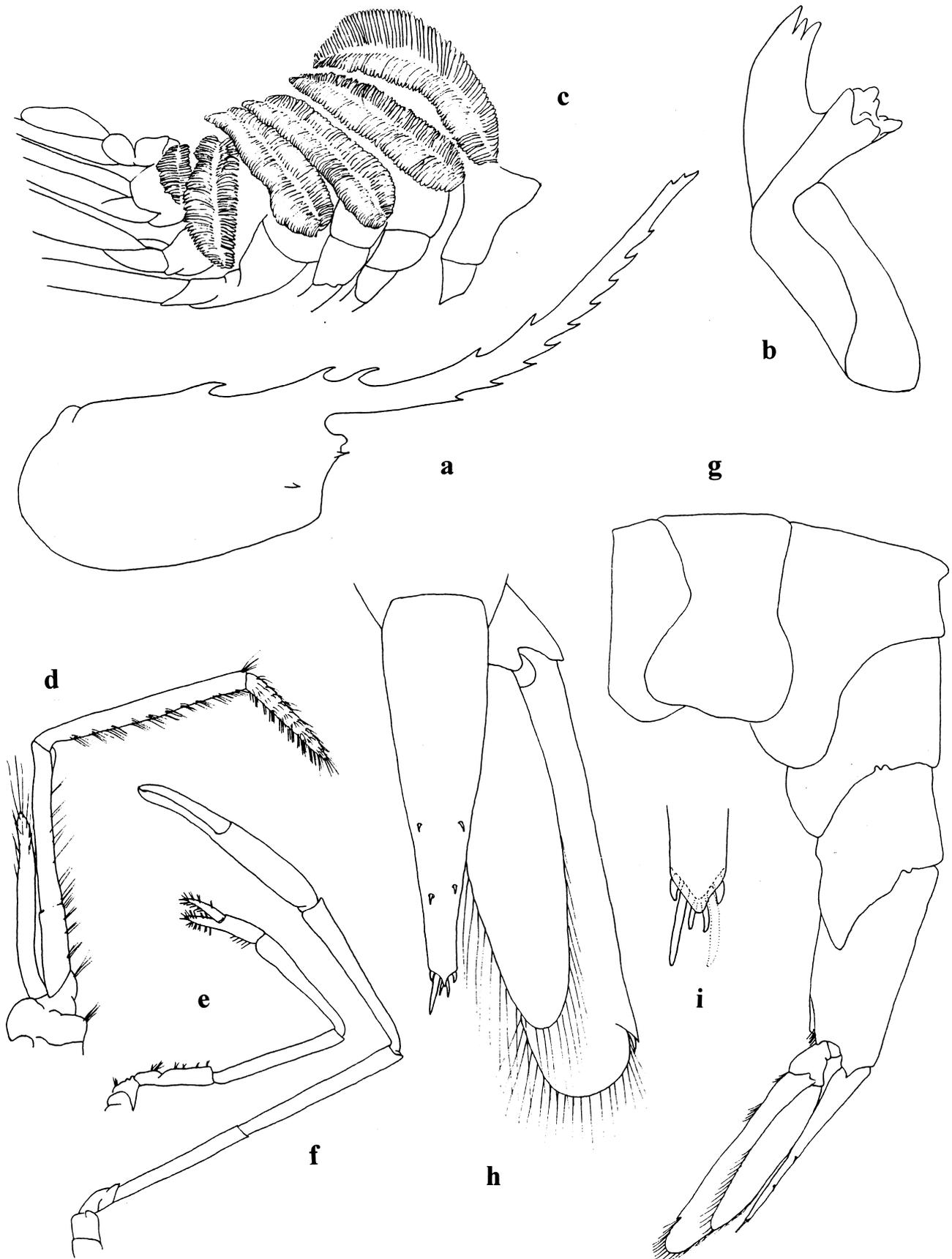


Fig. 13. *Urocaridella antonbruuni* (Bruce, 1967). a, carapace and rostrum, lateral view; b, mandible; c, thoracic pleuron 3-8, lateral view, show the pleurobranchiae; d, 3rd maxilliped; e, 1st pereopod; f, 2nd pereopod; g, abdomen, lateral view; h, telson and uropod, dorsal view; i, tip of telson, dorsal view.

**Material examined.** – 1 female, CN R140-28, [20°N, 108°30'E], 60m, muddy sand, AT, coll. J. Y. Liu, 9 Feb.1960.

**Diagnosis.** – Rostrum with 2 + 2 + 1-2/6-8 teeth, excluding the epigastric tooth on the carapace. Carapace with branchiostegal spine removed from margin by at least twice length of spine. Mandible without palp. First pereopod with fingers subequal to palm length, chela much shorter than carpus. Second pereopod with fingers more or less subequal to palm length, palm no longer than carpus. Third pereopod with propodus at least 4 times as long as dactyl. Third abdominal somite with nearly subrectangular dorsal profile, 5th abdominal pleuron rounded posteroventrally. Inner pair of posterior marginal spines on telson robust, without setae.

**Distribution.** – Previously recorded from the Comoro Islands, Japan, Indonesia, Great Barrier Reef, and the Palau Islands. Recorded here for the first time from South China Sea.

**Remarks.** – Borradaile (1915) erected the genus *Urocaridella*, for his new species *Urocaridella gracilis* Borradaile, 1915. Holthuis (1950) transferred this species to *Leander*, because the presence of a pleurobranch at the base of the third maxilliped, and as it “shows all characters of the genus *Leander*” (Holthuis, 1950: 30), and renamed this species as *Leander urocaridella* Holthuis, 1950 because it is a junior secondary homonym with *Leander gracilis* Smith, 1871. Chace & Bruce (1993) re-established the generic status of *Urocaridella* when describing a new species, *Urocaridella vestigialis* Chace & Bruce, 1993, from the *Albatross* collections. Their new species possesses a vestigial mandibular palp. It otherwise appears to be closely related to the pontonine species, *Periclimenes antonbruunii* Bruce, 1967, in which there is no mandibular palp. They suggested to “give greater weight to the configuration of the carapace and rostrum than to the usually more stable mandibular palp” (Chace & Bruce, 1993: 42). They transferred *P. antonbruunii* to this genus.

These three species share many characters morphologically: their rostrum is very slender and long and strongly curved dorsally, with 2 strong dorsal teeth proximally, which curve anteriorly and bear a series of small serrations on their distal ventral margins, there are 1-3 subapical dorsal teeth; the carapace has the lower margin of the orbital angle produced anteriorly, into an oval lobe; the branchiostegal spine is situated posterior to the anterior margin of the carapace, sometimes the distance is more than 2 times the length of the spine; there is a strong tooth situated at about the midlength of the dorsal surface of the carapace (epigastric tooth); the mouthparts are very similar, except for the mandible, which appears to vary in the development of the palp from *U. urocaridella* (developed, 2 segments) to *U. vestigialis* (vestigial) to *P. antonbruunii* (absent); the pereopods are subequal, slender and long. All three species have a pleurobranch at the base of third maxilliped, and 2 pairs of spines and a pair of submedian setae on the posterior margin of telson. The branchiae, consisting of one pleurobranch and one arthrobranch or 2 arthrobranches, on the third thoracic somite, have been discussed by many authors (e.g.,

Borradaile, 1917; Kemp, 1922; Holthuis, 1950, 1952a, 1955, 1993; Bruce, 1986, 1993), and considered very important for distinguishing the subfamily Palaemoninae from the Pontoninae. Borradaile (1917), as well as Kemp (1922), placed *Urocaridella* in the subfamily Pontoninae, and Holthuis (1950, 1952a) transferred it to the subfamily Palaemoninae mainly on account of the branchiae associated with third maxilliped. But the status of these branchiae overlaps in some taxa between these two subfamilies (Duris & Bruce, 1995). *Urocaridella* sensu Chace & Bruce (1993) is a special genus, which shares some characters from the two subfamilies, e.g., the branchiae of the third maxilliped and the posterior marginal spines on the telson, but the rostrum is unique in the family Palaemonidae.

### *Urocaridella urocaridella* (Holthuis, 1950)

(Fig. 14)

*Urocaridella gracilis* Borradaile, 1915: 210; 1917: 352, pl. 53: fig. 2; Bruce, 1990a: 150.

*Leander urocaridella* Holthuis, 1950: 6, 28 [new name for secondary junior homonym *Leander gracilis* (Borradaile)]; Liu et al., 1990a: 124, Fig. 22.

*Urocaridella urocaridella* - Chace & Bruce, 1993: 42, Fig. 16.

**Material examined.** – 5 males, 22 females (15 ovig) (IOCAS), 2 females (SI), CN 10B-3, [18°45'N, 108°30'E], 23m, muddy sand, BT, coll. Z. Fan, 26 Jan.1959; 2 males, 9 females (7 ovig), CN 19-9, [18°N, 108°30'E], 79m, muddy sand, BT, coll. Z. Fan, 28 Jan.1959; 2 ovig female, CN 22-24, [18°15'N, 109°15'E], 31.5m, sand, AT, coll. J. Y. Liu, 31 Jan.1959; 3 females (2 ovig), CN N62B-16, [20°15'N, 110°45'E], 55m, sand, AT, coll. Liang, 12 Jul.1959; 1 male, 3 females (1 ovig), 1 juv., CN S119-B-68, [23°30'N, 117°30'E], 37.9m, sand, AT, coll. W. Zhang, 16 Nov.1959; 2 ovig females, CN Q72-38, [18°15'N, 108°30'E], 78m, sand, AT, coll. Z. Tang, 19 Nov.1959; 1 ovig female, CN N157B-42, [18°15'N, 109°E], 22m, muddy sand, AT, 12 Mar.1960; 3 ovig female, CN N183B-52, [20°15'N, 110°45'E], 55m, sand, AT, coll. Y Wang, 9 Apr.1960; 1 male, 3 ovig females, CN R184B-2A, [20°N, 107°E], 31m, sand, AT, coll. Zhang, 13 Apr.1960; 1 male, 4 females (3 ovig), CN N219B-175, [18°15'N, 108°30'E], 54m, mud, AT, coll. J. Y. Liu, 16 May.1960; 1 female, CN K241B-12, [17°45'N, 107°45'E], 82m, sandy mud, AT, coll. Zheng, 12 Jul.1960; more than 50 spms, CN X142B-17, [18°30'N, 108°30'E], 29m, sandy mud, AT, coll. Sun, 6 Jan.1962; 1 ovig female, CN X158B-20, [19°N, 108°30'E], 22m, sandy mud, AT, coll. Sun, 13 Jan.1962; 1 male, CN X225B-38, [18°20'N, 108°15'E], 79m, sandy mud, AT, coll. Sun, 16 Aug.1962; 22 males, 42 females (26 ovig)(IOCAS), 1 male, 1 female (ZRC), CN X224B-93, [18°30'N, 108°30'E], 26m, AT, coll. Sun, 16 Aug.1962; 1 female, CN X233B-71, [18°30'N, 106°15'E], 26m, sand, mud, AT, 18 Aug.1962; 1 male, 3 ovig females, CN X249B-33, [19°30'N, 107°E], 52m, sand, AT, coll. Sun, 22 Aug.1962; 2 ovig females, CN 3-4, [19°30'N, 108°30'E], 52m, mud, BT, coll. Z. Fan; 1 male, St. 1, Sanya Bay, Hainan Is., 32-37m, mud, 21 Mar.1992; 1 male, CN B92-B11-31, St. 2, Sanya Bay, Hainan Is., 23 Mar.1992; 1 female, CN 54-394-5A, Hepu, Guangxi Province, coll. J. Y. Liu, 30 Dec.1954.

**Diagnosis.** – Rostrum with 2 + 3-5 + 1-3/10-12 teeth, excluding epigastric tooth on carapace. Carapace with branchiostegal spine removed from margin by about length of spine. Mandible with well developed 2-segmented palp. First pereopod with fingers distinctly longer than palm, palm subequal or slightly longer than carpus. Second pereopod

with fingers 1.5 times as long as palm, palm distinctly longer than carpus. Third pereopod with propodus less than three times as long as dactyl. Third abdominal somite with dorsal profile nearly subrectangular, 5th abdominal pleuron with small acute tooth posteroventral tooth. Posterior margin of telson acutely triangular, inner pair of posterior marginal setae slender, with setulose.

**Distribution.** – Maldive Islands, northeastern India, Andaman Islands, Mergui Archipelago, Indonesian, China, New Caledonia.

**Remarks.** – See Remarks under *Urocaridella antonbruunii*. The collection depth records of this species were from about 3.7 m (Kemp, 1922) to 125 m (Bruce, 1990a), the material collected from northern South China Sea is from 22 to 79.5 m depth also shows it has a wide bathymetric range species, as well as being a common species in this area.

PONTONIINAE KINGSLEY, 1878

*Anchistus custos* (Forskål, 1775)

*Cancer custos* Forskål, 1775: xxi, 94.

*Anchistus custos* - Holthuis, 1952a: 105; Chace & Bruce, 1993: 46,

72; Müller, 1993: 8; Bruce, 1996: 205; 2003: 211; Li, 1997: 228; 2000: 7, Fig. 8; 2001: 76; Davie et al., 1998: 96, photo; Li & Liu, 2002: 371, Fig. 1.

**Material examined.** – 9 males, 12 females (5 ovig)(IOCAS, 1 male, 1 female (ZRC), CN 55-K332A, Xinying, Hainan Is., intertidal, with *Pinna* sp., 23-25 May.1955.

**Distribution.** – Red Sea and eastern Africa to Philippines, southward to South Australia, and eastward to the Caroline and Fijian Islands (Chace & Bruce, 1993), also reported from Ambon, Indonesia (Debelius, 1999). Associated with mollusks of the genera *Pinna*, *Atrina* and *Vasum*.

*Conchodytes biunguiculatus* (Paulson, 1875)

(Fig. 15)

*Pontonia biunguiculata* Paulson, 1875: 111, pl. 15: fig. 1.

*Conchodytes biunguiculatus* - Kemp, 1922: 279, 280-282, Fig. 102;

Holthuis, 1952a: 17, 199-200; Müller, 1993: 13-14; Fransen,

1994: 89, Figs. 3-7, 12-15, 23, 27, 30, 35; Li, 2000: 24, Fig. 24;

2001: 76; Li & Liu, 2002: 372, Figs. 2a-f; Bruce, 2003: 212.

*Conchodytes kemp* Bruce, 1989b: 183.

**Material examined.** – 1 male, 2 females, Xincun, Hainan Is., 1-3m, with *Pinna* sp., 25 Apr.1955; 2 males, 2 ovig females, CN 55-K332C, Xinying, Hainan Is., intertidal, with *Pinna* sp., 23-25 May.1955.

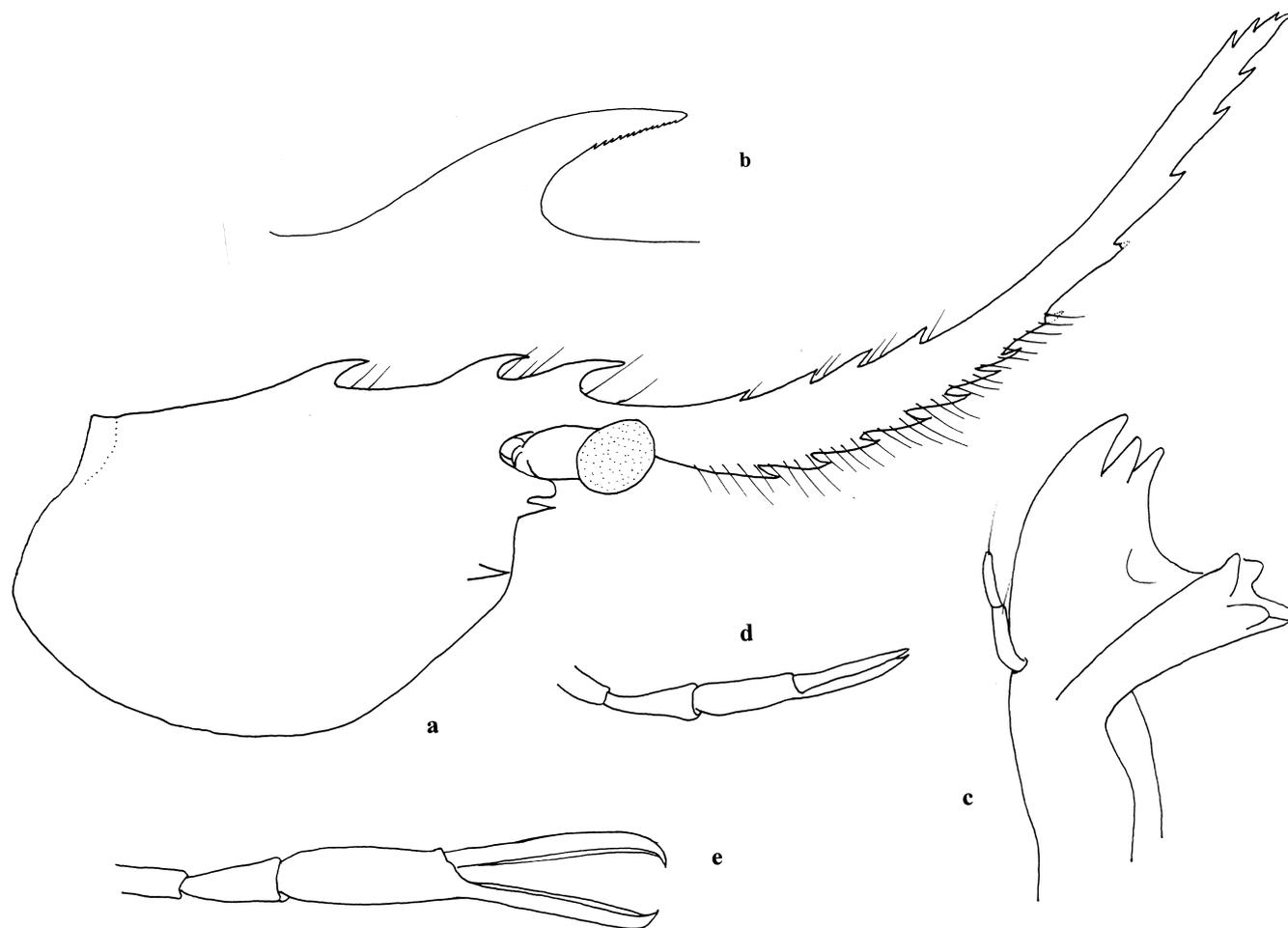


Fig. 14. *Urocaridella urocaridella* (Holthuis, 1950). a, carapace and rostrum, lateral view; b, 2nd dorsal tooth of rostrum; c, mandible; d, 1st pereopod; e, chela and carpus of 2nd pereopod.

**Diagnosis.** – First pereiopod with carpus and merus subequal in length. Chela of second pereiopod with one tooth on cutting edge of dactyl and two teeth on fixed finger, teeth blunt and serrated. Dactyl of third pereiopod with strong distal accessory tooth, basal process with small acute tooth. Telson with 2 pairs of dorsal spines and 3 pairs of posterior marginal spines, lateral pair of posterior marginal spines subdorsal and subterminal.

**Distribution.** – Western Indian Ocean, South China Sea, Philippines, Indonesia, and Japan.

***Kemponia cf. andamanensis* (Kemp, 1922)**

(Fig. 16)

*Periclimenes (Ancylocaris) andamanensis* Kemp, 1922: 204, Figs. 54-57.

*Periclimenes andamanensis* - Bruce, 1977: 269; 2003: 229; Chace & Bruce, 1993: 103; Müller, 1993: 70; Li, 1996: 229, Fig. 7; 1997: 238; 2000: 156, Fig. 192; 2001: 81; 2004: 68.

*Kemponia andamanensis* - Bruce, 2004: 12.

**Material examined.** – 3 males 6 females (3ovig), CN N219B-175C, [18°15'N, 108°30'E], muddy sand and shell pieces, 54m, AT, coll. J. Y. Liu, 16 May.1960; 3 males, 7 females, 1 ovig female, off Zhanjiang, Guangdong, coll. J. Y. Liu, ? Sep.1978; 5 males, 2 females, 20 juv., Qinglan Harbour, Hainan Is., intertidal, mud, 27 Apr.1980; 2 males, 4 females (IOCAS), 1 male, 1 female (ZRC), 1 male, 1 female (SI), CN 90C-349C, Meixia, Lingao, Hainan Is., intertidal, coll. J. Y. Liu, 2 Dec.1990; 1 male, CN 19-20, [18°N,

108°30'E], 79m, muddy sand, BT, coll. Z. Fan, 28 Jan.1959; 1 ovig female, CN X224B-59B, [18°30'N, 108°30'E], 26m, sand, AT, coll. Sun, 16 Aug.1962; 4 males, 3 females, CN 56K-876, Suixi, Caotan, coll. Baoling Wu, 31 Mar.1956.

**Diagnosis.** – Rostrum reaching level of distal end of scaphocerite or beyond, directed slightly anterodorsad in anterior half, with 1-2 + 6-8/2-4 teeth. Carapace with supraorbital spine. Scaphocerite with distolateral tooth far over-reaching distal margin of lamella. Fourth thoracic sternite with slender median process. Second pereiopods with distoventral tooth on merus; carpus armed with 1 distal tooth. Ambulatory pereiopods with dactyl simple; fifth pereiopods reaching as far as end of scaphocerite or beyond.

**Distribution.** – Madagascar, Andaman Islands, South China Sea, Ryukyu Islands, Indonesia, Australia.

**Remarks.** – See “Remarks” under *Kemponia grandis* (Stimpson, 1860). Our samples agree fully with the original description, with the exception of the ambulatory pereiopods. The dactyls of the third pereiopods of the types are 0.28 to 0.37 of the length of the propodi (Kemp, 1922), but those of our samples are about 0.5 as long as the propodi. The dactyls are much longer than those of the types. The species is close to *Kemponia longirostris* (Borradaile, 1915), also in the “*Periclimenes grandis* species group”, with long and slender ambulatory pereiopods. As re-described by Holthuis (1958), the dactyl of the third pereiopod of *K. longirostris* is about 0.29 of the length of the propodus and the fifth pereiopods

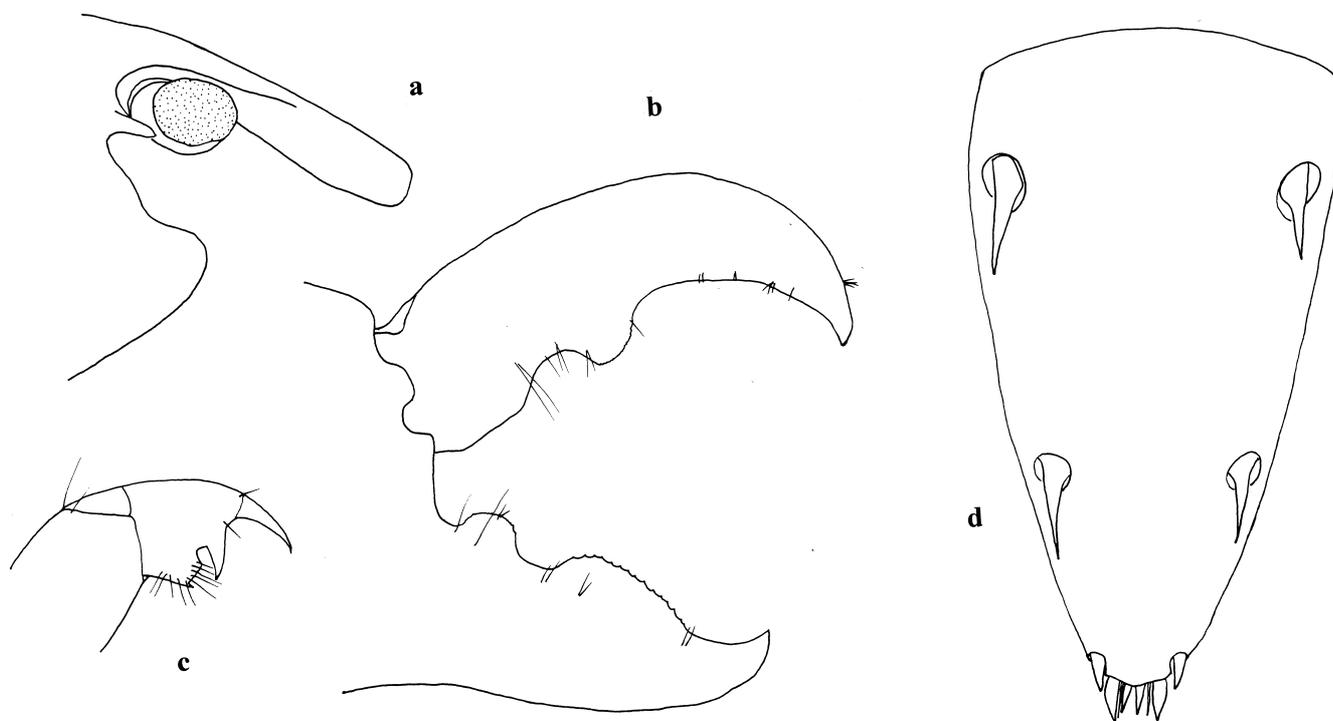


Fig. 15. *Conchodytes biunguiculatus* (Paulson, 1875). a, anterior carapace and rostrum, lateral view; b, chela of 2nd pereiopod; c, dactyl of 3rd pereiopod; d, telson.

reaching to about the end of scaphocerite. But *K. andamanensis* differs from *K. longirostris* in having the carpus of the second pereiopod always with an acute distal spine on the inner side, at least in adults. *Kemponia longirostris* lacks this acute spine in this position, at most having two blunt distal lobes on the carpus of the second pereiopods.

***Kemponia grandis* (Stimpson, 1860)**

*Anchistia grandis* Stimpson, 1860: 39.

*Periclimenes grandis* – Borradaile, 1898: 382; Bruce, 1975: 23, Fig. 1; 2003: 233; Chace & Bruce, 1993: 112; Müller, 1993: 84; Li, 1997: 238; 2000: 186, Fig. 235; 2001: 82; 2004: 69.

*Periclimenes (Ancylocaris) grandis* - Kemp, 1922: 210, Figs. 58, 59, pl. 7: fig. 10.

*Periclimenes (Harpilius) grandis* – Holthuis, 1952a: 79.

*Kemponia grandis* – Bruce, 2004: 16.

**Material examined.** – 14 males, 32 females, CN 54-255, Beigang, Luzhou Island, Guangxi Province, coll. Yongliang Wang and J. Y. Liu, 1 Dec.1954.

**Diagnosis.** – Rostrum up-turned, with 1-2 + 6-8/2-5 teeth. Carapace with supraorbital spine. Scaphocerite with distolateral tooth distinctly over-reaching distal margin of lamella. Fourth thoracic sternite with slender median process. Second pereiopods with distoventral tooth on merus; carpus stout, shorter than palm, armed distally with 1 distal tooth; chela with fingers 0.5 to 0.8 as long as palm. Ambulatory pereiopods with dactyl stout and simple; propodus with few spinules on flexor margin; fifth pereiopods not reaching as far as end of scaphocerite.

**Distribution.** – Red Sea to Mozambique, eastward to Japan, Indonesia, Great Barrier Reef, and Marshall Islands.

**Remarks.** – Bruce (2004) designated a new genus, *Kemponia*, to include the 24 species of an expanded “*Periclimenes grandis* species group”, which are primarily coral reef species and predominantly free-living, some as micro-predators, or associated with scleractinian corals. *Anchistia grandis* Stimpson, 1860 was designated as the type species of *Kemponia* by Bruce (2004).

***Kemponia johnsoni* (Bruce, 1987a)**

(Fig. 17)

*Periclimenes (Harpilius) calmani* - Johnson, 1962: 59.

*Periclimenes johnsoni* Bruce, 1987a: 115-125, Figs. 1-5; 2003: 236; Chace & Bruce, 1993: 115; Müller, 1993: 91; Li, 2000: 199, Fig. 254.

*Kemponia johnsoni* – Bruce, 2004: 16.

**Material examined.** – 3 males, 9 females (3 ovig), 6 juv. (IOCAS), 1 female (ZRC), 1 female (SI), Qinglan Harbour, Hainan Is., intertidal, mud, 27 Apr.1980; 1 male, 1 female, CN 90C-047A2, Haikou, Hainan Is., algae culture field, coll. X. Ren, 4 Nov. 1990.

**Diagnosis.** – Rostrum sexually dimorphic, being moderately deep in females, and more slender in males, with 1 + 7-9/4-5 teeth, posteriormost dorsal tooth distinctly isolated from others. Carapace without supraorbital spine. Scaphocerite with distolateral tooth not over-reaching distal margin of lamella. Fourth thoracic sternite with short, stout, tapering median process. Second pereiopods slender; without distoventral tooth on merus; carpus about 1.5 times as long

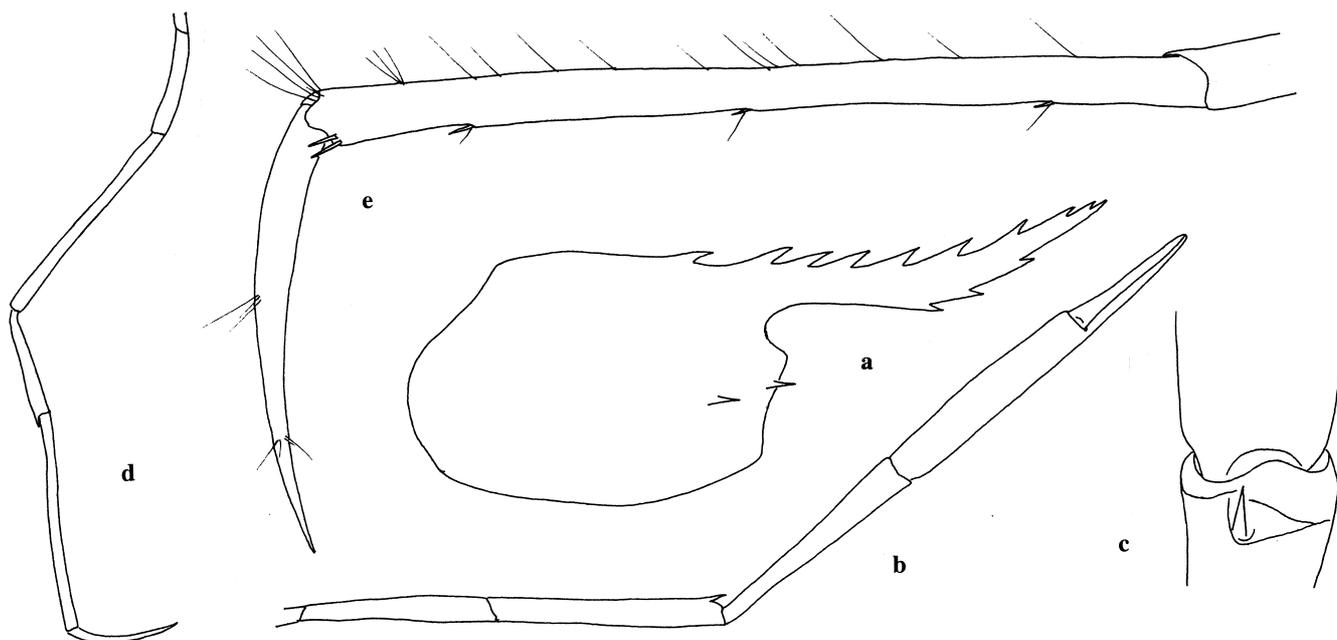


Fig. 16. *Kemponia* cf. *andamanensis* (Kemp, 1922). a, carapace and rostrum, lateral view; b, left 2nd pereiopod, outer view; c, same, carpo-propodal articulation, inner view; d, left 3rd pereiopod, outer view; e, same, propodus and dactyl.

as chela, unarmed distally; chela with fingers subequal to palm. Ambulatory pereiopods with dactyl slender, long and simple; propodus with few spinules on flexor margin; fifth pereiopods not reaching as far as end of scaphocerite.

**Distribution.** – Previously known only from Singapore.

**Remarks.** – See “Remarks” under *Kemponia grandis* (Stimpson, 1860).

***Kemponia nilandensis* (Borradaile, 1915)**

*Periclimenes (Falciger) nilandensis* Borradaile, 1915: 211; 1917: 372, pl. 54, fig. 13.

*Periclimenes (Ancylocaris) nilandensis.* – Kemp, 1922: 172.

*Periclimenes (Harpilus) nilandensis.* – Holthuis, 1952a: 58, fig. 22.

*Periclimenes nilandensis.* – Bruce, 1978: 222, Figs. 8, 9; 2003: 239; Chace & Bruce, 1993: 118; Müller, 1993: 98; Li, 2000: 215, Fig. 278.

*Kemponia nilandensis* – Bruce, 2004: 18.

**Material examined.** – 1 ovig female, CN 19-19, Beibu Bay, [18°N, 107°30'E], 79m, muddy sand, BT, coll. Zhengang Fan, 28 Jan.1959; 2 ovig females, CN 10-18, Beibu Bay, [18°45'N, 108°30'E], 23m, muddy sand, BT, coll. Zhengang Fan, 26 Jan.1959; 2 ovig females, CN X189B-33, Beibu Bay, [18°10'N, 107°E], 67m, sandy mud, AT, coll. Fuzeng Sun, 10 Apr.1962.

**Diagnosis.** – Rostrum reaching as far as or exceeding distal end of scaphocerite, with 2 + 6-8/3-5 teeth, posteriormost dorsal tooth not distinctly isolated from rest and posterior to level of hepatic spine. Carapace with supraorbital spine, hepatic spine slightly larger than antennal spine, arising slightly posteroventral to latter, orbital angle bluntly triangular, not ovate. Fourth thoracic sternite with slender median process. Abdomen with posteromedian margin of tergite convex. Scaphocerite with lateral margin straight, distolateral tooth reaching as far as or slightly exceeding distal margin of lamella. Second pereiopods robust, without

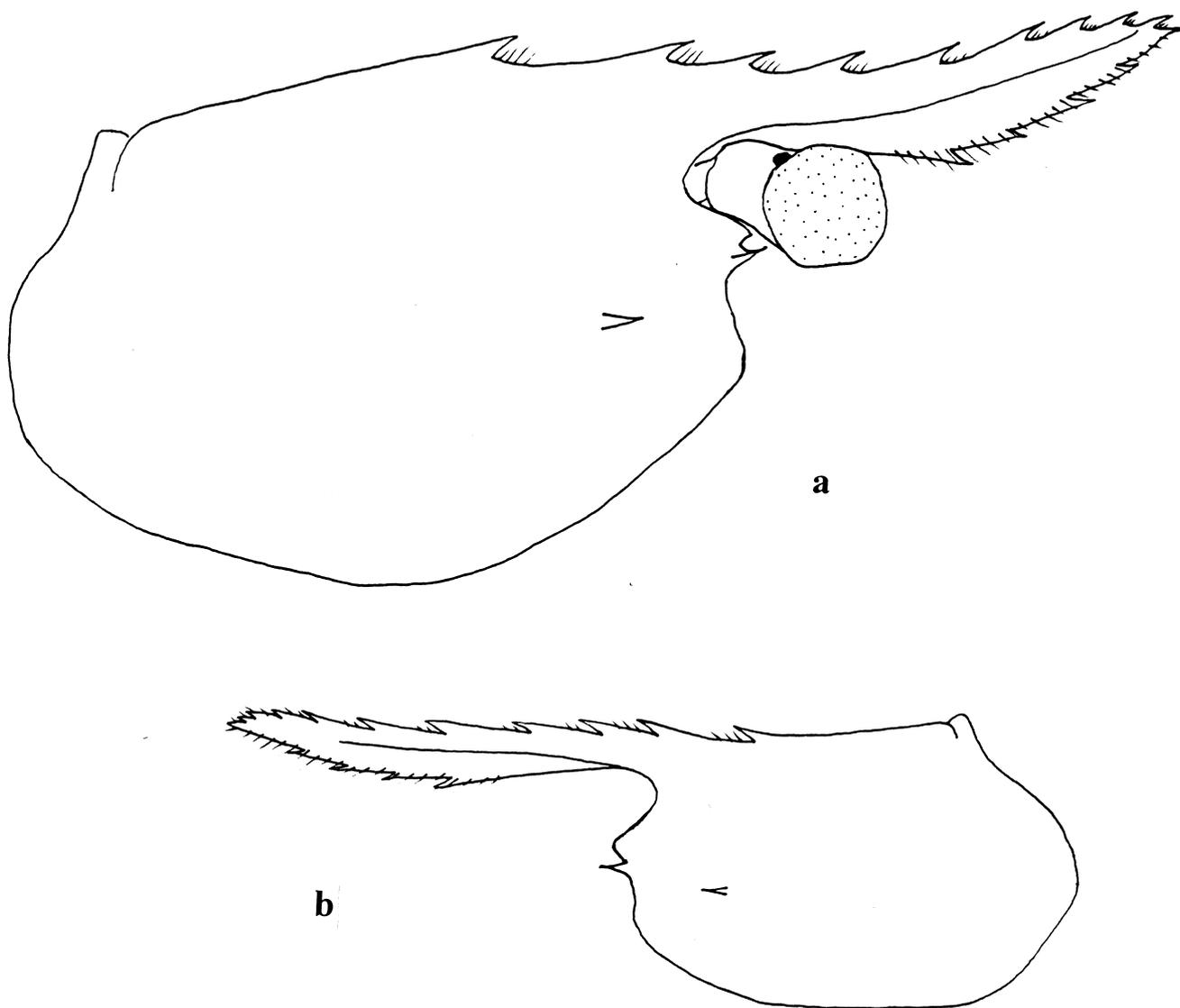


Fig. 17. *Kemponia johnsoni* (Bruce, 1987). a, carapace and rostrum, lateral view, female; b, same, male.

distoventral tooth on merus, carpus about 0.8 as long as palm, unarmed distally; fingers 0.65 as long as palm. Ambulatory pereiopods with dactyl not biunguiculate; propodus with spinules on flexor margin.

**Distribution.** – Previously reported from South Nilandu Atoll, Maldives, Kenya, Zanzibar, Madagascar, Maldives Islands, South China Sea, Indonesia, Northern Territory, Queensland and New Caledonia, to depths of 117-133 m.

**Remarks.** – See “Remarks” under *Kemponia grandis* (Stimpson, 1860).

***Kemponia platycheles* (Holthuis, 1952a)**  
(Figs. 18, 19)

*Periclimenes (Harpilius) platycheles* Holthuis, 1952a: 85, Fig. 33; Miyake & Fujino, 1968: 409, Figs. 3c-f.  
*Periclimenes platycheles* - Chace & Bruce, 1993: 120; Müller, 1993: 104; Li, 2000: 226, Fig. 299; De Grave, 2000: 138; Bruce, 2003: 240.

*Kemponia platycheles* – Bruce, 2004: 18.

**Material examined.** – 4 males (CL 4.0, 4.0, 4.0, 3.6 mm), 2 ovig females (CL 3.5, 3.4 mm), CN 92C-182D, Xincun Harbour, Hainan Is., 1-3m, with *Acropora* sp., coll. X. Li & V. Neumann, 27 Mar.1992.

**Diagnosis.** – Rostrum very long and slender, exceeding end of scaphocerite, distal half up-turned, with 1 + 6-8/5-8 teeth, posteriormost dorsal tooth slightly posterior to level of hepatic spine. Carapace without supraorbital spine, orbital angle broadly rounded. Scaphocerite narrow, with lateral margin deeply concave, distolateral tooth exceeding truncate distal margin of lamella. Mandible with incisor process tapering distally, with 3 marginal teeth. Telson with posterior margin with acute median process, with three pairs of posterior marginal spines, intermediate pair robust and very long. Second pereiopods sexual dimorphic, unequal, long, exceeding scaphocerite with entire carpus and chela; merus with sharp distal tooth on flexor margin; carpus expanded distally, 0.5 to 1.75 times as long as palm, with 2 sharp distal spines in female and 3 in male; fingers 0.33 to 0.5 as long

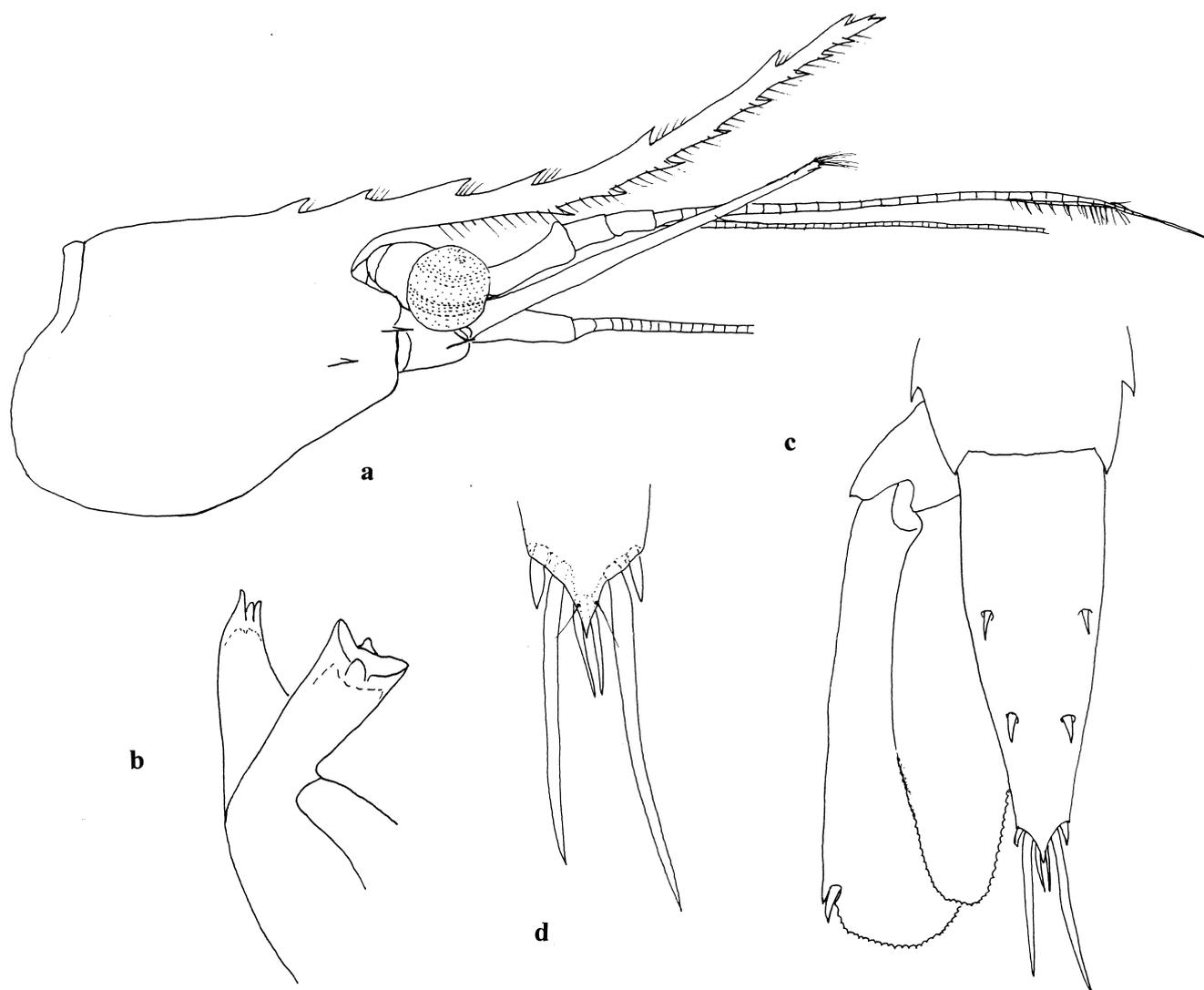


Fig. 18. *Kemponia platycheles* (Holthuis, 1952). a, carapace and anterior appendages, lateral view; b, mandible; c, telson and uropod, dorsal view; d, tip of telson.

as palm, proximal 0.6-0.7 of cutting edges denticulate, tips strongly curved; dactyl slightly twisted, upper margin with sharp flange along external lateral side, outer margin sometimes concave, in which case fixed finger convex. Ambulatory pereiopods with dactyl is simple; propodus with spinules on flexor margin; fifth exceeding scaphocerite. Uropod with exopod has one disto-lateral movable spine.

**Distribution.** – Previously reported from Indonesia and Palau Islands.

**Remarks.** – See “Remarks” under *Kemponia grandis* (Stimpson, 1860). The present specimens agree closely with the original description, but the carpus of their second pereiopods are distinctly shorter than the palm, and also stouter than that illustrated by Holthuis (1952). Thanks to the kindness of Dr. Dirk Platvoet, the type material has been available for re-examination. The holotype is in good condition, but lacks the right first pereiopod, the left third pereiopod, the left first pereiopod lacks the distal carpus and chela, the left second pereiopod and the left second pleopod are detached from the body; the paratype lacks most of the

pereiopods and pleopods, only the detached right first pereiopod, right second pereiopod and right first pleopod are present. The maxillula, maxilla, first to third maxilliped on right side have been dissected off, but the right mandible missing. In comparison, our samples are very similar to the types except for the second pereiopods and rostrum. In our samples, all the right second pereiopods are lost, except for one male, which has a short and regenerating right second pereiopod, so it is uncertain if the left second pereiopods are the major or minor limb, but the second pereiopods are distinctly sexually dimorphic, as De Grave (2000) noted, much larger in the males than in females, and the carpus in the male is shorter and stouter than that of the female. The second pereiopods in our two female specimens are similar to those of the holotype in size. The fingers of the second pereiopods in the males of our samples are different, the cutting edges armed sometimes with 2 large opposing teeth, sometimes with many small teeth on proximal 0.6-0.7 of the finger length. Concerning the variations in the proportional length of carpus against the palm and denticulations of cutting edges of the fingers of the second pereiopods, the material of Miyake and Fujino (1968: 410, Figs. 3c-f) on the basis of

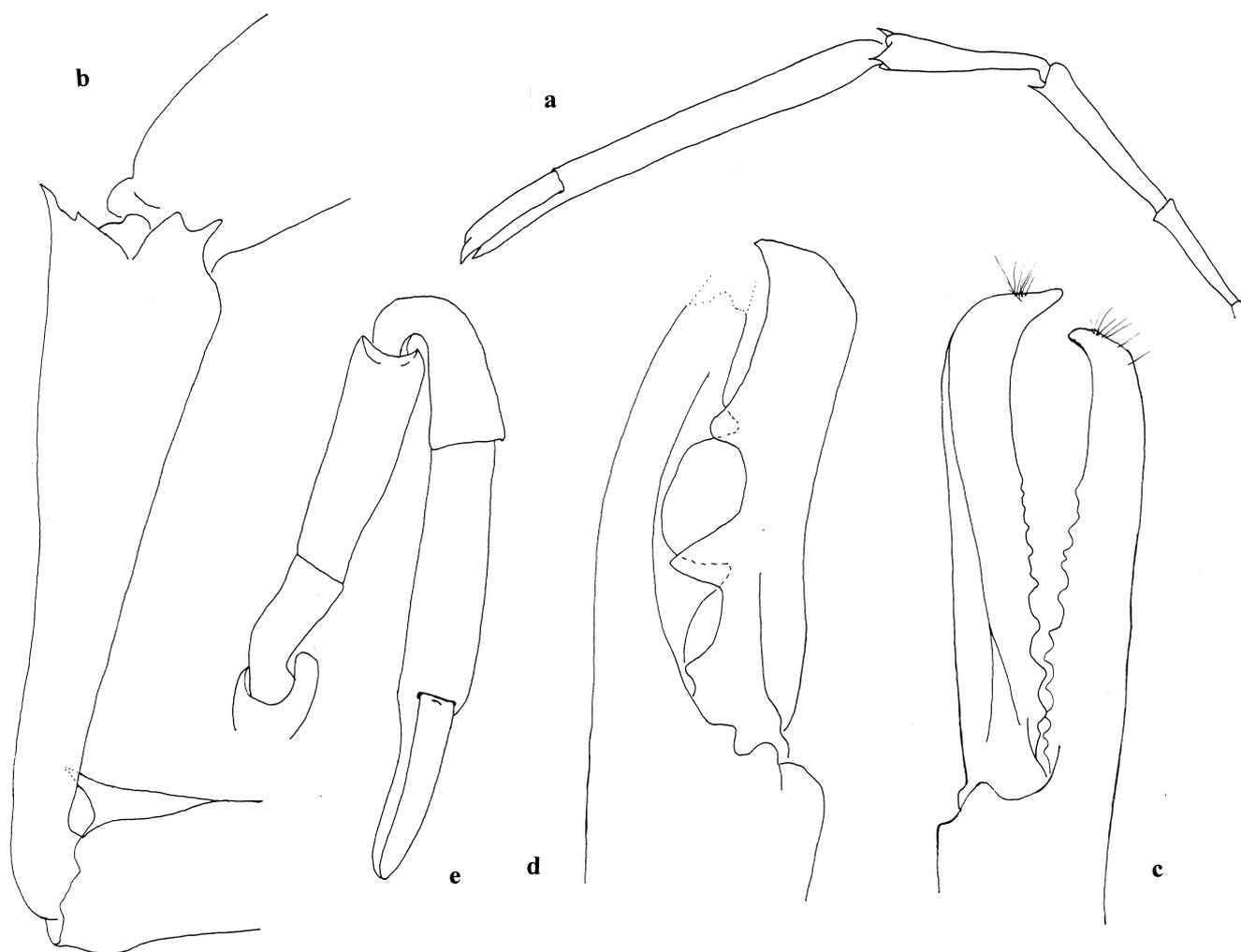


Fig. 19. *Kemponia platycheles* (Holthuis, 1952). a-d, major (left) 2nd pereiopod; b, same, tip of merus and carpus; c, d, same, fingers; e, regenerate 2nd pereiopod.

their specimens, and their illustrations (Figs. 3d, e) which may be based on their male specimen, are very close to the condition of two of our four males. It is considered that the differences appear to fall within the range of variation of this species. In three specimens with perfect rostra, the rostral formulae are respectively 1+6/6, 1+7/8 (males), and 1+8/8 (female). The female has more rostral teeth than in the types (1+6/4, 1+6/6). Besides the sexual dimorphism in the second pereopods and rostrum, the size of males is larger than females: in our samples, the carapace lengths of males are 3.6–4.0, average 3.9 mm, those of females are 3.4–3.5. The species has another unusual features, the posterior margin of telson in the holotype and all our specimens has a long and acute median process, as illustrated by Miyake and Fujino (1968: 408, Fig. 3f); a finger-like process on the fourth thoracic sternite indicates that the species belong to the “*Periclimenes grandis* species group *sensu lato* (Bruce, 1987b)”.

De Grave (2000) pointed out that the material from Lizard Island (Australia) recorded by Bruce (1983b, 1992) may belong to a closely related, as yet un-described species. Thanks to Dr. Penny Berents, who kindly sent the specimens from Lizard Island, Queensland, deposited in Australian Museum, so that the first author (XLi) had chance to check them. The female (no. P. 39292) is very close to the paratype of *Kemponia platycheles*, with the rostrum almost horizontal, carpus of second pereopod long, and the median process on the posterior margin of the telson round, but the chelae of the first pereopods are more slender than those of the paratype, as illustrated by Bruce (1992: 63, Fig. 15F); the ovigerous female (No. P. 39304) is close to the holotype of *K. platycheles*, with the rostrum distinctly up-curved on the distal half, second pereopod with a long carpus and cutting edges of fingers with two large teeth, and the median process on the posterior margin of the telson acute; the male (No. P. 39304) is close to our samples which with the rostrum distinctly up-curved on the distal half, and the median process of the posterior margin of the telson is acute, unfortunately, both the second pereopods of the male are regenerating. That is to say, the material from Lizard Island are very similar to *K. platycheles* in many characters, except for the first pereopod, as noted by Bruce (1992) and De Grave (2000).

### *Palaemonella rotumana* (Borradaile, 1898)

*Periclimenes rotumana* Borradaile, 1898: 383.

*Palaemonella vestigialis* Kemp, 1922: 123, Figs. 1, 2, pl. 3: 2; Holthuis, 1952a: 24, Figs. 2a, b, 3.

*Palaemonella rotumana* - Bruce, 1970b: 276, Fig. 2; 2002a: 288, 291; 2003: 221; Chace & Bruce, 1993: 89; Müller, 1993: 45; Li, 1996: 226, Fig. 5; 1997: 234; 2000: 105, Fig. 115; 2001: 80; De Grave, 2000: 129, Fig. 5; Li & Liu, 2003: 160, Figs. 5c–q.

**Material examined.** – 1 male, 1 female, CN 92C-187C, Xincun, coll. X. Li, 27 Mar.1992; 1 ovig female, CN 92C-1405C, Lanmai, Lingao, Hainan Is., intertidal, coll. X. Li, 9 Apr.1992; 1 ovig female, CN 92C-1419B, Linchang Reef, Hainan Is., intertidal, coll. X. Li, 10 Apr.1992; 1 male, CN R175B-27, [20°10'N, 110°15'E], 43.5m, corals, AT, coll. F. Sun, 11 Apr.1960; 1 male, CN Q55B-38,

[17°30'N, 108°E], sandy mud, 85m, BT, coll. Fengshan Xu, 16 Apr.1959.

**Distribution.** – Red Sea and eastern Africa to Hawaii, Eastern Mediterranean.

**Remarks.** – Commonest species of the genus, distributed from littoral to a depth of 128 meters. It is very close to *Palaemonella pottsi* (Borradaile, 1915). As pointed out and illustrated by Bruce (1970b, 2002a) and De Grave (2000), these two species can be distinguished by the configuration of the dactyl and propodus of the ambulatory pereopods. In *P. rotumana* the ventral margin of the dactyl of ambulatory pereopods is smoothly concave, not biconcave, and the apical ventral propodal spines are long, reaching 0.4–0.5 of the dactyl length, sometimes, this species has an obscure and sometimes a distinct postorbital ridge. In *P. pottsi* the unguis of dactyl of ambulatory pereopods is clearly demarcated, the ventral margin of corpus of the dactyl is sinuous or biconcave, and the apical ventral propodal spines are small; the carapace always without supraorbital tubercle. Additionally, *P. rotumana* is a free-living species, but *P. pottsi* is associated with crinoids.

### *Paraclimenes cf. franklini* (Bruce, 1990b) (Fig. 20)

*Periclimenes franklini* Bruce, 1990b: 55–64, Figs. 1–5; 1991: 314, Fig. 9; Müller, 1993: 83; Li, 2000: 182, Fig. 230.

*Paraclimenes franklini* - Bruce, 1994: 99, Fig. 45; 2003: 223.

**Material examined.** – 1 female, CN SIII29B-13 (CN), [22°N, 116°30'E], 86m, sand, AT, coll. W. Zhang, 20 Jul.1959.

**Diagnosis.** – Rostrum shallow, slightly up-turned, with 2 + 7/3–4 teeth, 2 postorbital dorsal teeth articulate. Carapace without supraorbital and antennal spines; hepatic spine slender, acute, reaching beyond anterior margin of carapace. Scaphocerite with distolateral tooth not reaching distal margin of lamella. Second pereopods markedly unequal and subsimilar; without distoventral tooth on merus; carpus stout and short, at most 0.33 as long as palm, unarmed distally; fingers of major chela with strongly hooked, acute tips, dactyl armed proximally with 2 teeth on cutting edge, separated by U-shaped notch, fixed finger similar, with low tooth opposing U-shaped notch on dactyl, with low tricuspid tooth proximally; minor second pereopod subsimilar to major second pereopod, chela with distal half of fingers with sharp cutting edge, proximal teeth smaller than in major second pereopod, subacute. Ambulatory pereopods slender, with dactyl stout and biunguiculate; propodus with spinules on flexor margin.

**Distribution.** – Previously only known from the type locality in the Coral Sea and from New Caledonia. Recorded here for the first time from South China Sea.

**Remarks.** – The only female specimen has the following differences from Bruce's (1990b) description: the rostrum is

distinctly up-turned, and longer, about 0.94 of carapace length; hepatic spine on carapace exceeding anterior margin of carapace; posteroventral angle of sixth abdominal segment acute; first pereiopod with carpus shorter, 0.8 of chela length; major second pereiopod with chela stouter, 1.3 times carapace length. Moreover, our specimen was collected from 86m, much shallower than the depth of types, which were in 296-302 m depth. It is possible that our specimen may represent a distinct species. Unfortunately, both types and our specimen lack records of host and coloration, which may be valuable for comparison. As reported in Bruce (1990b), the apparent differences of *P. franklini* from its close allied species *P. gorgonicola* (Bruce, 1969a) are: the former has two large articulated postrostral spines on the carapace, which are replaced by smaller, non-articulate teeth in *P. gorgonicola*, and the stylocerite reaches to about 0.8 of proximal segment length in *P. franklini* and 0.5 in *P. gorgonicola*. In our specimen, there is distinct suture at base of the two postrostral spines, although the spines are not mobile, and the stylocerite reaches to about 0.7 of the length of the proximal segment of the antennular peduncle. We therefore consider the specimen is closer to *P. franklini* (Bruce, 1990b). The first author (XLi) found other 2 males and 2 females collected from East China Sea (28°N, 122°58.5'E) at 80 meters depth, which are identical with this female specimen. The collection of further specimens, with information on the coloration of fresh specimens should help to identify the members of this genus.

*Paranchistus liui*, new species

(Figs. 21-23)

**Material examined.** – Holotype - female, CN 21-31, [21°N, 108°E], 30m, AT, coll. Z. Tang, 24 Jan.1959.

Paratypes – 1 male, CN Y95B-61, [19°45'N, 109°E], 24.4m, sandy mud, AT, coll. Z. Fan, 18 Apr.1960; 1 female (ovig), CN Y5B-33, [19°45'N, 107°30'E], 51.5m, sand, AT, coll. X. Ma, 4 Dec.1959.

**Diagnosis.** – Rostrum slightly ventral directed, dorsal and ventral margins subparallel, apex blunt, with 1 distodorsal tooth and 1 apical tooth which situated at the below middle of the apex. Carapace with lower orbital angle produced anteriorly and rounded. First pereiopods with cutting edges of fingers entire, not pectinate. Second pereiopods with the tips of fingers crossed. Third pereiopods with dactyl compressed, unguis not flattened, with sparse fine tubercles on extensor surface, ventral margin simple, not biunguiculate, corpus with distal margin slightly deeper than base of unguis.

**Description.** – Small sized shrimp. Body subcylindrical, smooth.

Rostrum almost reaching end of first segment of antennular peduncle, directed slightly ventrally, compressed but gradually broadening laterally proximally, dorsal and ventral margins subparallel; apex blunt, with setae and 2 teeth - one

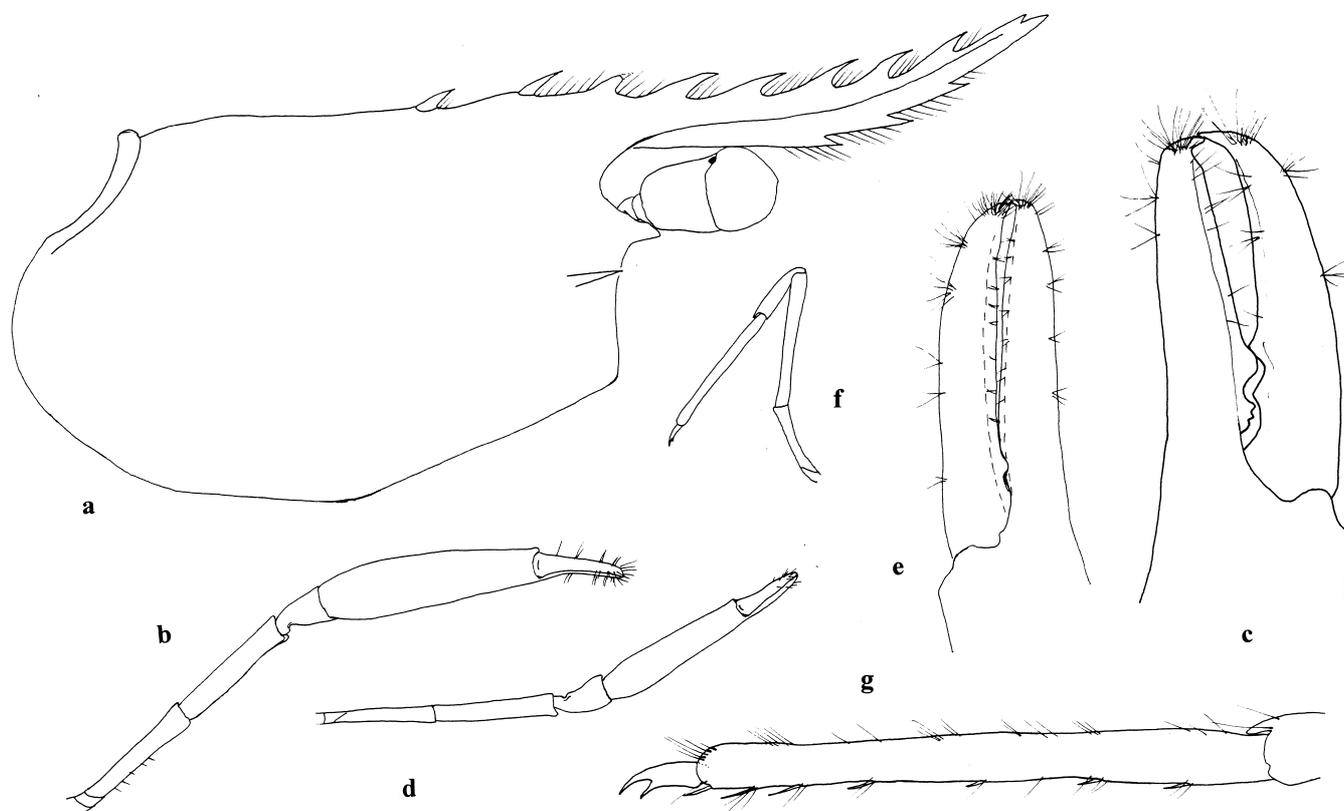


Fig. 20. *Paraclymenes* cf. *franklini* (Bruce, 1990). a, carapace and rostrum, lateral view; b, major 2nd pereiopod; c, same, fingers; d, minor 2nd pereiopod; e, same, fingers; f, 3rd pereiopod; g, same, dactyl and propodus.

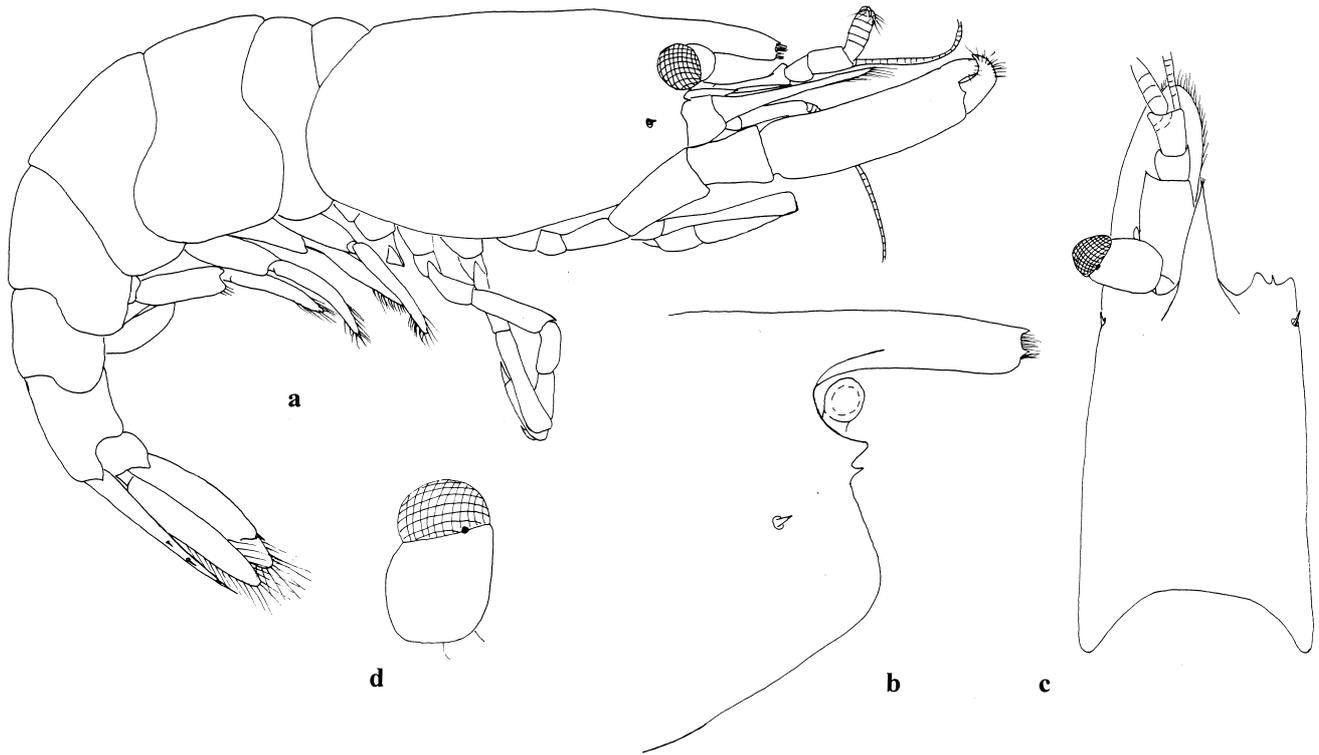


Fig. 21. *Paranchistus liui*, new species. a, body, lateral view; b, anterior region of carapace and rostrum, lateral view; c, carapace and anterior appendages, dorsal view, d, eye.

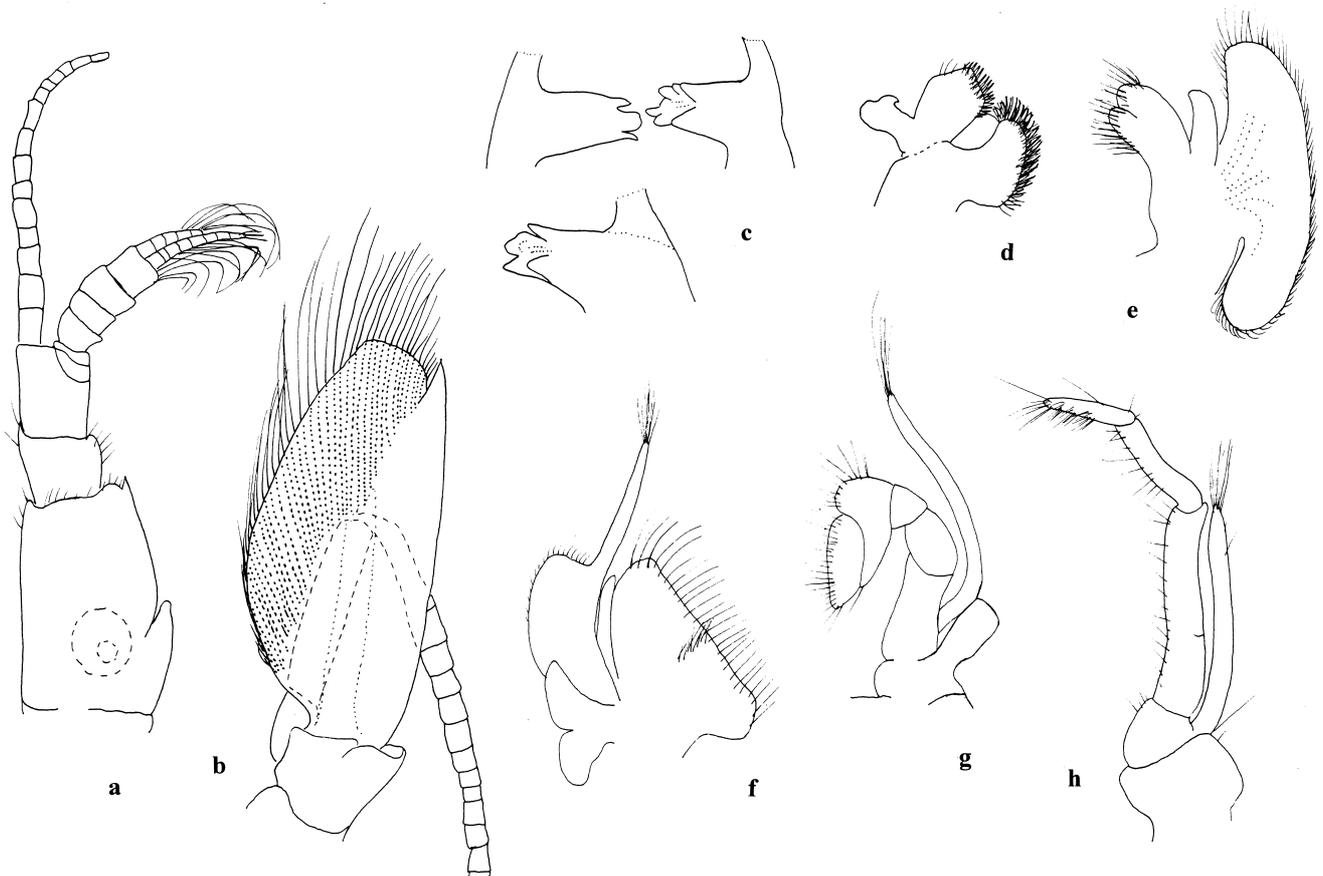


Fig. 22. *Paranchistus liui*, new species. a, antennule; b, antenna; c, mandible; d, maxillula; e, maxilla; f, 1st maxilliped; g, 2nd maxilliped; h, 3rd maxilliped.

distodorsal, the other placed just below middle of blunt apex, distoventral angle rounded. Carapace smooth; lower orbital angle produced anteriorly, rounded; antennal spine small, placed some distance below orbit, marginal, not beyond the lower orbital angle; hepatic spine small, movable and placed slightly lower than antennal spine; anterolateral angle of carapace rounded.

Abdomen smooth; pleura of anterior five somites broadly rounded, sixth somite slightly longer than fifth, with acute posterolateral and round posteroventral angles.

Telson about 1.5 times as long as sixth abdominal somite, lateral margins almost straight, with 2 similar pairs of small submarginal dorsal spines on posterior 0.4 length of the telson, posterior pair slightly nearer to anterior pair than to posterior margin of telson; posterior margin bearing 3 pairs of spines, outer pair extremely short, as in dorsal spines, about 0.25 of length of intermediate pair, intermediate pair long and robust, 0.16 times as long as the length of telson, submedian pair slender, about 0.75 as long as intermediate pair.

Eyes well developed, cornea hemispherical, shorter and narrower than eyestalk, eyestalk slightly longer than broad, ocellus distinct.

Antennule with first segment broad, outer margin slightly convex, anterolateral spine over-reaching adjacent convex

anterior margin of segment; stylocerite not reaching middle of segment, apex somewhat rounded, not acute. Second segment shorter and broader than third. Two rami of upper antennular flagellum fused proximally for 4 segments, free part of shorter ramus consisting of 5 segments, slightly shorter than half of fused portion.

Antenna with scaphocerite distinctly over-reaching antennular peduncle; outer margin slightly convex, distolateral tooth not reaching end of lamella; lamella broad.

Mandible with apex of incisor process broken off and missing; apical surfaces of molar process right and left oblique - right process oblique anteriorly, with 4-5 blunt teeth, left process oblique posteriorly, with 5-6 teeth—so that they oppose with each other. Maxillula with upper lacinia somewhat pentagonal, lower lacinia oval; palp with apex concave. Maxilla with distally rounded non-setose palp, shorter than endite; endite bilobed, with numerous setae distally; scaphocerite moderately broad. First maxilliped normal. Second maxilliped with distal margin of terminal segment straight. Third maxilliped with the terminal segment 0.75 length of penultimate, exopod just reaching to distal end of antepenultimate segment; latter segment with ischiomerus and basis indistinctly separated.

First pereiopod with chela subcylindrical; fingers approximately equal to palm in length, cutting edges entire,

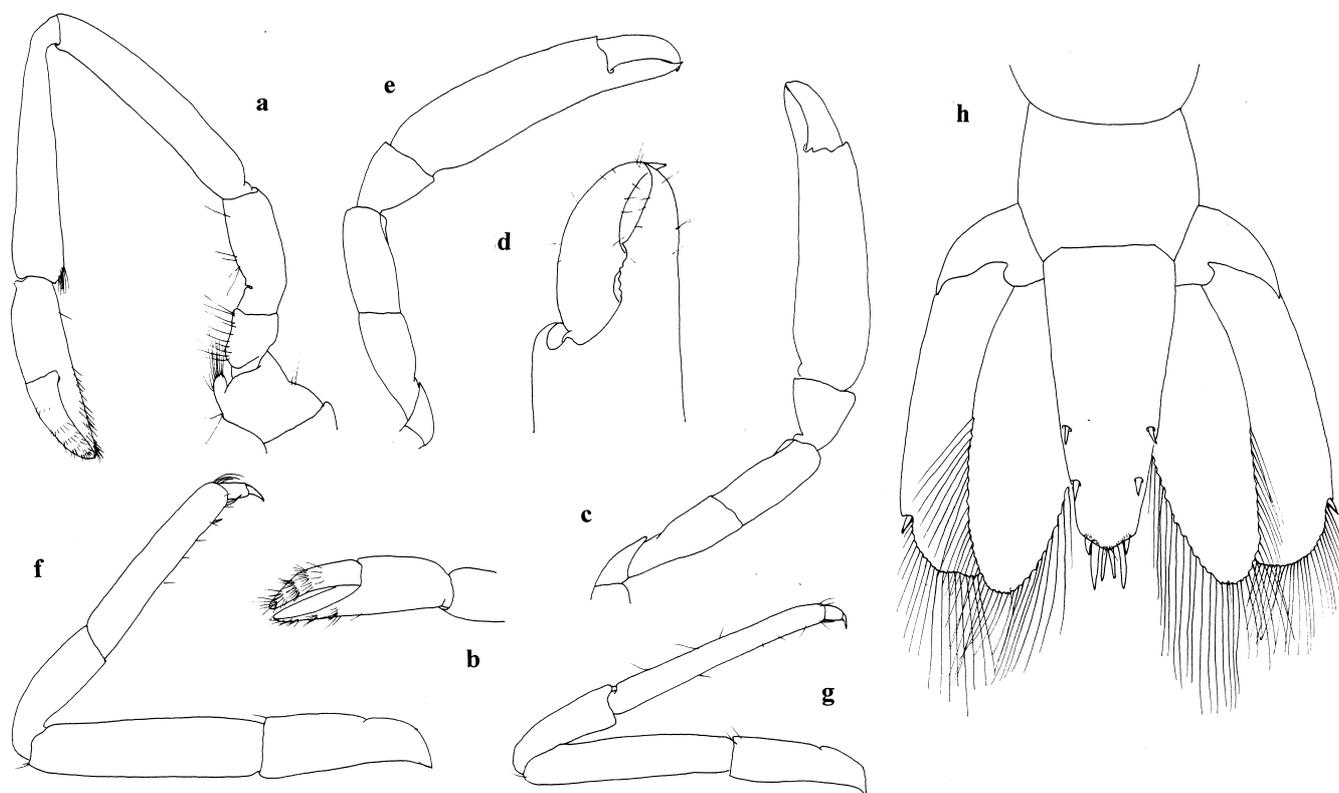


Fig. 23. *Paranchistus liui*, new species. a, 1st pereiopod; b, same, chela; c, major (left) 2nd pereiopod; d, same, fingers; e, minor (right) 2nd pereiopod; f, 3rd pereiopod; g, 5th pereiopod; h, telson and uropods, dorsal view.

not pectinate, with several transverse rows of setae on outer surface; carpus about 1.5 times as long as chela, broadening anteriorly, with tuft of setae distoventrally; merus as long as carpus; ischium more than half of merus length; basis about half as long as ischium, with row of long setae along the flexor margin; coxa with oval lobe bearing long setae apically. Second pereopods robust and equal in size, over-reaching scaphocerite with about half of chela; fingers short, about 0.33 as long as palm, tips crossing, movable finger with one strong tooth on cutting edge, fixed finger bearing 6 small teeth on cutting edge, distal tooth larger than other teeth; carpus shorter than fingers, anterior margin entire; merus 0.33 as long as chela; ischium equal to merus length. Third pereopods short and robust; dactyl compressed, unguis not flattened, with sparse fine tubercles on extensor surface, corpus with distal margin slightly deeper than base of unguis; propodus 5 times as long as dactyl, with 1 distal and 1 subdistal spine on flexor margin; carpus 0.67 as long as propodus; merus broader and longer than propodus; ischium stout, slightly shorter than propodus. Fifth pereopods slender and shorter than third; propodus longer than merus, with distoventral spine.

Uropods with protopodite posterolaterally acute, endopod over-reaching tips of posterior marginal telson spines, exopod with outer margin indistinctly convex, bearing lateral movable spine, lacking lateral fixed spine.

**Measurements (in mm).** – Holotype: CL, 3.3; carapace and rostrum, 4.1; total body length including rostrum, 10; second pereopod: dactyl, 0.75; chela, 3; carpus, 0.6; merus, 1; ischium, 0.85.

**Coloration and host.** – No data.

**Etymology.** - The specific name is given in honor of Prof. J. Y. Liu, carcinologist of the Institute of Oceanology, Chinese Academy of Sciences, Qingdao.

**Remarks.** – The species is most closely related to *P. ornatus* Holthuis, 1952a. Its small size, configuration of the rostrum, entire cutting edge of the chela of the first pereopods, simple dactyl with the distal margin of corpus slightly deeper than base of unguis in the third pereopods, distinguish *P. liui* from *P. ornatus* and other species in the genus.

***Paranchistus spondylis* Suzuki, 1971**  
(Fig. 24)

*Paranchistus spondylis* Suzuki, 1971: 15, Figs. 8, 9; Müller, 1993: 52; Li, 2000: 113, Fig. 124; Bruce, 2003: 223.

**Material examined.** – 2 juv., CN X295B-68, [20°N, 108°30'E], 64m, soft sandy mud, AT, within *Vulsella vulsella* (L.), coll. De, 18 Oct. 1962.

**Diagnosis.** – Rostrum straight, with margins subparallel, with 4 dorsal teeth and 1 subapical ventral tooth. Carapace with lower orbital angle not developed. First pereopods with cutting edges of fingers entire, not pectinate. Second

pereopods with dactyl slightly over-reaching fixed finger, if at all. Third to fifth pereopods with dactyl biunguiculate, not flattened on extensor margin, this margin covered with fine tubercles.

**Distribution.** – Previously only recorded from the type locality, Sagami Wan, Japan. Recorded here for the first time from South China Sea.

**Remarks.** – The construction of the tail-fan of the present specimens is different from Suzuki's (1971) description: in the present specimens, the telson is distinctly shorter than the uropods; the anterior pair of dorsal telson spines is clearly situated behind the middle of the telson length, the lateral posterior marginal telson spines are subdorsal, placed distinctly anterior to the intermediate and submedian pairs. The host of present specimens, *Vulsella vulsella* (L.), and depth of 64 m, are also different from the types, *Spondylus barbatus* and littoral. As the present specimens are juveniles, it is unlikely that they are another species, and their other characters agree well with Suzuki's (1971) description.

***Periclimenaeus* cf. *hecate* Nobili, 1904**

*Coralliocaris hecate* Nobili, 1904: 232; 1906: 58, pl. 3, fig. 2; Borradaile, 1917: 385.

*Periclimenaeus hecate* - Balss, 1921: 14; Bruce, 1974: 1574, Figs. 11, 12, 13E; 2002b: 581, Fig. 8; 2003: 224; Müller, 1993: 57; Li, 1996: 228, Fig. 6; 2000: 124, Fig. 143; Li & Liu, 2003: Fig. 7.

**Material examined.** – 1 ovigerous female, CL 2.0 mm, CN X295B-25B, Beibu Bay, [20°N, 108°30'E], 64m, soft sandy mud, AT, coll. De, 18 Oct. 1962.

**Distribution.** – Previously recorded from Djibouti, Kenya, Comoro Islands, Seychelle Islands, La Reunion, Maldive Islands, Indonesia, Nansha Islands, Western Australia and Queensland.

**Remarks.** – The single ovigerous female lacks both second pereopods, and the rostral formula is 3/0. However, its slightly up-curved rostrum and few dorsal rostral teeth (3), ratio of rostrum to carapace (0.43), chela to carpus of first pereopod (0.9), length to depth of palm of first pereopod (1.8), propodus of third pereopod to carapace (0.47), short and deep of dactyls of ambulatory pereopods, indicate it is consistent with *Periclimenaeus hecate* (Nobili, 1904). It also resembles *P. serrula* Bruce & Coombes, 1995. Its relative longer spines on the telson (0.1 of telson length in dorsolateral spines and 0.13 in intermediate posterior spines), may distinguish it from *P. serrula* (the ratios are 0.07 and 0.1 respectively).

***Periclimenaeus rastrifer* Bruce, 1980**  
(Fig. 25)

*Periclimenaeus rastrifer* Bruce, 1980: 27-33, Figs. 12, 13 A B; 1982a: 267, Fig. 21; 2003: 224; Müller, 1993: 61; Li, 2000: 133, Fig. 159.

**Material examined.** – 1 female, CN X6B-26, [19°45'N, 107°E], 42m, muddy sand, AT, coll. Z. Fan, ? Dec.1959; 2 males 1 female, CN K171B-79B, [20°15'N, 108°E], sand, 54m, AT, coll. F. Sun, 21 Jan.1959; 1 male CN X167B-13B, [19°30'N, 107°E], 47m, AT, coll. F. Sun, 15 Jan.1959; 1 male 6 females (3 ovig) 2 juv. (IOCAS), 1 ovig female (ZRC), CN X249B-51B, [19°30'N, 107°E], 52m, AT, 22 Aug.1962; 1 ovig female, CN K213B-112, [19°30'N, 107°E], muddy sand, 49.6m, AT, coll. Z. Fan, 7 Jul.1960; 2 females (ovig), CN K233B-91B, [19°N, 106°30'E], 42m, AT, coll. Z. Fan, 9 Jul.1960; 1 male 1 female (ovig), CN K224B-24, [19°N, 106°15'E], sand, 35m, AT, coll. Z. Fan, 9 Jul.1960.

**Diagnosis.** – Very small pontoniid shrimp. Rostrum with 5-6/0 teeth. Carapace without supraorbital tubercle or spine. Telson with 2 pairs of long dorsal spines, anterior pair placed close to anterior margin, posterior pair at about midway between anterior pair and posterior margin; lateral pair of posterior marginal spines small, intermediate and submedian pairs subequal in length to dorsal spines. Scaphocerite relatively elongate, with distolateral spine almost reaching distal margin of lamella. First pereopods with fingers

spatulate, distally denticulate, distinctly shorter than palm. Second pereopods with major pereopod with numerous small acute tubercles on merus and ischium, and minor pereopod with the tubercles only on middle portion of merus; fixed finger of major chela with large acute tooth proximally. Dactyls of ambulatory pereopods biunguiculate, corpus with well developed distal accessory tooth and series of acute 5-6 ventral denticles. Uropods with 1 movable lateral spine on exopod.

**Distribution.** – Previously recorded from New Caledonia (type location), Hong Kong, and Queensland.

**Remarks.** – *Periclimenaeus tchesunovi* Duris, 1990 is very similar to this species. Duris (1990: 619) remarked the differences between the two species as: 1). rostral lamina deeper, not tapering distally, rostral formula is 6/1 in *P. tchesunovi*; rostrum tapering distally, rostral formula is 7/0-1 in *P. rastrifer*; 2). Chelae of first pereopods longer, fingers occupying about 0.33 of their length in *P. tchesunovi*; fingers

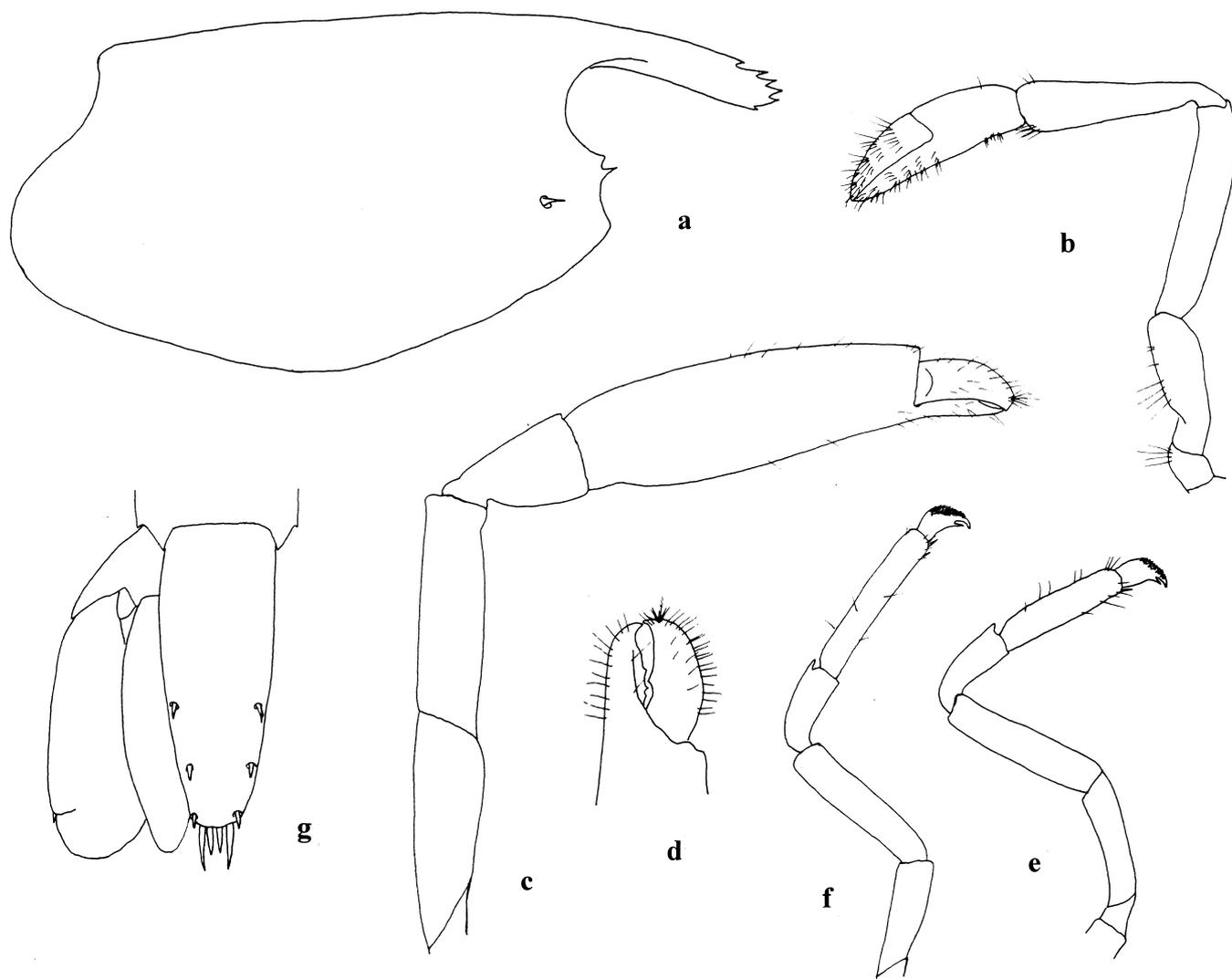


Fig. 24. *Paranchistus spondylis* Suzuki, 1971. a, carapace and rostrum, lateral view; b, 1st pereopod; c, 2nd pereopod; d, same, fingers; e, 3rd pereopod; f, 5th pereopod; g, telson and uropod, dorsal view.

longer than half length of chela in *P. rastrifer*; 3). Dactyl and palm of major second chela shorter and deeper, ratio of length to depth respectively 1.8:1 or 1.7:1 in *P. tchesunovi*; the ratios in *P. rastrifer* are 2.3:1 for both the segments. According to the illustrations of Duris (1990: Fig. 2A) and Bruce (1982a: Figs. 21A, B), it is difficult to decide in which species the rostral lamina is deeper; although the chela of the first pereiopod in *P. rastrifer* (Bruce, 1982a: Fig. 21C) looks deeper than that of *P. tchesunovi* (Duris, 1990: Fig. 2G), the ratio of the fingers to palm of both species is similar; ratios of length and depth in dactyl and palm of major second chela in both species are also similar according to the illustrations provided (Duris, 1990: Fig. 2I; Bruce, 1982a: Fig. 21D). In our material, the rostral formula is 5-6/0, average dorsal teeth of 16 available specimens is 5.6; the ratio of finger to chela of first pereiopod is 0.35-0.45, average in 14 available specimens is 0.40; the ratio of length to depth of dactyl of major second pereiopod is 1.60-1.96, the average in 11 available specimens is 1.81; that of palm of major second pereiopod is 1.87-2.23, the average in 11 available specimens

is 2.02. These characters of our material are intermediate between those of *P. rastrifer* and *P. tchesunovi*, the other characters are very similar in both species, except the apical teeth of fingers of first pereiopod, which is so fine that it is difficult to be used for distinguishing the two forms. It is not impossible that the two forms are synonymous.

***Periclimenaeus rhodope* (Nobili, 1904)**

(Fig. 26)

*Coralliocaris* (*Oncocaris*) *rhodope* Nobili, 1904: 232; 1906: 61, pl. 2, fig. 8; Borradaile, 1917: 385.

*Oncocaris rhodope* – Kemp, 1922: 278.

*Periclimenaeus rhodope* – Bruce, 1974: 1558, Figs. 1-2, 3a-b, 7a-b; 2003: 225; Müller, 1993: 61; Li, 1997: 235, Fig. 9; 2000: 133, Fig. 160.

**Material examined.** – 1 ovig female, 1 juv., CN 80X-110B, Jinyin Island, Xisha Islands, associated with *Siphonochalina* sp., coll. Carcinology Group, 16 May.1980.

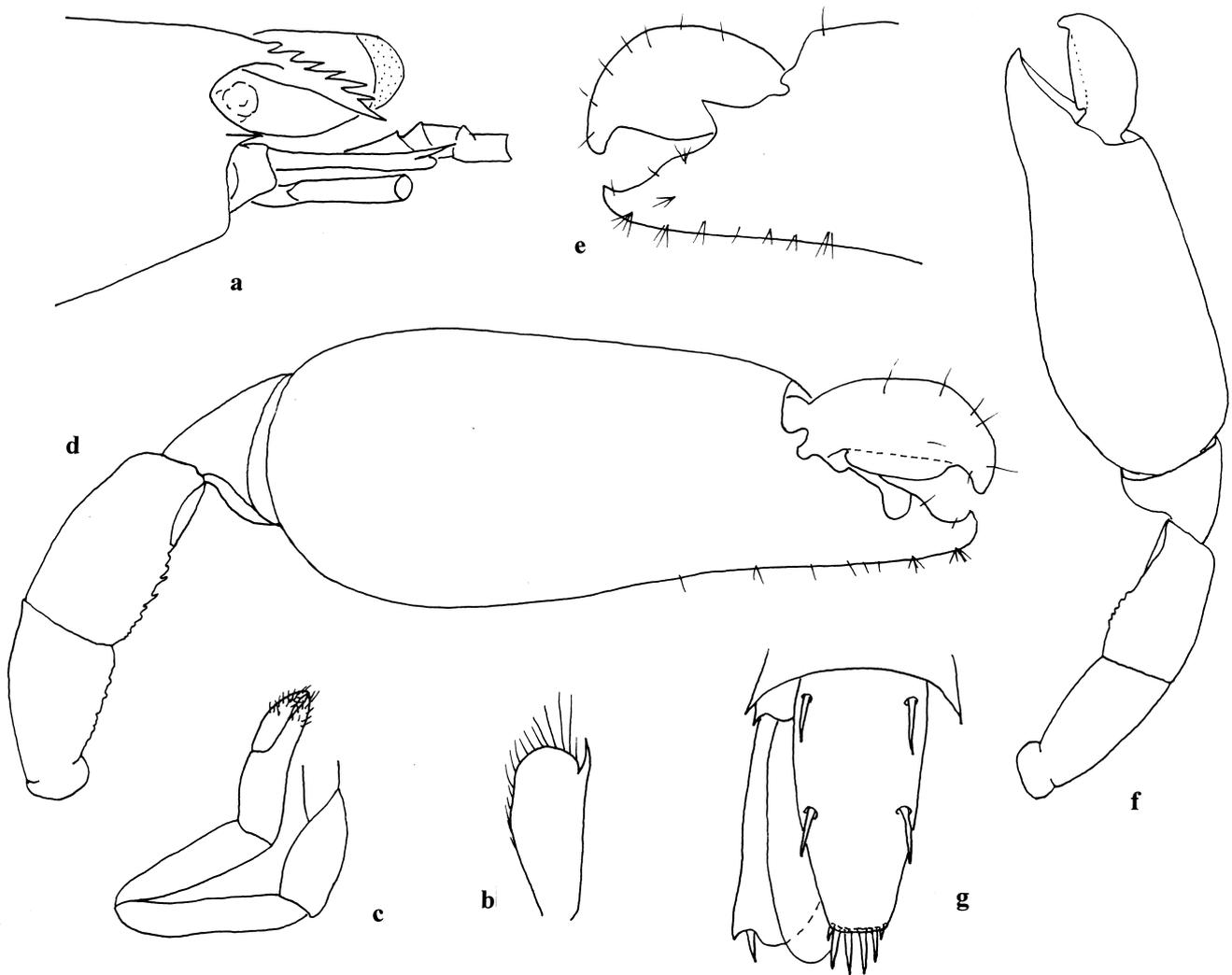


Fig. 25. *Periclimenaeus rastrifer* Bruce, 1980. a, carapace and anterior appendages, lateral view; b, scaphocerite; c, 1st pereiopod; d, major 2nd pereiopod, outer view; e, same, fingers, inner view; f, minor 2nd pereiopod, outer view; g, telson and uropod, dorsal view.

**Distribution.** – Previously recorded from type locality Djibouti, Zanzibar, Tanganyika, Kenya, Somalia, Queensland and Xisha Islands, South China Sea. Associated with sponges.

**Remarks.** – This species is closely related to *Periclimenaeus holthuisi* Bruce, 1969b. As indicated by Bruce (1974), *Periclimenaeus rhodope* can be distinguished from the latter by the distolateral spine of the scaphocerite greatly overreaching the lamina, which almost fails to reach the end of the lamina in *P. holthuisi*. The palm and carpus of the second pereiopods are finely tuberculate and the merus of third pereiopod is ventrally tuberculate in *P. rhodope*, an unusual features in this genus. The denticles on the dactyl and unguis of the third pereiopod are very acute (Fig. 22), but are finely crenulate in *P. holthuisi* (Holthuis 1952: Fig. 55i).

***Periclimenella spinifera* (De Man, 1902)**

*Periclimenes petitthouarsii* var. *spinifera* De Man, 1902: 824.  
*Periclimenes (Falciger) spiniferus* Borradaile, 1917: 324, 366, 369, pl. 52: fig.1.  
*Periclimenes spiniferus* - Patton, 1966: 271; Bruce, 1976: 95, Figs. 5, 6; Chace & Bruce, 1993: 122; Müller, 1993: 110; Li, 1996: 230; 1997: 240; Li & Liu, 1996: 497.

*Periclimenella spinifera* - Duris & Bruce, 1995: 656, Figs. 19, 20; Li, 1998: 223, Figs. 26-29; 2000: 144, Fig. 178; 2001: 80; Bruce, 2003: 226; Li & Liu, 2003; 163, Fig. 8.

**Material examined.** – 1 male, Luhuitou, Sanya, Hainan Is., coll. J. Y. Liu, 21 Nov.1990; 1 ovig female, CN 92C-1449, Xincun Harbour, Hainan Is., 1-3m, with living corals, coll. X. Li & V. Neumann, 26 Mar.1992; 6 males, 1 female, 9 ovig females (IOCAS), 1 male, 1 ovig female (ZRC), 1 male, 1 ovig female (SI), CN 92C-187B, Xincun Harbour, Hainan Is., 1-3m, with living corals, coll. X. Li & V. Neumann, 27 Mar.1992; 1 male, CN 92C-1412C, Lanmai, Lingao, Hainan Is., coll. X. Li, 9 Apr.1992.

**Distribution.** – Common and widely distributed in the Indo-West Pacific region, except for Red Sea and NW Indian Ocean. Free living, preferring coral reefs.

**Remarks.** – Duris & Bruce (1995) separated *Palaemon petitthouarsii* Audouin, 1826 and *Periclimenes petitthouarsii* var. *spinifera* De Man, 1902 from genus *Periclimenes*, and assigned them to a new genus *Periclimenella*, on the basis of their characteristic first and second pereiopods. The presence of a sound-producing mechanism in the chela of the second pereiopods was used to distinguish *Periclimenaeus* from *Exoclimenella* and the rest of the pontoniine genera (see Bruce, 1988). We follow Duris & Bruce (1995) here.

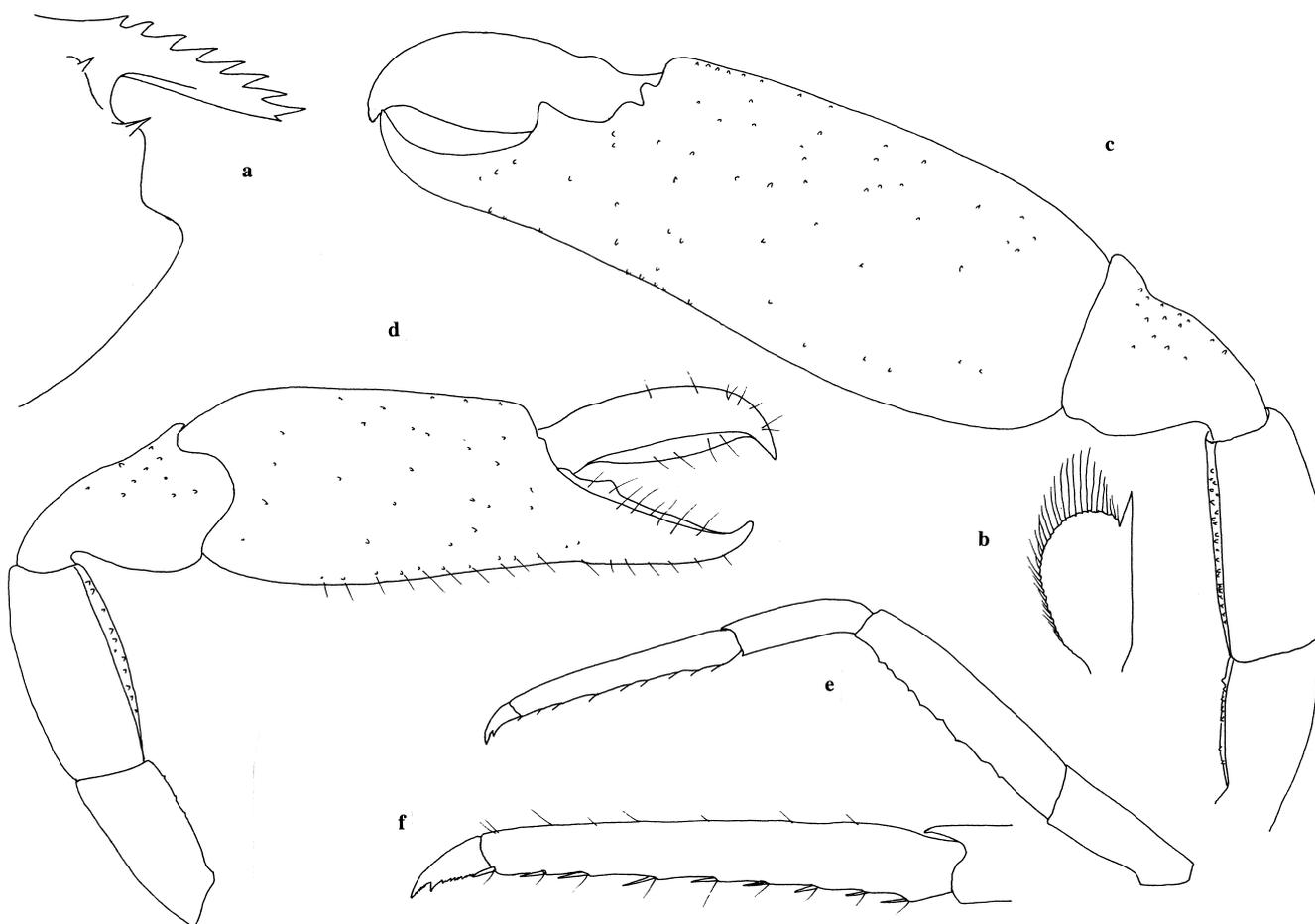


Fig. 26. *Periclimenaeus rhodope* (Nobili, 1904). a, anterior carapace and rostrum, lateral view; b, scaphocerite; c, major 2nd pereiopod; d, minor 2nd pereiopod; e, 3rd pereiopod; f, same, dactyl and propodus.

***Periclimenes chacei*, new species**

(Figs. 27, 28)

**Material examined.** – Holotype - 1 ovig female, CN 92C-182D3, Xincun, Hainan Is., 1-3m, with living corals, coll. X. Li and V. Neumann, 27 Mar.1992.

**Diagnosis.** – Small sized pontoniine shrimp. Rostrum short, deep, dorsal margin convex, with 0 + 6/0 teeth. Carapace without supraorbital spine. Scaphocerite broad, distal margin of lamella distinctly produced, much over-reaching distolateral tooth. Fourth thoracic sternite without median process. Second pereiopods without distoventral tooth on merus; carpus 0.6 times as long as palm, unarmed distally; chela with fingers 0.33 as long as palm. Ambulatory pereiopods with dactyl simple; propodus with spines on flexor margin; fifth pereiopods not reaching as far as end of scaphocerite.

**Description.** – Small sized shrimp. Integument smooth.

Rostrum deep and compressed laterally, over-reaching second segment of antennular peduncle, broadened laterally in proximal part; dorsal margin distinctly convex, with 6 teeth and few setae between teeth, the teeth vary gradually smaller

towards the apex, posteriormost tooth at level of orbital margin; tip rounded; ventral margin very slightly convex, with few setae on the proximal part, without tooth. Carapace without supraorbital spine, lower orbital angle slightly produced anteriorly; antennal spine marginal, placed some distance below orbit; hepatic spine larger than antennal spine, placed distinctly lower to latter.

Thoracic sternites without process, fourth and fifth with distinct transverse ridges, the ridge on sixth thoracic sternite indistinct.

Abdomen smooth; pleura of anterior five somites broadly rounded, sixth somite 1.9 times longer than fifth, with both of posterolateral and posteroventral angles rounded.

Telson elongate, subequal to sixth abdominal somite in length, 3.5 times as long as proximal width, lateral margins somewhat straight; dorsal surface with 2 pairs of spines on posterior half, posterior pair slightly nearer to anterior than to posterior margin of telson; posterior margin bearing 3 pairs of spines, lateral pair extremely short, like dorsal spines, intermediate pair long and robust, submedian pair slender, about 0.6 as long as intermediate pair.

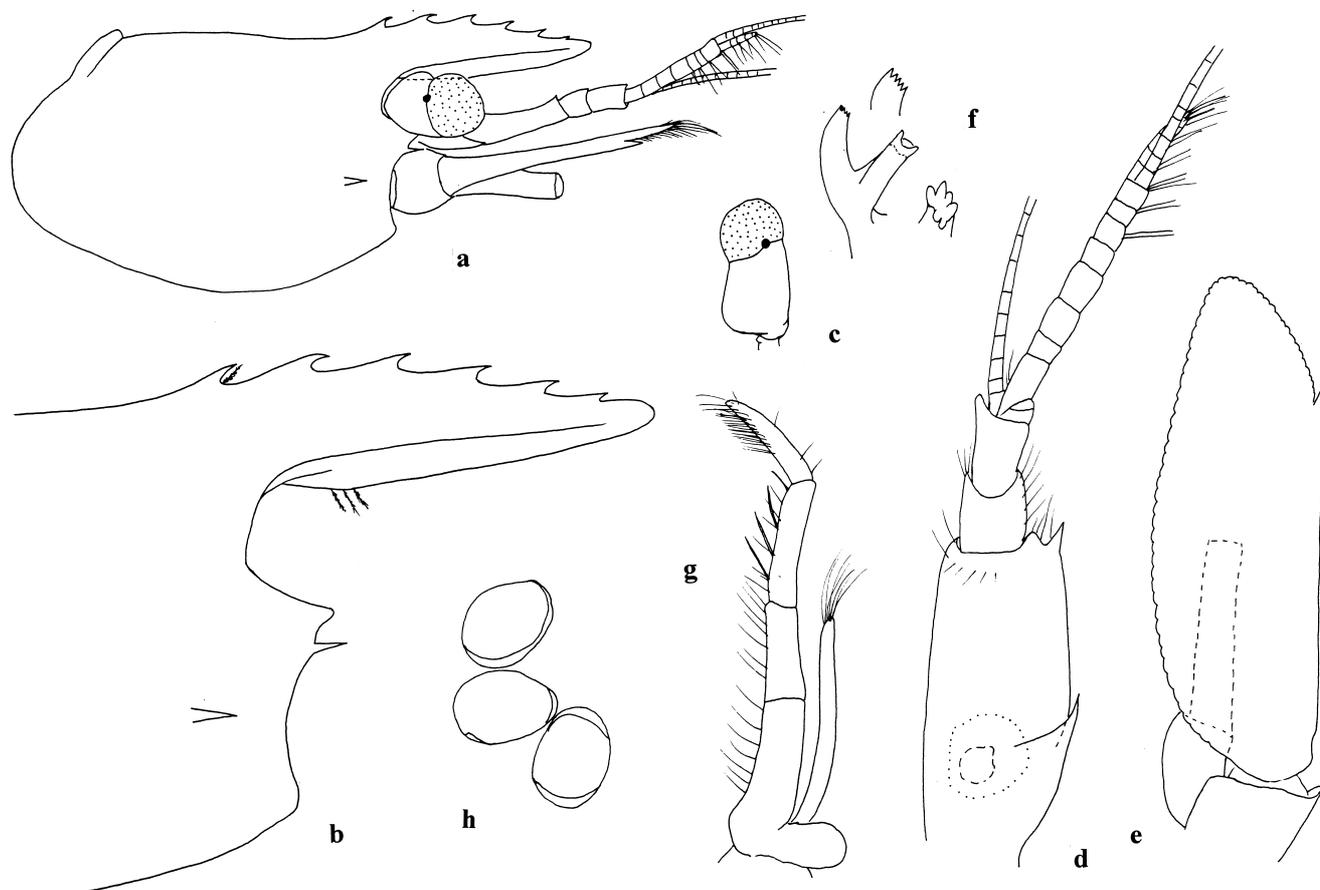


Fig. 27. *Periclimenes chacei*, new species. a, carapace and anterior appendages, lateral view; b, anterior region and rostrum; c, eye; d, antennule; e, antenna; f, mandible; g, 3rd maxilliped; h, eggs.

Eyes well developed, cornea globular, shorter than stalk, ocellus distinct.

Antennule with first segment broad, outer margin slightly convex, anterolateral spine over-reaching adjacent convex anterior margin of segment, without a small tooth at half length ventromedially; stylocerite not reaching middle of segment; second segment shorter and broader than third, length of second and third segments about half as long as first; both rami of upper antennular flagellum fused proximally for 8 segments, free part of shorter ramus consisting of 5 segments and shorter than half of fused portion. Antenna with basicerite laterally armed with a triangular tooth; scaphocerite distinctly over-reaching antennular peduncle; outer margin straight, distolateral tooth not reaching end of lamella; lamella broad, 3 times as long as wide, with anterior margin strongly produced.

Mandible slender, incisor process with 5 small acute teeth. Second maxilliped without podobranch. Third maxilliped with last segment 0.8 as long as penultimate segment, exopod just reaching to, but not beyond the end of antepenultimate segment; ischiomerus and basis distinct.

First pereiopod slender, fingers shorter than palm, cutting edges entire; carpus about 1.25 times as long as chela; merus slightly shorter than carpus; ischium more than half of merus.

Second pereiopods slender and equal; fingers short, about 0.33 as long as palm, movable finger with 2 strong tooth in the proximal half on cutting edge, fixed finger bearing 1 tooth opposed to distal tooth of movable finger; carpus 0.6 as long as palm, with distal margin unarmed; merus shorter than palm but longer than carpus, without distal tooth on flexor margin; ischium subequal to merus in length. Third pereiopods slender; dactyl 0.33 as long as propodus, simple, with apical 0.4 curved and narrow; propodus with few spines on flexor margin. Fifth pereiopods not reaching end of scaphocerite.

Uropods over-reaching tips of posterior marginal telson spines, exopod bearing lateral movable spine, lateral fixed tooth indistinct.

Eggs relatively large, diameter 0.29-0.43 mm.

**Measurements** (in mm). – Holotype: CL, 2.3; carapace and rostrum, 4.0; second pereiopod: dactyl, 0.57; chela, 2.49; carpus, 1.30; merus, 1.68; ischium, 1.55.

**Coloration.** – No data.

**Etymology.** – The specific name is given in honor of the late Dr. Fenner A. Chace, Jr. (1908-2004), famous carcinologist of the National Museum of Natural History, Smithsonian Institution, Washington.

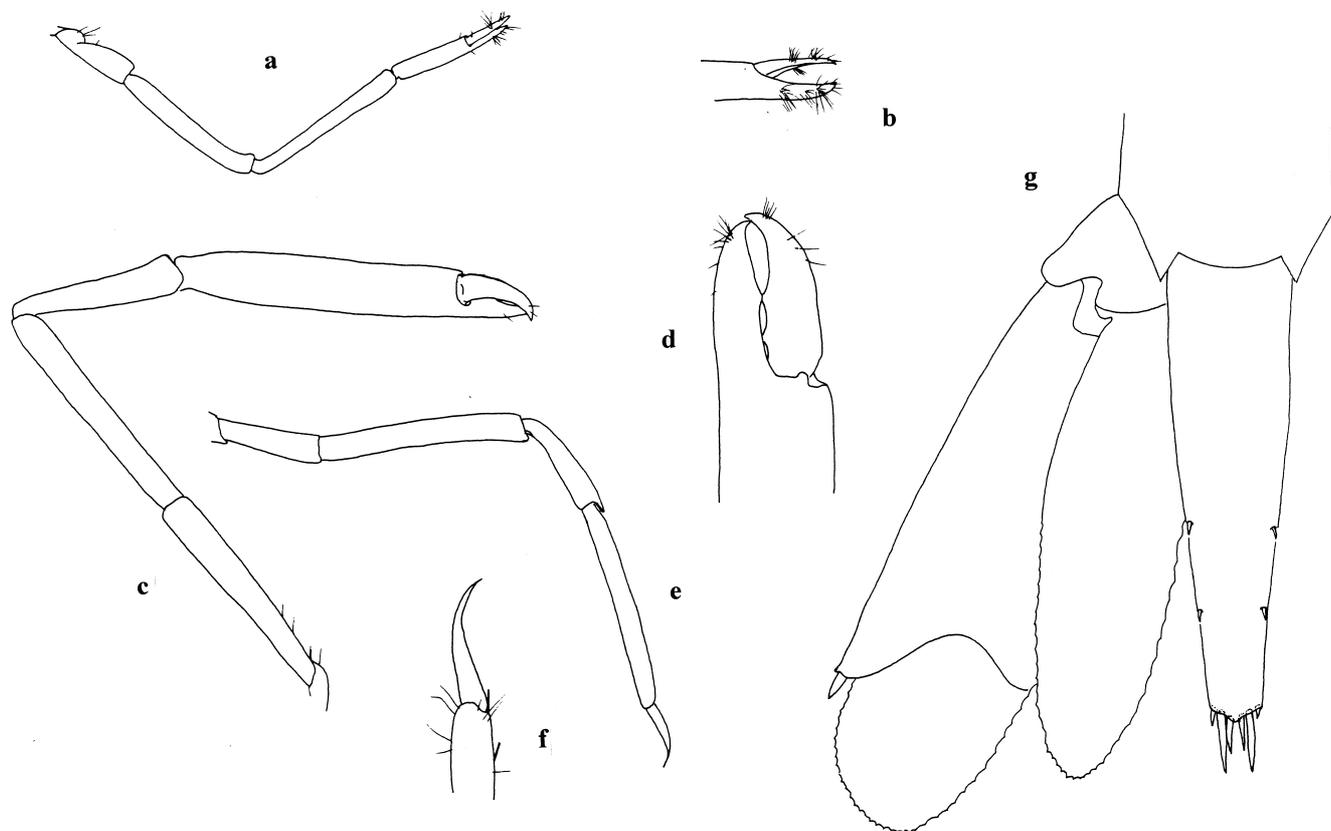


Fig. 28. *Periclimenes chacei*, new species. a, 1st pereiopod; b, same, fingers; c, 2nd pereiopod; d, same, fingers; e, 3rd pereiopod; f, same, dactyl; g, telson and uropod, dorsal view.

**Remarks.** – This very small *Periclimenes* species is closely allied to *Periclimenes ruber* Bruce, 1982b, which was collected from Queensland in association with crinoid host, and also with long and slender second pereiopods. The new species can be distinguished from *P. ruber* by its deeper rostrum, hepatic spine on carapace distinctly posteroventral to the antennal spine, equal second pereiopods (the major second pereiopod of *P. ruber* looks very large), and cutting edges second pereiopods fingers with 2 teeth on dactyl and 1 on fixed finger.

***Periclimenes hirsutus* Bruce, 1971a**  
(Fig. 29)

*Periclimenes hirsutus* Bruce, 1971a: 91, Figs. 1-6; 1976: 10; Müller, 1993: 86; Li, 2000: 189, Fig. 240.

**Material examined.** – 2 ovigerous females, CL 5.2, 5.5 mm, CN NB7B-14, [18°45'N, 110°30'E], 32m, sand, AT, coll. Shen, 8 Mar.1960; 1 male 2 females (ovig), CN X202B-55, [19°45'N, 107°30'E], sand, 46m, AT, coll. F. Sun, 15 Apr.1962; 1 female, CN N219B-175E, [18°15'N, 108°30'E], muddy sand and shell pieces, 54m, AT, coll. J. Y. Liu, 16 May.1960.

**Diagnosis.** – Rostrum over-reaching the antennular peduncle, with 10 small dorsal teeth, ventral unarmed. Carapace with antennal and hepatic spines, hepatic spine smaller than antennal and just behind latter, without supraorbital spine. Fourth thoracic sternite without median process. First pereiopods with fingers subspatulate, subequal to palm, carpus 1.5 times as long as chela. Second pereiopods robust, similar and equal, exceeding scaphocerite by chela; fingers slightly

more than 0.75 as long as palm, covered with row of short dense setae along the cutting edges, dactyl armed with 1, fixed finger with 2 blunt teeth on proximal 0.25 of cutting edges, carpus less than half as long as palm. Ambulatory pereiopods robust, covered with setae, propodi covered with more than 10 tufts of long setae along ventromedial and ventrolateral margins.

**Description.** – Middle-sized pontonine shrimps of subcylindrical and robust body form, covered with pubescence on the body surface, pereiopods and pleopods, propodus of ambulatory pereiopods also with many tufts of long setae. Rostrum well developed, compressed, directed anteroventrally, over-reaching the antennular peduncle but not reaching apical margin of scaphocerite, lateral carinae distinct, proximally extended laterally; dorsal margin with 10 small teeth, posteriormost tooth anterior to the level of orbital margin, at the level of inferior angle of orbit; ventral margin straight, unarmed. Carapace with orbit not developed, inferior orbital angle slightly produced and rounded; anterolateral angle rounded; antennal spine placed just below inferior orbital angle, hepatic spine smaller than antennal and just behind latter; supraorbital spine absent. Fourth thoracic sternite without median process. First pereiopods moderately slender, exceeding scaphocerite by chela; fingers broad, more or less subspatulate, subequal to palm, with the cutting edges entire, laterally with 4 rows of transverse setae; carpus 1.5 times as long as chela, with 2 long subdistal setae and 1 row of short setae; ischium subequal to chela, with long setae along flexor margin. Second pereiopods robust, similar and equal, exceeding scaphocerite by chela; fingers slightly more than

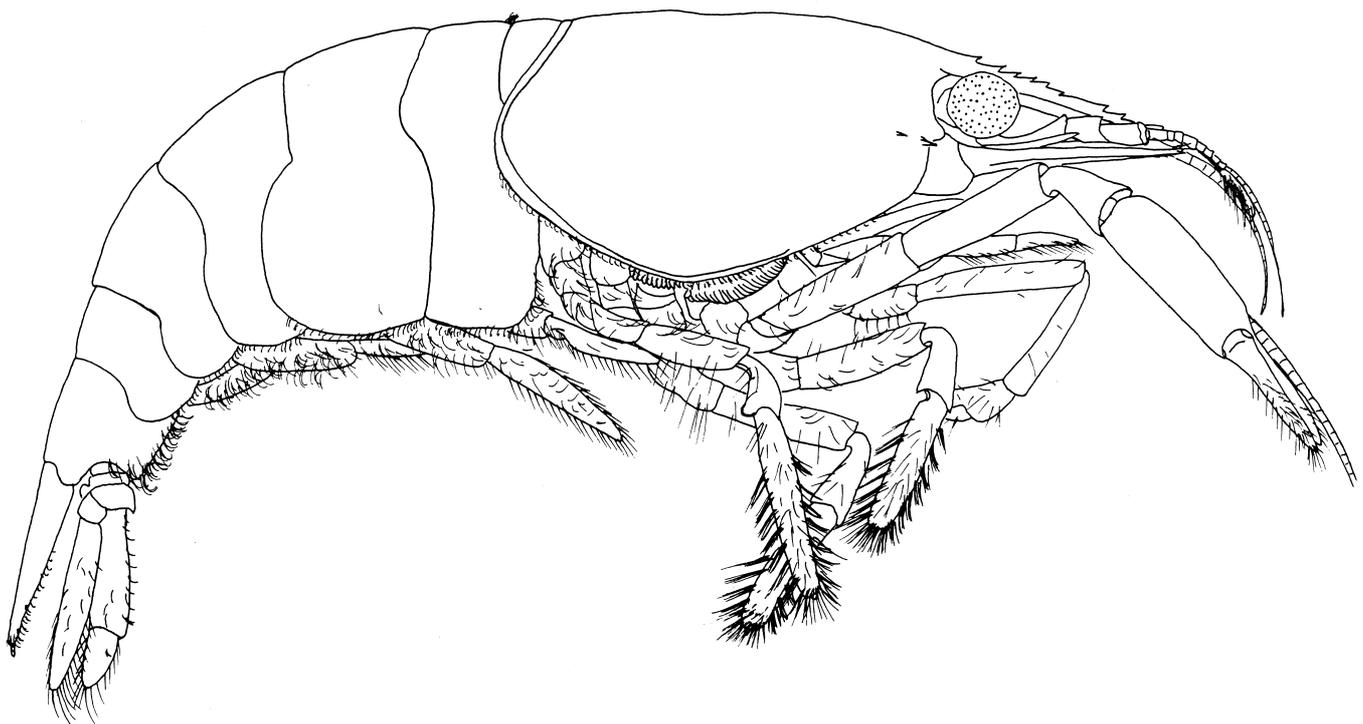


Fig. 29. *Periclimenes hirsutus* Bruce, 1971a, lateral view.

along the cutting edges, dactyl armed with 1, fixed finger with 2 blunt teeth on proximal 0.25 of cutting edges; tips of fingers hooked, outer surface with sparse setae; carpus less than 1.5 times as long as distal width, less than half as long as palm, with distal margin entire, merus distinctly shorter than palm, unarmed, ischium subequal to merus, unarmed. Ambulatory pereopods robust, third pereopods reaching distal margin of scaphocerite and fifth reaching distal margin of first antennular peduncle segment; covered with setae, longer and denser proximally; dactyls simple, narrow, slender and short, hooked, distal margin of corpus deeper than base of unguis; propodus covered with more than 10 tufts of long setae along ventromedial and ventrolateral margins; carpus broadened distally, 1.5 times as long as distal width, less than half as long as propodus; merus slightly longer than propodus.

**Distribution.** – Mtoni, Zanzibar, Fiji, Seychelles, Andaman Islands, New Caledonia. Recorded here for the first time from South China Sea.

**Remarks.** – The pubescence on the body of our specimens covered on the lower margins of carapace, abdominal pleura, telson, and sternites, the dorsal and lateral surface of the body are almost smooth, different from the types. This difference may have been due to abrasion during capture or subsequently.

#### *Periclimenes hongkongensis* Bruce, 1969a

*Periclimenes hongkongensis* Bruce, 1969a: 259; 1982a: 247, Figs. 8-10; 2003: 234; Müller, 1993: 87; Li, 2000: 191, Fig. 242.

**Material examined.** – 1 female, CN 54-394-5, Beibu Bay, off Hepu, Guangxi Province, coll. J. Y. Liu, 30 Dec.1954.

**Diagnosis.** – Rostrum not exceeding distal end of scaphocerite, with 1 + 12-17 small acute dorsal teeth, posteriormost tooth (epigastric spine) distinctly isolated from rest, posterior to level of hepatic spine, posterior 6-8 teeth appear to be articulated with carapace; ventral margin with 2-4 teeth. Carapace without supraorbital or postorbital spine, hepatic spine more robust than antennal spine, arising at much lower level than latter; inferior orbital angle acute produced. Scaphocerite with lateral margin straight, distolateral tooth not reaching to distal margin of lamella. Fourth thoracic sternite without median process. Second pereopods slender, markedly unequal, without distoventral tooth on merus, major second pereopod with carpus short and stout, about 0.45 of palm length, unarmed distally, fingers about 0.45 of the palm length; minor second pereopod with fingers subequal to palm length, carpus longer than palm length, about 1.25-1.3 times palm length, merus about 1.5 times palm length. Ambulatory pereopods with dactyl biunguiculate.

**Distribution.** – Previously reported only from Hong Kong.

**Remarks.** – The female specimen agrees closely with the original descriptions and illustrations of Bruce (1982a), except for the reduced rostral dentition, 1+12/2, the major second pereopod is missing and the distal part of telson is damaged.

The rostral dentition for this species is adjusted here from 1+ 13-17/3-4 to 1+ 12-17/2-4.

#### *Periclimenes magnificus* Bruce, 1979b

(Fig. 30)

*Periclimenes magnificus* Bruce, 1979b: 195, Figs. 1-5, pl. 1: figs. A-C; 2003: 238; Fransen, 1989: 143, Figs. 4b, c, 5e-g, 6i-m, 7i-p; Müller, 1993: 97; Debelius, 1999: 180, photos; Li, 2000: 212, Fig. 274.

**Material examined.** – 2 ovig females, CN R183B-44, [20°N, 107°30'E], 33.5 m, sand, AT, coll. Sun, 13 Apr.1960.

**Diagnosis.** – Rostrum not exceeding scaphocerite, with 1 + 7-8 dorsal teeth, posteriormost tooth isolated from rest and slightly posterior to level of hepatic spine, ventral margin with 1-3 small subapical teeth. Carapace without supraorbital spine, hepatic spine distinctly larger than antennal spine, orbital angle produced anteriorly in acute subovate lobe. Fourth thoracic sternite without median process. Abdomen with low, compressed median prominence on 3rd somite. Scaphocerite with lateral margin convex, distolateral tooth not exceeding distal margin of lamella. Second pereopods robust; without distoventral tooth on merus; carpus stout, about 0.75 as long as palm, unarmed distally; fingers with strongly hooked tips. Ambulatory pereopods with dactyl biunguiculate; propodus with few spinules in apical 0.25 to 0.33 of flexor margin.

**Distribution.** – Previously reported from Japan, Philippines, Indonesia, Thailand, Northern Territory, Queensland, Great Barrier Reef, Australia, Papua New Guinea, and New Caledonia. Associated with scleractinian corals and sea anemones.

#### *Periclimenes psamathe* (De Man, 1902)

(Fig. 31)

*Urocaris psamathe* De Man, 1902: 816, pl. 25: fig. 51; Borradaile, 1917: 354.

*Periclimenes (Ancylocaris) psamathe* - Kemp, 1922: 173.

*Periclimenes (Harpilius) psamathe* - Holthuis, 1952a: 61, Fig. 23; Monod, 1976: 14, Figs. 1-28.

*Periclimenes psamathe* - Bruce, 1966: 21, figs 1c, 2c, d; 1970a: 541-543, Fig. 3; 1979a: 227; 2003: 241; Bruce & Svoboda, 1984: 94; Müller, 1993: 105; Li, 2000: 229, Fig. 304; De Grave, 2000: 139.

**Material examined.** – 1 male, 9 females, 6 ovig females, CN 10B-5, [18°45'N, 108°30'E], 23m, muddy sand, BT, coll. Zhengang Fan, 26 Jan.1959; 1 ovig female, CN N219B-175C, [18°15'N, 108°30'E], 54m, muddy sand and shell pieces, AT, coll. J. Y. Liu, 16 May.1960.

**Diagnosis.** – Rostrum particularly long and slender, with 2 + 2 + 1 dorsal teeth, excluding the epigastric tooth on carapace, two proximal teeth and epigastric tooth large, ventrally denticulate, distal teeth small, simple, ventral margin unarmed. Carapace without supraorbital spine, antennal and hepatic spines present; inferior orbital angle produced, without

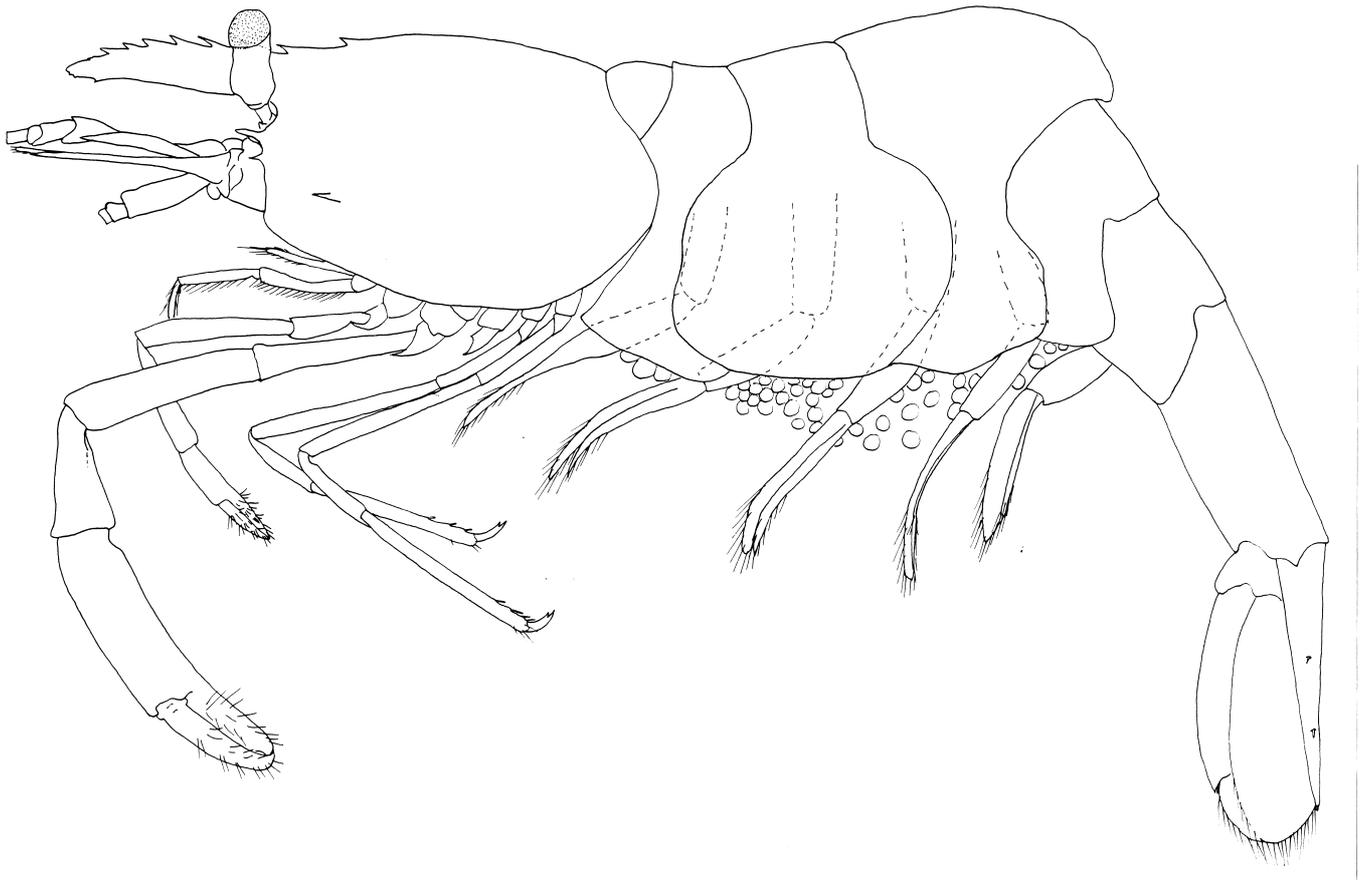


Fig. 30. *Periclimenes magnificus* Bruce, 1979b. Body, lateral view.

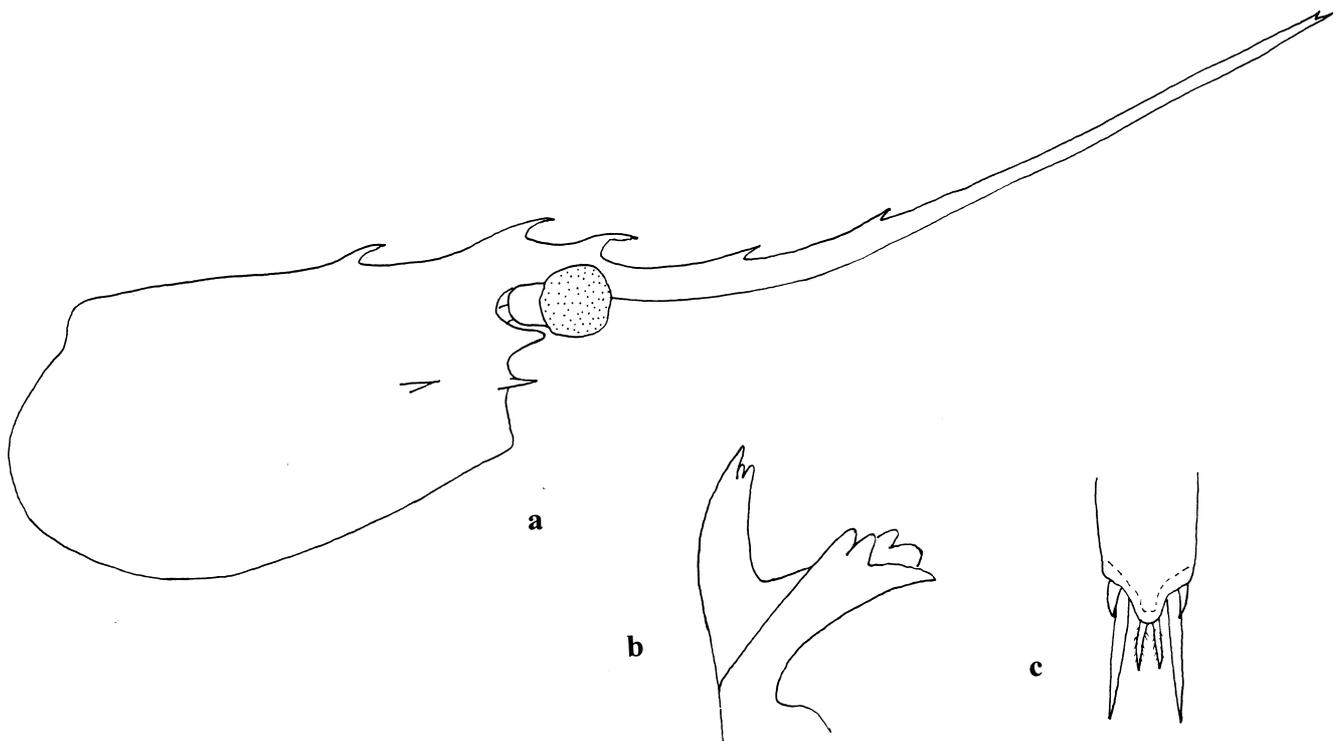


Fig. 31. *Periclimenes psamathe* (De Man, 1902). a, carapace and rostrum, lateral view; b, mandible; c, tip of telson, dorsal view.

reflected inner flange. Abdomen with pleura posteroventrally rounded; telson with two pairs of dorsal spines, three pairs of posterior marginal spines. Mandible without palp. Fourth thoracic sternite without medial process. Third maxilliped with slender endopod, ischiomerus and basis completely fused, exopod well developed with terminal plumose setae. First pereopod slender, with fingers distinctly shorter than palm, chela much shorter than carpus. Second pereopod very slender, markedly unequal, dissimilar, major pereopod highly elongate, chela and carpus tuberculate, fingers less than 0.33 as long as palm, with cutting edges dentate, chela about 0.33 to 0.4 as long as carpus; minor second pereopod small, chela and carpus smooth, fingers unarmed. Third pereopod slender, with propodus at least 5 times as long as dactyl.

**Distribution.** – Eastern Africa to South China Sea, Japan, Philippines, Great Barrier Reef of Australia, New Caledonia, and Marshall Islands. Associated with gorgonians.

**Remarks.** – This is a peculiar species in *Periclimenes* with very long and slender rostrum, of which the dorsal teeth and epigastric tooth are very similar to that of *Urocaridella* spp. in subfamily Palaemoninae. Its systematic position needs further study.

***Periclimenes sinensis* Bruce, 1969a**

(Fig. 32)

*Periclimenes sinensis* Bruce, 1969a: 270; 1982a: 255, Figs. 13, 14; 2003: 242; Müller, 1993: 109; Li, 2000: 236, Fig. 315.

*Periclimenes (Periclimenes) setoensis* Fujino & Miyake, 1969: 149, Figs. 4, 5.

**Material examined.** – 1 male, CN Q67B-19, [19°30'N, 108°E], 53.5m, sandy stone, BT, coll. Fengshan Xu, 18 Apr.1959; 1 female, CN K246B-35, Beibu Bay, [18°N, 107°30'E], 19m, muddy sand, AT, coll. Shoupeng Shen, 14 Jul.1960; 1 ovig female, CN X243B-77B, Beibu Bay, [19°50'N, 107°30'E], 48m, with *Umbellulifera* sp., AT, coll. Zhican Tang, 21 Aug.1962; 1 male, 1 ovig female, CN R183-42, Beibu Bay, [20°00'N, 107°30'E], 33.5m, crushed shells sand, AT, coll. Fuzeng Sun, 13 Apr.1960; 1 male, CN R45A-3, [18°15'N, 108°45'E], 39m, sandy mud, AT, coll. Zhengang Fan, 16 Jul.1959.

**Diagnosis.** – Rostrum not exceeding distal end of scaphocerite, with 1 + 8-10/2 teeth, posteriormost dorsal tooth not isolated from rest and anterior to level of hepatic spine. Carapace without supraorbital or postorbital spine, hepatic spine not distinctly larger than antennal spine, arising posteroventral to latter, orbital angle bluntly triangular, not ovate. Scaphocerite with lateral margin straight, distolateral tooth not reaching as far as distal margin of lamella. Fourth thoracic sternite without median process. Second pereopods subequal and similar, without distoventral tooth on merus, carpus about 0.75 as long as palm, unarmed distally; fingers about as long as palm. Ambulatory pereopods with dactyl biunguiculate; propodus with spinules on flexor margin.

**Distribution.** – Previously reported from Hong Kong, Japan, Philippines and Australia.

**Remarks.** – The samples agree mostly with the original descriptions and illustrations of Bruce (1982), with some differences from the type material of the species. In particular, the posterior rostral teeth do not appear to be articulated, at most with an obscure suture at the base of the most posterior

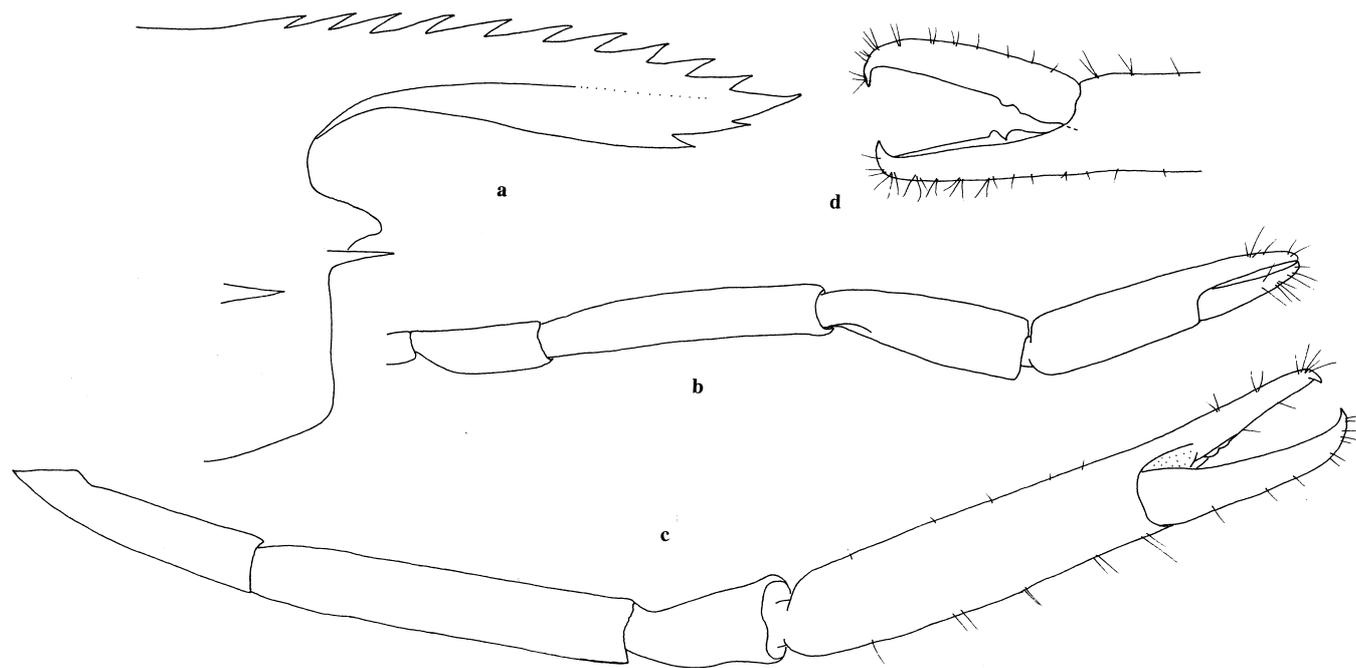


Fig. 32. *Periclimenes sinensis* Bruce, 1969. a, anterior region of carapace and rostrum, lateral view; b, right 1st pereopod; c, right 2nd pereopod; d, same, fingers.

1 or 2 teeth; the carpus of first pereiopod is distinctly shorter than the chela and relatively robust, and the fingers of second pereiopods are distinctly shorter than the palm, rather than subequal, the cutting edges with 2 blunt teeth on 0.4 of the proximal length in the fixed and 0.3 of proximal length in the dactyl. However, in all other features they fit those of *P. sinensis* very well. The differences may well fall within the range of variation of this species, which is as yet not known.

***Periclimenes tosaensis* Kubo, 1951**  
(Fig. 33)

*Periclimenes (Ancylocaris) tosaensis* Kubo, 1951: 268, Figs. 7, 8.  
*Periclimenes (Harpilius) tosaensis* - Bruce, 1966: 15, Figs. 1, 2, 3a, 4a, b.  
*Periclimenes tosaensis* - Bruce, 1981: 196, Fig. 5; 2003: 243; Chace & Bruce, 1993: 124; Müller, 1993: 113; Debelius, 1999: 177, photo; Li, 2000: 243, Fig. 323.

**Material examined.** – 1 male, 1 ovig female, CN S55B-28, [22°N, 116°E], 89m, mud, AT, coll. W. Zhang, 5 Apr.1959; 2 females, CN SIII7B-34, [21°N, 114°E], 80m, sandy mud, AT, coll. W. Zhang, 10 Jul.1959; 1 female, CN N67B-39, [19°30'N, 111°E], 38m, sand, AT, coll. Z. Tang, 13 Jul.1959; 1 male, CN N93B-56, [19°N, 111°E], 90m, muddy sand, AT, 28 Oct.1959; 1 female, CN S176B-14, [23°15'N, 117°30'E], 42m, sand, AT, coll. Wu, 4 Jan.1960; 1 female, CN N122B-28, [19°30'N, 111°15'E], 97m, sandy mud, AT, coll. J. Y. Liu, 10 Feb.1960; 1 male, CN N148B-69, [18°N, 109°30'E], 74m,

sandy mud, BT, coll. J. Y. Liu, 11 Mar.1960; 1 male, CN S206B-20, [21°15'N, 114°E], 68.5m, mud, AT, coll. Qu, 8 Apr.1960; 3 ovig females, 1 female (SI), CN S218B-36, [21°N, 115°E], 107m, muddy sand, AT, coll. Qu, 13 Apr.1960; 2 females, CN S227B-31, [22°N, 116°E], 84m, mud, AT, 22 Apr.1960; 1 ovig female, CN N207B-34A, [17°45'N, 109°30'E], 97m, sandy mud, BT, coll. J. Y. Liu, 14 May.1960; 1 male, CN X171B-9B, [20°15'N, 108°E], sand, 54m, AT, coll. F. Sun, 21 Jan.1959; 1 female, CN X147B-23, [19°N, 105°45'E], sandy mud, 37m, AT, coll. F. Sun, 7 Jan.1962; 1 female (ovig), CN N166B-13, [21°N, 111°30'E], mud, 41m, BT, coll. J. Y. Liu, 6 Apr.1960; 15) 2 males 3 females (1 ovig), CN N145B-89, [18°N, 110°E], muddy sand, 94m, AT, coll. S. Shen, 10 Mar.1960; 2 females (ovig), CN N148B-49, [18°N, 109°30'E], sandy mud, 74m, BT, coll. J. Y. Liu, 11 Mar.1960; 1 male, CN N151B-26, [17°N, 109°30'E], mud, 164m, BT, coll. J. Y. Liu, 11 Mar.1960; 1 female, CN N95B-47, [19°30'N, 111°E], sand, 39m, AT, coll. H. Li, 29 Oct.1959; 1 male, CN N48B-38, [21°N, 108°30'E], mud, 35m, AT, coll. Z. Tang, 20 Apr.1959; 20 males, 13 females (9 ovig) (IOCAS), 1 male, 1 ovig female (ZRC), CN S229B-3, [22°N, 116°30'E], sand, 88m, AT, S. Lu, 23 Apr.1960; 2 females (ovig), CN 9-42, [22°15'N, 116°E], sand, 64m, AT, coll. W. Zhang, 25 Jan.1959; 1 male, CN S228B-9, [21°45'N, 116°00'E], sand, 98.8m, AT, coll. J. Qu, 23 Apr.1960; 1 male, 1 female (ovig), CN S155B-20, [22°N, 115°30'E], mud, 78m, AT, coll. W. Zhang & S. Wu, 20 Nov.1959; 1 male, CN S219B-6, [21°30'N, 115°30'E], muddy sand, 115m, AT, coll. J. Qu, 13 Apr.1960; 1 female (ovig), CN S214B-27, [22°15'N, 115°E], mud, 41m, AT, coll. J. Qu, 12 Apr.1960; 1 female, CN S216B-49, [21°45'N, 115°E], mud, 81.5m, AT, coll. J. Qu, 13 Apr.1960; 1 female, CN S210B-37, [21°30'N, 114°30'E], mud, 73m, AT, coll. J. Qu, 8 Apr.1960; 2 females, CN S208B-30, [21°N, 114°30'E], muddy sand, 83m, AT, coll. J. Qu, 8 Apr.1960; 2 females (1ovig), CN 14-27, [21°15'N, 114°E], 66m, AT, coll. W. Zhang, 17

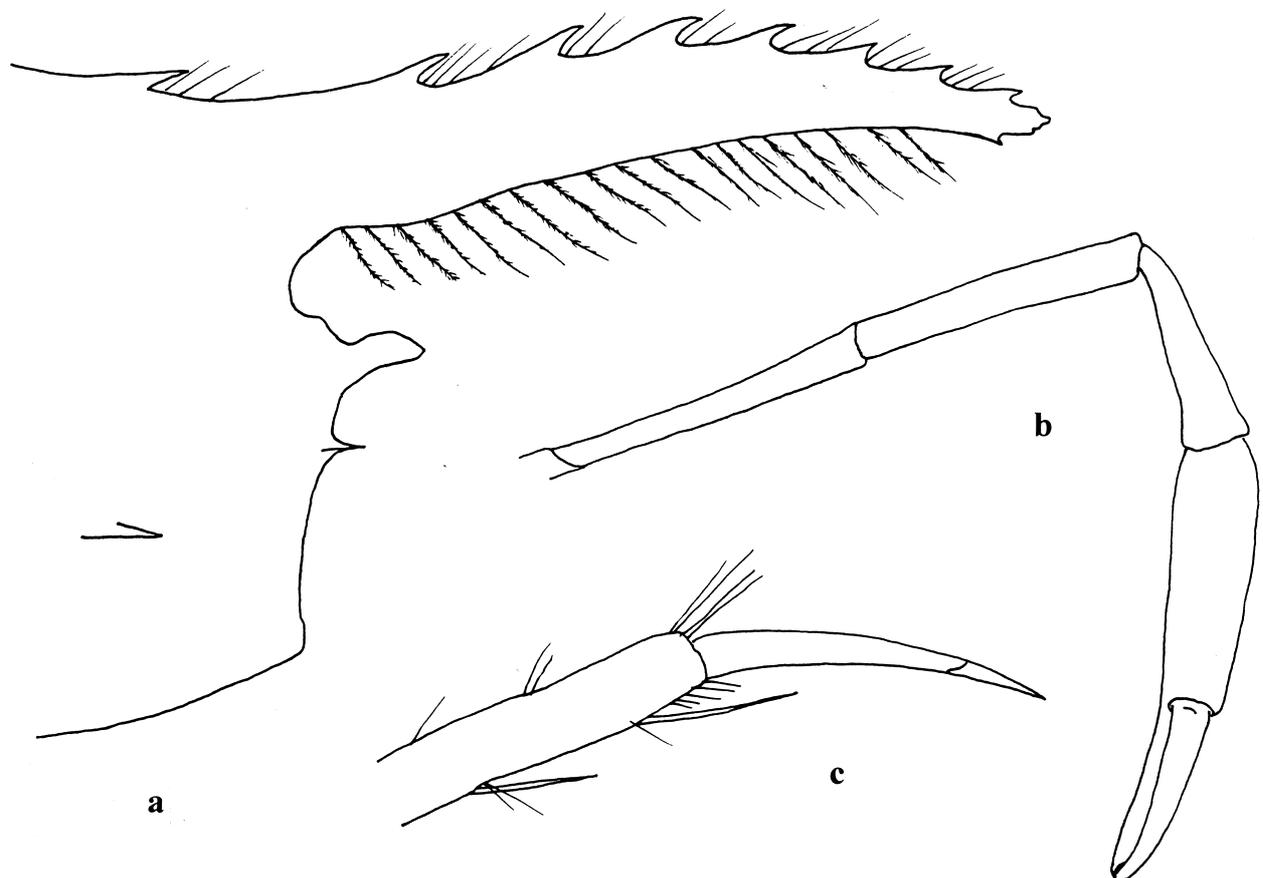


Fig. 33. *Periclimenes tosaensis* Kubo, 1951. a, anterior region of carapace and rostrum, lateral view; b, 2nd pereiopod; c, dactyl and apex of 3rd pereiopod.

Mar.1959; 1 male, CN S138B-32, [21°30'N, 113°45'E], sand, 45m, AT, S. Wu, 9 Dec.1959; 1 juv., CN R281B-11, [20°N, 107°30'E], sand, 30m, AT, coll. W. Zhang, 5 Nov.1960; 2 males, 6 females, CN R142B-31, [20°N, 107°30'E], sand, 33m, AT, coll. F. Sun, 9 Feb.1960; 1 female (ovig), CN Q116B-21, [22°15'N, 116°E], sand, 49.5m, AT, coll. Y. Wang, 10 Jan.1960; 1 female (ovig), CN Q27-10, [19°N, 110°45'E], sandy mud, 80m, BT, coll. Z. Fan, 5 Apr.1959; 1 female (ovig), CN Q40B-2, [17°45'N, 109°30'E], sandy mud, 84m, BT, coll. Z. Fan, 9 Apr.1959; 1 female (ovig), CN Q54B-17, [17°N, 108°30'E], muddy sand, 93.5m, BT, coll. F. Xu, 15 Apr.1959; 1 female (ovig), CN Z15B-12, [19°N, 107°30'E], sandy mud, 67.6m, AT, coll. Z. Fan, 16 May.1960; 1 female (ovig), CN SIII32B-5, [22°45'N, 116°30'E], sand and shell pieces, 33m, AT, coll. W. Zhang, 20 Jul.1959; 5 females, CN SIII29B-1, [22°N, 116°30'E], sand, 86m, AT, coll. W. Zhang, 20 Jul.1959; 1 male, CN S65B-3, 87m, [21°45'N, 115°E], AT, coll. W. Zhang, 8 Apr.1959; 1 female, CN SIII16B-29, [21°45'N, 115°E], mud, 83.7m, AT, coll. W. Zhang, 13 Jul.1959; 3 females (2 ovig), CN SIII1B-15, [21°45'N, 114°E], mud, 43.5m, AT, coll. W. Zhang, 9 Jul.1959; 1 female, CN SIII6B-9, [21°15'N, 114°E], mud, 73m, AT, coll. W. Zhang, 10 Jul.1959; 2 females (1 ovig), CN S75B-24, [21°45'N, 113°45'E], 34m, AT, S. Wu, 19 Apr.1959; 1 male, 1 female, CN R10B-23, [20°N, 107°30'E], sand and shell pieces, 32m, AT, coll. Liang & W. Zhang, 5 Dec.1959; 1 female, CN K164B-7, [20°N, 113°30'E], muddy sand, 129m, AT, coll. Z. Tang, 9 Apr.1960; 1 male, 1 female, CN K28B-25, [21°N, 112°30'E], muddy sand, 54m, AT, coll. F. Sun, 18 Apr.1959; 1 male, 2 females (ovig), CN L46B-71, [20°N, 111°30'E], sandy mud, 76.5m, AT, coll. X. Ma, 12 Apr.1959; 2 males, CN SIII11B-1, [21°45'N, 114°30'E], soft mud, 62.4m, AT, coll. Weiquan Zhang, 11 Jul.1959; 1 male, CN SIII4B-6, [21°30'N, 113°45'E], coarse sand, 40m, AT, coll. Jingzuo Qu, 9 Jul.1959; 4 females (1 ovig), CN SIII11B-1, [22°15'N, 115°E], sandy mud, 42m, AT, coll. Jingzuo Qu, 13 Jul.1959; 1 female, CN Q121B-11, [22°15'N, 116°30'E], sandy with shells, 45m, AT, coll. Shaowu Wang, 11 Jan.1960; 1 male, 2 females, CN SIII26B-8, [22°15'N, 116°E], muddy sand, 51.3m, AT, coll. Jingzuo Qu, 19 Jul.1959.

**Diagnosis.** – Rostrum not exceeding scaphocerite, ventral margin concave, with 1 + 6-9 dorsal teeth, posteriormost tooth isolated from rest and slightly anterior to level of hepatic spine, with 2 small subapical ventral teeth. Carapace without supraorbital spine, hepatic spine distinctly larger than antennal spine, lower than latter; orbital angle produced anteriorly into acute suboval lobe. Fourth thoracic sternite without median process. Abdomen with low, compressed median prominence on 3rd somite. Scaphocerite with lateral margin slightly concave, distolateral tooth not exceeding distal margin of lamella. Second pereopods robust; without distoventral tooth on merus; carpus about 0.8 as long as palm, unarmed distally; chela with fingers 0.67 to subequal to palm. Ambulatory pereopods with dactyl simple; propodus with very long spines on distal half of flexor margin; fifth pereopods not reaching end of scaphocerite.

**Distribution.** – Seychelles Islands, South China Sea, Japan, Philippines.

**Remarks.** – After Kubo (1951) described this species from Tosa Bay, Shikoku Japan, it has been recorded from Seychelles and South China Sea (Bruce, 1966, 1981). The rich samples (114 specimens from 48 stations/times) collected from northern South China Sea show that this is a very common species in this area and maybe in all the South China Sea and adjacent waters. It is very easy to distinguish it from other members of *aesopus*-group by its simple dactyls on

the ambulatory pereopods, which is unique in this group. The previous collection depth records were from about 42-134 m (42m, Seychelles, Bruce, 1976; 58.5 and 80.5-86m, northern South China Sea, Bruce, 1979a; 122-134 m, Philippines, Bruce, 1981; 50-60m, Tosa Bay, Hayashi, 1986). The present records are from 30 to 164 m depth, expand the bathymetric range of this species. This species ranges widely in depth, most of the specimens examined in this study were caught from 30 to 98.5 m depth.

## SUMMARY

This paper reports 12 species of subfamily Palaemoninae and 22 species of subfamily Pontoniinae. Bruce (2003) reviewed 116 species of Pontoniinae reported from South China Sea. Adding the 2 new species, *Paranchistus liui*, new species and *Periclimenes chacei*, new species, and the four newly recorded species, *Kemponia platycheles* (Holthuis, 1952a), *Paraclimenes fianklini* (Bruce, 1990b), *Paranchistus spondylis* Suzuki, 1971, *Periclimenes hirsutus* Bruce, 1971a, there are now 122 species of the subfamily Pontoniinae found in this area to date. As there have been few expeditions to Xisha Islands and Nansha Islands, the two large archipelagos in the South China Sea, further collection should find more interesting taxa of this subfamily in the South China Sea.

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