



***Periclimenaeus parkeri* sp. nov. (Crustacea: Decapoda: Pontoniinae) from the Kimberley, Western Australia**

Alexander J. BRUCE

Crustacea Section, Queensland Museum, P. O. Box 3300, South Brisbane, Queensland 4101, Australia
E-mail: abruce@broad.net.au

Abstract: *Periclimenaeus parkeri* sp. nov. (Crustacea: Decapoda: Pontoniinae), a shrimp from the Kimberley, Western Australia, is described and illustrated. The single specimen was found off Cassini Island, at 12 m, in an unidentified ascidian host. The new species has the fingers of both second pereopods with a molar process and fossa mechanism, a character that necessitates a minor revision of the definition of the genus *Periclimenaeus* Borradaile, 1915. A key to distinguish the new species from similar taxa is provided.

Résumé : *Periclimenaeus parkeri* sp. nov. (Crustacea : Decapoda : Pontoniinae), une crevette du Kimberley, Australie Occidentale. *Periclimenaeus parkeri*, sp. nov. (Crustacea : Decapoda : Pontoniinae) provenant du Kimberley, Australie Occidentale, est décrite et illustrée. L'unique spécimen a été trouvé près de l'île Cassini, à 12 m, dans un hôte ascidien non-identifié. Les doigts des deux seconds périopodes de la nouvelle espèce possèdent un mécanisme de processus molaire et fossa, un caractère qui nécessite une révision mineure du genre *Periclimenaeus* Borradaile, 1915. Une clé pour distinguer la nouvelle espèce des taxa similaires est donnée.

Keywords: *Periclimenaeus parkeri* • New Species • Crustacea • Decapoda • Pontoniinae • Western Australia • Ascidian host

Introduction

The shrimp genus *Periclimenaeus* Borradaile, 1915, is the second most speciose genus of the subfamily Pontoniinae, with 54 species reported from the Indo-West Pacific region and a further 15 from the East Pacific and Atlantic region. At generic level the morphology of the various species is

very consistent, the diagnostic character being the presence of well developed unequal dissimilar chelae on the second pereopods with the dactylus of the major chela bearing a distinct molar process that opposes into a fossa on the fixed finger. These features are lacking in the minor second pereopod in which the dactylus is generally compressed with an entire or denticulate cutting edge.

More recently a single specimen of another species of *Periclimenaeus* has been collected from Cassini Island, in the northern Kimberley region of Western Australia by Andrew Hosie, during the Western Australian Museum

2010 Kimberley Survey, sponsored by Woodside Energy. The specimen is a typical *Periclimenaeus* with the exception of one unique feature, the minor second pereiopod, which bears a small but distinct dactylar molar process, with an opposing fossa on the fixed finger. The specimen can not be referred to any other described pontoniine genera and in view of its otherwise close conformity to the other species of *Periclimenaeus* it is retained in that genus, necessitating a small modification to the generic definition. This new species is now described and illustrated. The holotype is deposited in the collection of the Western Australian Museum, Perth.

Abbreviations used: CL, post-orbital carapace length, WAM, Western Australian Museum, Perth.

Systematics

Palaemonidae Rafinesque, 1815

Pontoniinae Kingsley, 1879

Periclimenaeus Borradaile, 1915

***Periclimenaeus parkeri* sp. nov.**

(Figs 1-5)

Material examined

1 post-ovigerous ♀, holotype, dissected, Western Australia, Cassini Island, stn 34/K10-T1, 13°55.926'S-125°37.094'E, 16 October 2010, coll A. Hosie, scuba, 12 m, *ex* ascidian, WAM40287.

Diagnosis

Rostrum slender, exceeding proximal segment of antennular peduncle, dorsal teeth slender, dentition 4/0, without supraorbital teeth or tubercles, first abdominal somite with small broad anterodorsal lobe, proximal segment of antennular peduncle with small distolateral tooth, scaphocerite with small distolateral tooth, not exceeding lamella, first pereiopod chela with fingers slightly shorter than palm, spatulate, slender, tapering distally, cutting edges entire, major second pereiopod dactyl with massive molar process, distal cutting edge short, entire, merus with acute tubercles ventrally, minor second pereiopod with dactyl extending well beyond tip of fixed finger, distal cutting edge denticulate, with 26 small uniform denticles, proximal cutting edge with distinct small molar process, fixed finger with corresponding fossa proximally, third pereiopod with biunguiculate dactyl, corpus with accessory tooth remote from unguis, with acute proximal tooth, propod with two distoventral and four ventral spines, telson with two pairs of well developed dorsal spines at about 0.2 and 0.55 of telson length.

Description

A small sized pontoniine shrimp of subcylindrical body form.

Rostrum (Fig. 1A) slender compressed, horizontal, reaching to about middle of intermediate segment of antennular peduncle, 0.45 of CL, with four long slender acute teeth dorsally, all pre-orbital, interdental spaces with 4-5 slender simple setae, longer than dorsal teeth, tip short, acute, proximally convex with several dorsal setae, ventral margin concave, unarmed, non-setose.

Carapace (Fig. 1B) smooth, posterior margin slightly elevated, with sulcus anterior to posterior transverse carina, cardiac region slightly inflated (Figs 1G & 5A), without supraorbital teeth or tubercles, orbit feebly developed, inferior orbital angle obsolete, antennal tooth (Fig. 1A) well developed, marginal, slender, acute, extending beyond anterolateral margin of carapace, anterolateral margin not produced, broadly rounded. Well-developed ovary visible.

Abdomen with first somite with broad, narrow transverse anteromedian lobe (Figs 1G & 5A), and first five somites with broadly rounded pleura, sixth somite (Fig. 1H) depressed, dorsal length about 0.25 of CL, posterolateral angle acute, posteroventral angle larger, recurved and acute.

Telson (Fig. 1I) about 0.65 of CL, 2.1 times longer than anterior width, lateral margins straight, convergent to broadly convex posterior margin, about 0.45 of anterior margin width, without median process, with subequal pairs of dorsal spines (Fig. 5E), about 0.1 of telson length, at about 0.2 and 0.55 of telson length, anterior pair submarginal, posterior pair marginal, posterior spines (Fig. 5D) well developed, lateral spines similar to dorsal spines, intermediate spines robust, about 0.25 of telson length, submedian spines slender, 1.17 times intermediate spine length, 0.29 of telson length.

Antennule (Fig. 1C) with proximal segment of peduncle about twice as long as wide, medial margin straight, non-setose, with stout ventromedial tooth at about half length, distolateral angle with strong tooth, lateral margin expanded centrally, non-setose, stylocerite acute, reaching to about half segment length, projecting laterally, statocyst normal; intermediate segment about 0.3 of proximal segment length, with similar distal segment, about 1.9 times intermediate segment length, upper flagellum biramous, with about 12 groups of aesthetascs, five proximal segments fused, short ramus with single segment, long ramus with five segments, lower flagellum slender with about ten segments.

Antenna (Fig. 1D) with coxal segment with well developed median tubercle, basicerite unarmed, carpoperite subcylindrical, about 5.0 times longer than wide, extending well beyond scaphocerite; scaphocerite (Fig. 1E) about 2.5 times longer than maximal width, at about 0.85 of length,

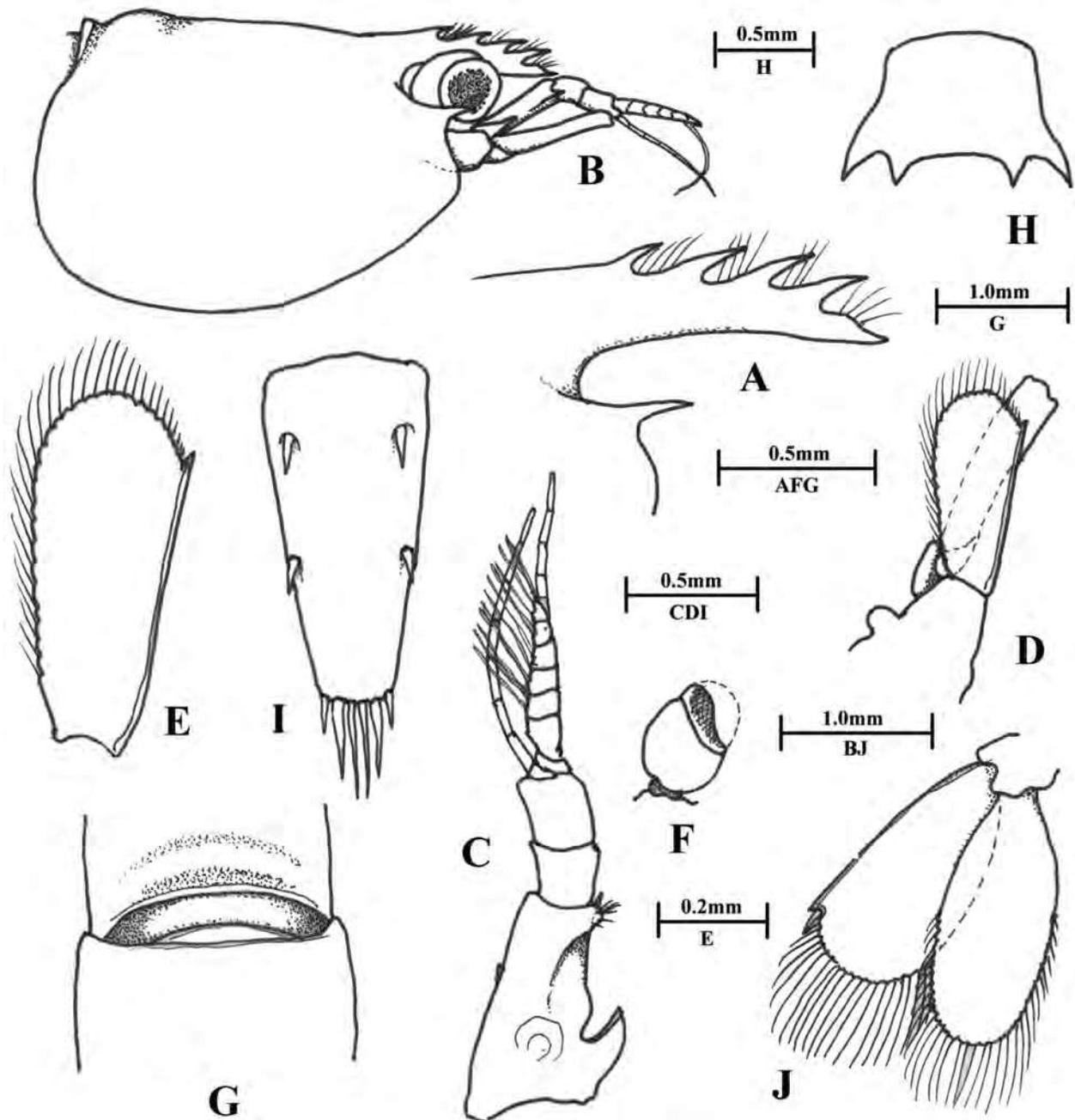


Figure 1. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. A. Rostrum. B. Carapace, antennae and eye. C. Antennule. D. Antenna. E. Scaphocerite. F. Eye. G. Posterior carapace and first abdominal tergite, dorsal. H. Sixth abdominal tergite, dorsal. I. Telson. J. Uropod.

Figure 1. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. A. Rostre. B. Carapace, antennes et œil. C. Antennule. D. Antenne. E. Scaphoc rite. F.  il. G. Carapace post rieure et premier tergite abdominal, vue dorsale. H. Sixi me tergite abdominal, vue dorsale. I. Telson. J. uropode.

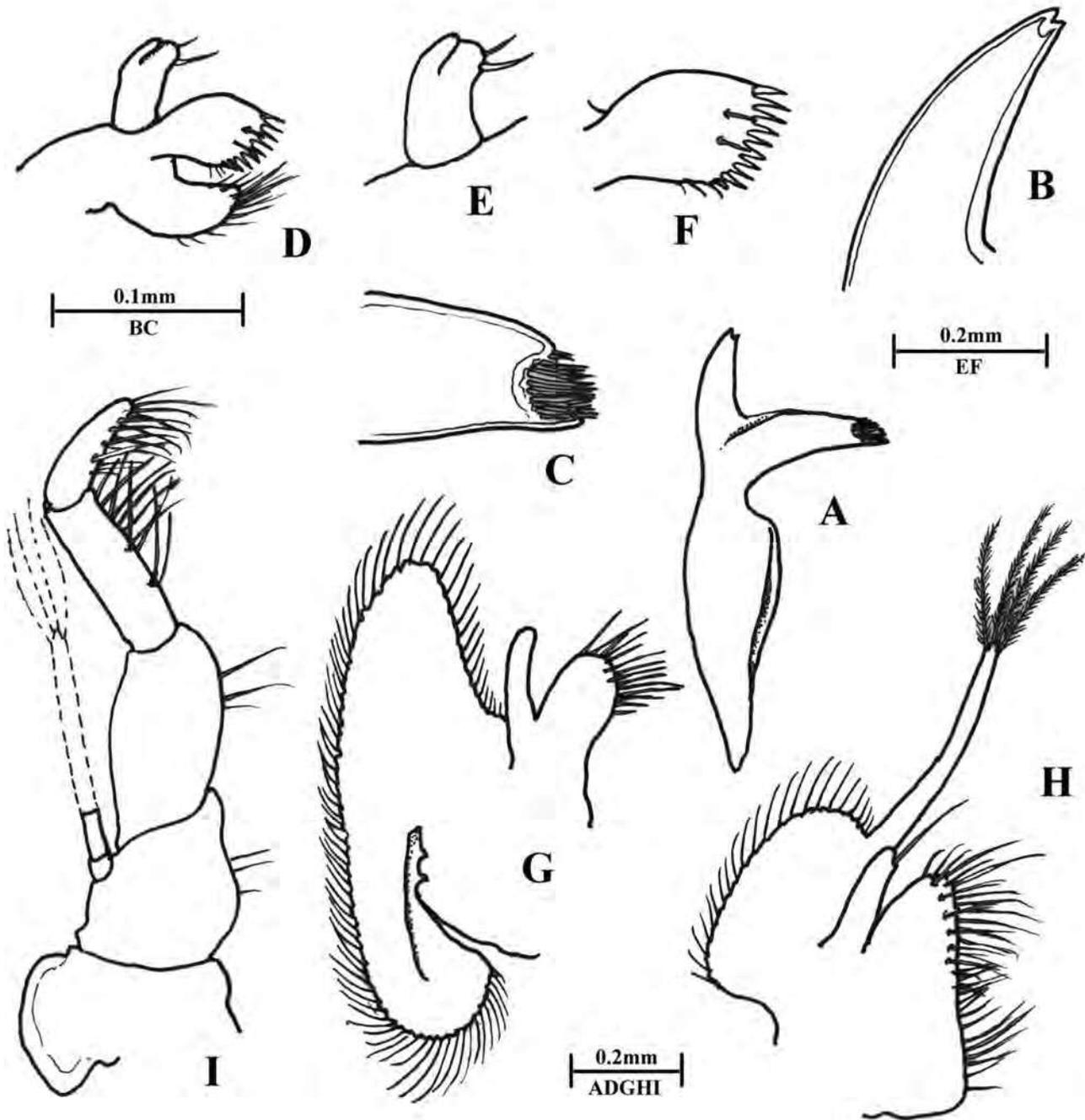


Figure 2. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** Mandible. **B.** Same, incisor process. **C.** Same, molar process. **D.** Maxillula. **E.** Same, palp. **F.** Same, distal upper lacinia. **G.** Maxilla. **H.** First maxilliped. **I.** Third maxilliped.

Figure 2. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** Mandibule. **B.** Idem, partie incisive. **C.** Idem, partie molaire. **D.** Maxillule. **E.** Idem, palpe. **F.** Idem, lacinie supérieure distale. **G.** Maxille. **H.** Premier maxillipède. **I.** Troisième maxillipède.

tapering proximally, anterior margin broadly rounded, lateral margin straight, with small acute tooth at about 0.83 of length.

Eye (Fig. 1F) with well pigmented hemispherical cornea, diameter about 0.2 of CL, oblique, stalk globular, about as long as wide.

Mandible (Fig. 2A) with slender corpus, without palp; incisor process (Fig. 2B) slender, tapering distally, feebly bidentate; molar process (Fig. 2C) slender, tapering and obliquely truncate distally, with two small acute teeth posteriorly and numerous peripheral spinules.

Maxillula (Fig. 2D) with feebly bilobed palp (Fig. 2E), lower lobe with small upper spinule and larger simple lower spinule; upper lacinia (Fig. 2F) broad, distally truncate, with nine robust simple marginal spines, mostly fully fused with lacinia, and two smaller submarginal spines; lower lacinia with several long simple spines distally and shorter spines ventrally.

Maxilla (Fig. 2G) with simple non-setose palp, about 4.0 times longer than basal width; distal endite simple, slightly longer than wide, rounded, with 14 finely setulose distal setae; proximal endite obsolete, coxal margin convex; scaphognathite 2.5 times longer than wide, anterior lobe 1.2 times longer than basal width, medial margin feebly concave, posterior lobe 3.0 times longer than basal width, subequal to anterior lobe length.

First maxilliped (Fig. 2H) with palp about 2.5 times longer than basal width, tapering slightly distally, with well developed preterminal sparsely setulose seta medially; basal endite bluntly angular with numerous sparsely setulose marginal and submarginal spiniform setae; exopod with broad caridean lobe, flagellum slender with four plumose terminal setae; epipod lost in dissection.

Second maxilliped lost in dissection.

Third maxilliped (Fig. 2I) with endopod short, robust; ischiomerus fully distinct from basis, short, stout, about twice as long as broad, with sparse simple setae medially; carpal segment about 0.8 of ischiomerus segment length, subcylindrical, 3.0 times longer than wide, with groups of long sparsely setulose spines medially; distal segment about 0.6 of ischiomerus segment length, 3.3 times longer than wide, tapering slightly distally terminally rounded, with groups of long densely denticulate spines medially; basis obliquely articulated with ischiomerus, robust, 1.2 times longer than broad, medial margin bi-concave, sparsely setose; coxal segment with short convex medial margin, with well developed lateral plate; without arthrobranch.

First pereopod (Fig. 4A) slender, exceeding carapocerite by carpus and chela; chela (Fig. 4B) subcylindrical, with palm oval in section, about 2.6 times longer than central width, non-setose, fingers 0.7 of palm length, slender, distally rounded, narrowly spatulate, cutting edges entire, dactyl (Fig. 4C) with two small acute hooked teeth distally,

fixed finger with single tooth, with several groups of short finely serrulate setae; carpus subequal to chela length, 4.7 times longer than distal width, tapering proximally; merus 1.15 times chela length, 5.8 times longer than maximal width proximally, tapering distally; ischium 0.75 of chela length 3.0 times longer than broad; basis without special features; coxa (Fig. 4D) with stout acute sparsely setose preterminal distoventral process.

Major second pereopod (Fig. 3A) with massive chela, about 2.8 times CL, palm subcylindrical, oval in section, smooth, glabrous, about 2.2 times longer than deep, dactylus (Fig. 3B) stout, about 0.43 of palm length, twice as long as greatest depth, semicircular with strongly convex dorsal margin and stout hooked distal tip, cutting edge with very large molar process extending along whole edge with distal cutting edge obsolete, posterior cutting edge deeply notched proximally to molar process, molar process with sparse setae, fixed finger (Fig. 3B) 1.3 times longer than basal depth, subequal to dactylus length, cutting edge with deep fossa over proximal third, extending posteriorly below the hinge region, flanked by smaller angular medial process and much larger broader lateral process, distal cutting edge entire, blunt, tip small, blunt; carpus short, about 0.26 of palm length, about 1.1 times longer than distal width, feebly excavate distally, strongly tapered proximally, unarmed; merus (Fig. 3C) about 0.35 of palm length, twice as long as wide, tapering slightly proximally, with five small acute ventral tubercles; ischium 0.28 of palm length, 1.7 times longer than distal width, tapering strongly proximally, unarmed; basis and coxa robust, without special features.

Minor second pereopod (Fig. 3D) with small chela, about 1.4 of CL, 0.46 of major chela length, palm subcylindrical, oval in section, smooth, glabrous, about 2.4 times longer than deep, tapering slightly distally, dactylus (Fig. 3E & F) about 0.34 of palm length, tip extending well beyond end of fixed finger, 2.2 times longer than depth at molar process level, dorsal margin feebly convex, tip bluntly rounded, cutting edge (Fig. 3G) with well defined low molar process proximally, distal cutting edge feebly concave, minutely denticulate with about 26 rounded, distally abraded denticulations; fixed finger (Fig. 3E & F) much shorter than dactylus, 1.4 times longer than basal width, with well developed fossa proximally, distal cutting edge thickened, entire; carpus 0.38 of palm length, 1.7 times longer than wide, tapering strongly proximally, unarmed; merus half palm length, 2.8 times longer than wide, with five minute acute ventral tubercles; ischium subequal to carpal length, 2.2 times longer than distal width, tapering slightly proximally, unarmed; basis and coxa without special features.

Third pereopod (Fig. 4E) robust, dactyl (Figs 4G & 5B) compressed, dorsal length about 0.16 of propod length,

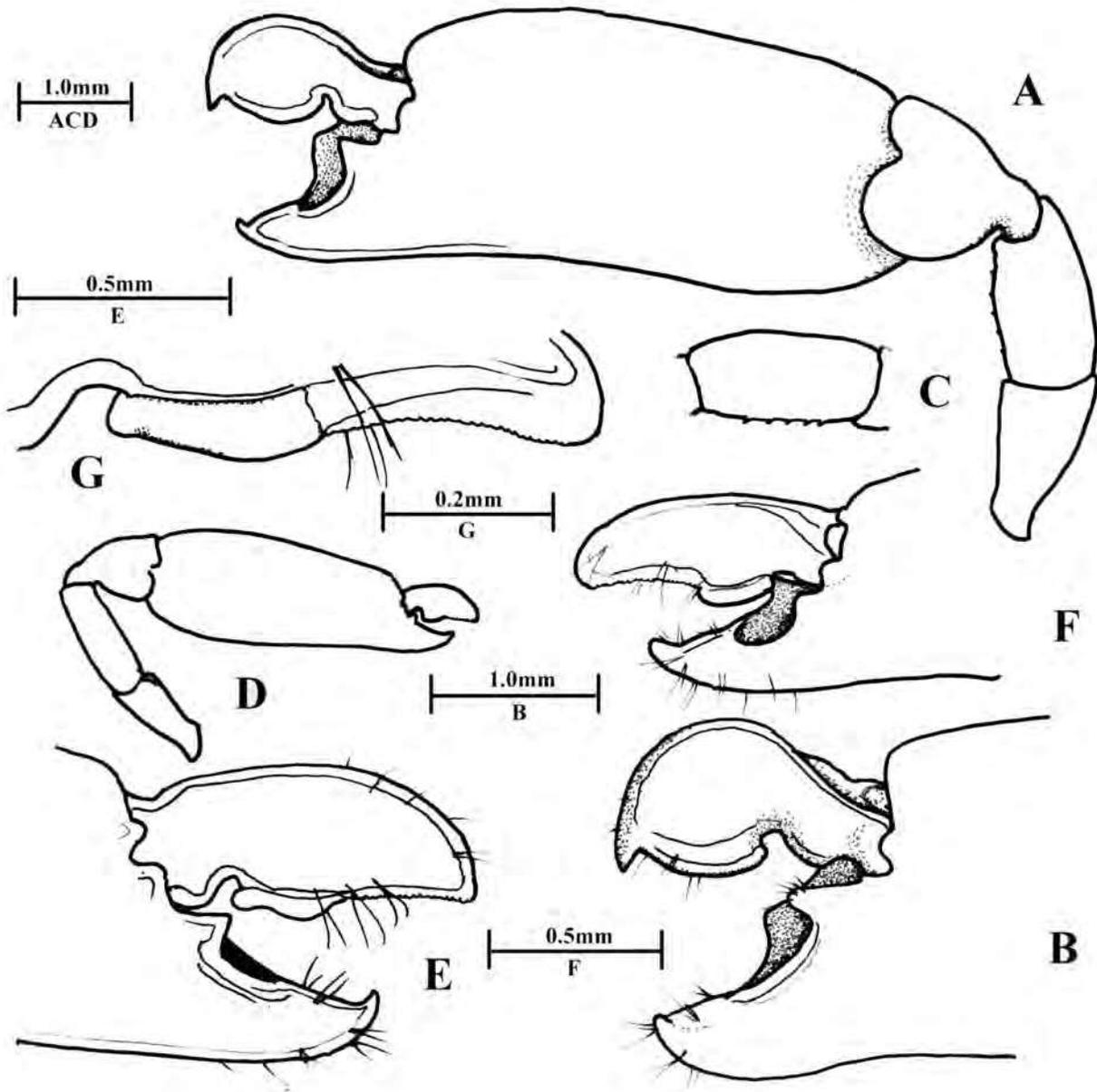


Figure 3. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** Major second pereiopod. **B.** Same, fingers, medial. **C.** Same, merus. **D.** Minor second pereiopod. **E.** Same, fingers, medial. **F.** Same, lateral. **G.** Same, dactylar cutting edge.

Figure 3. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** Second péréiopode principal. **B.** Idem, doigts, vue médiane. **C.** Idem, merus. **D.** Second péréiopode mineur. **E.** Idem, doigts, vue médiane. **F.** Idem, vue latérale. **G.** Idem, extrémité tranchante du dactyle.

unguis short stout curved, unarmed, about 2.5 times longer than basal width, 0.5 of dorsal corpus marginal length, corpus short, broad, length about 0.95 of basal width, ventral margin with large triangular preterminal tooth distally, with slender subacute process (Fig. 5C) proximally, bearing slender styliform terminal spinule, with distolateral sensory setae medially and laterally; propod

(Fig. 4F) about 0.42 of CL, 4.0 times longer than proximal width, tapering distally, distal width 0.4 of proximal width, with pair of well developed distoventral spines, longer spine about 1.18 times length of dorsal dactylar corpus, ventral margin with four spines of diminishing size proximally, at 0.19, 0.3, 0.58 and 0.85 of propod length, sparsely setose; carpus about 0.78 of propod length, 3.5

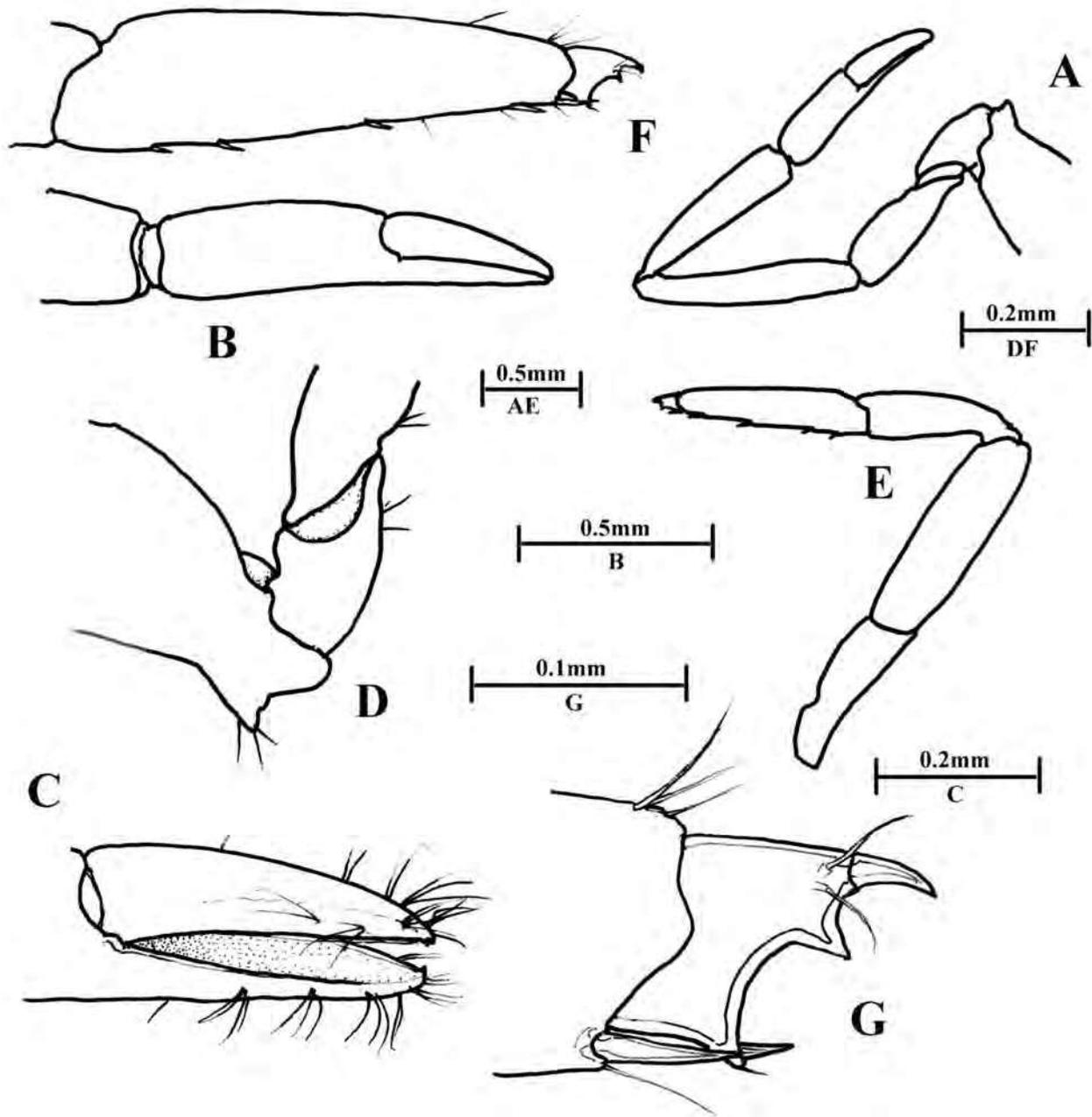


Figure 4. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** First pereopod. **B.** Same, chela. **C.** Same, tips of fingers. **D.** Same, baso-coxal articulation. **E.** Third pereopod. **F.** Same, propod and dactyl. **G.** Distal propod and dactyl.

Figure 4. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** Premier péréiopode. **B.** Idem, pince. **C.** Idem, extrémité des doigts. **D.** Idem, articulation baso-coxale. **E.** Troisième péréiopode. **F.** Idem, propode et dactyle. **G.** Partie distale du propode et dactyle.

times longer than distal width, tapering proximally, unarmed, merus 1.25 times propod length, 3.8 times longer than broad, unarmed; ischium 0.9 of propod length, unarmed; basis and coxa without special features.

Fourth pereopod similar to third, dactyl identical, propod of similar length to third but more slender, spinulation 2 : 1 : 1 : 1 : 1.

Fifth pereopod similar to third, dactyl identical, propod

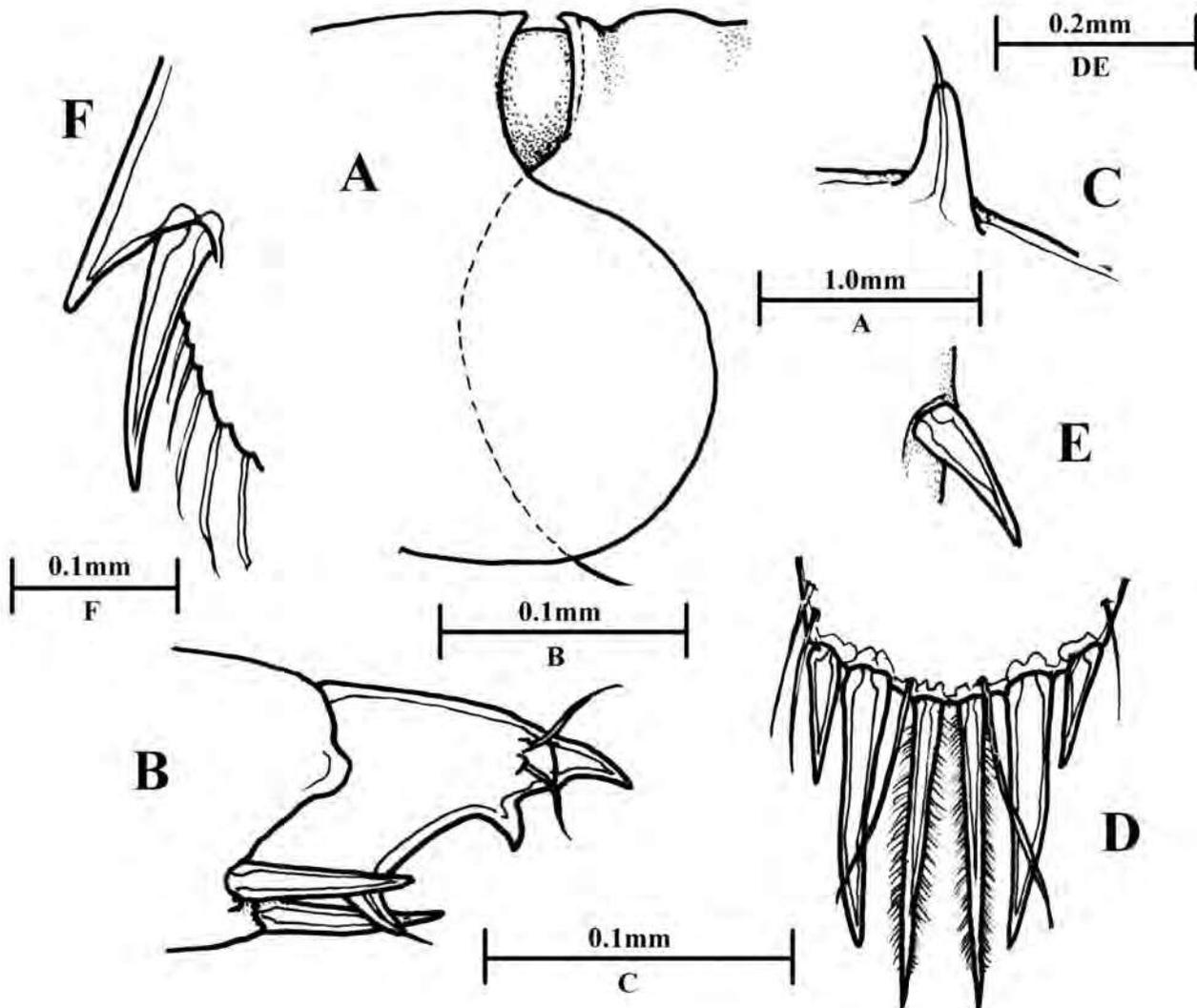


Figure 5. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** Articulation of posterior carapace and first abdominal somite. **B.** Third pereopod dactyl, oblique. **C.** Same, proximal ventral process of corpus. **D.** Posterior telson spines. **E.** Right dorsal telson spine. **F.** Exopod of uropod, posterolateral angle.

Figure 5. *Periclimenaeus parkeri*, sp. nov., holotype ♀, Cassini Island, WAM40287. **A.** Articulation de la carapace postérieure et premier somite abdominal. **B.** Dactyle du troisième péreopode, vue oblique. **C.** Idem, partie ventrale proximale du corpus. **D.** Epines postérieures du telson. **E.** Epine dorsale droite du telson. **F.** Exopode de l'uropode, angle postéro-latéral.

about 1.3 times third propod length, slender, with single distoventral spine and single distal ventral spine and numerous distoventral setae.

Pleopods without special features.

Uropod (Fig. 1J) with rami extending well beyond telson; protopod posterolaterally unarmed; exopod twice as long as broad, lateral margin straight, sparsely setose, with small acute tooth (Fig. 5F) at 0.85 of length with large slender spine medially, without diaeresis; endopod subequal to exopod length, 2.4 times longer than broad.

Measurements (mm)

Post-orbital carapace length, 2.7; carapace and rostrum, 3.5; total body length (approx.), 10.7 ; major second pereopod chela, 3.4; minor second pereopod chela, 2.7.

Host

Unidentified ascidian.

Colouration

No data.

Systematic position

Periclimenaeus parkeri sp. nov. is readily distinguished from all other species of the genus by the presence of a molar process and opposing fossa on the fingers of the minor second pereopod.

Periclimenaeus parkeri sp. nov. is most closely related to those species of the genus characterised by the presence of denticulations on the cutting edge of the minor second pereopod and the third pereopod dactyl biunguiculate with an acute basal process on the corpus. These species have been noted by Fransen (2006) as being generally associated with ascidian hosts, with the proviso that the hosts of some species remain as yet unknown. *Periclimenaeus parkeri* sp. nov. conforms to this association.

Key to related Indo-West Pacific species

Minor second pereopod dactylar cutting edge distally denticulate, third ambulatory dactyl biunguiculate, corpus with acute proximal tooth or process, otherwise unarmed.

1. Rostrum with one sub-distal ventral tooth; dactylus of minor second pereopod with minute teeth at proximal end of cutting edge only; dactylus of ambulatory pereopods more slender, with distal accessory tooth of corpus sub-terminal; R 5/1*P. manihinei* Bruce, 1976
– Rostrum without ventral teeth.....2
2. Carpus of third pereopod with robust articulated distal spine; basal tooth of corpus of third pereopod dactyl very long and slender*P. devaneyi* Bruce, 2010
– Carpus of third pereopod unarmed3
3. Major second pereopod dactyl with distal cutting edge unarmed4
– Major second pereopod dactyl with distal cutting edge denticulate6
4. Minor second pereopod fingers with small molar process and fossa*P. parkeri* sp. nov.
– Minor second pereopod fingers without molar process and fossa5
5. Third pereopod dactyl short, stout, with well developed accessory tooth, remote from unguis, separated by short straight interval from slender anteroverted styliform basal tooth*P. wolffi* Bruce, 1993
– Third pereopod dactyl longer, slender, with small accessory tooth, adjacent to unguis, separated by longer concave interval from acute basal tooth.....*P. fawatu* Bruce, 2006
6. Third pereopod dactyl with basal tooth bearing slender

terminal stylus, separated from well developed accessory tooth by short concave ventral margin, third pereopod propod with distoventral spines only, dorsal telson spines at 0.5 and 0.8 of telson length....*P. tridentatus* (Miers, 1884)

– Third pereopod dactyl with basal tooth lacking terminal stylus, separated from well developed accessory tooth by long straight ventral margin, third pereopod propod with distoventral and ventral spines, dorsal telson spines at 0.2 and 0.6 of telson length.....*P. creefi* Bruce, 2010

Etymology

Named in recognition of the skills of Dr David Parker, surgeon, Gold Coast Hospital, Queensland, and his colleagues, without whose expertise this contribution would not have been prepared.

Remarks

The brief original designation of the genus *Periclimenaeus* makes no reference to the second pereopods (Borradaile, 1915) and included two species *P. robustus* Borradaile, 1915 and *P. fimbriatus* Borradaile, 1915, the latter now placed in the genus *Paraclimenaeus* Bruce (Bruce, 2009). An expanded definition was later provided by Borradaile (1917), reporting the larger chela “with the moveable (finger) very wide with a process that fits into a hollow on the fixed finger”. The smaller chela has the fingers “with simple edges”. Kemp (1922) regarded *Periclimenaeus* as a subgenus of *Periclimenes* Costa and does not mention the second pereopod chelae. Holthuis (1952) provides a detailed definition of the genus but follows Borradaile with regard to the major chela and notes that the minor chela is “shorter and more slender, it is differently built”, that is, it lacks the process and fossa on the fingers. Holthuis (1955 & 1993), and Chace & Bruce (1993) in their keys and diagnoses of the genus, make no mention of the minor second pereopod. Bruce (1995) does mention the minor second pereopod as having “fingers variable, simple or dentate”. The discovery of *P. parkeri* sp. nov. therefore indicates that the definition of the genus *Periclimenaeus* needs modification, which is provided below, to enable it to include species in which the fingers of both second pereopod chelae are provided with a dactylar molar process and opposing fixed finger fossa.

A revised definition of the genus *Periclimenaeus* Borradaile, 1915

(adapted from Bruce, 1995).

Small, generally stoutly built or swollen bodied shrimps of subcylindrical body form. Rostrum small, dorsal carina dentate, ventral carina with or without teeth, lateral carinae

variable. Carapace smooth, glabrous, inferior orbital angle feeble or obsolete, orbit generally feebly developed, supra-orbital spines or tubercles present or absent, epigastric and hepatic teeth absent, antennal tooth present, anterolateral angle of branchiostegite rounded. Abdomen smooth, glabrous, often swollen; pleura with posterior margins rounded. Telson with two pairs of dorsal spines, three pairs of posterior spines. Antennule normal, upper flagellum with short ramus reduced. Antenna with basicerite unarmed, scaphocerite well developed, occasionally reduced. Eye normal, with globular cornea. Epistome unarmed. Mandible normal, without palp, molar process generally robust, bluntly dentate, incisor process variable, sometimes reduced, usually tridentate, sometimes broad, minutely denticulate; maxillula with palp simple or bilobed, laciniae slender or broadened; maxilla with simple palp, basal endite simple, bifid or bilobed, scaphognathite well developed; first maxilliped with short simple palp, basal endite broad, coxal endite distinct or obsolete, exopod with caridean lobe broad, flagellum with plumose terminal setae, epipod bilobed; second maxilliped with endopod normal, exopod with plumose terminal setae, epipod sub-rectangular, without podobranch, occasionally absent(?); third maxilliped with endopod generally robust, ischiomerus and basis fused, exopod well developed with plumose terminal setae, coxa stout, with oval lateral plate, arthrobranch rudimentary or absent. Fourth thoracic sternite without median process. First pereopods slender or robust, chela with fingers simple, slender or subspatulate, cutting edges entire or pectinate. Second pereopods well developed, chelae generally grossly unequal, dissimilar, one greatly enlarged, dactylus bearing molar process, fixed finger with opposing fossa; minor chelae with fingers variable, simple or dentate, rarely with molar process and fossa. Ambulatory pereopods slender, robust or stout, dactyls variable, generally short, stout, biunguiculate, occasionally long, slender, frequently with accessory ventral denticles, with or without acute or blunt basal process. Uropod with protopodite unarmed, exopod of uropod laterally spinulate, denticulate or unarmed, with distolateral tooth with spine medially.

Acknowledgements

I am most grateful to Andrew Hosie for the opportunity to report on this interesting pontonine shrimp, collected during the Western Australian Museum Kimberley Survey 2010, funded by Woodside Energy. This study was also supported by the Australian Biological Resources Study.

References

- Borradaile L.A. 1915.** Notes on Carides. *Annals and Magazine of Natural History*, **15**: 205-213.
- Borradaile L.A. 1917.** On the Pontoninae. 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, Zoology*, **17**: 323-396, pls. 52-57.
- Bruce A.J. 1995.** A synopsis of the Indo-West Pacific genera of the Pontoninae (Crustacea: Decapoda: Palaemonidae). *Theses Zoologicae*, **25** (1994): 1-172, figs 1-69.
- Bruce A.J. 2009.** Notes on some Indo-Pacific Pontoninae, XLVII. Re-evaluation of the genera *Apopontonia* Bruce, 1976, *Paraclimenaeus* Bruce, 1988 and *Climeniperaeus* Bruce, 1996. *Crustaceana*, **82**: 493-504, figs 1-2.
- Chace F.A. Jr. & Bruce A.J. 1993.** The Caridean Shrimps (Crustacea: Decapoda) of the *Albatross* Philippine Expedition 1907-1910, Part 6: Superfamily Palaemonoidea. *Smithsonian Contributions to Zoology*, **543**: i-vii, 1-252, figs. 1-23.
- Fransen C.H.J.M. 2006.** On Pontoninae (Crustacea, Decapoda, Palaemonidae) collected from ascidians. *Zoosystema*, **28**: 713-746, figs 1-18.
- Holthuis L.B. 1952.** The Decapoda of the *Siboga* Expedition. Part XI. The Palaemonidae collected by the *Siboga* and *Snellius* Expeditions with remarks on other species. II. Subfamily Pontoninae. *Siboga Expedition Monograph*, **39a 10**: 1-252, figs, 1-110, tab. 1.
- Holthuis L.B. 1955.** The recent genera of the Caridean and Stenopodidean shrimps (Class Crustacea, Order Decapoda, Supersection Natantia) with keys for their determination. *Zoologische Verhandelingen, Leiden*, **26**: 1-157, figs. 1-105.
- Holthuis L.B. 1993.** The recent genera of the caridean and stenopodidean shrimps (Crustacea, Decapoda) with an appendix on the order Amphionidacea. *Nationaal Natuurhistorisch Museum, Leiden*, 1-328, figs 1-312.
- Kemp S. 1922.** Notes on Crustacea Decapoda in the Indian Museum. XV. Pontoninae. *Records of the Indian Museum*, **24**: 113-288, figs. 1-105, pls. 3-9.