

A new species of *Eucalliax* Manning & Felder, 1991 (Decapoda: Callianassidae) from the Red Sea

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Abstract.—*Eucalliax kensleyi*, a new species, is described from sublittoral sediment in the Gulf of Aqaba, Red Sea. Of the species presently assigned to the genus *Eucalliax* Manning & Felder, 1991, the new species appears to be most closely related to *E. bulimba* (Poore & Griffin, 1979), presently known from a male taken in Moreton Bay and a female taken at Britomart Reef, Queensland, Australia. *Eucalliax kensleyi* differs from *E. bulimba* in having a very short subrectangular telson and a triangular tooth on the cutting edge of at least one cheliped.

Recent sampling of thalassinideans from sublittoral sandy bottoms in the Gulf of Aqaba, Red Sea revealed several new records and two undescribed species. One of those was described recently (Dworschak 2003), and the second species is described herein. The types have been deposited in the Naturhistorisches Museum Wien, Austria (NHMW).

Size is expressed as total length (tl in mm) from the tip of the rostrum to the end of the telson and as carapace length (cl in mm) from the tip of the rostrum to the posterior median edge of the carapace. Other abbreviations used include: RDC, Royal Diving Club; Mxp3, third maxilliped; coll., collected; QM, Queensland Museum, Brisbane, Australia.

Eucalliax Manning & Felder, 1991

Eucalliax kensleyi, new species

Figs. 1–4, 5a, b

Type material.—NHMW 16779, female, Aqaba, RDC, 9.9 m, P. Dworschak coll. with yabby pump 10 November 2001, holotype; NHMW 16780, 1 female, Aqaba, RDC, 22.6 m, P. Dworschak coll. with yabby pump 31 October 2002, paratype.

Other material investigated.—*Eucalliax*

aequimana (Baker, 1907), NHMW 19365, 1 female (cl 8.2), Western Australia, Shark Bay, Freycinet Reach, Whalebone, sand, 2–3 m depth, D. Abed-Navandi coll. with yabby pump 17 September 1998. *Eucalliax bulimba* (Poore & Griffin, 1979), holotype, QM W1525, 1 male (cl 10.0), Australia, SE Queensland, Moreton Bay, Mud Is., 27°20'S 153°15'E, V.F. Collin coll. 12 October 1942.

Diagnosis.—Rostrum acute, extending approximately ½ length of eyestalks. Carapace lacking dorsal oval. Antennal peduncles overreaching antennular peduncles. Chelipeds almost equal in size and shape, lacking acute teeth or spines at distal corners of carpus. Telson twice as broad as long, lacking transverse carina.

Description.—Dorsally, carapace of same length as abdominal somites 1 and 2 combined (Fig. 1a, b). Frontal margin of carapace with broadly triangular rostrum; rostrum acute terminally, flanked by weakly excavated shoulders forming anteriorly produced prominences lateral to margins of eyestalks; rostrum extending to ½ visible length of eyestalks in dorsal view, ventrally bearing few setae. Lateral projections with setae dorsally. Carapace lacking distinct dorsal oval, cardiac prominence, and dorsal

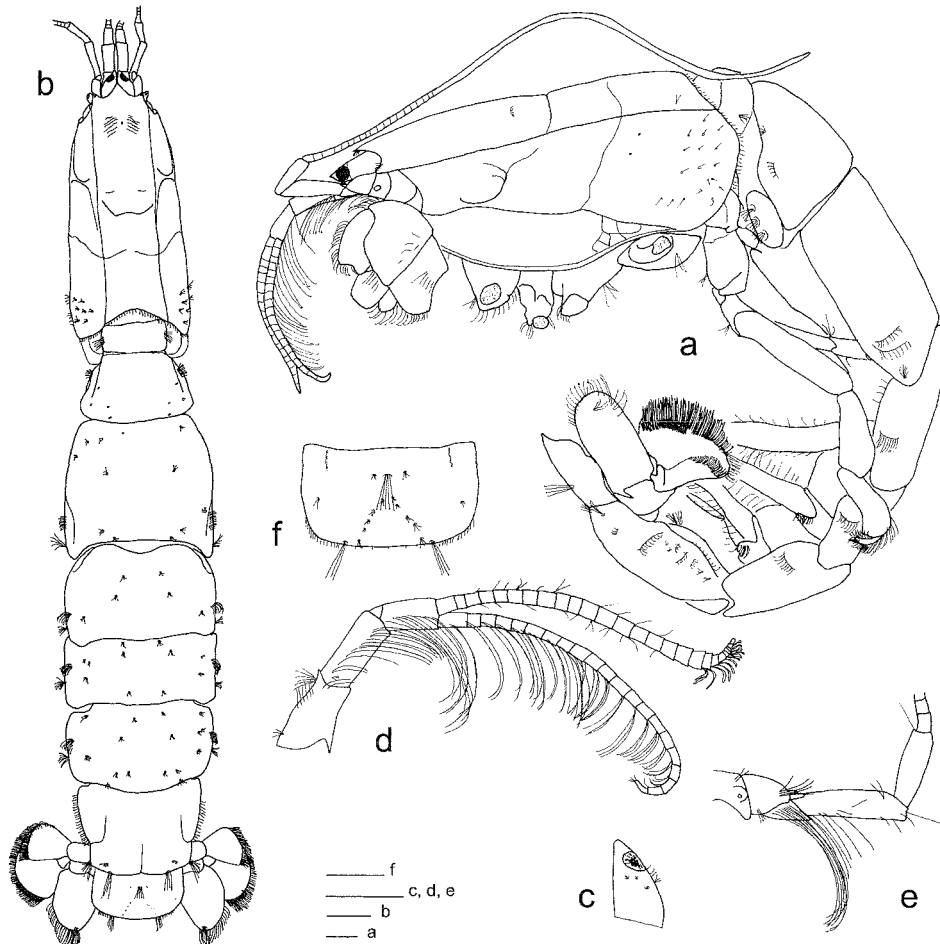


Fig. 1. *Eucalliax kensleyi*, female holotype, Aqaba, Red Sea, NHMW 16779: a, lateral view; b, dorsal view; c, dorsal aspect of right eyestalk; d, right first antenna in lateral view; e, right second antenna in lateral view; f, dorsal aspect of telson. Scale lines indicate 1 mm.

carina. Cervical groove distinct, disjunct near linea thalassinica. Linea thalassinica strong, parallel to midline of carapace. Strong hepatic boss in anterior $\frac{1}{3}$ of carapace ventral to linea thalassinica. Distinct suture (linea anomurica) ventral to hepatic boss extending posteroventrally to ventral margin of carapace, there continuing in complex network of sutures. Cardiac suture in middle posterior half of carapace well defined, incomplete across midline of carapace, extending anteroventrally to linea anomurica. Lateral face of branchiostegite with minute setose punctae in posterior $\frac{1}{5}$.

Subantennular region of epistome bearing dense tuft of long setae.

Eyestalks (Figs. 1a, b, c, 4a) dorsally flattened, slightly curved ventrally, length 1.7 times width, in dorsal view reaching beyond basal antennal article; mesial surfaces broadly triangular, flattened so eyestalks abutt closely at midline; anterolateral margin arcuate, joining mesial margin at rounded tip; pigmented region distinct in distal $\frac{1}{3}$ of dorsolateral surface, few setose punctae posteriorly on dorsal surface, few setae on lateral surface posterior to cornea.

Antennular peduncle shorter but slightly

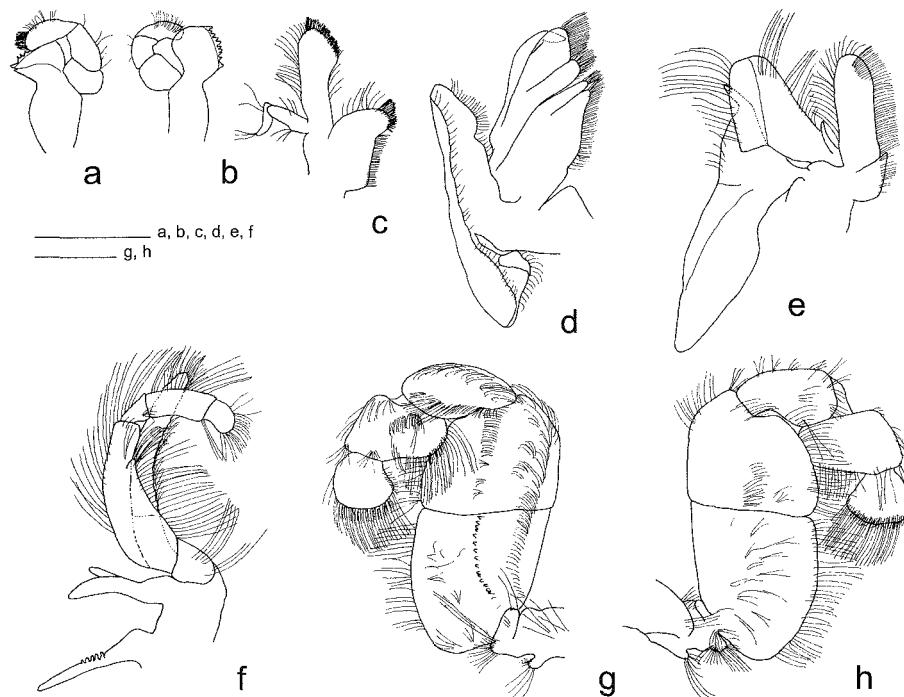


Fig. 2. *Eucalliax kensleyi*, female holotype, Aqaba, Red Sea, NHMW 16779, right appendages; a, g, internal surface; b-f, h, external surface: a, b, mandible, excluding paragnaths; c, first maxilla; d, second maxilla; e, first maxilliped; f, second maxilliped; g, h, third maxilliped. Scale lines indicate 1 mm.

heavier than antennal peduncle (Figs. 1a, b, 4a); basal article laterally and ventrally inflated; second article slightly longer than basal article, third article about $\frac{2}{3}$ length of second; second and third articles with ventrolateral row of long, ventrally directed setae, continued onto ventral ramus of flagellum; rami of flagellum about equal length, near 6 times length of third article of peduncle; dorsal ramus with sparse short setae, subterminal articles of dorsal ramus heavier than those of ventral ramus and with thick line of ventral aesthetascs (Fig. 1d).

Antennal peduncle 1.4 times length of antennular peduncle (Fig. 1b, e); basal article with dorsolateral carina bearing regular line of fine setae above laterally produced excretory pore; second article with deep, diagonal ventrolateral furrow, distally with field of long setae below ventrolateral suture and another on dorsolateral surface,

broad, articulated dorsal scale at joint with third article; third article elongate, longer than fourth or combined length of first two, fourth article narrower than third; flagellum sparsely setose, extending posteriorly to middle of pleonite 1 (Fig. 1a).

Mandible (Fig. 2a, b) with large, terminally setose, 3-segmented palp, third article of palp terminally rounded; incisor process with well defined teeth on cutting margin, internal surface with lip giving rise to molar process proximal to incisor teeth; paragnath uncalcified, set against proximal surface of molar process.

First maxilla (Fig. 2c) with endopodal palp long, narrow, terminal article deflected proximally at articulation; proximal endite densely setose on concave margin, terminally with dense field of setae; distal endite elongate, terminally truncate and armed with stiff bristles; exopodite low, rounded.

Second maxilla (Fig. 2d) with endopod

narrowed at distal end, terminus directed mesially, first and second endites each longitudinally subdivided, exopod forming large, broad, scaphognathite.

First maxilliped (Fig. 2e) with endopod reduced, minute; proximal endite triangular; distal endite elongate, mesial $\frac{1}{3}$ of external surface and all margins heavily setose, internal surface concave; exopod triangular, divided by transverse suture; distal part broad and with long marginal setation at its mesial end, proximal part with field of mesially directed setae near mesial end; epipod large, broad, weakly subdivided by transverse suture, its anterior end tapered, angular.

Second maxilliped (Fig. 2f) with long, narrow endopod; endopodal merus arcuate, slightly heavier in proximal half than in distal, flexor margin with dense fringe of long, close-set setae; carpus short; propodus heavy, weakly arcuate, length 2 times width, less than $\frac{1}{2}$ length of merus; dactylus short, about $\frac{1}{2}$ length of propodus, extensor margin arcuate, tip with dense serrate setae; exopod longer than endopodal merus and carpus combined, marginally fringed by long setae, subdivided by transverse suture at $\frac{1}{4}$ length; epipod small, biramous, arthrobranch greatly reduced.

Third maxilliped (Fig. 2g, h) with tiny exopod; endopod with long dense setation on mesial margin; endopodal ischium subtriangular, slightly longer than broad, proximomesial lip rounded, internal surface with medial longitudinally oriented elevation bearing well-defined curved row of 13 sharp teeth; merus subquadrate, slightly broader than long; carpus strongly flexed in proximal third with setose lobe on flexor margin; propodus large, subquadrate, 1.5 times broader than long; dactylus broad terminally, as long as broad, fringed with very dense field of close-set, stiff serrated setae on broad terminal margin.

Branchial formula includes exopods and epipods as described for first, second and third maxillipeds above; branchiae limited to single rudimentary arthrobranch on sec-

ond maxilliped, pair of arthrobranches on third maxilliped, and pair of arthrobranches on each of the first through fourth pereopods.

First pereopods with major and minor cheliped strongly developed, almost equal in size, dissimilar (in holotype) or similar (in paratype) in dentition of fixed fingers. Major cheliped of holotype (Fig. 3a, b) strongly calcified; ischium slender, superior margin almost straight, flexor margin with three low tubercles proximally, length about 1.6 times breadth; carpus broad, increasing in breadth distally, inferior margin arcuate, superior and inferior margins keeled, terminating distally in blunt corners, field of setae on mesial faces near margin; propodus heavy, length (including fixed finger) about 1.4 times height, inner surface of palm smooth; deep unarmed furrow extending posteriorly from just below gape of fingers on outer face of palm; superior and inferior propodal margins keeled, keel of inferior becoming ill-defined beyond mid-length and absent on fixed finger, tufts of setae on inner face below superior margin and above inferior margin; fixed finger thick, prehensile margin armed with one well separated triangular tooth in mid-length, microserration on upper margin of tooth and distally of it, distal $\frac{1}{3}$ of finger unarmed, terminating in acute tip; weak unarmed furrow extending from below the tooth to tip of finger on mesial face; dactylus heavy, curved, line of 8 setose punctae on internal side of superior margin, external face with weak punctae in proximal $\frac{3}{4}$ and one strong setose punctum near tip.

Minor cheliped (Fig. 3c, d) slightly smaller in size, similar in shape, ischium more slender, merus less broad and long, carpus and propodus 0.9 times the height of these articles in the major cheliped; no triangular tooth on cutting edge of fixed finger, but field of small tubercles on outer face of propodus below insertion of dactylus; dactylus more slender than in major cheliped.

Major and minor cheliped in female

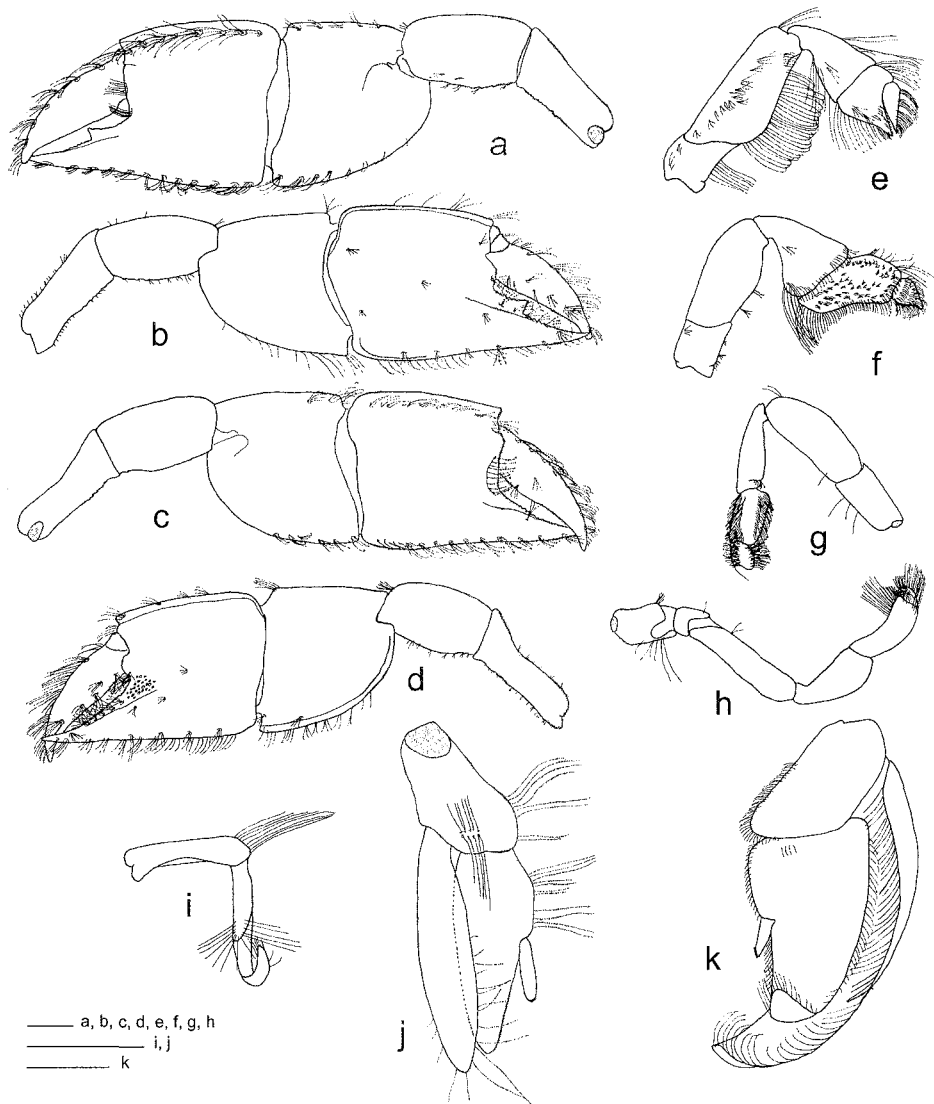


Fig. 3. *Eucalliax kensleyi*, female holotype, Aqaba, Red Sea, NHMW 16779; a, c, internal surface; b, d–h, external surface; a, b, major cheliped; c, d, minor cheliped; e, second pereopod; f, third pereopod; g, fourth pereopod; h, fifth pereopod; i, right first pleopod, posterior surface; j, right second pleopod, anterior surface; k, right third pleopod, posterior surface. Scale lines indicate 1 mm.

paratype of similar size and shape between the right and the left (Fig. 4b–e), both with triangular tooth on cutting edge of fixed finger.

Second pereopod (Fig. 3e) chelate, most of flexor margins of ischium and merus lined with evenly spaced long setae, similar setae restricted primarily to distal patches on flexor margin in carpus, inferior margin

of propodus with similar setal patches, which are long proximally, progressively more reduced in length and stiffened distally, subterminally becoming dense patch of short, stiff bristles; prehensile margins of both fingers corneous, finely microserrate along straight edge over most of length, microserration terminating distally in corneous tips of fingers; superior margin of dac-

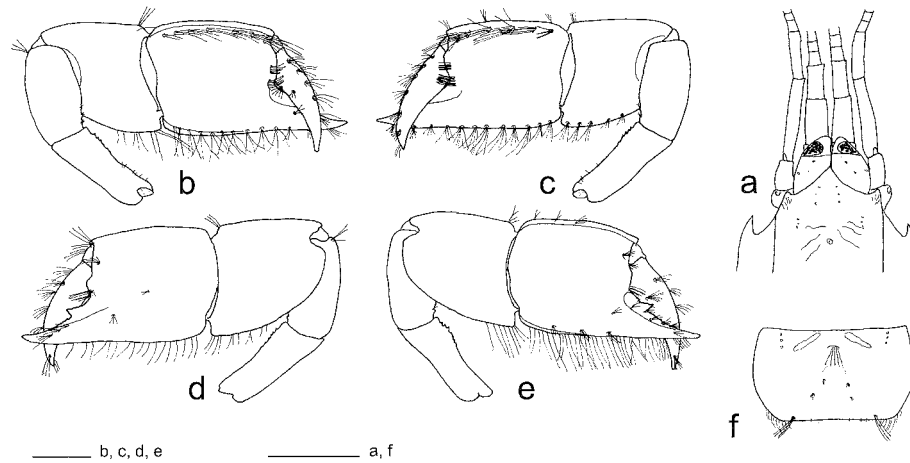


Fig. 4. *Eucalliax kensleyi*, female paratype, Aqaba, Red Sea, NHMW 16780; a, f, dorsal aspect; b, c, internal surface; d, e, external surface; a, anterior carapace, eyestalks, and antennae; b, c, left (major) cheliped; d, e, right (minor) cheliped; f, telson. Scale lines indicate 1 mm.

tylus slightly sinuous, with patches of stiff, arched bristles becoming increasingly reduced in length, close-set and more arched distally.

Third pereopod (Fig. 3f) ischium short, half length of merus; merus length about 2 times width, flexor margin weakly sinuous, with two tufts of setae; carpus broadly flared distally to produce strong inferior lobe, width there about $\frac{3}{4}$ length, inferior lobe terminally with field of long arched setae, diminishing in length toward articulation with propodus; propodus with strong proximally directed lobe on inferior margin, lobe terminally with field of long arched setae diminishing distally along margin, becoming close-set shorter bristles slightly longer at distal extreme, superior margin with tufts of long arched setae, patterned tufts of lighter setae on outer face of article; dactylus tear-shaped, length about 1.5 times width, terminating in narrow corneous tip hooked toward external side, inferior margin sinuous, external face crossed by fields of short, slightly hooked setae in which longest setae are near superior margin, with separate, dense field of slightly heavier short weakly hooked setae along lower extreme of external face and inferior margin.

Fourth pereopod (Fig. 3g) not subchelate, inferodistal corner of propodus rounded without evidence of fixed finger; dense setation on outer surface of both propodus and tear-shaped dactylus divided into upper and lower fields, setae slightly stronger in lower fields of both, densest on dactylus, especially on and near inferior margin; internal surface of propodus with single large very long seta originating from near superior margin and reaching distally well beyond tip of dactylus.

Fifth pereopod (Fig. 3h) minutely chelate, opposable surfaces of propodus and minute dactylus excavate, spooned, terminally rounded, forming beak-like chela obscured by dense fields of setation on distal $\frac{1}{2}$ of propodus and superior surface of dactylus.

Abdomen long (Fig. 1a, b); dorsal length ratio (along midline) of first to sixth abdominal somites 1.0: 1.14: 0.85: 0.78: 0.85: 0.85. First somite narrowed anteriorly, anterior $\frac{1}{3}$ offset by deep lateral and dorsal notch and subquadrate, tufts of setae laterally on anterior part and laterally in first $\frac{1}{2}$ of posterior part, pleuron triangular with rounded ventral margin. Posterior half ventrally with pair of conspicuous ovoid plates

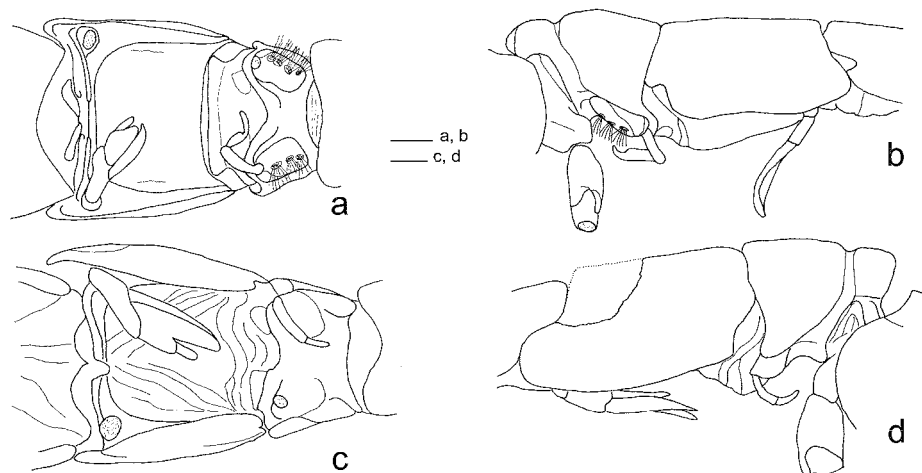


Fig. 5. *Eucalliax kensleyi*, female holotype, Aqaba, Red Sea, NHMW 16779; a, first and second abdominal somites, ventral surface, setae of pleopods not shown; b, first and second abdominal somites, left lateral surface, setae of pleopods not shown. *Eucalliax bulimba* (Poore & Griffin, 1979), male holotype, QM W1525; c, first and second abdominal somites, ventral surface, setae not shown; d, first and second abdominal somites, right lateral surface, setae not shown. Scale lines indicate 1 mm.

of thickened integument, each of which articulates to first pleopods at its posterior extreme and bearing three to four fields of long setae in the middle (Figs. 5a, b). Second somite with concave anterior margin, posterior margin expanded posterolaterally, with two setal rows near the posterior margin. Third to fifth somites each distinctly shorter than second somite; pleura each with tuft of short setae midlaterally and on posteroventral margin. Sixth somite subrectangular in dorsal view, slightly narrowed posteriorly, with lateral constriction in posterior $\frac{1}{3}$, lateral face with several short rows of setae, ventral margin of pleurite with short setae, posterior margin with two tufts of long setae each in the middle of each side and on posterolateral margin.

First pleopod of female (Fig. 3i) uniramous, composed of two articles, total length equal to that of second pleopod, proximal article about $\frac{3}{4}$ length of distal article, long setae distally, terminal article with long setae on broad shoulder at midlength and short setae distally.

Second pleopod of female (Fig. 3j) biramous, with appendix interna on endopod;

long setae on mesial margin of basipod and endopod, exopod overreaching endopod.

First and second pleopod of male unknown.

Third to fifth pleopod pairs (Fig. 3k) forming large, posteriorly cupped fans when cross-linked by hooked setae of appendices internae on opposed margins of endopods; endopod of each subtriangular. appendices internae finger-like, movable articulated to mesial margin of endopod.

Telson (Figs. 1f, 4f) about 2 times as broad as long, broadest at midlength, posterolateral margin rounded, with one tuft of setae each near lateral margin, dorsal surface with row of long setae at anterior $\frac{1}{3}$ and setose punctae arranged in a V-shape in posterior $\frac{1}{2}$.

Uropod with endopod oval, 1.5 times as long as broad, overreaching telson, dorsal surface with tufts of setae posteriorly, setae of posterior margin longest posterolaterally; exopod with anterodorsal plate falling short of distal endopod margin, distal edge of plate lined with short, thick spiniform setae grading to thinner longer setae of exopod margin and long, stiff, spiniform setae at

posterodistal corner of plate, distal margin of exopod with dense fringe of setation grading to large spiniform setae of posterodistal margin.

Size.—Of the two specimens, the holotype is the larger (tl ca 29 mm, cl 7.9 mm), the paratype measures in tl 17.5 mm and in cl 4.8 mm

Color (from notes and color photographs of live specimens).—Pale, carapace and tailfan white, abdomen translucent, chelipeds slightly pink.

Known range and habitat.—Known only from the type locality. Here it occurs in bare sediment adjacent to the fringing reef. *Eucalliax kensleyi* is rather rare. Among the over 220 specimens of thalassinideans collected with the yabby pump from small mounds in 2000, 2001 and 2002, only two were this new species. Its burrow openings are characterized by flat (ca. 1 cm high) gray mounds (diameter at their base ca. 7 to 10 cm).

Etymology.—Named in honor of the late Brian Kensley, for his outstanding contributions to carcinology.

Remarks.—Four genera of the Eucallianinae Manning & Felder, 1991 have been established so far: *Calliax* de Saint Laurent, 1973; *Eucalliax* Manning & Felder, 1991; *Paraglypturus* Türkay & Sakai, 1995; and *Calliaxina* Ngoc-Ho, 2003. Sakai (1999) synonymized *Eucalliax* with *Calliax*. Ngoc-Ho (2003), however, confirmed the validity of the former. *Callianassa bulimba* Poore & Griffin 1979 was placed either in *Calliax* (Sakai 1999) or *Eucalliax* (see Ngoc-Ho 2003) although this species has a minute exopod on Mxp3. The exopod in members of *Paraglypturus* and *Calliaxina*, however, is much more conspicuous than in *E. bulimba*. The new species is here placed into the genus *Eucalliax* considering the differences between the two genera as outlined by Ngoc-Ho (2003).

Eucalliax kensleyi is similar to *E. bulimba* (Poore & Griffin, 1979) as it also has a minute exopod on Mxp3 (see Sakai 1999: fig. 32c). It differs from the latter by 1) a

much more pronounced rostral projection and less produced lateral projections of the carapace front, 2) the shape of the telson which is widest distally (proximally in *E. bulimba*), 3) the shape of the uropodal exopod which is rounded (subrectangular in *E. bulimba*), 4) the presence of a large proximal triangular tooth on the fixed finger of at least one of the first pereopods (see Poore & Griffin 1979: fig. 21), and 5) the presence of conspicuous ovoid plates ventrally on first abdominal somite (absent in *E. bulimba*, see Fig. 5c, d). The new species shows some similarities with *E. aequimana* (Baker, 1907) with respect to the shape of the chelipeds, but differs from the latter by the presence of a minute exopod on Mxp3 and the much shorter telson which lacks the characteristic transverse carina.

Acknowledgments

This study was conducted during an annual reef course organized by the Institute of Ecology and Conservation Biology of the University of Vienna. The author wishes to thank the director of the Royal Diving Club for his hospitality, and Darryl Felder and Nguyen Ngoc-Ho for constructive comments on the manuscript.

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Associate Editor: Christopher B. Boyko