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THREE NEW SPECIES OF THE FAMILY GALATHEIDAE
(CRUSTACEA, ANOMURA)
FROM THE WESTERN ATLANTIC¹

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ABSTRACT

Three distinctive species of galatheid crustaceans are described as *Phylladorhynchus caribensis*, *Munida serrata*, and *Munidopsis granulens*. This constitutes the first report of the genus *Phylladorhynchus* in the western Atlantic.

INTRODUCTION

The galatheids described in this paper were taken during recent biological investigations being conducted in the tropical western Atlantic Ocean by the Rosenstiel School of Marine and Atmospheric Science aboard its research vessels JOHN ELLIOTT PILLSBURY and GERDA. The three new species are distributed among three genera, one of which has not been recorded from this area until now.

Baba (1969) erected new genera of the family Galatheaidae, based primarily on the shape of the rostrum, to accommodate three groups of aberrant forms which had been assigned previously to the genus *Galathea* Fabricius. *Phylladorhynchus* contained only three species when it was defined initially, all from Indo-Pacific waters; thus, *Phylladorhynchus caribensis*, from the Lesser Antilles and northeast of Colombia, is the first representative of the genus to be described from the Atlantic. One specimen came from a depth of 11 meters, which is the shallowest record of a galatheid in the western Atlantic.

Munida serrata, from off Grand Bahama Island, is quite different from all other western Atlantic species. It can be distinguished by the presence of long setae covering the cornea, and simultaneous armature of the posterior carapacial margin with the absence of medial cardiac spines.

Munidopsis granulens is a bizarre little species from Arrowsmith Bank. The even granulation over most body surfaces and part of the eyes serves to distinguish it from all described species.

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***Phylladorhynchus caribensis*, new species**

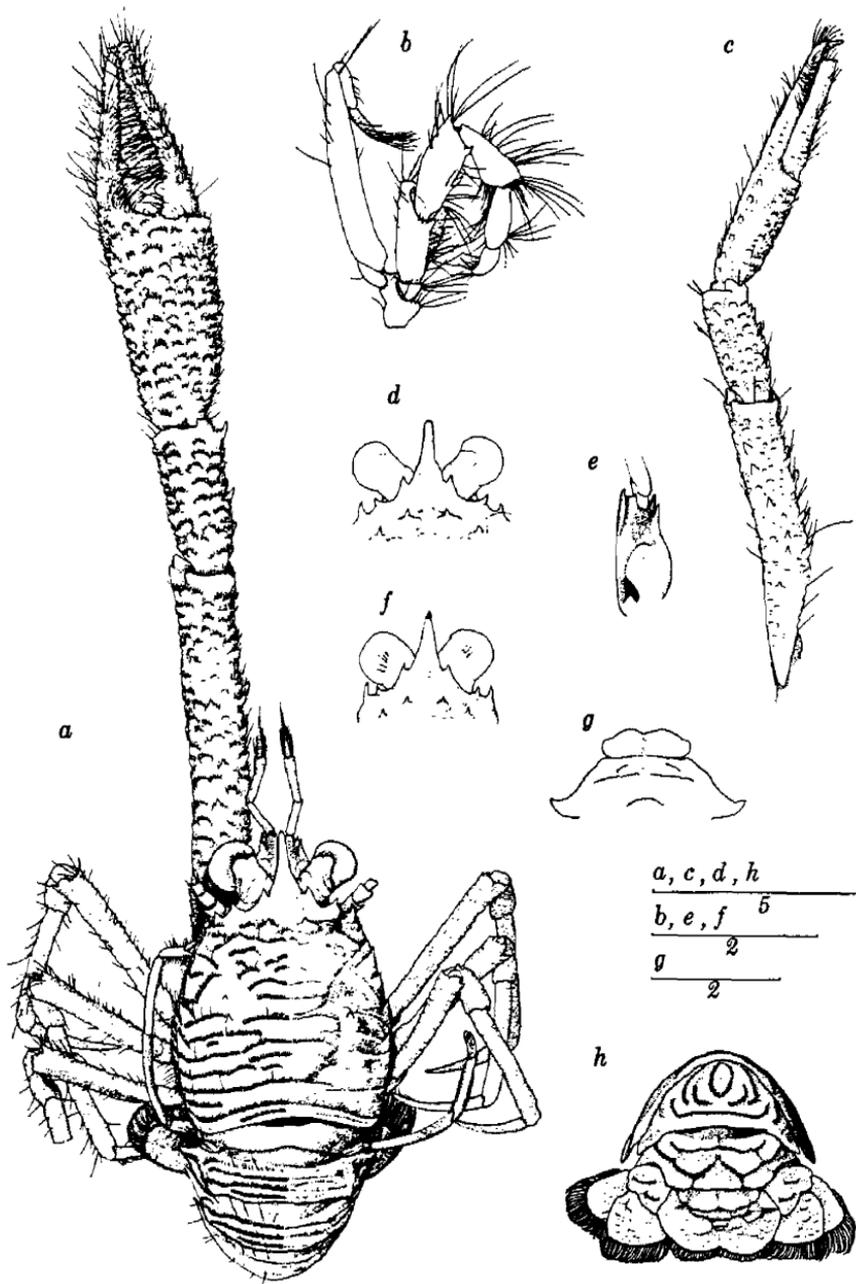
Fig. 1

Material Examined.—2 ♂, cl. (excluding rostrum) 5.1 mm (holotype), 5.5 mm (paratype); off Barbuda, Lesser Antilles; 17°44'N, 62°02'W; 38 m; PILLSBURY Sta. 973; 10-ft otter trawl; 21 July 1969; USNM 140187, 140188.—1 ♂, cl. 1.9 mm; off Peninsula of Guajira, northern Colombia; 12°21'N, 71°55'W; 11 m; PILLSBURY Sta. 772; 10-ft otter trawl; 29 July 1968; UMML 32:4381.

Description.—Carapace length, measured from orbital margin, approximately equal to width at widest part; transversely convex and slightly convex longitudinally. Mesogastric region swollen, well-defined posteriorly by cervical groove; shallower groove separating metagastric from inflated cardiac region; symmetrical sculpturing on dorsal surface of carapace consisting of transverse striae with short setae on low ridges, usually somewhat interrupted; approximately five such striations in midline anterior and posterior to cervical groove (excluding posterior ridge); several pairs of longer iridescent setae widely spaced along striations. Four pairs of spines on dorsal surface of carapace: anterior pair projecting from small ridgelike protuberance on each side of midline in protogastric region, one spine on each side posterolateral to this on similar projection in line with anterior-most striation, larger spine in each triangular area between branches of cervical groove, and one spine behind this on swelling posterior to cervical groove.

Rostrum with low, rounded carina extending only slightly beyond eyes, broad at base with well-developed tooth over eyestalk; lateral margins concave, smooth, narrowing distally; tip blunt, finely serrate, with minute denticle at apex surrounded by several short incurved setae. Frontal margin with expanded rim extending from rostrum to small tooth at lateral terminus of orbit; anterolateral margin sloping, armed with large spine. Lateral margin with five spines, anterior spine denticulate. Sides of carapace barely visible below lateral suture; distinct striations with rows of short setae continuing obliquely on branchiostegites below pleural suture. Ridge bordering posterior margin with two setose striae.

Abdomen unarmed. Anterior parts of abdominal tergites smooth; posterior parts of second, third, and fourth tergites with three transverse ridges and two distinct grooves; ridges bordered with setae anteriorly; additional striation on each segment posteriorly. Fifth tergite with central oval area



bounded by row of short outward-projecting setae; crescentic row of setae anterior and lateral to central oval; pair of curved striations posterolateral to oval and posterior striation with lateral ends curved anteriorly. Sixth tergite with two interrupted scalloped transverse striae with setae; protopod of uropod with two curved setose striae. Telson sculptured; posterior margin with medial indentation.

Sternum unarmed; intersegmental ridges distinct; sternite of first pereopod with several transverse striae.

Eyes slightly flattened dorsoventrally, with pigment in preserved specimens restricted to ring at base of cornea. Cornea wider than eyestalks, fringe of setae at base on dorsal surface.

Basal segment of antennular peduncle with three small terminal spines: one on thin dorsal expansion of mesial margin; two on lateral margin, dorsal spine smaller.

Basal segment of antenna with distal margin expanded, thin, scalloped, ventral prolongation serrate; second segment with small distolateral spine; distal margins of other segments irregular, but not spined. Antennal flagella missing in holotype and paratype; reaching beyond carpus of cheliped in small specimen.

Ischium of third maxilliped with mesial margin irregularly serrate, well-developed distal spine on ventral carina. One distal and one central spine on mesial margin of merus, one distal spine laterally.

No epipods on pereopods.

Chelipeds sculptured with anteriorly directed protuberances, some bearing small spine or denticle, most with short setae and granules giving finely serrated appearance. Cheliped of holotype more than four times carapace length; length of dactylus approximately equal to length of palm (propodus excluding finger); fingers widely gaping, dactylus with large rounded protuberance on opposable margin proximally, fixed finger with similar tooth distal to this; many setae between fingers. Carpus more than one-third length of entire chela, with sharp spine on mesial distal margin, two additional spines posterior to this on mesial margin. Merus approximately same length as chela, irregular row of four distinct spines on dorsal surface, four on dorsomesial margin, two large spines and one smaller proximally

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FIGURE 1. *Phylladorhynchus caribensis*, new species: *a*, holotype, dorsal view; *b*, holotype, right third maxilliped, ventral view; *c*, paratype, left cheliped, dorsal view; *d*, paratype, anterior carapace, dorsal view; *e*, holotype, right antennular peduncle, basal segment, ventral view; *f*, individual from PILLSBURY Sta. 772, anterior carapace, dorsal view; *g*, holotype, anterior sternites; *h*, holotype, fifth and sixth abdominal tergites, telson, and uropods (posterior setae plumose, curved under tailfan). (Scales in mm.)

on mesial surface. Several long, plumose setae on mesial surface of merus. Distal dorsal margins of all segments finely serrate.

In paratype, fingers not gaping, all segments shorter; length of both merus and entire chela approximately equal to carapace length, carpus approximately half as long as propodus, dactylus longer than palm. Spination similar to that in holotype, but more irregular, spines broader, more blunt.

Second, third, and fourth pereopods similar, flattened, with obscure transverse sculpturing, lacking spines except one at distal margins of merus and carpus. Scattered setae, especially on margins, some iridescent, many plumose. Dactyli sickle-shaped, smooth.

Fifth pereopods chelate, smooth; dactylus and propodus with tufts of setae, distal half of carpus with row of setae; other segments with short setae, a few iridescent. Ischium with many setae on anterior and posterior surfaces.

Remarks.—The form of the carapace of the holotype and paratype (both males) is practically identical, but the left chelipeds (right chelipeds are missing in both specimens) are quite different. The male from the coast of Colombia, although with pleopods developed as in the larger specimens, is so much smaller that comparison with the others has limited value. In the small specimen the chelipeds are similar to each other and resemble that of the paratype.

Discussion.—*Phylladorhynchus* is one of three genera erected by Baba (1969) when he divided the old genus *Galathea* Fabricius. He believes that the "proper" *Galathea* s.s. bears four rostral teeth on either side, while *Phylladorhynchus* has a "leaflet-like" rostrum with one large lateral tooth at the base and a small one near apex of each side. The distal part of the rostrum in both the holotype and paratype of *P. caribensis* is quite narrowed, but the rostrum of the smaller specimen from Colombia is more like that shown for other species which Baba included in *Phylladorhynchus*, especially *P. serrirostris* (Melin). Close examination of the rostral apex shows that it is not rounded, as it first appears, but finely serrate with an apical denticle. Thus there is a terminal constriction in this species which greatly resembles the tip of the rostrum of *Phylladorhynchus pusillus* (Henderson) as drawn by Tirmizi (1966: fig. 1A). The new species shows a form intermediate between *Galathea* and *Munida*, but fits into the genus *Phylladorhynchus* quite well. Other characters which support its placement in this genus are the arrangement of spines on the rather smooth carapace, the pyramidal outer orbital angle, five spines on the lateral margins, the shortened basal segment of the antennular peduncle, the short eyestalk with dilated corneal region, the nonspinose abdomen, and lack of epipods on all pereopods. Features which necessitate slight modification of the diagnosis given by Baba (1969) are the lack of spination on the

ambulatory legs and three rather than four or five terminal spines on the basal antennular segment; I believe that these characters are of specific rather than generic significance in this case.

Color.—The specimens preserved in alcohol are white; there is a trace of reddish pigment across the carapace near the posterior margin, a very faint spot on each lateral margin of the first abdominal tergite, and a small area on the base of the merus of the cheliped where the segment widens. Corneal pigment is restricted to a band near the base; the remainder of the cornea is very light brown.

Distribution.—Known only from the locations cited. The depth of 11 meters is the shallowest reported for any member of the Galatheidae in the western Atlantic; until now *Galathea rostrata* A. Milne Edwards from approximately 25 meters had the shallowest recorded depth of the Galatheidae in this region.

***Munida serrata*, new species**

Fig. 2

Material Examined.—1♂, holotype, cl. 6.1 mm; south of Grand Bahama Island, Bahamas; 26°35'N, 78°25'W; 329-421 m; GERDA Sta. 692; 10-ft otter trawl; 21 July 1965; USNM 140189.

Description.—Carapace length, measured from orbital margin, approximately equal to width; transversely convex with well-defined transverse striae; sides nearly straight. Rostral spine extending beyond eyes by approximately one-half length of rostrum; supraocular spines with lateral margins straight, perpendicular to frontal margin of carapace, not reaching cornea. Five pairs of spines on dorsal surface of carapace: one pair of gastric spines behind supraoculars; small spine lateral and posterior to these on each hepatic region; smaller spine laterally in anterior part of each triangular area formed by branching cervical groove; spine on triangular projection behind cervical groove at anteromesial angle of branchial region; and pair of bifurcate spines on either side of midline just anterior to posterior marginal ridge. Frontal margin nearly straight between supraocular and anterolateral spines, perpendicular to longitudinal axis of animal. Anterolateral spines not as long as supraoculars; reaching only about one-half length of latter, followed by five spines and one small denticle on lateral margin. Posterior ridge with several transverse striae and two or three small spines on each side near lateral termination.

Abdomen with transverse striae, ridges, and grooves. First tergite with transverse striae only; second tergite with four pairs of spines on anterior-most ridge, lateral three spines close together and decreasing in size laterally; third tergite with two pairs of spines; fourth tergite with single pair of spines.

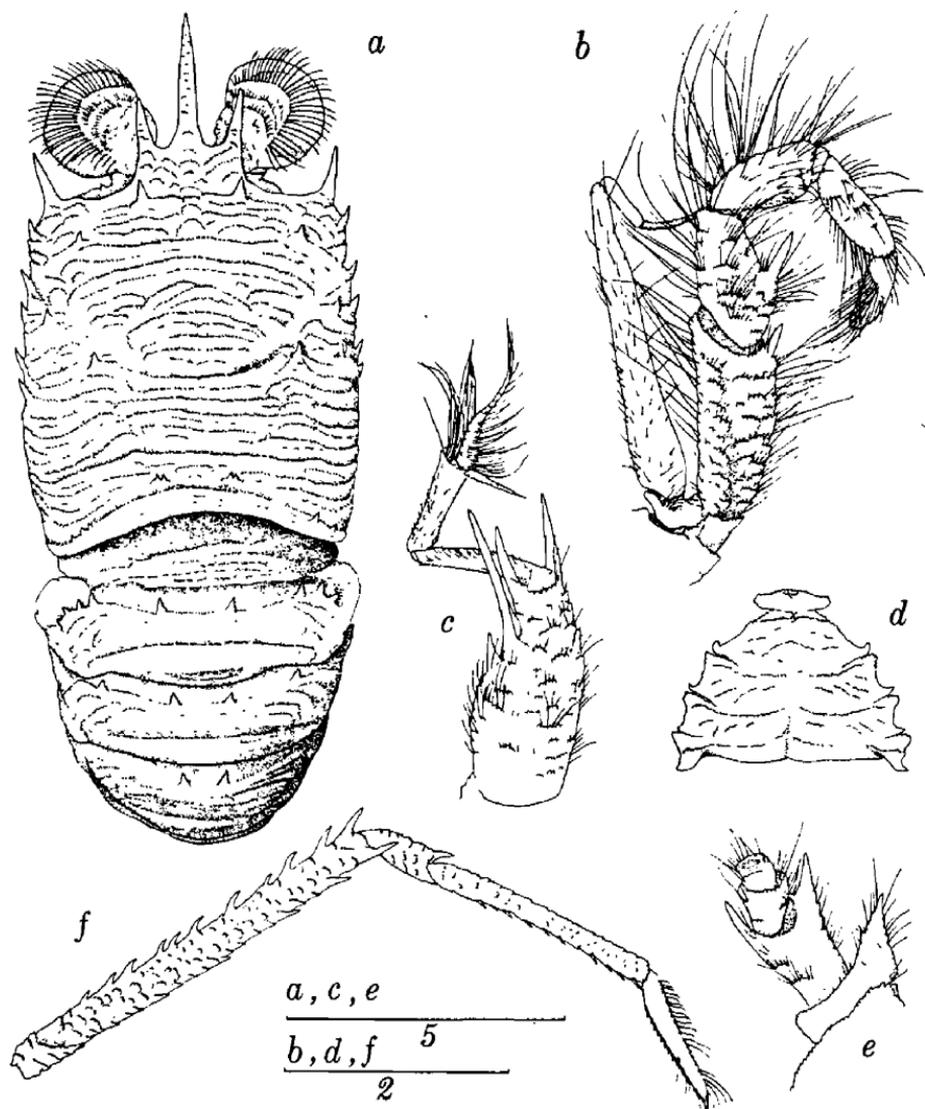


FIGURE 2. *Munida serrata*, new species, holotype: a, carapace and abdomen, dorsal view (setae shown on eyes only); b, right third maxilliped, ventral view; c, right antennule, ventral view; d, thoracic sternites, ventral view; e, right antennal peduncle, ventral view; f, right second pereopod, lateral view. (Scales in mm.)

All armed tergites with central transverse groove followed by second prominent ridge, two or three distinct striae on each smooth area.

Thoracic sternum without spines; intersegmental ridges distinct, striated, with several oblique striations on segments.

Eyes large, dorsoventrally flattened; dorsal surface of peduncle with several concentric setose striae; setae at base of cornea long, extending over and beyond cornea distally.

Basal segment of antennular peduncle with lateral and mesial terminal spines on constricted distal extension, mesial spine slightly longer; two lateral spines on base of segment, anterior one longer, reaching almost to end of mesial terminal spine; surfaces of segment with denticulate striations, many with short setae. Two segments of peduncle smooth with many distally directed short setae.

Basal segment of antennal peduncle with mesial angle projected to large spine; surface roughened with denticulate setose striae; second segment with mesial and lateral spine on distal margin; margins of third and fourth segments denticulate, but not spinose.

Merus of third maxilliped with one large spine just posterior to middle of mesial margin; ischium with mesial spine on distal margin; longitudinal groove on ventrolateral surface; both segments sculptured with denticulate ridges and setae, distal margins of merus and more proximal segments denticulate.

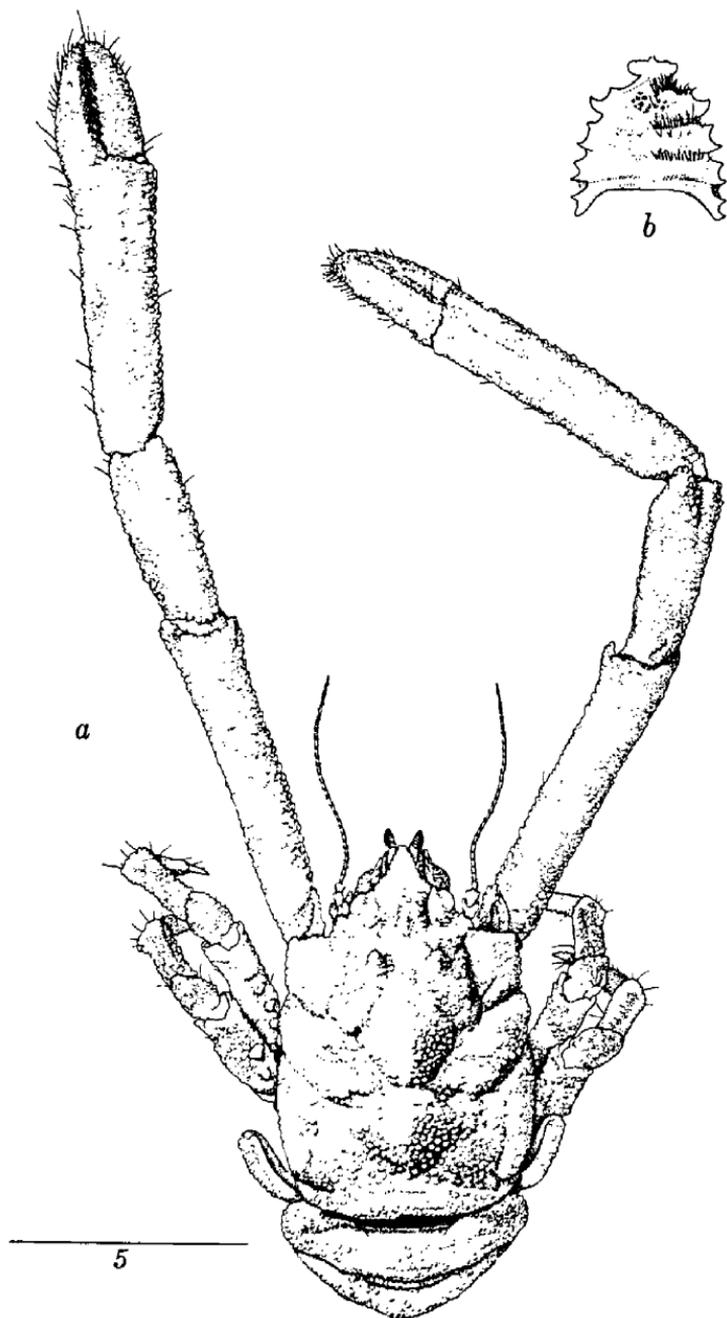
Chelipeds missing in unique type-specimen.

Of ambulatory legs, only right second pereopod present. Distal three segments flattened. Dactylus with corneous brown tip; approximately 14 corneous spines on ventral margin; dorsal margin with plumose setae, closely spaced proximally, spaces wider distally. Distal margin of propodus denticulate, 14 movable spines on ventral margin, denticulate ridges with setae on dorsal margin and both faces of segment, similar sculpturing on more proximal segments, mesial surface of propodus smoother with additional movable spine at distal ventral margin. Merus with dorsal and ventral distal spines, ten spines following this on dorsal edge, three on ventral margin; inner surface rounded, angle increasing proximally to ischium; latter segment with one ventrolateral spine distally.

Fifth pereopod chelate; lateral surface of merus sculptured with ridges and setae as in other appendages.

Uropods and telson with rugose sculpturing; posterior margin of telson deeply scalloped.

Discussion.—*Munida serrata* is the only species of the genus in the western Atlantic with the posterior margin of the carapace armed (near the lateral borders), and at the same time having no median spines on the carapace. In addition, it is unique in having a pair of bifurcate spines just anterior to



the posterior margin of the carapace. *M. serrata* is similar to *M. constricta* A. Milne Edwards in the spination of the abdomen, antennular peduncle, and third maxilliped, but the latter species lacks spines behind the cervical groove and on the posterior border of the carapace, and lacks long cilia on the eyestalk; also, *M. constricta* has three or four pairs of gastric spines, compared to the single pair in *M. serrata*.

The new species shares several characteristics with the European species, *M. rugosa* (Fabricius) (*M. bamffica* in Benedict's [1902] key), but in *M. serrata* the supraocular spines do not reach beyond the cornea. It is immediately evident that this species is different from all those considered by Chace (1942); neither choice of the first couplet in his key to the western Atlantic species is applicable to *M. serrata*, since the posterior margin of the carapace is armed, and the cardiac region lacks medial spines.

Color.—The holotype is preserved in alcohol, and is completely devoid of color except for some light brown pigment remaining in the cornea.

Distribution.—Known only from the type-locality.

***Munidopsis granulens*, new species**

Figs. 3, 4

Material Examined.—1 ♂, holotype, cl. 6.2 mm; Arrowsmith Bank, north-west Caribbean Sea; 21°02'N, 86°24'W; 347-353 m; PILLSBURY Sta. 584; 10-ft otter trawl; 23 May 1967; USNM 140190.

Description.—Carapace, measured from base of eye, slightly longer than broad; generally quadrangular, dorsal surface densely granulate; deep grooves separating distinct areas of carapace; mesogastric, metagastric, and cardiac regions and area between lateral branches of cervical groove greatly inflated, lateral part of branchial region and posterior margin of carapace swollen; gastric region with pair of protuberances posterior to and in line with eyes. Rostrum spade-shaped; lateral margins concave in proximal half between eyes, tapering to apex from widest point at distal margin of cornea, distolateral margins of rostrum also concave; shallow longitudinal depression in midline of rostral projection, posterior extension bifurcated by irregular row of granules forming obscure carina; depression or carina not extending to gastric protuberances. Frontal margin between rostrum and anterolateral angle of carapace indistinct due to contiguous granular overgrowth on eyestalk; front transverse between triangular projection behind antenna and anterolateral angle. Lateral margins nearly straight except

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FIGURE 3. *Munidopsis granulens*, new species, holotype: a, dorsal view; b, thoracic sternites, ventral view (setae shown on one side only). (Scales in mm.)

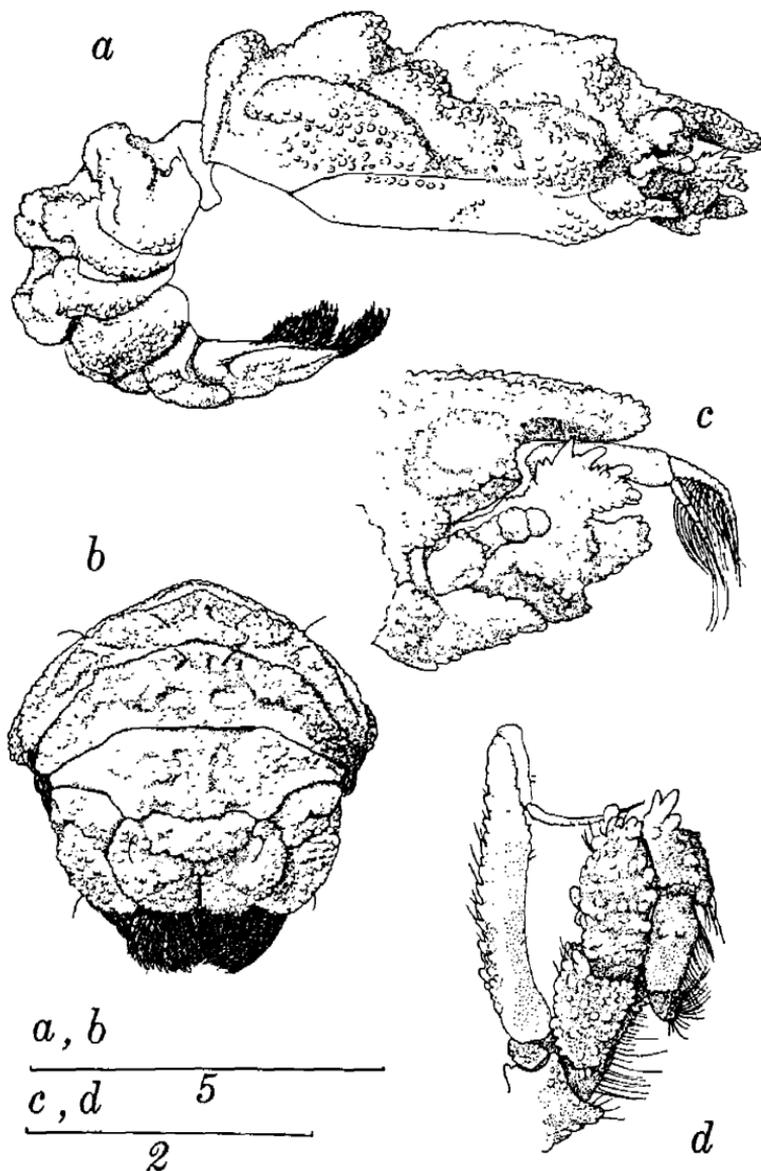


FIGURE 4. *Munidopsis granulens*, new species, holotype: *a*, carapace and abdomen, lateral view (pereiopods not shown); *b*, posterior abdominal tergites, telson, and uropods; *c*, right antennule, basal part of antenna (flagellum not shown), and anterior carapace, lateral view (slightly ventral); *d*, right third maxilliped, ventrolateral view. (Scales in mm.)

for convexities at swollen hepatic and branchial regions. Posterior margin slightly convex with small medial indentation.

First abdominal tergite smooth with low ridge, barely visible in dorsal view. All other abdominal tergites, telson, and uropods with dorsal surfaces granulate. Second and third tergites visible in dorsal view when specimen is in characteristic position with abdomen tucked under; posterior half of segments with prominent transverse carina, densely granulate; third, fourth, and fifth tergites with medial sculpturing increasingly elaborate posteriorly; sixth tergite with sculpturings and swellings, but without distinct transverse ridge; several pairs of obscure setae distributed over surface of abdomen.

Thoracic sternum unarmed, smooth except for several granules on each side of segment bearing chelipeds; intersegmental ridges distinct, with anteriorly directed setae.

Eyes colorless, small; with granulate overgrowths covering posteromedial part of cornea dorsally and ventrally.

Basal segment of antennular peduncle ornate; entire surface granulate except smooth area adjacent to anteroventral extension of base of antenna; dorsal projection with five spines; posterior one or two small, other three or four slightly curved; additional small spines between distal two; granulate distal projection extending from swollen base just mesial to dorsal projection; another shorter projection ventrally bearing distal segments of antennule.

Basal segment of antennal peduncle with large granulate projection ventrally, extending almost to base of antennal flagellum; smaller blunt lateral projection; second segment with several granules forming distolateral projection; third segment with granules on distal margin; last segment small. Antennal flagellum reaching almost to articulation of merus and carpus of cheliped.

Exopod of maxilliped with granulation on dorsolateral surface of long second segment. Endopod granulose, several rounded toothlike projections on dorsal and ventral margins near distal ends of ischium and merus; large rounded teeth dorsally near base of carpus (projecting anteriorly); propodus and dactylus smoother with long setae on mesial borders. Distal three segments flexed against concave mesial surfaces of ischium and merus. Ischium with sharp, toothed carina on mesial margin.

Epipods on chelipeds and first pair of ambulatory legs.

Pereiopods granulose on all surfaces.

Chelipeds without wide gape; manus slightly flattened dorsoventrally. Dactylus less than one-third length of propodus including fixed finger. Carpus about one-half length of propodus. Merus slightly shorter than entire propodus; several larger tubercles on dorsal surface near proximal end.

Second, third, and fourth pereiopods similar. Second pair when extended

not reaching distal end of merus of cheliped. Dactylus with corneous brown tip; row of minute corneous spines on ventral margin. Merus with several large tubercles or raised groups of granules on dorsal border. Dactylus and carpus about one-half length of propodus and ischium.

Fifth pereopods chelate, with granulations on lateral surface of merus.

Tailfan with granules on dorsal surface; telson and protopod of uropod sculptured with several swellings; telson with medial indentation on posterior margin. Plumose setae on telson and uropods posteriorly.

Discussion.—*Munidopsis granulens* is distinguished from all other species in the genus by the following combination of characters: carapace evenly granulate, eyes with granular overgrowths at base of cornea but without spines, chelipeds approximately three times length of carapace, epipods on chelipeds and first pair of ambulatory legs, and abdomen granulose and sculptured. *M. squamosa* (A. Milne Edwards) appears to be its closest relative in the western Atlantic, but that species has many large protuberances on the carapace, a mesial projection on the eyes, chelipeds less than two times the carapace length, and epipods on the second pair of ambulatory legs. *M. granulata* Miyake & Baba and *M. granosa* Alcock from Indo-Pacific waters resemble the new species in some features, but both lack epipods on the chelipeds and ambulatory legs, and neither have decoration on the eyes.

Color.—The holotype is preserved in alcohol and is completely devoid of color.

Distribution.—Known only from the location cited.

SUMARIO

TRES NUEVAS ESPECIES DE LA FAMILIA GALATHEIDAE (CRUSTACEA, ANOMURA) DEL ATLÁNTICO OCCIDENTAL

Tres nuevas especies de galateidos, colectados por el B/I PILLSBURY y el B/I GERDA de la Universidad de Miami, son descritas como *Phylladiorhynchus caribensis*, *Munida serrata* y *Munidopsis granulens*.

Phylladiorhynchus caribensis, de las Antillas Menores y la costa noreste de Colombia, es el primer representante del género reportado en el hemisferio occidental; la profundidad a que fue colectado uno de los ejemplares, 11 m, es el reporte de menor profundidad para cualquier miembro de la familia en el Atlántico occidental. Esta especie está caracterizada por un diente a cada lado en la base del rostrum triangular y una constricción terminal y denticulo.

Munida serrata, de cerca de la isla Grand Bahama, difiere de todas las otras especies de *Munida* previamente descritas en que tiene un par de espinas bifurcadas justamente anterior al margen posterior del carapacho,

largas setas cubriendo las córneas y ausencia simultánea de espinas cardíacas con armadura lateral del borde posterior del carapacho.

Munidopsis granulens, de Arrowsmith Bank, puede ser distinguida de todas las especies descritas, por los gránulos distribuidos sobre la mayoría de las superficies del cuerpo y sobre la parte basal de la córnea.

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