

DEEVEYA BRANSONI, A NEW SPECIES OF
TROGLOBITIC HALOCYPRID OSTRACODE
FROM ANCHIALINE CAVES ON SOUTH
ANDROS ISLAND, BAHAMAS
(CRUSTACEA: OSTRACODA)

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Abstract.—*Deeveya bransoni*, a new species of troglobitic halocyprid ostracode in the subfamily Deeveyinae, from anchialine caves on South Andros Island, Bahamas, is described and illustrated. A supplementary description is presented of the type species of the genus, *Deeveya spiralis* Kornicker and Iliffe, 1985, based on type specimens from the Turks and Caicos Islands.

The new species described herein increases to five the known number of troglobitic ostracodes in the Halocypridoidea: 1, *Danielopolina orghidani* (Danielopol, 1972) from Cuba; 2, a species of *Spelaeoecia* from Bermuda described by Angel and Iliffe (1987) and mentioned by Angel (1983:531); 3, *Deeveya spiralis* Kornicker and Iliffe, 1985, from the Turks and Caicos Islands; 4, *Danielopolina wilkensi* Hartmann, 1985, from the Canary Islands; and 5, *Deeveya bransoni*, new species, from the Bahamas. A supplementary description is presented of *Deeveya spiralis* Kornicker and Iliffe, 1985.

Superfamily Halocypridoidea
Dana, 1853

Composition.—The superfamily comprises the families Halocyprididae Dana, 1853, and Thaumatoocyprididae Müller, 1906.

Family Halocyprididae Dana, 1853

Composition.—The family comprises the subfamilies Halocypridinae Dana, 1852, Conchoecinae Claus, 1891, Archiconchoecinae Poulsen, 1969, Euconchoecinae Poulsen, 1969, and Deeveyinae Kornicker and Iliffe, 1985.

Subfamily Deeveyinae
Kornicker and Iliffe, 1985

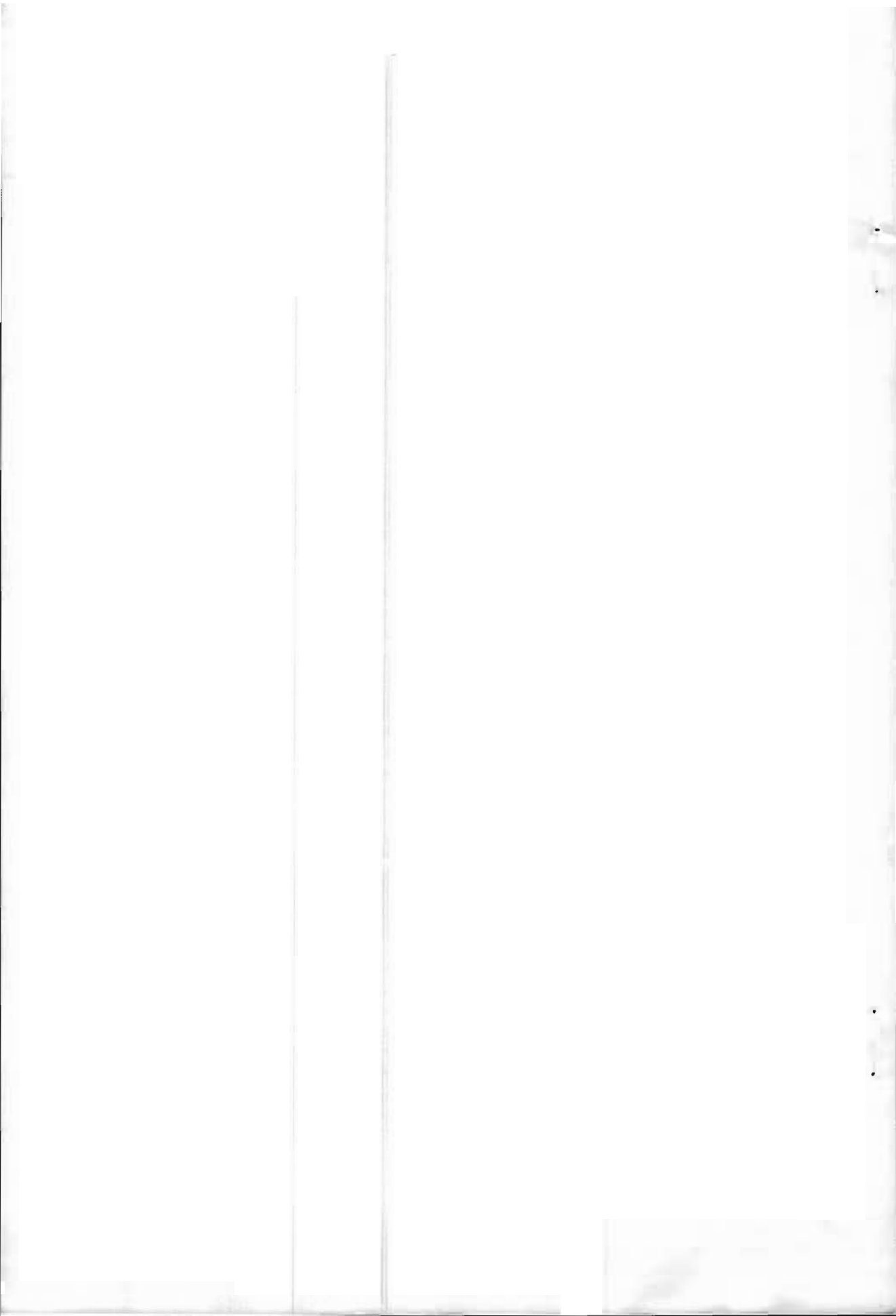
Composition.—The subfamily comprises the genera *Deeveya* Kornicker and Iliffe, 1985, and *Spelaeoecia* Angel and Iliffe, 1987.

Deeveya Kornicker and Iliffe, 1985

Type species.—*Deeveya spiralis* Kornicker and Iliffe, 1985.

Composition.—The genus comprises two species from marine caves: *D. spiralis* from the Turks and Caicos Islands, and *D. bransoni*, a new species from South Andros Island, Bahamas.

Terminology.—The distribution of bristles on joints 7 and 8 of the 1st antenna of *Deeveya* appears quite similar to those of members of the Myodocopina; therefore, the lettering system proposed by Skogsberg (1920:188) for bristles of the Cypridini-formes is used herein for *Deeveya* (Fig. 6e): "The one situated anteriorly = "the a-bristle"; the one placed distally-medially and somewhat anteriorly = "the b-bristle"; the posterior-distal one = "the c-bristle." The four bristles on the original 8th joint: The anterior of the two simple sensory filaments which are situated laterally, close to each other, is called "the d-bristle," the posterior



one of them is called "the e-bristle"; of the two distal-medial bristles, the anterior one is called "the f-bristle," the posterior one = "the g-bristle." On *Deeveya* the e-bristle is longer and stouter than other bristles of the 8th joint and is generally named the "principal bristle" in the Halocyprididae. The terminology used for *Deeveya* herein differs from the terminology proposed by Skogsberg (1920:583) for the bristles of the end joints of the 1st antenna of members of the genus *Halocypris*, but coincidentally the e-bristle is the principal bristle in both terminologies.

The terminology proposed by Skogsberg (1920:575) for bristles of the endopodite of the 2nd antenna of the Halocyprididae is applied herein to *Deeveya* (Figs. 1e, f; 4d; 6f, g): a- and b-bristles refer to the 2 dorsal bristles of the 1st joint; f-bristle (lateral) and g-bristle (medial) refer to the 2 long distal bristles of the 2nd joint; and h-, -i, and j-bristles refer to the 3 long terminal bristles of the 3rd joint. The c-, d-, and e-bristles of the 2nd joint, which are not present on all species of the Halocyprididae, and are mostly found only on males, were not present on the juveniles of known species of *Deeveya*, but a small proximal peg on the 2nd joint of the A-1 females of *D. spiralis* (Fig. 6g) and *D. bransoni* (Fig. 1f) may represent one of those bristles. An additional short unlettered bristle is present on the 3rd joint of *D. spiralis* (Fig. 6g).

Deeveya bransoni, new species

Figs. 1-5

Etymology.—The species is named for Mr. Richard Branson of Virgin Ltd, one of the main sponsors of the field work in which the junior author participated.

Material.—Bahama Islands, The Bluff, South Andros Island (map reference: Bahamas 1: 25000 O.S. series): Evelyn Green's Blue Hole (type locality) (grid reference TB 410648); 4 Jul 1986; collected from just beyond limit of daylight at depth of 22 m in

saline water; holotype, USNM 193301, A-1 female on slide and in alcohol (Palmer specimen SA/3/86).—Stargate Blue Hole (grid reference TB 403681); 3 Jul 1986; collected in saline water at depth of 30 m, 80 m from cave entrance; paratype, USNM 193302, juvenile female (A-2) on slide and in alcohol (Palmer specimen SA/2/86).

Distribution.—Known only from Evelyn Green's Blue Hole and Stargate Blue Hole, South Andros, Bahamas.

Habitat.—Specimens from both caves were from clear water with salinities in excess of 18‰ and a stable temperature of 25°C. They were collected just below the mixing zone between brackish and saline waters. The mixing zones in both caves have an associated growth of colonial bacterial plate, which may be providing a reducing environment and provides a primary food source (Cunliffe 1985). The two caves lie on a major fracture line which has its southern end extending offshore, and its northern end over 1 kilometer onshore. The fracture parallels the tongue of the Ocean, a 2000 m deep oceanic trough to the east of Andros. Current flow has been monitored along the line of the fracture (Smart, Whittaker, and Palmer, in prep.), and the fracture can be regarded as a subterranean tidal creek, which partially drains the fresh water lenses of South Andros. In Stargate Cave the A-2 female was free-swimming in clear water and appeared to be from a good population.

Description of A-1 female (Figs. 1-3).—Carapace oval in lateral view except for straight dorsal margin and slightly concave anterior margin (Fig. 1a). Right valve with small tubercle on dorsal margin near posterior end.

Ornamentation (Fig. 1c): Carapace when viewed with transmitted light appearing reticulate (reticulations appearing bright); minute rounded processes present on outer surface of walls of reticulations (processes generally appearing darker than walls and may extend above surface of valve).

Bristles (Fig. 1a): Valve margins with few



Fig. 1. *Deeveya bransoni*, A-1 female, holotype: a, Complete specimen from left side (dashed oval represents location of central adductor muscle attachment scars), length 1.68 mm; b, Detail of adductor muscle attachments (striate) and some reticulations as viewed through shell; c, Reticulations and bosses (small filled-in circles) viewed with transmitted light (stippled areas appear dark); d, Anterior of body showing divided Bellonci organ, left hepatic organ (upper dashed ovoid), left 1st antenna, and upper lip; e, Endopodite of left 2nd antenna, medial view; f, Fused joints 2 and 3 of left endopodite, lateral view; g, Left 7th limb, lateral view; h, Anterior of body from anterior showing upper lip (arcs at top represent sockets of 1st antennae); i, Anterior view of lower lip.

widely spaced bristles. Setal bristle at tip of posterodorsal tubercle of right valve just posterior to glandular opening.

Glands: Glandular opening on tip of posterodorsal tubercle of right valve.

Central adductor muscle attachments (Fig. 1b): Indistinct attachment scars forming cluster near valve midlength.

Shell size: USNM 193301, length 1.68 mm, height 1.27 mm.

First antenna (Fig. 1d): Elongate with 8 joints. 1st joint with distal lateral spines becoming longer near ventral margin; distal end of 1st joint overlapping proximal end of 2nd joint, especially near ventral margin. 2nd joint with distal medial spines and dorsal midbristle with short marginal spines; distal end of 2nd joint overlapping proximal end of 3rd joint. 3rd joint elongate, with spinous ventral bristle distal to midlength, few minute spines along dorsal margin, and longer medial spines near ventral margin. 4th joint short with small, slender, dorsal, terminal bristle reaching past 6th joint. 5th joint shorter than 4th, with long, terminal, filament-like ventral bristle bearing few, short, widely spaced, spines. 6th joint slightly shorter than 5th, bare. 7th joint about same length as 4th joint, with 1 short, distal, lateral a-bristle, and 2 long b- and c-bristles on small terminal pedistal (both bristles longer than bristle of 5th joint and with widely separated marginal spines and terminal papilla; medial b-bristle filament-like; lateral c-bristle with well-defined proximal rings and about $\frac{1}{3}$ longer than b-bristle). 8th joint small, with very long principal e-bristle and 3 shorter filament-like d-, f-, and g-bristles (all bristles with widely spaced marginal spines and terminal papilla; principal bristle about same length as c-bristle of 7th joint; g-bristle slightly longer than b-bristle of 7th joint, and longer than d- and f-bristles).

Second antenna (Fig. 1e, f): Protopodite with lateral spines forming cluster distal to middle. Endopodite 3-jointed. 1st joint with 2 distal dorsal a- and b-bristles on small

protuberance (proximal a-bristle about half length of distal b-bristle); 2nd joint forming right angle with 1st joint, with filament-like f-bristle slightly longer than half length of g-bristle (with widely separated marginal spines and terminal papilla) and medial g-bristle about twice length of protopodite, stouter than f-bristle and with fairly strong rings in proximal half (both f- and g-bristles longer than bristle of 5th joint and with widely separated marginal spines and terminal papilla); minute proximal lateral peg present near 3rd joint (Fig. 1f). 3rd joint fused to second, with filament-like h-, i-, and j-bristles, each less than half length of g-bristle (with widely spaced marginal spines and terminal papilla). Exopodite 9-jointed: 1st joint weakly divided into long proximal and short distal parts; proximal part with minute faint spines near dorsal (concave) margin; distal part with short ringed bristle reaching middle of 5th joint; 2nd joint with long bristle with small spines along middle part and distal natatory hairs; joints 3–8 each with long bristle with natatory hairs; 9th joint with 4 bristles (2 short and 1 medium length, all with distal ventral spines and no natatory hairs; 1 long with distal natatory hairs and ventral spines).

Mandible (Fig. 2): Coxale endite with teeth forming 3 rows (proximal (=dorsal), middle, distal (=ventral)) (Fig. 2b–d, f). Proximal row consisting of 4 broad teeth (Fig. 2b, f); densely packed spines between teeth and at each end; medial and lateral spines and hairs proximal to teeth; single bifurcate pointed or rounded tooth present between proximal and middle rows (about midway between posterior tooth of proximal row and anterior tooth of middle row), and adjacent to 2 stout spinous pointed bristles; 2 spinous bristles (posterior stouter) with bases just proximal and dorsal to bases of teeth forming middle row. Middle row with 5 teeth (posterior tooth longer than others) (Fig. 2c). Distal row forming ventral edge of endite with 6–7 teeth (middle tooth larger than others) (Fig. 2d). Basale with 3 proximal



Fig. 2. *Deeveya bransoni*, A-1 female, holotype, mandible: a, Proximal part of basale and endopodite of left limb, lateral view; b, Coxale endite of left limb, anterior view; c, d, Detail from b showing middle and distal teeth; e, Basale of left limb, lateral view; f, Coxale endite of right limb, posterior view; g, 3 terminal bristles of 3rd endopodial joint of left limb, lateral view.

bristles (2 stout and plumose, 1 slender with short marginal hairs) (Fig. 2a, e). Basale endite (Fig. 2e): anterior margin with single ringed bristle; posterior margin with proximal hairs, 1 short proximal bristle and 1 short distal tube-formed bristle; lateral side with few long hairs, 6 slender distal bristles (2 longer than others and entwined), and 1 short, stout, tooth just proximal to distal edge of endite; medial side with few long hairs; ventral edge with 6 terminal cusps (5 anterior serrate proximally, 1 posterior cusp bare, smaller than others and separated from them by space). Endopodite 3-jointed (Fig. 2a): 1st joint with 1 spinous, terminal, dorsal bristle, 1 spinous, distal, ventral bristle, and 4 spinous, distal, medial bristles; 2nd joint with 3 spinous, terminal, dorsal bristles, and 1 spinous, terminal, ventral bristle; 3rd joint hirsute medially and along dorsal margin, with 4 medial bristles forming row, and 3 stout, spinous, terminal bristles (ventral of these with long spines at midlength and shorter thinner spines distally; middle bristle longest, with smooth sharp tip, closely spaced posterior spines forming medial and lateral row and more widely spaced anterior spines) (Fig. 2g).

Maxilla (Fig. 3a): 3 well developed endites (bristles of endites not shown in illustration): endite I with 2 proximal bristles with long proximal hairs and about 8 terminal bristles; endite II with 2 proximal bristles with short marginal spines and about 7 terminal bristles; endite III with 1 proximal bristle with short marginal spines and about 5 terminal bristles. Coxale with 1 stout, hirsute, terminal, dorsal bristle. Basale with 1 slender ventral bristle with short marginal spines and 1 slender terminal bristle at midwidth. Endopodite: 1st joint with 4–5 spinous bristles on or near anterior margin, 5–6 bristles at distal posterior corner, and sparse surface hairs; 2nd joint with 2 stout claws, 5 slender bristles, and long hairs on anterior surface.

Fifth limb (Fig. 3b): Epipodite with hirsute bristles forming 3 groups: dorsal group

with 1 short and 4 long bristles; middle group with 6 long bristles; ventral group with 4 long and 1 short bristles. Protopodite and endopodite with 27 bristles including 2 pectinate claw-like bristles at ventral corner. Exopodite 3-jointed: 1st joint with total of 12 bristles: 2 distal dorsal bristles (longest bare, other with long marginal hairs), 2 lateral bristles (distal of these plumose), 1 medial bristle near middle, 3 proximal ventral bristles, and 4 bristles on distal ventral corner. 2nd joint elongate with 4 bristles (1 dorsal, 3 ventral). 3rd joint short with 2 long claw-like bristles and 2 slender ringed bristles (smallest bristle medial).

Sixth limb (Fig. 3c): Epipodite with hirsute bristles forming 3 groups: dorsal group with 1 short and 6 long bristles; middle group with 6 long bristles; ventral group with 5 long bristles. Protopodite with 2 joints: proximal joint with 4 bristles on or near ventral margin (2 plumose, 2 with short marginal spines); distal joint with 4 bristles on or near ventral margin (2 plumose, 2 with short marginal spines). Exopodite 4-jointed: 1st joint with plumose lateral bristle, 5–6 plumose bristles on or near ventral margin, and process with 4 bristles (1 long bristle bare, others plumose) on distal dorsal corner; 2nd joint with 4 bristles (bare or with short marginal spines) on or near ventral margin; 3rd joint separated from 2nd joint by suture, elongate with 3 bristles (2 ventral, 1 dorsal, either bare or with short marginal spines); 4th joint short, with 2 stout claw-like pectinate bristles and 2 slender bristles (1 long, ventral, 1 short, medial).

Seventh limb (Fig. 1g): Limb unjointed, with 3 terminal bristles (1 long, 2 shorter) with indistinct marginal hairs.

Furca (Fig. 3d): Each lamella with total of 7 claws followed by unpaired dorsal bristle; claws decreasing in width posteriorly along lamella; claw 4 slightly shorter than claw 5, and claw 5 about same length as claw 6; claws 1–4 with spines along posterior margin; claw 5 with longer spines along anterior margin than along posterior mar-

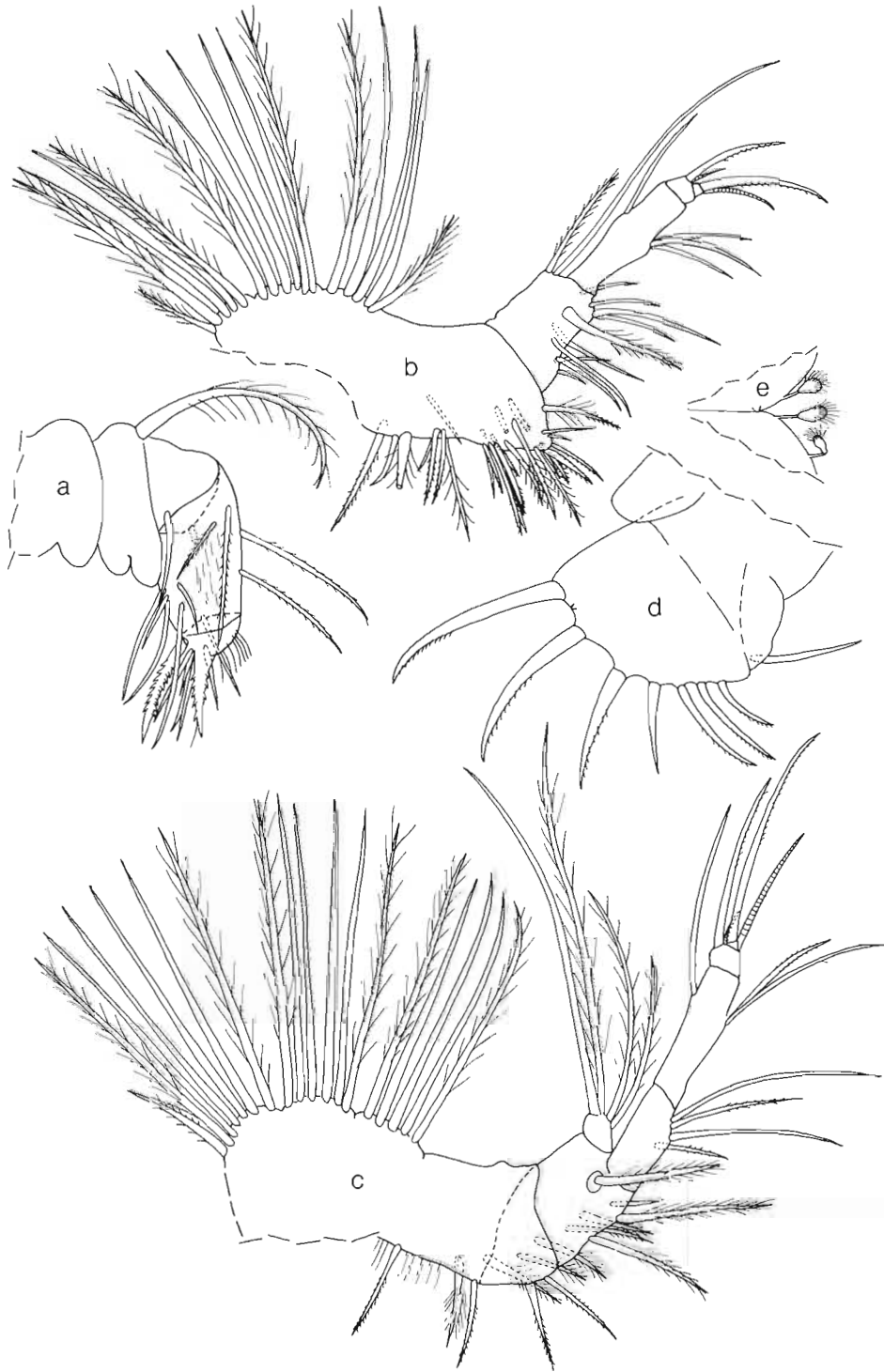


Fig. 3. *Deeveya bransoni*. A-1 female, holotype: a, Maxilla, endite bristles not shown; b, Left 5th limb, lateral view; c, Left 6th limb, lateral view; d, Left lamella of furca and apron; e, Ventral view of posterior end of hinged valves showing attached protists.

gin; claw 6 with spines along anterior margin, claw 7 with few spines along anterior margin; stout triangular protuberance on each lamella following last claw, and small process laterally between claws 1 and 2. Unpaired dorsal bristle with marginal spines.

Bellonci organ (Fig. 1d): Well developed, bifurcate distally, with branches tapering to pointed tip.

Lips (Fig. 1d, h, i): Anterior face of upper lip with 14 small tooth-like processes forming upper horizontal row, and 6 larger processes forming lower horizontal row (Fig. 1h); crescent-like low process at each end of upper row (Fig. 1d, h); posteroventral edge with slight concavity at midwidth (when viewed anteriorly (Fig. 1h) or posteriorly) having stout spine at each end of concavity (Fig. 1h); hair-like spines forming rows near concavity (Fig. 1h). Lower lip with triangular process at each side of mouth (Fig. 1i).

Posterior of body: Evenly rounded, unsegmented.

Apron (Fig. 3d): Curving shield anterior to both anus and proximal leading edge of furca.

Gut: Narrow in vicinity of mouth (Fig. 1d), broadening dorsal to central adductor muscle, then becoming narrower in short segment proximal to a second broad area (not as broad as anterior broad area), then narrowing at anus. Anterior and posterior broad areas containing brown unrecognizable organic particles.

Epizoa (Fig. 3e): Holotype with attached protists on posterodorsal edges of valves.

Description of A-2 female (Figs. 4, 5).—Carapace differs from that of A-1 female in having slightly convex dorsal margin (Fig. 4a).

Shell size: USNM 193302, length 1.21 mm, height 0.94 mm.

First antenna (Fig. 1b, c): Similar to that of A-1 female.

Second antenna (Fig. 4d): Longest of 4 bristles of 9th exopodial joint without nantatory hairs or spines. Limb otherwise similar to that of A-1 female.

Mandible (Fig. 5a–g): Coxale similar to that of A-1 female (Fig. 5b, d, g). Basale with 4 proximal bristles (3 stout and plumose, 1 slender, bare) (Fig. 5e). Basale endite (Fig. 5b–e) similar to that of adult female except entwined bristles cross in 2 or 3 places rather than 4 or 5 (Fig. 5e). Endopodite 3-jointed (Fig. 5a): 1st joint with 1 spinous terminal dorsal bristle, 1 spinous distal ventral bristle, and 2 spinous distal medial bristles; 2nd joint with 3 terminal dorsal bristles, and 1 terminal ventral bristle; 3rd joint hirsute medially and along dorsal margin, with 4 spinous medial bristles forming row, and 3 stout spinous terminal bristles similar to those of A-1 female (Fig. 5a, f).

Maxilla: 3 well developed endites: endite I with 2 proximal bristles (1 with long proximal hairs) and 9 terminal bristles; endite II with 2 proximal bristles and about 7 terminal bristles; endite III with 1 proximal bristle and about 6 terminal bristles. Coxale with 1 stout, hirsute, terminal, dorsal bristle. Basale with 1 slender ventral bristle and 1 shorter, slender terminal bristle at midwidth. Endopodite: 1st joint with 3 bristles on or near anterior margin, 3–4 bristles at distal posterior corner, and sparse surface hairs; 2nd joint with 2 stout claws, 4 slender bristles, and long hairs on anterior surface.

Fifth limb (Fig. 4e, f): Epipodite similar to that of A-1 female. Protopodite and endopodite with 24 bristles including 2 claw-like bristles and 1 small spinous medial bristle (Fig. 4f). Exopodite 3-jointed: 1st joint with total of 10 bristles: 2 distal dorsal bristles (longest bare, other with long marginal hairs); 2 lateral bristles (distal of these plumose), 1 medial bristle near middle, 2 proximal ventral bristles, and 3 bristles on distal ventral corner. 2nd joint elongate with 3 bristles (1 dorsal, 2 ventral). 3rd joint short with 2 long claw-like bristles and 2 slender ringed bristles (smallest bristle medial).

Sixth limb (Fig. 5h): Epipodite similar to that of A-1 female. Protopodite with 2 joints: proximal joint with 3 bristles on or near ventral margin (1 plumose, 2 with short



marginal spines); distal joint with 3 bristles on or near ventral margin (1 plumose, 2 with short marginal spines). Exopodite 4-jointed: 1st joint with plumose lateral bristle, 4 plumose bristles on or near ventral margin, and process with 4 bristles (1 long bristle bare, others plumose); 2nd joint with 2 ventral bristles; 3rd joint separated from 4th by weakly defined suture, elongate with 2 bristles (1 ventral, 1 dorsal); 4th joint short, with 2 claw-like pectinate bristles and 2 slender bristles (shortest of these medial).

Seventh limb (Fig. 4i): Limb unjointed, with 3 bare bristles (1 long, 2 short equi-length).

Furca (Fig. 4g): Each lamella with total of 6 claws followed by unpaired dorsal bristle; claws decreasing in width posteriorly along lamella, claw 4 slightly shorter than claw 5 and claw 6 slightly shorter than claw 5; claws 1-4 with spines along posterior margin; claw 5 with few distal hair-like spines along anterior margin; stout triangular protuberance on each lamella following last claw, and small process laterally between claws 1 and 2.

Bellonci organ (Fig. 4b): Well developed, bifurcate distally with branches tapering to pointed tip. Marginal hairs visible at high magnification ($\times 100$ objective).

Lips (Figs. 4b, 5i, j), posterior of body (Fig. 4g), apron (Fig. 4g), gut: Similar to those of A-1 female.

Comparisons.—The carapace of *D. bransoni* has bosses on walls of reticulations larger than those of *D. spiralis* (compare Figs. 1c and 6b). The A-1 female *bransoni* has a much smaller shell than that of the A-1 female of *spiralis*: 1.68 mm compared to 2.67–2.87 mm. The end joints of the exopodites of the 5th and 6th limbs of the A-1 female

bransoni bear four bristles whereas those of *spiralis* bear five. The ventral bristle on the end joint of the mandible of the A-1 female *bransoni* bears near midlength long stout marginal spines (Fig. 2g); these are less well developed and closer to the tip on *spiralis* (Fig. 6i).

Ontogenetic development.—The collection comprised an A-1 and A-2 female. Their carapaces are similar in shape and ornamentation except the dorsal margin of the shell is slightly convex on the A-2 instar and straight on the A-1. The 1st and 2nd antennae have the same number of bristles in both stages. The coxale and basale of the mandible are similarly developed, except the A-2 instar has four proximal bristles on the basale and only three on the A-1 (possibly a bristle broke off during dissection of the A-1 female), and the two entwined bristles of the basale cross each other two to three times on the A-2 instar and four to five times on the A-1. The endopodites of the mandible and maxilla and the exopodites of the 5th and 6th limbs of the A-2 instar have in total a smaller number of bristles, but fewer bristles are added on distal joints (Table 1). The 7th limb and Bellonci organ are similar for both stages. The furca of the A-2 instar has six claws, compared to seven for the A-1.

Deeveya spiralis

Kornicker and Iliffe, 1985

Fig. 6

Material.—Holotype, USNM 193117; paratype, USNM 193118.

Distribution.—The Hole, a marine cave on Providenciales Island, Caicos Islands, Turks and Caicos Islands.

Fig. 4. *Deeveya bransoni*, A-2 female, paratype: a, Complete specimen from right side, length 1.21 mm; b, Anterior of body showing divided Bellonci organ, right 1st antenna, and upper lip; c, Medial view of joints 1-4 of right 1st antenna showing spinosity; d, Endopodite of left 2nd antenna, lateral view; e, Right 5th limb, lateral view; f, Claw-like bristles and short stout medial bristle of endite of left 5th limb, medial view; g, Right lamella of furca (arrow indicates anus); h, Ventral or dorsal view of Bellonci organ under cover slip; i, Right 7th limb, lateral view.



Fig. 5. *Deeveya bransoni*. A-2 female, paratype: a-g, Mandible: a, Posterior view of proximal parts of coxale and basale, and lateral view of endopodite of right limb; b, Medial view of coxale endite of right limb, not under

Remarks.—Because both the holotype and paratype of *D. spiralis* had unextruded eggs in their ovaries, Kornicker and Iliffe (1985) interpreted the specimens to be adult females; however, they could be A-1 females, and they are so interpreted herein. A reason for this is that a species from a cave in Bermuda referred to *Spelaeoecia* by Angel and Iliffe (1987) has almost identical appendages to those of *Deeveya*, and the adult female of that species has eight claws on the furca, one more than on the known specimens of *D. spiralis*. It seems probable that the adult *Deeveya* will also have eight furcal claws, and the A-1 instar only seven.

Supplementary description of A-1 female (Fig. 6).—Kornicker and Iliffe (1985:fig. 2) illustrated a fragment of shell having convex pillow structures forming surfaces of areas within reticulate walls; further examination suggests that convex structures probably occur only on a decalcified shell, and that the outer surface of calcified specimens are essentially flat (Fig. 6c). Reticulations visible in transmitted light are structures within the shell wall and not surface structures. Minute bosses on the shell surface occur lateral to the walls forming reticulations, generally where walls intersect (Fig. 6b, c). Small round structures appearing lighter (when viewed with transmitted light) than surrounding area occur on the surface of some areas bounded by reticulate walls, but whether these are raised or depressed could not be ascertained (Fig. 6b), but they are shown raised in Fig. 6c.

First antenna (Fig. 6d, e): 5th joint with filament-like bristle with widely spaced minute marginal spines and terminal papilla. 6th joint bare. 7th joint with short ringed spinous lateral a-bristle near distal dorsal corner and 2 bristles on terminal ventral pedistal (medial b-bristle about $\frac{2}{3}$ length of

Table 1.—Number of bristles on mandible, maxilla, and 5th and 6th limbs of A-2 and A-1 females of *Deeveya bransoni*.

| | Growth stages | |
|----------------------|---------------|-------|
| | A-2 | A-1 |
| Mandible, endopodite | | |
| 1st joint | 4 | 6 |
| 2nd joint | 4 | 4 |
| 3rd joint | 7 | 7 |
| Maxilla, endopodite | | |
| 1st joint | 6-7 | 9-11 |
| 2nd joint | 6 | 7 |
| 5th limb, exopodite | | |
| 1st joint | 10 | 12 |
| 2nd joint | 3 | 4 |
| 3rd joint | 4 | 4 |
| 6th limb, exopodite | | |
| 1st joint | 9 | 10-11 |
| 2nd joint | 2 | 4 |
| 3rd joint | 2 | 3 |
| 4th joint | 4 | 4 |

lateral, filament-like, with minute widely spaced marginal spines and terminal papilla; lateral c-bristle about $1\frac{1}{2}$ times length of stem, ringed in proximal $\frac{2}{3}$ and with widely spaced marginal spines and terminal papilla (spines stouter than those on bristle of 5th joint)). 8th joint with 4 terminal bristles: d-bristle filament-like, short, with small widely spaced marginal spines and terminal papilla (tip of e-bristle of illustrated right limb aberrant; dashed line indicates length of e-bristle of left limb); e-bristle (principal bristle) about twice length of stem and distinctly ringed in proximal half, with small widely spaced marginal spines and terminal papilla; f-bristle about $\frac{1}{3}$ length of principal bristle; g-bristle more than half length of principal bristle, both f- and g-bristles filament-like, with small widely spaced marginal spines and small terminal papilla.

←
cover slip; c, Medial view of distal teeth of basale of right limb, not under cover slip; d, Anterior view of coxale endite of right limb, under cover slip; e, Lateral view of basale of right limb; f, Ventral terminal bristle of 3rd endopodial joint of right limb, lateral view; g, Posterior view of coxale endite of left limb, under cover slip; h, Right 6th limb, lateral view; i, Outline of upper lip from right side, anterior to right; j, Lower lip, ventral view.

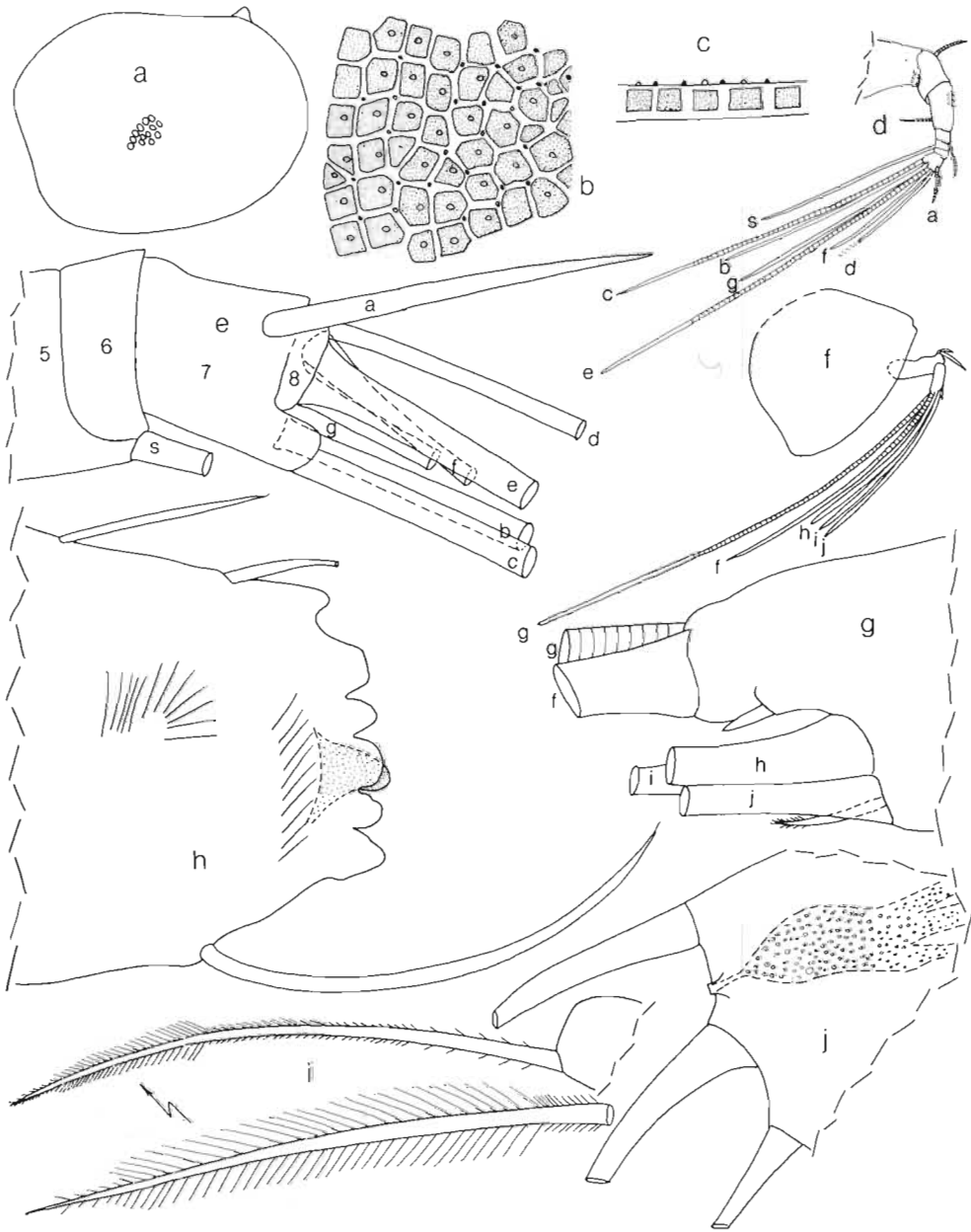


Fig. 6. *Deeveya spiralis*, A-1 female, paratype: a, Complete specimen from left side, length 2.67 mm; b, Lateral view using transmitted light of part of right valve just ventral to central adductor muscle attachments showing shell structure (stippled areas appear darker when viewed through microscope); c, Sketch of theoretical cross-section of shell shown in b (outside of shell at top). Holotype: d, Right 1st antenna, lateral view; e, Detail of tip of limb in d; f, Proto- and endopodite of right 2nd antenna, lateral view; g, Detail of tip of endopodite in f; h, Distal part of basale of right mandible, medial view; i, Ventral bristle of end joint endopodite of right mandible, medial view; j, Left lamella of furca showing gland between claws 1 and 2, lateral view.

Second antenna: Endopodite (Fig. 6f, g): 1st joint: dorsal margin with stout prominence bearing spinous a-bristle less than half length of spinous b-bristle, both bristles directed anteriorly. 2nd joint forming right angle with 1st joint, with 2 distal bristles: f-bristle filament-like, slightly more than half length of g-bristle, with widely spaced minute spines (smaller than marginal spines of g-bristle), and terminal papilla; g-bristle more than twice length of protopodite, with distinct rings in proximal half, with widely spaced minute marginal spines, and terminal papilla; minute, unringed, pointed peg present proximally on dorsal margin of joint. 3rd joint with 3 similar filament-like h-, i-, and j-bristles, each less than half length of g-bristle, with widely spaced minute marginal spines (spines about same size as those of f-bristle), and with terminal papilla; small, unringed, medial, terminal bristle with marginal spines along distal quarter present near dorsal corner of joint (length of bristle about half width of joint).

Mandible: Distal end of basale with stout lateral tooth (Fig. 6h); ventral (=posterior) bristle of 3rd endopodial joint with long hairs (Fig. 6i). (Figure 10 in Kornicker and Iliffe (1985:488) was incorrectly labelled and should be as follows: "b" is an illustration of the coxa, and "c" the basis and endopodite.)

Maxilla: Hirsute dorsal bristle on coxale (not on basale as stated by Kornicker and Iliffe 1985:490).

Furca (Fig. 6j): Small lateral process between claws 1 and 2 of each lamella representing glandular outlet (this process was overlooked by Kornicker and Iliffe 1985:491).

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