

***Codonocera cuspidata*, a New Species
of Pelagic Ostracode from off
Queensland, Australia
(Crustacea: Ostracoda: Cypridinidae)**

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ABSTRACT. *Codonocera cuspidata* is described and illustrated. The species was collected in a neuston tow north of Queensland, Australia, and is the second species of the genus reported from Australia. It differs from other species by a combination of characters of the 1st antenna, mandible, maxilla, 5th limb, 7th limb and Bellonci organ. A brief supplementary description of the type species of the genus *Codonocera cruenta* Brady, 1902, is presented, together with a key to *Codonocera* species in the *cruenta* group.

KORNICKER, LOUIS S., 1986. *Codonocera cuspidata*, a new species of pelagic ostracode from off Queensland, Australia (Crustacea: Ostracoda: Cypridinidae). Records of the Australian Museum 38(3): 119-134.

Members of the genus *Codonocera* are known only from Indo-Pacific and Australasian waters (McKenzie, 1967: 221). The genus has been recorded as far south as New Zealand (Barney, 1921: 178), but the only previous record in the vicinity of Australia is that of Bate & Sheppard (1982: 26), who identified 12 adult males from the Great Barrier Reef as *C. polygonia* Müller, 1906. Over 250 specimens of a new species of *Codonocera* captured in a neuston net north of Townsville, Queensland, provided the opportunity to study both the adult male and female as well as the A-1 and A-2 instars. The type species of the genus is briefly discussed.

Codonocera Brady

Type species. *Codonocera cruenta* Brady, 1902: 188, pl. XXII, figs 1-10, by monotypy.

Distribution. Indo-Pacific and Australasian waters (McKenzie 1967: 221).

Poulsen (1962: 311) divided the genus into 2 informal groups: the *goniacantha* group and the *cruenta* group. The new species described herein is in the latter group.

Diagnosis of *cruenta* group. Mandible with a total of

6 claws and bristles on end joint. Maxilla: exopodite with 2 plumose bristles; 1st endopodial joint with 2 beta-bristles; 2nd endopodial joint with spines on a-bristles, and with a total of 7 b- and c-bristles. 5th limb: 2nd exopodial joint with 5 or 6 a-bristles, and with a total of 5 or 6 b'- and b"-bristles; outer branch of 3rd exopodial joint with 1 bristle much longer than other.

Discussion of type species. Through the courtesy of Mr P. S. Davis, Deputy Curator, the Hancock Museum, Newcastle upon Tyne, I received a slide (no. 1.54.15) containing appendages of the holotype of the type species, *Codonocera cruenta*. Unfortunately, details of many appendages are obscure but some characters are discernable. 1st antenna without spine on ventral margin of 1st joint. Longest end claw of mandible 46% length of 2nd endopodial joint; longest dorsal claw of end joint about $\frac{2}{3}$ length of longest claw; shorter dorsal claw of end joint about $\frac{1}{2}$ length of longest dorsal claw. Maxilla: 1st endopodial joint with 2 beta-bristles; end joint with spinous a-bristles, 7 b- + d-bristles, and posterior c-bristle with marginal spines. 5th limb: main tooth with 6 constituent teeth; outer lobe of 3rd exopodial joint with 1 long and 1 short bristle, but area obscure. Furca not distinct but probably with 3 claws

on each lamella as shown by Brady (1902: pl.12, fig. 7). Distribution of pigment: 1st antenna with elongate pink spot on distal part of 2nd joint dorsal to mid-height, and faint tint of pink dispersed throughout 3rd joint; 2nd antenna with small maroon spot near proximal end of protopodite near mid-height; mandible with small maroon spot near coxale endite, small maroon area near proximal ventral corner of basale; maxilla with 1 maroon spot near bases of 1st and 2nd endites; 5th limb with 1 small maroon spot proximal to main tooth of 1st exopodial joint; 6th limb with 6 diffuse spots of maroon tint dispersed throughout stem, and several diffuse spots in skirt; 7th limb without pigment; furca with many (about 10) maroon spots in area between girdle and lamellae, but apparently not within area covered by lamellae; copulatory appendage with proximal maroon spot; lateral eye without black pigment; medial eye and Bellonci organ not on slide.

Brady (1902: pl. XXII, figs 4,5) illustrated pigment spots on the mandible and 5th limb that agree in location with those on the present slide.

The appendages clearly indicate that the holotype of *C. cruenta* is in the *cruenta* group of Poulsen. It is less clear whether the specimens studied by Poulsen (1962: 319) were correctly identified as *C. cruenta*. The jaw of the 7th limb illustrated by Poulsen (1962: fig. 145j,k) is unlike that illustrated by Brady (1902: pl. XXII, fig. 6); unfortunately, the tip of the single 7th limb on Brady's slide is completely obscure. The 10 anteroventral grooves on the carapaces of the specimens identified by Poulsen were not mentioned in the descriptions of the species by either Brady or Müller (1906). In the present analysis I have assumed that Poulsen's identification of the species is correct. All known *Codonocera* species in the *cruenta* group are separated out in the accompanying key.

Key to species of *Codonocera* in the *cruenta* group

1. About 10 grooves present along anterior edge of shell below incisur and between list and shell margin, grooves perpendicular to shell edge. *C. cruenta*
— Shell without 10 grooves. 2
2. Shell, triangular flap of infold of caudal process with medial spines; 5th limb, 1st exopodial joint with 5 constituent teeth. *C. weberi*
— Shell, triangular flap of infold of caudal process without medial spines; 5th limb, 1st exopodial joint with 6 constituent teeth. 3
3. 1st antenna, 1st joint with ventral spine. *C. stellifera**
— 1st antenna, 1st joint without ventral spine. 4
4. 7th limb, middle tooth of comb twice length of shorter lateral teeth; tip of Bellonci organ blunt. *C. mortenseni*
— 7th limb, middle tooth of comb only slightly longer than lateral teeth; tip of Bellonci organ pointed. 5
5. Male 2nd antenna, broad proximal part of 3rd endopodial joint about 105% length of narrow distal part; maxilla, posterior c-bristle bare; 5th limb, 2nd exopodial joint with 5 a-bristles. *C. elongata*
— Male 2nd antenna, broad proximal part of 3rd endopodial joint about 80% length of narrow distal part; maxilla, posterior c-bristle pectinate; 5th limb, 2nd exopodial joint with 6 a-bristles. *C. cuspidata*

**C. pusilla* Müller, 1906, and *C. penicillum* Müller, 1906 also fall here. They are insufficiently known to tell if they belong in the *cruenta* group.

Codonocera cuspidata n. sp.

Figs 1-9

Material examined. HOLOTYPE: AM P36127, adult female. PARATYPES: AM P36128, adult female; USNM 158594, 2 adult females; AM P36129, 2 adult females; AM P36130, P36131, 2 adult males; USNM 193157, 2 adult males; AM

P36132, 1 adult male; AM P36136, 1 A-1 male; AM P36137, 4 unsexed A-2 instars and P36250, 1 female A-2 instar; AM P36138, P36139, 2 A-1 females; P28852, 247 specimens (mostly A-1 instars, but some adult males and females and also A-2 instars); P36140, 1 A-2 male.

Type locality. North of Townsville, Queensland, Australia, 18°03' S, 147°10' E; 27 Feb. 1977; FNQ 79-105; neuston tow

No. 28; collected by The Australian Museum Fish Department and AIMS party on RV *Lady Basten*. Paratypes from same sample as holotype.

Etymology. From the Latin *cuspidatus* in reference to the cusps along the convex margins of shell ridges.

Description of male (Figs 1–5e). Carapace elongate with linear dorsal margin and broadly convex ventral margin; anterior of carapace broadly rounded dorsal to incisur but slightly concave immediately above inferior tip of rostrum; tip of rostrum with minute anterior projection; incisur short with broadly rounded posterior end; caudal process narrow in both lateral and dorsal views; dorsal edge of caudal process forming right angle with posterior edge of valve; when carapace closed, caudal process forming posteriorly oriented siphon; posterior edge of siphon in lateral view either linear or very slightly convex; dorsal edges of valves linear and slightly depressed; anterior half of dorsal margin slightly higher than posterior half resulting in slight step at mid-length (Fig. 1); anterior end of dorsal margin forming a fairly sharp corner on left valve but smoothly rounded on right; posterodorsal corner of each valve narrowly rounded in lateral view. Anterior margin below incisur without grooves perpendicular to valve edge.

SURFACE ORNAMENTATION. Narrow ridge along dorsal edge of incisur dividing into 2 branches at dorsal inner corner of incisur (1 branch continuing along ventral margin of incisur; 2nd branch continuing ventrally and anteriorly and intersecting anterior edge of valve just ventral to incisur) (Fig. 1). Surface of valves with abundant crescent-shaped ridges convex posteriorly; posterior margin of ridges cusped and forming high angle with valve surface. Long hairs forming vertical row near posterior end of each valve, and also present along posterior half of dorsal margin of each valve (Fig. 1); shorter hairs sparsely distributed over valve surface.

INFOLD (Fig. 2a,b). Rostral infold with 14 bristles forming row on left valve of AM P36130, and only 6 on right valve (probably aberrant); 1 long bristle posterior to row; 2 small bristles at inner end of incisur,

and 2 unequal bristles on dorsal edge of incisur; anteroventral infold with 1 bristle near inner edge of infold close to incisur, then 21 bristles forming row extending to mid-length of ventral margin; list along ventral margin broadening near caudal process forming triangular flap just anterior to caudal process; flap bearing bristles along edge and with pores present on lower half; list crenulate posterior to anteroventral bristles of left valve only.

CENTRAL ADDUCTOR MUSCLE ATTACHMENTS (Fig. 1). Consisting of 2 vertical rows of elongate attachments (3 in anterior row, 4 in posterior row); 3 round attachments forming vertical row between the rows of elongate attachments; the upper 2 round attachments smaller than the lower round attachment; 2 closely spaced round attachments dorsal to other scars. An additional round attachment present dorsal and posterior to other 5, at about mid-height of valve (not shown in Fig. 1).

SELVAGE. Lamellar prolongation (with smooth outer edge) broadest in vicinity of incisur; selvage divided into dorsal and ventral segments at incisur; lamellar prolongation absent along posterior edge of caudal process.

PIGMENTATION. Lavender colouration within haemocoel forming stellate patterns visible through shell; stellate patterns faint in some specimens.

SIZE (length x height). AM P36130, 2.89 x 1.89 mm; AM P36131, 2.99 x 1.87 mm; USNM 193157, AM P36132, 3 specimens, 2.87 x 1.89 mm, 2.92 mm x 1.97 mm, 2.83 x 1.92 mm.

FIRST ANTENNA (Fig. 2c–e). 1st joint bare. 2nd and 3rd joints with lavender pigment; 2nd joint with abundant spines on medial surface and along ventral margin; 3rd joint short, with 2 bristles bearing short marginal spines (1 dorsal bristle close to 2nd joint, and 1 ventral terminal bristle). 4th joint with 2 terminal bristles bearing short marginal spines (1 ventral, 1 dorsal). Sensory bristle of 5th joint with about 20 long filaments near middle on broad proximal part of bristle, and 4 shorter and more slender filaments on slender distal part of bristle. Medial bristle of 6th joint slender with short marginal spines, about twice length of fused joints 7 and 8. 7th joint: a-bristle with short marginal spines, about same length as bristle of 6th joint, but twice its width; b-bristle about 3 times length of a-bristle, with short, bare filament proximal to bulbous part of bristle, then a long filament terminating in bouquet comprising 5–10 suckers and 1 short stem without sucker; 3 short filaments present on b-bristle distal to bouquet; c-bristle almost twice length of b-bristle, with short proximal filament proximal to bulbous part of bristle, then a long stout filament terminating in bouquet comprising 5–6 suckers and 1 short stem without sucker; 8 slender filaments present distal to bouquet; suckers of c-bristle slightly farther from tip of limb than suckers of b-bristle. 8th joint: d- and e-bristles about same length as b-bristle, bare with blunt tips; f- and g-bristles 6 times length of b-bristle, with many short marginal filaments; g-bristle slightly longer than f-bristle.

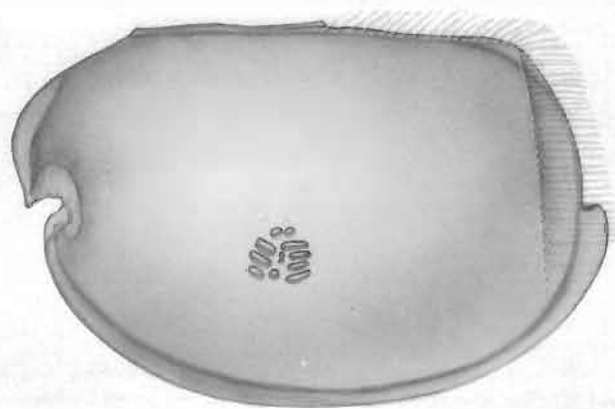


Fig. 1. *Codonocera cuspidata*, adult male paratype from left side [AM P36130], length 2.89 mm (stellate pigmentation not shown).



Fig. 2. *Codonocera cuspidata*, adult male paratype [AM P36130]: a, rostrum of left valve from inside (all bristles not shown); b, caudal process of left valve from inside; c, left 1st antenna (all long filaments of sensory bristle of 5th joint and all suckers of b- and c-bristles not shown); d, suckers of b-bristle; e, suckers of c-bristle; f, endopodite of right 2nd antenna; g, upper lip from left side.



Fig. 3. *Codonocera cuspidata*, adult male paratype [AM P36130]: a, left mandible; b, detail of claws and bristles of end joint (proximal ventral spines on longest claw not shown); c, right maxilla (exopodite not shown); d, medial eye, Bellonci organ, and outline of left lateral eye.

SECOND ANTENNA. Medial bristle of protopodite with short marginal spines, about same length as distal bristle of 1st endopodial joint. Endopodite 3-jointed (Fig. 2f): 1st joint cylindrical with 1 long and 3 short proximal bristles and 1 long distal bristle; the long proximal bristle and the distal bristle with short marginal spines; 2nd joint broadening distally, with 2 pectinate marginal bristles, and 4 small rounded teeth lateral to bristles; 3rd joint reflexed on 2nd with rounded corner, about 12 nodes (proximal 8 closely spaced) along proximal outer edge, about 20 serrations along distal inner edge, minute spines forming rows in vicinity of serrations (spines not shown on illustrated limb), and 2 pointed teeth at tip. Exopodite: ventral margin of bristle of 2nd joint with 14 stout rounded teeth followed by 7 smaller, slender spines; dorsal margin of bristle with 3 minute teeth; terminal segment of bristle about same length as combined lengths of segments with slender spines; bristles of joints 3-8 with natatory hairs, no spines; 9th joint with 1 short and 3 long bristles, all with natatory hairs, no spines; basal spines small; lateral spine of 9th joint obscure on specimen examined.

MANDIBLE (Fig. 3a,b). Coxale endite, coxale, basale and 1st endopodial joint with lavender pigment. Coxale endite stout, hirsute, with tip bearing 1-2 stout spines, and with small basal bristle. Basale with 3 a-bristles (2 proximal, 1 distal), a short stout spine near proximal a-bristle, a minute b-bristle near proximal c-bristle, and 3 c- and d-bristles (the longest and most distal with wreaths of long spines); dorsal margin of basale with bare mid-bristle just reaching past end of joint, and 2 terminal bristles (lateral of these with short marginal hairs; medial bristle about $\frac{3}{4}$ length of lateral bristle, with stouter spines on proximal half). Exopodite about $\frac{2}{3}$ length of dorsal margin of 1st endopodial joint, hirsute along margin; distal bristle reaching just past middle of proximal bristle, both with short marginal spines. 1st endopodial joint with 4 ventral bristles (1 minute, 1 about $\frac{2}{3}$ length of dorsal margin of joint, and 2 reaching past middle of ventral margin of 2nd endopodial joint, all bristles with short marginal spines). 2nd endopodial joint: medial surface and ventral margin spinous; ventral margin with 4 slender pointed bristles forming groups of 1, 1, and 2 bristles, all with spines along ventral margin; bristles in distal pair same width and length as others; dorsal margin of 2nd joint with about 15 short, medium and long bristles (1 long bristle near mid-length with base on lateral side), bare or with short, faint, marginal hairs, and about 25 faint knife-like bristles with bases on medial surface and forming rows, and about 7 bristles with stout distal spines. End joint with 4 claws and 2 bristles (Fig. 3b); longest lateral claw 44-47% length of 2nd endopodial joint (length of claw determined by measuring length of straight line connecting ends of arc formed by curved claw; length of 2nd endopodial joint measured along middle of joint), and with 4-5 proximal marginal spines; medial claw only slightly smaller than lateral and with 7 proximal spines; medial dorsal claw about $\frac{1}{2}$ length longest claw and without spines; lateral dorsal claw

about $\frac{1}{3}$ length of longest claw and with 4 faint proximal spines; lateral ventral bristle about same length as lateral dorsal claw, with short spines along ventral margin; medial bristle about $\frac{1}{2}$ length of lateral bristle, with short marginal spines.

MAXILLA (Figs 3c; 4a,b). Precoxale and coxale with fringe of dorsal hairs. Endites with lavender pigment; endite I with 7 spinous and pectinate bristles; endite II with about 7 spinous and pectinate bristles; endite III with about 5 spinous and pectinate terminal bristles and 1 spinous bristle near base of exopodite, and with small glandular protuberance on anterodistal margin (Fig. 3c). Coxale with long, stout, plumose dorsal bristle. Basale with 1 short, bare, dorsal bristle, 1 short, bare medial bristle near ventral margin, and 1 long, stout, spinous, ventral bristle. Exopodite well developed, hirsute, with 3 bristles (proximal outer bristle plumose and with base close to terminal bristles, terminal outer bristle plumose, inner terminal bristle with short marginal spines). 1st endopodial joint with hairs along dorsal margin, with 2 slender alpha-bristles with short, faint, marginal spines, and 2 beta-bristles (outer bristle long, stout, pectinate; inner bristle about $\frac{2}{3}$ length of outer bristle, narrow, ringed, with short marginal spines); cutting tooth well developed, with 2 cusps. End joint with 3 stout, pectinate a-bristles (each bristle with distal spine on each margin stouter than others, and with part of bristle distal to large spines slender, bare, ringed [Fig. 4b]; outer a-bristle with 5 spines along anterior edge and 3 on posterior edge; middle a-bristle with 7 spines along anterior edge and 3 along posterior edge; inner a-bristle with 13 spines along anterior edge and 2 spines along posterior edge); 5 stout, unringed, b-bristles (anterior bristle short, triangular, with or without 1 marginal spine; remaining bristles with 3-7 stout marginal spines); 2 pectinate c-bristles (anterior bristle with base medial to anterior b-bristle and with slender marginal spines, posterior bristle with base medial to inner d-bristle and pectinate); and 3 pectinate d-bristles with 7-10 marginal spines.

FIFTH LIMB (Fig. 4c-f). Epipodial appendage with 61 bristles; protopodite with small rounded anterior tooth. Endite I with 5 spinous bristles; endite II with 5 bristles (1 small, bare, 4 spinous and pectinate); endite III with 6-7 bristles (1 small, bare, others spinous and pectinate). Exopodite: anterior side of 1st joint with 3 anterior bristles (outer bristle with long proximal hairs and short distal spines; inner paired bristles comprising 1 long stout bristle with a few spines, and 1 slender bristle about half length other bristle, with long proximal and short distal spines); main tooth comprising small bare peg and 6 constituent teeth (posterior tooth small with 1 faint marginal tooth; anterior tooth long, stout, with 2 small proximal teeth; remaining teeth with several marginal teeth; bristle proximal to peg with faint marginal spines; 2nd joint with 6 stout pectinate a-bristles (longest of these with 9 teeth), 6 b'- + b"-bristles (longest of these with 14 marginal teeth), 1 posterior c-bristle with long proximal hairs and short distal spines, and 1 anterior d-bristle with abundant long proximal

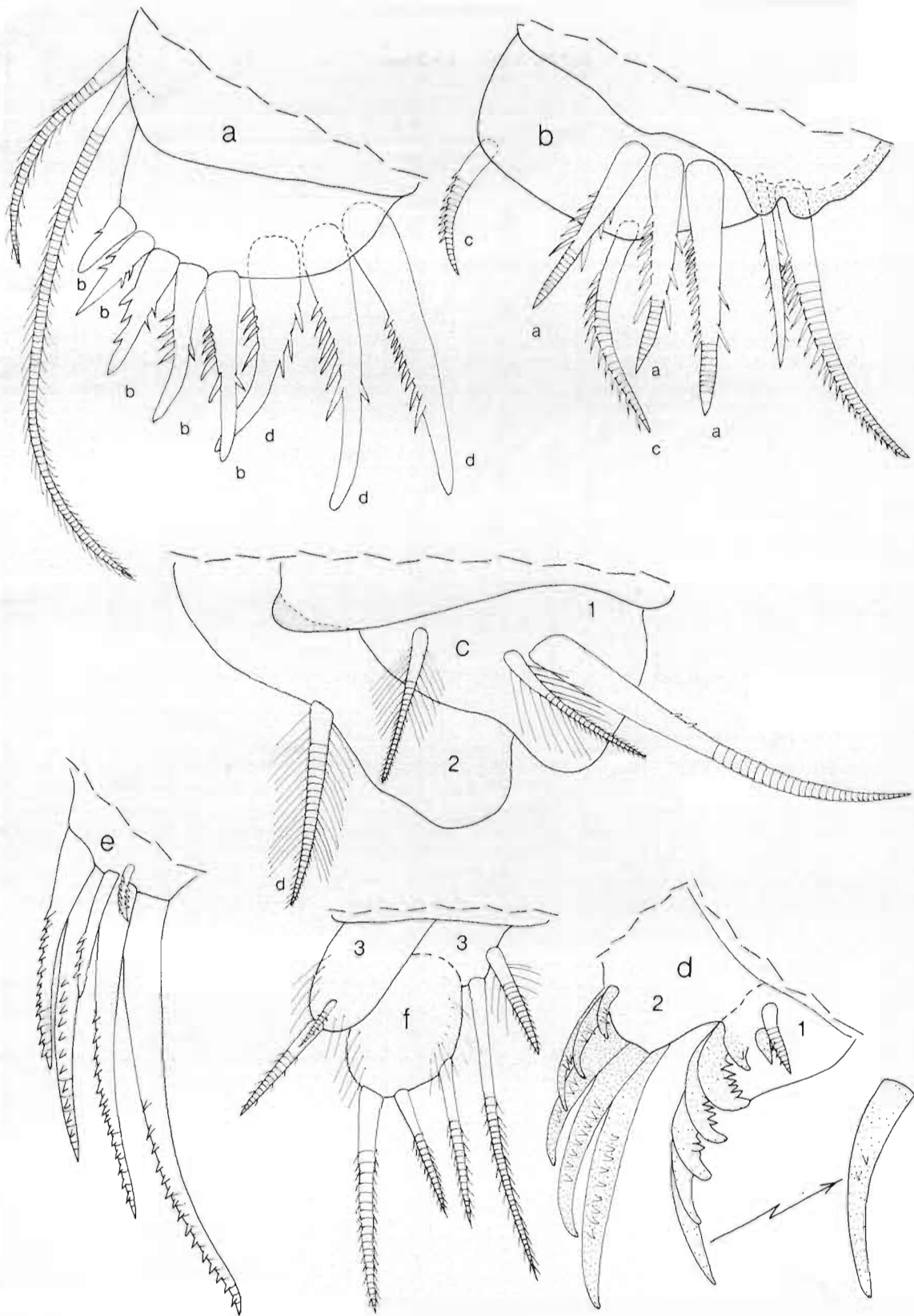


Fig. 4. *Codonocera cuspidata*, adult male paratype [AM P36130]: a, detail of right maxilla showing alpha-bristles (unlettered) of 1st endopodial joint, and b- and d-bristles of end joint; b, detail of left maxilla showing beta-bristles (unlettered) and cutting tooth of 1st endopodial joint, and a- and c-bristles of end joint; c, detail of right 5th limb from anterior showing anterior bristles of 1st exopodial joint and d-bristle of 2nd exopodial joint; d, detail of left 5th limb from posterior showing main tooth and proximal bristle of 1st exopodial joint, and a-bristles of 2nd exopodial joint; e, detail of left 5th limb from posterior showing b'- and b''-bristles of 2nd exopodial joint; f, detail of left 5th limb from posterior showing bristles of exopodal joints 3-5.

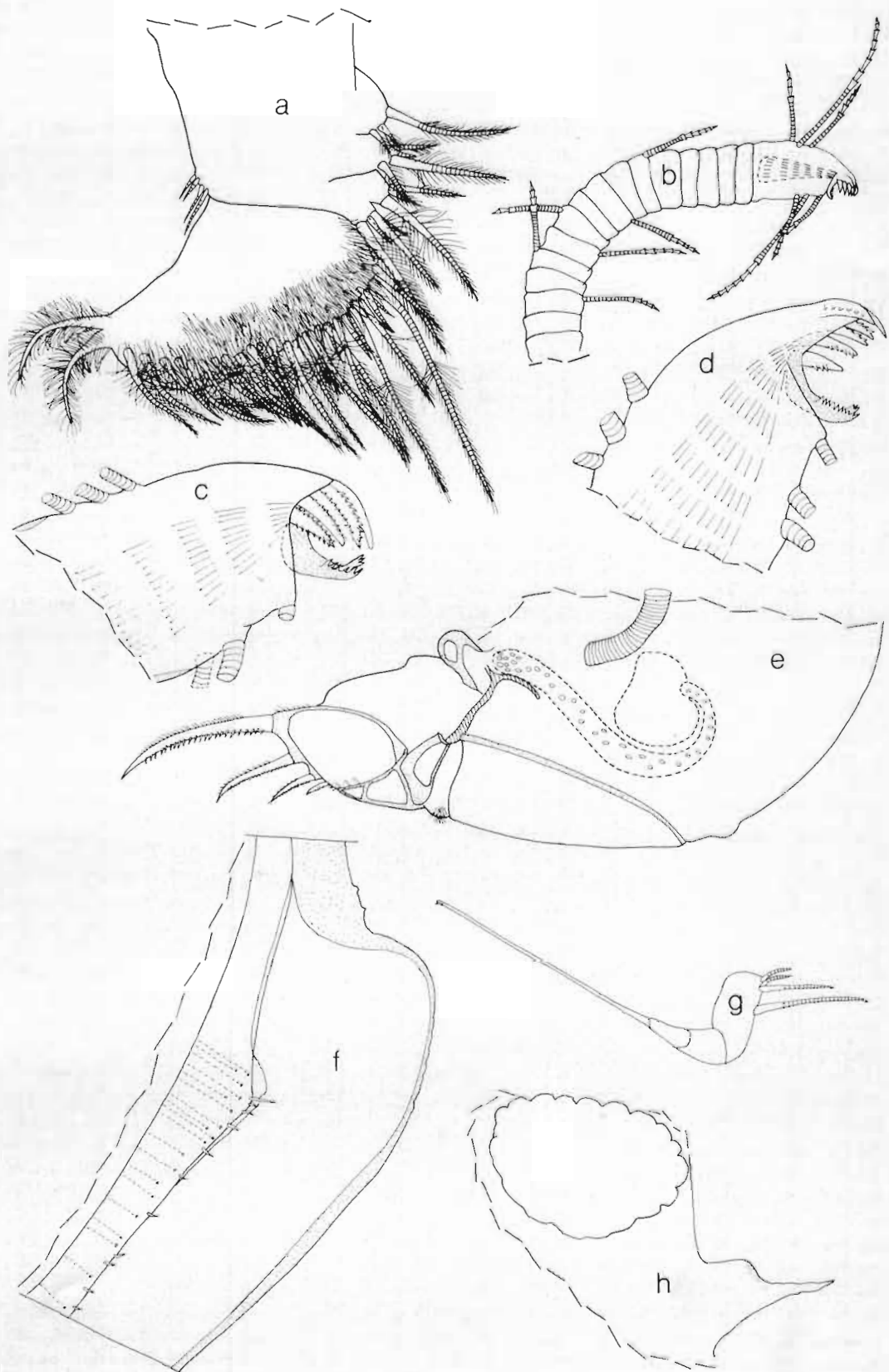


Fig. 5. *Codonocera cuspidata*, adult male paratype [AM P36130]: a, left 6th limb; b, 7th limb; c, Detail from b; d, tip of opposite 7th limb; e, posterior of body from left side showing proximal part of 7th limb, left furcal lamella, left copulatory apparatus, left Y-sclerite (dashed) and other sclerotized parts (stippled). Adult female holotype [AM P36127]: f, caudal process of right valve from inside; g, endopodite of right 2nd antenna; h, medial eye. Bellonci organ and outline of right lateral eye.

hairs and small distal spines; inner lobe of 3rd joint with short proximal bristle with long proximal hairs and short distal spines, and long distal bristle with short marginal spines; outer lobe of 3rd joint with short proximal bristle and longer terminal bristle, both with short marginal spines; 4th and 5th joints fused, with 3 bristles, all with short marginal spines; outer lobe of 3rd joint and fused 4th and 5th joints hirsute. Distal parts of endites and exopodial joints with lavender pigment.

SIXTH LIMB (Fig. 5a). Limb with lavender pigment; 4-5 bristles in place of epipodial appendage; endite I with 3 bristles (1 long terminal, 2 short, medial); endite II with 1 or 2 short medial bristles and 2 terminal (1 long, 1 short); endite III with 1 short medial bristle and 2 terminal bristles (1 long, 1 short); endite IV with 4 bristles; end joint hirsute, with 32-34 bristles (posterior 2 plumose, others with long proximal and short distal spines, or only short spines); with exception of 2 plumose posterior bristles, bristles of posterior half of end joint with bases medial and proximal to ventral margin of joint.

SEVENTH LIMB (Fig. 5b-d). Each limb with 6 proximal bristles (3 + 3) and 6 distal (3 + 3); each bristle with 3-7 terminal bells. End comb with central curved tooth not much longer than 4 teeth on each side (latter teeth with marginal spines). Jaw opposite comb with 3 teeth bearing marginal spines.

FURCA (Fig. 5e). Lavender pigment in lamellae proximal to claws; claw 1 of right lamella anterior to that of left; each lamella with 4 claws decreasing in size posteriorly along lamella; each claw with lateral and medial row of small teeth along posterior margins; teeth absent near tip of claw; claws 1-3 with abundant short hairs along anterior margin; minute spines forming rows just posterior, and also proximal, to base of claw 4; anterior margins of both lamellae with short hairs forming rows.

BELLONCI ORGAN (Fig. 3d). Small, finger-like, with pointed tip.

EYES (Fig. 3d). Medial eye bare, with small area with brown pigment. Lateral eye large, with black pigment and about 27 ommatidia (exact number uncertain).

POSTERIOR OF BODY (Fig. 5e). Abundant hairs forming narrow transverse row on margin in vicinity of posterior muscle attachment and posterior to end of Y-sclerite; hairs absent elsewhere.

Y-SCLERITE (Fig. 5e). Typical for Cypridininae.

COPULATORY LIMBS (Fig. 5e). Fairly small, lobate, with minute bristles; tubular vas deferens long, S-shaped, entering anterodorsal corner of testes.

UPPER LIP (Fig. 2g). Unpaired anterior part and paired posterior part with fairly large glandular openings; each paired part with 2 small tusks (anterior of these lateral, other with base in same plane as paired lobe but posterior to it; each tusk with only 2-3 glandular openings; glandular field containing about 7 small indistinct glandular openings present rather high on lip, proximal to each pair of tusks; posterior part of lobes hirsute.

Description of female (Figs 5f-8). Carapace higher

relative to length than carapace of male, and also larger (Fig. 6); dorsal margin convex, but fairly linear in central part; anterior end of dorsal margin forming slight hump on left valve but not on right; posterodorsal corner of each valve rounded; posterior end of caudal process fairly linear (Fig. 5f); incisur and anterior margin of carapace similar to that of male; caudal process of each valve forming half of posteriorly oriented siphon (Fig. 7f).

SURFACE ORNAMENTATION. Narrow crenulate ridge along dorsal margin of incisur continuing ventrally and intersecting edge of valve ventral to incisur (Fig. 7c,d); surface of valves with abundant crescent-shaped ridges (Figs 7-8c). Several long hairs forming irregular vertical row near posterior end of each valve; short hairs sparsely distributed over valve surface and emerging from open pore having raised rim and single node (Fig. 8c).

INFOLD (Figs 5f; 8d-f). Rostral infold with 14-17 divided bristles forming outer row and 1 bristle near middle; 2 minute bristles at inner end of incisur, and 2 unequal bristles on dorsal edge of incisur; anteroventral infold with 1 small bristle close to incisur, then 24-27 bristles forming row extending to mid-length of ventral margin; list along ventral margin broadening near caudal process forming triangular flap bearing small bristles along outer edge, and also with numerous minute pores (about 30); ventral list posterior to anteroventral bristles crenulate on left valve only.

CENTRAL ADDUCTOR MUSCLE ATTACHMENTS. Similar to those of male.

SELVAGE (Figs 5f; 8e,f). Lamellar prolongation with smooth outer edge broadest in vicinity of incisur, dividing into dorsal and ventral segments at incisur, but absent along posterior edge of caudal process. Another lamellar prolongation present along posterior edge of triangular flap of infold in vicinity of caudal process; prolongation divided at posterior tip of triangular process (Fig. 5f).

PIGMENTATION. Similar to that of male.

SIZE (length x height). Holotype, AM P36127, 3.22

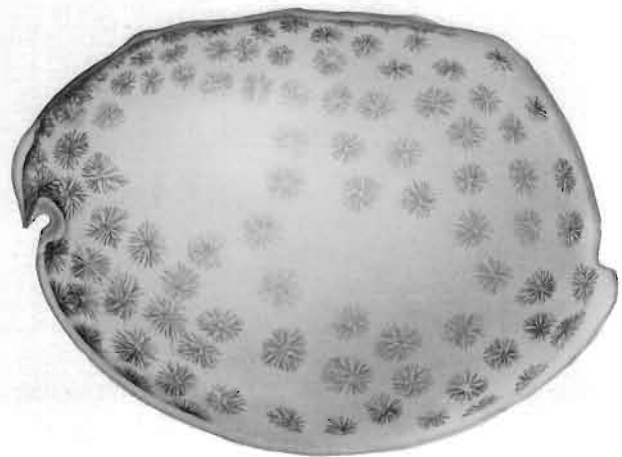


Fig. 6. *Codonocera cuspidata*, adult female holotype [AM P36127] from left side, length 3.22 mm.

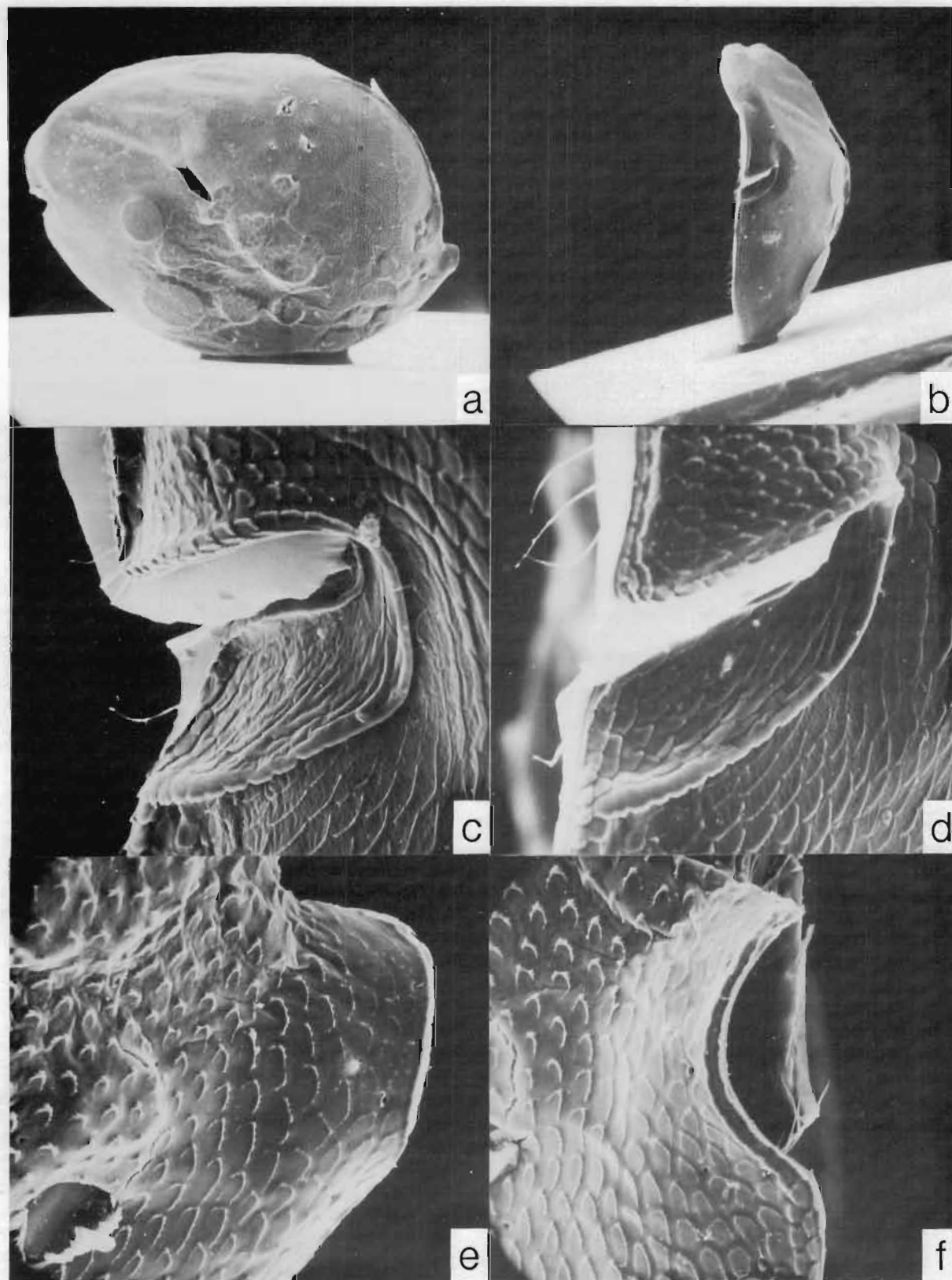


Fig. 7. *Codonocera cuspidata*, adult female holotype [AM P36127], left valve, length 3.22 mm: a, outside, X 32; b, anterior, X 31; c, incisur from left, X 250; d, incisur from anterior, X 250; e, caudal process from left, X 300; f, tip of caudal process from posterior, X 300. (Micrographs reduced to 80% for publication.)

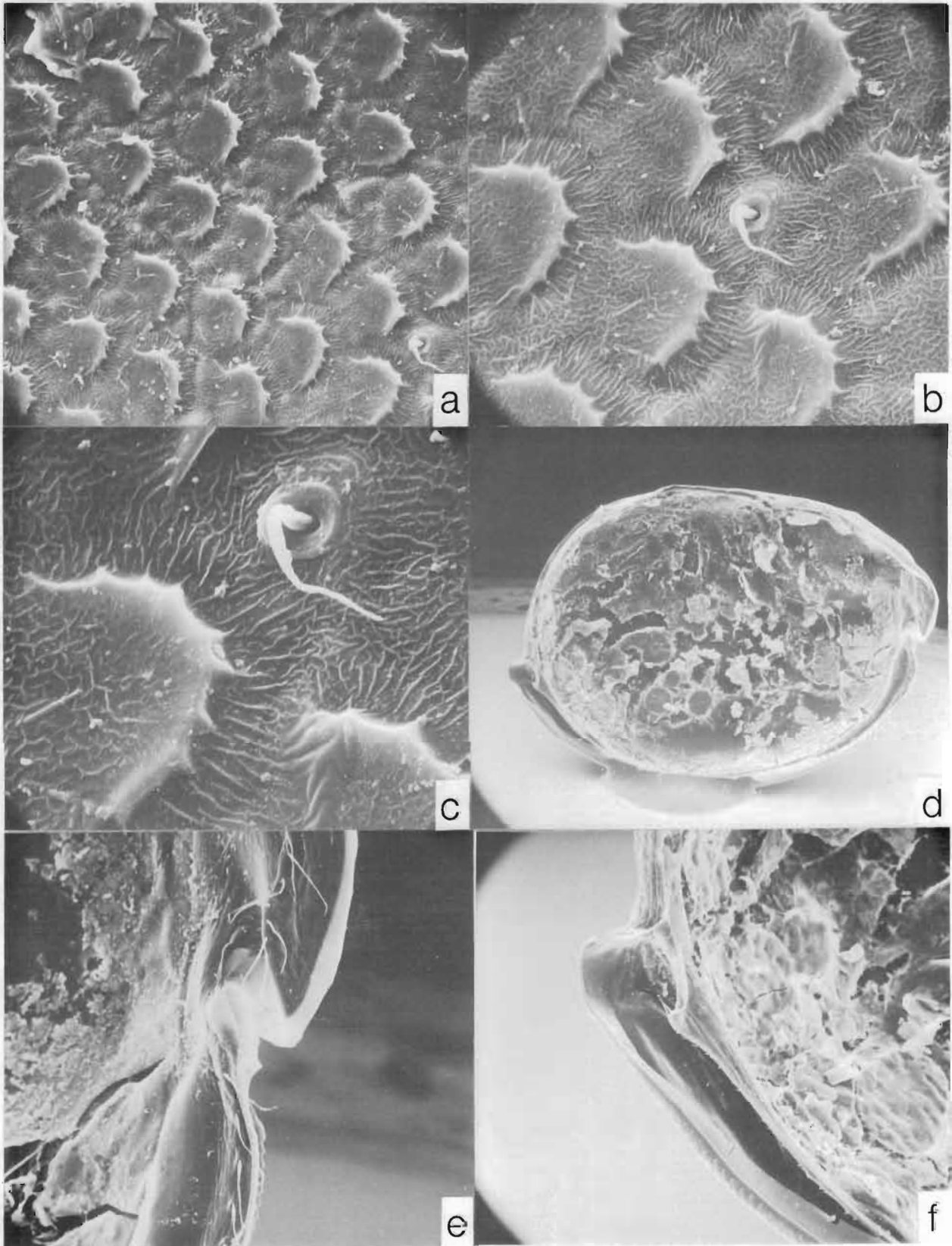


Fig. 8. *Codonocera cuspidata*, adult female holotype [AM P36127], left valve: a, cuspsate ridges near valve mid-length; b, detail from lower right of "a", X 1500; c, detail of bristle in "b", X 3000; d, inside of valve, X 30; e, incisur from inside, X 150; f, caudal process from inside, X 110. (Micrographs reduced to 80% for publication.)

x 2.40 mm; AM P36128, 3.44 x 2.54 mm; USNM 158594, AM P36129, 4 specimens, 3.13 x 2.48 mm, 3.43 x 2.60 mm, 3.45 x 2.58 mm, 3.45 x 2.61 mm.

FIRST ANTENNA. Joints 1-4 similar to those of male. Sensory bristle of 5th joint with 9-10 long filaments on broad proximal part of bristle, and 4 shorter and more slender filaments on slender distal part of bristle. Medial bristle of 6th joint similar to that of male. 7th joint: a-bristle similar to that of male; b-bristle about 3 times length of a-bristle, with 5 short marginal filaments; c-bristle broken on both limbs of specimen examined, stout, with short filaments on remaining part. 8th joint: d- and e-bristles similar to those on male; f-bristle about 3 times length of b-bristle, with 9 slender marginal filaments; g-bristle about 5 times length of b-bristle, with about 14 slender marginal filaments (distal marginal filament minute).

SECOND ANTENNA. Protopodite similar to that of male. Endopodite 3-jointed (Fig. 5g): 1st joint with 1 long and 2-3 small proximal bristles and 1 long distal bristle; 2nd joint about same length as 1st, bare; 3rd joint about half length of 2nd, with long terminal bristle about $\frac{1}{3}$ longer than endopodite. Exopodite: ventral margin of bristle of 2nd joint with 14 stout rounded teeth followed by 1 pointed spine; dorsal margin of bristle with 14 small, slender spines (base of each spine opposite base of tooth or spine of ventral margin); tip of bristle bare except for minute spine at tip. Basal spines on joints 5-8; some spines with minute, distal, marginal spine at each side near base of broad, pointed tip; lateral spine of 9th joint also with marginal spines but with rounded tip, about half length of 9th joint; exopodite otherwise similar to that of male.

MANDIBLE. Coxale, coxale endite, basale, all with lavender pigment; longest lateral claw of 3rd endopodial joint 40-44% of length of 2nd endopodial joint; limb otherwise similar to that of male.

MAXILLA. Endites I-III with 6,6,5 bristles; limb otherwise similar to that of male.

FIFTH LIMB. Small posterior tooth of main tooth of 1st exopodial joint with 4-5 marginal teeth. 2nd exopodial joint: longest a-bristle with 8 marginal teeth; longest of b'- + b"-bristles with 16 marginal teeth (proximal 2 of these minute). Limb otherwise similar to that of male.

SIXTH LIMB. 4 bristles in place of epipodial appendage; endite II with 2-3 short medial bristles and 2 terminal bristles (1 long, 1 short); endite III with no or 1 short medial bristle and 2 terminal bristles (1 long, 1 short); end joint with 26-28 bristles (posterior 2 plumose, others with long proximal and short distal spines, or only short spines). Limb otherwise similar to that of male.

SEVENTH LIMB, FURCA, BELLONCI ORGAN (Fig. 5h), EYES (Fig. 5h), POSTERIOR OF BODY, Y-SCLERITE, UPPER LIP. Similar to those of male.

GENITALIA. Small oval with attached ovoid spermatophore on each side of P36127.

Description of A-2 male (instar IV) (Fig. 9a,b). Carapace with convex dorsal and ventral margins (Fig.

9a); rostrum and caudal process similar to those of adult female; dorsal margin with linear part terminating posteriorly at midlength and forming slight step; small angular corner at anterior end of dorsal margin of left valve only. Anterior margin below incisur without grooves perpendicular to valve edge.

SURFACE ORNAMENTATION. Similar to that of adult.

INFOLD. Not examined.

CENTRAL ADDUCTOR MUSCLE ATTACHMENTS, SELVAGE: Similar to those of adult.

PIGMENTATION. Carapace pink, especially along edges, but without stellate chromatophores.

SIZE: AM P36140, length 1.83 mm, height 1.32 mm.

FIRST ANTENNA. 1st joint bare. 2nd joint with ventral and medial spines and with lavender pigment. 3rd joint short, with 2 bristles (1 ventral, 1 dorsal). 4th joint with 2 bristles (1 ventral, 1 dorsal). Sensory bristle of 5th joint with 6 long proximal filaments and 3-4 short distal filaments. Medial bristle of 6th joint with faint marginal spines. 7th joint: a-bristle about same length as bristle of 6th joint but thicker, with faint marginal spines; b-bristle about twice length of a-bristle, with 3 marginal filaments; c-bristle long, with short marginal filaments (obscure on specimen examined). 8th joint: d- and e-bristles bare; f- and g-bristles long with short marginal filaments (bristles obscure on specimen examined).

SECOND ANTENNA (Fig. 9b). Protopodite similar to that of adult female. Exopodite: ventral margin of bristle of 2nd joint with 8 stout teeth followed by 4 smaller teeth; 9th joint with 1 short and 3 long bristles and pointed lateral spine; joints 5-8 with pointed basal spines; bristles of joints 3-8 and bristles of 9th joint with natatory hairs, no spines. Endopodite 3-jointed (Fig. 9b): 1st joint cylindrical with 1 long and 1 short proximal bristle and 1 long, more distal bristle; 2nd joint longer than 1st joint, bare; 3rd joint about $\frac{3}{4}$ length of 2nd joint; inner margin with 1 long proximal bristle with blunt tip (bristle twice length of 3rd joint), and stout, ringed, terminal bristle $\frac{1}{3}$ to $\frac{1}{2}$ length of 3rd joint.

MANDIBLE. Coxale basale, exopodite, and 1st endopodial joint similar to those of adult; 2nd endopodial joint with fewer short knife-like bristles on medial surface near dorsal margin, otherwise similar to that of adult; end joint similar to that of adult except longest lateral claw 45-47% length of 2nd endopodial joint.

MAXILLA. Endite I with 5 bristles; bristles of endites II and III obscure on specimen studied. 2nd endopodial joint with 3 b-bristles, and with fewer marginal spines on a-d-bristles; limb otherwise similar to that of adult male.

FIFTH LIMB. Exopodite: main tooth of 1st joint comprising small, bare, pointed peg and 4 constituent teeth (posterior tooth well developed with 6 marginal teeth; anterior tooth large with 6 or 7 marginal teeth at mid-length); bristle proximal to peg with few marginal spines; 2nd joint with 4 pectinate a-bristles (longest of these with 5-6 marginal teeth), 5b'- and b"-bristles (longest of these with 13 stout teeth and 3 small proximal

spines), 1 posterior c-bristle with long proximal hairs and short distal spines, and 1 hirsute anterior d-bristle; inner lobe of 3rd joint with 2 bristles (proximal short, with long proximal hairs and short distal spines; distal long, with short marginal spines); outer lobe of 3rd joint with short proximal and longer terminal bristle, both with short marginal spines; 4th and 5th joints fused, with 3 bristles, all with marginal spines; outer lobe of 3rd joint and fused 4th and 5th joints hirsute.

SIXTH LIMB. Limb with lavender pigment; 2 bristles in place of epipodial appendage; endite I with 2 bristles (1 long terminal, 1 short, medial); endite II with 2 short medial bristles and 1 long terminal bristle; endite III with 1 or 2 medial bristles and 2 terminal bristles (1 long, 1 short); endite IV with 4 bristles; end joint hirsute, with 13 bristles (posterior 2 bristles plumose, others with long proximal and short distal spines, or only short spines); with exception of 2 plumose posterior bristles, bristles of posterior third of end joint with bases medial and proximal to ventral margin of joint.

SEVENTH LIMB. Each limb with 2 proximal bristles (1 on each side) with 1 terminal bell and spear-like clapper emerging from center of bell, and 2 terminal bristles (1 on each side) also with 1 terminal bell and spear-like clapper; all bristles strongly tapering. Terminal comb

with spinous middle tooth only slightly longer than 4 lateral spinous teeth (2 teeth on each side of middle tooth); jaw opposite comb terminating in 3 prongs with marginal spines.

FURCA. Similar to that of adult.

EYES. Medial eye bare, with brown pigment in dorsal half, and appearing darker along midline. Lateral eye large, with black pigment and about 25 ommatidia (exact number uncertain because of obscurity caused by pigment).

BELLONCI ORGAN. Proximal part about twice diameter of finger-like distal part; tip blunt.

EYES, POSTERIOR OF BODY, Y-SCLERITE, UPPER LIP. Similar to those of adult.

COPULATORY LIMB. Not observed.

Description of A-2 female (instar IV) (Fig. 9c,d). Carapace similar to that of A-2 male (Fig. 9c).

SIZE. AM P36250, length 1.92 mm, height 1.37 mm.

SURFACE ORNAMENTATION. Similar to that of adult.

INFOLD. Rostral infold and infold of caudal process similar in structure to that of adult, but bristles not counted.

CENTRAL ADDUCTOR MUSCLE ATTACHMENTS, SELVAGE. Similar to that of adult.

PIGMENTATION. Similar to that of A-2 male.

FIRST ANTENNA. Similar to that of A-2 male.

SECOND ANTENNA. Protopodite similar to that of A-2 male. Exopodite: bristle of 2nd joint with 10 stout teeth followed by 5 smaller teeth, limb otherwise similar to that of A-2 male. Endopodite 3-jointed: 1st joint with 1 long and 1 short proximal bristle and 1 long, more distal bristle; 3rd joint about same length as 1st joint, bare; 3rd joint short, with long terminal bristle.

MANDIBLE. Similar to that of A-2 male; longest lateral claw of end joint 46–48% length of 2nd endopodial joint.

MAXILLA. Endites I and II each with 6 bristles. Only left limb without stout b-bristle, and with only 2 a-bristles. Limbs otherwise similar to those of A-2 male.

FIFTH LIMB. Similar to that of A-2 male except for slightly different number of marginal teeth on teeth of 1st and 2nd exopodial joints.

SIXTH LIMB. Endites similar to those of A-2 male; end joint similar to that of A-2 male except with 15 bristles; 1 bristle in place of epipodial appendage.

SEVENTH LIMB. Similar to that of A-2 male.

FURCA. Similar to that of adult.

BELLONCI ORGAN (Fig. 9d). Broad proximally and then tapering to pointed tip.

EYES (Fig. 9d). Similar to those of A-2 male.

POSTERIOR OF BODY, Y-SCLERITE, UPPER LIP. Similar to those of adult.

Description of A-1 male (instar V) (Fig. 9e,f). Carapace similar to that of A-2 male (Fig. 9e), but without lavender pigment.

SIZE. AM P36136, length 2.34 mm, height 1.80 mm.

FIRST ANTENNA. Joints 1–4 similar to those of A-2 male; sensory bristle of 5th joint with 8 long proximal filaments and 4 short distal filaments (distal of these minute); medial bristle of 6th joint similar to that of

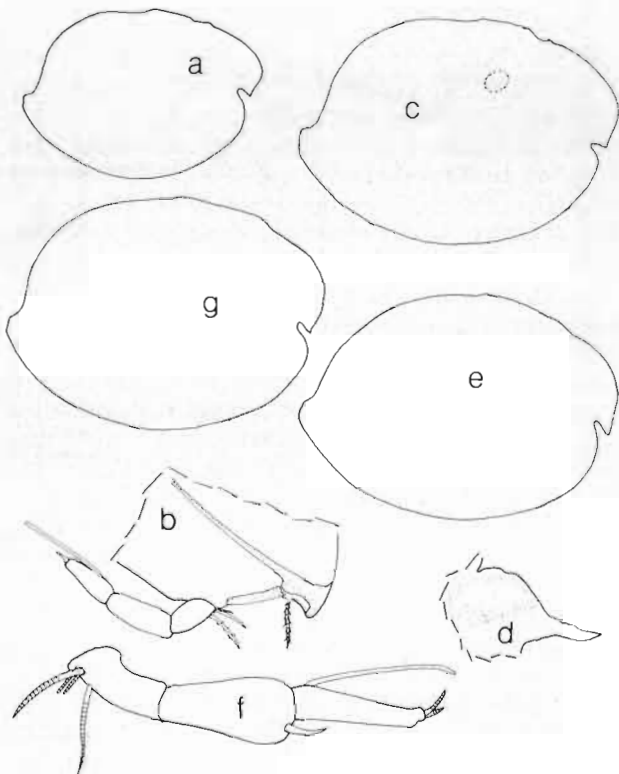


Fig. 9. *Codonocera cuspidata*, male instar IV paratype [AM P36140]: a, carapace from right, length 1.83 mm; b, distal part of protopodite, and endopodite of left 2nd antenna. Female instar IV paratype [AM P36250]: c, carapace from right (lateral eye dashed), length 1.92 mm; d, medial eye and Bellonci organ. Male instar V paratype [AM P36136]: e, carapace from right, length 2.34 mm; f, endopodite of right 2nd antenna. Female instar V paratype [AM P36138]: g, carapace from right, length 2.63 mm.

adult. 7th joint: a-bristle similar to that of adult; b-bristle similar to that of adult female, but with only 4 marginal filaments; c-bristle long, with many filaments (not counted). 8th joint: d- and e-bristles similar to those of adult; f- and g-bristles long with many filaments (not counted).

SECOND ANTENNA. Protopodite similar to that of adult female. Exopodite: ventral margin of bristle of 2nd joint with 11 rounded teeth followed by 5 pointed spine-like teeth; bristles of joints 3-9 similar to those of adult; basale spines small; lateral spine of 9th joint about same length as joint, with rounded tip and minute spine on each side near tip. Endopodite 3-jointed (Fig. 9f): 1st joint cylindrical, with 1 long and 2 short proximal bristles and 1 long more distal bristle; 2nd joint longer than 1st joint, widening distally, with 1 short bristle on outer margin and 3 weakly developed teeth lateral to base of bristle; 3rd joint thinner but slightly longer than 2nd joint, with 1 long proximal bristle on inner margin and 2 small ringed terminal bristles; 3rd joint not reflexed on 2nd as on adult male.

MANDIBLE. Coxale, basale, and 1st endopodial joint with pink pigment, and having similar number of bristles to adult, except for basale having only 2 a-bristles. Exopodite similar to that of adult. 2nd endopodial joint with fewer knife-like bristles than on adult. End joint with 6 bristles similar to those of adult; longest lateral claw 41-44% length of 2nd endopodial joint.

MAXILLA. 2nd endopodial joint: outer a-bristle with 4 spines along each edge; middle a-bristle with 5 spines along anterior edge and 4 along posterior edge; inner a-bristle with 8 spines along anterior edge and 1 along posterior edge; with 4 b-bristles. Limb otherwise similar to that of adult.

FIFTH LIMB. Exopodite: main tooth of 1st joint comprising small, bare, pointed peg and 5 constituent teeth (posterior tooth well developed with 4 marginal teeth; anterior tooth large with 2-3 small proximal teeth); bristle proximal to peg with few marginal spines; 2nd joint with 5 pectinate a-bristles (longest of these with 6 marginal teeth), 5 b'- and b''-bristles (longest of these with 14 marginal teeth), 1 posterior c-bristle with long proximal hairs and short distal spines, and 1 hirsute anterior d-bristle; inner lobe of 3rd joint with 2 bristles (proximal bristle short with long proximal hairs and short distal spines; distal bristle long with short marginal spines); outer lobe of 3rd joint with short proximal and longer terminal bristle, both with short marginal spines; 4th and 5th joints fused, with 3 bristles with short marginal spines; outer lobe of 3rd joint and fused 4th and 5th joints hirsute.

SIXTH LIMB. Limb with pink or lavender pigment. 3 bristles in place of epipodial appendage; endite I with 2-3 bristles (1 long terminal, 1-2 short medial); endite II with 2 short medial bristles and 2 terminal bristles (1 long, 1 short); endite III with 1 short medial bristle and 2 terminal bristles (1 long, 1 medium length); endite IV with 4 bristles; end joint hirsute, with 25 bristles (posterior 2 plumose, others with long proximal and

short distal spines, or only short spines); with exception of 2 plumose posterior bristles, bristles of posterior third of end joint with bases medial and proximal to ventral margin of joint.

SEVENTH LIMB. Each limb with 6 proximal bristles (3+3) with 1-3 bells, and 6 terminal bristles (3+3) with 1-4 bells; all bristles strongly tapering. Terminal comb with spinous middle tooth almost same length as adjacent spinous lateral teeth (3 on each side); jaw opposite comb curved, terminating in 3 prongs with marginal spines.

FURCA, EYES, BELLONCI ORGAN, POSTERIOR OF BODY, Y-SCLERITE, UPPER LIP. Similar to those of adult male.

Description of A-1 female (instar V) (Fig. 9g). Carapace similar in shape to that of A-2 female (Fig. 9g).

SIZE (length x height). AM P36138, 2.63 x 1.97 mm; AM P36139, 2.54 x 1.96 mm.

FIRST ANTENNA. Sensory bristle of 5th joint with 7 long terminal filaments and 4 short distal filaments (distal of these minute); limb otherwise similar to that of A-1 male.

SECOND ANTENNA. Protopodite similar to that of adult female. Exopodite: bristle of 2nd joint with 11 rounded teeth followed by 1 smaller pointed tooth; branch otherwise similar to that of A-1 male. Endopodite 3-jointed: 1st joint with 1 long and 2 short proximal bristles and 1 long, more distal bristle; branch otherwise similar to that of adult female.

MANDIBLE. Both limbs aberrant in having 3rd endopodial joint with 2 dorsal claws missing on right limb and 1 dorsal claw and 1 middle claw missing on left limb; longest lateral claw of end joint of right limb 45% length of 2nd endopodial joint; limb otherwise similar to that of A-1 male.

MAXILLA. 2nd endopodial joint: outer a-bristle with 5 spines along anterior edge and 4 along posterior edge; middle a-bristle with 7 spines along anterior edge and 3 spines along posterior edge; inner a-bristle with 10 spines along anterior edge and 2 spines along posterior edge; with 4 b-bristles, 2 c-bristles, and 3 d-bristles. Endite I with 5 bristles; endite II with 6 bristles; endite III with 6-7 distal bristles and 1 proximal bristle near base of endite. Limb otherwise similar to that of adult.

FIFTH LIMB. Similar to that of A-1 male; longest a-bristle of 2nd endopodial joint with 9 marginal teeth; longest of b'- and b''-bristles with 16 marginal teeth.

SIXTH LIMB. End joint with 20-23 bristles; limb otherwise similar to that of A-1 male.

SEVENTH LIMB. Similar to that of A-1 male.

FURCA, BELLONCI ORGAN, EYES, POSTERIOR OF BODY, Y-SCLERITE, UPPER LIP. Similar to those of adult female.

Ontogeny and sexual dimorphism (Table 1). In addition to adults, the collection contained a few A-2 instars and many A-1 instars. The A-2 instar is probably the 4th stage and the A-1 instar the 5th stage.

SHELL. The carapace of the juveniles have a dorsal margin more convex than that of the adult. The dorsal

margin of the adult male is less convex than that of the adult female. Juvenile males are larger than juvenile females, although the difference is less than for adults males and females (Table 1). Stellate lavender chromatophores, common in adults, were not observed in juveniles. Non-stellate lavender pigment was not observed in the A-2 instars, and only a slight amount was observed in the A-1 instars, whereas it is common in the adult. A pink colouration is present in both juveniles and adults, especially near the edges of the shells and around the periphery of calcareous nodules.

FIRST ANTENNA. A primary ontogenetic difference observed is an increase in the number of long proximal filaments on the sensory bristle of the adult. The abrupt increase from 8 to 20 during the development from A-1 to adult stages of the male suggests that filaments play a part in mating. The adult male bears clusters of suckers on the b- and c-bristles that are probably used for grasping the female during coupling.

SECOND ANTENNA. The number of small bristles on the 1st endopodial joints of both sexes increased from juveniles to adults (Table 1). The greatest development took place in the endopodite of the male. Its 2nd joint is cylindrical and bare in the A-2 instar, widens distally and bears 1 bristle in the A-1 instar, and further widens and bears 2 bristles as well as teeth on the adult; the 3rd joint bears 1 terminal bristle on the A-2 instar, and 2 on the A-1 instar and on the adult; the proximal part of the 3rd joint of the adult male is broad and crenulate, and the joint is reflexed on the 2nd. The endopodite of the adult male is thus capable of clasping the female while coupling.

MANDIBLE. Except for a smaller number of dorsal bristles on the 2nd endopodial joint, juvenile mandibles are similar to those of the adult.

MAXILLA. The number of b-bristles of the 2nd endopodial joint increased from 3 on the A-2 instar to 4 on the A-1 instar and to 5 on the adult.

FIFTH LIMB (Table 1). The number of constituent teeth of the main tooth of the 1st exopodial joint

increased from 4 on the A-2 instar to 5 on the A-1 instar and to 6 on the adult. A similar increase took place for the a-bristles of the 2nd exopodial joint. The b'- and b''-bristles increased from 5 on the A-2 and A-1 instars to 6 on the adult.

SIXTH LIMB. The bristles of the end joint increased at each stage (Table 1).

SEVENTH LIMB. The number of bristles increased from 4 to 12 in going from the A-2 to A-1 stage. Also, the bristles are very tapered in the A-2 stage, slightly tapered in the A-1 stage, and cylindrical in the adult.

FURCA, BELLONCI ORGAN, EYES, POSTERIOR OF BODY, Y-SCLERITE, UPPER LIP. Except for the A-2 male (AM P36140) having a Bellonci organ with a blunt tip, these characters are similar in juveniles and adults.

PIGMENTATION. Lavender pigment distributed in juveniles appendages as on adults. Pigment in appendages appearing as granules and not forming stellate patterns.

Remarks concerning shell nodules. Practically all specimens of *C. cuspidata* in the collection contain nodules in the shell. These nodules appear as flat discs generally oval in lateral view, or having linear edges where 2 or more discs are in contact. Discs are sparse in some shells and abundant in others. On some specimens the discs have a pink rim. Some of the specimens, primarily the juveniles, have small discs forming in a layer medial to larger discs; the smaller discs are entirely pink. Bate & Sheppard (1982: 29) contend that discs are formed as a step in shell calcification, and that shells become calcified by the coalescing of discs; whereas, Sohn & Kornicker (1969: 99) concluded that discs are formed mostly after death of the animal.

Station data recorded at time of collecting mentions that the specimens were bright lavender to pink. If nodules are formed after death of the animal, it follows that the concentration of pink pigment in, or around the periphery of, nodules probably also takes place after death.

Table 1. Selected characters changing during ontogeny.

Character	A-2		A-1		Adult	
	♀	♂	♀	♂	♀	♂
Shell length, mm	1.92	1.83	2.63	2.34	3.45	2.83
1st antenna, long filaments on sensory bristle	6	6	7	8	9-10	20
2nd antenna, bristles on 1st endopodal joint	3	3	4	4	4-5	5
Maxilla, b-bristles	3	3	4	4	5	5
5th limb						
Main tooth, constituent teeth	4	4	5	5	6	6
2nd joint, a-bristles	4	4	5	5	6	6
b' + b''-bristles	5	5	5	5	6	6
6th limb						
Bristles on end joint	15	13	20-23	25	26-28	32-34
Epipodial bristles	1	2	3	3	4	4-5
7th limb						
Proximal bristles	2	2	6	6	6	6
Terminal bristles	2	2	6	6	6	6
Bells on each bristle	1	1	1-4	1-4	3-7	3-7
Comb teeth	5	5	7	7	9	9

Table 2. Summary of characters by which the various species of *Codonocera* in the *cruenta* group may be distinguished.

	<i>cruenta</i>	<i>mortenseni</i>	<i>elongata</i>	<i>weberi</i>	<i>stellifera</i>	<i>cuspidata</i>
Length of mature specimens, ♂-♀, mm	3.2-3.9	-3.2	3.5-	-2.6	-3.9	2.8-3.5
Post. shell-process square (s) or rounded (r)	s	s	s	r	r	s
Grooves medially on shell margin below incisur	+	-	few	-	-	-
1st ant., 1st joint + or - ventral spine	-	-	-	-	+	-
1st ant., no. of filaments, ♂-♀, sensory bristle	50-15	-15	23-	-12	-12	24-14
Mandible end joint						
Length of longest claw in % of 2nd endop. joint	46	46	52	50	40	40-47
Longer dorsal claw + or - marginal spines	♂+, ♀-	-	-	-	-	-
Shorter dorsal claw + or - marginal spines	-	-	+	+	+	+
Longer ventral bristle + or - marginal hairs	-	-	+	-	-	+
Maxilla, longer posterior c - bristle + or - hairs or spines	+	+	-	+	+	+
Fifth limb						
Main tooth, no. of constituent teeth	6	6	6	5	6	6
Largest const. tooth + or - marginal teeth	-	+	-	-	+	+
2nd joint, no. of a-bristles	6	6	5	5	6	6
Smallest a-bristle + or - marginal teeth	+	-	+	+	+	+
Largest a-bristle + or - marginal teeth	+	+	+	+	+	+
No. b' - + b''-bristles	5	5	6	6	6	6
No. of teeth on longer b' - + b''-bristles	12-14	10-14	17-20	15-19	14-17	14-16
3rd joint, outer lobe, longer bristle + or - hairs	+	+	+	-	-	+

Comparisons. Bate & Sheppard (1982: 26) reported *Codonocera polygonia* Müller, 1906, from Wisteri Channel, Heron Island, on the Great Barrier Reef, Australia. The new species *C. cuspidata* differs from *C. polygonia* in having a total of 6 rather than 5 claws and bristles on the end joint of the mandible, and 6 rather than 5 constituent teeth on the 1st exopodial joint of the 5th limb, as well as in numerous other characters (for detailed description of *C. polygonia* see Poulson, 1962: 311, 35). Characters in which *C. cuspidata* differ from other members of the *cruenta* group are shown in Table 2, which is adapted from Poulsen (1962: Table 21). Although not listed in the table, the armature of the tip of the 7th limb is also useful in discriminating species of the *cruenta* group. The middle comb tooth is only slightly longer than the adjacent lateral teeth in *C. cuspidata*, whereas it is twice the length in *C. mortenseni* Poulsen, 1962, *C. stellifera* (Claus, 1873), and possibly *C. weberi* Poulsen, 1962. The jaw opposite the comb of the 7th limb forms a curving tusk in *C. cuspidata*, whereas it is fairly linear in *C. cruenta*. The jaw opposite the comb of *C. cuspidata* bears marginal spines not observed by Poulsen (1962: 322, 327) on *C. mortenseni* and *C. elongata* Poulsen, 1962. The new species *C. cuspidata* seems closest in morphology to *C. elongata* from which it differs in having a pectinate rather than a bare posterior c-bristle on the maxilla, and in having 6 rather than 5 a-bristles on the 5th limb, as well as the difference in the jaw of the 7th limb mentioned above. *Codonocera elongata* and *C. cuspidata* both have pointed tips on the Bellonci organ, and not blunt tips as on the other species in the *cruenta* group, according to Poulsen (1962: 310). *Codonocera formosa* (Dana, 1852) is insufficiently known for recognition; therefore, I refer it to *Codonocera* species indeterminate". Two species, *C. pusilla* Müller, 1906 and *C. penicillum* Müller, 1906, insufficiently known to place either in the *cruenta* or *goniacantha* groups, differ from *C. cuspidata* in having a ventral spine on the 1st joint of the 1st antenna. *Codonocera cuspidata* bears a basal bristle on the coxale endite of the mandible not previously reported on species of *Codonocera*.

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