

On a new species of freshwater crab (Crustacea: Brachyura: Gecarcinucidae: *Sundathelphusa*) from Flores, Indonesia

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Abstract. A new species of lowland semi-terrestrial crab, *Sundathelphusa flores*, new species, is described from Manggarai Barat Regency, a locality at the westernmost part of Flores Island, Indonesia. This new finding brings the number of species of the genus *Sundathelphusa* in Indonesia to eight. This new species is closely related to *Sundathelphusa tuerkayi* from Lombok Island. *Sundathelphusa flores*, however, can be distinguished from *S. tuerkayi* from the structure of the carapace and the shape of the male pleonal somite and gonopods.

Key words. Southeast Asia, Lesser Sunda Islands, diversity, semi-terrestrial, taxonomy, new gecarcinucoid

INTRODUCTION

Sundathelphusa Bott, 1969 is a large gecarcinucid freshwater crab genus consisting of 42 valid species (Ng et al., 2008; Ng & Anker, 2016; Ng & Mendoza, 2020) with most of the species found in the Philippines. So far, there are only seven species known from Indonesia. They are all found in Sulawesi, the Lesser Sunda Islands, the Moluccas (Maluku) Islands, and the Aru Islands: viz. *S. aruana* (Roux, 1911), *S. cassiope* (De Man, 1902) [type species], *S. halmaherensis* (De Man, 1902), *S. minahassae* (Schenkel, 1902), *S. molluscivora* Schubart & Ng, 2008, *S. rubra* (Schenkel, 1902), and *S. tuerkayi* Ng & Anker, 2016.

Sundathelphusa aruana (Roux, 1911) was reported by Bott (1970: 75) from the Moluccas (including the type locality in the Aru Islands) and the Lesser Sunda Islands of Lombok, Sumbawa, and Flores. Chia & Ng (2006) figured the lectotype of *Sundathelphusa aruana* sensu stricto and Ng & Anker (2016) subsequently showed that the material from Lombok should be referred to a new species, *S. tuerkayi*.

Sundathelphusa specimens were collected by the first author from Flores during field expeditions in 2019 and 2022. These expeditions were a research project between LIPI (Indonesian Institute of Sciences; now BRIN = National Research and Innovation Agency) and Staatliche Naturwissenschaftliche

Sammlungen Bayerns (SNSB) – the Bavarian Natural History Collection, Munich, Germany in 2019; and a research collaboration between BRIN and Museum für Naturkunde, Leibniz Institute for Evolution and Biodiversity Science, Berlin, Germany in 2022. The Flores specimens, including Bott's (1970) material, proved to belong to a separate species from *S. aruana* sensu stricto and *S. tuerkayi*. They are here described as a new species, *S. flores*.

MATERIAL AND METHODS

Specimens examined are deposited in the Museum Zoologicum Bogoriense (MZB), Directorate of Scientific Collection Management, National Research and Innovation Agency (BRIN), Cibinong District, Bogor Regency, Indonesia; and the Zoological Reference Collection (ZRC) of the Lee Kong Chian Natural History Museum, National University of Singapore, Republic of Singapore. Measurements, in millimetres, are of the maximum carapace width, maximum carapace length, and maximum carapace height, respectively. The carapace height (done only for adult specimens) is measured at two points, one from the highest part of the gastric region to the base of coxa of the third maxilliped; the other from the highest part of the branchial region perpendicular to directly beneath the base of the carapace (margin of the branchiostegal region). The following abbreviations are used: m asl = metres above sea level; coll. = collected by; G1 = male first gonopod; G2 = male second gonopod. The terminology used follows Ng (1988) and Davie et al. (2015). The elevation of the localities was estimated by using the FreeMapTools online application (<https://www.freemaptools.com/elevation-finder.htm>).

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Fig. 1. Live colouration, male (34.8 × 26.7 mm) (MZB Cru DW2228), photographed at creek of Wae Mese River, Flores. Photograph credit: Rena Tri Hernawaty.

TAXONOMY

Family Gecarcinucidae Rathbun, 1904

Sundathelphusa Bott, 1969

Type species. *Potamon* (*Geothelphusa*) *cassiope* De Man, 1902, by original designation.

Sundathelphusa flores, new species (Figs. 1–5)

Sundathelphusa aruana Bott, 1970: 75 (part) (not *Potamon* (*Geothelphusa*) *aruanus* Roux, 1911).

Material examined. Holotype: male (34.3 × 26.7 mm) (MZB Cru DW1934), aside road between Labuan Bajo and Terang, toward Tebedo Hamlet, Nggorang Village, Komodo District, Manggarai Barat Regency, Flores Island, Nusa Tenggara Timur Province, Indonesia, 348.5–350 m asl, 08°31'22.7"S 119°57'03.1"E, coll. D. Wowor, 26 September 2019. Paratypes: 1 male (17.2 × 14.4 mm), 4 females (16.9 × 14.1 mm, 21.0 × 17.7 mm, 22.9 × 18.9 mm, 26.5 × 21.6 mm) (MZB Cru DW1934), same data as holotype; 2 females (33.1 × 26.6 mm, 27.5 × 22.5 mm) (MZB Cru DW1934), 1 male (29.5 × 24.2 mm), 1 female (31.8 × 25.0 mm) (ZRC 2025.2027), same data as holotype; 4 males (31.7 × 25.5 mm–18.1 × 15.4 mm), 9 females (29.9 × 23.6 mm–12.9 × 10.6 mm) (MZB Cru DW2228), 1 male (34.8 × 26.7 mm), 1 female (38.9 × 30.1 mm) (ZRC 2025.2028), at edge of creek of Wae Mese River, Nggorang Village, Komodo

District, Manggarai Barat Regency, Flores Island, Nusa Tenggara Timur Province, Indonesia, at about 45 m asl, 08°33'39.74"S 119°56'14.78"E, coll. D. Wowor & R. T. Hernawati, 7 November 2022.

Comparative material. *Sundathelphusa tuerkayi* Ng & Anker, 2016, paratypes: 1 male (25.4 × 20.5 mm) (ZRC 2014.0849), north of Suranadi, Sesaot village, ~500 m above sea level, small stream, under vegetation near stream bank, coll. F. Muhammad, L.S. Pratama & A. Anker, 17 May 2014; 1 female (29.0 × 23.0 mm) (ZRC 2014.0850), same data as ZRC 2014.0849; 1 female (25.1 × 20.2 mm) (ZRC 2014.0851), same data as ZRC 2014.0849.

Diagnosis. Carapace transversely ovate, inflated (Fig. 2A, B, D); antero- and posterolateral regions covered with strong, short, oblique striae (Fig. 2A, B); epigastric cristae raised, rounded, not sharp; postorbital cristae low, rounded, posterior to epigastric cristae (Fig. 2A, B); external orbital tooth low, broadly triangular, outer margin gently sinuous, ca. 3 times longer than inner margin (Fig. 2A, B); epibranchial tooth low (Fig. 2A, B); frontal median triangle almost complete, dorsal margin strongly cristate (Fig. 2D, E); median lobe of posterior epistome triangular with lateral margins straight (Fig. 2D, E); ambulatory legs relatively long, slender (Figs. 2A, 5A); G1 relatively stout, subterminal segment bent and gradually tapering towards terminal segment, separated from latter by distinct suture (Fig. 4A–C).

Description of male holotype. Carapace transversely ovate, inflated, broader than long, widest at anterior half, dorsal

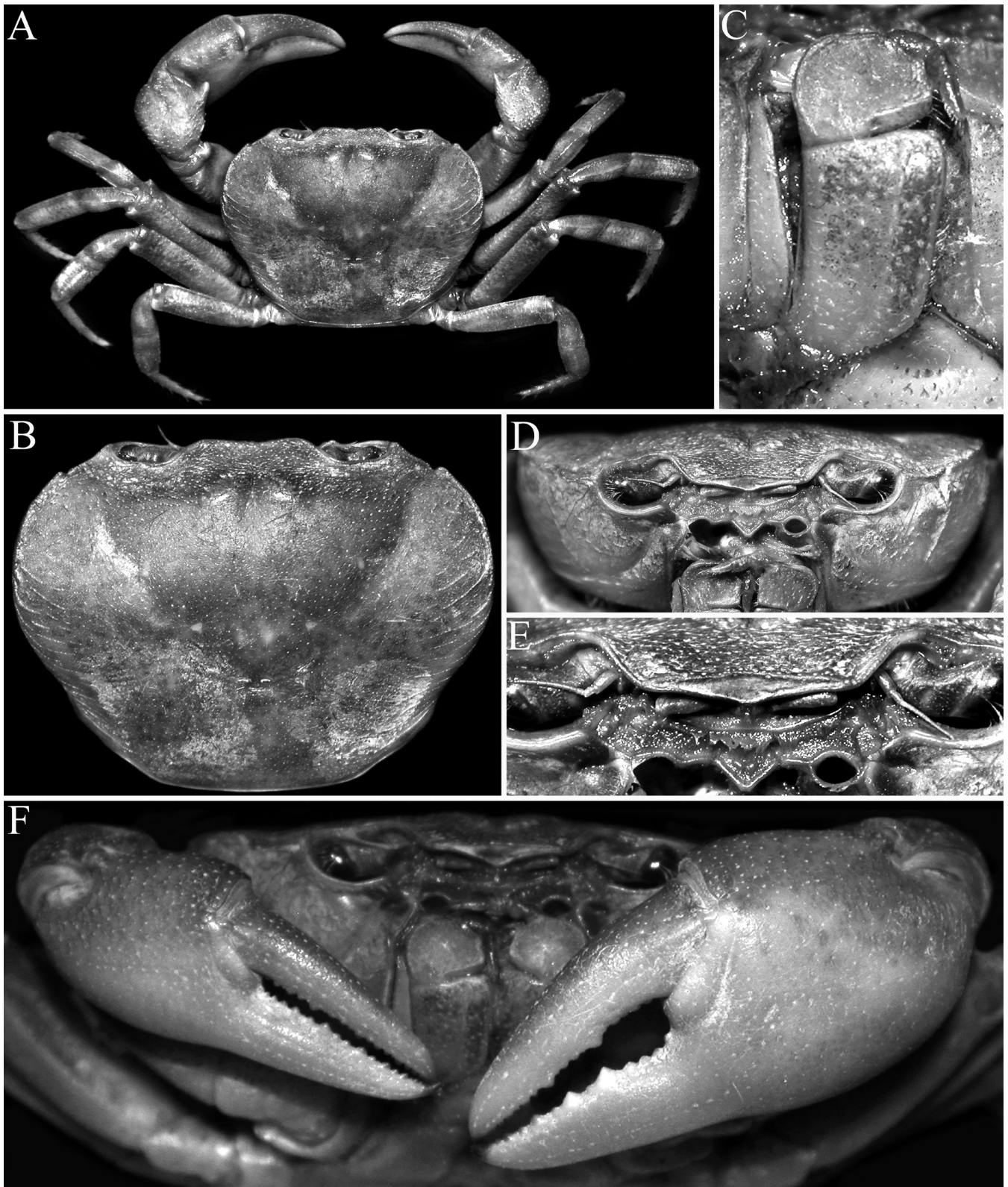


Fig. 2. *Sundathelphusa flores*, new species, holotype male (34.3 × 26.7 mm) (MZB Cru DW1934), Flores. A, overall dorsal habitus; B, dorsal view of carapace; C, right third maxilliped; D, frontal view of cephalothorax; E, frontal median triangle, antennae, antennules and epistome; F, chelae.

surface distinctly convex longitudinally and transversely, mostly smooth, frontal regions densely covered with pits, rugose; regions well-defined; antero- and posterolateral regions covered with strong oblique striae; cervical groove shallow but distinct; H-shaped gastric groove deep (Fig. 2A, B, D). Epigastric cristae raised, rounded, rugose, separated by

shallow median furrow; postorbital cristae low but distinct, rounded not sharp, slightly posterior to epigastric cristae, indistinctly joining anterolateral margin (Fig. 2A, B). Front relatively short, margin sinuous, deflexed, divided into 2 low rounded lobes separated by shallow concavity (Fig. 2A, B). External orbital tooth low, broadly triangular, tip reaching

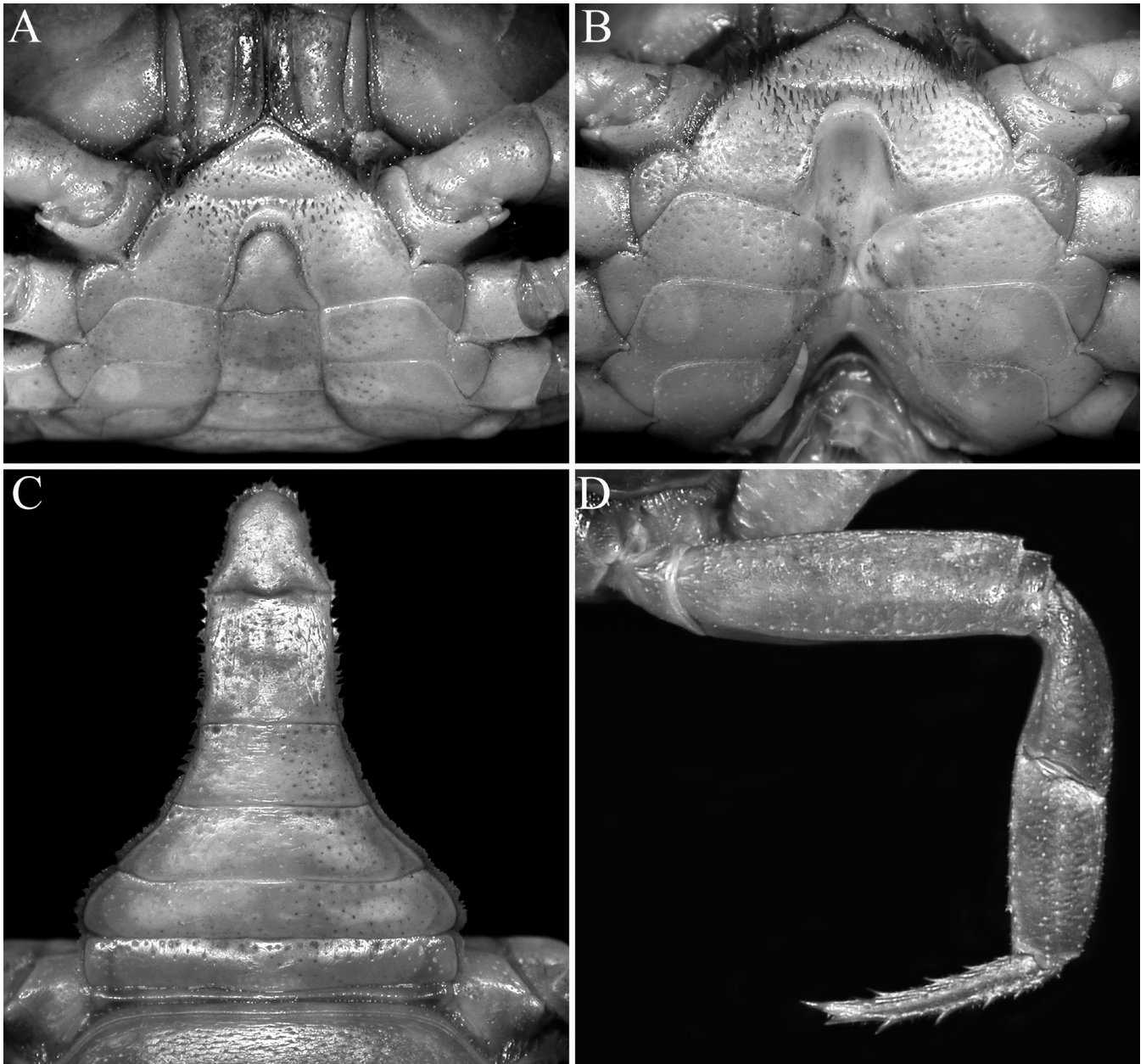


Fig. 3. *Sundathelphusa flores*, new species, holotype male (34.3 × 26.7 mm) (MZB Cru DW1934), Flores. A, buccal cavity, anterior thoracic sternum and pleon; B, anterior thoracic sternum and sternopleonal cavity; C, pleon; D, right ambulatory leg.

level of frontal margin; outer margin gently sinuous, about 3 times length of inner margin; epibranchial tooth low, separated from external orbital tooth by notch; anterolateral margin strongly convex, cristate, surface with strong striae; posterolateral margin straight, surface with prominent oblique striae, converging towards gently convex posterior margin of carapace (Fig. 2A, B). Frontal median triangle almost complete, lateral margins cristate, dorsal margin strong, almost confluent with lateral margins; orbit ovate, large; supraorbital margin smooth, confluent with frontal margin; infraorbital margin concave, cristate; suborbital region almost smooth; sub-branchial and pterygostomial regions with scattered low striae (Fig. 2A, B, D, E). Posterior margin of epistome with prominent triangular median lobe with straight lateral margins; lateral lobes relatively low, margins sinuous (Fig. 2D, E). Eyes well developed, occupying almost entire orbit, cornea pigmented (Fig. 2A, B, D–F).

Ischium of third maxilliped rectangular, much longer than broad, with oblique submedian sulcus, external surface pitted; merus quadrate, antero-external angle rounded; tip of exopod reaching midpoint of outer margin of merus, with long flagellum (Fig. 2C).

Chelipeds asymmetrical, left larger, not elongated; upper anterior edge of basis-ischium with low tubercle; merus margins with uneven granules, dorsal margin with low rounded subdistal tooth; carpus armed with strong tooth on inner distal angle, with granules basally (Fig. 2A). Major chela with surfaces pitted; fingers slightly longer than palm, gently curved, gaping when closed; cutting edges dentate (Fig. 2A, F). Minor chela with surfaces pitted, slender; fingers almost straight, distinctly longer than palm; cutting edges with numerous low teeth (Fig. 2A, F).

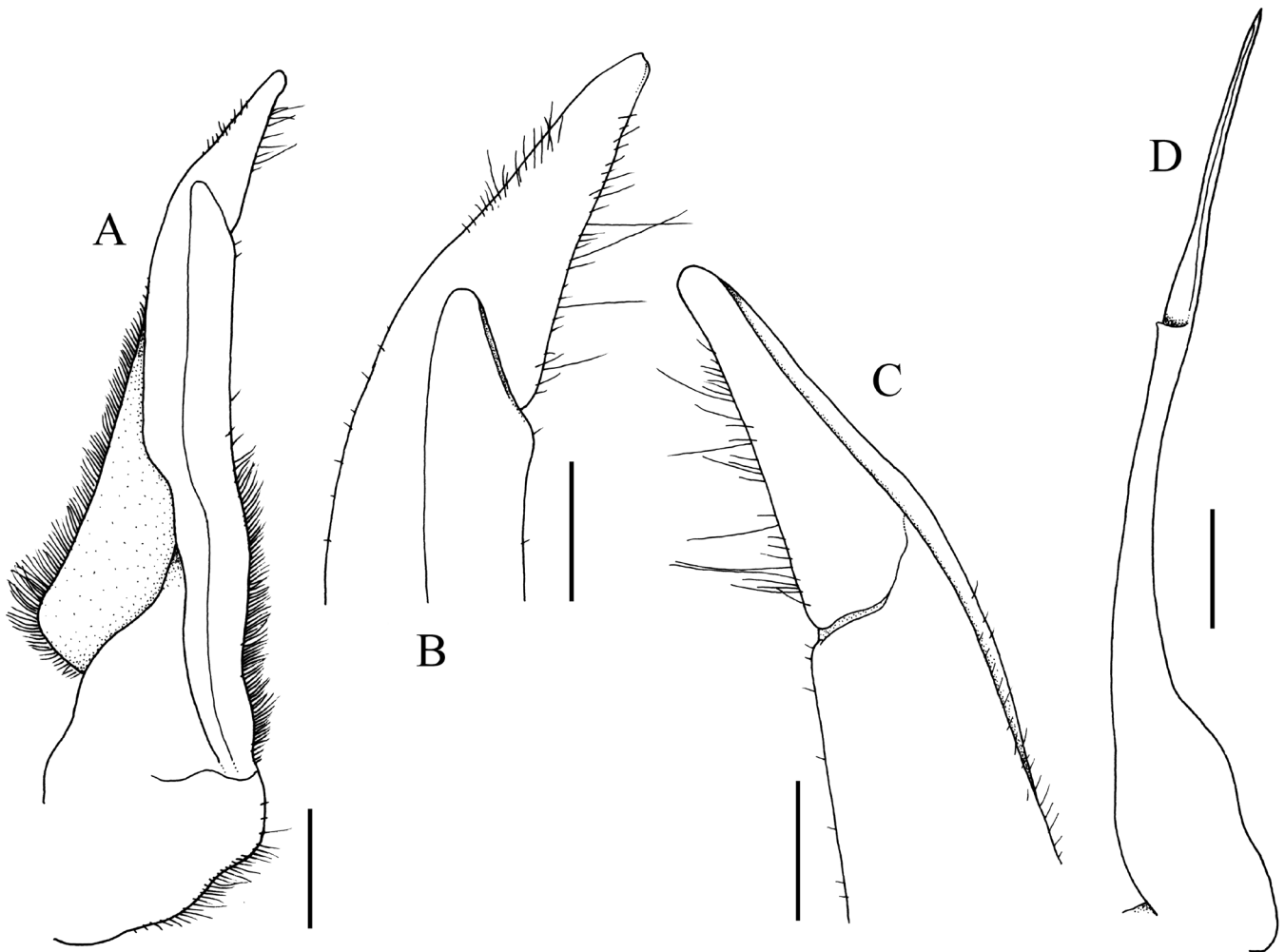


Fig. 4. *Sundathelphusa flores*, new species, holotype male (34.3 × 26.7 mm) (MZB Cru DW1934), Flores. A, left G1 (ventral view); B, distal part of left G1 (ventral view); C, distal part of left G1 (dorsal view); D, left G2. Scales: A, D = 1.0 mm; B, C = 0.5 mm.

Ambulatory legs relatively long, slender; second leg longest; surfaces of articles pitted and rugose; dorsal margins of meri subcristate, uneven, weakly serrate, without subdistal tooth or spine, posterior margins smooth; carpus and propodus with dorsal margins uneven to weakly serrate; outer surface of propodus with low subdorsal ridge; dactylus quadrate in cross-section, margins lined with strong pectinate spines (Fig. 2A, 3D).

Thoracic sternum relatively broad; surfaces distinctly pitted; sternites 1–3 completely fused, sternites 2 and 3 demarcated by shallow transverse median incomplete groove between them; sternites 3 and 4 separated by transverse groove becoming obscure laterally (Fig. 3A, B). Sternopleonal cavity reaching to level of anterior margin of cheliped coxae, anterior to suture between thoracic sternites 3 and 4 (Fig. 3A, B). Male pleonal locking tubercle large, rounded, positioned on anterior third of sternite 5 (Fig. 3B).

Male pleon broadly T-shaped; somite 1 short, very broad, reaching to coxae of fourth ambulatory legs; somite 2 very broad, transversely rectangular; somite 3 trapezoidal, as long as somite 2, lateral margins convex; somites 4 and 5 trapezoidal, progressively narrower; somite 6 rectangular,

longer than broad, with almost straight lateral margins; telson triangular with strongly concave lateral margins (Fig. 3A, C).

G1 relatively stout, subterminal segment gradually tapering towards terminal segment, separated from latter by distinct suture; terminal segment relatively elongate, straight, subconical, tapering to subtruncate tip, outer margin lined with setae, gently bent at about 30° outwards (Fig. 4A–C). G2 longer than G1; flagellum long, about three-quarters length of basal segment (Fig. 4D).

Female. Female chelipeds subequal, not inflated (Fig. 5A); pleon widely rounded, covering almost entire thoracic sternum, somites, and telson freely articulating (Fig. 5B). Vulvae large, round, on anterior half of somite 6; with short operculum that partially covers opening (Fig. 5C).

Variation. The carapaces of smaller specimens tend to be slightly less inflated, with the branchial regions relatively less swollen.

Notes on habitat. The Lesser Sunda Islands are very dry compared to other parts of Indonesia, with the islands to the east having progressively less annual rainfall (Monk et

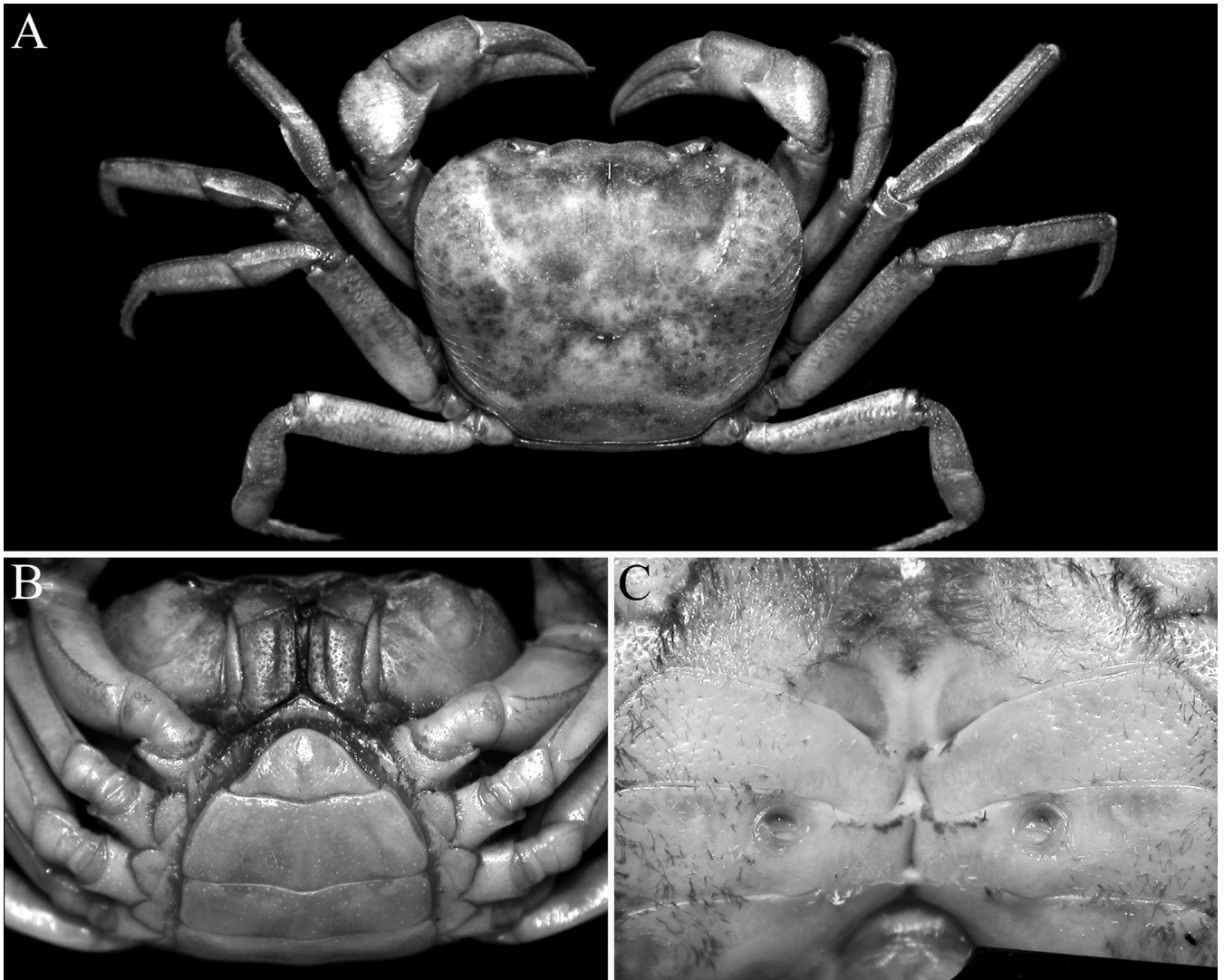


Fig. 5. *Sundathelphusa flores*, new species, paratype female (33.1 × 26.6 mm) (MZB Cru DW1934), Flores. A, overall dorsal habitus; B, buccal cavity, thoracic sternum and pleon; C, sternopleonal cavity and vulvae.

al., 1997; Kusumastuti et al., 2021). The Nusa Tenggara Archipelago, specifically East Nusa Tenggara Province, Indonesia, experiences the fewest number of rain days of 109 days with only 980 mm of annual rainfall in 2019 (Badan Pusat Statistik Kabupaten Manggarai Barat, 2025). The animals living in these islands must therefore be able to cope with the dry season and shortage of water. It is thus not surprising that the two *Sundathelphusa* species from Lombok and Flores have high carapaces with inflated branchial regions. The crabs dig deep holes to reach the water table during the dry season and the enlarged branchial chambers probably help them cope with the hypoxic stagnant water at the base of the burrow.

During the wet season (between November and March), *S. flores*, new species, was found hiding under stones at the edge of shallow water creeks surrounded by large trees and shrubs (Fig. 6A). At the end of dry season (between April and October), there is almost no surface water but under the dense leaf litter, the earth was relatively moist (Fig. 6B). The crabs can be dug out during this period since they make holes in the ground to hide. Their burrow entrances

have traces of their presence (Fig. 6B). The new species occurs from 45 to 350 m asl; and can be considered to be a lowland semi-terrestrial crab.

Colour. A uniform brown on all dorsal surfaces in life (Fig. 1), gradually paler towards ventral and becomes dark orange. The ventral surfaces are dirty-white.

Distribution. *Sundathelphusa flores*, new species, is known from Komodo District, Manggarai Barat Regency, Flores Island, Nusa Tenggara Timur Province, Indonesia.

Etymology. The species epithet is derived from the type locality, Flores, which derived its name from the Portuguese “Cabo das Flores” (Cape of Flowers). The name is used as a noun in apposition.

Remarks. *Sundathelphusa flores*, new species, is morphologically closest to *S. tuerkayi*, especially in the form of the epigastric and postorbital cristae, wider external orbital tooth and more slender ambulatory legs. *Sundathelphusa flores*, however, is easily separated from *S. tuerkayi* in having



Fig. 6. Habitat of *Sundathelphusa flores*, new species. A, creek of Wae Mese River, Flores, beginning of wet season 2022; B, at side road between Labuan Bajo and Terang, Flores, towards end of dry season 2019, with collector Makarius B. Banggur digging for crab.

the carapace appearing relatively less inflated, especially on the dorsal and lateral parts of the branchial regions when viewed frontally (Fig. 2A, B, D) (versus more prominently inflated overall; cf. Ng & Anker, 2016: figs. 1A, 2A); the striae on the carapace distinctly stronger (Fig. 2A, B) (versus striae lower; cf. Ng & Anker, 2016: figs. 1A, 2A); the surface of the frontal regions more distinctly pitted and rugose (Fig. 2A, B, D) (versus smoother; cf. Ng & Anker, 2016: figs. 1A, 2A); the dorsal ridge of the median frontal triangle is strong (Fig. 2D, E) (versus weaker; cf. Ng & Anker, 2016: fig. 3A); the median lobe of the posterior epistomal margin has the lateral margins straight (Fig. 2D, E) (versus gently convex; cf. Ng & Anker, 2016: fig. 3A); the male telson has strongly concave lateral margins (Fig. 3C) (versus lateral margins gently concave; cf. Ng & Anker, 2016: fig. 3E); male pleonal somites 2 and 3 are proportionately much wider (Fig. 3C) (versus narrower; cf. Ng & Anker, 2016: fig. 3E); and the G1 terminal article is bent at an angle and relatively longer with a tapering tip (Fig. 4A–C) (versus terminal article in line with the subterminal article, appears straight and not bent, and relatively shorter with a truncate tip; cf. Ng & Anker, 2016: fig. 4A–C).

While the branchial region of *S. tuerkayi* appears to be more inflated compared to *S. flores*, this is unfortunately not apparent when the carapace height (measured at both the high points of the gastric and branchial regions) is treated as

a ratio of the carapace length. For *S. tuerkayi*, the ratios of the carapace height to length are 0.52–0.67 (for the gastric region) and 0.42–0.49 (for the branchial region); while for *S. flores*, the ratios are 0.53–0.68 (for the gastric region) and 0.41–0.47 (for the branchial region). This is probably because the carapace length of *S. tuerkayi* is proportionately longer as well compared to *S. flores*.

The gape between the fingers of the major male chela is quite wide in large adult specimens (Fig. 2F); in smaller ones and females, the gape is not obvious. This is the same situation with *S. tuerkayi*. In the larger specimens of the two species, the male pleonal somite 6 of *S. flores* is more rectangular in shape with almost straight lateral margins (Fig. 3C) (versus subquadrate with lateral margins distinctly concave; cf. Ng & Anker, 2016: fig. 3E). Smaller specimens of *S. tuerkayi*, however, have the lateral margins of male pleonal somite 6 straighter (Ng & Anker, 2016: fig. 1B).

Bott (1970: 75) identified specimens from Flores as “*Sundathelphusa aruana*” but this is not correct. Chia & Ng (2006) figured the lectotype of *Sundathelphusa aruana* sensu stricto from the Aru Islands and noted that Bott’s material from the other islands need to be re-examined. Ng & Anker (2016) studied specimens from Lombok and showed that they belong to a separate new species, *S. tuerkayi*. The same is true now for the material we study from Flores; they are also not *S. aruana* sensu stricto. As such, we here also refer Bott’s (1970) Flores specimens to *S. flores*.

Ethnology. In Flores, *S. flores*, new species, is occasionally caught and eaten by local villagers. The crabs are usually deep-fried and eaten with rice. Whenever the locals go out to catch frogs for food among the piles of slightly moist dry leaf litter, they always encounter this crab as well (Makarius B. Banggur, pers. comm.).

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