

New record of the genus *Phycocaris* Kemp, 1916 (Decapoda: Caridea: Hippolytidae) from Hainan Island, China*

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Abstract The monotypic genus *Phycocaris* Kemp, 1916, which was established based on material from the Indian Ocean and previously only known from the type localities, Australia and Japan, is now newly recorded from the South China Sea. A detailed description of *Phycocaris simulans* Kemp, 1916 based on the specimen collected from Hainan Island is presented. Specific features and the differences between the Indian Ocean and the present material are described.

Keyword: new record; Hippolytidae; *Phycocaris*; China Sea

1 INTRODUCTION

The widespread caridean family Hippolytidae Bate, 1888 (*sensu lato*) was recently resolved into five families, namely Hippolytidae Bate, 1888 (*sensu stricto*), Lysmatidae Dana, 1852, Thoridae Kingsley, 1879, Bythocarididae Christoffersen 1987 and Merguiidae Christoffersen 1990, based on molecular phylogenetics (De Grave et al., 2014) and cladistic analysis (Christoffersen, 1987, 1990), leaving about 17 genera in the family Hippolytidae Bate, 1888 (*sensu stricto*). Recently, Xu and Li (2014a, b, 2015) reported four new species and two new records of the Hippolytidae Bate, 1888 (*sensu lato*) from Chinese seas, which all belong to the newly resurgent family Thoridae Kingsley, 1879. In brief, there are about 15 species within 7 genera from the family Hippolytidae Bate, 1888 (*sensu stricto*) distributed in Chinese seas, mostly living in the South China Sea.

During on-going studies on caridean shrimps from the collection of the Marine Biological Museum, Chinese Academy of Sciences (MBMCAS) in the Institute of Oceanology, Chinese Academy of Sciences (IOCAS), we found one peculiar hippolytid shrimp, *Phycocaris simulans* Kemp, 1916, which was collected from the sea grass bed of Hainan Island. *Phycocaris simulans* is a new record in the China Sea. The monotypic genus *Phycocaris* was established by Kemp based on the samples collected from the

Andaman Islands in the Indian Ocean (Kemp, 1916). Since then, the genus has rarely been reported in the literature, probably due to its particular appearance and body color, which closely resembles algal fragments. In addition to the type localities, it is only reported from Heron Island and Darwin, Australia (Bruce, 1983) and Kume Island, Japan (Kawamoto and Okuno, 2003). Except for the original description, there is no additional detailed description based on the samples outside the type localities. The present study gives a detailed description of *Phycocaris simulans* based on the specimen collected from the South China Sea. The differences between the type samples and the present specimen are also discussed.

The material examined in this study is deposited in the MBMCAS. It was first fixed with 10% formalin and then preserved within 75% ethanol. The following abbreviations are used in the text: Cl.: carapace length, the length from the posterior margin of orbit to the posterior margin of carapace; Coll.: collector(s); MBM: the MBMCAS in the IOCAS in Qingdao; No.: collection number; Ovig.: ovigerous; St.: station.

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2 TAXONOMY

Family Hippolytidae Spence Bate, 1888 (*sensu stricto*).

Genus *Phycocaris* Kemp, 1916.

Restricted synonymy:

Phycocaris simulans Kemp, 1916: 392–396, Pl. 36, Fig. 2; Bruce, 1983: 46.

Material examined MBM129778, 1 Ovig. (Cl. 1.5 mm); St. Dadonghai intertidal, Sanya, Hainan Island; 20 November 1997, Coll. Li Xinzheng; No. CJ97C-338.

Description Rostrum subtriangular in dorsal view (Fig. 1a, b), simple, both dorsal and ventral margins without teeth, extends nearly to the end of basal antennular segment, curved slightly down toward. Carapace smooth, with sparse long setae (Fig. 1a), large supraorbital spine, distinct branchiostegal spine and without antennal spine. Suborbital angle pointed; pterygostomian margin round and protruded.

Eye (Fig. 1b) relatively large and long, nearly overreaching tip of stylocerite. Eyestalk cylindrical; cornea slightly narrower than stalk, about half the length of the stalk, without ocellus.

Antennule (Fig. 1c) with slender and long stylocerite, reaching end of second antennular peduncle; basal segment of antennular broader than last two segments, approximately as long as last two segments combined. All segments without spine at distal end, ultimate segment ending in subtriangular plate. Outer flagellum longer and sturdier than inner flagellum, approximately 7 joints, with last two joints distinctly more slender than others, the proximal joint longest. Scaphocerite (Fig. 1d) 1.6 times as long as wide; small distolateral tooth slightly beyond blade; outer margin of the scaphocerite nearly straight, inner margin semicircle with long setae. Antennal basicerite without ventrolateral distal tooth.

Mouthparts with morphology very similar to original description (Kemp, 1916). Mandible (Fig. 1e) with incisor process bearing 6 teeth, without palp. First maxilla with broad palp (Fig. 1f); lower endite slender, with long plumose setae at tip; upper endite broad, distal-dorsal margin with long plumose setae, distal-ventral margin with stout spines. Second maxilla (Fig. 1g) with broad scaphognathite, well developed palp; upper endite bilobed, lower endite small. Epipod of first maxilliped not bilobed, mesial margin slightly concave (Fig. 1h). Second maxilliped with epipod bilobed, without podobranch (Fig. 1i). Third maxilliped (Fig. 1j) with moderate exopod

reaching half-length of antepenultimate segment of endopod, without epipod; ultimate segment of third maxilliped subequal to antepenultimate segment, approximately 1.5 times as long as penultimate segment, bearing 11 sharp transparent corneous spines in its distal third.

First pereopod short, robust (Fig. 1k); ischium, merus and carpus subequal in length, all slightly shorter than chela. Movable finger about half the length of the chela, both fingers armed with 3 horny spinules at inner tip. Second pereopods bilaterally symmetrical (Fig. 1l), reaching tip of scaphocerite, approximately 3 times as long as first pereopod; merus 1.5 times as long as ischium, these two segments combined slightly longer than carpus. Carpus consists of two segments with first slightly longer than the second. Fingers shorter than palm, chela longer than first segment of carpus, dactylus curved inward and longer than fixed finger; inner tip of fingers armed with spinules. Third pereopod exceeding scaphocerite by dactylus (Fig. 1m); carpus and propodus subequal in length, slightly shorter than merus; merus without subterminal spines; propodus bearing 3 pairs of long spines equidistantly on inner posterior half margin; dactylus distinctly biunguiculate, approximately one fifth the length of the propodus (excluding terminal spines), terminal spine largest, nearly subequal to the length of the dactylus, in addition to terminal spine, 5 or more spinules present on inner margin. Fourth and fifth pereopods similar to third pereopods.

Abdomen smooth (Fig. 1a), pleura of fourth and fifth somites rounded posteriorly. Tergite of the first and second abdominal somites with distinct transverse groove; dorsal surface of third abdominal tergite humped. Sixth abdominal somite distinctly longer than the fifth, its tergite produced posteromedially into sharp angle. First pleopod with normal endopod. Endopod of last four pairs of pleopods significantly enlarged, all with small appendix interna; endopod of third pleopod largest (Fig. 1n), those of second and fourth pleopods subequal in size, that of the fifth smaller.

Telson approximately 2.0 times as long as sixth abdominal somite (Fig. 1o), slightly longer than uropods; dorsolateral surface armed with two pairs of spines, proximal pair situated at proximal one third of telson; apex of telson truncate, armed with three pairs of spines, innermost pair longest, while outermost pair shortest. Outer branch of uropod (Fig. 1p) with small notch on distolateral margin, without tooth or spine.

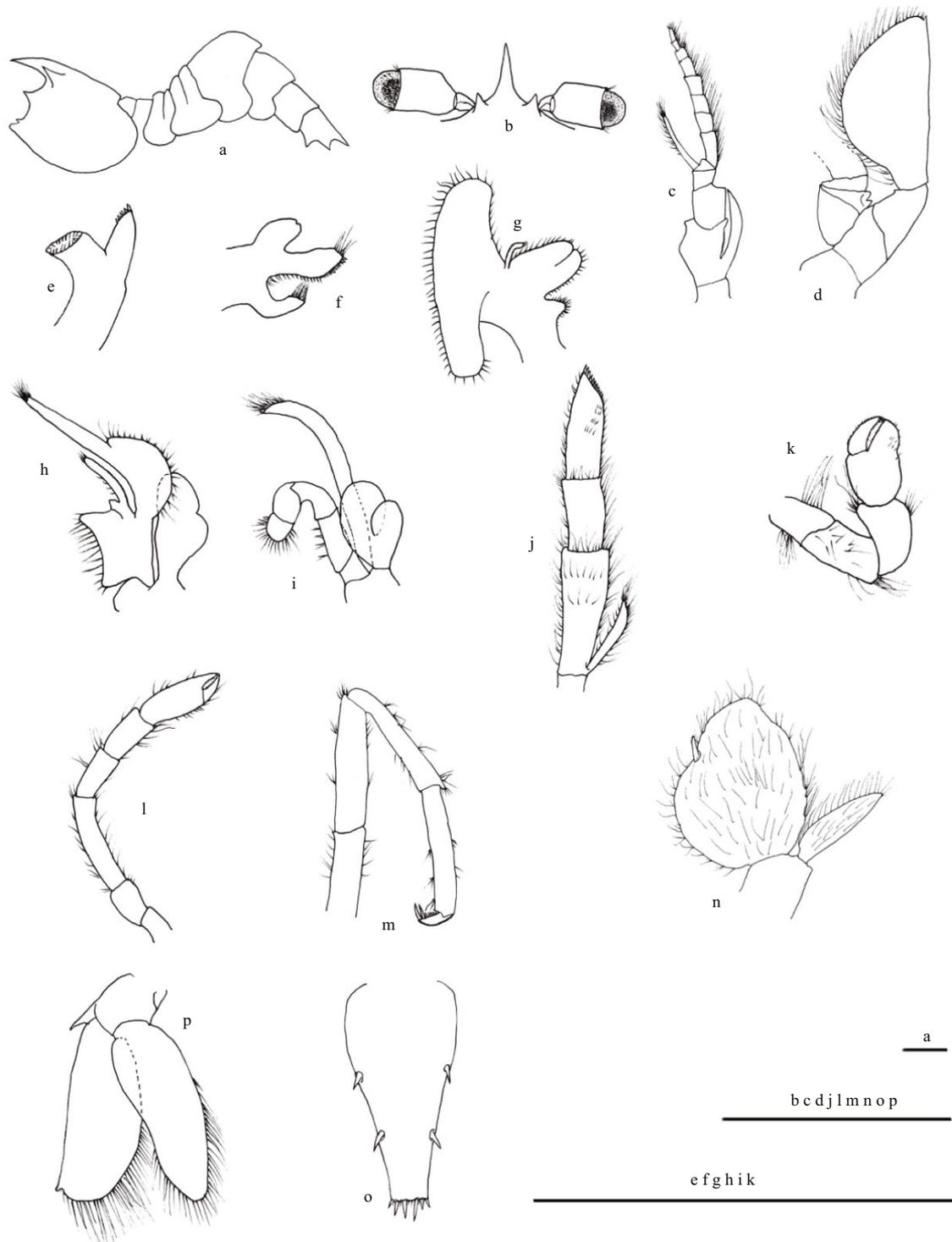


Fig.1 *Phycocaris simulans* Kemp, 1916

a. carapace and abdomen, lateral; b. rostrum and eye, dorsal; c. right antennule, dorsal; d. right scaphocerite, dorsal; e. right mandible, lateral; f. left maxillula, lateral; g. left maxilla, lateral; h. right first maxilliped, lateral; i. right second maxilliped, lateral; j. right third maxillipede, lateral; k. right first pereiopod, lateral; l. right second pereiopod, lateral; m. right third pereiopod, lateral; n. right third pleopod, lateral; o. telson, dorsal; p. right uropod, lateral. Scale bars: 1 mm.

Eggs relatively large, diameter about 0.3–0.4 mm.

Distribution Previously only known from the Andaman Islands, Indian Ocean; Heron Island and

Darwin, Australia; Kume Island, Japan. Now recorded from Hainan Island, the South China Sea.

Remarks The present specimen can be easily

recognized as belonging to the genus *Phycocaris* Kemp, 1916 according to the characteristics of supraorbital spine, mandible, third maxilliped, pereopods and pleopods. However, there are some differences between the present specimen and the original description given by Kemp (1916). The description given by Kemp (1916) stated that “the antero-lateral (pterygostomial) spine is absent, but there is a small spine at the base of the antenna”, while in our specimen a small spine is also present on the carapace but it is closer to the pterygostomial margin (Fig.1a). We considered this spine to be the branchiostegal spine. Furthermore, the suborbital angle is pointed and no accessory structure is observed in the present specimen. Kemp (1916) emphasized that his samples had dense and long hairs or setae on the surface of the appendages. However, in our sample these setae are present but not very dense. Moreover, the mandible of our specimen with the incisor process bearing six teeth, instead of seven teeth in Kemp’s material (1916). Except for these differences, our specimen is nearly identical to the original description given by Kemp (1916). The remarkable feature of the junction of cornea and stalk with a circle of long hairs mentioned by Kemp (1916) is also present in the South China Sea specimen.

3 ACKNOWLEDGMENT

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