

New Records of Sand Crabs (Crustacea: Decapoda: Albuneidae and Blepharipodidae) from the Western Pacific with Description of Two New Species of *Paralbunea* Serène, 1977

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Two new species belonging to the sand crab genus *Paralbunea* Serène, 1977 are described: one each from the Philippines and Taiwan. Both new species can be distinguished from each other, as well as the five other species of *Paralbunea*, by characters of the carapace, eyes, and pereopods. Additional new western Pacific locality records are given for two species of spiny sand crabs (Blepharipodidae) and six species of sand crabs (Albuneidae). A key to all seven species of *Paralbunea* is provided.

Key words: Hippoidea, New species, Philippines, Sand crab, Spiny sand crab, Taiwan, Taxonomy.

BACKGROUND

Sand crabs (Albuneidae) are specialized burrowers that live in sandy, often intertidal, habitats predominantly in the tropics, while spiny sand crabs (Blepharipodidae), although also in shallow waters, show an anti-tropical distribution (Boyko and Harvey 2009). The first thorough revision of albuneid and blepharipodid taxonomy was the monograph of Boyko (2002), which documented six recent species of spiny sand crabs and 47 recent species of sand crabs worldwide. Subsequently, an additional four species of sand crabs have been described from Japan (2), Cuba (1) and the Gulf of Mexico (1) (Osawa and Fujita 2007 2012; Ortiz 2015; Ortiz et al. 2018), bringing the total number of recent sand crab species to 51. Boyko (2010) provided updated distribution data for 14 species of albuneids and, subsequently, several papers giving new regional records for single species (e.g., Mashar et al. 2015; Reshmi et al. 2017) have been published.

In the summer of 2016, while visiting the Lee Kong Chian Natural History Museum, I examined a single specimen of sand crab from the Philippines belonging to *Paralbunea* Serène, 1977, which appeared to be undescribed. In April 2019, I was contacted by Martyn Low (National University of Singapore) and Tin-Yam Chan (National Taiwan Ocean University) asking for identification of a single specimen of *Paralbunea* from Taiwan based on an excellent color photograph; the specimen was subsequently loaned for first-hand examination. A thorough study of the Philippine and Taiwanese specimens showed that they each represent a new species, both of which are described herein. Although it is unfortunate that these new species are by necessity each based on only a single specimen, that both species have eluded discovery to date suggests that neither is likely to be frequently encountered and there seems to be no advantage to waiting for additional material. A key to all seven species of *Paralbunea*, including the two described herein as new, is provided.

MATERIALS AND METHODS

All measurements of the carapaces are given as length (CL) × width (CW). Specimens are deposited in the collections of National Taiwan Ocean University (NTOU) and the Zoological Reference Collection of the Lee Kong Chian Natural History Museum (formerly the Raffles Museum of Biodiversity Research) (ZRC). Near complete synonymies up to 2001 of all previously described species can be found in Boyko (2002 2010); only citations of species not given in Boyko (2002 2010) are included in the synonymy lists below. Although full descriptions of the new species are given following the conventions of anomuran descriptions, only those parts of the specimens that contain characters that are informative at the species level (as opposed to the genus level) are illustrated.

RESULTS

TAXONOMY

Hippoidea Latreille, 1825

Family Blepharipodidae Boyko, 2002

Genus *Blepharipoda* Randall, 1840

Blepharipoda liberata Shen, 1949

Blepharipoda liberata – Wang and Yang 1994: 573 [list]; Muraoka 1998: 56 [list]; Wang and Yang 2001: 351 [list]; Boyko 2002: 2, 8, 26, 27, 35–42, figs. 2D (part), 12, 13 [full synonymy]; Petryashev 2005: S11 [list]; Osawa and Fujita 2007: 127 [mention]; Boyko and McLaughlin 2010: 142 [list]; Park et al. 2011: 236 [list]; An et al. 2014: 534, 534 [Korea]; Sohtome et al. 2014: 109 [list]; Yoon et al. 2014: 938, 941 [Korea]; Mao and Li 2015: 118 [China].

Blepharipoda liberata [sic] – Yoon et al. 2014: 935 [Korea]; Wang 2015: 74–78, figs. 1–2 [China]; Ding et al. 2016: 1208–1214, fig. 2 (part) [Korea; genetic data]; Hou et al. 2017: 262–269, fig. 1 [China; nutrient composition]; Zhou et al. 2019: 169–174, figs. 1–3 [China].

Material examined: 1 male (23.3 mm CL × 18.2 mm CW), Qingdao, China, coll. fishermen (ZRC 2016.0113).

Range: Known from Japan, China, and Korea; depth range unknown (Boyko 2002).

Remarks: This specimen of *B. liberata* is tied for the male with the largest known carapace length (Boyko 2002). Mao and Li (2015) incorrectly cited this species as belonging to Albuneidae, the family it was formerly placed in prior to 2002 (Boyko 2002). *Blepharipoda liberata* is apparently “a commercially valuable seafood product that is highly popular in Shandong Province”

(Hou et al. 2017), although no specifics as to the number of specimens caught per season or year were provided. Zhou et al. (2019) determined the karyotype of this species, but gave an unusual context for doing so: they stated that “the question of whether *B. liberata* [sic] is a shrimp or a crab has been debated in recent years” when no author has ever suggested that *B. liberata* is anything but an anomuran. One further note, the erroneous spelling “*Blepharipoda liberata*” [sic] has appeared with increasing frequency in recent years, no doubt due to Microsoft Word consistently autocorrecting “*liberata*” to “*liberate*” and a lack of subsequent proofreading.

Genus *Lophomastix* Benedict, 1904

Lophomastix japonica (Duroufflé, 1889)

Lophomastix japonica – Boyko 2002: 2, 11, 12–18, 20, figs. 4, 5 [full synonymy]; Petryashev 2005: S13 [list]; Osawa and Fujita 2007: 127 [mention]; McLaughlin and Lemaitre 2008: 61 [mention]; Nyborg and Vega 2008: 361 [mention]; Boyko and McLaughlin 2010: 142 [list]; Park et al. 2011: 236 [list]; Ding et al. 2016: 1208–1214, fig. 2 (part) [Korea; genetic data].

Lophomastix [sic] *japonica* – Wang and Yang 1994: 573 [list]; Wang and Yang 2001: 351 [list].

Lophomastix [sic] *japonica* – Ding et al. 2016: 1214 [Korea; genetic data].

Material examined: 1 specimen (fragmented, unmeasurable, sex indeterminate), “Indochine” (ZRC 2016.0112).

Range: Known from Russia, Japan, China, and Korea, up to 50 m deep (Boyko 2002).

Remarks: The label with this specimen reads “*Pseudoalbunea gordonii* gen. & sp. nov.”; this is an unpublished manuscript name of Raoul Serène and is mentioned here as a historical note; these names have no status. The locality of “Indochine” (Indochina; east of India to south of China) as written on the original label is suspect, as *L. japonica* has never been collected in this region, comprising the coasts of Cambodia, Malaysia, Myanmar, Thailand, and Vietnam, and the waters are likely too warm for this species.

Family Albuneidae Stimpson, 1858

Genus *Albunea* Weber, 1795

Albunea holthuisi Boyko & Harvey, 1999

Albunea holthuisi – Boyko 2002: 3, 229, 230, 289–296, 303, 393, figs. 94, 95 [full synonymy]; Tsang et al. 2008: 362 [list]; Boyko 2010: 56 [Réunion Island]; Boyko and McLaughlin 2010: 140 [list]; Osawa et al. 2010: 8, 13, 16 [mention]; Poupin 2010: 32 [list].

Material examined: 1 female (14.9 mm CL ×

16.2 mm CW), northeast Taiwan, Yilan County, Taiwan, coll. P.K.L. Ng, 6 Nov. 2000 (ZRC 2001.0105).

Range: Zanzibar, Madagascar, Mascarene Islands (Réunion), Seychelles, Indonesia, Malaysia, Taiwan, Thailand, Australia (Queensland) at 9.1–120 m deep (Boyko 2002 2010; present study).

Remarks: This is the first record of *A. holthuisi* from Taiwan.

***Albunea microps* Miers, 1878**

(Fig. 1A)

Albunea microps – Boyko 2002: 3, 9, 229, 230, 246–254, 259, 260, 295, 312, 373, figs. 2a, 81, 82 [full synonymy]; Boyko 2010: 52–53 [Philippines]; Boyko and McLaughlin 2010: 140 [list]; Markham 2010: 152–153 [host of *Albunione australiana* Markham and Boyko, 1999]; Osawa et al. 2010: 8, 11 [mention]; Poupin 2010: 32 [list]; Osawa and Fujita 2012: 246 [mention].

Material examined: 1 male (fragmented, unmeasurable), Panglao Island, Bohol Province, Philippines, stn. R56, lagoon and upper reef slope, 1–10 m, 9°32.3'N, 123°43.1'E, coll. Panglao 2004 Expedition, 21 June 2004 (ZRC 2016.0115).

Range: From Zanzibar and Madagascar north

to Oman and eastward to the Philippines and New Caledonia, at 3–45 m deep (Boyko 2002). Also reported from the Ryukyu Islands, Japan at 52 m (Osawa and Fujita 2007).

Remarks: Although the male was collected in good condition (see Fig. 1A), at some point between being photographed and examined by the author, it became severely damaged. It is identifiable both by the color photograph of the fresh specimen and characteristic shape of the eyes and dactyli, all of which remain intact. *Albunea microps* was previously recorded from the Philippines (Boyko 2002).

***Albunea occulta* Boyko, 2002**

Albunea occulta Boyko, 2002: 3, 203, 229, 230, 312–320, 393, figs. 100, 101 [full synonymy]; Sakai 2005: 1120, 1126 [Japan]; Courtney et al. 2007: 252 [Queensland, Australia]; Poore et al. 2014: 8 [Western Australia].

Albunea occulta – Sakai and Sawada 2006: 1358 [list]; Boyko 2007: 182, 184 [Western Australia]; Osawa and Fujita 2007: 127 [mention]; Boyko 2010: 52 [mention]; Boyko and McLaughlin 2010: 141, 143, fig. 1B [list; Taiwan]; Tsang et al. 2011: 620 [list]; Osawa and Fujita 2012: 246 [mention]; Osawa et al. 2010: 2, 8, 9, 15–17, 19, 21, figs. 7, 8 [Taiwan]; Marimuthu et al. 2015: 135–138, figs. 2, 3 [Andaman Islands]; Fujita et al. 2017: 1, 2, 6,



Fig. 1. A, *Albunea microps* Miers, 1878, male, CL unknown (fragmented when examined) (ZRC 2016.0115). B, *Albunea symmysta* (Linnaeus, 1758), female, 19.0 mm CL (ZRC 2016.0114). Photographs courtesy of Tin-Yam Chan.

fig. 2A, B [Japan]; Reshmi et al. 2017: 225–227, fig. 1 [India]; Kumar et al. 2018: 1497–1499, figs. 2A, B, 3A, B [India]; Luque et al. 2019: 8, fig. 6 [mention]; Abdul Wahab et al. 2019: 12 [Western Australia].

Material examined: 1 male (17.3 mm CL × 17.4 mm CW), Taiwan, 15 m, gill net, rocky, coll. J. F. Huay 22 Oct. 1991 (ZRC 2008.0682); 1 female (19.2 mm CL × 21.3 mm CW), Yong'an, Kaohsiung Country, Taiwan, TMCD 2806, coll. G.-J. Xin (ZRC 2016.0117).

Range: Andaman Islands; southern Japan southward to the eastern and western coasts of Australia, at up to 82 m deep (Boyko 2002; Marimuthu et al. 2015).

Remarks: This species was previously known from Taiwan (Boyko 2002; Osawa et al. 2010)

***Albunea steinitzi* Holthuis, 1958**

Albunea steinitzi – Boyko 2002: 3, 55, 229, 230, 296, 303, 336, 352–359, figs. 111, 112 [full synonymy]; Siddiqui & Kazmi 2003: 88 [Pakistan]; Kazmi and Siddiqui 2006: 12, fig. 1 [key]; Boyko and McLaughlin 2010: 141 [list]; Osawa et al. 2010: 8, 13 [mention]; Naderloo et al. 2015: 401 [Iran]; Ebrahimzadeh and Naderloo 2019: 448 [list].

“*Albunea (steinitzi?)*” – Moazzam et al. 2004: 56 [Pakistan; larvae].

?*Albunea steinitzi* – Wisespongpan et al. 2008: 507, 510 [Thailand].

Material examined: 1 male (7.6 mm CL × 8.2 mm CW), 1 female (12.8 mm CL × 15.2 mm CW), Qeshm Island, Iran, coll. M. Asgari, 2008 (ZRC 2014.0030).

Range: From Pakistan in the Red Sea and southward to Tanzania; depth range unknown (Boyko 2002).

Remarks: This species has previously been reported from Iran (Naderloo et al. 2015). Although Moazzam et al. (2004) were unsure of the identification of their larval specimens, they were likely correct, as this species has been reported several times from Pakistan; but the record from Thailand (Wisespongpan et al. 2008) is dubious, as *A. steinitzi* has never been reported east of Pakistan.

***Albunea symmysta* (Linnaeus, 1758)**

(Fig. 1B)

Albunea symmysta [sic] – Komai 2000: 368 [list]; Subramonian and Gunamalai 2003: 112, 121, 126, 146 [mention]; Desantis et al. 2006: 48 [mention]; González-Acuña et al. 2009: 31 [mention]; Gallo and Costantini 2012: 2870 [mention]; Kumar et al. 2015: 89, 93 [India, as stomach contents of fish]; Lützen et al. 2016: 204 [mention as host of *Sacculina anceps* Boschma, 1931]; Niksirat and Kouba 2016: 449 [mention]; Tomas et al. 2019: 24 [mention].

Albunea symmysta – Boyko 2002: 3, 68, 229, 230, 253, 274, 295, 303–313, 320, 373, 393, 395, figs. 2D (part), 98, 99 [full synonymy]; Osawa and Fujita 2007: 128, 136, fig. 5A, B [India];

Boyko 2010: 56–57 [Madagascar, India]; Boyko and McLaughlin 2010: 141 [list]; Dev Roy and Mitra 2010: 188 [mention]; Osawa et al. 2010: 8, 9, 19–21, fig. 11 [Taiwan]; Keiler and Richter 2011: 345, 347, 353, figs. 1C.VI, 1D.IV, 6B [grooming leg setae study]; Darusman et al. 2015: 15 [mention]; Srinivasan et al. 2012: 60–63 [India, lipid content studied]; Hegde et al. 2013: 900 [India]; Mashar and Wardiatno, 2013: 33 [mention]; Mashar et al. 2014: 228–231 [Indonesia]; Siangcham et al. 2015: 2 [mention]; Mashar et al. 2015: 611–614, figs. 2, 3 [Indonesia]; Bhagawati et al. 2016a: 556, 557, 559, 560, 562, figs. 2A, 3 [Indonesia]; Bhagawati et al. 2016b: 226, 227, 229, figs. 6, 7, 8B [Indonesia]; Edritanti et al. 2016: 164 [mention]; Mahsar and Wardiatno 2016: 212 [mention]; Wardiatno et al. 2016a: 5 [mention]; Wardiatno et al. 2016b: 17 [mention]; Wardiatno et al. 2016c: 135–139 [Indonesia]; Dev Roy and Rath 2017: 88 [India; list]; Fujita et al. 2017: 1, 2 [mention]; Koedprang et al. 2017: 15 [mention]; Pramithasari et al. 2017: 103–111, fig. 1 [Indonesia]; Reshmi et al. 2017: 225, 227, fig. 2 [India]; Kumar et al. 2018: 1496, 1499, 1502 [mention]; Nugraha et al. 2018: 56, 62–64, 66 [Indonesia]; Dewi et al. 2019: 387–389 [Indonesia]; Hartoko et al. 2019: 523, 528, 530–532, 535, 536, fig. 2 (part) [Indonesia]; Wisespongpan et al. 2019: 699–700 [Indonesia].

?*Albunea symmysta* – Kakuda et al. 2002: 261, 269 [Japan, as dolphin stomach contents].

?*Albunea* aff. *symmysta* – Osawa and Fujita 2012: 248–250, fig. 2 [Japan].

Material examined: 1 female (19.0 mm CL × 18.5 mm CW), Mayacabac, Panglao Island, Bohol Province, Philippines, stn. M51, intertidal (0 m), sand and seagrass, 9°36.8'N, 123°52.2'E, coll. Panglao 2004 Expedition, 30 June 2004 (ZRC 2016.0114).

Range: From the east coast of India throughout southeast Asia to the Philippines and Indonesia as far east as Java, at up to 151.5 m deep; also from Taiwan, Queensland and Lord Howe Island, Australia (Boyko 2002; Osawa et al. 2010); questionably from Madagascar (Boyko 2010).

Remarks: This species has been previously reported from the Philippines (e.g., Boyko 2002). The records of Kakuda et al. (2002) and Osawa and Fujita (2012) may refer to the same taxon, but it is not clear that it is *A. symmysta sensu stricto*, as the occurrence of *A. symmysta* has not been verified in Japan.

Genus *Paralbunea* Serène, 1977

***Paralbunea chani* n. sp.**

(Fig. 2)

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Type material: holotype intersex specimen (13.6 mm CL × 17.5 mm CW), Dasi fishing port, Yilan County, Taiwan, coll. C. W. Huang (ex commercial trawler), 19 July 2011 (NTOU A01450).

Description: Carapace (Fig. 2A) wider than long. Anterior margin concave on either side of ocular sinus, becoming convex laterally, one (left) or three

(right) small spines on convex region, ventral row of long plumose setae submarginally. Rostrum present, reaching posterior margin of ocular plate. Ocular sinus smoothly concave, unarmed. Frontal region smooth; setal field broad posteriorly, narrowing anteriorly, with narrow lateral elements and strongly concave anterior margin. CG1 parallel to anterior margin of carapace, sinuous, slightly crenulate, medial and curved lateral elements slightly separate. Mesogastric region smooth, CG2 absent; CG3 present as two short oblique lateral elements; CG4 as two short oblique medial elements and two longer lateral elements contiguous with CG6. Hepatic region smooth, with long setose groove at median of lateral margin. Epibranchial region roughly triangular, smooth. Metagastric region smooth; CG5 absent; CG6 slightly crenulate laterally, entire, contiguous at apices with CG4 lateral elements; CG7 as two lateral elements separate from CG6. Cardiac region smooth; CG8 present as two minute, widely separated elements; CG9 present as four short elements; CG10 present as three short elements; CG11 absent. Branchial region with few lateral short rows of setae and posterior small setose punctae. Posterior margin deeply and evenly convex, submarginal groove not reaching to margin of posterior concavity. Branchiostegite with strong anterolateral submarginal spine, anterior region with scattered short, transverse lines ventral to linea anomurica, ventral region with many short rows of setae and covered with long plumose setae, posterior region membranous, with numerous irregular fragments and covered with long plumose setae.

Ocular plate (Fig. 2B) subquadrate, with broad median indentation. Median peduncular segments ovate. Distal peduncular segments as laterally inflated triangles, with strongly convex lateral margins and weakly convex mesial margins, cornea at distal tip indentation (pigment visible as distal spots in preserved specimen), mesial margins separated along length, lateral and distomesial margins with long simple setae, ventral surface with proximal transverse submarginal ridge lined with long plumose setae.

Antennule segment III narrow proximally, expanding distally to two times proximal width, plumose setae on dorsal and ventral margins; dorsal exopodal flagellum with ca. 140 articles ($n = 1$), long plumose setae on dorsal and ventral margins; ventral endopodal flagellum with three articles ($n = 1$), plumose setae on dorsal and ventral margins. Segment II slightly medially inflated in dorsal view, plumose setae on dorsal quarter and ventral margin, and scattered on ventral third of surface. Segment I wider than long, unarmed, lateral surface with long plumose setae on dorsal quarter and on dorsal and ventral margins.

Antenna with segment V approximately two

times longer than wide, long plumose setae on dorsal margin and few short setae on mediolateral surface, flagellum with seven articles ($n = 2$), long plumose setae on dorsal, ventral, and distal margins. Segment IV expanded distally, long plumose setae on dorsal and ventral margins, short simple setae on lateral surface. Segment III with long plumose setae on ventral margin, short simple setae on dorsal margin. Segment II short, widening distally, long plumose setae on margins and short plumose setae on lateral surface, antennal acicle long, thin, reaching distal margin of segment IV, long plumose setae on dorsal margin. Segment I rounded proximally, flattened ventromesially, long plumose setae on margins and dorsolateral surface; without dorsolateral lobe.

Mandible incisor process with two teeth, cutting edge with two teeth. Palp three-segmented, with plumose setae on margins and long, thick, simple setae arising from bend in second segment.

Maxillule distal endite proximally narrow, widening to inflated distal end, with thick simple setae on distal margin and thin plumose setae on dorsal margin. Proximal endite with thick simple setae on distal margin.

Maxilla exopod evenly rounded, with plumose setae along distal margin. Scaphognathite rounded on posterior lobe, with plumose setae.

Maxilliped I epipod with short plumose setae on margins and covering lateral surface. Endite tapered distally and subequal to first segment of exopod. Exopod with two segments; proximal segment narrow, margins parallel, with plumose setae; distal segment spatulate, approximately 1.3 times longer than wide, broadest medially, margins and lateral surface with long plumose setae. Endopod flattened and elongate, reaching to distal end of proximal exopodal segment, with plumose setae on surface, thick simple setae on mesial margin.

Maxilliped II dactylus evenly rounded, length equal to width, with thick simple setae distally and thin simple setae on distolateral surface. Propodus two times wider than long, with plumose setae on dorsal margin and long simple setae on distal margin. Carpus not strongly produced dorsodistally, approximately two times longer than wide, with long simple setae on dorsal and distal margins and in small patch on lateral surface. Merus approximately three times longer than wide, margins parallel, with long plumose setae on dorsal margin and scattered on surface, simple setae on ventral margin. Basis-ischium incompletely fused, with plumose setae on margins. Exopod one-half longer than merus, flagellum with one elongate article.

Maxilliped III (Fig. 2C) dactylus rounded at tip, long plumose setae on margins and lateral surface. Propodus with longitudinal median row of long

plumose setae on lateral surface, dorsal margin with long plumose setae, ventral margin with few short simple setae. Carpus weakly produced onto propodus and reaching one-third length of propodus, lateral surface with rows of long plumose setae medially and ventrally; tuft of long plumose setae distoventrally; long plumose setae on dorsal margin. Merus unarmed, distally slightly inflated, long plumose setae on margins, longitudinal row and six tufts of short plumose setae on lateral surface. Basis incompletely fused with ischium; crista dentata absent. Exopod two-segmented, proximal segment small, distal segment styliform, tapering, approximately three-quarters length of merus, plumose setae on margins; flagellum absent.

Pereopod I (Fig. 2D) dactylus curved and tapering, lateral and mesial surfaces smooth, dorsal margin with long plumose and short simple setae, ventral margin smooth. Propodus lateral surface with numerous short, transverse rows of setose rugae; dorsal margin unarmed; ventral margin distally produced into acute spine; cutting edge lacking teeth, lined with long plumose setae; dorsal and ventral margins with long plumose setae; patch of short plumose setae on lateral surface subdorsally. Carpus with dorsodistal angle smoothly rounded; dorsal and distal margins with long plumose setae; short oblique setose ridge in median of lateral surface; tuft of long plumose setae on ventral margin; mesial surface smooth. Merus unarmed; lateral surface without dorsomedial decalcified region, scattered transverse rows of short plumose setae on ventral half, dorsomedial margin with long plumose setae. Basis-ischium incompletely fused, unarmed. Coxa unarmed.

Pereopod II (Fig. 2E) dactylus smooth; base to heel nearly straight, heel with smoothly rounded low spur, heel to tip broadly indented, tip subacute, tip to base broadly convex; lateral surface smooth, several widely spaced submarginal tufts of short setae dorsodistally; mesial surface smooth, ventral margin with long plumose setae, dorsal margin with row of long plumose setae from junction with propodus to median of heel. Propodal dorsal surface smooth, ventral margin proximally inflated and rounded; oblique row of long plumose setae on distal margin of lateral surface; distal and ventral margins with long plumose setae; dorsolateral surface as narrow, oblique, flattened shelf, short setae on dorsal margin and long plumose setae on ventral margin; mesial surface with elevated, curved, setose ridge from ventral junction with dactylus almost to ventral proximal junction with carpus. Carpus produced one-fourth over propodus, gently rounded dorsally, with rounded distoventral angle; lateral surface nearly smooth, with irregular, interrupted row of short rugae medially and submarginal elevated ridge ventrally, rugae and ridge with long plumose

setae, margins with long plumose setae; mesial surface smooth, interrupted submarginal rows of long plumose setae dorsally, ventrally, and distally. Merus with medial decalcified area on lateral surface, long plumose setae on dorsodistal and ventromedial margins; mesial surface nearly smooth, with many short rows of long plumose setae. Basis-ischium incompletely fused and unarmed. Coxa unarmed.

Pereopod III (Fig. 2F) dactylus base to heel slightly concave, heel rounded and weakly produced, heel to indent slightly concave, indent broadly concave, tip subacute, tip to base smoothly convex; distal portion of dactylus broader than area of maximal indent; lateral surface smooth, dorsodistal margin with tufts of short setae, ventral margin with long plumose setae, dorsal margin with short simple and plumose setae; mesial surface smooth, row of plumose setae from junction with propodus to around heel. Propodus weakly inflated; lateral surface smooth, long plumose setae distally, simple setae on margins, long plumose setae on ventral margin; dorsolateral surface narrow, oblique, flattened, with short plumose setae on margins; mesial surface with few scattered long setae. Carpus inflated, produced dorsodistally, reaching one-third across propodus, broadly rounded, dorsolateral margin unarmed; lateral surface slightly rugose dorsodistally, with mat of short simple setae covering distal three-quarters of surface; with two long rows of setae medially; mesial surface smooth, distal and oblique rows of long plumose setae. Merus smooth, dorsal and ventral margins unarmed, dorsodistal and ventromesial margins with long plumose setae; lateral surface with large medially decalcified area and few long plumose setae; mesial surface smooth, with few scattered setae. Basis-ischium incompletely fused and unarmed. Coxa unarmed. Large gonopore on median mesial surface of coxa, surrounded with short plumose setae.

Pereopod IV (Fig. 2G) dactylus with base to heel slightly convex, heel low, heel to tip convex to straight, tip acute, tip to base broadly convex; lateral surface smooth, ventral margin with long plumose setae, dorsal margin with short simple setae; mesial surface with median decalcified area, demarcated ventrally by longitudinal elevated ridge with row of long plumose setae, setose punctae ventral to decalcified window. Propodus expanded ventrally, ventral expansion reaching ventral margin of dactylus, margins with long plumose setae, dorsal expansion with row of long plumose setae dorsally and mat of short setae ventrally; lateral and mesial surfaces smooth. Carpus not produced dorsodistally, small mat of setae along distal half of dorsal margin; lateral and mesial surfaces smooth, without medial decalcified area, dorsal margin with short simple and long plumose setae, ventral

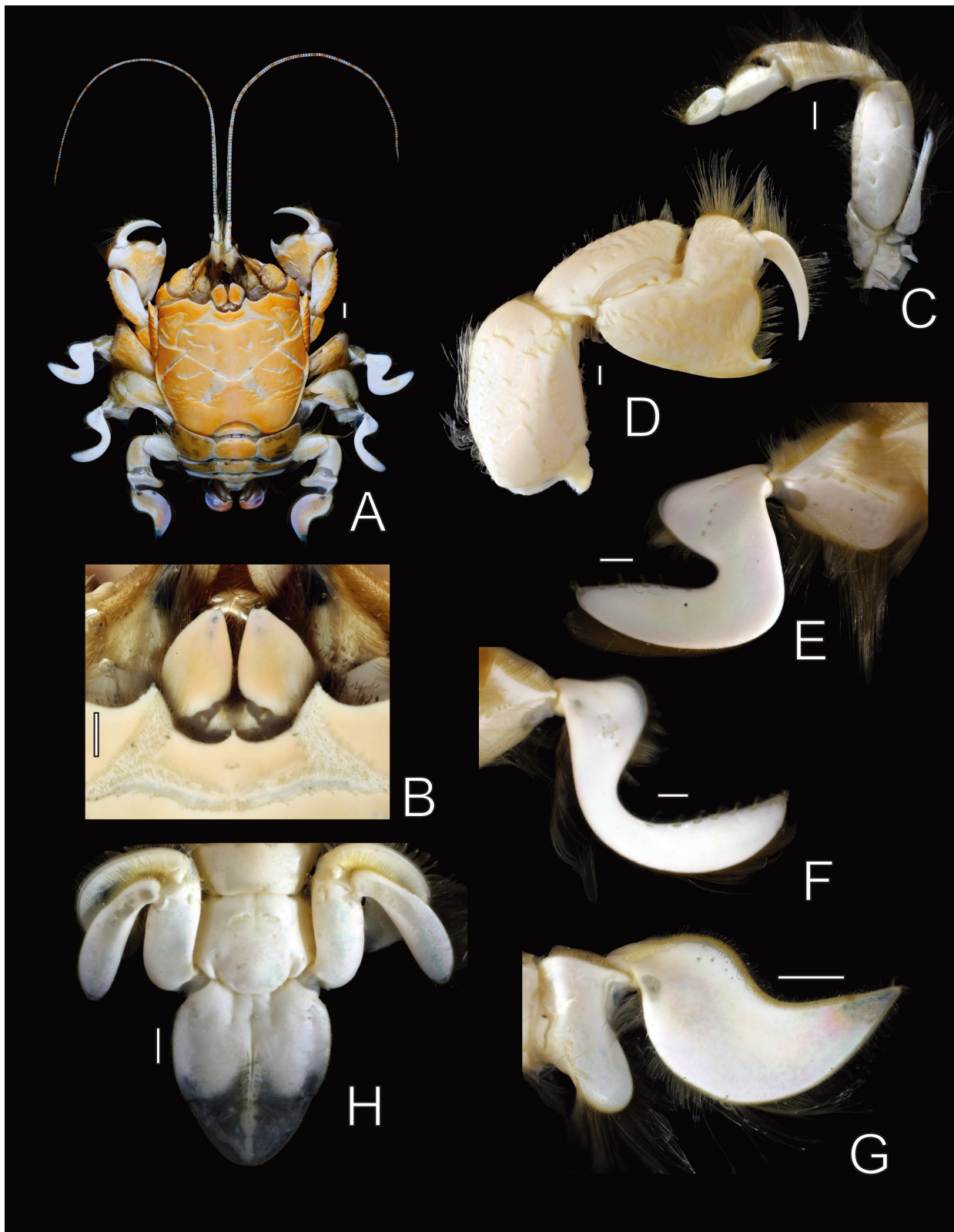


Fig. 2. *Paralbunea chani* n. sp., holotype intersex specimen, 13.6 mm CL (NTOU A01450). A, habitus. B, ocular peduncles and median frontal margin. C, left maxilliped III. D, right pereopod I. E, left pereopod II dactylus and propodus. F, right pereopod III dactylus and propodus. G, right pereopod IV dactylus and propodus. H, abdominal somite VI, uropods and telson. Scale bars: A = 2 mm; B–H = 1 mm. Habitus photograph courtesy of Tin-Yam Chan.

margin with short plumose setae. Merus lateral surface with few scattered short transverse rows of setae, dorsal and ventral margins with long plumose setae; proximal fourth of mesial surface with large decalcified window. Basis-ischium incompletely fused and unarmed. Coxa unarmed.

Pereopod V with well-developed gonopores.

Abdomen (Fig. 1A, H) with somite I wider than long, widest medially; dorsal surface with anterior margin convex, posterior margin slightly concave, with submarginal elevated and curved row of short setae, few scattered setose punctae proximolaterally, small transverse decalcified submedial windows present. Somite II dorsal surface with submarginal transverse ridge anteriorly, patch of setae at posterolateral angle extending onto pleura posteromesially; pleura expanded and directed laterally, anterolateral margin slightly concave, posterolateral margin rounded, anterior and lateral margins with long plumose setae, posterior margin with short setae. Somite III similar to somite II, but narrower and shorter, small patch of short thick setae on posterolateral angle; pleura thinner and shorter than that of somite II, directed anterolaterally, with setae as in somite II, anterolateral angle acute, dorsal surface obliquely flattened anterolaterally, with submarginal row of short simple setae. Somite IV similar that of somite III, but thinner and shorter; pleura thinner and shorter than on somite III, directed slightly anterolaterally, dorsal surface obliquely flattened anterolaterally, with submarginal row of short simple setae, margins with long plumose setae. Somite V narrower but longer than somite IV, lateral margins with plumose setae; pleura absent. Somite VI wider and longer than somite V, dorsal surface with two short oblique rows of setae laterad of midline anteriorly, posterior margins with few long plumose setae; pleura absent.

Stubs of pleopods on somites II–V; large uniramous, paired pleopods lacking.

Telson (Fig. 1H) spatulate, rounded distally, proximal half well calcified, distal half weakly calcified, margins with long plumose setae; median longitudinal groove long, extending three-fourths of surface and with short simple setae along distal two-thirds of groove; few short simple setae at proximolateral corners.

Range: Known only from Taiwanese waters (precise location and depth range unknown).

Remarks: The holotype of *Paralbunea chani* n. sp., is an intersex specimen, bearing well-developed gonopores on both the third and fifth pereopod coxae; however, the form of the telson is distinctly male when compared to males and females of other species in the genus. The holotype of *P. chani* n. sp. can be distinguished from each of the other species in the genus by several characters (those of other species in

parentheses). This species differs from *P. dayriti* (Serène and Umali, 1965) in having distal segments of the ocular peduncles indented at the tip (not indented), CG1 anterior margin strongly concave (weakly concave), CG4 lateral elements more than two times as long as those of *P. dayriti*, CG4 medial elements as single row on each side of midline and more than two times as long as those of *P. dayriti*, pereopod 2 dactylus heel distally rounded (triangular), pereopod 3 dactylus heel more broadly rounded, pereopod 4 dactylus heel less produced, and male telson less medially expanded, with the distal margin rounded (truncate).

It differs from *P. intermedia* (Balss, 1916) in having distal segments of the ocular peduncles with mesial margins convex (nearly straight) with small indentations at tip (no indentations), rostrum present (absent), CG1 anterior margin concave (straight), CG4 lateral elements more than two times as long as those of *P. intermedia*, CG4 medial elements as single row on each side of midline and more than two times as long as of *P. intermedia*, CG10 present as two small lateral elements (absent), pereopod 2 dactylus heel slightly more produced, pereopod 3 dactylus heel more produced, rounded, pereopod 4 dactylus heel more produced, rounded, and male telson more elongate, with the tip tapered.

It differs from *P. manihinei* Serène, 1977 in having distal ocular peduncles indented at tip (pointed at tip), rostrum with distal tooth (absent), CG1 anterior margin concave (nearly straight), CG4 lateral elements more than two times as long as those of *P. manihinei*, CG4 medial elements as single row on each side of midline, more than two times as long as those of *P. manihinei*, CG10 present as two small lateral elements (absent), pereopod 2 dactylus heel projection rounded (subquadrate), pereopod 3 dactylus heel slightly more produced, pereopod dactylus 4 heel with steeper slope, and male telson less expanded distally.

It differs from *P. paradoxa* (Gordon, 1938) in having distal segments of the ocular peduncles tapered distally, triangular in shape (not tapered, subquadrate in shape), and pereopod 3 and 4 dactylus heels not rounded (acutely produced).

It differs from *P. takedai* Osawa and Fujita, 2012 in having evenly triangular distal ocular peduncles (laterally inflated, mesiodistally tapered), CGs present on the anterior carapace (absent), pereopod 2 dactylus heel produced but rounded (acute), pereopod 3 dactylus heel low, rounded (acutely produced), pereopod 4 dactylus heel low and rounded (acutely produced), and telson distal margin rounded (slightly concave).

Finally, *P. chani* n. sp. differs from *P. chirotheca* n. sp. described below in having triangular distal segments of the ocular peduncles (mitten-shaped), acute rostral

spine (no spine), no spines lateral to the ocular sinus (those spines present), a long setal groove in the hepatic region nearly reaching the margin of the setal field (only small lateral element of the setal groove), medial CG4 elements oblique (straight), pereopods 2 and 3 dactyli with narrower indents, and pereopod 4 dactylus with steeper slope from heel to tip.

It is unfortunate that the type locality is so imprecise, owing to the collection of this specimen by a vessel for a local fishery.

Etymology: This species is named after Tin-Yam Chan (NTOU) in thanks for his help in providing this specimen for study, as well as this excellent color photographs of several species discussed herein.

***Paralbunea chirotheca* n. sp.**

(Fig. 3)

urn:lsid:zoobank.org:act:28C4D464-C6B5-45D7-B076-FA87C94CA4EB

Type material: holotype female (7.4 mm CL × 8.2 mm CW), west of Baclayon, Bohol Island, Philippines, sta. T6, coarse muddy sand with large sponges, 09°35.1'N, 123°51.2'E, 34–82 m, coll. PANGLAO 2004, 2 June 2004 (ZRC 2016.0421).

Description: Carapace (Fig. 3A) wider than long. Anterior margin concave on either side of ocular sinus, becoming convex laterally, four or five small spines in concave region, two spines just lateral to concave region, ventral row of long plumose setae submarginally. Rostrum minute, low, broadly triangular, just reaching posterior margin of ocular plate. Ocular sinus smoothly concave, unarmed. Frontal region smooth; setal field broad posteriorly, narrowing anteriorly, with narrow lateral elements and slightly concave anterior margin. CG1 parallel to anterior margin of carapace, sinuous, slightly crenulate, medial and curved lateral elements widely separate. Mesogastric region smooth; CG2 absent; CG3 present as two short oblique lateral elements; CG4 fragmented into two short slightly oblique medial elements and two longer lateral elements. Hepatic region smooth, with short setose groove at median of lateral margin. Epibranchial region roughly triangular, smooth, posterolateral margin lined with short thick setae. Metagastric region smooth; CG5 absent; CG6 slightly crenulate, nearly contiguous except at midpoint; CG7 as two oblique, short elements, separate from CG6. Cardiac region smooth; CG8 present as four short, widely separated elements; CG9 present as two short, widely separated elements; CG10 present as two long oblique elements; CG11 absent. Branchial region without rows of setae, few posterior small setose punctae present. Posterior margin deeply and evenly convex, with submarginal

groove barely reaching to margin of posterior concavity. Branchiostegite with strong anterolateral submarginal spine, anterior region with scattered short, transverse lines ventral to linea anomurica, with many short rows of setae and covered with long plumose setae ventrally, posterior region membranous, with numerous irregular fragments and covered with long plumose setae.

Ocular plate (Fig. 3B) triangular, with shallow median indentation. Median peduncular segments apparently lacking (or extremely weakly calcified). Distal peduncular segments rounded with strong distal indentation slightly off-center of median of distal margin (“mitten-shaped”), cornea at base of distal indentation, patch of pigment visible on ventral surface of peduncle, mesial margins approximated along short region of maximum convexity, margins with long plumose setae except in distal indentation, ventral surface with proximal transverse submarginal ridge lined with long plumose setae.

Antennule segment III narrow proximally, expanding distally to two times proximal width; plumose setae on dorsal and ventral margins; dorsal exopodal flagellum with 138 or 139 articles ($n = 2$), long plumose setae on dorsal and ventral margins; ventral endopodal flagellum with two articles ($n = 2$), plumose setae on dorsal and ventral margins. Segment II medially inflated in dorsal view, plumose setae on ventral margin and scattered on ventral half of surface. Segment I wider than long, unarmed, lateral surface with long plumose setae on dorsal quarter and on dorsal and ventral margins.

Antenna with segment V approximately two times longer than wide, long plumose setae on dorsal margin and few short setae on mediolateral surface, flagellum with eight articles ($n = 2$), long plumose setae on dorsal, ventral, and distal margins. Segment IV expanded distally, long plumose setae on dorsal and ventral margins, short simple setae on lateral surface. Segment III with long plumose setae on ventral margin, short simple setae on dorsal margin. Segment II short, widening distally, long plumose setae on margins and short plumose setae on lateral surface, antennal acicle long, thin, extending approximately one-half length of segment V, long plumose setae on dorsal margin. Segment I rounded proximally, flattened ventromesially, long plumose setae on margins and dorsolateral surface; lateral surface unarmed, without dorsolateral lobe.

Mandible incisor process with two teeth, cutting edge with two teeth. Palp three-segmented, with plumose setae on margins and long, thick, simple setae arising from bend in second segment.

Maxillule distal endite proximally narrow, widening to inflated distal end, with thick simple setae on distal margin and thin plumose setae on dorsal

margin. Proximal endite with thick simple setae on distal margin. Endopodal external lobe truncate distally and curled under, notched proximally; internal lobe reduced with one thick seta at distolateral margin.

Maxilla exopod evenly rounded, with plumose setae along distal margin. Scaphognathite rounded on posterior lobe, with plumose setae.

Maxilliped I epipod with short plumose setae on margins and covering lateral surface. Endite tapered distally and subequal to first segment of exopod. Exopod with two segments; proximal segment narrow, margins parallel, with plumose setae; distal segment spatulate, approximately 1.5 times longer than wide, broadest medially, margins and lateral surface with long plumose setae. Endopod flattened and elongate, reaching to distal end of proximal exopodal segment, with plumose setae on surface, thick simple setae on mesial margin.

Maxilliped II dactylus evenly rounded, length equal to width, with thick simple setae distally and thin simple setae on distolateral surface. Propodus two times wider than long, with plumose setae on dorsal margin and long simple setae on distal margin. Carpus not strongly produced dorsodistally, approximately two times longer than wide, with long simple setae on dorsal and distal margins and in small patch on lateral surface. Merus approximately three times longer than wide, margins parallel, with long plumose setae on dorsal margin and scattered on surface, simple setae on ventral margin. Basis-ischium incompletely fused, with plumose setae on margins. Exopod greater than two times length of merus, flagellum with one elongate slender article.

Maxilliped III (Fig. 3C) dactylus rounded at tip, long plumose setae on margins and lateral surface. Propodus with longitudinal median row of long plumose setae on lateral surface, dorsal margin with long plumose setae, ventral margin with few short simple setae. Carpus weakly produced onto propodus, scarcely exceeding proximal margin of propodus, lateral surface with rows of long plumose setae medially, ventromedially, and tuft of long plumose setae distoventrally; long plumose setae on dorsal margin. Merus unarmed, distally slightly inflated, long plumose setae on margins and longitudinal row of short plumose setae on lateral surface. Basis incompletely fused with ischium; crista dentata absent. Exopod two-segmented, proximal segment small, distal segment styliform, tapering, approximately one-half length of merus, plumose setae on margins; flagellum absent.

Pereopod I (Fig. 3D) dactylus curved and tapering; lateral and mesial surfaces smooth; dorsal margin with long plumose and short simple setae, short simple setae on ventral margin. Propodus lateral surface with numerous short, transverse rows of setose rugae; dorsal

margin unarmed; ventral margin distally produced into acute spine; cutting edge lacking teeth, lined with long plumose setae; dorsal and ventral margins with long plumose setae; patch of short plumose setae on lateral surface dorsally. Carpus with dorsodistal angle smoothly rounded; dorsal and distal margins with long plumose setae; oblique setose ridge in median of lateral surface; tuft of long plumose setae on ventral margin; mesial surface smooth. Merus unarmed; lateral surface without decalcified region but with scattered transverse rows of short plumose setae on ventral half, dorsomedial margin with long plumose setae; mesial surface without decalcified region, with few short transverse rows of setae scattered on surface. Basis-ischium incompletely fused, unarmed. Coxa unarmed.

Pereopod II (Fig. 3E) dactylus smooth; base to heel slightly concave, heel with smoothly rounded low spur, heel to tip broadly indented, tip subacute, tip to base broadly convex; lateral surface smooth, several widely spaced submarginal tufts of short setae dorsodistally; mesial surface smooth, ventral margin with long plumose setae, dorsal margin with row of long plumose setae from junction with propodus across heel. Propodal dorsal surface smooth, ventral margin proximally inflated and rounded; oblique row of long plumose setae on distal margin of lateral surface; distal and ventral margins with long plumose setae; dorsolateral surface as narrow, oblique, flattened shelf, short setae on dorsal margin and long plumose setae on ventral margin; mesial surface with elevated, curved, setose ridge from ventral junction with dactylus almost to ventral proximal junction with carpus. Carpus produced less than one-fourth over propodus, gently rounded dorsally, with rounded distoventral angle; lateral surface nearly smooth, with irregular, short interrupted row of rugae medially and submarginal elevated ridge ventrally, rugae and ridge with long plumose setae, margins with long plumose setae; mesial surface smooth, interrupted submarginal rows of long plumose setae dorsally, ventrally, and distally. Merus with medial decalcified area on lateral surface, long plumose setae on dorsodistal and ventromedial margins; mesial surface nearly smooth, with many short rows of long plumose setae. Basis-ischium incompletely fused and unarmed. Coxa unarmed.

Pereopod III (Fig. 3F) dactylus base to heel weakly concave, heel rounded and slightly produced, heel to indent nearly straight, indent broadly concave, tip subacute, tip to base smoothly convex; lateral surface smooth, dorsal margin with short simple and plumose setae, dorsodistal margin with tufts of short setae, ventral margin with long plumose setae, mesial surface smooth, row of plumose setae from junction with propodus to heel. Propodus weakly inflated;

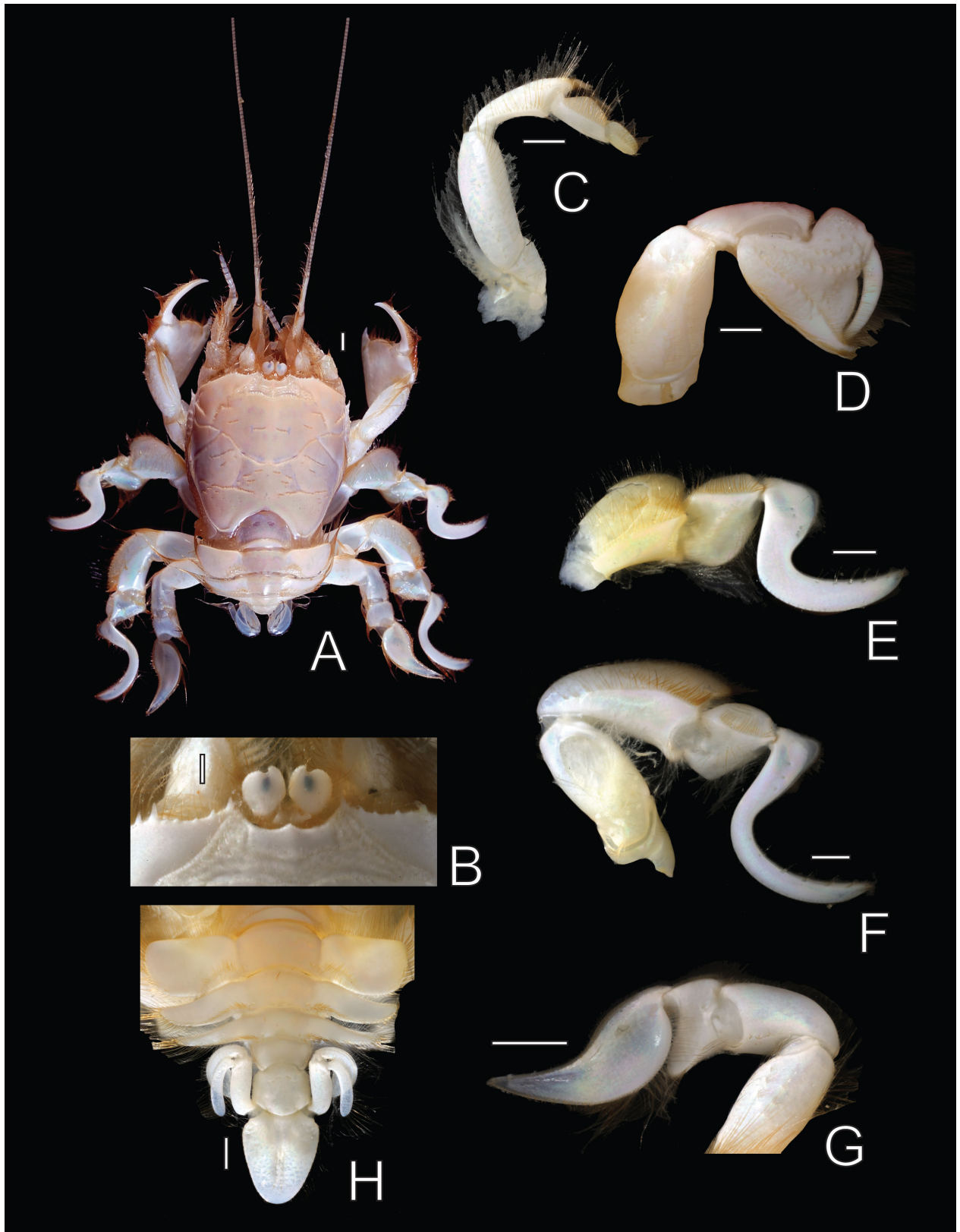


Fig. 3. *Paralbunea chirotheca* n. sp., holotype female (ZRC 2016.0421). A, habitus. B, ocular peduncles and median frontal margin. C, right maxilliped III. D, right pereopod I. E, right pereopod II. F, right pereopod III. G, left pereopod IV. H, abdominal somites, uropods and telson. Scale bars = 1 mm. Habitus photograph courtesy of Tin-Yam Chan.

lateral surface smooth, long plumose setae distally, simple setae on margins, long plumose setae on ventral margin, dorsolateral surface narrow, oblique, flattened, with short plumose setae on margins; mesial surface with few long setae scattered on surface. Carpus produced dorsodistally, inflated, reaching one-third across propodus, broadly rounded, dorsolateral margin unarmed; lateral surface smooth, with mat of short simple setae covering distal half of surface; with two long rows of setae medially; mesial surface smooth, distal and oblique rows of long plumose setae. Merus smooth, dorsal and ventral margins unarmed, dorsodistal and ventromesial margins with long plumose setae; lateral surface with large medial decalcified area and few long plumose setae; mesial surface smooth, with few scattered setae. Basis-ischium incompletely fused and unarmed. Coxa unarmed. Female with large gonopore on median mesial surface of coxa, surrounded with short plumose setae.

Pereopod IV (Fig. 3G) dactylus with base to heel concave, heel low, heel to tip convex to straight, tip acute, tip to base straight distally, becoming broadly convex proximally; lateral surface smooth, ventral margin with long plumose setae, dorsal margin with short simple setae; mesial surface with median decalcified area, demarcated ventrally by longitudinal elevated ridge with row of long plumose setae, setose punctae ventral to decalcified window. Propodus expanded dorsally and ventrally, ventral expansion not reaching ventral margin of dactylus, margins with long plumose setae, dorsal expansion with row of long plumose setae dorsally and mat of short setae ventrally; lateral and mesial surfaces smooth. Carpus not produced dorsodistally, small mat of setae along distal half of dorsal margin; lateral and mesial surfaces smooth, mesial surface with medial decalcified area, dorsal margin with short simple and long plumose setae, ventral margin with short plumose setae. Merus lateral surface with few scattered short transverse rows of setae, dorsal and ventral margins with long plumose setae; proximal fourth of mesial surface with large decalcified window. Basis-ischium incompletely fused and unarmed. Coxa unarmed.

Abdomen (Fig. 3H) with somite I wider than long, widest posteriorly; dorsal surface with anterior margin concave, posterior margin concave, with submarginal elevated and curved row of short setae, few scattered setose punctae proximolaterally, small transverse decalcified submedial windows present. Somite II dorsal surface with submarginal transverse ridge anteriorly, patch of setae at posterolateral angle, extending onto pleura posteromesially; pleura expanded and directed laterally, anterolateral and posterolateral margins rounded, anterior and lateral margins with long

plumose setae, posterior margin with short setae. Somite III similar to somite II, but narrower and shorter, small patch of short thick setae on posterolateral angle; pleura thinner and shorter than that of somite II, directed posterolaterally, with setae as in somite II, anterolateral angle subacute, dorsal surface obliquely flattened anterolaterally, with submarginal row of short simple setae. Somite IV similar to somite III, but thinner and shorter; pleura thinner and shorter than that of somite III, directed slightly posterolaterally, dorsal surface obliquely flattened anterolaterally, with submarginal row of short simple setae, margins with long plumose setae. Somite V longer than somite IV, lateral margins with plumose setae; pleura absent. Somite VI wider and longer than somite V, dorsal surface with two short oblique rows of setae laterad of midline anteriorly, posterior margins with few long plumose setae; pleura absent.

Female with uniramous, paired pleopods on somites II–V.

Telson (Fig. 3H) spatulate, rounded distally, evenly calcified, margins with long plumose setae; median longitudinal groove short, on medial half of surface, and with short simple setae along margins; few short simple setae at proximolateral corners.

Range: Known only from the type locality off Bohol Island, Philippines.

Remarks: The holotype of *P. chirotheca* n. sp. can be distinguished from each of the other species in the genus by several characters (those of other species in parentheses). It differs from *P. dayriti* in having mitten-shaped distal segments of the ocular peduncles (laterally inflated triangles), CG4 consisting of two short lateral and two short medial elements (two short lateral and four short medial elements), and pereopod 2 and 3 dactylus heels much less produced.

Paralbunea chirotheca n. sp. differs from *P. intermedia* in having mitten-shaped distal segments of the ocular peduncles (laterally inflated triangles), CG1 broader, CG4 with two lateral and two medial elements (no lateral and four medial elements), CG10 present (absent), pereopod 2 and 3 dactylus heels more produced, and telson more tapered.

It differs from *P. manihinei* in having mitten-shaped distal segments of the ocular peduncles (tapered), CG4 with two short lateral and two short medial elements (two short lateral and four short medial elements), CG8 with four medial elements (two medial elements), and CG10 present (absent).

The new species differs from *P. paradoxa* in having distal segments of the ocular peduncles mitten-shaped (subquadrate) and pereopod 3 and 4 dactylus heels rounded (acutely produced).

Finally, the new species differs from *P. takedai* in

having distal segments of the ocular peduncles mitten-shaped (laterally inflated and mesiodistally tapered) and pereopod 2 and 3 dactylus heels rounded (acute). Differences between *P. chirotheca* n. sp. and *P. chani* n. sp. are given in the Remarks for the latter species.

Etymology: The specific name (L., *chirotheca* = glove; feminine) is given for the distinctive mitten-like shape of the distal segments of the ocular peduncles.

***Paralbunea dayriti* (Serène & Umali, 1965)**

Paralbunea dayriti – Komai 2000: 368 [list]; Boyko 2002: 3, 181, 192, 197–203, 393, figs. 64, 65 [full synonymy]; Boyko 2007: 181–182 [Western Australia]; Osawa and Fujita 2007: 127 [mention]; Boyko 2010: 51–52 [Guam]; Boyko and McLaughlin 2010: 142 [list]; Osawa and Fujita 2012: 246, 260, 261 [mention]; Poore et al. 2014: 8 [Western Australia]; Fujita et al. 2017 [mention].

Material examined: 1 female (12.3 mm CL × 15.3 mm CW), Balicasag Island, Panglao, Bohol Province, Philippines, tangle nets, 50–500 m, coll. fishermen, 29 Nov. 2001 (ZRC 2001.0695); 1 female (8.4 mm CL × 10.5 mm CW), Yong'an, Kaohsiung County, Taiwan, coll. G.-J. Xin (ZRC 2016.0116).

Range: Known from southern Japan southward to Western Australia, and eastward to New Caledonia, Mariana Islands (Guam), the Marshall Islands, and Tahiti, at 6.1–45.5 m deep (Boyko 2002 2010; Osawa et al. 2010).

Remarks: The Philippines and Taiwan are both countries from which *P. dayriti* has been previously reported (Serène and Umali 1965; Boyko 2002). The present Philippine specimen was likely caught from the shallower range (ca. 50 m) of the tangle net deployment, judging from prior records of the species' depth range (Boyko 2002).

Key to species of *Paralbunea*

- 1 Pereopod III dactylus heel produced 2
- Pereopod III dactylus heel rounded 4
- 2 Pereopod IV dactylus heel acute 3
- Pereopod IV dactylus heel rounded
..... *P. dayriti* (Serène and Umali, 1965)
3. Ocular peduncles tapered mesiodistally
..... *P. takedai* (Osawa and Fujita, 2012)
- Ocular peduncles subquadrate *P. paradoxa* (Gordon, 1938)
- 4 Maxilliped III distodorsal carpal projection extending slightly onto propodus 5
- Maxilliped III distodorsal carpal projection extending halfway onto propodus *P. intermedia* (Balss, 1916)
- 5 CG10 absent *P. manihinei* (Serène, 1977)
- CG10 present 6
- 6 Ocular peduncles subtriangular, each with small distal indentation *P. chani* n. sp.
- Ocular peduncles ovate, each with deep distal indentation (mitten-shaped) *P. chirotheca* n. sp.

DISCUSSION

Although only a few species of albuneids (e.g., *Albunea symmysta*) and blepharipodids (e.g., *Blepharipoda liberata*) are reported with any frequency, the discovery of two new species of *Paralbunea* suggests that the diversity of albuneids is at least still in the discovery phase. Further collections in tropical Indo-Pacific localities are likely to uncover more undescribed species in this region, which has been proposed as the center of origin for albuneids (Boyko and Harvey 2009).

CONCLUSIONS

The diversity in the genus *Paralbunea* is increased to seven species, all but one of which is known from the Indo-Pacific, further highlighting this a region as a biodiversity hotspot for the subfamily Albuneinae. However, due to the secretive nature of these sand crabs, most species are still only known from one or a very few specimens, and more sampling is needed in sandy bottom habitats to better understand the species' distributions.

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Authors' contributions: The author performed the entirety of this research.

Competing interests: The author declares that he has no conflict of interest.

Availability of materials: All specimens are deposited in museum collections as stated in the paper.

Consent for publication: Not applicable.

Ethics approval consent to participate: Not applicable.

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