

## Revision of the Southeast Asian potamid crabs of the genus *Malayopotamon* Bott, 1968 (Crustacea: Decapoda: Brachyura)

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*Malayopotamon* Bott, 1968, a genus of potamid freshwater crabs from Sumatra and Java in Southeast Asia, is revised, and new generic characters are diagnosed. Ten species are now recognized in the genus, of which two are new species, from Sumatra. *Malayopotamon brevimarginatum javanense* (Bott, 1968) is recognized as a full species, *M. gestroi* (Nobili, 1900) is re-established as a valid species and *Potamon sumatrense* Miers, 1880, is referred to the genus for the first time. Diagnoses are presented for all species and a key presented for all the taxa.

KEYWORDS: Taxonomy, revision, *Malayopotamon*, Potamidae, new species, Southeast Asia.

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### Introduction

Bott (1968) established the potamid freshwater crab genus *Malayopotamon* as a subgenus of *Isolapotamon* Bott, 1968, and recognized three species and two subspecies from Java and Sumatra. Bott (1970a) subsequently elevated *Malayopotamon* to a full genus. *Malayopotamon* superficially resembles genera like *Johora* Bott, 1966 (from Peninsular Malaysia and Singapore), *Isolapotamon* Bott, 1968 (from Borneo), and *Allopotamon* Ng, 1988 (from Tambelan Islands), especially with regards to the overall carapace morphology and the presence of a distinct flagellum on the exopod of maxilliped 3 (Ng, 1988a, b; Ng and Tan, 1998). The structure of the male first pleopod of *Malayopotamon* species, however, is unique to the genus, being very stout and with the terminal segment quadrate (Bott, 1968, 1970b). We have since found other differences in the structures of the exopods of the third maxillipeds and abdominal segments which are diagnostic for the genus (see later).

Although the genus *Malayopotamon* was established fairly recently, most of the nominal species are not well known. There are also other problems. Bott (1970b) synonymized *Potamon gestroi* (Nobili, 1900) under *Malayopotamon granulatum* (De Man, 1892) with hardly any comment, but Ng and Wowor (1991) regarded it nevertheless as a good species. Ng and Yang (1985) described *Malayopotamon holthuisi* supposedly from Peninsular Malaysia but Ng (1988a) subsequently referred

it to *Stoliczia* Bott, 1966. *Potamon sumatrense* Miers, 1880, was mentioned by Bott (1970b) in his monograph but was not treated at all and its affinities with *Malayopotamon* were not realized then. Several species have also been described from China since Bott 1970b (see Dai *et al.*, 1979, 1980; Dai and Song, 1982; Cheng *et al.*, 1993). These and other problems, as well the present discovery of two new species, require that the genus be revised.

### Material and methods

All measurements, in millimetres, are of the carapace widths and lengths respectively. Terminology and methods essentially follow Ng (1988a). The abbreviations G1 and G2 are used for the male first and second pleopods respectively. The neck of the G1 refers to the slender proximal portion of the subterminal segment which is usually bent to various degrees in *Malayopotamon* species. Specimens are deposited in the Nationaal Natuurlijke Museum, former Rijksmuseum van Natuurlijke Historie (RMNH), Leiden; The National History Museum (NHM), London; Senckenberg Museum (SMF), Frankfurt am Main; Amsterdam Museum (ZMA), Amsterdam; Museo di Civico Storia Genoa (MGE), Italy; Balitbang Zoologi, Museum Zoologicum Bogoriense (MZB), Bogor; and Zoological Reference Collection (ZRC), Department of Biological Sciences, National University of Singapore. All specimens are from Indonesia unless indicated otherwise.

In this paper, Bott's (1970a) placement of *Malayopotamon* in the family Isolapotamidae is not followed. The characters used by Bott (1970a, b) to diagnose the family are unreliable and do not justify family recognition (see Ng, 1986, 1987, 1988a, b; Ng and Yang, 1985, 1986). We follow these authors in recognizing the Isolapotamidae Bott, 1970, as a junior synonym of Potamidae Ortmann, 1896.

The species in this paper are treated in alphabetical order except for the type species which is dealt with first.

### Taxonomy

#### Family Potamidae Ortmann, 1896

##### *Malayopotamon* Bott, 1968

*Isolapotamon* (*Malayopotamon*) Bott, 1968: 126.

*Malayopotamon* Bott, 1970a: 333; Bott, 1970b: 197.

#### Type Species

*Telphusa larnaudii* var. *brevimarginata* De Man, 1892, by original designation (= *M. brevimarginatum*).

#### Diagnosis

Carapace broader than long, anterior half often granulated or rugose to varying degrees, posterior half usually smooth, pubescent or glabrous; anterolateral margins convex, serrated. Exopod of maxilliped 3 slender, with outer margin straight or very slightly convex, reaching half length of merus, tip blunt, not tapering, with well developed, long flagellum. Lateral margins of male telson distinctly concave; lateral margins of male abdominal segment 6 distinctly convex, abdominal segment 6 of both sexes with a transverse median sulcus, parallel to abdominal sutures, not reaching lateral margins. G1 stout, terminal segment tubular or truncated, usually

half length of subterminal segment or shorter; G2 distal segment about half length of basal segment.

#### *Distribution*

Known only from West Java and Sumatra, Indonesia.

#### *Taxonomic remarks*

In diagnosing *Malayopotamon*, Bott (1968, 1970a, b) used the relatively short and stout G1s of the various species as the main character. He also regarded the genus as a wholly Javan and Sumatran taxon. The present revision has found that there are two other characters which can serve to distinguish *Malayopotamon* from all other Sundaic Potamidae. In *Malayopotamon* species, the distal part of the exopod of the maxilliped 3 does not taper sharply and the tip is rounded or blunt. The abdomen segment 6 (in both sexes) also has a small but distinct transverse median groove and the lateral margins of this segment are convex to slightly convex in adult males.

Six Chinese species have been attributed to *Malayopotamon* by various workers, viz. *M. purpureomanualis* (Wu, 1934), *M. engelhardti* (Bott, 1967), *M. fukienense* Dai, Chen, Song, Fan, Lin and Zeng, 1979, *M. gracilipa* Dai, Song, Li and Liang, 1980, and *M. angustipedum* Dai and Song, 1982, and *M. yonganense* Cheng, Lin and Luo, 1993 (see Ng, 1994, for comments on citation of authors). However, the Chinese *Malayopotamon* differ significantly from the *Malayopotamon* of Java and Sumatra in carapace morphology and gonopodal structure. Ng and Wowor (1991) commented that the Chinese species do not belong to *Malayopotamon s. str.* because of various carapace and gonopodal differences but did not elaborate. Dai and Türkay (1997) recently reappraised the generic affinities of all the Chinese species of *Malayopotamon* and transferred *M. engelhardti*, *M. fukienense* and *M. yonganense* into *Bottapotamon* Dai and Türkay, 1997; *M. purpureomanualis* into *Heterochelamon* Dai and Türkay, 1997; and *M. angustipedum* into *Mediapotamon* Dai and Türkay, 1997. Türkay and Dai (1997) also transferred *M. gracilipa* to *Yarepotamon* Türkay and Dai, 1997. The removal of all the Chinese *Malayopotamon* species into other genera hence restricts *Malayopotamon* Bott, 1968, for the Javanese and Sumatran species.

The convexity of the lateral margins of the male abdominal segment 6 allies *Malayopotamon* most closely with *Allopotamon* Ng, 1988, but the structures of their maxilliped 3 exopods and G1s are very different. Interestingly, Ng (1988b) also argued for the close affinities between *Allopotamon* and *Isolapotamon* on the basis of their similar maxilliped 3 exopods.

The present revision recognizes ten species, all Javanese and Sumatran in distribution, two of which are described as new. *Potamon gestroi* Nobili, 1900, is here recognized as a valid species, and *Malayopotamon sumatrense* (Miers, 1880), is redescribed. The ten recognized *Malayopotamon* species are *M. brevimarginatum* (De Man, 1892) (type species), *M. batak* Ng and Wowor, 1991, *M. gestroi* (Nobili, 1900), *M. granulatum* (De Man, 1892), *M. granulosum* (Balss, 1937), *M. javanense* (Bott, 1968) (= *M. holthuisi* Ng and Yang, 1985), *M. similis*, sp. nov., *M. sumatrense* (Miers, 1880), *M. tobaense* (Bott, 1968), and *M. turgeon*, sp. nov.

***Malayopotamon brevimarginatum*** (De Man, 1892)

(Figure 1)

*Telphusa larnaudii*: De Man, 1880: 2, pl. I (not *Thelphusa larnaudii* A. Milne-Edwards, 1869)*Telphusa larnaudii* var. *brevimarginata* De Man, 1892: 294 (part), pl. 17 figure 6.*Potamon (Potamon) larnaudii* var. *brevimarginatum*: Nobili, 1900: 500 (part).*Potamon (Potamon) brevimarginatus* Rathbun, 1904: 277, figure 16, pl. 10 figure 8.*Potamon (Potamon) brevimarginatum*: Colosi, 1920: 31; Calman, 1925: 167; Pesta, 1930: 94 (part).*Isolapotamon (Malayopotamon) brevimarginatum brevimarginatum*: Bott, 1968: 126, figure 12.*Malayopotamon brevimarginatum brevimarginatum*: Bott, 1970b: 197, pl. 41 figure 86, pl. 57 figure 86.*Material examined*

LECTOTYPE. Male (58.4 by 44.0mm) (RMNH 327), Silago River, Midden Sumatra Expedition, 1877. PARALECTOTYPES. Five juveniles (RMNH 326), Alahan Pandjang river, Midden Sumatra Expedition, 1877. One male, one female (RMNH 328), Alahan Pandjang river, Midden Sumatra Expedition, 1877. One male, one female (RMNH 1284), river near Singkarah, Sumatra, coll. M. Weber, 1888-1889. Three males, three females, five juveniles (RMNH 1753), Moeara Laboe (= Muaralabuh), Midden Sumatra Expedition, 1877. One male (40.1 by 30.9mm), one juvenile (RMNH 2588), river by Singkarah, Sumatra, coll. M. Weber, 1888-1889. Others: Four males, three females (ZRC), Kerinci, lake at Gunung Tujuh, coll. S. H. Tan and H. H. Tan, 12 Jun. 1996. One male, one female (ZRC), Sungai Pondok Kayuaro, 192.9 km from Padang towards Sungai Penuh, coll. T. H. T. Tan, 20 May 1997. One female (ovigerous) (ZRC), Sungai Pondok Kayuaro, 192.9 km from Padang towards Sungai Penuh, T. H. T. Tan, 20 May 1997. One male (MZB Cru 1193), Jambi, Kerinci, Sungei Panuk, ca. 1°42'S, 101°16'E, coll. Padmono, 11 July 1982. Two males (ZRC), cave, Sumpurkudus, central Sumatra, coll. C. Deharveng and A. Bedos, 1996. Two males (RMNH 17668), Padangpandjang, west coast, coll. E. Jacobson, April 1912. Two males, one female, five juveniles (RMNH 17665), Andalas, Tandjung, Padangse Bovenlanden (= Padang Highlands), coll. E. Jacobson, May 1914. One female (RMNH 2147), Padangse Bovenlanden, coll. E. Jacobson, 1913. Two females, three juveniles (RMNH 41952), Sungai Dareh, near Keju Aro, km 24 on road from Silok to Padang, coll. M. Kottelat, 5 May 1984. One male (RMNH 17666), Solok, coll. P. O. Stolz, May 1910. One male (RMNH 29931), Alas river, coll. B. De Wilde, July 1972. One male (RMNH 17667), Palembang, Ajer Njukur, Dempo, Pasemah, 1400m asl, coll. E. Jacobson, August 1916. All localities in Sumatra.

*Diagnosis*

Carapace rugose on anterior half, posterior half generally smooth, gastric region weakly striated; anterolateral margins convex, distinctly crested, epibranchial tooth prominent, not acute, separated from external orbital tooth by narrow cleft, outer margin of external orbital tooth slightly convex. G1 terminal segment slender, tubular, tip entire, with a notch on lateral margin.

*Taxonomic remarks*

De Man (1892) described this species (as a variety) on the basis of specimens collected from various parts of Sumatra (Manindjau: 14 specimens, Muka-Muka: one young male, Singkarah River: 30 specimens, Singkarah Lake: one young male,

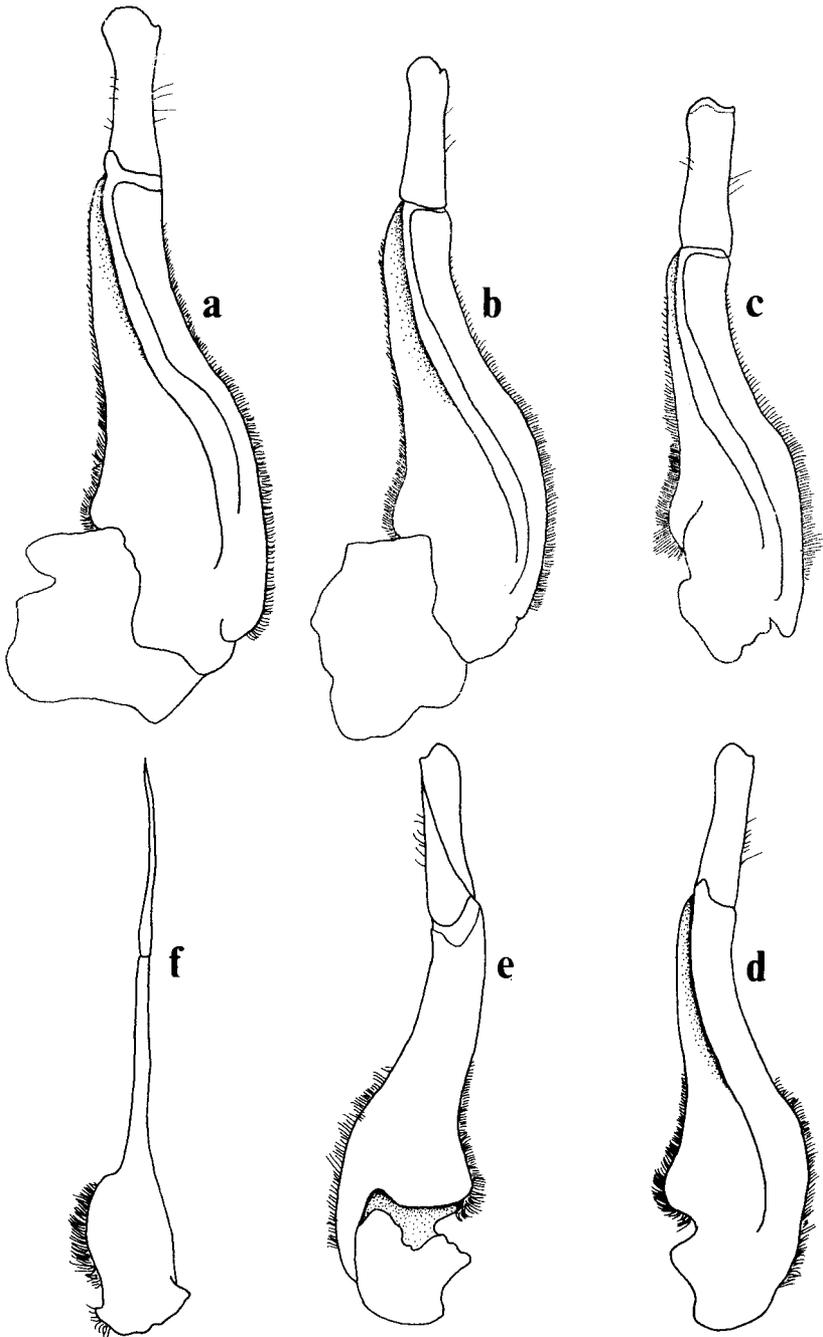


FIG. 1. *Malayopotamon brevimarginatum* (De Man, 1892). (a) lectotype male (58.4 by 44.0 mm) (RMNH 327); (b) Male (50.0 by 37.3 mm) (ZRC); (c) male (44.8 by 34.2 mm) (ZRC); (d–f) male (40.1 by 30.9 mm) (RMNH 2588). (a–d) left G1s (ventral views); (e) left G1 (dorsal view); (f) left G2.

Bahwa Lake: one young male, Panninggahan: two juveniles, Deli: one male) and west Java (Tjibodas: one young male). De Man (1892: 294) also referred to his earlier (1880: 2) record of '*Telphusa larnaudii*' from Sumatra (Silago: three specimens, Moeara Laboe: 14 specimens, Alahan Pandjang: 27 specimens) in describing this new form. *Telphusa larnaudii* A. Milne-Edwards, 1869 s. str. (= *Larnaudia larnaudii*) is known only from Thailand (see Bott, 1970b; Ng and Naiyanetr, 1993). As De Man (1892) did not designate a holotype for this *T. larnaudii* var. *brevimarginatum*, all his specimens, including those cited in his 1880 paper, are syntypes. Bott (1968) specified that the type locality of the species was Moeara Laboe (= Muara Labuh) and had specimens from that locality, but he did not specify that these specimens included the holotype nor designate a lectotype. We have examined a good part of the syntype series (RMNH lots 326, 327, 328, 1284, 1753 and 2588) and all are conspecific. In the interest of stabilizing the taxonomy of the entire genus, since *M. brevimarginatum* is the type species of the genus, a male specimen (RMNH 327) measuring 58.4 by 44.0 mm from the Silago River is hereby selected as the lectotype of *M. brevimarginatum*.

De Man (1892) also listed a juvenile specimen from Tjibodas (= Cibodas) (part of his type series) but to date, *M. brevimarginatum* has not been reliably reported from Java. All other records of '*M. brevimarginatum*' have invariably proved to be *M. javanense*. Bott (1968, 1970b), however, commented that De Man's (1892) specimen from Cibodas is probably *M. granulatum* rather than *M. javanense*. We disagree. Although De Man (1892) did not describe this specimen, it was he (De Man, 1892) who also described *M. granulatum*, and he would surely have been aware how different *M. granulatum* and *M. brevimarginatum* were. Their carapace morphologies are very different, even for juveniles and small specimens. It is thus very unlikely that De Man would have mistaken one for the other. On the other hand, *M. brevimarginatum* is very close to *M. javanense* and the two can easily be confused with each other, especially juveniles. We thus feel that De Man's (1892) record of '*M. brevimarginatum*' from Cibodas is probably *M. javanense* instead. We suspect Bott (1968, 1970b) may have been mistaken that Cibodas only had one species, *M. granulatum*, and he based his inference on this. As also noted later for *M. granulatum*, both species are in fact found in Cibodas.

Although *M. brevimarginatum* is close to *M. javanense*, they can be distinguished by several external features. In mature specimens of *M. brevimarginatum*, the gastric region is striated, with the striae relatively prominent. In *M. javanense*, the striae on the gastric region are generally less prominent. In large specimens of *M. brevimarginatum* (ca. 50 mm carapace width), the granules on the outer surface of the chela are well formed and pearl-like. The granules, however, are always low and flattened in *M. javanense*. The epibranchial tooth is also comparatively less acute in *M. brevimarginatum* compared to *M. javanense* for specimens of equivalent sizes. The G1 is of course, the most reliable and diagnostic character, with those of the two species being quite different. In *M. brevimarginatum*, the tip is flattened, with a notch on the lateral margin (figure 1). The G1 is more tubular and lacks the notch in *M. javanense* (figure 4).

Nobili (1900) records *M. brevimarginatum* from the forest of Si-Rambe, Balige and Mount Singalang in Sumatra. It is not so certain as to whether all his specimens are conspecific. Si-Rambe and Balige are towns/villages near Lake Toba in northern Sumatra, where *M. tobaense* is found. Interestingly, in her comments of the records prior to 1904, Rathbun (1904: 279) noted that the specimens from Balige recorded

by Nobili (1900) were '... probablement une espece différente'. As regards his record of a male specimen of *M. brevimarginatum* from Mount Singalang, it is pertinent to note that Nobili (1900) had described a new species, *M. gestroi*, from Mount Singalang. *Malayopotamon gestroi*, however, differs significantly from all congeners in its external morphology and the shape of the G1 (see remarks under *M. gestroi*). Specimens from these localities will need to be re-examined to ascertain their actual identities.

Rathbun (1904) examined some of De Man's (1892) specimens from Muara Labuh but also a male specimen from Palembang. The identity of her Palembang specimen cannot be ascertained but as she (Rathbun, 1904: figure 16) had a figure of the G1, she was apparently aware of its key diagnostic character (i.e. its G1). Her record of *M. brevimarginatum* from Palembang is thus tentatively accepted for the time being.

Calman (1925) recorded five specimens from Sungei Kumbang in Korinchi (= Kerinci) from over 1400m asl (no figures or description). It seems likely that the specimens obtained were *M. brevimarginatum* as recent collections from the lake at Gunung Tujuh, Kerinci (ZRC) showed that *M. brevimarginatum* is relatively common there. However, in the same lake, we also obtained a single specimen of *M. similis*, sp. nov. Both *M. brevimarginatum* and *M. similis* are thus sympatric and Calman's (1925) specimens must be examined before their identities can be ascertained.

Pesta's (1930) records of *M. brevimarginatum* from various parts of Sumatra are almost certainly mixed. For example, his specimens from Toba are more likely to be *M. tobaense*.

The terminal segment of the male G1 of *M. brevimarginatum* shows some variation as the species increases in size. When the specimen is relatively small (but apparently mature), the G1 terminal segment is relatively slender; with a small but distinct notch on the tip towards the lateral margin (figure 1C). As the specimen increases in size, the terminal segment becomes slightly stouter with the tip becoming pectinated (figure 1B). In larger specimens, the tip is distinctly flared (figure 1A). The length of the G1 terminal segment also becomes slightly proportionately shorter, being less than half the length of the subterminal segment. However, the basic shape of the entire G1 remains the same. The notch on the tip of the G1 terminal segment is remarkably consistent irrespective of size and is absent in all other species of *Malayopotamon*.

### *Life Colours*

The colour of the chelae seems to vary rather markedly. Live specimens taken from a cave in Sumpurkudus (ZRC) were white, with the frontal and anterolateral margins white. Those from Kerinci had orange chelae and orange frontal and anterolateral margins when alive. Their external morphology and G1 structures, however, are identical, and there is no reason to believe they are separate taxa. Even more dramatic colour variation has recently been reported in *Terrapotamon abboti* (Rathbun, 1898), a terrestrial crab from southern Thailand (Ng, 1988a; Ng and Tan, 1996).

### *Ecology*

*Malayopotamon brevimarginatum* prefers forested streams with relatively fast flowing water, often with rocky substrata. Two specimens (ZRC) were obtained

from inside a cave (but near the entrance) in Sumpurkudus. Neither had any adaptations to a cavernicolous life style (see Juberthie *et al.*, 1998).

***Malayopotamon batak* Ng and Wowor, 1991**

(Figures 2A, B)

*Malayopotamon batak* Ng and Wowor, 1991: 165.

*Material examined*

HOLOTYPE. Male (41.8 by 33.0mm) (MZB Cru 1253), Langkat Nature Reserve, Bukit Lawang, Bohorak, northern Sumatra, 3°30'N, 98°12'E, coll. 17 February 1973.

PARATYPE. One male (36.9 by 29.2mm) (ZRC 1989.3039), same data as holotype.

*Diagnosis*

Carapace rugose, dorsal surfaces covered with strong transverse striae and granules; anterolateral margins convex, serrated, serrae distinct; epibranchial tooth distinct, sharp, clearly demarcated from external orbital tooth; postorbital cristae entire; outer margin of external orbital tooth convex, slightly serrated. G1 terminal segment quadrate, truncate, margin of tip straight, glabrous.

*Taxonomic remarks*

The present species was described on the basis of its strongly rugose and granulose carapace as well as its characteristic G1 structure, the terminal segment being short and quadrate. The strongly rugose carapace is reminiscent of *M. granulatum* from Java. The postorbital cristae of *M. granulatum*, however, are not parallel to the

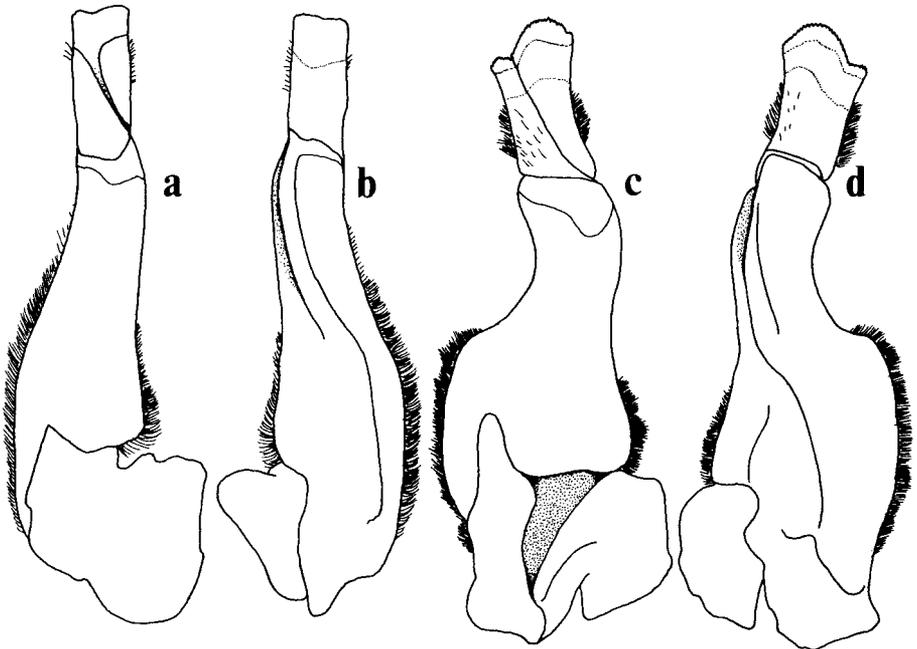


FIG. 2. Left G1s of *Malayopotamon* spp. (a, b) *M. batak* Ng and Wowor, 1991, paratype male (36.9 by 29.2mm) (ZRC 1989.3039); (c, d) *M. gestroi* (Nobili, 1900), paralectotype male (53.4 by 40.0mm) (MG III 242). (a, c) dorsal view; (b, d) ventral view.

frontal margin, but curving, forming a gentle curve around the contours of the orbits. The postorbital cristae of *M. granulatum* are also not entire and are lined with distinct granules. The postorbital cristae of *M. batak* are entire, forming a ridge which is not granulated. The postorbital cristae are also parallel to the frontal margin.

*Malayopotamon batak* also appears to have close affinities with *M. granulatum*. The serrae of the anterolateral margin of *M. granulatum* are, however, less well defined and often fused basally and not forming a ridge at the margins. The serrations on the anterolateral margin of *M. batak* on the other hand, are fused with each other at the base, forming a distinct ridge at the periphery of the carapace. The carpus of the cheliped of *M. batak* is covered with low, flattened granules whilst they are well formed and pearl-like in *M. granulatum*. The most characteristic difference between *M. batak* and *M. granulatum* is the form of the G1. The G1 terminal segment of *M. batak* is quadrate, with the tip straight (figure 2A, B). The G1 terminal segment of *M. granulatum*, however, is slender, tubular with the tip rounded (figure 3C, D).

The short and very quadrate terminal segment of G1 of *M. batak* is perhaps closest to that of *M. gestroi* in general structure. The G1 of *M. gestroi*, however, is relatively longer, stouter, the basal part of the subterminal segment is more dilated, the distal part is swollen, and the terminal segment is proportionately shorter relative to the subterminal segment and more filiform distally. Arguably, the lectotype male of *M. gestroi* is larger (57.0 by 44.0 mm) than the holotype male of *M. batak* (41.8 by 33.0 mm), but the differences in their external morphologies are so striking that

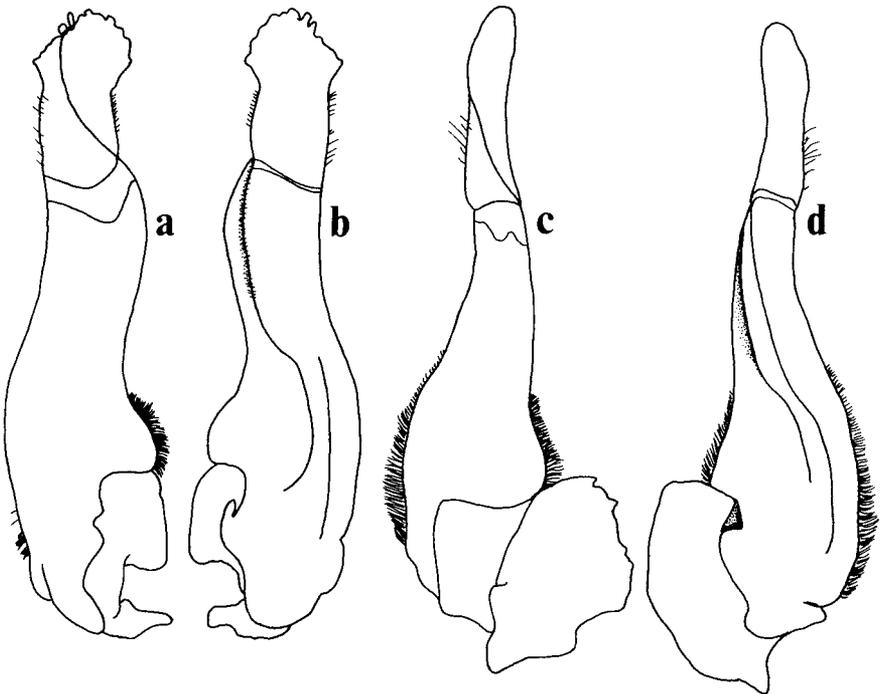


FIG. 3. Left G1s of *Malayopotamon* spp. (a, b) *M. granulatum* (De Man, 1892), male (40.2 by 32.0 mm) (ZRC); (c, d) *M. granulatum* (Balss, 1937), male (38.3 by 30.1 mm) (ZRC 1990.441). (a, c) dorsal view; (b, d) ventral view.

there can be no doubt that two different species are involved. The carapace dorsal surface of *M. gestroi* is pubescent (vs. glabrous in *M. batak*), the external orbital tooth of *M. gestroi* is broader than that of *M. batak*, and most significantly, the suture between the thoracic sternites 3 and 4 in *M. gestroi* is nearly straight, but V-shaped in *M. batak*. In any case, the paralectotype female of *M. gestroi* (32.2 by 24.3 mm) is smaller than the types of *M. batak* and the carapace differences are still valid.

The type locality of *M. batak* appears to be within the known distribution of *M. tobaense*. The carapace is, however, much more rugose in *M. batak* and the two species cannot be confused with each other. The serrations on the anterolateral margin of *M. tobaense* are also larger than those of *M. batak* of similar sizes. As mentioned earlier, their G1 structures also differ from each other significantly.

In the original description, Ng and Wowor (1991) illustrated the holotype male (36.9 by 29.2 mm, MZB Cru 1253) of the species but the caption incorrectly stated that it was the paratype (36.9 by 29.2 mm, ZRC 1989.3039). The captions for the figures of the gonopods are correct. Only two specimens are known, and the paratype male has the centre of the carapace partially crushed but is otherwise in good condition.

#### *Life Colours*

Not known.

#### *Ecology*

Not known.

### ***Malayopotamon gestroi*** (Nobili, 1900) (Figures 2C, D)

*Potamon (Potamon) gestroi* Nobili, 1900: 502; Rathbun, 1904: 264; Calman, 1925: 167.

*Malayopotamon granulatum*: Bott, 1970b: 200 (part) (not *Thelphusa granulata* De Man, 1892).

#### *Material examined*

LECTOTYPE. Male (57.0 by 44.0 mm) (MG) (slides examined only), Mt. Singalang, Sumatra, leg. O. Beccari, between 1865 and 1868. PARALECTOTYPES. One male (53.4 by 40.0 mm), one female (32.2 by 24.3 mm) (MG III 242), same data as holotype.

#### *Diagnosis*

Carapace pubescent with very short setae; anterolateral margins convex, not distinctly demarcated from posterolateral margins; epibranchial tooth distinct, separated from external orbital tooth by shallow triangular cleft; external orbital tooth broadly triangular but short, about twice length of inner orbital tooth. Chelipedal carpus upper margin with low granules. Ambulatory legs carpus, propodus and dactylus margins lined with relatively long stiff setae which are arranged in two rows on propodus and dactylus, arranged in one row on carpus. G1 very stout, not twisted, terminal segment short, truncate, tip of dorsal lobe extends well beyond tip of ventral lobe; distal part of subterminal segment slightly swollen.

#### *Taxonomic remarks*

Nobili (1900) in his description of *M. gestroi* did not designate any types. The specimens that he examined consist of two males and three females and they are

considered as syntypes. We have examined slides of the largest male (including its G1), and actual specimens of a pair of smaller syntypes. They are clearly conspecific. We hereby select the largest male, 57.0 by 44.0 mm, as the lectotype of *M. gestroi*.

*Malayopotamon gestroi* can be easily distinguished from all other *Malayopotamon* species by its pubescent carapace. The smaller female paralectotype is also pubescent. The presence of pubescence in other species of *Malayopotamon* is not as distinct and prominent as in *M. gestroi*. The G1 of *M. gestroi* is closest to those of *M. tobaense* and *M. batak*. The G1 of *M. gestroi* differs from that of *M. tobaense* in being straight, not twisted, and from that of *M. batak* in being stouter and in the presence of a swelling at the distal part of the subterminal segment.

Bott (1970b) synonymized Nobili's (1900) species with *M. granulatum* without comment, although he listed the types of *Potamon gestroi* in his material examined. *Malayopotamon granulatum* can, however, easily be differentiated from *M. gestroi* by having a glabrous, rugose and very granulose carapace, the postorbital cristae carries granules and are not entire, and the surfaces of the palm are granulated with the granules pearl-like. *Malayopotamon gestroi* was described from Mount Singalang in Sumatra, whilst *M. granulatum* has not been reported outside west Java.

Calman (1925) recorded a small female specimen (25.0 by 20.0 mm) from Sungei Kumbang in Kerinci, Sumatra from an altitude of 1400 m asl. He followed Nobili's (1900) descriptions in his identification, but a re-examination is necessary to confirm its identity. Calman (1925) also records *M. brevimarginatum* from the same stream, so his '*Potamon gestroi*' might well be *M. brevimarginatum* instead.

#### *Life Colours*

Not known.

#### *Ecology*

Not known.

### ***Malayopotamon granulatum* (De Man, 1892)**

(Figures 3A, B)

*Telphusa granulata* De Man, 1892: 290, pl. 16 figure 5.

*Telphusa larnaudii brevimarginata*. De Man, 1892: 294 (part) [not *Malayopotamon brevimarginatum* (De Man, 1892)]

*Potamon granulatum*. De Man, 1898: 403.

*Potamon (Potamon) granulatum*. Nobili, 1900: 500; Pesta, 1930: 93.

*Potamon larnaudii brevimarginata*. De Man, 1902: 567 [not *Malayopotamon brevimarginatum* (De Man, 1892)]

*Potamon (Potamon) granulatus*. Rathbun, 1904: 274; Rathbun, 1910: 310, pl. 4 figure 2; Yang, 1979: 17.

*Potamon (Potamon) brevimarginatum*. Pesta, 1930: 93 (part) [not *Malayopotamon brevimarginatum* (De Man, 1892)]

*Isolapotamon (Malayopotamon) granulatum*. Bott, 1968: 129, figure 16.

*Malayopotamon granulatum*. Bott, 1970b: 200, pl. 41 figure 90, pl. 58 figure 90 (part).

#### *Material examined*

One male (50.1 by 38.9 mm) (ZRC 1984.7058), Tjibodas (= Cibodas), coll. January 1935. One female (ZMA), Pasir Datau, ca. 1000 m asl, Java, coll. H. C. Delsman, April 1924. One female (ZMA), Tjibodas (= Cibodas), coll. J. Vervey, September 1929. Three males, one female (ZMA), Soekaboemi (= Sukabumi), De.102.288, coll. Kamerman. One male (RMNH 31574), Tjibodas (= Cibodas),

Bogor, coll. P. van Doesburg, 4 January 1977. Two males (MZB), Tjibodas (= Cibodas), 1400 m asl, coll. W. S. S. van Benthem Jutting, December 1930. One male (40.2 by 32.0 mm) (ZRC), Cibodas National Park, ca. 1400 m asl, West Java, coll. P. K. L. Ng, 13 June 1990.

### Diagnosis

Carapace protogastric and anterior half of mesogastric regions densely granulated, granules usually pearl-like; anterolateral margins granulated; postorbital cristae not entire, granulated, not parallel with frontal margin; epibranchial tooth sharp, clearly demarcated from external orbital tooth by triangular cleft; outer margins of external orbital tooth convex. G1 very stout, terminal segment squarish to quadrilateral.

### Taxonomic remarks

*Malayopotamon granulatum* was described from Cibodas on Gunung Gede. De Man (1892) listed two males (larger 44.5 by 34.5 mm) as his material examined but did not specify either as the holotype. He (De Man, 1892: pl. 16 figure 5), however, provided an excellent figure of the species which leaves no doubt as to its identity. As noted in the key, *M. granulatum* is the most granulated of all *Malayopotamon* species, and can only be confused with *M. batak* from northern Sumatra. In addition to their different G1s, the two species can also easily be distinguished by external carapace features, notably the form of the postorbital cristae (see key).

One lot of two specimens (ZMA) from Cibodas which had been identified as *M. granulatum* were found to contain two species. The smaller female specimen (22.6 by 17.5 mm) is *M. granulatum* while the larger male specimen (32.6 by 24.2 mm) is *M. javanense*. Both species have been collected in the same area but as yet not together. In the heights of Cibodas, both species are present, but *M. granulatum* appears to be generally more common. In the lower altitude streams below Cibodas, only *M. javanense* is present.

### Life colours

Carapace generally dark to reddish brown, legs brown to dark green.

### Ecology

The recent specimens were all collected from 1400 to 1500 m asl, and all records indicate *M. granulatum* as a montane species. The recent specimens were found under piles of large rocks in clear flowing water on rocky/sandy substrata.

### ***Malayopotamon granulosum* (Balss, 1937)**

(Figures 3C, D)

*Thelphusa granulosa* von Martens in Hilgendorf, 1878: 802 (*nomen nudum*)

*Potamon granulosum*: De Man, 1898: 435 (*nomen nudum*)

*Thelphusa granulosa*: Rathbun, 1906: 74 (*nomen nudum*)

*Potamon granulosus* Balss, 1937: 165, figures 26, 27, 28

*Isolapotamon (Malayopotamon) granulosum*: Bott, 1968: 128, figure 14

*Malayopotamon granulosum*: Bott, 1970b: 198, pl. 41 figure 88, pl. 57 figure 88.

*Material examined*

Nine males, three females (MZB Cru 1256), one male (38.3 by 30.1 mm), one female (30.7 by 24.2 mm) (ZRC 1990.441-442), D. Tes, Air Ketahun, Bengkulu, Sumatra, 3°23'S, 101°49'E, coll. B. Tappa and Yusuf, 25 September 1982.

*Diagnosis*

Anterior dorsal surface of carapace rugose, anterolateral margins distinctly serrated, epibranchial tooth very small, separated from external orbital tooth by narrow cleft, outer margin of external orbital tooth convex. G1 not twisted, terminal segment tubular, straight, margin of tip rounded.

*Taxonomic remarks*

We have identified the specimens from Bengkulu, Sumatra, with *M. granulosum* mainly because of similarities in the sculpture of the surfaces of their carapaces and chelipeds, as well as their G1 structures. These specimens were also collected very close to the type locality of *M. granulosum* in Kepahiang.

The G1 terminal segment of the type of *M. granulosum*, as depicted by Balss (1937), appears somewhat more elongate than those of the present specimens, and the tip also seems more tapered. Their subterminal segments are, however, almost identical. Since all the present males are much smaller than the 47.0 by 37.5 mm holotype male of *M. granulosum*, these differences can be explained by their sizes, and perhaps the orientation in which Balss (1937) drew the gonopod. The anterolateral margin of the type male is also more distinctly serrated than those of the present specimens, but this is also often associated with large sizes.

*Malayopotamon granulosum* is superficially similar to *M. granulatum* but other than their very different G1s, they can also easily be separated using external features. The postorbital cristae of *M. granulatum* are not entire and granulated whilst that of *M. granulosum* are entire and lined with striae. The anterolateral serrae of *M. granulosum* are also sharper and more saw-like compared to *M. granulatum*. The cheliped carpus is also less granulated in *M. granulosum* than *M. granulatum*. *Malayopotamon granulosum* has also not been reported outside of western Sumatra.

*Life colours*

Not known.

*Ecology*

Not known.

***Malayopotamon javanense* (Bott, 1968)**

(Figures 4A, B)

*Isolapotamon* (*Malayopotamon*) *brevimarginatum javanense* Bott, 1968: 127, figures 13, 18.  
*Malayopotamon brevimarginatum javanense*. Bott, 1970b: 198, pl. 41 figure 87, pl. 57 figure 87.  
*Malayopotamon holthuisi*: Ng and Yang, 1985: 64, figures 3, 4.  
*Stoliczia holthuisi*: Ng, 1988a: 80, figure 36.

*Material examined*

HOLOTYPE. Male (36.4 by 26.9 mm) (SMF 2851a), Buitenzorg (= Bogor), Jawa-Barat (West Java), coll. W. Kükenthal. PARATYPES. Two females (SMF 2851b), same data as holotype. One male (RMNH 12224), Tjiboeng (= Cibung), Buitenzorg

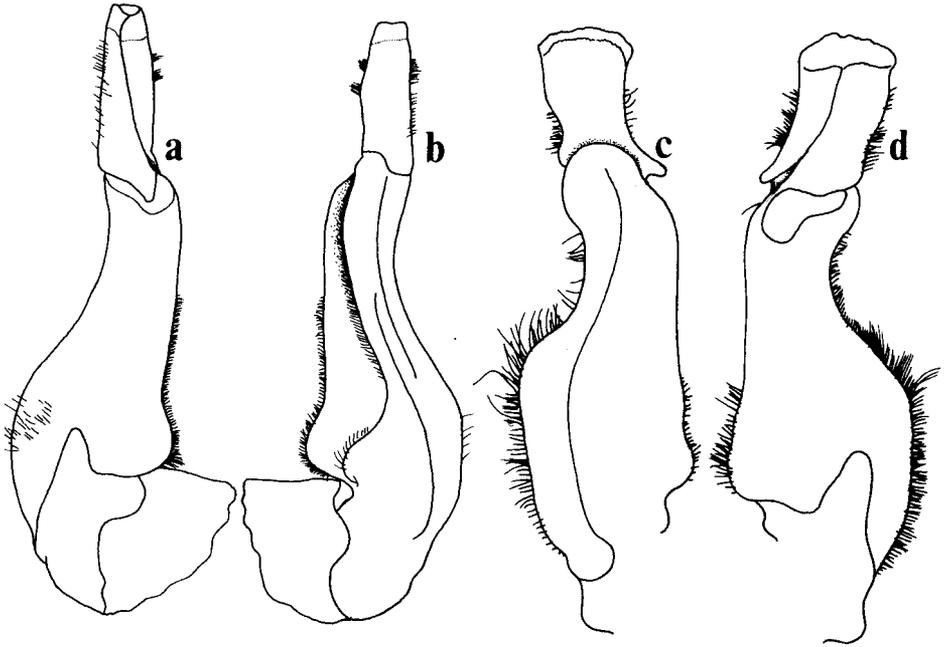


FIG. 4. G1s of *Malayopotamon* spp. (a, b) *M. javanense* (Bott, 1968), holotype male (36.4 by 26.9mm) (SMF 2851); (c, d) *M. sumatrense* (Miers, 1880), lectotype male (19.7 by 14.8mm) (NHM 1973.101). (a, d) dorsal view; (b, c) ventral view. (a, b) Left G1; (c, d) right G1.

(= Bogor), West Java, coll. W. C. van Heurn, 22 May 1932. Others: six males (ZRC 1985.4420-4425), Cibodas, Gunung Gede, 1400 to 1450m asl, West Java, coll. P. K. L. Ng, 5 August 1985. One female (41.6 by 31.2mm) (ZRC), Cibodas Botanic Gardens, in small drainage canal of almost dried pond, West Java, coll. P. K. L. Ng, 13 June 1990. Four females, one juvenile (ZRC), Sungai Cikundul, in small streams and ditches next to rice field, on road to Cibodas, Bogor, West Java, coll. P. K. L. Ng, 13 June 1990. One female (ZRC 1993.123) (43.0 by 32.5 mm), Cibodas Botanic Gardens, West Java, coll. N. Sivasothi, 12 November 1992. One male (RMNH 325), supposedly from New Guinea, no other data. One male (39.8 by 28.8mm), holotype of *Stoliczia holthuisi* (ZRC 1965.12.7.17), supposedly from Silensing, Pahang, Peninsular Malaysia, coll. R. Hanitsch.

#### Diagnosis

Carapace ovate, dorsal surface smooth, anterolateral margins serrated, anterolateral regions striated, posterolateral margin with low striae; postorbital cristae entire, not confluent with epigastric lobes and epibranchial tooth base; epibranchial tooth low, separated from external orbital tooth by narrow cleft; external orbital tooth acutely triangular, outer margin of external orbital tooth convex; epigastric lobes anterior of postorbital cristae, prominent, granulated; posterior carapace margin straight. Maxilliped 3 exopod not reaching half height of merus; sulcus on maxilliped 3 ischium sloping diagonally inwards, not meeting base of merus at mid point. Chela inner surface granulated, granules pearl-like. Male telson lateral margins concave approximately at mid point. G1 terminal segment tubular, margin of tip rounded.

*Taxonomic remarks*

Bott (1968) described the above taxon as a subspecies of *M. brevimarginatum* from somewhere in Buitenzorg (=Bogor). The G1 differences between *M. brevimarginatum* and *M. brevimarginatum javanense*, however, are such that it is perhaps better to recognize both of them as separate species (see discussion for *M. brevimarginatum* on the distinguishing features of the two taxa).

Ng and Yang (1985) described *M. holthuisi* based on one specimen from 'Silensing in Pahang', Peninsular Malaysia. Ng (1988a) noted, however, that the presence of the genus *Malayopotamon* in Malaysia was unexpected. Ng (1988a) subsequently transferred *S. holthuisi* to the genus *Stoliczia* Bott, 1966, mainly on the basis of the absence of a flagellum on the maxilliped 3 exopod. Comparison of the holotype male with the good series of specimens of *M. javanense* from West Java, including males of similar size to *M. holthuisi*, show that the two species are conspecific. The distal edges of both the left and right maxilliped 3 exopods appear damaged and all indications are that the flagella have broken off. The specimen is not in a good condition with most of the legs detached and the palps of the left maxilliped 3 have also broken off.

We are confident that the genus *Malayopotamon* is not present in Peninsular Malaysia and the data for the holotype of *M. holthuisi* are incorrect. The specimen is most certainly incorrectly labelled. To date, only two genera of potamids are known from Peninsular Malaysia, viz. *Johora* Bott, 1966, and *Stoliczia* Bott, 1966 (Ng, 1988a); and *Malayopotamon* is only reliably known from Sumatra and Java. To this effect, we are also confident that a specimen supposedly from New Guinea (RMNH 325) has been incorrectly labelled. The Nationaal Natuurlijke Museum, Leiden, at the end of the last century had specimens of freshwater crabs that were labelled from 'New Guinea', but were probably from Java (see Holthuis, 1982). The carapace features and G1 structure of this specimen agree with those of *M. javanense* very well. In any case, no potamid crabs are known from east of Borneo (Bott, 1970b).

*Live colour*

Carapace generally olive green to dark green. Chelae orangish in larger specimens.

*Ecology*

The recent specimens were obtained from 800 to 1400 m asl. They appeared more common in streams which are lower compared to *M. granulatum*. They were obtained from shallow streams with rocky/sandy substrata with dense vegetation lining the banks. In one stream (Sungai Cikundul), there were large numbers of an unidentified corbiculid freshwater mussel.

*Malayopotamon similis*, sp. nov.

(Figure 5)

*Material examined*

HOLOTYPE. Male (31.6 by 25.1 mm) (MZB), Danau Gunung Tujuh, Kerinci, Jambi, Sumatra, 2750m asl, 1°32'14.5"S 101°23'13.4", coll. S. H. Tan *et al.*, 12 June 1996.

### Diagnosis

Carapace broader than long, dorsal surface smooth, branchial and gastric regions inflated; anterolateral margins convex, granulated, anterolateral regions with low striae; posterolateral margin converging towards posterior carapace margin, posterolateral regions with few but very low striae; posterior margin straight; epibranchial region weakly striated; epibranchial tooth distinct, but low, separated from external orbital tooth by shallow cleft; outer margin of external orbital tooth straight, slightly serrated; epibranchial lobes distinct, not continuous with postorbital cristae; postorbital cristae prominent, sharp, continuous with base of epibranchial tooth. G1 terminal segment quadrate, tip filiform, with distinct projection at base of terminal segment, neck two-thirds length of subterminal segment.

### Etymology

Latin word for similar, alluding to the close affinities in carapace morphology that *M. similis* shares with *M. turgeo*. Adjective but used as a noun in apposition.

### Taxonomic remarks

*Malayopotamon similis* most closely resembles *M. sumatrense* in external morphology and G1 structure. Both species have a very unusual G1 structure, in which the base of the terminal segment has a hook-like projection. The projection is prominent and not found in any other species of *Malayopotamon*. The neck of the G1 of *M. similis*, however, is about two-thirds the length of the subterminal segment whereas it is about half the length in the G1 of *M. sumatrense*. The proximal portion, of the G1 terminal segment is not as strongly concave on the lower margin as that in *M. sumatrense* (figures 5C, E vs. Figures 4C, D).

*Malayopotamon similis* is also similar to *M. turgeo*, sp. nov., with regards to their inflated carapaces. The carapace of *M. similis*, however, is somewhat less inflated than that of *M. turgeo*. The cervical groove is also relatively deeper in *M. similis*. The G1 of *M. similis*, however, is very different from that of *M. turgeo*. The G1 terminal segment of *M. turgeo* is tubular and curves strongly upwards, the tip is smooth and entire, and the neck region is strongly curved, almost forming a U-shape. The G1 terminal segment of *M. similis* on the other hand, is quadrate and not tubular, the tip is filiform and the neck region is not strongly curved.

The single specimen of *M. similis* was caught at the Gunung Tujuh, Kerinci, which is approximately 200 km southeast of Agam, the type locality of *M. sumatrense*. The drainage systems of the two type localities are different. The type locality of *M. similis* is that of Gunung Kerinci, which drains out into the Jambi area, on the east side of Sumatra. The type locality of *M. sumatrense*, the district of Agam, drains out from Danau Maninjau and into the western part of Sumatra. The difference in drainage systems also argues against the conspecificity of the two species.

### Life Colours

Greenish brown overall.

### Ecology

The specimen was collected from the main lake at Gunung Tujuh, Kerinci. The substratum was rocky, with the crab hiding under a rock.

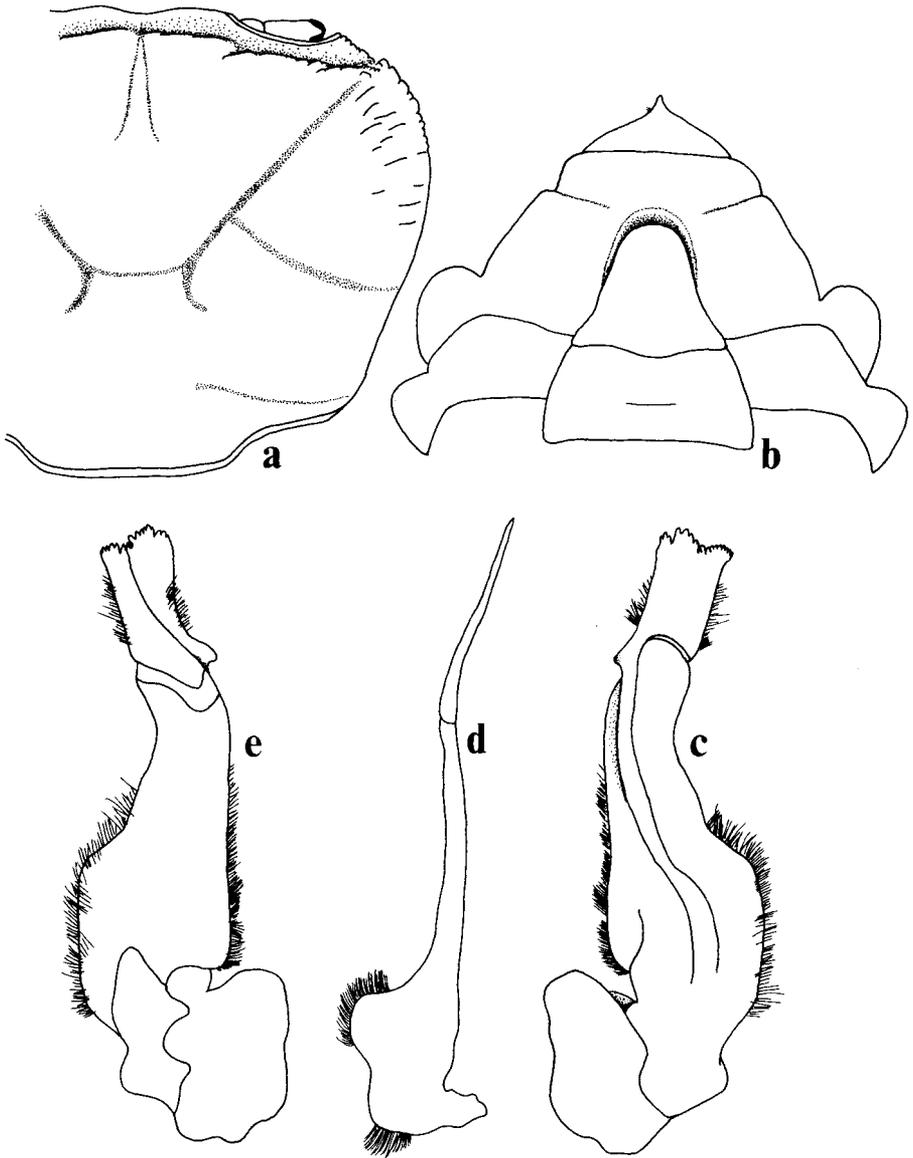


FIG. 5. *Malayopotamon similis*, new species, holotype male (31.6 by 25.1 mm) (ZRC). (a) right side of carapace; (b) anterior thoracic sternites and male abdomen; (c, e) left G1; (d) left G2; (c) ventral view; (e) dorsal view.

***Malayopotamon sumatrense* (Miers, 1880)**

(Figures 4C, D)

*Telphusa sumatrensis* Miers, 1880: 304, pl. 14 figures 1, 2.

*Adeleana sumatrensis*. Bott, 1970b: 58.

*Material examined*

LECTOTYPE. Male (19.7 by 14.8 mm) (NHM 1973.100), Agam, West Sumatra, purchased from E. Gerrard from P. Bleeker's collection. PARALECTOTYPES. One male, two females (NHM 1973.101), same data as lectotype.

*Diagnosis*

Carapace broader than long, dorsal surface smooth, except for striae at the epibranchial region, slightly inflated; postorbital cristae smooth, entire, not sharp, low, close to posterior orbital margin; epigastric lobes low, not prominent, separated from postorbital cristae by narrow cleft; epibranchial tooth indistinct, almost confluent with external orbital tooth, separated only by narrow cleft. Cheliped surfaces almost smooth, slightly punctate, fingers of larger males forming distinct gape when closed. G1 stout, terminal segment truncated, junction between terminal segment and subterminal segment with hook-like projection.

*Taxonomic remarks*

Some uncertainties surround the generic placement of this species. *Potamon sumatrense* Miers, 1880, was not treated in detail by Bott (1970b) and its G1 structure was not known. Bott (1970b), however, inexplicably mentioned this species under the discussion for *Adeleana sumatrensis* (Balss, 1934) (a gecarcinucoid) and commented that Miers' species appears to be related to the potamid *Potamon tenasserimense* De Man, 1898 (this species is currently in the genus *Thaiphusa* Ng and Naiyanetr, 1993). This is despite the very different carapace and male abdomen structures of *Telphusa sumatrensis*. The carapace of *T. sumatrensis* is distinctly more rectangular than any other potamoid known at present from Sumatra, and appears instead closer to gecarcinucoid genera like *Balssiathelphusa*, *Adeleana* and *Thelphusula*. Miers (1880), however, recorded (but did not figure) that the male abdomen of his specimens was like that of a specimen he had available of the potamoid *Telphusa larnaudii* (presently in the genus *Larnaudia*). He noted that the abdomen was quite different from that of the gecarcinucoid *Telphusa philippina* (at present in the genus *Sundathelphusa*). Examination of Miers' (1880) material indicates that his species is actually a potamid. Examination of its mandibular palps, male abdomen and G1 reveals that its real affinity lies with that of *Malayopotamon*, the only known potamid genus in Sumatra. *Telphusa sumatrensis* is here transferred to *Malayopotamon*.

Miers (1880) reported two males and two females, but he did not designate any types. These specimens are thus syntypes. The male specimen (RMNH 1973.100) is here designated the lectotype.

*Life colour*

Not known.

*Ecology*

Not known.

***Malayopotamon tobaense* (Bott, 1968)**

(Figure 6)

*Potamon (Potamon) brevimarginatum*. Pesta, 1930: 94 (part) [not *M. brevimarginatum* (De Man, 1892)]

*Isolapotamon (Malayopotamon) tobaense* Bott, 1968: 129, figures. 15, 19.

*Malayopotamon tobaense*. Bott, 1970b: 199, pl. 41 figure 89, pl. 58, figure 89.

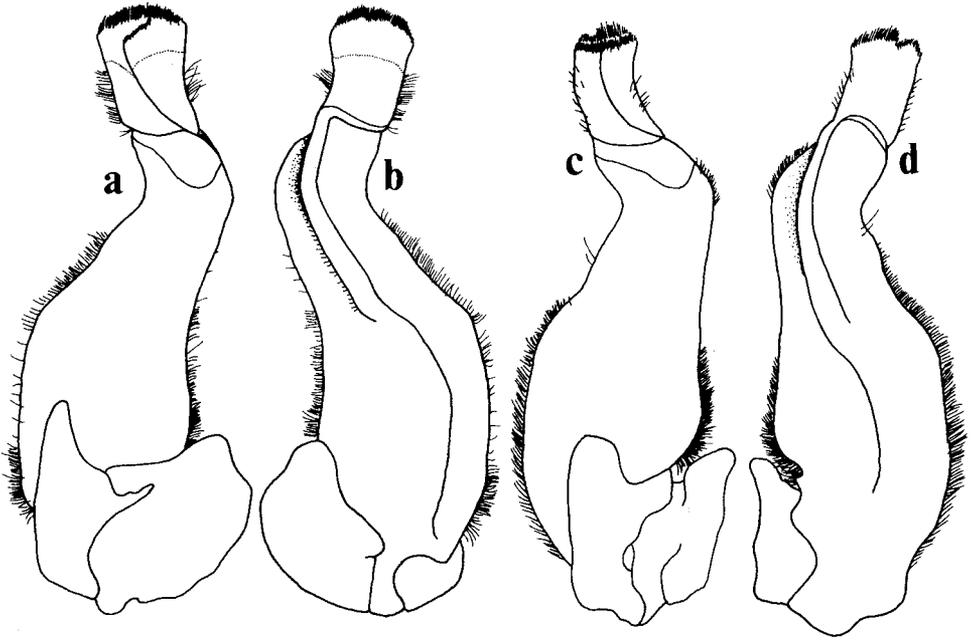


FIG. 6. Left G1s of *Malayopotamon tobaense* (Bott, 1968). (a, b) holotype, male (55.9 by 41.3 mm) (SMF 2851); (c, d) male (47.9 by 36.0 mm) (RMNH 31554). (a, c) dorsal view; (b, d) ventral view. (a, b) right G1 is laterally transposed.

#### Material examined

**HOLOTYPE.** Male (55.9 by 41.3 mm) (SMF 2845), Bungabondar (= Bungabandar), West Sumatra, coll. Schütz, 20 June 1912. **PARATYPES.** One male, five females (SMF 2631), same data as holotype. **Others:** one male (43.3 by 34.0 mm) (MZB Cru 1245), Sungei Alas, Katambe, Aceh, north Sumatra, ca. 3°05'N, 97°55'E, coll. S. Yatra, 19 January 1984. one male (MZB Cru 1246), Sungei Kecil, tributary of Sungei Alas, Aceh, north Sumatra, ca. 3°05'N, 97°55'E, coll. 28 March 1981. Two males, one female, one juvenile (MZB Cru 1280), stream 65 km from Katambe, north Sumatra, ca. 3°05'N, 97°55'E, coll. 1982. One male (24.1 by 19.3 mm), three females (MZB Cru 1252), Alur Sukarimbun Alas, Katambe, southeast Aceh, Sumatra, ca. 3°05'N, 97°55'E, coll. 10 October 1980. One male (47.9 by 36.0 mm), two females (RMNH 31554), Lake Toba, northern Sumatra, coll. A. C. J. Burgers, July 1976.

#### Diagnosis

Carapace rugose only on lateral regions, anterolateral margins distinctly serrate, epibranchial tooth well developed, sharp, separated from external orbital tooth by deep, broad triangular cleft, outer margin of external orbital tooth convex, slightly to distinctly serrated. G1 stout, twisted, terminal segment short, squarish, slightly tubular, tip turned upwards.

#### Taxonomic remarks

The well developed epibranchial tooth, smooth gastric regions and twisted G1 easily characterize *M. tobaense*. A small male specimen from within the known distribution of *M. tobaense* resembles this species externally but its G1 is neither

twisted nor stout. In any case, the G1 is clearly juvenile in form and the specimen is immature. *Malayopotamon batak* is also found in the same area but its carapace shapes, surface textures and G1 structures are very different (see key and discussion for *M. batak*).

Three specimens from Lake Toba (RMNH 31554) are distinct from all the other specimens with regards to their carapace shape and ambulatory leg proportions. The epigastric and progastric regions of these specimens in particular are very high, making the carapace more dome-shaped compared to typical *M. tobaense*. The ambulatory meri, propodi and dactyli of these specimens are also proportionately more slender and longer compared to typical *M. tobaense*. Their G1 structures, however, are almost identical (figure 6). Because of their very similar G1s, overlapping distributions and in lieu of more specimens, it seems best to place these three specimens under *M. tobaense* for the time being.

The type locality of *M. tobaense* is not in Lake Toba itself but Bungabandar, which is about 80km southeast of Lake Toba. The species is also common in the Katambe area north of Lake Toba. The species thus has a relatively wide distribution in the highlands of northern Sumatra.

#### *Life Colours*

Not known.

#### *Ecology*

The fishermen at and around Lake Toba are known to occasionally catch a very large species of freshwater crab for sale as food, although we have not been able to see or obtain any specimens recently from there. Considering the supposed size of the specimens, these crabs are probably *M. tobaense*.

#### ***Malayopotamon turgeo*, sp. nov.**

(Figure 7)

#### *Material examined*

HOLOTYPE. Male (35.1 by 26.9mm) (MZB), Aceh, Sumatra, coll. Hasan B. Munaf, October 1975. Others: three males, two males (USNM 144/564), Sumatra, coll. National Geographic Institution Expedition.

#### *Diagnosis*

Carapace subquadrate, smooth, branchial and gastric regions inflated; anterolateral margins convex, crested; posterolateral margins converging towards posterior carapace margin; anterolateral regions with low striae; posterolateral regions with few but very low striae; posterior carapace margin straight; epibranchial region lightly striated, epibranchial tooth distinct, but low, separated from external orbital tooth by shallow cleft; outer margin of external orbital tooth straight, slightly serrated; epibranchial lobes distinct, granulated, not continuous with postorbital cristae; postorbital cristae prominent, sharp, continuous with base of epibranchial tooth. G1 terminal segment tubular, curved, tip truncated, sinuous, longer than half length of subterminal segment.

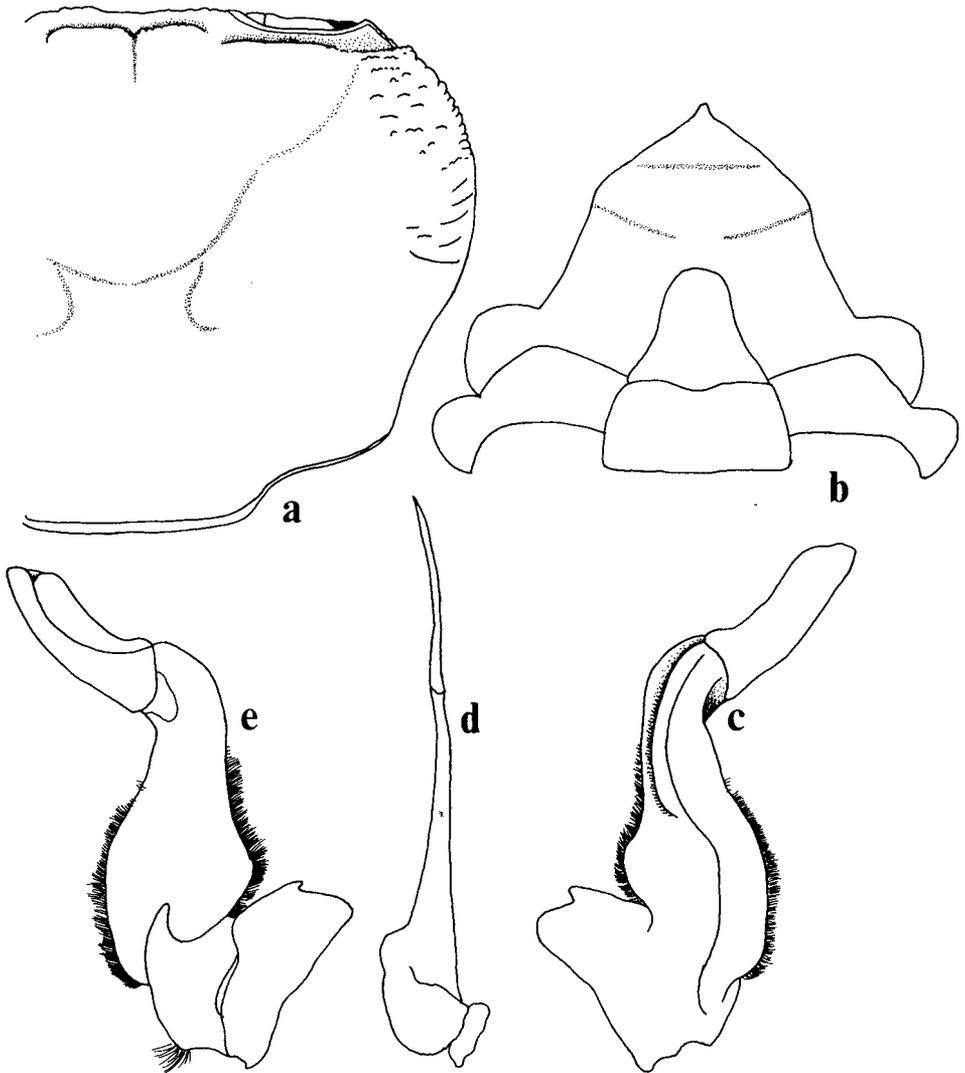


FIG. 7. *Malayopotamon turgeo*, new species. Holotype male (35.1 by 26.9 mm) (MZB). (a) right side of carapace; (b) anterior thoracic sternites and male abdomen; (c, e) left G1; (d) left G2. (c) ventral view; (e) dorsal view.

#### Etymology

In Latin, 'turgeo' means to inflate, alluding to the inflated carapace. Used as a noun in apposition.

#### Taxonomic remarks

*Malayopotamon turgeo*, sp. nov., can be easily distinguished from congeners by its relatively smooth dorsal carapace surface and strong inflation of the carapace. As a result of the inflation, the cervical and H-shape grooves are relatively shallower than all other species of *Malayopotamon*. In the other species of *Malayopotamon*, the cervical and H-shaped grooves are deep and distinct. The G1 of this species is

also quite unlike any of its congeners. Most other *Malayopotamon* species have relatively short G1 terminal segments. This species has the proportionately longest terminal segment (more than half the length of the subterminal segment) of the genus. The G1 terminal segment is also strongly curved upwards and the neck is strongly curved, almost forming a U-shape. This G1 shape is unique in the genus.

The granulation on the epibranchial region of the USNM specimens is less prominent than that seen in the holotype. However, all of the USNM specimens are smaller than the holotype, the largest being 27.5 by 21.2 mm, whilst the holotype is 35.1 by 26.7 mm.

*Life Colours*

Not known.

*Ecology*

Not known.

Key to the species of *Malayopotamon*

- 1 Carapace dorsal surface with low but distinct pubescence; suture between thoracic sternites 3 and 4 almost straight; G1 very stout, not twisted, terminal segment short, truncate, tip of dorsal lobe extends well beyond tip of ventral lobe (figures 2C, D) . . . . . *M. gestroi* (central Sumatra)
- Carapace dorsal surface glabrous or only very slightly pubescent; suture between thoracic sternites 3 and 4 broadly V-shaped; G1 not as above . . . . . 2
- 2 Branchial, gastric, orbital and frontal regions of carapace very rugose and granulose . . . . . 3
- Gastric, orbital and frontal regions of carapace rugose to almost smooth but never granulose, branchial regions with striae but not granulated . . . . . 4
- 3 Postorbital cristae not entire, low, not parallel with frontal margin; G1 very stout, terminal segment quadrate, truncated (figures 3A, B) . . . . . *M. granulatum* (Java)
- Postorbital cristae entire, high, parallel with frontal margin; G1 stout, terminal segment truncated, tip flattened, margin always straight (figures 2A, B) . . . . . *M. batak* (northern Sumatra)
- 4 Anterolateral margin serrated with sharp, saw-like teeth; G1 terminal segment tubular, margin of tip evenly rounded, longer than half length of subterminal segment (figure 3C, D) . . . . . *M. granulosum* (central Sumatra)
- Anterolateral margin serrated with low, rounded or blunt teeth; G1 otherwise . . . . . 5
- 5 Carapace (especially epibranchial region) appears inflated; postorbital cristae continuous with epibranchial tooth; G1 terminal segment tubular, curving upwards, tip smooth (figure 7) . . . . . *M. turgeo*, sp. nov. (northern Sumatra)
- Carapace not distinctly inflated; postorbital cristae not continuous with epibranchial tooth; G1 otherwise . . . . . 6
- 6 Epibranchial tooth very small, separated from external orbital tooth by small, shallow cleft; junction between terminal segment and subterminal segment with hook-like projection (figures 4C, D, 5) . . . . . 7
- Epibranchial tooth large, separated from external orbital tooth by distinct, often broad cleft; junction between terminal segment and subterminal segment entire, without hook-like projection . . . . . 8
- 7 G1 neck region about two-thirds length of subterminal segment (figure 5) . . . . . *M. similis*, sp. nov. (central Sumatra)
- G1 neck region about half length of subterminal segment (figures 4C, D) . . . . . *M. sumatrense* (central Sumatra)

- 8 Epibranchial tooth very distinct, sharp, separated from external orbital angle by distinct, broad V-shaped cleft; G1 distinctly twisted, terminal segment short, truncated, tip crowned with ring of setae (figure 6) . . . . . *M. tobaense* (northern Sumatra)
- Epibranchial tooth low, sometimes indistinct, separated from external orbital angle by narrow cleft, both structures sometimes appearing almost confluent; G1 not as above 9
- 9 Carapace gastric region with prominent striae; outer surfaces of chelae granulated, granules well-formed and pearl-like in large specimens (ca. 50 mm carapace width); epibranchial tooth relatively large, not very acute; G1 tubular, slender, tip with notch on one side (figure 1) . . . . . *M. brevimarginatum* (central Sumatra)
- Carapace gastric region with low striae, not prominent; outer surfaces of chelae granulated, granules low, flattened, usually fused with each other (all carapace widths); epibranchial tooth relatively small, sharp, very acute; G1 tubular, slender, tip without notch on one side (figures 4A, B) . . . . . *M. javanense* (Java)

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