

# Spider Crabs of the *Samadinia pulchra* complex (Crustacea: Decapoda: Epialtidae)

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**ABSTRACT.** The spiny spider crab, *Samadinia pulchra* (Miers in Tizard, Moseley, Buchanan & Murray, 1885) (type locality: Bohol Sea, Philippines) has long been considered to be widespread in the western Pacific and Indian Ocean, with *Anamathia livermorii* Wood-Mason in Wood-Mason & Alcock, 1891, described from the Andaman Sea, in its synonymy. Reassessment of *Samadinia pulchra* from throughout its purported range indicates that it comprises a complex of three species: *S. pulchra* sensu stricto, occurring in the northwestern Pacific, from the South China Sea to Japan; *S. livermorii*, occurring in the Indian Ocean, ranging from southwestern Indonesia to East Africa; and a new species, *S. jimlowryi* sp. nov., ranging from northwestern Australia to southeastern Indonesia.

## Introduction

The spiny spider crab, *Anamathia pulchra*, was described by Edward Miers in 1886 based on a single specimen collected by the HMS *Challenger* in the Philippines. It was soon followed by description of a similarly spiny species, *Anamathia livermorii* Wood-Mason in Wood-Mason & Alcock, 1891, from the Andaman Sea. Presumably on account of their strong similarities, *A. livermorii* was synonymized with *A. pulchra* and transferred to *Scyramathia* (see Alcock, 1895), then to *Rochinia* (see Rathbun, 1925), and most recently to *Samadinia* Ng & Richer de Forges, 2013, a genus of 37 species to date (see Lee *et al.*, 2021; Richer de Forges *et al.*, 2021; Takeda *et al.*, 2022; Davie & Lee, 2023; Lee *et al.*, 2023). Subsequent studies reported

*S. pulchra* (Miers, 1886) from wide-ranging localities including Japan and Taiwan (Sakai, 1938; Takeda, 1975; Ho *et al.*, 2004), the South China Sea (Serène & Lohavanijaya, 1973; Griffin, 1976), Indonesia (Griffin & Tranter, 1986a) and northern Australia (Griffin & Tranter, 1986b; Richer de Forges & Poore, 2008), and the western Indian Ocean from Madagascar and East Africa (Doflein, 1904; Richer de Forges & Ng, 2013; Muñoz *et al.*, 2021). Consequently, *S. pulchra* has long been regarded as wide-ranging in the Indo-West Pacific and distinguished from its congeners by the combination of strongly divergent rostral spines, and the presence of 20 long, upright dorsal spines on the carapace (including preorbital and hepatic spines). Here, we reassess *Samadinia pulchra* from throughout its purported range and recognize a complex of three species, documented below.

**Keywords:** Epialtidae, new species, deep sea, spider crab, taxonomy, species complex

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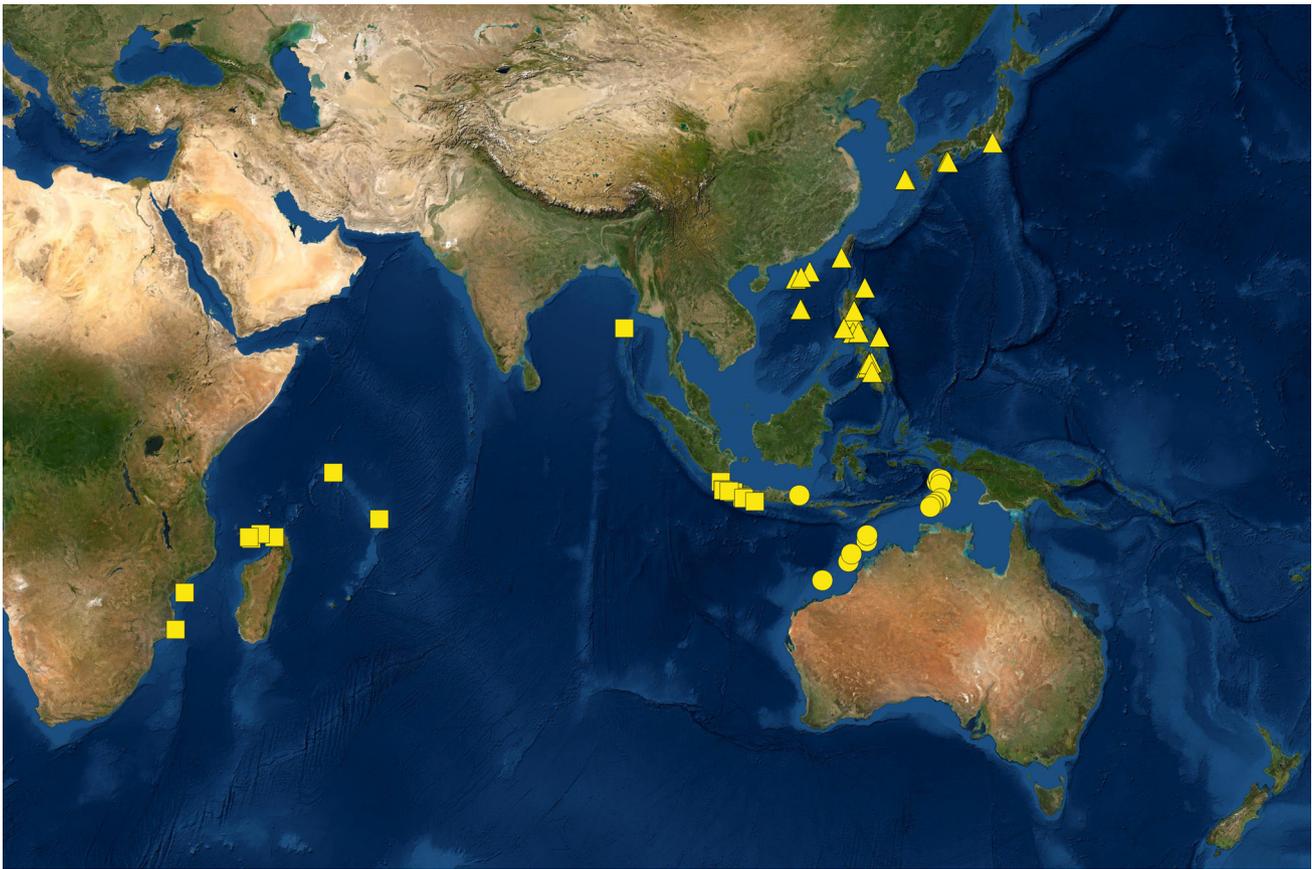
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**Figure 1.** Distribution of species of the *Samadinia pulchra* complex: *S. pulchra* (Miers in Tizard, Moseley, Buchanan & Murray, 1885) (▲), *S. jimlowryi* sp. nov. (●), *S. livermorii* (Wood-Mason in Wood-Mason & Alcock, 1891) (■).

## Materials and methods

Carapace length (cl) is measured along the dorsal midline and includes the rostral spines. Postrostral carapace length (pcl) is measured along the dorsal midline from the base of the sinus between the rostral spines and the posterior margin of the carapace. Carapace width (cw) is the greatest width across the branchial regions, excluding spines. Measurements are provided in millimetres. The abbreviations used are as follows: coll. = collector; G1 and G2 = the male first and second gonopod respectively; P1–P5 = pereopods 1–5; and stn = station.

Specimens examined are deposited in the collections of the following institutions: the Australian Museum, Sydney, Australia (AM); Muséum national d'Histoire naturelle, Paris, France (MNHN); Museum für Naturkunde, Berlin, Germany (ZMB); Museum Victoria, Melbourne, Australia (NMV); Museum Zoologicum Bogoriense, Cibinong, Bogor, Indonesia (MZB); National Museum of Natural History, Smithsonian Institution, Washington DC, USA. (USNM); National Museum of the Philippines, Manila, Philippines (NMCR); National Museum of Nature and Science, Tokyo, Japan (NSMT); Natural History Museum, London, UK (NHM); Natur-Museum und Forschungsinstitut Senckenberg, Frankfurt am Main, Germany (SMF); Western Australia Museum, Perth, Australia (WAM); and the Zoological Reference Collection, Lee Kong Chian Natural History Museum, National University of Singapore, Singapore (ZRC). The distribution map (Fig. 1) was prepared using QGIS 3.4.

## Systematic account

Superfamily Majoidea Samouelle, 1819

Family Epialtidae MacLeay, 1838

### Genus *Samadinia* Ng & Richer de Forges, 2013

Type species: *Samadinia longispina* Ng & Richer de Forges, 2013, by original designation.

### *Samadinia pulchra* (Miers in Tizard, Moseley, Buchanan & Murray, 1885)

Figs 1–3, 7A, B

*Amathia* (*Amathia*) *pulchra* Miers in Tizard, Moseley, Buchanan & Murray, 1885: 589.

*Anamathia pulchra*.—Miers, 1886: xxix (list), xl, xliii (list), 26–27, pl. IV fig. 1, 1a–c (type locality: Philippine Islands).

*Rochinia pulchra*.—Sakai, 1938: 278 (key), 278, 279, text-fig. 35, pl. 37 fig. 4.—Serène & Lohavanijaya, 1973: 55 (key), 56, 57, figs 119–122, pl. 11 A.—Takeda, 1975: 144, 145, 151 (table), fig. 4a, b.—Sakai, 1976: 223 (key), 223, 224, pl. 79 fig. 1.—Griffin, 1976: 210.—Griffin & Tranter, 1986a: 176 (key), 185, 187.—Griffin & Tranter, 1986b: 363.—Davie & Short, 1989: 182.—Ikeda, 1998: 12 (list), 14 (table), 35, pl. 37 figs 1–3.—Muraoka, 1998: 25.—Takeda, 2001: 241, 251 (table), 255 (table), 259 (table).—Casadio *et al.*, 2005: 159 (list).—Ng & Richer de Forges, 2007: 62 (list), 65.—Richer de Forges & Poore, 2008: 66 (list), 68, 69 (in part).—Ng *et al.*, 2008:

105 (list).—Ng & Richer de Forges, 2013: 362, fig. 5D.—Richer de Forges & Ng, 2013: 468, 469, fig. 1C (in part, Philippine material only).—Wang *et al.*, 2017: app. 1.—Ng *et al.*, 2017: 53 (list).—Tavares & Santana, 2018: 223 (list).—Lee *et al.*, 2019: 35, 40.

*Samadinia pulchra*.—Lee *et al.*, 2021: 22 (list), 33, 43 [new combination].

**Holotype:** NHM 1884.31, male (pcl 19.3 mm, cw 13.0 mm), S of Panglao Island, Bohol Sea, Philippines, 9°26'00"N 123°45'00"E, 375 fm (686 m), dredged, HMS *Challenger*, stn 210.

**Other material examined. Japan:** USNM 120721, 3 males (pcl 15.9 mm, cw 9.9 mm to pcl 17.6, cw 11.3 mm), 2 females (pcl 19.0 mm, cw 12.2 mm; pcl 18.8 mm, cw 12.5 mm), Tosa Bay, 33°17.5'N 133°32.88'E, coll. T. Sakai & K. Sakai, February 1966; NSMT-Cr 13615, 6 males (pcl 13.9 mm, cw 9.2 mm to pcl 21.1 mm, cw 14.1 mm), 2 ovigerous females (pcl 17.5 mm, cw 11.6 mm; pcl 17.8 mm, cw 12.2 mm), 1 female (pcl 18.3 mm, cw 12.9 mm), Tosa Bay, 33°13.5–12.8'N 133°41.6–41.4'E, 440–460 m, K00-8-400, FV *Kotaka Maru*, 24 August 2000; SMF, 4 ovigerous females (pcl 15.5 mm, cw 10.2 mm to pcl 17.3 mm, cw 11.2 mm), Tosa Bay, coll. K. Sakai, 1995; SMF, 1 male (cl 25.9 mm, pcl 16.2 mm, cw 10.7 mm), 1 ovigerous female (pcl 15.5 mm, cw 10.6 mm), Haritsunogani, Tosa Bay, TS00433, coll. K. Sakai; SMF, 1 ovigerous female (pcl 14.1 mm, cw 9.0 mm), 1 female (pcl 13.1 mm, cw 8.8 mm; with rhizocephalan), Mimase, Kochi, 10 March 1988; SMF, 1 male (cl 26.2 mm, pcl 19.0 mm, cw 12.3 mm), 1 ovigerous female (cl 26.3 mm, pcl 17.3 mm, cw 11.2 mm), off Kii, 250–350 m, coll. S. Nagai, November 1993. **Taiwan:** ZRC, 1 female (cl 29.9 mm, pcl 19.4 mm, cw 12.7 mm), SE of Kaohsiung, 22°4.2'N 120°10.2'E, 467–634 m, TAIWAN 2000 stn CP19, RV *Fishery Researcher I*, 29 July 2000. **South China Sea:** ZRC 1968.2.13.4, 1 male (cl 26.8 mm, pcl 17.3 mm, cw 11.6 mm), northern South China Sea, SSE of Hong Kong, cruise 4/64, st. 36, trawl (247), Hong Kong Fisheries Research Station, RV *Cape St. Mary*; ZRC 1968.2.15.4, 1 male (cl 13.2 mm, pcl 8.6 mm), 135 miles SSE of Hong Kong, 20°05'N 115°03'E, 299–300 fm (547–549 m), cruise no. 4/64 st. 119, trawl (218), Hong Kong Fisheries Research Station, RV *Cape St. Mary*, coll. O. T. Chan, 22 August 1964; ZRC 1968.2.15.3, 1 male (cl 31.1 mm, pcl 17.5 mm, cw 12.4 mm), SSE of Hong Kong, 394 fm (721 m), cruise 4/64 st. 121, trawl (219), Hong Kong Fisheries Research Station, RV *Cape St. Mary*, coll. O. T. Chan, 22 August 1964; ZRC 1968.2.15.5, 1 ovigerous female (cl 32.9 mm, pcl 19.1 mm, cw 13.5 mm), northern South China Sea, SSE of Hong Kong, cruise 4/64, trawl (130), Hong Kong Fisheries Research Station, RV *Cape St. Mary*; ZRC 2022.0792, 3 males (cl 24.2 mm, pcl 14.5 mm, cw 9.7 mm to cl 28.7 mm, pcl 17.8 mm, cw 11.6 mm), 1 female (cl 28.4 mm, pcl 17.4 mm, cw 11.0 mm), 6 ovigerous females (cl 21.7 mm, pcl 13.9 mm, cw 8.8 mm to cl 28.0 mm, pcl 17.4 mm, cw 11.5 mm), 1 juvenile female (cl 16.7 mm, pcl 10.5 mm, cw 6.3 mm), Macclesfield Bank, 16°13.60'N 115°01.61'E to 16°11.21'N 114°59.77'E, 526–510 m, ZHONGSHA 2015 stn CP4155, 28 July 2015; ZRC 2022.0793, 1 male (cl 36.0 mm, pcl 21.4 mm, cw 14.5 mm), Macclesfield Bank, 16°13.60'N 115°01.61'E to 16°11.21'N 114°59.77'E, 526–510 m, ZHONGSHA 2015 stn CP4155, 28 July 2015; ZRC 2022.0794, 5 males (cl 22.3 mm, pcl 13.9 mm, cw 8.5 mm to cl 37.2 mm, pcl 21.2 mm, cw 14.3 mm), E of Macclesfield Bank, 16°09.80'N 114°58.73'E to 16°12.19'N 115°00.53'E, 511–510 m, ZHONGSHA 2015 stn CP4156, 28 July 2015; ZRC, 1 ovigerous female (cl 25.0 mm, pcl 15.8 mm, cw 11.4 mm), W of Pratas, 20°44.86–42.28'N 116°08.01–08.01'E, 420–444 m, DONGSHA 2014 stn CP4128, 1 May 2014; ZRC 2022.0795, 1 male (cl 24.0 mm, pcl 14.6 mm, cw 9.2 mm), 19°53.06–53.03'N 114°21.68–24.74'E, 536–524 m, ZHONGSHA 2015 CP4137, 23 July 2015. **Philippines:** ZRC 2011.1059, 1 male (pcl 13.3 mm, cw 7.9 mm), NE of Luzon, 18°47.49'N 123°08.26'E, 507–540 m, AURORA 2007 stn CP2678, 23 May 2007; ZRC 2011.1052, 1 male (cl 26.4 mm, pcl 16.5 mm, cw 10.5 mm), 1 female (cl 19.6 mm, pcl 12.4 mm, cw 7.7 mm), 1 juvenile female (cl 16.9 mm, pcl 11.6 mm, cw 7.2 mm), off eastern Luzon, 15°59.07'N 121°49.22'E, 496–364 m, AURORA 2007 stn CC2745, 2 June 2007; ZRC 2011.1043, 1 male (cl 28.0 mm, pcl 17.9 mm, cw 12.6 mm), 1 female (cl 23.7 mm, pcl 15.0 mm, cw 9.9 mm), off eastern Luzon, 15°58.78–56.63'N 121°46.44–44.85'E, 182–220 m, AURORA 2007 stn CC2746, 2 June 2007; ZRC 2011.1049, 1 damaged male, 1 ovigerous female (pcl 15.7 mm, cw 9.6 mm), off eastern Luzon, 15°58.03'N 121°49.11'E, 422–431 m, AURORA 2007 stn CP2658, 20 May 2007; ZRC 2011.1053, 1 male (cl 20.0 mm, pcl 12.5 mm, cw 7.5 mm), 1 ovigerous female (cl 18.7 mm, pcl 12.2 mm, cw 7.6 mm), 1 female (cl 24.6 mm, pcl 15.6 mm, cw 9.8 mm), 3 juvenile females (cl 16.6 mm, pcl 11.5 mm, cw 6.9 mm to cl 20.4 mm, pcl 13.0 mm, cw 8.0 mm), off eastern Luzon, 15°56.41'N 121°48.88'E, 460–480 m, AURORA 2007 stn CP2659, 20 May

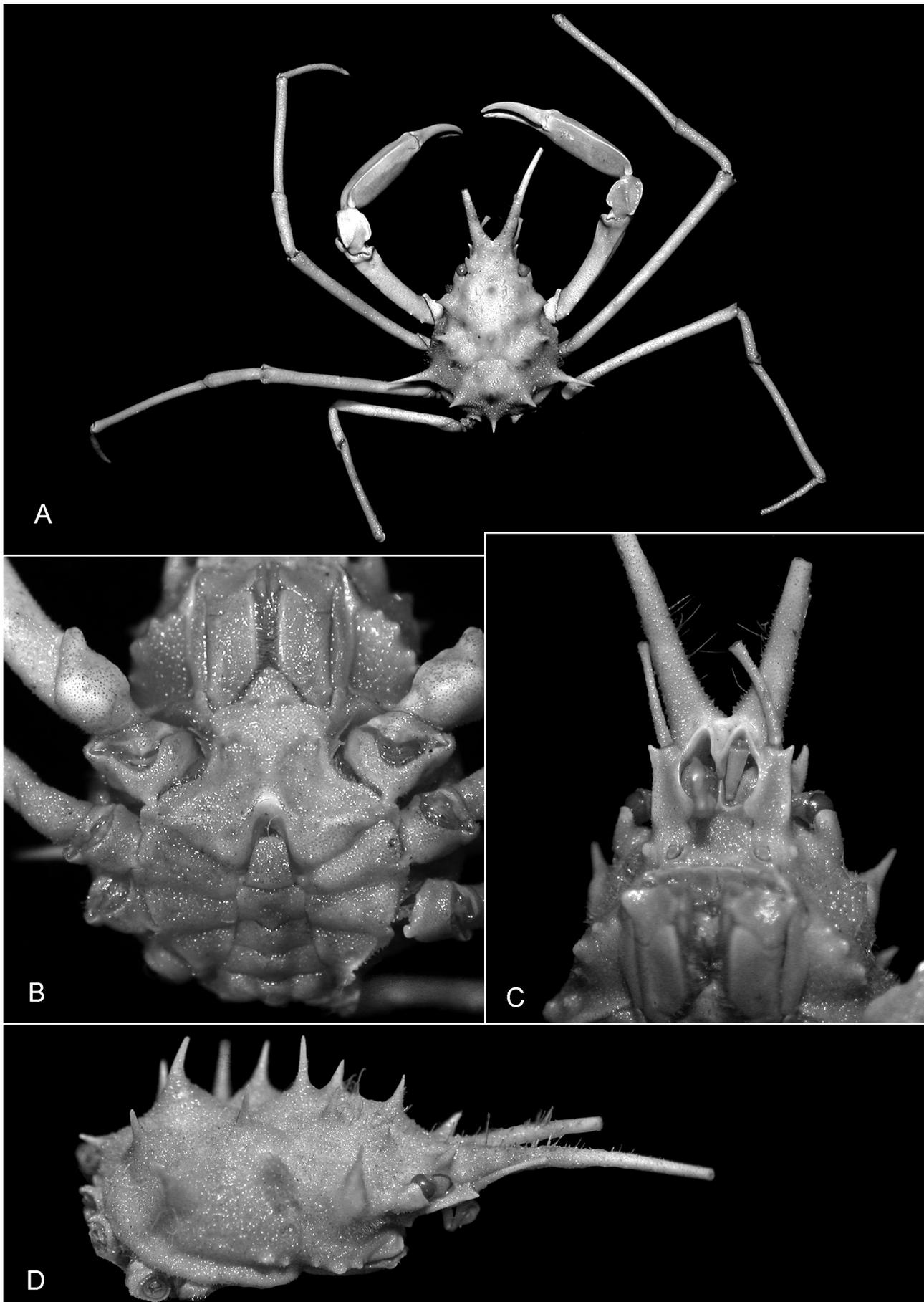
2007; ZRC 2013.0629, 1 ovigerous female (cl 23.0 mm, pcl 15.2 mm, cw 10.3 mm), off eastern Luzon, 15°07.61'N 121°36.95'E, 309 m, AURORA 2007 stn CP2708, 28 May 2007; USNM 49498, 1 ovigerous female (not measured), Verde Island Passage, 13°53'00"N 120°26'45"E, 454 m, *Albatross* stn 5282, 18 July 1908; USNM 49497, 1 male (not measured), Verde Island Passage, 13°48'30"N 120°28'40"E, 512 m, dark grey silt, *Albatross* stn 5283, 18 July 1908; USNM 49499, 1 male (not measured), Sibuyan Sea, SE Luzon, 13°17'45"N 122°22'00"E, 723 m, soft green mud, *Albatross* stn 5378, 4 March 1909; USNM 49495, 1 male (not measured), 1 female (not measured), Tablas Strait, E of Mindoro, 13°12'45"N 121°38'45"E, 518 m, green mud, *Albatross* stn 5123, 2 February 1908; USNM 49500, 1 female (not measured), Tablas Strait, SE of Mindoro, 12°25'35"N 121°31'35"E, 428 m, *Albatross* stn 5260, 3 June 1908; USNM 49494, 1 male (not measured), NW of Batag Island, Philippine Sea, 12°43'51"N 124°58'50"E, 564 m, green mud, *Albatross* stn 5444, 3 June 1909; ZRC, 2 females (cl 26.6 mm, pcl 16.2 mm, cw 11.2 mm; cl 25.5 mm, pcl 16.8 mm, cw 11.4 mm), same; ZRC, 1 male (cl 19.0 mm, pcl 13.3 mm, cw 9.1 mm), 1 ovigerous female (cl 25.0 mm, pcl 16.6 mm, cw 12.0 mm), S of Bohol, Bohol Sea, 9°31.4'N 124°00.6'E, 738–798 m, PANGLAO 2005 stn CP2350, 24 May 2005; USNM 49492, 1 ovigerous female (pcl 19.9 mm, cw 13.3 mm), between Siquijor and Bohol, 5.8 miles SW of Balicasag Island, Bohol Sea, 9°24'45"N 123°39'15"E, 503 m, globigerina ooze, *Albatross* stn 5528, 11 August 1909; USNM 49493, 2 males (not measured), between Panglao Island and Siquijor Island, Bohol Sea, 9°22'30"N 123°42'40"E, 717 m, globigerina ooze, *Albatross* stn 5527, 11 August 1909; ZRC, 1 ovigerous female (cl 27.5 mm, pcl 17.0 mm, cw 12.0 mm), S of Siquijor, Bohol Sea, 8°53.1'N 123°33.5'E, 516–543 m, PANGLAO 2005 stn CP2361, 26 May 2005; MNHN, 1 female (cl 43.2 mm, pcl 27.9 mm, cw 10.4 mm), Balicasag Island, Bohol Sea, 8°52.1'N 123°37.1'E, 569–583 m, PANGLAO 2005 stn CP2358, 26 May 2005; AM P.90365, 1 female (with rhizocephalan; pcl 16.4 mm, cw 11.3 mm), same; ZRC 2013.0623, 2 juvenile females (cl 19.9 mm, pcl 12.3 mm, cw 8.2 mm; cl 20.8 mm, pcl 12.7 mm, cw 8.4 mm), same; NMCR, 1 male (cl 34.5 mm, pcl 19.5 mm, cw 12.9 mm), NE of Aligbay Island, Sulu Sea, 8°46.2'N 123°16.1'E, 624–647 m, PANGLAO 2005 stn CP2384, 29 May 2005; USNM 49496, 1 male (not measured), Iligan Bay, Mindanao, 8°16'45"N 124°02'48"E, 924 m, grey mud, fine silt, *Albatross* stn 5513, 7 August 1908.

**Diagnosis.** Carapace with at least 20 sharp, slender, upright dorsal spines (paired preorbital; paired hepatic; 6 gastric; 1 median cardiac; 1 median intestinal; on each side, 4 pairs branchial); hepatic spine with lateral surface flattened or weakly sulcate. G1 distal margin oblique, straight to irregularly gently sinuous.

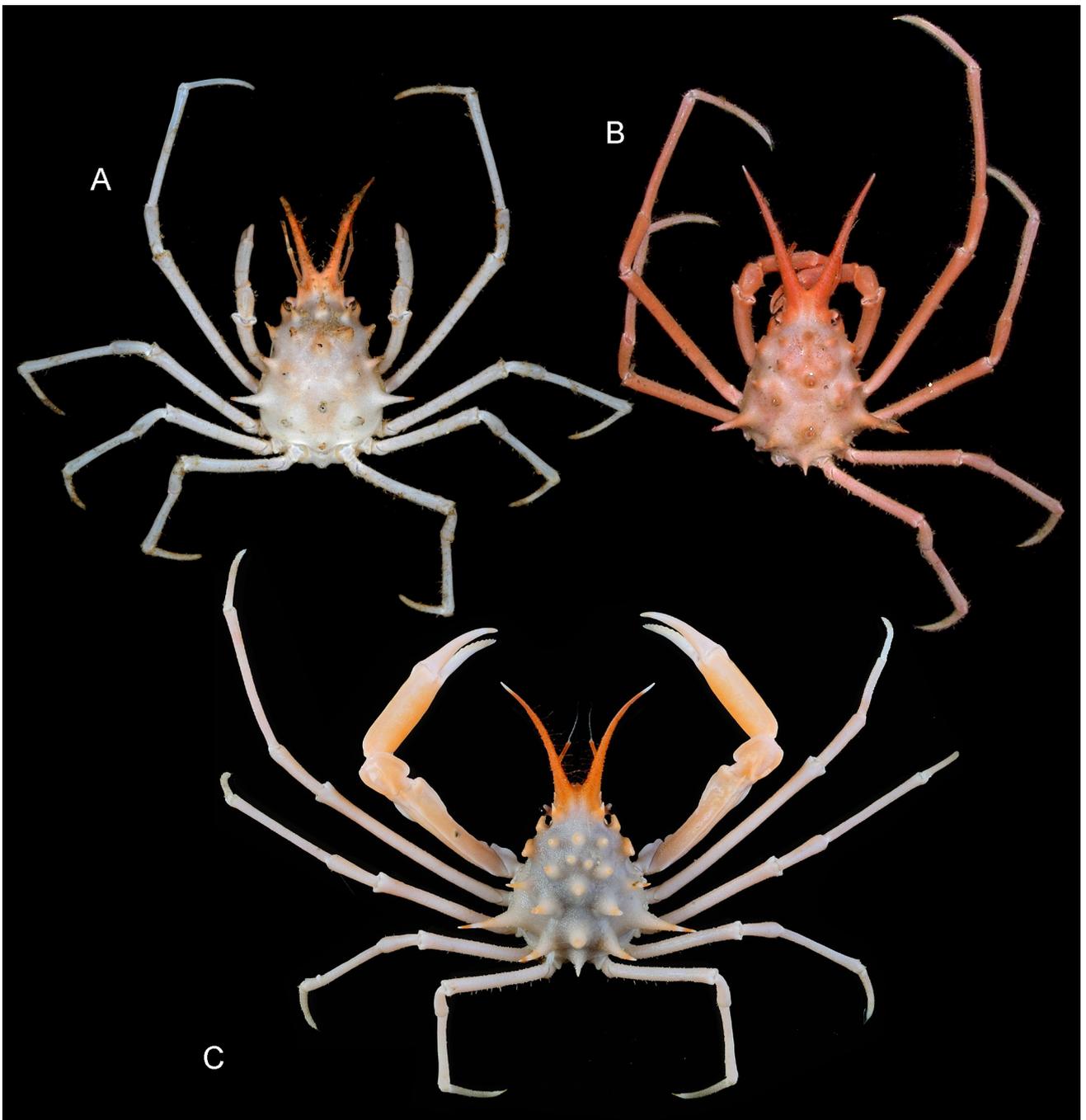
**Description** (specimens > 10 mm pcl). Carapace pyriform, pcl 1.4–1.7× width, regions weakly defined, entire surface with tomentum of short lobular setae.

Rostral spines usually strongly divergent for entire length (occasionally weakly divergent to subparallel), straight to outwardly curved (in dorsal view), straight to curved but slightly upcurved in lateral view; length 0.4–0.8× pcl; margins lined with short, soft, lobular setae and scattered simple setae. Dorsal orbital cave weakly expanded, produced as a long, slender upright spine, inclined anteriorly and usually slightly incurved; postorbital lobe short, anteriorly cupped; hiatus wide, U-shaped. Dorsal surface with long, slender, upright spines in following pattern: straight, near vertical hepatic spine with lateral surface flattened or weakly sulcate; gastric region with 6 slender upright spines (2 in midline; paired epigastric and protogastric spines) and usually with two shorter spines or tubercles in transverse row between anterior and posterior median spines; cardiac and intestinal regions each with straight, upright spine; branchial regions each with 4 straight, upright, spines, 2 near lateral carapace margin and directed laterodorsally, 2 on upper surface, almost vertical. Pterygostomial region with 3 or 4 tubercles in longitudinal row below moult suture, followed by tubercle on anterior branchial submargin slightly below moult suture.

Eyestalks short, sparsely setose anteriorly, cornea terminal. Basal antennal article length about twice width; surface shallowly sulcate longitudinally; anterolateral angle



**Figure 2.** *Samadinia pulchra* (Miers in Tizard, Moseley, Buchanan & Murray, 1885), holotype male (pcl 19.3 mm, cw 13.0 mm), Philippines, NHM 1884.31. (A) dorsal; habitus; (B) thoracic sternum and pleon; (C) ventral anterior cephalothorax; (D) carapace, right lateral view.



**Figure 3.** *Samadinia pulchra* (Miers in Tizard, Moseley, Buchanan & Murray, 1885). (A) male (pcl 12.5 mm, cw 7.5 mm), Philippines, CP2659, ZRC 2011.1053; (B) male (pcl 19.5 mm, cw 12.9 mm), Philippines, CP2384, NMCR; (C) male (pcl 21.4 mm, cw 14.5 mm), Macclesfield Bank, CP4155, ZRC. Image credits: Tin-Yam Chan.

blunt, weakly produced to small spine, visible in dorsal view; lateral margin lateral margin concave, not expanded under eyestalk; prominent tubercle situated between antennal gland and margin of ventral orbital hiatus.

Maxilliped 3 unarmed, merus subtriangular, anterolateral angle weakly produced, apex rounded, slightly wider than ischium; ischium subquadrate, outer surface with shallow longitudinal depression.

Cheliped (pereopod 1) length 1.2–2.1 (usually > 1.3) × pcl (male), 0.8–1.3 × pcl (usually < 1.2) (female); merus slightly shorter than propodus, extensor margin with proximal tubercle and small distal spine, flexor margin with 2 or 3 low, widely spaced tubercles; carpus shorter than dactylus,

unarmed, although large adult males with dorsal and mesial ridge; propodus smooth, laterally compressed, dorsally cristate and more robust in adult males, palm length 1.8–3.0 × height (male), 2.6–3.4 × height (female); dactylus and pollex equal, length 0.6–0.8 × palm length (male), 0.7–0.9 × palm length (female); occlusal margins crenulate, proximal gape slight in males, absent in females.

Ambulatory legs (P2–5) slender, subcylindrical in cross-section, sparsely covered with short simple setae and short, club-like setae; merus extensor margin with short distal spine, sometimes indistinct on P5; dactyli unarmed, covered with short setae, apex corneous. Pereopod 2 length 2.2–3.0 (usually > 2.5) × pcl (male), 1.5–2.8 × pcl (usually < 2.5)

(female); merus 0.8–1.2 × pcl (usually > 1.0) (male), 0.5–1.1 (usually < 0.9) (female). Pereopod 5 length 1.4–1.8 × pcl (male), 0.9–1.8 × pcl (female); merus 0.5–0.6 × pcl (male), 0.3–0.6 × pcl (female).

Pleon with 6 free somites and telson, unarmed; widest at somites 2 and 3 in males, at somites 5 and 6 in females; surface covered with short bulbous setae. Male telson triangular to linguiform, as long as wide, margins straight, apex rounded.

G1 straight, flattened; distally expanded, distolaterally produced to acute triangular point, distomesially forming low blunt lobe or obtuse angled; distal margin oblique, straight to irregularly gently sinuous. G2 simple, about ¼ length of G1; endopod absent.

**Colour in life.** Juveniles and small adults with carapace and pereopods overall creamy-white; rostral spines and anterior carapace spines dull orange; dorsal carapace spines distally diffusely dull orange; cheliped fingers pale pinkish (Fig. 3A). Largest specimens with pereopods dull pinkish-pale orange, carapace pale white to pale pinkish-orange centrally (Fig. 3B, C).

**Remarks.** *Samadinia pulchra* was described by Miers (in Tizard, Moseley, Buchanan & Murray, 1885) (see also Miers, 1886) from single male specimen collected off the Philippines. The species has since been widely reported in the Indo-West Pacific (e.g., Griffin & Tranter, 1986a; Richer de Forges & Ng, 2013). Although previously thought wide-ranging in the Indo-West Pacific, present results show that *S. pulchra* sensu stricto is restricted to the western Pacific from Japan and Taiwan to the South China Sea including the Philippines (Fig. 1). Previous records of *S. pulchra* from the Indian Ocean are referable to *S. livermorii* (Western Indian Ocean to Andaman Sea and southwestern Indonesia) and *S. jimlowryi* sp. nov. (southeastern Indonesia to northwestern Australia). Of these, *S. pulchra* is most similar to *S. livermorii*, sharing similar G1 morphology and straight dorsal carapace spines, differing in the laterally flattened hepatic spine (versus conical or cylindrical). *Samadinia pulchra* agrees with *S. jimlowryi* in the flattened to weakly sulcate lateral surface of the hepatic spine of the carapace (Figs 2D, 4C) but differs by the simple G1 distal margin (versus bilobate) (Figs 7A, B, C, E), and straight, shorter dorsal carapace spines (prominently longer, anteriorly recurved in *S. jimlowryi*; Figs 2D, 3, 4) (see Remarks for *S. livermorii*).

As in its congeners, carapace spine length varies allometrically in *S. pulchra*, albeit attaining proportionally shorter lengths than in *S. jimlowryi* (see Remarks for that species). Sexual dimorphism in cheliped robustness and more elongate walking legs in *S. pulchra* is marked, being most evident in males 16 mm pcl and larger (Figs 2A, 3C). Females are mature by 12–15 mm with the smallest ovigerous female (pcl 12.2 mm; ZRC 2011.1053). Apart from sexual dimorphism and normal allometric changes, variation is primarily evident in rostral form, ranging from straight (the usual condition) to outwardly curved (Figs 2A, 3). The pair of tubercles or low spines, usually present in a transverse row across the gastric region (Fig. 3C), may be absent or represented on one side only.

**Distribution.** Western Pacific, from Japan and Taiwan to the South China Sea (including Macclesfield Bank and Hong Kong) to the southern Philippines (Fig. 1); 95–924 m (usually 500–600 m) (Takeda, 2001; present results).

## *Samadinia jimlowryi* sp. nov.

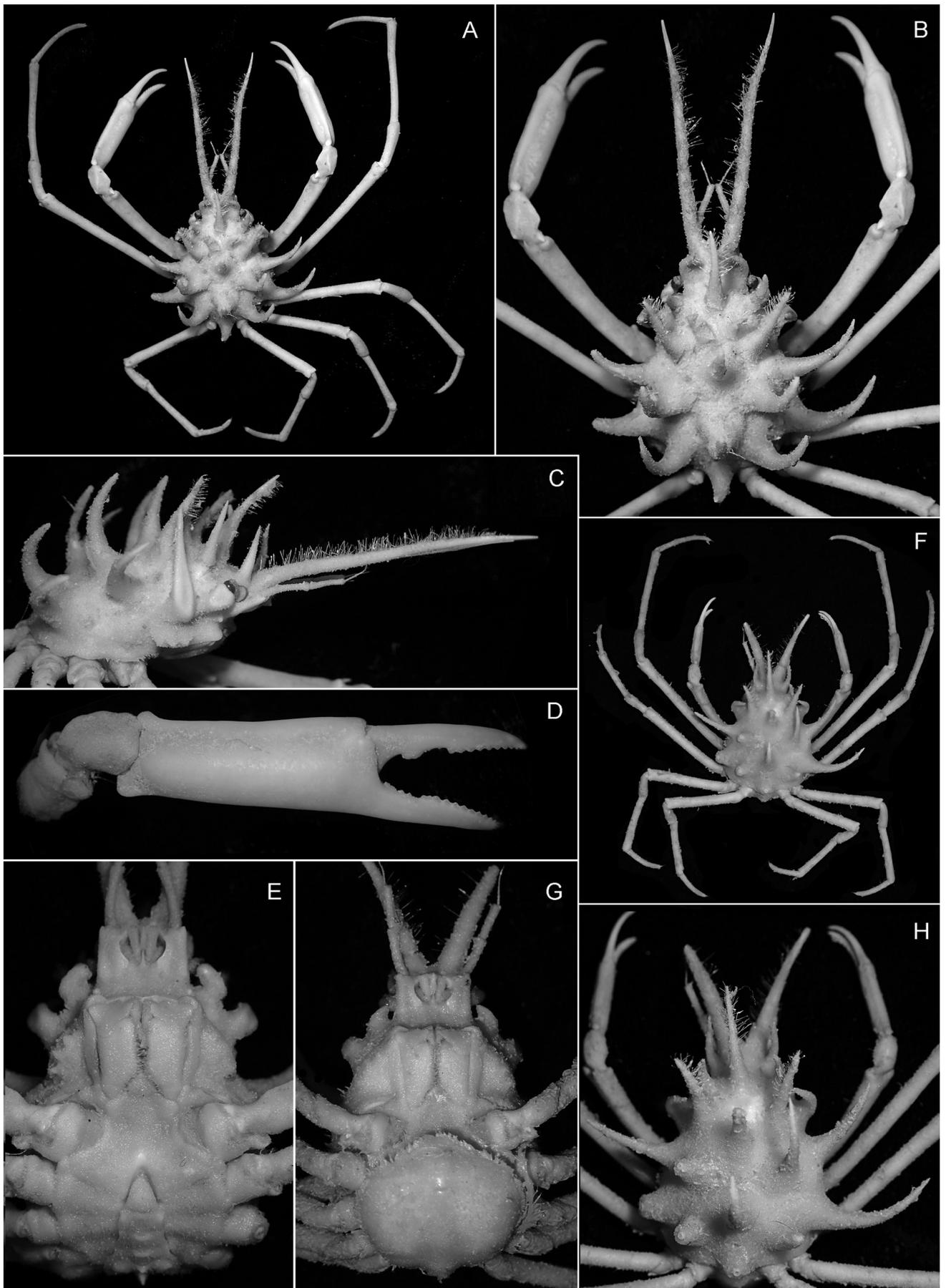
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Figs 1, 4, 5A, B, 7C–H

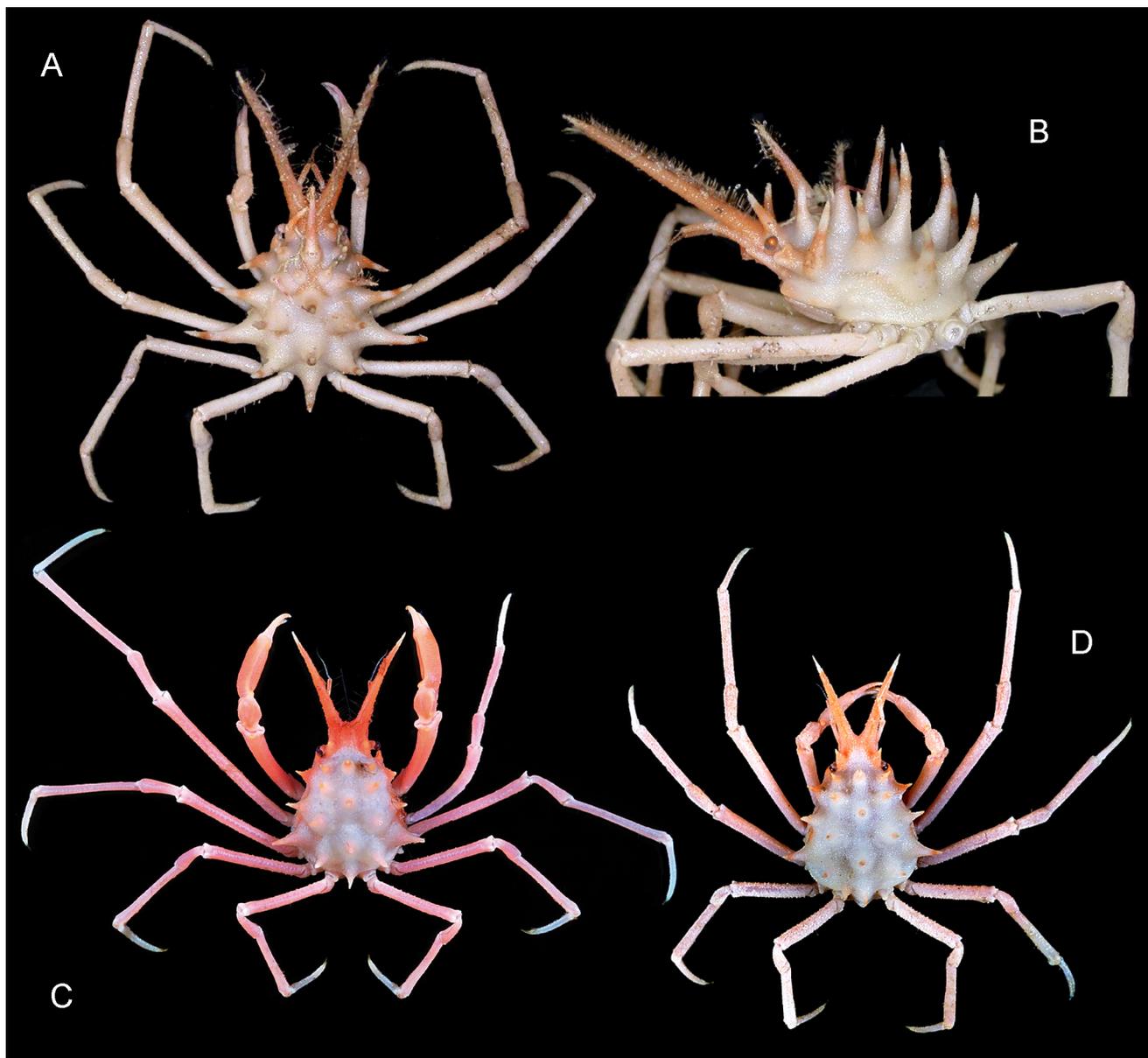
*Rochinia pulchra*.—Griffin & Tranter, 1986a: 185, 186.—Griffin & Tranter, 1986b: 363.—Richer de Forges & Poore, 2008: 68, 69, fig. 2b [not *Amathia* (*Amathia*) *pulchra* Miers in Tizard, Moseley, Buchanan & Murray, 1885].

**Holotype:** NMV J58025, male (cl 65.6 mm, pcl 32.7 mm, cw 22.3 mm), Kulumburu L29 transect, NW Australia, 13°15.90–16.35'S 123°22.45–21.40'E, 394–390 m, beam trawl, SS05/2007/180, RV *Southern Surveyor*, coll. D. Bray, 7 July 2007. **Paratypes:** NMV J75811, 1 female (cl 55.1 mm, pcl 28.7 mm, cw 20.2 mm), collected with holotype; NMV J58172, 1 juvenile female (cl 29.9 mm, pcl 16.8 mm, cw 10.8 mm), Ashmore L30 transect, NW Australia, 12°31.766–30.833'S 123°25.633–25.367'E, 401–404 m, beam trawl, SS05/2007/192, RV *Southern Surveyor*, coll. D. Bray, 7–8 July 2007; NMV J55681, 1 immature male (pcl 11.8 mm, cw 8.0 mm), Lacepede L26 transect, NW Australia, 15°47.72–48.50'S 121°03.50–02.88'E, 119–111 m, beam trawl, SS05/2007/129, RV *Southern Surveyor*, coll. D. Bray, 1 July 2007; NMV J55947, 1 immature female (cl 43.9 mm, pcl 23.7 mm, cw 15.4 mm), Leveque L27 transect, NW Australia, 14°49.03–48.53'S 121°27.55–29.57'E, 407–392 m, beam trawl, SS05/2007/107, RV *Southern Surveyor*, coll. D. Bray, 27 June 2007; NMV J558220, 1 spent female (cl 43.9 mm, pcl 23.7 mm, cw 15.4 mm), Leveque L27 transect, NW Australia, 14°51.20–50.72'S 121°25.88–27.02'E, 403–396 m, beam trawl, SS05/2007/144, RV *Southern Surveyor*, coll. D. Bray, 3 July 2007; AM P.35501, 1 ovigerous female (cl 41.9 mm, pcl 24.3 mm, cw 16.4 mm), North West Shelf, 240 km NW of Port Hedland, 18°06'S 117°45'E, 500 m, trawl, S02/82/31, RV *Soela*, coll. J. Paxton, 7 April 1982.

**Other material examined.** Indonesia: MNHN B29063, 5 males (cl 16.1 mm, pcl 10.3 mm, cw 6.6 mm to cl 46.6 mm, pcl 27.5 mm, cw 18.4 mm), 3 females (cl 37.8 mm, pcl 22.1 mm, cw 15.0 mm to cl 49.3 mm, pcl 29.1 mm, cw 21.0 mm), Kai, 5°17'S 132°50'E, 315–349 m, KARUBAR stn CP16, 24 October 1991; MNHN B29064, 4 females (cl 35.3 mm, pcl 22.4 mm, cw 14.7 mm to cl 59.6 mm, pcl 32.1 mm, cw 23.0 mm), Kai, 5°21'S 132°30'E, 329–389 m, KARUBAR stn CC10, 23 October 1991; MNHN B29100, 4 males (cl 19.8 mm, pcl 12.3 mm, cw 7.9 mm to cl 71.6 mm, pcl 38.5 mm, cw 26.3 mm), 1 female (cl 59.0 mm, pcl 32.2 mm, cw 21.7 mm), 1 juvenile female (cl 38.9 mm, pcl 22.7 mm, cw 14.6 mm), Kai, 5°23'S 132°29'E, 368–389 m, KARUBAR stn CP09, 23 October 1991; MNHN B29099, 2 females (cl 19.2 mm, pcl 13.4 mm, cw 8.1 mm; cl 23.5 mm, pcl 13.8 mm, cw 8.9 mm), Kai, 5°23'S 132°37'E, 413–436 m, KARUBAR stn CP12, 23 October 1991; MNHN B29096, 1 female (cl 19.7 mm, pcl 11.5 mm, cw 7.5 mm), Kai, 5°30'S 132°52'E, 336–346 m, KARUBAR stn CP25, 26 October 1991; MNHN B29093, 1 male (cl 31.3 mm, pcl 19.4 mm, cw 12.4 mm), 2 juvenile females (pcl 12.8 mm, cw 8.3 mm; pcl 18.7 mm, cw 11.4 mm), Kai, 5°49'S 132°18'E, 296–299 m, KARUBAR stn CP05, 22 October 1991; MNHN B29095, 1 male (pcl 13.0 mm, cw 8.5 mm), Kai, 6°07'S 132°42'E, 241–363 m, KARUBAR stn CP37, 27 October 1991; MNHN B29061, 2 males (cl 23.7 mm, pcl 15.0 mm, cw 9.5 mm; pcl 17.2, cw 10.6 mm), 1 spent female (cl 58.0 mm, pcl 29.7 mm, cw 20.6 mm), 4 juvenile females (cl 15.4 mm, pcl 9.7 mm, cw 6.1 mm to cl 26.2 mm, pcl 16.1 mm, cw 10.5 mm), Kai, 6°08'S 132°45'E, 390–502 m, KARUBAR stn CP35, 27 October 1991; AM P.34657, 1 male (cl 25.3 mm, pcl 15.9 mm, cw 10.1 mm), off Boeleng, Bali, 7°29'S 114°49'E, ca. 240 m, trawl, Th. Mortensen Java–South Africa Expedition stn 15n, 10 April 1929; MNHN B29098, 1 female (cl 26.7 mm, pcl 15.5 mm, cw 9.7 mm), Tanimbar, 7°54'S 132°47'E, 302–305 m, KARUBAR stn CP45, 29 October 1991; MNHN B29092, 2 males (cl 20.9 mm, pcl 12.9 mm, cw 7.7 mm; cl 19.3 mm, pcl 12.6 mm, cw 7.7 mm), 1 female (cl 29.1 mm, pcl 17.1 mm, cw 10.8 mm), Tanimbar, 8°20'S 132°11'E, 399–405 m, KARUBAR stn CP59, 31 October 1991; MNHN B29097, 2



**Figure 4.** *Samadinia jimlowryi* sp. nov. A–E, male holotype (pcl 32.7 mm, cw 22.3 mm), northwestern Australia, NMV J75811; F–H, spent female paratype (pcl 23.7 mm, cw 15.4 mm), northwestern Australia, NMV J58220. (A, F) dorsal habitus; (B, H) carapace, dorsal view; (C) carapace, right lateral view; (D) right chela; (E, G) ventral cephalothorax and pleon.



**Figure 5.** *Samadinia jimlowryi* sp. nov., female paratype (pcl 23.7 mm, cw 15.4 mm), Western Australia, SS05/2007/107, NMV J55947: (A) dorsal habitus; (B) carapace, left lateral view. *Samadinia livermorii* (Wood-Mason in Wood-Mason & Alcock, 1891): (C) male (pcl 14.8 mm, cw 10.0 mm), Mozambique, CC3154, ZRC 2011.1050; (D) ovigerous female (pcl 15.8 mm, cw 10.5 mm), Madagascar, DW3176, MNHN IU-2011-5997. Image credits: Karen Gowlett-Holmes (A, B), Tin-Yam Chan (C, D).

females (cl 17.3 mm, pcl 10.6 mm, cw 6.8 mm; cl 27.4 mm, pcl 16.1 mm, cw 10.4 mm), Tanimbar, 8°38'S 131°44'E, 477–480 m, KARUBAR stn CP71, 2 November 1991; MNHN B29094, 3 females (cl 18.1 mm, pcl 10.8 mm, cw 6.7 mm to cl 30.5 mm, pcl 17.3 mm, cw 11.1 mm), Tanimbar, 8°41'S 131°47'E, 410–413 m, KARUBAR stn CP70, 2 November 1991; MNHN B29119, 2 males (cl 57.0 mm, pcl 33.7 mm, cw 24.3 mm; cl 71.2 mm, pcl 36.8 mm, cw 25.6 mm), 7 ovigerous females (cl 46.0 mm, pcl 26.8 mm, cw 18.2 mm to cl 64.0 mm, pcl 33.5 mm, cw 24.0 mm), 1 juvenile female (cl 30.4 mm, pcl 17.5 mm, cw 12.1 mm), Tanimbar, 8°42'S 131°53'E, 356–368 m, KARUBAR stn CP69, 2 November 1991; MNHN B29062, 1 male (cl 50.9 mm, pcl 27.5 mm, cw 18.8 mm), Tanimbar, 8°57'S 131°27'E, 352–346 m, KARUBAR stn CP77, 3 November 1991.

**Diagnosis.** Carapace with at least 20 sharp, slender, anteriorly curved dorsal spines (paired preorbital; paired hepatic; 6 gastric; 1 median cardiac; 1 median intestinal; on each side, 4 pairs branchial); hepatic spine with lateral surface flattened or weakly sulcate. G1 distal margin oblique, with short rounded projection adjacent to distomesial projection.

**Description** (specimens > 10 mm pcl). Carapace pyriform, pcl 1.4–1.6 × width, regions weakly defined, entire surface with tomentum of short lobular setae. Pseudorostral spines usually strongly divergent for entire length (occasionally weakly divergent to subparallel), straight to outwardly curved (in dorsal view), straight but slightly upcurved in lateral view; length 0.6–1.0 × pcl; margins lined with short, soft, lobular setae and scattered simple setae. Dorsal orbital cave weakly expanded, produced as a long, slender upright spine, inclined anteriorly and usually slightly incurved; postorbital lobe short, anteriorly cupped; hiatus wide, U-shaped. Dorsal surface with long, slender, upright spines in following pattern: straight, near vertical hepatic spine with lateral surface flattened or weakly sulcate; gastric region with 6 slender upright spines: 2 in midline (anteriormost longest, 0.5 × pcl in holotype), paired epigastric and protogastric spines, and usually with 2 shorter spines or tubercles in transverse row

between anterior and posterior median spines; cardiac and intestinal regions each with spine, usually slightly curved anteriorly; branchial regions each with 4 spines, apices slightly curved anteriorly, 2 near lateral carapace margin and directed laterodorsally, 2 on upper surface, almost vertical. Pterygostomial region with 3 or 4 tubercles in longitudinal row below moult suture, followed by tubercle on anterior branchial submargin slightly below moult suture.

Eyestalks short, sparsely setose anteriorly, cornea terminal. Basal antennal article length about twice width; surface shallowly sulcate longitudinally; anterolateral angle blunt, weakly produced, not visible in dorsal view; lateral margin lateral margin concave, not expanded under eyestalk; prominent tubercle situated between antennal gland and margin of ventral orbital hiatus.

Maxilliped 3 unarmed, merus subtriangular, anterolateral angle weakly produced, apex rounded, slightly wider than ischium; ischium subquadrate, outer surface with shallow longitudinal depression.

Cheliped (pereopod 1) length 1.2–1.9 × pcl (usually > 1.4) (male), 1.2–1.4 × pcl (usually < 1.4) (female); merus slightly shorter than propodus, extensor margin with 1 or 2 small proximal spines or acute tubercles and small but distinct distal spine; carpus shorter than dactylus, unarmed, although large adult males with dorsal and mesial ridge; propodus smooth, laterally compressed, dorsally cristate and more robust in adult males, palm length 2.4–3.2 × height (male), 3.1–3.5 × height (female); dactylus and pollex equal, length 0.7–0.8 × palm length (male), 0.8 × palm length (female); occlusal margins crenulate, proximal gape slight in males, absent in females.

Ambulatory legs (P2–5) slender, subcylindrical in cross-section, sparsely covered with short simple setae and short, club-like setae; merus extensor margin with short distal spine, sometimes indistinct on P5; dactyli unarmed, covered with short setae, apex corneous. Pereopod 2 length 2.6–3.1 × pcl (male), 2.5–2.7 × pcl (female); merus 1.0–1.2 × pcl (male), 1.0–1.1 (usually 1.0) (female). Pereopod 5 length 1.5–1.8 (usually > 1.7) × pcl (male), 1.6–1.8 × pcl (usually 1.6) (female); merus 0.5–0.6 in both sexes.

Pleon with 6 free somites and telson; widest at somites 2 and 3 in males, at somites 5 and 6 in females; surface covered with short bulbous setae; somites 1 and 2 with short stout median spine; somite 3 with median tubercle. Male telson triangular, slightly longer than wide, margins straight, apex rounded.

G1 straight, flattened; distally expanded, distolaterally produced to acute triangular point, distomesially a short, rounded to bluntly angular projection; distal margin oblique, with short rounded projection adjacent to distomesial projection. G2 simple, about ¼ length of G1; endopod absent.

**Colour in life.** Carapace and pereopods overall creamy-white. Rostral spines and anterior carapace spines dull orange; dorsal carapace spines with dull orange subdistal band. Cheliped fingers pinkish. (Fig. 5A, B).

**Etymology.** Named in honour of our late colleague and friend, Jim Lowry, for his substantial contributions to carcinology.

**Remarks.** *Samadinia jimlowryi* sp. nov. is separable from both *S. pulchra* and *S. livermorii* by the form of the G1. In *S. jimlowryi*, the G1 apex has a narrow and blunt but prominent lobe on the anteromesial angle resulting in a prominently uneven distal margin (Fig. 7C, E–H), compared

to the essentially straight or more evenly irregular margin in *S. pulchra* and *S. livermorii* (Fig. 7A, B, I, J). The new species further differs from both *S. pulchra* and *S. livermorii* in the curvature of the dorsal and lateral carapace spines. In *S. jimlowryi* the carapace spines tend to be anteriorly curved (Fig. 4A–C, F, H) (versus directed essentially vertically; Figs 1A, D, 2, 5C, D, 6A, C, D, F) being most evident in specimens above about 20 mm pcl and becoming more pronounced with increasing body size. *Samadinia jimlowryi* is similar to *S. pulchra* and further differs from *S. livermorii* in the flattened (versus rounded) lateral surface of the hepatic spine.

The length of the dorsal carapace spines in *S. jimlowryi* varies allometrically, with smallest specimens having proportionally shorter spines. The rostral spines distinctly diverge, are occasionally subparallel, and vary in length from two-thirds to as long as postrostral carapace length (Fig. 4A, B, F, H). The rostral spines in dorsal view are straight or curved outwards, and in lateral view, generally appear straight and slightly inclined dorsally. Several specimens are encrusted with sponge and barnacles.

*Samadinia jimlowryi* apparently matures at a larger size than either *S. pulchra* or *S. livermorii*, which are ovigerous by pcl 15 mm or less. Females of *S. jimlowryi* show a rather abrupt change in pleonal size and shape at 23–24 mm pcl, at which size they are mature. The male gonopods reach full length by ca. 12 mm pcl, although the final form of the oblique margin of the tip (with the acutely angular tip and two blunt lobes) is not evident until about 16–20 mm pcl (Fig. 7C, E–H). Marked inflation of the chelipeds is not evident until ca. 25 mm pcl. A pair of processes in transverse row (rarely on one side only) is usually present between the anterior two median gastric spines. These processes range from a low blunt tubercle in the smallest specimens (usually concealed by the surface tomentum), to a sharp spine two-thirds the height of the median gastric spines in some of the largest specimens.

Previous records of *S. pulchra* from southern Indonesia and northwestern Australia (Griffin & Tranter, 1986a, b; Richer de Forges & Poore, 2008) have been re-assessed and are referable to *S. jimlowryi*. *Samadinia pulchra* sensu stricto is not known from Australian or Indonesian waters.

**Distribution.** Timor and Arafura seas, from southeastern Indonesia to northwestern Australia (Fig. 1); 240–502 m.

## *Samadinia livermorii* (Wood-Mason in Wood-Mason & Alcock, 1891)

Figs 1, 5C, D, 6, 7I, J

*Anamathia Livermorii* Wood-Mason in Wood-Mason & Alcock, 1891: 260 (type locality: *Investigator* Station 56, between North and South Sentinel Island, Andaman Islands).—Alcock, 1894: 401.

*Anamathia livermorei* [sic].—Anonymous, 1891: 56.—Huys *et al.*, 2014: 26.

*Scyramathia livermorii*.—Alcock & Anderson, 1895: pl. 14 fig. 3.

*Scyramathia pulchra*.—Alcock, 1895: 202–203.—Alcock, 1899: 1 (list), 4 (list), 5 (list), 52.—Doflein, 1904: 84, pl. 27 fig. 12.—Rathbun, 1911: 194 (list), 250 [not *Amathia* (*Amathia*) *pulchra* Miers in Tizard, Moseley, Buchanan & Murray, 1885].

*Rochinia pulchra*.—Richer de Forges & Ng, 2013: 468, figs 1A, B, 2B (in part).—Muñoz *et al.*, 2021: 33, figs 9D, 12 [not *Amathia* (*Amathia*) *pulchra* Miers in Tizard, Moseley,

Buchanan & Murray, 1885].

*Samadinia livermorii*.—Lee et al., 2023: 328.

**Material examined.** **Andaman Sea:** NHM 1896.5.14.7, 1 ovigerous female (cl 18.1 mm, pcl 12.3 mm, cw 8.0 mm), 13°47'30"N 92°36'00"E, 561 fm (1027 m), RIMSS *Investigator* stn 112, 7 November 1890. **Indonesia:** ZRC 2020.0032, 2 ovigerous females (cl 17.5 mm, pcl 12.5 mm, cw 8.5 mm; cl 18.8 mm, pcl 12.7 mm, cw 8.6 mm), Sunda Strait between Tabuan Island and Sumatra, 5°45.126–45.225'S 104°51.080–51.710'E, 425–442 m, SJADES 2018 stn CP08, 25 March 2018; ZRC 2020.0033, 1 spent female (cl 23.1 mm, pcl 13.6 mm, cw 9.2 mm), 1 ovigerous female (cl 24.1 mm, pcl 14.4 mm, cw 10.2 mm), S of Panaitan Island, Sunda Strait, 6°46.739–45.924'S 105°09.239–08.360'E, 559–571 m, SJADES 2018 stn CP23, 27 March 2018; ZRC 2020.0034, 1 male (cl 19.3 mm, pcl 11.5 mm, cw 7.4 mm; with rhizocephalan), S of Panaitan Island, Sunda Strait, 6°50.185–50.923'S 105°10.353–10.776'E, 876–937 m, SJADES 2018 stn CP25, 27 March 2018; MZB, 2 males (cl 24.2 mm, pcl 14.1 mm, cw 10.1 mm; cl 21.3 mm, pcl 14.0 mm, 9.7 mm), 1 juvenile female (pcl 6.9 mm, cw 4.5 mm), S of Pameungpeuk, Indian Ocean, 7°47.972–48.257'S 107°45.298–45.706'E, 476–530 m, SJADES 2018 stn CP47, 1 April 2018; ZRC 2020.0035, 1 male (cl 28.0 mm, pcl 16.4 mm, cw 14.4 mm; with epicaridean), Pelabuhanratu Bay, Indian Ocean, 7°04.874–05.348'S 106°25.396–25.044'E, 569–657 m, coll. SJADES 2018, stn CP51, 2 April 2018; MZB, 1 male (cl 28.7 mm, pcl 15.7 mm, cw 11.0 mm), same; MZB, 2 males (cl 24.3 mm, pcl 15.1 mm, cw 10.5 mm; cl 19.4 mm, pcl 13.2 mm, cw 8.5 mm), 1 ovigerous female (cl 20.8 mm, pcl 13.3 mm, cw 9.3 mm), S of Tanjong Boyongkareuceng, Indian Ocean, 7°42.912–43.255'S 107°36.559–37.234'E, 312–525 m, SJADES 2018 stn CP33, 29 March 2018; ZRC 2020.0036, 1 female (cl 26.4 mm, pcl 14.7 mm, cw 10.3 mm; with rhizocephalan), E of Tinjil Island, Indian Ocean, 6°57.221–56.664'S 105°54.754–55.315'E, 517–727 m, SJADES 2018 stn CP26, 28 March 2018; ZRC 2020.0037, 1 male (cl 21.1 mm, pcl 12.0 mm, cw 10.4 mm; with epicaridean), 1 female (cl 11.2 mm, cw 7.2 mm), S of Tanjong Gedeh, Java, Indian Ocean, 7°51.120–51.718'S 107°46.245–46.375'E, 637–689 m, SJADES 2018 stn CP48, 1 April 2018; ZRC 2020.0038, 5 males (cl 34.7, pcl 20.3 mm, cw 14.6 mm; cl 27.2 mm, pcl 17.0 mm, cw 11.6 mm; cl 25.6 mm, pcl 15.2 mm, cw 10.6 mm; cl 25.1 mm, pcl 15.8 mm, cw 10.8 mm; cl 22.6 mm, pcl 14.5 mm, cw 10.3 mm), 1 damaged male, 9 females (cl 26.7 mm, pcl 17.3 mm, cw 12.3 mm; cl 25.3 mm, pcl 17.4 mm, cw 12.2 mm; cl 22.5 mm, pcl 14.4 mm, cw 10.3 mm; cl 14.5 mm, pcl 9.0 mm, cw 6.5 mm; cl 8.9 mm, cw 5.4 mm), 3 females (cl 21.7 mm, pcl 15.0 mm, cw 13.3 mm; cl 23.2 mm, pcl 14.1 mm, cw 12.4 mm; cl 17.4 mm, pcl 11.4 mm, cw 9.7 mm; with epicaridean), 2 ovigerous females (cl 24.0 mm, pcl 16.5 mm, cw 11.6 mm; pcl 14.6 mm, cw 10.2 mm), S of Cilacap, Indian Ocean, 8°15.885–16.060'S 109°10.163–10.944'E, 528–637 m, SJADES 2018 stn CP39, 30 March 2018. **Seychelles:** USNM 41400, 1 male (pcl 18.1 mm, pcl 12.6 mm, cw 8.0 mm), 4°35'S 55°40'E, 62 m, Sealark expedition stn F7, RV *Sealark*, 20 October 1905. **Saya de Mahla Bank:** USNM 41399, 1 female (cl 27.5 mm, pcl 18.2 mm, cw 12.9 mm), 10°30'S 61°30'E, 229 m, Sealark expedition stn C5, RV *Sealark*, 4 September 1905. **Madagascar:** MNHN-IU-2016-6897, 1 juvenile female (cl 9.4 mm, pcl 6.8 mm, cw 4.4 mm), 12°22'S 46°25'E, 346–349 m, BIOMAGLO stn DW4788, 22 January 2017; ZRC 2011.1048, 1 male (pcl 13.5 mm, cw 9.2 mm), 1 ovigerous female (cl 23.3 mm, pcl 15.3 mm, cw 10.7 mm), 12°46'S 48°12'E, 355–380 m, MIRIKY 2009 stn CP3224, 2 July 2009; MNHN-IU-2016-9321, 1 juvenile male (cl 5.6 mm, pcl 4.0 mm, cw 2.4 mm), 12°58'S 45°15'E, 687–712 m, BIOMAGLO stn DW4866, 7 February 2017; MNHN IU-2011-5997, 1 ovigerous female (cl 23.9 mm, pcl 15.8 mm, cw 10.5 mm), 12°59'21.588"S 48°06'05.4"E, 495–509 m, MIRIKY 2009 stn DW3176, 25 June 2009. **Comores:** MNHN, 1 female (cl 26.5 mm, pcl 15.9 mm, cw 10.9 mm), W of Great Western Pass, Mayotte, 12°46'S 44°58'E, 475–510 m, BENTHEDI BENT-61F, 29 Mar 1977. **Mozambique Channel:** MNHN-IU-2011-5989, 3 males (pcl 15.1 mm, cw 10.2 mm to pcl 24.3 mm, cw 15.7 mm), 2 ovigerous females (pcl 14.9 mm, cw 10.7 mm; pcl 28.3 mm, cw 16.2 mm), 19°34.98'S 36°47.71'E, 636 m, MAINBAZA stn CC3154, 13 April 2009; ZRC 2011.1050, 2 males (cl +22.0 mm, pcl 14.8 mm, cw 10.0 mm, cl 19.8 mm, pcl 13.4 mm, cw 8.9 mm), 2 ovigerous females (pcl 18.1 mm, cw 12.1 mm; pcl 15.4 mm, cw 10.3 mm), 19°36'S 36°47'E, 636 m, MAINBAZA 2009 stn CC3154, 13 April 2009; MNHN-IU-2017-8772, 1 juvenile female (cl 9.2 mm, pcl 6.5 mm, cw 4.3 mm), 23°59'S 35°39'E, 206–210 m, MAINBAZA stn CC3160, 15 April 2009.

**Diagnosis.** Carapace with at least 20 slender, sharp, upright dorsal spines (paired preorbital; paired hepatic; 6 gastric; 1 median cardiac; 1 median intestinal; on each side, 4 pairs branchial); hepatic spine ovate to circular in cross-section, lateral surface rounded. G1 distal margin oblique, straight to irregularly gently sinuous.

**Description (specimens > 10 mm pcl).** Carapace pyriform, pcl 1.4–1.6× width, regions weakly defined, entire surface with tomentum of short lobular setae. Pseudorostral spines usually strongly divergent for entire length (occasionally weakly divergent), straight to outwardly curved (in dorsal view), straight to curved but slightly upcurved in lateral view; length 0.4–0.8 × pcl; margins lined with short, soft, lobular setae and scattered simple setae. Dorsal orbital eave weakly expanded, produced as a long, slender upright spine, inclined anteriorly and usually slightly incurved; postorbital lobe short, anteriorly cupped; hiatus wide, U-shaped. Dorsal surface with long, slender, upright spines in following pattern: straight, near vertical hepatic spine, ovate to circular in cross-section, with lateral surface rounded; gastric region with 6 slender upright spines (2 in midline; paired epigastric and protogastric spines) and usually with two shorter spines or tubercles in transverse row between anterior and posterior median spines; cardiac and intestinal regions each with straight, upright spine; branchial regions each with 4 straight, upright, spines, 2 near lateral carapace margin and directed laterodorsally, 2 on upper surface, almost vertical. Pterygostomian region with 3 or 4 tubercles in longitudinal row below moult suture, followed by tubercle on anterior branchial submargin slightly below moult suture.

Eyestalks short, sparsely setose anteriorly, cornea terminal. Basal antennal article length about twice width; surface shallowly sulcate longitudinally; anterolateral angle blunt, weakly produced to small spine, visible in dorsal view; lateral margin lateral margin concave, not expanded under eyestalk; prominent tubercle situated between antennal gland and margin of ventral orbital hiatus.

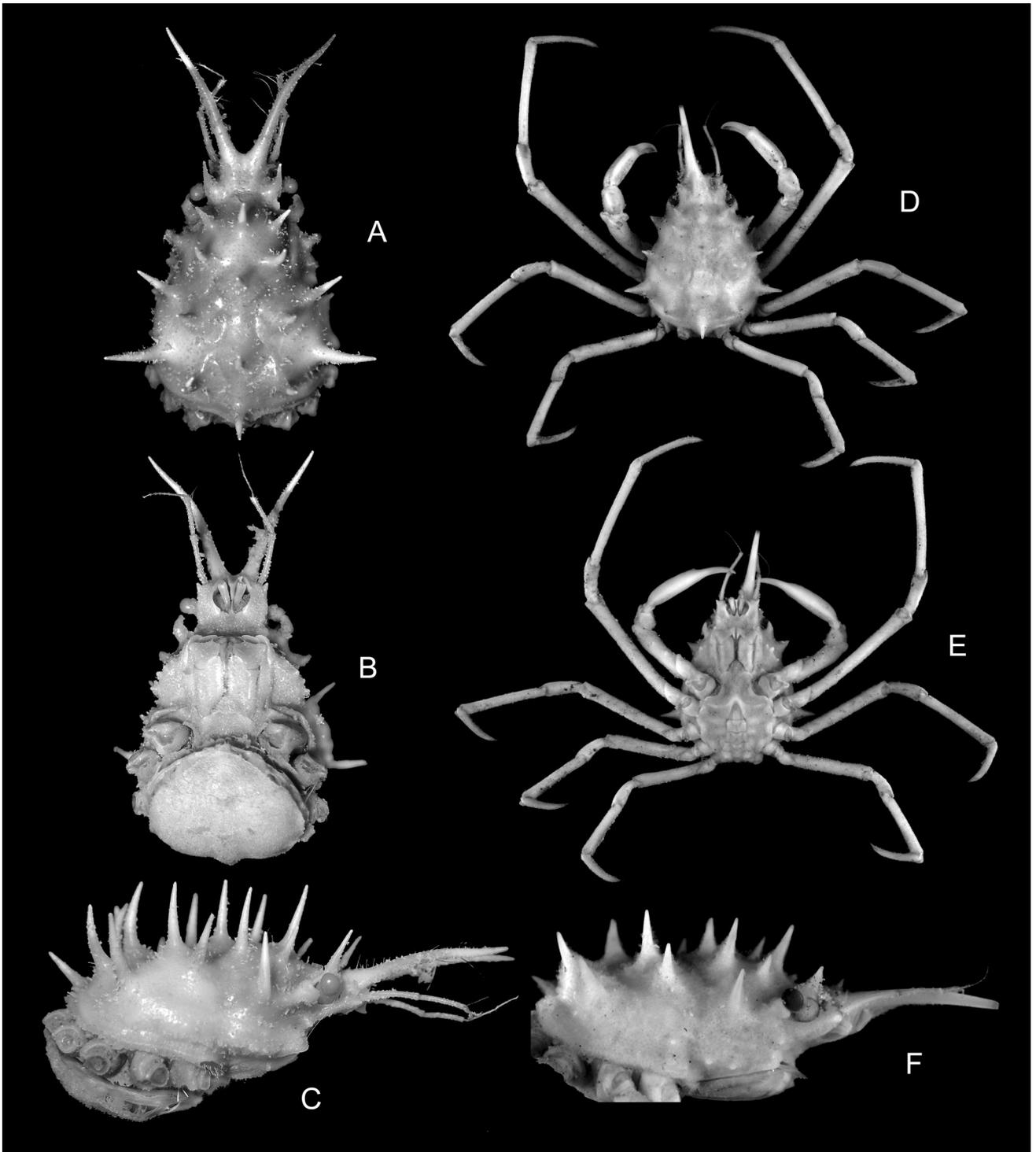
Maxilliped 3 unarmed, merus subtriangular, anterolateral angle weakly produced, apex rounded, slightly wider than ischium; ischium subquadrate, outer surface with shallow longitudinal depression.

Cheliped (pereopod 1) length 1.1–2.0 (usually > 1.4) × pcl (male), 0.7–1.3 × pcl (female); merus slightly shorter than propodus, extensor margin with proximal tubercle and small distal spine, flexor margin with 2 or 3 low, widely spaced tubercles; carpus shorter than dactylus, unarmed, although large adult males with dorsal and mesial ridge; propodus smooth, laterally compressed, dorsally cristate and more robust in adult males, palm length 2.0–3.1 (usually > 2.4) × height (male), 2.2–3.3 (usually > 2.6) × height (female); dactylus and pollex equal, length 0.6–0.9 × palm length (male), 0.7–0.9 × palm length (female); occlusal margins crenulate, proximal gape slight in males, absent in females.

Ambulatory legs (P2–5) slender, subcylindrical in cross-section, sparsely covered with short simple setae and short, club-like setae; merus extensor margin with short distal spine, sometimes indistinct on P5; dactyli unarmed, covered with short setae, apex corneous. Pereopod 2 length 2.0–3.4 × pcl (usually > 2.6) (male), 1.9–2.6 (usually < 2.4) × pcl (female); merus 0.8–1.3 (usually ≥ 1.0) (male), 0.7–1.0 (usually < 0.9) (female). Pereopod 5 length 1.4–1.9 (usually > 1.6) × pcl (male), 0.9–1.6 (usually < 1.5) × pcl (female); merus 0.5–0.7 (usually 0.6) × pcl (male), 0.4–0.6 (usually < 0.5) × pcl (female).

Pleon with 6 free somites and telson, unarmed; widest at somites 2 and 3 in males, at somites 5 and 6 in females; surface covered with short bulbous setae. Male telson triangular, as long as wide, margins straight, apex rounded.

G1 straight, flattened; distally expanded, distolaterally

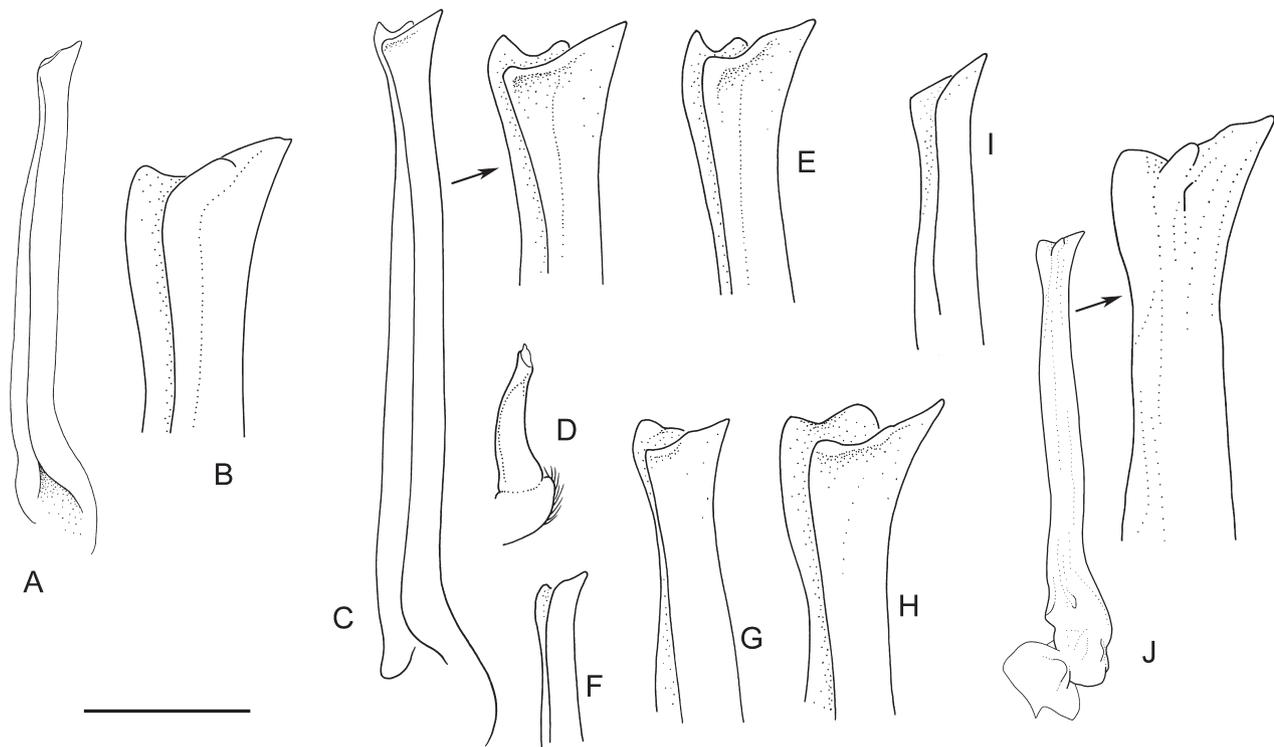


**Figure 6.** *Samadinia livermorii* (Wood-Mason in Wood-Mason & Alcock, 1891): A–C, ovigerous female (cl 18.1 mm, pcl 12.3 mm, cw 8.0 mm), Andaman Sea, NHM 1896.5.14.7; D–F, male (pcl 13.5 mm, cw 9.2 mm), Madagascar, ZRC 2011.1048. (A) dorsal habitus; (B, E) ventral cephalothorax and pleon; (D) habitus; (C, F) carapace, right lateral view.

produced to acute triangular point, distomesially bluntly approximately right-angled; distal margin oblique, straight to irregularly gently sinuous. G2 simple, about  $\frac{1}{4}$  length of G1; endopod absent.

**Colour in life.** Carapace off-white to whitish-orange dorsally, anterior margins and rostral spines orange or pink; chelipeds and ambulatory legs pink. (Fig. 5C, D).

**Remarks.** Comparison of specimens from across the wide putative range of *S. pulchra*, including the *Investigator* specimen from the Andaman Sea, shows that specimens from the Western Indian Ocean to the Andaman Sea and southwestern Indonesia are not referable to *S. pulchra* sensu stricto, but to *S. livermorii*, according with recognition of both species as separate by Richer de Forges *et al.* (2021) in anticipation of present results. Other eastern Indian



**Figure 7.** G1 (A–C, E–I) and G2 (D), left pleonal view. *Samadinia pulchra* (Miers in Tizard, Moseley, Buchanan & Murray, 1885): (A) holotype, pcl 19.3 mm, Philippines, NHM 1884.31; (B) male (pcl 17.3 mm, cw 11.6 mm), South China Sea, ZRC 1968.2.13.4. *Samadinia jimlowryi* sp. nov.: (C–D) male holotype (pcl 32.7 mm, cw 22.3 mm), NMV J58025; (E) male (pcl 15.9 mm, cw 10.1 mm), Bali, AM P.34657; (F–H) male (pcl 12.3 mm, cw 7.9 mm), male (pcl 20.6 mm, cw 13.6 mm), male (pcl 38.5 mm, cw 26.3 mm), MNHN B29100. *Samadinia livermorii* (Wood-Mason in Wood-Mason & Alcock, 1891): (I) male (pcl 15.1 mm, cw 10.2 mm), Madagascar, MNHN IU-2011-5989; (J) male (pcl 20.3 mm, cw 14.6 mm), Indonesia, ZRC 2020.0038. Scale bars: A, C, D, J = 2.0 mm; B, F–I = 1.0 mm, E = 0.5 mm.

Ocean records attributed to *S. pulchra* (i.e., Australia and southeastern Indonesia) are based on *S. jimlowryi* sp. nov., described herein.

*Samadinia livermorii* was described based on a male and two females from the Andaman Sea between North Sentinel Island and South Sentinel Island (RIMSS *Investigator* stn 56, 220–240 fms) and has long been considered a synonym of *S. pulchra*. Unfortunately, the fate of the type material of *S. livermorii* is currently not known: the specimens ought to be in the Zoological Survey of India, Calcutta, but they could not be found despite extensive searches (S. Mitra, pers. com.). Neither are they in the collections of the Natural History Museum (London), Smithsonian Institution (Washington DC) nor the Australian Museum (Sydney), where many specimens from the *Investigator* expeditions are now deposited. Thus, the type material of *S. livermorii* appears to be lost. Nevertheless, a non-type specimen of *S. livermorii* from the Andaman Sea collected by the *Investigator* (female, pcl 12.3 mm, NHM 1896.5.14.7) anchors our identification of the western Indonesian and western Indian Ocean specimens as *S. livermorii*.

Among the three species of the *S. pulchra* complex, *S. livermorii* morphologically resembles *S. pulchra* in the straight or slightly uneven distal margin of the adult G1 (Fig. 7A, B, I, J) (versus bilobate in *S. jimlowryi*; Fig. 7C, H) and in having typically straight, upright dorsal carapace spines (Fig. 6C, F) (versus anteriorly curved spines in *S. jimlowryi*; Fig. 4A–C, F, H). *Samadinia livermorii* differs from both

*S. jimlowryi* and *S. pulchra* in having a rounded rather than flattened outer surface of the hepatic spine (Fig. 6C, F versus Fig. 2D, 4C). The length of the carapace spines is subject to allometry and individual variation, but the longest carapace spine in adult *S. livermorii* and *S. pulchra* is  $0.2 \times$  pcl, compared to  $0.5 \times$  pcl in *S. jimlowryi*.

Specimens of *S. livermorii* examined are similar throughout the range, although females from the eastern Indian Ocean might mature at a smaller size than those from the west. Eastern specimens are mature by pcl 12–13 mm, with the smallest ovigerous female at pcl 12.3 mm (NHM 1896.5.14.7) compared to pcl 14.9 mm (ZRC 2011.1050) for western Indian Ocean specimens. In other respects, the eastern and western Indian Ocean specimens agree well and so are considered conspecific. Despite the good collections of *S. livermorii* from the western and eastern Indian Ocean, none are yet known from intermediate localities, almost certainly an artefact of limited sampling at outer shelf and slope depths in the Indian region. Only in recent years have efforts to document the Indian deep-water crustacean fauna accelerated (e.g., Ah Yong & Kumar, 2018; Devi *et al.*, 2019; Ng *et al.*, 2019; Macpherson *et al.*, 2020; Padate *et al.*, 2020, 2021, 2022), so it is likely that *S. livermorii* will eventually be found there. All known specimens of *S. livermorii* are from Indian Ocean localities.

**Distribution.** East Africa to the Andaman Sea and southwestern Indonesia (Fig. 1); 62–1027 m (usually 400–500 m).

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