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Parker, A. R., 1998. A new genus and two new species of Cypridinidae (Crustacea: Ostracoda: Myodocopina) from Australia. *Records of the Australian Museum* 50(1): 1–17. [13 May 1998].

doi:10.3853/j.0067-1975.50.1998.1271

ISSN 0067-1975

Published by the Australian Museum, Sydney

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A New Genus and Two New Species of Cypridinidae (Crustacea: Ostracoda: Myodocopina) from Australia

A.R. PARKER

Division of Invertebrate Zoology, Australian Museum, 6 College Street, Sydney, NSW 2000, Australia

arparker@laurel.ocs.mq.edu.au

ABSTRACT. A new genus and two new species of Cypridinidae, *Lowrya taiti* and *Lowrya kornickeri*, are described from New South Wales, Australia. Both species are scavengers. They possess an elongate frontal knob and a structurally coloured red area on the rostrum of the carapace. The adult males of these species bear large compound eyes with very large dorsal ommatidia and very large “suckers” arising from cup-shaped processes near the base of the c-setae of the first antennae. *Lowrya taiti* possesses “coelotrichs”, which are unusual evagination/setal sensillae of the carapace (Parker, submitted), and a concave anterior margin of the left rostrum only. *Lowrya kornickeri* is unusual because it bears an additional small “sucker” distal to the large basal “sucker” on the basal setule of the b-seta of the male first antenna.

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Cohen (1982) reported 24 genera and about 100 species worldwide in the Cypridinidae. Since 1982 about 60 additional species of cypridinids have been described. Only a few species of cypridinids have previously been reported as scavengers (Sars, 1922; Natas, 1979; Collins *et al.*, 1984; Stepien & Brusca, 1985; Cohen, 1983; Vannier & Abe, 1993).

The Australian Museum has conducted extensive trapping of scavenging crustaceans in eastern Australian seas from 1986 to 1995 known as the SEAS (Scavengers of Eastern Australian Seas) Project. Scavenging cypridinids were present at all depths, and down to about 100 m depth they numerically dominate the scavenging guild, with numbers of individuals reaching to 75,000 per trap (J.K. Lowry, personal communication). From this collection an undescribed genus emerged, identified from other genera

under a dissecting microscope by the possession of a red structural colour on the rostrum of the carapace. The two species described herein, *Lowrya taiti* and *L. kornickeri*, are from this new genus, caught during the above trapping program using single chamber traps designed by Keable (1995).

Lowrya taiti is distinguished from *L. kornickeri* by the presence of coelotrichs (concave sensilla; Parker, in prep.) forming a row on the external carapace surface parallel with the anterior, ventral and posterior carapace margins. *Lowrya taiti* also uniquely exhibits a concave margin of the left carapace rostrum only, with strong sclerotization in the corresponding supplementary region of the right carapace rostrum. *Lowrya kornickeri* is characterized by the presence of a small “sucker” distal to the larger, usual “sucker” of the basal setule of the b-seta of the male first antenna.

Skogsberg (1920) considered the “suckers” (although possibly olfactory organs; Kornicker, 1983) of the adult male first antennae, and the endopodite of the adult male second antenna, to be “the most noteworthy” in classifying the Cypridinidae. Kornicker (1983) illustrated the different types of “sucker” arrangements on the first antennae of adult male cypridinids, and their use in grouping genera. The exceptionally large size of the basal “suckers”, and their extrusion from a separate cup-like basal section, of the c-setae on the adult male first antennae, are characters unique to *Lowrya* and *Sheina*.

Descriptions have been generated from the taxonomic data base program DELTA (Dallwitz *et al.*, 1993).

New definitions of types of hair-like structures for Myodocopina are used to standardize the terminology of homologous parts both within a specimen and within Crustacea, adapted from Watling (1989) (Fig. 1). A seta is

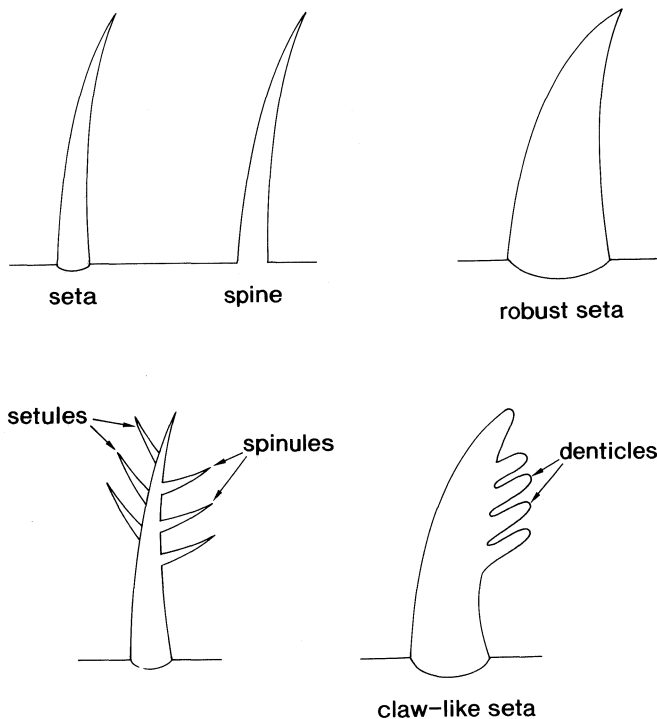


Fig. 1. Definitions of hair-like structures used in the following species descriptions.

a hair-like structure (extension of the cuticle) with an articulate base; a spine is a hair-like structure with a non-articulate base. Exceptionally broad setae and spines are given the prefix “robust”. A setule is a “seta” which occurs on a seta or spine; a spinule is a “spine” which occurs on a seta or spine. Denticle refers to a broad (robust) spinule. Setous refers to a dense collection of setae, except when the setae are very fine and long which is referred to as hirsute; spinous refers to a dense collection of spines. Claws refer to the large robust setae or spines historically termed as such for Myodocopa, occurring only on the furca and the terminal article of the mandibular endopodite. Claw-

like refers to the curved, robust nature of setae or spines bearing few broad denticles, giving the appearance of a “claw”.

Material is lodged in the Australian Museum, Sydney (AM), the National Museum of Natural History, Washington D.C. (NMNH) and the Natural History Museum, London (BMNH).

Systematics

Myodocopina

Cypridinidae

Lowrya n.gen.

Diagnosis. Unique characters are an elongate frontal knob and a spine mid-way along ventral margin of second exopodial article of the second antenna. Unusual characters are as follows. A rectangular oval carapace (with rounded corners); red colouration on rostrum when viewed from certain directions due to strong sclerotization (structural colour, not to be confused with maroon pigmentation of first antennae which is often visible through the carapace); lateral processes arising from rostrum, along dorsal edge of incisure. First antenna: very large basal “sucker” of c-seta on adult male first antennae, arising from separate cup-like basal section; some halophores (setules on first antennae; Parker, 1995, 1998) with spinules. Second antenna: endopodite with 3 articles; spine on ventral margin of second exopodial article; third exopodial article seta with proximal robust setae. Mandible with three broad terminal claws (of similar length), ventromedial and ventrolateral mandibular claws with very long spinules. Fourth limb: 1 α -seta (with many setules) and 2 β -setae. Sixth limb: terminal article short and approximately square. Seventh limb: few non-terminal and terminal setae; few terminal long and short teeth. Male copulatory “limb”: hood with peak with an abrupt joint near inner edge of limb. Furca: very broad fourth claw; claws 2 and 4 fused to lamella. Upper lip: single unpaired anteroventral field of nozzles; short tusks. Posterior of male body: without dorsal folds.

Type species. *Lowrya taiti* n.sp.

Species composition. *Lowrya* contains *L. taiti* n.sp. and *L. kornickeri* n.sp.

Etymology. In honour of James K. Lowry, carcinologist, who discovered new guilds of scavenging crustaceans off Australia with unexpected compositions, including high proportions of cypridinids.

Remarks. *Lowrya* is most similar to the monotypic genus *Sheina* Harding, 1966. Both genera bear very large “suckers” on the c-setae of the male first antennae, which appear to be morphologically similar (arising from a basal cup-like process). These two genera are only known from

eastern Australia. *Lowrya* differs from *Sheina* in the shapes of its carapace and furca, and in that it bears a well-developed coxal endite on its mandibles, the c-seta (lateral seta) of the terminal endopodial article of the mandible lacks a dorsal hirsute pad (see Kornicker, 1986). *Lowrya* also shares some characters with *Vargula* Skogsberg, 1920, e.g., an upper lip with tusks without lobes, endopodite of second antenna with three articles (the second article with a seta). It can be noted that *Vargula subantarctica* Kornicker, 1975, for example, also bears some halophores with spines, and males of *V. psydrax* Kornicker, 1994, bear a first antenna with an almost cup-like process at the base of the c-seta, although the “sucker”, which is not as well developed as in *Lowrya*, does not arise from this process. However, *Vargula* is polyphyletic and requires reorganisation (Cohen & Morin, 1990). *Lowrya* bears only one α -seta on its fourth limb, a character shared with *V. magna* Kornicker, 1984, *V. tsujii*, Kornicker & Baker, 1977, and *Kornickeria* Cohen & Morin, 1993, although *Lowrya* has a have very different carapace shape to these taxa. The sclerotization of the rostrum, forming lateral processes, in *Lowrya* is most similar to that of *Paracypridina* Poulsen, 1962, and to some extent *Heterodesmus* Brady, 1866, although *Lowrya* is separated from these genera by the possession of an endopodite of the second antenna with three articles.

Lowrya taiti n.sp.

Figs 1–4

Type locality. Off Providential Head, Bate Bay, NSW, Australia (34°07'S 151°10'E); baited trap set overnight at 46 m depth. Collected by J.K. Lowry, S.J. Keable and A.R. Parker on M.V. Krista, 14–15 January 1991. Total of 70 *Lowrya* sp. caught in trap (62 males), in addition to 11 other species of cypridinid ostracods, 3 species of cirrolanid isopods, 3 species of lysianassoid amphipods, and 1 species each of a nebalicean, gastropod and a polychaete. Undescribed species of the cypridinid ostracods *Paradoloria* (926 individuals), *Vargula* (860) and *Cypridinodes* (464) constituted the dominant scavenging species.

Type material. HOLOTYPE: AM P44618, adult female. PARATYPES: AM P44619, adult male; AM P45529, adult female; AM P45530, adult male; AM P45531, 3 adult males (undissected); BMNH 1995:1601–1602, 2 adult males (undissected); NMNH, 2 adult males (undissected).

Other material examined. AM P45532, adult male, cleaned using ultrasound, critical point dried, mounted on a scanning electron microscope (SEM) stub, and coated with gold (examined in a SEM).

Description of adult female characters.

COLOUR OF LIVING OSTRACODS. Beige with a red area above the incisure visible from certain orientations.

CARAPACE. Holotype: length = 1.27 mm, height = 0.81 mm; length/height = 1.57. Paratype: length = 1.36 mm, height = 0.91 mm; length/height = 1.49.

Shape: rectangular oval, very slightly protruding keel; margins straight for much of length dorsally, slightly rounded ventrally (Fig. 2E). Keel joined by slight dorsal concave curve to curved posterior margin of valve (Fig. 2D); dorsal edge of keel at about midheight of valve; dorsal edge of incisure slightly overlapping ventral edge at inner end, line on outer surface of valve curving from inner dorsal edge of incisure to anterior margin of valve (ventral to incisure) is faint. Tip of rostrum rounded; with smooth adjacent margins (Fig. 2A).

Valve surface smooth at low magnification, but with scale-like pattern visible on anterior margins with a light microscope at 100 times magnification (as in Fig. 5C); setae on valve surface medium sized and scattered evenly; 9 muscle scars, forming a triangle with smaller scars inside triangle (Fig. 2F).

Infold: infold posterior to rostrum with row of 11 setae, double type, parallel to valve margin, 9 of these setae are dorsal to incisure; 1 seta posterior to carapace infold row, double type; 4 setae anterior to carapace infold row, double type. Posterodorsal edge of incisure without setae. Posterior to dorsal inner corner of incisure with 1 seta, double type. Sclerotized ridge (list) dorsal to incisure forming an angular shape within rostrum (point of angle near rostral tip), more strongly sclerotized section nearest incisure (Fig. 2A). Sclerotization of rostrum very strong, resulting in external lateral processes on rostrum. Anteroventral infold, near inner corner of incisure, with 6, medium length, double setae; posterior edge of carapace infold without setae. Infold parallel to anteroventral/ventral margin with 26 setae, double type, 4 of these setae in the region ventral to incisure, diminishing in length posteriorly; 1 seta anterior to anteroventral/ventral row, no setae posterior to row. Left valve with 30 setae parallel to anteroventral/ventral margin. In vicinity of keel, list remains constant in width, forming a shallowly curved narrow smooth ridge; keel infold simple. Ridge of keel unornamented except for minute short setae or papillae emerging from unrimmed pores, and without setae; list of left valve ending in pronounced dorsal knob, without processes. Right valve with posterior margin of keel possessing no setae, with few minute setae or papillae emerging from pores; dorsal margin of keel with pronounced projection.

Lamellar prolongation of *selvage*: narrow along rostrum; along lower margin of incisure selvage is broad and striated; along ventral margin selvage is narrower, terminating posteroventrally. “Coelotrichs” (sensilla consisting of a spherical evagination of the epicuticle and a fine “hair”; Parker, submitted) (Figs 1C; 4D,F) forming rows near carapace margins present: 5–6 in rostral row, 4–5 in incisure row (Fig. 2A), 32–34 in ventral row, 5–6 in keel row; total of 46–51.

FIRST ANTENNA (Fig. 2I). *First article* bare. *Second article* with medial fine spines forming rows, and spines on ventral and dorsal margins. *Third article* very short and slightly trapezoid, without medial spines, setae of 3rd and 4th articles ringed with short spines; third article with 1 slightly longer and stouter ventral seta, distally, and 1 dorsal seta, just proximal to middle. *Fourth article* with 1 dorsal seta, longer than dorsal seta of 3rd article, and 1 ventral

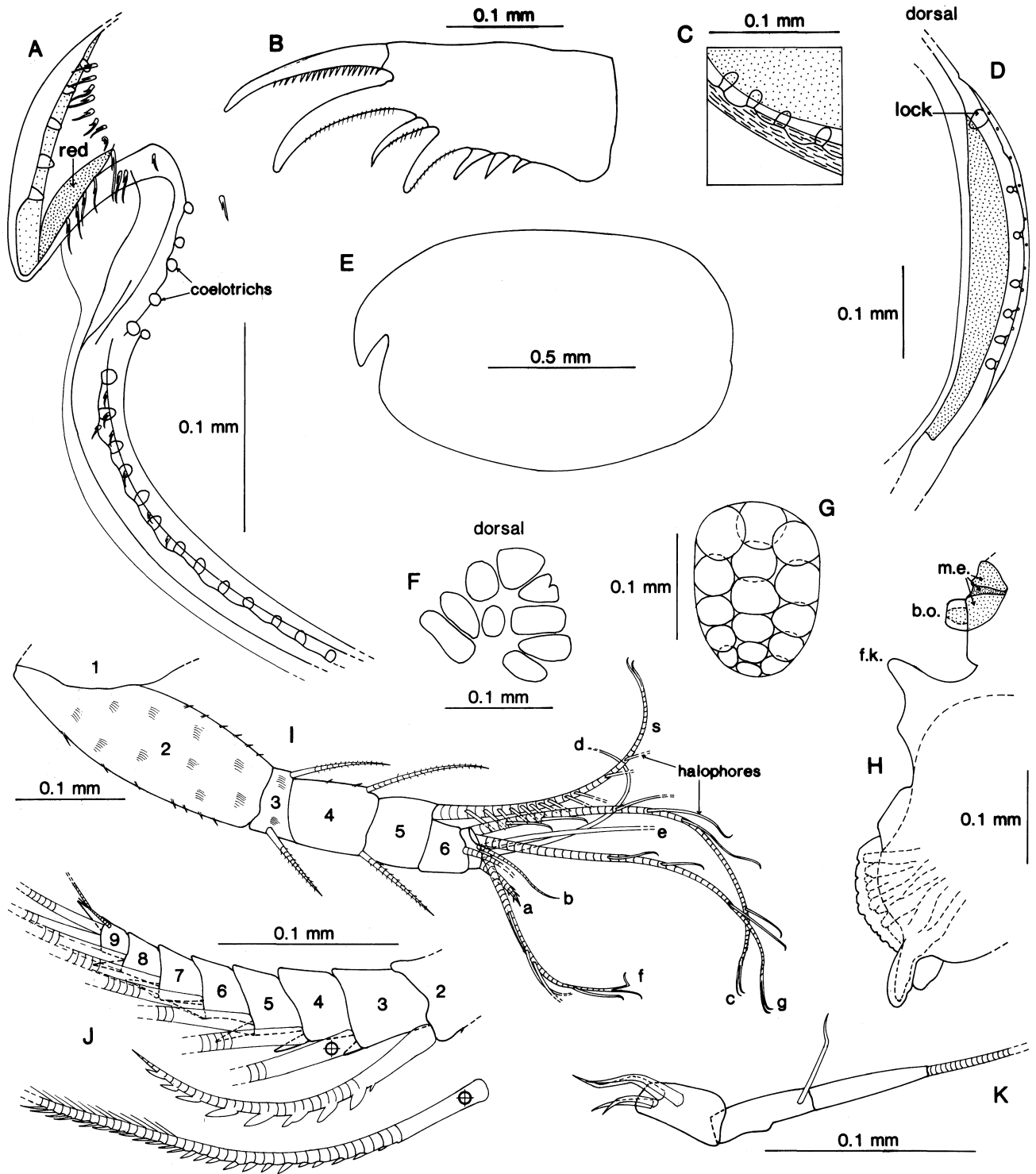


Fig. 2. *Lowrya taiti*, adult female (AM P44618). **A**, anterior of right carapace valve, medial view (area of sclerotization shaded). **B**, left furcal lamella, lateral view. **C**, appearance of coelotrichs (in anteroventral section of left carapace valve) at 200 times magnification, lateral view (setae not visible). **D**, posterior (keel) of right carapace valve, medial view. **E**, right carapace valve, medial view. **F**, central adductor muscle scars of right carapace valve, medial view. **G**, left lateral (compound) eye, lateral view (dorsal above). **H**, anterior of body, limbs removed, showing medial eye (m.e.), Bellonci organ (b.o.), frontal knob (f.k.), and upper lip. **I**, right 1st antenna, medial view. **J**, exopodial articles 2-9 of left 2nd antenna, including seta of 3rd article, medial view. **K**, endopodite of right 2nd antenna, medial view.

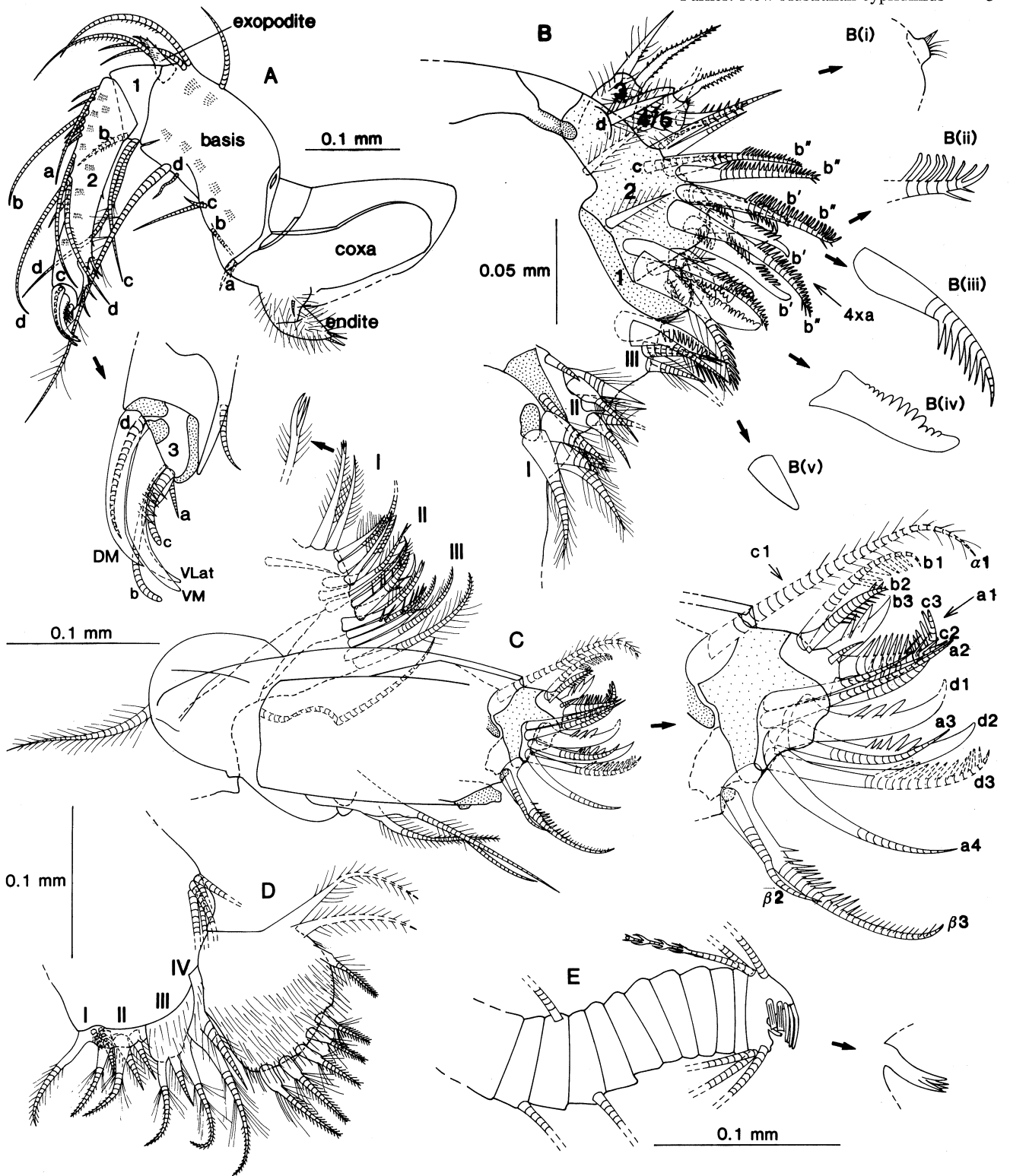


Fig. 3. *Lowrya taiti* adult female (AM P44618). **A**, right mandible, medial view. **B**, terminal part of 5th limb, anterior view, showing endites (I, II and III), and exopodial articles (1-5). **B(i)**, terminal process of 5th exopodial article. **B(ii)**, terminal part of 2nd b"-seta. **B(iii)**, longest a-seta. **B(iv)**, longest "tooth". **B(v)**, peg. **C**, right 4th limb, medial view. **D**, right 6th limb, lateral view, showing endites (I-IV). **E**, terminal part of 7th limb, showing peg.

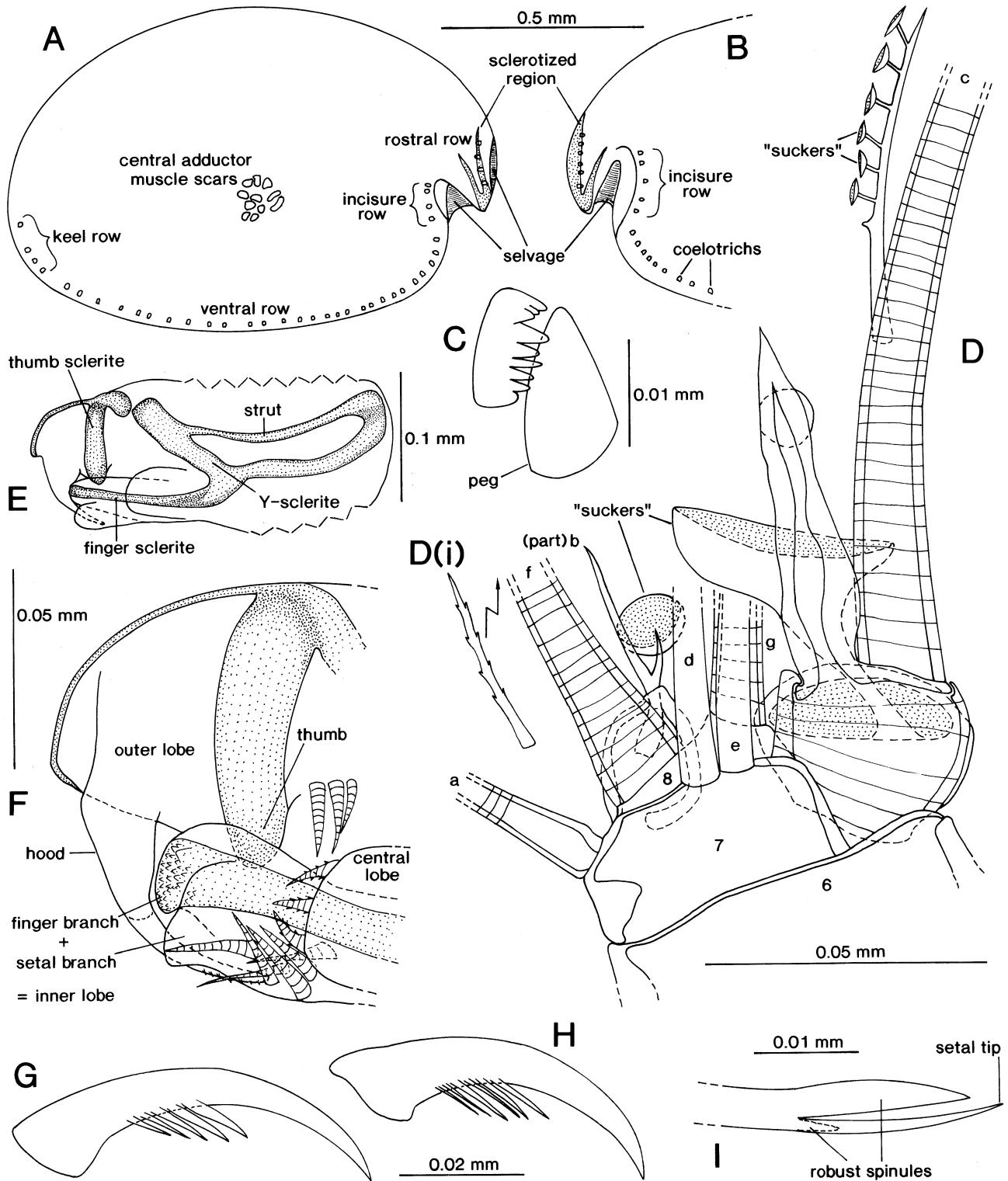


Fig. 4. *Lowrya taiti* adult male (AM P44619). **A**—left carapace valve, medial view, showing rows of coelotrichs. **B**—anterior of right carapace valve, medial view. **C**—smallest “tooth” and peg of left 5th limb, anterior view. **D**—terminal part of right first antenna, lateral view, shaft of b-seta missing. **D(i)**, 3rd most proximal halophore of the f-seta. **E**—left copulatory “limb”, ventral view, showing internal sclerites. **F**—terminal part of left copulatory “limb”, ventral view. **G**—VM claw of right mandible, lateral view. **H**—VLat claw of right mandible, lateral view. **I**—terminal part of seta of 2nd exopodial article of the right 2nd antenna, lateral view, showing small medial spine.

seta, sub-terminally, longer than ventral seta of 3rd article. *Fifth article*: s-seta with 10 proximal halophores, halophores long and bare; distally 2 non-terminal halophores, more slender and shorter (note that halophores are generally short for Cypridinidae). *Sixth article* with short bare and ringed medial seta near dorsal margin. *Seventh article*: a-seta short (shorter than seta of 6th article), stout and ringed with few distal spines; b-seta short, thin, ringed and bare; c-seta long and ringed, with 6 non-terminal halophores, halophores slender and bare. *Eighth article*: d- and e-setae (including terminal halophores) much longer than b-seta, bare and filamentous; f-seta shorter than c-seta, with 4 non-terminal halophores, halophores bare; g-seta of similar length to c-seta, with 3 non-terminal halophores, halophores bare. Bifurcate tips (2 terminal halophores) present on c-, f-, g- and s-setae.

SECOND ANTENNA. *Endopodite* with 3 articles (Fig. 2K). *First article* with 4 proximal setae; 2 short, 2 long. *Second article* elongate, with terminal long bare seta. *Third article* longer than 2nd article; terminal seta very long. *Exopodite* (Fig. 2J): *second article* bearing seta with tip reaching to about article number 8, bearing 9 ventral robust spinules, of which most proximal robust spinule is much smaller than others, and no dorsal spinules; medium-short thin spine on ventral margin of article. *Articles 3–8* with basal robust setae, robust seta of 5th article longest, and with natatory setae with many setules, broad setules present on seta of 3rd article only; ventral broad setules of seta of 3rd article short and stout proximally, becoming thin setules distally. Lateral robust seta of *ninth article* of similar length to that of fifth article. *Ninth article* with 4 setae; 2 long with many setules; 1 thinner, shorter and bare; 1 very short, thin and bare.

MANDIBLE (Fig. 3A). *Coxal endite* spinous; seta near base short, ringed and bare; 2 terminal setae, ringed and bare. Setae on ventral margin of *basis*: longest medial a-seta short-medium long and bare, and about 2 times longer than shortest seta; shortest a-seta bare; lateral b-seta medium length and bare, positioned closer to c-setae than a-setae; longest c-seta long and bare; shortest c-seta short and bare; longest d-seta much longer than basis, with rings of long spinules; shortest d-seta much less than 0.5 times length of basis, and bare; space between c- and d-setae much larger than space between c-setae. Distal part of dorsal margin of basis with 3 setae; 1 more proximal seta, medium length and bare, and 2 subterminal setae, subequal in length, long with short spinules. *Exopodite* of similar length as 1st endopodial article; medial surface smooth; dorsal process with few short spines, extending to a rounded tip, and with 2 ventral setae, of which the proximal seta is long, with short spinules. *Endopodite*: *First endopodial article* with 3 ventral setae; a-seta absent, b-seta medium length with many fine spinules, c-seta long and bare, d-seta long with rings of long spinules. *Second endopodial article* long, thin, and slightly tapered; spines (in rows) on medial surface are short and straight or slightly crescent shaped; dorsal margin with 11 setae; 1 a-, 1 b-, 1 c-, 2 d-setae; d-setae longest; d-setae long with short spinules; 5 dorsomedial shorter setae, of which there are no short, stout and unringed medial setae with long stout spinules; and 1

seta distal to d-setae. Ventral margin with few short spines, and 3 setae proximal to finger seta; no very short fine setae on ventral margin at base of finger. Finger seta about 60% length of finger. Finger long, slender with wide base, curved with rounded tip and unringed. *End article* with 3 claws; claws all similarly curved and of approximately equal length; longest claw longer than finger; DM (dorsomedial) claw shortest and thinnest, tapered, with an almost pointed tip, without spinules; VM (ventromedial) claw longest, proximally stout, distally tapered, with a rounded tip, bearing 1 minute spinule; VLat (ventrolateral) claw slightly shorter than VM claw, proximally stout, distally tapered, with a rounded tip, bearing 5 very long spinules. *End article* with 4 setae; ventromedial a-seta short, tapered, with an almost pointed tip; ventrolateral b-seta very long, untapered, with a rounded tip; ventromedial c-seta medium length, broad and slightly tapered, with a rounded tip; dorsolateral d-seta long, tapered, with an almost pointed tip; b-seta longest; a-seta shortest.

FOURTH LIMB (Fig. 3C). *Endite I* with 9 setae; *endite II* with 5 setae; *endite III* with 4 setae; trifid tips present on a few endite setae. *Coxa* with long dorsal seta with many setules. *Basis* with no lateral setae, and 2 medial setae. *Exopodite* bare, with 1 proximal seta, which is long with many setules; and 2 terminal setae, which are long with proximal robust setules. *Endopodite*: *first endopodial article* approximately rectangular, and bare; cutting tooth large, with 3 cusps, cusps squarish in shape, partial suture or cutting edge separating proximal part from rest of cutting tooth present. 1 α -seta; α 1-seta very long with distal setules. 2 β -setae; β 2-seta medium length and bare, β 3-seta very long and denticulate. *Second endopodial article* much narrower than 1st article, with 4 a-setae: a1-seta thin with a widened base, medium length and bare, distally ringed; a2-seta thin with a widened base, long and bare, ringed throughout most of length; a3-seta thin with a widened base, long and bare, ringed throughout most of length; a4-seta thin with a widened base, long and bare, distally ringed. 3 b-setae: b1-seta medium width, medium length, ringed throughout most of length, with 6 denticles, denticles medium broad, of medium length and present distally; b2-seta medium width with a widened base, medium length, unringed, with 11 denticles, denticles narrow, short and present distally; b3-seta (most posterior) claw-like, medium length, unringed, with 2 denticles, denticles very broad, long and present centrally. 3 c-setae: c1-seta (most anterior) very thin, short and bare, ringed throughout most of length; c2-seta broad, medium length, ringed throughout most of length, with 10 denticles, denticles medium broad, long and present along most of setal length; c3-seta broad, long and spinous, ringed throughout most of length, with 10 denticles, denticles medium broad, long and present along most of setal length. 3 d-setae: d1-seta claw-like, long, unringed, with 3 denticles, denticles very broad, of medium length and present centrally; d2-seta claw-like, long, unringed, with 5 denticles, denticles broad, long and present centrally, of these denticles 2 are large, and positioned distally on the anterior side of the d2-seta; d3-seta thin with a widened base, long, distally ringed, with 10 denticles, denticles

medium broad, long and present distally, of these denticles 2 are large, and positioned proximally on the anterior side of the d3-seta.

FIFTH LIMB (Fig. 3B). With 40 *epipodial setae*. Anterior distal tooth of *Protopodite* with rounded tip. *Endite I* with 6 setae; *endite II* with 6 setae; *endite III* with 6 setae. *First exopodial article*: posterior row of 6 pectinate teeth (claw-like setae); tooth 1 (smallest, most posterior) with 7 denticles, tooth 2 with 7 denticles, tooth 3 with 8 denticles, tooth 4 with 9 denticles, tooth 5 with 10 denticles, tooth 6 with 12 denticles; peg large, and triangular; peg-seta medium length, stout, and with setules throughout length, peg-seta about same length as longest tooth. Anterior side of article with row of 3 setae; 1st-seta (inner) medium length, medium width, and with setules throughout length; 2nd-seta long, medium width, and with distal setules; 3rd-seta long, medium width with a broadened base, with many setules and distal spinules. Additionally 1 more proximal anterior seta on 1st exopodial article, close to protopodite; proximal anterior seta medium length, thin, and with setules throughout length. *Second exopodial article*: with 4 a-setae, a-setae claw-like, ringed, and coarsely denticulate; 7 b-setae, b-setae medium length to long, and most ringed (posterior row of 3 b'-setae, anterior row of 4 b''-setae); posterior c-seta ringed throughout most of length, and with distal spinules; anterior d-seta unringed with many setules. Inner lobe of *third exopodial article* with 3 setae; most proximal seta very short, unringed, and bare; subterminal seta long, distally ringed, and bare; terminal seta medium length, distally ringed, and bare. Outer lobe of 3rd exopodial article hirsute with 2 medium broad setae; outer seta medium length, unringed, and with proximal setules. *Fourth and fifth exopodial articles* fused and hirsute. Fourth article with 1 medium broad seta. Fifth article with 2 medium broad setae, subequal in length, unringed, with many spinules. Terminal process on inner 5th article medium sized with long spines and a group of spines forming a triangular sub-process.

SIXTH LIMB (Fig. 3D). With 5 setae in place of *epipodite*; these setae are bare and ringed. *Endites* with medial setae. *Endite setae*: *I* = 3; 1 long, distally ringed, with short distal setules, and without robust setules; 2 very short, medium width, ringed, with short setules, without robust setules. *II* = 5 setae; 2 long, distally ringed, with long proximal setules and short distal robust setules; 3 medium short, medium width with broad base, ringed, with long setules, without spinules. *III* = 3 setae; 2 long, distally ringed, with long proximal setules and short distal robust setules; 1 medium short, thin with broad base, ringed, with long proximal setules and without robust setules. *IV* = 2 setae; 1 very long, distally ringed, with long central setules and short distal robust setae; 1 medium long, thin with broad base, ringed, with long central setules and without robust setae. *Endites* separated from each other and rest of limb by sutures or grooves. *Terminal article* approximately square shaped, basally separated by suture or groove from rest of limb; medial surface hirsute; lateral surface with rows of

stout long setae along ventral margin. 5 anterior ventral terminal setae, with broad bases abruptly constricting to a narrow distal width, distally ringed, with long proximal setules and long distal spinules; setae of terminal article reducing evenly in length from most anterior seta to most posterior, with bases on margin of article; gap posterior to anterior ventral terminal setae long, including a rounded corner and a small anterior recess, gap = about 40% ventral length of terminal article, followed by 3 posterior setae, mostly unringed, some with bases on edge of article, some with bases set back from edge, the longest is the most posterior; the most anterior is medium length, with a broad base abruptly constricting to a narrow distal width, with long proximal setules and long distal spinules.

SEVENTH LIMB (Fig. 3E). Total of 9 setae. *Comb side* with 1 nonterminal seta, and 3 terminal setae; minimum number of bells on setae = 4, maximum number of bells on setae = 6. *Peg side* with 2 nonterminal setae, and 3 terminal setae; minimum number of bells on setae = 4, maximum number of bells on setae = 6. *Comb* of 3 long teeth on each side, coarsely denticulate, with rounded tips, central tooth slightly longer than others; 2 short teeth on each side, medium length, with square tips, and deep grooves. *Peg* medium length, slightly curved, narrow; tip of peg similar width to centre of peg, with many points; base of peg recessed from outer limb edge.

FURCA (Fig. 2B). Left lamella with 7 claws, right lamella with 7 claws; claws 2 and 4 fused to lamella; claw 3 shorter and thinner than claw 4; claw 1 long and medium wide; claw 4 exceptionally broad; claw 5 short and thin; anterior claws short and thin; claws generally increasing in size posteriorly (with exception). Claws generally evenly curved, four most posterior claws with spinules; distal medial robust setules of most posterior claw absent. Lamellae elongate, tapered and bare.

ANTERIOR OF BODY (Fig. 2H). *Bellonci organ*: shape (non-extended) is square; length (non-extended) = 0.03 mm; width similar to length; slightly pigmented.

Eyes: *medial eye* (Fig. 2H) medium sized; length = 0.04 mm; pigmented. *Lateral eye* (Fig. 2G): length = 0.18 mm; large (about 20 times size of medial eye); broadest dorsally; with at least 16 ommatidia, largest ommatidia located dorsally; ommatidia light amber in transmitted light, pigment between ommatidia maroon in transmitted light.

Upper lip (Fig. 2H): single undivided anterior part directed anteroventrally, ventral field of anterior part pear-shaped, with about 18 valves; valves large, and arranged in about 3–5 anterior-posterior rows on a single plane; anterior part bare. Pair of lateral *tusks* short, medium width with parallel margins, each with 1 valve, valves medium sized, positioned terminally; tusks not hirsute; spurs on tusks absent; tusks terminating at a rounded posterior corner. Upper lip pigmented.

Frontal knob (Fig. 2H): very elongate, rounded, width less than length; without projections ventral to frontal knob.

POSTERIOR OF BODY. Dorsal folds absent. *Y-sclerite* with ventral branch shorter than 50% length of dorsal branch.

Description of adult male characters

Most characters common to both sexes have been omitted from the following description.

CARAPACE (Fig. 4A,B). Length = 1.12–1.20 mm (number of specimens examined = 9), height = 0.80 mm; length/height = 1.5. Coelotrichs: 4 in rostral row, 3 in incisure row, 27 in ventral row, 4 in keel row; total of 38.

FIRST ANTENNA (Fig. 4D). *Fifth article*: s-seta with 8 bare proximal halophores (most proximal 6 halophores longest and separated by a small gap from more central 2 halophores), and 2 shorter, bare, distal non-terminal halophores. *Seventh article*: b-seta with basal setule with bulbous base, large proximal “sucker” (transparent), without non-terminal halophores, additionally 2 setules present, each bearing 7 small “suckers”, small process just proximal to most proximal “sucker” present; c-seta with bulbous base with large basal setule with sub-terminal process, and additional cup-shaped basal process from which a large “sucker” (diameter greater than width of each of the distal five articles; transparent) arises, 6 short and slender non-terminal halophores, additionally 2 proximal setules, each bearing 6–7 small “suckers”, small process just proximal to most proximal “sucker” present. *Eighth article*: f-seta with 5 non-terminal halophores, with short spinules; g-seta with 11 non-terminal bare halophores.

COPULATORY “LIMB” (Fig. 4E,F). *First article*: Y-sclerite prominent; *strut* present so that the sclerite forms an irregular rectangular loop; loop broader distally; *finger sclerite* medium wide, terminating at distal tip of finger branch. *Inner lobe* elongate with rounded tip. *Finger branch* and *setal branch* separated by a deep terminal cleft; tip of finger branch with many minute scales. Terminal and cleft region of setal branch bears minute scales; external surface of setal branch with 6 setae, ringed and bare. *Outer lobe* with *thumb sclerite* terminating at dorsal hood edge; *thumb* small and bare, located proximally on thumb sclerite, near hood; thumb with 3 ringed, bare setae, located proximal to tip of thumb sclerite. *Hood*: dorsoventral margin medium length, distally triangular, with an anterior step-like constriction, becoming a finger-like lobe; length of anterior peak small; tip of hood complete, with few minute scales or spines. Hood extends less than half way over inner lobe. *Central lobe*: width about equal to length; length = about 50% of that of inner lobe. The central lobe bears 3 terminal setae, which are ringed with spinules.

ANTERIOR OF BODY (Fig. 5A). *Lateral eye*: very large, length = 0.20 mm; broadest dorsally; at least 16 ommatidia (7 large, of approximately equal size; about 9 small, of approximately equal size), largest ommatidia located dorsally.

Etymology. This species is named in honour of Noel N. Tait, invertebrate zoologist, who provided the author with much invaluable advice on zoological subjects.

Lowrya kornickeri n.sp.

Figs 5–7

Type locality. Collected from east of Grotto Point, Port Jackson, NSW, Australia (33°49.05'S 151°15.92'E); baited trap set overnight at 11 m depth. Collected by P. Berents, A.R. Parker, K.B. Attwood and A. Murray on M.V. Sula, 25–26 November 1993. In addition to *Lowrya kornickeri* unidentified cirrolanid isopods and lysianassoid amphipods were caught. Only a small (representative) proportion of this trap sample was made available (this study was not the primary purpose of the trapping), therefore relative abundances are unknown. No adult females are known.

Type material. HOLOTYPE: AM P45463, adult male. PARATYPES: AM P45465, adult male; AM P45464, juvenile (A-1) female; AM P42244, adult male; BMNH 1995:1603, adult male (undissected); NMNH, adult male (undissected).

Description of adult male characters

COLOUR OF LIVING OSTRACODS. Beige with a red area above the incisure when viewed from certain directions.

CARAPACE. Length = 1.24 mm, height = 0.82 mm; length/height = 1.51. Range of length = 1.22–1.28 mm (number of specimens examined = 4).

Shape (Fig. 6A): rectangular oval, very slightly protruding keel; margins slightly rounded, posterodorsal margin more steeply sloped than anterodorsal margin. Keel joined to curved posterior margin of valve by smooth convex curve; dorsal edge of keel slightly below midheight of valve; dorsal edge of incisure slightly overlapping ventral edge at inner end, prominent line on outer surface of valve curving from inner dorsal edge of incisure to anterior margin of valve (ventral to incisure). Tip of rostrum rounded, with few small anterior bumps.

Valve surface: smooth at low magnification, but with faint scale-like pattern visible on anterior margins with light microscope at 100×; setae on valve surface medium sized and scattered evenly; 9 *muscle scars*, forming a circle.

Infold (Fig. 6B): infold posterior to rostrum with row of 8 setae, double type, at an angle to valve margin, all dorsal to incisure; no setae anterior or posterior to carapace infold row. Dorsal edge of incisure with 4 single setae. Dorsal to dorsal inner corner of incisure with 1 double seta, at an angle with incisure margin. Sclerotized ridge (list) dorsal to incisure at an angle with incisure margin; sclerotization strong, causing red colouration from certain directions (after preservation) of dorsal incisure margin. Anteroventral infold, near inner corner of incisure, with 5 double setae (2 medium length, 3 short); posterior edge of carapace infold without setae. Infold parallel to anteroventral/ventral margin with 21 double setae; 3 in the region ventral to incisure; diminishing in length posteriorly; no setae anterior or posterior to anteroventral/ventral row. List becomes broader in vicinity of keel, forming a shallowly curved wide smooth ridge; keel infold simple. Ridge of keel unornamented except for minute

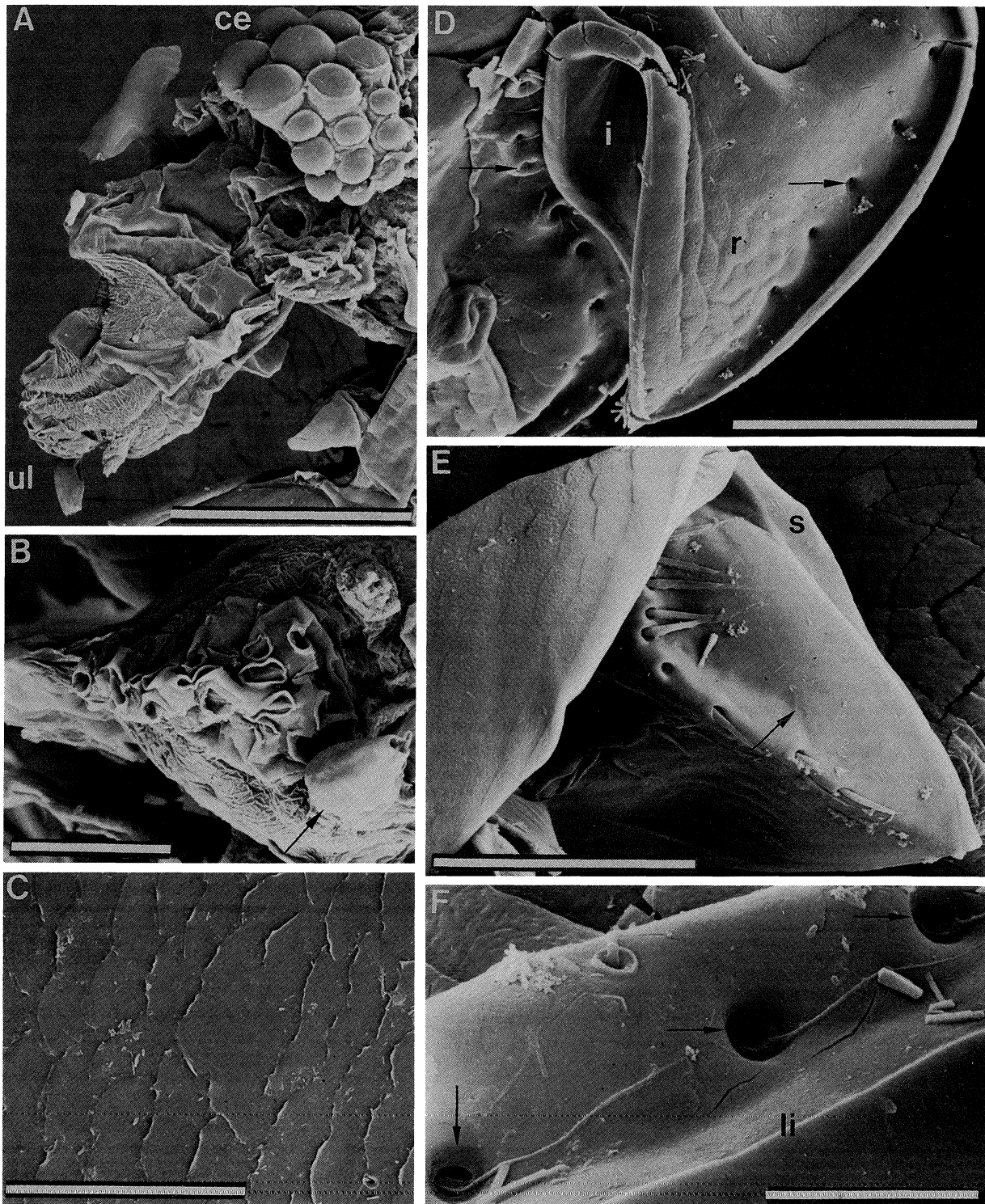


Fig. 5. *Lowrya taiti* Scanning electron micrographs, adult male (AM P45532). **A**, anterior of body, limbs removed, showing upper lip (ul) and compound eye (ce); right tusk arrowed, left tusk broken. **B**, upper lip, ventral view (right tusk arrowed). **C**, surface of right carapace valve, central region (anterior to the right), lateral view. **D**, rostrum (r) and incisure (i) of the right carapace valve, lateral view; examples of coelotrichs arrowed. **E**, rostrum of right carapace valve, medial view, showing internal setae, selvage (s) and sclerotized region (inner edge of “angle” arrowed); sclerotized region remains rigid while remaining carapace has curled after drying. **F**, three coelotrichs (arrowed) of the ventral row (anterior part) of the left carapace valve, also showing recessed “lip” near edge of valve (l), and a more common type of external carapace seta (distributed randomly over entire surface). Scales: **A** = 0.2 mm; **B** and **C** = 50 μ m; **D** and **E** = 0.1 mm; **F** = 20 μ m.

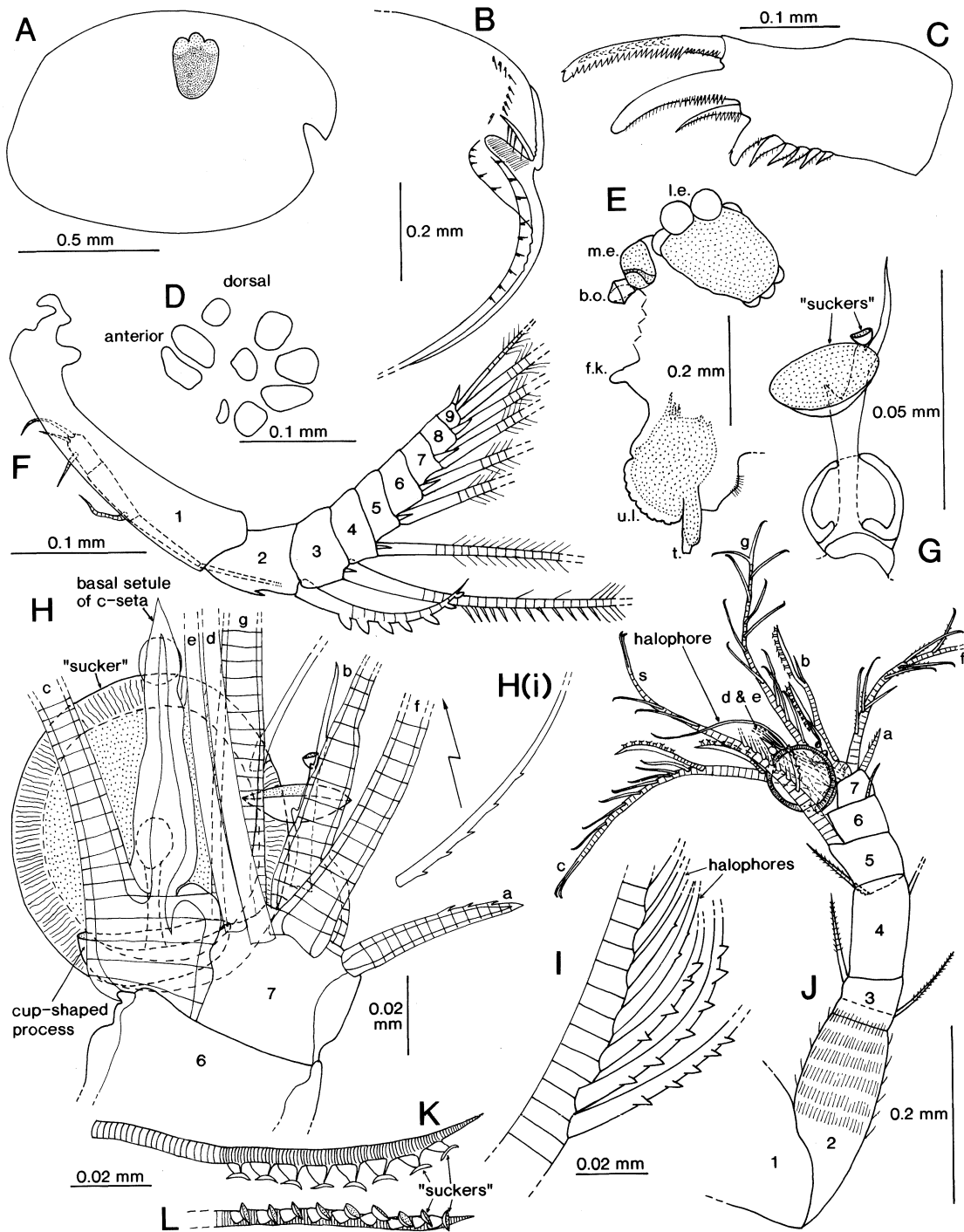


Fig. 6. *Lowrya kornickeri* adult male (AM P45463). **A**, whole animal, lateral view. **B**, anterior of left carapace valve, medial view. **C**, left furcal lamella, lateral view. **D**, central adductor muscle scars of right carapace valve, medial view. **E**, anterior of body, limbs removed, showing medial eye (m.e.), lateral eye (l.e.), Bellonci organ (b.o.), frontal knob (f.k.), and upper lip (u.l.) including left tusk (t.), areas of maroon pigmentation shaded. **F**, endopodite (dashed) and exopodite of left 2nd antenna, lateral view. **G**, basal setule of b-seta of right 1st antenna, bearing 2 "suckers", medial view. **H**, terminal articles of left 1st antenna, s-seta not illustrated, 8th article not visible, lateral view. **H (i)**, proximal section of 7th most proximal halophore of the f-seta of the left 1st antenna, lateral view. **I**, proximal halophores arising from shaft of s-seta of right 1st antenna, medial view. **J**, right 1st antenna, medial view. **K**, 2nd most proximal setule of the c-seta of the left 1st antenna, showing "suckers", lateral view. **L**, distal part of 2nd most proximal setule of the b-seta of the left 1st antenna, showing "suckers", dorsolateral view.

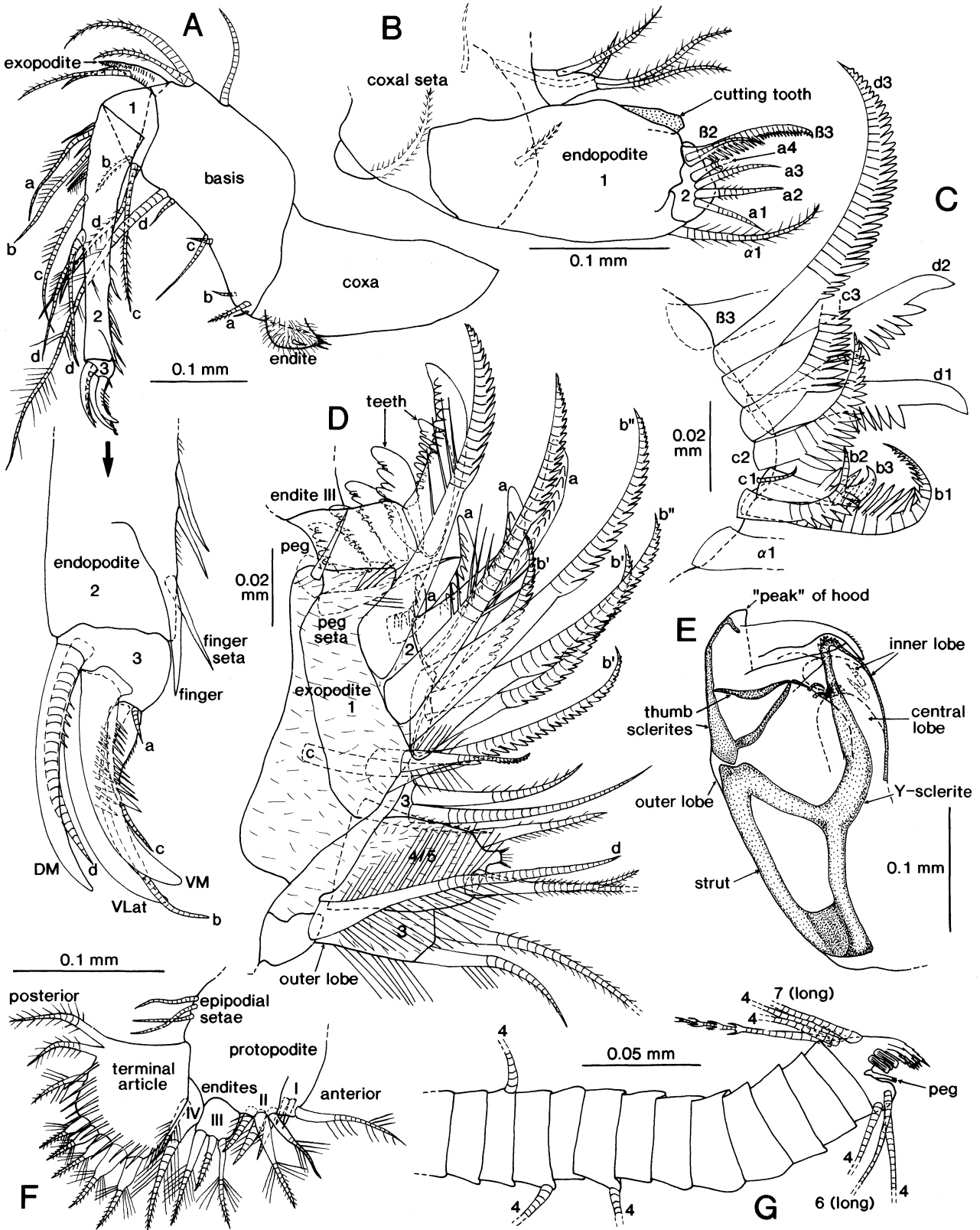


Fig. 7. *Lowrya kornickeri* adult male (AM P45463). **A**, right mandible, medial view. **B**, left 4th limb, showing some terminal endopodial setae, lateral view. **C**, terminal endopodial setae of right 4th limb excluded from **B**, medial view. **D**, terminal section of exopodite of right 5th limb, anterior view (the spines of many setae are longer than appear in this illustration, due to the angle of observation). **E**, left copulatory "limb", dorsal view. **F**, right 6th limb, lateral view. **G**, terminal section of 7th limb.

short setae or papillae emerging from unrimmed pores, without setae; list of left valve without dorsal knob, and without processes. Right valve with posterior margin of keel without setae, with few papillae emerging from pores; dorsal margin of keel without process.

Lamellar prolongation of *selvage*: medium width along rostrum; very broad and striated along lower margin of incisure; narrower along ventral margin; terminating anteroventrally. Coelotrichs (evagination/"hair" sensillae; Parker, submitted) absent.

FIRST ANTENNA (Fig. 6G–K). *First article* bare. *Second article*: many medial spines forming rows, and spines on ventral and dorsal margins. *Third article*: short, without medial spines; with ventral seta of approximately equal to length of dorsal seta, positioned distally; 1 dorsal seta at base of article. *Fourth article*: 1 dorsal seta, of approximately equal length to dorsal seta of 3rd article; 1 ventral seta, positioned terminally, shorter than ventral seta of 3rd article; setae of 3rd and 4th articles ringed with short spinules. *Fifth article*: s-seta (formally the sensory seta of the fifth article; Parker, 1995, 1998) with 7 long proximal halophores (setules on the first antennae; Parker, 1995, 1998), some with proximal spinules; distally 2 non-terminal halophores, more slender and shorter (note that all halophores are generally short for Cyprinididae). *Sixth article*: short, bare and ringed medial seta near dorsal margin. *Seventh article*: a-seta medium length, stout and ringed with few distal spinules; b-seta short, with basal setule with bulbous base, large proximal "sucker" (transparent) and small distal "sucker", without non-terminal halophores, additionally 2 setules present, each bearing 8–9 small "suckers", small process just proximal to most proximal "suckers" absent; c-seta long and ringed with bulbous base with large basal setule with sub-terminal process, and additional cup-shaped basal process from which a very large "sucker" (diameter > width of each of the distal five articles; transparent) arises, with 7 short and slender non-terminal halophores, most proximal halophore with few short spinules, additionally 2 proximal setules present, each bearing 8 small "suckers", small process proximal to most proximal "sucker" absent. Small "suckers" on the non-basal setules of the b- and c-setae bear widened, almost cone-shaped, shafts. *Eighth article* (very reduced or absent): d- and e-setae (including terminal halophores) longer than b-seta, bare and filamentous; f-seta shorter than c-seta, with 8 short non-terminal halophores, most with small proximal spinules; g-seta shorter than c-seta and longer than f-seta, with 9 short non-terminal halophores, some with small proximal spinules. Bifurcate tips (2 terminal halophores) present on c-, f-, g- and s-setae.

SECOND ANTENNA. *Protopodite*: long, bare seta. *Endopodite* (Fig. 6F): 3 articles. *First article*: 3 proximal setae; 2 short, 1 long, and no distal setae. *Second article*: elongate, with terminal long bare seta. *Third article*: longer than 2nd article and narrow; terminal seta long and unringed. *Exopodite* (Fig. 6F): *second article*: bearing seta with tip reaching to about 8th article, bearing 7 ventral robust spinules, most proximal spinule is similar size to others, no dorsal spinules; medium-short thin spine on ventral margin of article. *Articles 3–8*: with basal robust

setae becoming longer distally; natatory setae with many fine setules, broad setules present on seta of 3rd article only. *Ninth article*: lateral robust seta of similar length to that of 8th article; 2 setae, both long with many fine setules.

MANDIBLE (Fig. 7A). *Coxal endite*: spinous; seta near base short, ringed and bare; 2 terminal setae, unringed and bare. Setae on ventral margin of *basis*: longest medial a-seta short-medium length, with short distal spinules, about 3 times longer than shortest seta; shortest a-seta bare; lateral b-seta short and bare, positioned very close to a-setae; longest c-seta long and bare; shortest c-seta short and bare; longest d-seta much longer than basis, with rings of long spinules; shortest d-seta much less than 0.5 times length of basis, and bare; space between c- and d-setae much larger than space between c-setae. Distal part of dorsal margin of basis: 3 setae; 1 more proximal seta, medium length and bare; 2 subterminal setae, subequal in length, with short spinules. *Exopodite*: similar length as 1st endopodial article; medial surface wrinkled; dorsal process hirsute, extending to a pointed tip; with 2 ventral medium-broad setae, longest with short spinules. *Endopodite*: *First endopodial article*: 3 ventral setae; a-seta absent, b-seta medium length with spinules, c-seta long with spinules, d-seta long with rings of long spinules. *Second endopodial article*: long, very thin, and slightly tapered; spines (in rows) on medial surface are long and straight; dorsal margin with 11 setae; 1 a-, 1 b-, 1 c-, 2 d-setae; c-seta longest; d-setae long with short spinules; 5 dorsomedial shorter setae (1 short, stout and unringed with long stout spinules); 1 seta distal to d-setae; ventral margin with few long spines and 3 setae proximal to finger. Finger seta about 60% length of finger; finger long, slender with wide base, curved with pointed tip and unringed. *Terminal article*: with 3 claws; claws all similarly curved and of approximately equal length; longest claw longer than finger; DM (dorsomedial) claw shortest and thinnest, tapered, with an almost pointed tip, bearing 5 spinules of medium length; VM (ventromedial) claw midsize, proximally stout, distally tapered, with rounded tip, bearing 12 spinules (6 medium length and proximal, 6 long and more distal); VLat (ventrolateral) claw slightly longer than VM claw, proximally stout, distally tapered, with a rounded tip, bearing 12 spinules (6 medium length and proximal, 6 long and more distal); 4 setae; ventromedial a-seta short, tapered, with an almost pointed tip; ventrolateral b-seta very long, almost bulbous proximally, distally tapered, with unevenly curved tip, bearing many short spinules; ventromedial c-seta medium length, tapered, with rounded tip; dorsolateral d-seta long, tapered, with almost pointed tip; b-seta longest; a-seta shortest.

FOURTH LIMB (Fig. 7B,C). *Endite I* with at least 6 setae; *endite II* with 5 setae; *endite III* with 5 setae; trifid tips present on a few endite setae. *Coxa*: long dorsal seta with many setules. *Basis*: no lateral setae, 3 medial setae. *Exopodite*: bare; 1 proximal seta, long with many setules; 2 terminal setae, long with many setules. *Endopodite*: *first endopodial article*: approximately rectangular, uniformly spinous; cutting tooth large, with 2 squarish cusps, partial suture or cutting edge separating proximal part from rest of cutting tooth; 1 α -seta ($\alpha 1$), very long with many setules; 2 β -setae: $\beta 2$ -seta medium length and bare, $\beta 3$ -seta very long and denticulate. *Second endopodial article*: much

narrower than 1st article; 4 a-setae; broad with widened bases, medium long with proximal spinules, ringed throughout most of length; 3 b-setae; b1-seta medium width with widened base, long, ringed throughout most of length, with 7 long medium-broad denticles, present proximally, and about 9 smaller distal spinules; b2-seta medium width with a widened base, medium length, ringed throughout most of length, with 6 broad denticles of medium length and present centrally; b3-seta (most posterior) claw-like, medium length, unringed, with 2 long, broad denticles, present centrally; 3 c-setae; c1-seta (most anterior) very thin, short and bare, ringed throughout most of length; c2-seta medium width with widened base, medium length, ringed throughout most of length, with 16 proximal broad denticles, longer proximally; c3-seta broad, long, ringed throughout most of length, with 15 long, broad denticles, present distally; 3 d-setae; d1-seta claw-like, medium length, unringed, with 6 long, broad denticles, present centrally; d2-seta claw-like, long, unringed, with 9 long, broad denticles, present centrally; d3-seta medium width with widened base, very long, distally ringed, with 35 medium-broad denticles, medium length proximally, decreasing in length distally, present along most of setal length.

FIFTH LIMB (Fig. 7D). 38 *epipodial setae*. *Protopodite*: anterior distal tooth with rounded tip. *Endite I* with 6 setae; *endite II* with 6 setae; *endite III* with 7 setae. *First exopodial article*: posterior row of 6 denticular teeth; tooth 1 (smallest, most posterior) with 5 denticles, tooth 2 with 8 denticles, tooth 3 with 8 denticles, tooth 4 with 9 denticles, tooth 5 with 9 denticles, tooth 6 with 10 denticles; peg large, triangular; peg-seta medium length, stout, with very long, thin proximal spinules, peg-seta shorter than longest tooth; anterior side with row of 3 setae; 1st-seta (inner) short, thin with broadened base, and with very long, thin proximal spinules and long, broad distal spinules; 2nd-seta very long, medium width with broadened base, very long, thin proximal spinules and long and broad distal spinules; 3rd-seta very long, medium width with broadened base and distal spinules; additionally 1 proximal anterior bare seta, very short, medium width with broadened base, close to protopodite. *Second exopodial article*: 4 a-setae, claw-like and coarsely denticulate; 5 b-setae, medium-long to very long, ringed, posterior row of 3 b'-setae, anterior row of 2 b"-setae; posterior c-seta unringed and bare; anterior d-seta distally ringed, with very long, thin proximal spinules. Inner lobe of *third exopodial article* with 3 setae; most proximal seta short, unringed, with distal spinules; subterminal seta long, ringed and bare; terminal seta medium-long, distally ringed, with distal spinules. Outer lobe of 3rd exopodial article: hirsute, 2 medium-broad setae; outer seta medium-long, distally ringed, with long thin proximal spinules and short thin distal spinules along outer margin only. *Fourth and fifth exopodial articles* fused and hirsute. *Fifth article*: 2 setae, subequal in length, ringed, with many short setules; terminal process large with long spines. *Fourth article*: 1 seta.

SIXTH LIMB (Fig. 7F). 3 bare and ringed setae in place of *epipodite*. *Endites* with medial setae, separated from each other and rest of limb by sutures or grooves (except endites I and II, which are fused to rest of limb). *Endite setae*: I = 3; 1 very long, distally ringed, with long setules;

2 very short, medium width, ringed, with long setules and without spinules; II = 5; 2 long, distally ringed, with long central setules and short distal spinules; 3 medium short, medium width with broad base, ringed, with long setules; longest with short distal spinules; III = 3; 2 long, distally ringed, with long central setules and with short distal spinules; 1 medium short, medium width, ringed, without setules and with short spinules; IV = 2, 1 very long, ringed, with long central setules and with short distal spinules; 1 short seta, medium long, thin with broad base, distally ringed, with long central setules and without spinules. *Terminal article*: approximately square shaped, basally separated by suture or groove from rest of limb; medial surface hirsute; lateral surface with rows of long spines; 5 anterior ventral terminal setae, with broad base abruptly constricting to narrow distal width, distally ringed, with long central setules and long distal spinules, reducing evenly in length from most anterior seta to most posterior, with bases on margin of article; gap posterior to anterior ventral terminal setae medium length, including rounded corner, gap = about 20% ventral length of terminal article, followed by 3 ringed posterior setae, some with bases on edge of article, some with bases set back from edge, longest is posterior, most anterior setae long, with broad base abruptly constricting to a narrow distal width, with long central setules and long distal spinules.

SEVENTH LIMB (Fig. 7G). Total of 10 setae. *Comb side*: 1 nonterminal seta, 4 terminal setae; minimum number of bells on setae = 4, maximum number of bells on setae = 7. *Peg side*: 2 nonterminal setae, 3 terminal setae; minimum number of bells on setae = 4, maximum number of bells on setae = 6. *Comb*: 3 long teeth on each side, long teeth long, coarsely denticulate, with pointed tips, central long tooth longer than others; 2 short teeth on each side, short teeth medium long, with square tips, and deep grooves. *Peg*: long, slightly curved, very narrow; tip of peg similar width to centre of peg, and with many points; base of peg recessed from outer limb edge.

COPULATORY "LIMB" (Fig. 7E). *First article*: Y-sclerite prominent; *strut* present so that sclerite forms an irregular rectangular loop; loop broader distally; *finger sclerite* broad proximally, becoming narrow distally, forming a continuous section along inner margin of inner lobe, terminating near base of inner lobe. *Inner lobe*: elongate with rounded tip. *Finger branch* and *setal branch* separated by a deep terminal cleft. *Finger branch*: tip with stout spines; terminal and cleft region bare. *Setal branch*: external surface with 2 bare, ringed setae. *Outer lobe*: *thumb sclerite* forming edge of a triangle with an extended tip; *thumb* small and bare, located proximally on thumb sclerite, near hood; 2 bare, ringed setae located proximal to tip of thumb sclerite. *Hood*: dorsoventral length medium long; distally triangular becoming a finger-like lobe; anterior peak short; tip of hood complete, with few minute scales or spines; hood extends almost entirely over inner lobe. *Central lobe*: width approximately equal to length; length = about 50% of that of inner lobe; 3 terminal ringed and setae with many spinules.

FURCA (Fig. 6C). Left lamella with 9 claws, right lamella with 9 claws; claws 2 and 4 fused to lamella; claw 3 longer but thinner than claw 4; claw 1 long and medium wide;

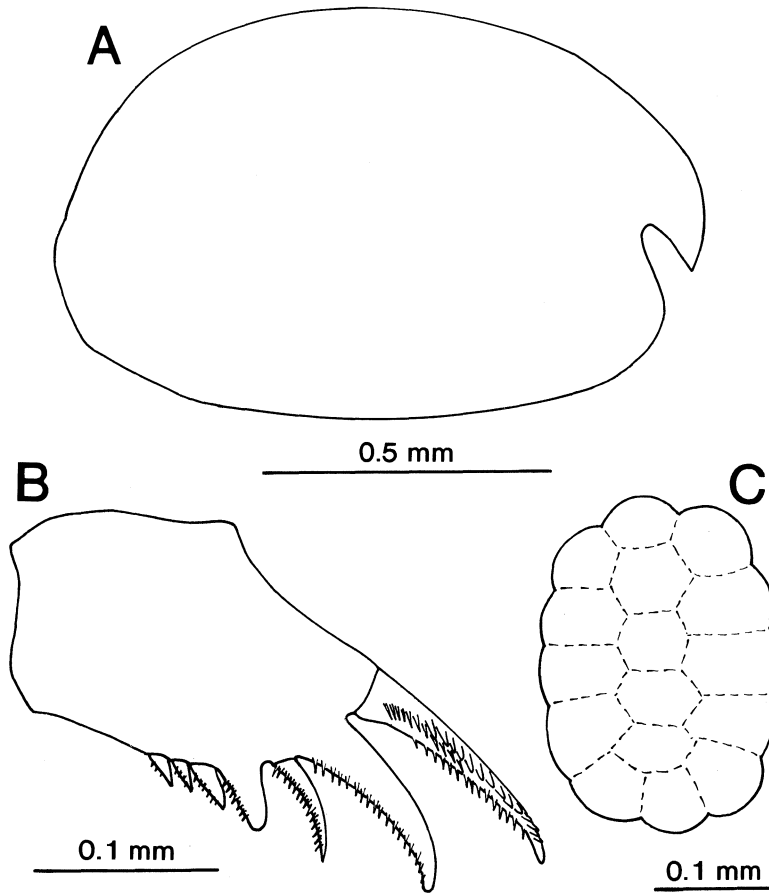


Fig. 8. *Lowrya kornickeri* juvenile (A-1) female (AM P45464). **A**, right carapace valve, lateral view. **B**, left furcal lamella, medial view (right lamella with 8 claws). **C**, left lateral (compound) eye, lateral view (dorsal above).

claw 4 exceptionally broad; claw 5 short and broad; anterior claws short and broad; claws generally increasing in size posteriorly; claws generally slightly curved; all claws with spinules; distal medial robust setules of most posterior claw broad; lamellae with concave posterior part of ventral margin, leading to an anterior ventral hump; left lamella bare, right lamella with medial long thin setae near distal ventral margin.

ANTERIOR OF BODY (Fig. 6E). *Bellonci organ*: (non-extended) is trapezoid (terminal margin longer than basal margin); length (non-extended) = 0.03 mm; width greater than length; tip (extended) bluntly rounded; without pigment.

Eyes: medial eye (Fig. 6E) large, length = 0.06 mm; pigmented. *Lateral eye* (Fig. 6E): very large, length = 0.27 mm; about 10 times size of medial eye; broadest dorsally; with at least 16 ommatidia (7 large, of approximately equal size; 9 small, of approximately equal size), largest ommatidia located dorsally; ommatidia light amber in transmitted light, matrix between ommatidia maroon in transmitted light.

Upper lip (Fig. 6E): pigmented. *Anterior*: single undivided process directed anteroventrally; ventral field of process pear-shaped, with about 16 large valves,

arranged in about 3–5 anterior-posterior rows on a single plane; anterior process bare. *Posterior*: with very fine setae posteriorly. *Tusks*: short, consistently medium width; each with 2 valves, valves medium sized, forming a step-like profile of posterior tusk margin; tusks without setae or spines; spurs on tusks absent.

Frontal knob (Fig. 6E): large, rounded, width less than length; no projections ventral to frontal knob.

POSTERIOR OF BODY. *Dorsal folds*: absent. *Y-sclerite*: ventral branch <50% length of dorsal branch.

Description of juvenile (A-1) female characters.

Most characters common to both sexes have been omitted from the following description.

CARAPACE (Fig. 8A). Length = 1.14 mm, height = 0.70 mm; length/height = 1.63.

FIRST ANTENNA. Without “suckers” and basal setules of b- and c-setae; all halophores without spinules.

MANDIBLE. All setae generally with less spinules than male. *Second endopodial article*: dorsal margin with 7 bare setae; 1 a-, 1 b-, 2 shorter-, 1 c-, 2 d-setae (no setae distal to d-setae). *Third endopodial article*: c-seta of left limb curves in opposite direction to claws and b- and d-setae

(probable artifact of slide preparation); c-seta of right limb similar to that of the male.

SIXTH LIMB. *Terminal article*: row of 4 anteroventral setae.

SEVENTH LIMB. Total of 8 setae. *Comb side*: without non-terminal setae; 3 terminal setae.

FURCA (Fig. 8B). Left lamella with 7 claws, right lamella with 8 claws; claws 2 and 4 proximally broader than in male; large medial robust setae of claw 1 (most posterior claw) present along almost complete length of claw; lamellae irregularly shaped, with very prominent hump midway along ventral margin.

ANTERIOR OF BODY. *Lateral eye* (Fig. 8C): large, length = 0.27 mm; broadest centrally (dorsal side similar size to ventral side); with at least 16 equally sized ommatidia.

Etymology. This species is named in honour of Louis S. Kornicker, myodocopid ostracod expert, who has described a large proportion of the known myodocopines, and taught the author important techniques for working with ostracods.

Discussion

Species of *Lowrya* are scavengers. The well-developed "armature" of their fourth and fifth limbs (many terminal setae with large spinules or denticles) and large spinules on most mandibular claws are probably useful adaptations to feeding since these parts are all used in the scavenging feeding process. However, cypridinids known not to scavenge also possess such armature, to some extent. Also the broad fourth claw of the furcae of *Lowrya* may be an adaptation to scavenging because the furca plays an important role in tearing into animal carcasses (Parker, 1997b). Other scavenging cypridinids do not possess such a broad fourth claw of the furca.

Lowrya taiti n.sp. and *L. kornickeri* are relatively easy to identify under a dissecting microscope by non-ostracod specialists, without making dissections. They are relatively small cypridinids, all with a similar, rectangular oval, carapace shape, with a red colouration of a section of the rostrum visible from certain directions (present in preserved specimens). This red colouration is a structural colour (no pigments involved) and is therefore caused by the physical nature of the sclerotized area of the rostrum. The precise mechanism behind this reflection can only be determined using transmission electron microscopy. It is unusual because previously known forms of sclerotization are either colourless, a deep amber or brown/black (due to melanin) in crustaceans (Stevenson, 1985). The red colour in *Lowrya*, however, is rather weak and may not be functional. Red light may not be present at the depths where *Lowrya taiti* n.sp. exist (Jerlov, 1976). This colour is probably incidental to the strong lateral processes of the rostrum, which provide a cover for the second antennae when protruded through the incisure. This may provide protection from sediment during digging, where the second antennae plays a major role (see Vannier & Abe, 1993).

The distribution of small "suckers" on the non-basal setules of the b- and c-setae of the adult male first antennae of *Lowrya kornickeri* and *L. taiti* indicates that they belong

in the *Cypridina* group within the Cypridinini (definitions from Kornicker 1975, 1983). The large basal "suckers" of the c-setae of the male first antennae of *Lowrya kornickeri* and *L. taiti* (a character shared only with *Sheina orri*), and the intriguing cup-shaped sections from which they arise, justify a functional morphology study of these, and all other male first antennal "suckers" within the Cypridinidae. These "suckers" are supposedly suctorial organs used by the adult male to grasp the female during copulation, as observed in a contentious study of *Vargula hilgendorffii* (Müller, 1890) (Okado & Kato, 1949). However, from video recordings of a species of *Skogsbergia*, a cypridinid with male first antennal "suckers", during mating, it was observed that these "suckers", or any part of the male first antenna, did not make contact with the female (Parker, 1997a). Therefore, the possibility that these "suckers" have a sensory function (Kornicker, 1983) should be investigated. The cup-shaped basal sections, and the bulbous proximal parts, of the basal setules of the c- and b-setae of the male first antennae of *Lowrya kornickeri* and *L. taiti* provide evidence for a functional mechanism for the whole "sucker" system which is more complex than one required for a "simple" suctorial organ. Additionally, the large "sucker" of the c-seta of the male first antenna of *Lowrya kornickeri*, at least, might be somewhat restricted by its position (Fig. 6J) to function as a suctorial organ. In living *Azygocypridina lowryi* Kornicker, 1985, in a large petri dish full of water, the largest angular movement of first antennal setae is only about 15° (Parker, 1998). It can be noted that the large "suckers" (at least) bear a close resemblance to the calceoli of certain amphipods; the calceolus is a presumed sensory receptor (Lincoln & Hurley, 1981). Lincoln (1985) suggests, with evidence, that the calceoli may function as phonoreceptors, sensitive to water borne pressure waves.

ACKNOWLEDGMENTS. I thank the Australian Museum for the use of their facilities, and Jim Lowry (Australian Museum) for providing the material, comments on the manuscript, and advice on composing a DELTA database for cypridinid ostracods, which was used, for the first time, to produce both species descriptions herein. I also thank Helen Stoddart and Steve Keable (Australian Museum) and Noel Tait (Macquarie University) for helpful discussions on systematics and DELTA, Roger Springthorpe (Australian Museum) for advice on figure production, and Geoff Avern (Australian Museum) for implementing the electron microscopy work in this study. Thanks are due to Penny Berents (Australian Museum) for making specimens of *Lowrya kornickeri* available. This study was funded by an Australian Biological Resources Study Grant.

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