New species of mysids (Crustacea: Mysidae) from the east coast of South Africa, with notes on habitat preferences

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(with 6 figures)
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Three new species of Mysidae are described, taken by hand-net, using SCUBA, from reef habitats in 20–40 m water depth on the KwaZulu-Natal shelf. *Idiomysis robustus* is the fifth described member of this curious genus, and shares the peculiar body shape of all the other known *Idiomysis* species. The species is found in small shoals, over low-profile, scattered reef. *Kainommatomysis zuluensis* is the third described species in this genus. Observations suggest this species does not swarm conspicuously, and it has only been collected by sweeping a handnet among gorgonians and seaweeds. *Australerythrops africanus* is only the second described species of this genus. It has not been seen over open reef, but is commonly found in small to medium-sized caves, or hovering around the entrance to a cave, in swarms containing hundreds, and sometimes thousands of individuals.

Key words: *Idiomysis, Kainommatomysis, Australerythrops,* shelf waters, Western Indian Ocean, Mysidae.

CONTENTS

INTRODUCTION

The mysid fauna of the east coast of South Africa is well known within the estuarine and shallow subtidal habitats, due largely to the efforts of Olive Tattersall (1952, 1958, 1962, 1969) and Tris Wooldridge (Wooldridge 1978, 1988, Wooldridge & McLachlan 1987; Wooldridge & Mees 2000; Wooldridge & Mees 2003). A concerted effort to search for juvenile fishes recruiting to the local line fishery, has recently led to the discovery of a considerable number of new mysid species on and adjacent to reef habitats in depths of 15–60 m on the KwaZulu-Natal shelf. Some of these species have very specific habitat preferences, and coupled with their often high numbers, must play a significant role in the food of many fish species associated with these reefs. Their identification and habitat preferences are an important first step in elucidating this role.

Mysids were collected using a small handnet while SCUBA diving. Small caves, weed beds, stands of gorgonians and soft corals were specifically targeted, while on other occasions the net was used to sweep at random close to the seabed in broken reef.

SYSTEMATICS

Terminology follows Tattersall & Tattersall (1951), and specimen length was measured from the anterior margin of the carapace to the distal end in the telson.

Idiomysis robustus sp. nov.

Figs 1 and 2

Material

Holotype (SAM A45291) deposited in the Iziko South African Museum, Cape Town. Adult male from Park Rynie (30°18.7′S, 030°48.5′E) collected at a depth of 38 m by A. Connell, 20 November 1999. Paratypes (SAM A45292) include 10 adult males, 10 adult females and several juveniles, also deposited in the Iziko South African Museum, Cape Town. Collection date and locality are as for the holotype.

Description

Sexes alike, although the large marsupium of the females gives them a bulkier appearance (Fig. 1A). Measuring the length of individuals is difficult, since specimens usually become fixed, in death, in the curious pose that is typical of this genus (Fig. 1A). Males 4.9–6.0 mm, females 4.8–5.4 mm.

Carapace does not cover last three thoracic somites in lateral view, smoothly rounded in dorsal view (Fig. 1C). Eyes almost perfectly round in lateral view, longer than wide in dorsal view.

Antennular peduncle three-segmented, less robust in the female (Fig. 1D) than in the male (Fig. 1E). Inner margin of third segment in male forms a hirsute lobe. Antennal scale (Fig. 1F) short and broad, with a prominent blunt spine

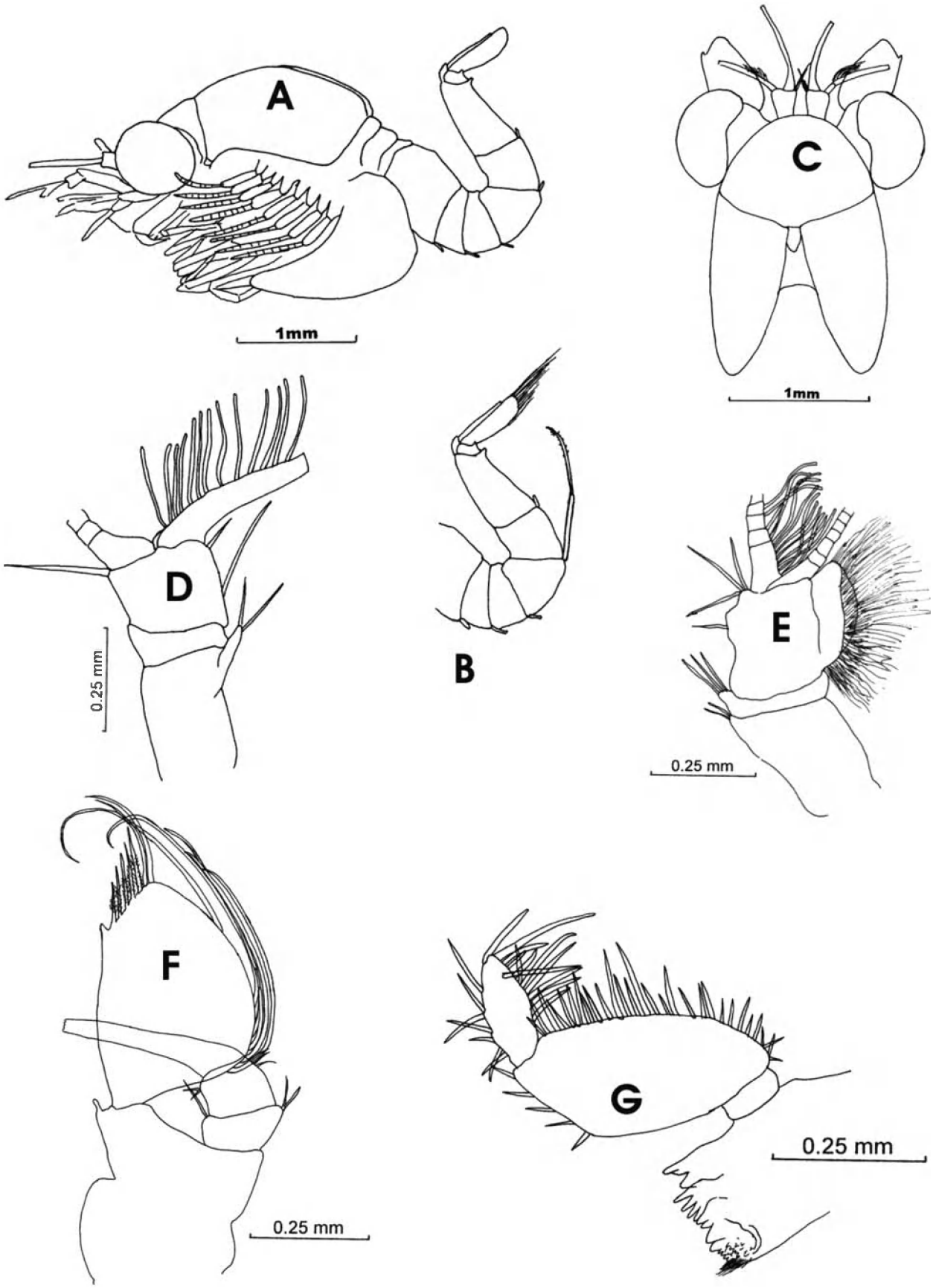

Fig. 1. *Idiomysis robustus* sp. nov. **A**, Adult female in lateral view. **B**, Adult male abdomen and telson in lateral view. **C**, Head and thorax in dorsal view. **D**, Female antennular peduncle. **E**, Male antennular peduncle. **F**, Antenna and antennal scale. **G**, Mandible and palp.

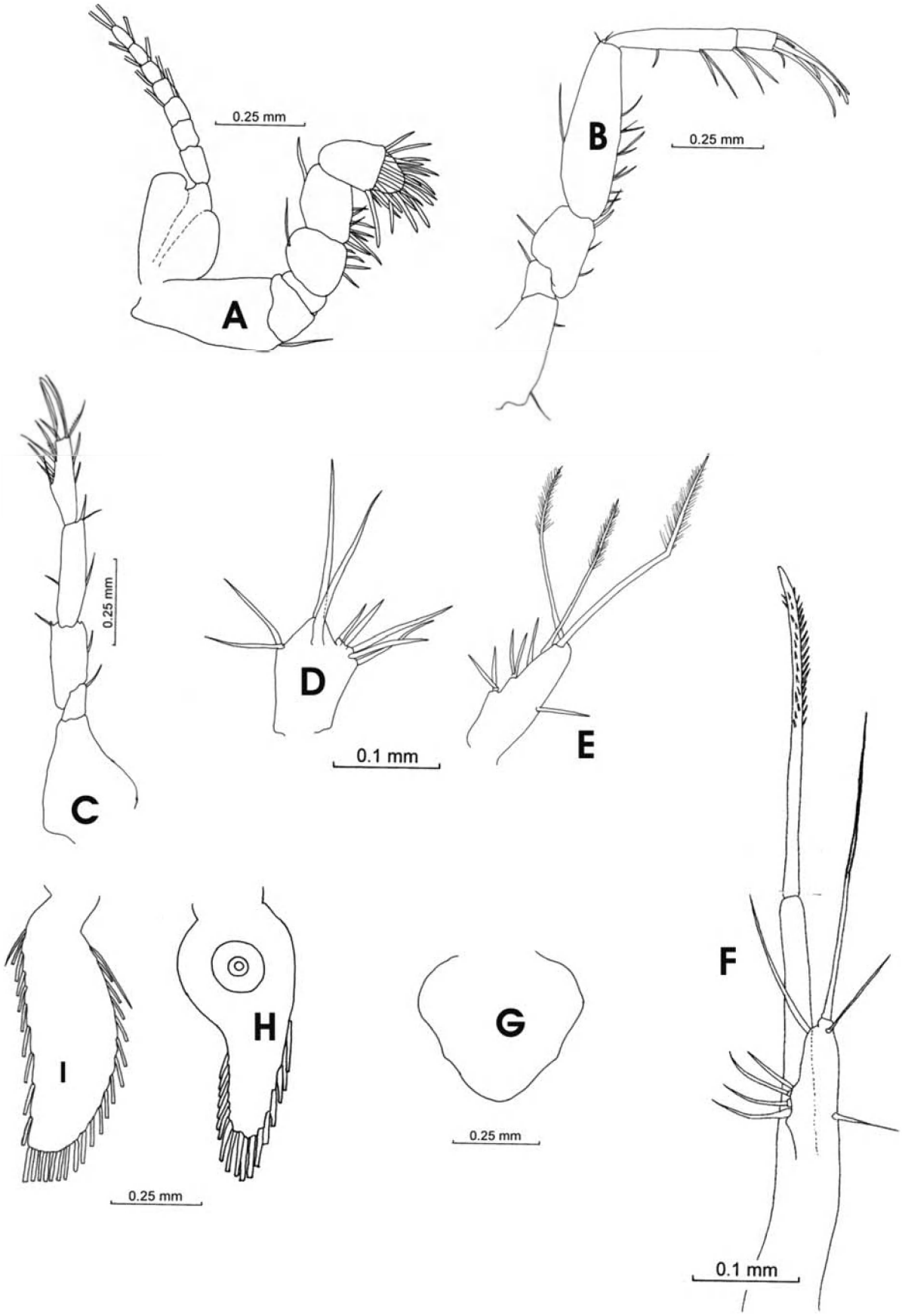

Fig. 2. *Idiomysis robustus* sp. nov. **A**, First thoracic limb. **B**, Fifth thoracic limb. **C**, Seventh thoracic limb. **D**, Adult male first pleopod. **E**, Adult female second pleopod. **F**, Male fourth pleopod. **G**, Telson. **H**, Endopod of uropod. **I**, Exopod of uropod.

terminally on the outer margin. Terminal lobe has five bristled setae and two plumose setae, the seventh being terminal, and curved. Inner margin has *ca.* 15 curved plumose setae, which tend to angle slightly upward from the scale edge, to form a cupped structure with the scale. No distal suture was noted.

Mandible (Fig. 1G) with incisor and molar processes, a lacinia mobilis, and a set of bristles outside the molar process. Second segment of palp with *ca.* 30 robust setae on the inner edge, and 5–6 distomedially on the outer edge. Terminal segment with *ca.* eight medial setae and 11 setae laterally. Maxillule and maxilla normal for the genus.

First thoracic limb (Fig. 2A) short and stout, consisting of seven segments. Second limb similar. Limbs three to six more elongate (Fig. 2B). Seventh and eighth limbs shorter (Fig. 2C).

First, second, third and fifth pleopods in both sexes (Figs 2D and 2E), of one reduced segment with 2–3 long plumose setae terminally, and 6–7 shorter setae, all plumose. First pleopod about 30% longer than wide, second, third and fifth pleopods length more than twice width. Male fourth pleopod with endopod similar to other pleopods, with three terminal setae; exopod one-segmented, terminating in a pinnate seta (Fig. 2F). In lateral view (Fig. 1B), the male pleopod four extends upwards and outwards to just beyond the uropods, but would only reach the base of the telson if the abdomen was straight. Telson short (Fig. 2G), only extending about halfway across the statocysts. Uropod endopods (Fig. 2H) slightly shorter than exopods (Fig. 2I).

Colour in freshly caught specimens pale brown, with dark brown bases to the thoracic limbs, and in a line ventrally along the abdomen. Darker pigment dorsally in the arch of the abdomen, and the broodpouch of the female. Eyes orange. Some specimens distinctly pink in body colour; possibly newly moulted. Specimens collected in shallow water at Vetch's Pier, Durban, have the entire head and thorax a dark chocolate-brown.

Remarks

This is the fifth species of *Idiomysis* recorded in the literature, after *I. inermis* Tattersall 1922, from the Gulf of Manaar and Moreton Bay, Queensland, Australia (Greenwood & Hadley, 1982), *I. japonica* Murano, 1978, from Nagasaki, Japan (according to ICZN Article 31.2, this should be *I. japonicus*), *I. tsurnamali* Bacescu, 1973*a* from the Gulf of Eilat, Red Sea, and *I. mozambicus* Deprez *et al.,* 2001, from Nacala Bay, northern Mozambique. *I. robustus* is easily distinguished from all described species by the blunt terminal spine on the outer edge of the antennal scale. It is also the largest species described thus far, as shown in the table below.

Species	Male	Female	Reference
I. inermis	3.4–4.4	4.0–5.0	Greenwood & Hadley 1982
I. japonicus	3.3	3.7–3.9	Murano 1978
I. mozambicus	2.9–3.9	2.6–2.9	Deprez *et al.* 2001
I. tsurnamali	4.2–4.5	4.2–4.5	Bacescu 1979

Habitat notes

The species was first encountered while diving in 35 m water depth, off Park Rynie about 55 km south of Durban on the KwaZulu-Natal coast of South Africa. Small groups of 5–30 individuals were seen hovering above small depressions on sandy substrate, among rocks and low-profile reef. It was also quite common at 18–20 m water depth, on the Aliwal Shoal, a reef about 4 km offshore, at Scottburgh, 4 km north of Park Rynie. More recently, it has been collected at Vetch's Pier, Durban, in 2 m water depth. In all cases, small groups were observed over small sand hollows, with no evidence of commensalism (Bacescu 1973*a*; Greenwood & Hadley 1982). Underwater observations have shown that they swim in the same curious body position seen in preserved specimens.

***Kainommatomysis zuluensis* sp. nov.**

Figs 3 and 4

Material

Holotype (SAM A45293) deposited in the Iziko South African Museum, Cape Town. Adult male from Park Rynie (30°18.7′S, 30°48.5′E) at a depth of 40 m. Collected by A. Connell, 26 December 1999. Paratypes (SAM A45294) include two adult males, 20 adult females and several juveniles, also deposited in the Iziko South African Museum, Cape Town. Collection date and locality as for the holotype, and the same locality on 28 December 1999.

Description

Sexes alike, slightly dorso-ventrally flattened in the thorax. Males 5.2–5.5 mm, and females 5.5–5.7 mm. Brown pigment stains the ischium and proximal half of the merus of all legs, in most fresh specimens.

Carapace with a bluntly pointed rostrum (Fig. 3A), which extends forward to the midpoint of the eye cornea. Eye pigment red-brown, with the clear lens posteriorly that characterizes the genus.

Antennular peduncle with the male lobe well developed and hirsute (Fig. 3B).

Antennal peduncle with second segment longer than third (Fig. 3C).

Antennal scale setose all round, about 5× longer than broad (Fig. 3D).Distal transverse suture present. Prominent spine present on the outer distal corner of the antennal sympod (often broken off or damaged).

Mandible and palp as illustrated (Fig. 3E). Maxillule small and unremarkable (Fig. 3F). Maxilla normal (Fig. 3G).

First thoracic limb typically modified to assist feeding (Fig. 3H). Limbs 3–8 are slender, and have the propodus composed of three sub-segments, with a well-developed claw terminally (Fig. 3I).

Pleopods of both sexes rudimentary and uniramous, except for the fourth pleopod of the male. Male first pleopod only slightly longer than wide (Fig. 3J). Male pleopods two and three similar, both with prominent side lobes (Figs 3K and 4A). Male fourth pleopod (Fig. 4B) with endopod similar to fifth pleopod (Fig. 4C), but with an elongate three-segmented exopod, terminating in a long curved plumose seta (Fig. 4B), which reaches past the tip of the fifth pleopod, but not quite to the rear edge of the fifth abdominal segment. Male fifth pleopod elongate, with eight terminal and subterminal setae (Fig. 4C).

Female fourth pleopod (Fig. 4D), similar to male third

	K. foxi	*K. schieckei*	*K. zuluensis*
Distance from endopod tip, of distal spine on inner edge of uropod endopod:	Less than distal spine length	5× distal spine length	3× distal spine length
Number of uropod endopod inner edge spines	30–32	17	22–26
Telson outer edge spines	14, evenly spaced, plus one larger terminal spine	3 basal and 10 outer edge spines, enlarging gradually towards tip, plus two subequal terminal spines	16–20, evenly spaced, enlarging gradually towards tip, plus one slightly larger, terminal spine
Exopod of male fourth pleopod	Four-segmented, plus a long, powerful terminal plumose seta	As *K. foxi*, but only three-segmented; segment two 4× longer than segment three	As *K. foxi,* but only three-segmented; last two segments subequal
Male fourth pleopod exopod segments' length ratio*	2:1:1:1	12:3:1	3.5:1.2:1

*From basal to distal segment, using the shortest as the unit of measure, excluding the elongate terminal seta.

pleopod. Female fifth pleopod similar to male, but with fewer terminal setae (Fig. 4E).

Exopod of uropod about 28% longer than endopod (Fig. 4F). Endopod has 22–26 spines on the inner edge; terminal spine about three spine lengths from the endopod tip (Fig. 4G).

Telson deeply cleft, with 16–20 spines along outer margin, gradually increasing in size towards the tip, plus slightly larger terminal spine. Inner margin of cleft smooth, except for a single pair of spines at the base of the cleft, and a pair of long plumose setae (Fig. 4H).

Remarks

The spelling *Kainommatomysis* is correct, as used by Tattersall (1922) in the original description of the genus. It has subsequently been misspelled by several authors.

This is the third known member of this genus, after *K. foxi* Tattersall 1927*a*, and *K. schieckei* Bacescu 1973*b*. It can be separated from these two species as indicated in the above table (based on the original authors' descriptions).

Habitat notes

This species has not been seen swarming. All 18 samples containing this species were from depths ranges of 33–44 m. Of these, nine had only one specimen, but three samples, two in late December 2000, and one in early January 2001, had 12, 21 and 15 specimens respectively. All were collected by sweeping through gorgonians and soft corals on hard, lumpy reef, and in adjacent gullies. The species was not found in fairly extensive collections from the shallower waters of the Aliwal Shoal (18–22 m water depth), a shallower reef system, approximately the same distance offshore (4 km), located 4–5 km to the north of the type locality.

Australerythrops africanus **sp. nov.**

Figs 5 and 6

Material

Holotype (SAM A45295), deposited in the Iziko South African Museum, Cape Town. Adult male from Park Rynie (30°18.7′S, 030°48.5′E) at a depth of 34 m. Collected by A. Connell, 27 March 1999. Paratypes (SAM A45296) include 10 adult males, 10 adult females and several juveniles, also deposited in the Iziko South African Museum, Cape Town. Collection date and locality as for the holotype.

Description

Sexes alike, males 7.1–8.1 mm, and females 7.1–7.5 mm. Orange pigment stains the head, thoracic limbs and telson, in most fresh specimens. This extends to the pouch in mature females. Eyes rounded in lateral view, black. Carapace rounded, without a rostrum (Fig. 5A), anterolateral corner with a small spine.

Antennular peduncle with the male lobe well developed and hirsute. Second segment short (Fig. 5A). Antennal scale extends just beyond antennular peduncle (Fig. 5A), outer edge smooth, terminal spine prominent, no terminal suture (Fig. 5B).

Mandibles and palp as illustrated (Fig. 5C). Maxillule, maxilla and first thoracic limb normal for the genus, the latter terminating in a moderate claw (Fig. 5D). Second thoracic limb slender, terminating in a short claw and two longer, robust, curved setae (Fig. 5E). Limbs 3–8 slender, the carpo-propodus composed of four or five sub-joints. Examples with five sub-joints illustrated (Figs 5F to 5K). Table 1 presents carpo-propodus subjoint counts of 15 specimens.

Dactylus with a feeble claw terminally, and three or four slender setae arising terminally on the dactylus, subequal in length to the claw. Terminal claw also surrounded by four longer setae, arising terminally on last sub-joint of carpo-propodus (Figs 5F to 5K). On third limb only, longest

Table 1. Carpo-propodus subjoint counts on limbs 3–8 in *Australerythrops africanus*

	n	P3	P4	P5	P6	P7	P8
Adult males	2	5	5	5	5	5	5
Adult males	3	4+	4+	4+	5	5	5
Gravid female	4	4+	4+	4+	4+	4+	4
Gravid female	1	4+	4+	5	5	5	4+
Female immature	1	4+	4+	4+	4+	4+	4
Juveniles	3	3+	3+	3+	3+	3+	3
Juvenile	1	3+			4		4

+ indicates first subjoint elongate.

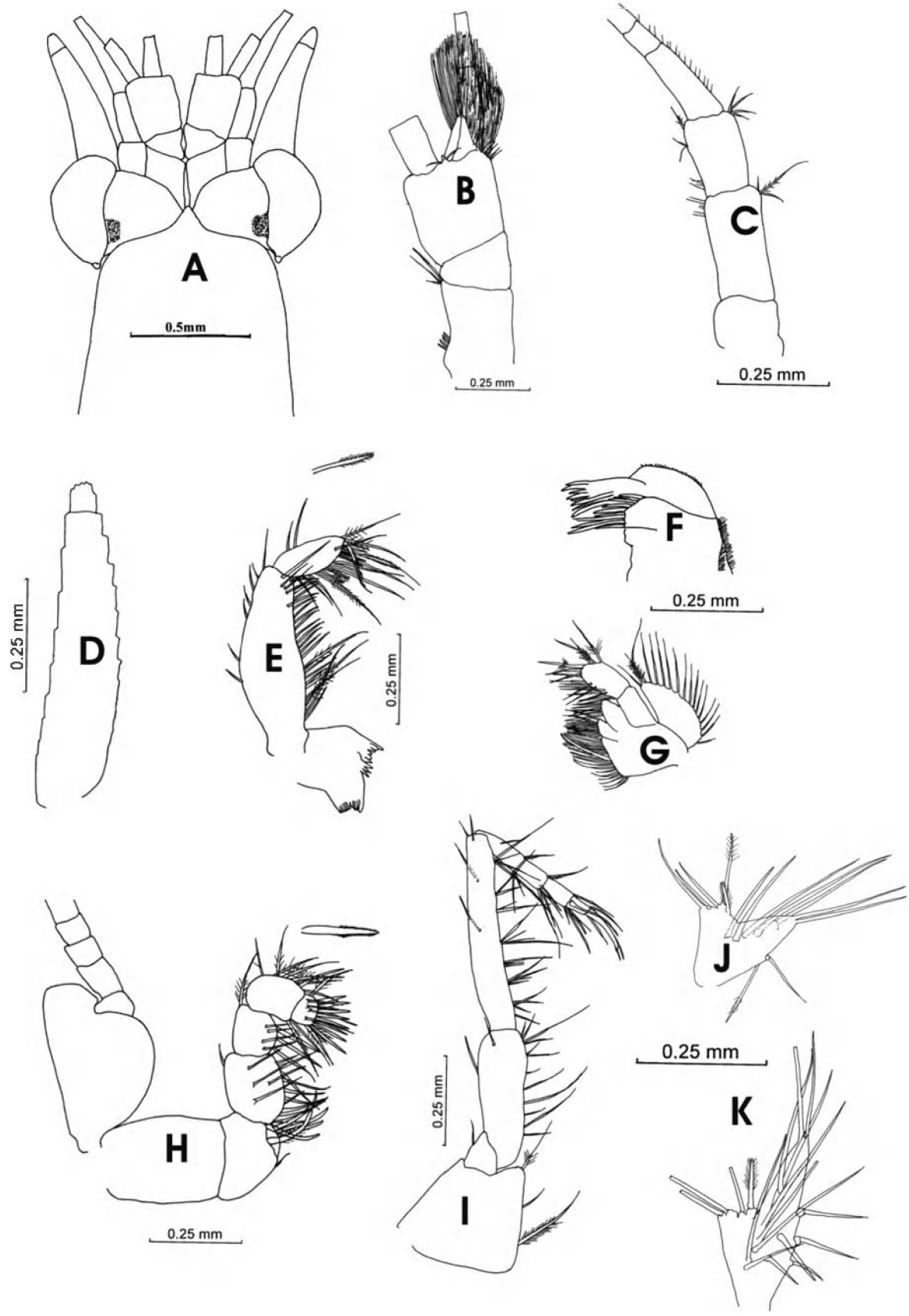

Fig. 3. *Kainommatomysis zuluensis* sp. nov. **A**, Adult female head and thorax. **B**, Male antennular peduncle. **C**, Antennal base. **D**, Antennal scale. **E**, Mandible and palp, with inset of robust terminal seta. **F**, Maxillule. **G**, Maxilla. **H**, First thoracic limb. **I**, Seventh thoracic limb. **J**, Male first pleopod. **K**, Male second pleopod.

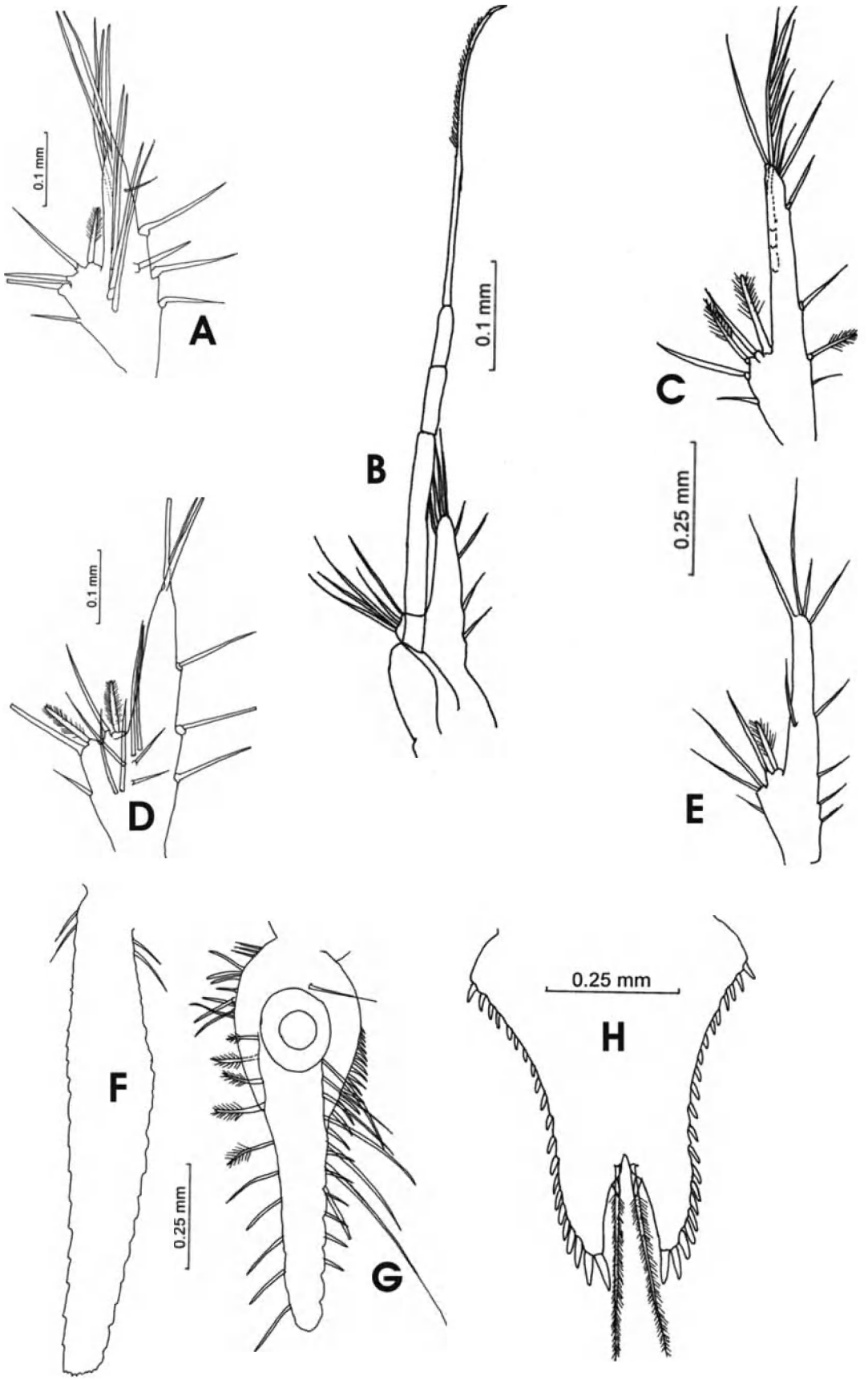

Fig. 4. *Kainommatomysis zuluensis* sp. nov. **A**, Male third pleopod **B**, Male fourth pleopod. **C**, Male fifth pleopod. **D**, Female fourth pleopod. **E**, Female fifth pleopod. **F**, Exopod of uropod. **G**, Endopod of uropod. **H**, Telson. Note the pair of short spines at base of cleft, almost obscured by plumose setae.

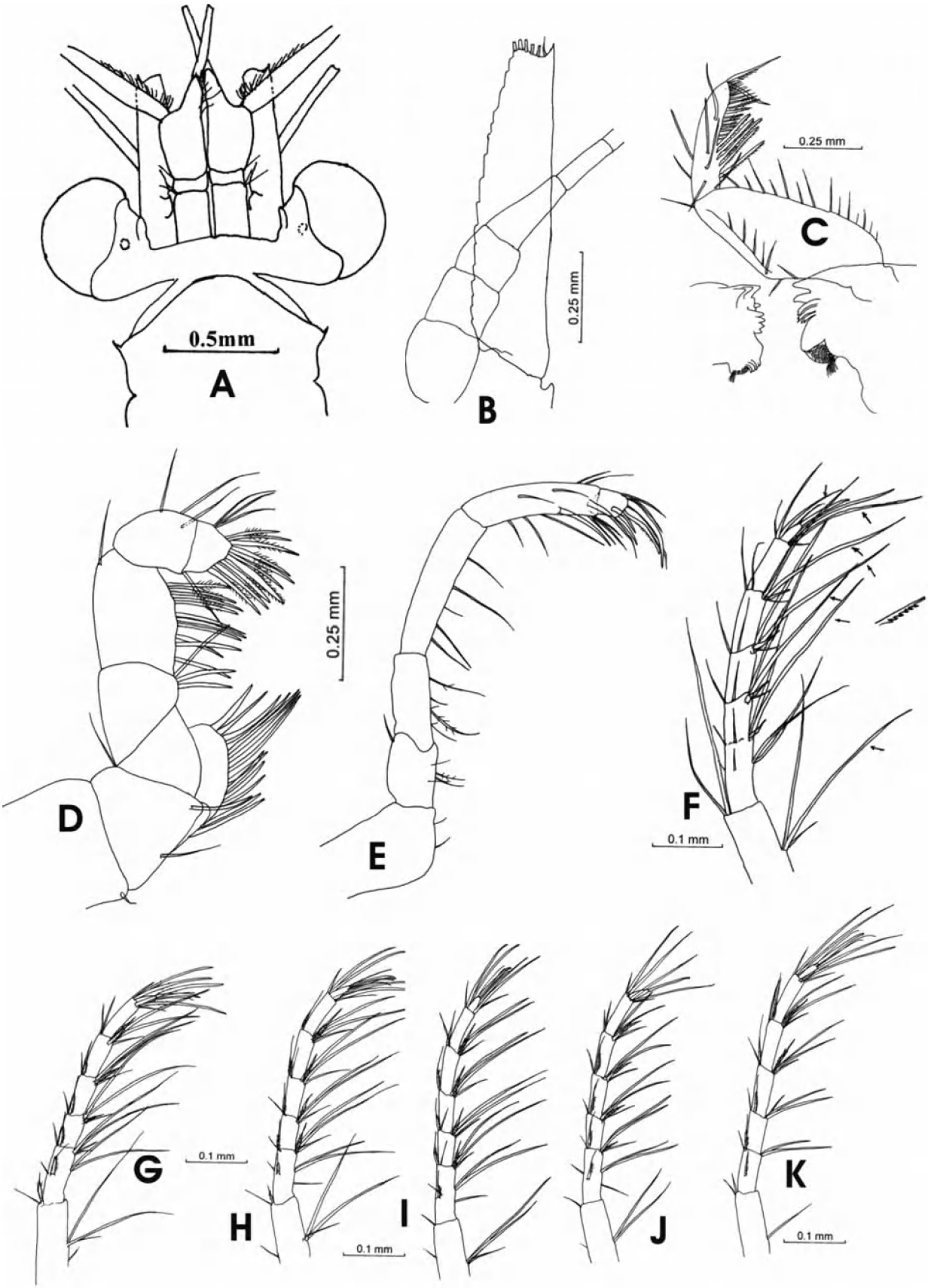

Fig. 5. *Australerythrops africanus* sp. nov. **A**, Adult male head and thorax, dorsal view. **B**, Antenna and scale. **C**, Mandibles and palp. **D**, First thoracic limb. **E**, Second thoracic limb. **F**, Carpo-propodus of third leg, with inset of serrated seate (arrowed). **G–K**, Carpo-propodus of legs 4–8, respectively, from an adult male.

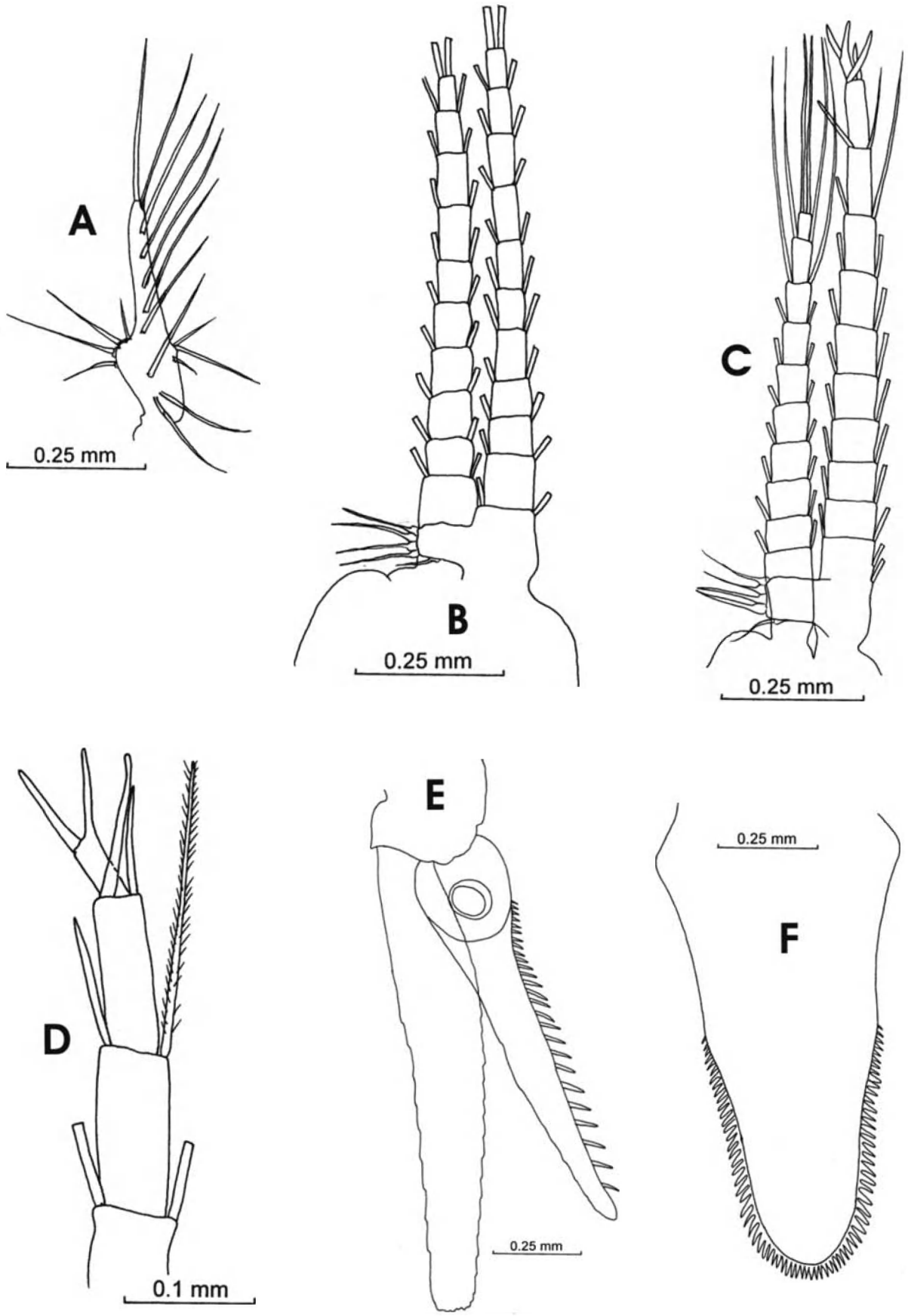

Fig. 6. *Australerythrops africanus* sp. nov. **A**, Male first pleopod **B**, Male fourth pleopod. **C**, Male fifth pleopod. **D**, Terminal segments of endopod of male fifth pleopod. **E**, Uropods **F**, Telson.

terminal seta on inner edge of each subjoint, serrated (Fig. 5F); on limbs four to eight, equivalent setae are smooth. Eighth limb is more slender than limbs three to seven.

First pleopod reduced in both sexes (Fig. 6A). Setae brittle, with most, including terminal setae broken off in some specimens examined. Female pleopods two to five similar to first pleopod, with the same setal arrangement. Pleopods two to four biramous in the male; endopod about one segment longer than exopod, both rami terminating in unspecialised setae (Fig. 6B). Endopod of male fifth pleopod with four modified setae terminally, one forming a forked shape with the terminal elongation of the final segment (Fig. 6D). Endopod extending three segments longer than exopod (Fig. 6C).

Endopod of uropod armed with 24–26 spines on the inner edge, terminating about one or two final-spine lengths short of the tip (Fig. 6E). Telson entire, linguiform, with fine, evenly spaced spines on lateral and distal margins, without terminal setae or basal spines (Fig. 6F).

Remarks

Tattersall's (1927*b*) description of *Australerythrops paradicei*, described the sixth joint (carpo-propodus) of limbs four to eight, as divided into four subjoints, while in the third leg, the first subjoint was further divided by an oblique articulation. In *A. africanus,* subdivision of the carpo-propodus appeared to be related to size, in that, of the specimens examined, only the two largest adult males showed a five-jointed carpo-propodus on limbs three to eight (Table 1), while only one in five females had five subjoints, but not on all legs. Juveniles usually had three subjoints (see Table 1).

This is only the second described species in the genus, and the male is easily separated from *A. paradicei* by the structure of the terminal segments of the endopod of pleopods four and five. Since the telson is identical to *A. paradicei,* I can find no distinguishing feature to separate the females, unless the female pleopods lack terminal setae (Tattersall 1927*b*, fig. 30g). It seems more likely that these were broken off in Tattersall's specimens.

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