

A new species of ghost shrimp from the Gulf of Aqaba, Red Sea (Crustacea: Decapoda: Callianassidae)

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Abstract

A new species of ghost shrimp, *Callianassa aqabaensis* sp.n., is described on the basis of specimens collected from sublittoral habitats in the Gulf of Aqaba, northern Red Sea. It differs from all other members of the subfamily Callianassinae in having a well-developed branchiostegal scerite and in having the combination of an acute rostrum, operculiform Mxp3 and unequal chelipeds, with a meral hook present only in the major one. In addition, both male and female specimens have both male and female gonopores, thus being the first record for intersex within the Callianassidae.

Key words: Callianassidae, new species, Gulf of Aqaba, intersex

Introduction

Callianassid ghost shrimp are among the most common burrowing organisms in littoral and sublittoral sediments. About 8 species from this family have been reported to occur in the Red Sea (SAKAI 1999). Only 3 species have been studied in detail: *Callianassa bouvieri* NOBILI, 1904 (DWORSCHAK & PERVESLER 1988), *Glypturus* (as *Callichirus*) *laurae* (DE SAINT LAURENT, 1984) (DE VAUGELAS & DE SAINT LAURENT 1984, DE VAUGELAS 1984, 1990, DE VAUGELAS & BUSCAIL 1990, ABU-HILAL & al. 1988), and *Neocallichirus* (as *Callichirus*) *jousseau mei* (NOBILI, 1904) (DE VAUGELAS 1984, 1990).

Recent sampling in the Gulf of Aqaba revealed several new records and two undescribed species. One of these taxa is described herein.

Material and methods

Specimens were collected at three different sites in the Gulf of Aqaba, Jordan (Fig. 1):

- 1) In front of the Royal Diving Club (RDC) (29.470°N 34.973°E), ca. 15 km south of the town of Aqaba.
- 2) In front of Club Murjan (29.489°N 34.988°E), ca. 10 km south of the town of Aqaba.
- 3) At the diving spot "Saudi Border" (29.451°N 34.970°E), ca. 20 km south of the town of Aqaba near the border to Saudi Arabia.

Animals were collected in October/November 2000 and November 2001 with a yabby pump while SCUBA-diving at depths between 4 and 30 m. Specimens were chilled on ice before they were fixed in 4% formaldehyde, Bouin's solution, 96% or 75% ethanol.

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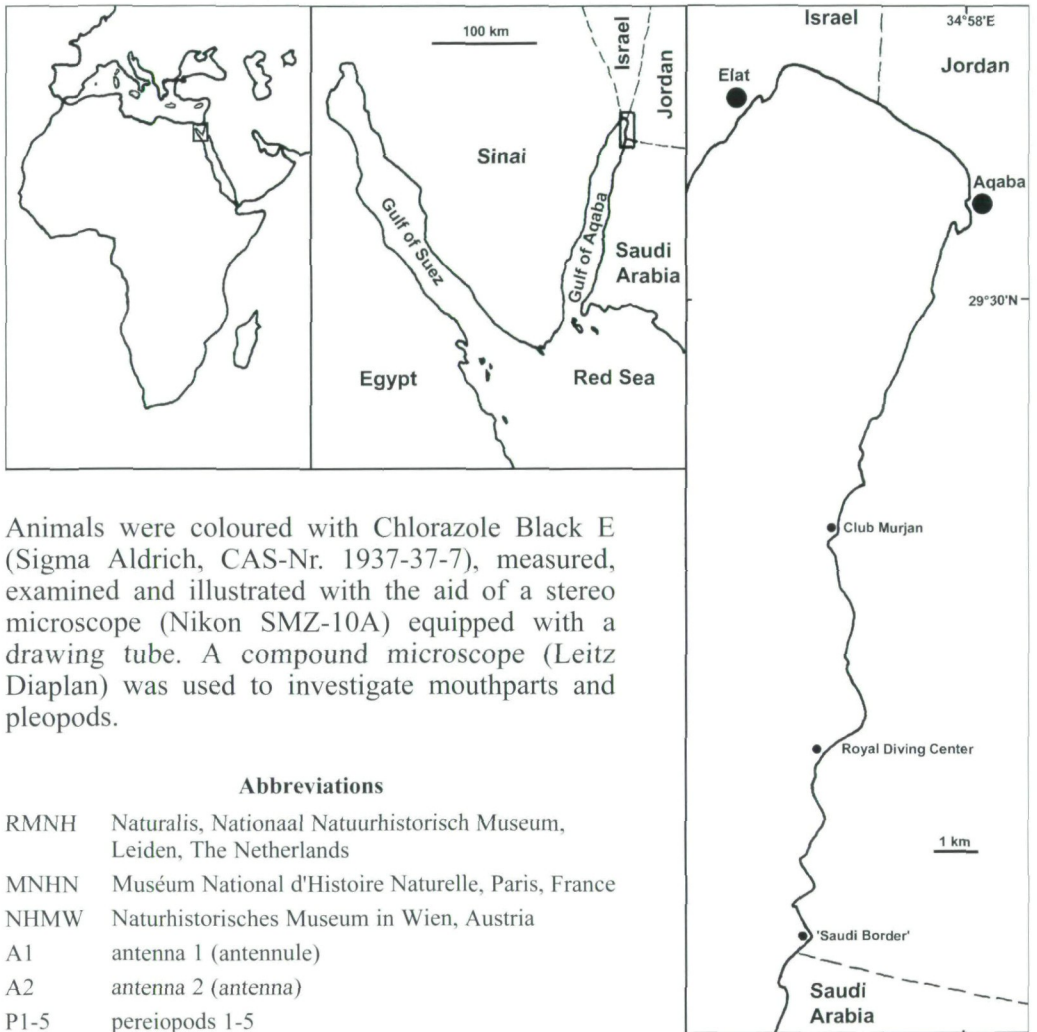


Fig. 1: Sampling sites in the Gulf of Aqaba

Animals were coloured with Chlorazole Black E (Sigma Aldrich, CAS-Nr. 1937-37-7), measured, examined and illustrated with the aid of a stereo microscope (Nikon SMZ-10A) equipped with a drawing tube. A compound microscope (Leitz Diaplan) was used to investigate mouthparts and pleopods.

Abbreviations

RMNH	Naturalis, Nationaal Natuurhistorisch Museum, Leiden, The Netherlands
MNHN	Muséum National d'Histoire Naturelle, Paris, France
NHMW	Naturhistorisches Museum in Wien, Austria
A1	antenna 1 (antennule)
A2	antenna 2 (antenna)
P1-5	pereiopods 1-5
Plp1-5	pleopods 1-5
Mxp1-3	maxillipeds 1-3
tl	total length in mm
cl	carapace length (including rostrum) in mm
RDC	Royal Diving Club, Aqaba, Jordan

Callianassa aqabaensis sp.n. (Figs 2-36)

Holotype: NHMW 16759, 1 male (tl 24, cl 6.2), Aqaba, Murjan, 10-14 m, P. Dworschak collected with yabby pump, 7 November 2001.

Allotype: NHMW 16760, 1 female (tl 23, cl 5.6), Aqaba, Saudi Border, 4-10 m, P. Dworschak collected with yabby pump 11 November 2001.

Paratypes: Aqaba, RDC, 23 October 2000: NHMW 16769, 1 male (cl 5.0); MNHN-Th 1422, 1 male (cl 5.4). – Aqaba, RDC, 11-13 m, 24 October 2000: MNHN-Th 1423, 1 male (cl 6.5); NHMW 16770, 1 female

(cl 3.2). – Aqaba, RDC, 8-10 m, 25 October 2000: NHMW 16771, 1 female (cl 3.5), 1 male (cl 3.2). – Aqaba, RDC, 11-28 m, 26 October 2000: NHMW 16772, 1 female (cl 3.3). – Aqaba, RDC, 10-14 m, 1 November 2000: MNHN-Th 1424, 1 female (cl 5.2); MNHN-Th 1425, 1 female (cl 3.6). – Aqaba, RDC, 9-19 m, 10 November 2001: NHMW 16761, 1 female (cl 5.2, both P1 missing); NHMW 16765, 1 female (cl 5.1), 1 male (cl 4.6). – Aqaba, RDC, 4-16 m, 12 November 2001: RMNH D 50013, 2 males (cl 4.5; 5.5), 2 females (cl 3.2; 4.0). – Aqaba, Saudi Border, 4-10 m, 11 November 2001: NHMW 16762, 1 juvenile; NHMW 16766, 1 female (cl 5.5). – Aqaba, Murjan, 10-14 m, 7 November 2001: NHMW 16763, 1 male (cl 6.7); NHMW 16764, 2 males (cl 5.0; 5.4). – Aqaba, Murjan, 4-10 m, 7 November 2001: NHMW 16768, 2 females (cl 4.7; 4.8).

Non-type material: Aqaba, RDC: 4.5 m, 1 November 2001, NHMW 16774, 1 female (cl 3.5, abdomen missing); 11-17 m, 2. November 2001, NHMW 16773, 1 female (cl 4.0, in Bouin's); 6-11 m, 3 November 2001, NHMW 16776, 5 males (cl 3.0; 3.3; 3.3; 3.5; 3.6); 4 November 2001, NHMW 16767, 1 female (cl 5.5, in Bouin's, with bopyrid isopod); 6-20 m, 10 November 2001, NHMW 16777, 5 males (cl 4.3; 4.3; 4.5; 4.5; 4.6; 6.0), 2 females (cl 4.3; 5.0).

Diagnosis: Rostrum with acute tip reaching to cornea. Branchiostegal scerite well defined as triangular plate. Eyestalks broadly triangular, dorsal cornea distinctive. A1 peduncle slightly shorter than A2 peduncle. Mxp3 operculiform, merus slightly projecting beyond articulation with carpus. Chelipeds unequal, major of adults with acute proximal meral hook, inferior margin of ischium with spines. Minor cheliped with merus unarmed, inferior margin of ischium with spines. Female Plp1 simple, two-segmented; Plp2 biramous. Male Plp1 simple, one-segmented, Plp2 vestigial or biramous. Plp3-5 with stubby projecting interna in both sexes.

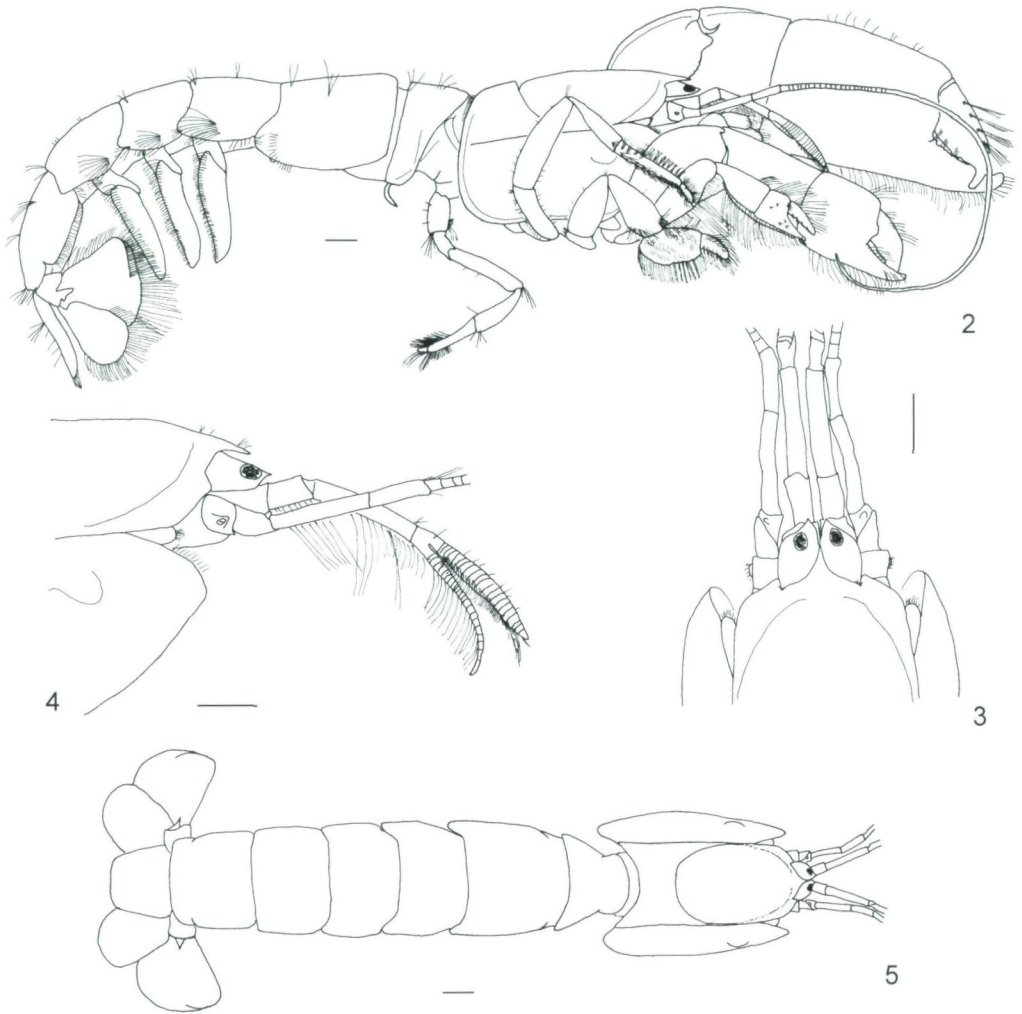
Description of male holotype: Frontal margin of carapace (Figs 2-4) consisting of acute rostrum reaching to cornea or two-thirds of eyestalks, and blunt lateral projections to each side; rostrum with short dorsal setae.

Carapace occupying about one-fourth of total body length (Fig. 2), lacking dorsal carina, with distinct linea thalassinica, and with a defined dorsal oval marked posteriorly by deep transverse cardiac furrow extending anteroventrally to either side above linea thalassinica as shallow sinuous groove demarcating posterior half of dorsal oval. Shallow groove originating immediately below linea thalassinica demarcating small triangular plate (branchiostegal scerite) between linea thalassinica and branchiostegite, plate rounded anteriorly and with short setae (Figs 3-4). Rounded hepatic boss laterally on anterior third of branchiostegite.

Abdomen long (Fig. 2); lateral length ratio of first to sixth abdominal somites 1.0: 2.0: 1.6: 1.4: 1.7: 2.0. First abdominal somite narrowed anteriorly, pleuron triangular with rounded ventral margin. Second abdominal somite with anterior margin straight, posterior margin expanded posterolaterally; with setal row near the posterior margin. Third to fifth abdominal somites each distinctly shorter than second somite; pleura each with tuft of moderately long plumose setae midlaterally and on posteroventral margin. Sixth abdominal somite subquadrate in dorsal view, slightly narrowed posteriorly, with lateral constriction in posterior half; ventral margin of pleurite with short setae.

Telson (Fig. 22) longer than broad (about 1.1 times as long as broad), posterior margin convex, with tiny median spine and two movable spinules each on posterolateral margin; dorsal surface with short transverse carina at anterior third bordered posteriorly by row of short and long setae (omitted in figure).

Ocular peduncle flattened dorsally, curved ventrally, longer than width at base, tip in dorsal view reaching to end of basal antennular segment (Fig. 4); mesial surfaces of



Figs 2-5: *Callianassa aqabaensis* sp.n.: holotype (NHMW 16759) in (2) lateral view, front in (3) dorsal and (4) lateral view (setae only shown in part). Allotype (NHMW 16760) in dorsal view (5, setation omitted). Scale is 1 mm.

peduncles touching each other proximally, divergent distally; anterolateral margin weakly sinuous in dorsal view, terminating in acute tip (Fig. 3). Cornea dark, disk shaped, about one-third of peduncle width in diameter, located dorsolaterally in distal third of peduncle.

Antennular peduncle as slender as and slightly shorter than antennal peduncle (Fig. 3). Basal segment short, with few setae mesially; penultimate segment slightly shorter than basal segment, with long setae ventrally; ultimate segment elongate, about 2.5 times as long as penultimate segment, with long setae ventrally; flagella subequal in length, longer than ultimate segment of peduncle; dorsal flagellum thicker than ventral one, with tufts of aesthetascs; ventral flagellum with dense setae. Antennal peduncle with first segment stout, excretory pore on lateral face; second segment short, as long as basal

segment, with distolateral margin produced in short, blunt projection; third segment shorter than second one; fourth segment longest, distinctly longer than basal 3 segments combined, cylindrical; fifth segment 0.6 times as long as fourth segment, cylindrical; scaphocerite rudimentary, scale-like; flagellum distinctly longer than carapace.

Epistome with long setae.

Mandibles (Figs 6, 7) with large, 3-segmented palp, elongated third article of palp slightly tapered and terminally rounded, concave on proximal external surface, long setae distally on second article and on proximal extensor surface of third, all upper surface of the latter with field of short, weakly hooked setae, heavier and less hooked setae terminally; incisor process with row of rounded calcareous teeth on mesial margin, with deeply concave inner surface; molar process with two small marginal teeth; paragnath rounded.

First maxilla (Fig. 8) with long, narrow endopod deflected proximally at articulation; proximal endite with very dense fine setation on lower mesial margin, terminal lobe with large setae; distal endite elongate, proximally narrow, and broadening terminally where it is armed with short stiff bristles; exopodite low and setose.

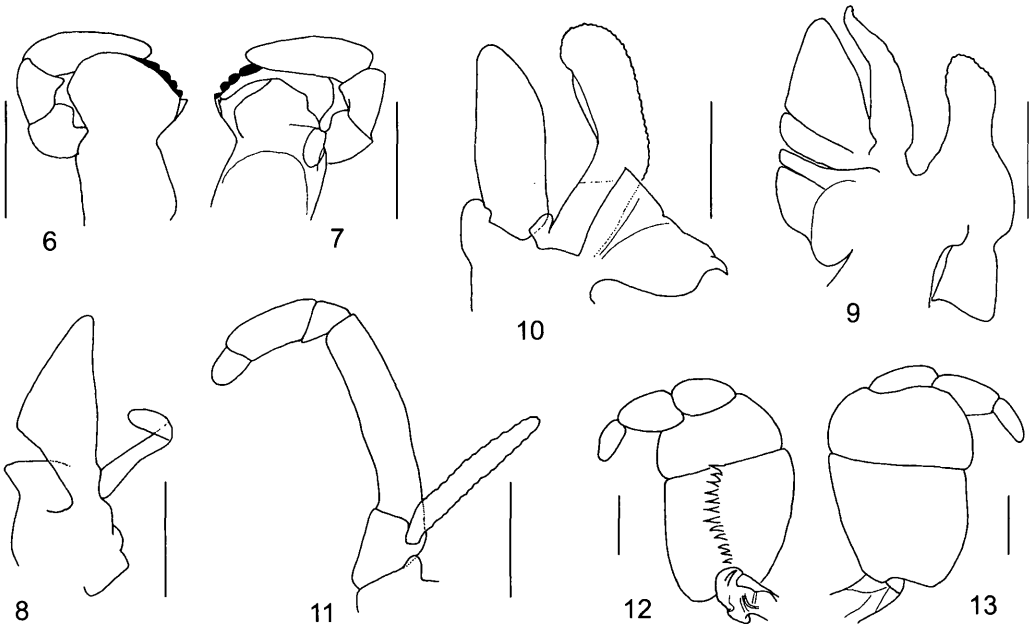
Second maxilla (Fig. 9) with endopod narrow distally, tip slightly bent; first and second endites each longitudinally subdivided and densely setose terminally; first endite with arcuate setose crest across external surface of lower lobe, internal surface fused to broad, rounded plate bearing long marginal setae; exopod forming large, broad scaphognathite.

First maxilliped (Fig. 10) with endopod greatly reduced, minute; proximal endite narrow, with setae on distomesial margin; distal endite elongate with straight mesial and curved outer margin, mesial half of external surface and margins heavily setose; exopod not noticeably broad, curved mesially, with marginal setae; epipod weakly bilobed with distal lobe smaller than proximal lobe, posterior end tapering to narrow terminus.

Second maxilliped (Fig. 11) with long, narrow endopod; endopodal merus length exceeding 4 times width, flexor margin with dense fringe of long, close-set setae; carpus short; propodus slightly arcuate, length 2 times width; dactylus short, about half as long as propodus, with terminal brush of stiff bristles; exopod narrow, shorter than endopodal merus, marginally fringed by long setae; epipod small.

Third maxilliped (Figs 12, 13) lacking exopod; endopod with long dense setation on flexor and extensor margins; coxa with upwardly curved spine; combined length of ischium-merus about 1.4 times width; ischium trapezoidal, widest at articulation with merus, internal surface with well defined crista dentata forming row of 12 outwardly curved spines; merus wider than long, distal margin of lateral face projecting beyond articulation with carpus; carpus ovoidal, longer than wide, with dense field of setae distally; propodus slender, ovoidal, 1.6 times as long as wide, internal surface with median field of dense setae; dactylus narrow, slightly arcuate, with small brush of setae terminally.

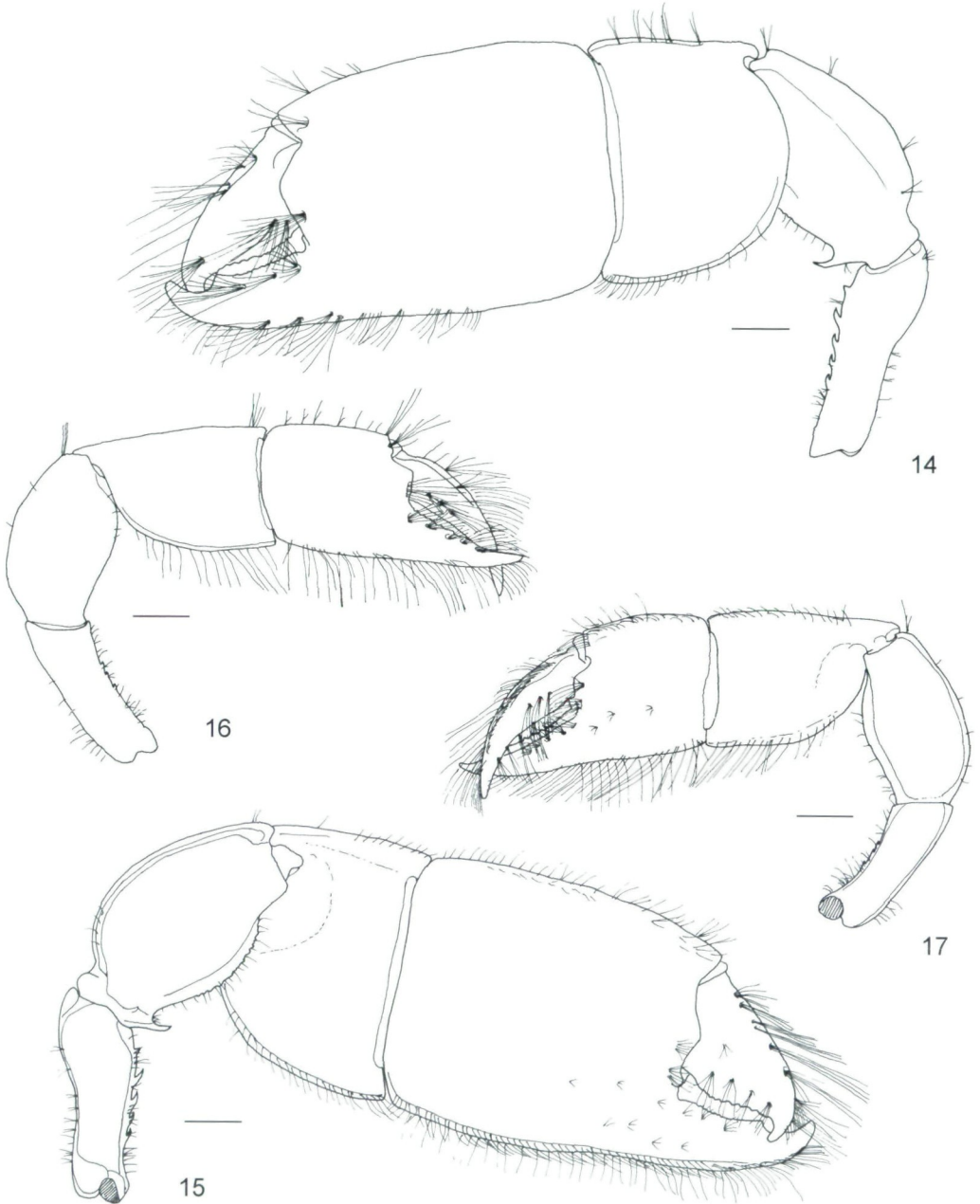
Branchial formula including exopods and epipods as described for first and second maxillipeds above; branchiae limited to pair of arthrobranchs on third maxilliped and pair of arthrobranchs on each of first through fourth pereopods.



Figs 6-13: *Callianassa aquabaensis* sp.n.: holotype (NHMW 16759): lateral (6) and mesial (7) view of mandible, mesial views of right maxilla 1 (8), maxilla 2 (9), mxp1 (10), mxp2 (11), mesial (12) and lateral (13) face of right mxp3 (setation omitted from all). Scale is 1 mm.

First pereiopods (Figs 14-17) forming dissimilar chelipeds, major cheliped heavy and massive (Figs 14, 15); ischium stout, extensor margin sinuous, flexor margin with 5 acute spines; merus 1.6 times as long as wide, dorsal margin convex, smooth; flexor margin convex with strong hook-like spine proximally and serrated carina medially; carpus shorter than merus, 0.8 times as long as wide, extensor margin straight, forming thin, unserrated carina overhanging mesial face; proximal flexor margin evenly rounded in outline, also forming sharply edged, unserrated carina, distal extensor corner slightly produced, mesial face with decalcified area proximally. Chela 1.6 times as long as wide; palm subrectangular in lateral view, 1.1 times as long as wide, extensor margin forming unserrated carina, slightly arched in lateral view; flexor margin (including fixed finger) also forming unserrated carina extending to midlength of fixed finger; lateral and mesial faces weakly convex, without spines or tubercles. Fixed finger noticeably curved on extensor margin; cutting edge armed with small tubercles proximally and one blunt tooth in distal third. Dactylus 0.55 times as long as palm, 0.66 times as wide at base as long, hooked distally, crossing tip of fixed finger; upper mesial face with tufts of strong setae, upper lateral face slightly excavated medially, with tufts of setae; cutting edge with row of small teeth.

Minor first pereiopod (Figs 16, 17) with chela about half as long and wide as major one. Ischium with slightly curved extensor margin, flexor margin with 3 small spines. Merus as long as and twice as wide as ischium, both extensor and flexor margins convex, margins and surfaces smooth. Carpus longer than merus and palm, 1.4 times as long as wide, extensor margin straight, flexor margin convex proximally, forming an unserrated



Figs 14-17: *Callianassa aqabaensis* sp.n.: holotype (NHMW 16759), lateral (14) and (15) mesial face of major cheliped; lateral (15) and mesial (17) face of minor cheliped. Scale is 1 mm.

carina, mesial face with uncalcified area proximally. Chela 1.8 times as long as wide, palm almost quadrate in lateral view; lateral and mesial faces weakly convex, without tubercles or spines; fixed finger slightly curved on extensor margin; cutting edge with

small triangular teeth; tufts of strong setae below cutting edge on lateral and mesial faces. Dactylus 1.2 times as long as palm, thin, about 0.33 wide as long proximally, slightly curved, crossing tip of fixed finger; mesial and lateral faces with tufts of setae medially; upper face slightly excavated with strong setae; cutting edge with low teeth; very narrow hiatus present when fingers are closed.

Second pereopod (Fig. 18) chelate. Ischium short, with few setae on extensor margin. Merus becoming shallower in distal half, 3 times as long as greatest width at midlength; flexor margin slightly sinuous, with row of long setae becoming shorter distally. Carpus becoming strongly wider distally, about twice as long as wide, with long setae on flexor and shorter setae on extensor margin, two tufted patches of short setae distally on lateral surface. Chela 1.1 times as long as carpus, with numerous setae becoming shorter and stiffer distally on both flexor and extensor margins, few tufts of short setae on lateral face. Palm 1.2 times as wide as long. Dactylus 1.5 times as long as palm; cutting edge of fixed finger with small low teeth proximally and distally, cutting edge of dactylus sharp, tips of fingers corneous.

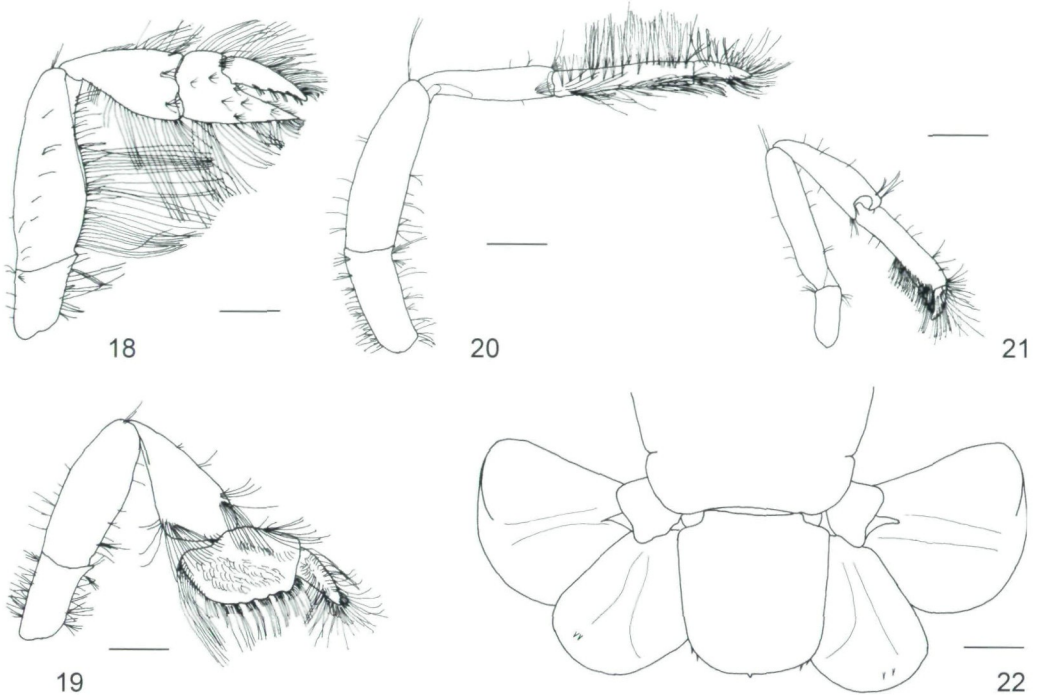
Third pereopod (Fig. 19) coxa with gonopore on mesial face (Fig. 23). Ischium short, flexor and extensor margins with tufts of setae. Merus twice as long as ischium, 2.8 times as long as wide. Carpus triangular in lateral view, 2 times as long as wide, bearing submarginal row of long setae distally along extensor margin and marginal row of long setae on flexor margin. Propodus with flexor margin produced into small lobe directed proximally, with long setae proximally on flexor and distally on extensor margin, lateral surface with numerous tufts of short setae except on longitudinal median portion; mesial surface with scattered tufts of short setae; tufts of long and short setae distally on flexor margin. Dactylus tear-shaped, weakly curved, terminating in corneous tip, with short to long setae on margins and lateral face.

Fourth pereopod (Fig. 20) slender, longer than P2 and P3. Ischium short, with tufts of setae on extensor and flexor margin. Merus twice as long as ischium, 3 times as long as wide. Carpus 0.8 times as long as merus, 4 times as long as wide, one tuft of setae distolaterally. Propodus as long as carpus, more slender, with row of tufts of long setae on extensor margin, flexor margin with row of long setae on proximal 0.75 and dense cluster of stiff setae on distal 0.25. One long, stiff, thick, serrated seta on distal margin opposing dactylus (not figured). Dactylus slender, ending in corneous tip, with short to long setae on margins and lateral face.

Fifth pereopod (Fig. 21) slender, subchelate, shorter than P2-4. Coxa short, rounded, two times as long as wide, gonopore distally on anteromesial face (Fig. 23). Ischium shorter than coxa. Merus 2.5 times as long as ischium, 5 times as long as wide. Carpus becoming wider distally, with tuft of setae dorsodistally. Propodus as long as carpus, flexor margin with dense cluster of stiff setae on distal half, obscuring short fixed finger. Dactylus slightly curved, setose.

First pleopod uniramous, consisting of one article (Fig. 25), only few setae distally. Second pleopod a vestigial bud (Figs 23, 28).

Third to fifth pleopods (Fig. 31) forming large, posteriorly cupped fans when coupled at mesial margins of endopods; protopods broad, endopods broadly triangular, each with stubby appendix interna projecting from proximal third of mesial margin (Fig. 32); appendices internae with cincinnuri; each exopod longer and narrower than endopod.



Figs 18-22: *Callianassa aqabaensis* sp.n.: holotype (NHMW 16759), lateral faces of right P2 (18), P3 (19), P4 (20), P5 (21). Dorsal view of telson and uropods (22, setation omitted). Scale is 1 mm.

Uropod (Fig. 22) with protopod having distinctly bilobed posterodorsal margin; endopod ovate, 1.5 times as long as wide, slightly overreaching telson; dorsal surface of endopod carinate medially in proximal 0.75, bearing two submarginal spinules at posterolateral margin, dense setae on posterolateral and mesial margin; exopod slightly longer than endopod, anterior margin straight with long setae, posterolateral margin rounded with several rows of dense stiff setae; dorsal plate weakly developed, fringed with stiff setae.

Description of female: General shape of body (Fig. 5) and chelipeds similar to that of the male. Gonopores present on coxae of P3 and coxae of P5 (Fig. 24). First pleopod uniramous, composed of two articles (Fig. 26); second pleopod biramous, endopod composed of two articles, with few setae distally on both rami and laterally on exopod (Fig. 29).

Size: Ranging in known specimens from cl 2.5 to 6.7 mm, and tl 9 to 23 mm.

Colour: Integument translucent except for both chelipeds which are pink in smaller and red in larger specimens near articulations and on upper surfaces. Larger specimens with yellow to pale red chromatophores on dorsal oval and abdominal somites 3-6; telson and uropods yellow. Translucence of abdomen revealing large yellow to orange-brown lobes of hepatopancreas filling first 2 somites of abdomen.

Type locality: Red Sea, Gulf of Aqaba

Known range and habitat: Known only from subtidal sediments south of Aqaba. Here, the bottom adjacent to the fringing reef consists of a gently (Murjan) to steeply (from 3 to 18 m within 100 m at RDC) sloping fine sand bottom. The bottom, bare of seagrass, is characterised by numerous large mounds and funnels produced by the large callianassid shrimp *Glypturus laurae* (DE SAINT LAURENT, 1984)(see DE VAUGELAS & DE SAINT LAURENT 1984). Between these large mounds, numerous smaller mounds (up to 22·m²) and funnels (up to 20·m²) are present. Sampling with the yabby pump yielded three species from those types of burrow openings: the thomassiniid *Thomassinia gebioides* DE SAINT LAURENT, 1979, and the callianassids *Callianassa cf. gravieri* NOBILI, 1905 and the new species described herein.

Etymology: Named after the type locality.

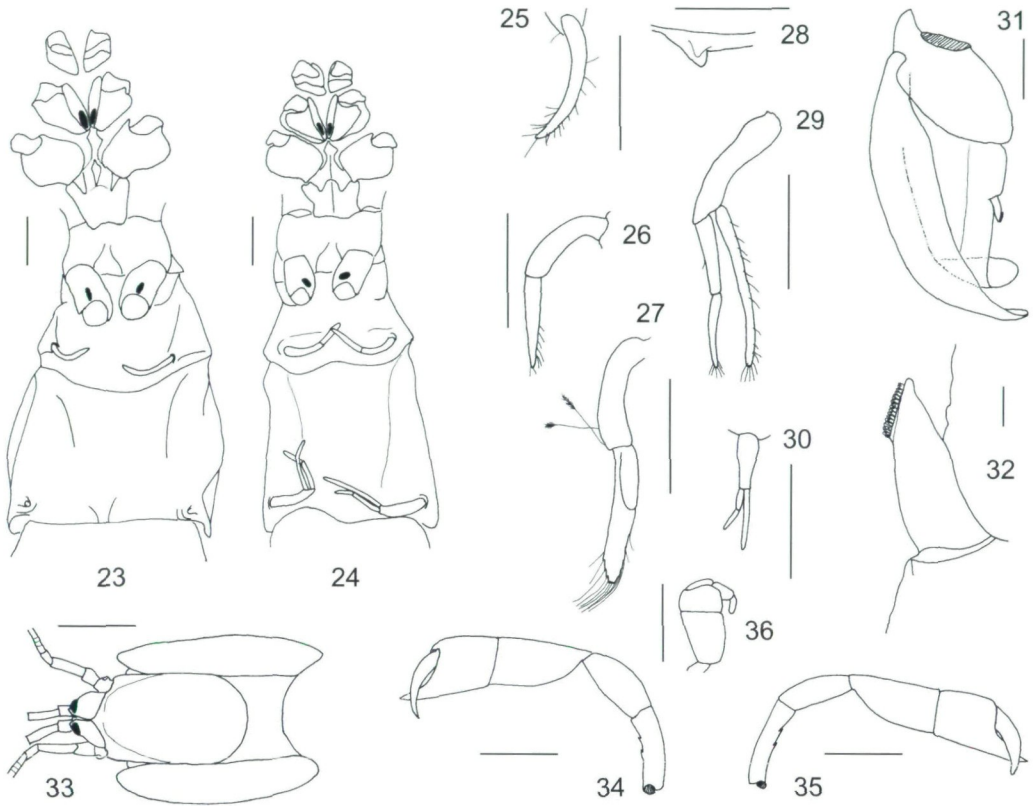
Parasites: One specimen was parasitised by an as yet unidentified bopyrid isopod.

Variations: All individuals with cl > 3 mm have both male and female gonopores. First and second pleopods, however, showed a clear sexual dimorphism. In one group (females) the Plp1 is simple and consists of two articles (Fig. 26) with the Plp2 always present and biramous (Fig. 29). In some specimens, the Plp1 showed a differentiation in the second article, being broader (with shoulder) proximally (Fig. 27) and flattened distally. In the second group (males), the Plp1 is simple and consists of only one article (Fig. 25). The Plp2 is either a small bud (Fig. 28) or biramous (Fig. 30) and always shorter than that of females of even smaller size (Figs 23, 24). Juvenile specimens that lack gonopores have no signs of Plp1-2. The shape and size of the chelipeds showed no obvious sexual dimorphism.

The major cheliped is heavy and massive in larger specimens, but similar to minor in very small ones. In one juvenile (cl 2.5, Figs 34, 35) and a small female (cl 3.2), the meral hook is missing also in the major cheliped, and in one female (cl 3.3) it is only weakly developed. In juveniles, the postocular projections are less developed than in larger specimens (Fig. 33). The number of spines on the flexor border of the ischium of major P1 ranges from two to six, that on ischium of minor P1 from two to four. The Mxp3 appears less wide in smaller specimens than in larger ones, the combined length of the ischium-merus being up to 1.8 times width (Fig. 36). The number of spines of the *crista dentata* ranges from 10 to 14.

Discussion

With its slender propodus and dactylus of Mxp3 and stubby projecting appendices inter-nae, *Callianassa aqabaensis* sp.n. is clearly a member of the subfamily Callianassinae sensu MANNING & FELDER (1991). Ten genera can be placed into this subfamily: *Callianassa* (s.s.) LEACH, 1814, *Trypaea* DANA, 1852, *Biffarius* MANNING & FELDER, 1991, *Notiax* MANNING & FELDER, 1991, *Neotrypaea* MANNING & FELDER, 1991, *Poti* RODRIGUES & MANNING, 1992, *Gilvossius* MANNING & FELDER, 1992, *Necallianassa* HEARD & MANNING, 1998, *Nihonotrypaea* MANNING & TAMAKI, 1998, and *Pseudobiffarius* HEARD & MANNING, 2000. When using the key in MANNING & FELDER (1991) and that in POORE (1994), *Callianassa aqabaensis* sp.n. keys out as *Notiax* MANNING & FELDER, 1991. With the slightly projecting merus of Mxp3, however, *Callianassa aqabaensis* sp.n. does not fit the definition of *Notiax* given by MANNING & FELDER (1991).



Figs. 23-36: *Callianassa aqabaensis* sp.n.: 23, 25, 28, 31, 32 holotype (NHMW 16759); 24, 26, 29 allotype (NHMW 16760); 27, paratype (NHMW 16761); 30, paratype (NHMW 16763), 33-36, paratype (NHMW 16762). Sternum and coxae of P2-5, abdominal somites 1-2 of (23) male and (24) female in ventral view (setation omitted), lateral views of left Plp1 (25) and (28) right Plp2, anterior view of right Plp3 (31) (setation omitted) and (32) appendix interna of male holotype (cl 6.2); posterior views of left Plp1 (26) and Plp2 (29) of allotype; anterior view of right Plp1 (27) of female paratype (cl 5.2); anterior view of left Plp2 (30) of male paratype (cl 6.7 mm); dorsal view of carapace (33), mesial views of major (34) and minor (35) cheliped, and lateral view of Mxp3 (36) of juvenile paratype (cl 2.5) (setation omitted). Scale is 1 mm in 23-31, 33-36; 100 μ m in 32.

In addition, male Plp2 differs from that in *Notiax*, which was defined as slender and biramous in the text (MANNING & FELDER 1991: 773) but figured as uniramous (MANNING & FELDER, 1991: Fig. 11f); see also FERRARI (1981: Pl. 11 fig. 17). In the second species in this genus, *N. santarita* THATJE, 2000, the male lacks Plp2 and the Mxp3 lacks a crista dentata (THATJE 2000). The new species also has some characters of *Pseudobiffarius* HEARD & MANNING, 2000, but differs because the chelipeds are unequal in females, A1 is shorter than A2 peduncle, and Plp2 is present (at least as buds) in males. The new species is therefore placed in the genus *Callianassa* sensu lato. This genus is considered here as a polyphyletic clade, with the species included as listed in TUDGE & al. (2000), but not in the sense of SAKAI (1999) who proposed a much larger genus as he synonymised all genera attributable to the subfamily Callianassinae (see above) with *Callianassa* (see NGOC-HO in press).

When using the key to the Indo-Pacific species of *Callianassa* in SAKAI (1999), *Callianassa aqabaensis* sp.n. keys out near *C. bouvieri* and *C. acutirostrella*. It differs, however, from the first by the shape of the chelipeds and the presence of Plp1-2 in males. From the latter, it differs in the shape of the tailfan and the much shorter rostral spine.

The new species also resembles *Callianassa brevirostris* SAKAI, 2002 in the shape of the front, Mxp3, major P1, P3, and Plp3-5, but differs in the shape of the telson by having a convex posterior margin, the uropodal endopod being broader, and the female Plp1 being only two-articulated while it is three-articulated in *Callianassa brevirostris*.

Members of the family Callianassidae are usually gonochoristic. Hermaphrodites among the Thalassinidea are, however, typical of the Calocarididae (see RUNNSTRÖM 1915, KENSLEY 1989). Within the Upogebiidae, a few specimens have been observed to possess both male and female gonopores in several species: *Upogebia deltaura* (TUNBERG 1986), *U. stellata* (PINN & al 2001), *U. thistlei* (WILLIAMS 1986), *U. edentata* (LIN & al. 2001), *Austinogebia spinifrons* (SAKAI 1984, SAKAI & TÜRKAY 1995, NGOC-HO 2001), *A. edulis* (NGOC-HO & CHAN 1992). According to NGOC-HO (2001) those instances must be referred to as "intersex" rather than "hermaphrodite" as it is uncertain whether such gonopores are functional or not. All females of *Callianassa aqabaensis* sp.n. are clearly immature because they show no sign of ripe ovaries, which are usually visible as yellow, orange or red masses shining through the translucent tegument of the abdominal somites. This is the first record of intersex within the family Callianassidae.

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