

ON TWO SPECIES OF DEEP-SEA HOMOLODROMOID CRABS OF THE GENUS  
*DICRANODROMIA* (CRUSTACEA: DECAPODA: BRACHYURA: HOMOLODROMIIDAE)  
FROM THE PHILIPPINES, INCLUDING ONE NEW SPECIES

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**ABSTRACT.** – Two species of deep sea homolodromiid crabs, *Dicranodromia martini* and *D. chenaе*, new species, are recorded from the Philippines. *Dicranodromia martini* shows some morphological variation in its pereiopods: larger specimens have relatively shorter dactyli of the second and third pereiopods; and the largest specimen lacks a movable spine on the extensor margin of the fifth pereiopod, a feature present in smaller specimens. The first male gonopod of *D. martini* is described for the first time. A new species, *Dicranodromia chenaе*, can be differentiated from the allied *D. doederleini* by its different carapace form, structures of the antennal basis and features of the female thoracic sterna.

**KEY WORDS.** – *Dicranodromia martini*, *Dicranodromia chenaе*, new species, Homolodromiidae, Philippines, taxonomy.

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## INTRODUCTION

The family Homolodromiidae currently contains two genera and 22 species from the Indo-West Pacific and the Atlantic (Guinot, 1995; Martin et al., 2001; Ng & McLay, 2005). From the Philippines, two homolodromiid species have been recorded to date: *Dicranodromia martini* Guinot, 1995 (from the Sulu Sea, 930 m and north of Mindanao Island, 750 m) and *D. danielae* Ng & McLay, 2005 (Balicasag Island, Panglao, 200–300 m). During the PANGLAO 2005 deep-sea expedition conducted in the Bohol and Sulu Seas in the Central Philippines, two more homolodromiids were obtained: *Dicranodromia martini* and *D. chenaе*, new species. The present study report describes the new species as well as discusses the morphological variation observed in *D. martini*.

Specimens are deposited in the National Museum of the Philippines, Manila (NMCR); and the Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore (ZRC). Carapace length (CL) is measured from the tip of the pseudo-rostrum to the posterior margin of the carapace and carapace width (CW) is measured across the greatest width. G1 and G2 are used for the male first and second gonopods, respectively. The

terminology follows that used by Guinot (1995). The abbreviations P2–P5 are used for the pereiopods 2–5, respectively.

## TAXONOMY

### HOMOLODROMIIDAE

#### *Dicranodromia* A. Milne Edwards, 1880

**Remarks.** – The genus *Dicranodromia* now contains 17 species, nine of which occur in the Indo-West Pacific (Guinot, 1995; Ng & McLay, 2005). Most species are represented by only few specimens, so it is not easy to ascertain variation, sexual differences and changes that may be due to relative growth. Even with the best known species, *D. doederleini* Ortmann, 1892, there are a number of problems with assessing the significance of the variation observed (see Guinot, 1995: 206–207).

**Comparative material.** – *Dicranodromia danielae* Ng & McLay, 2005: 1 ovigerous female, holotype (CL 14.2 mm, CW 10.8 mm) (ZRC 2005.0094), Balicasag Island, Panglao, Bohol, Visayas, the Philippines, in tangle nets, ca. 200–300

m, coll. local shell fishermen, 2 Mar.2004. *Homolodromia paradoxa* (A. Milne Edwards, 1880): 1 male (CL 31.9 mm, CW 23.4 mm) (ZRC 1999.0047), off Suriname, 7°48'N 54°11'W, coll. Mar. Res. Stn., 22 Apr.1980. *Homolodromia kai* Guinot, 1993: 1 ovigerous female (CL 34.3 mm, CW 26.4 mm) (ZRC 1999.0040), Tungsha Islands, 650 m depth, coll. P.-H. Ho, 22 Apr.1995; 1 male (CL 26.5 mm, CW 20.2 mm) (ZRC 2007.0103), southwest of Kaohsiung, Taiwan, station CD141, 277–355m, 22°21.64'N 120°13.44'E, 24 Nov.2001; 1 male (CL 13.7 mm, CW 9.9 mm) (ZRC 2007.0104), southwest of Kaohsiung, Taiwan, station CP130, 709–728m, 22°18.77'N 120°6.99'E, 22 Aug.2001.

***Dicranodromia martini* Guinot, 1995**

(Figs. 1, 3a, b, 4)

**Material examined.** – 1 male (CL 16.6 mm, CW 12.3 mm) (ZRC 2007.0105), Maribohoc Bay, Panglao, Bohol, station CP 2396, 609–673 m, 9°36.3'N 123°42.0'E, 31 May 2005; 1 female (CL 34.2 mm, CW 28.1 mm) (ZRC 2007.0106), Bohol and Sulu Seas, station CP 2363, 437–439 m, 9°06.0'N 123°25.0'E, 26 May 2005; 1 female (CL 12.8 mm, CW 9.6 mm) (NMCR 19114), Bohol Sea, station CP 2388, 762–786 m, 9°26.9'N 123°34.5'E, 30 May 2005. All from the Philippines, coll. MV DA-BFAR, PANGLAO 2005 Expedition.

**Remarks.** – Three specimens recently collected by the Panglao Expeditions agree well with the description of *Dicranodromia martini* Guinot, 1995. Guinot (1995: 223) stated that the dactyli of P2 and P3 are as long as the carpi, but our specimens show minor variation in this character. The largest specimen (a female, ZRC 2007.0106, CL 34.2 mm, Fig. 1a), has the P2 and P3 dactyli slightly shorter than the carpi, whereas those of the medium-sized specimen (a male, ZRC 2007.0105, CL 16.6 mm, Fig. 1b, c) are as long as the carpi, and those of the smallest specimen (a female, NMCR 19114, CL 12.8 mm, Fig. 1d) are slightly longer than the carpi. Guinot’s (1995: Fig. 20C) figure of the P2 of a small specimen (U.S. Museum of Natural History, Washington DC, USNM 128563, CL 13 mm) also has the dactylus slightly longer than the carpus.

The male (ZRC 2007.0105) and the smaller female specimen (NMCR 19114) both have a movable spine on the extensor margin of the dactylus of the P5 (Fig. 3a), but this spine is completely absent on the larger female specimen (ZRC 2007.0106, CL 34.2 mm) (Fig. 3b). This character was figured for *D. felderi* Martin, 1990, by Martin (1990: Fig. 3d) and Guinot (1995: Fig. 3H), and *D. spinosa* Martin, 1994, by Martin (1994: Fig. 2f). The spine might be missed in many

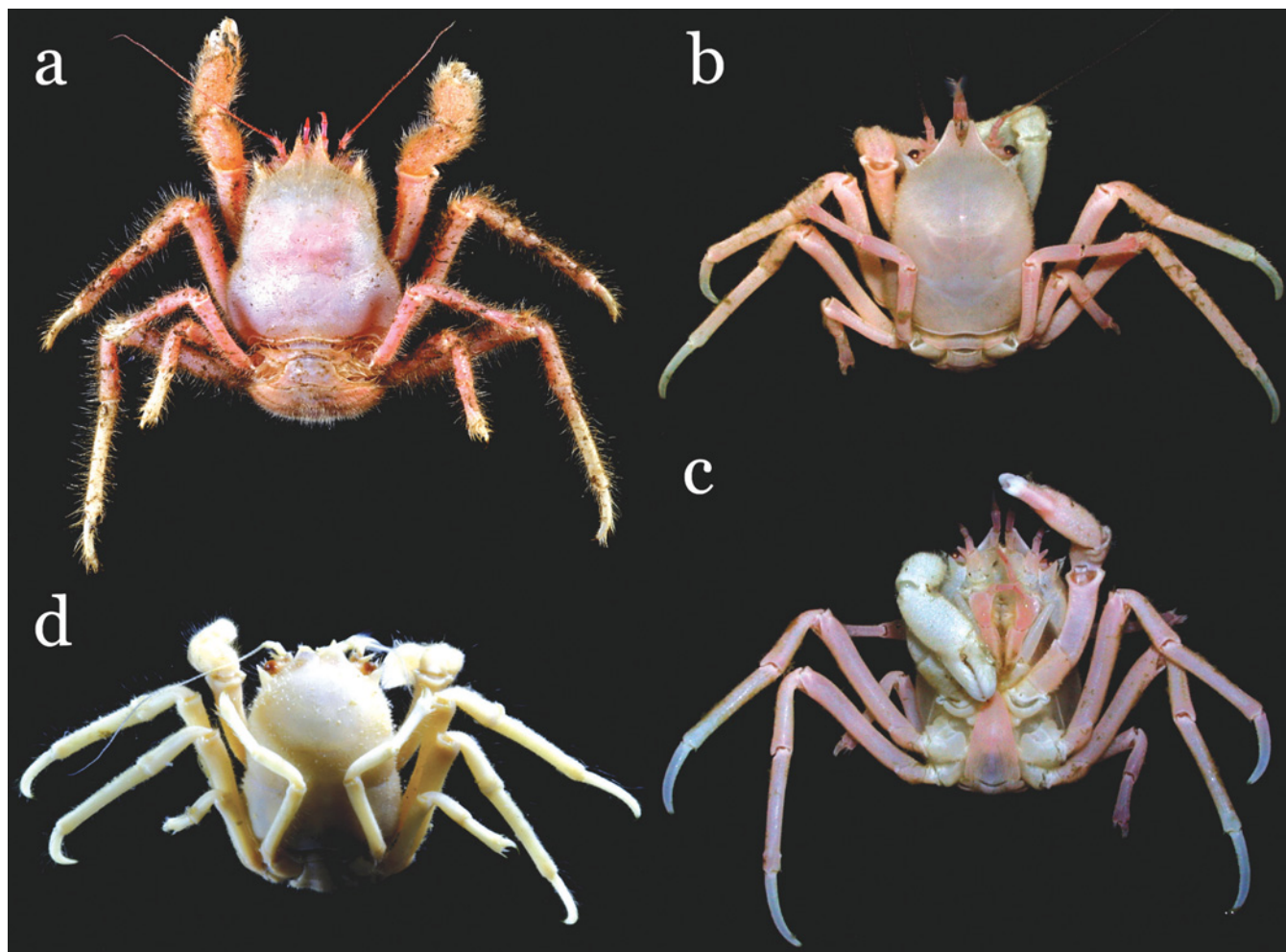


Fig. 1. *Dicranodromia martini* Guinot, 1995: a, female (CL 34.2 mm, CW 28.1 mm) (ZRC 2007.0106); b, c, male (CL 16.6 mm, CW 12.3 mm) (ZRC 2007.0105); d, female (CL 12.8 mm, CW 9.6 mm) (NMCR 19114). a–c, colours in life.

species as the many setae on the dactylus make it difficult to observe and it can easily be missed. Indeed, a re-examination of the holotype of *D. danielae* Ng & McLay, 2005, reveals the presence of such a spine as well (Fig. 4c) although Ng & McLay (2005: Fig. 4B) did not figure it. Examination of specimens of *Homolodromia paradoxa* (A. Milne Edwards, 1880) and *H. kai* Guinot, 1993, as well as a careful check of the references for other *Homolodromia* species, reveals that they all lack the spine (cf. *H. bouvieri* Doflein, 1904: Martin, 1992: Fig. 2G; Guinot, 1995: Fig. 3D; *H. robertsi* Garth, 1973: Garth, 1973: Fig. 1A; Baéz & Martin, 1989: Fig. 2f; *H. monstrosa* Martin, Christiansen & Trautwein, 2001: Martin et al., 2001: Fig. 5e). Careful examination of more material will be needed to ascertain the importance of this character at the generic and specific levels. This character has been used in the taxonomy of the family Dromiidae and its evolution discussed (see McLay, 1993).

The largest female specimen (ZRC 2007.0106) also possesses a more inflated posterolateral margin of the carapace and a more anteriorly directed external orbital tooth (Fig. 1a). We, however, hesitate to consider these differences as interspecific, as only one specimen is available. Considering the limited number of specimens of *D. martini* known and the significant differences in sizes of the material on hand, we prefer to provisionally treat all three specimens as *D. martini*.

The only male specimen (ZRC 2007.0105, CL 16.6 mm) already possesses a well developed G1 and G2 (Fig. 4) and the species appears to be mature at this size. The G1 is already chitinised, and the distal segment is slightly directed inwards with a ventral side of an outer layer marginally covering an inner layer to form a groove for the G2. The G2 is long, with the distal segment longer than the distal two segments of the G1 and is slightly sinuous along half its length.

### *Dicranodromia chenae*, new species

(Figs. 2, 5–8)

**Material examined.** – Holotype: female (CL 30.5 mm, CW 22.7 mm) (NMCR 19115), Bohol Sea, station CP 2343, 273–356 m, 9°27.4'N 123°49.4'E, the Philippines, coll. MV DA-BFAR, PANGLAO 2005 Expedition, 23 May 2005.

**Description.** – Carapace sub-trapezoidal, widest across intestinal-mesobranchial regions, CL 1.34 times CW; dorsal surface convex, surface sparsely granulated around margins, covered by dense, stiff setae; setae also present on pereopods, thoracic sternum and abdomen. Branchial-cardiac groove distinct, curving medially anteriorly; cervical groove shallower but still discernible. Pseudo-rostrum bifurcate, each lobe triangular, sloping inwards, slightly incurving distally, tapering tip terminated by sharp tooth; external orbital tooth with relatively broad base, oriented anterolaterally, but distal part abruptly narrowing, directed more anteriorly, anterior margin with 1 or 2 small teeth; supraorbital margin separated from external orbital tooth by triangular cleft, outer part with a few small teeth; infraorbital margin present only on outer half, bifurcated, outer lobe much larger, reaching half length of pseudo-rostrum in dorsal view. Subhepatic region produced anteriorly, epistome with small spinules, posterior margin upturned, with median fissure. Antennae well-developed, with long flagellum; basis with strong, circular conical lateral external projection as long as antennal basis, with a spinule on distal end. Eyes with long peduncle, distal part with small teeth, cornea placed between lateral external projection of antennal basis and outer lobe of infraorbital tooth in dorsal view. Third maxilliped narrow, sloping dorsally from inner to outer part; ischium relatively wide distally, longer than merus; merus sloping dorsally from subproximal outer to distal inward; palp (carpus, propodus, dactylus) relatively long, reaching beyond distal inner angle of ischium by half length of dactylus; exopod with slightly subdistal part

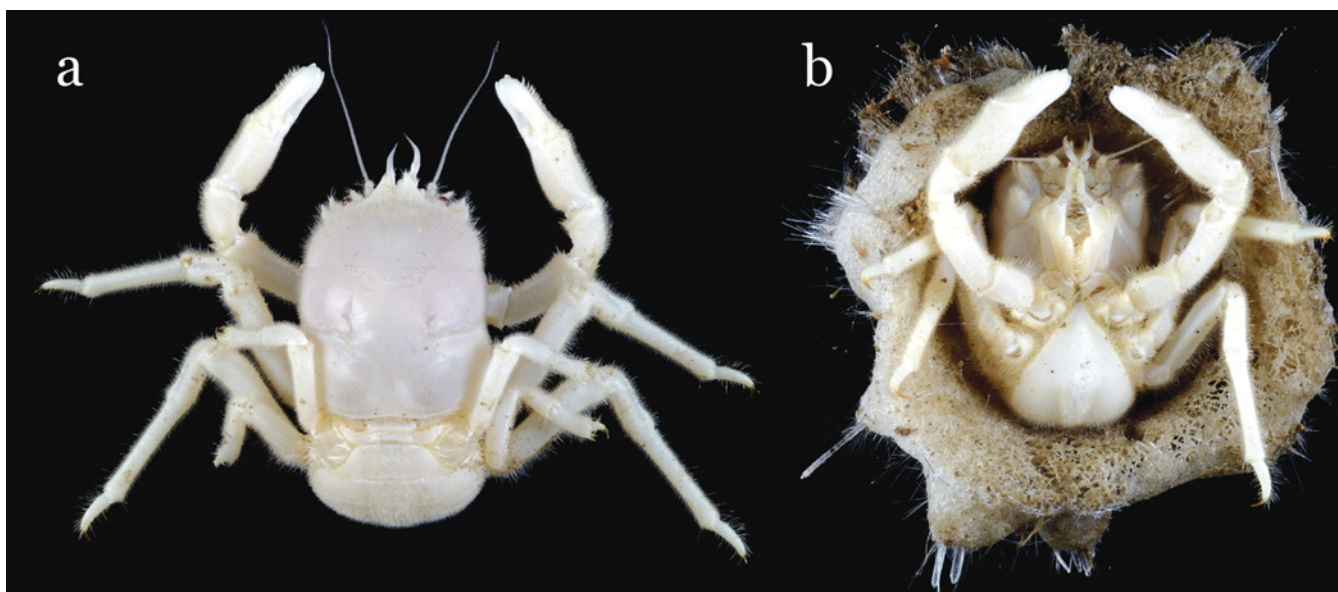


Fig. 2. *Dicranodromia chenae*, new species. Holotype female (CL 30.5 mm, CW 22.7 mm) (NMCR 19115): Colours in life (a, b) and carrying sponge (b).

concave, widest on proximal third, slightly wider than half width of ischium.

Chelipeds (P1) almost symmetrical, densely covered with stiff setae on most parts; merus with both outer lower and inner lower margins sparsely lined with small teeth; palm with slightly convex outer surface, upper half with scattered granules; inner surface with scattered rounded tubercles on upper half, longitudinal shallow ridge on upper third, relatively less setose below ridge; movable finger thick, occluding surface hollowed, distal half gently swollen laterally, curving distally downwards, upper outer part with cleft through medial third, setae covering upper dorsal part to below cleft; immovable finger with distal deep U-shaped depression, into which tip of movable finger fits when chela closed; outer upper margin with 1 basal triangular tooth, followed by a few small and 4 or 5 anteriorly directed lobe-like teeth, setae present only proximally to middle of outer surface, inner upper margins concave on proximal half. P2 and P3 relatively short, P3 longer than P2; meri without conspicuous tooth on posterior margins; propodi almost straight, with 1 movable yellow spine on distal inner angle;

dactylus with length about two-thirds of carpus, terminating in strongly incurving claw, flexor margin lined equidistantly with 6–8 teeth; P4 stouter, shorter than P5; P5 with thin, long spine on distal part of dorsal outer angle of carpus and proximal fourth of outer surface of propodus; distal end of propodus not produced, sharp spines fringing distal margin except for inner surface of base of dactylus; dactylus claw-like, strongly incurving, dactylus of P5 with a movable spine on proximal third of extensor margin.

Thoracic sternite 7 with short, anteriorly-convex transverse ridge from posterior inner part of sexual opening, with oblique ridge from posterior to transverse ridge to just anterior to inner end of suture between thoracic sternites 7 and 8, posterior end of oblique ridge partially covering spermathecal aperture; aperture placed posterior to a line joining posterior margin of P3 coxae.

Abdomen with 6 free segments and telson; segments relatively short; telson long, as long as combined length of first to fifth abdominal segments.

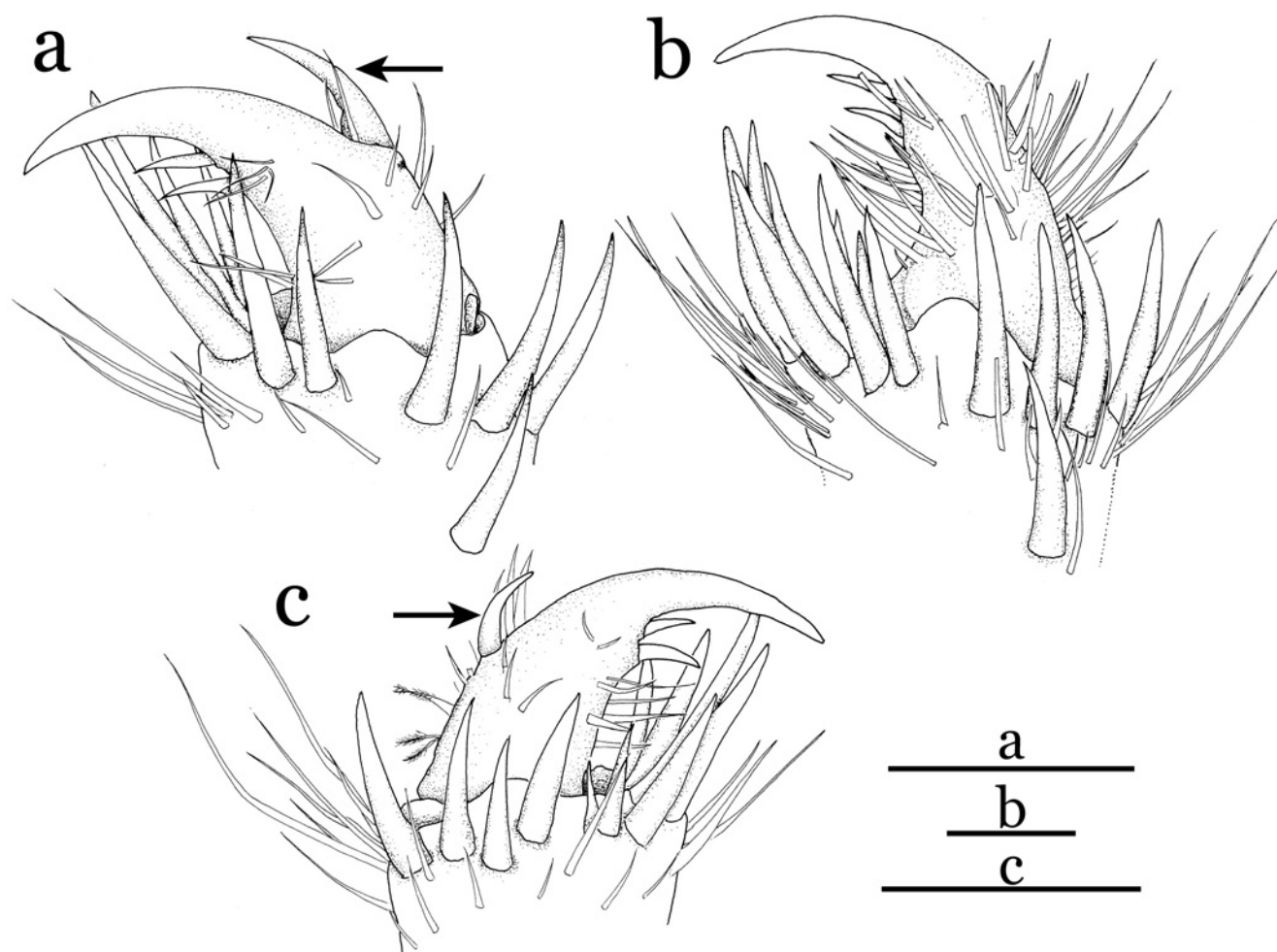


Fig. 3. Dactylus of P5 of *Dicranodromia* species: a, *D. martini* Guinot, 1995, male (CL 16.6 mm, CW 12.3 mm) (ZRC 2007.0105); b, *D. martini* Guinot, 1995, female (CL 34.2 mm, CW 28.1 mm) (ZRC 2007.0106); c, *D. danielae* Ng & McLay, 2005, holotype ovigerous female (CL 14.2 mm, CW 10.8 mm) (holotype, ZRC 2005.0094). Scale bars = 1.0 mm. Arrows indicate the movable spine of the extensor margin of the dactylus.

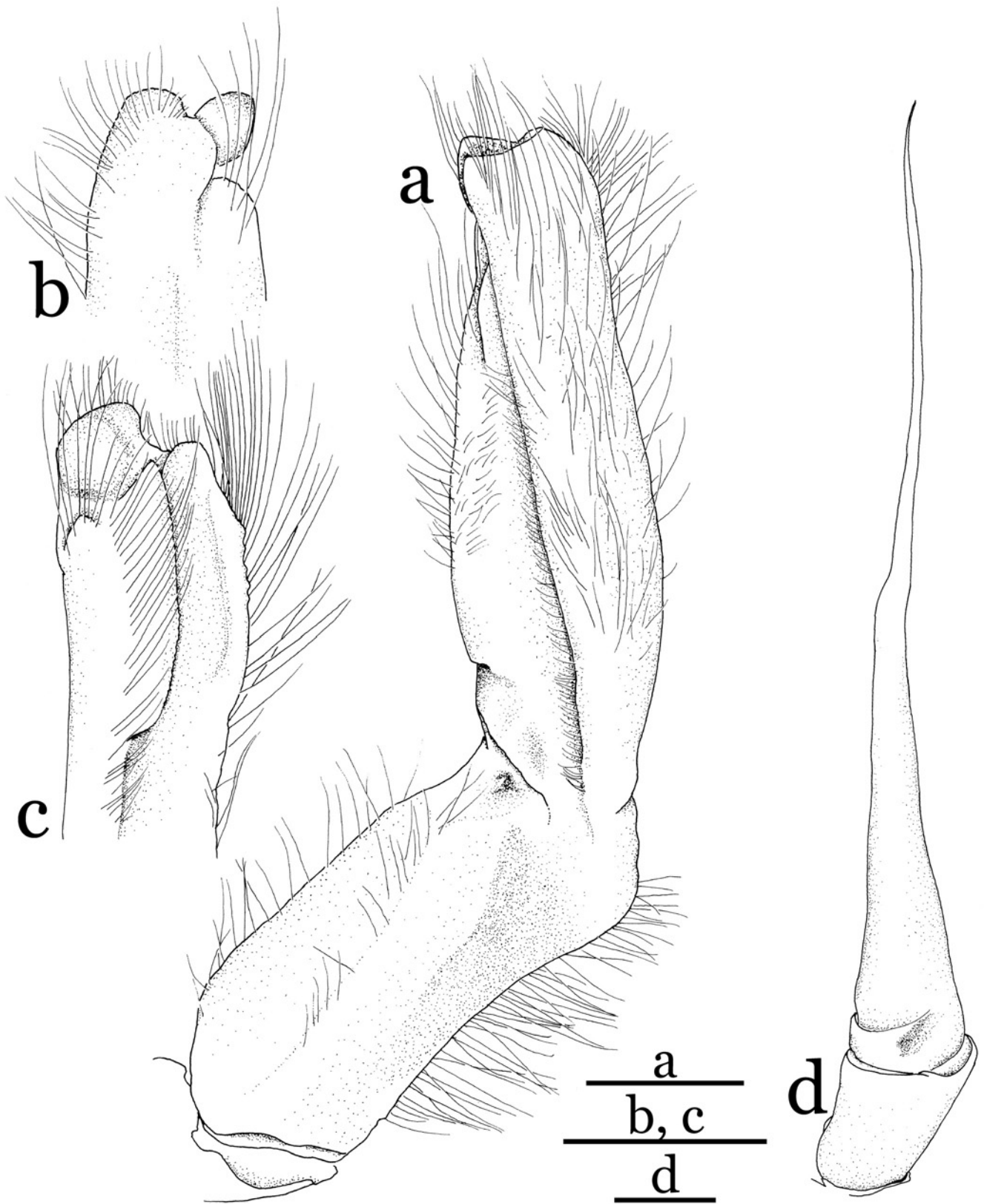


Fig. 4. G1 and G2 of *Dicranodromia martini* Guinot, 1995. Male (CL 16.6 mm, CW 12.3 mm) (ZRC 2007.0105): a, left G1, ventral view; b, distal part of left G1, dorsal view; c, distal part of left G1, inner view; d, left G2, ventral view. Scale bars = 1.0 mm.

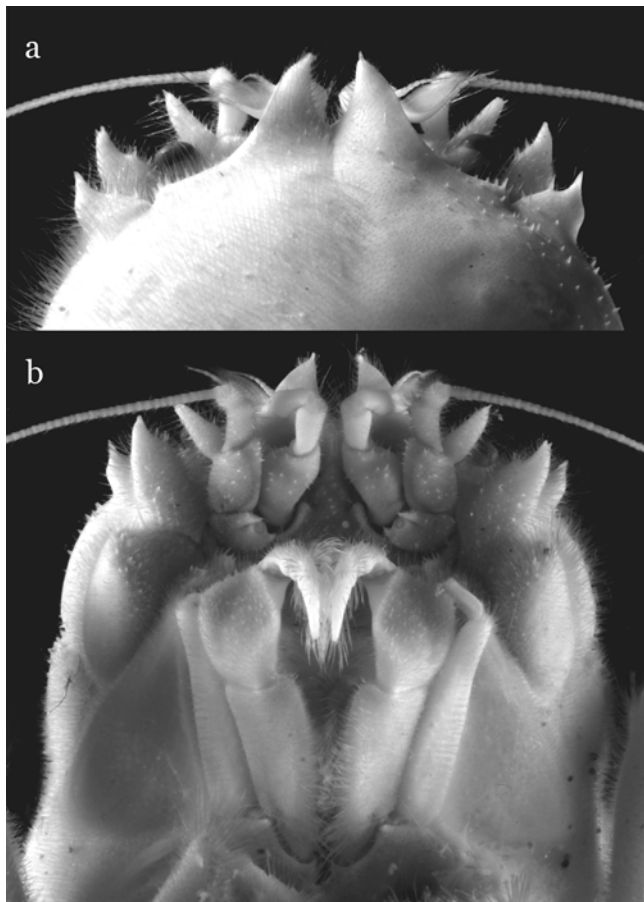


Fig. 5. Anterior part of cephalothorax of *Dicranodromia chенае*, new species. Holotype female (CL 30.5 mm, CW 22.7 mm) (NMCR 19115): a, dorsal view; b, ventral view.

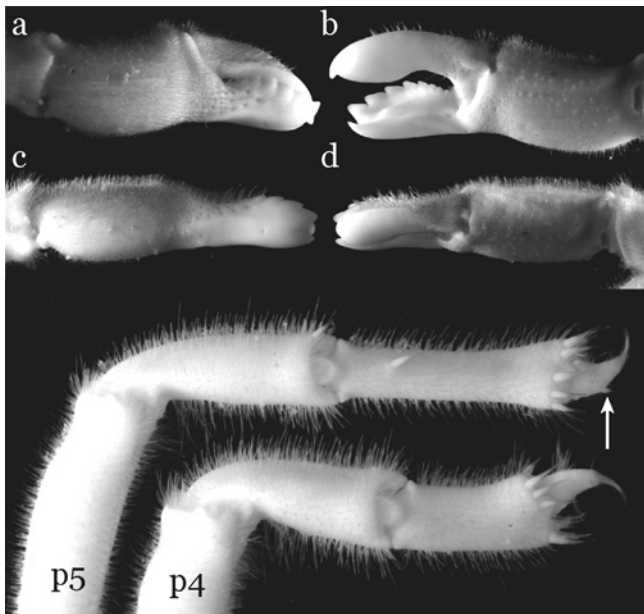


Fig. 6. Right chela, P4 and P5 of *Dicranodromia chенае*, new species. Holotype female (CL 30.5 mm, CW 22.7 mm) (NMCR 19115): a, outer view; b, inner view; c, lower view; d, upper view; p4, pereopod 4, outer view; p5, pereopod 5, outer view. Arrow indicates the movable spine of the extensor margin of the dactylus.

**Etymology.** – The species is named in honour of the late Chen Huilian, a good friend and renowned Chinese carcinologist, who unfortunately passed away just before Christmas 2006.

**Remarks.** – *Dicranodromia chенае*, new species, is distinct from all known Indo-West Pacific species by the inward-sloping pseudo-rostrum and the external orbital tooth with a wide base and sinuous anterior-inner margin. *Dicranodromia chенае* can be separated from *D. doederleini* Ortmann, 1892, by moderately short pereiopods and less granulated outer surface of the palm of the cheliped. Additional characters of *D. chенае*, differentiating it from *D. doederleini*, are the long

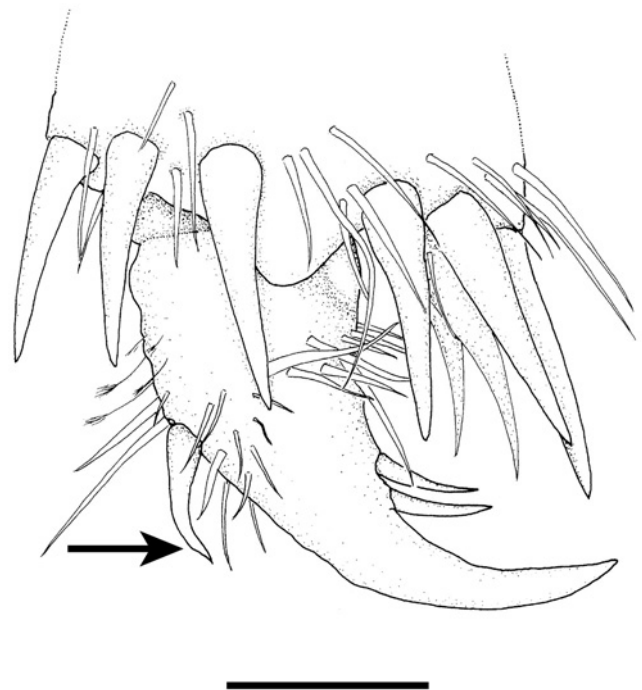


Fig. 7. Outer view of P5 dactylus of *Dicranodromia chенае*, new species. Holotype female (CL 30.5 mm, CW 22.7 mm) (NMCR 19115). Scale bar = 1.0 mm. Arrow indicates the movable spine of the extensor margin of the dactylus.

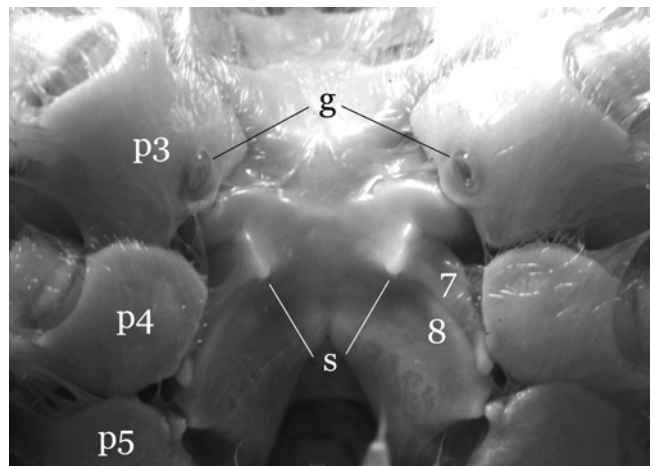


Fig. 8. Thoracic sternum of *Dicranodromia chенае*, new species. Holotype female (CL 30.5 mm, CW 22.7 mm) (NMCR 19115): 7, 8 = thoracic sternite 7 and 8; g = gonopore; p3–5 = P3–P5; s = spermathecal aperture.

distal outer projection of the antennal basis (as long as antennal basis vs. distinctly shorter than antennal basis), the absence of a true rostrum (vs. present in *D. doederleini*), and the relative position of the spermathecal aperture and the presence of an anterior eave (spermathecal aperture placed posterior to a line joining posterior margin of coxae of P3 vs. placed anterior to the line, without anterior eave).

Two species of *Dicranodromia*, *D. martini* Guinot, 1995, and *D. danielae* Ng & McLay, 2005, have been recorded from the Philippines thus far. *Dicranodromia martini* and *D. danielae* share a similar shape of the extra-orbital tooth, which is not found in *D. chenae*. Furthermore, *D. martini* can be distinguished from *D. chenae* by its longer pereopods and greater coverage of setae on the chela, and *D. danielae* can be differentiated from *D. chenae* by the arrangement of the spines on the outer surface of the P5 propodus and straight posterior margin of the epistome.

Ikeda (1998: 20, Pl. 1 Fig. 3) was probably the first author to record the carrying behaviour for camouflage of homolodromiid crabs; he mentioned that *D. doederleini* often carried a glass sponge. Ho & Ng (1999) subsequently reported a sponge-carrying *Homolodromia kai* Guinot, 1993, from Taiwan, although the kind of sponge was not identified. When the holotype of *D. chenae* was collected, it was still alive and carrying a glass sponge (Fig. 2b). The sponge fitted over the entire carapace surface and is carried in the same way as in dromiids. This is only the third observation of sponge carrying behaviour in homolodromiid crabs.

#### ACKNOWLEDGEMENTS

The specimen was collected during the Philippine-French-Singapore Deep Sea Expedition, Panglao 2005, to the Bohol and Sulu Seas, and we thank the organisers, Philippe Bouchet (Muséum national d'Histoire naturelle, Paris, MNHN), Danilo Largo (University of San Carlos, Cebu) and Luduvina Labe (Bureau of Fisheries of the Philippines, Manila) for their kind help and support. We acknowledge the financial support of TOTAL Foundation, ASEAN Regional Centre for Biodiversity and Conservation (ARCBC) (Manila), MNHN; and the Faculty of Science, National University of Singapore. We thank Bertrand Richer de Forges (Institut de Recherche pour le Développement, Nouméa, New Caledonia), Tan Swee Hee, Joelle Lai (ZRC), Marivene Manuel-Santos (NMCR), as well as Chan Tin Yam and Lee Chia-Wei (National Ocean University, Keelung, Taiwan) for their help during the cruise. Chan Tin Yam, kindly photographed the fresh specimens during the cruise. We also thank two anonymous reviewers of the manuscript for their useful comments.

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