



Benthic Marine Cypridinoidea
from Bermuda (Ostracoda)

LOUIS S. KORNICKER

SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 331

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ABSTRACT

Kornicker, Louis S. Benthic Marine Cypridinoidea from Bermuda (Ostracoda). *Smithsonian Contributions to Zoology*, number 331, 15 pages, 10 figures, 1981.—Four species in four genera of benthic Cypridinoidea are reported from Bermuda. Two new species are described and illustrated, and a supplementary description is given of a previously described species. One of the species is described but left in open nomenclature. Benthic marine Cypridinoidea have not previously been reported from Bermuda.

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Benthic Marine Cypridinoidea from Bermuda (Ostracoda)

Louis S. Kornicker

Introduction

Benthic Cypridinoidea have not been reported previously from Bermuda. The present report is based on several small collections in the National Museum of Natural History, Smithsonian Institution. They contain four species of which three are new: *Sarsiella absens*, *Rutiderma sterreri*, and *Bruuniella* species A. The latter species is left in open nomenclature because the collection contains only a juvenile male. The fourth species, *Parasterope muelleri* (Skogsberg, 1920), is a widespread species that has been reported from both sides of the Atlantic.

The occurrence of a species of *Rutiderma* in Bermuda is not unexpected, because the genus has been previously reported from the Bahamas (Kornicker, 1958:236), but Bermuda represents the northernmost record of the genus in the western Atlantic. The only previously described species of *Bruuniella* is *B. breviata* Poulsen, 1965 (p. 323), which Poulsen described from two specimens collected off Thailand. However, I have in manuscript the description of a third species of *Bruuniella* collected in Martha's Vineyard, Mass., indicating that the genus is widespread. Both *Sarsiella* and *Parasterope* are widely distributed genera. Bermuda contains few endemic crustaceans, so that having three endemic species of

Ostracoda in a small collection containing a total of only four species is unexpected, and suggests that Ostracoda may have speciated in Bermuda more rapidly than have other crustaceans. This might be attributed in part to the absence of planktonic larvae in the life cycle of benthic Cypridinoidea.

ACKNOWLEDGMENTS.—Several people assisted in the preparation of this manuscript. The shaded renderings of ostracode carapaces are by Mrs. Carolyn Bartlett Gast. Initial camera lucida drawings of most appendages were made by Mrs. Kathryn Schroeder, who also inked the final drawings. The manuscript was reviewed by Mrs. Anne Cohen and, in part, by Dr. Thomas E. Bowman. I wish to thank all of these individuals, as well as the collectors of the specimens, who are mentioned in the station list.

This is contribution number 823 from the Bermuda Biological Station.

Station Data with Specimens Collected

Rosalie Maddocks, collector, 1963

Sta 630729; 27 Jul, probably washings of algae hand collected on class trips to Ferry Reach and/or Harrington Sound

Rutiderma sterreri: 1 juvenile (USNM 158288)

Sta 630820; 20 Aug, Harrington Sound, grab sample about 11 m depth, no sediment in grab, oysters with algae, and encrusted shells

Rutiderma sterreri: 1 ovigerous female (USNM 158115), 2 juveniles (USNM 158284)

Louis S. Kornicker, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.

Sta 630827(1); Castle Harbor, 1963, cove at west end of Longbird Bridge causeway, high tide time

Sarsiella absens: 1 juvenile (USNM 158290)

Parasterope muelleri: 1 juvenile female (USNM 158289)

Sta 630823(1); 23 Aug, Castle Harbor, cove near west end of Longbird Bridge causeway, at low tide level; mud near mangroves; 6-inch core in firm mud with short thin grass, 1-inch segment

Rutiderma sterreri: 2 juveniles (USNM 158287)

Sta 630823(5); 23 Aug, Castle Harbor, cove near west end of Longbird Bridge Causeway, at low tide level; mud near mangroves; hand sample of sediment, 5½-inch core in coarse sand with *Thalassia* and *Halimeda* overlying soft mud

Rutiderma sterreri: 1 juvenile with choniostomatid parasite within carapace (USNM 158286)

M. L. Jones, collector, 1976

Sample 2: 29 May, Spanish Point, small boat harbor, near sunken barge, breakwater; rocks and sand/mud beneath and under rocks

Rutiderma sterreri: 1 A-1 male (USNM 158285)

Sample 3: 30 May, near Dennis Hideaway (restaurant on Smith's Sound, Governor's Island); associated with rocks, about 2 feet deep

Bruniella species A: 1 A-1 male (USNM 158119)

Parasterope muelleri: 1 A-1 male (USNM 158120), 1 juvenile male (USNM 158294)

L. W. Peterson, collector, 1960, 1961

Sta 7: 19 Aug 1960, Hamilton Harbor, washed from red sponge and algae, low tide, 2-3 ft.

Rutiderma sterreri: 5 ovigerous females + 1 juvenile (USNM 106459); 1 ovigerous female (USNM 158283)

Parasterope muelleri: 1 ovigerous female (USNM 158118)

Sta 14a; 25 Aug 1960, off St. George near St. Catherine Fort; *Sea Venture* (20-30 ft boat); gorgonians

Parasterope muelleri: 1 ovigerous female (USNM 157719)

Sta number unknown, 13 Aug 1961

Parasterope muelleri: 1 ovigerous female (USNM 158292), 1 adult female (USNM 158293), 21 juveniles (USNM 158295)

W. Sterrer, collector

Castle Harbor; coarse sand

Sarsiella absens: 2 adult females (USNM 158114, 158116); 1 ovigerous female (USNM 158291)

SARSIELLIDAE Brady and Norman, 1896

SARSIELLINAE Brady and Norman, 1896

Sarsiella Norman, 1869

Sarsiella absens, new species

FIGURES 1, 2

ETYMOLOGY.—The specific name is from the Latin *absens* (away from, absent) in reference to the lack of a ventral bristle on the 3rd joint of the female 1st antenna of this species.

HOLOTYPE.—USNM 158116, adult female on slide and in alcohol.

TYPE-LOCALITY.—Castle Harbor, Bermuda.

PARATYPES.—USNM 158114, 1 adult female and USNM 158291, 1 ovigerous female, both from same sample as holotype; USNM 158290, 1 juvenile from station 630827(1) Castle Harbor.

DESCRIPTION OF ADULT FEMALE (Figures 1, 2).—Carapace oval in lateral view with short rounded caudal process; posterodorsal part of each valve forming large bulge (Figure 1).

Ornamentation (Figures 1, 2a,f,l): Each valve with 2 more-or-less horizontal ribs: 1 extending

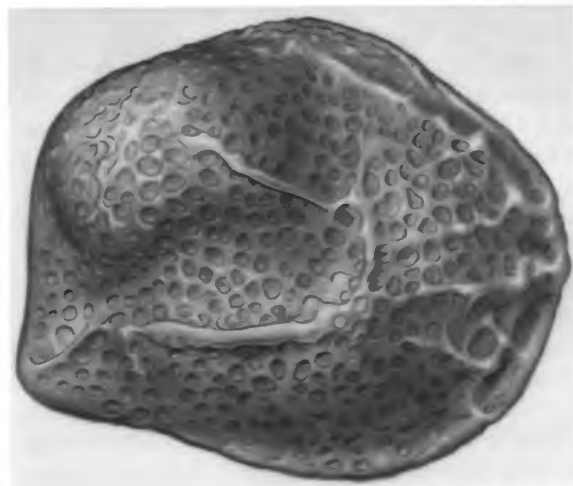


FIGURE 1.—*Sarsiella absens*, new species, adult female, USNM 158114, paratype, length 1.17 mm, complete specimen, lateral view.

onto posterodorsal bulge, other below bulge; anterior part of valves with weakly developed radiating ribs (Figure 1). Surface with numerous well-developed fossae (Figures 1, 2a); surface between fossae and also inside of fossae with minute papillae. Anterior and ventral margins, and margin of caudal process with long bristles (Figure 2k,l); bristles very sparsely distributed on lateral surface of valve (Figure 2a). No gelatinous coating on valves.

Infold (Figure 2k,l): 1 minute bristle present near inner edge of infold near middle of anterior edge of valve (Figure 2k); infold of caudal process with 8 or 9 small bristles (Figure 2l); additional smaller bristles present along inner edge of infold (Figure 2l); 2 setal bristles present on posterior infold dorsal to caudal process.

Selvae: Wide lamellar prolongation without marginal fringe present along anterior, ventral, and posterior margins of each valve.

Size: USNM 158116, length 1.17 mm, height 0.97 mm; USNM 158114, length 1.17 mm, height 1.02 mm; USNM 158291, length 1.22 mm, height 1.01 mm.

First Antenna (Figure 2b): 1st joint bare. 2nd joint with single dorsal bristle bearing few spines. 3rd and 4th joints fused; 3rd joint short, with short spinous dorsal bristle and no ventral bristle; 4th joint long, with single dorsal bristle with few spines, and 3 ventral bristles of different lengths. Sensory bristle of long 5th joint with minute proximal filament and spine at tip. Minute 6th joint with small medial bristle. 7th joint: a-bristle about twice length of bristle of 6th joint, with faint marginal spines; b-bristle about one-third longer than a-bristle, bare; c-bristle slightly longer than sensory bristle of 5th joint, with minute proximal filament and spine at tip. 8th joint: d- and e-bristles bare with blunt tips; d-bristle stouter and about one-third longer than e-bristle, only slightly shorter than c-bristle; f-bristle only slightly shorter than d-bristle, with 1 minute proximal filament and spine at tip; g-bristle slightly longer than f-bristle, with 2 minute proximal filaments and spine at tip.

Second Antenna (Figure 2c): Protopodite bare.

Endopodite 1-jointed with 1 short spinous anterior bristle and small process near middle of ventral edge. Exopodite: long 1st joint with small medial terminal bristle with blunt tip; bristle of 1st joint long, with about 20 stout proximal ventral spines followed by natatory hairs; bristles of joints 3–8 with stout ventral spines and distal natatory hairs; 9th joint with 2 bristles (1 long with faint proximal ventral spines and distal natatory hairs, 1 short with faint slender marginal spines), joint small (width about half that of width of 8th joint).

Mandible (Figure 2d): Coxale endite consisting of stout spine; ventral margin of coxale spinous with distal spines stouter than hairlike proximal spines. Basale: dorsal margin with 1 spinelike bristle distal to middle and 2 subterminal bristles; medial side with 3 short proximal bristles near ventral margin; ventral margin with 1 spinelike bristle distal to middle; lateral side with 2 distal bristles near ventral margin. 1st endopodial joint with medial spines, 1 minute spinelike medial bristle near base of stout terminal claw; terminal claw with few minute proximal teeth on each margin. 2nd endopodial joint with 2 minute spinelike dorsal bristles and stout ventral claw. 3rd endopodial joint with stout terminal claw and 3 minute spinelike bristles at base, 2 ventral, 1 dorsal; tips of stout terminal claws of endopodial joints tapering to point.

Maxilla (Figure 2e): Typical for genus. Exopodite with 3 bristles (longer of these spinous and slightly more than twice length of 2 other bare bristles).

Fifth Limb (Figure 2f): Single endite with 1 small bristle. Exopodite: 1st joint with 2 spinous bristles; remaining joints fused; 2nd joint with 3 spinous bristles; joints 3–5 with total of 4 bristles.

Sixth Limb (Figure 2g): Single endite with 2 or 3 bristles. End joint with 12 spinous bristles followed by space and then 2 broad hirsute bristles.

Seventh Limb (Figure 2h): Proximal group with 4 bristles, 2 on each side; terminal group with 6 bristles, 3 on each side; each bristle with up to 8

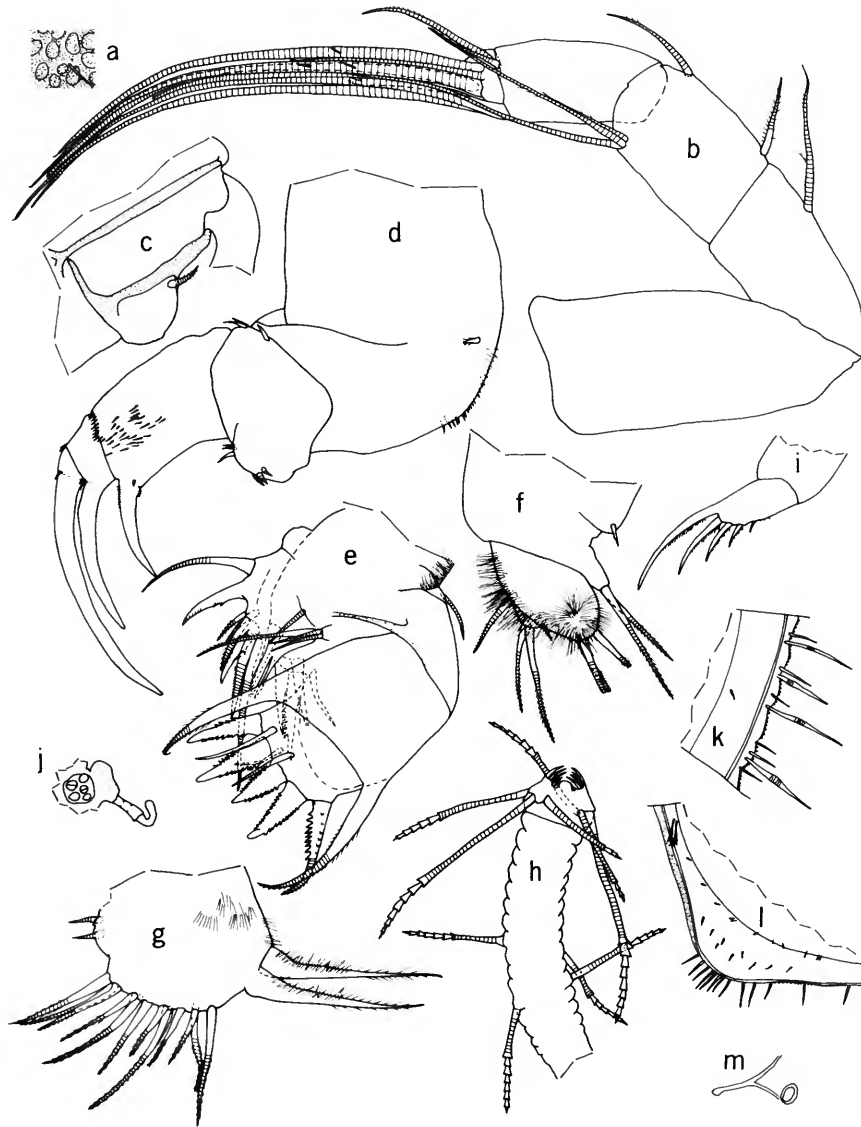


FIGURE 2.—*Sarsiella absens*, new species, adult female, USNM 158116, holotype, length 1.17 mm: *a*, detail of lateral surface of right valve showing fossae and a bristle; *b*, right 1st antenna, medial view; *c*, endopodite, distal part of protopodite, and proximal end of 1st exopodial joint of left 2nd antenna, medial view; *d*, right mandible, medial view; *e*, right maxilla, lateral view; *f*, distal part of 5th limb; *g*, 6th limb; *h*, 7th limb; *i*, left lamella of furca, lateral view; *j*, right lateral eye, medial eye and bellonci organ. Adult female, USNM 158114, paratype, length 1.17 mm: *k*, anterior margin of left valve viewed from inside; *l*, posteroventral corner of left valve viewed from inside; *m*, Y-sclerite and right genital opening, anterior towards right.

bells. Terminus with opposing combs, each with 6–9 recurved teeth.

Furca (Figure 2i): Each lamella with 5 slender, pointed claws; claw 1 fused to lamella, remaining claws separated from lamella by suture; claws 1–4 with large and small teeth along posterior margin; several minute spines following claw 5.

Bellonci Organ (Figure 2j): Elongate with suture near middle and weakly segmented proximally, tip rounded.

Eyes (Figure 2j): Lateral eye with 5 ommatidia, pigmented light amber. Medial eye about same size as lateral eye, bare, pigmented light amber.

Upper Lip: Helmet shaped, typical for genus.

Genitalia (Figure 2m): Oval sclerotized ring on each side of body.

Y-Sclerite (Figure 2m): Typical for genus.

COMPARISONS.—The new species *Sarsiella absens* differs from previously described species of *Sarsiella* that have a short rounded caudal process in not having a ventral bristle on the 3rd joint of the female 1st antenna. The endopodite of the 2nd antenna of the female differs from many species of the genus in having only 1 proximal anterior bristle and in not having a ventral spine or bristle.

RUTIDERMATIDAE Brady and Norman, 1896

Rutiderma Brady and Norman, 1896

Rutiderma sterreri, new species

FIGURES 3–5

ETYMOLOGY.—The species is named after Dr. Wolfgang Sterrer, director of the Bermuda Biological Station.

HOLOTYPE.—USNM 158115, ovigerous female on slide and in alcohol.

TYPE-LOCALITY.—Station 630820, Harrington Sound, Bermuda.

PARATYPES.—USNM 106459, 5 ovigerous females and 1 juvenile; USNM 158283, 1 ovigerous

female; USNM 158284, 2 juveniles; USNM 158285, 1 A-1 male; USNM 158286, 1 juvenile with choniostomatid copepod parasite; USNM 158287, 2 juveniles; USNM 158288, 1 juvenile.

DESCRIPTION OF ADULT FEMALE (Figures 3–5).—Well-defined incisur forming right angle with rostrum (Figures 3, 4a); well-developed triangular caudal process (Figures 3, 4b,d, 5a,b).

Ornamentation (Figures 3, 4b–d, 5a,b): Carapace ornate and rugose with 2 horizontal ribs terminating in large posterior processes connected by vertical rib (Figure 3); additional rib present just within anterodorsal margin and connected to both valve edge and upper horizontal rib by radiating riblets; additional less well-defined ribs present along ventral margin interconnected by radiating riblets; distinct rib extending from rostrum to anteroventral valve margin and extending only slightly past end of valve; anterior edge of rostrum and ventral margin of valve with minute processes forming scalloped appearance; middle of posterior edge of left valve with small process (Figures 4d, 5a) absent on right valve; surface of valve with numerous small fossae (Figure 3); bristles present along anterior and ventral margins of valves and sparsely distributed over lateral surfaces; 2 lateral bristles on posterior edge of caudal process (Figures 4b–d, 5a,b).

Infold (Figures 4a,b,d, 5a,b): Rostral infold

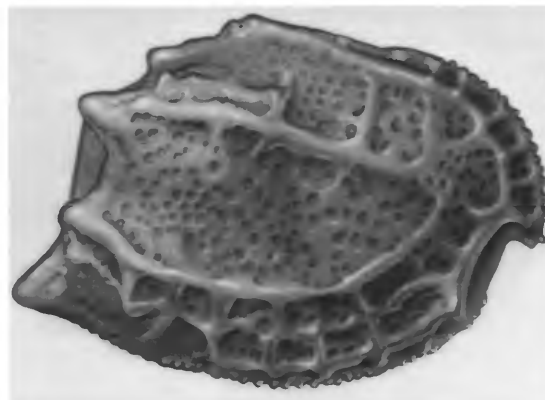


FIGURE 3.—*Rutiderma sterreri*, new species, adult female, USNM 158115, holotype, length 1.10 mm, complete specimen, lateral view.



FIGURE 4.—*Rutiderma sterreri*, new species, adult female, USNM 158115, holotype, length 1.10 mm, inside views of right valve: *a*, rostrum; *b*, caudal process; *c*, tip of caudal process showing minute bristle dividing lamellar prolongation of selvage; *d*, inside view of caudal process of left valve. Appendages: *e*, right 1st antenna, medial view; *f*, endopodite, distal part of protopodite and part of 1st exopodial joint of left 2nd antenna, medial view; *g*, left mandible, medial view; *h*, left maxilla, medial view (exopodite not shown); *i*, distal part of left 5th limb, posterior view. Right 5th limb, anterior view: *j*, endites I-III; *k*, teeth of 1st exopodial joint; *l*, 2nd exopodial joint (not all bristles shown). Remaining appendages: *m*, 6th limb; *n*, 7th limb; *o*, left lamella of furca, left Y-sclerite, posterior of body; *p*, right lateral eye, medial eye and bellonci organ, anterior of body, upper lip; *q*, detail of distal part of bellonci organ, from *p*.

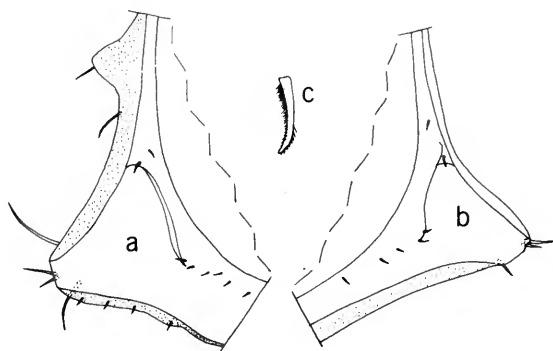


FIGURE 5.—*Rutiderma sterreri*, new species, adult female, USNM 158283, paratype, length 0.94 mm, inside views of carapace: a, caudal process of left valve; b, caudal process of right valve. Furca: c, claw 1 of right lamella.

with 6–8 bristles forming row parallel to anterior margin (Figure 4a); 2 minute bristles at inner end of incisur; anteroventral infold with 8 bristles forming row, and 7 or 8 ridges paralleling inner edge of infold; posterior end of ventral infold near caudal process with about 10 small bristles forming irregular row; anterior part of caudal process with slightly curved list having 2 small bristles at or near lower end and 1 at or near upper end; 1 small bristle present dorsal to end of list of both valves (Figures 4b,d, 5a,b).

Selva: Broad lamellar prolongation with marginal fringe present along anterior and ventral valve margins; narrower bare prolongation along margin of caudal process; lamellar prolongation divided at inner end of incisur and at tip of caudal process on either side of minute bristle (Figure 4c).

Size: USNM 158115, length 1.10 mm, height 0.73 mm. USNM 106459 (5 ovigerous females): length 0.98 mm, height 0.71 mm, length 0.99 mm, height 0.74 mm, length 0.99 mm, height 0.71 mm, length 0.99 mm, height 0.72 mm, length 1.02 mm, height 0.74 mm. USNM 158283, length 0.94 mm, height 0.73 mm.

First Antenna (Figure 4e): 1st joint with few small lateral spines forming rows. 2nd joint with few spines and 2 bristles (1 dorsal, 1 lateral). 3rd and 4th joints fused; small 3rd joint with 2 or 3

bristles (1 ventral, 1 or 2 dorsal); long 4th joint with 3 bristles (2 ventral, 1 dorsal). Sensory bristle of long 5th joint with 1 minute proximal filament and spine at tip. Minute 6th joint with short spinous medial bristle. 7th joint: a-bristle spinous, slightly longer than bristle of 6th joint; b-bristle about one-third longer than a-bristle, bare except for spine at tip; c-bristle about same length as sensory bristle of 5th joint, with 1 minute proximal filament and spine at tip. 8th joint: d- and e-bristles well developed, with blunt tips; f-bristle stout, about twice length of b-bristle, with minute proximal filament and spine at tip; g-bristle longer than f-bristle, with 1 proximal filament with slender tip.

Second Antenna (Figure 4f): Protopodite bare. Endopodite single jointed with 4 short anterior bristles. Exopodite: elongate 1st joint with minute medial bristle on distal margin; bristles of joints 2–5 relatively short, ventral margins with pointed proximal spines followed by row of blunt teeth; bristles of joints 6–8 with long bristles with natatory hairs but no spines; 9th joint with 5 bristles (3 long with natatory hairs, 1 short bare or with natatory hairs, 1 minute bare); bristles 2–8 with minute spines forming rows near distal margins.

Mandible (Figure 4g): Coxale endite bifurcate, pectinate. Basale: dorsal margin with 1 short bristle near middle and 2 more distally (longer of these more than twice length of other); ventral margin with 4 proximal bristles (2 short pectinate, 2 slender, ringed), and 2 or 3 short distal bristles. 1st endopodial joint with 2 short ventral bristles and numerous medial spines forming rows. 2nd endopodial joint: dorsal margin with 3 short proximal bristles; ventral margin with 2 small distal bristles; terminal claw with proximal dorsal tooth and tip forming right angle; small sclerotized process with minute terminal spine or bristle present at medial side of base of terminal claw; medial surface of joint with numerous spines forming rows. 3rd endopodial joint with 3 slender medial bristles, 2 slender lateral bristles, 1 long unringed spinous bristle just ventral to terminal claw, and terminal claw with truncate distal end.

Maxilla (Figure 4h): Endites I and II with 2

stout pectinate bristles and 3 slender ringed bristles; endite III with 3 stout pectinate bristles and about 3 slender bristles (not all shown on illustrated limb). Precoxale and coxale with fringe of hairs along dorsal margin; coxale with spinous dorsal bristle. Basale with 1 spinous bristle near dorsal margin. Endopodite: 1st joint with 1 medial bristle near basale, 1 spinous alpha-bristle, 1 spinous beta-bristle, and few spines forming row near dorsal margin; 2nd joint with 2 stout pectinate claws, and 5 slender, ringed, spinous bristles. Exopodite obscure on limb examined.

Fifth Limb (Figure 4i-l): Endite I with 3 bristles; endite II with 5 bristles; endite III with about 6 bristles (Figure 4j). Exopodite: main tooth of 1st joint consisting of 3 stout pectinate teeth followed by proximal smaller smooth tooth and ringed bristle (Figure 4k); outer edge of joint with 1 bristle proximal to distal tooth; inner edge of large flat tooth of 2nd joint with 3 stout lobes (largest of these with 2 secondary teeth on inner margin, other lobes smooth, Figure 4l); posterior side of tooth with minute bristle at outer distal corner, and 2 slender bristles near base of proximal lobe; 1 bristle present on inner edge of tooth proximal to proximal lobe; inner lobe of 3rd joint with 3 bristles (1 much smaller than others), outer lobe with 2 spinous bristles; 4th and 5th joints fused, with total of 4 spinous bristles.

Sixth Limb (Figure 4m): Endite I with 2 or 3 bristles; endite II with 2 bristles; endites III and IV each with 3 bristles. End joint with 3 spinous bristles on projecting process followed by 4 hirsute bristles (anterior 2 of these with small marginal spines near tip). 2 bristles present in place of epipodial appendage.

Seventh Limb (Figure 4n): Each limb with 6 bristles in distal group, 3 on each side, and 4 in proximal group, 2 on each side; each bristle with distal marginal spines and up to 5 bells. Terminus with comb of about 5 alate teeth opposite comb with about 3 teeth, some with spines.

Furca (Figures 4o, 5c): Each lamella with 4 strong claws followed by 2 weak secondary claws; secondary claws placed laterally just dorsal to edge of each lamella; claws bearing teeth along

posterior margins; hairs present medially near bases of stout claws and following claws.

Bellonci Organ (Figure 4p,q): Elongate, widening near middle, then tapering distally, but widening slightly before terminating in rounded tip; minute hairs visible distally under oil immersion (Figure 4q).

Eyes (Figure 4p): Medial eye tapering distally, with brown pigment; lateral eye small but distinct, with brown pigment and 4 ommatidia.

Upper Lip (Figure 4p): Consisting of simple lobe.

Y-Sclerite (Figure 4o): Typical for genus.

Posterior of Body (Figure 4o): Hirsute.

Eggs: USNM 158115 and 158283 each with 4 eggs in marsupium.

Parasites: USNM 158286, 1 juvenile with chonistomatid copepod within posterior end of carapace (ostracode left intact).

COMPARISONS.—The new species *Rutiderma sterreri* differs from *R. dinochelatum* Kornicker, 1958, in that the tip of the bellonci organ is rounded, not pointed. The lengths of the 3 specimens of *R. dinochelatum* listed by Kornicker (1958:237) ranged from 1.14 to 1.22 mm (average 1.18 mm). The lengths of 7 ovigerous females of *R. sterreri* measured herein ranged from 0.94 mm to 1.10 mm (average 1.00 mm). A closer comparison of the 2 species will require a better description of *R. dinochelatum*, on which I am presently working.

CYLINDROLEBERIDIDAE Müller, 1906

CYLINDROLEBERIDINAE Müller, 1906

Parasterope Poulsen, 1965

Parasterope muelleri (Skogsberg, 1920)

FIGURES 6-8

Parasterope muelleri (Skogsberg).—Kornicker and Caraion, 1974 [synonymy].

HOLOTYPE.—One adult female on slides in Swedish State Museum, Stockholm.

TYPE-LOCALITY.—English Channel, off Salcombe, coast of England.

MATERIAL.—USNM 157719, 1 ovigerous female, sta 14A. USNM 158118, 1 ovigerous female, sta 7. USNM 158292, 1 ovigerous female, USNM 158293, 1 adult female, USNM 158295, 21 juveniles, all from 13 Aug 1961. USNM 158289, 1 juvenile female, sta 630729(1). USNM 158120, 1 A-1 male, USNM 158294, 1 juvenile male, both from sta 3.

DESCRIPTION OF ADULT FEMALE (Figures 6–8).—Carapace slightly tumid in lateral view, greatest height behind valve middle, anterior and posterior margins evenly rounded (Figures 6, 7a).

Infold: Infold behind rostrum with 3 or 4 bristles along list, and about 20 bristles dorsal and posterior to list; about 21 bristles on broad anteroventral infold; about 11 bristles along ventral infold to point near lowermost hyaline flaplike bristle on posterior list. List beginning near inner margin of anterior part of ventral infold, extending along ventral infold and continuing on posterior infold where it broadens; posterior list with about 24 broad transparent flaplike bristles and about 18 small bristles (generally only 1, but in some places 2 small bristles between each pair of hyaline bristles); about 11 bristles between broad posterior list and posterior margin of valve, all bristles being confined to ventral half of posterior infold (Figure 7b).

Size: USNM 157719, length 1.01 mm, height 0.66 mm; USNM 158118, length 1.03 mm, height 0.63 mm; USNM 158293, length 1.11 mm, height 0.92 mm; USNM 158292, length 1.03 mm, height 0.67 mm.



FIGURE 6.—*Parasterope muelleri* (Skogsberg, 1920), adult female, USNM 157719, length 1.01 mm, complete specimen, lateral view.

First Antenna (Figure 7c): 1st joint with medial spines and hairs in distal ventral corner. 2nd joint with spinous dorsal bristle and shorter lateral bristle, and with few spines on medial and lateral surface. 3rd and 4th joints forming square; suture between joints fairly distinct on medial side; dorsal margin of 3rd joint with 6 spinous bristles; short ventral margin with 1 small bristle; 4th joint with concave dorsal margin; dorsal margin with single spinous terminal bristle; ventral margin with 2 slender bare bristles. 5th joint: lateral side with short spines forming row along distal dorsal margin (indicated by a series of dots on illustrated limb); sensory bristle with 6 long terminal filaments. 6th joint with 1 long medial bristle. 7th joint: a-claw with faint medial and lateral spines near dorsal margin; b-bristle with 4 or 5 long filaments including stem; c-bristle reaching slightly past tip of sensory bristle of 5th joint, with several short marginal filaments. 8th joint: d-bristle represented by minute spine; e-bristle bare, with blunt tip not quite reaching tip of sensory bristle of 5th joint; f-bristle bent dorsally, with 4 marginal filaments; g-bristle about same length as c-bristle, with several marginal filaments.

Second Antenna (Figure 7d): Protopodite with small, distal, medial bristle, and faint spines forming rows on dorsal half of medial surface of joint. Endopodite 3-jointed, but with 2nd and 3rd joints fused; 3rd joint with long terminal bristle. Exopodite: 1st joint with small medial bristle and few ventral hairs; bristle of 2nd joint reaching past tip of 9th joint and with numerous slender spines along ventral margin; bristles of joints 3–8 with natatory hairs, some also with slender ventral spines; 9th joint with 4 bristles (2 long and 1 medium with natatory hairs, 1 short, bare); joints 4–8 with pointed basal spines increasing in length on distal joints; spine of 8th joint about two-thirds length of 9th joint: lateral spine of 9th joint pointed, about same length as joint: distal margins of joints 2–8 with faint spines forming row.

Mandible (Figure 7e): Coxale endite: ventral branch with spines forming 4 oblique rows; tip of



FIGURE 7.—*Parasterope muelleri* (Skogsberg, 1920), adult female, USNM 157719, length 1.01 mm: *a*, complete specimen showing position of left lateral eye, position and approximate number of central adductor muscle attachments, and position of 6 eggs; *b*, posteroventral corner of left valve showing bristles on list and infold; *c*, right 1st antenna, medial view; *d*, endopodite and distal part of protopodite of left 2nd antenna, medial view; *e*, right mandible, medial view; *f*, left maxilla, medial view; *g*, right lamella of furca, lateral view; *h*, right lateral eye, anterior to right; *i*, medial eye and bellonci organ; *j*, upper lip, anterior to left; *k*, posterior of body (2 posterior claws of furca at bottom), anterior to right; *l*, right Y-sclerite, anterior to right.

branch consisting of 2 slender teeth with minute spines near bases; small medial bristle present near base of ventral branch; dorsal branch with 5 or 6 low processes proximal to short main spine; tip of branch pointed; posterior distal bristle hirsute and with base set back from tip of branch. Basale endite with 4 pectinate end-type bristles, 3 triaenid bristles (each with 3 pairs of marginal spines proximal to terminal pair), 1 dwarf bristle, and well-developed glandular process. Basale with 2 spinous, subterminal, dorsal bristles, and a few spines on medial surface, otherwise bare. Exopodite slightly shorter than dorsal margin of 1st endopodial joint, hirsute with 2 short subterminal bristles. Endopodite: 1st joint with 3 long spinous ventral bristles; dorsal margin of 2nd joint with stout a-, b-, c-, and d-bristles, and 1 small bristle just proximal to a-bristle; lateral side with 2 long bristles (1 between b- and c-bristles, and 1 between c- and d-bristles); medial side spinous, with cleaning bristles forming 2 rows (3 bristles in proximal row, 6 in distal row), and 1 fairly long bristle just distal to the d-bristle; ventral margin with 3 long spinous terminal bristles; 3rd joint with stout dorsal claw with ventral spines, and 5 bristles.

Maxilla (Figure 7f): Endite I with 3 long and 1 short bristle; endite II with 3 long bristles. Epipodial appendage triangular, not reaching middle of dorsal margin of basale, hirsute near tip. Basale: lateral side with 1 short proximal bristle; ventral margin with 1 short proximal bristle and 1 long terminal bristle; dorsal margin faintly hirsute; medial side near dorsal margin with 2 short bristles, 1 proximal, 1 distal. Endopodite: 1st joint with 1 short dorsal bristle and a fairly short beta-bristle; end joint with 1 long bristle more than twice length of beta-bristle. Exopodite absent.

Fifth Limb: Lateral side of comb with stout spinous exopodial bristle, 2 small, slender, bare bristles just ventral to base of stout bristle, and 4 or 5 short bristles near ventral margin just anterior to base of stout bristle; shape of comb typical for genus.

Sixth Limb (Figure 8a): Anterodorsal corner

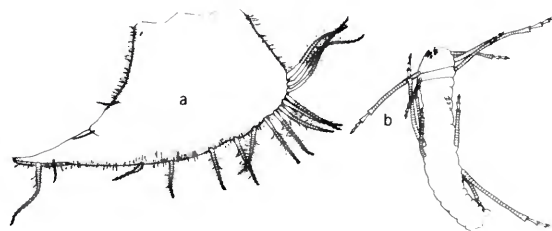


FIGURE 8.—*Parasterope muelleri* (Skogsberg, 1920), adult female, USNM 157719, continued: a, right 6th limb, medial view; b, 7th limb.

with minute medial bristle. Anterior margin of trunk with 2 short endite bristles; anterior tip of skirt with 2 spinous bristles (anterior of these much longer and stouter than other); ventral and posteroventral margin of skirt with 13–15 spinous and hirsute bristles.

Seventh Limb (Figure 8b): 6 bristles, 3 on each side, in both proximal and distal groups; each bristle with up to 4 bells. Terminus with opposing combs, each with about 14 spinous teeth.

Furca (Figure 7g): Each lamella with 9 claws (posterior 2 of these bristle-like).

Bellonci Organ (Figure 7i): Elongate, broadening in middle, with rounded tip.

Eyes: Medial eye pigmented light amber, bare (Figure 7i). Lateral eyes pigmented, about same size as medial eye, with about 18 ommatidia (Figure 7h).

Posterior of Body (Figure 7k): Spinous, without thumblike process.

Upper Lip (Figure 7j): Upper lip consisting of 2 hirsute lobes, each with 2 anterior spines. Hirsute lateral flaps present on each side of mouth.

Y-Sclerite (Figure 7l): Typical for genus.

Eggs (Figure 7a): USNM 157719 with 12 eggs in marsupium.

Remarks.—The A-1 male from Bermuda (USNM 158120) differs from that described from the Gulf of Naples by Kornicker (1974:38) in having on the sensory bristle of the 5th joint of the 1st antenna, 1 small proximal filament in addition to the 6 long terminal filaments.

Bruuniella* Poulsen, 1965**Bruuniella* species A**

FIGURES 9, 10

ETYMOLOGY.—Because only a single juvenile male is in the collection, the species has not been given a formal name.

MATERIAL.—USNM 158119, A-1 male on slide and in alcohol, unique specimen, from Dennis Hideaway, sample number 3, 30 May 1976.

DESCRIPTION OF A-1 MALE (Figures 9, 10).—Carapace elongate in lateral view, greatest height at middle (Figure 9); dorsal margin broadly convex, ventral margin linear; posterior evenly rounded; incisur wide, inner end slightly below midheight.

Infold (Figure 10a–c): Rostral infold with 7–9 bristles forming row parallel to anterodorsal margin, 1 or 2 bristles on list, and 3 bristles forming row between list and incisur (Figure 10a,b); anteroventral infold with about 10 bristles forming row; about 10 bristles forming row along ventral infold. List beginning near inner margin of anterior infold extending along ventral infold and becoming broader on posterior infold; broad posterior list with about 7 broad transparent bristles (Figure 10c); a slender bristle (possibly 2) present between broad bristles, but difficult to see on specimen examined; approximately 3 small processes and 3 bristles present between broad posterior list and posterior margin of valve.

Size: USNM 158119, length 0.72 mm, height 0.44 mm.



FIGURE 9.—*Bruuniella* species A, A-1 male, USNM 158119, length 0.72 mm, complete specimen, lateral view.

First Antenna (Figure 10d): 1st joint bare. 2nd joint with medial spines forming rows, and 1 dorsal bristle with long proximal hairs and short distal spines along anterior margin. 3rd, 4th, and 5th joints fused; ventral margin with 2 spinous proximal bristles and few long proximal hairs; dorsal margin with 7 bristles (1 proximal and 1 distal spinous bristle, 3 spinous clawlike bristles with anterior enlargements near base, and 2 slender spinous bristles with bases on medial side near middle clawlike bristle); sensory bristle of 5th joint with 6 long terminal filaments (proximal of these more slender than others); medial side of 6th joint and distal part of fused joints 3 to 5 with abundant short spines near dorsal margin. Short medial bristle of 6th joint with base near ventral margin. Seventh joint: a-bristle clawlike with proximal teeth on dorsal margin, and minute toothed process proximally on medial side; b-bristle about one-third longer than a-bristle, with 4 marginal filaments; c-bristle about same length as b-bristle, with 3 marginal filaments. 8th joint: d-bristle absent; e-bristle about same length as a-bristle, bare with blunt tip; f-bristle bent dorsally, with 4 marginal filaments; g-bristle slightly longer than a-bristle, with 3 marginal filaments.

Second Antenna (Figure 10e): Protopodite bare. Endopodite with 3 elongate joints: 1st joint bare, 2nd joint with 3 short bristles near middle, 3rd joint with 1 long weakly ringed bristle near middle. Exopodite: elongate 1st joint bare; bristle of 2nd joint reaching past 9th joint, with short marginal hairs; joints 2–8 with natatory bristles, some bristles with faint ventral spines; 9th joint with 3 bristles (1 long bristle with natatory hairs, 1 medium length bristle with few short hairs, 1 short bare bristle); faint spines forming row along distal margin observed on joints 5–8.

Mandible (Figure 10f): Coxale endite: dorsal branch broken off both limbs of specimen examined; ventral branch with long proximal and short distal hairs and simple pointed tip. Basale: endite with 2 short pectinate end bristles and 2 slender bare proximal bristles; medial surface with long hairs near dorsal margin; dorsal margin with 2 spinous terminal bristles, ventral margin



FIGURE 10.—*Brunniella* species A, A-1 male, USNM 158119, length 0.72 mm, inside views of carapace: *a*, anterior of right valve; *b*, anterior of left valve; *c*, posterodorsal corner of left valve showing bristles of list and bristles and processes of infold. Appendages: *d*, right 1st antenna, medial view; *e*, endopodite, distal part of protopodite, and proximal end of 1st exopodial joint of left 2nd antenna, medial view; *f*, left mandible, medial view (dorsal branch of coxale broken off); *g*, right maxilla, medial view (epipodial appendage not shown); *h*, comb of left 5th limb, lateral view; *i*, left 6th limb, lateral view; *j*, anterior end of right 6th limb, lateral view; *k*, 7th limb; *l*, left lamella of furca, medial view; *m*, detail of distal end of 3rd claw of right lamella of furca, lateral view; *n*, right lateral eye; *o*, medial eye and bellonci organ; *p*, upper lip, anterior to right; *q*, posterior of body showing Y-sclerite (stippled).

bare. Exopodite hirsute, with 2 small bristles reaching just past distal end of 1st endopodial joint. 1st joint short, with 3 ventral bristles (middle of these shorter than others and with short marginal spines, other 2 with long proximal and short distal spines). 2nd and 3rd endopodial joints fused, with 3 stout claws (middle of these with broader base than others, distal claw longer than others and with short marginal spines), and 10 bristles.

Maxilla (Figure 10g): Epipodite triangular, bare (not shown on illustrated limb); endite I with 1 long and 1 short bristle; endite II with 3 long bristles. Basale with medial hairs distally, 1 minute ventral bristle near middle, and 1 longer terminal bristle with base on medial side. Endopodial joints fused, with 1 long hirsute terminal bristle. Proximal 3 bristles of baleen-comb without spoon-shaped tips of remaining bristles (only proximal of these 3 bristles shown on illustrated limb, spoon-tipped bristles not shown).

Fifth Limb (Figure 10h): Comb with 1 long spinous exopodial bristle with 1 slender bristle ventral to its base; a total of 6 exopodial bristles forming groups of 2, 3, and 1 bristles near ventral margin. (Comb triangular on both limbs of specimen studied, but it is possible that this could be the result of upper edge of comb being folded, and that the upper margin is actually more-or-less parallel to lower margin. More specimens are needed to establish shape of comb of this species.)

Sixth Limb (Figure 10i,j): Anterior and posterior margins concave; medial side with faint bristle-like spine in anterior proximal corner and 1 minute stumpy bristle-like spine near middle of anterior margin; anterior end of skirt with single

bristle on right limb (missing or broken off on left limb); ventral margin of skirt with stiff hairlike spines but no bristles; anterior margin of limb with fine hairs; lateral flap with fine hairs but no bristles.

Seventh Limb (Figure 10k): Each limb with 3 or 4 terminal bristles strongly tapering distally (a juvenile character); 1 or 2 long terminal bristles with 3 bells, 2 short terminal bristles without bells; all bristles without marginal spines. Terminus with small opposing combs each with numerous minute teeth.

Furca (Figure 10l,m): Each lamella with 5 claws, all with minute teeth along posterior edge; claws 3-5 with 7-10 fairly strong teeth on posterior edge near tip; some claws with hairs and minute teeth distally along anterior margins.

Bellonci Organ (Figure 10o): Fairly short, broadening anteriorly with rounded tip.

Eyes: Medial eye well developed, bare, unpigmented (Figure 10o). Lateral eye with black pigment, larger than medial eye, with many ommatidia (Figure 10n).

Upper Lip (Figure 10p): Consisting of 1 small hirsute lobe on each side of shallow saddle; 1 or 2 small faint anterior spines present on lip.

Posterior of Body (Figure 10q): Evenly rounded without dorsal process; long hairs forming rows near middle.

Y-Sclerite (Figure 10q): Elongate with loop at proximal end.

COMPARISONS.—*Bruuniella* species A differs from the only previously described species of the genus *Bruuniella breviata* Poulsen, 1965 (p. 323), in having at most only 1 bristle along the ventral margin of the 6th limb. The 6th limb of *B. breviata* bears about 18 ventral bristles.

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