

FURTHER RECORDS OF THE HYMENOCERINE SHRIMP *PHYLLOGNATHIA SIMPLEX* FUJINO (CRUSTACEA: DECAPODA)

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ABSTRACT

The small hymenocerine shrimp *Phyllognathia simplex* Fujino, known only from Sagami Bay, Japan, has recently been collected from Lizard Island (Queensland, Australia) and Wongat Island (Madang, Papua-New Guinea). An amended description of the species is given.

KEYWORDS: Crustacea, Decapoda, Palaemonidae Hymenocerinae, *Phyllognathia simplex*, distribution, Australia, Papua New Guinea.

INTRODUCTION

The only previously known specimens of the small hymenocerine shrimp *Phyllognathia simplex* Fujino were collected from 20-50m in Sagami Bay, Hokkaido, Japan, in 1963 and the lack of further records suggested that the species might be restricted to Japanese waters. The holotype, an ovigerous female, lacks the posterior telson, and the paratype, another ovigerous female, is extensively mutilated. The collection of two further specimens confirms the accuracy of Fujino's account and enables some further details to be added, as well as providing considerable increase of the known distribution of the species. CL refers to postorbital carapace length; TL total body length.

SYSTEMATICS

Phyllognathia simplex Fujino (Figs 1-2)

Phyllognathia simplex Fujino, 1973: 90-99.

Material. 1 ♀ juv. NTM Cr. 005983. Wongat Island, Madang, Papua-New Guinea, 6 m, 19 ix 1987, coll. J. Mizen; 1 ovig. ♀, NTM Cr. 006035 Stn. NQ 131, Lizard Island, Queensland, 14° 40'S. 145° 17'E, 15m, 13 xii 1987, coll. G.C.B. Poore and D. Petch.

Description. The two specimens agree closely, in general, with the original species description.

Larger ovigerous ♀ with rostral tip missing, dentition 7/3, possibly 8/4, all teeth anterior to posterior orbital margin, post-rostral carina extending to about 0.3 of post-orbital carapace length, ventral rostral margin with well developed median row of

plumose setae, dorsal interdental spaces feebly setose, posterior half of dorsal carina with submedian pairs of long simple setae; inferior orbital angle feebly produced, with small reflected ventral flange; antennal spine distinctly postmarginal, tip not exceeding anterolateral carapace margin, branchiostegite with anterolateral angle strongly produced, medially reflected beneath basicerite, margins setose. Smaller specimen with rostrum intact, dentition 8/3, postrostral carina less well developed, with more numerous long simple submedian dorsal setae.

Telson about 1.9 times length of sixth abdominal segment, 2.5 times longer than wide, lateral margins straight, convergent, dorsal spines well developed, marginal, at 0.25 and 0.66 of telson length; posterior margin angular, about 0.3 of anterior width, with small acute median point, lateral posterior spines slightly larger than dorsal, intermediate spines robust, about 0.25 of telson length, submedian spines slender, about 0.6 of intermediate spine length, setulose.

Mouthparts of ovigerous ♀ similar to holotype. Mandible (right) with molar process elongate, slender, with two blunt distal teeth separated by group of 4 simple setae. Maxillula with feebly bilobed palp, lower lobe with single relatively long, slender simple seta; upper lacinia narrow, distally truncate with 5 short, stout, feebly biserrate distal spines; lower lacinia elongate, narrow, with few long feebly setulose setae. Maxilla with broad tapering palp with 7-8 long plumose setae laterally, medial border glabrous, basal endite greatly reduced, small rounded lobe

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with 2 long sparsely setulose setae, coxal region feebly convex, scaphognathite with densely setose margins. First maxilliped with palp elongate, tapering, non-setose, basal endite well developed, rounded, distomedial margin sparsely setose, setae simple, coxal region non-setose. exopod with slender flagellum with 4 plumose distal setae, cari-

dean lobe narrow, margin strongly setose, epipod large, elongate, feebly bilobed, anterior lobe 4.0 times longer than posterior. Second maxilliped with dactylar segment short and broad, armed with short, stout strongly biserrate spines distally intergrading to long slender setulose setae proximally, proximal segments of endopod normal,

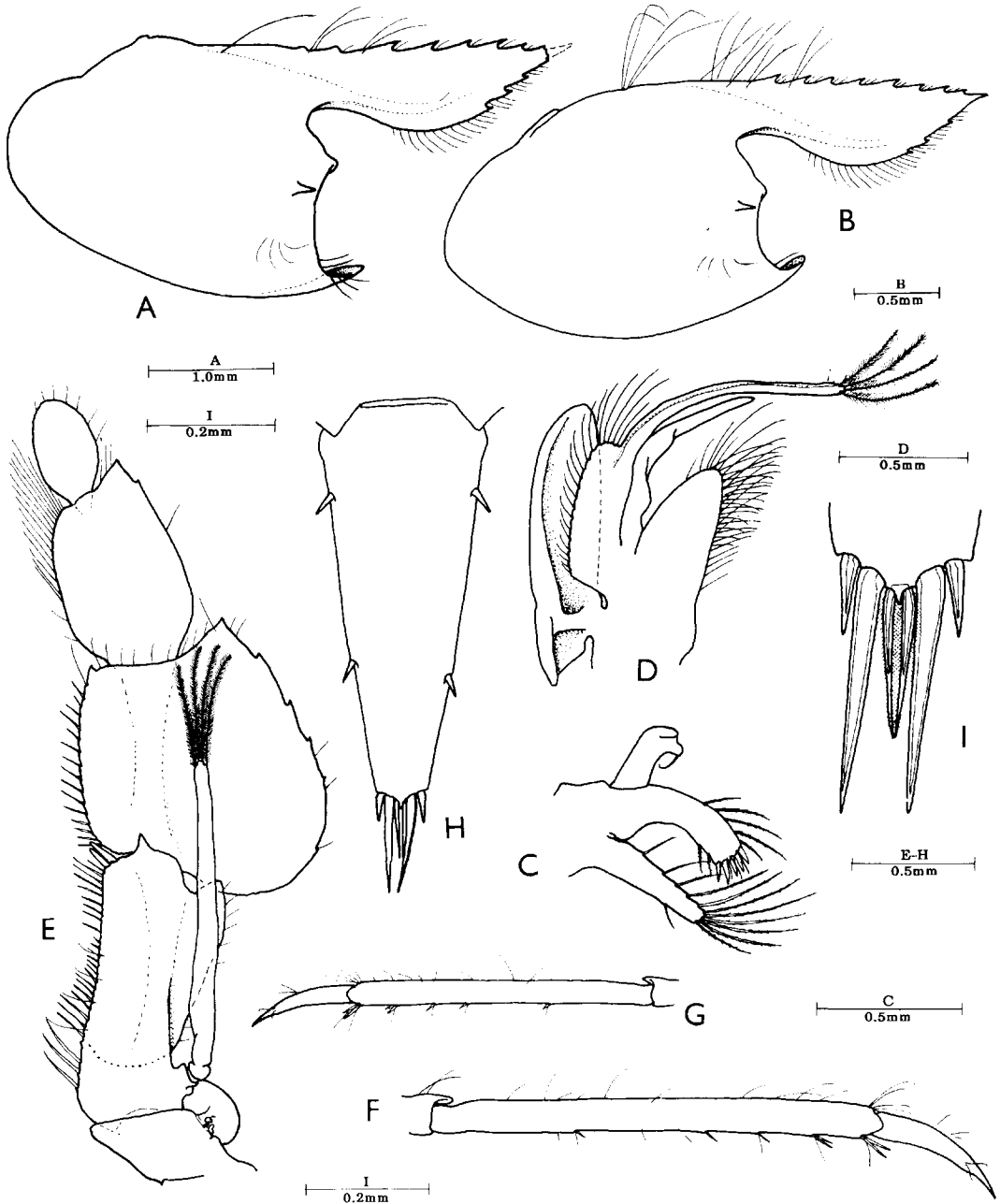


Fig. 1. *Phyllognathia simplex* (A, C-F, ovig ♀, B, G, H, juv. ♀); H, A, B, carapace and rostrum; C, maxilla; D, first maxilliped; E, third maxilliped; F, G, third pereiopod, propod and dactyl; H, telson; I, posterior telson spines

exopod flagellum with four plumose distal setae only, coxa with small medial process, with large subcircular epipod laterally, without podobranch. Third maxilliped with ischium enclosed by anterolateral branchiostegite, meral segment beneath basicerite, endopod with four distinct segments: terminal dactylar segment oval, laminar, about 1.8 times longer than broad, sparse simple setae round distal and lateral margins; propod laminar, about 1.4 times longer than broad, about 1.7 times dactyl length, with distolateral angle acutely produced with single small lateral accessory tooth, lateral margin almost devoid of setae, medial margin with dense fringe of long simple setae distally; carpus subequal to axial length of propod, maximum length about 1.2 times maximum width, lateral margin very broadly expanded, laminar, posteriorly rounded,

with acute distolateral lobe, lateral margin dentate, medial margin expanded, laminar, with small acute distomedial tooth, medial margin with numerous short, spiniform setae; ischium comparatively robust, axial length about 1.2 times carpal length, with acute distodorsal tooth, about 1.6 times longer than greatest width, lateral margin expanded with anterolateral lobe, margin sparsely setose, medial margin with 2 stout peglike distal spines, rest with numerous feebly serrulate spiniform setae; basis short, stout, about 0.25 of ischiomerar axis length, not medially produced, with 3 simple medial spines, exopod with flagellum slender, reaching to mid carpus, with 4 plumose setae distally; coxa compressed, projecting medially, non-setose, with small oval lateral plate, without discernable arthrobranch.

First and second pereiopods as previously

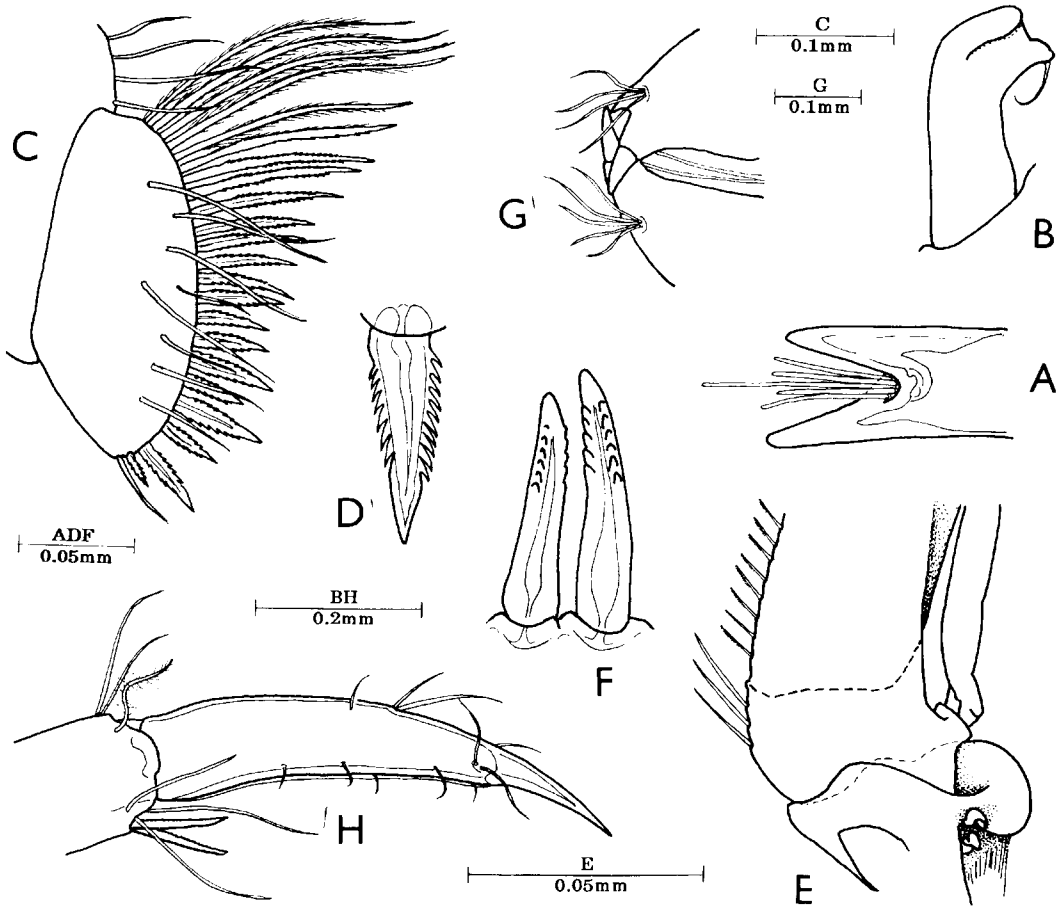


Fig. 2. *Phyllognathia simplex* ovigerous ♀: A, molar process of right mandible; B, palp of maxillula; C, dactylar segment of second pereiopod; D, same, marginal spine; E, third maxilliped, coxo basal region, dorsal; F, same, distomedial spines of meral segment; G, third pereiopod, dactyl.

described. First pereopods with coxae with small ventro-median process, fourth thoracic sternite with low thick, posteriorly carinate, triangular, transverse median process. Second pereopods with coxae unarmed. Fifth thoracic sternite with broad, thin, transverse plate with small median notch and rounded median tubercle posteriorly, posterior to coxae. Chela of second pereopods with small subterminal accessory tooth on fixed finger forming notch into which closed dactyl fits. Third ambulatory pereopod with dactyl about 5.5 times longer than proximal depth, with sharp ventral margin, unguis feebly demarkated, about 0.3 of corpus length; corpus compressed, feebly curved, tapering distally, without distoventral accessory tooth, with dorsal and distolateral setae; propod about 2.4 times dactyl length in ovigerous female, 2.7 in juvenile, with distoventral pair of finely serrulate spines, ventral margin with one distal pair and 3 single ventral spines: fourth and fifth pereopods similar, propods less strongly spinose. Pleopods and uropods without special features.

Measurements (mm). Ovig. ♀ — TL, 10.0; CL, 3.5; CL, 1.6; ovum length, 0.5. Juv. ♀ — TL, 7.2; CL, 2.7; CL, 1.0.

Colouration. Juv. ♀ : Carapace silvery-grey dorsally, greyish-white laterally, with longitudinal dorsolateral line of five round blue spots surrounded by bright yellow. Eyestalk with longitudinal row of three small red spots. Ovig. ♀ : Generally mottled brown-cream, "sand like", with transparent caudal fan. Carapace with dorsolateral lines of yellow patches with deep blue centres; abdomen with similar smaller patches. Lamellar mouths parts with yellow spots. Chelae and pereopods banded, reddish and white. Ova orange.

Remarks. The present records represent a considerable extension of the known distribution of *P. simplex* and clearly indicate that it is not restricted to Japanese waters. However, records are as yet too few to suggest that the species has an anti-tropical distribution, as noted for some other taxa (Briggs 1987).

The third maxillipeds in the genus *Phyllognathia* Borradaile are unusual amongst palaemonoid shrimps, with the endopod having four segments instead of the usual three.

The only shrimp genus having a similar configuration is the genus *Hymenocera* Latreille. The genera *Phyllognathia* and *Hymenocera* are unique in having maxillipeds in which the ischium and merus are distinctly articulated, as noted by Borradaile (1917) in his key to the then known genera of Gnathophyllidae. This clearly suggests a close relationship between these two genera, in contradistinction to other genera, which is confirmed by many other details of their general morphology. The functional importance of this articulation is not clear, but it may be noted than in aquarium observations of *Hymenocera* feeding on the asteroid *Linckia*, fine precision feeding movements are carried out, they could almost be termed dissections, with the chelae of the first pereopod, behind a guard formed by the depressed endopods of the third maxillipeds. The relationship between ischium and basis is also unusual in the third maxilliped of *Phyllognathia simplex*, as there is no trace of a division between these segments dorsally but it is quite distinct ventrally. In *Hymenocera* also, the articulation between ischium and basis is very feebly marked.

Both collectors remarked on the striking colour pattern of the two shrimps, not previously recorded. The pattern appears similar to, but quite distinct from, that of *Phyllognathia ceratophthalma* (Bals), which consists of large orange patches outlined with black spots, in longitudinal rows on a yellow-brown ground colour (Bruce 1980).

REFERENCES

- Borradaile, L.A. 1917. On Carides from the Western Indian Ocean. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner. *Transactions of the Linnean Society of London Series 2 Zoology* **17**: 397-412.
- Briggs, J.C. 1987. Antitropical distribution and evolution in the Indo-West Pacific Ocean. *Systematic Zoology* **36** (3): 237-247.
- Bruce, A.J. 1980. Shrimp: The complex life relationships of shrimps on the Great Barrier Reef. *Geo* **2**: 38-53.
- Fujino, T. 1973. A new shrimp *Phyllognathia simplex* sp. nov. (Crustacea, Decapoda, Gnathophyllidae) from Sagami Bay, Japan. *Annotationes Zoologicae Japonenses* **46**: 90-99.

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