

*HOLOOTHERES DANIELAE*, A NEW SPECIES OF PINNOTHERID CRAB  
FROM THE INDO-WEST PACIFIC (DECAPODA, BRACHYURA),  
WITH A KEY TO THE GENUS

BY

SHANE T. AHYONG<sup>1</sup>)

Marine Biodiversity & Biosecurity, National Institute of Water and Atmosphere,  
Private Bag 14901, Kilbirnie, Wellington, New Zealand

ABSTRACT

*Holotheres danielae* sp. nov., a symbiont of holothurians, is described from Roebuck Bay, Western Australia. It is the sixth species of the genus and represents the first record of the genus from Australia. The new species is most similar to *H. halingi* (Hamel, Ng & Mercier, 2003) from the Solomon Islands, but differs in the form of the maxilliped 3 ischiomerus and the dactyli of the walking legs. A key to the species of *Holotheres* is provided.

RÉSUMÉ

*Holotheres danielae* sp. nov., une espèce symbiotique des holothuries, est décrite de Roebuck Bay, Western Australia. C'est la sixième espèce du genre et représente le première registre de ce genre en Australie. La nouvelle espèce est proche de *H. halingi* (Hamel, Ng & Mercier, 2003) des îles Salomon, mais en diffère par la forme de l'ischiomerus du 3ème maxillipède et celles des dactyles des pattes marcheuses. Une clef des espèces d'*Holotheres* est présentée.

INTRODUCTION

Ng & Manning (2003) established *Holotheres* for five species of pinnotherid crabs that are obligate symbionts of holothurians: *H. semperi* (Bürger, 1895), *H. flavus* (Nauck, 1880), *H. setnai* (Chopra, 1931), *H. halingi* (Hamel, Ng & Mercier, 2003), and *H. villosissimus* (Doflein, 1904) (see also Ng et al.,

---

<sup>1</sup>) e-mail: s.ahyong@niwa.co.nz

2008). Most species of *Holotheres* are very similar in overall morphology, although *H. villosissimus* is aberrant in having long, shaggy carapace setae (in contrast to short and fine) and in the structure of maxilliped 3 in which the inner margin of the ischiomerus is distinctly angled in the distal quarter (rather than at, or proximal to the midlength in congeners) and in which the dactylus and propodus are proportionally much shorter. The taxonomic position of *H. villosissimus* requires further scrutiny, and, as remarked by Ng & Manning (2003), this poorly known species requires a redescription.

The Australian pinnotherid crab fauna was most recently enumerated by Ahyong & Brown (2003), who recognized 12 species and six genera of the Pinnotherinae from Australian waters. A new species of *Holotheres* from Roebuck Bay, Western Australia, is described herein, adding an additional genus and species to the Australian pinnotherid inventory.

## MATERIAL AND METHODS

Morphological terminology generally follows Ahyong & Ng (2007). Measurements are in millimetres (mm). Carapace length (cl) is measured along the midline. Carapace width (cw) is the greatest width. The specimens used in this study are deposited in the Australian Museum, Sydney (AM), and the Zoological Reference Collection, Raffles Museum of Biodiversity Research, National University of Singapore (ZRC).

## TAXONOMY

Family PINNOTHERIDAE De Haan, 1833

Genus *Holotheres* Ng & Manning, 2003

***Holotheres danielae* sp. nov.** (fig. 1A-H)

Type material. — AM P64675, spent female holotype (cw 6.5 mm, cl 6.6 mm), Roebuck Bay, Broome, Western Australia, from holothurians (*Haplodactyla* sp.), dredged.

Description of holotype. — Carapace (fig. 1A) slightly longer than wide; front slightly produced, anterior margin sinuous; lateral margins subtruncate, subparallel; posterior margin projecting, rounded; margins setose, dorsal surface smooth, glabrous or with short, fine, sparse setation. Antennular sinus

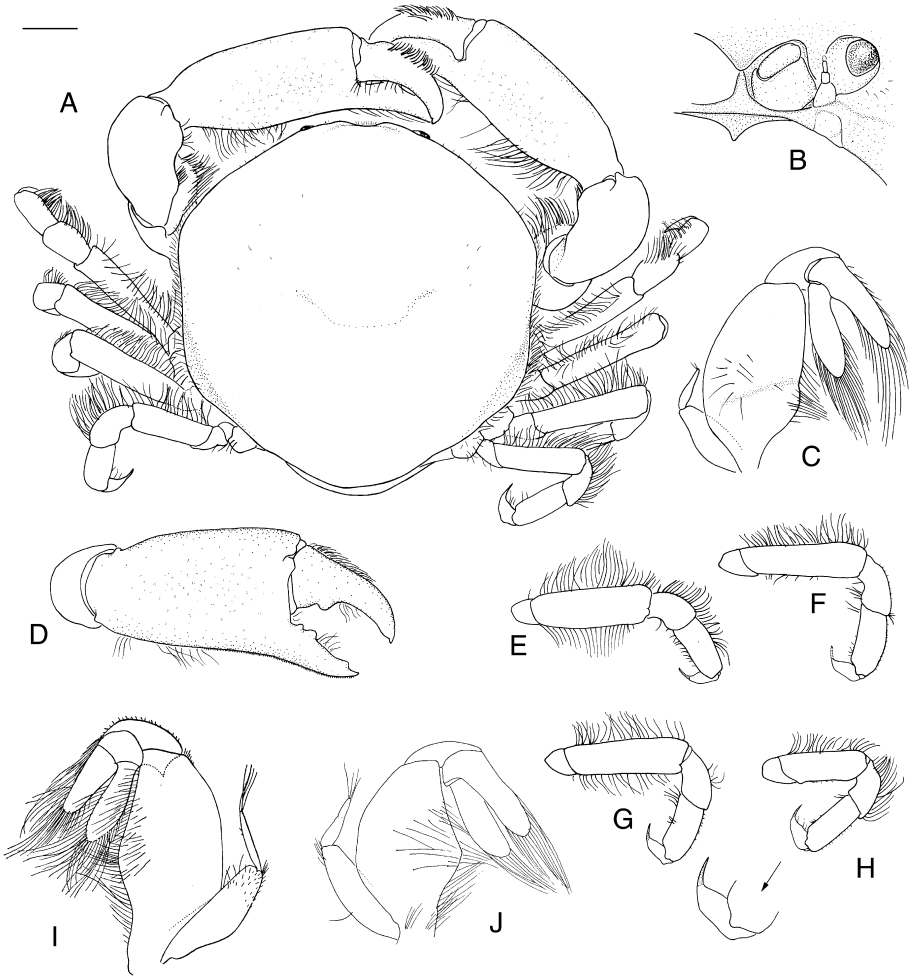


Fig. 1. A-H, *Holotheres danielae* sp. nov., female holotype, cl 6.6 mm, cw 6.5 mm (AM P64675). A, dorsal habitus; B, left cephalothorax, anterior view; C, right maxilliped 3, outer view; D, right chela; E-H, right pereopods 2-5; I, *H. setnai* (Chopra, 1931), right maxilliped 3, oral view [after Chopra, 1931, fig. 5]; J, *H. halingi* (Hamel, Ng & Mercier, 1999), right maxilliped 3, outer view, ovigerous female paratype, cl 10.1 mm, cw 10.7 mm (ZRC 1999.1229). Scale: A, D-H = 1.0 mm, B, C = 0.5 mm, I, J = 0.75 mm.

wider than orbit (fig. 1B); antennules folded slightly obliquely. First two antennal segments fused to epistome. Eyes partially visible in dorsal view, filling orbit, cornea pigmented.

Maxilliped 3 (fig. 1C) ischiomerus length about twice width; mesial margin obtusely rounded proximal to midlength; central mesial margin setose; outer margin strongly convex. Carpus shorter than propodus. Propodus digitiform,

distally setose. Dactylus inserting at base of propodus; elongate, subspatulate, widest at midlength, gently tapering to blunt, setose apex; apex fractionally over-reaching propodal apex. Exopod inner and outer margins convex, sparsely setose; distal segment setose.

Chelipeds (fig. 1D) symmetrical. Dactylus and pollex relatively straight, crossing distally when fingers closed. Dactylus dorsally setose; occlusal margin sparsely setose, with blunt proximal tooth. Pollex occlusal margin with low distal and 2 low proximal teeth; pollex with fringe of short setae on inner ventral margin. Propodus dorsal margin about 1.4 times as long as dactylus, about 1.5 times height; ventral margin faintly sinuous, concave at base of pollex; setose on inner proximal margin. Carpus inner margin with tuft or short setae.

Walking legs (pereopods 2-5) (fig. 1E-H) similar in form, symmetrical from left to right, segments variously setose on flexor and extensor margins; relative lengths in decreasing order pereopod 2 > pereopod 3 > pereopod 4 > pereopod 5. Dactyli subequal, broad, thick proximally, tapering abruptly to spiniform corneous unguis. Pereopod 2 dactylus 0.7 propodus length; propodus length 2.3 height, 1.3 carpus length; merus length 3.1 height, 2.5 carpus length. Pereopod 3 sparsely setose; dactylus 0.7 propodus length; propodus length 2.3 height, 1.4 carpus length; merus length 3.3 height, 2.1 carpus length. Pereopod 4 dactylus 0.6 propodus length; propodus length 2.4 height, 1.3 carpus length; merus length 3.5 height, 2.3 carpus length. Pereopod 5 dactylus 0.7 propodus length; propodus length 2.5 height, 1.3 carpus length; merus length 3.0 height, 1.8 carpus length.

Abdomen with all somites freely articulating, widest at somite 5, covering bases of walking legs.

Host. — The host was originally identified as *Haplodactyla* sp. The only Australian holothurian previously known under this generic name is currently known as *Acaudina molpadioides* (Semper, 1868), which occurs off northwestern Australia, including Broome, from 0-54 m (Rowe & Gates, 1995). Thus, *A. molpadioides* is likely to be the host of *H. danielae*. The collection date was not recorded, but the hand writing is similar to that of A. Livingstone, who made collections from Roebuck Bay and environs in 1929.

Etymology. — Named in honour of Danièle Guinot, esteemed colleague and friend, for her monumental contribution to the systematics of the Brachyura.

Remarks. — Of the known species of *Holotheres*, *H. danielae* sp. nov. most closely resembles *H. halingi* from the Solomon Islands in general habitus, carapace shape (subtruncate and subparallel lateral margins; prominently projecting posterior margin), very sparsely setose carapace surface, and setation

pattern of the walking legs (setae primarily confined to the flexor and extensor margins). *Holotheres danielae* differs from *H. halingi* in the shapes of the maxilliped 3 ischiomerus and walking leg dactyli. The maxilliped 3 ischiomerus of *H. danielae* (fig. 1C) is also proportionally more slender than in *H. halingi* (fig. 1J), being about twice as long as broad and without a prominently angled mesial margin, contrasting with a length that is distinctly less than twice the breadth, with a prominent, obtuse, mesial angle. The walking leg dactyli of *H. danielae* are abruptly narrowed in the distal half, with styliform apices, rather than evenly tapering as in *H. halingi*. In the form of the maxilliped 3 ischiomerus, *H. danielae* also resembles *H. setnai* (fig. 1I) from the Andaman Sea, but the two species are readily distinguished by the subtruncate rather than evenly rounded lateral carapace margins, and shorter maxilliped 3 dactylus, which only fractionally, rather than distinctly over-reaches the propodal apex. The known species of *Holotheres* can be distinguished by the key below.

Distribution. — At present known only from Roebuck Bay, Broome, Western Australia.

#### KEY TO SPECIES OF *HOLOOTHERES*

1. Dorsal and lateral surfaces of carapace entirely and densely covered by long, shaggy, plumose setae. Maxilliped 3 ischiomerus obtusely angled at distal quarter of inner margin ..... *H. villosissimus*
- Dorsal and lateral surfaces of carapace covered at most with short tomentum. Maxilliped 3 ischiomerus obtusely angled at midlength or on proximal half of inner margin ..... 2
2. Walking legs covered with setae. Carapace setose over entire surface ..... 5
- Walking legs setose on extensor and flexor margins. Carapace setose marginally; sparsely setose or glabrous centrally ..... 3
3. Dactyli of walking legs tapering abruptly to slender spiniform unguis. Maxilliped 3 ischiomerus twice as long as wide ..... *H. danielae*
- Dactyli of walking legs tapering evenly to spiniform apex. Maxilliped 3 ischiomerus distinctly less than twice as long as wide ..... 4
4. Pereopod 2 longest of walking legs ..... *H. halingi*
- Pereopod 3 longest of walking legs ..... *H. flavus*
5. Ischiomerus of maxilliped 3 more than twice as long as wide ..... *H. setnai*
- Ischiomerus of maxilliped 3 less than twice as long as wide ..... *H. semperi*

#### ACKNOWLEDGEMENTS

Grateful thanks are extended to Stephen Keable (Australian Museum) for the loan of specimens. This study was partially supported by the NIWA

Capability Fund and New Zealand Foundation for Research Science and Technology (C01X0502) and a fellowship from the National University of Singapore.

## REFERENCES

- AHYONG, S. T. & D. E. BROWN, 2003. Description of *Durckheimia lochi* n. sp., with an annotated checklist of Australian Pinnotheridae (Crustacea: Decapoda: Brachyura). *Zootaxa*, **254**: 1-20.
- AHYONG, S. T. & P. K. L. NG, 2007. The pinnotherid type material of Semper (1880), Nauck (1880) and Bürger (1895) (Crustacea: Decapoda: Brachyura). *Raffles Bulletin of Zoology*, (Supplement) **16**: 191-226.
- BÜRGER, O., 1895. Ein Beitrag zur Kenntniss der Pinnotherinen. *Zoologische Jahrbücher* (Abtheilung für Systematik, Geographie und Biologie der Thiere), **8**: 361-390.
- CHOPRA, B., 1931. Further notes on Crustacea Decapoda in the Indian Museum. II. On some decapod Crustacea found in the cloaca of holothurians. *Records of the Indian Museum*, **33**: 303-325.
- DOFLEIN, F., 1904. Brachyura. In: *Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia", 1898-1899*, **6**: i-xiv, 1-314, figs. 1-68, pls. 1-57. (Verlag von Gustav Fischer, Jena).
- HAAN, W. DE, 1833-1849. Crustacea. In: P. F. VON SIEBOLD (ed.), *Fauna Japonica, sive descriptio animalium, quae in itinere per Japoniam, jussu et auspiciis superiorum, qui summum in India Batavia imperium tenent, suscepto, annis 1823-1830 collegit, notis, observationibus a adumbrationibus illustravit*, **1-8**: i-xxi, vii-xvii, ix-xvi, 1-243, pls. 1-55, A-Q, circ. pl. 2. (Lugduni Batavorum = Leiden).
- HAMEL, J.-F., P. K. L. NG & A. MERCIER, 1999. Life cycle of the pea crab *Pinnotheres halingi* sp. nov., an obligate symbiont of the sea cucumber *Holothuria scabra* Jaeger. *Ophelia*, **50** (3): 149-175.
- NAUCK, E., 1880. Das Kaugerüst der Brachyuren (mit Beschreibung neuer Gattungen und Arten, z. T. von C. Semper). *Zeitschrift für Wissenschaftliche Zoologie*, Leipzig, **34** (1): 1-69, pl. 1.
- NG, P. K. L., D. GUINOT & P. J. F. DAVIE, 2008. *Systema Brachyurorum*, Part I. An annotated checklist of extant brachyuran crabs of the world. *Raffles Bulletin of Zoology*, (Supplement) **17**: 1-286.
- NG, P. K. L. & R. B. MANNING, 2003. On two new genera of pea crabs parasitic in holothurians (Crustacea: Decapoda: Brachyura: Pinnotheridae) from the Indo-West Pacific, with notes on allied genera. *Proceedings of the Biological Society of Washington*, **116** (4): 901-919.
- ROWE, F. W. E. & J. GATES, 1995. Echinodermata. In: A. WELLS (ed.), *Zoological catalogue of Australia*, **33**: 1-510. (CSIRO Publishing, Melbourne).

First received 18 June 2009.

Final version accepted 25 June 2009.