Zootaxa 981: 1–20 (2005)
www.mapress.com/zootaxa/

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

981

Pontoniine shrimps from the 2003 NORFANZ Expedition, 10 May–16 June (Crustacea: Decapoda: Palaemonidae)

A.J. BRUCE[1]

[1]*Crustacea Section, Queensland Museum, P. O. Box 3300, South Brisbane, Queensland, 4101 Australia*
abruce@broad.net.au

Table of contents

Abstract

A report is presented on a small collection of pontoniine shrimps, from the Tasman Sea, by the 2003 NORFANZ Expedition. The report includes information on 5 taxa, including two species new to science, *Periclimenes fenneri* and *P. tangeroa*. *Hamiger novaezealandiae* Borradaile is now recorded for the first time since 1910.

Key words: Decapoda, Natantia, Pontoniinae, *Periclimenes fenneri*, *P. tangeroa* spp. nov., *Hamiger novaezaelandiae* (Borradaile) second record, with hexactinellid sponge host; Tasman Sea, sea mount fauna

Accepted by J. Goy: 30 Apr. 2005; published: 16 May 2005

Introduction

The 2003 NORFANZ Expedition explored the deep sea habitats of the Tasman Sea, particularly of sea mounts and the abyssal plain around Lord Howe and Norfolk Islands. The expedition was carried out aboard the NIWA research vessel *Tangeroa*. A small collection of pontoniine shrimps was obtained and kindly made available for study by the Te Papa Tangarewa Museum, Wellington. Although only six species were obtained the small collection is of unusual interest, with 2 new species of *Periclimenes*, and the re-discovery of *Hamiger novaezealandiae* (Borradaile), previously known only from the holotype and allotype specimens collected by the *Terra Nova* Antarctic expedition in 1910, this time with the identification of its host. One of the new species collected, a new species of *Balssia* Kemp, the first occurrence of this northeastern Atlantic genus in the Indo-West Pacific region, has been separately described (Bruce, 2004)..
Fuller synonymies are to be found in Li (2000).

Abbreviations used:

CL, post-orbital carapace length.
NIWA, National Institute of Water and Atmospheric Research Ltd., Wellington.
NMNZ, National Museum of New Zealand, Wellington.
NORFANZ, Norfolk Island-France-Australia-New Zealand.
QM, Queensland Museum, Brisbane.
RMNH, Rijksmuseum van Natuurlijke Historie, Leiden.
TPM, Te Papa Tangarewa, Wellington.

Taxonomy

Sub-phylum Crustacea
Order Decapoda Latreille, 1802
Family Palaemonidae Rafinesque, 1815
Sub-family Pontoniinae Kingsley, 1878

Genus *Altopontonia* Bruce, 1990

***Altopontonia disparostris* Bruce, 1990**
(Fig. 8A)

Altopontonia disparostris Bruce, 1990: 192-202, figs. 25-33, 39k; –1991: 390-391; 1996: 204. – Li, 2000,: 2, fig. 2.

*Material examined***.** (1) 1 ♂, 11 ♀ (8 ovig.), NORFANZ stn. 20/60 or 69, North Norfolk Ridge, 29°41.84’S 168°02.62’E, 322–337 m, beam trawl, 14 May 2003, NMNZ CR.9991; RMNH D 51028 (1 ovig. ♀).

(2) 1 ovig. ♀, CL NORFANZ stn. 20/84, North Norfolk Ridge, 29°41.84'S 168°02.62'E, 322-337 m, beam trawl, 14 May 2003, QM W27570.

Colouration (Fig. 8A). (From colour slide). Uniform deep red, except for narrow median dorsal stripe, deepest yellow on rostrum, posteriorly to fourth abdominal tergite. Specimen (2) lacked the dorsal yellow stripe and had the ambulatory propods transparent.
*Host***.** No data.

Remarks. The specimens agree fully with the original description. The ovigerous female (2), CL 3.2, has a bluntly rounded non-setose preterminal distal dorsal tooth and a very small distal ventral rostral tooth only. The single male in lot (1), CL 1.6 mm, has a well developed rostral dentition: the dentition is feebly developed in all females, as in the type material.

The present specimens were collected from slightly shallower depths than the earlier specimens, which were mainly from over 400 m. The type specimens were collected from 503 m.

Distribution. Recorded only from the region of New Caledonia, the Loyalty Islands and the northern Tasman Sea.

Genus *Hamiger* (Borradaile, 1916)

Hamiger novaezealandiae (Borradaile, 1916)
(Fig. 8B)

Periclimenes (Hamiger) novae-zealandiae Borradaile, 1916: 87, fig. 4.
Periclimenaeus novae-zealeandiae —Holthuis, 1952: 130.
Hamiger novaezealandiae — Bruce, 1986: 911-919, figs. 1-4. — Li, 2000: 55-56, fig. 58.

Material examined. (1) 1 ♂, CL 8.6, NORFANZ stn: 133, Reinga Ridge, 33°23.74'S 170°13.03"E, orange roughy trawl, 456-490 m, 1 June 2003, coll. P.F.Davie and R.Webber, RMNH D 51027.

(2) 3 ♂, CLs 7.5, 6.2, 6.2, NORFANZ stn. 136, South Norfolk Ridge, 33°23.60'S 170°12.38'E, beam trawl, 469-490 m, 1 June 2003, coll. P.F.Davie and R.Webber, NMNZ CR.9992, CR.9993, CR.9994.

(3) 1 ♂, 1 ovig. ♀, CLs 6.0, 8.3, NORFANZ stn. 139, West Norfolk Ridge, 34°24.50'S 168°23.19'E, orange roughy trawl, 382-390 m, 2 June 2003, coll. P.F.Davie and R.Webber, QM W27569

Host. *Lophocalyx* sp. nov., [Porifera: Hexactinellida], (det. K.Tabachnick, 24 July 2004).

Colouration **(**Fig. 8B**).** (From colour photo). Body and antennae translucent whitish, eyestalks white, ovary pale yellowish, first and second pereiopods, ambulatory pereiopods and caudal fan coppery brown, fingers of minor second pereiopod transversely banded with white

Remarks. The specimens agree precisely with the previous descriptions (Borradaile, 1916; Bruce, 1986). All specimens had both second pereiopods attached. The largest

male had a rostral dentition of 9/2, with three teeth on the carapace. The female has a dentition of 6/2, but the distal rostrum appeared slightly damaged. One specimen, from stn. 136, has three ventral rostral teeth. The unusual major chela, missing in the female type specimen, is exactly as in the male.

The type specimens were collected in 1910 from the H.M.S. *Terra Nova¸* the vessel of the British Antarctic Exploring Expedition, lead by Captain Robert Falcon Scott. The Biologist-in-Charge was Denis G. Lillie, a marine biologist, who presumably collected the type material, but is not mentioned on the original specimen label. No further specimens have since been collected until the present, almost a century later. The host of the type specimens was not identified. The present collections establish that it is an associate of hexactinellid sponges. The specimens (3) were collected as a heterosexual pair from the spongocoel of the hosts. Few pontoniines are known to be associated with hexactinellid hosts. *Periclimenes forcipulatus* Bruce, 1991 has been reported in association with the hexactinellid *Phoronema* sp., (Bruce, 1991) but it was not clear that the shrimp was in the sponge cavity. Also found on the same *Phoronema* host was a specimen of *Mesopontonia monodactylus* Bruce, 1991. It should be noted that the host sponge of *Hamiger novaezealandiae*, *Lophocalyx* sp., is not of the hollow cylindrical Venus Flower Basket type structure commonly found to permanently enclose a variety of spongicolid stenopid shrimp associates. It is a very large stalked sponge, about 0.6 m in length by 0.4 m width, with a highly convoluted outer surface. Photographs show thick walls enclosing capacious irregular internal spaces where portions have been broken off during collection.

*Distribution***.** The type locality and only previous record is from 7 miles NE of North Cape, New Zealand, at 128 m.

Genus *Periclimenes* Costa, 1884

Periclimenes vaubani Bruce, 1990

(Fig. 1)

Periclimenes vaubani Bruce, 1990,: 174-181, figs. 16-19, 38 a-d, 39g.; 1991, 315. — Li, 2000,: 245, fig. 325.

*Material examined***.** 1 ♂, #3249. NORFANZ stn. 154/056, West Norfolk Ridge, 34°37.20'S 158°57.03'E, 3 June 2003, 521-539 m, beam trawl, NMNZ CR. 9995

*Remarks***.** The single male specimen has a CL of 2.6 mms and agrees well with the original description. The rostrum (Fig. 1) has a dentition of 1+7/2, slender and acute, reaching to just beyond the distal margin of the proximal segment of the antennular peduncle, first tooth on carapace smaller than more distal teeth. The major second pereiopod is missing. The third pereiopod propod has a pair of distoventral spines and two distal ventral spines all largely obscured by transverse rows of long setae. The posterodorsal margin of the third abdominal segment is non-denticulate.

FIGURE 1. *Periclimenes vaubani* Bruce, 1990, Male, carapace and rostrum. Scale bar 1.0 mm.

Distribution. Type locality, New Caledonia, 26°16'S, 167°15'E, 445-450 m. Other records from the New Caledonian region, at 470 m, 650 m, and at 505-515 m (Bruce, 1991.

***Periclimenes fenneri* sp. nov.**
(Figs. 2–4, 8C)

*Diagnosis***:** Rostrum slender, dentition 1+9/3, exceeding antennular peduncle; carapace and abdomen smooth; hepatic spine large, antennal smaller; posterior margin of third abdominal tergite minutely denticulate; cornea well developed; fourth thoracic sternite without median process; second pereiopods missing; third pereiopod dactyl feebly biunguiculate, propod with numerous setae, single distoventral spine only: telson with two pairs of dorsal spines.

*Material examined***.** 1 ♀, NORFANZ stn. 154/109, West Norfolk Ridge, 34°37.20'S 158°59.03'E, 521–539 m, 3 June 2003, beam trawl, NMNZ CR. 9996.

Description: A small sized species of *Periclimenes* of subcylindrical body form.

Rostrum (Fig. 2B) well developed, about 0.85 of CL, slightly exceeding antennular peduncle, slightly up-curved, shallow, acute, dorsal margin with distinct carina, best developed posteriorly, with 9 slender acute teeth evenly distributed along length, first tooth situated posterior to level of orbital margin, interdental spaces with short plumose setae; ventral margin carinate, proximal half concave, unarmed, proximally setose, distal half convex with 3 acute teeth, first tooth ventral to sixth dorsal tooth.

Carapace (Fig. 2A) smooth, glabrous, with epigastric tooth at about 0.25 of CL; supraorbital spines absent; orbit feebly developed, inferior orbital angle produced, blunt, without ventral flange; antennal spine small, marginal, not exceeding inferior orbital angle; hepatic spine larger, at lower level than antennal spine, vertically below halfway between epigastric spine and first rostral tooth; anterolateral margin not produced, bluntly subrectangular.

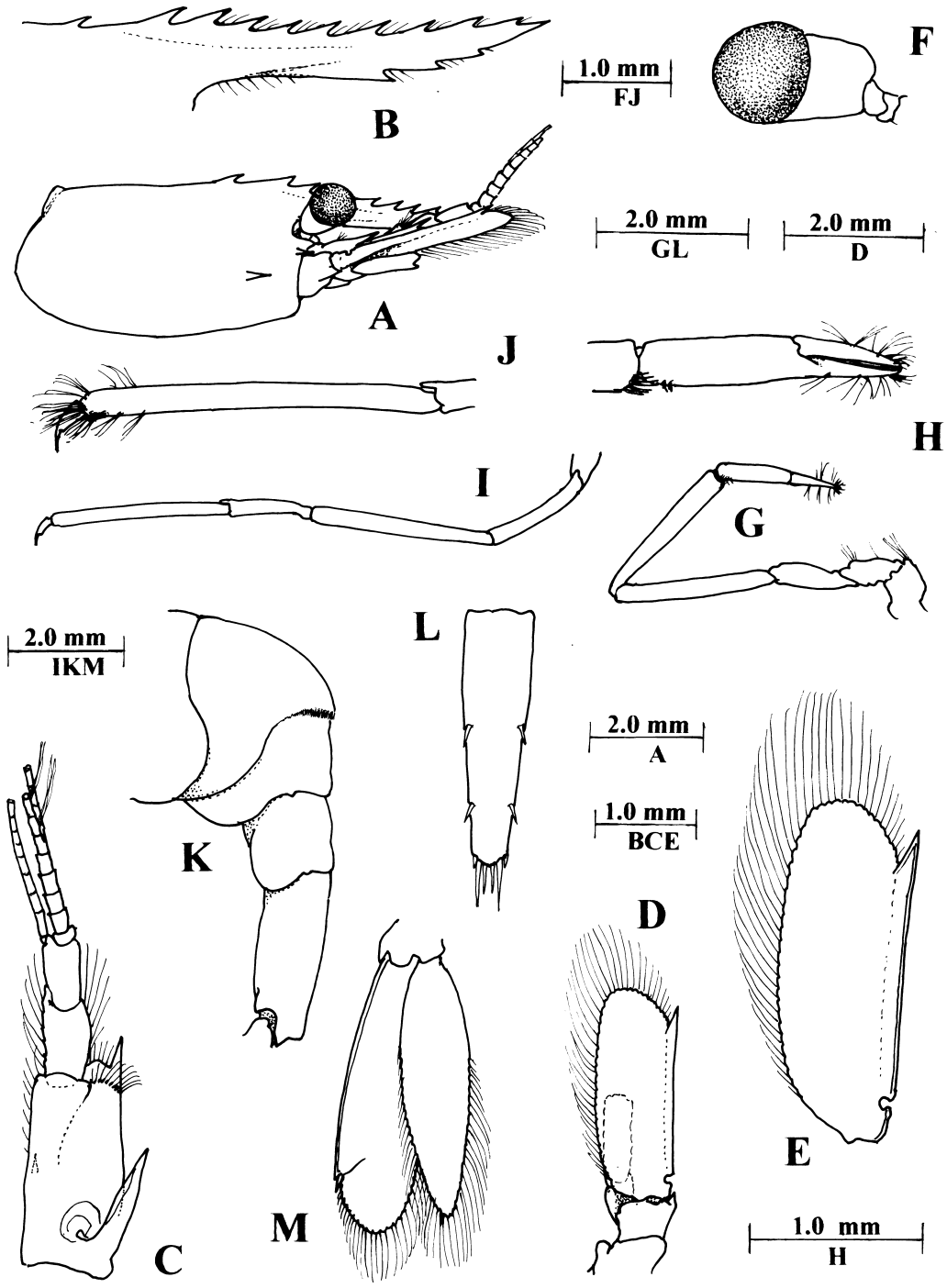

FIGURE 2. *Periclimenes fenneri* sp. nov., female holotype. A, carapace, eye and antennae. B, rostrum. C, antennule. D, antenna. E, scaphocerite. F, eye. G, first pereiopod. H, same, chela. I, third pereiopod. J, same, propod and dactyl. K, posterior abdominal segments. L, telson. M, uropod.

Abdomen (Fig. 2K) smooth, glabrous, third tergite not produced or carinate, posterior margin minutely denticulate (Fig. 4H); pleura small, broadly rounded, margins non-setose; sixth segment about 2.0 times as long as fifth, 0.7 of CL, 2.5 times longer than deep, posterolateral angle and posteroventral angles well developed, posterolateral larger, acute, posteroventral smaller, blunt.

Telson (Fig. 2L) about 0.7 of CL, subequal to sixth segment length, slender, 3.8 times longer than anterior width, proximal fourth with sides subparallel, posterior three fourths lateral margins straight, posteriorly convergent to angular posterior margin, about 0.5 of anterior margin width, with 2 pairs of well developed similar submarginal dorsal spines, about 0.07 of telson length, at 0.43 and 0.77 of telson length; posterior margin (Fig. 4I) with small obtuse median point, lateral spines small, about 0.6 of dorsal spine length, intermediate spines long slender, about 0.19 of telson length, submedian spines well developed, slender, about 0.68 of intermediate spine length, densely setulose.

Antennule (Fig. 2C) with proximal segment 2.0 times longer than central width, medial and lateral margins subparallel, medial margin with slender ventral tooth at about 0.5 of length; distal margin with plumose setae, lateral margin with well developed distal lobe, rounded, with 5 short plumose setae, with large slender acute tooth laterally, slightly exceeding half intermediate segment length, distodorsal medially with numerous plumose setae, laterally with arc of about 15 plumose setae reaching to external margin; stylocerite slender, acute, reaching just beyond half segment length, statocyst normal, statolith subcircular. Intermediate segment 2.5 times longer than width, about 0.5 of proximal segment length; medial and lateral margins with long densely plumose setae, very obliquely articulated with distal segment. Distal segment about 0.75 of intermediate segment length, 2.0 times longer than width, flagella incomplete, proximal 4 segments fused.

Antenna (Fig. 2D) with basicerite with strong distolateral tooth, ischiocerite and merocerite normal, carpocerite subcylindrical about 3.5 times longer than width, flagella lacking; scaphocerite (Fig. 2E) well developed, exceeding antennular peduncle, lamella broad, about 2.8 times longer than central width, distal margin broadly rounded, well exceeding distolateral tooth, lateral margin sublinear, with strong acute distal tooth, about 0.13 of lamellar length.

Eye (Fig. 2F) with large, well pigmented, globular cornea, about 0 18 of CL, without accessory pigment spot; stalk short, with about 0.8 of corneal diameter.

Ophthalmic somite small, without median dorsal process.

Epistome unarmed.

Mandible (Fig. 3A) with corpus stout, without palp; molar process (Fig. 4A) robust, tapering , distally truncate with 4 blunt tubercles and setose knob; incisor process (Fig. 4B) distally oblique with 3 acute teeth, central tooth smaller than outer teeth.

Maxillula (Fig. 3B) with bilobed palp (Fig. 4C), dorsal lobe non-setose, ventral lobe with small tubercle bearing short curved simple seta; basial endite 1.5 times longer than broad, centrally expanded, distal margin truncate with 6 robust short simple spines, with

similar numbers of more slender spines and setae: coxal endite tapering, distally pointed with about 16 long simple distal and ventral spines.

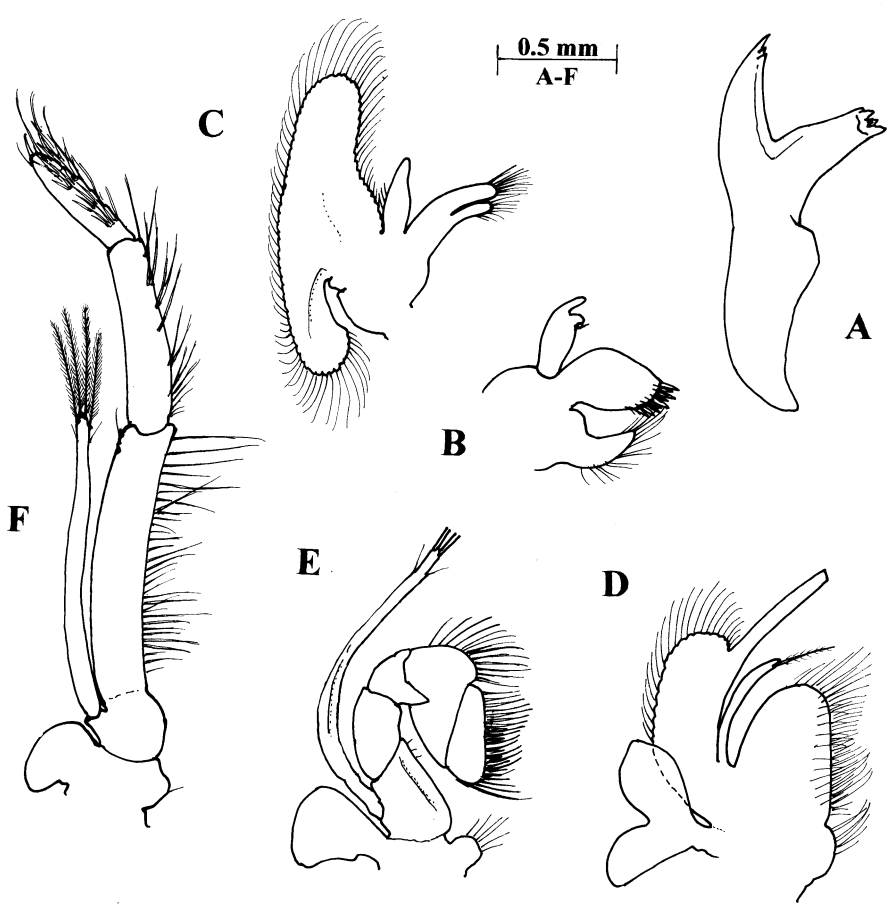

FIGURE 3. *Periclimenes fenneri* sp. nov., female holotype, mouthparts from right side. A, mandible. B, maxillula. C, maxilla. D, first maxilliped. E, second maxilliped. F, third maxilliped.

Maxilla (Fig. 3C) with tapering palp about 3.5 times longer than basal width,. with 3 short proximolateral setae, basial endite bilobed, distal lobe larger and longer than proximal lobe, with about 11 slender simple setae, proximal lobe with 8; coxal endite obsolete, medial margin broadly convex; scaphognathite elongate, narrow, about 3.0 times longer than central width, anteromedial margin emarginate.

First maxilliped (Fig. 3D) with elongate, very slender palp, about 13.0 times longer than basal width, with preterminal plumose seta; basial endite broad, distally rounded, medial margin straight with numerous slender simple setiform spines marginally and submarginally, distinctly separated by small notch from smaller rounded coxal entire, fringed with 6 simple setae; exopod with well developed caridean lobe, flagellum appearing nor-

mal, although distal portion lost; epipod well developed, deeply bilobed, distal lobe larger than proximal.

Second maxilliped (Fig. 3E) of normal form, endopod with dactylar segment broad, about 2.5 times longer than distal width, medial margin straight, with numerous robust. simple spines; propodal segment with anteromedial margin slightly medially produced, with numerous slender setiform spines; carpus, ischiomerus and basis without special features; exopod well developed, with 4 long plumose terminal setae, few short distal setae; coxa with large rounded lobe medially, with 6 slender simple setae; epipod subtriangular, without podobranch.

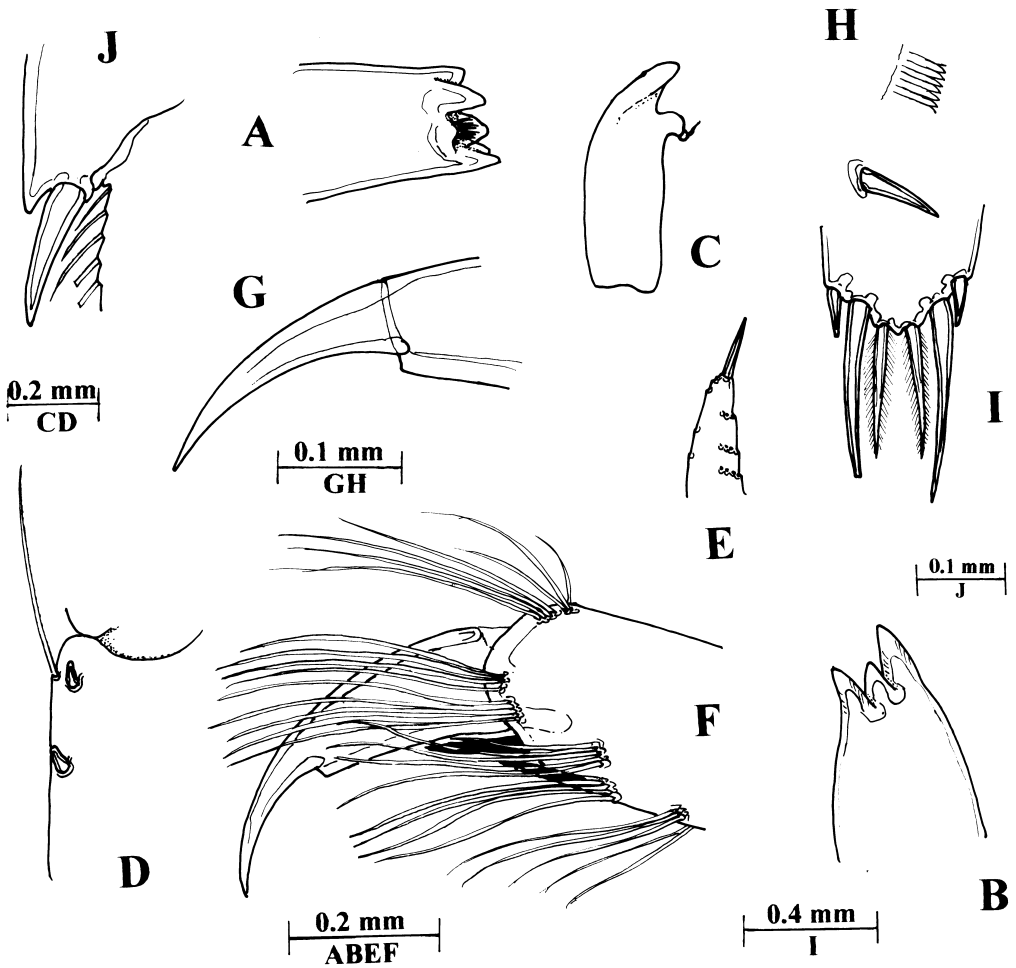

FIGURE 4. *Periclimenes fenneri* sp. nov., female holotype,. A, Mandible, molar process. B, same, incisor process. C, maxillula, palp. D, third maxilliped, endopod, distolateral angle of merus. E, same, tip of terminal segment, setae omitted. F, third pereiopod, distal propod and dactyl, propodal spines black. G, same, distal corpus and unguis. H, third abdominal tergite, posterior marginal denticulations. I, telson, posterior marginal spines, dorsal spine inset above. J, uropod, distolateral angle of exopod.

Third maxilliped (Fig. 3F) extending to proximal end of carpocerite; ischiomerus fused to basis, junction indicated by small notch on medial margin, ischiomeral portion about 6.0 times longer than width, uniform, medial margin with numerous long simple setae, distolateral margin with two small blunt spines (Fig. 4D), penultimate segment 0.7 of antepenultimate segment length, 4.3 times longer than proximal width, with numerous slender simple setae distributed along medial margin, terminal segment 0.5 of antepenultimate segment length, about 5.0 times longer than basal width, tapering distally terminating in short simple spine (Fig. 4E), about 0.14 of segment length, ventromedial surface with about 6 transverse rows of setae, of increasing length distally, basal region with concave medial margin, non-setose, exopod as second maxilliped, coxa with medial margin angular, with well developed semicircular lateral plate, without arthrobranch.

Thoracic sternites broad, third and fourth with low transverse ridge, fifth with stronger ridge with median notch, sixth to eighth unarmed, fourth without finger-like median process.

First pereiopod (Fig. 2G) slender, exceeding carpocerite by carpus and chela; chela (Fig. 2H) slender, with subcylindrical palm about 3.0 times longer than deep, with two rows of short cleaning setae proximoventrally, fingers similar, slender, tapering distally, about 0.66 of palm length, with groups of long finely serrulate setae distally, distal half of cutting edges sharp, entire, tips strongly hooked with small stout terminal ungues; carpus about 1.3 times chela length, 7.0 times longer than distal width, tapering proximally, with several long robust serrulate setae distoventrally; merus slender, subequal to carpal length, uniform, 8.5 times longer than wide; ischium 0.54 0f carpal length, 3.8 times longer than distal width, tapering slightly proximally; basis and coxa of normal form, ventral basis with group of several short setae, distoventral coxa with small lobe with longer terminal setae.

*Second pereiopods***.** Missing.

Third pereiopod. (Fig. 2I) slender, exceeding carpocerite by distal third of carpus, propod and dactyl; dactyl normal (Fig. 4F), slender, curved, feebly biunguiculate, about 0.15 of propod length; unguis (Fig. 4G), feebly demarkated from corpus, curved, about 3.7 times longer than basal width, 0.75 of corpus length, corpus 1.8 times longer than basal width, dorsal margin convex, ventral margin concave with small subrectangular distal accessory tooth; propod (Fig. 2J) about 0.7 of CL, 13.0 times longer than width, uniform, with numerous groups of long simple setae distally, largely obscuring the dactyl, with 1 distoventral spine (possibly 2), length greater than basal width of dactyl, 1 similar preterminal distoventral spine, ventral margin otherwise without spines or setae; carpus about 0.45 of propod length, 4.0 times longer than distal width, tapering slightly proximally, unarmed; merus subequal to propod length, 10.0 times longer than width, uniform, unarmed; ischium 0.6 of merus length, bowed, 0.6 times longer than depth, uniform, unarmed; basis and coxa without special features. Fourth and fifth pereiopods similar to third.

Uropod (Fig. 2M) with protopodite normal, posterolaterally unarmed; rami slightly exceeding posterior telson margin, exopod about 3.6 times longer than distal width, with lateral margin entire, proximally feebly convex, distally sublinear, non-setose, with small acute distal tooth, with much larger mobile spine medially (Fig. 4J), dieresis poorly indicated; endopod slightly shorter than exopod, about 4.0 times longer than maximal width.

Measurements: Carapace length, 4.8 mms; carapace and rostrum, 9.0 mms; total body length (approx.), 25.0 mms.

Colouration (Fig. 8C): (From colour photo). Generally translucent, without conspicuous colouration. Second pereiopod with pinkish fingers.

Host: No data.

Etymology: The species is named in recognition of the enormous contribution to caridean systematics of Dr Fenner A. Chace (1908-2004).

Systematic position: Several "deep-water" species of *Periclimenes* have simple biunguiculate dactyls on the ambulatory pereiopods and two pairs of dorsal spines on the telson: *P. coriolis* Bruce, 1985, *P. curvirostris* Kubo, 1940, *P. foveolatus* Bruce, 1981, *P. involens* Bruce, 1996, *P. laccadivensis* (Alcock and Anderson, 1894), *P. latipollex* Kemp, 1922., *P. ordinarius* Bruce, 1991, *P. parvispinatus* Bruce, 1990, *P. richeri* Bruce, 1990, *P. tenuirostris* Bruce, 1991, and *P. vaubani* Bruce, 1990. All of these have a well developed, acute accessory tooth on each ambulatory dactyl. In none of these has a denticulate posterior margin to the third abdominal tergite been reported. The mouthparts of *P. fenneri* are typical of the genus *Periclimenes.*

Periclimenes fenneri appears most closely related to *P. laccadivensis* (Alcock and Anderson) and may be distinguished by the following features:

1 In *P. fenneri* the rostrum is longer, distinctly exceeding the antennular peduncle, *vs* falling short of distal end in *P. laccadivensis.*
2 Only a single postorbital rostral tooth present in *P. fenneri, , vs* two postorbital teeth in *P. laccadivensis.*
3 Posterior margin of third abdominal tergite denticulate in *P. fenneri, vs* entire in *P. laccadivensis.*
4 Carpus of first pereiopod about 1.3 times chela length in *P. fenneri, vs* "a little longer than chela" (Kemp, 1922).
5 Dactyl of third ambulatory pereiopod with obsolescent accessory tooth in *P. fenneri , vs* well developed slender acute accessory tooth in *P. laccadivensis.*

Remarks: The present specimen is remarkable for the presence of a series of minute denticulations along the posterior margin of the third abdominal tergite. Such denticulations have only been recorded in species of the genera *Exoclimenella* Duris and Bruce, 1995, and *Periclimenella* Duris and Bruce, 1995. The species of these genera have the fingers of the first pereiopods strongly spatulate with finely pectinate cutting edges and can thus be readily omitted from consideration. These fingers in the present specimen lack

these features and are typical of the genus *Periclimenes.* The tergal denticulations can be difficult to discern and may have been overlooked in other species of *Periclimenes*. Despite the lack of second pereiopods, *P. fenneri* can still be distinguished from all other Indo-West Pacific species of the genus *Periclimenes* by the diagnostic dactylus of the ambulatory pereiopods.

***Periclimenes tangeroa* sp.nov.**
(Figs. 5-7, 8D)

Diagnosis: Rostrum slightly exceeding antennular peduncle, with deep lamina, dentition 1+7/1; carapace and abdomen smooth; third abdominal tergite posterodorsally entire, fourth thoracic sternite without median process; distolateral tooth of scaphocerite robust, not exceeding lamella; cornea of eye small; minor second pereiopod with chela surface finely granular, dactylus non-spatulate, merus with small acute tubercles ventrally; third pereiopod with dactyl minutely biunguiculate, propod with three minute ventral. spines; telson with four pairs of dorsal spines, posterior spines reduced.

Material examined: 1 ovig. ♀, NORFANZ stn. 006/010, South Norfolk Ridge, 34°09.14'S 171°27.95'E, 242-254 m, Sherman sledge, 12 May 2003, NMNZ CR. 9997.

Description: A large species of *Periclimenes*, of robust subcylindrical body form. The single specimen lacks the major second pereiopod and one third pereiopod.

Rostrum (Fig. 5C) well developed, extending slightly beyond antennular peduncle, horizontal, about 0.6 of CL, feebly up-turned distally, dorsal carina well developed, with seven small acute teeth evenly distributed along whole length, with feeble interdental setation, tip acute (Fig. 6A), ventral carina well developed distally, non-setose with single small acute tooth at about 0.6 of rostral length, distoventral margin sinuous, with minute obsolescent denticle.

Carapace (Fig. 5A) smooth, glabrous, with stout epigastric tooth at 0.25 of CL, supra orbital spines absent, antennal spine small, marginal, not exceeding inferior orbital angle (Fig. 5B), hepatic spine well developed, in advance of level of epigastric tooth, larger than antennal spine, at more ventral level, tip not reaching anterior margin of branchiostegite, anterolateral angle slightly produced, rounded.

Abdomen smooth, glabrous, third tergite not posterodorsally produced, posterior margin entire, pleura of first to fifth segments broadly rounded (Fig. 5G), sixth segment about 1.8 times as long as fifth, 0.4 of CL, 1.4 times longer than deep, posterolateral angle and posteroventral angles well developed, subequal, acute.

Telson (Fig. 5H) about 0.73 of CL, 3.75 times longer than anterior width, lateral margins almost straight, posteriorly convergent, with four pairs of small marginal spines at about 0.45, 0.63, 0.77 and 0.95 of telson length, spines about 0.04 of telson length, posterior margin (Fig. 5I) rounded, without median point, 0.33 of anterior width, posterior spines reduced, lateral spines about subequal to dorsal spines (?, one missing, one broken),

intermediate spines 2.1 times dorsal spine length, 0.07 of telson length, submedian spines short, non-setulose, slightly shorter than dorsal spines.

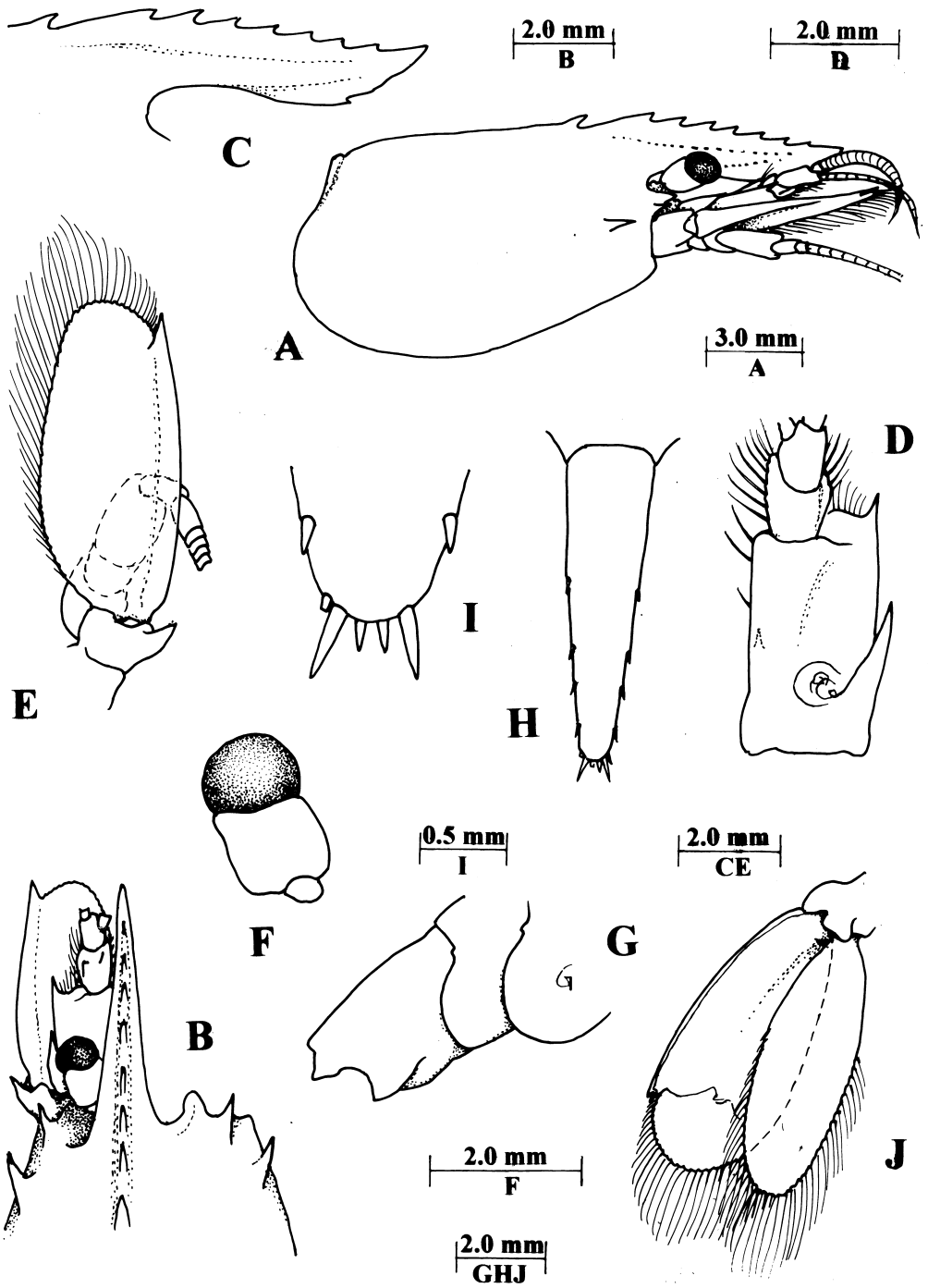

FIGURE 5. *Periclimenes tangeroa* sp. nov., ovigerous female holotype. A, carapace and antennae, dorsal. B, anterior carapace and left antennae, dorsal. C, rostrum. D, antennular peduncle. E, antenna. F, posterior abdominal segments, lateral. G, telson. H, same, posterior spines. I, uropod.

Antennule (Fig. 5D) with proximal segment of peduncle about 1.7 times longer than wide, medial and lateral margins subparallel, medial margin with well developed ventral tooth at about 0.5 of length, distolateral angle strongly produced, convex with six plumose setae, with slender acute distolateral tooth reaching to level of proximal border of distal peduncular segment, stylocerite slender, acute, reaching to 0.7 0f segment length, statocyst normal, statolith granular; intermediate segment very obliquely articulated with distal segment, distomedial and distolateral margins with numerous plumose setae, dorsal length about 0.2 of proximal segment length; distal segment dorsal length about 1.5 times intermediate segment dorsal length; upper flagellum biramous, proximal 14 segments fused, shorter free ramus with 6 segments, with about 35 groups of aesthetascs, lower flagellum slender, with numerous segments.

Antenna (Fig. 5E) with basicerite with stout distolateral tooth, coxal segment with rounded antennal gland protuberance; carpocerite short, robust, about 1.6 times longer than wide, reaching to about 0.5 of scaphocerite length, flagellum well developed; scaphocerite well developed, well exceeding tip of rostrum, broad, about 2.3 times longer than central width, lateral margin stout, feebly convex, with strong acute distolateral tooth, about 0.1 of lateral margin length, slightly exceeded by broadly rounded distal margin of lamella.

Eye (Fig. 5F) with cornea well developed, small, globular, well pigmented, without accessory pigment spot, diameter about 0.1 of CL slightly oblique; stalk subcylindrical, width subequal to length, 0.9 of corneal diameter.

Ophthalmic somite small, without *bec ocellaire*, with accessory pigment spot.

Epistome unarmed.

The mouthparts on the right side have been examined in detail and appear indistinguishable from those illustrated for *P. alcocki* by Bruce (1991, fig. 4a-k).

Thoracic sternites without median process on fourth thoracic segment, fifth with low transverse ridge, with median notch, sixth similar to fifth, slightly larger, seventh to ninth broad, unarmed.

First pereiopod (Fig. 6B) slender, exceeding carpocerite by half carpus and chela; chela (Fig. 6C) with palm oval in section, about 2.5 times longer than deep, with sparse short cleaning setae proximoventrally; fingers about 0.7 of palm length, slender, dactylus about 4.6 times longer than basal depth, tapering to small simple acute hooked tip, cutting edge laminar, entire; fixed finger similar; carpus about 1.4 times chela length, 6.3 times longer than distal width, tapering proximally, with few distoventral cleaning setae; merus slightly longer than carpus, slightly bowed, about 8.0 times longer than wide, uniform; ischium 0.55 of carpus length; basis 0.5 of ischium length.

Minor second pereiopod (Fig. 6D) with chela (Fig. 6E) minutely tuberculate, subequal to CL, palm oval in section, subcylindrical, about 4.0 times longer than distal width, slightly tapered proximally; fingers (Fig. 6F) about 0.95 of palm length, sparsely setose, dactylus about 4.7 times longer than proximal depth, tapering distally to acute hooked tip,

distal two thirds of cutting edge sharp, entire, proximal third with small acute distal tooth and larger more irregular proximal tooth; fixed finger similar to dactyl, distal tooth larger than proximal tooth; carpus about 0.38 of palm length, slightly excavate distally, tapered

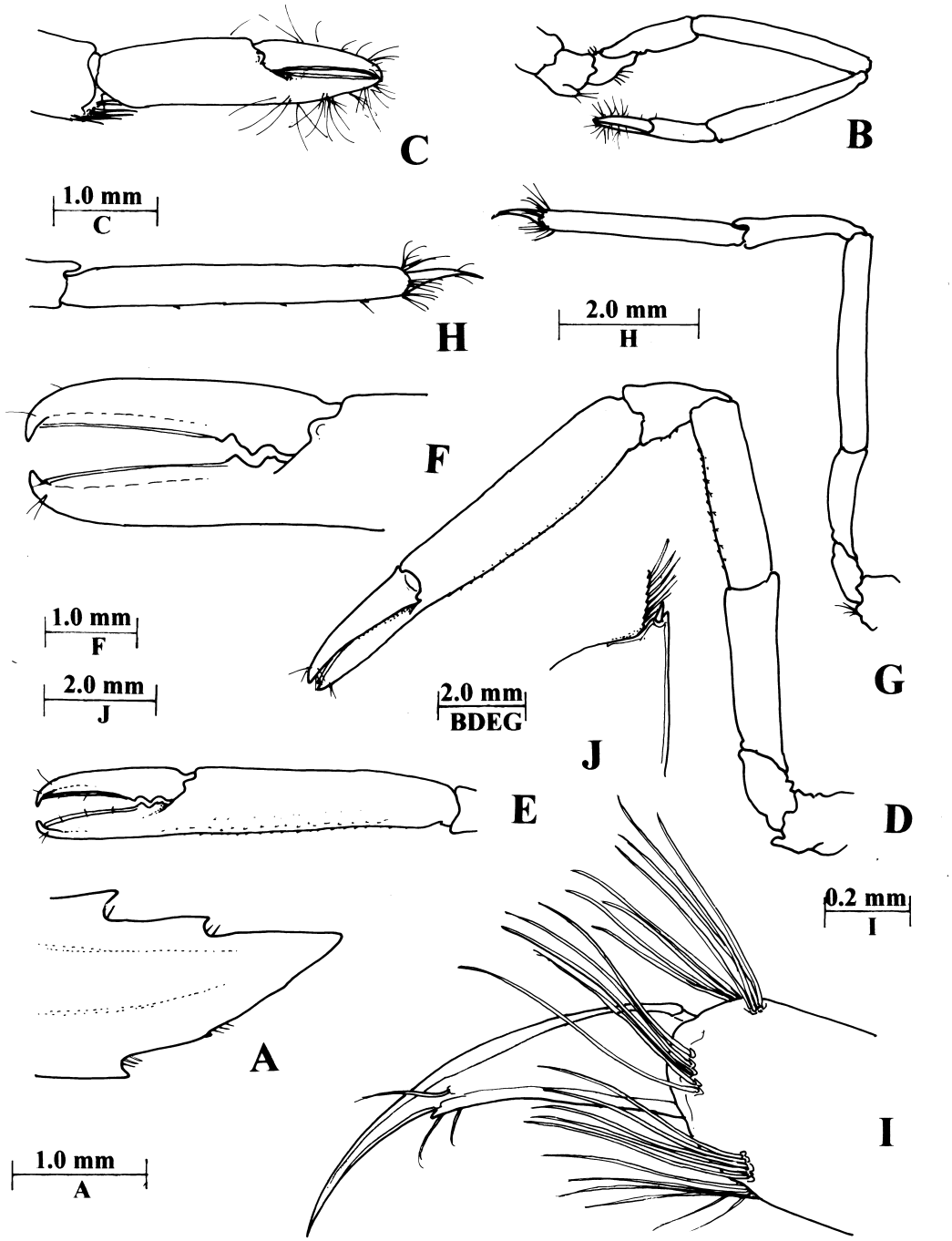

FIGURE 6. *Periclimenes tangeroa* sp. nov., ovigerous female holotype. A, rostrum, distal end. B, first pereiopod. C, same, chela. D, second pereiopod. E, same, chela. F, same, fingers. G, third pereiopod. H, same, propod and dactyl. I, same, distal propod and dactyl.

strongly proximally, unarmed, feebly denticulate ventrally; merus about 0.7 of palm length, 4.0 times longer than deep, uniform, unarmed, ventral margin coarsely denticulate; ischium subequal to meral length, about 3.7 times longer than distal width, tapering slightly proximally, ventral margin non-denticulate; basis robust, about 0.4 of ischial length, without special features; coxa with small distoventral lobe.

Third pereiopod (Fig. 6G) with dactyl (Fig. 6I), slender, curved, very acute, minutely biunguiculate, 0.28 of propod length; unguis feebly demarkated from corpus, curved, about 5.5 times longer than basal width (Fig. 7A), corpus 2.1 times longer than basal width, dorsal margin convex, ventral margin concave with minute acute distal accessory tooth (Fig. 7B), about 0.07 of unguis length, with medial and lateral distal sensory setae; propod (Fig. 6H) about 0.5 of CL, 8.2 times longer than proximal depth, tapering very slightly distally, with 3 minute ventral spines at 0.35, 0.68 and 0.92, without visible distoventral spine (possibly lost in dissection), with small groups of simple setae distally; carpus 0.57 of propod length, with well developed distodorsal lobe, unarmed; ischium 1.1 times propod length, 9.5 times longer than width, uniform, unarmed; ischium, basis and coxa without special feature. Fourth and fifth pereiopods similar.

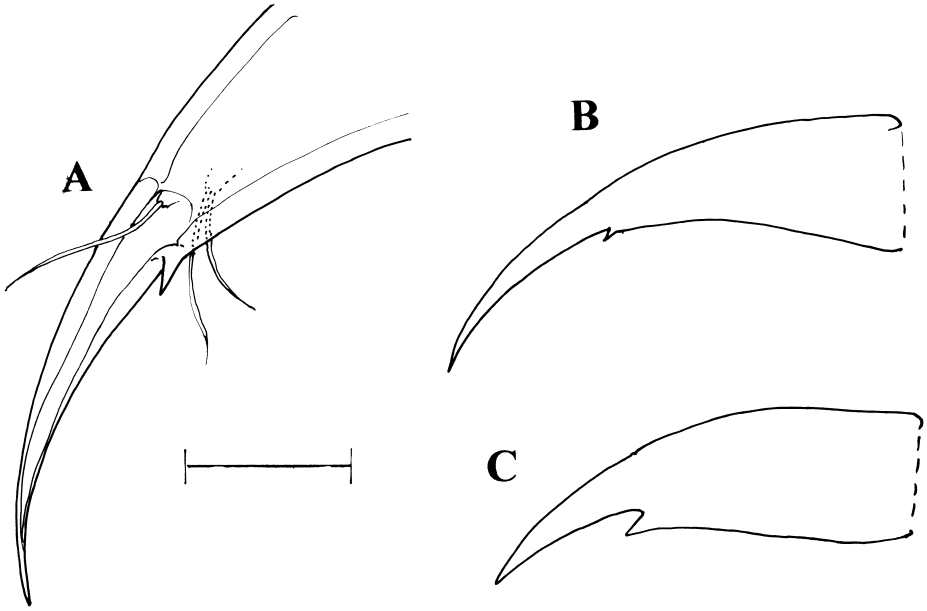

FIGURE 7. *Periclimenes tangeroa* sp. nov., ovigerous female holotype. A, third pereiopod dactyl, distal corpus and unguis. Third pereiopod dactyls, not to scale, adjusted to same basal depth. B, *Periclimenes tangeroa* sp. nov. C, *Periclimenes alcocki* Kemp (redrawn from Bruce, 1996). A, scale bar 0.2mm.

FIGURE 8. A, *Apopontonia disparostris* Bruce, NORFANZ stn. 20. B, *Hamiger novaezealandiae* Borradaile, NORFANZ stn. 133, male. C, *Periclimenes fenneri* sp. nov., holotype, NORFANZ stn. 154. D, *Periclimenes tangeroa* sp. nov., holotype, NORFANZ stn. 006. Scale bars in millemeters.

Uropod (Fig. 5J) with protopod unarmed, distolaterally rounded, rami reaching to level of distal end of telson; exopod about 2.2 times longer than wide, lateral margin entire, feebly convex, with small distolateral lobe with very small acute tooth (Fig. 6I), with larger mobile spine medially; endopod slightly shorter than exopod, about 2.8 times longer than width.

Ova: Numerous and small.

Measurements: CL 10.2 mm; carapace and rostrum, 15.4 mm; total body length (approx.), 42 mm; second pereiopod, chela, 10.0 mm; ova length, 0.55 mm.

Colouration (Fig. 8D): (From colour photo) Body and antennae whitish, rostrum pale red, pereiopods with merus and ischium reddish, carpus dull bluish, minor second pereiopod chela dull reddish banded with dull blue, ambulatory propods white, uropods reddish, lateral exopod white.

Host: No data.

Etymology. The species is named after the NIWA research vessel, the R.V. *Tangeroa.*

Systematic position: Only five *Periclimenes* species with four pairs of dorsal telson spines are known: *P. alcocki* Kemp, 1922, *P. aleator* Bruce, 1991, *P. brevirostris* Bruce 1991, *P. platyrhynchus* Bruce 1991 and *P. poupini* Bruce, 1992. *Periclimenes tangeroa* is most closely related to *P. alcocki.* It may be distinguished by the following features:

1 Dorsal carina of rostrum with seven teeth, ventral carina with single distinct tooth only, *vs* 8-11 and 2-4.
2 Rostrum without post orbital teeth *vs* with one postorbital tooth
3 Hepatic spine in advance of level of epigastric tooth, *vs* at same level.
4 Corneal diameter about 0.1 of CL, *vs* about 0.75.
5 Third pereiopod dactyl slender, minutely biunguiculate, about 0.28 of propod length, corpus tapering strongly distally; propod with minute distoventral and two similar ventral spines (Fig. 7B), *vs* more robust, with larger accessory tooth, about 0.17 of propod length, corpus tapering feebly distally, and propod without ventral spines (Fig. 7C).

Remarks: The holotype specimen of *P. alcocki* was collected from the Laccadive Sea at 9°34’57”N 75°36’30:E, at a depth of 750 m, and is held in the collections of the Zoological Survey of India (registration number ZSI 4789/7). No additional specimens were collected. Kemp’s description and illustrations clearly show the differences from *P. tangeroa* with the exception of the ambulatory dactyl, which was not illustrated and, in the description, described “as in *P. laccadivensis”*. The figure for *P. laccadivensis* shows a small slender but well developed dactylar accessory tooth (Kemp, 1922, fig. 20c). Attempts to obtain further information have not been successful. Bruce (1996) referred a population of 90 specimens from the Arafura Sea to *P. alcocki* and commented upon their remarkable morphological uniformity. The ambulatory dactyl of similar specimens was illustrated by

Bruce (1991, fig. 5h) and shows a small but stout accessory tooth. This identification should possibly be regarded as provisional, pending re-examination of the holotype, as the hepatic spine in the holotype is directly below the epigastric tooth in the holotype, whereas it is markedly in advance in the New Caledonian specimens. Kemp's description states that the rostrum bears on its dorsal carina "….. 9 teeth, three posterior teeth stand on the carapace behind the orbit". From his Fig. 21, it appears to show an epigastric tooth and one posterior rostral tooth. It is assumed that the preserved second pereiopod of the present specimen is the minor second pereiopod. Kemp states that in his specimen of *P. alcocki* the second pereiopods unequal but the "longer limb the dactylus is conspicuously spatulate" and "The smaller chela is similar". This dactylus in *P. tangeroa* is non-spatulate.

Acknowledgements

I am most grateful to Rick Webber for providing access to the NORFANZ pontoniine specimens and associated data. Karen Gowlett Holmes provided the photos of the fresh specimens. The comments by a reviewer are also much appreciated. Dr Konstatin Tabachnick kindly identified the hexactinellid sponge. This study was supported by the Australian Biological Resources Study.

References

Borradaile, L.A. (1916) Crustacea, Part I. Decapoda. *Natural History Reports of the British Antarctic Expedition,* 3 (2), 75–110, figs. 1–16.

Bruce, A.J. (1986) A re-examination of *Periclimenes (Hamiger) novae-zealandiae* Borradaile, with the recognition of a new pontoniine shrimp genus *Hamiger* Borradaile, 1916. *Journal of Natural History,* 20 (4), 911–919, figs. 1–4.

Bruce, A.J. (1990) Crustacea Decapoda: 5. Deep-sea Palaemonoid shrimps from New Caledonian waters. *In*: A. Crosnier (Ed.), Resultats des Campagnes MUSORSTOM, 6. *Mémoires du Muséum National d'Histoire Naturelle*, 145, 149–215, figs. 1–39.

Bruce, A.J. (1991) Crustacea Decapoda: Further deep-sea Palaemonoid shrimps from New Caledonian waters. *In*: A. Crosnier (ed.), Résultats des Campagnes MUSORSTOM, 9, *Mémoires du Muséum National d'Histoire Naturelle*, (A), 152, 299–411, figs. 1–75.

Bruce, A.J. (1996) Crustacea Decapoda: Palaemonid shrimps from the Indo-West Pacific region, mainly from New Caledonia. *In*: A. Crosnier (ed.), Résultats des Campagnes MUSORSTOM, 15. *Mémoires du Muséum National d'Histoire Naturelle*, 168, 197–267, figs 1–31.

Bruce, A.J. (2004) *Balssia antipodarum* sp. nov., the first occurrence of the genus *Balssia* Kemp in the Indo-West Pacific region (Crustacea: Decapoda: Pontoniinae). *Cahiers de Biologie Marine*, 45, 365–392, figs 1–3.

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 Monograph,* 39a^{10}, 1–252, figs, 1–110, tab. 1.

Kemp, S. (1922) Notes on Crustacea Decapoda in the Indian Museum. XV. Pontoniinae. *Records of the Indian Museum*. 24, 113–288, figs. 1–105, pls. 3–9.

Li, Xinzheng. (2000) *Catalog of the Genera and Species of Pontoniinae Kingsley, 1878.* Xueyuan Press, Beijing, pp. 319, figs 1–408.

