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A NEW PARACALLIOPIID, *KATOCALLIOPE KUTYERI* GEN. ET SP. NOV. (CRUSTACEA: AMPHIPODA) FROM QUEENSLAND

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Abstract: *Katocalliope kutyeri* gen. et sp. nov. of the Paracalliopiidae is described from beach sands in Queensland. It exhibits many features characteristic of fossorial amphipods in other families.

Barnard and Karaman established the Paracalliopiidae to accommodate *Paracalliope* Stebbing 1899; and raised *Paracalliope indica* K. H. Barnard 1935 to generic status (*Indocalliope*) within that family; the family now embraces 4 species of *Paracalliope* from Australia, New Zealand and Indonesia and one monotypic genus from India (as well as several undescribed Australian species (Barnard & Drummond in preparation)).

Katocalliope gen. nov., by virtue of its paired eyes, characteristic male gnathopods and fused second and third urosomites, is deemed to belong in the Paracalliopiidae, and to be distinct from both *Paracalliope* and *Indocalliope* at the generic level. Its inclusion necessitates slight amendment to the family diagnosis.

LEGENDS

On figures, capital letters denote morphological parts as follows: A, antenna; B, body; C, coxa; D, dactyl; G, gnathopod; I, inner plate or ramus; L, labium; M, mandible; O, outer plate or ramus; P, pereopod; Q, calceolus; R, uropod; S, maxilliped; T, telson; U, labrum; V, palp; X, maxilla; Y, gill; Z, oostegite.

Lower case letters to the left of the capital letter refer to specimens cited in figure captions; those to the right of capitals or in the body of the drawing are descriptive: d, dorsal; o, opposite; r, right; s, setae removed.

SYSTEMATICS

Family Paracalliopiidae Barnard & Karaman 1982

Diagnosis: (Additions to the familial diagnosis are italicized.) Head, eyes, coxae 1-3, pereopod 3-6, uropods 1-2 ordinary. Accessory flagellum vestigial *or absent*. Mandibular palp present *or absent*. Coxa 4 poorly excavate posteriorly. Female gnathopods feeble, mittenform *or almost simple*; male gnathopods larger, gnathopod 2 enlarged, wrist small, hand large (usually rotated inward on death), palm oblique. Pereopod 7 elongate, dactyl elongate and setose. Uropods 1-3 extending equally *or not*, peduncle or uropod 3 *short* to slightly elongate, rami short, equal, lanceolate, outer 1-articulate. Telson laminar, entire. Urosomites 2-3 coalesced.

See Barnard and Karaman (1982) for variables.

Key 1 to the Genera of Paracalliopiidae

1. Palm of male gnathopod 2 with 2 thick spines, mandibular palp absent ..... *Katocalliope*
   Palm of male gnathopod 2 with 4 thick spines, mandibular palp present 2
2. Inner plate of maxilla 1 with 1 seta ..... *Indocalliope*
   Inner plate of maxilla 1 with 8 + setae .. *Paracalliope*

Key 2 to the Genera of Paracalliopiidae

1. Inner plates of maxillae 1-2 densely setose medially ..... *Paracalliope*
   Inner plates of maxillae 1-2 not setose medially 2
2. Mandibular palp present, peduncle of uropod 3 elongate, epimera with small tooth, palp of maxilliped strongly exceeding outer plate .... *Indocalliope*
   Mandibular palp absent, peduncle of uropod 3 short, epimera smooth, palp of maxilliped not exceeding outer plate ..... *Katocalliope*

Key 3 to the Genera of Paracalliopiidae

1. Mandible lacking palp, peduncle of uropod 3 short, palp of maxilliped not exceeding outer plate ..... *Katocalliope*
   Mandible with long palp, peduncle of uropod 3 elongate, palp of maxilliped strongly exceeding outer plate 2
2. Medial margins of maxillae 1-2 naked .. *Indocalliope*
   Medial margins of maxillae 1-2 setose .. *Paracalliope*

Katocalliope gen. nov.

Diagnosis: Paracalliopiidae lacking mandibular palp; inner plate of maxilla 1 poorly armed (generally with 1 seta only); brood plates unexpanded; epimera rounded (lacking notches or small teeth); peduncle of uropod 3 short.

Etymology: The prefix Kato is from the Aboriginal Languages, meaning short. The name is feminine.

Type Species: *Katocalliope kutyeri* sp. nov.

Relationship: *Katocalliope* differs from *Paracalliope* and *Indocalliope* in the lack of teeth on the epimera, the very short palp of the maxilliped, the short uropod 3 with short peduncle, and the absence of a mandibular palp. Pereopods 3-6 of *Katocalliope* are more markedly fossorial than those of the other 2 genera; the articles of these pereopods are thicker and shorter, and much

better armed than those of *Paracalliope* and *Indocalliope*.

In addition, *Paracalliope* differs from *Katocalliope* in the medially setose inner plate of maxilla 1 and the expanded oostegites. The latter have not been described for *Indocalliope*.

The slightly tapering coxa 3 of *Katocalliope* and unshortened outer ramus of uropod 2 cannot be evaluated as generic characters until more species have been described and these differences confirmed.

There may possibly be some generic value in the greatly elongate setae of the anterior coxae on *Katocalliope*.

A few species of *Paracalliope* are known to have a vestigial accessory flagellum, but in others its presence requires confirmation. The mandible of *Katocalliope*, besides lacking a palp, is characterized by greater elongation of the molar and extension of the base of the incisor than seems to be typical of *Paracalliope*; but this character too needs further investigation in some *Paracalliope* species. Articles 2-3 of antenna 1 are short and equal in *Katocalliope* and the facial row of setae on maxilla 2 is poorly developed.

The fossorial character and general facies of *Katocalliope* are distinctive within the Paracalliopiidae and bear strong resemblance to two closely allied families, Oedicerotidae and Exoedicerotidae.

Katocalliope kutyeri sp. nov.
Figs 1-4

ETYMOLOGY: *Kutyeri* comes from an Aboriginal word meaning 'thin': in reference to the extremely thin female gnathopods [noun in apposition].

IDENTIFICATION: This is clearly not *Pherusa australis* Haswell (1880, p. 103, pl. 7, fig. 1) because that species, the type of which has been lost, is shown to have a very spinose uropod 3 with elongate peduncle.

DESCRIPTION OF HOLOTYPE MALE 'k' 1.96 mm: Rostrum of medium size, blunt, lateral cephalic lobes small and subacute. Eyes of medium size, with irregular core of pigment at bases of 10 or more ommatidia.

Antennae turned outwards laterally, somewhat fossorial, of medium length; antenna 1 slightly longer than antenna 2, article 1 large, outer facial formula 2+2; articles 2 and 3 short and equal in length; primary flagellum with 7-8 articles, aesthetasc formula 0-1-1-3-5-6-0-0; accessory flagellum probably represented by weak boss. Antenna 2 sharply twisted outwards, gland cone of medium size, article 4 slightly expanded, moderately setose but setae very strong; article 5 shorter and thinner than 4, clavate, bearing stout setae distally; flagellum short, thick, 5-6 articulate, first 2 articles short and irregularly broadened, each with tympanic calceolus on 'dorsal' margin (situated dorsally after antenna 2 flattened on slide).

Epistome flat anteriorly; upper lip articulate, weakly emarginate below.

Mandibular incisor short, teeth ill-defined; lacinia mobilis on each side spine-like, right scarcely distinguishable from closest raker spine, left stouter, both minutely toothed apically; rakers 3, left rakers of holotype considerably shorter than right (Fig. 3 Ml), presumably abnormal or damaged, normal rakers similar on both sides (as in Fig. 3 nMr), increasing in length away from lacinia mobilis; incisorial body (incisor, lacinia mobilis, rakers) basally much extended, almost pediculate from main mandibular body; molar also elongate, constricted just above base, poorly triturative; palp absent, mandibular body normally supporting palp not developed. Lower lip with strong extended mandibular lobes, inner lobes small and fused together.

Inner plate of maxilla 1 leaf-like, with apical point and one apical seta; outer plate large, with 11 spines, orad spines with large thick and blunt serrations (mopped spines), aborad spines thinner, some apparently without serrations or apically bifid; palp thin, articles 1 and 2 subequal in length, apex of article 2 with 4 thick setae.

Both plates of maxilla 2 setose apically, outer plate broad; inner plate distinctive, slightly geniculate, directed outwards across outer, bearing a straggling row of 5 or 6 setae of different lengths almost submarginally as well as several medial setae and 2 medium-length stiff setae on a sub-basal protruberance covered with a stubble of fine setules.

Maxillipeds large, inner plate broad and apically flat and spinose; outer plate enlarged, dwarfing palp, with one strong apical seta, medial margin with spatulate spines and aboral pairs of facial spines; palp relatively small, scarcely exceeding outer plate, dactyl unguiform, with 2 accessory apical setules.

Coxa 1 expanded distally, coxae 2-3 tapering distally, coxa 4 adz-shaped and weakly bevelled ventrally, not as enlarged, relatively, as in female; coxa 5 scarcely shorter than 4; long ventral setae of coxae 1-3, 8-1-1; of coxa 4 in two groups of 5 and 1; short ventral setae on coxa 1, 1 anterior, 2 posterior; coxae 2-4, 1-1-1.

Gnathopod 1 small, wrist of medium length, lobate, hand slightly longer than wrist, expanded palm naked, very oblique and poorly defined but with small callus at posteroproximal limit and 4 facial setae on hand close to margin; dactyl not reaching apex of palm when closed.

Gnathopod 2 large, wrist of medium length, lobate, lobe narrow and pointing slightly distad; hand much longer than wrist, expanded, palm oblique and deeply excavated in middle, this sinus bearing 2 thick spines, proximal limit of palm with large callus delimited by row of setae; dactyl not reaching apex of palm when closed, resting in shallow depression about middle of callus.

Pereopods 3-4 typically fossorial with article 4 elongate and some articles bearing very thick stiff setae; dactyls without visible slits but with absorbed nail and external apical flake.

Pereopods 5-6 short, fossorial as in Oedicerotidae, with strongly setose articles 4-5.

Pereopod 7 greatly elongate as in Oedicerotidae and other Paracalliopiidae, articles 5 and 6 slightly more spinose anteriorly than in *Paracalliope*; dactyl (article 7) typically elongate and setose.

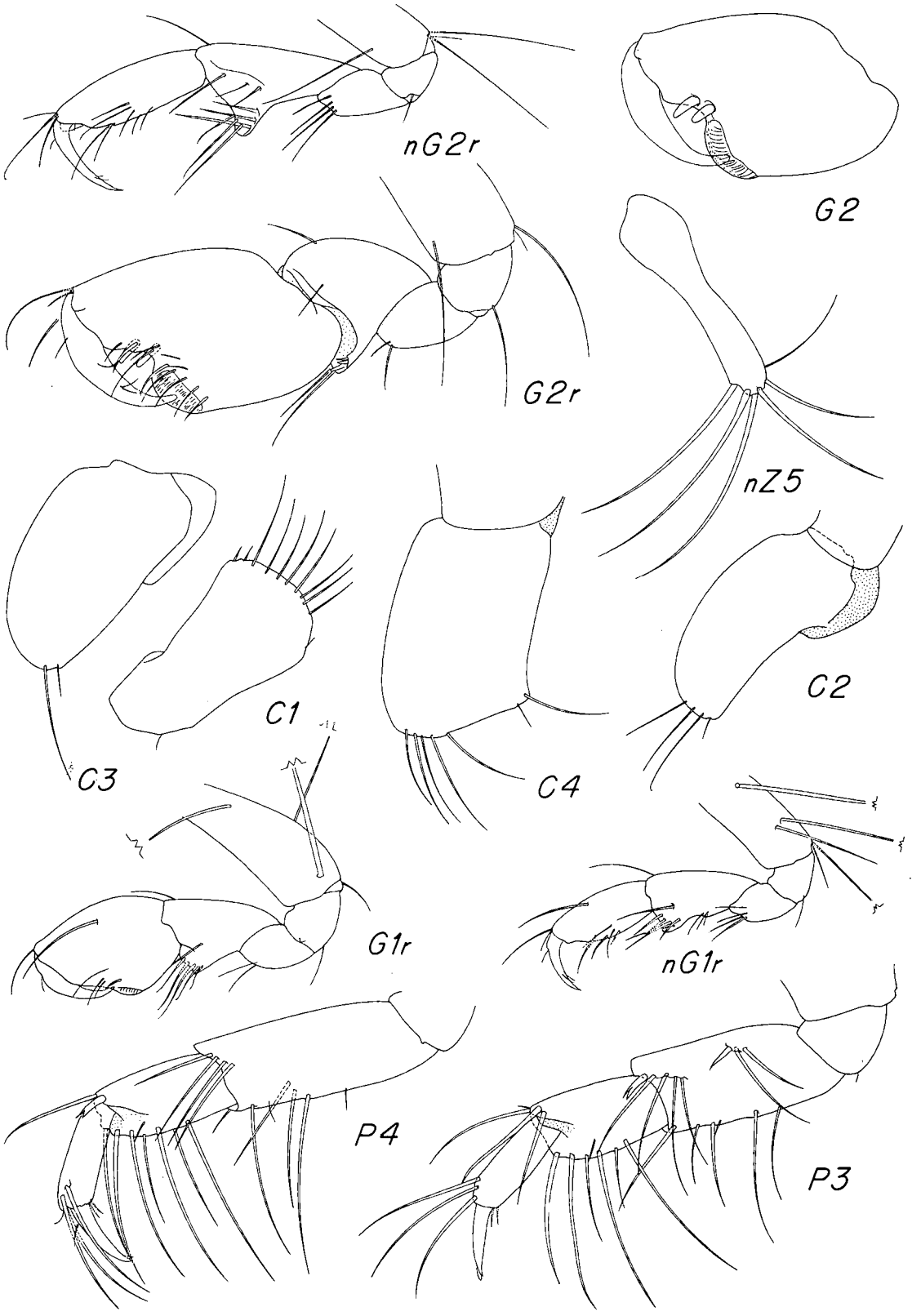

Fig. 1 – *Katocalliope kutyeri*, unattributed figures, male holotype 'k'; n, female 'n'.

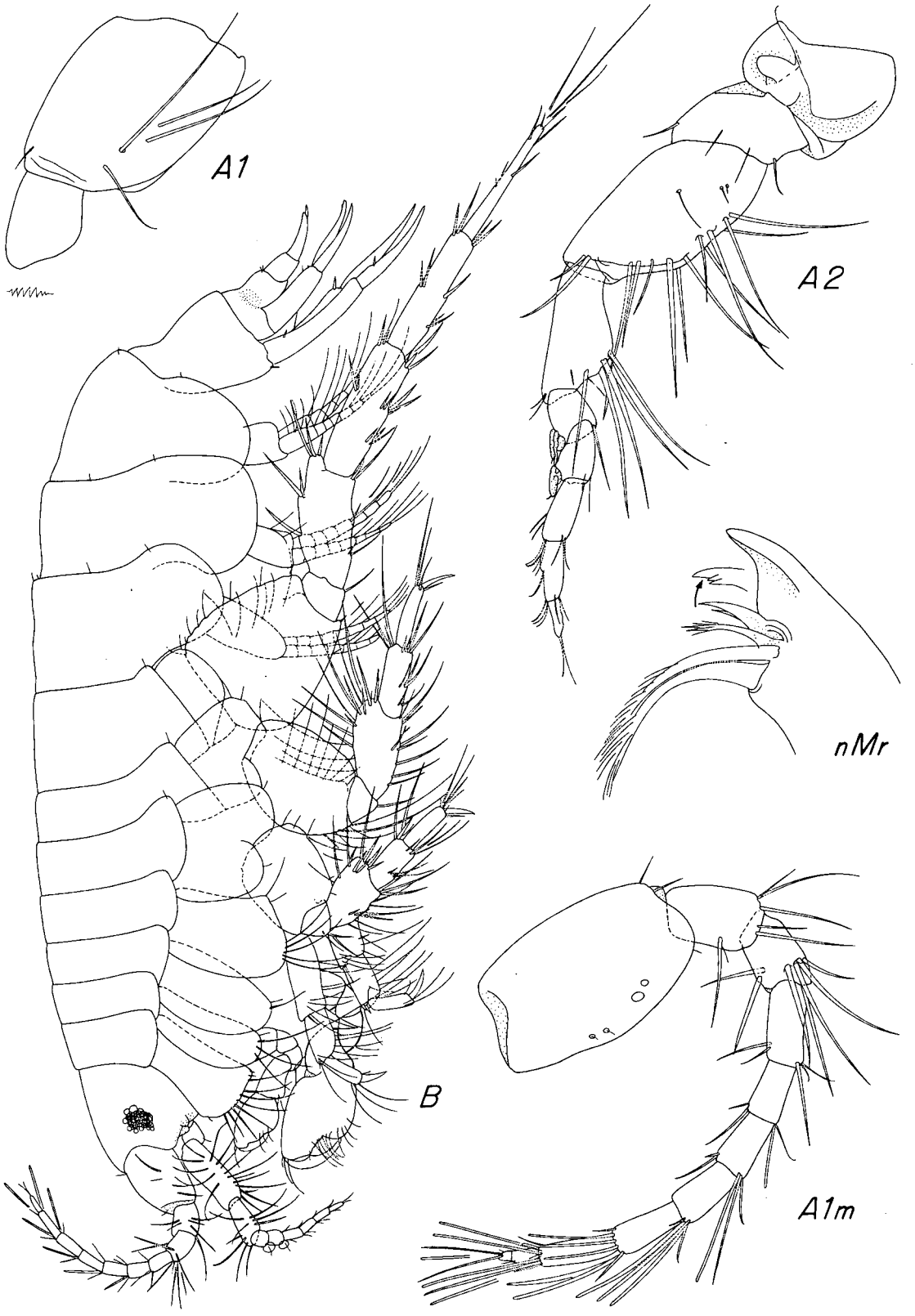

Fig. 2—*Katocalliope kutyeri*, unattributed figures, male holotype 'k'; n, female 'n'.

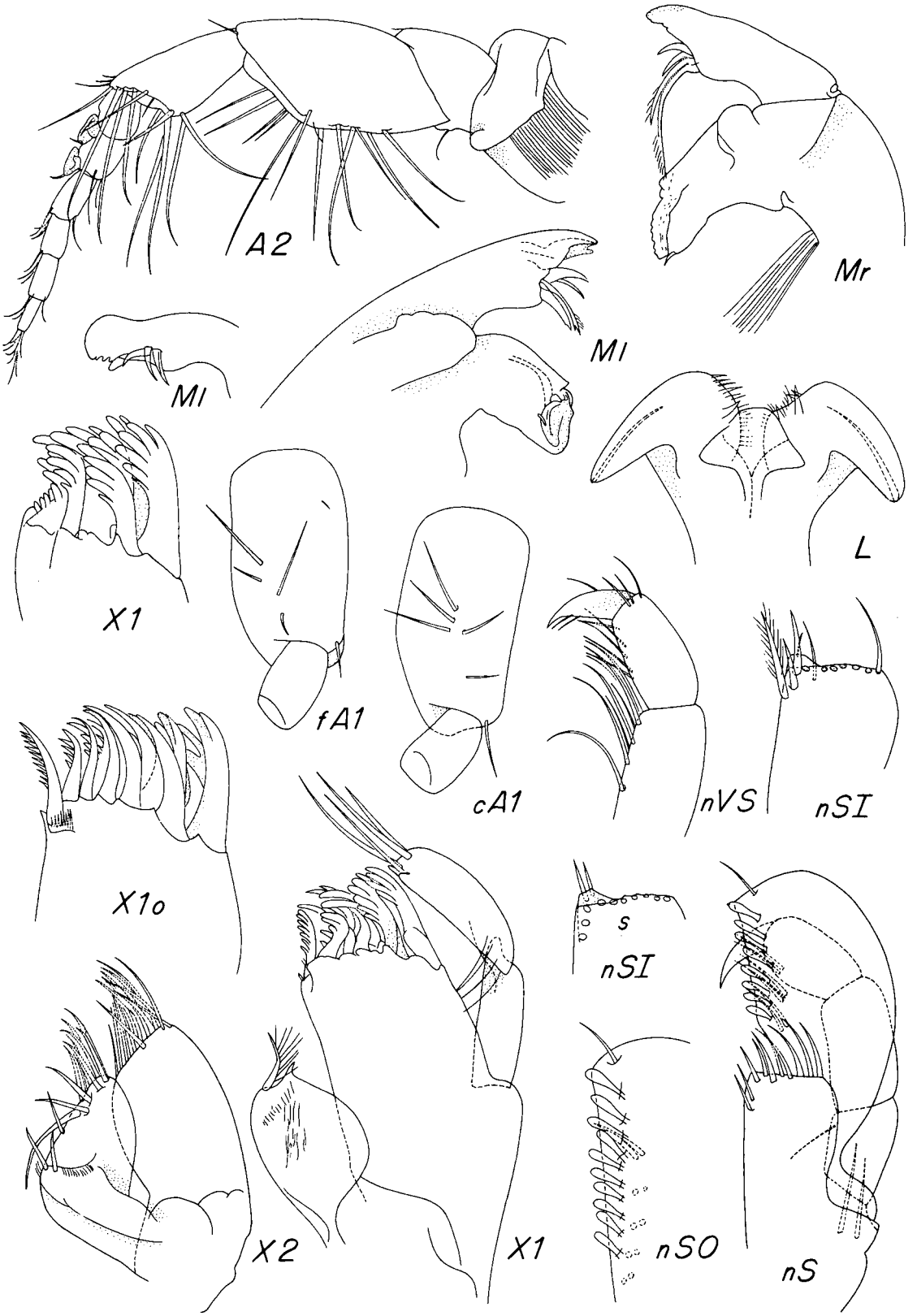

Fig. 3—*Katocalliope kutyeri*, unattributed figures, male holotype 'k'; c, female 'c'; f, female 'f'; n, female 'n'.

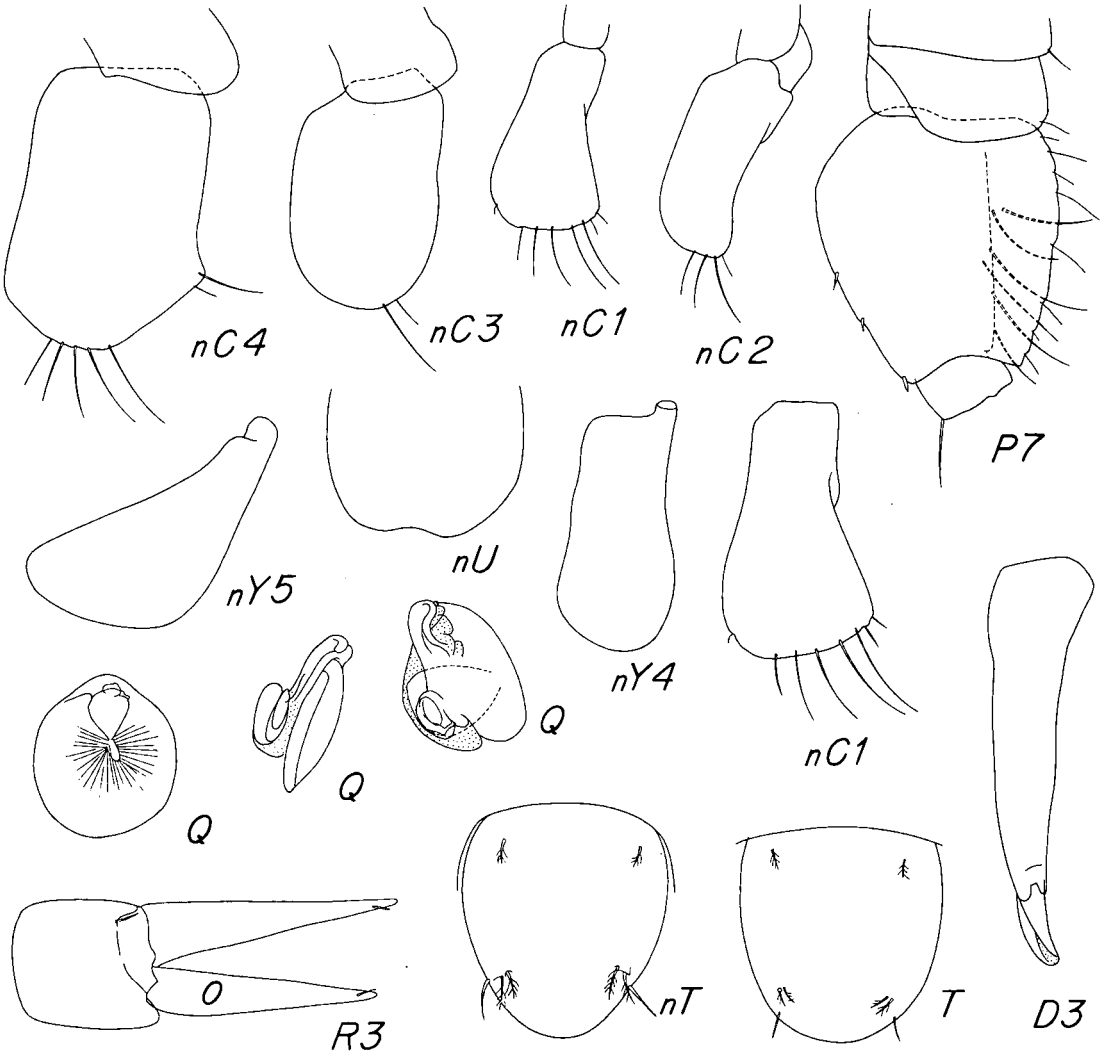

Fig. 4—*Katocalliope kutyeri*, unattributed figures, male holotype 'k'; n, female 'n'.

Gills present on coxae 2-6, rectangular or clavate.

Pleopods ordinary, peduncles elongate, rami elongate, subequal and multiarticulate. Pleonal epimeron 2 dominant; all epimera rounded posteroventrally. Urosomites 2-3 fused together. When urosome unflexed uropod 1 extending beyond uropod 2, and both beyond uropod 3; all naked except outer ramus of uropod 1 with 1 spine; peduncle of uropod 1 with inner spine and outer setule, dorsal base of outer edge with 1 spine; peduncle of uropod 2 with strong spine on each apex. Peduncle of uropod 3 short, inner ramus weakly dominant, each ramus lanceolate, with subapical setule, otherwise naked. Telson short, ovate, entire, dorsally with pair of basolateral setules, 2 pairs of apicolateral setules, each apicolateral margin with setule.

FEMALE 'n': Like male but calceoli absent and aesthetascs fewer (one aesthetasc each only on last 2 articles of antenna 1); flagellum of antenna 1 with only 6 articles, first 2 flagellar articles of antenna 2 unthickened. Gnathopods 1-2 both very slender, hands and wrists subequally long, wrists lobate, lobe on gnathopod 2 pointing posteriorly and not distally as in most species of *Paracalliope*; palms obsolescent, oblique, poorly defined by setal groups; dactyls thin, curved, each with 2 subapical accessory setules.

Coxae 1-4 relatively more diverse than in male, coxae 2-3 tapering less, coxa 4 much larger than coxae 1-2, broader than in male, with broadened anteroventral region.

Oostegites present on coxae 2-5, narrow, apically setose.

VARIATIONS: The number of flagellar articles on antenna 1 varies from 6-8 in males (apparently mature) and from 5-6 in females with setose oostegites; on antenna 2 between 5 and 6 in males and usually 5 in females. Setal formula on the outer face of antenna 1 is usually 3-2 in larger specimens (near 2 mm) and 2-2 in smaller specimens (near 1.75 mm). The number of calceoli on male antenna 2 is always 2. Visible ommatidia vary from 5-10 in adults. Coxae 1-3 vary more than most other features in this species because of the strong sexual distinctions; and the numbers of setae on each varies slightly between individuals, even of approximately the same size. Lateral facial armature formulas on article 4 of pereopods 3 and 4 are also variable: the formula for pereopod 3 on female 'c' is 6-2; female 'f', 4-2; female 'n', 4-1; male 'z', 4-2; formula for pereopod 4, female 'c', 5-0; female 'f', 4-0; female 'n', 4-0; male 'z', 3-0 with no spine present.

Uropods are very consistent (though occasional rami have an aberrant setule or rudimentary spine) in that only the outer ramus of uropod 1 is armed; it carries a thick sub-basal spine. The peduncle of uropod 1 has a dorsobasal spine, an apicolateral setule and an apicomedial spine. The peduncle of uropod 2 carries a thick spine apically on each side.

ILLUSTRATIONS: To show relative size differences of coxae in the two sexes drawings of male and female coxa 4 have been adjusted to the same size and coxae 1-3 drawn to the magnification appropriate for each sex. In the female (which is the 'basic' expression of the species) coxa 4 is much larger than coxa 1; but in the male this disparity is reduced during development, and in the adult coxa 4 has become smaller, relative to coxa 1, than it is in the female.

The short second and third mandibular raker spines of the holotype (illustrated) are not the normal condition in this species. Examination of 10 other specimens shows rakers to be similar on both sides. Serrations on the first raker, usually rather obscure, are not shown.

Maxilla 2 is abnormally flattened and the outer plate skewed in order to represent setae in their full length. In normal aspect the plates are more closely attached at the base, and the basomedial setae less sub-marginal.

Lateral setae on palp article 3 of the maxilliped are not shown in illustrations.

HOLOTYPE: Museum of Victoria J6931, male 'k' 1.96 mm.

TYPE LOCALITY: Redcliffe Beach near Brisbane 27°14″S, 150°07″E, coll. Deborah M. Dexter, 15 April 1981, core taken at low tide between tide lines. Voucher Material: Type locality, J6935 female 'c' 1.99 mm, J6934 female 'f' 1.80 mm, J6932 female 'n' 1.90 mm, J6933 female 'r' 1.78 mm, J6936 male 'z' 1.67 mm + 8 slides.

OTHER MATERIAL: 60 specimens all from type locality.

DISTRIBUTION: Known only from type locality.

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