

Hermit crabs of the genera *Calcinus* Dana, *Clibanarius* Dana, and *Dardanus* Paul'son from the PANGLAO 2004 Expedition, with description of a new species and a checklist of the hermit crabs of the Philippines (Crustacea: Anomura: Paguroidea)

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Abstract. The PANGLAO 2004 expedition in the central Visayas region of the Philippines revealed the occurrence of 43 species of diogenid hermit crabs of the genera *Calcinus*, *Clibanarius*, and *Dardanus* in the Philippines. Using morphological, colour pattern, and mitochondrial DNA evidence, the *Dardanus lagopodes* (Forskål, 1775) complex is revised with the validation of *D. sanguinolentus* (Quoy & Gaimard, 1824) and the addition of one new species, *Dardanus balhibuon*. Eight species represent new records for the Philippine Archipelago. For each reported species, a list of the total number of specimens collected during the expedition is presented, and the geographic range and habitat are discussed. Colour photographs are provided for most species. A checklist of all hermit crab species recorded from the Philippines is presented, and species of these three genera previously reported from the Philippines but not found during the PANGLAO 2004 expedition are discussed.

Key words. hermit crabs, Diogenidae, *Calcinus*, *Clibanarius*, *Dardanus*, new species, COI, Philippines

INTRODUCTION

The Philippines is recognised as a global hotspot of marine biodiversity, and the diversity of its hermit crab fauna is fairly well studied, although the literature is scattered and usually combined with reports of hermit crabs from other regions (e.g., Buitendijk, 1937; Estampador, 1937; Yap-Chiongco, 1938; Estampador, 1959; de Saint Laurent, 1972; Forest, 1987; Lemaitre, 1996, 1997, 1999; Cassidy & McLaughlin, 1997; McLaughlin, 2004; Cassidy, 2005; Komai & Osawa, 2006). Recently an expedition was undertaken to survey the crustacean and molluscan fauna around Panglao Island in the central Visayas, the Philippines (the PANGLAO 2004 Expedition; Bouchet et al., 2009). This expedition has already resulted in the discovery of several new species and new records of hermit crabs, mostly from the family Paguridae (McLaughlin & Rahayu, 2005; 2007; McLaughlin, 2008; McLaughlin & Lemaitre, 2009; Rahayu & Forest, 2009; Asakura, 2010; Komai & Rahayu, 2013a, b, d, 2014; Rahayu & Komai, 2013a, b; Jung et al., 2017). So far, about 153 species of hermit crab in the families Coenobitidae,

Diogenidae, Paguridae, Parapaguridae, and Pylochelidae have been recorded from the Philippines (Table 3). This report discusses 43 Philippine species of diogenid hermit crab from the genera *Calcinus* Dana, 1851, *Dardanus* Paul'son, 1875, and *Clibanarius* Dana, 1852, of which 35 were collected during the PANGLAO 2004 Expedition, with eight species newly recorded, and one species new to science. The new species, belonging to the *Dardanus lagopodes* (Forskål, 1775) complex, is here described. In addition, *D. sanguinolentus* (Quoy & Gaimard, 1824) is recognised as a valid species corresponding to the “red knee” morph of *D. lagopodes* as defined by Ball & Haig (1972).

MATERIAL AND METHODS

The synonymy presented here is restricted to the original description, important papers detailing useful information on the species, and all Philippine records. The geographic range of each species is reported, based on previously published papers (e.g., Ball & Haig, 1972; Reay & Haig, 1990; Hoover, 1998; Rahayu, 2000; McLaughlin et al., 2007; Malay & Paulay, 2010). Recent records from the western Indian Ocean (Mayotte, Juan de Nova, Europa, Glorieuses) and the South Pacific (Wallis & Futuna, Marquesas) can be found in contributions by Poupin et al. (2012, 2013), Poupin (2016), and in the internet database of Legall & Poupin (2016). Names were checked for validity against McLaughlin et al. (2010) and the World Register of Marine Species (Lemaitre & McLaughlin, 2017). Information on the habitat of each species is also reported, as derived from the PANGLAO 2004 expedition data. Collection stations (abbreviated “stn”) are prefixed by “R” for specimens collected by hand by SCUBA

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Table 1. Specimens used in the genetic analyses, including museum catalogue numbers and corresponding GenBank accession numbers.

Species	Catalog No.	GenBank No.	Locality
<i>Dardanus lagopodes</i>	ZRC 2015.0487	LN908202	Panglao I., Philippines
	ZRC 2015.0488	LN908204	Balicasag I., Philippines
	ZRC 2015.0489	LN908203	Panglao I., Philippines
	ZRC 2015.0490	LN908201	Panglao I., Philippines
	NTOU A01422	LN908207	Kenting, Taiwan
	UF 1760	LN908209	Tikehau, Tuamotu
<i>Dardanus sanguinolentus</i>	ZRC 2015.0491	LN908197	Pamilacan I., Philippines
	ZRC 2015.0492	LN908206	Panglao I., Philippines
	ZRC 2015.0493	LN908205	Panglao I., Philippines
	ZRC 2015.0494	LN908198	Panglao I., Philippines
	ZRC 2015.0495	LN908199	Panglao I., Philippines
	ZRC 2015.0496	LN908210	Panglao I., Philippines
	NTOU A01421	LN908195	Kenting, Taiwan
	NTOU A01423	LN908196	Taiwan
<i>Dardanus balhibuon</i> , new species	NMCR 40109	LN908200	Pamilacan I., Philippines
<i>Dardanus sanguinocarpus</i>	UF 2263	LN908208	Hawai'i
	UF 12042	LN908212	French Frigate Shoals, Hawai'i
<i>Dardanus guttatus</i>	UF 13968	LN908211	Nosy Iranja, Madagascar

divers, “B” for brushings off the reef matrix, “S” for suction sampling, “M” for intertidal hand-collections, “N” for trap collections, “D” for dredgings, and “PN” for specimens purchased from local fishers (see Bouchet et al., 2009 for more details on sampling methods and stations). For some stations involving SCUBA divers and traps (e.g., stations R, B, S, and N), the recorded minimum and maximum depths refer to the entire dive or trap depth range, however the actual depth range of a species may be much narrower. In such cases, the actual depth range is approximated based on historical records for the species.

The shield length (SL; measured in mm from the tip of the rostrum to the posterior margin of the carapace) is reported for all the PANGLAO 2004 material. The order of listing does not reflect phylogenetic relationships within each genus – species found during the PANGLAO 2004 Expedition are listed in alphabetical order, except for members of the *D. lagopodes* complex, which are grouped together for a more logical discussion of species delineation; and Philippine records from other publications but not found during the PANGLAO 2004 Expedition are listed at the end. Unless otherwise stated, the material examined are deposited at the Zoological Reference Collection, Lee Kong Chian Natural History Museum (formerly the Raffles Museum of Biodiversity Research), National University of Singapore (ZRC). Material deposited in other institutions are the Crustacean Collection of the National Museum of the Philippines, Manila (NMCR), National Taiwan Ocean University, Keelung (NTOU), the Muséum National d'Histoire Naturelle, Paris (MNHN), the Naturhistorisches Museum Wien, Vienna (NHMW), and the Florida Museum of Natural History, Gainesville (UF). While some of Jose V. Yap-Chiongco's specimens are deposited in

the Invertebrate Museum, Institute of Biology, University of the Philippines Diliman, many are in poor condition (J.C.E. Mendoza, pers. comm.), and since they are in the process of moving their collections to a new building, specimens are not readily accessible (I.K.C. Fontanilla, pers. comm.). Spelling contractions used include ovig. (ovigerous); indiv. (individual); I. (island); m (meters); and mm (millimeters). Dates are given in a “day.month.year” format, with months abbreviated as roman numerals (i for January, ii for February, etc.).

Samples used in the molecular phylogenetic analysis of the *Dardanus lagopodes* complex are listed in Table 1. DNA was extracted using the Geneaid genomic DNA mini kit. Approximately 700 base pairs (bp) of the mitochondrial gene fragment cytochrome oxidase I (COI) was amplified using the Folmer primers (LCO1490 and HCO2198; Folmer et al. 1994). PCR amplification consisted of initial denaturation (95°C, 5 mins); 40 cycles of denaturation (95°C, 30 s), annealing (47.8°C, 40 s), and extension (72°C, 40 s); and final extension (72°C, 10 mins). The PCR products were then cleaned (High Pure PCR Product Purification Kit, Roche Applied Science) and cycle-sequenced (ABI 310 Genetic Analyzer). Chromatograms were checked and edited using Geneious Pro 4.9.2 (Drummond et al., 2010). Pairwise Kimura 2-parameter distances were computed using MEGA v6.06 (Tamura et al., 2013). The best model of DNA evolution was determined by the Akaike Information Criterion (AIC) as implemented by jModelTest v2.1.6 (Darriba et al., 2012). The model selected was TrN+I+G. Maximum likelihood (ML) analyses were done using RAXML-HP2 v8.1.24 (Stamatakis, 2014). A thousand rapid bootstrap inferences were performed, followed by a thorough ML tree search.

Since the exact nucleotide evolution model selected by jModelTest could not be implemented by the program, a general time-reversible model with gamma shape parameters was applied (GTRGAMMA). Bayesian inference of the phylogeny was performed using MrBayes v3.2.3 (Ronquist et al., 2011). Flat priors and a GTR+I+G model was specified. Two Markov Chain Monte Carlo (MCMC) simulations were run from random starting points for 1 million generations and sampled every 100 generations. Convergence of runs was assessed using Tracer (Rambaut & Drummond, 2007). The initial 25% of the trees were discarded as the burn-in phase, and posterior probabilities were calculated based on the remaining 75% of the trees. Phylogenetic computations were done using the online computing resources of the CIPRES Science Gateway (Miller et al., 2010; <http://www.phylo.org>). The congeneric species *Dardanus sanguinocarpus* Degener, 1925 and *D. guttatus* (H. Milne Edwards, 1848) were used as outgroups in the analysis. New DNA sequences generated during this study are deposited in GenBank (accession numbers listed in Table 1).

TAXONOMIC ACCOUNT

Superfamily Paguroidea Latreille, 1802

Family Diogenidae Ortmann, 1892

Calcinus Dana, 1851

Remarks. *Calcinus* is a tropical to subtropical genus distributed from supratidal and intertidal habitats all the way down to deeper slopes. Most species are associated with coral reefs. *Calcinus* species are typically very colourful, and live colouration is invaluable in species identification (e.g., Poupin & McLaughlin, 1998; Poupin & Lemaitre, 2003).

Of the 45 described species of *Calcinus*, 33 occur in the Indo-West Pacific, with diversity peaking in oceanic islands (Malay & Paulay, 2010). Ten species have been previously reported from the Philippines (Estampador, 1937, 1959; Buitendijk, 1937; Yap-Chiongco, 1938; Malay & Paulay, 2010) and nine of them were collected by the PANGLAO 2004 Expedition.

Calcinus elegans (H. Milne Edwards, 1836)

(Fig. 1A)

Pagurus elegans H. Milne Edwards, 1836: 278, pl. 13, Fig. 2 (New Ireland, New Guinea, type locality).

Calcinus elegans – Estampador, 1937: 505; Yap-Chiongco, 1938: 206, pl. 2, Fig. 10; Estampador, 1959: 53; Haig & McLaughlin, 1984: 108; Wooster, 1984: 128–130; Haig & Ball, 1988: 159; Morgan, 1991: 274–276, Figs. 7–9; Gherardi & McLaughlin, 1994: 618; Poupin, 1997: 687, Figs. 2A, 3A, 4A; Asakura, 2002: 40–43, Figs. 7–8, Fig. 21C–D; McLaughlin et al., 2007: 155–156, unlabelled figures.

Material examined. 1 male SL 10.0 mm, 1 indiv. in shell (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 4.8 mm (ZRC), stn M20, Pamilacan I., 9°29.3'N, 123°55.1'E, 0–2 m,

13.vi.2004; 1 male SL 5.4 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004.

Habitat. Intertidal to shallow subtidal, 0–2 m deep, on hard bottoms (coralline and rocky substrates).

Remarks. The name *C. elegans* previously included the Indo-West Pacific form, with bright blue bands on the pereopods, and the Hawai'ian form, with orange-red banded pereopods (Haig & McLaughlin, 1984; Hoover, 1998). However the consistent colour differences, the geographical separation of these two colour forms, and genetic evidence all suggest that they are distinct species (Malay & Paulay, 2010, Fig. 9). The Hawai'ian form should be properly named *C. pictus* (Owen, 1839) based on Owen's (1839) description and colour illustration of specimens collected in Oahu (see also Legall & Poupin, 2016).

Calcinus fuscus Malay, Komai & Chan, 2012

(Fig. 1B)

Calcinus anani – Kato & Okuno, 2001: 69, unnumbered photograph; Kawamoto & Okuno, 2003: 74, 1 unnumbered photograph; Asakura, 2002: 29–35, Figs. 2–3, Fig. 21A; Poupin & Lemaitre, 2003: 8, 13 (in part); Okuno & Arima, 2004: 54, Fig. 2A (not *Calcinus anani* Poupin & McLaughlin, 1998).

Calcinus fuscus Malay, Komai, & Chan 2012: 167, Figs. 1, 2 (Kume Island, Japan, type locality); Legall & Poupin, 2016.

Material examined. 1 ovig. female SL 5.6 mm (ZRC), stn B9, Napaling, Panglao I., 9°33.1'N, 123°44.0'E, 8.5–10 m, 8.vi.2004; 2 males SL 3.0–4.6 mm (ZRC), stn B15, Sungcolan, Panglao I., 9°38.8'N, 123°49.2'E, 2–4 m, 16.vi.2004; 2 males SL 4.0–4.1 mm (ZRC), stn B32, Looc, Panglao I., 9°35.8'N, 123°44.6'E, 20 m, 26.vi.2004; 1 female SL 2.5 mm (ZRC), stn B36, north of Doljo, Panglao I., 9°35.9'N, 123°44.5'E, 24 m, 1.vii.2004; 2 females SL 3.4–4.6 mm (ZRC), stn B39, Pontod Lagoon 1 outside, 9°32.8'N, 123°42.1'E, 17–25 m, 3.vii.2004; 1 male SL 4.1 mm (ZRC), stn B42, between Momo and Napaling, Panglao I., 9°37.0'N, 123°46.0'E, 30–33 m, 6.vii.2004; 1 female SL 3.0 mm (ZRC), stn R47, Sungcolan, Panglao I., 9°38.8'N, 123°49.2'E, 4–25 m, 16.vi.2004; 1 male SL 3.2 mm (ZRC), stn R63, Napaling, Panglao I., 9°37.2'N, 123°46.4'E, 3–40 m, 24.vi.2004.

Habitat. Subtidal, 2–33 m deep, reef slopes and ledges, occasionally from caves in the reef wall.

Remarks. This species is closely related to the Polynesian endemic *C. anani* Poupin & McLaughlin, 1998. However the two species are genetically differentiated, and show distinct differences in colouration, depth distribution, and geographic range (see Malay et al., 2012).

Calcinus gaimardii (H. Milne Edwards, 1848)

(Fig. 1C)

Pagurus gaimardii H. Milne Edwards, 1848: 68 (Ambon, Indonesia, type locality).

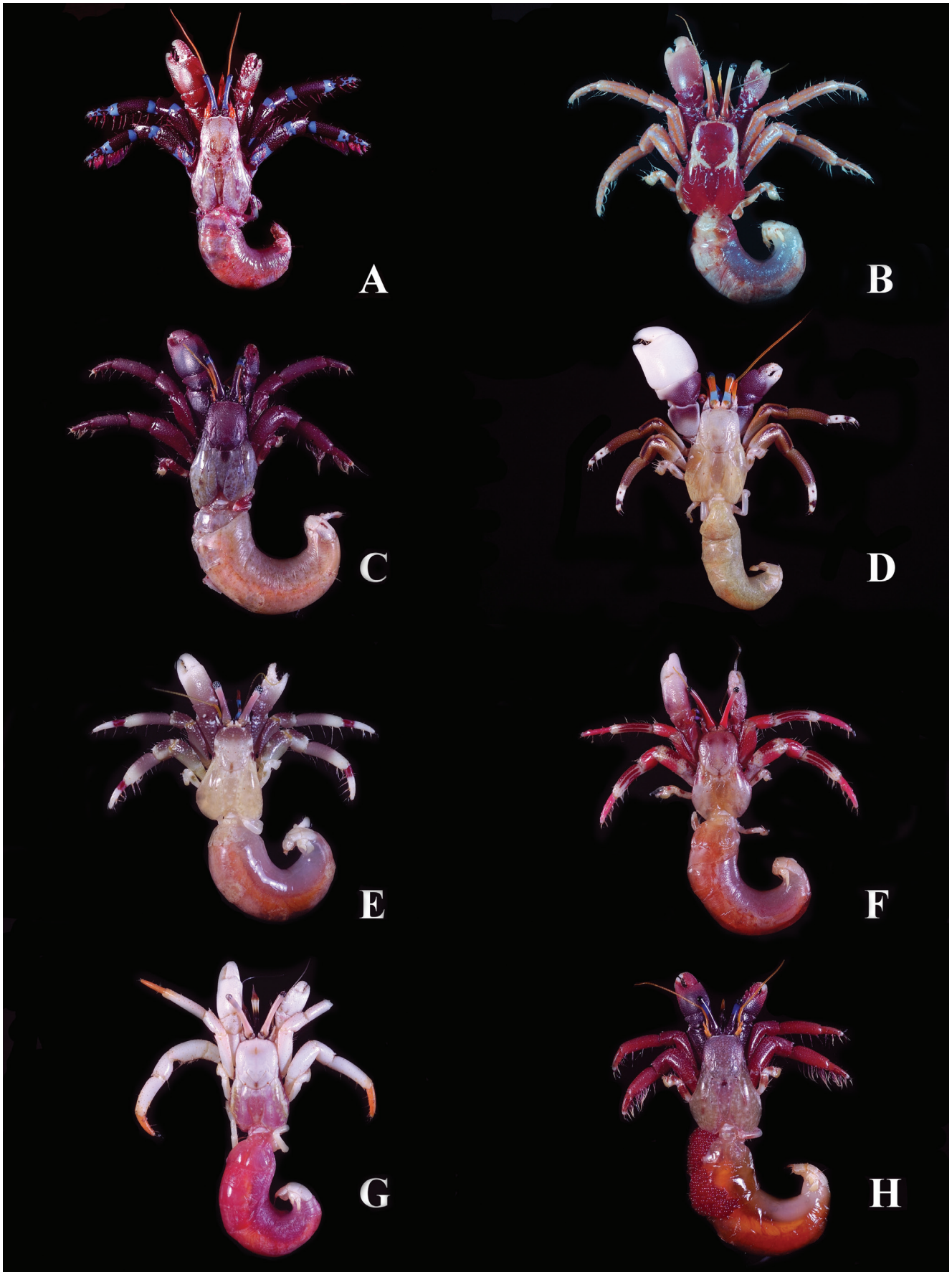


Fig. 1. A, *Calcinus elegans* (H. Milne Edwards, 1836). Male SL 10.0 mm, stn M1; B, *Calcinus fuscus* Malay, Komai & Chan, 2012. Male SL 4.1 mm, stn B42; C, *Calcinus gaimardii* (H. Milne Edwards, 1848). Female SL 5.6 mm, stn R14; D, *Calcinus laevimanus* (Randall, 1840). Male SL 4.4 mm, stn M2; E, *Calcinus latens* (Randall, 1840). Male SL 3.0 mm, stn R1; F, *Calcinus lineapropodus* Morgan & Forest, 1991. Male SL 4.5 mm, stn R16; G, *Calcinus minutus* Buitendijk, 1937. Male SL 4.7 mm, stn R10; H, *Calcinus morgani* Rahayu & Forest, 1999. Female ovig SL 4.8 mm, stn M2.

Calcinus gaimardii – Morgan, 1991: 876–878 (in part, form I), Fig. 13.

Calcinus gaimardii – Rahayu & Forest, 1999: 463–465, Figs. 1A, 2A, B, E, F, I; Asakura, 2002: 48–52, Figs. 1A–C, 1H–N, 12–14; McLaughlin et al., 2007: 157–158, 2 unlabelled figures; Malay & Paulay, 2010, Appendix S1.

Material examined. 1 male SL 7.0 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 2 males SL 5.7–7.0 mm (ZRC), 1 indiv. sex unknown SL 5.4 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 female SL 5.5 mm, 1 male SL 5.5 mm (ZRC), stn M3, Danao, Panglao I., 9°32.5'/33.1'N, 123°44.7'/45.5'E, 0–2.5 m, 31.v.2004; 2 males SL 5.2–5.8 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 1 female SL 6.6 mm (ZRC), stn M19, Pamilacan I., 9°30.0'N, 123°55.3'E, 0–2 m, 11.vi.2004; 1 male SL 5.2 mm (ZRC), stn M20, Pamilacan I., 9°29.3'N, 123°55.1'E, 0–2 m, 13.vi.2004; 3 ovig. females SL 3.5–7.5 mm, 1 female SL 5.0 mm, 2 males SL 6.5–7.5 mm (ZRC), stn M22, Napaling, Panglao I., 9°37.2'N, 123°46.4'E, 0–3 m, 15.vi.2004; 5 males SL 3.7–6.3 mm (ZRC), stn R1, Balicasag I., 9°31.2'N, 123°41.3'E, 5–7 m, 30.v.2004; 1 male SL 6.0 mm (ZRC), stn R11, Biking, Panglao I., 9°35.2'N, 123°50.5'E, 4 m, 2.vi.2004; 1 female SL 5.6 mm (ZRC), stn R14, Baclayon, Bohol I., 9°37.4'N, 123°54.5'E, 6–8 m, 3.vi.2004; 1 female SL 5.4 mm, 1 male SL 6.6 mm (ZRC), stn R14, Baclayon, Bohol I., 9°37.4'N, 123°54.5'E, 6–8 m, 3.vi.2004; 2 males SL 3.0–5.1 mm (ZRC), stn R17, Black Forest, Panglao I., 9°31.1'N, 123°41.3'E, 3–15 m, 4.vi.2004; 1 male SL 6.2 mm (ZRC), stn R21, Rico's Wall, Panglao I., 9°31.0'N, 123°40.8'E, 2–50 m, 5.vi.2004; 1 male SL 6.0 mm (ZRC), stn R23, lagoon off Poblacion, Panglao I., 9°33.5'/34.8'N, 123°42.7'/46.3'E, 1–5 m, 5, 6, & 21.vi.2004; 1 ovig. female SL 4.1 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 2 ovig. females SL 3.5–4.2 mm, 2 males SL 5.8–6.1 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 3 ovig. females SL 4.4–5.4 mm, 1 female SL 3.0 mm, 1 male SL 6.8 mm, 1 indiv. in shell (ZRC), stn R27, Napaling, Panglao I., 9°37.0'N, 123°46.3'E, 2–20 m, 7.vi.2004; 1 male SL 6.0 mm (ZRC), stn R36, Pamilacan I., 9°30.2'N, 123°55.3'E, 3–32 m, 9.vi.2004; 1 ovig. female SL 6.2 mm, 4 males SL 5.4–6.8 mm, 3 indivs. in shell (ZRC), stn R38, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–37 m, 11.vi.2004; 1 female SL 5.8 mm (ZRC), stn R40, Pamilacan I., 9°29.2'N, 123°55.1'E, 8–33 m, 12.vi.2004; 1 male SL 6.6 mm (ZRC), stn R42, Baclayon Takot, Bohol I., 9°37.1'N, 123°52.6'E, 8–22 m, 12.vi.2004; 3 males SL 4.8–6.5 mm (ZRC), stn R43, Cortes Takot, Bohol I., 9°41.3'N, 123°49.5'E, 3–41 m, 13.vi.2004; 1 female SL 4.5 mm (ZRC), stn R70, Pamilacan I., 9°30.1'N, 123°55.5'E, 20 m, 1.vii.2004; 1 ovig. female SL 4.4 mm, 6 males SL 3.6–6.0 mm (ZRC), stn R73, Balicasag I., 9°30.9'N, 123°40.8'E, 2–30 m, 2.vii.2004; 1 ovig. female SL 5.7 mm (ZRC), stn S12, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–8 m, 14.vi.2004.

Habitat. Intertidal to subtidal, 0–12 m deep, intertidal reef flats, seagrass beds, and reef slopes, on rocky, coralline,

sandy, and mixed substrates. This species is typically found in areas sheltered from strong wave action.

Remarks. *Calcinus gaimardii* closely resembles *C. morgani* Rahayu & Forest, 1999, in morphology and colour pattern. Examination of live colour patterns is the most reliable way to separate these two species: the ocular peduncles of *C. gaimardii* have a narrow blue band distally; proximally the peduncle is orange coloured with a longitudinal tapering dark brown stripe running down the dorsal surface of the peduncle. In *C. morgani* the distal blue band on the ocular peduncle is broader, and the proximal portion of the ocular peduncle lacks orange colouration. In *C. gaimardii* dark brown pigmentation covers the shield (either the anterior half or the entire shield is dark coloured), while in *C. morgani* the entire shield is light-coloured (gray-white to cream). Also, the ambulatory legs and distal portions of the chelae are typically dark brown (light brown to white with brown spots in juvenile) in *C. morgani*, while the colouration of these areas in *C. gaimardii* tends towards orange-brown or reddish-brown.

While the two species are sympatric, the geographic range of *C. gaimardii* (eastern Indian Ocean to Fiji) is more restricted than that of *C. morgani* (east Africa to Tuamotu; see Malay & Paulay, 2010; Fig. 8). In addition, *C. gaimardii* prefers more wave-sheltered habitats than *C. morgani* (Asakura, 2002).

Calcinus laevimanus (Randall, 1840)

(Fig. 1D)

Pagurus laevimanus Randall, 1840: 135 (type locality unknown).

Calcinus herbstii – Estampador, 1937: 505; Yap-Chiongco, 1938: 205–206; Estampador, 1959: 53.

Calcinus herbsti – Fize & Serène, 1955: 41–49, Fig. 6.

Calcinus laevimanus – Buitendijk, 1937: 267; Wooster, 1984: 156–158; Haig & Ball, 1988: 160; Morgan, 1991: 888–890, Figs. 30–33; Gherardi & McLaughlin, 1994: 619–622; Poupin, 1997: 702–703, Figs. 2F, 3G, 4E; McLaughlin et al., 2007: 162–164, 2 unlabelled figures; Malay & Paulay, 2010, Appendix S1.

Material examined. 1 ovig. female SL 3.5 mm, 2 females SL 2.8–4.5 mm, 2 males SL 5.2–5.5 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 4.4 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 male SL 4.5 mm (ZRC), stn M15, Baclayon, Bohol I., 9°37.2'N, 123°55.4'E, 0–1 m, 9.vi.2004; 1 female SL 5.5 mm, 2 males SL 4.0–5.0 mm, 8 indivs. in shell (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 ovig. female SL 5.1 mm, 1 male SL 3.7 mm, 4 indivs. in shell (ZRC), stn M20, Pamilacan I., 9°29.3'N, 123°55.1'E, 0–2 m, 13.vi.2004; 1 ovig. female SL 4.6 mm, 2 females SL 3.5–3.6 mm, 3 males SL 4.5–4.6 mm (ZRC), stn M24, Manga, Panglao I., 9°42.1'N, 123°51.3'E, 0–1 m, 17.vi.2004; 3 males SL 4.7–6.8 mm (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004; 1 indiv. in shell (ZRC), stn M51, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004.

Habitat. Intertidal, reef flats and seagrass beds, on rocky, sandy, and sand-mud bottoms.

Remarks. This species inhabits the upper intertidal zone where species of *Clibanarius* are typically predominant.

***Calcinus latens* (Randall, 1840)**

(Fig. 1E)

Pagurus latens Randall, 1840: 135–136 (Hawai'i, type locality).
Calcinus terrae-reginae – Estampador, 1937: 505; Yap-Chiongco, 1938: 206–207; Estampador, 1959: 53.
Calcinus latens – Grant & McCulloch, 1906: 34–35; Estampador, 1937: 505; Yap-Chiongco, 1938: 207–208; Fize & Serène, 1955: 58–66, Fig. 9, pl. 2 nos. 9–11; Estampador, 1959: 53; Ball & Haig, 1972: 101–102; Wooster, 1984: 154–156; Haig & Ball, 1988: 160; Morgan, 1991: 890–983, Figs. 34–36; Gherardi & McLaughlin, 1994: 622–624; Poupin, 1997: 703–704, Figs. 3H, 6C; Hoover, 1998: 256, 1 unlabelled figure; McLaughlin et al., 2007: 167–169, 2 unlabelled figures; Malay & Paulay, 2010: Appendix S1.

Calcinus abrolhensis Morgan, 1988: 218–222, Fig. 1 (Houtman Abrolhos, Australia, type locality).

Material examined. 1 male SL 2.8 mm (ZRC), stn D5, Pontod Islet, Panglao I., 9°33.6'N, 123°43.5'E, 0–3 m, 6.vi.2004; 2 males SL 1.8–3.9 mm, 1 indiv. in shell (ZRC), stn D8, Dao, Panglao I., 9°34.0'N, 123°48.9'E, 1–4 m, 9.vi.2004; 1 female SL 2.4 mm, 2 males SL 0.8–1.4 mm, 3 indivs. in shell (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 4 males SL 3.8–4.9 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 female SL 3.1 mm, 3 males SL 3.1–3.5 mm (ZRC), stn M3, Danao, Panglao I., 9°32.5'/33.1'N, 123°44.7'/45.5'E, 0–2.5 m, 31.v.2004; 1 male SL 5.5 mm (ZRC), stn M5, Doljo Point, Panglao I., 9°35.5'N, 123°43.3'/44.3'E, 0–2 m, v.2004 to vi.2004; 1 female SL 2.5 mm, 1 male SL 5.0 mm (ZRC), stn M7, Momo Beach, Panglao I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 2 females SL 4.5–4.9 mm, 2 males SL 3.6–5.9 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 female SL 2.5 mm, 1 male SL 3.1 mm (ZRC), stn M20, Pamilacan I., 9°29.3'N, 123°55.1'E, 0–2 m, 13.vi.2004; 29 indivs. not sexed and measured (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004; 1 ovig. female SL 4.2 mm, 14 males SL 2.4–5.2 mm, 8 indivs. in shell (ZRC), stn M51, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 3 males SL 1.3–2.9 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004; 1 male SL 3.0 mm, stn R1, Balicasag I., 9°31.2'N, 123°41.3'E, 5–7 m, 30.v.2004; 1 male SL 2.6 mm (ZRC), stn R10, Biking, Panglao I., 9°35.3'N, 123°50.5'E, 2–10 m, 1.vi.2004; 1 female 2.0 mm (ZRC), stn R11, Biking, Panglao I., 9°35.2'N, 123°50.5'E, 4 m, 2.vi.2004; 1 male SL 3.9 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 2 females SL 3.6–4.5 mm (ZRC), stn R36, Pamilacan I., 9°30.2'N, 123°55.3'E, 3–32 m, 9.vi.2004; 3 males SL 2.7–5.4 mm (ZRC), stn R38, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–37 m, 11.vi.2004; 1 male SL 5.4 mm (ZRC), stn R44, lagoon near Doljo Point, Panglao I.,

9°33.3'/34.6'N, 123°43.9'/43.4'E, 2 m, 14.vi.2004; 1 male SL 4.5 mm (ZRC), stn R50, Looc, Panglao I., 9°35.7'N, 123°44.4'E, 3–7 m, 17.vi.2004; 1 male SL 3.4 mm (ZRC), stn R53, Sungcolan Bay, Panglao I., 9°38.4'N, 123°49.7'E, 3–5 m, 20.vi.2004; 1 ovig. female SL 4.5 mm (ZRC), stn R58, Looc (lagoon side), Panglao I., 1–3 m, 9°35.7'N, 123°44.7'E, 1–3 m, 22.vi.2004; 1 indiv. in shell (ZRC), stn R66, Sungcolan inlet, Panglao I., 9°38.3'N, 123°50.3'E, 1–3 m, 28.vi.2004.

Habitat. Intertidal to subtidal, 0 to approximately 10 m deep, reef flats, seagrass beds, and reef slopes, on sandy, sand-mud, rocky, coralline, and soft bottoms.

Remarks. Yap-Chiongco (1938) and Estampador (1937, 1959) report both *C. latens* and *C. terrae-reginae* from the Philippine waters. *Calcinus terrae-reginae* was synonymised with *C. latens* by Grant & McCulloch (1906).

Calcinus latens is apparently a species complex, with three distinct forms found in Hawai'i, the Gulf of Oman, and the wider Indo-West Pacific region (Malay & Paulay, 2010). This species complex is very abundant throughout its range, and occupies a wide variety of different habitats.

***Calcinus lineapropodus* Morgan & Forest, 1991**

(Fig. 1F)

Calcinus lineapropodus Morgan & Forest, 1991: 650 (Cocos (Keeling) Islands and Christmas Island, type localities); Morgan, 1991: 893–894, Figs. 37–39; McLaughlin et al., 2007: 176–177, 2 unlabelled figures; Malay & Paulay, 2010: Appendix S1.

Calcinus undescribed sp. – Haig & Ball, 1988: 161.

Calcinus sp. 1 – Wooster, 1984: 138–141.

Material examined. 1 ovig. female SL 3.6 mm, 1 male SL 5.1 mm (ZRC), stn R1, Balicasag I., 9°31.2'N, 123°41.3'E, 5–7 m, 30.v.2004; 3 males SL 2.1–3.9 mm, 2 indivs. in shell (ZRC), stn R8, House Reef, Panglao I., 9°31.2'N, 123°41.3'E, 4–24 m, v.2004 to vii.2004; 1 male SL 4.5 mm (ZRC), stn R16, Black Forest, Panglao I., 9°31.1'N, 123°41.3'E, 6–22 m, 4.vi.2004; 1 female SL 3.0 mm (ZRC), stn R17, Black Forest, Panglao I., 9°31.1'N, 123°41.3'E, 3–15 m, 4.vi.2004; 1 male SL 3.6 mm, 1 indiv. in shell (ZRC), stn R40, Pamilacan I., 9°29.2'N, 123°55.1'E, 8–33 m, 12.vi.2004; 1 male SL 4.5 mm (ZRC), stn R43, Cortes Takot, Bohol I., 9°41.3'N, 123°49.5'E, 3–41 m, 13.vi.2004; 1 male SL 3.9 mm (ZRC), stn R70, Pamilacan I., 9°30.1'N, 123°55.5'E, 20 m, 1.vii.2004; 1 male SL 4.2 mm (ZRC), stn R72, north of Doljo, Panglao I., 9°35.9'N, 123°44.5'E, 20 m, 1.vii.2004; 1 male SL 3.1 mm (ZRC), stn R73, Balicasag I., 9°30.9'N, 123°40.8'E, 2–30 m, 2.vii.2004; 1 female SL 2.9 mm (ZRC), stn R75, west of Pontod, Panglao I., 9°32.8'N, 123°42.1'E, 3–35 m, 3.vii.2004; 2 males SL 3.0–3.5 mm (ZRC), stn S12, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–8 m, 14.vi.2004; 1 female SL 2.4 mm (ZRC), stn S42, Pamilacan I., 9°30.1'N, 123°55.5'E, 15–20 m, 1.vii.2004.

Habitat. Subtidal, 3 to approximately 25 m deep, reef slopes and platforms, on sandy and coralline bottoms.

***Calcinus minutus* Buitendijk, 1937**

(Fig. 1G)

Calcinus minutus Buitendijk, 1937: 269–271, Figs. 13–15 (Kera, near Timor, Indonesia, type locality); Forest, 1958: 185–190, Figs. 1, 6–8, 14, 18; Ball & Haig, 1972: 102; Wooster, 1984: 152–154; Haig & Ball, 1988: 160–161; Morgan, 1991: 894–896, Figs. 40–42; Poupin, 1997: 704–706, Fig. 6A; McLaughlin et al., 2007: 172–173, 2 unlabelled figures; Malay & Paulay, 2010: Appendix S1.

Material examined. 3 males SL 3.8–6.2 mm, 1 damaged indiv. (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 3.6 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 ovig. female SL 5.8 mm, 1 male SL 4.5 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 2 females SL 3.6–5.0 mm, 1 male SL 4.8 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 female SL 3.1 mm, 1 male SL 6.1 mm (ZRC), stn M19, Pamilacan I., 9°30.0'N, 123°55.3'E, 0–2 m, 11.vi.2004; 1 ovig. female SL 3.9 mm, 1 female SL 3.0 mm, 1 male SL 3.7 mm (ZRC), stn N4, Alona Reef, Panglao I., 9°32.9'N, 123°46.9'E, 15–20 m, 10.vi.2004; 1 male SL 3.0 mm (ZRC), stn N5, Alona Reef, Panglao I., 9°32.9'N, 123°46.9'E, 20–35 m, 10.vi.2004; 2 males SL 2.1–3.3 mm (ZRC), stn R1, Balicasag I., 9°31.2'N, 123°41.3'E, 5–7 m, 30.v.2004; 2 females SL 3.6–3.7 mm (ZRC), stn R8, House Reef, Panglao I., 9°31.2'N, 123°41.3'E, 4–24 m, v.2004 to vii.2004; 1 male SL 4.7 mm (ZRC), stn R10, Biking, Panglao I., 9°35.3'N, 123°50.5'E, 2–10 m, 1.vi.2004; 2 females SL 3.0–3.5 mm (ZRC), stn R23, lagoon off Poblacion, Panglao I., 9°33.5'/34.8'N, 123°42.7'/46.3'E, 1–5 m, 5, 6, & 21.vi.2004; 1 male SL 5.7 mm (ZRC), stn R38, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–37 m, 11.vi.2004; 1 female SL 3.5 mm (ZRC), stn R49, San Isidro, Panglao I., 9°34.6'N, 123°49.9'E, 1–32 m, 17.vi.2004; 1 ovig. female SL 3.5 mm (ZRC), stn R61, between Dao and San Isidro, Panglao I., 9°34.3'N, 123°49.3'E, 4–22 m, 23.vi.2004; 2 ovig. females SL 3.9–4.0 mm (ZRC), stn R70, Pamilacan I., 9°30.1'N, 123°55.5'E, 20 m, 1.vii.2004; 1 male SL 3.4 mm (ZRC), stn R71, Arco Point, Panglao I., 9°34.1'N, 123°48.9'E, 2–20 m, 1.vii.2004; 8 indivs. in shell (ZRC), stn R73, Balicasag I., 9°30.9'N, 123°40.8'E, 2–30 m, 2.vii.2004; 1 female SL 3.4 mm (ZRC), stn S12, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–8 m, 14.vi.2004.

Habitat. Mostly subtidal, occasionally intertidal, 0 to approximately 15 m deep, reef slopes and flats, on coralline, mixed seagrass-coral and sand-coral substrates. Facultative associate of live branching corals (e.g., *Acropora*, *Pocillopora*).

***Calcinus morgani* Rahayu & Forest, 1999**

(Fig. 1H)

Calcinus morgani Rahayu & Forest, 1999: 465, Figs. 1B, 2C, D, G, H, J (Sidangoli, Halmahera, Indonesia, type locality); Asakura, 2002: 43–48, Figs. 9–11, Fig. 21E–I; McLaughlin et al., 2007: 159–161, 3 unlabelled figures; Malay & Paulay, 2010: Appendix S1.

Calcinus gaimardii – Haig & Ball, 1988: 159; Poupin 1997: 688–690, Figs. 2B, 5D; Morgan, 1991: 876–878, Fig. 11 (in part, form II) [not *Calcinus gaimardii* (H. Milne Edwards, 1848)]. *Calcinus gaimardi* – Wooster, 1984: 131–133 (misspelling of *Calcinus gaimardii*).

Calcinus areolatus Rahayu & Forest, 1999: 468–471, Fig. 4 (Ambon, Indonesia, type locality).

Material examined. 2 ovig. females SL 4.0–6.5 mm, 5 females SL 3.0–4.4 mm, 8 males SL 1.8–7.0 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 ovig. female SL 4.8 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 male SL 3.6 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 2 females SL 2.5–4.0 mm (ZRC), stn M3, Danao, Panglao I., 9°32.5'/33.1'N, 123°44.7'/45.5'E, 0–2.5 m, 31.v.2004; 1 ovig. female SL 6.4 mm, 1 female SL 3.4 mm, 1 male SL 5.5 mm, 1 indiv. in shell (ZRC), stn M5, Doljo Point, Panglao I., 9°35.5'N, 123°43.3'/44.3'E, 0–2 m, v.2004 to vi.2004; 1 female SL 6.3 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 3 females SL 2.7–5.8 mm (ZRC), stn M20, Pamilacan I., 9°29.3'N, 123°55.1'E, 0–2 m, 13.vi.2004; 1 ovig. female SL 9.5 mm, 2 males SL 3.0–6.5 mm (ZRC), stn M22, Napaling, Panglao I., 9°37.2'N, 123°46.4'E, 0–3 m, 15.vi.2004; 1 male SL 6.5 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004; 1 male SL 5.8 mm (ZRC), stn R11, Biking, Panglao I., 9°35.2'N, 123°50.5'E, 4 m, 2.vi.2004; 10 indivs. in shell (ZRC), stn R20, Cathedral, 9°31.1'N, 123°41.5'E, 7–48 m, 5.vi.2004; 1 ovig. female SL 5.6 mm, 1 female SL 5.0 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 1 ovig. female SL 4.0 mm (ZRC), stn R59, Momo Beach, Panglao I., 9°36.2'N, 123°44.9'E, 2–20 m, 22.vi.2004; 1 male SL 5.3 mm (ZRC), stn R61, between Sao and San Isidro, Panglao I., 9°34.3'N, 123°49.3'E, 4–22 m, 23.vi.2004; 1 ovig. female SL 5.1 mm, 3 males SL 4.9–5.7 mm (ZRC), stn R73, Balicasag I., 9°30.9'N, 123°40.8'E, 2–30 m, 2.vii.2004; 1 male SL 5.2 mm (ZRC), stn S42, Pamilacan I., 9°30.1'N, 123°55.5'E, 15–20 m, 1.vii.2004.

Habitat. Intertidal to subtidal, 0 to approximately 12 m, reef flats, slopes, and ledges, on coralline, sandy, and mixed substrates.

Remarks. *Calcinus morgani* closely resembles and is easily mistaken for *C. gaimardii* (see remarks under *C. gaimardii*).

***Calcinus pulcher* Forest, 1958**

(Fig. 2A)

Calcinus pulcher Forest, 1958: 287–288 (Nha Trang, Vietnam, type locality); Haig & Ball, 1988: 161; Morgan, 1991: 896–898, Figs. 43–45; McLaughlin et al., 2007: 178–179, 2 unlabelled figures; Malay & Paulay, 2010: Appendix S1; Poupin, 2016: 48, Fig. 5.

Material examined. 1 female SL 2.5 mm (ZRC), stn B5, Biking, Panglao I., 9°35.2'N, 123°50.4'E, 4 m, 2.vi.2004; 2 males SL 1.5–2.3 mm (ZRC), stn B9, Napaling, Panglao I., 9°33.1'N, 123°44.0'E, 8.5–10 m, 8.vi.2004; 2 males SL 2.4–

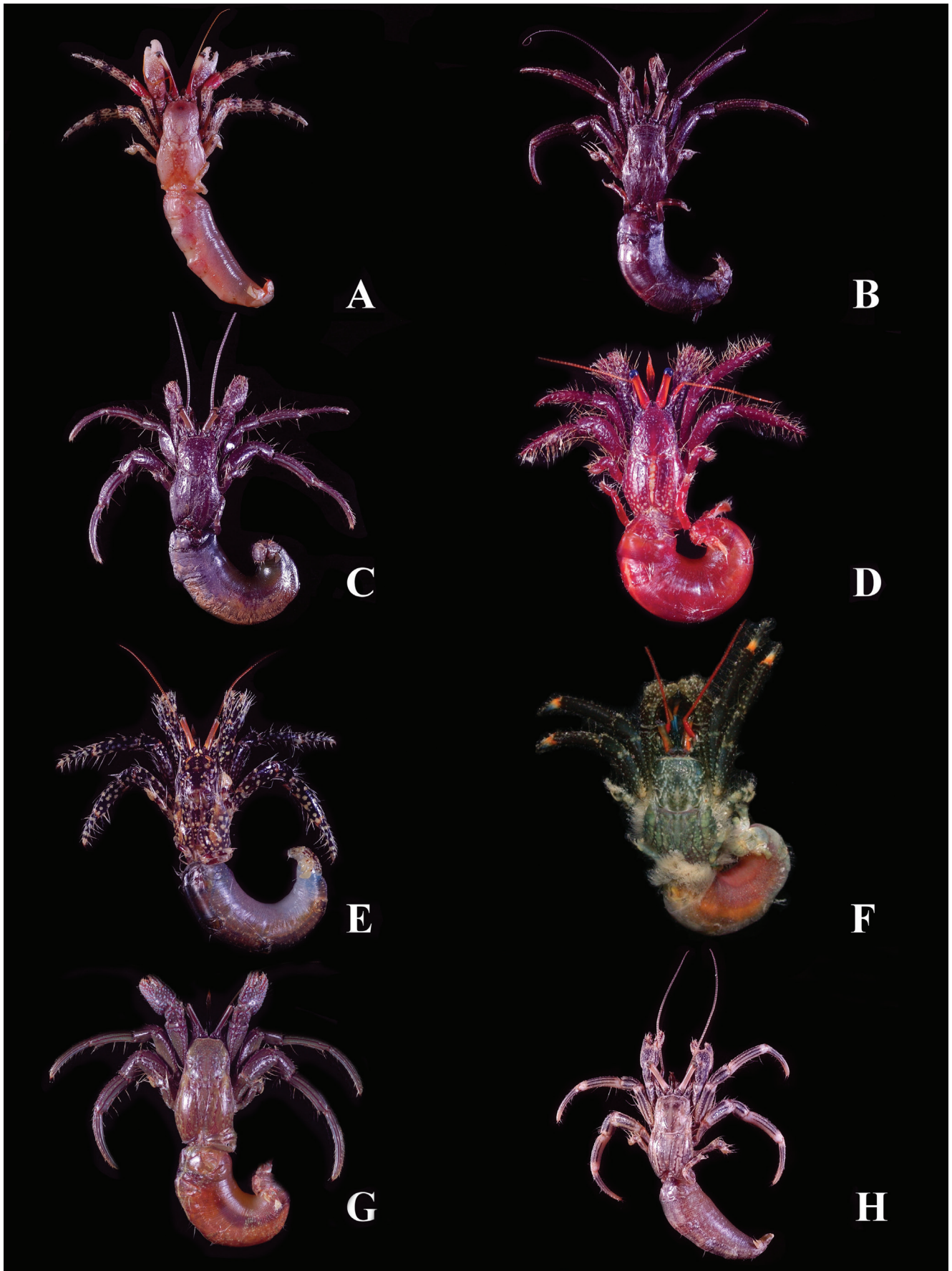


Fig. 2. A, *Calcinus pulcher* Forest, 1958. Male SL 4.8 mm, stn R24; B, *Clibanarius ambonensis* Rahayu & Forest, 1993. Male SL 4.0 mm, stn M16; C, *Clibanarius antennatus* Rahayu & Forest, 1993. Male SL 3.9 mm, stn M34; D, *Clibanarius corallinus* (H. Milne Edwards, 1836). Male SL 3.0 mm, stn M58; E, *Clibanarius cruentatus* (H. Milne Edwards, 1848). Specimen not measured and sexed, Stn M2; F, *Clibanarius englaucus* Ball & Haig, 1972. Male SL 4.2 mm, stn M1; G, *Clibanarius infraspinus* (Hilgendorf, 1869). Male SL 9.0 mm, stn S53; H, *Clibanarius laevimanus* Buitendijk, 1937. Specimen not measured and sexed, stn M9.

2.6 mm (ZRC), stn B12, Doljo Point, Panglao I., 9°35.6'N, 123°43.2'E, 24–27 m, 14.vi.2004; 2 males SL 3.0–3.1 mm (ZRC), stn B16, Bingag, Panglao I., 9°37.6'N, 123°47.3'E, 20 m, 17.vi.2004; 1 indiv. in shell (ZRC), stn B19, Pamilacan I., 9°29.4'N, 123°56.0'E, 17 m, 21.vi.2004; 1 ovig. female SL 3.6 mm, 1 indiv. in shell (ZRC), stn B39, Pontod Lagoon I., Panglao I., 9°32.8'N, 123°42.1'E, 17–25 m, 2.vii.2004; 1 female SL 4.4 mm, 2 males SL 3.8–4.4 mm (ZRC), stn R1, Balicasag I., 9°31.2'N, 123°41.3'E, 5–7 m, 30.v.2004; 3 ovig. females SL 2.2–4.0 mm, 5 males 2.9–5.6 mm (ZRC), stn R3, Alona Reef, Panglao I., 9°33.0'N, 123°46.5'E, 5–24 m, v.2004 to vii.2004; 1 male SL 3.7 mm (ZRC), stn R8, House Reef, Panglao I., 9°31.2'N, 123°41.3'E, 4–24 m, v.2004 to vii.2004; 2 males SL 3.0–5.8 mm (ZRC), stn R8, House Reef, Panglao I., 9°31.2'N, 123°41.3'E, 4–24 m, v.2004 to vii.2004; 1 ovig. female SL 3.6 mm, 1 male SL 3.5 mm (ZRC), stn R10, Biking, Panglao I., 9°35.3'N, 123°50.5'E, 2–10 m, 1.vi.2004; 1 female SL 4.0 mm, 1 male SL 3.5 mm (ZRC), stn R11, Biking, Panglao I., 9°35.2'N, 123°50.5'E, 4 m, 2.vi.2004; 1 male SL 3.1 mm (ZRC), stn R13, Doljo Point, Panglao I., 9°35.6'N, 123°43.2'E, 2–41 m, 2.vi.2004; 1 female SL 3.6 mm (ZRC), stn R14, Baclayon, Bohol I., 9°37.4'N, 123°54.5'E, 6–8 m, 3.vi.2004; 1 male 3.0 mm (ZRC), stn R15, Arco Point, Panglao I., 9°33.5'N, 123°48.6'E, 6–30 m, 3.vi.2004; 1 female SL 3.4 mm (ZRC), stn R16, Black Forest, Panglao I., 9°31.1'N, 123°41.3'E, 6–22 m, 4.vi.2004; 1 ovig. female SL 3.1 mm (ZRC), stn R17, Black Forest, Panglao I., 9°31.1'N, 123°41.3'E, 3–15 m, 4.vi.2004; 1 male SL 4.8 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 1 male SL 3.5 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 2 ovig. females SL 2.9–5.1 mm, 2 males SL 4.3–4.4 mm (ZRC), stn R27, Napaling, Panglao I., 9°37.0'N, 123°46.3'E, 2–20 m, 7.vi.2004; 1 male SL 5.6 mm (ZRC), stn R36, Pamilacan I., 9°30.2'N, 123°55.3'E, 3–32 m, 9.vi.2004; 2 males SL 4.0–5.5 mm (ZRC), stn R37, Momo Beach, Panglao I., 9°36.5'N, 123°45.6'E, 28–32 m, 10.vi.2004; 4 males SL 4.5–5.0 mm (ZRC), stn R43, Cortes Takot, Bohol I., 9°41.3'N, 123°49.5'E, 3–41 m, 13.vi.2004; 1 female SL 3.5 mm (ZRC), stn R48, Bingag, Panglao I., 9°37.6'N, 123°47.3'E, 4–20 m, 17.vi.2004; 2 females SL 3.5 mm, 2 males SL 3.5–4.5 mm (ZRC), stn R49, San Isidro, Panglao I., 9°34.6'N, 123°49.9'E, 1–32 m, 17.vi.2004; 2 males SL 4.2–4.5 mm (ZRC), stn R57, Lagoon, 9°34.8'N, 123°42.7'E, 1–2 m, 21.vi.2004; 1 male SL 4.6 mm, 1 indiv. in shell (ZRC), stn R59, Momo Beach, Panglao I., 9°36.2'N, 123°44.9'E, 2–20 m, 22.vi.2004; 1 female SL 3.3 mm (ZRC), stn R70, Pamilacan I., 9°30.1'N, 123°55.5'E, 20 m, 1.vii.2004; 1 female SL 3.9 mm (ZRC), stn R71, Arco Point, Panglao I., 9°34.1'N, 123°48.9'E, 2–20 m, 1.vii.2004; 2 females SL 4.0–4.3 mm, 2 males SL 3.6–4.9 mm, 1 indiv. in shell (ZRC), stn R73, Balicasag I., 9°30.9'N, 123°40.8'E, 2–30 m, 2.vii.2004; 5 indivs. in shell, stn R75, west of Pontod, Panglao I., 9°32.8'N, 123°42.1'E, 3–35 m, 3.vii.2004; 1 ovig. female SL 2.9 mm, 2 females SL 2.9–3.6 mm, 1 male SL 3.6 mm (ZRC), stn R77, between Momo and Napaling, Panglao I., 9°37.0'N, 123°46.0'E, 2–10 m, 6.vii.2004; 1 ovig. female SL 3.1 mm, 1 male SL 2.5 mm, 1 indiv. in shell (ZRC), stn S12, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–8 m, 14.vi.2004; 1 indiv. in shell (ZRC), stn S17, San

Isidro, Panglao I., 9°34.6'N, 123°49.9'E, 6 m, 17.vi.2004; 1 male SL 5.5 mm (ZRC), stn S24, Momo Beach, Panglao I., 9°36.1'N, 123°45.0'E, 2–4 m, 22.vi.2004.

Habitat. Subtidal, 2–41 m deep, on reef flats, slopes, plateaus, and caves, on coral, rubble, and mixed sand-coral substrates.

Remarks. *Calcinus pulcher* has a cryptic form, apparently restricted to the Western Indian Ocean, that lacks the bright red patches on the carpi of the second pereopods characteristic of the typical Western Pacific colour morph (Malay & Paulay, 2010: Fig. 13; Poupin, 2016: Fig. 5). The cryptic colour morph is genetically distinct from typical *C. pulcher* (Malay and Paulay, 2010).

Clibanarius Dana, 1852

Remarks. The species of *Clibanarius* are restricted to the upper intertidal zone. Members of this genus tend to be tolerant of low salinities, often inhabiting estuaries and mangrove areas. *Clibanarius* includes the only known species of freshwater hermit crab from Vanuatu (*Cl. fonticola*, McLaughlin & Murray, 1990). Osawa & Fujita (2008: Table 1) provide a comprehensive overview of the geographic range and habitat preferences of the Indo-West Pacific species of *Clibanarius*.

There are 59 species of *Clibanarius* listed in McLaughlin et al. (2010), of which 43 are known from the Indo-West Pacific. Previous reports from the Philippines list 11 species (excluding two doubtful records of presumably West Atlantic species, *Clibanarius antillensis* and *Cl. sclopetarius*). The current report adds seven newly recorded species of *Clibanarius*, bringing the total species count for the Philippines to 18. As in *Calcinus* and several other diogenid genera, species identifications in *Clibanarius* depend principally on colour patterns, and in the absence of colouration several species are very difficult to identify.

Clibanarius ambonensis Rahayu & Forest, 1993 (Fig. 2B)

Clibanarius ambonensis Rahayu & Forest, 1993 (1992): 753, Figs. 2b, 3c, d (Ambon, Indonesia, type locality); Rahayu, 2003: 99–100; Osawa & Fujita, 2008: 2–7, Figs. 1–4; Rahayu & Setyadi, 2009: 18, unnumbered figure.

Material examined. 1 male SL 4 mm (ZRC), stn M16, Sungcolan inlet, Panglao I., 9°38.2'N, 123°50.3'E, 0–1 m, 9.vi.2004; 3 males SL 2.5–3.0 mm (ZRC), stn M27, north of Abatan River, Bohol I., 9°43.6'N, 123°51.2'E, 0–1 m, 23.vi.2004; 3 females SL 5.5–6.5 mm, 4 males SL 4.2–6.3 mm (ZRC), stn M29, Abatan River, Bohol I., 9°44.7'N, 123°55.2'E, 0–1 m, 23.vi.2004; 1 ovig. female SL 2.9 mm, 4 males SL 2.8–3.1 mm, 5 indivs. in shell (ZRC), stn M30, mouth of Abatan River, Bohol I., 9°43.1'N, 123°51.5'E, 0–1 m, 24.vi.2004; 2 females SL 2.3–2.7 mm, 1 male SL 2.3 mm, 1 indiv. in shell (ZRC), stn M31, Abatan River, Bohol I., 9°43.0'N, 123°52.2'E, 0–1 m, 24.vi.2004; 3 males SL 3.9–7.0 mm (ZRC), stn M37, north of Cortes Bridge, Abatan

River, Bohol I., 9°44.8'N, 123°55.5'E, 0–2 m, 26.vi.2004; 2 males SL 2.5–3.2 mm (ZRC), stn M40, Looc (lagoon inside), Panglao I., 9°35.7'N, 123°44.7'E, 0–3 m, 22 & 28.vi.2004.

Habitat. Intertidal, in estuarine river habitats, mangroves and nipa palms.

Remarks. Although the colour of the specimen in this study (Fig. 2B) is dark brown, much darker than the specimens studied by Osawa & Fujita (2008) and Rahayu & Setyadi (2009), the morphological characters agree well with the description of the species. This is the first report of this species from the Philippines.

***Clibanarius antennatus* Rahayu & Forest, 1993**

(Fig. 2C)

Clibanarius antennatus Rahayu & Forest, 1993 (1992): 755, Figs. 2c, 3e, f (Barombong, Sulawesi, Indonesia, type locality); Rahayu, 2003: 99.

Material examined. 1 female SL 2.0 mm, 3 males SL 2.2–2.8 mm (ZRC), stn M28, Abatan River, Bohol I., 9°44.5'N, 123°53.8'E, 0–1 m, 23.vi.2004; 1 female SL 6.0 mm, 1 male SL 3.9 mm (ZRC), stn M34, Abatan River, Bohol I., 9°43.8'N, 123°52.7'E, 0–1 m, 25.vi.2004; 1 male SL 4.9 mm (ZRC), stn M34, Abatan River, Bohol I., 9°43.8'N, 123°52.7'E, 0–1 m, 25.vi.2004; 2 females SL 2.6–6.5 mm (ZRC), stn M42, Abatan River, Bohol I., 9°43.9'N, 123°53.4'E, 0–1 m, 28.vi.2004; 1 ovig. female SL 5.8 mm, 1 female SL 6.1 mm, 2 males SL 6.8–7.6 mm (ZRC), stn M42, Abatan River, Bohol I., 9°43.9'N, 123°53.4'E, 0–1 m, 28.vi.2004; 1 ovig. female SL 4.9 mm, 5 females SL 3.4–5.5 mm, 4 males SL 5.2–7.1 mm, 5 indivs. in shell (ZRC), Cortes mangrove, Bohol I.

Habitat. Intertidal, near river mouths, on sand-mud substrates.

Remarks. This is the first report of this species from the Philippines.

***Clibanarius corallinus* (H. Milne Edwards, 1848)**

(Fig. 2D)

Pagurus corallinus H. Milne Edwards, 1848: 63 (New Guinea, type locality).

Clibanarius corallinus – Buitendijk, 1937: 264; Estampador, 1937: 500; Yap-Chiongco, 1938: 187; Forest, 1953a: 442–442; Fize & Serène, 1955: 132–138, Fig. 20; Miyake, 1956: 313–315, figs. 6–7; Estampador, 1959: 47; Ball & Haig, 1972: 96; Lee, 1969: 43; Haig & Ball, 1988: 163; McLaughlin et al., 2007: 117–118, 2 unnumbered figures.

Clibanarius corallinus var. *spinatus* Yap-Chiongco, 1938: 187–188 (Puerto Galera, Mindoro, Philippines, type locality).

Material examined. 2 males SL 2.3–2.5 mm (ZRC), stn M17, Pontod Islet, Panglao I., 9°33.4'N, 123°43.0'E, 0–1 m, 9.vi.2004; 2 females SL 3.8–5.5 mm, 6 males SL 2.5–9.0 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 2 males SL 2.3–2.4 mm (ZRC), stn M19, Pamilacan I., 9°30.0'N, 123°55.3'E,

0–2 m, 11.vi.2004; 2 ovig. females SL 5.7–6.1, 5 females SL 2.9–7.0 mm, 2 males SL 2.2–3.2 mm, 3 indivs. in shell (ZRC), stn M20, Pamilacan I., 9°29.3'N, 123°55.1'E, 0–2 m, 13.vi.2004; 1 ovig. female SL 4.9 mm, 1 male SL 5.2 mm (ZRC), stn M24, Manga, Panglao I., 0–1 m, 9°42.1'N, 123°51.3'E, 17.vi.2004; 1 male SL 3.0 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004; 1 ovig. female SL 4.6 mm, 1 female SL 5.3 mm, 2 males SL 2.5–8.3 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004; 1 male SL 2.9 mm (ZRC), no locality.

Habitat. Intertidal, reef flats and seagrass beds, on sandy, rocky, and mixed substrates.

Remarks. Yap-Chiongco (1938) reported a variety of *Cl. corallinus* he called var. *spinatus* based on three specimens from Puerto Galera, Mindoro, Philippines. Unfortunately, the specimens examined by Yap-Chiongco could not be located.

***Clibanarius cruentatus* (H. Milne Edwards, 1848)**

(Fig. 2E)

Pagurus cruentatus H. Milne Edwards, 1848: 62 (New Guinea, type locality; not New Zealand, see Osawa & Chan, 2009).

Clibanarius cruentatus – Estampador, 1937: 501; Yap-Chiongco, 1938: 189; Fize & Serène, 1955: 123–128, Fig. 18; Estampador, 1959: 48; Cassidy & McLaughlin, 1997: 82–84, Fig. 3; Osawa & Chan, 2009: 322–323, Figs. 3C, 5 and 7B.

Material examined. 1 male SL 6.7 mm, 1 indiv. in shell (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 5.2 mm, 1 indiv. in shell (ZRC), stn M7, Momo Beach, Panglao I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 2 males SL 3.8–3.9 mm (ZRC), stn M10, Bingag/Tabalong, Panglao I., 9°37.8'N, 123°48.4'E, 0–3 m, 5.vi.2004; 4 indivs. in shell (ZRC), stn M11, Sungcolan Bay, Panglao I., 9°38.3'N, 123°49.6'E, 0–3 m, 6.vi.2004; 2 males SL 3.2–4.3 mm, 3 indivs. in shell (ZRC), stn M23, Bingag/Tabalong, Panglao I., 9°37.8'N, 123°48.4'E, 0–1 m, 16.vi.2004; 1 female SL 4.4 mm, 1 male SL 3.5 mm (ZRC), stn M24, Manga, Panglao I., 9°42.1'N, 123°51.3'E, 0–1 m, 17.vi.2004; 1 female SL 3.0 mm (ZRC), stn M26, Taloto, Bohol I., 9°40.9'N, 123°51.1'E, 0–2 m, 19.vi.2004; 2 males SL 4.0–5.5 mm (ZRC), stn M34, Abatan River, Bohol I., 9°43.8'N, 123°52.7'E, 0–1 m, 25.vi.2004; 1 male SL 3.2 mm (ZRC), stn M51, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 3 males SL 6.9–8.5 mm, 1 indiv. in shell (ZRC), stn R66, Sungcolan inlet, Panglao I., 9°38.3'N, 123°50.3'E, 1–3 m, 28.vi.2004.

Habitat. Intertidal, reef flats and seagrass beds, on rocky and sandy substrates.

***Clibanarius englaucus* Ball & Haig, 1972**

(Fig. 2F)

Clibanarius englaucus Ball & Haig, 1972: 97–100, Fig. 5 (Kurum, Karkar Island, Indonesia, type locality); Haig & Ball, 1988: 163; Cassidy & McLaughlin, 1997: 78–80, Fig. 1; McLaughlin et al., 2007: 123–124, 2 unlabelled figures; Poupin et al., 2013: 33, Fig. 17B–D.

Clibanarius humilis – Yu & Foo, 1991: 44, 1 unlabelled figure [not *Clibanarius humilis* (Dana, 1851)].

Material examined. 1 male SL 4.2 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 ovig. female SL 2.1 mm, 5 females SL 2.0–2.9 mm, 21 males SL 2.2–4.2 mm, 3 indivs. in shell, 1 damaged indiv. (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 indiv. in shell (ZRC), stn M20, Pamilacan I., 9°29.3'N, 123°55.1'E, 0–2 m, 13.vi.2004; 1 male SL 2.6 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004.

Habitat. Intertidal, reef flats, on sandy and coralline substrates.

Clibanarius humilis (Dana, 1851)

Pagurus humilis Dana, 1851: 271 (Fiji and Tongatabu, type localities); Forest, 1953a: 443–446, Figs. 1, 5; Gherardi & McLaughlin, 1994: 629–632; McLaughlin et al., 2007: 129–130, 2 unlabelled figures.

Material examined. 1 female SL 2.6 mm, 1 male SL 1.7 mm (ZRC), stn M10, Bingag/Tabalong, Panglao I., 9°37.8'N, 123°48.4'E, 0–3 m, 5.vi.2004; 1 indiv. sex undetermined SL 2.6 mm (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004.

Habitat. Intertidal, seagrass beds, on sandy, sand-mud, and rocky substrates.

Remarks. This is the first report of this species from the Philippines.

Clibanarius infraspinus (Hilgendorf, 1869)

(Fig. 2G)

Pagurus infraspinus Hilgendorf, 1869: 97 (Singapore, type locality).

Clibanarius infraspinus – Estampador, 1937: 501; Yap-Chiongco, 1938: 191–192; Fize & Serène, 1955: 77–83, Fig. 10; Estampador, 1959: 48; McLaughlin et al., 2007: 113–114, 3 unlabelled figures.

Material examined. – 1 male SL 9.0 mm (ZRC), stn S53, off Abatan River mouth, Bohol I., 9°42.7'N, 123°51.1'E, 2 m, 5.vii.2004.

Habitat. Intertidal to subtidal, near river mouths, 0–2 m deep, on mud-sand substrates.

Remarks. Juvenile colouration of *Cl. infraspinus* is markedly different from the adult colour pattern (see McLaughlin et al., 2007).

Clibanarius laevimanus Buitendijk, 1937

(Fig. 2H)

Clibanarius laevimanus Buitendijk, 1937: 254–258, Figs. 3–5 (Marathea, Aroe Island, Indonesia and Bongao, Philippines,

type localities); Dehancé, 1963: 31; Rahayu & Forest, 1993 (1992): 757–758; Cassidy & McLaughlin, 1997: 80–82, Fig. 2; Poupin et al., 2013: 36, Fig. 18C.

Material examined. 1 ovig. female SL 2.3 mm, 3 females SL 2.0–2.2 mm, 3 males SL 2.2–3.0 mm, 1 indiv. in shell (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 17 females SL 2.0–3.5 mm, 43 males SL 1.8–4.1 mm, 8 indivs. in shell (ZRC), stn M9, inside lagoon near Doljo Point, Panglao I., 9°35.1'N, 123°43.6'E, 0–0.5 m, 4.vi.2004; 3 ovig. females SL 3.0–3.2 mm, 13 females SL 2.2–4.2 mm, 10 males SL 1.8–4.5 mm, 4 indivs. in shell (ZRC), stn M11, Sungcolan Bay, Panglao I., 9°38.3'N, 123°49.6'E, 0–3 m, 6.vi.2004; 6 damaged indivs. (ZRC), stn M15, Baclayon, Bohol I., 9°37.2'N, 123°55.4'E, 0–1 m, 9.vi.2004; 1 female SL 2.6 mm, 3 males 2.2–3.0 mm, 1 indiv. in shell (ZRC), stn M17, Pontod Islet, Panglao I., 9°33.4'N, 123°43.0'E, 0–1 m, 9.vi.2004; 2 males SL 2.6–2.7 mm, 2 indivs. in shell (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 4 females SL 2.8–4.4 mm, 1 male SL 4.4 mm, 1 indiv. in shell (ZRC), stn M24, Manga, Panglao I., 9°42.1'N, 123°51.3'E, 0–1 m, 17.vi.2004; 6 females SL 1.7–2.4 mm, 8 males SL 1.6–4.7 mm (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004; 2 females SL 1.8–2.0 mm, 3 males SL 2.5–3.1 mm, 1 indiv. in shell (ZRC), stn M40, Looc (lagoon inside), Panglao I., 9°35.7'N, 123°44.7'E, 0–3 m, 22 & 28.vi.2004; 1 ovig. female SL 2.6 mm, 9 females SL 2.1–6.9 mm, 7 males SL 2.0–2.5 mm, 2 indivs. in shell (ZRC), stn R26, Sungcolan Bay, Panglao I., 9°38.4'/38.5'N, 123°49.1'/49.4'/49.7'E, 1–5 m, 6, 20, & 30.vi.2004.

Habitat. Intertidal, reef flats, seagrass beds, and mangroves, on rocky, sandy, and mud-sand substrates.

Remarks. Buitendijk (1937: 258) noted that the syntypes from Bongao in the southern Philippines have stronger tubercles, greater spination, and different colouration from the specimens collected in Indonesia. The morphological characters and colouration of the specimens in this study agree well with the description of the species from Indonesia by Buitendijk (1937). This species can be difficult to separate from the affiliated *Clibanarius striolatus* with almost the same morphology and colour pattern (see Poupin et al., 2013).

Clibanarius longitarsus (De Haan, 1849)

(Fig. 3A)

Pagurus longitarsus De Haan, 1849: 211, Fig. 3, pl. 50 (Japan, type locality).

? *Pagurus asper* H. Milne Edwards, 1848: 62, 63 (Indian Ocean, type locality).

Clibanarius longitarsus – Buitendijk, 1937: 253–254; Fize & Serène, 1955: 83–90, fig. 11; Haig & Ball, 1988: 163; McLaughlin et al., 2007: 119–120, 2 unlabelled figures; Rahayu, 2003: 100–101.

Material examined. 19 females SL 4.4–7.8 mm, 17 males SL 5.2–9.5 mm, 1 indiv. in shell (ZRC), stn M9, inside lagoon near Doljo Point, Panglao I., 9°35.1'N, 123°43.6'E, 0–0.5 m, 4.vi.2004; 2 females SL 4.6–6.1 mm, 8 males SL 3.2–8.2 mm, 8 indivs. in shell (ZRC), stn M11, Sungcolan

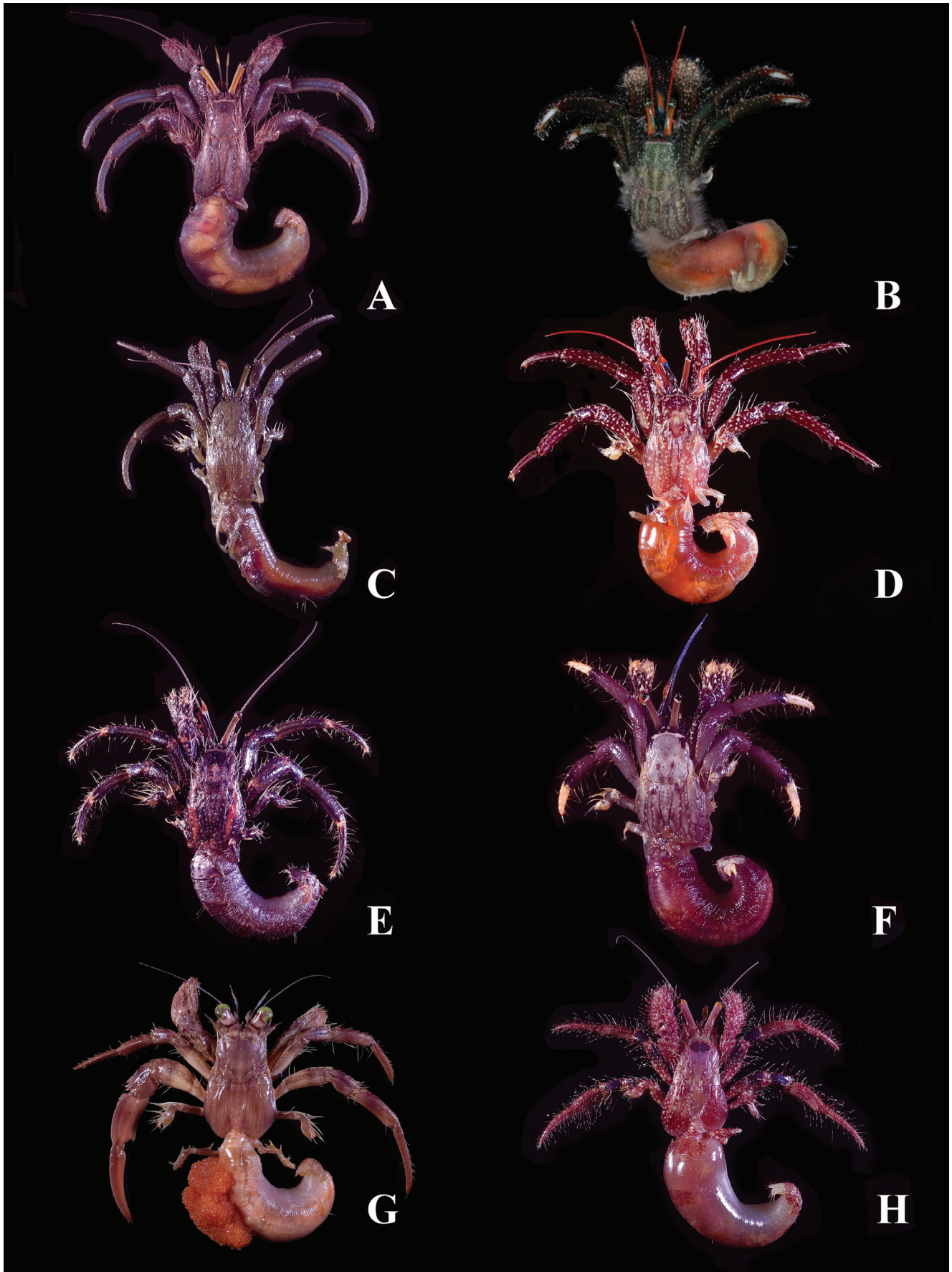


Fig. 3. A, *Clibanarius longitarsus* (De Haan, 1849). Specimen not measured and sexed, stn M52; B, *Clibanarius merguiensis* De Man, 1888. Male SL 3.5 mm, stn M51; C, *Clibanarius serenei* Rahayu & Forest, 1993. Male SL 3.6 mm, stn M11; D, *Clibanarius snelliusi* Buitendijk, 1937. Male SL 5.3 mm, stn M1; E, *Clibanarius striolatus* Dana, 1852. Specimen not measured and sexed, stn M9; F, *Clibanarius virescens* (Krauss, 1843). Male SL 4.1 mm, stn M8; G, *Dardanus deformis* (H. Milne Edwards, 1836). Female SL 8.8 mm, stn M3; H, *Dardanus lagopodes* (Forskål, 1775). Female SL 6.6 mm, stn M8.

Bay, Panglao I., 9°38.3'N, 123°49.6'E, 0–3 m, 6.vi.2004; 1 female SL 6.0 mm (ZRC), stn M16, Sungcolan inlet, Panglao I., 9°38.2'N, 123°50.3'E, 0–1 m, 9.vi.2004; 1 female SL 8.2 mm (ZRC), stn M19, Pamilacan I., 9°30.0'N, 123°55.3'E, 0–2 m, 11.vi.2004; 1 ovig. female SL 5.6 mm, 2 males SL 3.4–5.1 mm (ZRC), stn M23, Bingag/Tabalong, Panglao I., 9°37.8'N, 123°48.4'E, 0–1 m, 16.vi.2004; 1 female SL 5.6 mm, 4 males SL 4.5–5.5 mm (ZRC), stn M24, Manga, Panglao I., 9°42.1'N, 123°51.3'E, 0–1 m, 17.vi.2004; 1 male SL 6.3 mm (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004; 3 males SL 4.0–6.5 mm (ZRC), stn M27, north of Abatan River, Bohol I., 9°43.6'N, 123°51.2'E, 0–1 m, 23.vi.2004; 1 male SL 3.7 mm (ZRC), stn M28, Abatan River, Bohol I., 9°44.5'N, 123°53.8'E, 0–1 m, 23.vi.2004; 3 females SL 4.0–5.6 mm, 2 males SL 3.8–4.1 mm (ZRC), stn M30, mouth of Abatan River, Bohol I., 9°43.1'N, 123°51.5'E, 0–1 m, 24.vi.2004; 2 indivs. in shell, stn M41, Abatan River, Bohol I., 9°43.9'N, 123°52.3'E, 0 m, 28.vi.2004; 1 ovig. female SL 3.9 mm, 2 males SL 2.1–5.2 mm (ZRC), stn M42, Abatan River, Bohol I., 9°43.9'N, 123°53.4'E, 0–1 m, 28.vi.2004; 1 female SL 3.0 mm, 6 males SL 2.9–6.4 mm, 2 indivs. in shell (ZRC), stn M44, inner part of Danao embayment, 9°33.1'N, 123°44.9'E, 0 m, 29.vi.2004; 1 male SL 5.2 mm (ZRC), stn M46, Abatan River, Bohol I., 9°44.8'N, 123°55.5'E, 0–1 m, 29.vi.2004; 1 female SL 3.5 mm (ZRC), stn M50, Abatan River, Bohol I., 9°43.2'N, 123°52.3'E, 0 m, 30.vi.2004; 1 female SL 6.3 mm, 5 males SL 3.0–7.0 mm (ZRC), stn M51, Mayabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 2 females SL 1.1–3.8 mm, 1 male SL 7.3 mm (ZRC), stn M52, mouth of Danao embayment, Panglao I., 9°34.2'N, 123°44.9'E, 0–1 m, 30.vi.2004; 1 male SL 7.8 mm (ZRC), stn M53, Mayabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 2.vii.2004; 2 males SL 7.3–8.1 mm (ZRC), stn S33, Abatan River Estuary, Bohol I., 9°43.8'N, 123°52.7'E, 1–3 m, 28.vi.2004; 1 male SL 3.5 mm (ZRC), stn S47, Abatan River, Bohol I., 9°43.9'N, 123°52.5'E, 2–8 m, 3.vii.2004.

Habitat. Brackish intertidal, river mouths, fringing mangroves, and nipa palms, on sandy, rocky, and sand-mud substrates.

Remarks. Rahayu (2003) noted that *Cl. longitarsus* has very variable colouration, however the longitudinal blue stripe on the lateral face of ambulatory legs, a specific character of this species, is always present, even after long periods of preservation in alcohol. This species is reported for the first time in the Philippines.

***Clibanarius merguiensis* De Man, 1888**
(Fig. 3B)

Clibanarius aequabilis var. *merguiensis* De Man, 1888: 247 (Mergui Archipelago, Burma, type locality)

Clibanarius merguiensis – Fize & Serène, 1955: 145–150, Fig. 22; Cassidy & McLaughlin, 1997: 85–87, Fig. 4; Rahayu & Forest, 1993 (1992): 774, Fig. 7; Rahayu & Komai, 2000: 27–28; McLaughlin et al., 2007: 133–134, 2 unlabelled figures.

Material examined. 1 ovig. female SL 2.1 mm, 2 males SL 1.4–3.4 mm (ZRC), stn M1, Alona Beach, Panglao I.,

9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 2.6 mm, 1 damaged male unmeasured (ZRC), stn M7, Momo Beach, Panglao I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 1 female SL 2.6 mm, 2 males SL 2.5–3.7 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 2 ovig. females SL 2.3–2.5 mm, 6 males SL 1.6–3.6 mm (ZRC), stn M11, Sungcolan Bay, Panglao I., 9°38.3'N, 123°49.6'E, 0–3 m, 6.vi.2004; 1 female not measured, 4 damaged indivs. (ZRC), stn M15, Baclayon, Bohol I., 9°37.2'N, 123°55.4'E, 0–1 m, 9.vi.2004; 2 males SL 3.1–4.0 mm (ZRC), stn M24, Manga, Panglao I., 9°42.1'N, 123°51.3'E, 0–1 m 17.vi.2004; 2 ovig. females SL 1.8–2.3 mm, 3 females SL 1.2–1.9 mm, 3 males SL 1.5–3.0 mm (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004; 3 ovig. females SL 2.8–2.9 mm, 3 females SL 1.2–2.2 mm, 17 males SL 1.5–3.5 mm, 1 indiv. in shell (ZRC), stn M51, Mayabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 1 male SL 3.4 mm (ZRC), stn R53, Sungcolan Bay, Panglao I., 9°38.4'N, 123°49.7'E, 3–5 m, 20.vi.2004.

Habitat. Intertidal, reef flats, seagrass beds, and mangroves, on rocky, sandy, and sand-mud substrates.

Remarks. The variation of colour pattern on the second and third pereopods of *Cl. merguiensis* showed by Rahayu & Forest (1993) is also present in the material studied here.

***Clibanarius rhabdodactylus* Forest, 1953**

Clibanarius zebra var. *rhabdodactylus* Forest, 1953a: 448, Figs. 3, 8 (Hikueru, Tuamotu, type locality).

Clibanarius rhabdodactylus – Rahayu & Forest, 1993 (1992): 777; McLaughlin et al., 2010: 20.

Material examined. 1 male SL 3.3 mm (ZRC), stn M8, Doljo Point, Panglao I., mixed intertidal platform, fringe mangrove, seagrass, 9°35.5'N, 123°43.3'/123°44.3'E, 0–2 m, 4.vi.2004.

Habitat. Intertidal.

Remarks. Apparently this is an uncommon species as not many specimens have been found so far, and only one specimen was collected for the first time from the Philippines.

***Clibanarius serenei* Rahayu & Forest, 1993**
(Fig. 3C)

Clibanarius 1 – Fize & Serène, 1955: 90–93, pl. 3 nos. 2, 8, 11, 14. *Clibanarius serenei* Rahayu & Forest, 1993 (1992): 762, Figs. 4c, 5c, 6c (Kendari, Indonesia, type locality); Rahayu, 1996: 337.

Material examined. 1 male SL 3.6 mm (ZRC), stn M11, Sungcolan Bay, Panglao I., 9°38.3'N, 123°49.6'E, 0–3 m, 6.vi.2004; 2 females SL 2.7–4.5 mm, 4 males SL 2.6–4.7 mm (ZRC), stn M28, Abatan River, Bohol I., 9°44.5'N, 123°53.8'E, 0–1 m, 23.vi.2004; 1 male SL 6.5 mm (ZRC), stn M46, Abatan River, Bohol I., 9°44.8'N, 123°55.5'E, 0–1 m, 29.vi.2004; 2 males SL 5.2–5.9 mm (ZRC), stn M47, middle part of Danao embayment, 9°33.1'N, 123°44.9'E, 0

m, 29.vi.2004; 1 male SL 6.8 mm, 1 indiv. in shell (ZRC), stn S35, Abatan River, Bohol I., 9°43.9'N, 123°53.4'E, 29.vi.2004.

Habitat. Intertidal, mangrove areas and nipa palms, on sandy and muddy substrates.

Remarks. This is a new record for the Philippines.

***Clibanarius snelli* Buitendijk, 1937**
(Fig. 3D)

Clibanarius snelli Buitendijk, 1937: 259–260, Fig. 7–9 (Endeh, Flores, Indonesia, type locality); Fize & Serène, 1955: 128–132, Fig. 19; Ball & Haig, 1972: 96–97; Rahayu & Forest, 1993 (1992): 770; McLaughlin et al., 2007: 125–126, 1 unlabelled figure.

Material examined. 1 male SL 5.3 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004.

Habitat. Intertidal.

Remarks. This is a new record for the Philippines.

***Clibanarius striolatus* Dana, 1852**
(Fig. 3E)

Clibanarius striolatus Dana, 1852: 463 (Tonga and Fiji, type localities); Buitendijk, 1937: 258; Estampador, 1937: 501; Yap-Chiongco, 1938: 192; Fize & Serène, 1955: 97–105, Fig. 13, pl. 3 no. 4; Estampador, 1959: 48; Rahayu & Forest, 1993 (1992): 758; Gherardi & McLaughlin, 1994: 632–635; McLaughlin et al., 2007: 121–122, 2 unlabelled figures.

Clibanarius A – Fize & Serène, 1955: 109–114, Fig. 15, pl. 3 no. 6.

Material examined. 1 indiv. in shell (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 2.5 mm (ZRC), stn M3, Danao, Panglao I., 9°32.5'/33.1'N, 123°44.7'/45.5'E, 0–2.5 m, 31.v.2004; 1 female SL 4.2 mm, 5 males SL 3.0–6.8 mm, 6 indivs. in shell (ZRC), stn M7, Momo Beach, Panglao I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 1 female SL 4.2 mm, 2 males SL 3.4–3.6 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 4 females SL 2.3–4.0 mm, 11 males SL 1.7–6.2 mm, 1 indiv. in shell (ZRC), stn M9, inside lagoon near Doljo Point, Panglao I., 9°35.1'N, 123°43.6'E, 0–0.5 m, 4.vi.2004; 1 male SL 6.0 mm (ZRC), stn M10, Bingag/Tabalong, Panglao I., 9°37.8'N, 123°48.4'E, 0–3 m, 5.vi.2004; 2 females SL 3.7–4.5 mm, 6 males SL 3.7–5.0 mm, 1 indiv. in shell (ZRC), stn M11, Sungcolan Bay, Panglao I., 9°38.3'N, 123°49.6'E, 0–3 m, 6.vi.2004; 1 ovig. female SL 3.3 mm, 1 male SL 5.0 mm, 33 indivs. in shell (ZRC), stn M15, Baclayon, Bohol I., 9°37.2'N, 123°55.4'E, 0–1 m, 9.vi.2004; 1 female SL 3.8 mm, 11 males SL 3.2–5.0 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 female SL 6.2 mm (ZRC), stn M19, Pamilacan I., 9°30.0'N, 123°55.3'E, 0–2 m, 11.vi.2004; 7 females SL 2.9–7.7 mm, 23 males SL 1.2–5.7 mm, 2 indivs. in shell

(ZRC), stn M24, Manga, Panglao I., 9°42.1'N, 123°51.3'E, 0–1 m, 17.vi.2004; 13 females SL 2.1–4.3 mm, 17 males SL 2.2–5.5 mm, 6 indivs. in shell (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004; 1 male SL 4.0 mm (ZRC), stn M40, Looc (lagoon inside), Panglao I., 9°35.7'N, 123°44.7'E, 0–3 m, 22 & 28.vi.2004; 2 males SL 1.6–2.2 mm, 1 indiv. in shell (ZRC), stn M50, Abatan River, Bohol I., 9°33.6'N, 123°45.1'E, 0–0.5 m, 29.vi.2004; 1 ovig. female SL 3.6 mm, 5 females SL 3.0–3.5 mm, 12 males SL 1.4–4.3 mm, 2 indivs. in shell (ZRC), stn M51, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 1 male SL 3.5 mm (ZRC), stn M52, mouth of Danao embayment, Panglao I., 9°34.2'N, 123°44.9'E, 0–1 m, 30.vi.2004; 2 males SL 3.1–4.5 mm (ZRC), stn M53, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 2.vii.2004; 1 ovig. female SL 2.7 mm, 2 females SL 2.3–3.1 mm (ZRC), stn R26, Sungcolan Bay, Panglao I., 9°38.4'/38.5'N, 123°49.1'/49.4'/49.7'E, 1–5 m, 6, 20, & 30.vi.2004; 3 females SL 2.5–4.7 mm, 2 males SL 4.5–5.0 mm (ZRC), stn R58, Looc (lagoon side), Panglao I., 9°35.7'N, 123°44.7'E, 1–3 m, 22.vi.2004.

Habitat. Intertidal, mangrove areas, nipa palms, and seagrass beds, on sandy, sand-mud, and rocky substrates.

Remarks. *Clibanarius striolatus* is a common species in intertidal environments and is very abundant in the Philippines (authors' pers. obs.). It closely resembles *Cl. laevimanus* (see remarks under that species).

***Clibanarius virescens* (Krauss, 1843)**
(Fig. 3F)

Pagurus virescens Krauss, 1843: 56, Fig. 3, pl. 4 (South Africa, type locality).

Clibanarius virescens – Fize & Serène, 1955: 138–145, Fig. 21; Miyake, 1956: 315–318, Figs. 8–9; Haig & Ball, 1988: 163–164; Morgan, 1988: 317–318, Fig. 1; Gherardi & McLaughlin, 1994: 636; Cassidy & McLaughlin, 1997: 87–89, Fig. 5; McLaughlin et al., 2007: 126–128, 3 unlabelled figures.

Clibanarius philippinensis Yap-Chiongco, in Estampador, 1937: 501–502 (Manila Bay and Taytay, Palawan, Philippines, type localities); Estampador, 1959: 49–50.

Material examined. 1 male SL 6.0 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004 ; 1 male SL 4.8 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 2.3 mm (ZRC), stn M10, Bingag/ Tabalong, Panglao I., 9°37.8'N, 123°48.4'E, 0–3 m, 5.vi.2004; 2 males SL 4.2–5.3 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 5 ovig. females SL 2.7–3.9 mm, 1 female SL 2.1 mm, 6 males SL 3.0–4.3 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 male SL 3.6 mm (ZRC), stn M7, Momo Beach, Panglao I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 1 male SL 4.1 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 2 ovig. females SL 2.9–3.2 mm, 2 females SL 2.7 mm, 3 males 3.2–5.9 mm, 1 indiv. in shell (ZRC), stn M11, Sungcolan Bay, Panglao I., 9°38.3'N, 123°49.6'E, 0–3 m, 6.vi.2004; 1 ovig. female SL

3.2 mm, 1 female SL 3.6 mm (ZRC), stn M15, Baclayon, Bohol I., 9°37.2'N, 123°55.4'E, 0–1 m, 9.vi.2004; 1 female SL 1.9 mm, 1 male SL 2.2 mm, 1 indiv. in shell (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 ovig. female SL 1.9 mm, 2 females SL 2.1–4.0 mm, 13 males SL 2.0–4.6 mm (ZRC), stn M19, Pamilacan I., 9°30.0'N, 123°55.3'E, 0–2 m, 11.vi.2004; 2 males SL 5.3–6.0 mm (ZRC), stn M22, Napaling, Panglao I., 9°37.2'N, 123°46.4'E, 0–3 m, 15.vi.2004; 2 females SL 2.0–2.4 mm (ZRC), stn M24, Manga, Panglao I., 9°42.1'N, 123°51.3'E, 0–1 m, 17.vi.2004; 1 female SL 2.1 mm, 2 males SL 2.1–2.4 mm (ZRC), stn M25, Danao, Panglao I., 9°33.1'N, 123°44.6'E, 0–1 m, 17.vi.2004; 2 females SL 2.4–2.8 mm, 1 male SL 3.9 mm (ZRC), stn M51, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 3 ovig. females SL 3.4–3.5 mm, 1 female SL 2.9 mm, 1 male SL 3.0 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 2 males SL 3.7–4.5 mm (ZRC), stn R53, Sungcolan Bay, Panglao I., 9°38.4'N, 123°49.7'E, 3–5 m, 20.vi.2004; 1 male SL 3.9 mm (ZRC), stn R76, lagoon, 9°N, 123°E, 5.vii.2004; 2 males 4.1–6.6 mm, 5 indivs. in shell (ZRC), Alona Beach, Panglao I., no other info.

Habitat. Intertidal, reef flats, seagrass beds, and mangrove areas, on rocky, sandy, mud-sand and coralline substrates.

Remarks. *Clibanarius philippinensis*, described from the Philippines by Yap-Chiongco (in Estampador, 1937), was tentatively synonymised with *Cl. virescens* by Haig & Ball (1988) due to similarities in morphology and colouration. Type material of *Cl. philippinensis* was destroyed during World War II (Estampador, 1959) thus a comparison of specimens is not possible. *Clibanarius virescens* is very abundant in the intertidal zone.

Dardanus Paul'son, 1875

Remarks. A genus of mostly large hermit crabs found in shallow waters to deeper slopes, and in tropical, subtropical, to temperate latitudes. Forty-four valid species have been described (McLaughlin et al., 2010; Rahayu, 2010), of which 30 are found in the Indo-West Pacific and 12 were previously reported from the Philippines. The PANGLAO 2004 expedition collected 8 of them and added one new record. Moreover, the species *D. lagopodes* is determined to be a species complex and is now formally separated into three distinct species, with *D. sanguinolentus* Quoy & Gaimard, 1824) revalidated and a new species described, thus bringing the total species count in the Philippines to 15.

Dardanus dearmatus (Henderson, 1888)

Pagurus dearmatus Henderson, 1888: 58, Fig. 5, pl. 6 (Admiralty Islands, type locality); Yap-Chiongco, 1938: 196–197.

Pagurus dearmatus – Estampador, 1937: 502; Estampador, 1959: 50 (misspelling of *Pagurus dearmatus*).

Dardanus dearmatus – Rahayu, 2000: 386; Asakura & Hirayama, 2002: 223–229, Figs. 7–10.

Material examined. 1 male SL 5.2 mm (ZRC), stn PN1, Balicasag I., 9°31.2'N, 123°41.3'E, 50–500 m, v.2004 to vii.2004.

Habitat. Subtidal to approximately 500 m.

Remarks. This is typically a shallow subtidal species (to about 15 m, i.e., Rahayu, 2000) but there are reports of *D. dearmatus* from 29–46 m in the Admiralty Islands (Henderson, 1888) or much deeper waters, e.g., 605–915 m in Saya de Malha Bank (Laurie, 1926). The single specimen from Balicasag Island is also from relatively deep water (50–500 m), and was collected via tangle net.

Cassidy (2005), without further explanation, stated his opinion that Estampador's (1937) report of *D. dearmatus* actually refers to *D. gemmatus*. Estampador's (1937) specimens could not be located for verification (Asakura & Hirayama, 2002: 229). Regardless of the identity of Estampador's material, this report confirms the presence of *D. dearmatus* in Philippine waters.

Dardanus deformis (H. Milne Edwards, 1836)

(Fig. 3G)

Pagurus deformis H. Milne Edwards, 1836 272, Fig. 4, pl. 13 (Aldabra and Seychelles, type localities); Yap-Chiongco, 1938: 195–196; Fize & Serène, 1955: 199–207, Fig. 31 and 33E–F, pl. 4 no. 6.

Pagurus biformis – Estampador, 1959: 50 (misspelling of *Pagurus deformis*).

Dardanus deformis – Ball & Haig, 1972: 92–93; Gherardi & McLaughlin, 1994: 638–639; Cassidy, 2005: 96–102, Figs. 1–5; McLaughlin et al., 2007: 79–80, 2 unlabelled figures.

Material examined. 1 ovig. female SL 11.1 mm, 4 females SL 9.7–14.3 mm, 1 male SL 11.0 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 1 male SL 9.8 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 ovig. female SL 8.8 mm (ZRC), stn M3, Danao, Panglao I., 9°32.5'/33.1'N, 123°44.7'/45.5'E, 0–2.5 m, 31.v.2004; 1 ovig. female SL 7.4 mm, 4 females SL 6.9–8.2 mm, 2 males SL 3.9–13.2 mm (ZRC), stn M7, Momo Beach, Panglao I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 1 female SL 7.5 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 1 ovig. female SL 12.0 mm (ZRC), stn M17, Pontod Islet, Panglao I., 9°33.4'N, 123°43.0'E, 0–1 m, 9.vi.2004; 1 female SL 10.0 mm (ZRC), stn M22, Napaling, Panglao I., 9°37.2'N, 123°46.4'E, 0–3 m, 15.vi.2004; 1 female SL 8.0 mm (ZRC), stn M51, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 2 ovig. females SL 11.0–11.9 mm, 3 females SL 9.6–12.8 mm, 1 male SL 12.3 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004; 1 indiv. in shell (ZRC), stn N6, Tawala, Panglao I., 9°32.9'N, 123°47.0'E, 40–45 m, 11.vi.2004; 1 female SL 6.6 mm (ZRC), stn PN1, Balicasag I., 9°31.2'N, 123°41.3'E, 50–500 m, v.2004 to vii.2004; 1 ovig. female SL 9.0 mm (ZRC), stn R26, Sungcolan Bay, Panglao I., 9°38.4'/38.5'N, 123°49.1'/49.4'/49.7'E, 1–5 m,

6, 20, & 30.vi.2004; 1 female SL 11.8 mm (ZRC), stn R42, Baclayon Takot, Bohol I., 9°37.1'N, 123°52.6'E, 8–22 m, 12.vi.2004; 1 female SL 11.8 mm (ZRC), stn R42, Baclayon Takot, Bohol I., 9°37.1'N, 123°52.6'E, 8–22 m, 12.vi.2004; 1 female SL 8.3 mm (ZRC), stn R50, Looc, Panglao I., 9°35.7'N, 123°44.4'E, 3–7 m, 17.vi.2004; 1 male SL 8.0 mm (ZRC), stn S5, Napaling, Panglao I., 9°37.1'N, 123°46.1'E, 2–4 m, 8.vi.2004; 2 females SL 11.5–14.2 mm (ZRC), off Alona Beach Resort, Panglao I.

Habitat. Intertidal to subtidal, 0–45 m deep, reef flats, seagrass beds, and reef slopes, on coralline, sandy, and rocky substrates; associated with anemones.

Dardanus guttatus (Olivier, 1812)

Pagurus guttatus Olivier, 1812: 640 (Pacific Ocean, type locality); Estampador, 1937: 503; Yap-Chiongco, 1938: 200; Fize & Serène, 1955: 173–182, Figs. 26 and 27 C–D, pl. 5 nos. 1–3; Estampador, 1959: 51.

Dardanus guttatus – Haig & Ball, 1988: 165; Gherardi & McLaughlin, 1994: 639–640; Cassidy, 2005: 104–109, Figs. 7–9.

Material examined. 1 damaged individual (ZRC), Maribohoc Bay, Bohol I., no other data.

Habitat. Intertidal to shallow subtidal, on coralline or rocky substrates; occupies shells with narrow apertures (e.g., strombid and conid shells).

Remarks. *Dardanus guttatus* is easily distinguished from other species of *Dardanus* by the distinctive blue patches on the carpi of its chelipeds and ambulatory legs.

Dardanus lagopodes (Forskål, 1775)

(Figs. 3H, 5A–B)

Cancer lagopodes Forskål, 1775: 93 (Red Sea, type locality).

Pagurus sanguinolentus – Forest, 1953b: 559–560, Figs. 12–14 [in part]; Fize & Serène, 1955: 166–173, Fig. 25, pl. 4 nos. 4–5 [in part] (not *Pagurus sanguinolentus* Quoy & Gaimard, 1824).

Pagurus affinis H. Milne Edwards, 1836: 274 (Sri Lanka, type locality).

Pagurus euopsis Dana, 1852: 452–453 (Upolu, Samoa, type locality); Estampador, 1937: 503 (in part).

Dardanus lagopodes – Lewinsohn, 1969: 32, Fig. 1–2 pl. 2 [in part]; Ball & Haig, 1972: 92–93 [in part]; Haig & Ball, 1988: 166; McLaughlin et al., 2007: 91–93, 3 unlabelled figures [in part].

Material examined. 1 male SL 7.8 mm (ZRC), stn B1, Alona Reef, Panglao I., 9°33.0'N, 123°46.5'E, 8–14 m, 30.v.2004; 2 males SL 4.4–5.6 mm (ZRC), stn B3, Arco Point, Panglao I., 9°33.5'N, 123°48.6'E, 8 m, 31.v.2004; 1 male SL 9.0 mm (ZRC), stn B7, Catarman, Panglao I., 9°35.9'N, 123°51.8'E, 4–30 m, 5.vi.2004; 1 ovig. female SL 2.9 mm, 1 male SL 3.9 mm (ZRC), stn B9, Napaling, Panglao I., 9°33.1'N, 123°44.0'E, 8.5–10 m, 8.vi.2004; 1 female SL 10.1 mm, 1 male SL 11.1 mm (ZRC), stn M1, Alona Beach, Panglao I., 9°32.9'N, 123°46.6'E, 0–1 m, v.2004 to vii.2004; 2 males SL 7.8–9.8 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 2 males SL 10.3–12.8 mm (ZRC), stn M7, Momo Beach, Panglao

I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 1 female SL 6.6 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 1 male SL 11.2 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 male SL 14.0 mm (ZRC), stn M19, Pamilacan I., 9°30.0'N, 123°55.3'E, 0–2 m, 11.vi.2004; 1 ovig. female SL 9.1 mm, 1 female SL 7.3 mm, 1 male SL 8.0 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004; 2 males SL 8.0–9.8 mm (ZRC), stn N2, Alona Reef, Panglao I., 9°32.9'N, 123°46.6'E, 12 m, 7.vi.2004; 1 male SL 7.2 mm (ZRC), stn N4, Alona Reef, Panglao I., 9°32.9'N, 123°46.9'E, 15–20 m, 10.vi.2004; 1 female SL 6.9 mm, 3 males SL 7.4–12.6 mm (ZRC), stn R1, Balicasag I., 9°31.2'N, 123°41.3'E, 5–7 m, 30.v.2004; 1 male SL 7.8 mm (ZRC), stn R3, Alona Reef, Panglao I., 9°33.0'N, 123°46.5'E, 5–24 m, v.2004 to vii.2004; 1 male SL 7.5 mm (ZRC), stn R5, Catarman, Panglao I., 9°36.6'N, 123°52.4'E, 5–16 m, 31.v.2004; 1 female SL 8.3 mm, 2 males SL 10.4–11.5 mm (ZRC), stn R6, Baclayon, Bohol I., Loay, Bohol I., 9°36.6'N, 123°57.8'E, 5–12 m, 31.v.2004; 1 female SL 7.2 mm (ZRC), stn R8, House Reef, Panglao I., 9°31.2'N, 123°41.3'E, 4–24 m, v.2004 to vii.2004; 1 ovig. female SL 7.0 mm, 2 males SL 7.3–9.4 mm (ZRC), stn R10, Biking, Panglao I., 9°35.3'N, 123°50.5'E, 2–10 m, 1.vi.2004; 1 female SL 8.7 mm, 1 male SL 9.5 mm (ZRC), stn R11, Biking, Panglao I., 9°35.2'N, 123°50.5'E, 4 m, 2.vi.2004; 1 female SL 10.2 mm, 1 male SL 9.0 mm (ZRC), stn R13, Doljo Point, Panglao I., 9°35.6'N, 123°43.2'E, 2–41 m, 2.vi.2004; 2 females SL 9.5–12.0 mm, 1 male SL 14.1 mm (ZRC), stn R14, Baclayon, Bohol I., 9°37.4'N, 123°54.5'E, 6–8 m, 3.vi.2004; 1 male SL 10.3 mm (ZRC), stn R15, Arco Point, Panglao I., 9°33.5'N, 123°48.6'E, 6–30 m, 3.vi.2004; 2 males SL 7.2–8.9 mm (ZRC), stn R17, Black Forest, Panglao I., 9°31.1'N, 123°41.3'E, 3–15 m, 4.vi.2004; 3 males SL 3.8–9.5 mm (ZRC), stn R20, Cathedral, 9°31.1'N, 123°41.5'E, 7–48 m, 5.vi.2004; 1 male SL 9.6 mm (ZRC), stn R23, lagoon off Poblacion, Panglao I., 9°33.5'/34.8'N, 123°42.7'/46.3'E, 1–5 m, 5, 6, & 21.vi.2004; 1 female SL 3.8 mm (ZRC), stn R24, Bingag, Panglao I., 9°37.5'N, 123°46.8'E, 0–2 m, 6.vi.2004; 1 female SL 6.7 mm, 1 male SL 6.5 mm (ZRC), stn R27, Napaling, Panglao I., 9°37.0'N, 123°46.3'E, 2–20 m, 7.vi.2004; 1 female SL 11.5 mm (ZRC), stn R28, Napaling, Panglao I., 9°37.0'N, 123°46.3'E, 20–54 m, 7.vi.2004; 2 males SL 6.3–8.0 mm (ZRC), stn R36, Pamilacan I., 9°30.2'N, 123°55.3'E, 3–32 m, 9.vi.2004; 1 male SL 13.3 mm (ZRC), stn R38, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–37 m, 11.vi.2004; 1 ovig. female SL 5.5 mm, 1 female SL 8.6 mm, 2 males SL 11.4–12.5 mm (ZRC), stn R38, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–37 m, 11.vi.2004; 1 ovig. female SL 7.5 mm (ZRC), stn R42, Baclayon Takot, Bohol I., 9°37.1'N, 123°52.6'E, 8–22 m, 12.vi.2004; 3 ovig. females SL 6.5–12.0 mm, 4 males SL 5.5–13.0 mm (ZRC), stn R43, Cortes Takot, Bohol I., 9°41.3'N, 123°49.5'E, 3–41 m, 13.vi.2004; 1 ovig. female SL 6.5 mm, 1 male SL 9.5 mm (ZRC), stn R48, Bingag, Panglao I., 9°37.6'N, 123°47.3'E, 4–20 m, 17.vi.2004; 1 ovig. female SL 6.5 mm, 1 male SL 8.5 mm (ZRC), stn R58, Looc (lagoon side), Panglao I., 9°35.7'N, 123°44.7'E, 1–3 m, 22.vi.2004; 2 females SL 6.7–10.1 mm, 2 males SL 6.2–7.4 mm (ZRC), stn R73, Balicasag I., 9°30.9'N, 123°40.8'E, 2–30 m, 2.vii.2004; 2

males SL 7.1–10.8 mm (ZRC), stn R75, west of Pontod, Panglao I., 9°32.8'N, 123°42.1'E, 3–35 m, 3.vii.2004; 1 female SL 7.9 mm, 1 male SL 10.0 mm (ZRC), stn R76, lagoon, 9°N, 123°E, 5.vii.2004; 2 ovig. females SL 6.9–7.2 mm (ZRC), stn R77, between Momo and Napaling, Panglao I., 9°37.0'N, 123°46.0'E, 2–10 m, 6.vii.2004.

Other material: *Dardanus affinis* (H. Milne Edwards, 1836) holotype, male SL 23 mm (MNHN Pg. 1305), Ceylon (Sri Lanka).

Description. Shield nearly as long as it is wide; anterior margin between rostrum and lateral projections shallowly concave; lateral margins slightly convex, slightly irregular, with tufts of long setae. Posterior margin rounded. Dorsal surface of shield somewhat inflated, with tufts of long setae, strongly calcified; Y-shaped line present posteriorly. Rostral lobe weakly produced. Lateral projections large, bluntly triangular, produced. Posterior carapace lateral elements well calcified, unarmed. Branchiostegites unarmed.

Ocular peduncles 0.8–0.9 times length of shield, subcylindrical, somewhat inflated distally, diameter of corneas 0.2 length of ocular peduncles. Ocular acicles broad, distal margins each with 3 spines, with fringe of setae along distal margins. Interocular plate with pair of protrusions.

Antennular peduncles slender, when fully extended, distal ultimate segments reaching base of corneas; ultimate and penultimate segments unarmed, basal segment distal margin with tufts of long setae. Antennal peduncles, when fully extended, reaching 0.7 length of ocular peduncles; fifth segment unarmed, with 3–4 scattered setae on dorsal and ventral surfaces; fourth segment with tufts of setae on mesiodistal margin; third segment with tufts of long setae on ventral surface; second segment with dorsolateral distal angle produced, terminating in strong simple spine, lateral margin unarmed, dorsomesial distal angle bearing 1 spine, mesial margin, lateral margin, and dorsolateral distal angle with tufts of setae; first segment unarmed. Antennal acicle short, barely passing base of fourth segment and terminating in strong bifid spine; dorsomesial margin with 3 spines, dorsolateral margin unarmed or with single spine. Antennal flagella bearing minute seta on each articulation.

Third maxilliped with well developed crista dentata; basis with 2 small corneous spines.

Chelipeds unequal, left larger than right. Left cheliped stout. Outer face of palm, dactyl, and fixed finger convex; bearing rows of corneous-tipped conical spines; with tufts of long and short setae, not concealing armature. Dactyl and fixed finger each terminating in strong corneous claw, cutting edges each with 5–6 (dactyl) or 7–9 (fixed finger) low, molar-like calcareous teeth. Upper margin of palm and dactyl with row of corneous-tipped conical spines, spines larger in upper proximal angle; lower margin bearing row of conical corneous tipped spines. Inner face of dactyl smooth but with row of tufts of setae, inner face of fixed finger with irregular rows of low corneous-tipped spines distally and tufts of setae;

inner face of palm with tufts of setae. Carpus with upper margin bearing 2 prominent corneous-tipped spines and 2 smaller spines proximally; outer face with irregular rows of corneous-tipped spines distally, remaining of surface with sparse corneous-tipped spines and tufts of setae, lower outer margin with 1 strong corneous-tipped spines; inner face with scattered tufts of setae. Merus with distal margin bearing row of corneous-tipped spines; ventral margin with row of corneous-tipped spines, more prominent spines distally; lateral face with tufts of long setae; ischium with 4 teeth on ventromesial margin. Right cheliped smaller and more slender than left, armament similar.

Second pereopods and right third pereopod generally similar; second pair more slender than right third. Dactyls 1.3–1.4 length of propodi; each terminating in strong corneous claw; subcylindrical; ventral margins each with 5–7 small corneous spines distally; dorsal margins each with row of corneous spines; spines obscured by tufts of setae; lateral and mesial surfaces with rows of tufts of setae. Propodi 1.3 length of carpi; dorsal margins each with row of corneous spines obscured by tufts of setae; lateral faces convex, unarmed, and with rows of tufts of setae; ventral margins unarmed but with row of tufts of setae; mesial faces flattened, smooth, unarmed, with rows of tufts of setae. Carpi 0.6–0.7 length of meri; lateral faces flattened with tufts of setae on dorsal and ventral margins; dorsal surfaces covered with tufts of long setae, each bearing two prominent corneous-tipped conical spine distally; distal margins of lateral faces each with row of small, corneous-tipped spines obscured by tufts of setae. Meri lateral faces flattened or slightly convex, with tufts of setae on dorsal and ventral margins; ventral margins each with row of small spines obscured by tufts of seta; dorsal margins each with row of tufts of setae. Ischia unarmed.

Left third pereopod stout. Dactyl 1.6 length of propodus, terminating in large corneous claw; dorsal, ventral margins, and lateral face with rows of corneous spines and tufts of short and long setae, mesial face with 3 corneous spines distally and rows of tufts of setae on entire surface. Propodus 1.3 length of carpus, 2.3–2.4 as long as broad; dorsal margin with row of corneous spines obscured by tufts of setae; lateral face convex or flattened, with irregular rows of corneous spines obscured by tufts of short and long setae; ventral margin with row of sometimes bi-spinous corneous-tipped spines, obscured by tufts of setae. Carpus 0.8 length of merus; lateral face flattened; dorsal margin with row of corneous-tipped spines; dorsolateral angle with several strong corneous-tipped spines covered by dense tufts of long setae; dorsal, distal, and ventral margins covered by dense tufts of setae; mesial face slightly convex, smooth, unarmed, distal margin bearing tufts of long setae. Merus lateral face convex, with tufts of long setae on the dorsal, ventral, and subdistal margins; mesial face flattened with tufts of setae on subdorsal margin; ventral margin crested with row of tubercles bearing dense tufts of long setae and 2 calcareous teeth distally. Ischium unarmed.

Sternite of third pereopods with anterior lobe rectangular, with 2 protrusions each bearing tuft of long setae anteriorly.

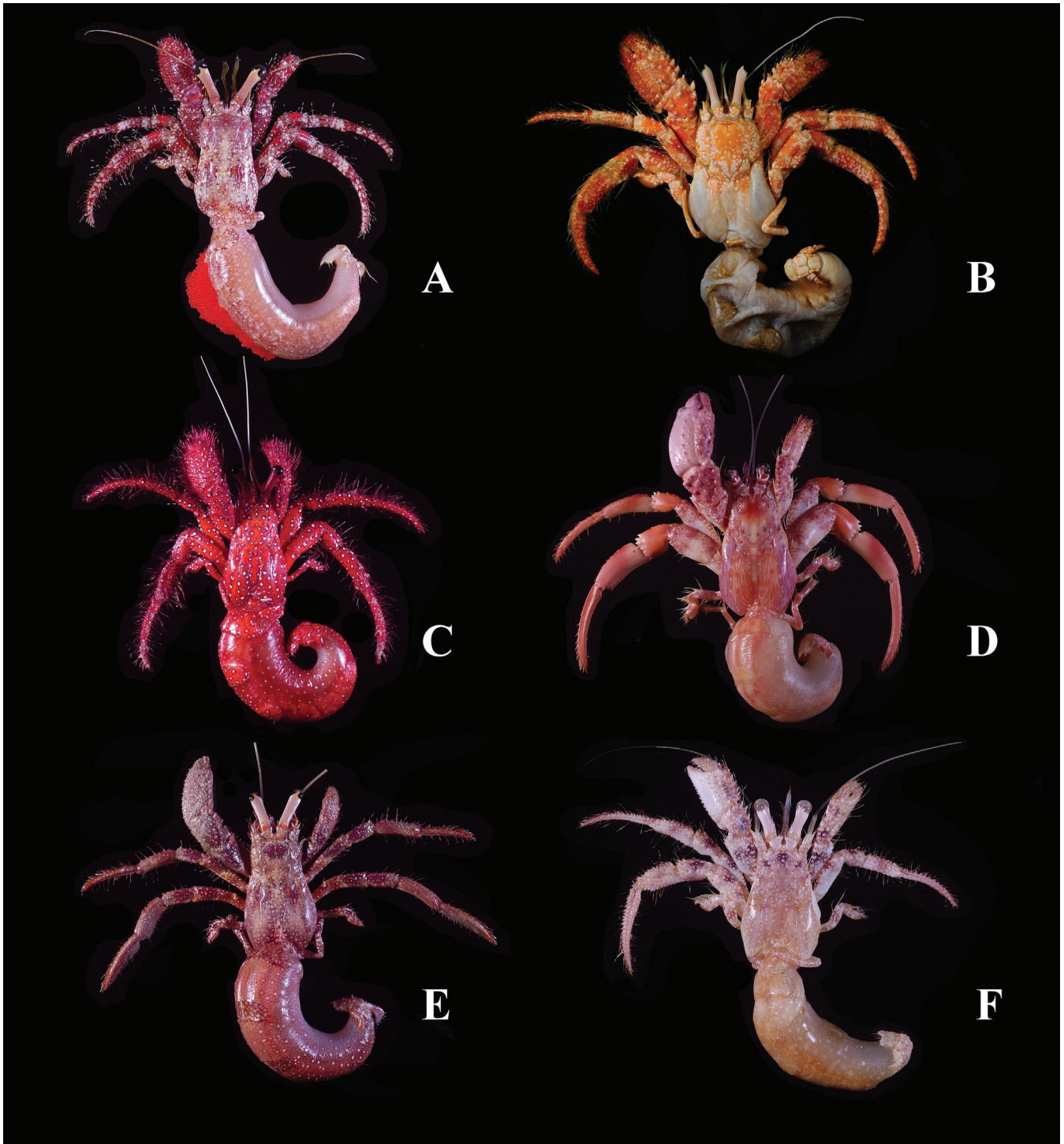


Fig. 4. A, *Dardanus sanguinolentus* (Quoy & Gaimard, 1824). Female ovig. SL 6.3 mm, stn R6; B, *Dardanus balhibuon*, n. sp. Holotype female SL 14.3 mm, stn R38, NMCR 40109, preserved colouration; C, *Dardanus megistos* (Herbst, 1804). Male SL 11.0 mm, stn M8; D, *Dardanus pedunculatus* (Herbst, 1804). Male SL 13.4 mm, stn N3; E, *Dardanus scutellatus*. Male SL 9.8 mm, stn D12; F, *Dardanus woodmasoni* (Alcock, 1905). Male SL 5.8 mm, stn R76.

Fourth pereopods semichelate; dactyls with 5 corneous ventral spines on lateral face; propodal rasps well developed; carpi each with sharp dorsodistal spine covered by dense tuft of long setae.

Fifth pereopods chelate; rasps of dactyl and propodus well developed.

Male pleon with first to fifth left pleopod fringed with sparse setae, uniramous. Female pleon with second to fifth left pleopods fringed with long setae; first to third triramous; fourth and fifth uniramous, very large, elongate, triangular fleshy membrane fringed with long setae present between fourth and fifth pleopods.

Uropods strongly asymmetrical, left larger than right; endopods and exopods with well developed rasps.

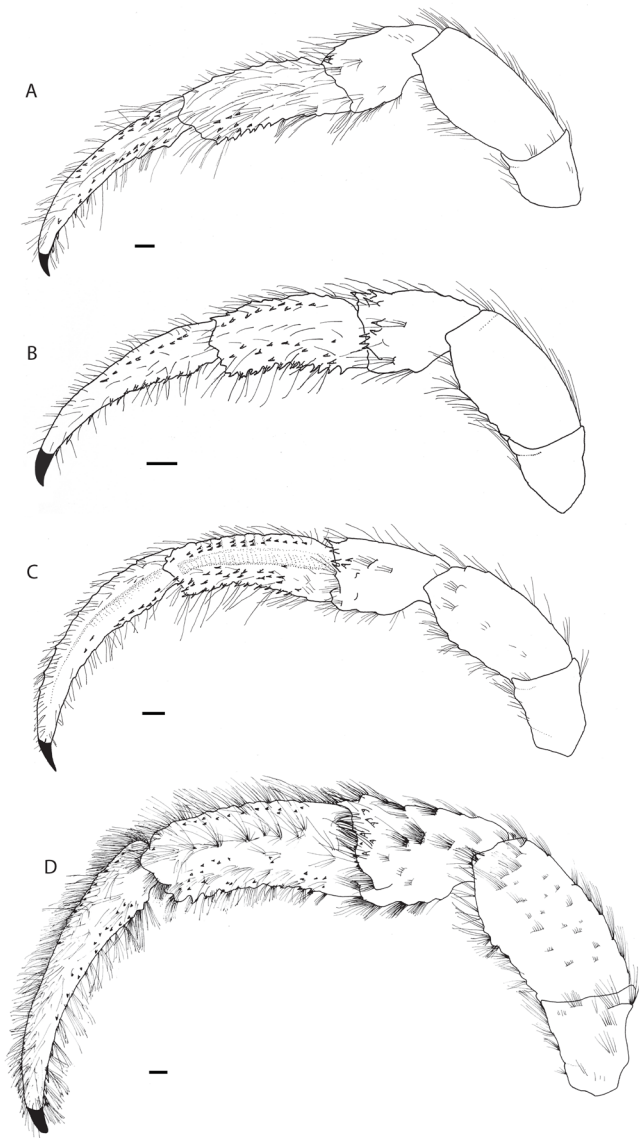


Fig. 5. Lateral view of left third pereopod. A, *Dardanus lagopodes* (Forskål, 1775). Male SL 9.8 mm, stn N2, ZRC 2015.0489; B, *Dardanus lagopodes* (Forskål, 1775). Female SL 7.6 mm, stn R1, ZRC 2015.0488; C, *Dardanus sanguinolentus* (Quoy & Gaimard, 1824). Male SL 7.8 mm, stn R38, ZRC 2015.0491; D, *Dardanus balhibuon*, new species, holotype. Female SL 14.3 mm, stn R38, NMCR 40109. Scale bars = 1 mm.

Telson with lateral constrictions; marginal area partially calcified; posterior lobes separated by median cleft, left much larger than right, each with 7 ventral corneous spines near terminal margin, terminal margins fringed with long setae; anterior lobes with long setae on lateral margins.

Colour. Shield brownish purple, with large brown spot anteriorly; posterior carapace mottled red and tan. Ocular peduncles uniform purplish brown, with narrow yellow line next to black cornea. Antennules and antennae yellowish brown. Chelipeds reddish purple with white tubercles and white-tipped red setae. Pereopods 2 and 3 reddish purple; broad black band at distal end of merus and large black patch on carpus; setae reddish purple with white tips (see Haig & Ball, 1988).

Habitat. Intertidal to subtidal, 0 to approximately 20 m deep, reef flats, seagrass beds, reef slopes and plateaus, on coralline, sandy, mud-sand, rubble, and rocky substrates.

Remarks. *Dardanus lagopodes* was described by Forskål (1775) as *Cancer lagopodes* from the Red Sea, and is a very common species in the Indo-West Pacific. Two colour forms have been reported for *D. lagopodes*, the “black/brown/blue knee” form (colour description varies depending on author) and the “red knee” form (Fize & Serène, 1955 as *Pagurus sanguinolentus*; Lewinsohn, 1969; Ball & Haig, 1972; McLaughlin et al., 2007). In addition, considerable morphological variation has been noted for this species (Forest, 1953b; Fize & Serène, 1955; Ball & Haig, 1972). In the course of the present study, strong morphological, colour, and genetic differences were detected within *D. lagopodes*, which can now be recognised as a species complex. For the first time, it has been possible to link morphological variation with the different colour forms and with mitochondrial DNA data. Morphological and genetic differences clearly indicate that the two colour forms, the “black/brown/blue knee” (hereafter simply referred to as the “blue knee” form) and the “red knee” form, represent two distinct species.

In the absence of colouration, these two species are most easily distinguished on the basis of the sculpturing on the propodus of the left third pereopod (LP3). The LP3 of the blue knee form exhibits great variation: the propodus smooth, cylindrical, and of the same width as the dactyl (Fig. 5A); or it may be flattened, broader, and covered with corneous spines (Fig. 5B). Nonetheless the LP3 propodus never bears a sulcus on its outer surface. On the other hand the red knee form is characterised by a deep sulcus on the upper half of the lateral face of the left third pereopod dactyl and propodus (Fig. 5C).

The two species are also clearly distinct genetically. Tree-based analyses (maximum likelihood and Bayesian approaches) yielded congruent results, and showed reciprocally monophyletic blue knee and red knee clades (Fig. 9). No phylogeographic structuring was detected within each of the two species despite inclusion of both Philippine and Taiwan samples. Moreover, inclusion of one blue knee specimen from the Tuamotu did not increase phylogeographic structuring.

Average intraspecific K2P values are 0.9% ($\pm 0.5\%$) for the blue knee species and 1.5% ($\pm 0.4\%$) for the red knee species. The average K2P genetic distance between blue knee and red knee species is 19.1% ($\pm 0.4\%$). As a comparison, in the diogenid genus *Calcinus* K2P distances separating closely related sister-species ranged from 2.6% – 25% (average $16.1 \pm 5.3\%$; see Malay & Paulay, 2010). Therefore, the genetic distance between blue knee and red knee *Dardanus* is within the range of interspecific genetic distances for diogenids. The fact that blue knee and red knee morphs maintain reciprocal monophyly and large genetic distances in sympatry is compelling evidence that they are

good biological species. The phylogeny also revealed one distinctly different COI haplotype from a specimen initially identified as *D. lagopodes* in the field, which upon closer examination turned out to be a new species (*Dardanus balhibuon* new species, described below).

To which colour form the name *D. lagopodes* is applied has to be determined. Unfortunately, virtually all of Forskål's types have been lost, including that of *D. lagopodes* (viz. Ng et al., 2008). However, in his very short diagnosis, Forskål (1775) mentioned the colour "cinereo-fuscus", or gray-brown. This shows that Forskål dealt with the blue knee colour form. Moreover, Lewinsohn (1969) examined specimens from the type locality (the Red Sea) and reported the presence of both colour forms, while emphasising the brown colouration in his notes. The figure of *D. lagopodes* from the type locality provided by Lewinsohn (1969: pl. 2, Figs. 1, 2) matches very well with the morphological characters of the left cheliped and LP3 of the blue knee form. Furthermore, the two color forms are easily recognised and very common in intertidal areas throughout the Indo-West Pacific, thus there is no doubt that Forskål's types *D. lagopodes* were of the blue knee species.

The following species have long been regarded as synonyms of *D. lagopodes* (Forskål, 1775): *D. sanguinolentus* (Quoy & Gaimard, 1824); *D. affinis* (H. Milne Edwards, 1836); *D. euopsis* (Dana, 1852); *D. depressus* (Heller, 1861); and *D. hellerii* Paul'son, 1875. Quoy & Gaimard (1824) described *D. sanguinolentus* from a specimen probably collected in Mauritius (see Forest, 1953b, p. 560). Unfortunately their description and illustration lack sufficient detail to distinguish which species they described. Forest (1953b) examined the type specimen of *D. sanguinolentus* at the Muséum national d'Histoire naturelle, and noted that *D. sanguinolentus* has "une depression longitudinale" on the lateral face of propodus of the left third pereopod, while for the type of *D. affinis* the propodus of the third left pereopod is more elongate, the lateral face is not depressed but straight or convex (see Forest, 1953b, Figs. 13, 14). Forest (1953b) did not describe the colouration but the description of these characters already indicates that Forest was dealing with the two forms of *D. lagopodes*.

The first author had the opportunity to re-examine the holotypes of *D. sanguinolentus* and *D. affinis* at the Muséum national d'Histoire naturelle in Paris, and confirms that the *D. sanguinolentus* holotype (MNHN Pg. 1304) bears the deep sulcus on the outer face of the LP3 propodus characteristic of the red knee form. On the other hand, the *D. affinis* holotype (MNHN Pg. 1305) has a smoothly convex LP3 propodus, corresponding to the *D. lagopodes* blue knee form. Therefore it is now possible to assign the species name *D. sanguinolentus* (Quoy & Gaimard, 1824) to the red knee form, while *D. affinis* is a junior synonym of *D. lagopodes*.

The original description of *D. depressus* can be applied to both *D. lagopodes* and *D. sanguinolentus*, however Heller (1861) mentioned the colouration of the species as "rubescens". The syntypes of *D. depressus* were redescribed

by McLaughlin & Dworschak (2001, p. 150–151). They describe the left third pereopod of *D. depressus* as having a "weak longitudinal sulcus" on the lateral face of the dactyl, while the lateral face of the propodus is "concave in dorsal half". Photographs of the syntypes (NHMW 19396, two syntypes) kindly provided by P. Dworschak show that the description corresponds to the sulcus on the lateral face of the left third pereopod that characterises *D. sanguinolentus*. The depressed carapace noted in the original description of *D. depressus* appears to be an ecological feature related to occupation of shells with a narrow aperture (Paul'son, 1875; Forest, 1953b).

The type specimen of *D. euopsis* could not be located for study, and is probably lost. Most of Dana's specimens from the US exploring expedition were lent to William Stimpson, and sadly were burned in the great Chicago fire of 1871 (Evans, 1967). However, Dana (1852: 453) described the colouration of the pereopods of *D. euopsis* as follows: "The legs are pale sepia with a dark maroon (nearly black) broad band on the third and fourth joints of the second and third pairs". This colouration showed that Dana (1852) was likely dealing with *D. lagopodes* sensu stricto.

Dardanus hellerii was described from the Red Sea by Paul'son (1875). Paul'son's type specimens cannot be located (M. Tuerkay, pers. comm.). However, Paul'son (1875) stated that his specimen was very close to *D. depressus* (= *D. sanguinolentus*) except for its ophthalmic somite with prominent interocular structure which is oval in shape and has two distal denticles and small median groove, and the colour of the legs is yellowish with external surface of merus red. The oval shape of the interocular structure cannot be considered as a specific character of the *D. hellerii*, as examination of the species in the genus *Dardanus* revealed that all have the same structure. The colour mentioned by Paul'son (1875) matched the colour of *D. sanguinolentus*. Therefore it is highly likely that Paul'son was dealing with *D. sanguinolentus*.

In conclusion, the name *Dardanus lagopodes* (Forskål, 1775) should refer to the blue knee form. *Dardanus affinis* (H. Milne Edwards, 1836) and *D. euopsis* (Dana, 1852) are junior synonyms of *D. lagopodes*. The name *D. sanguinolentus* (Quoy & Gaimard, 1824) is relevant for the red knee species. *Dardanus depressus* (Heller, 1861) is a junior synonym for *D. sanguinolentus*. *Dardanus hellerii* Paul'son, 1875 is a *nomen dubium* but if it belongs to the "*D. lagopodes*" species complex, it should also be a junior synonym of *D. sanguinolentus* according to the original colour description.

While many published records of *D. lagopodes* lack sufficient detail to distinguish this species from *D. sanguinolentus*, by careful checking we are able to determine that *D. lagopodes* is known with certainty from the Red Sea (type locality), Djibouti, East Africa, South Africa, Mayotte, Glorieuses, Madagascar, Réunion, Mauritius, Maldives, India, Cocos (Keeling) Islands, Christmas Island, Indonesia, Malaysia, Vietnam, New Guinea, Australia, Philippines, Taiwan, Japan, Marianas, New Caledonia, Loyalty Islands, Marshall Islands,

Kiribati, Tuvalu, Rotuma, Wallis and Futuna, Samoa, Cooks, Society, and Tuamotu.

The Philippine record of *Pagurus euopsis* by Estampador (1937: 503) and Estampador (1959: 51) can represent both *D. lagopodes* and *D. sanguinolentus* since no colouration or morphology account was mentioned. The present paper confirms that both *D. lagopodes* and *D. sanguinolentus* are present in the Philippines.

***Dardanus sanguinolentus* (Quoy & Gaimard, 1824)**
(Figs. 4A, 5C)

Pagurus sanguinolentus Quoy & Gaimard, 1824: 532, Fig. 2, pl. 79 (? Mauritius, type locality, see Forest, 1953b, p. 560); Forest, 1953b: 559–560, Figs. 12–14 [in part]; Fize & Serène, 1955: 166–173, Fig. 25, pl. 4 nos. 4–5 [in part].

Pagurus euopsis – Yap-Chiongco, 1938: 200; Estampador, 1937: 503 (in part).

Dardanus lagapodes – Cassidy, 2005: 109–112, Figs. 10–12 (misspelling of *Dardanus lagopodes*) [not *Dardanus lagopodes* (Forskål 1775)].

Dardanus lagopodes – Lewinsohn, 1969: 32, Fig. 1–2, pl. 2 [in part]; Ball & Haig, 1972: 92–93 [in part]; McLaughlin et al., 2007: 91–93, 3 unlabelled figures [in part, particularly p. 93, Fig. c] [not *Dardanus lagopodes* (Forskål, 1775)].

Pagurus depressus Heller, 1961: 22 (Red Sea, type locality); McLaughlin & Dworschak, 2001: 150–151.

?*Dardanus Hellerii* Paul'son, 1875: 90, 91, pl. 12, Fig. 4, 4a–c (Red Sea, type locality).

Material examined. Holotype: female SL 26 mm (MNHN Pg. 1304), ?Mauritius; 1 ovig. female SL 4.3 mm (ZRC), stn B3, Arco Point, Panglao I., 9°33.5'N, 123°48.6'E, 8 m, 31.v.2004; 1 male SL 6.7 mm (ZRC), stn M2, west end of Alona Beach, Panglao I., 9°32.8'N, 123°45.9'E, 0–2 m, 30.v.2004; 1 male SL 7.0 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 ovig. female SL 6.3 mm, 1 female SL 6.9 mm (ZRC), stn R6, Baclayon, Bohol I., Loay, Bohol I., 9°36.6'N, 123°57.8'E, 5–12 m, 31.v.2004; 1 female SL 6.9 mm (ZRC), stn R6, Baclayon, Bohol I., Loay, Bohol I., 9°36.6'N, 123°57.8'E, 5–12 m, 31.v.2004; 2 females SL 5.2–7.1 mm (ZRC), stn R10, Biking, Panglao I., 9°35.3'N, 123°50.5'E, 2–10 m, 1.vi.2004; 1 female SL 8.0 mm (ZRC), stn R16, Black Forest, Panglao I., 9°31.1'N, 123°41.3'E, 6–22 m, 4.vi.2004; 2 males SL 5.2–6.4 mm (ZRC), stn R21, Rico's Wall, Panglao I., 9°31.0'N, 123°40.8'E, 2–50 m, 5.vi.2004; 2 females SL 7.5–8.3 mm (ZRC), stn R23, lagoon off Poblacion, Panglao I., 9°33.5'/34.8'N, 123°42.7'/46.3'E, 1–5 m, 5, 6, & 21.vi.2004; 2 males SL 8.4–11.8 mm (ZRC), stn R29, Pontod Islet, Panglao I., 9°33.5'N, 123°42.6'E, 3–35 m, 7.vi.2004; 1 female SL 12.0 mm (ZRC), stn R31, Pamilacan I. south-southwest slope, 9°29.4'N, 123°56.0'E, 10–41 m, 8.vi.2004; 1 ovig. female SL 6.5 mm (ZRC), stn R36, Pamilacan I., 9°30.2'N, 123°55.3'E, 3–32 m, 9.vi.2004; 1 male SL 7.8 mm (ZRC), stn R38, Pamilacan I., 9°29.4'N, 123°56.0'E, 6–37 m, 11.vi.2004; 1 male SL 4.0 mm (ZRC), stn R58, Looc (lagoon side), Panglao I., 9°35.7'N, 123°44.7'E, 1–3 m, 22.vi.2004; 1 ovig. female SL 6.5 mm, 2 males SL 6.9–7.5 mm (ZRC), stn R71, Arco Point, Panglao I., 9°34.1'N, 123°48.9'E, 2–20 m, 1.vii.2004; 1 ovig. female SL

5.8 mm (ZRC), stn S15, Cortes Takot, Bohol I., 9°41.3'N, 123°49.5'E, 4–6 m, 16.vi.2004.

Description. Shield approximately 0.9 times as long as broad; anterior margin between rostrum and lateral projections shallowly concave; lateral margins slightly convex, with sparse tufts of long setae. Posterior margin rounded. Dorsal surface of shield somewhat inflated, with tufts of long setae, strongly calcified; Y-shaped line present posteriorly. Rostral lobe weakly produced. Lateral projections large, bluntly triangular, produced. Posterior carapace lateral elements well calcified, unarmed. Branchiostegites unarmed.

Ocular peduncles 0.9 times length of shield, longer than antennal and antennular peduncles, subcylindrical, somewhat inflated distally, diameter of corneas 0.2 length of ocular peduncles. Ocular acicles broad, distal margins each with 3 small spines, with fringe of setae along distal margins. Interocular plate with pair of protrusions.

Antennular peduncles slender, when fully extended, reaching base of corneas; ultimate and penultimate segments unarmed, basal segment distal margin with fringe of long setae.

Antennal peduncles when fully extended reaching 0.6 length of ocular peduncles; fifth segment unarmed, with 3–4 scattered setae on dorsal and ventral surfaces; fourth segment with tufts of setae on mesiodistal margin; third segment with tufts of long setae on ventral surface; second segment with dorsolateral distal angle produced, terminating in simple or bifid spine, lateral margin unarmed, dorsomesial distal angle unarmed or bearing 1 spine, mesial margin, lateral margin, and dorsolateral distal angle with tufts of setae; first segment with ventrolateral distal angle unarmed or with 1 spine, ventromesial distal angle produced, rounded. Antennal acicle terminating in bifid spine; dorsomesial margin with 3 spines, dorsolateral margin unarmed or with single small spine. Antennal flagella bearing minute seta on each articulation.

Third maxilliped with well developed crista dentata; basis with 1 or 2 small corneous spines, spines concealed by tufts of long setae.

Chelipeds unequal, left larger than right. Left cheliped stout. Outer face of palm, dactyl, and fixed finger convex; bearing irregular rows of corneous-tipped conical spines, with sparse short and long setae. Dactyl and fixed finger each terminating in strong corneous claw, cutting edges each with 3 large and 4 small (dactyl) or 2 large and 4 small (fixed finger) molar-like calcareous teeth. Upper margin and outer face of dactyl with row of corneous-tipped spines, with rows of tufts of long and short setae. Palm and fixed finger with rows of corneous-tipped spines accompanied by tufts of sparse setae; lower margin of palm with corneous-tipped spines, smaller spines proximally. Inner face of palm, dactyl, and fixed finger slightly convex with irregular rows of tufts of setae. Carpus with upper margin bearing 4 corneous-tipped spines; outer face slightly convex with irregular rows of corneous-tipped spines, distal outer face with transverse rows of small corneous-tipped spines; inner face with scattered

tufts of setae particularly on the inner distal margin. Merus with row of spines on ventral margin; entire lateral face with tufts of long setae. Ischium with 3 teeth on ventromesial margin. Right cheliped more slender than left, armament similar to left.

Second pereopods and right third pereopod generally similar, but setation and armament slightly different between second pair and right third; second pair more slender than right third; of second pair, left slightly shorter than right. Dactyls all 1.6–1.7 length of propodi; each terminating in strong corneous claw; subcylindrical, with rows of setae on dorsal and ventral margins, and on median of lateral and mesial faces; dorsal margins each with row of spines; ventral margins each with 7 small corneous spines. Propodi 1.5 length of carpi; dorsal margins each with row of small corneous spines with sparse tufts of setae; ventral margins unarmed but with sparse tufts of setae; lateral faces convex, unarmed, and with rows of sparse tufts of setae; mesial faces flattened, smooth, unarmed, with sparse tufts of setae. Carpi 0.6–0.7 length of meri; dorsal margins with tufts of long setae, bearing 2 prominent corneous-tipped conical spines distally; distal margins each with row of transverse corneous-tipped spines and few tufts of setae. Meri lateral faces flattened, with tufts of setae on dorsal and ventral margins; ventral margins each with 2–3 corneous-tipped spines or unarmed. Ischia unarmed.

Left third pereopod stout. Dactyl 1.2 length of propodus, terminating in large corneous claw; lateral face flattened or concave, dorsal and ventral margins each with double rows of corneous spines accompanied by tufts of setae; mesial face convex, with tufts of long setae along median line. Propodus 1.4 length of carpus, 2.2–2.5 as long as broad; lateral face flattened, with longitudinal concavity on upper half; dorsal margin of lateral face with 2 irregular rows of sharp corneous spines; subventral 0.3 of lateral face with irregular rows of sharp corneous spines; mesial face convex, smooth, with rows of sparse tufts of long setae. Carpus 0.9 length of merus; dorsal margin with row of 4 corneous-tipped spines not concealed by tufts of setae; distal margin with transverse row of corneous-tipped spines, remaining of outer face with few spines. Merus lateral face flattened, with tufts of setae on dorsal and ventral margins; ventral margin with 2–3 corneous-tipped spines or unarmed. Ischia unarmed.

Sternite of third pereopods with anterior lobe rectangular, with 2 protrusions each bearing tuft of long setae anteriorly.

Fourth pereopods semichelate; dactyls each with 5 corneous ventral spines on lateral face; propodal rasps well developed; carpi each with sharp dorsodistal spine covered by tuft of long setae.

Fifth pereopods chelate; rasps of dactyl and propodus well developed.

Male pleon with first to fifth left pleopod fringed with sparse setae, uniramous. Female pleon with second to fifth left pleopods fringed with long setae; second to fourth triramous; fifth uniramous; single, large, elongate, triangular fleshy

membrane fringed with long setae present between fourth and fifth pleopods.

Uropods strongly asymmetrical, left larger than right; endopods and exopods with well developed rasps.

Telson with lateral constrictions; marginal area partially calcified; posterior lobes separated by median cleft, left much larger than right, each with 7 (left) or 4 (right) ventral corneous spines near terminal margin, terminal margins fringed with long setae; anterior lobes with long setae on lateral margins.

Colour. Shield reddish brown, with small bright red or orange-and-blue patches on the antero-distal corners; posterior carapace mottled red and tan. Ocular peduncles uniform purplish brown, with narrow yellow line next to black cornea. Antennules and antennae yellowish brown. Chelipeds reddish purple with white tubercles, bright red or orange-and-blue patch on carpus; setae reddish purple with white tips. Pereopods 2 and 3 reddish purple; large bright red patch on carpus; setae reddish purple with white tips.

Habitat. Intertidal to subtidal, 0 to approximately 20 m deep, reef flats, seagrass beds, reef slopes, on coralline, sandy, and mud-sand substrates. Often collected from the same spot as *D. lagopodes*.

Remarks. The species *D. sanguinolentus* (Quoy & Gaimard, 1824) refers to the “red knee” form previously synonymised with *D. lagopodes*. The latter name is now restricted to the “blue knee” form. *Dardanus sanguinolentus* is distinguished morphologically from *D. lagopodes* by the presence of a deep sulcus on the upper half of the lateral face of the dactyl and propodus of LP3. The two species are also genetically distinct (Fig. 9). See further detailed remarks under *D. lagopodes*.

The geographic range of *D. sanguinolentus* broadly overlaps with that of *D. lagopodes*. While colouration is not always reported in checklists, *D. sanguinolentus* is known with certainty from the Red Sea, Réunion, Seychelles, Europa Island, Juan de Nova Island, Mayotte, Papua New Guinea, Indonesia, Vietnam, Philippines, Taiwan, Okinawa, Guam, Australia, New Caledonia, Fiji, and Society. This is the first time that *D. sanguinolentus* is formally reported from the Philippines as the species reported by Cassidy (2005) was under the name of *D. lagopodes*.

Dardanus balhibuon, new species (Figs. 4B, 5D, 6–8)

Material examined. Female, holotype SL 14.3 mm (NMCR 40109), stn R38, Pamilacan I., Bohol Prov., 9°29.4'N, 123°56.0'E, 6–37 m, 11.vi.2004.

Description. Shield (Fig. 6A) 0.9 times longer than wide; anterior margin between rostrum and lateral projections shallowly concave; lateral margins slightly convex, slightly irregular, with dense tufts of long setae. Posterior margin rounded. Dorsal surface of shield somewhat inflated, with

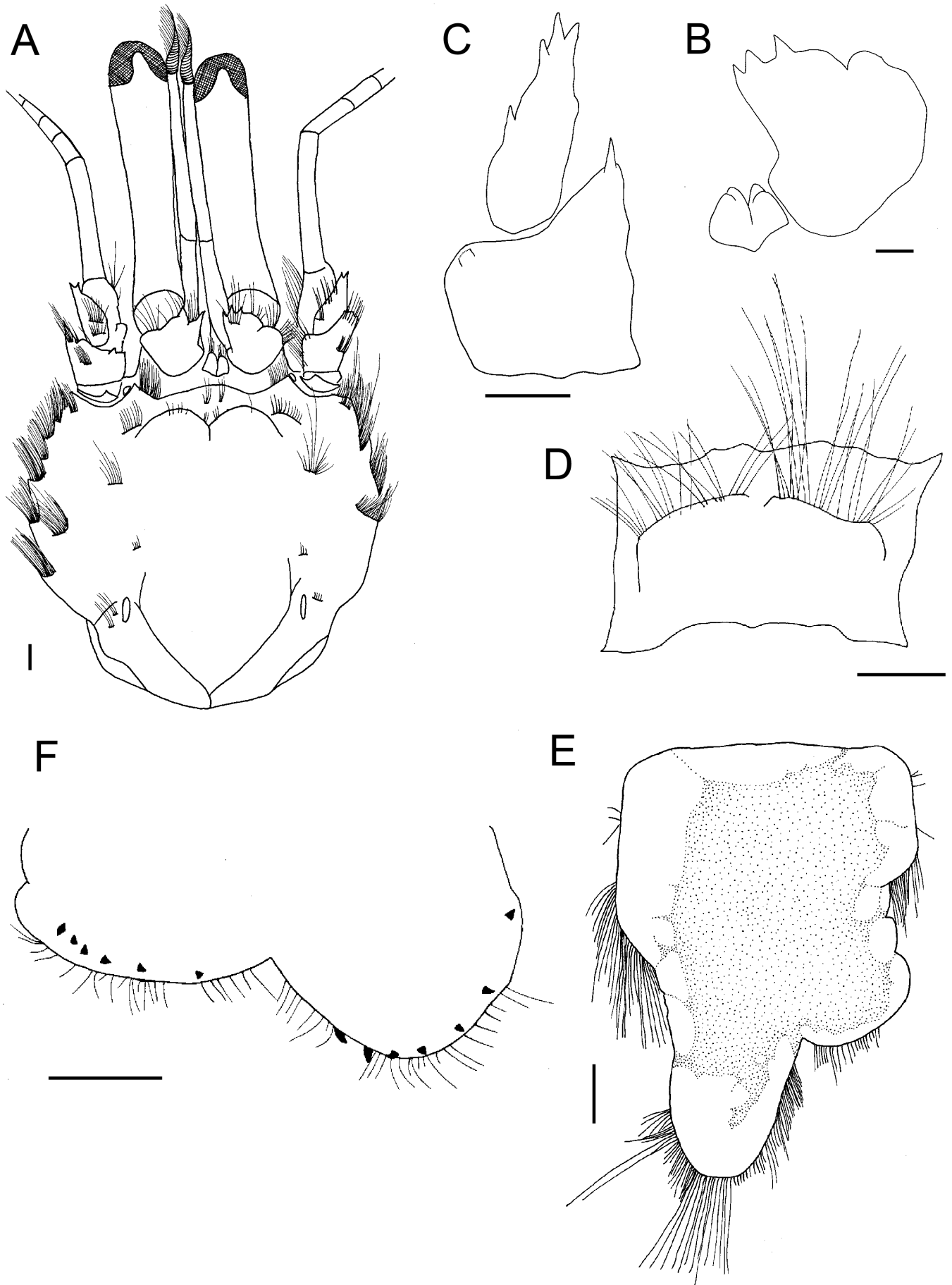


Fig. 6. *Dardanus balhibuon*, new species, holotype. Female SL 14.3 mm, stn R38, NMCR 40109. A, Shield and cephalic appendages; B, Interocular plate and right ocular acicle; C, Right antennal peduncle; D, Anterior lobe of sternite of third pereopods; E, Telson, dorsal view; F, Posterior lobes of telson, ventral view. Scale bars = 1 mm.

tufts of long setae, strongly calcified; Y-shaped line present posteriorly. Rostral lobe weakly produced. Lateral projections large, bluntly triangular, produced. Posterior carapace lateral elements well calcified, unarmed. Branchiostegites unarmed.

Ocular peduncles (Fig. 6A) 0.8 times length of shield, subcylindrical, somewhat inflated distally, diameter of corneas slightly less than 0.2 of ocular peduncles length. Ocular acicles (Fig. 6B) broad, distal margins each with 3 spines, with fringe of setae along distal margins. Interocular plate (Fig. 6B) with pair of protrusions.

Antennular peduncles (Fig. 6A) slender, when fully extended, ultimate segments reaching middle of corneas; ultimate and penultimate segments unarmed, basal segment distal margin with fringe of long setae.

Antennal peduncles (Fig. 6A, C), when fully extended reaching 0.6 length of ocular peduncles; fifth segment unarmed, with 3–4 scattered setae on dorsal and ventral surfaces; fourth segment with tufts of setae on mesiodistal margin; third segment with tufts of long setae on ventral surface; second segment with dorsolateral distal angle produced, terminating in strong simple or bifid spine, lateral margin unarmed, dorsomesial distal angle unarmed or bearing 1 spine, mesial margin, lateral margin, and dorsolateral distal angle with dense tufts of setae; first segment with ventrolateral distal angle with 2 spines, ventromesial distal angle produced, rounded. Antennal acicle (Fig. 6C) terminating in strong bifid spine; dorsomesial margin with 3 spines, dorsolateral margin unarmed or with single small spine. Antennal flagella bearing minute seta on each articulation.

Third maxilliped with well developed crista dentata; basis with 1 or 2 small corneous spines, spines concealed by dense tufts of long setae.

Chelipeds vastly unequal, left larger than right. Left cheliped (Fig. 7A, B) very stout, 1.7 times longer than wide. Outer face of palm, dactyl, and fixed finger (Fig. 7A) convex; bearing irregular rows of corneous-tipped conical spines; and covered with tufts of mixed short and long setae, setae not arising singly but rather in dense tufts of 3 or more. Dactyl and fixed finger each terminating in strong corneous claw, cutting edges each with 5 (dactyl) or 7 (fixed finger) low, molar-like calcareous teeth. Upper face of palm and dactyl with 2 or 3 irregular rows of corneous-tipped conical spines, spines larger and more hooked in upper proximal angle; lower margin bearing row of conical corneous tipped spines. Inner face of palm, dactyl, and fixed finger (Fig. 7B) slightly convex; fixed finger and disto-lateral corner of palm with 3–4 irregular rows of low corneous-tipped spines; inner face with scattered tufts of setae particularly on upper and lower margins. Carpus with upper margin bearing 4 prominent corneous-tipped spines; outer face slightly convex with irregular rows of corneous-tipped spines, lower outer margin with 4 small corneous-tipped spines; inner face with scattered tufts of setae particularly on inner distal margin. Merus with disto-dorsal and disto-ventral margins of lateral face each bearing 4–5 corneous-tipped spines; entire lateral

face with tufts of long setae; ventromesial margin crested with 7 calcareous teeth, proximal larger. Ischium with 4 teeth on ventromesial margin.

Right cheliped (Fig. 7C, D) more slender than left, 1.7 times longer than wide. Outer face of palm, dactyl, and fixed finger (Fig. 7C) bearing irregular rows of corneous-tipped spines, spines absent from lower proximal area of palm; covered with dense tufts of long setae, setae not arising singly, but rather in dense tufts of 3 or more. Dactyl terminating in strong corneous claw; cutting edge with 6 low molar-like calcareous teeth; upper margin with 3 irregular rows of strong corneous-tipped conical spines. Fixed finger terminating in strong corneous claw; cutting edge with 6 low molar-like calcareous teeth; outer, lower, and inner faces with irregular rows of low corneous-tipped spines. Inner face of palm, dactyl, and fixed finger (Fig. 7D) slightly convex; fixed finger and disto-lateral corner of palm with low corneous-tipped spines; inner face of palm with scattered tufts of long setae. Carpus with upper margin bearing 3 strong corneous-tipped conical spines; outer face with few strong spines; distal margin of outer face with 2 strong corneous-tipped corneous spines near midline; outer face covered with tufts of long setae. Merus with distal margin bearing 3 corneous-tipped spines, two of which prominent and located at dorso-distal and ventro-distal angles; upper margin with 1 corneous-tipped spine sub-distally; outer face covered with tufts of long setae; ventromesial margin crested with 3 large calcareous teeth proximally. Ischium with 5 calcareous teeth on ventromesial margin.

Second pereopods (Fig. 8A) and right third pereopod generally similar, but setation and armament slightly different between second pair and right third; second pair more slender than right third; of second pair, left slightly shorter than right. Dactyls all 1.3–1.4 length of propodi; each terminating in strong corneous claw; subcylindrical; ventral margins each with 5–10 small corneous spines distally; dactyls otherwise unarmed but densely covered with dense tufts of setae, setae especially dense on dorsal surfaces. Propodi 1.4 length of carpi; lateral faces convex, unarmed, and uniformly covered with dense tufts of setae (second) or setae absent from the lower 0.6 of lateral face (right third); mesial face flattened, smooth, unarmed, with sparse (second) or moderate (right third) tufts of setae. Carpi 0.7–0.8 length of meri; lateral faces flat with tufts of setae on dorsal and ventral margins; dorsal faces flat, covered with tufts of long setae, bearing one prominent corneous-tipped conical spine on the disto-mesial angle and 8–13 small to moderate corneous-tipped spines on distal 0.3. Meri lateral faces flat (second) or slightly convex (right third), with tufts of setae on dorsal and ventral margins; ventrolateral distal angle bearing 1 strong corneous-tipped spine (second) or unarmed (right third); ventral margins crested with row of tubercles bearing dense tufts of long setae and 0–2 calcareous teeth distally. Ischia unarmed.

Left third pereopod (Fig. 5D) stout. Dactyl 1.4 length of propodus, terminating in large corneous claw; lateral face flattened and covered with tufts of short and long setae, setae especially dense along dorsal and ventral margins and

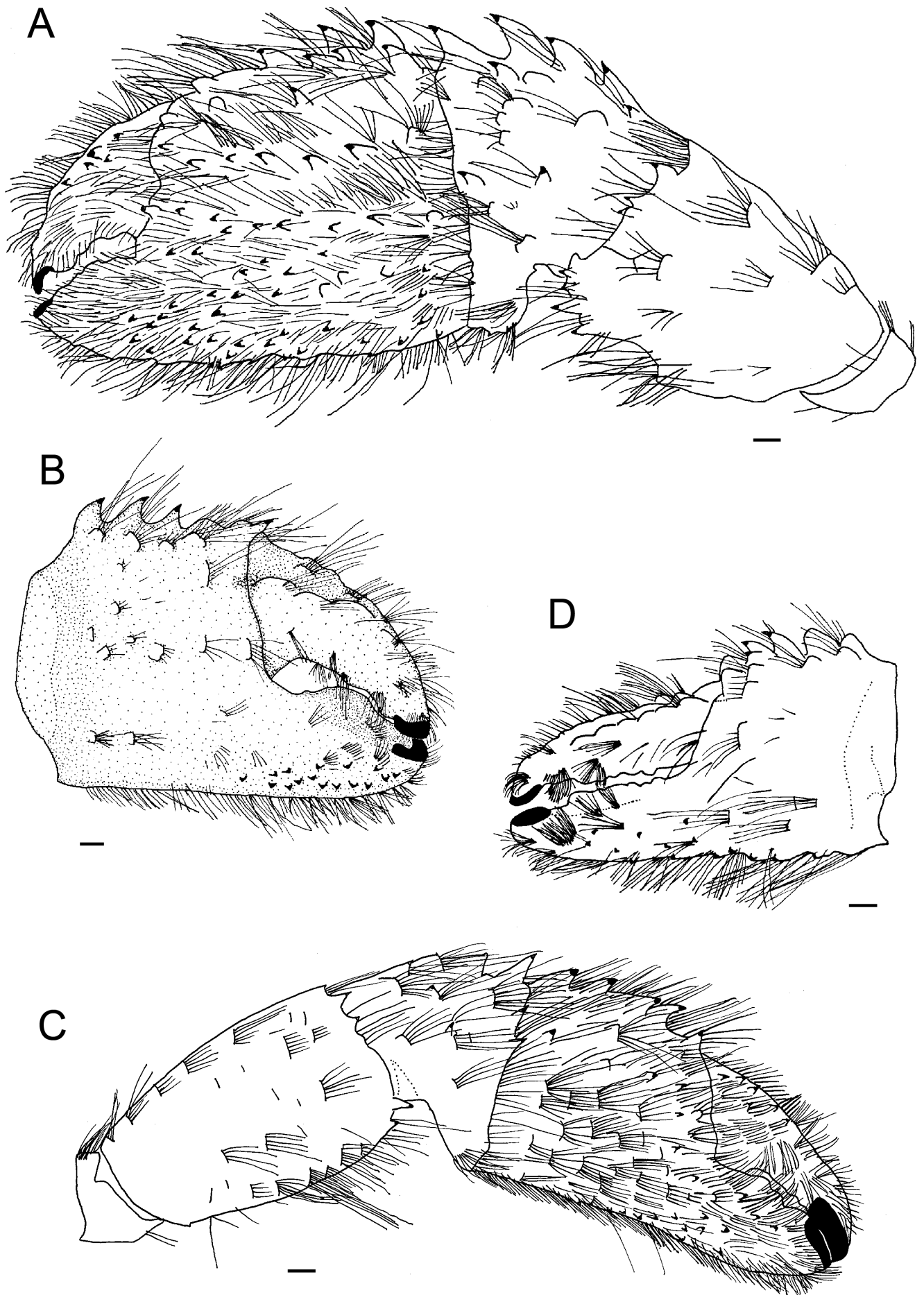


Fig. 7. *Dardanus balhibuon*, new species, holotype. Female SL 14.3 mm, stn R38, NMCR 40109. A, Left cheliped, outer view; B, Left cheliped, inner view; C, Right cheliped, outer view; D, Right cheliped, inner view. Scale bars = 1 mm.

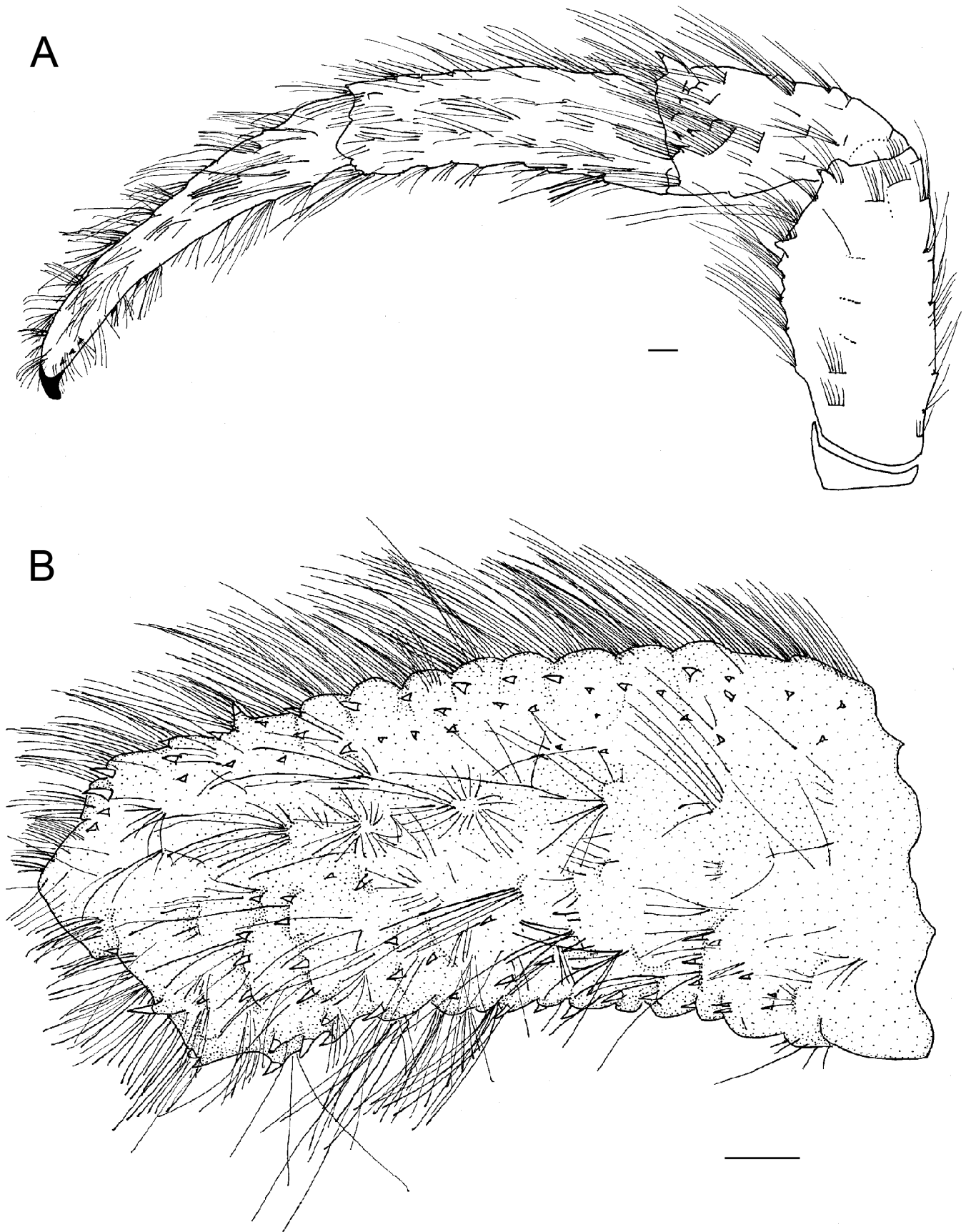


Fig. 8. *Dardanus balhibuon*, new species, holotype. Female SL 14.3 mm, stn R38, NMCR 40109. A, Left second pereopod, lateral view; B, Propodus of left third pereopod, lateral view. Scale bars = 1 mm.

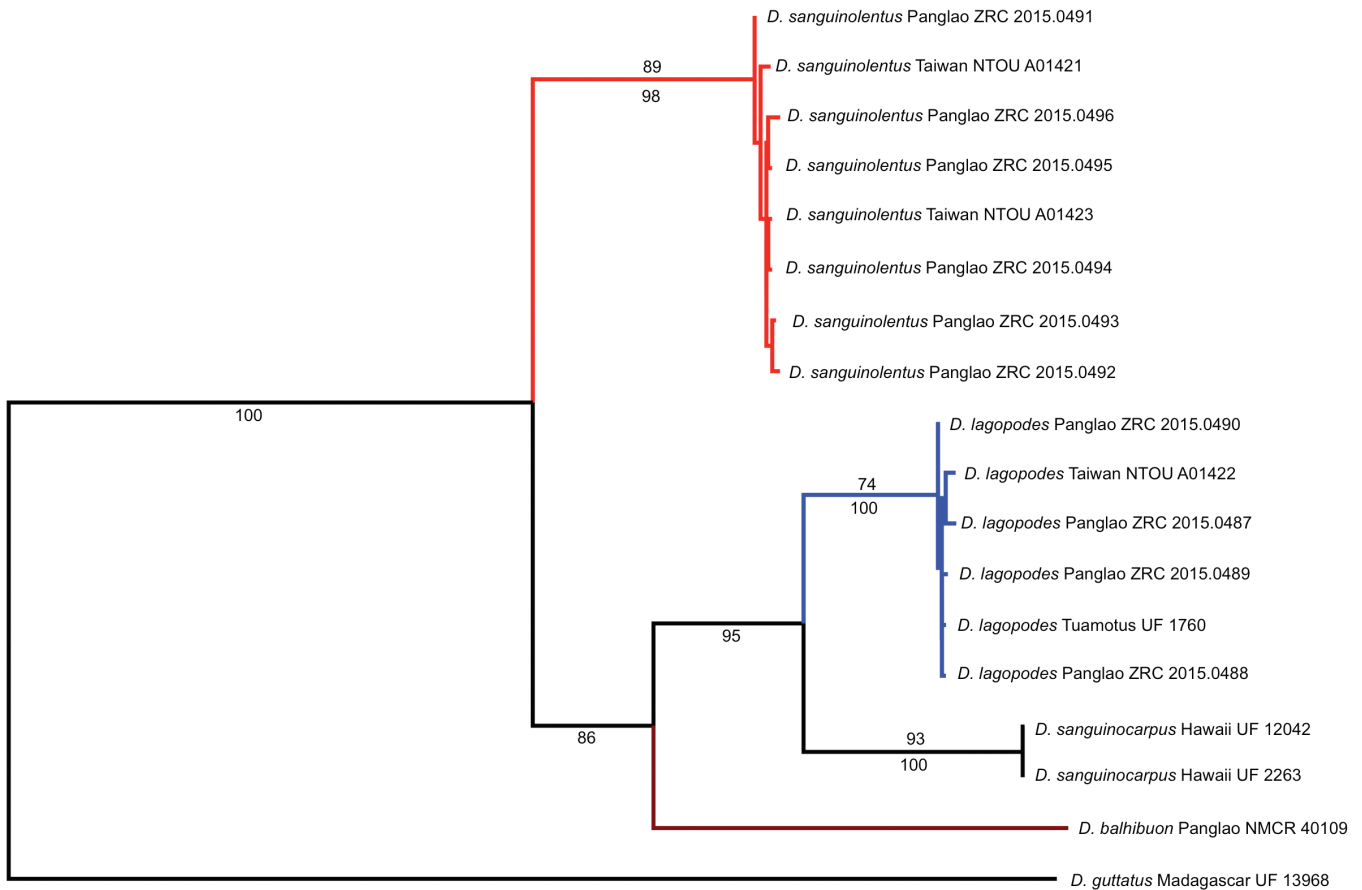


Fig. 9. Maximum likelihood phylogram based on COI mitochondrial DNA sequences. Branch support for the major clades are indicated above (= likelihood bootstrap values) and below (= Bayesian posterior probabilities) the branches. Bootstrap values < 70% were not reported.

not arising singly but rather in dense tufts of 3 or more; dorsal and ventral areas of lateral face with 1 (dorsal) or 2–3 (ventral) rows of sharp corneous spines on proximal 0.5; ventral margin with 5 small corneous spines distally; mesial face convex, with tufts of long setae along median line. Propodus (Fig. 8B) 1.4 length of carpus, very broad, 2.1 as long as broad; lateral face flattened, with nearly indistinct longitudinal lobe along midline (not visible in figure), covered with tufts of short and long setae, setae especially dense along dorsal and ventral margins; dorsal margin of lateral face with 2 irregular rows of sharp corneous spines; subventral 0.3 of lateral face with irregular rows of sharp corneous spines; distal margin of lateral face with 3 small corneous spines; mesial face convex, smooth, bearing 5 small corneous spines on ventral half of distal margin, with sparse tufts of long setae forming 3 longitudinal rows (2 rows on dorsal half, 1 row subventrally). Carpus 0.8 length of merus; lateral face flat; dorsal margin with row of corneous-tipped spines; dorsolateral angle with several strong corneous-tipped spines covered by dense tufts of long setae; dorsal, distal, and ventral margins covered by dense tufts of setae; mesial face slightly convex, smooth, unarmed, distal margin bearing tufts of long setae. Merus lateral face strongly convex, with tufts of long setae on the dorsal, ventral, and subdistal margins; mesial face flattened with tufts of setae on subdorsal margin; ventral margin crested with row of tubercles bearing dense tufts of long setae and 2 calcareous teeth distally. Ischium unarmed.

Sternite of third pereopods (Fig. 6D) with anterior lobe rectangular, with 2 protrusions each bearing tuft of long setae anteriorly.

Fourth pereopods semichelate; dactyls each with 5 corneous ventral spines on lateral face; propodal rasps well developed; carpi each with sharp dorsodistal spine covered by dense tuft of long setae (spine missing/broken in right fourth pereopod).

Fifth pereopods chelate; rasps of dactyl and propodus well developed.

Female pleon with second to fifth left pleopods fringed with long setae; second to fourth triramous; fifth damaged; single, very large, elongate, triangular fleshy membrane fringed with long setae present between fourth and fifth pleopods.

Uropods strongly asymmetrical, left larger than right; endopods and exopods with well developed rasps.

Telson (Fig. 6E, F) with lateral constrictions; marginal area partially calcified; posterior lobes separated by median cleft, left much larger than right, each with 7 (left) or 6 (right) ventral corneous spines near terminal margin, terminal margins fringed with long setae; anterior lobes with long setae on lateral margins.

Colour. In life unknown, but the specimen was initially mistakenly identified as *D. lagopodes* and therefore live

Table 2. Morphological characters separating members of the “*Dardanus lagopodes*” species complex.

Morphology	<i>Dardanus lagopodes</i> (Forskål, 1775)	<i>Dardanus sanguinolentus</i> (Quoy & Gaimard, 1824)	<i>Dardanus balhibuon</i> , new species
Shield	0.9–1 times as long as broad, lateral margin with tufts of setae	0.9–1 times as long as broad, lateral margin with tufts of setae	0.9 times as long as broad, lateral margin with dense tufts of long setae
Ocular peduncles	0.9 times length of shield, corneas 0.2 length of ocular peduncles	0.9 times length of shield, corneas 0.2 length of ocular peduncles	0.8 times length of shield, corneas 0.3 length of ocular peduncles
Antennular peduncles	Not reaching base of corneas	Reaching base of corneas	Reaching middle of corneas
Antennal peduncles	0.7 times length of ocular peduncles	0.6 times length of ocular peduncles	0.6 times length of ocular peduncles
Left second pereopod	Dactyl 1.3–1.4 length of propodus, ventral margin with 5–7 spines distally	Dactyl 1.6–1.7 length of propodus, ventral margin with 7 spines distally	Dactyl 1.3–1.4 length of propodus, ventral margin with 6 spines distally
Left third pereopod	Dactyl 1.3–1.4 length of propodus, ventral margin with 3 spines; propodus 2.3–2.4 as long as broad, no longitudinal sulcus on dactylus and propodus	Dactyl 1.2 length of propodus, ventral margin with 3 spines; propodus 2.3–2.5 as long as broad, longitudinal sulcus on lateral face of dactylus and propodus	Dactyl 1.2 length of propodus, ventral margin with 5 spines; propodus 2.1 as long as broad, indistinct midline longitudinal lobe on lateral face of propodus
Telson	Asymmetrical, posterior lobe separated by median cleft, each with 7 corneous spines near terminal margin	Asymmetrical, posterior lobe separated by median cleft, left lobe with 7, right lobe with 4 corneous spines near terminal margin	Asymmetrical, posterior lobe separated by median cleft, left lobe with 7, right lobe with 6 corneous spines near terminal margin
Setosity	Long setae covering surface of pereopods and chelae, shield with sparse tufts of long setae; setae arise singly	Long setae covering surface of pereopods and chelae, shield with sparse tufts of long setae; setae arise singly	Very long, extremely dense setae nearly obscuring surface of pereopods and chelae, shield bearing dense tufts of very long setae; multiple (3+) setae arise from single spot

colouration must resemble *D. lagopodes* or the closely related *D. sanguinolentus*. Colour in preservative (Fig. 4B): shield, ocular acicles, and antennae orange with white spots; ocular peduncles pale brown; antennules and antennal flagellae pale yellow; chelipeds and ambulatory legs orange with white spots and mottlings overall; ambulatory legs with a wide deep orange-red ring on the subdistal dorsal face of the propodus; chelipeds and ambulatory legs with bright orange patches on outer faces of carpi and meri.

Habitat. Subtidal, 6–37 m deep, on reef slope.

Etymology. From the Boholano/Cebuano word, “balhibuon”, meaning hairy, referring to the exceptionally setose condition of the species.

Remarks. A single specimen was found that closely resembles *D. lagopodes* and *D. sanguinolentus* in morphology and overall colouration after preservation in alcohol, and yet differs in some important respects: this new species is larger (14.3 mm SL) than typical *D. lagopodes* and *D.*

sanguinolentus, and is exceedingly setose, with numerous (3 or more) long setae arising in tufts from the same spot. The excessively setose condition of the entire body is one of the most distinct features of the new species, a condition which is not mentioned in the original descriptions nor observed in the type specimens of *D. lagopodes*, *D. sanguinolentus*, or any of their junior synonyms. Another easy way to see the differences between these three species is from the shape of left third pereopod. In *D. lagopodes* the lateral face of dactyl and propodus of the left third pereopod is convex or slightly flattened, in *D. sanguinolentus* those lateral surfaces are flattened with a longitudinal concavity medially, while in *D. balhibuon* n. sp. they are flattened with indistinct longitudinal lobe along the midline (Table 2, Figs. 5, 8B; indistinct longitudinal lobe in *D. balhibuon* not shown in line figures). While it is allied to *D. lagopodes* and *D. sanguinolentus*, COI sequence data show that *D. balhibuon* n. sp. is genetically very distinct from other members of the *D. lagopodes* complex (Fig. 9). *Dardanus balhibuon* is presently only known from Pamilacan Island, the Philippines.

Dardanus megistos (Herbst, 1804)

(Fig. 4C)

Cancer megistos Herbst, 1804: 28, Fig. 1, pl. 61 (type locality unknown).

Pagurus punctulatus – Estampador, 1937: 503; Yap-Chiongco, 1938: 197–198; Estampador, 1959: 50.

Pagurus megistos – Fize & Serène, 1955: 160–166, Fig. 24, pl. 4 nos. 1–3.

Dardanus megistos – Haig & Ball, 1988: 166; Cassidy, 2005: 112–114, Figs. 13–14; McLaughlin et al., 2007: 94–95, 2 unlabelled figures.

Material examined. 1 male SL 12.2 mm (ZRC), stn M7, Momo Beach, Panglao I., 9°36.1'N, 123°45.2'E, 0–3 m, 1.vi.2004; 1 male SL 11.0 mm (ZRC), stn M8, Doljo, north coast, Panglao I., 9°35.4'N, 123°44.3'E, 0–1 m, 2.vi.2004; 1 male SL 26.2 mm (ZRC), stn N4, Alona Reef, Panglao I., 9°32.9'N, 123°46.9'E, 15–20 m, 10.vi.2004; 1 male 25.0 mm (ZRC), Balicasag I., from tangle nets, 50–500 m, 28.xi.2001.

Habitat. Intertidal to subtidal, 0 to approximately 50 m deep, reef flats, seagrass beds, mangrove areas, and reef slopes, on rocky substrates.

Dardanus pedunculatus (Herbst, 1804)

(Fig. 4D)

Cancer pedunculatus Herbst 1804: 25, pl. 61, Fig. 3 (type locality unknown).

Pagurus asper – Estampador, 1937: 502; Yap-Chiongco, 1938: 197; Estampador, 1959: 50.

Pagurus haani – Fize & Serène, 1955: 207–214, Figs. 32–33 A–B, pl. 4 no. 7.

Dardanus pedunculatus – Haig & Ball, 1988: 166; Cassidy, 2005: 114–116, Figs. 15–16; McLaughlin et al., 2007: 83–84, 2 unlabelled figures.

Material examined. 1 male SL 16.8 mm (ZRC), stn N2, Alona Reef, Panglao I., 9°32.9'N, 123°46.6'E, 12 m, 7.vi.2004; 2 females SL 8.4–11.0 mm, 4 males SL 5.7–13.4 mm (ZRC), stn N3, Alona Reef, Panglao I., 9°32.9'N, 123°46.6'E, 25–30 m, 7.vi.2004; 3 females SL 10.2–15.2 mm, 4 males SL 8.3–14.0 mm (ZRC), stn N5, Alona Reef, Panglao I., 9°32.9'N, 123°46.9'E, 20–35 m, 10.vi.2004; 1 ovig. female SL 15.6 mm, 1 female SL 12.9 mm (ZRC), stn N8, Tawala, Panglao I., 9°32.8'N, 123°46.6'E, 32–55 m, 14.vi.2004; 1 ovig. female SL 13.0 mm, 2 males SL 6.5–12.0 mm (ZRC), stn N10, Tawala, Panglao I., 9°33.0'N, 123°46.8'E, 35–60 m, 21.vi.2004; 1 female SL 13.1 mm (ZRC), stn N12, lagoon off Poblacion, Panglao I., 9°34.2'N, 123°43.2'E, 1–2 m, 24.vi.2004; 1 male SL 2.7 mm (ZRC), stn R5, Catarman, Panglao I., 9°36.6'N, 123°52.4'E, 5–16 m, 31.v.2004; 1 female SL 9.2 mm (ZRC), stn R13, Doljo Point, Panglao I., 9°35.6'N, 123°43.2'E, 2–41 m, 2.vi.2004; 1 male SL 15.4 mm (ZRC), stn R31, Pamilacan I. south-southwest slope, 9°29.4'N, 123°56.0'E, 10–41 m, 8.vi.2004; 1 male 11.5 mm (ZRC), stn R37, Momo Beach, Panglao I., 9°36.5'N, 123°45.6'E, 28–32 m, 10.vi.2004; 1 ovig. female SL 19.0 mm (ZRC), Balicasag I., vii.2003.

Habitat. Subtidal, 2 to 60 m deep, reef slopes, on coralline substrates; associated with anemones.

Remarks. At first glance, *D. pedunculatus* resembles *D. deformis*, and *D. gemmatus* in that all 3 species are associated with anemones and have similar white- and red-banded ocular peduncles. *Dardanus pedunculatus* can be distinguished from *D. gemmatus* on the basis of the outer surface of the left cheliped: in *D. pedunculatus* the lower half of the left chela is smooth, while in *D. gemmatus* the entire outer surface of the left chela is covered with tubercles. The lateral surface of the left cheliped of *D. pedunculatus* and *D. deformis* resemble each other more closely, but the two species differ in the morphology of the left third pereopod: the dactyl and propodus of the left third pereopod in *D. deformis* are considerably broader than the right third pereopod (pereopods are more symmetrical in *D. pedunculatus*); and in *D. pedunculatus* the lateral face of the dactyl shows a strong carina in the proximal half, which is absent in *D. deformis*.

Dardanus scutellatus (H. Milne Edwards, 1848)

(Fig. 4E)

Pagurus scutellatus H. Milne Edwards, 1848: 61 (Zanzibar, type locality); Forest, 1953b: 560–561; Fize & Serène, 1955: 189–195, Fig. 29, pl. 6 nos. 5–10.

Pagurus fabimanus – Estampador, 1937: 503; Yap-Chiongco, 1938: 199; Estampador, 1959: 50.

Dardanus scutellatus – Gherardi & McLaughlin, 1994: 641–642.

Material examined. 1 female SL 8.8 mm (ZRC), stn B7, Catarman, Panglao I., 9°35.9'N, 123°51.8'E, 4–30 m, 5.vi.2004; 1 male SL 6.0 mm (ZRC), stn D5, Pontod Islet, Panglao I., 9°33.6'N, 123°43.5'E, 0–3 m, 6.vi.2004; 1 male SL 9.7 mm (ZRC), stn M18, Gak-Ang Islet, off Panglao I., 9°33.0'N, 123°45.5'E, 0–1 m, 10 & 12.vi.2004; 1 male SL 9.8 mm (ZRC), stn D12, Panglao Channel, Tagbilaran, Panglao I., 9°38.5'N, 123°51.0'E, 2–4 m, 20.vi.2004; 1 ovig. female SL 4.5 mm, 1 female SL 5.2 mm, 2 males SL 6.3–6.5 mm (ZRC), stn M58, Balicasag I., 9°31.3'N, 123°41.0'E, depth unknown, 4.vii.2004; 2 ovig. females SL 5.1–7.7 mm, 5 males SL 4.7–8.9 mm (ZRC), stn M51, Mayacabac, Panglao I., 9°36.8'N, 123°52.2'E, 0 m, 30.vi.2004; 5 females SL 3.1–9.1 mm, 5 males SL 4.0–6.8 mm (ZRC), stn R50, Looc, Panglao I., 9°35.7'N, 123°44.4'E, 3–7 m, 17.vi.2004.

Habitat. Intertidal to shallow subtidal, 0 to approximately 5 m deep, seagrass beds and reef slopes, on sandy and soft substrates.

Remarks. This species resembles *D. guttatus*, but is distinctively different in colouration (see 'remarks' under latter species) and in habitat. It is also affiliated to *D. woodmasoni*, but can be distinguished by the lower margin of the big chela, which is smooth or poorly denticulated, while it is obviously denticulated in *D. woodmasoni*. *Dardanus scutellatus* is a relatively uncommon species.

***Dardanus setifer* (H. Milne Edwards, 1836)**

Pagurus setifer H. Milne Edwards, 1836: 274 (Australia, type locality); Fize & Serène, 1955: 182–189, Fig. 27 A & B, Fig. 28, pl. 5 nos. 4–8.

Dardanus setifer – Haig & Ball, 1988: 167; Cassidy, 2005: 117–121, Figs. 17–19; McLaughlin et al., 2007: 100–101, 1 unlabelled figure; McLaughlin, 2008: 276–277, Fig. 1b.

Material examined. 1 female SL 8.5 mm (ZRC), stn B7, Catarman, Panglao I., 9°35.9'N, 123°51.8'E, 4–30 m, 5.vi.2004; 1 female SL 6.0 mm (ZRC), stn N8, Tawala, Panglao I., 9°32.8'N, 123°46.6'E, 32–55 m, 14.vi.2004; 1 ovig. female SL 4.5 mm, 2 males SL 5.0–6.0 mm (ZRC), stn R58, Looc (lagoon side), Panglao I., 9°35.7'N, 123°44.7'E, 1–3 m, 22.vi.2004.

Habitat. Subtidal, 2 to approximately 40 m, reef flats, seagrass beds, mangroves, and reef slopes, on sand and mud substrates.

Remarks. Among the species of *Dardanus* with the lateral face of propodus of the left third pereopod sculptured, *D. setifer* resembles *D. crassimanus* and *D. scutellatus* in the shape and proportion of cephalic appendages. The three species differ in having a heavily setose left third pereopod and left cheliped in *D. crassimanus*; the elongate palm of the left cheliped covered by short, stiff setae in *D. scutellatus*; and the short palm, covered by thorn-like spines, accompanied by short, stiff setae in *D. setifer*. This is the first record of this species from the Philippines.

***Dardanus woodmasoni* Alcock, 1905**
(Fig. 4F)

Pagurus wood-masoni Alcock, 1905: 85, Fig. 3, pl. 9 (Maldives and Andamans, type localities); Estampador, 1937: 503; Yap-Chiongco, 1938: 198–199; Fize & Serène, 1955: 195–198, Fig. 30, pl. 6 no. 1–4; Estampador, 1959: 50.

Dardanus woodmasoni – Haig & Ball, 1988: 167.

Material examined. 1 male SL 4.6 mm (ZRC), stn D5, Pontod Islet, Panglao I., 9°33.6'N, 123°43.5'E, 0–3 m, 6.vi.2004; 1 female SL 3.8 mm (ZRC), stn D12, Panglao Channel, Tagbilaran, Panglao I., 9°38.5'N, 123°51.0'E, 2–4 m, 20.vi.2004; 1 ovig. female SL 5.5 mm (ZRC), stn R50, Looc, Panglao I., 9°35.7'N, 123°44.4'E, 3–7 m, 17.vi.2004; 1 female SL 4.7 mm (ZRC), stn R58, Looc (lagoon side), Panglao I., 9°35.7'N, 123°44.7'E, 1–3 m, 22.vi.2004; 1 male SL 5.8 mm (ZRC), stn R76, 9°N, 123°E, lagoon, 5.vii.2004.

Habitat. Intertidal to shallow subtidal, 0–7 m deep, mangroves and seagrass beds, on soft, muddy, and sandy substrates.

Species previously recorded from the Philippines, but not found during the PANGLAO 2004 Expedition.

***Calcinus vachoni* Forest, 1958**

Calcinus vachoni Forest, 1958: 285, Figs. 2, 3, 9, 10, 15, 19 (Nha Trang, Vietnam, type locality); Morgan, 1991: 905–907, Figs. 60–62; Malay & Paulay, 2010: Fig. 6, Appendix S1.

Habitat. Subtidal, reef slopes, on coral, rubble, and rocky substrates.

Remarks. *Calcinus vachoni* is an uncommon species in the Philippines and it was not collected during the PANGLAO 2004 expeditions, however it was previously collected from the NW coast of Luzon (Malay & Paulay, 2010, Appendix S1). *Calcinus vachoni* appears to be a species complex, with undescribed cryptic taxa in the western Indian Ocean (Mascarenes) and the central Pacific (Cook Islands) (Malay & Paulay, 2010).

***Clibanarius clibanarius* (Herbst, 1791)**

Cancer clibanarius Herbst, 1791: 20, Fig. 1, pl. 23 (Singapore, type locality).

Clibanarius clibanarius – Estampador, 1937: 501; Yap-Chiongco, 1938: 190–191; Estampador, 1959: 48.

Habitat. Unknown (Osawa & Fujita, 2008).

Distribution. West and southeast Africa, Pakistan, Bay of Bengal, India, Indonesia, Singapore (type locality), Malaysia, Philippines, Hong Kong.

***Clibanarius eurysternus* (Hilgendorf, 1879)**

Pagurus eurysternus Hilgendorf, 1879: 822 (Mozambique, type locality).

Clibanarius eurysternus – Buitendijk, 1937: 258; Yap-Chiongco, 1938: 189–190; Fize & Serène, 1955: 118–123, Fig. 17; Miyake, 1956: 310–313, Figs. 4–5; Haig & Ball, 1988: 163; McLaughlin et al., 2007: 115–116, 2 unlabelled figures.

Clibanarius eurysternus – Estampador, 1937: 501; Estampador, 1959: 48 (misspelling of *Cl. eurysternus*).

Habitat. Intertidal to shallow subtidal, reef flats, on sand-mud, sand-rock, or coralline sand substrates; occupies shells with narrow apertures, i.e., gastropods in the family Conidae.

***Clibanarius padavensis* De Man, 1888**

Clibanarius padavensis De Man, 1888: 242 (Mergui Archipelago, type locality); Buitendijk, 1937: 254; Estampador, 1937: 50; Yap-Chiongco, 1938: 193–194; Estampador, 1959: 48; Ball & Haig, 1972: 95–96, Fig. 4.

Habitat. Intertidal, mangrove areas particularly on mangrove propagule roots, mud and rubble substrates.

***Dardanus arrosor* (Herbst, 1796)**

Cancer arrosor Herbst, 1796: 170, Fig. 1, pl. 43 (type locality unknown).

Pagurus striatus – Estampador, 1937: 503; Estampador, 1959: 51.

Dardanus arrosor – McLaughlin et al., 2007: 76–78, 3 unlabelled figures.

Habitat. From 30–290 m in the Indo-West Pacific (Rahayu, 2000, McLaughlin et al., 2007).

Table 3. List of hermit crabs reported from the Philippines, locality records from the Philippines (when available), and general geographic distributions. Doubtful records of species supposedly only distributed in the Atlantic are excluded.

Species	Records in the Philippines (Author & Island Locality)	General Distribution
Coenobitidae Dana, 1851		
<i>Birgus latro</i> (Linnaeus, 1767)	Estampador, 1937; 1959 (Mindanao, Cebu, Luzon, Samar)	East Coast of Africa to West Pacific
<i>Coenobita cavipes</i> Stimpson, 1858	Rahayu et al., 2016 (Cebu)	Indo-West Pacific
<i>Coenobita brevimanus</i> Dana, 1852	Estampador, 1937; 1959; Yap-Chiongco, 1938 (as <i>Coenobita clypeata</i> var. Puerto-galera Yap-Chiongco, 1938) (Mindanao)	Indo-Pacific
<i>Coenobita perlatus</i> H. Milne Edwards, 1837	Estampador, 1937; 1959 (Mindoro)	Indo-West Pacific
<i>Coenobita pseudorugosus</i> Nakasone, 1988	Nakasone, 1988 (Cebu)	Philippines
<i>Coenobita rugosus</i> H. Milne Edwards, 1837	Estampador, 1937; 1959 (Mindanao)	Indo-West Pacific
<i>Coenobita violascens</i> Heller, 1862	Estampador, 1937; 1959; Yap-Chiongco, 1938 (as <i>Coenobita cavipes</i> Stimpson, 1852) (Palawan, Samar); Nakasone, 1988 (Cebu); Rahayu et al., 2016 (Cebu, Panglao)	Indo-West Pacific
Diogenidae Ortmann, 1892		
<i>Aniculus aniculus</i> (Herbst, 1791)	Estampador, 1937; 1959 (Mindoro)	Indo-West Pacific
<i>Calcinus elegans</i> H. Milne Edwards, 1837	Estampador, 1937; 1959 (Mindoro); present paper (Panglao, Pamilacan, Balicasag)	Indo-West Pacific from South Africa, Somalia, to Japan, Line Islands, Fiji, and Pitcairn Islands
<i>Calcinus fuscus</i> Malay, Komai & Chan, 2012	Malay et al., 2012; present paper (Panglao)	Philippines, New Guinea, New Caledonia, & Japan
<i>Calcinus gaimardii</i> (H. Milne Edwards, 1848)	Malay & Paulay, 2010; present paper (Panglao, Pamilacan, Bohol, Balicasag)	Indo-West Pacific from Maldives, Cocos (Keeling) Islands, Australia to New Caledonia and Fiji
<i>Calcinus laevimanus</i> (Randall, 1840)	Estampador, 1937; 1959 (as <i>C. herbstii</i> De Man, 1888) (Luzon, Mindoro); present paper (Panglao, Bohol, Pamilacan)	Indo-Pacific from South Africa, Kenya, Somalia to Australia, Japan, New Caledonia, Tuamotu, Hawai'i
<i>Calcinus latens</i> (Randall, 1840)	Estampador, 1937; 1959 (Mindoro); present paper (Panglao, Balicasag, Pamilacan)	Indo-Pacific from Red Sea, Persian Gulf, Mozambique, Somalia to Australia, Japan, Fiji, Tuamotu, Hawai'i
<i>Calcinus lineapropodus</i> Morgan & Forest, 1991	Malay & Paulay, 2010; present paper (Panglao, Pamilacan, Bohol, Balicasag)	Indo-Pacific from Eastern Indian Ocean, Cocos (Keeling) Islands and Christmas Island to New Guinea, Japan, Kiribati, Tuamotu
<i>Calcinus minutus</i> Buitendijk, 1937	Malay & Paulay, 2010; present paper (Panglao, Pamilacan, Balicasag)	Indo-West Pacific from Cocos (Keeling) Islands and Christmas Island to Japan, Fiji, Samoa, Kiribati
<i>Calcinus morgani</i> Rahayu & Forest, 1999	Malay & Paulay, 2010; present paper (Panglao, Pamilacan, Balicasag)	Indo-Pacific from South Africa, Somalia to Japan, Kiribati, Tuamotu
<i>Calcinus pulcher</i> Forest, 1958	Malay & Paulay, 2010; present paper (Panglao, Pamilacan, Bohol, Balicasag)	Indo-West Pacific from Madagascar, Maldives to Japan, Loyalty Island
<i>Calcinus vachoni</i> Forest, 1958	Malay & Paulay, 2010	Indo-Pacific from Glorieuses, Western Australia to Japan, Tuamotu, Easter Island

Species	Records in the Philippines (Author & Island Locality)	General Distribution
<i>Cancellus panglaoensis</i> McLaughlin, 2008	McLaughlin, 2008 (Panglao)	Philippines
<i>Clibanarius ambonensis</i> Rahayu & Forest, 1993	Present paper (Panglao, Bohol)	Indonesia, Philippines, Japan
<i>Clibanarius antennatus</i> Rahayu & Forest, 1993	Present paper (Bohol)	Indonesia, Philippines, Gulf of Thailand
<i>Clibanarius clibanarius</i> (Herbst, 1791)	Estampador, 1959 (Palawan)	Indo-West Pacific from West and Southest Africa, Pakistan across Malay archipelago to Philippines, Hong Kong
<i>Clibanarius corallinus</i> (H. Milne Edwards, 1848)	Estampador, 1959 (Luzon); present paper (Panglao, Pamilacan, Balicasag)	Indo-Pacific from Andaman Islands, Australia to Japan, Line Islands, Tuamotu
<i>Clibanarius cruentatus</i> (H. Milne Edwards, 1848)	Estampador, 1937; 1959 (Palawan); Cassidy & McLaughlin, 1997 (Cebu); present paper (Panglao, Bohol)	Indo-West Pacific from Indonesia, New Guinea to Taiwan, Australia
<i>Clibanarius englaucus</i> Ball & Haig, 1972	Cassidy & McLaughlin, 1997 (Cebu); present paper (Panglao, Pamilacan)	Indo-West Pacific from Mayotte to Japan
<i>Clibanarius eurysternus</i> (Hilgendorf, 1879)	Estampador, 1937; 1959 (Luzon, Mindoro)	Indo-West Pacific from Mozambique, Somalia to Japan, Wallis and Futuna, French Polynesia
<i>Clibanarius humilis</i> (Dana, 1851)	Present paper (Panglao)	Indo-Pacific from Mayotte, Madagascar to Japan, Kiribati, Tuamotu
<i>Clibanarius infraspinus</i> (Hilgendorf, 1869)	Estampador, 1959 (Luzon, Palawan, Mindoro); present paper (Bohol)	Red Sea across Indian Ocean, Malay archipelago to Taiwan and Japan
<i>Clibanarius laevimanus</i> Buitendijk, 1937	Cassidy & McLaughlin, 1997 (Cebu); present paper (Panglao, Bohol)	Somalia, Kenya, Cocos (Keeling) Islands to Indonesia, Philippines
<i>Clibanarius longitarsus</i> (De Haan, 1849)	Present paper (Panglao, Pamilacan, Bohol)	Indo-West Pacific from Red Sea, South Africa to Japan, New Caledonia
<i>Clibanarius merguiensis</i> De Man, 1888	Cassidy & McLaughlin, 1997 (Cebu); present paper (Panglao, Bohol)	Indo-West Pacific from Mozambique, Kenya to New Caledonia
<i>Clibanarius padavensis</i> De Man, 1888	Estampador, 1959 (Mindoro, Luzon)	Indo-West Pacific from Mozambique, Pakistan across Malay archipelago to Australia, New Guinea
<i>Clibanarius rhabdodactylus</i> Forest, 1953	Present paper (Panglao)	Indo-Pacific from Mayotte, Indonesia, Philippines, and Tuamotu
<i>Clibanarius serenei</i> Rahayu & Forest, 1993	Present paper (Panglao, Bohol)	Indonesia, Malaysia, Singapore, Vietnam, Philippines
<i>Clibanarius snelli</i> Buitendijk, 1937	Present paper (Panglao)	Indonesia, New Guinea, Vietnam, Philippines, Taiwan
<i>Clibanarius striolatus</i> Dana, 1852	Estampador, 1959 (Palawan); present paper (Panglao, Bohol, Pamilacan)	Indo-West Pacific from Red Sea, Persian Gulf, Mozambique, Madagascar to Australia, Japan, Society
<i>Clibanarius virescens</i> (Krauss, 1843)	Cassidy & McLaughlin, 1997 (Cebu); present paper (Panglao, Bohol)	Indo-West Pacific from Red Sea, South Africa to Japan, Marshall Islands, Fiji
<i>Dardanus arrosor</i> (Herbst, 1796)	Estampador, 1937; 1959 (as <i>Pagurus striatus</i> Latreille, 1802) (off Cebu)	Wide distribution in the Indo-West Pacific and Mediterranean
<i>Dardanus balhibuon</i> , new species	Present paper (Pamilacan)	Philippines
<i>Dardanus dearmatus</i> (Henderson, 1888)	Estampador, 1937; 1959 (as <i>Pagurus dermatus</i> Henderson, 1888, misspelling) (Mindoro); present paper (Balicasag)	Indo-Pacific from Sri Lanka, Maldives to New Guinea, Marquesas

Species	Records in the Philippines (Author & Island Locality)	General Distribution
<i>Dardanus deformis</i> (H. Milne Edwards, 1848)	Estampador, 1937; 1959 (as <i>Pagurus biformis</i> misspelling) (Mindoro, Palawan); present paper (Panglao, Balicasag, Bohol)	Indo-Pacific from Red Sea, South Africa to Australia, Japan, Tuamotu, Hawai'i
<i>Dardanus gemmatus</i> (H. Milne Edwards, 1848)	Cassidy, 2005 (Visayas)	Indo-Pacific from Mayotte to Japan, Tuamotu, Marquesas, Hawai'i
<i>Dardanus guttatus</i> (Olivier, 1811)	Estampador, 1937; 1959 (Mindoro); present paper (Bohol)	Indo-Pacific from Somalia, Kenya to Japan, New Caledonia, Kiribati, Tuamotu
<i>Dardanus hessii</i> (Miers, 1884)	Estampador, 1937; 1959 (as <i>Pagurus semilimanus</i> Henderson, 1888) (Mindanao)	Indo-West Pacific from Gulf of Oman, Red Sea to Japan, New Guinea
<i>Dardanus lagopodes</i> (Forskål, 1775)	Estampador, 1937; 1959 as <i>Pagurus euopsis</i> Dana, 1852 (Mindoro); present paper (Panglao, Pamilacan, Bohol, Balicasag)	Indo-Pacific from Red Sea, South Africa to Japan, Kiribati, Tuamotu
<i>Dardanus megistos</i> (Herbst, 1804)	Estampador, 1937; 1959 (as <i>Pagurus punctulatus</i> Olivier, 1811) (Mindoro, Palawan); present paper (Panglao, Balicasag)	Indo-Pacific from Red Sea, South Africa to Japan, Tuamotu, Hawai'i
<i>Dardanus pedunculatus</i> (Herbst, 1804)	Estampador, 1937; 1959 (as <i>Pagurus asper</i> De Haan, 1849) (Mindoro); present paper (Panglao, Balicasag, Pamilacan)	Indo-Pacific from South Africa, Gulf of Aden to Japan, Tuamotu, Marquesas, Hawai'i
<i>Dardanus sanguinolentus</i> (Quoy & Gaimard, 1824)	Cassidy, 1995 (as <i>D. lagapodes</i> [Forskål, 1775], misspelling); present paper (Panglao, Pamilacan, Bohol)	Indo-Pacific from Red Sea, Réunion to Okinawa, Fiji, Society
<i>Dardanus scutellatus</i> (H. Milne Edwards, 1848)	Estampador, 1937; 1959 (as <i>Pagurus fabimanus</i> Dana, 1852) (Mindoro); present paper (Panglao, Balicasag)	Indo-West Pacific from Somalia, Mozambique to Japan, Kiribati, Society
<i>Dardanus setifer</i> (H. Milne Edwards, 1836)	Present paper (Panglao)	Indo-West Pacific from South Africa, Madagascar, Pakistan to Hong Kong, Philippines, New Caledonia
<i>Dardanus vulnerans</i> (Thallwitz, 1892)	Estampador, 1937; 1959 as <i>Pagurus vulnerans</i> Thallwitz, 1892 (Mindoro)	Persian Gulf, Pakistan, Bay of Bengal, New Guinea, Philippines
<i>Dardanus woodmasoni</i> (Alcock, 1905)	Estampador, 1937; 1959 (Mindoro); present paper (Panglao)	Indo-West Pacific from Red Sea to Japan, Marshall Islands, New Caledonia
<i>Diogenes avarus</i> Heller, 1865	Estampador, 1937; 1959 (Mindoro)	Indo-West Pacific
<i>Diogenes brevirostris</i> Stimpson, 1858	Estampador, 1937; 1959 (Palawan)	South Africa
<i>Diogenes lanaris</i> Yap-Chiongco, in Estampador, 1937	Estampador, 1937; 1959 (Palawan)	Philippines
<i>Paguroopsis typica</i> Henderson, 1888	Estampador, 1937; 1959 (off Tablas)	Indo-West Pacific
<i>Paguristes alcocki</i> McLaughlin & Rahayu, 2005	McLaughlin & Rahayu, 2005; Rahayu & Forest, 2009 (Balicasag, Panglao)	Indonesia, Philippines, West Australia
<i>Paguristes albimaculatus</i> Komai, 2001	Rahayu & Forest, 2009 (Verde Island Passage, Balicasag, Panglao)	Philippines, Japan, Taiwan
<i>Paguristes arostratus</i> Rahayu, 2006	Rahayu & Forest, 2009 (Verde Island Passage, Bohol)	Indonesia, Philippines
<i>Paguristes antennarius</i> Rahayu, 2006	Rahayu & Forest, 2009 (Verde Island Passage, Panay)	Indonesia, Philippines
<i>Paguristes aulacis</i> Rahayu & Forest, 2009	Rahayu & Forest, 2009 (off Manila Bay)	Philippines
<i>Paguristes brachyrostris</i> Rahayu, 2006	Rahayu & Forest, 2009 (off Manila Bay)	Indonesia, Philippines
<i>Paguristes calvus</i> Alcock, 1905	Rahayu & Forest, 2009 (off Manila Bay, Balicasag)	Indian Ocean, Indonesia and Philippines

Species	Records in the Philippines (Author & Island Locality)	General Distribution
<i>Paguristes gonagrus</i> (H. Milne Edwards, 1836)	Rahayu & Forest, 2009 (Bohol, Balicasag)	China Sea and Philippines
<i>Paguristes lewinsohni</i> McLaughlin & Rahayu, 2005	Rahayu & Forest, 2009 (Balicasag)	Red Sea, Arabian Sea, Philippines
<i>Paguristes macrops</i> Rahayu & Forest, 2009	Rahayu & Forest, 2009 (Pamilacan, Balicasag)	Philippines
<i>Paguristes palythophilus</i> Ortmann, 1892	Rahayu & Forest, 2009 (Verde Island Passage)	Indo-West Pacific
<i>Paguristes puniceus</i> Henderson, 1896	Rahayu & Forest, 2009 (Balicasag)	Indo-West Pacific
<i>Paguristes runyanae</i> Haig & Ball, 1988	Rahayu & Forest, 2009 (Panglao, Bohol)	Indonesia, Philippines
<i>Paguristes versus</i> Komai, 2001	Rahayu & Forest, 2009 (Verde Island Passage)	Philippines, Japan, Taiwan
<i>Pseudopaguristes hians</i> (Henderson, 1888)	Estampador, 1937; 1959 (off Manila)	
Paguridae Latreille, 1802		
<i>Catapaguroides brevidactylus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Catapaguroides conicus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Catapaguroides crassimanus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Catapaguroides cristimanus</i> de Saint Laurent, 1968	Komai & Rahayu, 2013b (Bohol Sea)	Indonesia, Philippines, Japan
<i>Catapaguroides hirsutus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Catapaguroides karubar</i> McLaughlin, 1997	Komai & Rahayu, 2013b (Bohol Sea)	Indonesia, Philippines
<i>Catapaguroides levigatus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Catapaguroides pusillus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Catapaguroides tenuiclavus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Catapaguroides tuber</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013b (Bohol Sea)	Philippines
<i>Decaphyllus brevis</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013d (Panglao)	Philippines
<i>Decaphyllus deliquus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013d (Panglao)	Philippines
<i>Decaphyllus litoralis</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013d (Panglao)	Philippines, Ryukyu Islands
<i>Decaphyllus proprius</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013d (Panglao)	Philippines
<i>Decaphyllus spinulodigitus</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013d (Panglao)	Philippines
<i>Decaphyllus tenuis</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013d (Panglao)	Philippines

Species	Records in the Philippines (Author & Island Locality)	General Distribution
<i>Lophopagurus indonesiensis</i> (McLaughlin, 1997)	Komai & Rahayu, 2013d (Panglao)	Indonesia, Philippines
<i>Michelopagurus limatulus</i> (Henderson, 1888)	Estampador 1937, 1959 (as <i>Pagurodes limatulus</i>) (South of Philippines)	Indonesia, Philippines, Taiwan
<i>Nematopagurus alcocki</i> McLaughlin, 1997	McLaughlin, 2004 (Verde Island Passage)	Indo-Pacific
<i>Nematopagurus jacquesi</i> McLaughlin, 2004	McLaughlin, 2004 (Manila Bay, Mindanao)	Indonesia, Philippines
<i>Nematopagurus kosiensis</i> McLaughlin, 1998	McLaughlin, 2004 (Verde Island Passage)	Philippines, New Caledonia, Hawaii, Tuamotu
<i>Nematopagurus lepidochirus</i> (Doflein, 1902)	McLaughlin, 2004 (Verde Island Passage)	Indo-West Pacific
<i>Nematopagurus lewinsohni</i> Türkay, 1986	McLaughlin, 2004 (off Manila Bay)	Red Sea, Saudi Arabia, Indonesia, Philippines, New Caledonia
<i>Nematopagurus meiringae</i> McLaughlin, 1998	McLaughlin, 2004 (Verde Island Passage)	East Indian Ocean and West Pacific
<i>Nematopagurus scutelliformis</i> McLaughlin, 1997	McLaughlin, 2004 (Verde Island Passage)	Indonesia, Philippines, New Caledonia
<i>Pagurixus anceps</i> (Forest, 1954)	McLaughlin & Haig, 1984 (Sumilon)	Indo-Pacific
<i>Pagurixus carinimanus</i> Komai & Osawa, 2006	McLaughlin & Haig, 1984 (Palawan)	Philippines, Japan, Guam
<i>Pagurixus concolor</i> Komai & Osawa, 2006	Komai & Rahayu, 2013c (Panglao)	Indo-Pacific
<i>Pagurixus formosus</i> Komai, 2010	Komai & Rahayu, 2013c (Panglao)	Philippines, Taiwan
<i>Pagurixus haigae</i> Komai & Osawa, 2007	Komai, 2010; Komai & Rahayu, 2013c (Panglao)	Thailand and West Pacific
<i>Pagurixus longipes</i> Osawa, Fujita & Okuno, 2006	Komai & Rahayu, 2013c (Panglao)	Philippines, Ryukyu Islands
<i>Pagurixus maorus</i> (Nobili, 1906)	Komai & Rahayu, 2013c (Panglao)	Indo-West Pacific
<i>Pagurixus nomurai</i> Komai & Asakura, 1995	Komai & Rahayu, 2013c (Panglao)	Western and central Pacific
<i>Pagurixus rubrovittatus</i> Komai, 2010	Komai & Rahayu, 2013c (Panglao)	Philippines, New Caledonia and Chesterfield Islands
<i>Pagurixus ruber</i> Komai & Osawa, 2006	Komai & Rahayu, 2013c (Panglao)	Indo-Pacific
<i>Pagurixus spiniferore</i> Komai & Rahayu, 2013	Komai & Rahayu, 2013c (Balicasag)	Philippines
<i>Pagurus conformis</i> De Haan, 1849	Komai & Rahayu, 2013c (Balicasag)	Philippines, Japan, Taiwan
<i>Pagurus confusus</i> Komai & Yu, 1999	Komai & Rahayu, 2014 (Balicasag and Bohol)	Philippines, Japan, Taiwan
<i>Pagurus fungiformis</i> Komai & Rahayu, 2004	Komai & Rahayu, 2014 (Panglao)	Indonesia, Philippines
<i>Pagurus hirtimanus</i> (Miers, 1880)	Estampador, 1937; 1959 (as <i>Eupagurus janitor</i> Alcock, 1905) (Mindoro); Komai & Rahayu, 2014 (Panglao, Balicasag)	Indo-West Pacific
<i>Pagurus kaiensis</i> McLaughlin, 1997	Komai & Rahayu, 2014 (Balicasag, Pamilacan)	Indonesia, Philippines
<i>Pagurus kulkarnii</i> Sankolli, 1962	Komai & Rahayu, 2014 (Panglao)	Indian Ocean, Taiwan, Philippines

Species	Records in the Philippines (Author & Island Locality)	General Distribution
<i>Pagurus moluccensis</i> Haig & Ball, 1988	Komai & Rahayu, 2014 (Panglao)	Indonesia, Philippines
<i>Pagurus pergranulatus</i> (Henderson, 1896)	Komai & Rahayu, 2014 (Panglao)	East Indian Ocean, Malaysia, Australia, Indonesia
<i>Pagurus spinulentus</i> (Henderson, 1888)	Estampador, 1959; Komai & Rahayu, 2014 (Panglao, Balicasag, Pamilacan)	Philippines
<i>Pagurus truncatispinosus</i> Komai & Rahayu, 2014	Komai & Rahayu, 2014 (Panglao, Balicasag, Pamilacan)	Philippines
<i>Pliopagurus curvimanus</i> Komai, 2013	Komai, 2013 (Bohol Sea)	Philippines
<i>Pseudopagurodes annae</i> Rahayu & Komai, 2013	Rahayu & Komai, 2013a (Panglao)	Philippines
<i>Pseudopagurodes capsellatus</i> Rahayu & Komai, 2013	Rahayu & Komai, 2013a (Panglao)	Philippines
<i>Pseudopagurodes piliferus</i> (Henderson, 1888)	Estampador, 1937; 1959 (as <i>Pagurodes piliferus</i>) (off Tablas); McLaughlin & Rahayu, 2007 (off Tablas, Panglao Island)	Philippines
<i>Pylopaguropsis pygmaeus</i> Rahayu & Komai, 2013	Rahayu & Komai, 2013b (Pamilacan)	Philippines
<i>Pylopaguropsis rahayuae</i> Asakura, 2010	Asakura, 2010 (Balicasag)	Philippines
<i>Pylopaguropsis similis</i> Rahayu & Komai, 2013	Rahayu & Komai, 2013b (Balicasag)	Philippines
<i>Spiropagurus spiriger</i> (De Haan, 1850)	Estampador, 1937; 1959 (off Manila)	Indo-West Pacific
<i>Tomopaguropsis rahayuae</i> Jung et al., 2017	Jung et al., 2017 (Bohol Sea)	Philippines
<i>Trichopagurus macrochela</i> Komai & Osawa, 2005	Komai, 2013 (Panglao)	Philippines, Japan
<i>Trichopagurus tenuidactylus</i> Komai, 2013	Komai, 2013 (Panglao)	Philippines
Pylochelidae Spence Bate, 1888		
<i>Bathychelodes incisus</i> (Forest, 1987)	Forest, 1987 (Verde Island Passage, Sombbrero Island); McLaughlin & Lemaitre, 2009 (Mindoro, Mindanao)	West Pacific
<i>Bathychelodes integer</i> (Forest, 1987)	Forest, 1987; McLaughlin & Lemaitre, 2009 (Panglao)	Indonesia, Philippines, Solomon Islands
<i>Cheiroplatea mitoi</i> Miyake, 1978	McLaughlin & Lemaitre, 2009 (Mindanao)	Philippines, Japan, Taiwan, Solomon Islands
<i>Parapylocheles scorpio</i> (Alcock, 1894)	Forest, 1987 (Mindoro, Mindanao)	Andaman Sea, Philippines
<i>Pomatocheles gaillardi</i> Forest, 1987	McLaughlin & Lemaitre, 2009 (Panglao)	Indonesia, Philippines
<i>Pylocheles mortensenii</i> (Boas, 1926)	Forest, 1987 (Verde Island Passage); McLaughlin & Lemaitre, 2009 (Panay)	Indonesia, Philippines, Australia, New Zealand
<i>Trizocheles boasi</i> Forest, 1987	McLaughlin & Lemaitre, 2009 (Balicasag)	Indonesia, Philippines, Solomon Islands
<i>Trizocheles laurentae</i> Forest, 1987	Forest, 1987; McLaughlin & Lemaitre, 2009 (Verde Island Passage)	Philippines, Solomon Islands
<i>Trizocheles manningi</i> Forest, 1987	Forest, 1987 (Mindanao); McLaughlin & Lemaitre, 2009 (Panglao)	Philippines
<i>Xylocheles macrops</i> (Forest, 1987)	Forest, 1987 (Verde Island Passage); McLaughlin & Lemaitre, 2009 (Bohol, Balicasag)	Philippines, Taiwan, Solomon Islands
<i>Xylocheles miersi</i> (Alcock & Anderson, 1899)	McLaughlin & Lemaitre, 2009 (Verde Island Passage, Balicasag)	Andaman Sea, Indonesia, Philippines, Vanuatu

Species	Records in the Philippines (Author & Island Locality)	General Distribution
Parapaguridae Smith, 1882		
<i>Bivalvopagurus sinensis</i> (de Saint Laurent, 1972)	Lemaitre, 1993 (near Lubang)	South China Sea
<i>Oncopagurus indicus</i> (Alcock, 1905)	Lemaitre, 1996 (near Tuluran)	Indonesia, Philippines, Western Australia, Hawai'i
<i>Oncopagurus monstrosus</i> (Alcock, 1894)	Lemaitre, 1996 (Mindoro, Mindanao, Cebu)	Indo-West Pacific
<i>Oncopagurus orientalis</i> (de Saint Laurent, 1972)	Lemaitre, 1997 (Luzon)	Indonesia, Philippines
<i>Paragiopagurus acutus</i> (de Saint Laurent, 1972)	de Saint Laurent, 1972; Lemaitre, 2013 (Verde Island Passage)	Western Australia, West Pacific
<i>Paragiopagurus bicarinatus</i> (de Saint Laurent, 1972)	de Saint Laurent, 1972; Lemaitre, 1996; 2013 (Luzon)	Western Pacific
<i>Paragiopagurus diogenes</i> (Whitelegge, 1900)	Lemaitre, 2013 (North of Verde Island Passage)	Western Indian Ocean, Western and central Pacific
<i>Paragiopagurus hirsutus</i> (de Saint Laurent, 1972)	de Saint Laurent, 1972; Lemaitre, 2013	Indo-West Pacific
<i>Parapagurus furici</i> Lemaitre, 1999	Lemaitre, 1999 (Bicol Peninsula)	Arabian Sea to West Pacific, Tasman Sea
<i>Parapagurus holthuisi</i> Lemaitre, 1989	Estampador 1937, 1959 (as <i>Parapagurus abyssorum</i> Henderson, 1888) (off Philippines)	Eastern and central Pacific
<i>Parapagurus richeri</i> Lemaitre, 1999	Lemaitre, 1999 (Luzon)	Western Indian Ocean to West Pacific, New Zealand, Tasman Sea
<i>Sympagurus affinis</i> (Henderson, 1888)	de Saint Laurent, 1972; Lemaitre, 2004 (Verde Island Passage)	Indo-Pacific
<i>Sympagurus brevipes</i> (de Saint Laurent, 1972)	Lemaitre, 1996; 2004 (Luzon, Mindoro, Mindanao)	Zanzibar, Indonesia, Philippines, Australia
<i>Sympagurus trispinosus</i> (Balss, 1911)	Lemaitre, 1994 (Luzon, Palawan, between Leyte and Mindanao, Jolo)	Indo-Pacific

***Dardanus gemmatus* (H. Milne Edwards, 1848)**

Pagurus gemmatus H. Milne Edwards, 1848: 60 (Marquesas, type locality).

Dardanus gemmatus – Haig & Ball, 1988: 164–165; Cassidy, 2005: 102–104, Fig. 6, McLaughlin et al., 2007: 81–82, 2 unlabelled figures.

Habitat. Subtidal to deepwater, 10–50 m, possibly 100 m (McLaughlin et al., 2007); associated with anemones.

Remarks. Cassidy (2005) expressed the belief that previous Philippine records of *D. dearmatus* by Estampador (1937, 1959) and Yap-Chiongco (1938) actually refer to *D. gemmatus*, but did not explain the reason for his opinion.

***Dardanus hessii* (Miers, 1884)**

Pagurus hessii Miers, 1884: 264, Fig. 4, p. 28 (Arafura Sea, type locality); Alcock, 1905: 93–94; Fig. 4, pl. 8.

Pagurus hessi – Fize & Serène, 1955: 214–220, Fig. 34, pl. 4 no. 8 (misspelling of *Pagurus hessii*).

Pagurus semilimanus – Estampador, 1937: 503; Estampador, 1959: 51 (misspelling of *Pagurus similimanus*).

Dardanus hessii – Haig & Ball, 1988: 165; McLaughlin et al., 2007: 87–88, 1 unlabelled figure.

Habitat. Subtidal, 10–55 m, possibly to 80 m; mud, sand-mud, or sandy substrates.

***Dardanus vulnerans* (Thallwitz, 1892)**

Pagurus vulnerans Thallwitz, 1892: 30 (New Guinea, type locality); Estampador, 1937: 503; Yap-Chiongco, 1938: 198; Estampador, 1959: 50.

Distribution. Persian Gulf, Pakistan, Bay of Bengal, New Guinea (type locality), Philippines.

Remarks. Yap-Chiongco (1938) noted that *D. vulnerans* could easily be mistaken for *D. megistos*, but lists characters that distinguish *D. vulnerans* from the latter species.

Doubtful records of West Atlantic species in the Philippines

Clibanarius antillensis Stimpson, 1859

Clibanarius antillensis Stimpson, 1859: 85 (Barbados, type locality); Estampador, 1937: 501; Yap-Chiongco, 1938: 188; Estampador, 1959: 48.

Remarks. Yap-Chiongco (1938) noted that *Cl. antillensis* was only previously known from the West Atlantic, yet reported collecting 150 specimens of this species from Mindoro and Palawan provinces. It is reasonable to assume that his collections probably were comprised of another, abundant hermit crab species, however the identity of the species is not known and Yap-Chiongco's collections are no longer extant (Estampador, 1959). It is possible that *Cl. antillensis sensu* Yap-Chiongco (1938) is *Cl. ransonii* Forest, 1953 judging from the white stripe on the ambulatory legs, also from the fact that dactyls of ambulatory legs are shorter than propodi with carina on lateral surfaces of both segments. However, *Cl. ransonii* has not yet been reported from the Philippines.

Clibanarius scolopetarius (Herbst, 1796)

Cancer scolopetarius Herbst, 1796: 23, pl. 23, Fig. 3 (Cuba, type locality).

Clibanarius scolopetarius – Estampador, 1937: 501; Yap-Chiongco, 1938: 192–193; Estampador, 1959: 48.

Remarks. Yap-Chiongco (1938) “provisionally” identified 36 specimens from Mindoro and Palawan as *Cl. scolopetarius*. This cannot be verified since the specimens have been lost and there is insufficient detail in the texts to permit re-identification. Given that the known distribution of *Cl. scolopetarius* is in the Atlantic, reports of this species in the Philippines are highly doubtful. Yap-Chiongco (1938) and Estampador (1937; 1959) possibly confused *Cl. rhabdodactylus* with this species as these two species have similar banded legs (compare photos of the two species available in Legall & Poupin, 2016).

CONCLUSION

In this paper we document 43 species of *Calcinus*, *Clibanarius*, and *Dardanus* in Philippine waters. Of these, the majority are broadly distributed in the Indo-West Pacific, while a handful of presumably rare species are known from only a few localities. *Calcinus fuscus*, *Clibanarius ambonensis*, *Cl. antennatus*, *Cl. serenei*, *Cl. snelliusi*, and the new species *Dardanus balhibuon* are known only from West Pacific. *Calcinus elegans*, *C. gaimardii*, *C. minutus*, *C. pulcher*, *C. vachoni*, *Clibanarius clibanarius*, *Cl. cruentatus*, *Cl. englaucus*, *Cl. eurysternus*, *Cl. infraspinus*, *Cl. laevimanus*, *Cl. longitarsus*, *Cl. merguensis*, *Cl. padavensis*, *Cl. striolatus*, *Cl. virescens*, *Dardanus dearmatus*, *D. hessii*, *D. setifer*, *D. scutellatus*, *D. vulnerans*, and *D. woodmasoni* are distributed from the Indian Ocean across the Malay Archipelago to the West Pacific. The species distributed across the entire Indo-Pacific (reaching at least Hawai'i or Tuamotu) are *Calcinus laevimanus*, *C. latens*, *C. lineapropodus*, *C. morgani*, *Clibanarius corallinus*, *Cl. humilis*, *Cl. rhabdodactylus*, *Dardanus deformis*, *D. gemmatus*, *D. guttatus*, *D. lagopodes*, *D. megistos*, *D.*

pedunculatus, and *D. sanguinolentus*. *Dardanus arrosor* is believed to be distributed across tropical to temperate waters of the Mediterranean and West Pacific (see Table 3).

Table 3 also presents a list of all known hermit crab species from Philippine waters, in all 153 species with more than 50% from deep water. The family Diogenidae is the most species-rich group in shallow waters, but so far it is only represented by 64 species. The small number of species is probably because of the scarcity of studies focusing on Philippine diogenid hermit crabs.

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