

On a new species of vampire crab from the *Geosesarma foxi* species-group (Crustacea: Brachyura: Sesarmidae) in northern Peninsular Malaysia

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Abstract. *Geosesarma bunian*, new species, is described from Gunung Jerai in the northern Malaysian state of Kedah. Collected from over 1,100 m above sea level, the species is a member of the *G. foxi* (Kemp, 1918) species group, and is the fifth species known. Morphologically, *G. bunian* is closest to *G. faustum* Ng, 2017 from Penang, but the species can be distinguished by characters of the male first gonopod, male chelae and live coloration.

Key words. taxonomy, Kedah, Peninsular Malaysia, Gunung Jerai, comparative morphology, Southeast Asia

INTRODUCTION

Geosesarma De Man, 1892 is a large and primarily Southeast Asian sesarmid genus with 72 described species, most of which occur in Indonesia (see Ng & Wowor, 2019, 2024). They are wholly freshwater crabs as they do not need to return to the sea to breed, their large eggs hatching directly into juvenile crabs (Ng, 2004). There are 12 known species from Peninsular Malaysia and Singapore (Ng, 1988, 2004, 2017).

The *Geosesarma foxi* (Kemp, 1918) species-group occurs in southern Thailand and northern Peninsular Malaysia, and its members are characterised by possession of a distinctly quadrate carapace, the exopod of the third maxilliped is without a flagellum, the ambulatory legs are long and slender, and the male first gonopod is relatively slender with the distal chitinous part elongate and spatulate. Four known taxa are recognised in this species-group: three from Malaysia—*G. foxi* sensu stricto (Pulau Langkawi, Kedah), *G. serenei* Ng, 1986 (Bukit Larut, Perak), and *G. faustum* Ng, 2017 (Penang), with one from Thailand, *G. todaeng* Ng, Yeesin & Promdam, 2023 (Narathiwat).

Recent collections from Gunung Jerai in the northern Malaysian state of Kedah obtained a species of the *G. foxi* group. While it is morphologically close to *G. faustum* from Penang, it differs in characters of the male gonopod and chelae, and is here recognised as a new species, *G. bunian*.

MATERIAL AND METHODS

The terminology used essentially follows that in Ng (1988) with recent amendments recommended by Davie et al. (2015). Measurements, in millimetres, are of the maximum carapace width and length, respectively. The following abbreviations are used: asl = above sea level; G1 and G2 = male first and second gonopods, respectively; P2–P5 = pereopods 2–5, respectively (= first to fourth ambulatory legs, respectively). Specimens examined are deposited in the Zoological Reference Collection (ZRC) of the Lee Kong Chian Natural History Museum, National University of Singapore.

TAXONOMY

Family Sesarmidae Dana, 1851

Genus *Geosesarma* De Man, 1892

Type species. *Sesarma* (*Geosesarma*) *nodulifera* De Man, 1892, subsequent designation by Serène & Soh (1970).

Geosesarma bunian, new species (Figs. 1–5)

Material examined. Holotype: male (10.1 × 10.1 mm) (ZRC 2024.0558), Gunung Jerai (Kedah Peak), Kedah, Peninsular Malaysia, 1,150 m asl, 5°47'18.67"N, 100°26'5.28"E, coll. S. Khadijah-Ahmad, Noorhasanah binti Abdul Rahman, CT

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Fig. 1. *Geosesarma bunian*, new species. Colour in life. A, C, holotype male (10.1 × 10.1 mm) (ZRC 2024.0558), Kedah; B, D, paratype female (10.1 × 9.9 mm) (ZRC 2024.0559), Kedah.

Lau & Mohd Mushahril Bin Abdul Shukor, 21 October 2023. Paratypes: 1 male (8.3 × 8.3 mm), 2 females (10.1 × 9.9 mm, 8.4 × 8.3 mm) (ZRC 2024.0559), same data as holotype.

Diagnosis. Carapace quadrate, as wide as long, adult width to length ratio ca. 1.0, lateral margins parallel (Figs. 2, 4A, B); dorsal surface with regions just visible, anterior regions with small, low rounded granules on gastric regions (Figs. 2C, D, 4A, B); front distinctly deflexed, 2 frontal lobes broad with almost straight margins in dorsal view; postfrontal, postorbital cristae sharp, distinct (Figs. 2C, D, 3A, 4A, B); external orbital tooth (= first lateral tooth) triangular, directed obliquely laterally, outer margin gently convex to almost straight, tip extending just beyond lateral margin; second lateral tooth low, distinct, separated from rest of margin by cleft (Figs. 2C, D, 4A, B). Merus of third maxilliped subovate, shorter than ischium; exopod slender with no trace of flagellum (Fig. 5A). Outer surface of palm of adult male covered with small, low rounded granules and striae; inner surface granulated but without transverse ridge; dorsal margin of dactylus with cluster of 12–14 tubercles on proximal part and another 7 or 8 arranged in a longitudinal row towards tip of finger, reaching to three-quarters length of finger (Fig. 3B–D). Ambulatory legs with long, slender merus, with low subdistal spine on dorsal margin, surfaces gently rugose (Figs. 1A, B, 4C). Male pleon triangular; somite 6 wide with convex lateral margins; telson almost semicircular, slightly recessed into distal margin of somite 6 (Fig. 3E, F). G1 relatively stouter; outer margin of subdistal part of subterminal segment (in ventral view) with distinct wide shelf-like angle (Fig. 5B–E), distal chitinous part

elongated, bent at angle of ca. 55° from longitudinal, distal part gently curved, tip spatuliform (Fig. 5B–I). Vulvae on anterior half of sternite 6, raised, opens obliquely inwards, operculum visible, with large truncate vulvar process that arches over opening (Fig. 4F).

Etymology. The name is derived from a Malay term used to describe the “hidden people” of the forest or Orang Bunian. They are often described as beautifully dressed forest denizens. The name, *bunian*, here used as a Latin noun in apposition, alludes to the beautiful colours of the new species as well as it escaping scientific attention until now.

Variation. The smaller male paratype of *G. bunian* (8.3 × 8.3 mm, ZRC 2024.0559) has relatively more slender chelae, and the cluster of tubercles on the proximo-dorsal part of the dactylus is not evident. The dorsal surface of the carapace of this smaller male is also relatively smoother and it does not show the marked two-colour tone (Fig. 4A) of the holotype male and paratype females (Figs. 2C, D, 4B). It agrees with the holotype, however, in all other characters.

Colour. Ambulatory legs and carapace with posterior half dark grey to almost black, with numerous small specks of blue and white; anterior half of carapace and chelipeds pale yellow, fingers white (Fig. 1).

Remarks. Morphologically, *G. bunian*, new species, is closest to *G. faustum* but the G1 subterminal article is proportionately stouter and shorter (Fig. 5B, C) (versus more slender and longer; Ng, 2017: fig. 12B, C); and the narrowed shelf-like



Fig. 2. *Geosesarma bunian*, new species. A, C, holotype male (10.1 × 10.1 mm) (ZRC 2024.0558), Kedah; B, D, paratype female (10.1 × 9.9 mm) (ZRC 2024.0559), Kedah. A, B, overall dorsal view; C, D, dorsal view of carapace.

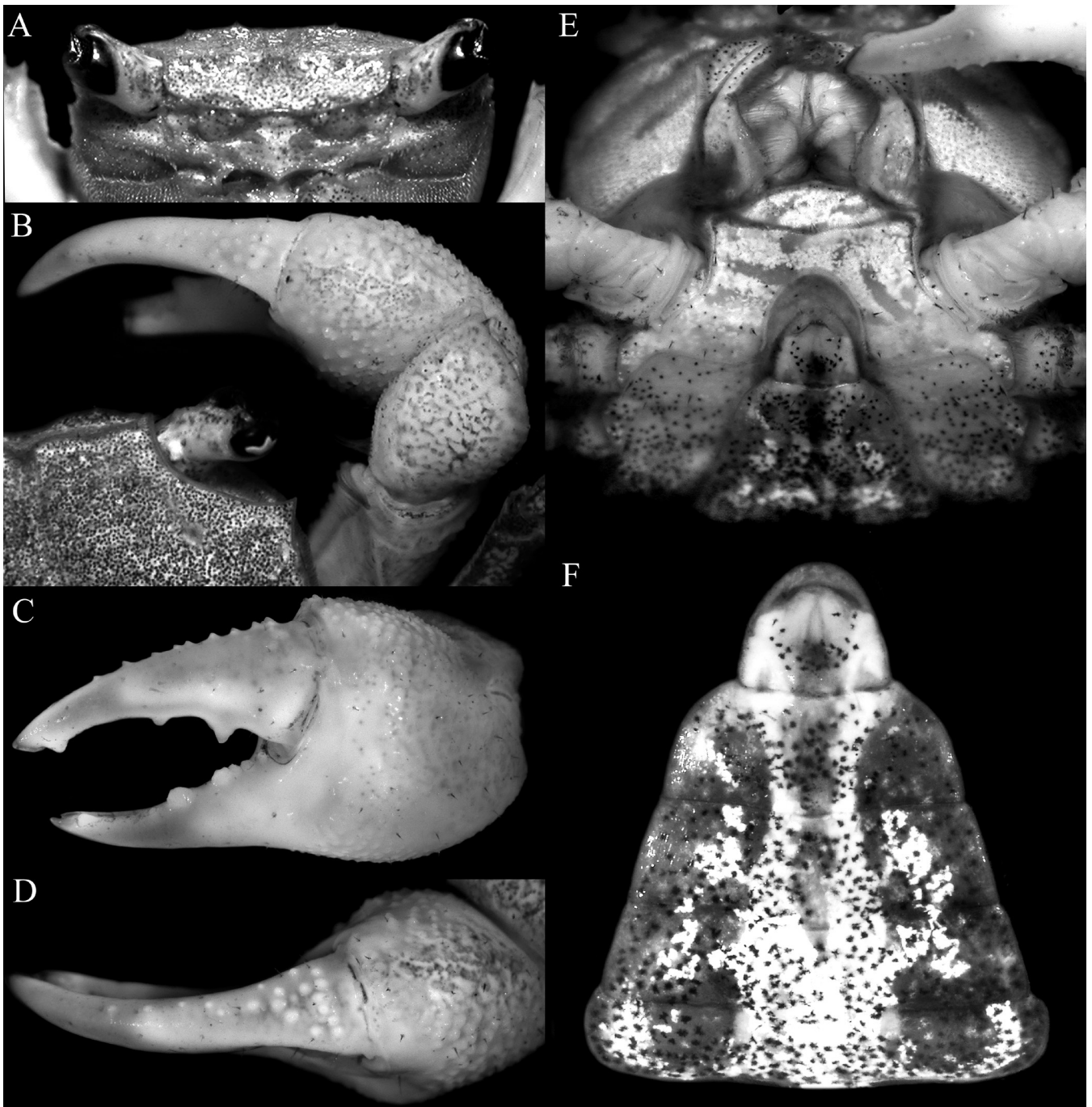


Fig. 3. *Geosesarma bunian*, new species. Holotype male (10.1 × 10.1 mm) (ZRC 2024.0558), Kedah. A, frontal view of cephalothorax; B, dorsal view of right cheliped; C, outer view of left chela; D, dorsal view of left chela; E, buccal cavity, anterior thoracic sternum and pleon; F, male pleonal somites 3–6 and telson (setae denuded).

distal part of the subterminal article before it meets the chitinous distal part is relatively wider (Fig. 5B–E) (versus narrower; Ng, 2017: fig. 12B–E). In addition, the chitinous distal part of *G. bunian* (Fig. 5B–E) also appears to be slightly shorter than that of *G. faustum* (Ng, 2017: fig. 12B–E) because the tip is more rounded in shape. On the basis of the specimens on hand, the male pleonal somite 6 of *G. bunian* is also relatively transversely narrower (Fig. 3F) than that of *G. faustum* (Ng, 2017: fig. 11E).

The G1 of *G. bunian* is perhaps more like that of *G. todaeng* in that it is relatively stouter with the more prominent shelf-like structure on the distal part of the subterminal article; the

chitinous distal part, however, is more strongly bent (55° versus 45° along the longitudinal axis) (cf. Fig. 5B–E, Ng et al., 2023: fig. 5A–E). *Geosesarma todaeng* can easily be distinguished from *G. bunian* in having a more inflated carapace with the gastric regions more swollen (Ng et al., 2023: fig. 3A); the species is also known from lowland freshwater swamps in southern Thailand rather than the montane hill habitats *G. bunian* occurs in (see Ecology section).

Unlike adult male *G. faustum* and *G. todaeng*, in *G. bunian*, the proximal part of the dorsal margin of the dactylar finger has a dense aggregation of relatively larger rounded and/

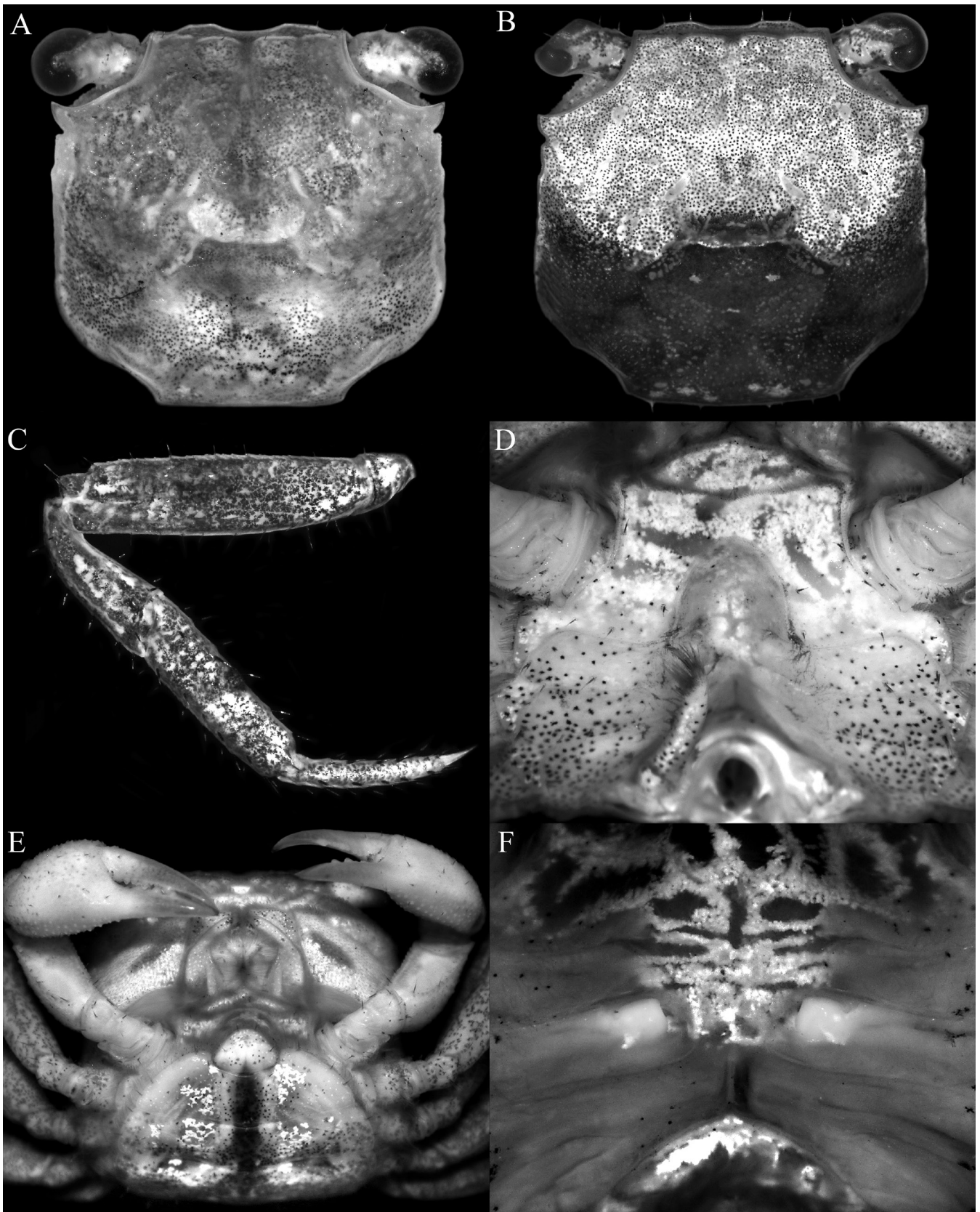


Fig. 4. *Geosesarma bunian*, new species. A, paratype male (8.3 × 8.3 mm) (ZRC 2024.0559), Kedah; B, paratype female (8.4 × 8.3 mm) (ZRC), Kedah; C, D, holotype male (10.1 × 10.1 mm) (ZRC 2024.0558), Kedah; E, F, paratype female (10.1 × 9.9 mm) (ZRC 2024.0559), Kedah. A, B, dorsal view of carapace; C, left P5; D, male sternopleonal cavity showing G1s; E, female pleon; F, female sternopleonal cavity showing vulvae.

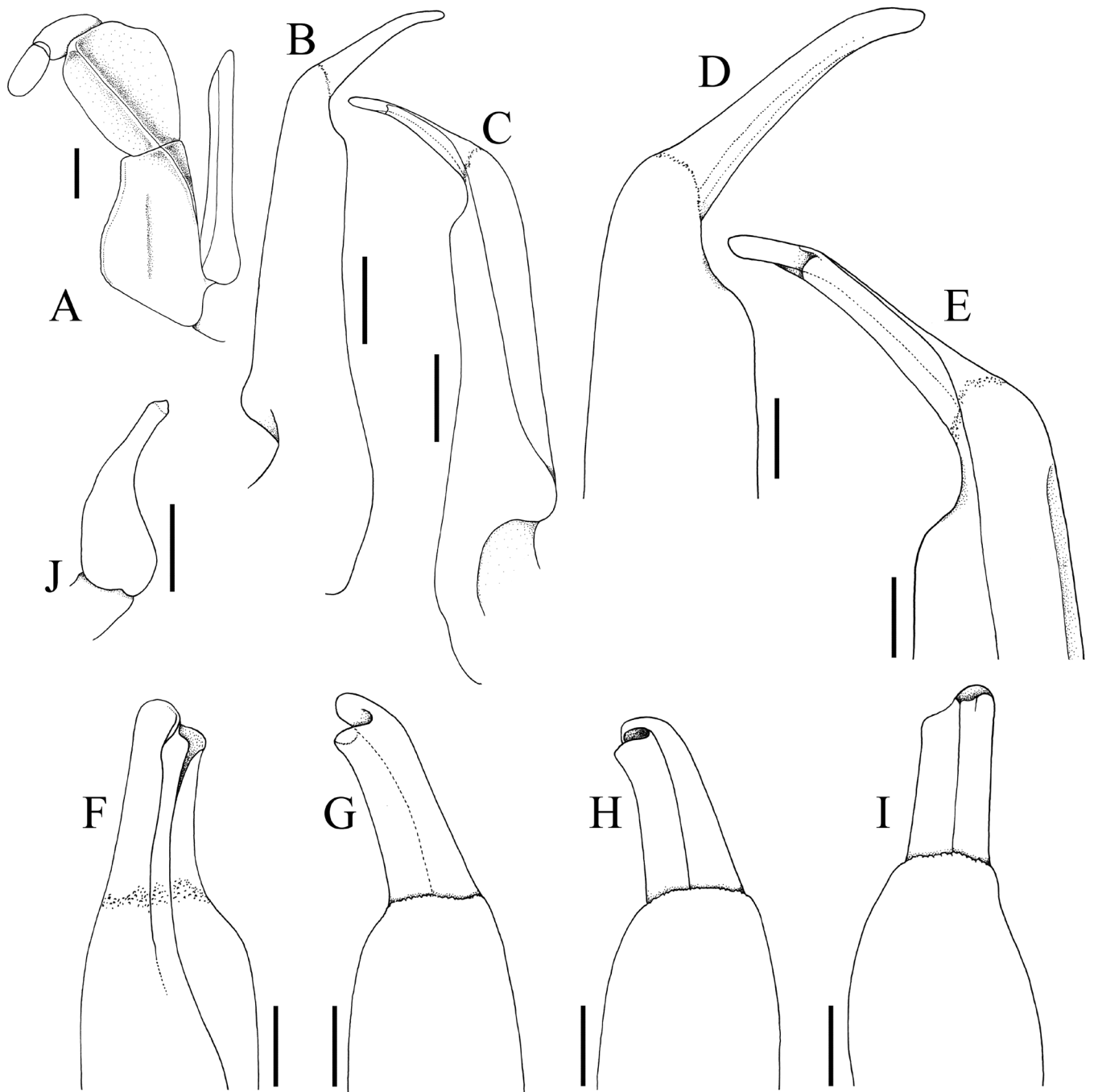


Fig. 5. *Geosesarma bunian*, new species, holotype male (10.1 × 10.1 mm) (ZRC 2024.0558), Kedah. A, left third maxilliped (mostly denuded); B, left G1 (ventral view); C, left G1 (dorsal view); D, distal part of left G1 (ventral view); E, distal part of left G1 (dorsal view); F, distal part of left G1 (outer lateral view); G, H, I, distal part of left G1 (mesial views); J, left G2. Setae o structures denuded or not drawn. Scales: A–C, J = 0.5 mm; D–I = 0.2 mm.

or sharp tubercles numbering 12–14 with another seven or eight arranged in a longitudinal row towards the tip of the finger (Fig. 3D); and when viewed laterally, nine or 10 can be clearly counted (Fig. 3C). In *G. faustum* and *G. todaeng*, the proximal part has only three or four more prominent tubercles which are more acute in form and most can be counted laterally (7–9 in *G. faustum* and 7 or 8 in *G. todaeng*; Ng, 2017: fig. 11D; Ng et al., 2023: fig. 3F, G).

In *G. foxi* and *G. serenei*, the vulvae open laterally inwards (Ng, 2017: figs. 5F, 6H); this contrasts with those of *G. faustum*, *G. todaeng* and *G. bunian* that are directed

obliquely inwards (Fig. 4F; Ng, 2017: fig. 11H; Ng et al., 2023: fig. 4E).

There appears to be a colour difference between *G. bunian* and *G. faustum*; the former having the anterior half of the carapace and chelipeds pale yellow (Fig. 1); whilst the latter has these parts bright yellow to orange (Ng, 2017: fig. 8).

Ecology. The type locality, Gunung Jerai or Kedah Peak, is an isolated patch of highlands in the northern state of Kedah in Peninsular Malaysia. Only one species of freshwater crab is known from this mountain, the gecarcinucid *Phricotelphusa*

annicola, described from the west slope at an altitude of 800 m asl (Ng, 1994).

Geosesarma bunian, new species, was collected in burrows on the slope alongside the jeep track towards the summit of Gunung Jerai, at an altitude of about 1,150 m asl at night. Some specimens were observed on a low shrub about 1.5 m from the ground. One of the specimens was found in a burrow beside one housing a mygalomorph spider. The species probably has arboreal habits similar to *G. faustum* and *G. foxi* as well (see Ng, 2017).

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