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Deep-sea spider crabs of the families Epialtidae MacLeay, 1838 and Inachidae MacLeay, 1838, from the South China Sea, with descriptions of two new species (Decapoda, Brachyura, Majoidea)

Bee Yan LEE [1,4,*], Bertrand RICHER DE FORGES [2] & Peter K.L. NG [3]

[1] Department of Biological Sciences, National University of Singapore, Block S3 Level 2, 14 Science Drive 4, Singapore 117543, Republic of Singapore.
[2] 5 Rue Félix Franchette, 98800, Nouméa, New Caledonia.
[3] Lee Kong Chian Natural History Museum, National University of Singapore, 2 Conservatory Drive, Singapore 117377.
[4] Tropical Marine Science Institute, National University of Singapore, 18 Kent Ridge Road, Singapore 119227, Republic of Singapore.

[*] Corresponding author: beeyan06@gmail.com
[2] Email: b.richerdeforges@gmail.com
[3] Email: peterng@nus.edu.sg

[1] urn:lsid:zoobank.org:author:DAA24DD7-C2FC-459A-B590-3C247126C127
[2] urn:lsid:zoobank.org:author:419F01B9-7B2F-43F5-9196-5CFCBD512711
[3] urn:lsid:zoobank.org:author:8ACB5B5C-7DC3-43A7-82E4-420AD0FF7377

Abstract. Recent expeditions (NANHAI 2014, DONGSHA 2014 and ZHONGSHA 2015) conducted in deep waters of the South China Sea obtained interesting material of various spider crabs (Majoidea) including several new records for the area, and two new species of epialtids of the genera *Oxypleurodon* Miers, 1885 and *Stegopleurodon* Richer de Forges & Ng, 2009. Two poorly known species, previously only known from their types, *Rochinia strangeri* Serène & Lohavanijaya, 1973 and *R. kagoshimensis* (Rathbun, 1932) comb. nov., are redescribed, refigured, and their taxonomy discussed.

Keywords. Deep South China Sea, Epialtidae, Inachidae, taxonomy, new species.

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Introduction

There have been a number of reports on the brachyuran crab fauna in and around the deep waters of the South China Sea (SCS), notably by Gordon (1930, 1931), Serène & Lohavanijaya (1973), Chen (1980, 1998), Chen & Xu (1991), Ng & Huang (1997), Chen & Ng (1999a, b), Ho & Ng (1999), Ng & Chen (1999, 2004, 2005), Ng (2000), Ng *et al.* (2001), Ho *et al.* (2004) and Lee *et al.* (2015).

However, the diversity in this large area remains poorly understood. We here report on the material collected from three recent expeditions (NANHAI 2014, DONGSHA 2014 and ZHONGSHA 2015), which add two new species of epialtid crabs, one in the genus *Oxypleurodon* Miers, 1886 and another in *Stegopleurodon* Richer de Forges & Ng, 2009, to the fauna of the SCS. The re-descriptions of two poorly known species*, Rochinia strangeri* Serène & Lohavanijaya, 1973 and *Rochinia kagoshimensis* (Rathbun, 1932) comb. nov., are also included based on fresh material as well as the types.

The four island groups within the SCS – Macclesfield Bank (also known as Zhongsha Islands), Pratas Islands (also known as Dongsha or Tungsha Islands), Spratly Islands (also known as Nansha Islands) and Paracel Islands (also known as Xisha Islands) – are known by several different names. This reflects the complex history of the islands in a dynamic geopolitical situation with uncertainties regarding their ownership. For convenience and in the context of the actual expeditions conducted, the names as used by the collectors will be followed.

Material and methods

Specimens examined are deposited in: National Taiwan Ocean University (NTOU), Keelung, Taiwan; Zoological Reference Collection (ZRC), Lee Kong Chian Natural History Museum (previously known as the Raffles Museum of Biodiversity Research), National University of Singapore (NUS), Singapore; National Museum of Natural History (USNM), Smithsonian Institution, Washington D.C., USA; Senckenberg Museum Frankfurt (SMF), Frankfurt, Germany and Muséum national d'Histoire naturelle (MNHN), Paris, France.

Measurements provided, in millimetres, are of maximum carapace length (excluding pseudorostral spines) and maximum carapace width (measured across the base of the lateral spine). The following abbreviations are used:

G1 = male first gonopod
P2 and P4 = second and fourth walking legs respectively
stn = station
SCS = South China Sea

Results

Infraorder Brachyura Latreille, 1802
Superfamily Majoidea Samouelle, 1819
Family Epialtidae Macleay, 1838
Subfamily Pisinae Dana, 1851

Genus ***Goniopugettia*** Sakai, 1986

Remarks

There are currently two species in this genus, of which *Goniopugettia tanakae* Sakai, 1986, is the type species (subsequent designation by Ng *et al.* 2008: 103). Little is known of the type species, *Goniopugettia tanakae*, and the original description is brief, in Japanese (see Sakai 1986: 2), and with only a single figure (Sakai 1986: frontispiece fig. 3). Moreover, this species has not been reported again since its description. There is a need to examine the type material of Sakai (1986) to re-define the genus and type species more accurately.

Goniopugettia sagamiensis (Gordon, 1930)
Fig. 1A–B

Pugettia brevirostris Parisi, 1915: 287–289, text-fig. 2, pl. 7 fig.1 [not *Hyastenus brevirostris* Doflein, 1906 = *Rochina brevirostris* (Doflein, 1904)].
Pugettia sagamiensis Gordon, 1930: 520 (list), 521 (type locality: Sagami Bay, Japan).

Pugettia sagamiensis – Gordon 1931: 557, 558, text-figs 35, 36c. — Sakai 1935: 87, 88, fig. 36; 1938: 253 (key), 253–254, pl. 25 fig. 3; 1965: 73, 74, pl. 33 fig. 2; 1976: 194 (key), 195, pl. 69 fig. 2. — Takeda 1982: 120, un-numbered text-fig. — Miyake 1983: 36, pl. 12 fig. 4. — Baba *et al.* 1986: 225, 313, pl. 169. — Ikeda 1998: 34, pl. 36.
Rochinia sagamiensis – Griffin & Tranter 1986a: 176 (key), 187, fig. 62g–h. — Takeda 1997: 242, pl. 1 fig. E; 2001: 242, 251 (table), 255 (table), 259 (table). — Takeda & Kubodera 1998: 217–218. — Huang & Hsueh 1998: 224, fig. 1E–H.
Goniopugettia sagamiensis – Sakai 1986: 1, frontispiece fig. 4, pl. 1 figs 1–6. — Miyake 1991: 36, pl. 12 fig. 4. — Ng *et al.* 2001: 13. — Ng *et al.* 2008: 103 (list). — Wang *et al.* 2013: 513 (table).

Material examined

SOUTH CHINA SEA: 1 ♀ (41.8 × 30.1 mm) (ZRC 2016.0064), Dongsha, stn CP4120, 22°12.98′ N, 120°24.69′ E to 22°13.11′ N, 120°22.53′ E, 327–372 m, coll. DONGSHA 2014 Expedition, 29 Apr. 2014.

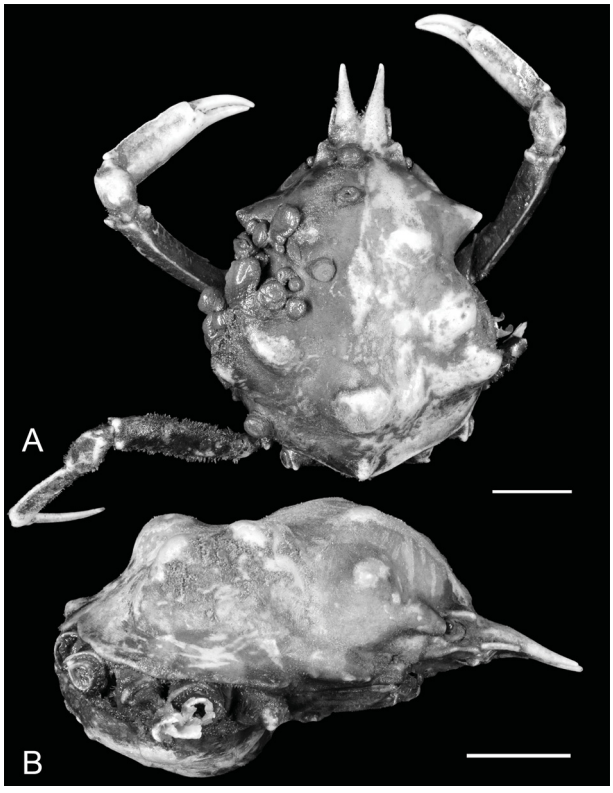

Fig. 1. *Goniopugettia sagamiensis* (Gordon, 1930), ♀ (41.8 × 30.1 mm) (ZRC 2016.0064), South China Sea with carapace half cleaned, left side of carapace with zootharian attached. **A**. Overall dorsal view. **B**. Lateral view of carapace. Scale bars = 10 mm.

Remarks

The species was first briefly described as *Pugettia sagamiensis* by Gordon (1930), followed by a more detailed description by Gordon (1931). This species was transferred to *Goniopugettia* by Sakai (1986). In the same year, however, Griffin & Tranter published a large revision on all the Indo-West Pacific Majoidea and placed this species in *Rochinia* (Griffin & Tranter 1986a: 187). Ng *et al*. (2001) was the next to recognise *Goniopugettia* and used this name for the Taiwanese material.

Distribution

This species is known from Japan (Sakai 1965; 1986) and Taiwan (Ng *et al*. 2001; Wang *et al*. 2013). The specimen caught during the DONGSHA cruise within the South China Sea is the most southern known record.

Genus ***Naxioides*** A. Milne-Edwards, 1865

Remarks

Ten species have been described in the genus *Naxioides* A. Milne-Edwards, 1865 (Poupin 1995; Ng *et al.* 2008: 104).

Naxioides robillardi (Miers, 1882)
Fig. 13A

Naxia (*Naxioides*) *robillardi* Miers, 1882: 339–341, pl. 20 fig. 1 (type locality: Mauritius).
Hyastenus elegans Miers, 1886: 26 (list), 40 (list), 44 (list), 58–59, pl. 6 fig. 3.
Naxia mammillata Ortmann, 1893: 56, pl. 3 fig. 7 (type locality: Kagoshima, Japan).

Naxioides robillardi – Balss 1929: 14 (list). — Griffin 1974: 21–22. — Griffin & Tranter 1986a: 169 (key), 171. — Poupin 1995: 86–96, 105 (key), figs 7, 8a–b, 9a–b. — Takeda & Komatsu 2005: 278. — Ng *et al.* 2008: 104 (list). — Richer de Forges & Ng 2013: 479 (list).
Naxioides mamillata – Rathbun 1911: 194 (list), 253. — Balss 1929: 14 (list). — Sakai 1938: 268–270, pl. 27 fig. 1; 1965: 78, pl. 35 fig. 1. — Serène & Lohavanijaya 1973: 52, figs 98–103, pl. 9C–D. — Takeda 1982: 124, un-numbered text-fig.
?*Naxioides robillardi* – Guinot & Richer de Forges 1986: 149–150, pl. 11 figs A–D.

(For complete synonymy, see Poupin 1995: 89).

Material examined

SOUTH CHINA SEA: 1 ♂ (39.2 × 24.5 mm) (ZRC 2016.0065), northwest of Dongsha, stn CP4159, 20°45.92′ N, 116°41.11′ E to 20°47.62′ N, 116°42.34′ E, 221–190 m, coll. ZHONGSHA 2015 Expedition, 30 Jul. 2015.

Remarks

Poupin (1995) provided a detailed review of *Naxioides mammillata* Ortmann, 1893 (type locality Japan), under which he synonymised with *N. robillardi* (Miers, 1882) (type locality Mauritius). On the basis of a large series of specimens from the Indian and Pacific Oceans, Poupin (1995) observed that there was too much variation in the carapace armature to recognise both as separate species. Poupin's (1995) arguments in synonymising the two taxa are followed in this study.

Distribution

This species was recorded from Mauritius (Miers 1882), Japan (Ortmann 1893), the Indian and Pacific Oceans (Poupin 1995) and South China Sea (Serène & Lohavanijaya 1973).

Genus ***Oxypleurodon*** Miers, 1885

Remarks

There are currently 30 recognised species within this genus (Richer de Forges & Ng 2009a, b; Richer de Forges 2010; Richer de Forges & Corbari 2012; Lee *et al*. 2015). The type species of this genus is *Oxypleurodon stimpsoni* Miers, 1885, by monotypy. With the description of another new species from the SCS, there are now 31 species in *Oxypleurodon*.

Oxypleurodon stimpsoni Miers, 1885
Figs 2A–C, 3A–C, 13B

Oxypleurodon stimpsoni Miers, 1885: 588 (type locality: Ki Islands, Banda Sea, Indonesia).

Oxypleurodon stimpsoni – Miers 1886: 26 (list), 29 (list), 38–39, pl. 6 fig. 1a–b. — Ho *et al.* 2004: 648, fig. 3E. — Ng *et al.* 2008: 105 (list). — Richer de Forges & Ng 2009b: 248 (table), 251, 253, fig. 7A. — Froglia & Clark 2011: 51. — Lee *et al.* 2015: 1257, fig. 1A.

Sphenocarcinus stimpsoni – Takeda 1982: 121, un-numbered text-fig. — Guinot & Richer de Forges 1986: 135 (key), 136, figs 19C–D, 21A–B, pl. 8 figs G–I.

(For complete synonymy, see Richer de Forges & Ng 2009b: 251.)

Material examined

SOUTH CHINA SEA: 1 ♂ (14.0 × 9.0 mm) [photographed] (ZRC 2016.0072), 1 ♂ (10.5 × 7.1 mm), 1 ♀ (13.3 × 9.3 mm), 1 ovigerous ♀ (14.2 × 9.5 mm) (ZRC 2016.0071), 1 ♀ (9.0 × 5.5 mm), 1 ovigerous ♀ (NTOU), 1 ♀ (11.8 × 7.7 mm), 1 ovigerous ♀ (11. 8 × 7.6 mm) (MNHN-IU-2016-175), continental slope, Dongsha, stn CP4135, 19°58.42′ N, 114°32.93′ E to 19°58.94′ N, 114°37.70′ E, 211–218 m, coll. ZHONGSHA 2015 Expedition, 23 Jul. 2015; 1 ovigerous ♀ (11.0 × 6.9 mm) (ZRC 2016.0073), west of Zhongsha, seamount, stn CP4151, 16°04.72′ N, 113°55.09′ E to 16°02.58′ N, 113°53.93′ E, coll. ZHONGSHA 2015 Expedition, 27 Jul. 2015.

INDONESIA: 1 ♂ (14.0 × 9.0 mm) (AM P.34658), Kai Island, stn 46, 5°47.20′ S, 132°13′ E, 300 m, coll. Danish Kai Islands Expedition, 2 May 1922.

PHILIPPINES: 1 ♂ (14.9 × 10.2 mm), 1 ♀ with *Sacculina* (15.5 × 10.4 mm), 1 ♀ (14.0 × 9.2 mm) (ZRC 2011.0056), northwest coast of Panglao Island, 146–549 m, coll. J. Arbasto, Jan.–Mar. 2011; 2 ♂♂ (13.4 × 8.8 mm, 11.6 × 7.9 mm), 1 ♂ with *Sacculina* (15.7 × 10.5 mm), 1 ♀ with *Sacculina* (11.5 × 8.1 mm) (ZRC 2013.0761), Bohol, off Panglao Island, Balicasag Island, P.K.L. Ng *et al.* leg., 25–30 Jul. 2003.

Remarks

Oxypleurodon stimpsoni Miers, 1885, is the type species of the genus. Miers (1885) first mentioned the species in a narrative, followed by a detailed description and figures of the species based on material in the "*Challenger*" expedition, collected from Indonesia and the Philippines in 1886. The first description of the genus and species by Miers (1885) was not known to Tavares (1991), when he revised the genus (Froglia & Clark 2011: 51). Specimens from Indonesia were measured and figured by Miers (1886: 39, pl. 6 fig. 1). This species appears to be common in the depth range of 250 to 580 m in the tropical West Pacific and Indo-Malayan archipelago. The specimens examined from the South China Sea (SCS) have dorsal plates on carapace with rounded angles, and the articles of the ambulatory legs are cylindrical and slightly carinate (Figs 2C, 3C). The large series of specimens from Balicasag Island, the Philippines,

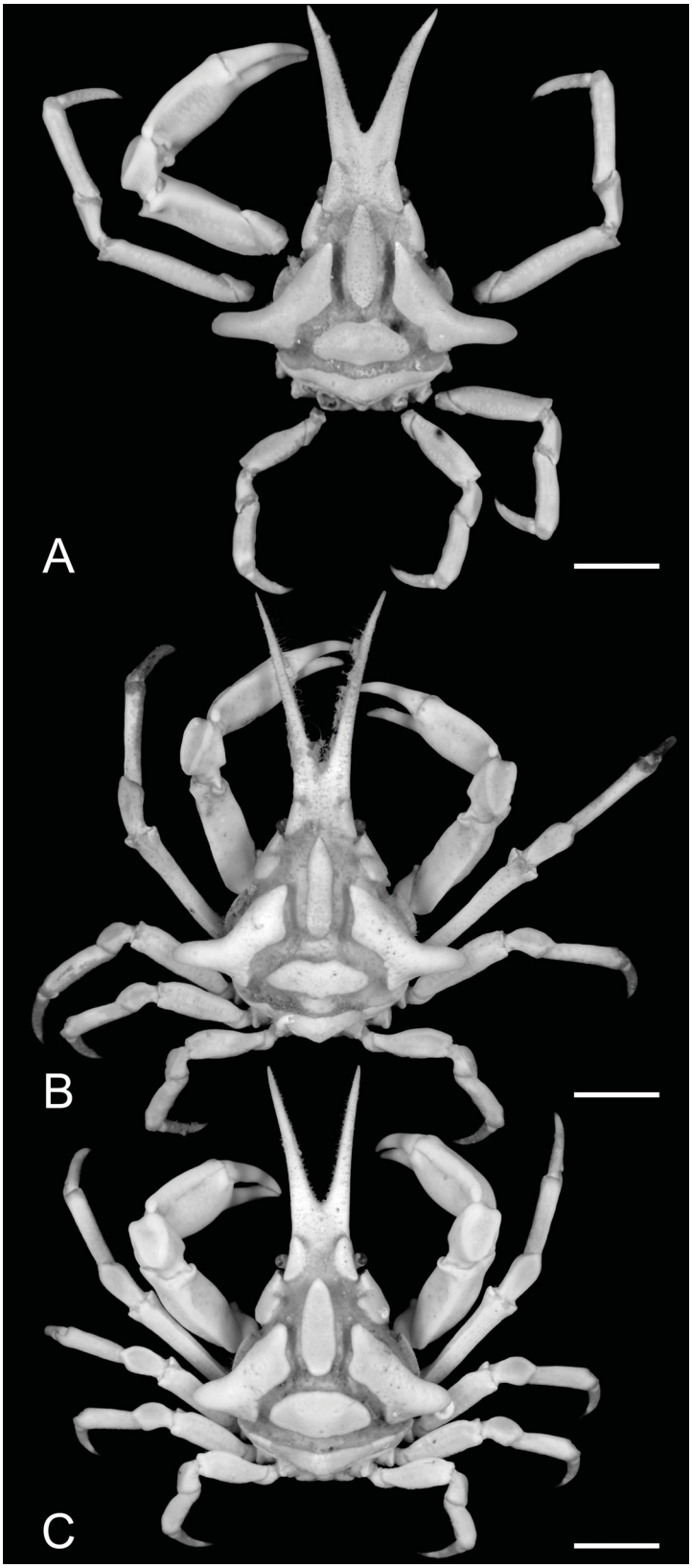

Fig. 2. *Oxypleurodon stimpsoni* Miers, 1885, overall dorsal view. **A**. ♂ (14.0 × 9.0 mm) (AM P34658), Indonesia. **B**. ♂ (14.9 × 10.2 mm) (ZRC 2011.0056), Philippines. **C**. ♂ (with *Sacculina*, 14.0 × 9.0 mm) (ZRC 2016.0072), South China Sea. Scale bar = 5 mm.

differ from the SCS material in several features: the pseudorostral spines are relatively more divergent; the angles of the plates (especially the gastric plate) are sharper; and the articles of the ambulatory legs are more distinctly carinate (Figs 2B, 3B). Interestingly, the morphology of the only specimen collected by the AURORA cruise on the east coast of Luzon is closer to the SCS material than those from the Bohol Sea. With regards to the specimen from the Kai Islands in Indonesia, which is closer to the type locality, the dorsal plates look relatively more inflated and the branchial plates are more elongated (Figs 2A, 3A) compared to the SCS specimens (Figs 2C, 3C); and the meri of the ambulatory legs are also weakly carinate. The variation observed here is difficult to explain and suggests that we are dealing with a species-complex. To resolve this matter, all the available specimens from across its wide range

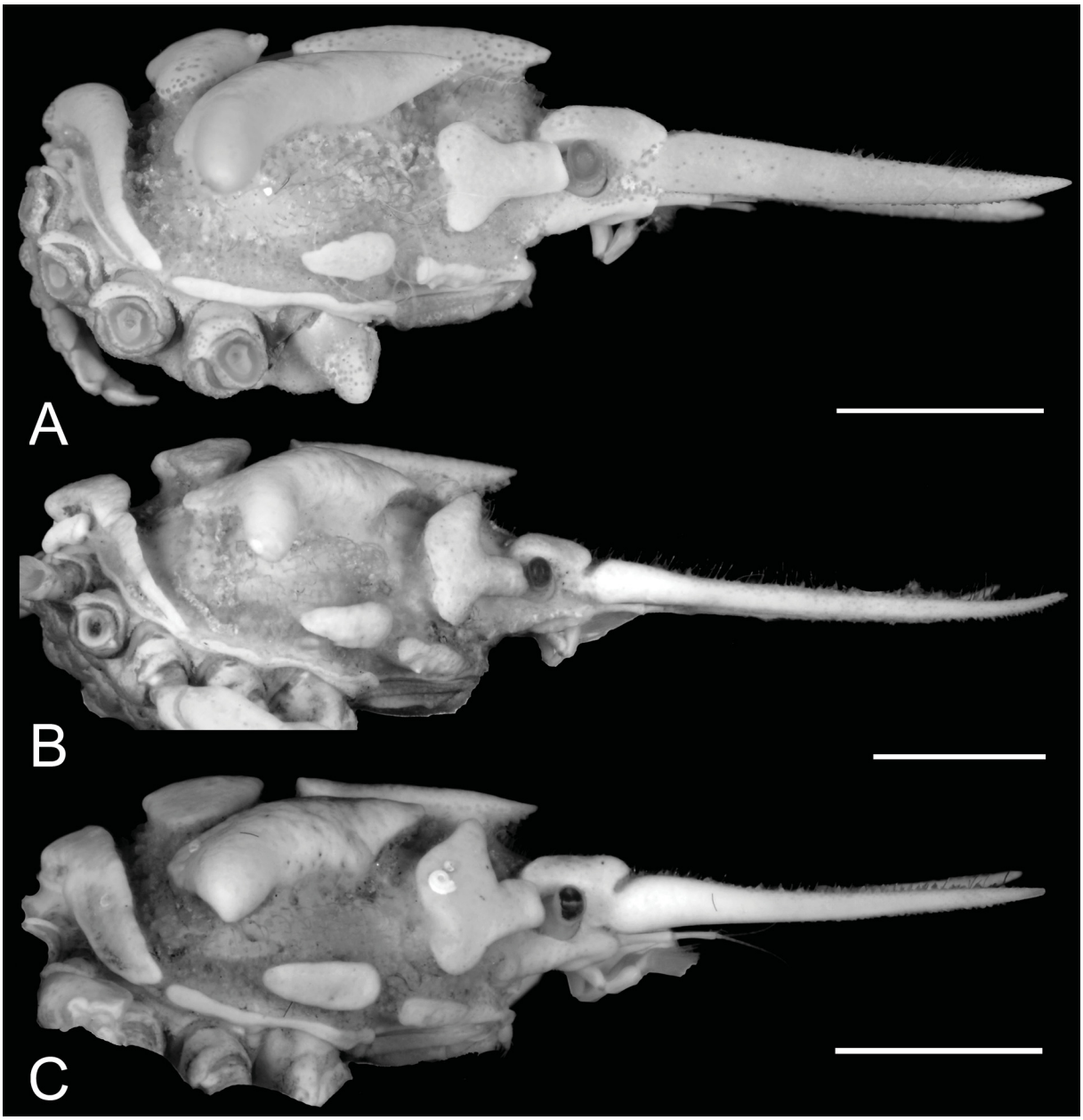

Fig. 3. *Oxypleurodon stimpsoni* Miers, 1885, lateral view of carapace. **A**. ♂ (14.0 × 9.0 mm) (AM P34658), Indonesia. **B**. ♂ (14.9 × 10.2 mm) (ZRC 2011.0056), Philippines. **C**. ♂ (14.0 × 9.0 mm) (ZRC 2016.0072), South China Sea. Scale bars = 5 mm.

(including the types) will need to be examined. At present, only one species is recognised, *O. stimpsoni sensu lato*.

Distribution

This species was recorded from Indonesia (Miers 1885), the Philippines (Miers 1886; Richer de Forges & Ng 2009), Japan (Sakai 1938) and South China Sea (Lee *et al.* 2015).

Oxypleurodon auritum (Rathbun, 1916)
Fig. 13C

Sphenocarcinus auritus Rathbun, 1916: 527 (list), 540–541 (type locality: east coast of Luzon, Atalaya Point, Batag Island, the Philippines).

Sphenocarcinus auritus – Griffin 1976: 211, fig. 10b. — Takeda 1982: 123, un-numbered text-fig. — Guinot & Richer de Forges 1986: 135 (key).
Oxypleurodon auritum – Ng *et al*. 2008: 104 (list). — Richer de Forges & Ng 2009b: 248 (table), 251 (list), 253, figs 2C, 3B, 5A, 10E, F. — Lee *et al*. 2015: 1257, 1258, fig. 1B.

(For the complete synonymy, see Richer de Forges & Ng 2009b: 253.)

Material examined

SOUTH CHINA SEA: 1 ♂ (16.7 × 11.1 mm) [photographed] (ZRC 2016.0066), 2 ♂♂ (14.5 × 9.4 mm, 13.8 × 8.9 mm), 2 ♀♀ (11.5 × 7.5 mm, 11.3 × 7.3 mm), 2 ovigerous ♀♀ (11.3 × 7.6 mm, 10.9 × 7.7 mm), (ZRC 2016.0069), northeast of Zhongsha, 16°13.60′ N, 115°01.61′ E to 16°11.21′ N, 114°59.77′ E, stn CP4155, 526–510 m, coll. ZHONGSHA 2015 Expedition, 28 Jul. 2015; 1 ♂ (12.5 × 7.7 mm) [photographed] (ZRC 2016.0068), 1 ♂ (14.0 × 9.1 mm) [photographed] (ZRC 2016.0070), 1 ♂ (11.0 × 7.1 mm), 1 ♀ (8.0 × 5.2 mm), 3 ovigerous ♀♀ (13.0 × 8.6 mm, 10.6 × 7.5 mm, 10.2 × 6.5 mm) (ZRC 2016.0067), 2 ♂♂ (11.2 × 7.1 mm, 10.3 × 6.6 mm), 1 ♀ (9.0 × 6.0 mm), 1 ovigerous ♀ (10.3 × 6.9 mm) (MNHN-IU-2016-176), 2 ♂♂ (12.5 × 8.3 mm, 10.0 × 6.4 mm), 1 ♀ (11.0 × 7.1 mm), 1 ovigerous ♀ (11.2 × 7.3 mm) (NTOU), northeast of Zhongsha, stn CP4156, 511–510 m, 16°09.80′ N, 114°58.73′ E to 16°12.19′ N, 115°00.53′ E, coll. ZHONGSHA 2015 Expedition, 28 Jul. 2015.

Remarks

Oxypleurodon auritum was described from the east coast of Luzon, the Philippines (Rathbun, 1916), and has also been reported from Tosa Bay, Japan (Takeda & Nagai 1979; Lee *et al*. 2015). Richer de Forges & Ng (2009b) referred specimens from the Bohol Sea, with a similar "mushroom-shaped" cardiac plate to a new species, *O. boholense* Richer de Forges & Ng, 2009. Two other species with similar cardiac plates, *O. barazeri* Richer de Forges & Ng, 2009b, from the Solomon Islands and *O. christiani* Richer de Forges & Corbari, 2012 from Papua New Guinea, were recently described (Richer de Forges & Ng 2009b; Richer de Forges & Corbari 2012).

The present specimens from the SCS are clearly conspecific with *O. auritum* as presently defined. The previous record of *O. auritum* from the SCS by Lee *et al*. (2015) was based on one specimen from the NANHAI 2014 expedition; the recent surveys collected more material. The live colours of this species were documented by Richer de Forges & Ng (2009b) and Lee *et al*. (2015).

Distribution

This species was recorded from the Philippines (Rathbun 1916), Japan (Takeda & Nagai 1979) and South China Sea (Lee *et al.* 2015).

Oxypleurodon forte Lee, Corbari & Richer de Forges, 2015
Fig. 13D

Oxypleurodon forte Lee, Corbari & Richer de Forges, 2015: 1258–1262, figs 2–4 (type locality: South China Sea).

Material examined

SOUTH CHINA SEA: 1 ♂ (12.9 × 7.7 mm) [photographed] (ZRC 2016.0075), 2 ♂♂ (17.7 × 11.9 mm, 10.7 × 6.6 mm), 1 ♀ (10.1 × 6.5 mm) (ZRC 2016.0076), 1 ♂ (11.6 × 7.3 mm), 1 ♀ (13.1 × 8.7 mm) (MNHN-IU-2016-177), west of Zhongsha, stn CP4152, 16°01.55′ N, 113°53.35′ E to 16°04.72′ N, 113°55.11′ E, 412–410 m, coll. ZHONGSHA 2015 Expedition, 27 Jul. 2015; 1 ♂ (13.3 × 8.2 mm), 1 ovigerous ♀ (13.2 × 8.1 mm) (ZRC 2016.0077), north of Dongsha, stn DW4158, 21°06.76′ N, 116°44.64′ E to 21°04.88′ N, 116°44.23′ E, 325–310 m, coll. ZHONGSHA 2015 Expedition, 30 Jul. 2015; 1 ♂ (14.2 × 9.1 mm) [photographed] (ZRC 2016.0078), west of Zhongsha, stn CP4151, 16°04.72′ N, 113°55.09′ E to 16°02.58′ N, 113°53.93′ E, 410–356 m, coll. ZHONGSHA 2015 Expedition, 27 Jul. 2015.

Remarks

Oxypleurodon forte was collected on seamounts in the middle of the SCS during the NANHAI 2014 cruise (Lee *et al*. 2015). The new series of small specimens collected during ZHONGSHA shows that the species has a wider distribution in the SCS.

Distribution

This species is known only from the South China Sea.

Oxypleurodon sanctaeclausi Richer de Forges & Ng, 2009
Fig. 13E

Oxypleurodon sanctaeclausi Richer de Forges & Ng, 2009a: 2–5, figs 1A–C, 3A, B, 11A (type locality: Bohol Sea, the Philippines).

Oxypleurodon sanctaeclausi – Richer de Forges & Ng 2009b: 248 (table). — Lee *et al.* 2015: 1261.

(For the complete synonymy of this species, see Richer de Forges & Ng 2009a: 2.)

Material examined

SOUTH CHINA SEA: 1 ♀ (16.6 × 11.5 mm) (ZRC 2016.0074), northwest of Dongsha, stn CP4160, 20°48.88′ N, 116°43.15′ E to 20°47.29′ N, 116°42.06′ E, 251–195 m, coll. ZHONGSHA 2015 Expedition, 30 Jul. 2015.

Remarks

Richer de Forges & Poore (2008) recognised a new species, *O. wilsoni*, from south of the Western Australian coast (ca 30° S). They separated it from the allied *O. luzonicum* (Rathbun, 1916) by a number of characters but based this on material they had from the northern part of the Western Australian coast (ca 15° S). Richer de Forges & Ng (2009a) clarified the identity of *O. luzonicum* s. str. on the basis of topotypic material and recognised a new species, *O. sanctaeclausi* Richer de Forges & Ng, 2009, from the Bohol Sea, east of the Philippines. Species identified as "*O. luzonicum*" from the Indonesian archipelago and the Philippines by Richer de Forges (1995) are now all referred to *O. sanctaeclausi* as well (Richer de Forges & Ng 2009a: 4). The South China Sea is now added to the range of *O. sanctaeclausi*.

Oxypleurodon leonis sp. nov.
urn:lsid:zoobank.org:act:AB7D2D15-4E55-4F8C-AD73-76157AD6ECF3
Figs 4B, 5A–C, 6A–D

Diagnosis

Small species, carapace pyriform, bearing plates and obtuse spines, covered by continuous short tomentum. Short diverging pseudorostral spines, long setae on inner border. Postocular plate small, flattened, forming cavity protecting eye. Hepatic plate elongate dorso-ventrally, with concave surface. Carapace border with long, narrow sub-branchial plate. Dorsal carapace bearing several swellings with blunt spines covered by short round setae: 1 mediogastric, 2 epigastrics, 1 prominent cardiac swelling rounded on top, 2 sharp, curved branchial plates, 2 epibranchial swellings, 1 prominent posterior blunt tooth. Basal antennal article fused to carapace, curved, with smooth flattened surface. Male cheliped inflated, smooth surface, propodus enlarged, borders carinate; carpus short, with 2 carinae; merus trigonal in cross-section, carinate; ventral side of merus with 2 granules; distal part of basis-ischium forming blunt tooth along merus.

Etymology

The species name is dedicated to our colleague and friend Professor Leo Tan, who is actively encouraging a multitude of biodiversity studies in Singapore. The name is used as a noun in apposition.

Material examined

Holotype

SOUTH CHINA SEA: ♂ (13.5 × 9.0 mm), north of Zhongsha, stn DW4145, 16°06.69′ N, 114°20.26′ E to 16°07.50′ N, 114°18.98′ E, 180–226 m, coll. ZHONGSHA 2015 Expedition, 26 Jul. 2015 (NTOU).

Paratypes

SOUTH CHINA SEA: 1 ♂ (15.1 × 9.6 mm) [photographed] (ZRC 2016.0541), 3 ♂♂ (15.6 × 10.5 mm, 11.7 × 7.2 mm), 1 ♂ with *Sacculina* (13.5 × 8.5 mm), 1 ♀ (11.3 × 7.0 mm), 2 ovigerous ♀♀ (11.3 × 7.5 mm, 10.9 × 7.2 mm) (ZRC 2016.0542), 1 ♂ (14.8 × 10.0 mm), 1 ovigerous ♀ (11.2 × 7.1 mm) (NTOU), same locality and collection data as holotype; 1 ♂ (14.2 × 8.9 mm) [photographed] (ZRC 2016.0543),

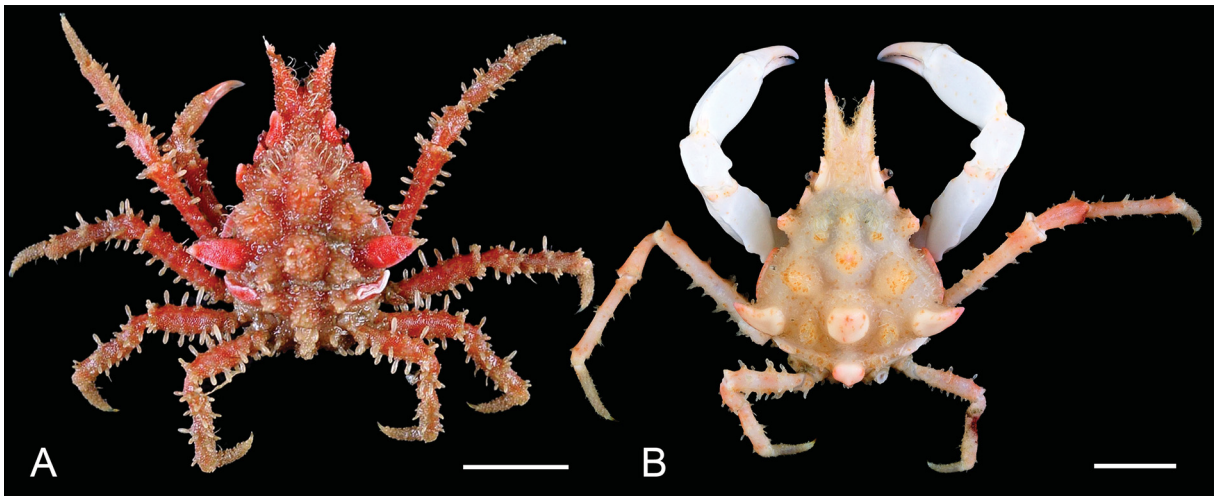

Fig. 4. Colour in life. **A**. *Oxypleurodon bipartitum* (Guinot & Richer de Forges, 1986), ovigerous ♀ (10.9 × 9.6 mm) (NMCR) (after Richer de Forges & Ng 2009b). **B**. *Oxypleurodon leonis* sp. nov., paratype, ♂ (15.1 × 9.6 mm) (ZRC 2016.0541), South China Sea. Scale bars = 5 mm.

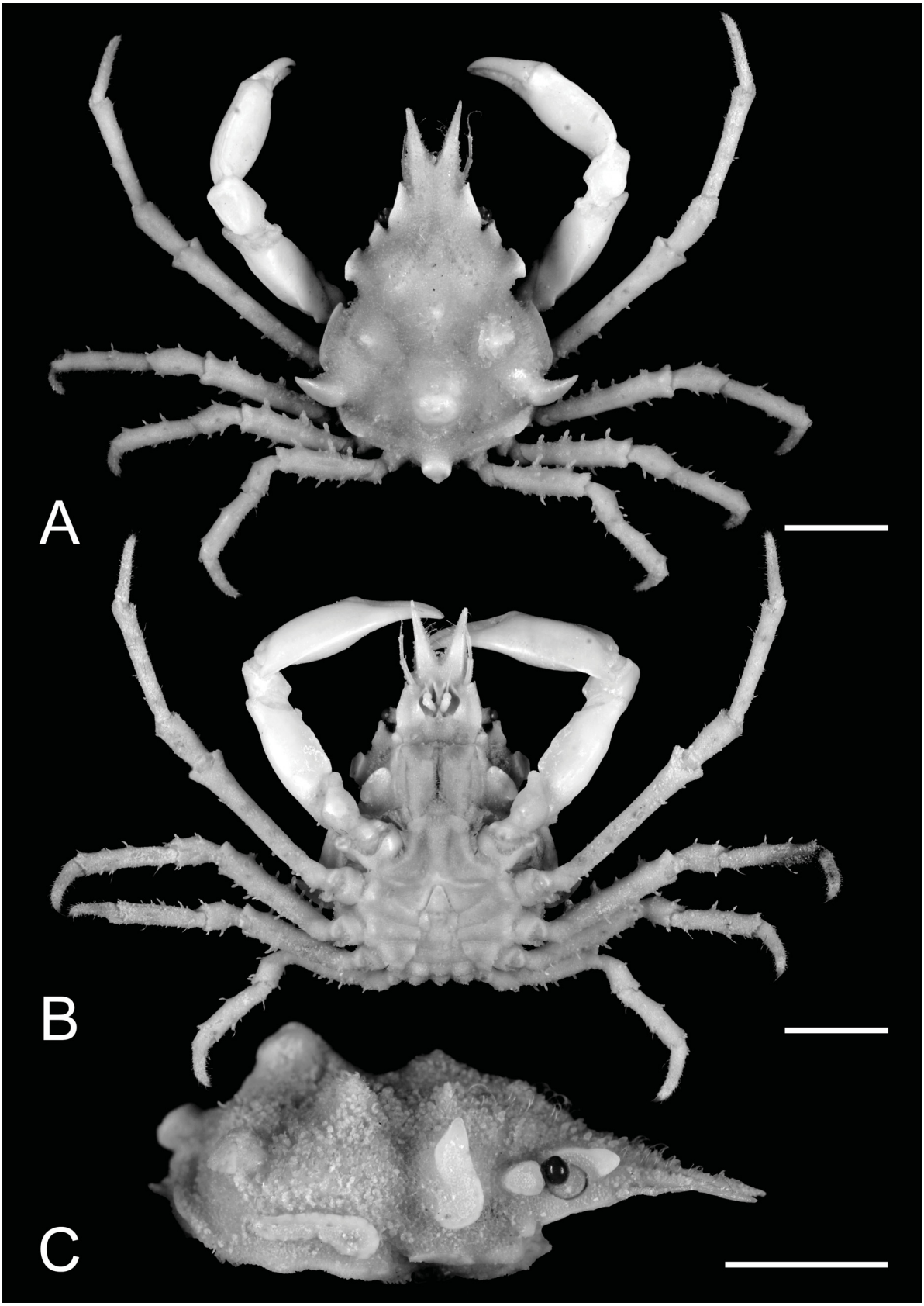

Fig. 5. *Oxypleurodon leonis* sp. nov., holotype, ♂ (13.5 × 9.0 mm) (NTOU), South China Sea. **A**. Overall dorsal view. **B**. Overall ventral view. **C**. Lateral view of carapace. Scale bars = 5 mm.

north of Zhongsha, stn CP4153, 16°13.94′ N, 114°27.21′ E to 16°14.247′ N, 114°29.55′ E, 318 m, coll. ZHONGSHA 2015 Expedition, 27 Jul. 2015; 2 ♂♂ (13.6 × 9.0 mm, 11.5 × 7.2 mm), 1 ovigerous ♀ (11.6 × 7.2 mm) (MNHN-IU-2016-178), north of Zhongsha, stn CP4147, 16°09.83′ N, 114°15.25′ E to 16°08.15′ N, 114°17.97′ E, 343–259 m, coll. ZHONGSHA 2015 Expedition, 26 Jul. 2015.

Comparative material

PHILIPPINES: *Oxypleurodon bipartitum* (Guinot & Richer de Forges, 1986): 1 ♀ (10.4 × 6.6 mm), 1 ovigerous ♀ (10.4 × 6.2 mm) (ZRC 2012.1163), stn CP2340, off Balicasag Island, off Aliguay Island, Bohol Sea, 9°29.4′ N, 123°44.4′ E, 271–318 m, coll. Panglao 2005 Expedition, 23 May 2005; 2 ♂♂ (13.1 × 8.5 mm, 8.4 × 5.6 mm) (ZRC 2016.0082), stn PN1, Balicasag Island, off Panglao Island, Bohol Sea, tangle nets, coll. Dec. 2003; 3 ♂♂ (only the measurement of the largest specimen is given: 13.8 × 8.5 mm), 1 ♀ (10.0 × 6.6 mm), 1 ovigerous ♀ (10.8 × 6.8 mm) (ZRC 2001.0612), Balicasag Island, off Panglao Island, Bohol Sea, 50–500 m, tangle nets, coll. local fishermen, 28 Nov. 2001.

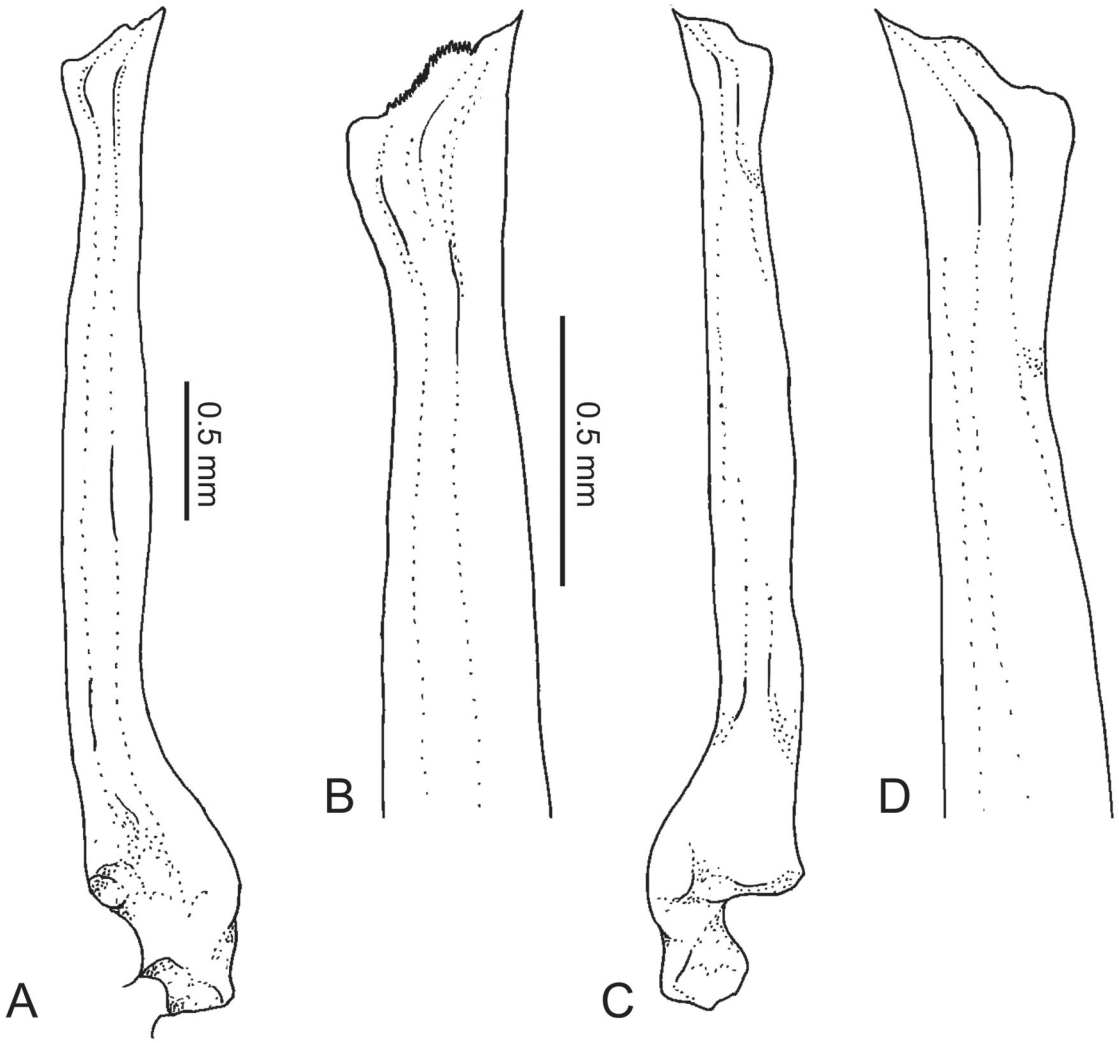

Fig. 6. *Oxypleurodon leonis* sp. nov., holotype, ♂ (13.5 × 9.0 mm) (NTOU), South China Sea, drawing of left G1. **A**. Ventral view. **B**. Ventral view of distal portion. **C**. Dorsal view. **D**. Dorsal view of distal portion.

Description

Small species, pyriform carapace with plates, obtuse spines, covered by layer of short tomentum (Figs 4B, 5A). Short diverging pseudorostral spines, long setae on inner border. Supraocular eave narrow, forming sharp anterior angle (Figs 4B, 5A). Postocular plate small, flattened, forming a cup protecting eye. Hepatic plate elongate dorso-ventrally, with concave surface (Figs 4B, 5A). Carapace border with long, narrow sub-branchial plate (Figs 4B, 5A). Dorsal carapace bearing several swellings with blunt spines covered by short round setae: 1 mesogastric, 2 epigastrics, 1 prominent cardiac swelling rounded on top, 2 sharp, curved branchial plates, 2 epibranchial swellings, 1 prominent posterior blunt tooth (Figs 4B, 5A).

Antennae at same level of pseudorostral spines. Antennules completely retractable in deep fossae. Basal antennal article fused to carapace, slightly curved, with smooth flattened surface, slightly rounded external distal angle; distinct tubercle at base of basal antennal article (Fig. 5B). Squarish epistome. Pterygostomial region enlarged into plate with rounded edge (Fig. 5B). Buccal frame totally covered by third maxillipeds when closed.

Male cheliped inflated, smooth surface, propodus enlarged, each border carinate, cutting edges of fingers serrulate; carpus short with 2 carinae; merus trigonal in cross-section, carinate; ventral side of merus with 2 granules; distal part of basis-ischium forming blunt tooth. Ambulatory legs relatively short, P2 longest; merus, carpus, and propodus with strong stout setae; dactylus strong, claw-like, with sharp, curved tip.

Male thoracic sternum anteriorly depressed, sternites 1–3 fused (Fig. 5B). Male abdomen with triangular telson and 6 free somites (Fig. 5B). G1 straight with flattened tip (Fig. 6).

Colouration

In the fresh specimens of *O. leonis* sp. nov., the carapace is slightly pink and covered by a layer of white tomentum; chelipeds bright white, ambulatory legs pinkish (Fig. 4B).

Remarks

The material from the ZHONGSHA cruise is superficially close to *O. bipartitum* (Fig. 4A), which was originally described from material collected off the western coast of Luzon, the Philippines. *Oxypleurodon bipartitum* s. str. was collected in large numbers by fishermen using tangle nets in Balicasag Island, central Philippines (Richer de Forges & Ng 2009b), which makes it possible for us to directly compare the two species. In typical *O. bipartitum* (Fig. 4A), the pseudorostrum is proportionately longer and the carapace not as wide as the SCS material. In *O. leonis* sp. nov., the supraocular eave is narrow and forms a thin "overhang" (Figs 4B, 5A) as compared to *O. bipartitum* in which the same structure is thick (Fig. 4A). The shape of the branchial plate is also different, being distinctly more flattened in *O. bipartitum* rather than more convex and slightly curved in *O. leonis* sp. nov. (Figs 4B, 5A). In *O. bipartitum*, the lateral plates (postocular, hepatic, and lateral branchial) are relatively larger and more foliose (Fig. 4A) compared to those in *O. leonis* sp. nov. (Figs 4B, 5A). The pattern of setal arrangement on both species is very different as well; in *O. leonis* sp. nov., there is a distinct, even tomentum of short setae on the cardiac, gastric, and epibranchial regions (Figs 4B, 5A) whereas in *O. bipartitum*, the same regions have groups of long and stout setae instead. In *O. leonis* sp. nov., the posterior border of the carapace is slightly carinate (Figs 4B, 5A) while in *O. bipartitum*, it forms a large curved carina (Fig. 4A).

Distribution

Only known from South China Sea.

Genus ***Rochinia*** A. Milne-Edwards, 1875

Remarks

There are currently 39 recognised species in this genus (Ng *et al.* 2008; Richer de Forges & Ng 2013; Takeda & Marumura 2014; Tavares *et al.* 2016), with the species distributed across the Indo-Pacific and Atlantic Oceans (Griffin & Tranter 1986a; Ng & Richer de Forges 2007). The type species of *Rochinia* is *R. gracilipes* A. Milne-Edwards, 1975, by monotypy. Garth (1958) mentioned that the group formed by *Rochinia* and *Scyramathia* is not monophyletic due to the form of the male first gonopod. Thus far, despite new species being described from this genus (see Ng & Richer de Forges 2007, 2013; Richer de Forges & Poore 2008; Richer de Forges & Ng 2013), the genus has not been revised as a whole. Some genera, which were once synonymised under *Rochinia*, such as *Sphenocarcinus* A. Milne-Edwards, 1875 and *Oxypleurodon* Miers, 1885, have been resurrected and redefined (Tavares 1991; Richer de Forges & Ng 2009b). New genera have also been established: *Goniopugettia* Sakai, 1986, *Laubierinia* Richer de Forges & Ng, 2009, *Guinotinia* Richer de Forges & Ng, 2009, *Garthinia* Richer de Forges & Ng, 2009 and *Samadinia* Ng & Richer de Forges, 2013, all of which are related to *Rochinia*. It has been discussed by various authors (see Ng & Richer de Forges 2007, 2013; Richer de Forges & Poore 2008) that *Rochinia* is not homogeneous. However, splitting the genus into distinct groups is not a simple task. Ng & Richer de Forges (2013) recognised a new genus, *Samadinia* Ng & Richer de Forges, 2013 and also listed four possible groups within *Rochinia*. The diagnosis of the genus as provided by previous authors, such as Griffin & Tranter (1986a, b) is no longer useful given the significant changes in species composition since 1986. The authors of the present paper are currently revising this genus. With the new combination for one species, *Rochinia kagoshimensis* (Rathbun, 1932) comb. nov., a total of 40 species are now recognised in this genus.

Rochinia kotakae Takeda, 2001
Figs 7A, 8A

Rochinia kotakae Takeda, 2001: 238–241, figs 3, 4 (type locality: Tosa Bay, Southwest Japan).

Rochinia kotakae – Ho *et al*. 2004: 650–651, figs 3H, 4. — Ng & Richer de Forges 2007: 62 (list); 2013: 363, fig. 5E.— Ng *et al*. 2008: 105 (list). — Richer de Forges & Ng 2013: 463 (list), 474, 478–479, figs 1D, 7, 8I–L.

Material examined

SOUTH CHINA SEA: 1 ovigerous ♀ (14.0 × 9.1 mm) (ZRC 2016.0079), Nanhai, continental slope, stn CP4118, 20°00.76′ N, 115°00.83′ E to 20°01.28′ N, 115°02.12′ E, 700–723 m, coll. NANHAI 2014 Expedition, 12 Jan. 2014; 5 ♂♂ (only the measurement of the largest specimen is given: 17.2 × 12.0 mm), 1 ♂ (16.9 × 11.2 mm) [photographed], 1 ♀ (15.9 × 10.2 mm), 1 ovigerous ♀ (16.8 × 11.3 mm) (ZRC 2016.0544), Horse Shoe Ridge, stn CST12, 22°0.95′ N, 118°53.95′ E to 22°4.86′ N, 11°52.78′ E, 1346–758 m, coll. T.W. Wang, 29 Apr. 2016; 1 ♂ (13.0 × 8.1 mm), 1 ♀ (9.3 × 5.7 mm) (ZRC 2016.0545), Horse Shoe Ridge, stn CST13, 22°1.22′ N, 118°53.80′ E to 22°6.19′ N, 118°52.45′ E, 1311–816 m, coll. T.W. Wang, 30 Apr. 2016.

Remarks

Rochinia kotakae is characterised by its long divergent pseudorostral spines, very long and sharp branchial spines pointing outward, and distinctly flattened postocular and hepatic spines. This species was described based on a single female specimen collected from Tosa Bay, Japan (Takeda 2001). Ho *et al*. (2004) later gave a more detailed description of a male specimen that was collected from Taiwan. Richer de Forges & Ng (2013) provided photographs of specimens of *R. kotakae*, from the Philippines

and Taiwan (Richer de Forges & Ng 2013: fig. 7). The present specimen from the SCS agrees well with the earlier material.

The only other species of *Rochinia* known to have this type of carapace pattern, with the flattened hepatic spine and very long branchial spines, is *R. sibogae* Griffin & Tranter, 1986, described from the Ceram Sea, Indonesia. However, in *R. sibogae*, the post-ocular and the hepatic foliated spine are fused (Griffin & Tranter 1986b: fig. 12b). In *R. kotakae*, these two spines are clearly separated (Fig. 8A).

Distribution

This species was recorded from Japan (Takeda 2001), Taiwan (Ho *et al.* 2004) and the Philippines (Richer de Forges & Ng 2007). This is a new record for the South China Sea.

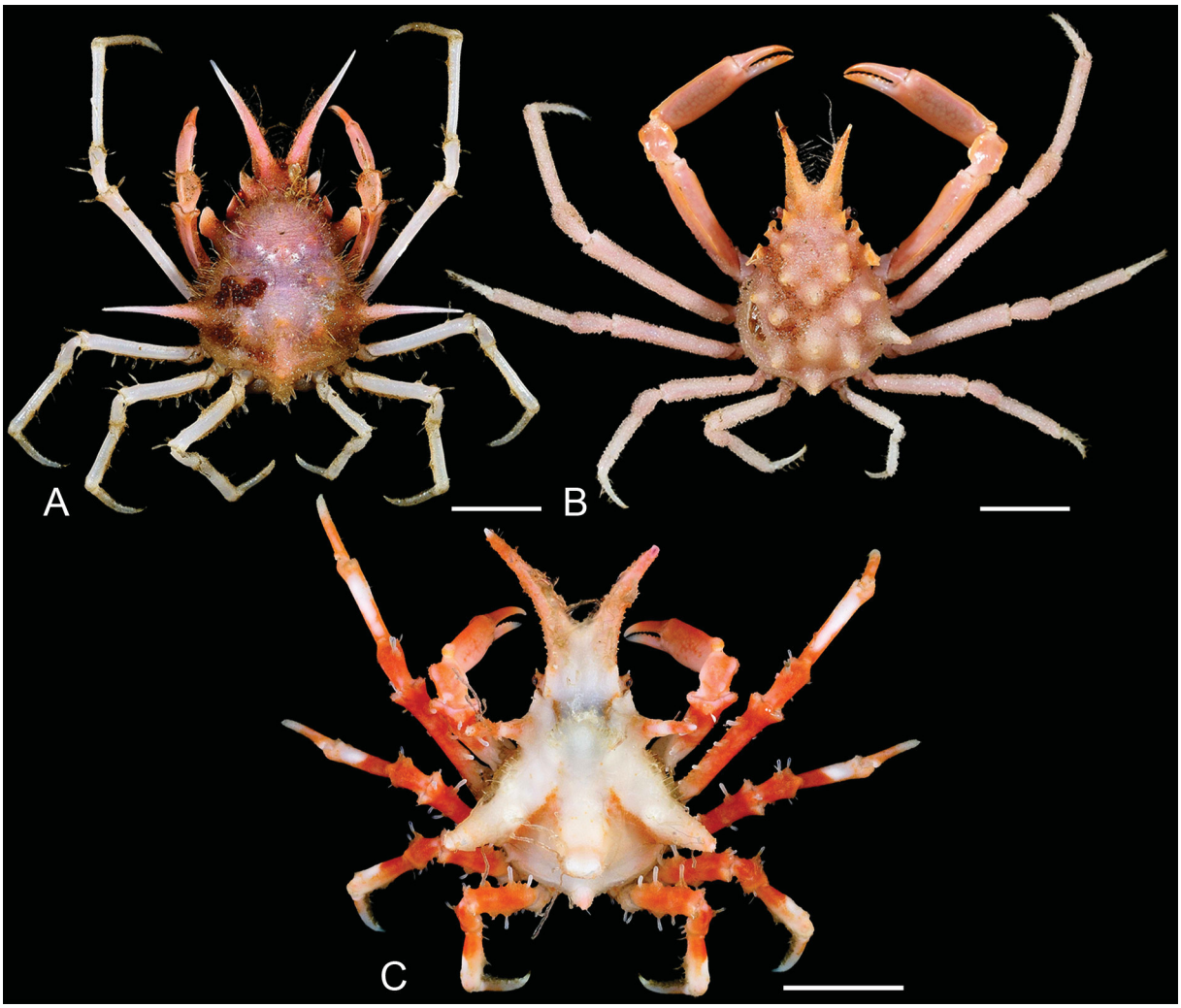

Fig. 7. Colour in life. **A**. *Rochinia kotakae* Takeda, 2001, ovigerous ♀ (14.0 × 9.1 mm) (ZRC 2016.0079), South China Sea. **B**. *Rochinia strangeri* Serène & Lohavanijaya, 1973, ♂ (12.2 × 8.0 mm) (ZRC 2016.0546), South China Sea. **C**. *Rochinia kagoshimensis* (Rathbun, 1932) comb. nov., ♂ (10.7 × 6.9 mm) (ZRC 2016.0549), South China Sea. Scale bars = 5 mm.

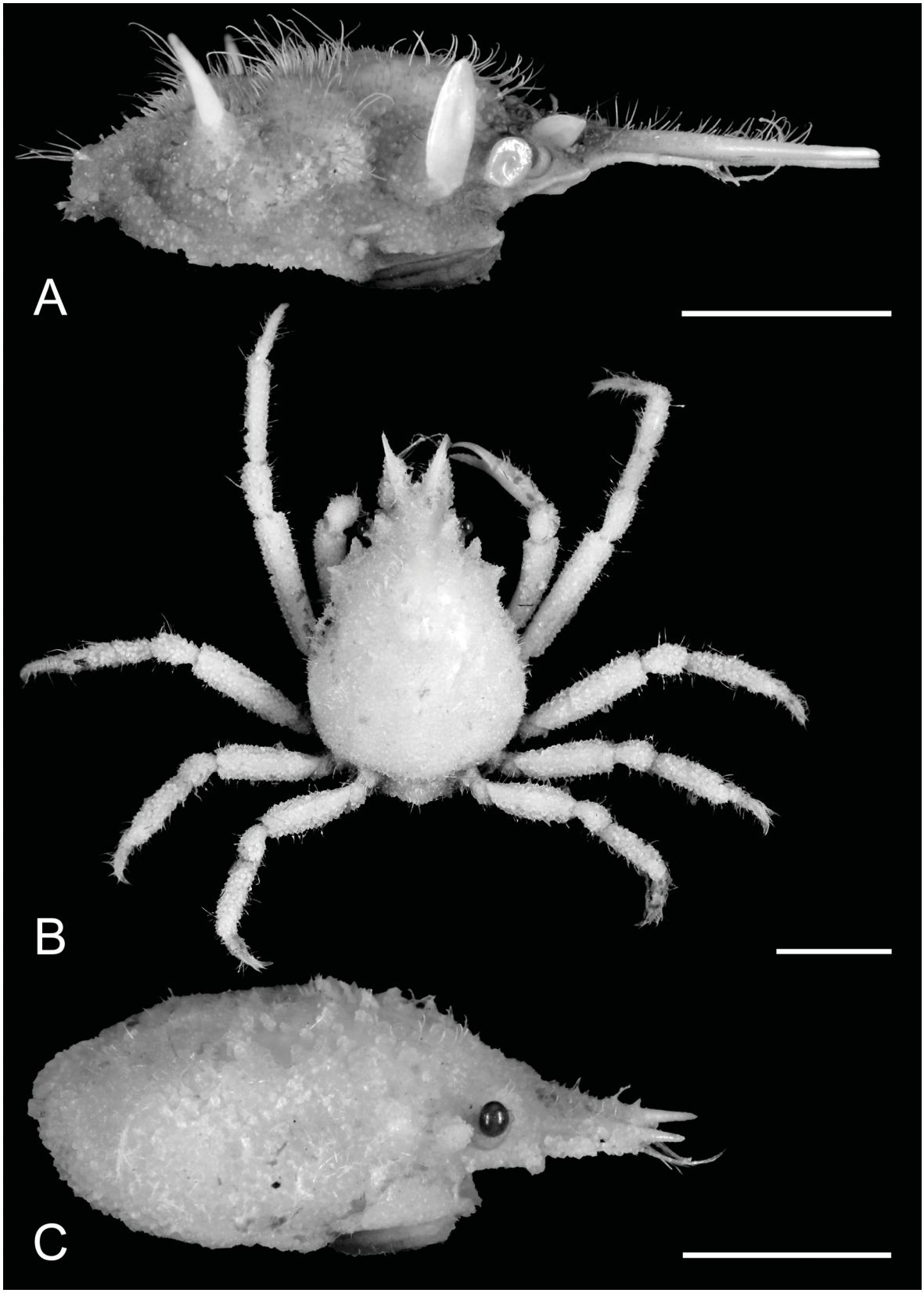

Fig. 8. A. *Rochinia kotakae* Takeda, 2001, ovigerous ♀ (14.0 × 9.1 mm) (ZRC 2016.0079), South China Sea, lateral view of carapace. **B–C**. *Rochinia* sp., ♀ (7.6 × 5.3 mm) (ZRC 2016.0551), South China Sea. **B**. Overall dorsal view. **C**. Lateral view of carapace. Scale bars: A = 5 mm; B–C = 2.5 mm.

Rochinia strangeri Serène & Lohavanijaya, 1973
Figs 7B, 9A–F, 11A–D

Rochinia strangeri Serène & Lohavanijaya, 1973: 57–58, figs 123–128, pl. 11 fig. B–C (type locality: South China Sea).

Rochinia strangeri – Griffin & Tranter 1986a: 175 (key). — Takeda 2001: 241. — Ng & Richer de Forges 2007: 62 (list); 2013: 361. — Ng *et al*. 2008: 105 (list).

Material examined

SOUTH CHINA SEA: holotype, ♂ (10.7 × 7.2 mm) (USNM149304), 15°40′ N, 109°45.5′ E, 4019 m, coll. NAGA Expedition, 28 Feb. 1960; 3 ♂♂ (12.2 × 8.0 mm, 12.1 × 8.0 mm, 9.3 × 6.1 mm) (ZRC 2016.0546), 1 ♂ (10.5 × 6.9 mm), 1 ovigerous ♀ (10.0 × 6.7 mm) (NTOU), 1 ♂ (10.0 × 6.7 mm), 2 ovigerous ♀♀ (12.2 × 8.4 mm, 10.2 × 6.9 mm) (MNHN-IU-2016-179), Nanhai, continental slope, stn CP4117, 20°00.88′ N, 114°08.80′ E to 20°01.87′ N, 114°09.35′ E, 421–333 m, coll. NANHAI 2014 Expedition, 11 Jan. 2014; 1 ♀ (12.2 × 8.0 mm) (ZRC 2016.0547), Zhongsha, continental slope, stn CP4137, 19°53.06′ N, 114°21.68′ E to 19°53.03′ N, 114°24.74′ E, 536–524 m, coll. ZHONGSHA 2015 Expedition, 23 Jul. 2015; 1 ♂ (12.4 × 8.1 mm), 1 ♀ (13.5 × 8.7 mm), 1 ovigerous ♀ (12.6 × 8.5 mm) (ZRC 2016.0548), Dongsha, stn CP4128, 20°44.86′ N, 116°08.01′ E to 20°42.28′ N, 116°08.01′ E, 420–444 m, coll. DONGSHA 2014 Expedition, 1 May 2014.

Diagnosis

Small species, pyriform carapace. Two short diverging pseudorostral spines. Carapace with several spines: 3 forming median line on gastric and cardiac regions, and posterior carapace margin; 2 protogastrics; 1 long branchial spine pointing outwards, 2 smaller epibranchial spines, 1 on each side of cardiac region. Carapace dorsal surface with 15 spines (Fig. 9A, D). Carapace covered by dense tomentum of rounded setae. Eye protected by supraocular eave-like plate pointing upwards, elevated postocular spine forming plate. Hepatic plate flattened, raised, pointing upwards. Basal antennal article smooth, with curved surface. Single granule on distal side of opening of green gland. Border of pterygostomial region with 3 or 4 granules. Buccal frame square, totally covered by third maxillipeds when closed (Fig. 9B, E). Male cheliped long: propodus long, slender; cutting edges of fingers serrulate; carpus with 2 carinae; merus long, triagonal in cross-section, carinate on angles. Ambulatory legs relatively long, P2 longest; articles covered by thin velvety setae (Fig. 9A). G1 straight with flattened tip (Fig. 11A–D).

Colouration

In the fresh SCS specimens of *R. strangeri*, the carapace is pale pink while the pseudorostral spines, supraorbital eave, postorbital spine and hepatic spine are pale orange; the cheliped is pinkish orange while the ambulatory legs are pale pink with the distal sections white (Fig. 7B).

Remarks

Little is known of this species, and the original description for *Rochinia strangeri* by Serène & Lohavanijaya (1973) was relatively brief. Therefore, the species is re-diagnosed here. The species is characterised by the anterior border of the carapace bearing a series of three prominent spine-like plates on the supraocular, postocular and hepatic regions (cf. Serène & Lohavanijaya 1973). The only other species of *Rochinia* that have such strong and flattened hepatic plates are *R. soela* Griffin & Tranter, 1986, from the Northwest Shelf of Australia, Indian Ocean (Griffin & Tranter 1986b: 366), *R. galathea* Griffin & Tranter, 1986, from off Natal, Indian Ocean (Griffin & Tranter 1986b: 361) and *R. tomentosa* Griffin & Tranter, 1986, from Halmahera Sea (= Bougainville Strait), west of Waigeo Island (Griffin & Tranter 1986a: 190). However, these species are very different in other aspects of the

carapace morphology. *Rochinia galathea* has only nine spines on the carapace (cf. Griffin & Tranter 1986b: fig. 11h) (versus 15 spines on the carapace in *R. strangeri*, see Figs 7B, 9A, D). *Rochinia soela* has an additional curved flattened hepatic plate, and there are only branchial spines on the carapace (cf. Griffin & Tranter 1986b: fig. 13b, f) (versus straight flattened hepatic plate and 15 spines on carapace in *R. strangeri*, Figs 7B, 9A, D). The closest species appears to be *R. tomentosa*, whose dorsal carapace surface is covered by a dense tomentum and has flattened postocular and hepatic plates (cf. Griffin & Tranter 1986a: fig. 61b, f). However, the carapace of *R. tomentosa* has no spines on its carapace as compared to the 15 present on *R. strangeri* (Figs 7B, 9A, D).

Serène & Lohavanijaya (1973: 167, pl. 11 fig. B) figured *Rochinia strangeri* and compared it with *R. pulchra* (Miers, 1886) and *R. riversandersoni* (Alcock, 1895). The species listed by Richer de Forges &

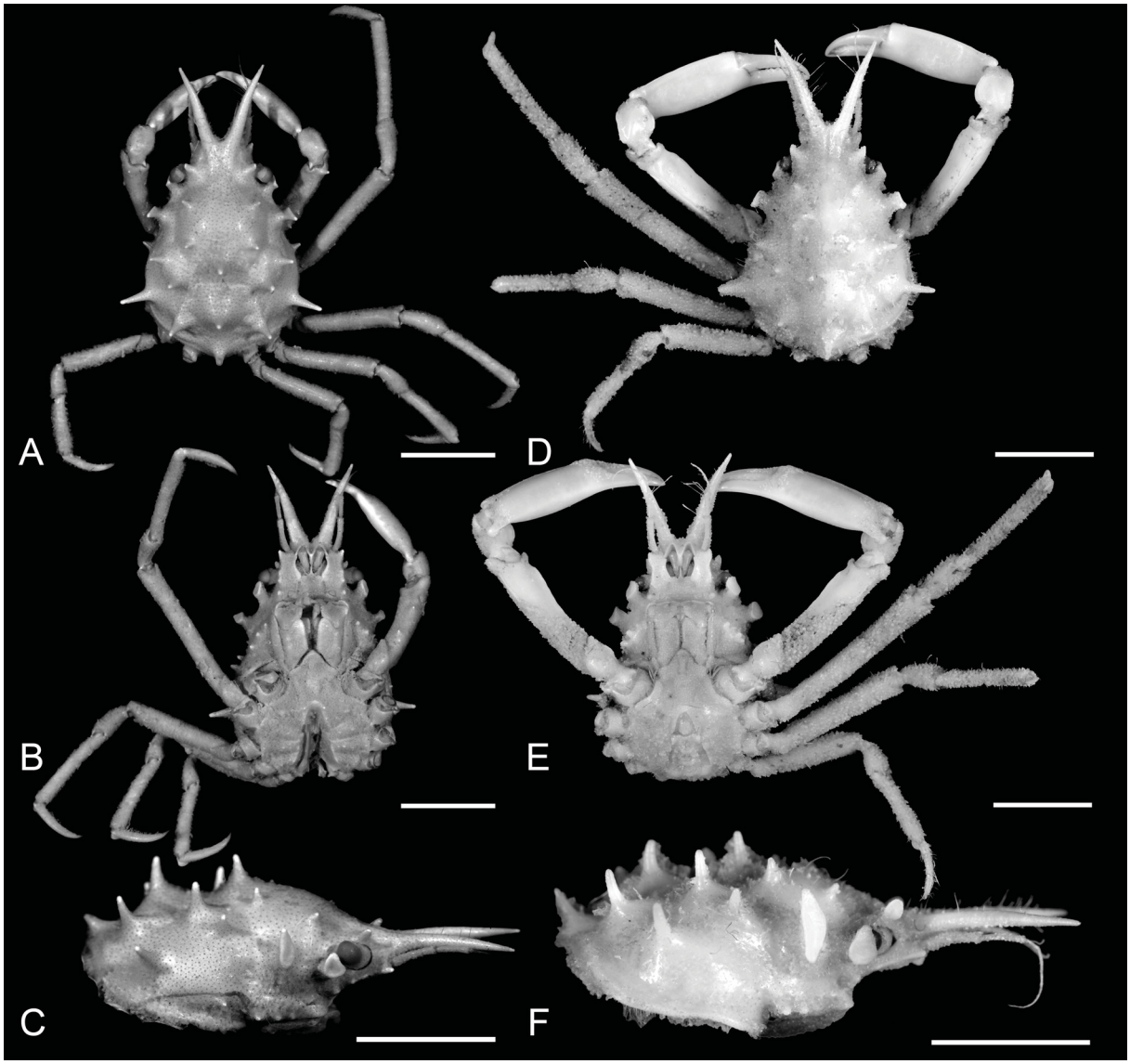

Fig. 9. *Rochinia strangeri* Serène & Lohavanijaya, 1973. **A–C**. Holotype, ♂ (10.7 × 7.2 mm) (USNM149304), South China Sea. **A**. Overall dorsal view. **B**. Overall ventral view. **C**. Lateral view of carapace. **D–F**. ♂ (12.1 × 8.0 mm) (ZRC 2016.0546), South China Sea. **D**. Overall dorsal view. **E**. Overall ventral view. **F**. Lateral view of carapace. Scale bars = 5 mm.

Poore (2008: 69, fig. 2d) as *R. strangeri*, is a different species, morphologically more similar to *R. soela*; which will have to be re-examined to ascertain its true identity.

Distribution

Only known from South China Sea.

Rochinia kagoshimensis (Rathbun, 1932) comb. nov.
Figs 7C, 10A–F, 11E–J

Pugettia kagoshimensis Rathbun, 1932: 31 (type locality: Sata Misaki Light, Japan).

Pugettia kagoshimensis – Yokoya 1933: 153. — Sakai 1938: 253 (key), 259–260; 1976: 194 (key), 198–199, text-fig. 105. — Griffin & Tranter 1986a: 92 (key). — Wicksten & Stachowicz 2013: 359 (list). — Ohtsuchi *et al.* 2014: 557 (list).

Material examined

JAPAN: holotype, ♂ (11.2 × 6.8 mm) (USNM 48253), stn 4935, eastern sea, off Kagoshima gulf, coll. *Albatross*, 16 Aug. 1906.

SOUTH CHINA SEA: 1 ♂ (10.7 × 6.9 mm) (ZRC 2016.0549), Dongsha, northwest of Dongsha, stn CP4159, 20°45.92′ N, 116°41.11′ E to 20°47.62′ N, 116°42.35′ E, 221–190 m, coll. ZHONGSHA 2015 Expedition, 30 Jul. 2015.

Comparative material

JAPAN: holotype of *Rochinia debilis* Rathbun, 1932, ♀ (10.8 × 7.0 mm) (USNM49572), stn 5091, Joga Shima Light, 35°04.10′ N, 139°38.12′ E, 360 m, coll. *Albatross*, 26 Oct. 1906; 1 ♂ (23.1 × 15.8 mm), 1 ♀ (21.6 × 14.7 mm) (SMF49904), Tsurugasaki, Miura City, Kanagawa Prefecture, coll. K. Sakai, 8 Mar. 1998; 2 ♂♂ (28.9 × 21.0 mm, 27.1 × 19.8 mm), 1 ovigerous ♀ (27.4 × 18.0 mm) (SMF49905), Tsurugasaki, Miura city, Kanagawa Prefecture, coll. K. Sakai, 19 Jun. 1998.

Description

Small species. Carapace triangular, covered with tomentum, large tuft of long setae on mesogastric region (Figs 7C, 10A, D). Pseudorostral spines relatively long, curved, diverging. Small round eyes. Supraorbital eave narrow, forming sharp distal angle. Small postorbital angle forming cavity protecting eye. Carapace with distinct spines: 2 long hepatic spines, pointed obliquely outwards; 1 short gastric spine surrounded by hooked setae; 1 strong thick cardiac spine with blunt squarish tip; 2 thick branchial spines long, pointing outward with blunt tips, proximal small spine on each branchial spine and pointing upwards; 1 tooth on posterior margin of carapace, with spine on anterior region of tooth. Long setae along lateral edge of carapace, between hepatic and branchial spines.

Antennae shorter than pseudorostral spine. Antennules totally retractable inside deep fossae. Basal antennal article wide, fused on carapace, rectangular with straight distal edge, sharp external distal angle (Fig. 10B, E). Distinct tubercle at base of basal antennal article. Epistome small. Pterygostomial region with 2 or 3 small granules on edge. Buccal frame squarish.

Male cheliped short, propodus slightly inflated, fingers serrulate, carpus carinate, merus bearing swellings on border, covered by short setae. Ambulatory legs: P2 longest; on each leg, distal border of carpus and merus with stout setae; merus with several small bulbous setae; distal end of merus with

blunt spine; dactylus slightly curved with sharp tip, proximal region covered with row of setae, short spines on distal third of dactylus.

Male thoracic sternum anteriorly slightly depressed. Male abdomen with triangular telson and 6 somites, widest at second and third (Fig. 10B, E). G1 with wide, flattened tip; constricted in distal region near tip (Fig. 11E–J).

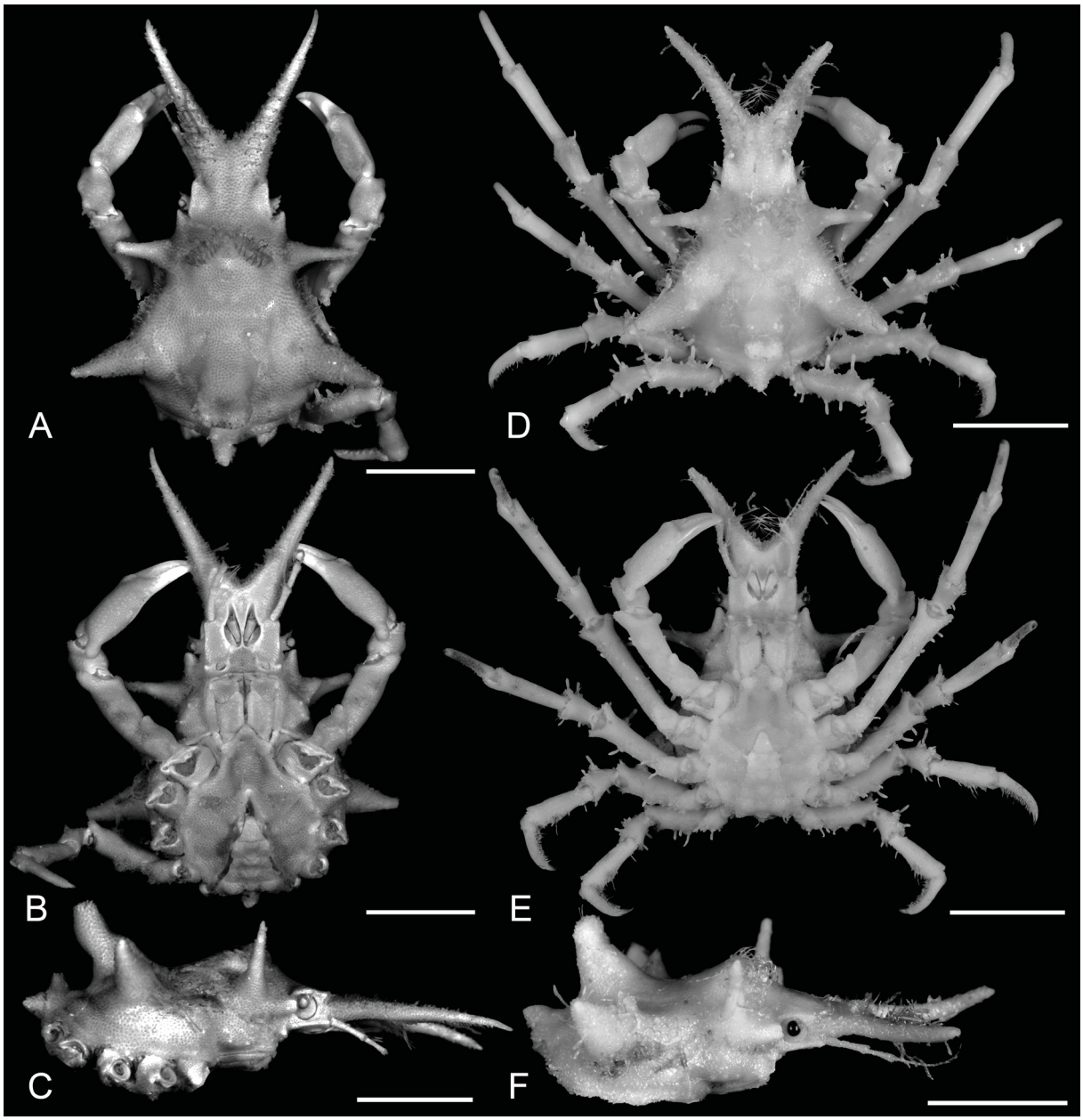

Fig. 10. A–C. *Rochinia kagoshimensis* (Rathbun, 1932), holotype, ♂ (11.2 × 6.8 mm) (USNM 48253), off Kagoshima gulf. **A**. Overall dorsal view. **B**. Overall ventral view. **C**. Lateral view of carapace. **D–F**. *Rochinia kagoshimensis* (Rathbun 1932) comb. nov., ♂ (10.7 × 6.9 mm) (ZRC 2016.0549), South China Sea. **D**. Overall dorsal view. **E**. Overall ventral view. **F**. Lateral view of carapace. Scale bars = 5 mm.

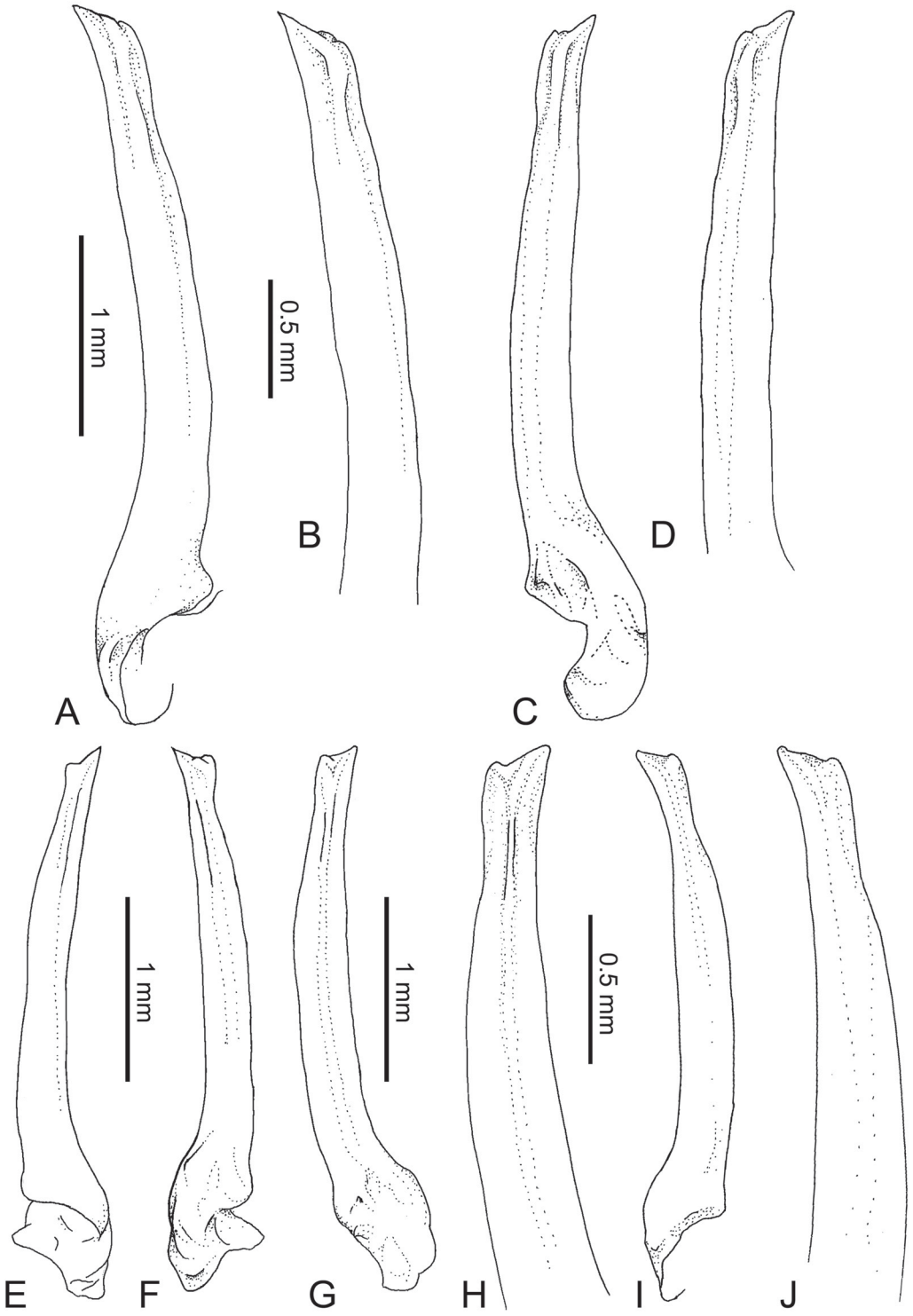

Fig. 11. A–D. *Rochinia strangeri* Serène & Lohavanijaya, 1973, ♂ (12.1 × 8.0 mm) (ZRC 2016.0546), South China Sea, drawing of left G1. **A**. Ventral view. **B**. Ventral view of distal portion. **C**. Dorsal view. **D**. Dorsal view of distal portion. **E–F**. *Rochinia kagoshimensis* (Rathbun, 1932), holotype, ♂ (11.2 × 6.8 mm) (USNM 48253), off Kagoshima gulf, drawing of left G1. **E**. Ventral view. **F**. Dorsal view. **G–J**. *Rochinia kagoshimensis* (Rathbun, 1932) comb. nov., ♂ (10.7 × 6.9 mm) (ZRC 2016.0549), South China Sea, drawing of left G1. **G**. Ventral view. **H**. Ventral view of distal portion. **I**. Dorsal view. **J**. Dorsal view of distal portion.

Colouration

In the fresh SCS specimen of *R. kagoshimensis*, the carapace is white, with the pseudorostral spines orange-pink, and the ambulatory legs orange with the dactylus and distal part of propodus white (Fig. 7C).

Remarks

Little is known of this species. The species was originally described as *Pugettia kagoshimensis* by Rathbun (1932) from Japan, with no figures illustrated. Sakai (1976) provided a rather schematic line drawing of the holotype specimen (Sakai 1976: text-fig. 105). The holotype is shown in Fig. 10A–C. The overall carapace morphology shows long hepatic spines that are not typically seen in *Pugettia* Dana, 1851 (Figs 7C, 10A, D). The G1 morphology (Fig. 11) is also unlike typical *Pugettia*, which is scyriform shape with three angles at the G1 tip. This species is therefore transferred to *Rochinia sensu lato* on the basis of the G1 morphology. This species was previously known only from Japan from the holotype specimen.

The specimen collected from the SCS is very similar to the type of *R. kagoshimensis* (Rathbun, 1932) comb. nov., although there are some differences. For the holotype of *R. kagoshimensis*, the pseudorostral spines are straight and diverging (Fig. 10A), whereas for the SCS specimen, the pseudorostral spines are distinctly curved outwards (Fig. 10D). On the carapace of the specimens, the hepatic and branchial spines of the holotype are pointed in a more upward direction (Fig. 10A, C) while in the SCS specimen, it is pointed more outwards (Fig. 10D, F). The strong and blunt cardiac spine on the carapace is relatively thicker on the SCS specimen (Fig. 10F) compared to the holotype (Fig. 10C). On the pterygostomial region, the holotype of *R. kagoshimensis* has two small granules on the edge (Fig. 10B) whereas on the SCS specimen, there are three small granules instead (Fig. 10E). As there is only one male specimen collected from SCS, it is uncertain if both are conspecific or these differences are only the result of variation. Both specimens are treated as the same species for the time being.

Rochinia kagoshimensis has a similar general carapace shape (Fig. 10A, E) to *R. debilis* Rathbun, 1932 (Fig. 12) due to both having similar pseudorostral spines, large and diverge branchial spines; and dorsal surface of the carapace is covered by a tomentum of short setae. The main differences are on the cardiac spine: wide and blunt in *R. kagoshimensis* (Fig. 10C, F), while in *R. debilis*, it is reduced to a small swelling (Fig. 12). In *R. kagoshimensis*, the hepatic spines are proportionately longer compared to *R. debilis*, which is reduced to a short spine on a convexity (Fig. 8A). *Rochinia debilis* is currently known only from Japan (Sakai 1976).

Distribution

This species was recorded from Japan (Rathbun 1932). This is a new record for the South China Sea.

Rochinia sp.
Fig. 8B–C

Material examined

SOUTH CHINA SEA: 1 ♀ (9.1 × 6.4 mm) (ZRC 2016.0550), Nanhai, continental slope, stn CP4117, 20°00.88′ N, 114°08.80′ E to 20°01.87′ N, 114°09.35′ E, 421–333 m, coll. NANHAI 2014 Expedition, 11 Jan. 2014; 1 ♀ (7.6 × 5.3 mm) (ZRC 2016.0551), continental slope, stn CP4116, 20°02.32′ N, 114°10.22′ E to 20°02.92′ N, 114°11.29′ E, 298–262 m, coll. NANHAI 2014 Expedition, 11 Jan. 2014.

Diagnosis

Small species, pyriform carapace, smooth surface. Short diverging pseudorostral spines. One supraocular spine formed at anterior angle of supraocular eave. One postocular spine, 1 hepatic spine of same length.

No distinct spine on dorsal surface of carapace. Gastric and cardiac regions slightly raised. Dorsal surface of carapace covered by tomentum of thick short setae. Basal antennal article fused with carapace, smooth, distal external angle forming blunt spine.

Remarks

What is here referred to as *Rochinia* sp., is probably a new species. However, as there are only two female specimens, one of which is in poor condition, it is not formally described here.

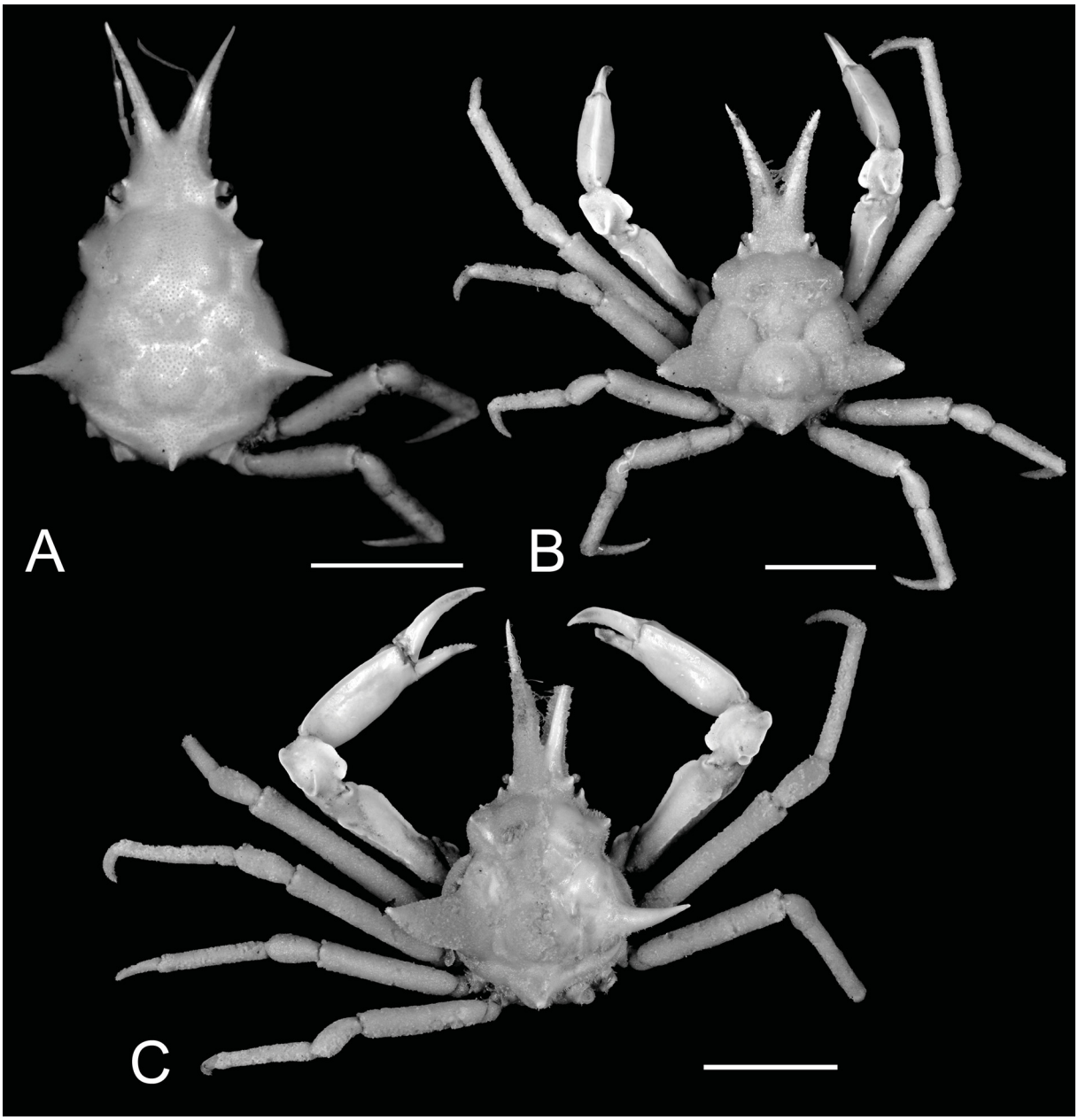

Fig. 12. *Rochinia debilis* Rathbun, 1932, overall dorsal view. **A**. Holotype, ♀ (10.8 × 7.0 mm) (USNM49572), Japan. **B**. ♂ (23.1 × 15.8 mm) (SMF49904), Japan. **C**. ♂ (28.9 × 21.0 mm) (SMF49905), Japan, carapace half cleaned. Scale bars: A = 5 mm; B–C = 10 mm.

This species is closest in morphology to *R. daiyuae* Takeda & Komatsu, 2005. However, in this species the hepatic spine is flattened and pointing upwards (Fig. 8B–C), whereas in *R. daiyuae*, the flattened hepatic spine is pointed anteriorly (Takeda & Komatsu 2005: fig. 3A).

Distribution

Only known from South China Sea.

Genus ***Stegopleurodon*** Richer de Forges & Ng, 2009

Remarks

The type species of this genus is *Stegopleurodon planirostrum* Richer de Forges & Ng, 2009, from New Caledonia. Until the discovery of the new species from the present SCS expeditions, the genus was monotypic.

Stegopleurodon pteridion sp. nov.
urn:lsid:zoobank.org:act:97E6134C-B0F4-4147-87E7-522E8BCD6545
Figs 13F, 14A–C, 15A–D

Diagnosis

Carapace surface smooth, with 2 large lateral lobes; 1 postocular lobe with sharp anterior angle, 1 branchial lobe (Fig. 16A). Outer lateral border of branchial lobe thin, expanded above lateral border, forming wing-like structure. Dorsal surface with 2 convex regions: 1 small gastric swelling, 1 large cardiac one. Posterior part of cardiac convexity forms ridge joining posterior border of carapace. Male cheliped with propodus inflated, carinate on upper border; carpus squarish in cross-section with each angle carinate; merus triangular in cross-section, with each angle carinate. Ambulatory legs with merus, carpus, propodus enlarged, carinate on upper border; lower border of merus of P2–P5 each with 2 crested carinae with margin bearing setae-like spines; dactylus curved, sharp.

Etymology

The name '*pteridion*' means 'with wings' in Greek. The name is treated as a Latin noun in apposition.

Material examined

Holotype

SOUTH CHINA SEA: ♂ (13.1 × 7.9 mm) (NTOU), northeast of Zhongsha, stn CP4156, 16°09.80′ N, 114°58.73′ E to 16°12.19′ N, 115°00.53′ E, 511–505 m, 28 Jul. 2015, coll. ZHONGSHA 2015 Expedition.

Description

Small size species. Carapace pyriform. Pseudorostrum composed of 2 short dorsoventrally flattened parallel teeth with rounded edge. Supraorbital eave narrow, forming rounded anterior and posterior angles. Carapace surface smooth, with 2 large lateral lobes; 1 postocular lobe with sharp anterior angle, and 1 branchial lobe (Figs 13F, 14A). Outer lateral border of branchial lobe thin, expanded above lateral border, forming wing-like structure. Dorsal surface with 2 convex regions: 1 small gastric swelling, 1 large cardiac one (Figs 13F, 14A). Posterior part of cardiac convexity forms ridge joining posterior border of carapace.

Antennae shorter than pseudorostrum. Antennule retractable in deep fossae. Eyes with short cornea, rounded; anterior region of eye protected by supraorbital eave; postorbital plate forms a cavity protecting posterior region of eye. On lateral side of carapace, behind postocular plate, a series of long hooked

setae. Basal antennal article flat, curved on proximal edge; distinct tubercle at base of basal antennal article (Fig. 14B). Epistome small. Pterygostomial region relatively large, smooth, with 2 distinct plates present (Fig. 14B). Buccal frame quadrangular, completely closed by third maxillipeds.

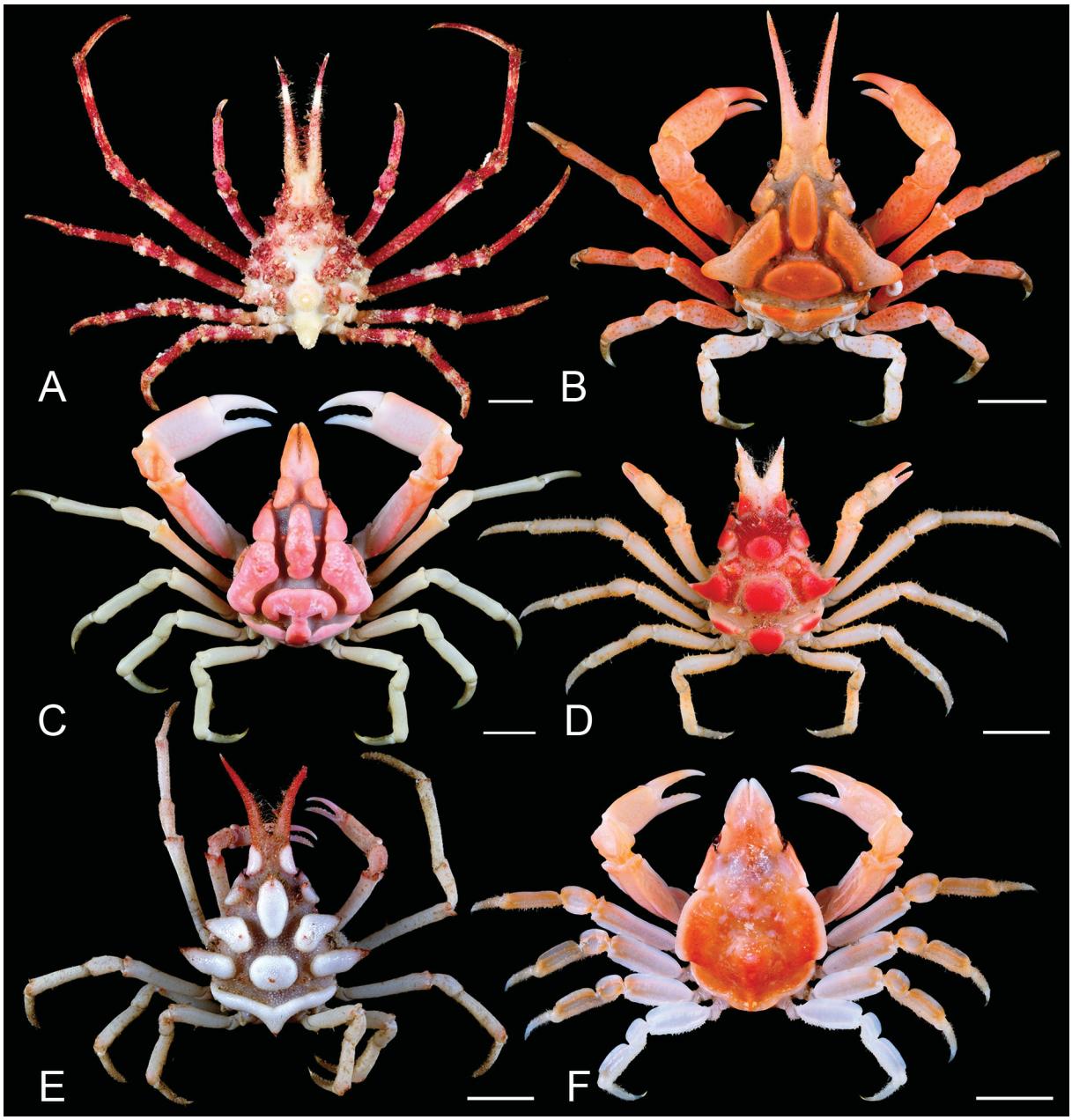

Fig. 13. Colour in life. **A**. *Naxioides robillardi* (Miers, 1882), ♂ (39.2 × 24.5 mm) (ZRC 2016.01065), South China Sea. **B**. *Oxypleurodon stimpsoni* Miers, 1885, ♂ (with *Sacculina*, 14.0 × 9.0 mm) (ZRC 2016.0072), South China Sea. **C**. *Oxypleurodon auritum* (Rathbun, 1916), ♂ (16.7 × 11.1 mm) (ZRC 2016.0066), South China Sea. **D**. *Oxypleurodon forte* Lee, Corbari & Richer de Forges, 2015, ♂ (14.2 × 9.1 mm) (ZRC 2016.0078), South China Sea. **E**. *Oxypleurodon sanctaeclausi* Richer de Forges & Ng 2009, paratype, ♀ (18.7 × 16.8 mm) (ZRC 2009.0019) (after Richer de Forges & Ng 2009a). **F**. *Stegopleurodon pteridion* sp. nov., holotype, ♂ (13.1 × 7.9 mm) (NTOU), South China Sea. Scale bars: A = 10 mm; B–F = 5 mm.

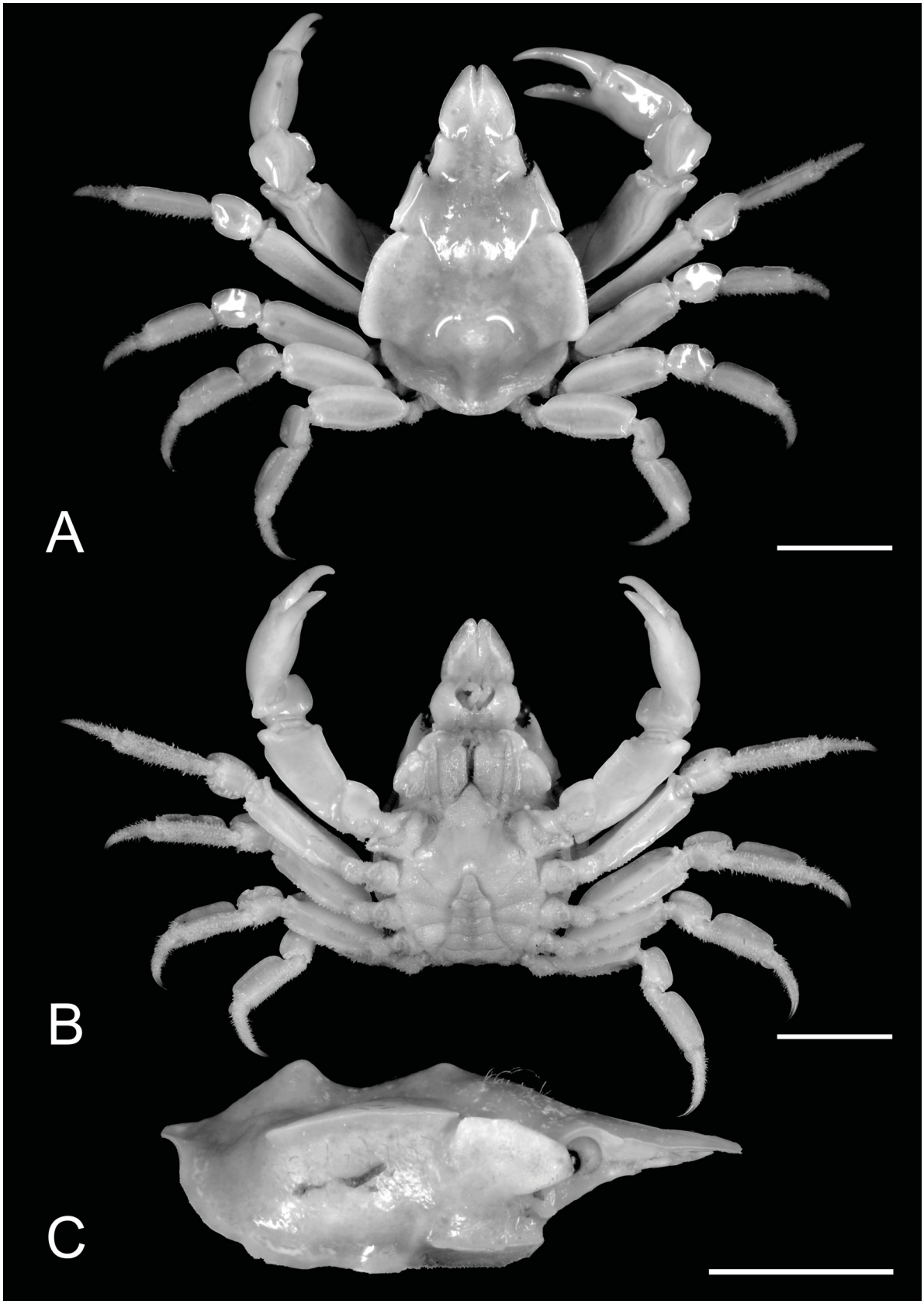

Fig. 14. *Stegopleurodon pteridion* sp. nov., holotype, ♂ (13.1 × 7.9 mm) (NTOU), South China Sea. **A**. Overall dorsal view. **B**. Overall ventral view. **C**. Lateral view of carapace. Scale bars = 5 mm.

Male cheliped with propodus inflated, carinate on upper border; carpus squarish in cross-section with each angle carinate; merus triangular in cross-section, with each angle carinate. Ambulatory legs with merus, carpus, propodus enlarged, carinate on borders; merus triangular in cross-section, lower border of merus of P2–P5 each with 2 crested carinae with margin bearing spine-like setae; carpus with 2 carinae on anterior region, posterior region covered with setae; propodus with single carina on anterior region, posterior region covered with setae; dactylus curved, sharp, covered with setae except at tip.

Male thoracic sternum anteriorly deeply depressed, covered with setae, smooth when denuded; sternites 1–3 fused (Fig. 14B). Male abdomen with triangular telson and 6 free somites, widest at third. G1 straight, constricted distally (Fig. 15).

Colouration

In the fresh specimen, the carapace is orange with the chelipeds pinkish-orange; the first three pairs of ambulatory legs are pale orange, with the last pair entirely white (Fig. 13F).

Remarks

The new species fits well with the description of *Stegopleurodon* Richer de Forges & Ng, 2009, but it is clearly different from the only species known, *S. planirostrum* Richer de Forges & Ng, 2009, from

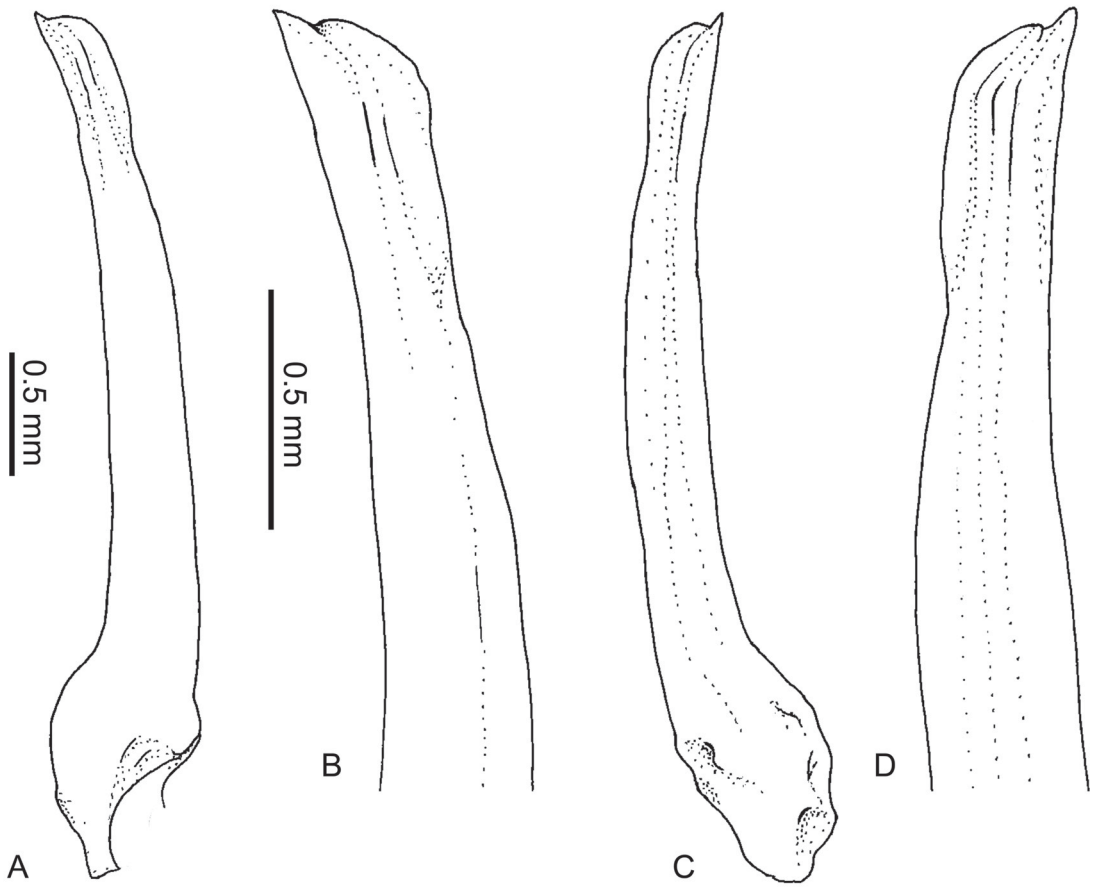

Fig. 15. *Stegopleurodon pteridion* sp. nov., holotype, ♂ (13.1 × 7.9 mm) (NTOU), South China Sea, drawing of left G1. **A**. Ventral view. **B**. Ventral view of distal portion. **C**. Dorsal view. **D**. Dorsal view of distal portion.

New Caledonia (Richer de Forges & Ng 2009b). *Stegopleurodon pteridion* sp. nov. has thin anterolateral lobes (Fig. 14A, C), whereas those on *S. planirostrum* are thick and strong (cf. Richer de Forges & Ng 2009b: fig. 8A, C). *Stegopleurodon planirostrum* has a proportionately wider carapace than *S. pteridion* sp. nov. (Fig. 14A). In *S. planirostrum*, there are strong ridges on the carapace: one longitudinal and two transverse, forming a cross on the gastric and another on the cardiac region (cf. Richer de Forges & Ng 2009b: fig. 8A). In *S. pteridion* sp. nov., only one ridge is present on the posterior part of the carapace between the cardiac region and the posterior margin of the carapace (Fig. 14A, C).

Distribution

Only known from South China Sea.

Family Inachidae MacLeay, 1838

Genus ***Cyrtomaia*** Miers, 1886

Remarks

There are currently 29 species in this genus (Ng *et al.* 2008; Richer de Forges & Ng 2008). The type species is *Cyrtomaia murrayi* Miers, 1886, by subsequent designation by Guinot & Richer de Forges (1982) (Ng *et al.* 2008; Richer de Forges & Ng 2008).

Cyrtomaia murrayi Miers, 1885

Cyrtomaia murrayi Miers, 1885: 588, fig. 196 (type locality: Kai Islands, Indonesia).

Cyrtomaia murrayi – Miers 1886: 15, 26 (list), 43 (list), pl. 3 fig. 1. — Serène & Lohavanijaya 1973: 44, 46 (key). — Sakai 1976: 178 (key), 180, pl. 62. — Guinot & Richer de Forges 1982: 7–8, 13, 15 (list), 16 (key), 17–18, 49 (list), 80 (table), 83, 85, figs 5A–B, 6A–B, 7A–B, 54; 1986: 86 (list), 115–116, pl. 6 fig. I. — Griffin & Tranter 1986a: 24 (key), 29, fig. 9h–i, pl. 2. — Ng & Huang 1997: 269–270, fig. 5F. — Ng *et al*. 2001: 13 (list). — Richer de Forges & Ng 2007: 56 (list), 57; 2009: 1207 (key). — Ng *et al*. 2008: 111 (list).

(For complete synonymy, see Guinot & Richer de Forges 1986: 115.)

Material examined

SOUTH CHINA SEA: 1 ♂ (15.7 × 28.7 mm) (ZRC 2016.0086), north of Zhongsha, stn CP4149, 16°06.54′ N, 114°20.05′ E to 16°06.75′ N, 114°22.97′ E, 165–162 m, coll. ZHONGSHA 2015 Expedition, 26 Jul. 2015; 1 ♀ (14.4 × 17.5 mm) (ZRC 2016.0083), north of Zhongsha, stn CP4150, 162–163 m, 16°06.83′ N, 114°24.04′ E to 16°06.60′ N, 114°21.45′ E, coll. ZHONGSHA 2015 Expedition, 26 Jul. 2015.

Distribution

This species seems common in relatively shallower waters, between 150 and 250 m in Indonesia, the Philippines, Japan (Richer de Forges & Ng 2007) and Taiwan (Ng & Huang 1997). The species has also been recorded from East Africa, western Australia and South China Sea (Griffin & Tranter 1986a).

Cyrtomaia horrida Rathbun, 1916

Cyrtomaia horrida Rathbun, 1916: 527 (list), 523–533 (type locality: the Philippines, between Negros and Siquijor, 9°08′15″ N, 123°23′20″ E).

Cyrtomaia horrida – Serène & Lohavanijaya 1973: 46 (key). — Sakai 1976: 178 (key), 180–181, pl. 60. — Griffin 1976: 188, 218 (list), fig. 3. — Guinot & Richer de Forges 1986: 86 (list), 119–120,

pl. 6 fig. A–C. — Griffin & Tranter 1986a: 24 (key), 25–26. — Ikeda 1998: 33, pl. 32. — Richer de Forges & Ng 2007: 56 (list), 57, 59–60, figs 1C, 2; 2008: 19–20. — Ng *et al.* 2008: 111 (list). — Richer de Forges *et al.* 2009: 1207 (key).

(For complete synonymy, see Guinot & Richer de Forges 1986: 119.)

Material examined

SOUTH CHINA SEA: 1 badly damaged specimen (45.6 × 48.4 mm) (ZRC 2016.0084), north of Zhongsha, stn CP4147, 16°09.83′ N, 114°15.25′ E to 16°08.15′ N, 114°17.97′ E, 343–249 m, coll. ZHONGSHA 2015 Expedition, 26 Jul. 2015.

Remarks

The *Cyrtomaia* species from the Philippines have been treated by Richer de Forges & Ng (2007), with the more common species being *C. horrida* Rathbun, 1916 and *C. echinata* Rathbun, 1916.

Distribution

Cyrtomaia horrida is known from Solomon Islands (Richer de Forges & Ng 2008), Indonesia, South China Sea (Griffin & Tranter 1986), the Philippines (Richer de Forges & Ng 2007) and Japan (Sakai 1976).

Cyrtomaia largoi Richer de Forges & Ng, 2007

Cyrtomaia largoi Richer de Forges & Ng, 2007: 56 (list), 61–63, figs 1D, 4–6 (type locality: Bohol sea, the Philippines).

Cyrtomaia largoi – Ng *et al.* 2008: 111 (list). — Richer de Forges *et al.* 2009: 1205–1207, fig. 1.

Material examined

SOUTH CHINA SEA: 1 ♀ (39.6 × 44.6 mm) (ZRC 2016.0085), no other collection data.

Remarks

This deep-sea species was first described from the Bohol Sea in the Philippines, and is believed to be associated with glass-sponges (Richer de Forges & Ng 2007). The species is characterized by the two pseudorostral spines, which are tightly appressed along most of their length.

Distribution

Besides the type locality in the Phillipines, this species has previously been recorded in Taiwan by Richer de Forges *et al.* (2009). This is a new record for the South China Sea.

Cyrtomaia owstoni Terazaki, 1903

Cyrtomaia owstoni Terazaki, 1903: 239, 240 (un-numbered text-fig.) (type locality: Misaki, Japan).

Cyrtomaja owstoni [sic] – Sakai 1938: 240, pl. 35 fig. 1; 1965: 71, pl. 31 fig. 2.
Cyrtomaia owstoni – Serène & Lohavanijaya 1973: 45 (key), 46–47, figs 73–78, pl. 7 C, D. — Sakai 1976: 178 (key), 179, pl. 59. — Griffin 1976: 188. — Griffin & Tranter 1986a: 24 (key), 29–30. — Ikeda 1998: 32–33, pl. 30. — Richer de Forges & Ng 2007: 56 (list). — Ng *et al.* 2008: 111 (list).

Material examined

SOUTH CHINA SEA: 1 ♂ (22.0 × 24.4 mm) (ZRC 2016.0088), south of Taiwan bank, stn CP4166, 22°07.62′ N, 118°43.30′ E to 22°03.29′ N, 118°45.46′ E, 587–756 m, coll. ZHONGSHA 2015 Expedition,

1 Aug. 2015; 1 ♂ (11.6 × 12.4 mm), 1 ♀ (17.1 × 18.6 mm) (ZRC 2016.0087), south of Taiwan Bank, stn CP4165, 22°09.89′ N, 118°42.02′ E to 22°07.29′ N, 118°43.39′ E, 443–618 m, coll. ZHONGSHA 2015 Expedition, 1 Aug. 2015.

Remarks

Cyrtomaia owstoni Terazaki, 1903, is characterized by the curved branchial spines that are longer than the protogastric spines (Griffin & Tranter 1986a).

Distribution

The species is known from Japan (Sakai 1938, 1965, 1976; Ikeda 1998), the Philippines (Griffin 1976) and South China Sea (Serène & Lohavanijaya 1973).

Genus ***Platymaia*** Miers, 1886

Remarks

There are currently 10 recognised species within this genus, and the type species is *Platymaia wyvillethomsoni* Miers, 1886, by monotypy (Ng *et al.* 2008: 112).

Platymaia* aff. *remifera
Fig. 16A–B

Material examined

SOUTH CHINA SEA: 1 ovigerous ♀ (29.2 × 31.3 mm) (ZRC 2016.0089), north of Zhongsha, stn CP4153, 16°13.94′ N, 114°27.21′ E to 16°14.25′ N, 114°29.55′ E, 318 m, coll. ZHONGSHA 2015 Expedition, 27 Jul. 2015; 1 juvenile (10.7 × 10.5 mm) (ZRC 2016.0090), Dongsha, stn CP4128, 20°44.86′ N, 116°08.01′ E to 20°42.28′ N, 116°08.01′ E, 420–444 m, coll. DONGSHA 2014 Expedition, 1 May 2014; 7 juveniles (only the measurement of the largest specimen is given: 10.6 × 10.0 mm) (ZRC 2016.0091), Nanhai, continental slope, stn CP4117, 20°00.8788′ N, 114°08.80′ E to 20°01.87′ N, 114°09.36′ E, 421–333 m, coll. NANHAI 2014 Expedition, 11 Jan. 2014.

TAIWAN: 1 ovigerous ♀ (32.7 × 35.8 mm) (ZRC 2009.0674), TungKang, P.K.L. Ng leg., Jun. 2009; 1 ♂ (41.7 × 45.6 mm) (ZRC 1998.458), Tashi, P.K.L. Ng leg., 25 May 1998; 1 ♂ (28.4 × 31.3 mm), 1 ovigerous ♀ (31.8 × 34.0 mm) (ZRC 2016.0092), northeast Taiwan, Tashi port, 300–700 m, P.K.L. Ng leg., Jun. 1993; 2 ♂♂ (31.2 × 33.9 mm, 27.7 × 29.2 mm), 1 ovigerous ♀ (32.0 × 34.4 mm) (ZRC 2001.0253), PingTung County, TungKang fishery port, K. Lim & H.H. Tan leg., 23 Nov. 2001; 2 ♂♂ (33.0 × 36.5 mm, 32.4 × 35.5 mm), 1 ♀ (32.9 × 35.5 mm) (ZRC 1999.0769), I-Lan County, Tachi fish port, P.K.L. Ng & K. Lim leg., May 1999.

HONG KONG: 2 ♂♂ (36.8 × 39.2 mm, 30.8 × 33.0 mm) (ZRC 1968.2.1.37), Cr. 4/64, stn 59, T/174, no other collection data.

PHILIPPINES: 2 ♀♀ (35.9 × 39.3 mm, 22.0 × 24.8 mm) (ZRC 2016.0096), Bohol Sea, off Pamilacan Island, stn CP2341, 9°24.5′ N, 123°49.7′ E, 544–712 m, coll. PANGLAO 2005, 23 May 2005; 1 ♀ (35.5 × 36.4 mm) (ZRC 2016.0093), Bohol Sea, off Balicasag Island, stn CP2398, 9°32.6′ N, 123°40.5′ E, 713–731 m, coll. PANGLAO 2005, 31 May 2005; 1 ♂ (21.1 × 24.0 mm) (ZRC 2016.0094), Balicasag Island, P.K.L. Ng leg.; 1 ♂ (19.0 × 21.1 mm), 2 ♀♀ (34.6 × 37.2 mm, 15.0 × 17.0 mm), 2 juveniles (ZRC 2016.0095), Bohol Sea, Maribojoc Bay, stn CP2332, 9°38.8′ N, 123°45.9′ E, 396–418 m, coll. PANGLAO 2005, 22 May 2005.

VANUATU: 1 ♂ (22.5 × 24.3 mm) (ZRC 2016.0097), west coast of Malo Island, stn AT70, 15°40.7′ E, 167°00.5′ E, 517–614 m, coll. SANTO 2006, 7 Oct. 2006.

Remarks

Platymaia remifera Rathbun, 1916, was described from the Philippines, between Cebu and Bohol (Rathbun 1916: 530) without figures. Guinot & Richer de Forges (1986) first published photographs of the holotype specimen (Guinot & Richer de Forges 1986: pl. 2 figs A–C).

The present large female specimen from the SCS material has a granulated carapace. On the interior border of the branchial region, there is a series of three strongly curved spines (Fig. 16A), whereas the Taiwanese specimen has a series of five weak spines (Fig. 16B). On the thoracic sternum, there is a line of sharp spines adjacent to the margins of the abdomen. Compared to the material from Taiwan, which typically has granulation on thoracic sternum, all the specimens examined in this study possess spination that is similar to those from the Philippines (from PANGLAO 2005 expedition). This collection of *Platymaia* aff. *remifera* should be compared to the type material of *P. remifera* Rathbun, 1916, that was collected from the central Philippines, and *P. alcocki* Rathbun, 1916, that was collected from the Indian Ocean. Unfortunately, *P. alcocki*, was described on the basis of a juvenile specimen; hence certain morphological characteristics of the adult might not be obvious.

Distribution

This species seems to be very common in the northern Taiwanese waters (Ng & Huang 1997), as well as the Philippines (Guinot & Richer de Forges 1986; Ng & Huang 1997), and has been reported from the SCS by Serène & Lohavanijaya (1973).

Discussion

Overall, a total of 11 species from the family Epialtidae MacLeay, 1838, and five species from the family Inachidae MacLeay, 1838, are reported from the SCS. Of these, two are new to science, *Oxypleurodon leonis* sp. nov. and *Stegopleurodon pteridion* sp. nov., while four are new records for SCS. Species

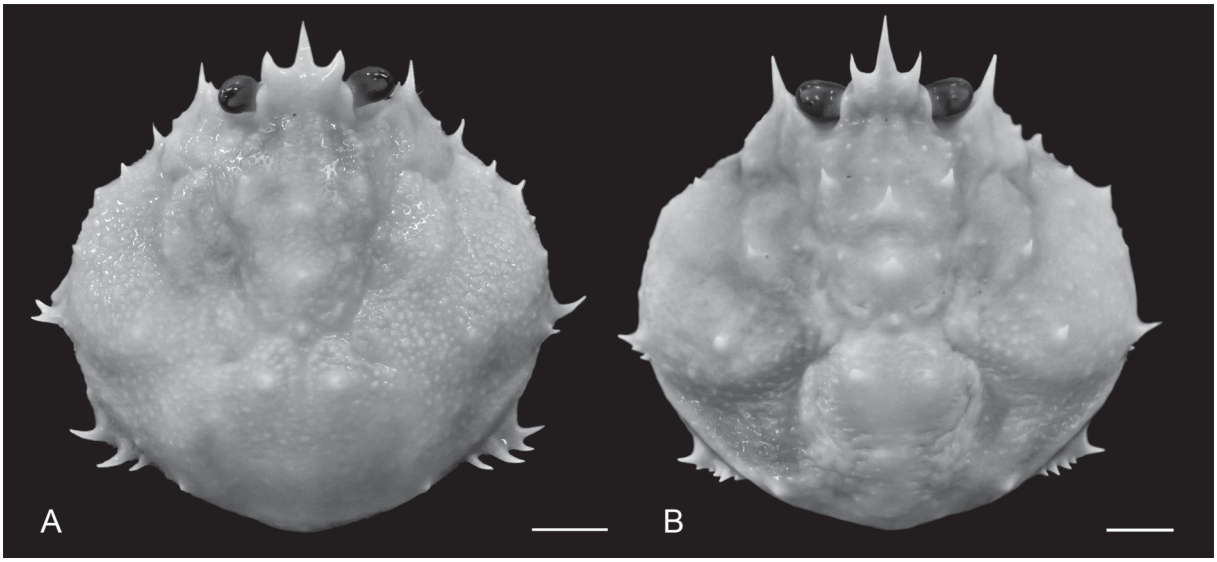

Fig. 16. *Platymaia remifera* Rathbun, 1916, overall dorsal view. **A**. Ovigerous ♀ (29.2 × 31.3 mm) (ZRC 2016.0089), South China Sea. **B**. ♂ (33.0 × 36.9 mm) (ZRC 1999.0769), Taiwan. Scale bars = 5 mm.

that are not well known, *Rochinia kagoshimensis* (Rathbun, 1932) comb. nov. and *Rochinia strangeri* Serène & Lohavanijaya, 1973, are redescribed and re-figured with fresh materials and type materials.

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