



## ***Palaemonella dijonesae* sp. nov. (Crustacea: Decapoda: Pontoniinae) from Western Australia\***

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A recent publication by Bruce (2008a) reported the presence of *Palaemonella spinulata* Yokoya, 1936 in the Dampier Archipelago, Western Australia. This report noted that “The holotype specimen from Misaki, Japan, is considered to be lost (Holthuis 1952; Bruce 1970; Okuno pers. comm.). The designation of a neotype would appear useful but one from Japanese or nearby waters would be more appropriate than one of the present specimens”. The brief description provided by Yokoya (1936), with only a single figure showing the whole specimen, antennule, antenna, mandible, second maxilliped and posterior telson, is inadequate for comparison with other species of the genus. This deficiency has now been rectified by Hayashi (2009) who has provided a detailed and well illustrated description of *P. spinulata* and designated a neotype from Sagami Bay, near Misaki, the type locality. This re-description immediately indicated that the Western Australian specimens were not conspecific and they are now described as a new species. The specimens are held in the collections of the Western Australian Museum, Perth.

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

### **Systematic account**

#### **Palaemonidae Rafinesque, 1815**

#### **Pontoniinae Kingsley, 1879**

#### ***Palaemonella* Dana, 1852**

#### ***Palaemonella dijonesae* sp. nov.**

(Fig. 1)

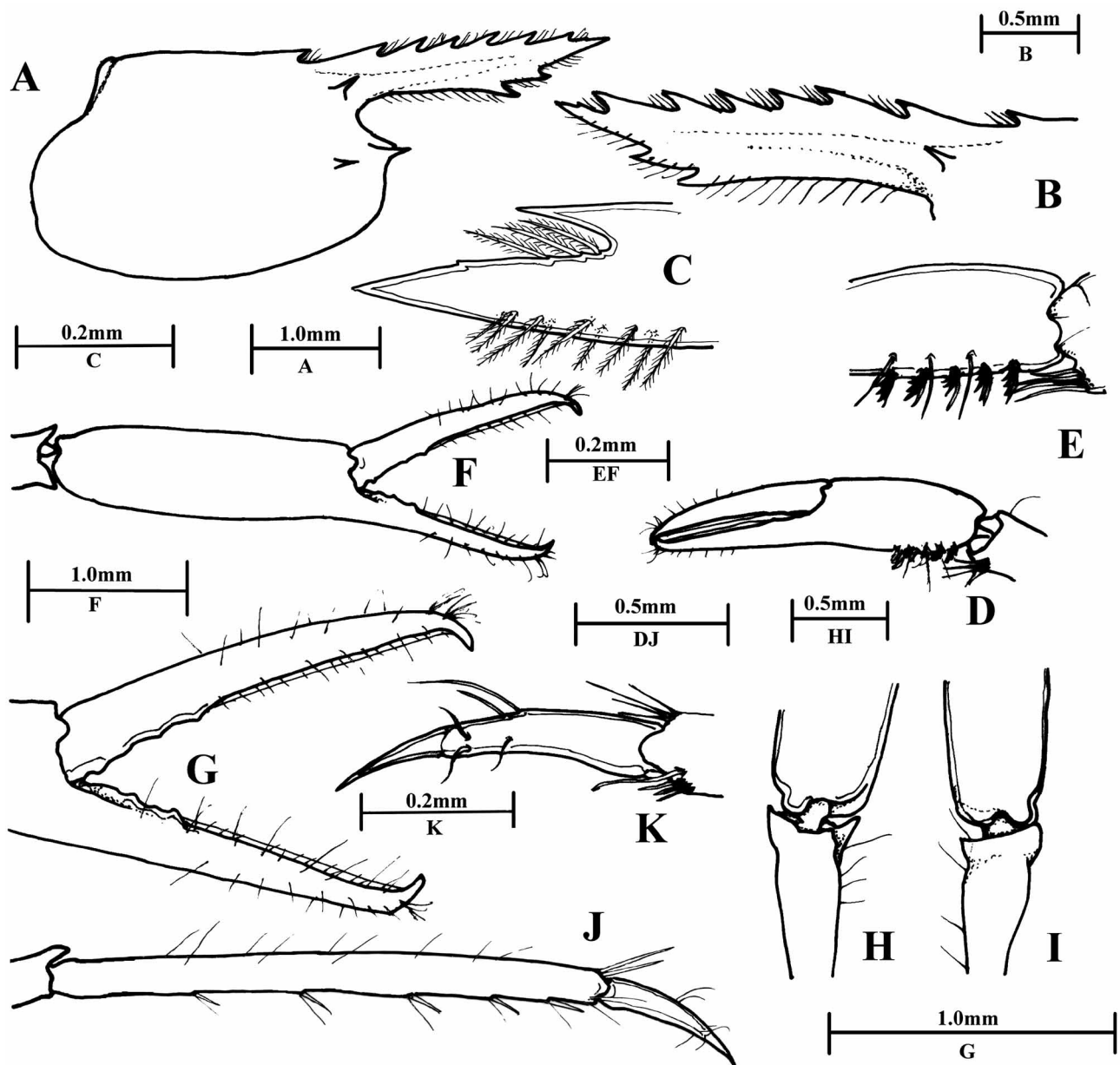
*Palaemonella spinulata*. — Bruce, 2008a: 107–108, figs 2–3.

**Material examined.** Holotype, ov. female WAM C29308, Rocky Head, Enderby Island, Dampier Archipelago, stn DA2/99/73, 20°40'14"S, 116°27'96"E, 12.5 m, 24 July 1999; paratype male, WAM C28094, Nelson Rocks, Dampier Archipelago, stn DA3/99/68, 20°27.998'S, 116°39.707E, 6.3 m, 7 July 1999.

**Diagnosis.** Rostrum as long (female) or longer (male) than CL, dentition 1+7/2, carapace without postorbital ridge, supraorbital spines present, well developed, antennal spine only slightly exceeding inferior orbital angle, mandibular palp 2-segmented, distal segment twice length of proximal segment, second pereopods without distoventral ischial spine, ambulatory dactyli not elongate.

**Description.** The major features of a male of *P. dijonesae* have been described and illustrated by Bruce (2008a, Figs 2–3 as *P. spinulata*). These can be augmented by further description of the female holotype specimen.

Rostrum (Fig. 1B) subequal to CL, straight, horizontal, dorsal carina well developed, with 6 acute teeth and minute preterminal tooth (Fig. 1C), first tooth well in advance of posterior orbital margin, teeth with 3–4 plumose interdental setae, ventral carina well developed distally with 2 well developed acute teeth distal to fourth dorsal tooth, ventral margin with submarginal plumose setae distally, longer median setae proximally. Carapace (Fig. 1A) with epigastric tooth at 0.72 of CL, supraorbital spine well developed, without supraorbital or postorbital ridges, inferior orbital angle feebly produced, antennal spine well developed, marginal, extending slightly beyond inferior orbital angle, hepatic spine well developed, at slightly lower level than antennal spine, below supraorbital spine.



**FIGURE 1.** *Palaemonella dijonesae* sp. nov., holotype female, Enderby Island, Dampier Archipelago, WAM C29308: A, carapace and rostrum; B, rostrum; C, same, tip; D, first pereiopod, chela; E, same, carpo-propodal joint, medial; F, second pereiopod, chela; G, same, fingers; H, same, carpo-propodal joint, ventral; I, same, dorsal; J, third pereiopod, propodus and dactylus; K, same, dactylus.

Third maxilliped with 7 distolateral meral spinules, terminal segment with strong distal spine.

First pereopod chela (Fig. 1D) with fingers slightly longer than palm length, slender, dactylus about 6.5 times longer than proximal depth, with small hooked tip, cutting edges straight, laminar, entire; corpus of oval section, about 2.3 times longer than central depth, with 5 transverse rows of short curved serrulate setae proximo-ventrally, with longitudinal row of 3 longer straight simple setae more dorsally (Fig. 1E).

Right second pereopod only, chela (Fig. 1F) about 1.6 times CL, 3.5 times longer than central depth, fingers (Fig. 1G) about 0.73 of palm length, slender with strongly hooked tips, dactylus 6.2 times longer than proximal depth, proximal third of cutting edge with 2 small acute teeth, distal cutting edge laminar, entire, fixed finger similar, with 2 slightly larger teeth proximally, with further rudimentary rounded tooth more proximally; carpus 0.43 of chela length, distally swollen, with preterminal constriction, distally cupped with medial and lateral bluntly angular projections (Figs. 1H–I); merus 0.52 of palm length, with strong terminal distoventral tooth; ischium 0.39 of palm length, unarmed.

Third ambulatory pereopod with propodus (Fig. 1J) about 0.7 of CL, about 14 times longer than wide, with distoventral spines missing, 5 small ventral spines, with 2 spiniform setae disto-dorsally, dactylus (Fig. 1K) 6.5 times longer than basal width, 0.27 of propodus length, dorsal margin with 2 simple setae at about half length, ventral margin feebly biconcave, unguis distinctly demarcated; fourth pereopod similar to third, distoventral propodus with 2 short spines, about 0.2 of dactylus length,.

**Measurements.** Holotype female, postorbital carapace length, 2.3 mm; carapace and rostrum, 4.5 mm; total body length, 14.0 mm; major second pereopod chela, 3.7 mm; length of ovum, 0.5 mm. Paratype male, postorbital carapace length, 2.3 mm; carapace and rostrum, 4.5 mm; total body length, 14.0 mm; major second pereopod chela, 6.3 mm; minor second pereopod chela, 6.0 mm.

**Etymology.** Named in honour of Dr Diana S. Jones, Acting Chief Executive Officer, Western Australian Museum, Perth, and principal organizer of the Dampier Archipelago surveys.

**Colouration.** No data.

**Systematic position.** *Palaemonella dijonesae* sp. nov. most closely resembles *Palaemonella spinulata* Yokoya, 1936, with which it was earlier confused. The most conspicuous difference between *P. dijonesae* sp. nov. and *P. spinulata* is the presence of a well developed supraorbital spine and the absence of supra- and post-orbital ridges in the former and the small supraorbital spines and well developed post-orbital carina in the latter, which also has small supraorbital ridges. In *P. dijonesae* sp. nov. the first pereopod fingers are subequal to the palm length, in *P. spinulata* distinctly longer. In *P. dijonesae* sp. nov. the male rostrum is distinctly longer than the carapace length, in *P. spinulata*, about subequal.

**Remarks.** *Palaemonella spinulata* has been reported in Australian waters from the Cobourg Peninsula, Northern Territory (Bruce & Coombes 1995); Darwin Harbour, Fannie Bay, (Bruce & Coombes 1997); Moreton Bay, Dunwich, Queensland (Bruce 1983); Heron Island (Bruce 1981); North East Herald Cay (Davie & Short 2001). These specimens are likely to belong to *P. dijonesae* and need to be re-examined to establish their identities. The same can also apply to the specimens of *P. spinulata* reported from New Caledonia and the Loyalty Islands (Touho; Lifou, Santal Bay, and numerous adjacent localities, Li & Bruce 2006). The specimens reported from Chinese waters in Li (2001) from Dadonghai, Sanya and Xiaodonghai, Hainan Island, are most likely to be correctly identified. However, the specimens from the northern Mariana Islands (Agrihan Island, Hayashi *et al.* 1994) and the Austral Islands (Rapa and Rarapai Islands, Li 2008) should probably also be re-examined. Also the specimen from Souris Chaude, La Réunion (Bruce 1978) should be reassessed, if it can be located, as it may belong to *P. maziwi* Bruce, 2002a.

## Discussion

Bruce (2002b) provided a key to the 11 then known Indo-West Pacific species of *Palaemonella*. The number of Indo-West Pacific species currently referred to this genus is now, with the inclusion of *P. dijonesae* sp. nov., 19 species. Two distinctive taxa (Bruce 2003; Li *et al.* 2008) have not been named due to their damaged states but are likely to represent further new species. The species range from inter-tidal pools to *P. meteorae* reported from a depth of 500m (Bruce 2008b). They may be distinguished by the following key.

## Key to the Indo-West Pacific *Palaemonella* species.

1. Supraorbital spines present ..... 2
- Supraorbital spines absent ..... 6
2. Second pereopods with distoventral ischial spine ..... *P. crosnieri* Bruce, 1978
- Second pereopods without distoventral ischial spine ..... 3
3. Supra- and post-orbital ridge distinct..... 4
- Without supra- or post-orbital ridge ..... 5
4. R 2+7/2, ambulatory dactyli long slender, about 9–11 times longer than basal width .....  
..... *P. longidactylus* Hayashi, 2009
- R 1–2+6–7/1–2, ambulatory dactyli shorter, about 4.6–6 times longer than basal width ... *P. spinulata* Yokoya, 1936
5. Rostrum as long as or longer than CL, R 1+6–7/2 ..... ***P. dijonesae* sp. nov.**
- Rostrum shorter than CL, R 1+5–6/1–2 ..... *P. maziwi* Bruce, 2002a
6. Ambulatory dactyli elongate, more than 8.0 times longer than basal width, propodus more than 20 times longer than wide..... 7
- Ambulatory dactyli not elongate, less than 8.0 times longer than basal width, propodus less than 20 times longer than wide ..... 12
7. Hepatic spine in branchiostegal position ..... 8
- Hepatic spine not in branchiostegal position ..... 10
8. With postorbital carina, with first rostral tooth postorbital, epigastric spine at 0.29–0.31 of postorbital carapace length..... 9
- Without postorbital carina, without postorbital rostral tooth, epigastric spine at 0.25 of postorbital carapace length .  
..... *P. meteorae* Bruce, 2008b
9. Antennal spine large, hepatic spine small..... *P. komaii* Li & Bruce, 2006
- Antennal and hepatic spines both small..... *Palaemonella* sp., Li, Mitsuhashi & Chan, 2008
10. Ambulatory propodus sub-segmented, with ventral spinules..... *P. dolichodactylus* Bruce, 1991
- Ambulatory propodus not sub-segmented, without ventral spinules..... 11
11. Second pereopod chelae with fingers shorter than palm, ambulatory propodus 2.4 times longer than dactylus.....  
..... *Palaemonella* sp. Bruce, 2003
- Second pereopod chelae with fingers longer than palm, ambulatory propodus 5.0 times longer than dactylus.....  
..... *P. hachijo* Okuno, 1999
12. Merus of second pereopod distoventrally unarmed..... 13
- Merus of second pereopod with distoventral tooth..... 16
13. With well developed post-rostral carina with 3 teeth, two teeth posterior to level of hepatic spine R 36/2–3 .....  
..... *P. aliska* Marin, 2008
- Without well developed post-rostral carina without teeth posterior to level of hepatic spine ..... 14
14. Carpus of second pereopod with two conspicuous distomedial teeth; R 1+6–7/2–3..... *P. lata* Kemp, 1922
- Carpus of second pereopod distomedially unarmed..... 15
15. Small species, rostrum shorter than antennular peduncle; R 6/1 ..... *P. pusilla* Bruce, 1975
- Larger species, rostrum longer than antennular peduncle; R 8/2 ..... *P. burnsi* Holthuis, 1973
16. Distoventral carpal tooth on second pereopods distinctly preterminal; R 1 + 5–7/1–2 ..... *P. tenuipes* Dana, 1852
- Distoventral carpal spines on second pereopod terminal ..... 17
17. Supraorbital ridges distinct ..... 18
- Without supraorbital ridges, R 2+7/4, slender, teeth curved ..... *P. foresti* Bruce, 2002b
18. Dactyli of ambulatory pereopods ventrally concave; distal propodal spines long, about 0.5 of dactyl length .....  
..... *P. rotumana* (Borradaile, 1898)
- Dactyli of ambulatory pereopods ventrally sinuous or biconcave; distal propodal spines short about 0.25 of dactyl length.....  
..... *P. pottsii* (Borradaile, 1915)

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## Literature cited

- Borradaile, L.A. (1898) A revision of the Pontoniidae. *The Annals and Magazine of Natural History*, series 7, 2, 376–391.
- Borradaile, L.A. (1915) Notes on Carides. *The Annals and Magazine of Natural History*, series 8, 15, 205–213.
- Bruce, A.J. (1970) Observations on the Indo-West Pacific species of the genus *Palaemonella* Dana, 1852 (Decapoda, Pontoniinae). *Crustaceana*, 19(3), 273–287.
- Bruce, A.J. (1975) Further observations on the Indo-West Pacific species of the genus *Palaemonella* Dana, 1852 (Decapoda Natantia, Pontoniinae). *Crustaceana*, 29, 169–185.
- Bruce, A.J. (1978) A report on a collection of pontoniine shrimps from Madagascar and adjacent seas. *Zoological Journal of the Linnean Society*, 62, 205–290.
- Bruce, A.J. (1981) Pontoniine shrimps of Heron Island. *Atoll Research Bulletin*, 245, 1–33.
- Bruce, A.J. (1983) The pontoniine shrimp fauna of Australia. *Australian Museum Memoir*, 18, 195–218. (1982).
- Bruce, A.J. (1991) Shallow-water palaemonoid shrimps from New Caledonia (Crustacea: Decapoda). In: B. Richer de Forges (Ed.), *Le benthos des Fonds Meubles des Lagons de Nouvelle-Calédonie*, 1. ORSTOM, Paris, pp. 221–279.
- Bruce, A.J. (2002a) A new species of *Palaemonella* (Crustacea: Decapoda: Pontoniinae) from East Africa. *The Beagle, Records of the Museums and Art Galleries of the Northern Territory*, 18, 15–18.
- Bruce, A.J. (2002b) Notes on some Indo-Pacific Pontoniinae. XLVI *Palaemonella foresti* sp. nov., a new pontoniine shrimp from western Australia (Decapoda, Palaemonidae), with a review of the Indo-West Pacific species of the genus *Palaemonella* Dana, 1852. *Crustaceana*, 75(3–4), 277–298.
- Bruce, A.J. (2003) The Pontoniine Shrimp Fauna of Hong Kong and the South China Sea (Crustacea: Decapoda: Palaemonidae). In: Morton, B. (Ed.), *Perspectives on Marine Environment Change in Hong Kong and Southern China, 1977–2001. Proceedings of an International Workshop Reunion Conference, Hong Kong 21–26 October 2001*. Hong Kong, Hong Kong University Press, pp. 209–257.
- Bruce, A.J. (2008a) Palaemonoid shrimps from the Dampier Archipelago (Crustacea: Decapoda), with a review of the Western Australian pontoniine shrimp fauna. In: Jones, D.S. (Ed.), *Crustaceans collected by the Western Australian Museum/Woodside Energy Ltd. Partnership to explore the Marine Biodiversity of the Dampier Archipelago, Western Australia, 1998–2002. Records of the Western Australian Museum Supplement*, 73, 97–129.
- Bruce, A.J. (2008b) A new species of *Palaemonella* Dana, 1852 (Crustacea: Decapoda; Pontoniinae) from the Red Sea. *Zootaxa*, 1844, 63–68.
- Bruce, A.J. & Coombes, K.E. (1995) The palaemonoid shrimp fauna (Crustacea: Decapoda: Caridea) of the Cobourg Peninsula, Northern Territory. *The Beagle, Records of the Museums and Art Galleries of the Northern Territory*, 12, 101–144.
- Bruce, A.J. & Coombes, K.E. (1997) An annotated check-list of the caridean shrimps (Crustacea: Decapoda) of Darwin Harbour, with descriptions of three new species of *Periclimenes* (Palaemonidae: Pontoniinae). In: Hanley, J.R., Caswell, G., Megirian, D. & Larson, H.K. (Eds.), *Proceedings of the Sixth International Marine Biological Workshop. The Marine flora and fauna of Darwin Harbour, Northern Territory, Australia*. Museums and Art Galleries of the Northern Territory and the Australian Marine Sciences Association, Darwin, Australia, 1997, pp. 301–337.
- Dana, J.D. (1852) Conspectus Crustaceorum, &c. Conspectus of the Crustacea of the Exploring Expedition under Capt. C. Wilkes, U. S. N. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1852, 10–28.
- Davie, P.J.F. & Short, J.W. (2001) Decapod Crustacea of North East Cay, Herald Cays, Coral Sea. Herald Cays Scientific Study Report. *Geography Monograph Series, The Royal Geographical Society of Queensland, Inc., Brisbane* 6, 75–86.
- Hayashi, K.-I. (2009) Redescription of *Palaemonella spinulata* Yokoya with designation of a neotype and description of a new species of *Palaemonella* from Japan (Decapoda: Caridea: Palaemonidae). In: Komai, T. & Komatsu, H. (Eds.), *Crustaceans of Japan Part 1. Bulletin of the National Museum of Nature and Science*, Suppl. 3, 89–103.
- Hayashi, K.-I., Komai, T. & Asakura, A. (1994) Macrura (Crustacea: Decapoda: Stenopodidea, Caridea and Palinuridae) collected from the Northern Mariana Islands, Micronesia. *Natural History Research, Special Issue* 1, 267–273.
- 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 Pontoniinae. *Siboga Expedition*, 39a10, 1–252.
- Holthuis, L.B. (1973) Caridean shrimps found in land-locked saltwater pools at four Indo-West Pacific localities (Sinai Peninsula, Funafuti Atoll, Maui and Hawaii Islands), with the description of one new genus and four new species. *Zoologische Verhandelingen*, 128, 1–48, Plates 1–7.
- Kemp, S. (1922) Notes on Crustacea Decapoda in the Indian Museum, XV. Pontoniinae. *Records of the Indian Museum*, 24, 113–288, Plates 1–9.
- Kingsley, J.S. (1879) List of the North American Crustacea belonging to the suborder Caridea. *Bulletin of the Essex Institute*, 10 [for 1878], 53–71.

- Li, X. (2001) Some pontoniine shrimps (Crustacea: Caridea) from Hainan Island, South China Sea. *In*: Matsuura, K. (Ed.), *Marine Fauna of the Shallow Waters around Hainan Island, South China Sea*, National Science Museum Monograph, 21, 75–86.
- Li, X. (2008) Report on some species of Palaemonidae from French Polynesia. *Zoosystema*, 30(1), 203–252.
- Li, X. & Bruce, A.J. (2006) Further Indo-West Pacific palaemonoid shrimps (Crustacea: Decapoda: Palaemonoidea), principally from the New Caledonian region. *Journal of Natural History*, 40 (11–12), 611–738.
- Li, X., Mitsuhashi, M. & Chan, T.-Y. (2008) Deep-water pontoniines from the Philippines “PANGLAO 2005” Expedition, with descriptions of four new species. *Journal of Crustacean Biology*, 28(2), 385–411.
- Okuno, J. (1999) *Palaemonella hachijo*, a new species of shrimp (Crustacea: Decapoda: Palaemonidae) from a submarine cave in southern Japan. *Proceedings of the Biological Society of Washington*, 112, 739–745.
- Rafinesque, C.S. (1815) *Analyse de la Nature ou Tableau de l'Univers et des corps organisés*, Palerme, 224 pp.
- Yokoya, Y. (1936) Some Rare and New species of Decapod Crustaceans found in the vicinity of the Misaki Marine Biological Station. *Japanese Journal Zoology*, 7, 129–146.