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Crustaceana 92 (3) 307-334

CRUSTACEANA

REAPPRAISAL AND REDESCRIPTION OF THE THREE SPECIES OF THE RECENTLY DEFINED GENUS *GUINEARMA* SHAHDADI & SCHUBART, 2017, WITH A KEY TO THE WEST AFRICAN SESARMIDAE (DECAPODA, BRACHYURA)

BY

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ABSTRACT

West African mangroves host seven species of sesarmid crabs; three of which belong to the recently established genus *Guinearma* Shahdadi & Schubart, 2017, i.e., *G. alberti* (Rathbun, 1921), *G. huzardi* (Desmarest, 1825), and *G. kamermani* (De Man, 1883). The last species was originally described based on a single male specimen, and no further record has been published so far. Moreover, the three species of *Guinearma* were previously only briefly and superficially described. Along with some new records for *G. kamermani*, here we newly describe and illustrate the three species of *Guinearma* in detail, and discuss their diagnostic key features (mostly chelar characters). To facilitate their identification in the field, the other four species of West African Sesarmidae (i.e., *Armases elegans* (Herklots, 1851), *Chiromantes angolense* (De Brito Capello, 1864), *C. buettikoferi* (De Man, 1883), and *Metagrapsus curvatus* (H. Milne Edwards, 1837)) are also illustrated and an identification key is provided.

RÉSUMÉ

Les mangroves de la côte Ouest Africaine sont colonisées par sept espèces de crabes de la famille des Sesarmidae. Trois de ces sept espèces ont été reconnues comme lignée du genre *Guinearma* Shahdadi & Schubart, 2017 (*G. alberti* (Rathbun, 1921), *G. huzardi* (Desmarest, 1825), et *G. kamermani* (De Man, 1883)), qui est nouvellement décrit. *Guinearma kamermani*

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DOI 10.1163/15685403-00003863

a été précédemment décrite à partir d'un seul spécimen mâle, et aucun autre n'a jusqu'à ce jour été collecté. De plus, toutes ces trois espèces (*G. alberti*, *G. huzardi* et *G. kamermani*) ont été précédemment décrites d'une façon brève et superficielle. Dans le présent travail, ces trois espèces ont été minutieusement re-décrites, illustrées et comparées entre elles à partir des caractères de diagnoses (principalement les caractères de leurs pinces). Afin de faciliter l'identification de ces trois espèces, les quatre autres espèces (*Armases elegans* (Herklots, 1851), *Chiromantes angolense* (De Brito Capello, 1864), *C. buettikoferi* (De Man, 1883), et *Metagrapsus curvatus* (H. Milne Edwards, 1837)) de la famille des Sesarmidae qui colonisent aussi les mangroves de la côte Ouest Africaine, ont été illustrées et une clé d'identification est comprise.

INTRODUCTION

Recently, Shahdadi & Schubart (2017) described *Guinearma* as a new genus of sesarmid crabs, comprising two well-known (*G. alberti* (Rathbun, 1921) and *G. huzardi* (Desmarest, 1825)) and one less common (*G. kamermani* (De Man, 1883)) species of West African mangrove crabs. Their generic placements has changed several times in their complex taxonomic history.

Desmarest (1825) described a new species of sesarmid mangrove crab from the mouth of the Senegal River (border between Senegal and Mauritania) as *Grapsus huzardi*. This species was described a second time as *Sesarma africana* by H. Milne Edwards (1837) and in the following decades was reported repeatedly under that name. In 1883, De Man described *Sesarma* (*Chiromantes*) *kamermani* based on a single male from Muserra, Congo. He suggested a close relationship between his new species and *Sesarma africana* H. Milne Edwards, 1837, according to their morphological similarities. The third species was described as *Sesarma* (*Chiromantes*) *alberti* by Rathbun (1921) based on several specimens from different sites in Congo. In her description, Rathbun only compared the new species with *Sesarma africana* H. Milne Edwards, 1837.

Monod (1956) discovered the synonymy of *Sesarma africana* and *Grapsus huzardi* and transferred the latter to *Sesarma* Say, 1817, following chronological priority. From then on, the three West African species were treated as members of the subgenus *Sesarma* (*Chiromantes*), until Manning & Holthuis (1981) transferred them to the subgenus *Sesarma* (*Perisesarma*). Ng et al. (2008) listed the three species as members of the genus *Perisesarma* De Man, 1895. However, they questioned the assignment to this genus, noting they were morphologically and geographically divergent compared to other species of *Perisesarma* (see Ng et al., 2008; Davie, 2010; Shahdadi & Schubart, 2015). In their review of *Perisesarma*, Shahdadi & Schubart (2017) suggested a new taxonomic classification for most species formerly included in the genus, according to phylo-

genetic groupings. They transferred the three West African species to the new and monophyletic genus *Guinearma* and confirmed that the three species represent good phylogenetic units, and that the genus is closely related to the West African endemic genus and species *Metagrapsus curvatus* (H. Milne Edwards, 1837).

Compared to the commonly reported species *G. huzardi* and *G. alberti* (see Monod, 1956; Manning & Holthuis, 1981), *G. kamermani* is a poorly known species. After the original description and the listings in the faunistic reviews by Monod (1956) and Manning & Holthuis (1981), no further reports have been published for this species.

In their comprehensive monographs, Monod (1956) and Manning & Holthuis (1981) listed these three West African mangrove species with details on taxonomic changes, synonyms and records, along with their geographic distribution. However, in the original descriptions, all of these three species were only characterized briefly, so that many morphological aspects and morphometric relationships were not included. With the establishment of the genus *Guinearma*, Shahdadi & Schubart (2017) added many more morphological features and morphometric relationships to their taxonomy.

The current study aims to contribute further to the knowledge of the West African sesarmid fauna by presenting detailed morphological and morphometric descriptions of the three species of West African *Guinearma*, along with offering comparative images to support their taxonomic placement and facilitate identifications. For the latter purpose, the remaining four West African sesarmid species are also shown and compared in a single figure. Furthermore, the present study lists some more records of *G. kamermani*, confirmed by morphological comparison of studied specimens with the holotype.

Measurements (in millimetres) are of the maximum carapace width × length. Calculated means are followed by ± standard deviation. Abbreviations used are as follows: G1, male first gonopod; P, propodus; cw, carapace maximum width; cl, carapace maximum length; fw, front width; cwp, carapace width at posterior end; pl, palm length; pw, palm width; ce, cutting edge length at fixed finger; cdl, chelar dactylus length; mr, merus length; mw, merus width; prl, propodus length; prw, propodus width; tw, telson width; tl, telson length; s6w, pleon somite 6 width; s6l, pleon somite 6 length (fig. 6A-D); SMF, Forschungsinstitut und Museum Senckenberg, Frankfurt a. M., Germany; RMNH, Naturalis Biodiversity Center, Leiden, The Netherlands [formerly: Rijksmuseum van Natuurlijke Historie]; MNHN, Muséum National d'Histoire Naturelle, Paris, France; ZMB, Zoologisches Museum, Berlin, Germany; RBINS, Royal Belgian Institute of Natural Science, Brussels, Belgium; RMCA, Royal Museum for Central Africa, Brussels, Belgium; ZSMA, Zoologische Staatssammlung, Munich, Germany; NHMW, Naturhistorisches Museum Wien, Vienna, Austria; AMNH, American Museum of Natural History, New York, NY, U.S.A.

TAXONOMY

Family SESARMIDAE Dana, 1851
Guinearma Shahdadi & Schubart, 2017
Guinearma huzardi (Desmarest, 1825) (figs. 1-5)

Grapsus huzardi Desmarest, 1825: 131.
Sesarma africana H. Milne-Edwards, 1837: 73.
Sesarma (*Chiromantes*) *huzardi* — Monod, 1956: 437.
Sesarma (*Perisesarma*) *huzardi* — Manning & Holthuis, 1981: 245.
"Perisesarma" huzardi — Ng et al., 2008: 222.
Guinearma huzardi — Shahdadi & Schubart, 2017: 541.

Material examined.— No type determination and designation here (see Remarks, below). Other material: 1 female (fig. 1) (MNHN-B.3643) (20.2 × 17.4), Senegal, coll. Delambre; 6 males, 2 females (MNHN-B.16255), Senegal; 2 males (MNHN-IU-2016-10655), Senegal, coll. Maurice Maindron; 1 female (MNHN-IU-2016-10657), Senegal, coll. 1896; 2 males (MNHN-B.10885), Gabon; 1 female (MNHN-B.3645), no locality; 1 male (MNHN-IU-2016-10653), Gulf of Guinea, Ghana; 1 male (MNHN-IU-2016-10654), Niger; 1 female (MNHN-IU-2016-10656), Angola; 27 males, 27 females (MNHN-B.16673), Pointe-Noire, Congo; 9 males, 4 females (MNHN-B.16694), Pointe-Noire, Congo; 3 males, 2 females (MNHN-B.16254), Congo; 32 small juvenile males and females (MNHN-B.16253), Pointe-Noire, Congo; 6 males, 2 females (MNHN-B.13655), Liberia, Monrovia mangroves; 1 female (MNHN-B.16674), Bay of Cameroon; 1 female (MNHN-B.16676), Ivory Coast, Lagune Ebrie; 1 female (MNHN-B.16675), Cameroon; 1 male (RMNH.CRUS.D.132), Guinea, Boutry coast; 3 females (RMNH.CRUS.D. 134), Guinea, Boutry coast; 1 male (RMNH.CRUS.D.30867), Nigeria, Movida, coll. C. B. Pourell, 30.Jul.1975; 1 male (RMNH.CRUS.D.39220), Guinea Bissau, Byagore Archiplago, Roxa Island, coll. et don. L. Zwarts, Jan. 1987; 1 male (RMNH.CRUS.D.18729), Benin, Lake Nokue, City Cotonou; 4 females (RMNH.CRUS.D. 15539), Nigeria, Niger delta; 1 female (RMNH.CRUS.D.30881), Nigeria, Mayuka Creek; 2 males, 1 female (SMF 49914), Cameroon, Kribi, coll. P. A. Mvogo Ndongo, 25.May.2014; 1 male (SMF

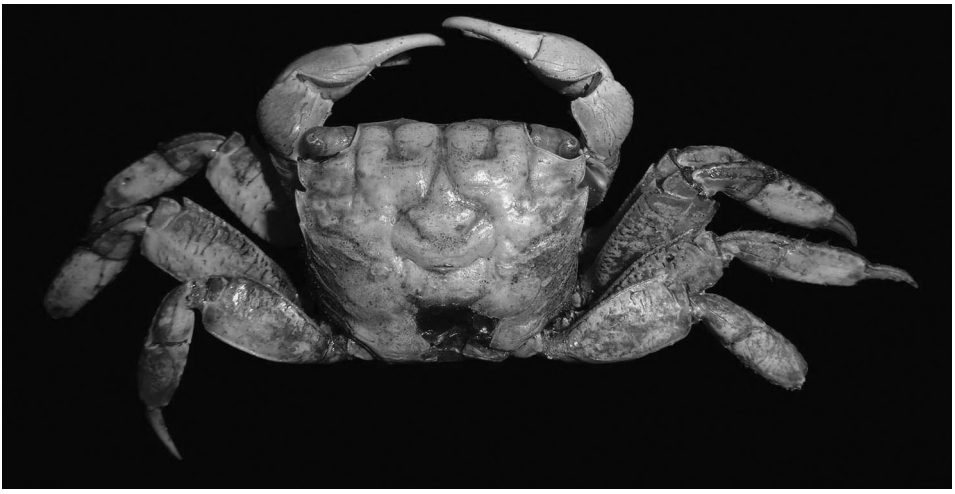

Fig. 1. *Guinearma huzardi* (Desmarest, 1825), female (20.2 × 17.4), MNHN-B3643, Senegal, dorsal habitus.

1968), no locality; 1 male (SMF 4110), Moanda-Tonda, coll. Dartenelle; 16 males, 18 females (SMF 49913), Ghana, Elmina, coll. C. D. Schubart & K. Duffner, 4.Jul.2001; 1 male (SMF 50752), Cameroon, Tiko; 1 female (SMF 50753), no locality; 2 males (SMF 50751), Gambia, Tendaba; 2 males (NHMW 25928), Cameroon, Campo, coll. P. A. Mvogo Ndongo, Sep. 2015; 3 males (NHMW 25927), Ghana, Ada Foah, coll. C. D. Schubart, 14.Jul.2001; 2 males, 3 females (ZMB 30646), Ghana, Busua lagoon, coll. C. D. Schubart, 7.Jul.2001; 2 males, 5 females (ZMB 30648), Ghana, Ada Foah, coll. C. D. Schubart, 14.Jul.2001; 2 males, 1 female (ZMB 30647), Cameroon Lokoundje, coll. P. A. Mvogo Ndongo, Sep. 2015; 3 males (ZMB 4.764; 16.635), Angola, Chinchoxo, Cabinda; 1 male (ZMB 11.731), Congo, Loango; 1 male (ZMB 23.061), Monrovia, Liberia; 1 male (ZMB 15.187), Cameroon; 5 males, 6 females (ZSM-A20170090), Cameroon, Kribi, coll. P. A. Mvogo Ndongo, Sep. 2015; 8 males, 2 females (ZSM-A20170089), Cameroon, Campo, coll. P. A. Mvogo Ndongo, Sep. 2015; 1 male (ZSM-A20170091), Gambia, Lamin, coll. R. Diesel, 5.Dec.1998; 1 male, 2 females (RMCA 508-510), Congo, Banana, coll. Wanson, 1934; 1 male, 1 female (RMCA 31271-31272), 1 male, 1 female (RMCA 17396-17397), Congo, Banana, coll. Schwetz, 1935; 1 male (RMCA 36433), Congo, Moanda, coll. E. Dartevelle, 1947; 2 females (RMCA 9792-9793), 7 males (RMCA 9819-9825), 3 females (RMCA 17277-17279), 4 males (RMCA 9809-9812), 8 females (RMCA 9794-9801), 6 males (RMCA 9813-9818), 6 females (RMCA 9826-9831), 7 males (9802-9808), 3 males (RMCA 17285-17287), 17 males, 2 females (RMCA 17293-17310), 10 females (RMCA 17262-17272), 5 males (RMCA 17288-17292), 6 females (RMCA 17095-17100), 2 females (RMCA 17346-17347), 4 males (RMCA 17349-17354), 5 males (RMCA 17341-17345), 5 males (RMCA 17089-17094), 9 females (RMCA 17253-17261), Republic of the Congo, Landana, coll. E. Dartevelle, 1937.

Redescription.— Medium- to large-sized sesarmid crab (largest studied specimen: male 48.4 × 44.2 mm, ZMB 4764); carapace subrectangular to slightly trapezoidal, slightly broader than long (cw/cl in males = 1.16 ± 0.04, N = 38). Carapace surface punctate, with numerous short transverse to oblique crests edged with rows of short setae, sometimes forming low tufts. Front moderately deflexed, with broad, relatively deep, median concavity (fw/cw = 0.58 ± 0.02, N = 77 males and females). Post-frontal lobes prominent, median lobes slightly broader than lateral ones, separated by deep furrow. Dorsal carapace regions moderately well indicated; gastric region demarcated; cardiac region separated from intestinal region, lateral branchial ridges prominent, upper orbital border finely granulate, lower orbital border indistinct, orbital spaces with tufts of long setae. Anterolateral margin with sharp exorbital angle, pointing anteriorly, with 2 epibranchial teeth, anterior one well developed, pointing antero-laterally, posterior one smaller but distinct (less pronounced in smaller specimens). Greatest width between epibranchial teeth (in most cases between anterior pair, but in larger animal, between the posterior pair); lateral margin straight to slightly concave behind the posterior epibranchial tooth, edge with row of short setae. Eyes with cornea slightly wider than eyestalk (figs. 1, 2A, 3A, 5A).

Chelipeds homochelous; chelae large, especially in older males because of strong allometric growth (fig. 2): in males ratio of pl/cw ranges from 0.52 (in a male with 12.4 mm cw) to 1.02 (in a male with 37.6 mm cw) (mean = 0.73 ± 0.14, N = 37) (fig. 6E); chelae robust, ratio of palm width/palm length in males =

Fig. 2. *Guinearma huzardi* (Desmarest, 1825), male (43.9 × 39.1), ZMB30646, Ghana, Busua lagoon: A, dorsal habitus; B, ventral habitus.

0.56 ± 0.04 (N = 63). Merus with dorsal border crenulated, distinct subdistal spine; ventral border with coarse spine-like prominences, no indication of subdistal spine; anterior border armed with coarse spine-like prominences, last one forming subdistal spine; inner face smooth, with longitudinal row of setae on ventral side and scattered setae on dorsal half; anterior face smooth, outer face with rows of fine granulates (fig. 3C, D, E). Upper surface of palm with 1 oblique pectinated crest with short teeth on distal half (13-27 teeth in studied specimens), crest starting from angle between inner and distal margin. Teeth forming crest are thicker and stouter distally, proximally followed by row of small granules, on inner part of upper surface of palm. Adjacent to pectinated crests, one to several short row(s)

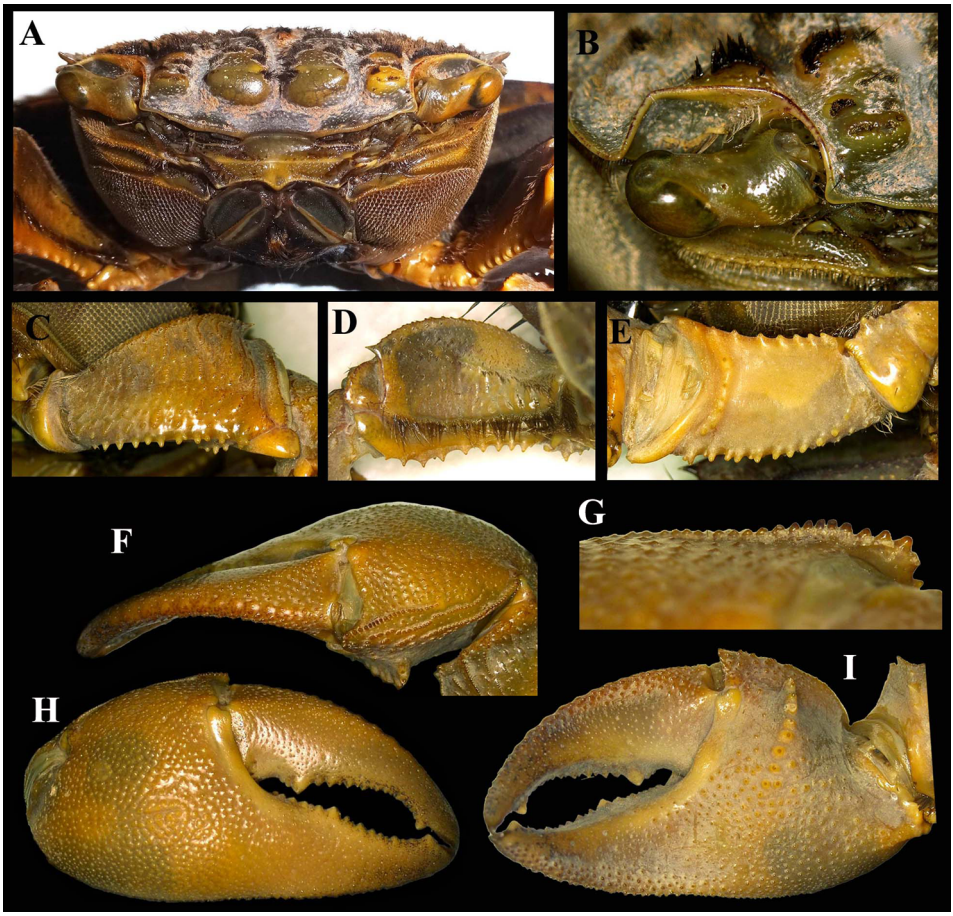

Fig. 3. *Guinearma huzardi* (Desmarest, 1825) male (43.9 × 39.1), ZMB 30646, Ghana, Busua lagoon: A, frontal view; B, orbit; C, merus of left cheliped, outer face; D, merus of left cheliped, inner face; E, merus of left cheliped, anterior face; F, right chela, dorsal view; G, dorsal palm, pectinated crest; H, right chela, outer view; I, right chela, inner view.

of granules, sometimes with chitinous tip (figs. 3F, G, 13B). Outer surface of palm without setae, coarsely granular except for smooth, punctate distal half of fixed finger (fig. 3H); inner surface of palm granular except area facing carpus and distal half of fixed finger (fig. 3I); row of coarse granules creates vertical ridge behind area facing carpus (fig. 3F, I). Ventral border of chela almost straight, granular, sometimes with chitinous tip; cutting edge (fixed finger) proportionally long, ce/pl = 0.46 ± 0.03, N = 37 males. Dactylus gently arched downwards, slightly curved inwards (fig. 3F, H), cdl/pl = 0.61 ± 0.03, N = 37 males; dorsal surface of dactylus with 11-19 (in studied specimens) oval, low, but distinct tubercles, proximally accompanied by scattered granules with chitinous cap. Fingers with

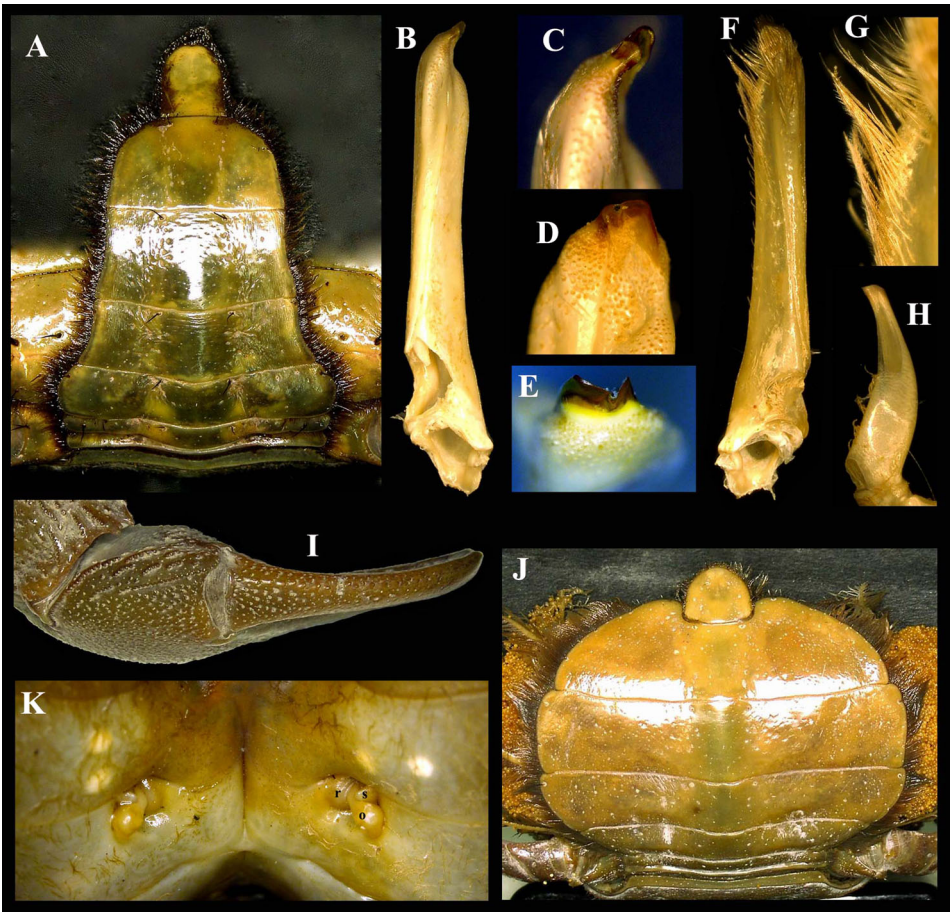

Fig. 4. *Guinearma huzardi* (Desmarest, 1825): A, male (37.6 × 35.0), SMF 49914, Cameroon, Kribi: pleon; B-H, male (26.2 × 23.6), SMF 49914, Cameroon, Kribi: B, left denuded G1; C, apical process of left G1, dorsal view; D, apical process of left G1, lateral view; E, apical process of left G1, anterior view; F, right G1 with setae; G, setae on apical process of right G1; H, second gonopod; I-K, *G. huzardi* female (37.8 × 33.9), ZMB 30646, Ghana, Busua lagoon: I, right chela, dorsal view; J, pleon; K, vulva.

chitinous tips, cutting edge of both fingers with series of variably sized teeth, among those are 2 distinctly larger teeth. In older males, the space between fingers is divided into three distinct gaps when fingers closed, the median gap being largest (fig. 3H, I).

Ambulatory legs (figs. 1, 2, 5) relatively short, broad; 3rd pair longest, length (basis-dactylus) 1.73 ± 0.08 times cw (N = 75 males and females), merus with anterior margin crenulated, distinct subdistal spine, dorsal surface with many short transverse ridges, flattened, broad, ml/mw = 2.20 ± 0.14 (N = 76 males and females), propodus broad, prl/prw = 2.51 ± 0.22 (N = 74 males and females),

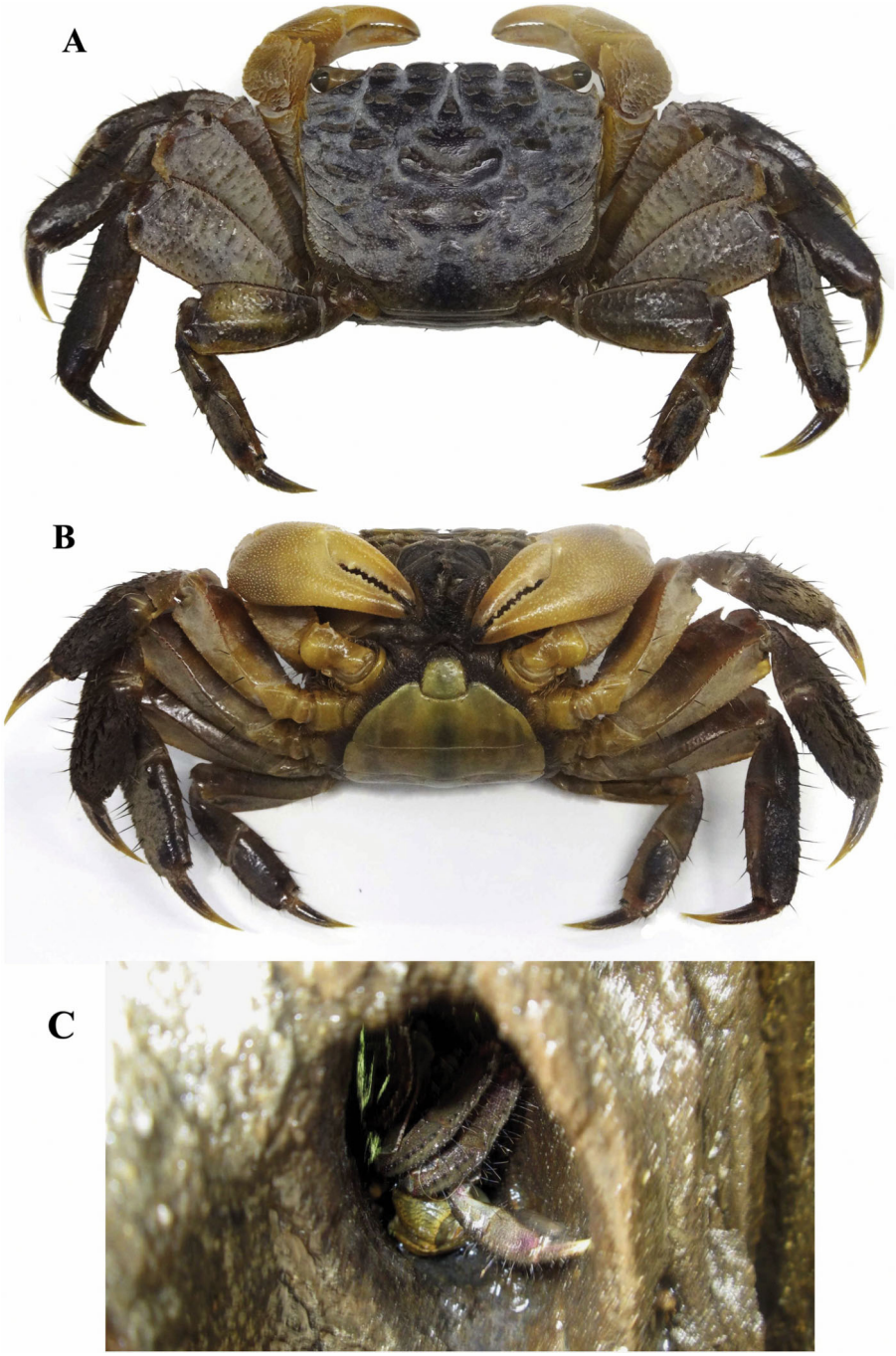

Fig. 5. A-B, *Guinearma huzardi* (Desmarest, 1825) female (28.0 × 24.3), ZMB 30646, Ghana, Busua lagoon: A, dorsal habitus; B, ventral habitus; C, specimen in situ, withdrawn in a hole of mangrove trees trunks, south of Cameroon.

dactylus 0.80 ± 0.08 times length of propodus (N = 77 males and females). Merus, carpus and propodus of 1st, 2nd and 3rd ambulatory legs with bundles of long setae, especially on anterior and posterior border and ventral face, denser on the 2nd and 3rd leg. Propodus of 1st, 2nd and 3rd ambulatory legs covered with dense setae, much denser on the 1st and 2nd leg.

Male pleon (fig. 4A) rather narrow, with telson longer than basal width (tl/tw = 1.23 ± 0.13, N = 37), almost as long as somite 6 (s6l/tl = 1.02 ± 0.12, N = 37); somite 6 longer than others, s6w/s6l = 1.64 ± 0.11 (N = 37); somites 4 and 5 trapezoidal; somite 5 longer than 4, somite 3 widest, laterally convex; somite 2 medially longer than lateral edges.

G1 (fig. 4B-G) relatively long, straight; apical corneous beak short, bent at angle of about 35° to vertical axis, arched in cross section, with notch in position of aperture, aperture small, subterminal, positioned at dorsal half of corneous beak.

Females (fig. 5) with comparatively slightly wider carapace (cw/cl = 1.19 ± 0.04, N = 40) and smaller chelipeds (pl/cw = 0.60 ± 0.05, N = 40); chelae proportionally longer than in males (pl/pw in female = 2.00 ± 0.09, N = 40; vs in male = 1.87 ± 0.10, N = 37), dactylar pectinate crest reduced to row of granules, some granules with chitinous cap. Chelar dactylar tubercles also much less prominent than in males, tubercles very low, almost all tubercles replaced by granules with chitinous cap, inner surface of palm lacks vertical ridge. Pleon (fig. 4J) broad, evenly rounded, broadest at somite 4, fringed with long setae. In adult specimens, pleon touches coxae of ambulatory legs, telson as broad as long (telson length/width = 0.99 ± 0.19, N = 39), inserted into somite 6, less than half length. Vulva (fig. 4K) positioned in depression on anterior edge of sternite 6, somewhat touching posterior margin of sternite 5; elongated operculum almost parallel to sternal sutures, small sternal cover on anterolateral corner of operculum. Slightly wider carapace of females compared to males is more obvious at posterior part (see Remarks).

Colour.— Specimens kept in ethanol for a few days still show some coloration: carapace dark brown; ambulatory legs dark to light brown, ventral face of meri lighter, chelipeds brighter than other parts, light brown to cream; sternal segments buff (figs. 2, 5).

Habitat and distribution.— This is a common species of muddy estuarine areas, mangroves, salt marshes and tidal rice lands, distributed in West Africa from the Senegal River to Angola (Manning & Holthuis, 1981). *Guinearma huzardi* also can be encountered on mangrove trees, often hiding in holes of mangrove trees trunks (fig. 5C). Consequently, this species is affected by human logging activities.

Remarks.— This species was originally described by Desmarest (1825), and the type material must have been deposited in the Muséum National d'Histoire

Naturelle, Paris, France. Seemingly, the description has been based on a single specimen collected by the son of M. Huzard from Senegal prior to 1825. We examined specimens of *G. huzardi* deposited in the Paris collection and none of them was signed as type nor was any labelled with Huzard as the collector. Due to the lack of information, we can, therefore, not confirm which specimen is the type. However, an upcoming catalogue will discuss this issue (P. Martin-Lefevre, pers. comm.).

Like in many other sesarmid species, males of *G. huzardi* have larger chelipeds (i.e., pl/cw: Man-Whitney $U = 310.0$, $n_{male} = 37$, $n_{female} = 40$, $p < 0.001$ two-tailed) (fig. 6E) and also more robust chelae (i.e., pw/pl: Man-Whitney $U = 219.0$, $n_{male} = 37$, $n_{female} = 40$, $p < 0.001$ two-tailed) (fig. 6F) compared to females. This is a result of allometric growth of male chelae after adulthood and suggests sexual selection (see also Flores et al., 2002). Another sign of sexual dimorphism is that females have, relatively, slightly wider carapaces (i.e., maximum cw/cl: Man-Whitney $U = 544.0$, $n_{male} = 38$, $n_{female} = 40$, $p = 0.031$ two-tailed) (fig. 6G), especially at the posterior end (i.e., cwp/cl: Man-Whitney $U = 424.5$, $n_{male} = 38$, $n_{female} = 40$, $p = 0.001$ two-tailed) (fig. 6H). This can be explained by broader pleons in females to maximize the number of carried eggs (see Flores & Negreiros-Fransozo, 1999).

There is a single dried female (20.5 × 18.0) (MNHN-B3645) labelled as originating from the Barbados Islands (see also Rathbun, 1918: 288). Otherwise, there are no reports of this species from the Western Atlantic. This record is dubious, and occurrence of this species in areas other than the East Atlantic is very unlikely; so, this finding needs confirmation.

Guinearma alberti (Rathbun, 1921) (figs. 7-9)

Sesarma (*Chiromantes*) *alberti* Rathbun, 1921: 448.
Sesarma (*Chiromantes*) *alberti* — Monod, 1956: 440.
Sesarma (*Perisesarma*) *alberti* — Manning & Holthuis, 1981: 245.
"Perisesarma" alberti — Ng et al., 2008: 222.
Guinearma alberti — Shahdadi & Schubart, 2017: 541.

Material examined.— Holotype (fig. 7A): male (33.9 × 31.02) (AMNH3505), Congo, Malela, coll. 8.Jul.1915; paratypes: 8 males (23.6 × 20.5; 32.7 × 29.2; 29.7 × 26.7; 30.9 × 27.8; 31.5 × 27.6; 29.3 × 27.0; two males with damaged carapace), 5 females (26.3 × 23.4; 23.7 × 19.6; 29.9 × 26.5; 24.0 × 20.3; 1 carapace damaged), 1 juvenile (carapace damaged) (AMNH3505A) same data as holotype; 2 males (19.5 × 17.8; 12.7 × 11.1), 2 females (20.4 × 18.57; 18.7 × 16.3), 1 juvenile (10.5 × 8.2) (AMNH3397), Congo, St. Antonio, coll. August 1915; 2 females (19.0 × 16.6; 21.1 × 18.6), 1 juvenile (9.7 × 8.6) (AMNH3460), Congo, Banana, coll. July and August 1915 (type material was collected by H. Lang & J. Chapin during AMNH Lang-Chapin Congo Expedition).

Other material: 1 male (MNHN-IU-2016-10663), Congo; 1 male, 2 females (MNHN-B.16206), Cameroon; 1 male (MNHN-B.16204), Sierra Leone; 1 female (MNHN-B.16705), Congo, Pointe-Noire; 1 male (MNHN-B.16704), Congo, Pointe-Noire; 1 male (MNHN-B.16207), Cameroon;

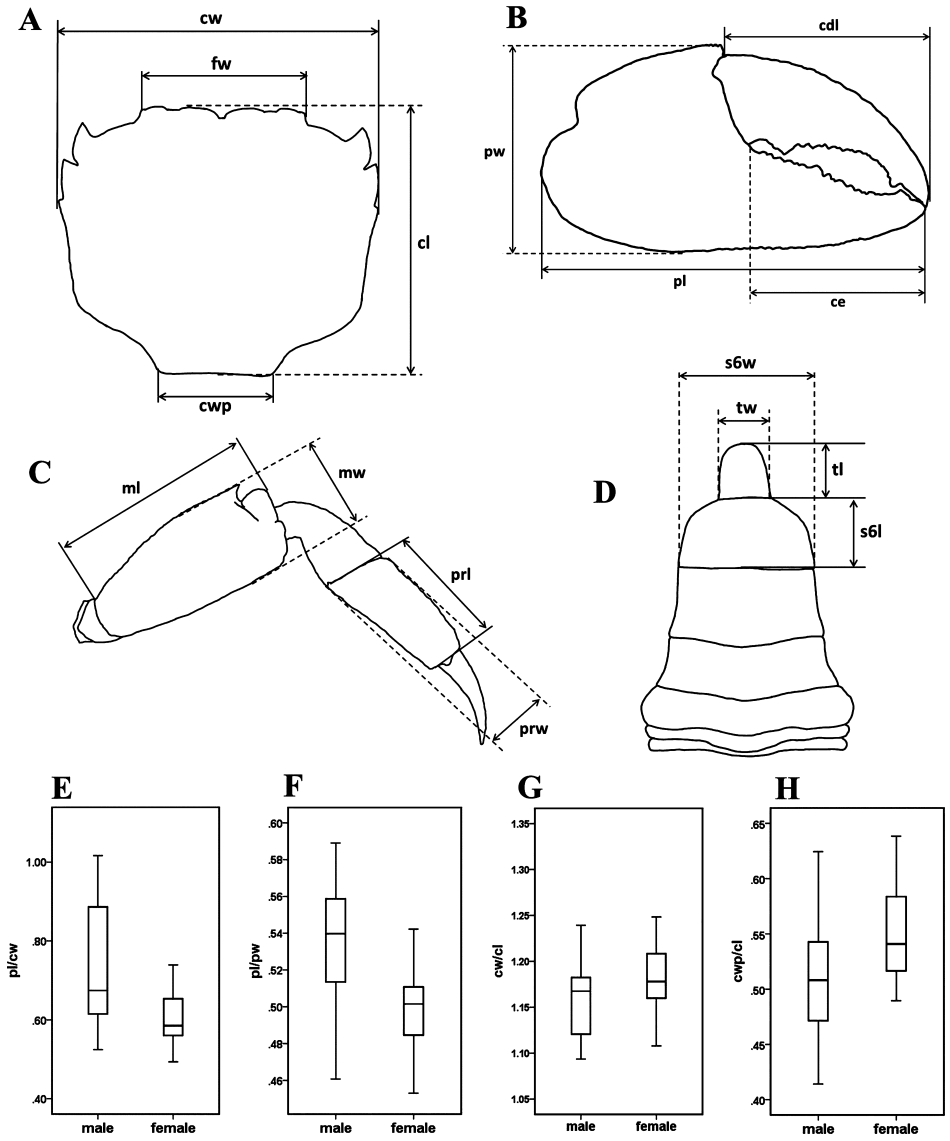

Fig. 6. A-D, Line drawings of morphometric characters used for these sesarmid crabs: A, carapace; B, right chela; C, 3rd ambulatory leg; D, male pleon; E-H, boxplots showing morphometric comparisons between males and females in *Guinearma huzardi* (Desmarest, 1825); E, ratio between palm length to carapace width; F, ratio of palm length to palm width; G, ratio of maximum carapace width to carapace length; H, ratio of carapace width at posterior end to carapace length.

1 female (MNHN-B.16203), Ivory Coast, Abidjan; 1 male (RMNH.CRUS.D. 15536), Nigeria, Port Harcourt, coll. H. Y. G. Beets, May-Aug. 1960; 1 male (RMNH.CRUS.D. 30883), Nigeria Mayuka Creek, coll. C. B. Powell, Oct-Dec. 1975; 1 male (RMNH.CRUS.D. 30991), Nigeria Mayuka Creek; 1 male (RMNH.CRUS.D. 30569), Nigeria Mayuka Creek; 1 male, 1 female (NHMW 25929),

3 males (ZMB 30650), 15 males, 3 females (ZSM-A20170092), Cameroon Lokoundje, coll. P. A. Mvogo Ndongo, Sep. 2015; 22 males, 14 females (ZMB 30649), Cameroon, Mouanko, coll. P. A. Mvogo Ndongo, Sep. 2015; 5 males, 3 females (ZSM-A20170093), Cameroon, Campo, coll. P. A. Mvogo Ndongo, Sep. 2015; 20 males, 17 females (SMF 50754), Cameroon, Tiko, coll. P. A. Mvogo Ndongo, Sep. 2015; 1 male, 1 female (SMF 49911), Ghana, Ada Foah, coll. C. D. Schubart, 14.Jul.2001; 1 male (SMF 49912), Cameroon, Tiko, coll. Ch. Otto, 9.Jan.1984; 3 males (SMF 4360), Moanda-Tonda; 2 males (RBINS 113218), Congo, Banana, Belqe; 3 males, 2 females (RBINS 113214), Liberia, Greenville, Sinoe River; 1 male (RBINS 113227), Congo, Banana; 2 females (RMCA 527-528), 2 males (RMCA 529-30), 1 male (RMCA 531), 3 juveniles (RMCA 569-571), 1 male (RMCA 572), Congo, Malela, coll. H. Lang & J. Chapin during AMNH Lang-Chapin Congo Expedition, Jul. 1915.

Redescription.— Medium-sized sesarmid crab (largest studied specimen: male 32.0 × 29.1 mm, RBINS113227), carapace subrectangular, slightly broader than long (cw/cl = 1.18 ± 0.04, N = 100 males and females). Carapace surface punctate, with some short transverse to oblique crests edged with rows of short setae. Front moderately deflexed, with broad, relatively deep, median concavity, fw/cw = 0.60 ± 0.02 (N = 100 males and females), post-frontal lobes prominent, median lobes slightly broader than lateral ones, separated by deep furrow. Dorsal carapace regions moderately well indicated; gastric region demarcated; cardiac region separated from intestinal region, lateral branchial ridges prominent, upper orbital border finely granulate, lower orbital border indistinct, orbital spaces bear tufts of long setae. Anterolateral margin with sharp exorbital angle, pointing anteriorly, with 2 epibranchial teeth, anterior one well developed, pointing laterally, posterior one distinct, less pronounced in smaller specimens. Greatest width between anterior epibranchial teeth; lateral margin slightly concave behind posterior epibranchial tooth, edged with row of short setae. Eyes with cornea slightly wider than eyestalk (figs. 7A, 8A, 9A).

Chelipeds homochelous (fig. 7); chelae (fig. 7) large: in males ratio of pl/cw ranges from 0.48 (in a male with 11.3 mm cw) to 0.82 (in a male with 23.6 mm cw) (mean = 0.62 ± 0.08, N = 63), chelae robust (fig. 8C, D), ratio of pw/pl = 0.56 ± 0.04 (N = 63 males). Merus (fig. 8B) with dorsal border crenulated, distinct subdistal spine; ventral border with coarse spine-like prominences, no indication of subdistal spine; anterior border with coarse spine-like prominences, last one forming subdistal spine; inner face smooth with longitudinal row of setae on ventral side and scattered setae on dorsal half, anterior face smooth, outer face with rows of fine granules; upper surface of palm with 1 oblique pectinated crest with short teeth on distal half (16-25 teeth in studied specimens), crest starting from angle between inner and distal margins. Teeth forming crest thicker and stouter distally, proximally followed by a row of small granules, on inner part of upper surface of palm. Adjacent to pectinated crests, one to several short row(s) of granules, sometimes with chitinous cap (figs. 8D, 13A). Outer surface of palm without setae, coarsely granular except for smooth, punctate distal half of fixed

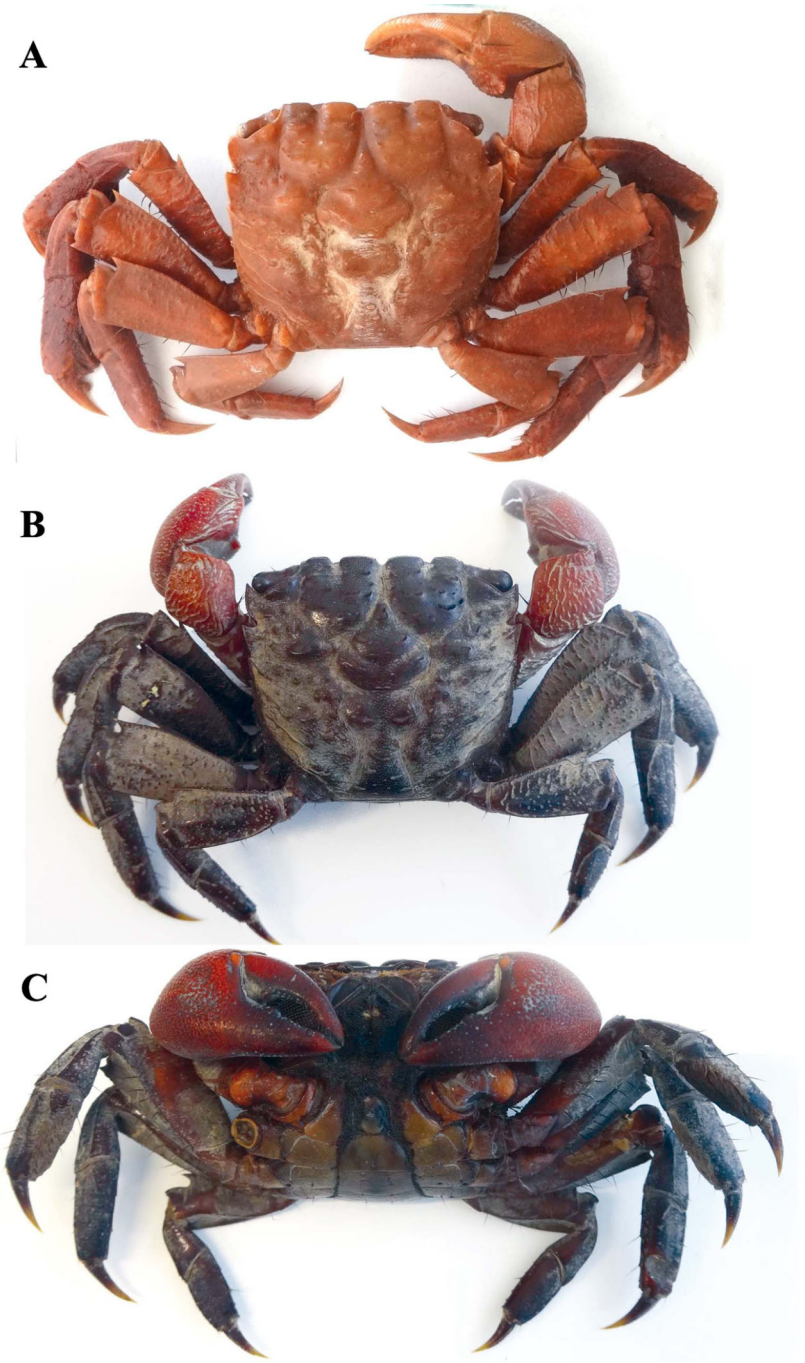

Fig. 7. A, *Guinearma alberti* (Rathbun, 1921), holotype male (33.9 × 31.0) (AMNH3505), Congo, Malela, dorsal habitus; B-C, *G. alberti* male (27.5 × 25.0), ZMB 30650, Cameroon Lokoundje: B, dorsal habitus; C, ventral habitus.

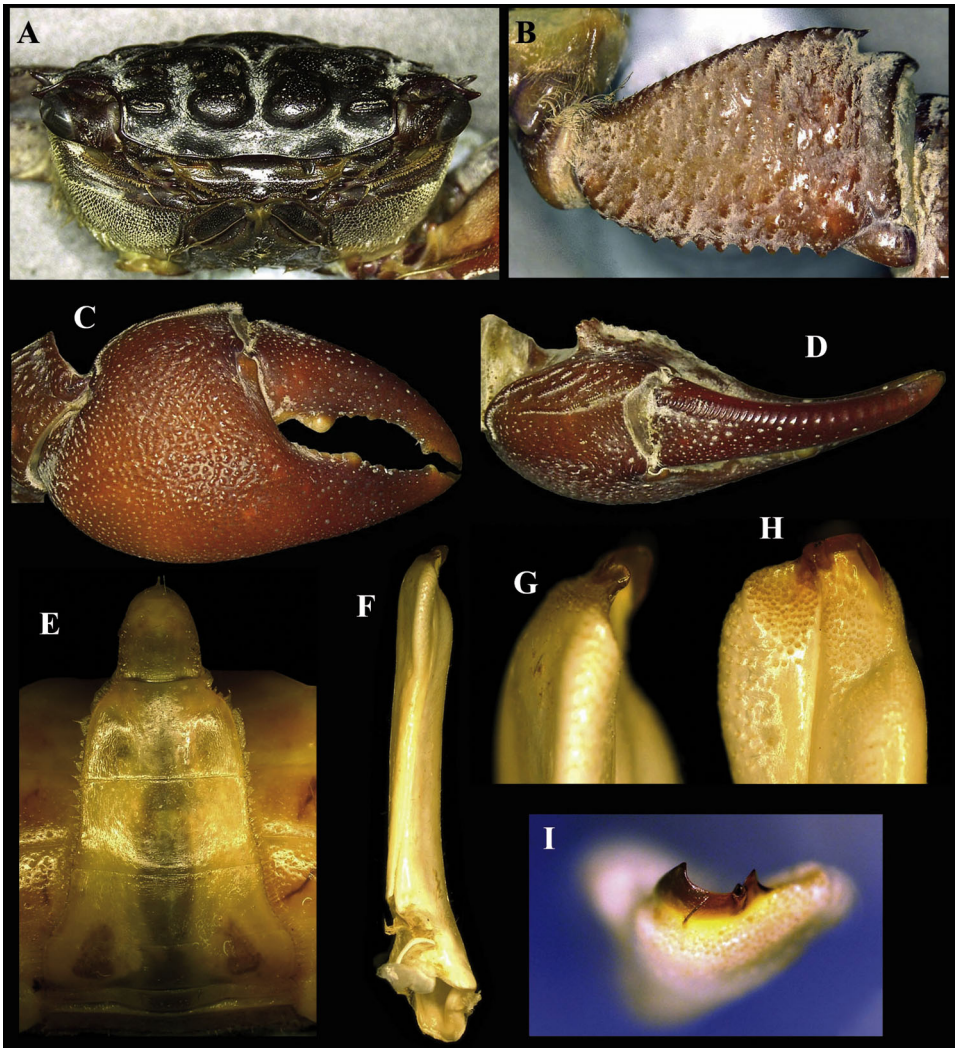

Fig. 8. *Guinearma alberti* (Rathbun, 1921), A-D, F-I, male (26.7 × 24.5), NHMW 25929, Cameroon, Lokoundje; E, male (20.8 × 18.1), SMF 49911, Ghana, Ada Foah. A, Carapace, frontal view; B, merus of left cheliped, outer face; C, right chela, outer view; D, right chela, dorsal view; E, pleon; F, left denuded G1; G, apical process of left G1, dorsal view; H, apical process of left G1, lateral view; I, apical process of left G1, anterior view.

finger (fig. 8C); inner surface of palm granular except area facing carpus and distal half of fixed finger, a row of coarse granules creates a vertical, prominent ridge behind area facing carpus. Ventral border of chela almost straight, finely granulate; ce/pl = 0.45 ± 0.03 (N = 62 males). Dactylus gently arched downwards, slightly curved inwards (fig. 8C, D), cdl/pl = 0.62 ± 0.04 (N = 63 males); dorsal surface of dactylus with about 30 (26-34 in studied specimens) low, but distinct

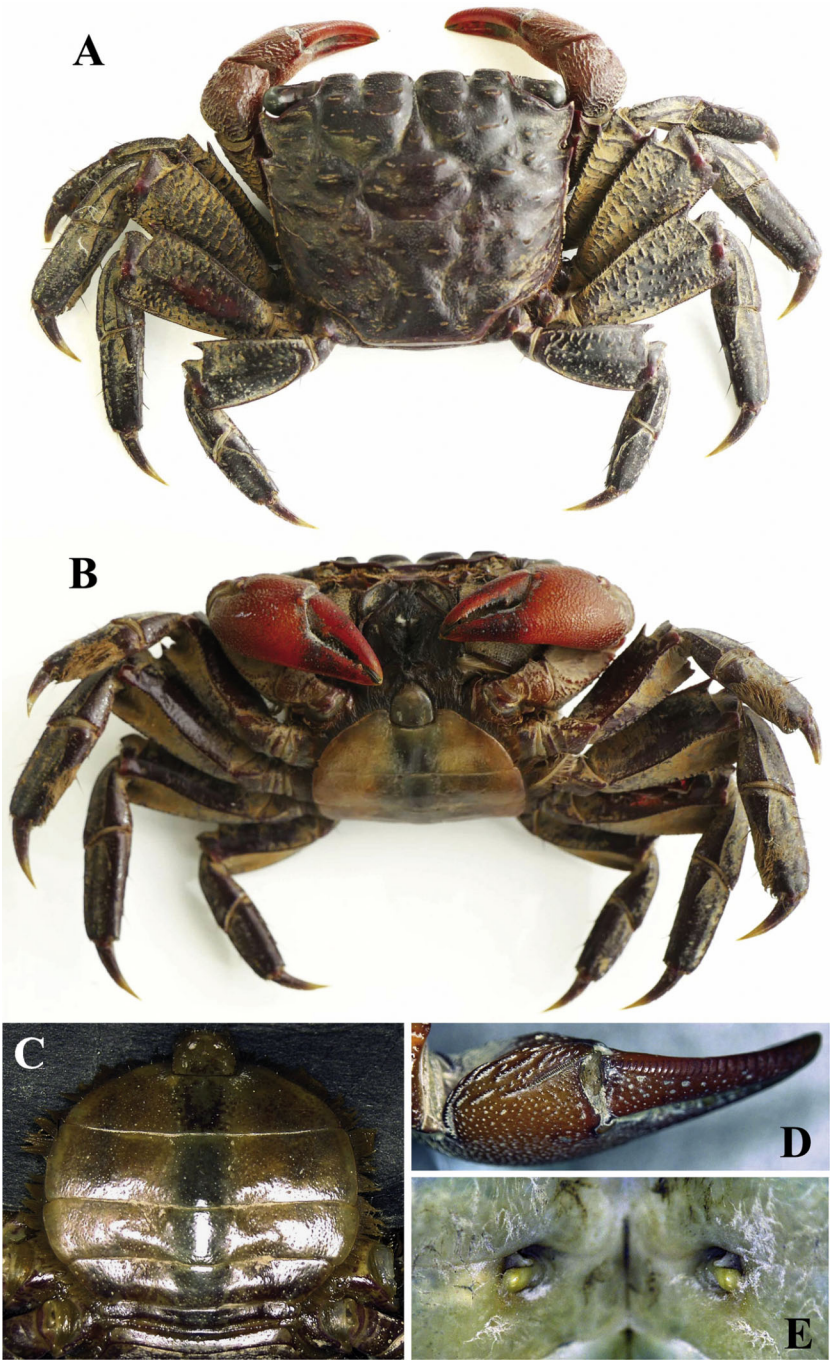

Fig. 9. *Guinearma alberti* (Rathbun, 1921): A-B, female (24.4 × 21.1), ZSMA 20170093, Cameroon, Campo; A, dorsal habitus; B, ventral habitus; C-E, female (25.7 × 22.8), NHMW 25929, Cameroon, Lokoundje; C, pleon; D, right chela, dorsal view; E, vulvae.

tubercles, which are significantly elongated transversely, looking like transverse lines or ridges, more spaced and elongated distally. Fingers with chitinous tips, cutting edge of both fingers with a series of variably sized teeth, among those are 2 distinctly larger teeth. In older males, the space between fingers is divided into three distinct gaps when fingers closed, the median one being largest (fig. 8C).

Ambulatory legs (figs. 7, 9A, B), relatively short, broad; 3rd pair longest, length (basis-dactylus) = 1.5 ± 0.1 times cw (N = 100 males and females), merus with anterior margin crenulated, distinct subdistal spine, dorsal surface with many short transverse ridges, flattened, broad, ml/mw = 2.13 ± 0.18 (N = 100 males and females), propodus broad, prl/prw = 2.76 ± 0.32 (N = 100 males and females), cdl/pl = 0.69 ± 0.07 (N = 100 males and females). Merus, carpus and propodus of 1st, 2nd and 3rd ambulatory legs with long setae, especially on anterior border. Propodus of 1st and 2nd ambulatory legs covered with dense setae.

Male pleon (fig. 8E) rather narrow, with telson longer than basal width (tl/tw = 1.19 ± 0.10, N = 63), almost as long as somite 6 (s6l/tl = 1.01 ± 0.08, N = 63); somite 6 longer than others, s6w/s6l = 1.58 ± 0.08 (N = 63); somites 5 and 4 trapezoidal; somite 5 longer than 4, somite 3 widest, laterally convex; somite 2 medially longer than lateral edges.

G1 (fig. 8F-I) relatively long, straight; apical corneous beak short, bent at angle of about 35° to vertical axis, arched in cross section, with notch in position of aperture, aperture small and subterminal, positioned at dorsal half of corneous beak.

Females (fig. 9) with comparatively smaller chelipeds (pl/cw = 0.55 ± 0.05, N = 37, vs in males = 0.62 ± 0.08, N = 63); chelae proportionally slightly longer than in male (pl/pw in female 1.91 ± 0.10, N = 37; vs in male = 1.80 ± 0.15, N = 63), dactylar pectinated crest and chelar dactylar tubercles are as prominent as in males, but inner surface of palm lacks vertical ridge (fig. 9D). Pleon (fig. 9C) broad, evenly rounded, broadest at somite 4, fringed with long setae. In adult female specimens, pleon touches coxae of ambulatory legs, telson as broad as long (tl/tw = 1.06 ± 0.06, N = 37), inserted into somite 6 less than half length. Vulva (fig. 9E) positioned in depression on anterior edge of sternite 6, touching posterior margin of sternite 5; elongated operculum almost parallel to sternal sutures, small sternal cover on anterolateral corner of the operculum.

Colour.— Carapace and ambulatory legs are dark red to black except for the ventral face of meri that are brighter; chelipeds are shiny, dark to pigment red; sternal segments are cream (figs. 7, 9A, B).

Habitat and distribution.— Mangrove swamps, from Guinea to Angola (Manning & Holthuis, 1981). In Ghana, this species was most common in mangroves along river mouths (C. D. Schubart, pers. observ.)

Remarks.— Like in many other sesarmid species, males of *G. alberti* also have larger chelipeds (i.e., pl/cw: Man-Whitney $U = 558.0$, $n_{male} = 63$, $n_{female} = 37$,

$p < 0.001$ two-tailed) and more robust chelae (i.e., pw/pl: Man-Whitney $U = 551.0$, $n_{male} = 63$, $n_{female} = 37$, $p < 0.001$ two-tailed) than females.

Guinearma kamermani (De Man, 1883) (figs. 10-12)

Sesarma kamermani De Man, 1883: 165.
Sesarma (*Chiromantes*) *kamermani* — Monod, 1956: 441.
Sesarma (*Perisesarma*) *kamermani* — Manning & Holthuis, 1981: 247.
Perisesarma kamermani — Ng et al., 2008: 222.
Guinearma kamermani — Shahdadi & Schubart, 2017: 541.

Material examined.— Holotype (fig. 10A): male (29.5 × 26.0) (RMNH.CRUS.D.166), Muserra, Congo, coll. P. Kamerman, 1882. Other material: 1 male (29.4 × 24.1) (RMNH.CRUS.D.27386) Angola, Luanda, coll. G. Hartmann, 17.Jun.1967; 2 males (22.3 × 18.5; 22.1 × 18.4) (RMNH.CRUS.D.27387) Angola, Luanda, coll. G. Hartmann, 18.Jun.1967; 1 male (40.4 × 34.3) (RBINS 113104) Congo, Banana, Belqe; 1 female (29.2 × 23.7) (RMCA 511), 2 males (33.0 × 27.6; 31.5 × 25.9) (RMCA 512-513) Congo, Banana; 1 female (32.3 × 28.0) (RMCA 17398) Congo, Banana, coll. Schwetz, 1936.

Redescription.— Medium- to large-sized sesarmid crab (largest of studied specimens: male 40.4 × 34.3 mm, RBINS 113104), carapace subrectangular, to weakly trapezoidal, slightly broader than long, greatest width between anterior epibranchial teeth (cw/cl = 1.19 ± 0.03, N = 7 males and females). Carapace surface smooth, shining, punctate, with numerous short transverse to oblique crests edged with rows of short setae, sometimes forming low tufts. Front = 0.56 ± 0.01 times carapace width (N = 7 males and females), moderately deflexed, with broad, relatively deep, median concavity. Post-frontal lobes prominent, median lobes slightly broader than lateral ones, separated by deep furrow. Dorsal carapace regions moderately well indicated; gastric region demarcated; cardiac region separated from intestinal region, lateral branchial ridges prominent, upper orbital border finely granulate, lower orbital border indistinct, orbital spaces with tufts of long setae. Anterolateral margin with sharp exorbital angle, pointing anteriorly. Well developed epibranchial tooth, pointing antero-laterally, indication of second epibranchial tooth; lateral margin straight, edged with row of short setae (figs. 10A, D, E, 11A, 12A).

Chelipeds homochelous (fig. 11A); chela (figs. 10A, B, 11B, C) large (pl/cw = 0.74 ± 0.07, N = 6 males) and robust (pw/pl = 0.53 ± 0.02, N = 6 males). Merus with dorsal border crenulated and distinct subdistal spine; ventral border lined with coarse spine-like prominences and no indication of subdistal spine; anterior border also with coarse spine-like prominences, last one becoming subdistal spine; inner face smooth, with a longitudinal row of setae on ventral side and scattered setae on dorsal half, anterior face smooth, outer face with rows of fine granules. Upper surface of palm with one longitudinal row of granules from stem to stern, forming ridge (instead of pectinated crest) accompanied with 2 or 3 oblique rows of granules on inner side, some granules with chitinous tips (figs. 10C, 11C, 13C).

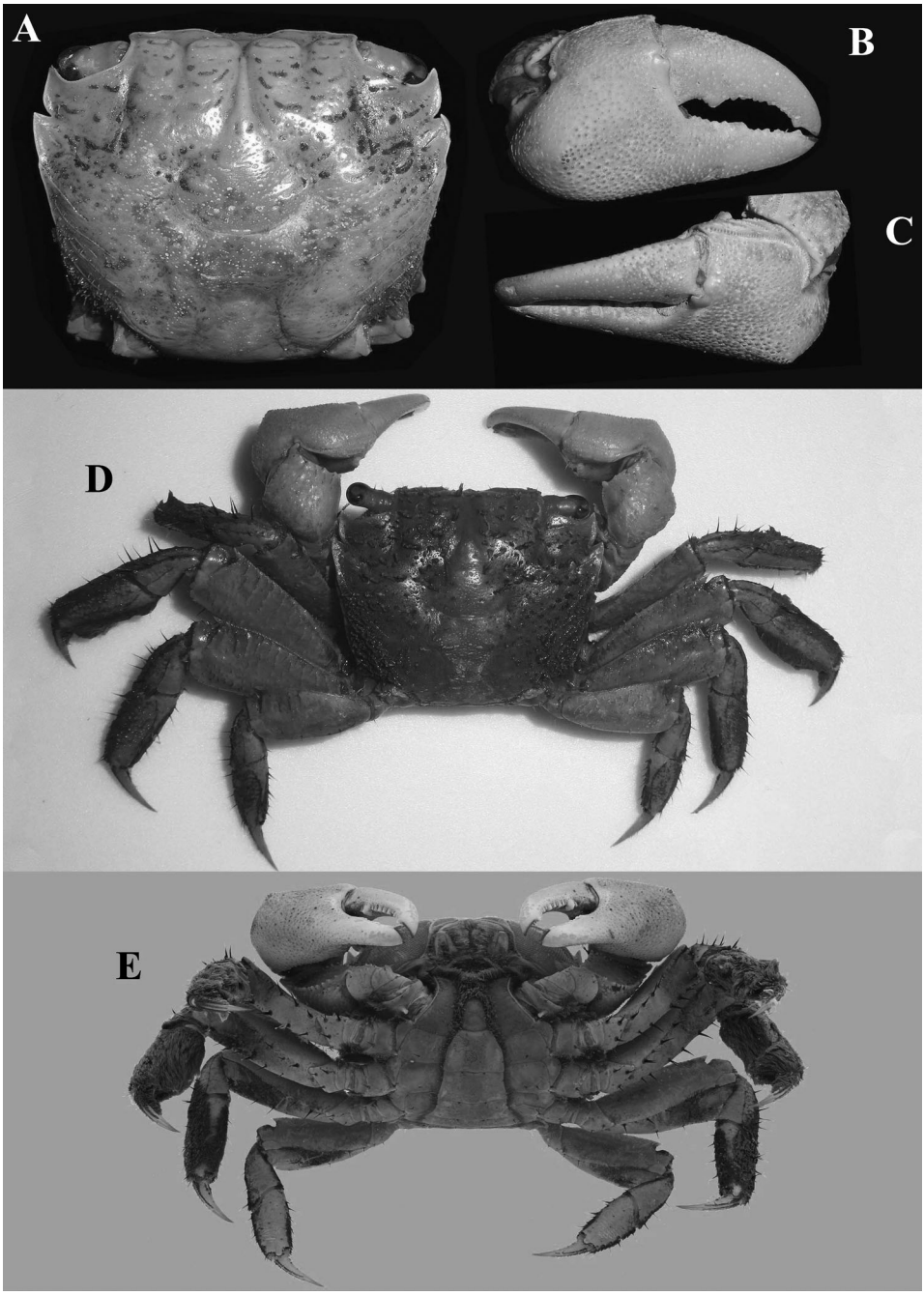

Fig. 10. *Guinearma kamermani* (De Man, 1883); A-C, holotype, male (29.5 × 26.0), RMNH.CRUS.D.166, Angola, Muserra: A, dorsal habitus; B, right chela, outer view; C, left chela, dorsal view; D-E, male (33.0 × 27.6) RMCA R.G. 512, Congo, Banana: D, dorsal habitus; E, ventral habitus. [Photo for fig. E taken by Jonathan Brecko, RMCA.]

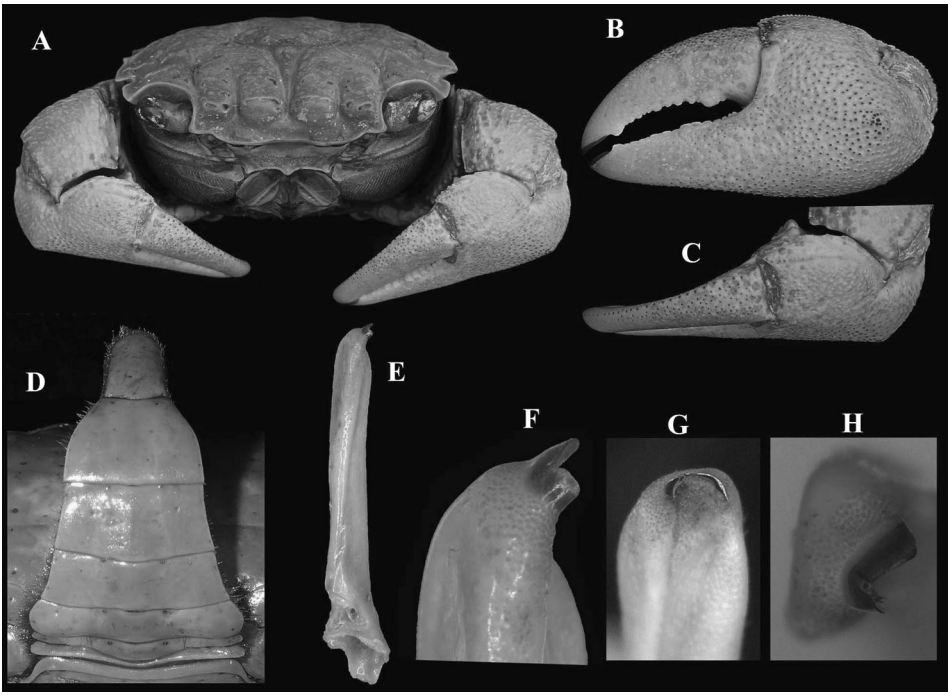

Fig. 11. *Guinearma kamermani* (De Man, 1883): A-C, male (40.4 × 34.3), RBINS 113104, Congo, Banana, Belqe; A, frontal view; B, left chela, outer view; C, left chela, dorsal view; D-H, male (29.5 × 26.0), holotype, RMNH.CRUS.D.166, Angola, Muserra; D, pleon; E, left denuded G1; F, apical process of left G1, dorsal view; G, apical process of left G1, lateral view; H, apical process of left G1, anterior view. [Photos for figs. A-C taken by Yves Barette from RBINS.]

Upper margin of palm with strong tubercles. Outer surface of palm without setae, coarsely granular except for smooth, punctate distal half of fixed finger, unusually flattened, which makes distinct, pointed/angle at posterior part, granules here have chitinous tip (more pronounced in older males) (figs. 10B, C, 11B, C). Inner surface of palm granular except area facing carpus and distal half of fixed finger, sparse tufts of long setae, row of course granules creating a vertical ridge behind area facing carpus; ventral border of chela almost straight, ce/pl = 0.45 ± 0.03, N = 5 males). Dactylus (figs. 10B, C, 11B, C) from outer view becoming more curved in older males, from top almost straight, cdl/pl = 0.61 ± 0.03, N = 5 males); dorsal surface with no sign of distinct tubercles, only scattered granules with chitinous cap (fig. 13F). Fingers with chitinous tip, cutting edge of both fingers with series of variably sized teeth, among those 2 distinctly larger teeth. In older males, the space between fingers is divided into three distinct gaps when fingers are closed, the median one being largest (fig. 10B).

Ambulatory legs (figs. 10D, E, 12A, B) relatively short, broad; 2nd and 3rd pairs longest, almost equal in length, length of 3rd pair (basis-dactylus) = 1.62 ± 0.03

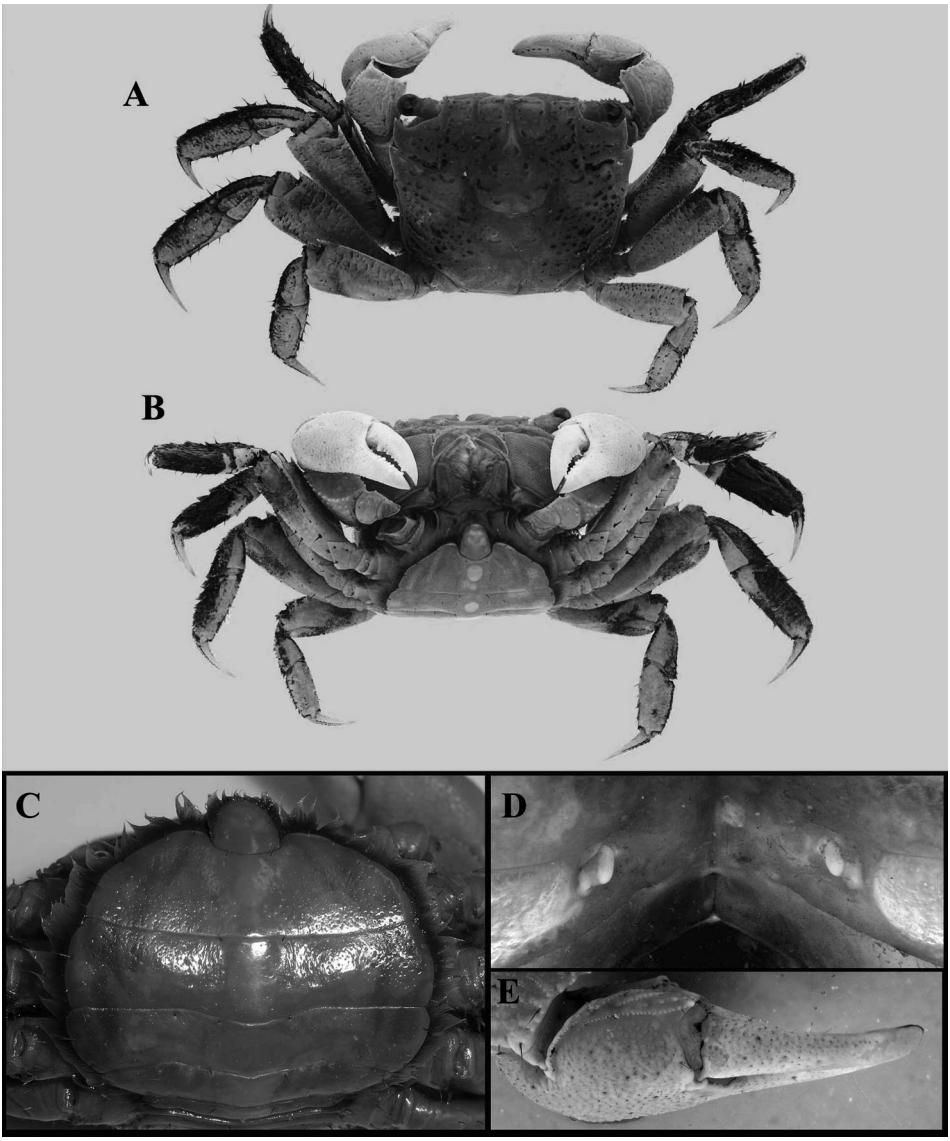

Fig. 12. *Guinearma kamermani* (De Man, 1883), female (29.2 × 23.7), RMCA 511, Congo, Banana; A, dorsal habitus; B, ventral habitus; C, pleon; D, vulvae; E, right chela, dorsal view. [Photos for figs. A, B, D taken by Jonathan Brecko, RMCA.]

times cw (N = 6 males and females), merus with anterior margin crenulated, dorsal surface with many short transverse ridges, ml/mw = 2.06 ± 0.20, N = 6), prl/prw = 2.59 ± 0.60, N = 6), dactylus = 0.68 ± 0.15 times length of propodus (N = 6); carpus and merus of 2nd, 3rd and 4th ambulatory legs covered with long setae, denser on 2nd ambulatory leg.

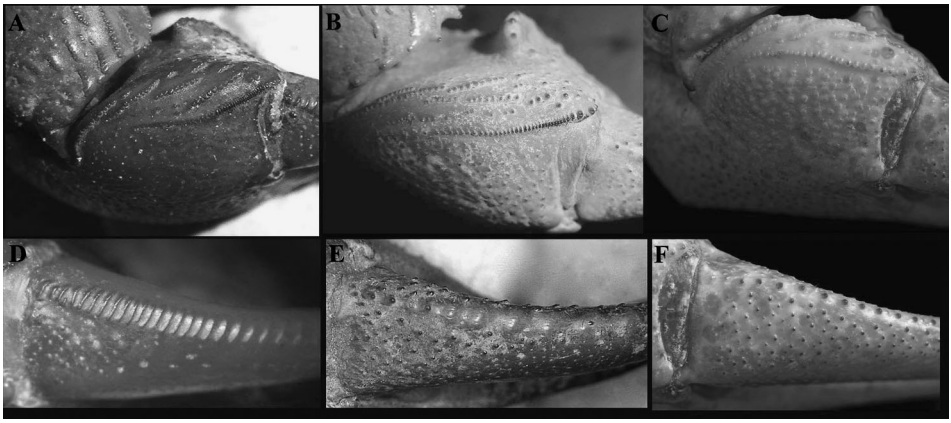

Fig. 13. A-C, Pectinated crest on palm in: A, *Guinearma alberti* (Rathbun, 1921), male (23.6 × 20.8), RMNH.CRUS.D.51536, Nigeria, Niger Delta; B, *G. huzardi* (Desmarest, 1825), male (38.4 × 34.7), RMNH.CRUS.D.132, Guinea, Boutry coast; C, *G. kamermani* (De Man, 1883), male (29.4 × 24.1), RMNH.CRUS.D.27386, Angola, Luanda; D-F, proximal chelar dactylar tubercles in: D, *G. alberti*, male (20.8 × 18.1), SMF 49911, Ghana, Ada Foah; E, *G. huzardi*, male (37.6 × 35.0), SMF 49914, Cameroon, Kribi; F, *G. kamermani*, male (29.5 × 26.0), RMNH.CRUS.D.166, holotype, Angola, Muserra.

Male pleon (figs. 10E, 11D) relatively narrow, with telson longer than basal width (tl/tw = 1.32 ± 0.07, N = 5 males), almost as long as somite 6; somite 6 longer than others = 1.54 ± 0.8 times as wide as long (N = 5); somites 4 and 5 trapezoidal; somite 3 widest, laterally convex; somite 2 medially longer than lateral edges.

G1 (fig. 11E-H) relatively long, straight; apical corneous beak short, bent at angle of about 35° to vertical axis, arched in cross section, with notch in position of aperture, aperture small and subterminal, positioned at dorsal half of corneous beak.

Females (fig. 12) with proportionally smaller chelipeds (pl/cw = 0.39, vs in males = 0.74 ± 0.07, N = 6). Pleon (fig. 12C) broad, evenly rounded, broadest at somites 4 and 5, fringed with long setae, touches coxae of ambulatory legs, telson longer than wide (tl/tw = 1.21), inserted into somite 6 less than half length. Vulva (fig. 12D) positioned in depression on anterior edge of sternite 6, touching posterior margin of sternite 5, vulva with an elongated operculum almost parallel to sternal sutures, without sternal cover.

Colour.— Colour in life was not recorded.

Habitat and distribution.— Habitat was not recorded, except for the holotype, all other specimens of *G. kamermani* examined here, were collected together with *G. huzardi*. The material examined originates from Congo and Angola.

Remarks.— This species seems to be rare compared to its congeners, from which it can be easily distinguished morphologically (see general remarks and discussion below) and genetically (see Shahdadi & Schubart, 2017).

GENERAL REMARKS AND DISCUSSION

The three species of the genus *Guinearma* are easily recognizable by their chelar morphology, mainly by the dactylar tuberculation patterns and tubercle morphology in adult males. The chelar dactylus of *G. alberti* has a large number (about 30) of very small and low transversely elongated tubercles (proximally resembling a continuous crest without distinct spaces between the tubercles) (figs. 8D, 13D), while *G. huzardi* has 11-19 transversely ovate, low but distinct and clearly separated tubercles (figs. 3F, 13E). In contrast, the tubercles of *G. kamermani* are so inconspicuous that they are replaced by small granules with a chitinous cap (figs. 11C, 13F). This species is also distinct from the first two by the absence of a pectinated crest formed by short and stout teeth (as in *G. alberti* (fig. 13A) and *G. huzardi* (fig. 13B)) on the male chelar palm. Instead, *G. kamermani* has a row of granules with chitinous caps (forming a ridge from stem to stern on the upper face of the palm) (fig. 13C). The chelae of *G. kamermani* are also distinct by having very flat outer surfaces with a prominent proximal point (figs. 10B, C, 11B, C; Monod, 1956: 442, fig. 596).

In females of *G. alberti*, the pectinated crests and dactylar tubercles are as prominent as in males, therefore they are easily distinguished from *G. huzardi*, in which both characters are not as markedly expressed in females. Females of *G. kamermani* are also distinguishable from those of the congeneric species by the absence of a sternal cover on the vulvae.

Guinearma alberti also seems to be different from *G. huzardi* and *G. kamermani* in overall carapace morphology: the carapace in *G. alberti* (e.g., fig. 7B) is rectangular, while in the other two (e.g., figs. 2A, 10A) it seems to be slightly trapezoidal. The anterolateral part of the carapace also shows differences in *G. alberti*; its exorbital angle is pointed antero-laterally and is separated from the epibranchial tooth by a proportionally wider angle (fig. 14A), while in *G. huzardi* (fig. 14B) and *G. kamermani* (fig. 14C) the exorbital angle is pointed anteriorly and separated from the epibranchial tooth by an acute angle. Furthermore, *G. alberti* and *G. huzardi* are also very distinct in coloration, especially their chelar colour. *Guinearma huzardi* has light brown to cream chelae, while they are red in *G. alberti*.

Morphometric comparisons also revealed some differences between the two more common species (*G. kamermani* was not included in these comparisons

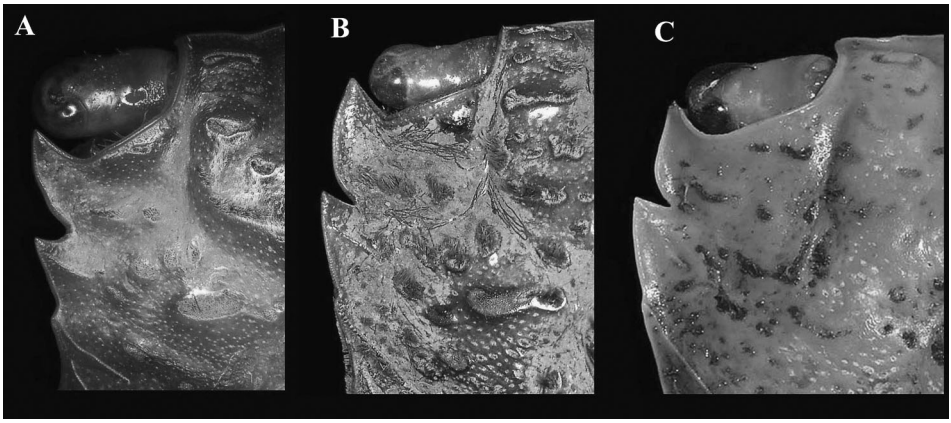

Fig. 14. Dorsal view of anterolateral region of carapace in: A, *Guinearma alberti* (Rathbun, 1921) male (20.8 × 18.1), SMF 49911, Ghana, Ada Foah; B, *G. huzardi* (Desmarest, 1825), male (37.6 × 35.0), SMF 49914, Cameroon, Kribi; C, *G. kamermani* (De Man, 1883), male (29.5 × 26.0), RMNH.CRUS.D.166, holotype, Angola, Muserra.

because of low sample size). *Guinearma huzardi* seems to reach larger overall sizes compared to *G. alberti* (fig. 15A), i.e., maximum carapace width in studied material of *G. huzardi* = 48.4 mm (N = 380) vs. 32.0 mm in *G. alberti* (N = 137). The proportional size of the male chelae is also larger in *G. huzardi* (fig. 15B): the ratio of palm length/cw in *G. huzardi* reaches 0.98 (N = 37) while it does not exceed 0.82 in *G. alberti* (N = 63). *Guinearma huzardi* has proportionally longer ambulatory legs than *G. alberti* (fig. 15C), i.e., the ratio of 3rd ambulatory leg/cw is 1.74 ± 0.08 in *G. huzardi* and 1.51 ± 0.10 in *G. alberti* (Man-Whitney $U = 261.0$, $n_{alberti} = 100$, $n_{huzardi} = 76$, $p < 0.001$ two-tailed).

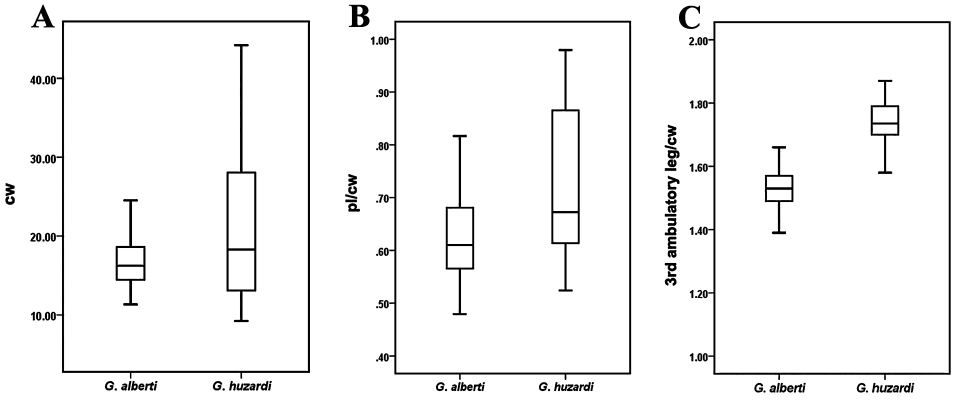

Fig. 15. Boxplots showing morphometric comparisons between *Guinearma alberti* (Rathbun, 1921) and *G. huzardi* (Desmarest, 1825) (outliers are excluded): A, maximum carapace width; B, ratio of palm length to carapace width in males; C, ratio of length of 3rd ambulatory leg (basis to dactylus) to carapace width.

In addition to the three species of *Guinearma*, four other sesarmid species (fig. 16) have been previously recorded from West Africa (Manning & Holthuis, 1981). They are easily recognizable from each other according to their key morphological characters that are summarized below to facilitate their identification.

Armases elegans (Herklots, 1851) (fig. 16A, B) has a squarish carapace (almost as wide as long), a flattened body and relatively long ambulatory legs with long propodi and hook-like dactyli (specialized for mangrove tree climbing), 3rd ambulatory leg ca. 2.3 times as long as carapace width, with extremely long propodus (about five times as long as wide) and very short dactylus (ca. 0.3 times propodus length).

Metagrapsus curvatus (H. Milne Edwards, 1837) (fig. 16 C, D) has a carapace that is wider than long, to some extent ovate, with two distinct, blunt epibranchial teeth/prominences (the widest part of the carapace between the posterior pair), a markedly vaulted body, the upper face of the chelar palm with one oblique, pectinated crest formed by a row of well-developed short and stout chitinous teeth distally, followed by fine granules proximally.

Chiromantes buettikoferi (De Man, 1883) (fig. 16E, F) has a rectangular to slightly trapezoidal carapace with no epibranchial tooth. The most discriminative character in this species is that the outer face of the chela is unusually flattened; the chela is elongated with a relatively short dactylus (cdl/pl ca. 0.4)

Chiromantes angolense (De Brito Capello, 1864) (fig. 16G, H) also has a rectangular to slightly trapezoidal carapace with no epibranchial tooth. The chelae are also flattened, but not as marked as in *C. buettikoferi*, with relatively long dactyli (cdl/pl ca. 0.7); the male pleon has a relatively large telson. In females, the positioning of the vulvae is markedly different from that in other West African sesarmids and moved laterally, outside of the sternal depression.

The last two species (C. *buettikoferi* and C. *angolense*) are currently assigned to *Chiromantes*. However, their generic placement has been questioned and they will be transferred into a new genus (see Ng et al., 2008: 223, note 4; Schubart & Ng, in prep.).

KEY TO THE KNOWN WEST AFRICAN SPECIES OF SESARMIDAE

1. Ambulatory legs with extremely long and slender propodi (P4 with propodus about five times as long as wide) (fig. 16A, B) ..... *Armases elegans* (Herklots, 1851)
– Ambulatory legs with shorter propodi (P3 with propodus about two to three times as long as wide) (e.g. figs. 16E, F) 2
2. Carapace without any anterolateral tooth or any prominence 3
– Carapace with one or two distinct anterolateral teeth or prominences 4
3. Chela with outer face unusually flattened and a relatively short dactylus (cdl/pl ca. 0.4) (fig. 16E, F) ..... *Chiromantes buettikoferi* (De Man, 1883)

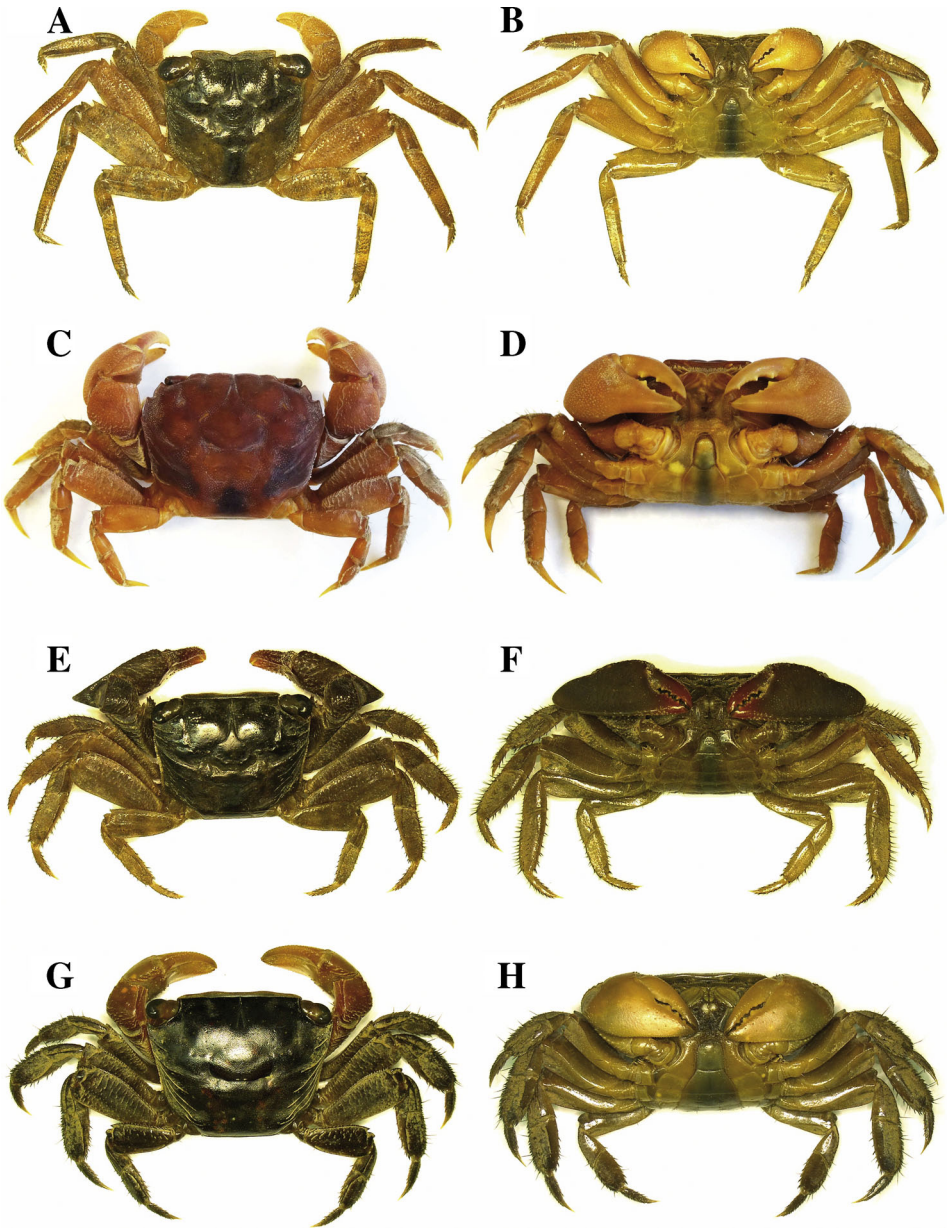

Fig. 16. General habitus of the four other sesarmid species known from West Africa: A-B, *Armases elegans* (Herklots, 1851), male (12.5 × 12.0), SMF 50748, Cameroon, Tiko River; C-D, *Metagrapsus curvatus* (H. Milne Edwards, 1837), male (27.80 × 23.29), SMF 49917, Ghana, Ada Foah; E-F, *Chiromantes buettikoferi* (De Man, 1883), male (13.51 × 10.9), SMF 50750, Cameroon Campo River; G-H, *Chiromantes angolense* (De Brito Capello, 1864), male (19.7 × 15.6), SMF 50749, Cameroon Campo River.

– Chela with outer face not as flattened as above and a relatively long dactylus (cdl/pl ca. 0.7) (fig. 16G, H) ..... *Chiromantes angolense* (De Brito Capello, 1864)

4. Carapace to some extent ovate, widest part between the posterior pair of epibranchial teeth (fig. 16 C, D) ..... *Metagrapsus curvatus* (H. Milne Edwards, 1837)
– Carapace subrectangular, widest part usually between the anterior pair of epibranchial teeth (e.g., fig. 1) 5

5. Chelar dactylar tubercles not well developed, palm pectinated crest with no chitinous teeth (fig. 13C, F) ..... *Guinearma kamermani* (De Man, 1883)
– Chelar dactylar tubercles well developed, palm pectinated crest with chitinous teeth (fig. 13A, D) 6

6. Chelar dactylar tubercles significantly elongated transversely, looking like transverse lines or ridges (26-34 in number) (fig. 13D) ..... *Guinearma alberti* (Rathbun, 1921)
– Chelar dactylar tubercles oval (11-19 in number) (fig. 13E) ..... *Guinearma huzardi* (Desmarest, 1825)

ACKNOWLEDGEMENTS

We are indebted to many institutions and colleagues which/who facilitated specimens, photos, allowed access to samples, or helped in the field. Among those our special thanks go to Yves Samyn, Thierry Backeljau, Yves Barette, Brigitte Segers and Cédric d'Udekem d'Acoz from the Royal Belgian Institute of Natural Sciences, Brussels (Belgium); to Didier van den Spiegel, Jonathan Brecko and Christophe Allard from the Royal Museum for Central Africa, Tervuren (Belgium); to Angelika Brandt and Kristin Arnold from the Senckenberg Museum Frankfurt a. M. (Germany); to Charles Fransen and Karen van Dorp from the Naturalis Biodiversity Center in Leiden (The Netherlands); to Laure Corbari, Paula Martini-Lefevre and Danièle Guinot from the Muséum National d'Histoire Naturelle, Paris (France); to Charles Oliver Coleman from the Museum für Naturkunde Berlin (Germany); Peter C. Dworschak from Naturhistorisches Museum, Wien (Austria); to Roland Melzer and Stefan Friedrich from Zoologische Staatssammlung München (Germany); to Estefania Rodriguez and Lily Berniker from the American Museum of Natural History, New York (U.S.A.). The first author's visits to the Naturalis Biodiversity Center in Leiden (the Netherlands) (NL-TAF) and Muséum National d'Histoire Naturelle, Paris (France) (FR-TAF) received support from the SYNTHESYS Project (http://www.synthesys.info/), financed by the European Community, Research Infrastructure Action under the FP7 'Capacities' and is greatly appreciated. We furthermore appreciate the help of three reviewers and of the managing editor of Crustaceana, Carel von Vaupel Klein.

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First received 29 August 2018.
Final version accepted 13 October 2018.