BRILL

Crustaceana 86 (6) 718-727

CRUSTACEANA

HYASTENUS BARU, A NEW SPECIES OF SPIDER CRAB FROM INDONESIA (BRACHYURA, MAJOIDEA, EPIALTIDAE) WITH A KEY TO THE SPECIES OF *HYASTENUS*

BY

AMANDA M. WINDSOR[1]) and SHANE T. AHYONG
Australian Museum, 6 College Street, Sydney, NSW 2010, Australia

ABSTRACT

A new species of spider crab, *Hyastenus baru* n. sp., was collected from deep water off the eastern Indonesian island Kei-Besar by the French-Indonesian KARUBAR expedition in 1991. The new species is similar to several other members of the genus, but differs in spination of the carapace and ambulatory pereopods.

RÉSUMÉ

Une nouvelle espèce de crabe araignée, *Hyastenus baru* n. sp., a été collectée en eau profonde au large de l'île est-indonésienne de Kei Besar, par l'expédition franco-indonésienne KARUBAR en 1991. Cette nouvelle espèce ressemble à plusieurs autres espèces du genre, mais en diffère par la répartition et le nombre d'épines de la carapace et par les péréiopodes ambulatoires.

INTRODUCTION

The epialtid spider crab genus *Hyastenus* White, 1847 currently includes 38 valid species (Ng et al., 2008) that were divided into three groups, named Groups 1-3 based on gonopod 1 morphology by Griffin & Tranter (1986). Most species of *Hyastenus* belong to Group 1, recognised by the relatively straight gonopod 1 with a subterminal aperture and convex lobe behind the apex. An undescribed *Hyastenus* Group 1 species was collected from the Banda Sea near the Kei Islands, Maluku Province, Indonesia as part of the KARUBAR expedition to Indonesia in 1991. This species, known from a single male specimen, is sufficiently distinct from other species of *Hyastenus* to warrant its recognition as a new species, described below.

[1]) Corresponding author; e-mail: amwindsor@gmail.com

 DOI:10.1163/15685403-00003202

MATERIAL AND METHODS

Morphological terminology generally follows Griffin & Tranter (1986). Carapace length (cl) is measured dorsally from the rostral apices to the posterior margin of the carapace, excluding the intestinal spine. Postrostral carapace length (pcl) is measured along the dorsal midline from the base of the rostral sinus to the posterior margin of the carapace, excluding the intestinal spine. Carapace width (cw) is the greatest carapace width and excludes the epibranchial spines. The specimen is deposited in the Muséum national d'Histoire naturelle, Paris (MNHN). Comparative material of selected species of *Hyastenus* species in the Australian Museum (AM) is given in the Appendix. For future comparative purposes, the sequence of the COI DNA barcode region has been deposited in GenBank under accession number KC688316.

TAXONOMY

EPIALTIDAE MacLeay, 1838
PISINAE Dana, 1851
Hyastenus baru n. sp.
(figs. 1-2)

Material examined.— Holotype: MNHN-IU-2012-994, male (cl 11.5 mm, pcl 7.8 mm, cw 4.7 mm), Banda Sea, Kei Islands, west of Kei-Besar, KARUBAR stn DW22, 5°22′S 133°01′E, 85-124 m, 25 October 1991.

Diagnosis.— Carapace pyriform, gastric and cardiac regions strongly elevated, both lacking apical tubercle; a blunt, medial tubercle on anterior face of gastric elevation; low, indistinct lateral protogastric tubercle; strong, lateral branchial spine and 2 small dorsal tubercles in longitudinal row; pterygostomian margin with row of 2 tubercles followed by 1 sub-branchial tubercle. Rostral horns divergent for entire length, horns half as long as postrostral carapace length. Anterolateral spine of fused basal antennal article with median, dorsally directed accessory spinule visible in dorsal view. Pereopod 2-4 meri with 2 or 3 spines on proximal half of extensor margin.

Description.— Carapace pyriform, 1.6 times as long as wide, regions defined; sparsely covered with short hooked setae. Rostral horns divergent for entire length, horizontal in lateral view, length half postrostral carapace length; margins lined with short, soft, lobular setae and scattered simple setae.

Orbital eave weakly expanded, preorbital angle produced as a stout, anterodorsally directed spine; antorbital angle produced as a very short, bluntly angular lobe; postorbital lobe short, anteriorly cupped, laterally truncate; dorsal orbital hiatus a

shallow, narrow U-shape; orbit open ventrally, eyestalk unprotected; hiatus broad, U-shaped.

Gastric region elevated, without apical tubercle; a low, blunt tubercle anterior to peak of gastric elevation; protogastric region with low indistinct tubercle laterally; urogastric region flat, lacking tubercles. Hepatic region slightly inflated, with small, low tubercle on lateral margin. Pterygostomian region with 2 tubercles in longitudinal row below moult suture.

Branchial region slightly inflated; lateral margin with straight, laterally directed epibranchial spine at level of pereopod 3; dorsal surface with 2 short, conical tubercles in longitudinal row, anterior tubercle at level of pereopod 2, posterior tubercle at level of pereopod 3, mesial to lateral epibranchial spine. Branchial sub-margin with 1 tubercle anteriorly, slightly below moult suture, in line with pterygostomian tubercles.

Cardiac region elevated, smooth, conical, unarmed, apex bluntly rounded, slightly higher than gastric region. Intestinal region with short, conical posterodorsally directed spine, with short setae.

Eyestalks short, sparsely setose anteriorly, cornea terminal.

Basal antennal article about twice as long as wide; anterolateral spine prominent, visible in dorsal view; lateral margin with short anterodorsally directed spinule; lateral margin convex, slightly expanded under eyestalk; prominent tubercle situated between antennal gland and margin of ventral orbital hiatus. Penultimate antennal article overreaching base of rostral sinus by distal half; ultimate article about 0.6 length of penultimate article; margins of both articles with small, scattered bulbous setae.

Maxilliped 3 smooth, merus triangular, anterolateral angle strongly produced, apex rounded, broader than ischium; ischium subquadrate, mesial margin 12-dentate, outer surface with shallow longitudinal depression.

Cheliped (pereopod 1) slender, about 0.9 pcl, with scattered bulbous or club-shaped setae; merus slightly shorter than propodus, extensor margin with 2 proximal spines and strong distal spine; carpus about as long as dactylus, with small tubercle at distal third of lateral margin; propodus smooth, dactylus and pollex equal, shorter than one-half palm length, occlusal margins crenulate, proximal gape slight.

Ambulatory legs slender; pereopod 2 2.0 pcl; pereopod 3 1.2 pcl; pereopod 4 as long as pcl; pereopod 5 0.9 pcl; sparsely covered with short simple setae and short, club-like setae. Pereopod 2 and 3 merus extensor margin with prominent distal spine and 3 smaller proximal spines; dactylus flexor margin with 10 or 11 (pereopod 2) or 7 (pereopod 3) well-spaced spines, distal 2 perpendicular to dactylar axis, remainder slightly inclined proximally. Pereopod 4 merus extensor margin with short distal spine and 2 smaller proximal spines; dactylus flexor margin with

7 well-spaced spines, distal 2 perpendicular to dactylar axis, remainder slightly inclined proximally. Pereopod 5 merus extensor margin with blunt distal angle and 1 proximal spine; dactylus flexor margin with 6 well-spaced spines, perpendicular to dactylar axis.

Male abdomen with 6 free somites and telson, widest at somites 2 and 3; surface sparsely covered with short bulbous setae; segment 1 with a medial elevation, somite 3 with rounded elevations near lateral margins. Telson triangular, as long as wide, margins straight, apex rounded.

Gonopod 1 (= male pleopod 1) straight, flattened, tapering to acute distal point; aperture subdistal, lateral margin with weakly bilobed subdistal swelling.

Etymology.— The species name means "new" in Bahasa Indonesia, acknowledging that this is a new species from Indonesia. The name is used here as if it were a noun in apposition.

Remarks.— Of the species in *Hyastenus* Group 1 (Griffin & Tranter, 1986), *Hyastenus baru* most closely resembles *H. ambonensis* Griffin & Tranter, 1986, *H. brockii* De Man, 1887, *H. subinermis* Zehntner, 1894, and *H. uncifer* Calman, 1909 on the basis of the size and position of branchial tubercles and spines and the relative length and divergence of the rostral horns.

Hyastenus baru and *H. ambonensis* (AM P34609; Griffin & Tranter, 1986: fig. 39) both have elevated cardiac and gastric regions, but the cardiac region is lower than the gastric region in *H. ambonensis*. Both species also share the presence of a median tubercle on the anterior surface of the gastric elevation, but this tubercle is prominent in *H. ambonensis* and short and blunt in *H. baru* (fig. 1B). The lateral protogastric tubercles are conspicuous in *H. ambonensis*, as are the tubercles at the apices of the gastric and cardiac elevations but these are obscure and absent in *H. baru*, respectively. The distal angle of the ambulatory pereopod meri is a blunt projection, not a sharp spine as in *H. baru* (fig. 2F). There are no proximal meral spines on any pereopod in *H. ambonensis* (cf. Griffin & Tranter, 1986, fig. 39e). *Hyastenus ambonensis* overlaps in depth range with *H. baru*, with the type of *H. ambonensis* having been collected from 90 m (Griffin & Tranter, 1986).

The cardiac and gastric regions in *H. brockii* (AM P34616, P34617, P34618; Griffin & Tranter, 1986, fig. 38h) are low, with the cardiac region not higher than the gastric region, as opposed to the strong elevation of these regions in *H. baru*. There is no medial tubercle on the anterior surface of the gastric elevation in *H. brockii*, but the lateral gastric tubercles are not obscured as in *H. baru* (fig. 1B). In both *H. brockii* and *H. baru* (figs. 1A, 2A, B) there is a small accessory spinule on the anterolateral spine of the basal antennal article, both of which are visible in dorsal view in both species. In *H. brockii*, there is a terminal spine on pereopod 2 and a small proximal spine on the flexor margin of the same pereopod, but not on

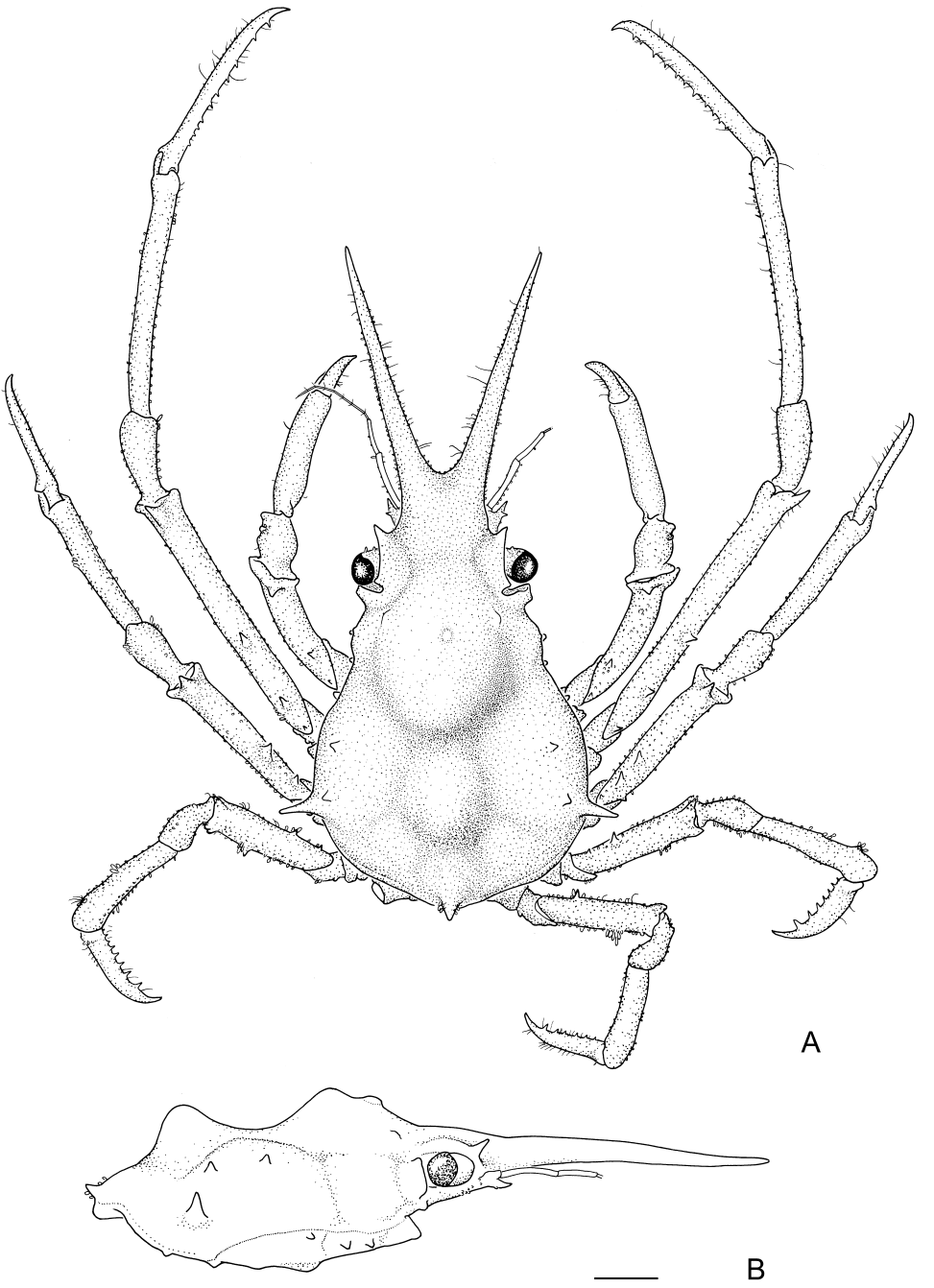

Fig. 1. *Hyastenus baru* sp. nov., male holotype, cl 11.5 mm, cw 4.7 mm (MNHN). A, dorsal habitus; B, carapace, right lateral view. Scale bar = 1.0 mm.

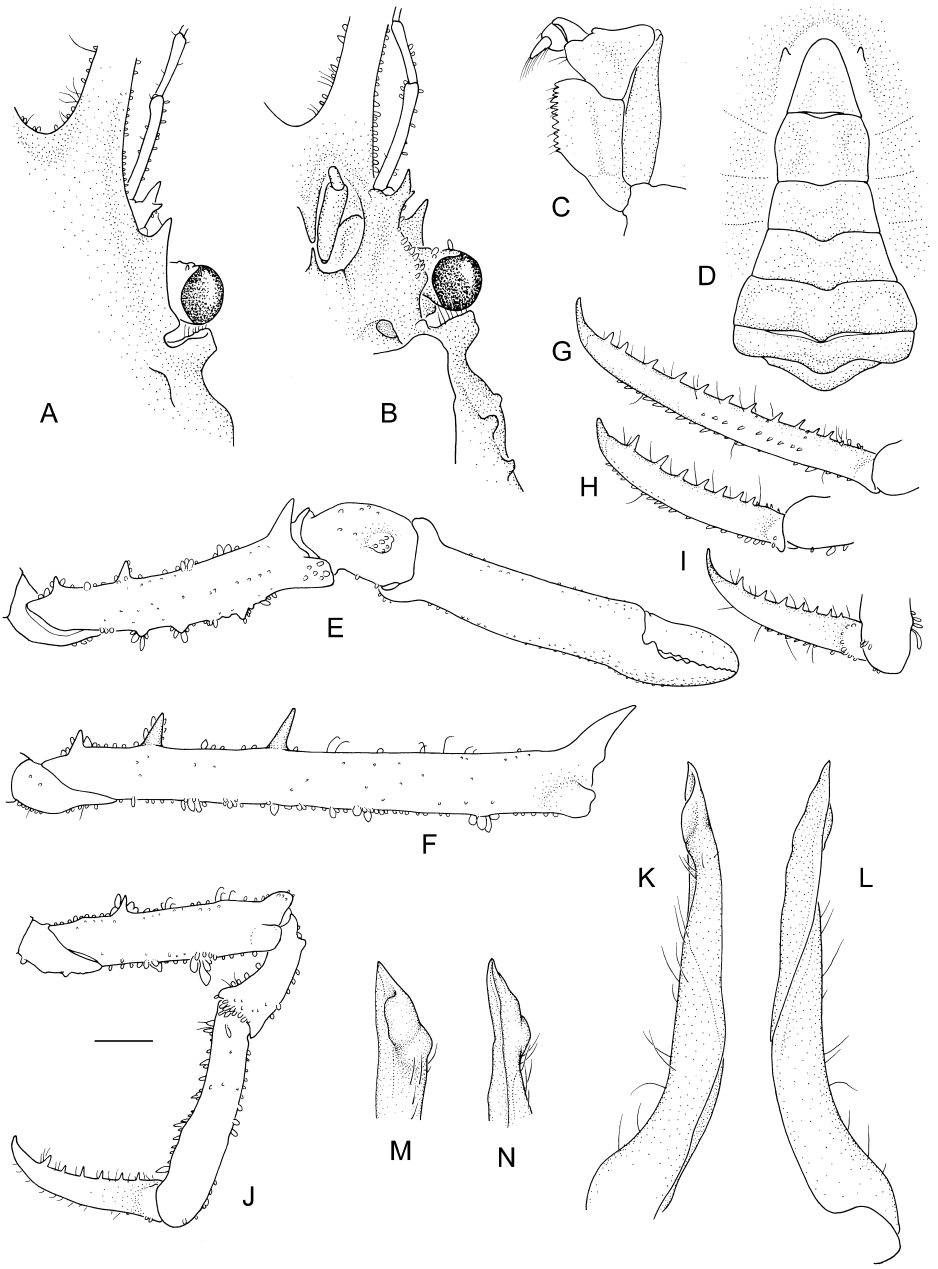

Fig. 2. *Hyastenus baru* sp. nov., male holotype, cl 11.5 mm, cw 4.7 mm (MNHN). A, right antennal and orbital region, dorsal view; B, left antennal and orbital region, ventral view; C, left maxilliped 3; D, abdomen; E, right pereopod 1 (cheliped); F, right pereopod 2 merus; G, right pereopod 2 dactylus; H, right pereopod 3 dactylus; I, right pereopod 4 dactylus; J, right pereopod 5; K, right gonopod 1, abdominal view; L, right gonopod 1, sternal view; M, tip of right gonopod 1, lateral view; N, tip of right gonopod 1, sternolateral view. Scale bar: A-J = 2.0 mm, K-N = 0.2 mm.

any other pereopod. *Hyastenus brockii* is reported from depths of 8-54 m (Griffin & Tranter, 1986).

Hyastenus baru shares with *H. subinermis* (AM P34639; Loh & Ng, 1999: figs. 6-8) a rostrum that is approximately half pcl, no apical tubercles on either the gastric or cardiac elevations, and obscure lateral gastric tubercles. The species differ in the absence of a medial gastric tubercle, and the absence of both proximal and distal spines on all ambulatory pereopods in *H. subinermis*. In *H. subinermis*, the gastric and cardiac regions are both low and not conically elevated as in *H. baru*. *Hyastenus subinermis*, which was shown to be a senior synonym of *H. trispinosus* Rathbun, 1916 by Loh & Ng (1999), is reported from depths of 18-34 m (Griffin & Tranter, 1986; Rathbun, 1916).

The rostrum of *H. uncifer* (AM P34640; Griffin & Tranter, 1986, figs. 38e, f, i, 39c, 42e-g) is equal to the pcl compared to one-half pcl in *H. baru*. Whereas *H. uncifer* does not have strongly elevated cardiac or gastric regions, these regions do have an apical tubercle in contrast to the strong elevation and absence of apical tubercles in *H. baru*. The lateral gastric tubercles are more prominent in *H. uncifer* than in *H. baru* (fig. 1A). *Hyastenus uncifer* is reported from shallower depths (13-15 m) (Griffin & Tranter, 1986) than *H. baru*.

A key to the species of *Hyastenus* is given below, modified from Griffin & Tranter (1986). *Hyastenus* Group 1 species are marked in boldface.

KEY TO THE SPECIES OF THE GENUS *HYASTENUS*

1. Carapace strongly tuberculate; protogastric and mesogastric regions with 13 or more tubercles; cardiac region with 6 or more tubercles 2
– Carapace moderately or weakly tuberculate or smooth; protogastric and mesogastric regions with 0-7 tubercles; cardiac region with 0-5 tubercles 3

2. Preorbital angle of eave not produced, rounded; anterolateral angle of basal antennal article not produced. Tubercles on dorsal part of hepatic region subequal to dorsal branchial tubercles; lateral branchial tubercle sub-equal to branchial tubercle medial to it . . . . . ***H. whitei*** Griffin, 1976
– Preorbital angle of eave sharp, weakly produced or sometimes a short spine; anterolateral angle of basal antennal article produced as a blunt lobe or spine. Tubercles on dorsal part of hepatic region smaller than dorsal branchial tubercles; lateral branchial tubercle or spine higher than branchial tubercle medial to it . . . . . ***H. sebae*** White, 1847

3. Upper orbital hiatus very narrow, U-shaped (almost slit-like), shallow; lower orbital hiatus a shallow slit 4
– Upper orbital hiatus U-shaped or keyhole-shaped, not particularly narrow or shallow; lower orbital hiatus broadly U-shaped 6

4. Mesogastric region with a large tubercle at the summit and a spine or large tubercle on the anterior slope . . . . . *H. aries* (Latreille, 1825)
– Mesogastric region with a tubercle at the summit, the anterior slope smooth or with a low tubercle 5

5. Branchial region with a short lateral branchial spine (0.1 cw) and a tubercle medial and anterior to it ..... ***H. auctus*** Rathbun, 1916
– Branchial region with a robust lateral branchial spine (1/6 to 1/4 cw) but lacking a tubercle medial to the spine ..... *H. elatus* Griffin & Tranter, 1986

6. Lateral margin of basal antennal article with two lobes of similar shape and size, sometimes, but not always parallel 7
– Lateral margin of basal antennal article with anterolateral lobe low narrow (or lacking) and margin behind it with a broad, weak to strong, convexity or lobe or else nearly straight .. 10

7. Rostral spines fused for basal third. Intestinal region with a strong, blunt posterior spine ... . *H. mindoro* Griffin & Tranter, 1986
– Rostral spines separate from the base. Intestinal region with a rounded tubercle, sometimes very low 8

8. Rostral spines very short, about 1/6 pcl. Dorsal branchial margin with 5-9 tubercles, epibranchial tubercle hardly higher than other tubercles ..... *H. fraterculus* Rathbun, 1916
– Rostral spines 1/4 to 1/2 pcl. Dorsal branchial margin with 2-4 tubercles and an epibranchial spine higher than the tubercles 9

9. Cardiac region with a pair of submedial tubercles. Lobes on lateral margin of basal antennal article apically rounded ..... *H. biformis* Rathbun, 1916
– Cardiac region with a medial tubercle. Lobes on lateral margin of basal antennal article subacute ..... *H. scrobiculatus* Rathbun, 1916

10. Anterior half of branchial region with at least 1 dorsal tubercle (sometimes low) 11
– Anterior half of branchial region devoid of tubercles 20

11. Urogastric region with a wide tubercle; mesogastric and protogastric regions with 6 prominent tubercles arranged in a 'Y' ..... ***H. pleione*** (Herbst, 1803)
– Urogastric region smooth; mesogastric and protogastric regions with low tubercles or no more than 4 prominent tubercles 12

12. Branchial submargin with a tubercle above cheliped base and 2-5 submarginal tubercles behind it ..... ***H. hilgendorfi*** De Man, 1887
– Branchial submargin with a tubercle above cheliped base but no other tubercles 13

13. Merus of pereopods 2 and 3 with 2 or 3 spines on extensor margin ..... ***H. baru*** n. sp.
– Merus or pereopods 2 and 3 without spines on extensor margin 14

14. Postorbital lobe long, slender ..... *H. ternatensis* Buitendijk, 1939
– Postorbital lobe short, broad 15

15. Basal antennal article with a deep concavity on the margin behind the anterolateral spine. Lateral protogastric tubercle generally low 16
– Basal antennal article with a shallow concavity on the margin behind the anterolateral spine. Lateral protogastric tubercle generally prominent 17

16. Intestinal region with a medial spine ..... ***H. subinermis*** Zehntner, 1894
– Intestinal region smooth or with a low tubercle ..... *H. convexus* Miers, 1884

17. Rostral spines 1/2 to 2/3 postrostral carapace length; gastric regions strongly elevated with 2 prominent mesogastric tubercles; branchial region with a strong lateral branchial spine directed laterally ..... ***H. ambonensis*** Griffin & Tranter, 1986
– Rostral spines 2/3 to 1 1/3 postrostral carapace length; gastric regions weakly to moderately elevated, mesogastric tubercles low or distinct but not prominent; branchial region with a very short epibranchial spine, sometimes curved forwards 18

18. Hepatic margin and intestinal region each with a spine; anterior branchial region with 1 dorsal tubercle ..... ***H. uncifer*** Calman, 1900

– Hepatic margin and intestinal region with a tubercle; anterior branchial region with 2 dorsal tubercles 19

19. Preorbital spine of eave horizontal; anterior margin of postorbital lobe weakly sinuous. First pleopod of male (G1) with a medial lobe behind apex . . . . . ***H. borradailei*** (Rathbun, 1907)
– Preorbital spine of eave slightly upturned; anterior margin of postorbital lobe nearly straight. First pleopod of male (G1) with a lateral lobe behind the apex . . . ***H. brockii*** De Man, 1887

20. Rostral spines very short; 1/6 to 1/4 pcl . . . . . *H. planasius* (Adams & White, 1848)
– Rostral spines at least 1/3, more usually 1/2 pcl or more 21

21. Mesogastric region with 1-3 tubercles or spines 22
– Mesogastric region smooth 26

22. Branchial region with an epibranchial spine 23
– Branchial region with an epibranchial tubercle or smooth but not with a spine 25

23. Mesogastric region with a large tubercle or spine at the summit and a spine or large tubercle on the anterior slope . . . . . *H. spinosus* A. Milne-Edwards, 1872
– Mesogastric region with a tubercle at the summit, anterior slope smooth or with a very low tubercle 24

24. Rostral spines subparallel; carapace narrow posteriorly (cw = 0.6 pcl) . . . . . *H. espinosus* (Borradaile, 1903)
– Rostral spines divergent; carapace broad posteriorly (cw = 0.7-0.75 pcl) . . . . . *H. diacanthus* (De Haan, 1839)

25. Rostral spines parallel or weakly divergent (distance between tips about 1 1/2 times basal width). Anterolateral angle of basal antennal article not produced . . . . . *H. elongatus* Ortmann, 1893
– Rostral sines strongly divergent from base (distance between tips about 3 times basal width). Anterolateral angle of basal antennal article with a slender spine . . . . . ***H. kyusyuensis*** (Yokoya, 1933)

26. Anterolateral angle of basal antennal article sharp, with a short to moderate spine, sometimes bifid 27
– Anterolateral angle of basal antennal article not produced, rounded, blunt 30

27. Preorbital angle of eave produced further laterally than almost obsolete antorbital angle . . . . . ***H. bispinosus*** Buitendijk, 1939
– Preorbital and antorbital angles of eave about equally produced laterally 28

28. Rostral spines about 2/3 pcl or more; hepatic region with a small tubercle . . . . . *H. cracentis* Griffin & Tranter, 1986
– Rostral spines 1/2 pcl or less; hepatic region smooth 29

29. Antorbital angle of eave rounded. Anterolateral angle of basal antennal article with 1 spine. Epibranchial spine lacking or very small . . . . . ***H. inermis*** (Rathbun, 1911)
– Antorbital angle of eave acute. Anterolateral angle of basal antennal article with 2 spines. Epibranchial spine small but distinct . . . . . ***H. minutus*** Buitendijk, 1939

30. Epibranchial spine robust, about 1/6 to 1/2 cw. Teeth on dactyl of pereopod 5 very small . . . . . *H. campbelli* Griffin & Tranter, 1986
– Epibranchial spine short about 1/12 cw; teeth on dactyl of pereopod 5 robust . . . . . ***H. hendersoni*** (Laurie, 1906)

ACKNOWLEDGEMENTS

We are grateful to Alain Crosnier for the loan of specimens and for his hospitality to STA during visits to the Muséum national d'Histoire naturelle. Amanda Windsor's research at the Australian Museum was supported by an Endeavour Fellowship from the Australian Government (No. 3295_2012).

REFERENCES

CALMAN, W. T., 1909. On decapod Crustacea from Christmas Island, collected by Dr. C. W. Andrews, F.R.S., F.Z.S. Proceedings of the Zoological Society of London: 703-713.

DE MAN, J. G., 1888. Bericht über die von Herrn Dr. J. Brock im Indischen Archipel gesammelten Decapoden und Stomatopoden. Archiv für Naturgeschichte, **53**(1): 289-600, pls. 11-228.

GRIFFIN, D. J. G. & H. A. TRANTER, 1986. The Decapoda Brachyura of the Siboga Expedition. Part VIII: Majidae. Siboga-Expeditie, **39**: 1-335.

LOH, L. W. & P. K. L. NG, 1999. Notes on some southeast Asian species of spider crabs of the genera *Doclea* and *Hyastenus* (Crustacea: Decapoda: Brachyura: Majidae). Raffles Bulletin of Zoology, **47**(1): 59-72.

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, **17**(Supplement): 1-286.

RATHBUN, M. J., 1916. New species of crabs of the families Inachidae and Parthenopidæ. Proceedings of the United States National Museum, **50**: 527-559.

ZEHNTER, L., 1894. Voyage de MM.M. Bedot et C. Pictet dans l'Archipelel Malais. Crustacés de l'Archipel Malais. Revue Suisse de Zoologie et Annales du Musée d'Histoire Naturelle de Genève, **2**: 135-214, pls. VII-IX.

APPENDIX

Comparative material.— *Hyastenus ambonensis* Griffin & Tranter, 1986: AM P34609, 1 spent female paratype (cl 20.0 mm, pcl 14.6 mm, cw 9.3 mm), Ambon Bay, Ambon, 90 m, dredge, stones, sand, Danish Kei Islands Expedition, 3 Mar 1922. — *Hyastenus borradailei*: AM P13893, 2 males (cl 9.2 mm, pcl 6.1 mm, cw 4.0 mm; cl 16.2 mm, pcl 8.8 mm, cw 5.5 mm), Ninety Mile Beach between Cape Jaubert and Wallal, Western Australia, 9 m, dredge, coll. A. A. Livingstone, Sep 1929; AM P24104, 1 male (cl 19.8 mm, pcl 9.3 mm, cw 6.1 mm), 1 female (cl 19.4 mm, pcl 9.0 mm, cw 5.9 mm), Broadhurst Reef, Townsville, Queensland, on hydroid (?*Solanderia* sp.), 10.5 m, coll. I. Loch, 11 Oct 1975. — *Hyastenus brockii* De Man, 1887: AM P34617, 1 female (cl 11.6 mm, pcl 7.3 mm, cw 4.9 mm), Ambon Reef, Ambon, Siboga Expedition; AM P34618, 1 female (cl 11.6 mm, pcl 6.4 mm, cw 4.0 mm), Banda, off Waling, ~15 m, sand, Danish Kei Islands Expedition, 15 May 1922; AM P34616, 1 male (cl 10.9 mm, pcl 6.2 mm, cw 4.1 mm), bank between Bahuluwang and Tambulungen islands, Salayer, south Sulawesi, 8-10 m, dredge, dead coral, *Halimeda*, lithithamnion, Siboga sta. 66, 7-8 May 1899. — *Hyastenus subinermis* Zehntner, 1894: AM P34639, 1 male (cl 12.0 mm, pcl 8.1 mm, cw 5.6 mm), 1 ovigerous female (cl 16.1 mm, pcl 11.4 mm, cw 8.1 mm), Ambon reef, Ambon, Siboga Expedition. — *Hyastenus uncifer* Calman, 1909: AM P34640, 1 male (cl 11.7 mm, pcl 5.7 mm, cw 3.6 mm), off Neira Banda, 13 m, sand, Danish Kei Islands Expedition, coll. Dykker, 12 Jun 1922.

First received 20 December 2012.
Final version accepted 9 March 2013.