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A new species of the freshwater crab genus *Potamonemus* Cumberlidge & Clark, 1992 (Crustacea: Potamonautidae) endemic to the forested highlands of southwest Cameroon, Central Africa

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Running title: A new *Potamonemus* species of freshwater crabs from Cameroon

Abstract

A new species of freshwater crab of the genus *Potamonemus* Cumberlidge & Clark, 1992, is described from Mount Manengouba Reserve and the Bakossi National Park in the tropical rainforests of southwestern Cameroon, Central Africa. *Potamonemus man* **n. sp.** is recognized by characters of the carapace and chelipeds. In addition, a phylogenetic analysis based on partial sequences of three mitochondrial DNA genes (COI, 12S rRNA, and 16S rRNA) that included representatives of all other freshwater crab genera found in Cameroon recovered each of the new species as a distinct lineage. A diagnosis and illustrations of the new species are provided, and it is compared to the other species in this genus. Brief notes are provided on the ecology of the new species and the two other species of *Potamonemus*. An identification key to the species of *Potamonemus* is provided and its conservation status discussed.

Keywords

Morphological comparison, *Potamonemus man* **sp. nov.**, conservation, southwest Cameroon, identification key

Introduction

Potamonemus Cumberlidge and Clark, 1992 is one of five genera of freshwater crabs currently known from Cameroon, the other four being *Buea* Cumberlidge, Mvogo Ndong, Clark and Daniels, 2019, *Louisea* Cumberlidge, 1994, *Potamonantes* MacLeay, 1838, and *Sudanonantes* Bott, 1955 (Cumberlidge 1987, 1989, 1993a–c, 1994a, b; 1995a–d, 1999; Cumberlidge and Boyko 2001; Cumberlidge and Clark 1992; Cumberlidge et al. 2019; Mvogo Ndong et al. 2017a–c, 2018, 2019, 2020). *Potamonemus* was originally established as a monotypic genus for *P. mambilorum* Cumberlidge and Clark, 1992, and in the following year two more species were described, namely *P. asylos* Cumberlidge, 1993 and *P. sachsi* Cumberlidge, 1993. Subsequent phylogenetic analyses of the Afrotropical freshwater crab fauna (Daniels et al. 2006, 2015) supported the close relationship between *P. mambilorum* and *P. sachsi*, but indicated that *P. asylos* formed a separate genetic lineage from these two species. Recently, *P. asylos* was assigned to a new genus, *Buea* Cumberlidge, Mvogo Ndong, Clark & Daniels, 2019. Mvogo Ndong et al. (2020) recently described three additional *Buea* species, including *B. bangem* Mvogo Ndong, von Rintelen, Tomedi-Tabi and Cumberlidge, 2020, *B. mundemba* Mvogo Ndong, von Rintelen and Cumberlidge, 2020, and *B. nlonako* Mvogo Ndong, von Rintelen and Cumberlidge, 2020.

Cumberlidge et al. (2019) and Mvogo Ndong et al. (2020) established that *Buea* is endemic to southwest Cameroon, and that *Potamonemus* is a more widely distributed species, with a range including southwest Cameroon and eastern Nigeria. Cumberlidge et al. (2019) revised the diagnostic characters of *Potamonemus* as follows: mandibular palp 2-segmented, no anterior flap at the junction between the two segments; G1 with long TA (TA/SS 0.63), slim, curving outward, lacking marginal setae, and tapering to a pointed tip; G2 with remarkably short TA (TA/SS 0.13). The three protected areas surveyed in the present study for freshwater decapods are located in a biodiversity hotspot in southwest Cameroon that has been recognised by Conservation International (2011) for several other freshwater taxa. In this study, one new species of *Potamonemus* is described from this hotspot using an integrative approach based on morphological characters and molecular genetic data, and notes on the ecology and conservation of these species are provided.

The extensive systematic surveys of the lowland and upland zones in the tropical rainforests of southwest Cameroon from 2017 to 2020 resulted in the collection of several new taxa, including new species of *Potamonemus*. The purpose of the present study is to describe a new species of *Potamonemus*, and provide a key to the three species now assigned to *Potamonemus*. The molecular analysis based on three partial mitochondrial genes (COI, 12S rRNA, and 16S rRNA) also recovers the three new species as separate genetic lineage within *Potamonemus*. For all the species treated in this study we also provide notes on their ecology and conservation.

Materials and methods

Sampling: Field surveys of freshwater decapods were conducted in 2017 at Mount Manengouba Reserve and the Bakossi National Park, and in 2018 and 2020 at Nlonako Ecological Reserve. The appropriate transects were made in each study area. Crabs were collected from small rivers, using nylon fishnets and dip nets, and near small permanent streams where crabs were found in puddles, under fallen leaves, under stones, and in burrows. The condition of the habitat was recorded (as the number of plants destroyed by natural and human activities), and further threats to freshwater organisms including freshwater crabs were evaluated during structured discussions with local people.

Morphological analyses: All measurements (in mm) were taken with digital callipers. The terminology used follows Cumberlidge (1999), and the classification follows Ng et al. (2008). Characters of the gonopods, carapace, thoracic sternum, chelipeds, third maxillipeds, and mandibles were examined in detail, and photographs were taken using a Leica microscope (model Z16A POA), and LAS V4 and Helicon Focus 6.7.1 software. Post processing of the images was undertaken using Adobe Photoshop CC5 and Photo Impact. The newly collected specimens were deposited in the Museum für Naturkunde, Berlin, Germany (**ZMB**). Other material is deposited in the Institute of Fisheries and Aquatic Sciences, University of Douala at Yabassi (**IFAS**), the Senckenberg Museum, Frankfurt, Germany (**SMF**), the Zoological Institute Museum, Hamburg, Germany (**ZIM**), the Naturhistorisches Museum Wien, Austria (**NHMW**), and the Zoologische Staatssammlung, München, Germany (**ZSM**).

Abbreviations used:

a	pleonal (abdominal) segment or pleomere.
a5/a6	sulci between adjacent pleomeres.
asl	above sea level.
CW	carapace width measured at widest point.
CL	carapace length measured along medial line from anterior to posterior margin.
CH	carapace height measured at maximum height of cephalothorax.
E	episternite.
FW	front width measured along anterior frontal margin between inner angles of orbits.
G1	male first gonopod.
G2	male second gonopod.
P2–5	pereiopods 2–5 or ambulatory legs 1–4.
SS	subterminal segment of G1 or G2.

S4/E4 (S4/E4, S5/E5, S6/E6, S7/E7) episternal sulci between adjacent thoracic sternites and episternites.

S thoracic sternite.

S1/S2 (or S2/S3, S4/S5, S5/S6, S6/S7) sternal sulci between adjacent thoracic sternites.

TA terminal article of G1 or G2.

TS terminal segment of mandibular palp.

Details for DNA extraction, DNA sequencing, PCR, and molecular phylogenetic analyses are given in Mvogo Ndongo et al. 2019, 2020.

All sequences used in this study are given in Table 1.

Systematic account:

Infraorder Brachyura Latreille, 1802

Superfamily Potamoidea Ortmann, 1896

Family Potamonautidae Bott, 1970

Subfamily Potamonautinae Bott, 1970

Potamonemus man sp. nov.

Figs 1d; 2d; 3d; 4d; 5g, h, l; 6 j, k, l; 7d, h.

Common name: Man Lake freshwater crab.

Holotype. 1 adult ♂ (CW 24.51 mm, CL 17.09 mm, CH 9.62 mm, FW 7.62 mm), Southwest Region, Mount Manengouba Ecological Reserve, Man Lake, Mount Manengouba (5.02414°N, 9.82142°E), 1,958 m asl, 14 March 2017, coll. P.A. Mvogo Ndongo (ZMB Crust. 30320).

Paratypes. 1 adult ♂ (CW 21.37 mm, CL 15.61 mm, CH 8.45 mm, FW 6.69 mm), 1 adult ♀ (CW 23.55 mm, CL 16.87 mm, CH 10.09 mm, FW 7.60 mm) Southwest Region, Mount Manengouba Ecological Reserve, Man Lake, Mount Manengouba (N 5.03604°, 9.82906°E), 1,958 m asl, 14 March 2017, coll. P.A. Mvogo Ndongo (ZMB Crust. 30324). 2 adult ♂ (CW 20.12 mm, CL 14.64 mm, CH 7.92 mm, FW 6.76 mm; CW 20.40 mm, CL 14.73 mm, CH 8.16 mm, FW 6.63 mm); 3 subadult ♂ (CW 18.46 mm, CL 13.89 mm, CH 7.40 mm, FW 6.16 mm; CW 19.38 mm, CL 13.78 mm, CH 7.78 mm, FW 6.63 mm; CW 14.05 mm, CL 10.67 mm, CH 5.84 mm, FW 5.30 mm), Southwest Region, Mount Manengouba Ecological Reserve, Man Lake, Mount Manengouba (N 5.03604°, 9.82906°E), 1,958 m asl, 14 March 2017, coll. P.A. Mvogo Ndongo (IFAS-017); 4 adult ♀ (CW 19.39 mm, CL 14.07 mm, CH 7.74 mm, FW 6.48 mm; CW 17.37 mm, CL 12.46 mm, CH 6.94 mm, FW 6.33 mm; CW

16.88 mm, CL 12.06 mm, CH 6.36 mm, FW 5.20 mm) Mount Manengouba Ecological Reserve, Man Lake, Mount Manengouba (N 5.03604°, 9.82906°E), 1,958 m asl, 14 March 2017, coll. P.A. Mvogo Ndongo (IFAS-018).

Other material. A population of *P. man* **sp. nov.** from Bakossi National Park (Figs 1c; 2c; 3c; 4c; 5e, f, j; 6 g, h, i; 7c, g). 1 adult ♂ (CW 30.41 mm, CL 20.57 mm, CH 12.50 mm, FW 9.32 mm), 1 adult ♀ (CW 27.48 mm, CL 20.06 mm, CH 11.31 mm, FW 8.19 mm) Cameroon, Southwest region, Man, Bakossi National Park (5°01'51.9"N 9°41'15.1"E), 1,253 m asl, 15 March 2017, coll. P. A. Mvogo Ndongo (ZMB Crust. 30328).

5 adult ♂ (CW 27.61 mm, CL 19.37 mm, CH 11.39 mm, FW 8.65 mm; CW 26.54 mm, CL 19.09 mm, CH 10.80 mm, FW 9.13 mm; CW 25.55 mm, CL 18.68 mm, CH 10.58 mm, FW 8.41 mm; CW 25.36 mm, CL 18.05 mm, CH 10.70, FW 8.41 mm;) (IFAS-014); 2 subadult ♂ (CW 22.17 mm, CL 15.76 mm, CH 9.04 mm, FW 7.35 mm; CW 22.02 mm, CL 15.67 mm, CH 9.06 mm, FW 7.49 mm; CW 22.04 mm, CL 16.00 mm, CH 9.22 mm, FW 7.65 mm; CW 21.35 mm, CL 15.19 mm, CH 8.76 mm, FW 6.81 mm), Cameroon, Southwest region, Man, Bakossi National Park (05°02'05.5"N, 09°41'57.9"E), 1,248 m asl, 15 March 2017, coll. P.A. Mvogo Ndongo (IFAS-015). 2 subadult ♀ (CW 23.76 mm, CL 17.57 mm, CH 9.88 mm, FW 7.68 mm; CW 23.31 mm, CL 16.63 mm, CH 9.08 mm, FW 7.59 mm), Cameroon, Southwest region, Man, Bakossi National Park (05°02'05.5"N, 09°41'57.9"E), 1,248 m asl, 15 March 2017, coll. P.A. Mvogo Ndongo (IFAS-016).

***Potamonemus mambilorum* Cumberlidge and Clark, 1992** (Figs 1b; 2b; 3b; 4b; 5c, d, i; 6 d, e, f; 7b, f.). 6 adult ♂ (CW 29.05 mm, CL 21.17 mm, CH 12.10 mm, FW 8.85 mm; CW 29.56 mm, CL 21.35 mm, CH 12.34 mm, FW 9.12 mm; CW 29.16 mm, CL 20.70 mm, CH 12.00 mm, FW 9.12 mm; CW 28.93 mm, CL 20.69 mm, CH 11.85 mm, FW 9.94 mm; CW 26.74 mm, CL 19.62 mm, CH 11.32 mm, FW 9.63 mm; CW 26.74 mm, CL 19.62 mm, CH 11.32 mm, FW 9.63 mm). 2 adult ♀ (CW 27.06 mm, CL 19.76 mm, CH 12.45 mm, FW 8.34 mm; CW 26.68 mm, CL 19.06 mm, CH 11.03 mm, FW 7.72 mm); Cameroon, Littoral region, Mount Nlonako Ecological Reserve (04. 89182°N, 009. 98483°E, 900 m asl, 26 May 2018, coll. P.A. Mvogo Ndongo (ZMB Crust. 32428).

Diagnosis. Carapace anterior surface smooth except for faint urogastric groove (Fig. 1d). Broad epimeral (longitudinal) suture on carapace sidewall (branchiostegite), with prominent epimeral suture dividing carapace sidewall into 2 regions, vertical (pleural) groove lacking (Fig. 1d). Outer lower margin of cheliped merus lined by small blunt teeth, inner lower margin smooth, distal meral tooth distinct, pointed (Fig. 3d). Major cheliped dactylus straight (not arched) (Fig. 5g). Sternal sulcus S2/S3, completely crossing sternum; S3/S4 incomplete,

reduced to 2 short, distinct notches on each side of sternum (Fig. 3d). G1 with long TA (TA/SS 0.66), slim, curving outward, lacking marginal setae, tapering to pointed tip; G2 TA remarkably short (TA/SS 0.13) (Fig. 6j, l). A small species, mature between CWs 20–25 mm.

Description. Carapace ovoid, medium height (CH/FW 1.17), wide (CW/FW 3.19); carapace surface smooth; postfrontal crest distinct, completely crossing carapace, lateral ends meeting anterolateral margins (Fig. 1d); exorbital tooth low, distinct; intermediate, epibranchial teeth each reduced to small granule (Fig. 4d); anterolateral margin behind epibranchial tooth smooth (Fig. 4d). Carapace branchiostegite with prominent epimeral suture dividing wall into subhepatic/suborbital, pterygostomial regions; vertical (pleural) suture faint (Fig. 3d). Sternal sulcus S2/S3 deep, completely crossing sternum; S3/S4 incomplete, reduced to 2 short, distinct notches on each side of sternum (Fig. 3d); margins of S3, S4 raised, broad (Fig. 3d); episternal sulci S4/E4, S5/E5, S6/E6 faint or missing, S7/E7 complete (Fig. 3d). Mandibular palp 2 segmented; medium sized anterior lobe at junction between segment ($0.25 \times$ TS length; Fig. 7h). Third maxillipeds filling entire buccal cavern, except for transversely oval efferent respiratory openings in superior lateral corners; ischium smooth, lacking vertical groove; exopod lacking flagellum (Fig. 7d).

Male chelipeds greatly unequal, right cheliped larger than left (Figs 1d; 5g, h). Movable finger (dactylus), fixed finger (pollex of propodus) of right (major) cheliped both slim, elongated; fixed finger with 3 large pointed teeth (2 proximal, 1 distal); movable finger relatively stout, straight (not highly arched), with 4 small but distinct teeth (2 proximal, 2 distal; Fig. 5g). Left (minor) cheliped dactylus, propodus smaller than right cheliped, with small teeth on occluding margins (Fig. 5h). Inner inferior margin of cheliped merus lined by small teeth, outer inferior margin smooth; distal meral tooth large, pointed (Fig. 5d). Cheliped carpus inner margin with large pointed distal tooth; proximal tooth much smaller, followed by granule (Fig. 5l). Ambulatory legs (P2–5) slender, P4 longest, P5 shortest; dactyli P2–5 tapering to point, each bearing rows of downward-pointing sharp bristles, P5 dactylus shortest (Fig. 1d).

Male pleon triangular, margins not indented and lacking setae (Fig. 3d). G1 with long TA (TA/SS 0.66), slim, curving outward, lacking marginal setae, tapering to pointed tip; G2 TA remarkably short (TA/SS 0.13) (Fig. 6j, l); G1 SS, broad in basal, midsection, distal quarter tapering sharply, narrow at junction with G1 TA (Fig. 6j, l). G2 TA extremely short (G2 TA/SS 0.3; Fig. 6k).

Size. Small species, CW in mature individuals ranging from 20–30.4 mm.

Colour in life. Dorsal carapace and all ambulatory legs dark brown; chelipeds red.

Type locality. Stream near Man Lake, Mount Manengouba, in Manengouba Ecological Reserve, Southwest Region of Cameroon.

Etymology. The species is named for Man Lake, one of a pair of small lakes in the caldera at the summit of Mount Manengouba (the other lake being Woman Lake). The species epithet is a noun in apposition.

Habitat. The species is from a small stream flowing into Man Lake in the caldera at the summit of Mount Manengouba Ecological Reserve near Bangem in the Southwest Region of Cameroon. Mount Manengouba is located along the Cameroon Volcanic Line, a 1,600 km long chain of volcanoes that stretches from the Gulf of Guinea islands to the mountains of eastern Nigeria and western Cameroon, including Mount Cameroon.

Remarks. The new species is assigned to *Potamonemus* because it conforms to the genus diagnosis (Cumberlidge & Clark, 1992; Cumberlidge, 1994; Cumberlidge et al. 2019). *Potamonemus man* **sp. nov.** most closely resembles *P. sachsi* in that the dactylus of the major cheliped of both species is straight rather than highly arched. These two species can be distinguished from each other by the smooth carapace and branchiostegal sidewalls in *P. man* **sp. nov.** (Fig. 1D; 2D) (vs. patches of short setae along the anterolateral and posterolateral margins of the carapace that continue around to the sidewalls in the subhepatic and pterygostomial regions of the branchiostegite in *P. sachsi* (Cumberlidge et al. 2019 fig. 4c)). The highly arched dactylus of the major cheliped of *P. mambilorum* distinguishes it from both *P. man* **sp. nov.** and *P. sachsi*. Finally, *P. man* **sp. nov.** can be distinguished from *P. mambilorum* and *P. sachsi* by the body size of adult specimens: the new species and *P. sachsi* are adult between CWs 20-30.4 mm and CWs 23-28 mm respectively, while *P. mambilorum* is the largest species (adult at CWs 29-38 mm).

A phylogenetic tree (Fig. 8) based on 1,848 base pairs representing the combined partial sequences of three mtDNA markers (COI, 16S RNA, 12S RNA) recovered three species of *Potamonemus* as a single clade with strong BI and ML confidence values (1/100 at this node). The three species of *Potamonemus* (*P. mambilorum*, *P. man* **sp. nov.**, and *P. sachsi*) each form an independent lineage. Genetically, *P. mambilorum* and *P. man* **sp. nov.**, are sister species, which is not supported morphologically (see above). All three species are found in the same area.

Uncorrected p-distance between *Potamonemus man* **sp. nov.** and *P. mambilorum* is 2.2% for 12S RNA and 0.6% for 16S RNA, between *P. man* **sp. nov.** and *P. sachsi* 4.5% (12S) and 4.6% (16S), respectively. The intraspecific distance within *P. man* is 0% for COI, there is no second sequence for the other two genes.

Conservation

Potamonemus man **sp. nov.** is found in an area of great conservation interest. Its aquatic habitats also serve as key spawning grounds for fish and invertebrates, a refugia for other forest wildlife e.g., monkeys, including primates (chimpanzees and gorillas), and drills, as well as manatees, elephants, birds, turtles, snakes and amphibians (Cumberlidge et al. 2019, Mvogo Ndongo et al. 2017a–c, 2018, 2019, 2020). The specimens of *P. man* **sp. nov.** were all collected from a small forested stream near Man Lake in the Mount Manengouba Ecological Reserve, in sympatry with the endangered freshwater crab *Louisea balssi* (Bott, 1959). The area where the specimens of *P. man* **sp. nov.** were collected are threatened from intensive agricultural practices, firewood collection. In addition, the farmers encroaching on these habitats use agro-chemicals and pesticides on their crops, and these pollutants eventually drain into the aquatic systems, potentially poisoning the freshwater communities (Mvogo Ndongo et al. 2018). Furthermore, excessive accumulation of CO₂ in the bottom layers of the Man Lake in the caldera at the summit of Mount Manengouba lies on top of a volcanic conduit that acts as a condenser or trap for volatile chemicals released from the underlying magma (Kusakabe 2017). The waters of Man Lake are an unusual green colour, and this may explain why very little life has been recorded from this habitat. There are no reports of invertebrates (insects, molluscs, crabs and other crustaceans) or vertebrates (fish, amphibians, snakes, birds) from the lake itself, suggesting that the accumulation of lethal compounds may be excluding most organisms, except for certain microbes. Discussions with local fishermen and other people from nearby villages in the Manengouba area also confirm that the waters of Man Lake are a potential danger to humans as well (see Mvogo Ndongo et al. 2018).

The distributional range of *P. mambilorum* is extended in this work by the discovery of populations in Mount Nlonako Ecological Reserve in the Littoral region of Cameroon. *Potamonemus mambilorum* was previously known from seven localities in the forested highlands and lowlands of southwestern Cameroon (EOO 43,291 km²). The extinction risk status of this species was assessed as Least Concern (Cumberlidge 2008a) but this was before the threats to the freshwater ecosystems of this part of Africa were brought to light. The extinction risk status of *P. sachsi* was assessed as Vulnerable B1ab(iii)+2ab(iii) based on its distributional range that includes the Bamenda highlands in southwest Cameroon and the

neighboring Obudu plateau in southeast Nigeria, which is continuous with the Bamenda highlands (EOO 24,219 km²) and perceived threats (Cumberlidge 2008b). The areas where *P. mambilorum* and *P. sachsii* occur are now known to be at risk from a number of anthropogenic threats, including deforestation, together with intensive and encroaching agricultural practices and firewood collection, as well as release of pollutants such as agro-chemicals potentially affecting the eggs, hatchling-carrying female crabs, and other aquatic organisms.

Key to the species of *Potamonemus* Cumberlidge & Clark, 1992

- 1a. Dactylus of major cheliped highly arched (Fig. 5a) *P. mambilorum*
- 1b. Dactylus of major cheliped either straight or only slightly concave 2
- 2a. Carapace sidewalls in subhepatic and pterygostomial regions smooth *P. man* sp. nov.
- 3b. Carapace sidewalls in subhepatic and pterygostomial regions with fields of short setae,
..... *P. sachsii* (Cumberlidge, 1994: figs. 3a, 4c)

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Table 1: Species and specimens of *Louisea*, *Buea*, *Potamonemus*, *Sudanonautes*, and *Potamonautes* and the outgroup taxa included in the molecular analysis. All measurements in mm.

Species	Locality	Museum Number	Reference study	GenBank Accession Number		
				COI	12S rRNA	16S rRNA
<i>L. nkongsamba</i> (CW 20.0)	Mt. Nlonako	ZMB Crust. 31618	Mvogo Ndongo et al. 2019	MN188072	MN217386	MN217393
<i>L. balssi</i> (CW 14.8)	Manengouba	ZMB Crust.29628	Mvogo Ndongo et al. 2019	MN188070	MN217384	MN217391
<i>L. edeaensis</i> (CW 17.2)	Lake Ossa	LZUY 15-3 (T351-30)	Mvogo Ndongo et al. 2017c	KY964474	KY964479	KY964472
<i>B. mundemba</i> . (CW 26.2)	Korup N. P.	ZMB Crust. 30321	Mvogo Ndongo et al. 2019	MN188069	MN217388	MN217396
<i>B. bangem</i> (CW 26.5)	Bakossi N.P.	IFAS-010	Mvogo Ndongo et al. 2020	MT019691	MT021447	---
<i>B. asylos</i> (CW 25.4)	Buea & Kumba	NHM 1994.588-591	Daniels et al. 2015	KP640489	KP640410	KP640453
<i>Potamonemus man</i> sp. nov	Bakossi N. P.	ZMB Crust. 30327	Mvogo Ndongo et al. 2019	MN188067	MN217390	MN217398
<i>Potamonemus man</i> sp. nov	Mt. Manengouba R.	ZMB Crust. 30320	Present study	Aw	Aw	Aw
<i>P. mambilorum</i>	Southwest Cameroon	NHM 1991.183	Daniels et al. 2015	---	KP640409	KP640452
<i>P. sachsii</i>	Southwest Cameroon	NMU09.04.1983	Daniels et al. 2015	---	AY803490	AY803530
<i>Potamonautes idjiwiensis</i>	D. R. Congo	SAM A78437	Daniels et al. 2015	KP640481	KP640402	KP640446
<i>Potamonautes obesus</i>	Tanzania	Unaccessioned	Daniels et al. 2015	AY803647	AY803497	AY803537
<i>Afrithelphusa monodosa</i>	Guinea	NMU 25.IV.2005.C	Daniels et al. 2015	KP640469	KP640386	KP640430
<i>Globonautes macropus</i>	Liberia	NMU VII. 1988	Daniels et al. 2015	---	KP640391	KP640435
<i>Sudanonautes aubryi</i>	Cameroon	LZUY-06	Mvogo Ndongo et al. 2017c	KY069938	KY964475	KY069950
<i>Sudanonautes tiko</i>	Cameroon	ZMB Crust.29628	Mvogo Ndongo et al. 2017c	KY069941	KY964476	KY069954

LZUY: Zoological Collection of the Laboratory of Zoology, University of Yaounde 1, Cameroon; NHM: Natural History Museum, London, UK; NMU: Northern Michigan University Museum, USA; ZMB: Museum für Naturkunde, Berlin, Germany.

Figure captions



Figure 1. Species of *Potamonemus* from southwestern Cameroon, whole animal, dorsal view. **a** Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428). **b** adult male, (CW 28 mm) of *P. P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) **c** adult male (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) **d** adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320). Scale bars: 15 mm (**a**), 16 mm (**b**), 17 mm (**c**), 16 mm (**d**).

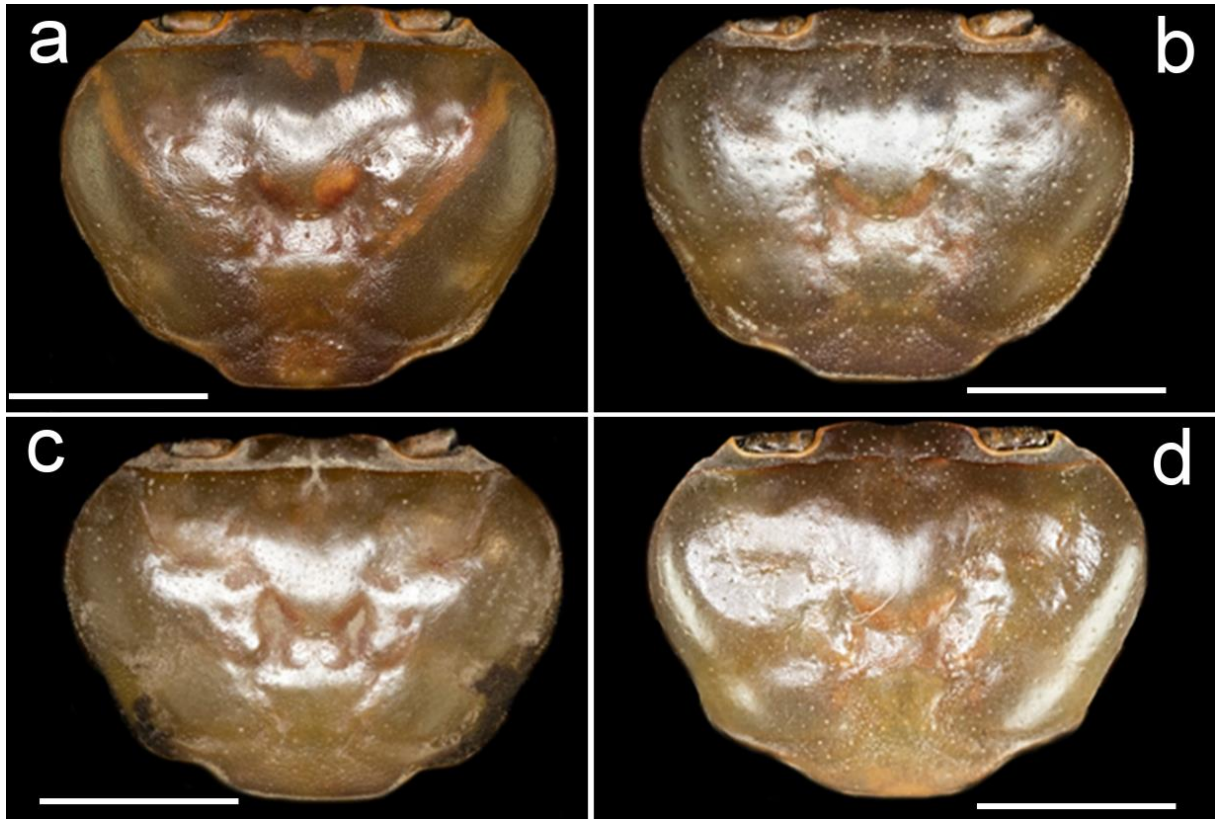


Figure 2. Species of *Potamonemus* from southwestern Cameroon, dorsal view. **a** Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) **b** adult male (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) **c** adult male, holotype (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) **d** adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320). Scale bars: 13 mm (**a**), 13 mm (**b**), 14 mm (**c**), 11 mm (**d**).

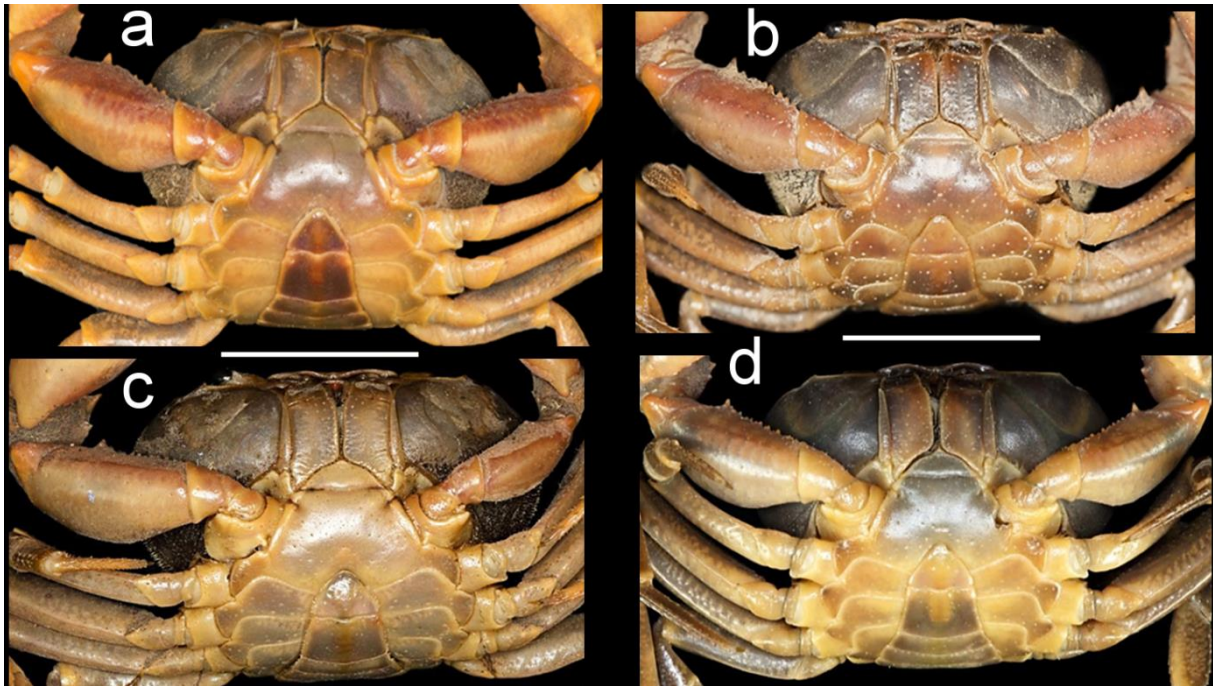


Figure 3. Species of *Potamonemus* from southwestern Cameroon, ventral view. **a** Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) **b** adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) **c** adult male (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) **d** adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320). Scale bars: 16 mm (**a**), 17 mm (**b**), 16 mm (**c**), 17 mm (**d**).



Figure 4. Species of *Potamonemus* from southwestern Cameroon, frontal view. **a** Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) **b** adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) **c** adult male (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) **d** adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320). Scale bars: 13 mm (**a**), 12 mm (**b**), 14 mm (**c**), 11 mm (**d**).

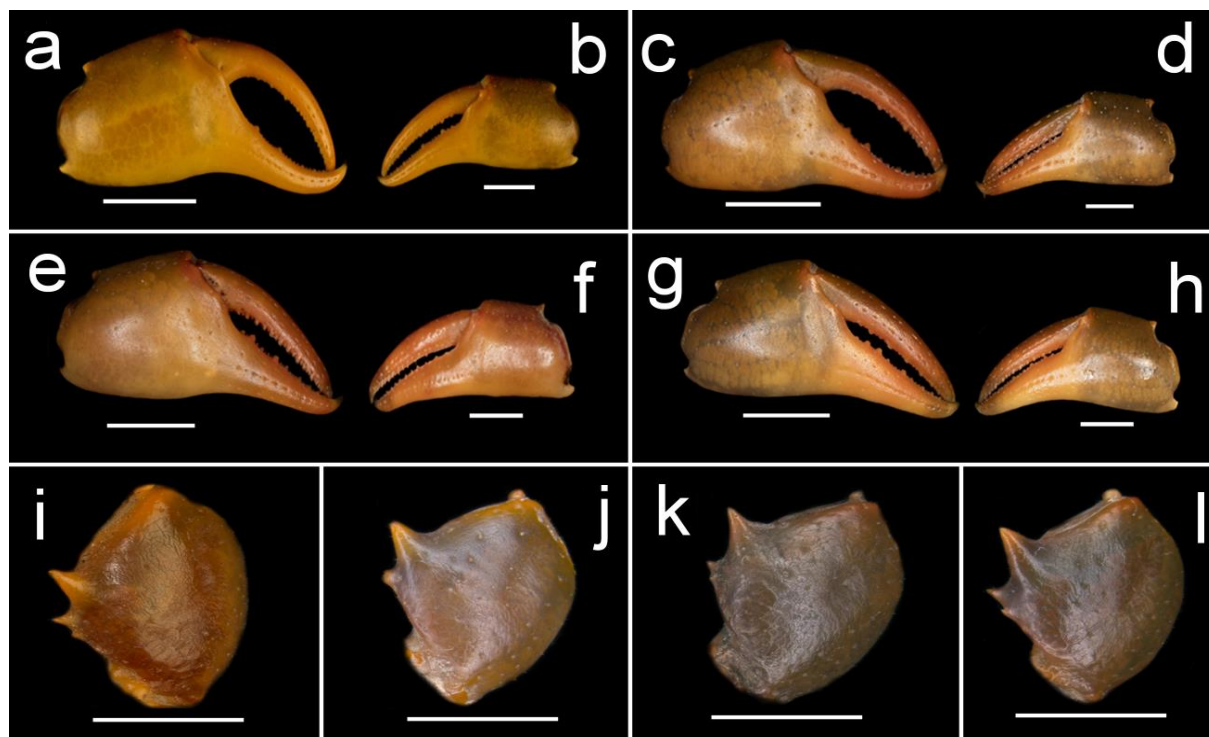


Figure 5. Dorsal view of the cheliped merus of adult males of species of *Potamonemus* from southwestern Cameroon. **a,b** Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) **c,d** adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) **e, f** largest adult male, holotype (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) **g, h** adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320). Dorsal view of the cheliped carpus of adult males of adult males of species of *Potamonemus*. **i** Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) **j** adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) **k** adult male, holotype (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) **l** t adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320). Scale bars: 5 mm (**a**), 5 mm (**b**), 5 mm (**c**), 5 mm (**d**).

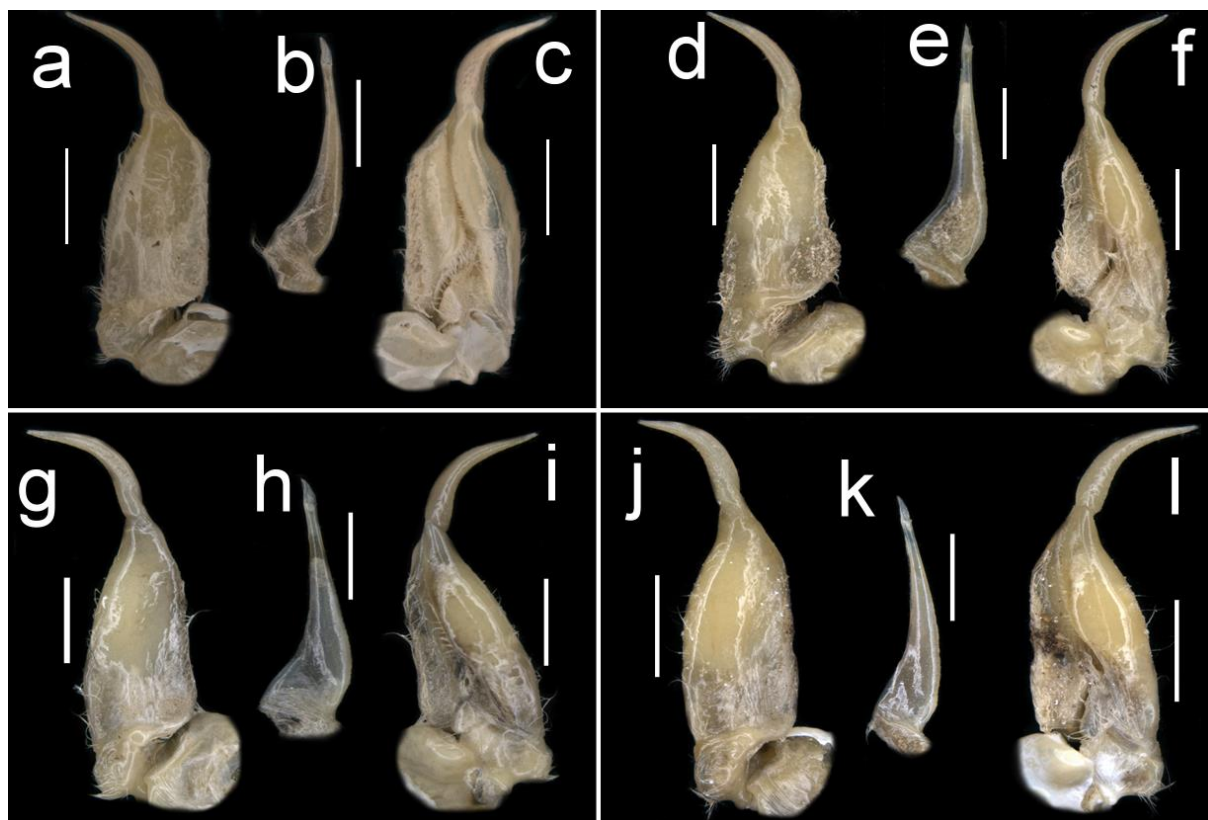


Figure 6. Dorsal view of left (**a, d, g, j**) and ventral view of left (**c, f, I, l**) G1 of adult males of species of *Potamonemus* from southwestern Cameroon: largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) (**a, c**). adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) (**d, f**). adult male (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) (**g, i**). adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320) (**j, l**). G 2 of adult males of species of *Potamonemus* from southwestern Cameroon. Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) (**b**). adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) (**e**). adult male, holotype (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) (**h**). adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320) (**k**). Scale bars: 2 mm (a, b, c, d, e, f, g, h, i, j, k, l).

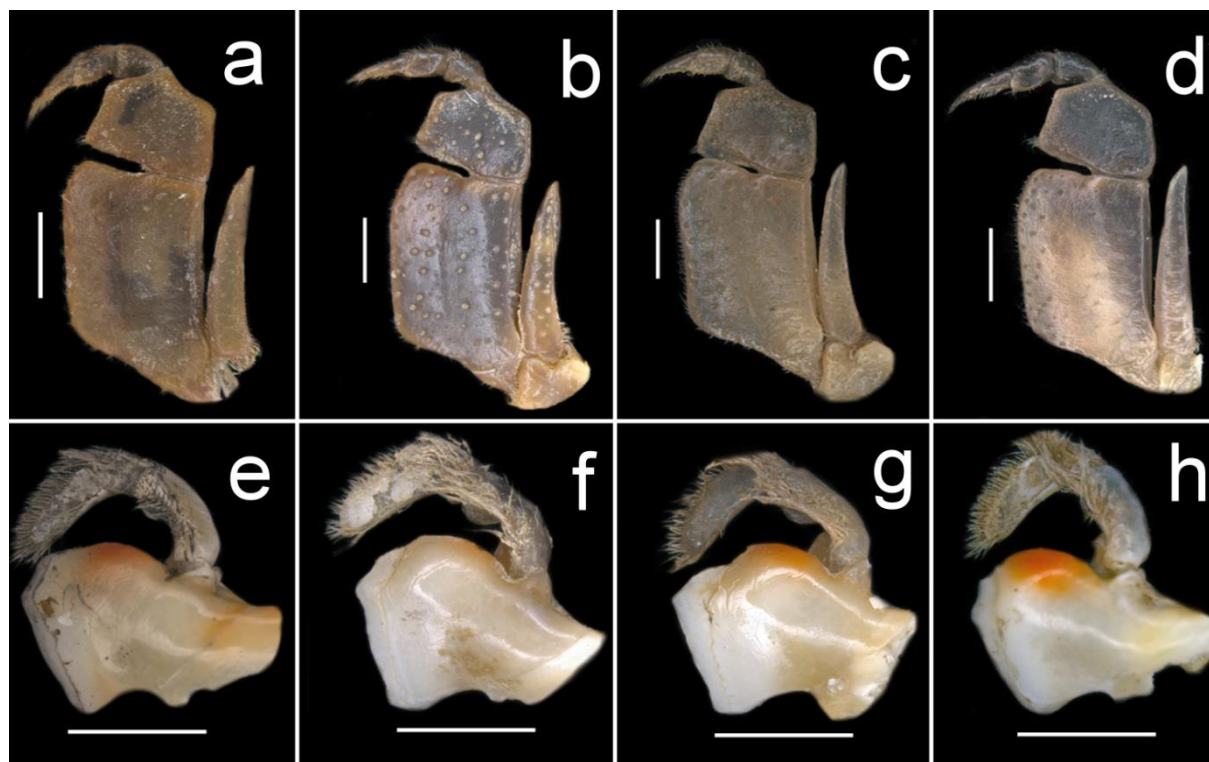


Figure 7. Frontal view of the left mandible of adult males of species of *Potamonemus* from southwestern Cameroon: Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) (a). adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) (b). adult male (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) (c). adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320) (d). Frontal view of the left mandible of adult males of species of *Potamonemus* from southwestern Cameroon. Largest adult male (CW 29 mm) of *P. mambilorum* from Mt. Nlonako (ZMB Crust. 32428) (e). adult male, holotype (CW 28 mm) of *P. mambilorum* from small stream around the mountain (ZMB Crust. 30326) (f). adult male, holotype (CW 31 mm) of *P. man* **sp. nov.** from Bakossi National Park (ZMB Crust. 30328) (g). adult male, holotype (CW 25 mm) of *P. man* **sp. nov.** from Man Lake, Mount Manengouba (ZMB Crust. 30320) (h). Scale bars: 5 mm (a, b, c, d), 2 mm (e, f, g, h).

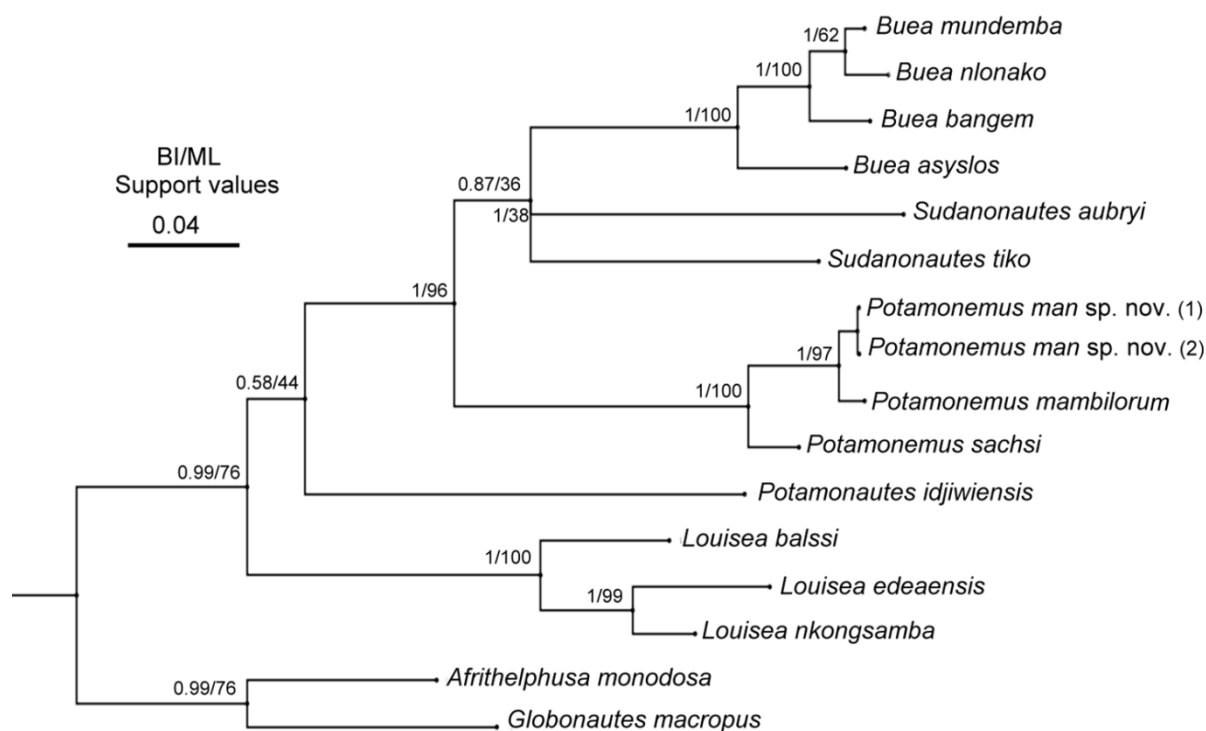


Figure 8. Bayesian Inference (BI) tree topology for the freshwater crab taxa from Cameroon included in this study derived from mtDNA sequences corresponding to three loci (partial 16S rRNA, COI, and 12S rRNA genes). Bayesian Inference (BI) and ML statistical values (%) on the nodes indicate bootstrap support and posterior probabilities, respectively.