A new species of freshwater crab of the Genus *Potamiscus* Alcock, 1909 (Crustacea: Brachyura: Potamidae: Potamiscinae) from Manipur, North-Eastern India

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Abstract

A new species of potamid freshwater crab, *Potamiscus palelense* **n. sp.,** belongs to sub family potamiscinae, is described from a stream and river banks of Maha river of palel town of Manipur, India. The new species is differentiated from all the congeners by well suite of carapace and gonopod characters, including a longitudinally convex carapace, regions and grooves are indistinct, G1 terminal segment S-shaped, with narrow neck like curve at base. *Potamiscus* Alcock, 1909, is now represented by 10 species including *Potamiscus palelense* **n sp.** of which 5 species are available in northeast India, a key to the Indian species are provided here.

Key words: Crustacea, taxonomy, new species, *Potamiscus*, Manipur, India

Introduction

The genus *Potamiscus* Alcock, 1909 established as a subgenus of Potamon for those species in which the third maxilliped exopod lacks a flagellum or those flagellum are vestigial or represent as papillae; and included *Potamon* (*Potamiscus*) *annandali* Alcock, 1909 (Type species), *P*. (*P*) *sikkimense* (Rathbun, 1905), and *P. (P) tumidulum* Alcock, 1909, Kemp (1913, 1923) subsequently described five more *Potamiscus* species from Northeast India and Myanmar. Bott (1966, 1970) redefined and rearrange the Potamiscus genus solely on the G1 characters, and raising it to the genus rank while reassigning three more species, *P. tannanti* (Rathbun, 1904), *P. tumidus* (Wood-Mason, 1871) and *P. pealianus* (Wood Mason, 1871) to the genus. Eight other *Potamiscus* species have been described from southern and South western china, *P. loshingense* Wu, 1935; *P. montosus* Dai, Song, He, Cao, Xu & Zhong, 1975; *P. yongshengense* Dai and Chen, 1985; *P. elaphrius* Dai, Chen, Liu, Luo, Yi, Liu, Gu & Liu, 1990; *P. rongjingense* Dai, Chen, Liu, Luo, Yi, Liu, Gu & Liu, 1990; *P. mutouensis* Dai, 1990; *P. yiwuensis* Dai and Cai, 1998 and *P. cangyuanense* Dai, 1999 (Dai, 1999; Dai and Cai, 1998).

Yeo and Ng (2003, 2007) and Ng *et al* (2008) revised and reassigned many species of Potamidae family of Asian countries and validate 10 species to genus Potamiscus of which 4 species, namely *P. annandale*

(Alcock, 1909), *P. decourcyi* (Kemp, 1913), *P. pealianus* (Wood-Mason, 1871), *P. tumidulus* (Alcock, 1909) described from India and 5 species, i.e. *P. yiwuensis* Dai & Cai, 1998; *P. mutouensis* Dai, 1990; *P. cangyuanensis* Dai, 1999; *P. montosus* Dai, Song, He, Cao, Xu & Zhong, 1975 from China and *P. rangoonensis* (Rathbun, 1904) from Myanmar and Thailand.

In a recent survey at Manipur, the second author collected 4 examples of potamid freshwater crabs, after proper identification this species reveals as new to science, a detail account on taxonomical aspect's are stated here in this paper.

The specimens have been deposited in the National Zoological Collections (NZC) of Zoological survey of India (ZSI), Crustacea Division, Kolkata. The morphometry and terminology are used after Yeo & Ng. (2007). The following abbreviations were used: cl, carapace length; cw, carapace width; ch carapace height; fw, frontal width; mxp3- third maxilliped, p2-p5, first to fourth ambulatory legs; G1, first gonopod of male; G2, second gonopod of male, measurements in millimetres.

Taxonomy

Family Potamidae Ortmann, 1986

Subfamily Potamiscinae Bott, 1970

***Potamiscus* Alcock, 1909**

1909. *Potamiscus* Alcock. *Rec. Ind. Mus*, 3: 246 – Type species by original Designation : *Potamon (Potamiscus) annandali* Alcock, 1909 by original designation, Gender masculine.

Diagnosis: Carapace slightly wider than long, dorsal surface longitudinally convex, anterolateral margin gently convex, Posterolateral margin almost parallel, epigastric cristae well developed, well developed cristate post orbital cristae, narrow slit like anterolateral fossae, relatively shorter, stouter and glabrous ambulatory legs, Terminal part of Go / 1 short conical, G2 longer than G1. Exopodite of 3rd maxillipeds without or with vestigial flagellum. (Modified after, Alcock,1909; Bott, 1966 & 1970; Brandis and Sharma, 2005 and Yeo and Ng, 2007).

Potamiscus palelense n. sp.

(Figs. 1– 4)

Type material. INDIA: adult male, holotype (cw 29.47 mm, cl 24.19 mm, fw 9.70 mm, ch 16.43 mm), small hill stream connected with maha river at palel town, in the boundary of Chandel and Thoubal district

of Manipur, Latitude: 24.45°N, Longitude: 94.02°E, Altitude: 830 Mt. collected on 24 September 2017, coll. Mema Devi Waikhom (ZSI, C 6466/2; Paratypes 3 females (cw, 37.29– 42 mm, cl, 31.43– 33.59 mm, fw, 11.53– 13.20 mm; ch, 22.07– 24.76 mm) collection data same as above, (ZSI, C 6467/2).

Diagnosis. Carapace longitudinally convex, regions and grooves are not distinct, anterolateral borders distinct, finely serrated (Fig. 1A); epibranchial tooth prominent, triangular, inner arm is about half than the outer; anterolateral regions with many granules and oblique striae, anterolateral border and posterolateral border are of same length, epigastric cristae prominent, weakly rugose, post orbital cristae not sharp, weakly rugose, epigastric cristae are not separated from post orbital cristae by a distinct groove, and form a a straight oblique line up to the cervical groove (Fig. 1A); Abdomen tongue shaped, 7th segment wider than long, both lateral part gently concave, terminal end narrowly rounded, 6th segment trapizoid, lateral part gently convex (Fig. 2C), G1 terminal segment 'S' shaped, lower part has a neck like curve (Fig. 2A, B, E, F, 4A-C).

Description of male holotype. Carapace glabrous, 1.22 times broader than long, carapace width about 3.04 times of frontal length, height 0.68 times than length; Carapace longitudinally convex (Fig. 1A), regions and grooves are not distinct, anterolateral borders distinct, finely serrated; epibranchial tooth prominent, triangular, inner arm is about half than the outer; anterolateral regions with many granules and oblique striae (Fig. 1A), anterolateral border and Posterolateral border are of same length, epigastric cristae prominent, weakly rugose, post orbital cristae not sharp, weakly rugose, epigastric cristae are not separated from post orbital cristae by a distinct groove, and form a a straight oblique line up to the cervical groove; post orbital cristae are not confluent with epibranchial tooth, its represent by some granules upto the epibranchial tooth, epibranchial tooth small but prominent, outer arm of external orbital tooth and inner arm of epibranchial tooth form a small cleft (Fig. 1A), frontal region deflected, a horizontal quadrangular ridge on frontal region, just in front of the epigastric cristae; cervical groove is very superficial in all along the course, except in branchial region where it cuts the post orbital cristae indistinctly and in cardiac region where it meets the semicircular groove; mesogastric groove A–shaped, in frontal region it cuts the frontal ridge deeply, cardiac groove prominent as well as H–groove; frontal margin very much deflected downwardly (Fig.1B), antennular fossae slit like, epistomal median tooth is broadly triangular, frontal median triangle complete, eye with a large retina(Fig. 1B); abdominal cavity imaginary line joining the median base of cheliped (Fig. 1C).

Abdomen tongue shaped, 7th segment wider than long, both lateral part gently concave, terminal end narrowly rounded, 6th segment trapizoid, lateral part gently convex, lower border of 5th segment convex, lateral part distinctly convergent towards 6th segment, lower border of 4th and 3rd segment is almost straight, 3rd segment is widest (Fig. 1C).

Suture between sternite 1 and 2 is not visible, suture of sternite 2 and 3 is prominent and well grooved, distinctly straight line, suture of sternite 3 and 4 is not detectable, only a slight oblique depression comes from the upper border of cheliped bases towards the apex of the abdominal cavity is quite visible, abdomen and sternal plates are punctured by small holes in all along under high magnification (Fig. 1C).

Ischium of 3rd maxilliped is almost rectangular, median sulcus prominent, merus is pentagonal,concave in middle, slightly wider than long, exopod just longer than ischium, flagellum of exopod vestigial, represent like a papillae(Fig. 1C).

Cheliped unequal, left one is distinctly smaller than right, dorsal part of propodus with 4-5 sharp granules, lateral parts are smooth, the lower border with some small garnules; dactylus slightly longer than propodus, dactylus and pollex with 8-10 small and 3-4 larger mollariform teeth, terminal part of cutting edge blunt, inner distal major tooth of carpus is sharp and stout, with a sharp small sub tooth, inner border of merus with a strong distal tooth, cheliped is not longer than carapace length, 2nd and 3rd leg is longer than carapace width and cheliped length, last walking leg is as long as carapace width (Fig. 1A).

Ambulatory legs are not much large, dactylus is slender and larger than propodus, terminal part of dactylus is slightly bent to the inner side, 3–4 ridges of spines on dactylus, propodus of 4th legs are more than twice as long as width (Fig. 1A).

G1 long, stout, terminal part of G1 crescent shaped or 'S'– shaped with a low narrow dorsal flap, mid portion of terminal part wide, tip slender, upwardly curved, lower base neck like narrow , Sub-terminal part broad (Fig. 2A-B, E-F, 4A-C), G2 with terminal part slender, straight, terminal part is more than half of sub–terminal part (Fig. 2C-D, 4D-E).

Colour. Dorsal surface are reddish brown, brown walking legs, ventral pale brown to creamy white.

Paratypes. In female paratype right cheliped is larger than left (Fig. 3A), vulva present in the line of sutures of 5th and 6th sternite (Fig. 3D), vulval openning is broad, facing upper inner side of abdominal cavity (Fig. 3C).

Etymology. Specific epithet refers to Palel town, of Manipur, one of the important state of Northeast India, located in Indo-Burmese hot-spot of Biodiversity, where the crabs seems to be endemic.

Type Locality. Palel town of Manipur. This town located in the border of Chandel and Thoubal District of Manipur.

Remarks. This new species is well differ from Chinese species by its carapace and gonopod characters (see Dai, 1999: fig. 100, 1-6, for *P. cangyuanens*e; fig. 99, 1-8 for *P. montosus*; fig. 105, 1-6 for *P. ronghinesis*;

and fig. 106, 1-9 for *P. motuoense*), the present new species is differ from *P. annandalei* (Alcock, 1909), *P. decourcyi* (Kemp, 1913), *P. pealianus* (Wood-Mason, 1871) by its G1 structure, that is very long 'S'- shaped terminal segment, and a neck like region in the base of terminal segment with curved outwardly tip (G1 conical or sub conical in *P. annandale* (Alcock, 1909) (see Bott, 1970: fig. 28 pl. 38), or cylindrical in *P. decourcyi* (Kemp, 1913) (see Bott, 1970: fig. 29, pl. 38) *P. pealianus* (Wood-Mason, 1871) (see Bott, 1970: fig. 33, Pl. 38)

This new species of Potamiscus has many similarities with its congeners *P. decourcyi* (kemp, 1913), As, both this species has external orbital tooth outer margin are almost straight, antennular fossae slit like, third maxilliped exopod with small papillae represent as a flagellum, but differs from the later species in many carapace and gonopod characters.

Cervical grooves superficial, not deeply graven and regions of carapace not well defined in *P. palelense* **n. sp.** (vs. cervical groove 'S'–shaped, deeply graven, regions well defined in *P. decourcyi*); in *P. decourcyi*, lateral margin of 6th abdominal segment with lateral line convergent towards pleon (vs. 6th abdominal segment lateral margin convex in new species); Outer side of palm of cheliped rough with large granules and short wrinkles in *P. decourcyi,* (vs. outer side of palm of cheliped nearly smooth) Post orbital cristae concave in *P. decourcyi,*(vs. post orbital cristae straight) G1 terminal part with no dorsal flap in *P. decourcyi,*(vs. G1 terminal part with a low narrow dorsal flap).

The *Potamiscus palelense* n. sp. has also some similarities with *P. pealianaus,* like external orbital tooth outer margin are almost straight, antennular fossae slit like, 3rd maxilliped exopod with a short vestigial flagellum or a small papillae represent as a flagellum, male abdomen tongue shaped; but both species differers each other by many carapace and gonopod characters, 6th segment of abdomen in *P. pealianus* is a perfect square like as its lateral borders are parallel to each other (vs. lateral line of 6th abdominal segment of *P. palelense* **n. sp.** is distinctly convex); carapace moderately convex (vs. carapace highly convex); G1 with no dorsal flap (vs. G1 with low narrow dorsal flap)

Geographical Distribution: *Potamiscus palelense* **n. sp.** is known only from the type locality, Maha river,near Palel town Manipur. This town is very adjacent to Chandel and Thoubal District of Manipur.

Key to the species of *Potamiscus* from India

1. Terminal member of G1 directed to the outside, short, conical, not bent….2

   Terminal member of G1 directed to the outside, slender, long and curved…4

2. Epigastric and post orbital cristae hardly separated from each other and extended up to inner line of epibranchial tooth, Carapace, exopodite of Mxp / 3 without flagellum….*P. annandale* (Alcock, 1909)

   -Epibranchial cristae and pot orbital cristae clearly separated by a notch, the post orbital cristae only to the cervical furrow…3

3. Carapace rough, Mxp / 3 without flagellum…*P. decourcyi* (Kemp, 1913)

   -Carapace on the upper side smooth, flat…*P. pealianus* (Wood-Mason, 1871)

4. Carapace smooth, G1 terminal part long, S- shaped, …*P. palelense* **n. sp.**

   -Terminal member of G1 slender, bottle-shaped, tapering…*P. tumidulus* (Alcock, 1909)

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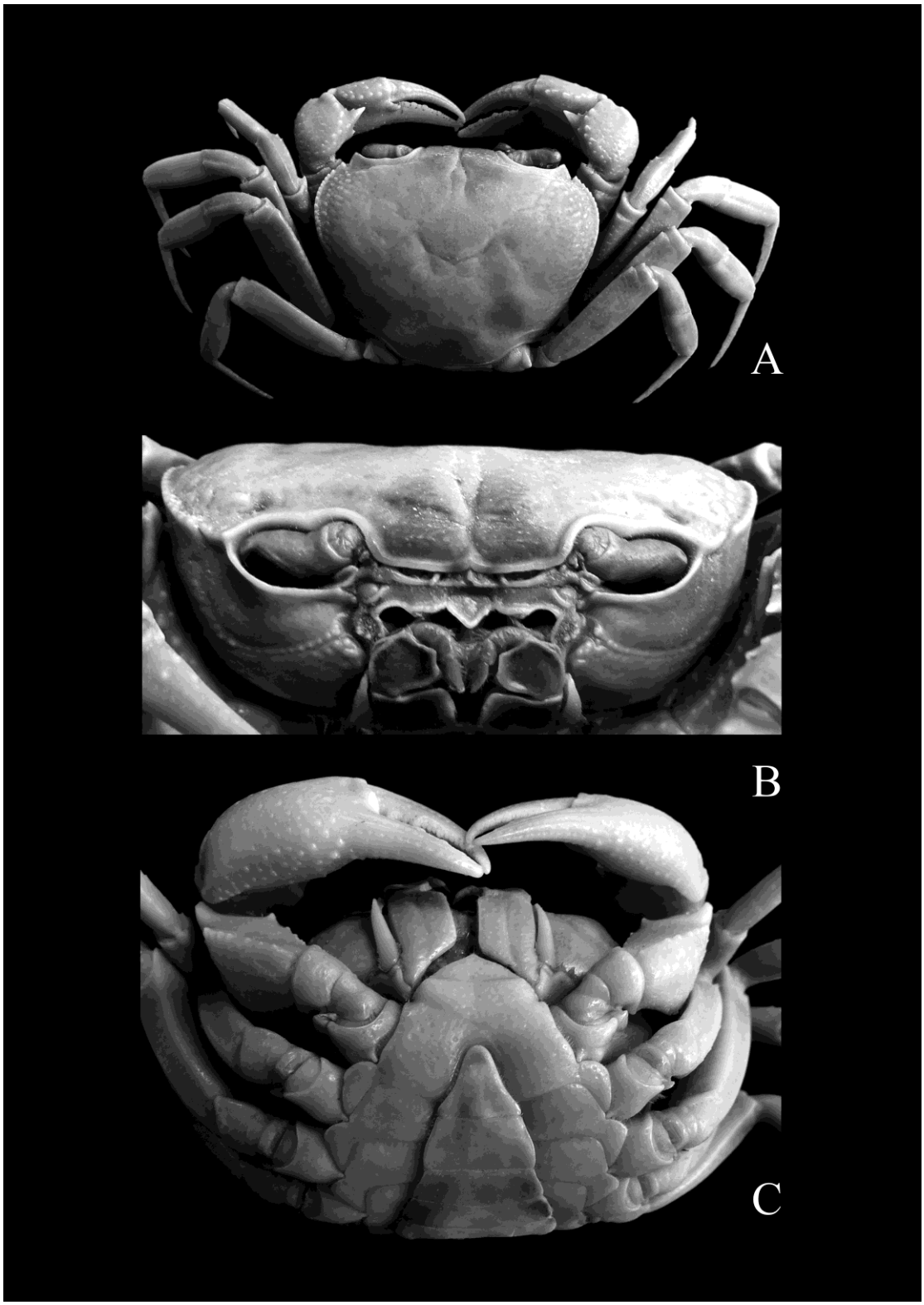
Figure Legends

Figure 1. *P. palelense* **n. sp**. holotype male (ZSI, C 6466/2) A. dorsal view; B. frontal view; C. ventral view

Figure 2. *P. palelense* **n. sp**.holotype male (ZSI, C 6466/2) A. dorsal view of right G1; B. terminal part of G1 dorsal view; C. dorsal view of right G2; D. ventral view of G2; E. ventral view of G2; 2F. terminal part of G1

Figure 3. *P. palelense* **n. sp**. paratype female (ZSI, C 6467/2) A. dorsal view; B. frontal view; C. thorasic sternites showing vulvae; D. ventral view

Figure 4. *P. palelense* **n. sp**. holotype male (ZSI, C 6466/2) A. G1 dorsal view; B. G1 ventral view; C. terminal part of G1 ventral view; D. G2 dorsal view; E. G2 ventral view.



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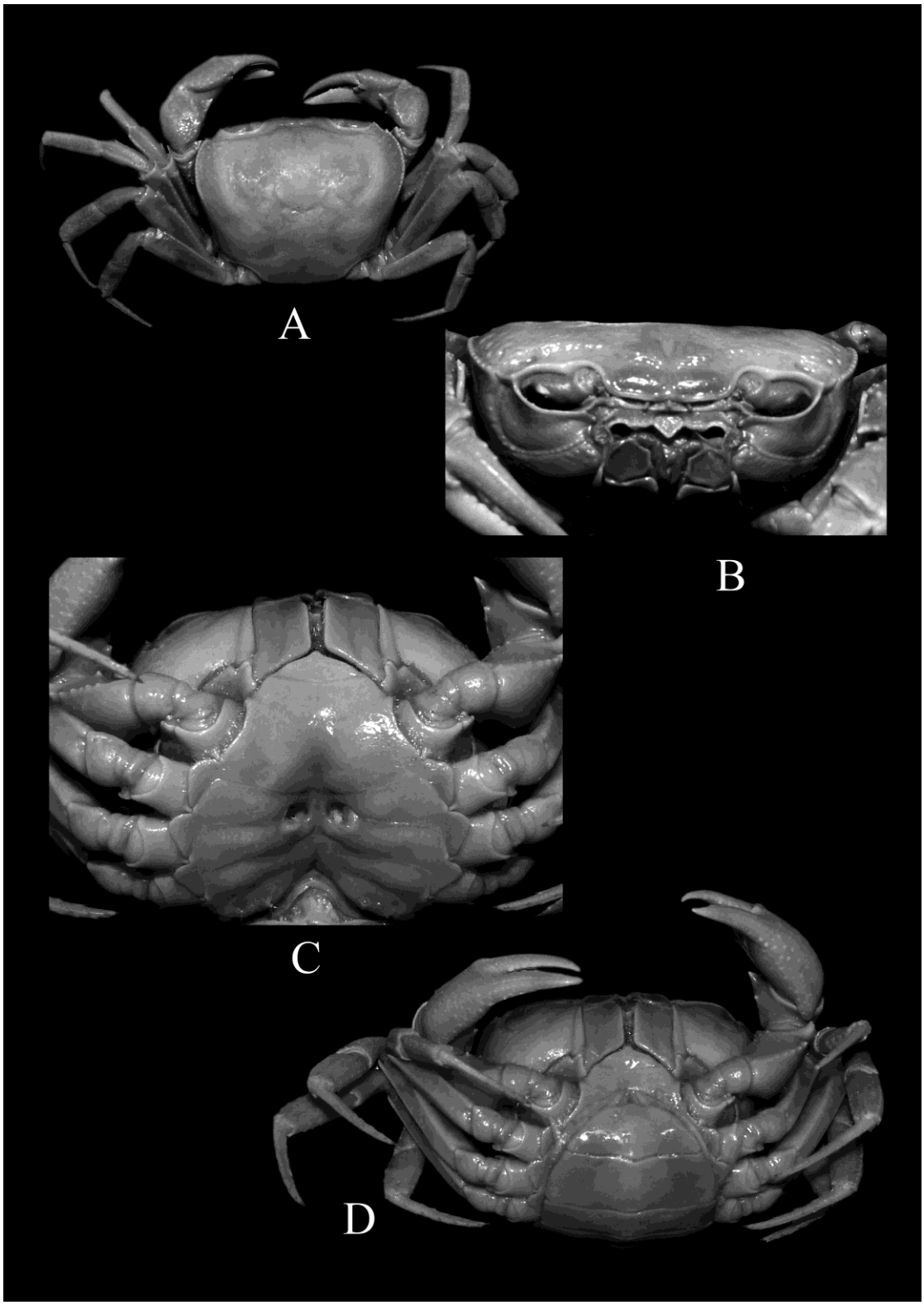

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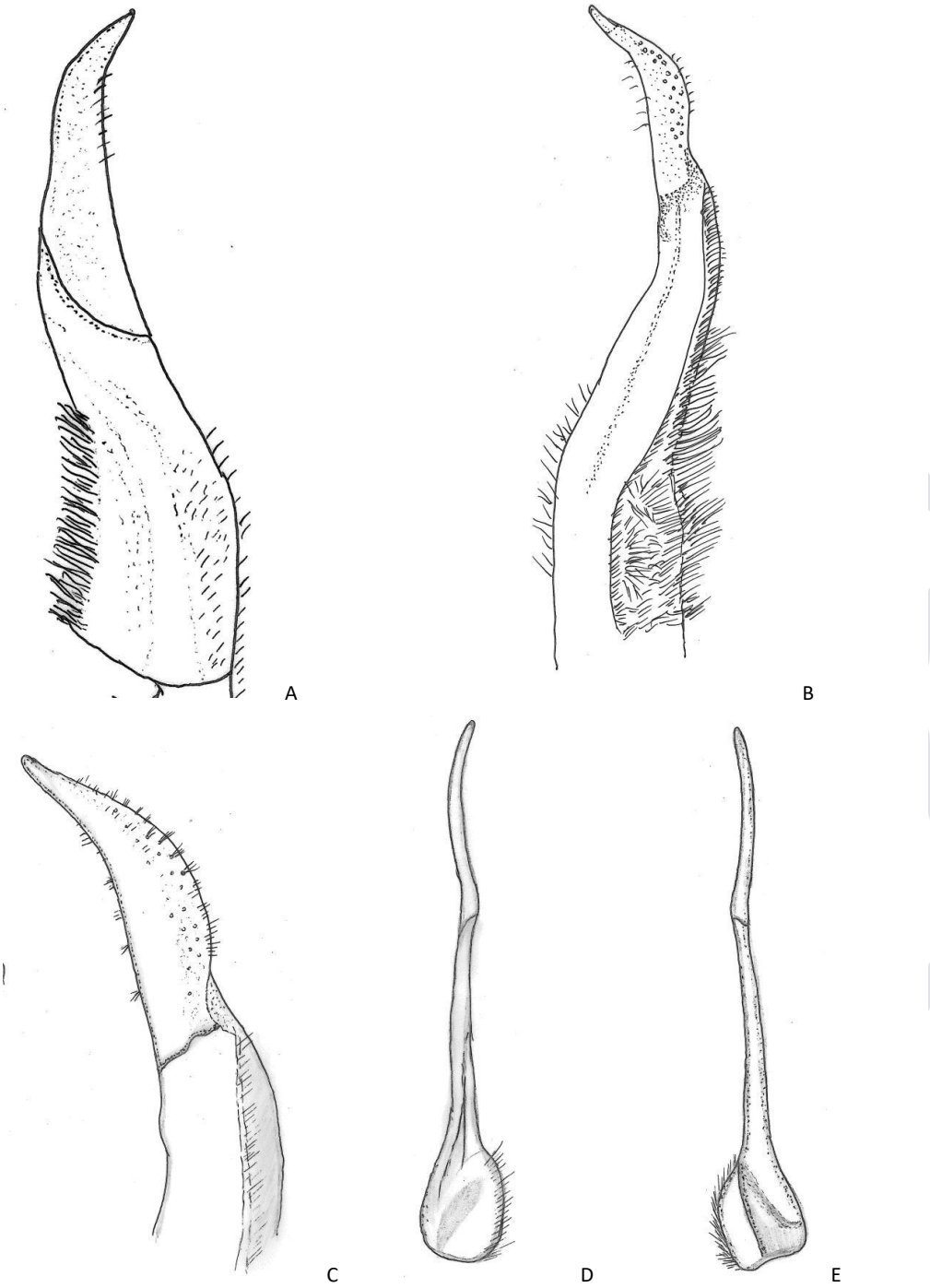

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