

Observations on *Nannosquilla*,
with Descriptions of
Three New Species
from the Northwestern Atlantic
(Crustacea: Stomatopoda)

DAVID K. CAMP
and
RAYMOND B. MANNING

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ABSTRACT

Camp, David K., and Raymond B. Manning. Observations on *Nannosquilla*, with Descriptions of Three New Species from the Northwestern Atlantic (Crustacea: Stomatopoda). *Smithsonian Contributions to Zoology*, number 444, 17 pages, 8 figures, 1986.—A modified and expanded definition of *Nannosquilla* is presented along with redescriptions of *N. hancocki* and *N. antillensis*. Two new species are described from the Caribbean Sea based on specimens previously reported as *N. antillensis*, including the paratypes from St. John, Virgin Islands (*N. virginalis*), and another specimen from Banco Chinchorro, Yucatan (*N. yucatanica*). Another new species, *N. disca*, is described from the eastern Gulf of Mexico, off Florida. The second known specimen of *N. adkisoni* is compared with the holotype, and the third specimen of *N. carolinensis* is reported. A key to identification of western Atlantic species of *Nannosquilla* is offered. *Lysiosquilla varicosa* provisionally was assigned to *Nannosquilla* when the genus was erected in 1963. The species does not conform to our current understanding of the limits of the genus. It is relegated to the status of species inquirendum; there are no extant specimens, and the original description omits characters diagnostic at the genus-group level.

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Contents

	<i>Page</i>
Introduction	1
Acknowledgments	2
The <i>Lysiosquilla varicosa</i> Problem	2
Family NANNOSQUILLIDAE Manning, 1980	3
<i>Nannosquilla</i> Manning, 1963	3
<i>Nannosquilla adkisoni</i> Camp and Manning, 1982	4
<i>Nannosquilla antillensis</i> (Manning, 1961)	4
<i>Nannosquilla carolinensis</i> Manning, 1970	6
<i>Nannosquilla disca</i> , new species	6
<i>Nannosquilla hancocki</i> (Manning, 1961)	8
<i>Nannosquilla virginialis</i> , new species	9
<i>Nannosquilla yucatanica</i> , new species	12
Discussion	14
Key to Adults of Species of <i>Nannosquilla</i> from the West Atlantic	15
Literature Cited	17

Observations on *Nannosquilla*, with Descriptions of Three New Species from the Northwestern Atlantic (Crustacea: Stomatopoda)

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Introduction

The stomatopod crustacean genus *Nannosquilla* Manning, 1963, is currently represented by 21 species. All but one are confined to the Americas, making it the second largest stomatopod genus in the New World after *Squilla* Fabricius, 1787, with 24 American species. American representatives of both genera are believed to have developed since the breakdown of the Tethys Sea and to have speciated more actively than those of other genera (Manning, 1977:165; Reaka and Manning, in press).

Few new species of *Squilla* have been described recently (eight species described since 1960, two of these since 1970), but 13 new species of *Nannosquilla* have been described since the genus was defined in 1963. Unlike many other stomatopods, members of *Nannosquilla* are diminutive (see Camp and Manning, 1982:1-2) and difficult to collect. Most species are poorly represented in collections, some only by the holotype. Their external morphology is relatively monotonous when compared to that of many other stomatopods. The dorsal surface of the body is smooth, lacking spines, carinae, and tubercles used as distinguishing characters in other groups. In this respect, *Nannosquilla* is similar to the gonodactyloid genus *Gonodactylus*. In that genus, the more important distinguishing characters are subjective features based on relative shape of telsonal morphology (Manning, 1969:295) and, to some extent, color in life (Manning and Reaka, 1981:196). Similarly, some important distinguishing characters in *Nannosquilla* include

subjective features such as relative shape of the rostral plate and false eave of the telson and, to some extent, chromatophore patterns in preserved material (Camp and Manning, 1982:2). In some of the better-represented and distinctive species, such as *N. grayi* (Chace, 1958), we are able to document morphological variation (Camp and Manning, 1982, fig. 2). Other, more poorly represented and less distinctive species, such as *N. baliops* Camp and Manning, 1982, and *N. whitingi* Camp and Manning, 1982, are difficult to distinguish from their closely related congeners. However, as more specimens become available, our understanding of relationships within and among species of *Nannosquilla* increases.

In 1982, we described five new species of *Nannosquilla* from the northwestern Atlantic based on specimens that had accumulated in our respective institutions (Camp and Manning, 1982). While preparing that report, we examined most northwestern Atlantic specimens of related species deposited in the National Museum of Natural History, including two of the three known lots of *N. antillensis* (Manning, 1961), and noted differences between the single specimen of *N. antillensis* from waters off Yucatan, Mexico, and the series of specimens from St. John, Virgin Islands. Because the holotype of *N. antillensis* from waters off Cubagua Island, Venezuela, was at the Allan Hancock Foundation and not immediately available for examination, we decided to exclude our observations on specimens of *N. antillensis* from that report. Later examination of the holotype revealed that specimens previously reported as *N. antillensis* comprised a complex of three species, one from each of the three widely separated localities. At the same time, we examined the holotype of *N. hancocki* (Manning, 1961) and noted characteristics that, in light of our in-

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creased understanding of the group, necessitated a redescription of that species. Finally, other specimens became available for study; one proved to be an additional undescribed species, another represented the second known record of *N. adkisoni* Camp and Manning, 1982, and the last represented the second known record of *N. carolinensis* Manning, 1970. In this paper, we discuss the generic placement of the single extra-American species currently assigned to *Nannosquilla*, update the generic definition, redescribe *N. hancocki* and *N. antillensis*, describe the new species, discuss variation in *N. adkisoni*, present the new record for *N. carolinensis*, and offer a key to the identification of western Atlantic species.

This is also an opportune time to correct an error in the original description of *Nannosquilla dacostai* Manning, 1970. Contrary to the published description (Manning, 1970:101), that species lacks a mandibular palp, as do all members of the genus.

Measurements and terminology used herein were defined in Manning (1969:9–15). Specimens have been deposited in the National Museum of Natural History, Smithsonian Institution, under USNM catalogue numbers, the Allan Hancock Foundation, University of Southern California (AHF), and Rosenstiel School of Marine and Atmospheric Science, University of Miami, under UMML catalogue numbers.

ACKNOWLEDGMENTS.—We thank Janet Haig, Allan Hancock Foundation, University of Southern California, and Gilbert L. Voss, Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, for the loan of specimens, and C.W. Hart, Jr., Smithsonian Institution, and W.G. Lyons, Florida Department of Natural Resources, for their critical review of the manuscript. The illustrations were prepared by Lilly King Manning. We are particularly indebted to M. Takeda, National Science Museum, Japan, and T. Ito, Kyoto University, for searching the collections of their respective institutions for the types of *L. varicosa*.

The *Lysiosquilla varicosa* Problem

Nannosquilla was erected for 10 species formerly assigned to *Lysiosquilla* Dana, 1852. Seven species were from the West Atlantic or East Pacific; three species from other geographic areas were provisionally assigned to the genus because of morphobiological characters that differed from those of the American species (Manning, 1963:319). Later examination of specimens not seen prior to 1963 prompted transferral of the East Atlantic *L. occulta* Giesbrecht, 1910, to a monotypic genus, *Nannosquilloides* Manning (1977:89). Similarly, the species from the Indian Ocean, *L. hystricotelson* Barnard, 1958, was made the type-species of another monotypic genus, *Keppelius* Manning (1978:9). The third species assigned provisionally to *Nannosquilla* was *L. varicosa*

Komai and Tung, 1930, from waters off Japan.

Lysiosquilla varicosa must be considered a species inquirendum. The description was based on two specimens, one female, 34 mm long, collected at Senoumi, Suruga Bay (34°51'N, 138°33'E; 123 m depth), and the other, a female 31 mm long, collected off Asizuri-Zaki, Kôti Prefecture (now called Ashizuri Misaki, Kochi Prefecture, in recent atlases) (32°44'N, 133°01'E; 223 m depth). The syntypes apparently are no longer extant, and no other specimens have been reported (Dr. M. Takeda, National Science Museum, Tokyo, and Dr. T. Ito, Kyoto University, in litt.) The species apparently belongs to Nannosquillidae but is unique within the family by having the following combination of characters (Figure 1): (1) the rostral plate is cordiform, longer than wide, with a long apical spine; (2) the cornea is deeply bilobed; (3) the antennal peduncle bears two sharp mesial spines (or papillae); (4) the dorsal surface of the sixth abdominal somite is sculptured; (5) the ventral surface of the sixth abdominal somite has anterolateral and posterolateral spines; (6) the dorsal surface of the telson is strongly sculptured laterally; and (7) the graded series of spines on the outer margin of the proximal segment of the exopod of the uropod are sharp and not recurved distally. By contrast, species of *Nannosquilla* sensu stricto share the following characters: (1) the rostral plate is subquadrate or subpentagonal, wider than long, and lacks a long apical spine; (2) the cornea is subglobular; (3) the antennal peduncle lacks spines or papillae; (4) the dorsal surface of the sixth abdominal somite is smooth, not sculptured; (5) the ventral surface of the sixth abdominal somite lacks posterolateral spines; (6) the dorsal surface of the telson lacks strong lateral sculpture; and (7) the spines on the proximal segment of the exopod of the uropod are usually spatulate and recurved distally. Komai and Tung (1930) did not mention the mandibular palp or the thoracic epipods in their description; both are important generic characters within Nannosquillidae. All species of *Nannosquilla* lack a palp and have only four epipods. Clearly, *L. varicosa* should not be assigned to *Nannosquilla*, but the lack of extant specimens and our ignorance of the mandibular palp and epipods dissuades us from erecting a new genus for the species. If additional specimens become available for study (and they should, considering the extent of collecting effort occurring in the vicinity of the type-locality), the species should be redescribed and its generic affinity stabilized.

Our indirect removal of *L. varicosa* from *Nannosquilla* demonstrates that all known members of the genus are confined to the Americas. *Coronis* Desmarest, 1823, represented by only two species in the West Atlantic, and *Meiosquilla* Manning, 1968, represented by five species in the West Atlantic and two in the East Pacific, are the only other non-monotypic stomatopod genera known to be confined to the Americas.

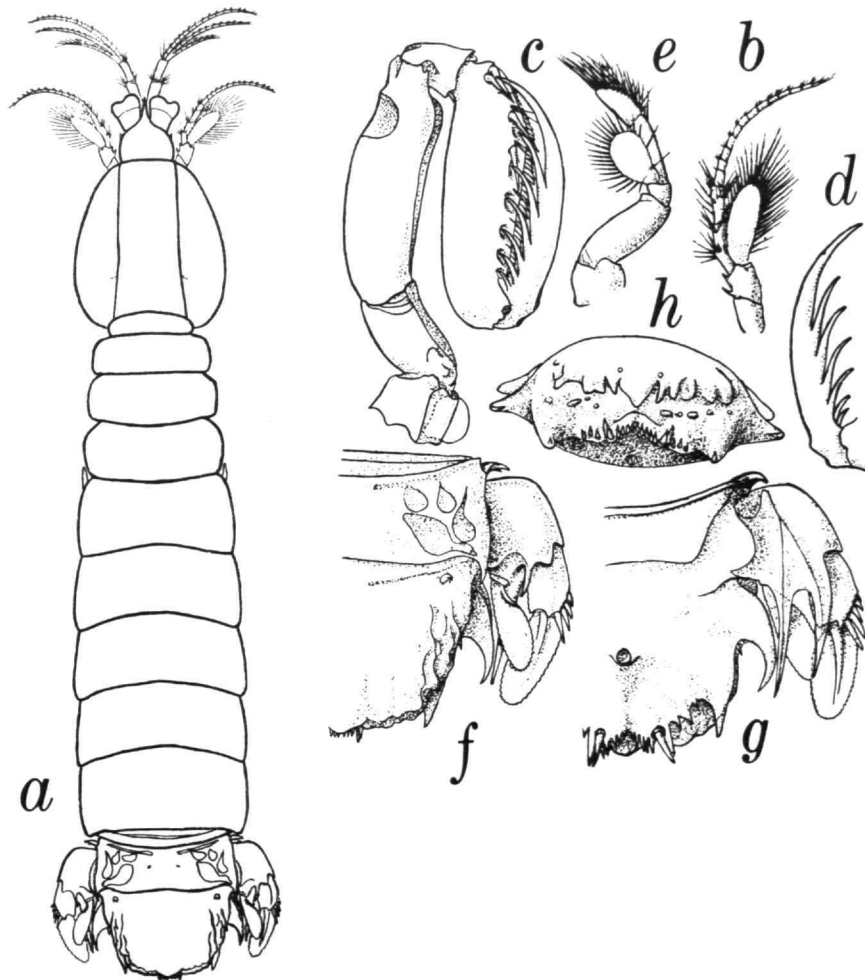


FIGURE 1.—*Lysiosquilla varicosa* Komai and Tung, 1930: *a*, dorsal view; *b*, antenna; *c*, claw; *d*, dactylus of claw; *e*, walking leg; *f*, sixth abdominal somite, telson, and uropod; *g*, telson and uropod, ventral view; *h*, telson, posterior view. (From Komai and Tung, 1930, figs. 2, 3.)

Family NANNOSQUILLIDAE Manning, 1980

Nannosquilla Manning, 1963

DEFINITION.—Size very small to small, maximum length about 40 mm, usually less than 30 mm. Body smooth, depressed, loosely articulated. Eye elongate; cornea subglobular, set obliquely on peduncle, often expanded laterally beyond peduncle. Rostral plate subrectangular or subpentagonal, wider than long; anterior margins sloping to acute or variously obtuse apex, not produced forward as elongate spine. Antennal protopod without papillae. Carapace without cervical groove, carinae, or spines. Exposed thoracic somites without longitudinal carinae; eighth somite without

median ventral keel. Mandibular palp absent; 4 epipods present. Propodi of third and fourth thoracic appendages broader than long, beaded or ribbed ventrally. Raptorial claw slender; dactylus with 6–17 teeth; propodus slender, opposable margin completely pectinate, with 4 movable spines proximally; dorsal ridge of carpus undivided; merus unarmed, longer than ischium; ischiomerar articulation terminal; ischium unarmed. Endopods of pereopods (walking legs) two-segmented, distal segment ovate or subcircular on anterior 2 pereopods, more slender on third. Basal segment of pereopod usually without posteromesial lobe; lateral spine, if present, minute. Abdomen depreseed, smooth, loosely articulated, unarmed dorsally; articulated anterolateral plates small; sixth somite with or without posterolateral

spines, with strong, ventrally curved process anterior to each uropod. Telson broader than long, dorsal surface smooth; posterior portion produced into dorsal false eave of various shapes, overhanging most true marginal armature; posterior margin of eave with or without spinose projections; true marginal armature, on either side of midline, consisting of row of 4–12 slender submedian denticles, single movable (or fixed) submedian tooth, 3–6 fixed lateral teeth and denticles, and 0–1 fixed posterolateral tooth. Uropod basal segment terminating in distal, dorsal spine; proximal segment of exopod with graded series of slender, spatulate, movable spines on outer margin and non-plumose stiff setae on rounded lobe of inner, distal margin; endopod with distinct proximal fold on inner margin; spines of basal prolongation slender, triangular in cross section, usually one longer than other, rarely subequal in length.

REMARKS.—The original diagnosis of *Nannosquilla* was brief and included at least one character known only on the extra-American species. Removal of those species to other genera and the more recent discovery of additional species prompted our inclusion of this updated definition of the genus. Members of *Nannosquilla* can be distinguished from those of all other genera within the family by presence of only four epipods combined with lack of papillae on the antennal protopod.

Nannosquilla adkisoni Camp and Manning, 1982

Nannosquilla adkisoni Camp and Manning, 1982:4, fig. 4.

MATERIAL EXAMINED.—USNM 228089, 1♀, TL 18 mm; eastern Gulf of Mexico, off Florida, 27°37'N, 83°31'W; 37.8 m; sand-shell over limestone with sponge, coral, algae cover; box dredge; R/V *Hernan Cortez*; D. Camp et al., leg.; 8 Jul 1982.

REMARKS.—We at first thought this specimen represented yet another new species closely allied to *N. adkisoni*, *N. heardi* Camp and Manning, 1982, and *N. disca*, new species. All are known from single specimens occurring in similar depths off the western coast of Florida, and the differences between them are subtle. However, the female reported here is more similar to the male holotype of *N. adkisoni*; most differences between the two specimens are minor and within the limits of variation documented for other species.

On the male holotype (Camp and Manning, 1982, fig. 4), the anterolateral corners of the rostral plate do not quite form a right angle with the lateral margins of the plate; the angle is slightly obtuse. On the female, the corners are rounded-off right angles. The upper margin of the carpus of the raptorial claw on the holotype lacks a distal spine, present on the female. More importantly, the posterolateral corners of the sixth abdominal somite are not produced posteriorly on the holotype, although they are subacute, whereas on the female they are acute and somewhat pro-

duced. We believe these differences may be attributable to the larger size and presumed greater maturity of the female. Carapace length of the male is 3.0 mm, contrasted with 6.8 mm for the female. Spines and angles often become more acute on stomatopods with increased maturity of the animals. Also, the female differs by having five spines on the outer distal margin of the proximal segment of the uropodal exopod; the male has six spines. The number of spines can vary between specimens of a species or even from one side of the body to the other in stomatopods, although this is rare (Camp, 1973).

Some features of the false eave of the telson on the female appear to be quite different from those of the holotype. The median projection of the false eave is broad on the female and very narrow on the male. This difference, however, is within the range of variation for this character demonstrated for other species, such as *N. grayi* (see Camp and Manning, 1982, fig. 2). Finally, the eave merges with the true posterior margin of the telson at the level of the lateralmost (seventh) fixed lateral tooth on the female, but at the level of the sixth tooth on the male. The original description of the holotype was incorrect in stating that the eave merged with the posterior margin at the level of the fourth tooth (see Camp and Manning, 1982, fig. 4). All other characters of the female agree closely with those of the male.

Some features of the telson on this specimen appear similar to those of *N. disca*, notably the wide median projection on the false eave, the merging of the false eave with the true posterior margin at the level of the seventh fixed lateral tooth, and the inverted V formed by the submedian denticles. In this last feature, however, all of the denticles on each side of the midline are in a straight row on the female, whereas in *N. disca*, the innermost denticle is above the line formed by the other denticles in the row (Figure 3). The holotype of *N. disca* is quite distinct from the female in many other characters. The anterolateral corners of the rostral plate are much more broadly rounded, and the plate completely conceals the antennular processes; the anterior margin of the ophthalmic somite is an obtuse point, rather than very sinuous; and the distalmost spine on the exopod of the uropod has a rounded, rather than acute, apex.

Nannosquilla heardi differs from all three specimens mentioned above by having only four submedian denticles on each side of the midline on the posterior margin of the telson, rather than six.

Nannosquilla antillensis (Manning, 1961)

FIGURE 2

Lysiosquilla antillensis Manning, 1961:35–38, pl. 9 [in part, holotype only]; 1963:319 [listed].

Nannosquilla antillensis.—Manning, 1969:72–74, fig. 17 [in part, holotype only].—Camp and Manning, 1982:2 [discussion].—Reaka and Manning, in press, tables 3, 6 [listed; size, habitat].

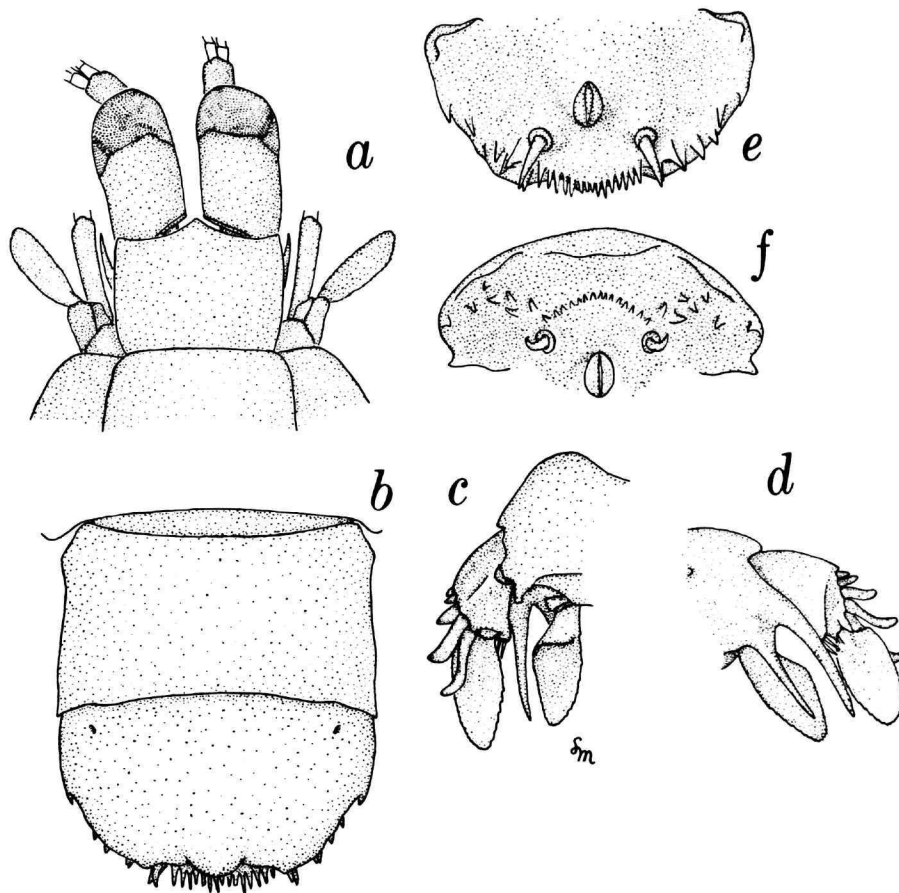


FIGURE 2.—*Nannosquilla antillensis* (Manning, 1961), female holotype, TL 24.5 mm: *a*, anterior part of body; *b*, sixth abdominal somite and telson; *c*, uropod (dorsal spine broken); *d*, uropod, ventral view; *e*, telson, ventral view; *f*, telson, posterior view.

MATERIAL EXAMINED.—AHF 3919; holotype, 1♀, TL 24.5 mm; southeastern Caribbean Sea, off Cubagua Island, Venezuela [10° 49' N, 64° 11' W], 4–9 m, AHF sta A24-39; 14 Apr 1939.

DESCRIPTION.—Eye small, appearing elongate, not overreaching antennular peduncle. Cornea subglobular, set obliquely on stalk, at most slightly expanded laterally, width 0.75 rostral plate length. Ocular scales with bases fused medially, apices distinct, rounded. Anterior margin of ophthalmic somite with blunt spine; ventral spine also present.

Antennular peduncle short, about half carapace length. Flagella short, upper with 17 articles, longer lower with 16 free articles, shorter with 8 free articles. Antennular processes visible as anteriorly directed spines projecting beyond sides of rostral plate, apices overreaching anterolateral corners of plate.

Antennal peduncle short, not extending beyond eye;

flagellum with 13 articles. Antennal scale short but overreaching basal segment of peduncle.

Rostral plate rectangular, length 0.75 width, scarcely reaching bases of eyestalks. Lateral margins of plate subparallel, slightly convex, at most slightly divergent anteriorly. Anterolateral corners acute, sharply pointed angles. Anterior margins concave, gently sloping mesially to obtusely angled apex, latter projecting beyond anterolateral corners of plate.

Mandibular palp absent; 4 epipods present.

Dactylus of raptorial claw with 8 teeth (right claw missing from holotype); proximal notch on outer margin of dactylus flanked by subacute proximal lobe and broadly rounded distal lobe. Carpus lacking spine at distal end of upper margin, ending in blunt lobe.

Basal segment of walking leg lacking distinct posteromesial lobe and lateral spine.

Sixth abdominal somite with posterolateral corners form-

ing very acute angles, spine-like, produced posteroventrally.

Telson short, length 0.6 width, dorsum smooth. Median projection of false eave very prominent, slightly swollen dorsally, apex rounded. Submedian depressions of false eave deep, short, about half length of lateral margin of telson, deepest adjacent to median projection, sloping posterolaterally to prominent, obtuse submedian projections; margins of depressions slightly sinuous. Lateral margin of false eave forming 55° angle with midline of telson. Marginal armature of telson consisting of single short, fixed denticle on midline and, on either side, 7 longer fixed submedian denticles, entire row forming semicircle in posterior view with uppermost, mesial denticles not out of line with remainder; 1 movable submedian tooth originating anterior to and slightly lateral of lateralmost submedian denticle; and 7 fixed lateral teeth and denticles. Of fixed lateral teeth, fifth and seventh on margin of false eave, remainder below eave.

Basal segment of uropod with ventral, proximal tubercle; dorsal spine of basal segment slender, sharp, short (broken in Figure 2c), not overreaching basal fourth of endopod. Outer spine of basal prolongation slightly but distinctly longer than inner. Proximal segment of exopod with 2–3 non-plumose stiff setae on inner distal corner and graded series of 5 spines on outer distal margin; distal 2 spines spatulate, penultimate with blunt apex, distalmost curved, apex rounded.

Color faded; few, scattered chromatophores on dorsum.

SIZE.—Total length of holotype 24.5 mm; other measurements (in mm): carapace length 4.9; rostral plate length 1.2, width 1.6; telson length 1.8, width 3.1.

DISTRIBUTION.—Currently known only from the type-locality in the southeastern Caribbean Sea, off Cubagua Island, Venezuela; 4–9 m depth.

REMARKS.—*Nannosquilla antillensis* is now restricted to only the holotype. The paratypes from Lameshur Bay, St. John, Virgin Islands, are referred to *N. virginalis*, new species, described below. The single specimen previously reported as *N. antillensis* from waters off Banco Chinchorro, Yucatan, Mexico (Manning, 1969:72), is referred to *N. yucatanica*, new species, described below. Differences among the three species are noted under discussions of the new species.

Nannosquilla carolinensis Manning, 1970

Nannosquilla carolinensis Manning, 1970:99, fig. 1.

MATERIAL EXAMINED.—USNM 221025, 1♀, TL 10 mm; off South Carolina, 32°49'30"N, 78°39'48"W; 34 m; MARMAP Survey; 25 May 1981.

REMARKS.—This small specimen, a juvenile female, agrees with the original account except for two features. There are but seven teeth on the claw, and the outer spine

of the basal prolongation of the uropod is clearly the longer on both uropods.

This specimen is so young that secondary sexual features cannot be seen. It is likely that the relative lengths of the spines of the basal prolongation will change with growth.

Except for the relative lengths of the spines, the specimen keyed out to *N. carolinensis* in the key given below.

Nannosquilla disca, new species

FIGURE 3

MATERIAL EXAMINED.—USNM 228090; holotype, 1♀, TL about 18 mm (broken); eastern Gulf of Mexico, off Florida, 27°37'N, 83°54'W; 52 m; R/V *Columbus Iselin*, K. Shaw, leg.; 13 Aug 1978.

DESCRIPTION.—Eye small, stout, extending about to end of second segment of antennular peduncle. Cornea set obliquely on stalk, strongly expanded laterally, width about 0.9 times rostral plate length. Ocular scales with bases fused medially, apices distinct, rounded. Anterior margin of ophthalmic somite with obtuse point; ventral spine, if present, indistinct.

Antennular peduncle short, about half carapace length. Flagella short, upper with 12 articles, longer lower with 10 free articles, shorter with 4 free articles. Antennular processes slender, anteriorly directed spines completely concealed from dorsal view by rostral plate.

Antennal peduncle short, scarcely overreaching eye; flagellum with 9 articles. Antennal scale short but extending beyond basal segment of peduncle.

Rostral plate subrectangular, appearing almost cordiform because of extremely rounded anterolateral corners, length 0.64 width, distinctly overreaching bases of eyestalks. Lateral margins of plate strongly convex. Anterolateral corners broadly and obtusely rounded. Anterior margins slightly concave, sloping mesially to obtuse, bluntly pointed apex, latter projecting beyond anterolateral corners of plate.

Mandibular palp absent; 4 epipods present.

Dactylus of raptorial claw with 8 teeth; proximal notch on outer margin of dactylus flanked by subacute proximal lobe and broadly rounded distal lobe. Carpus with blunt, acute projection, unarmed, at distal end of upper margin.

Basal segment of walking leg lacking distinct posteromesial lobe and lateral spine.

Sixth abdominal somite with posterolateral corners forming acute angles, not markedly produced posteroventrally.

Telson short, length 0.52 width, dorsum smooth. Median projection of false eave prominent, wider than long, apex rounded. Submedian depressions of false eave shallow, short, about half as long as lateral margin of telson, forming even curve toward broad submedian projections. Lateral margin of false eave forming about 45° angle with midline of telson. Marginal armature on each side of midline con-

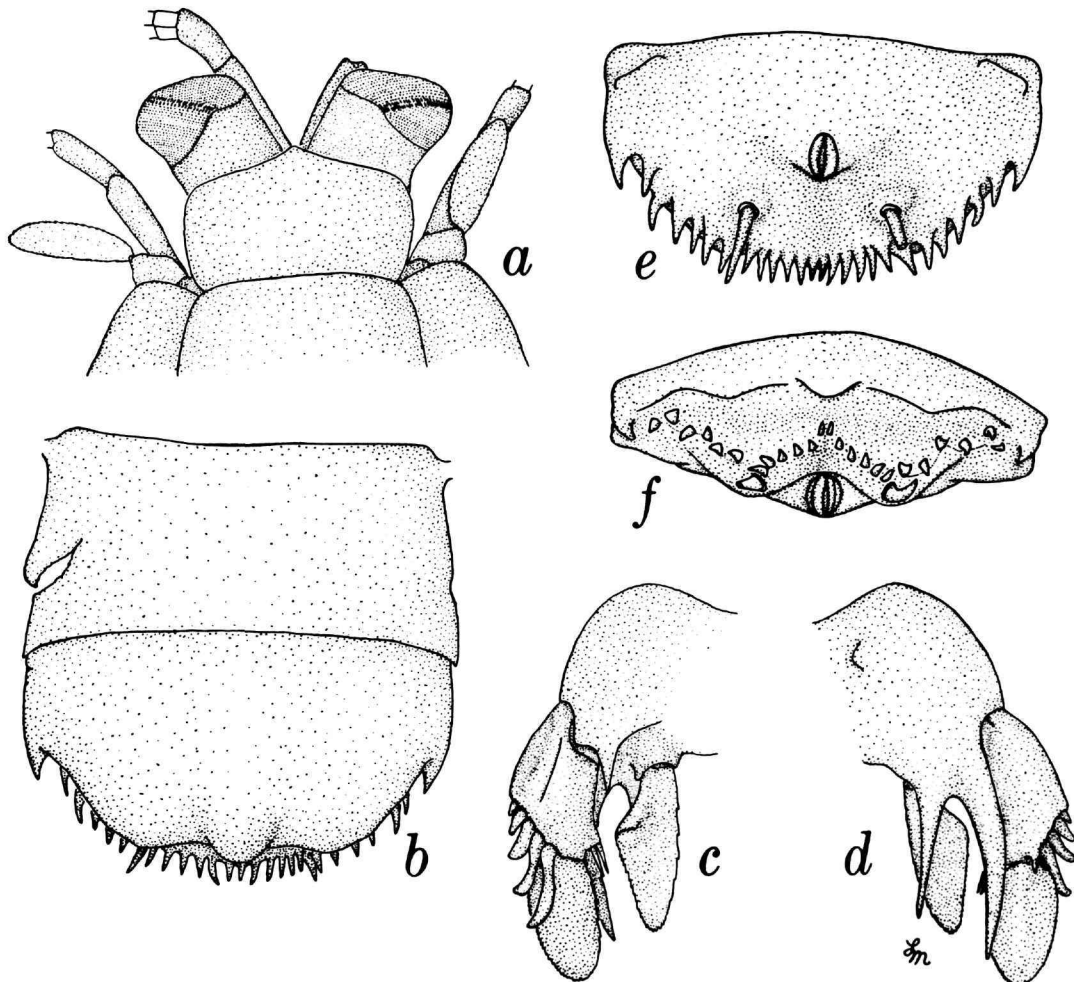


FIGURE 3.—*Nannosquilla disca*, new species, female holotype, TL 18 mm: a, anterior part of body; b, sixth abdominal somite and telson; c, uropod; d, uropod, ventral view; e, telson, ventral view; f, telson, posterior view.

sisting of 6 fixed submedian denticles, entire row forming inverted V in posterior view, with mesial 2 denticles higher than remainder and above outline of V; 1 movable submedian tooth originating anterior to and slightly lateral of anteriormost submedian denticle; and 7 fixed lateral teeth. Of fixed lateral teeth, only lateralmost on false eave, remainder below it.

Basal segment of uropod with erect, ventral, proximal tubercle; dorsal spine of basal segment slender, sharp, not overreaching basal fourth of endopod. Outer spine of basal prolongation distinctly longer than inner. Proximal segment of exopod with 2 non-plumose stiff setae on inner distal corner and graded series of 5 spines on outer distal margin, distal 2 spines spatulate; penultimate spine with blunt apex, distalmost more slender, apex rounded.

Color completely faded; few, scattered chromatophores on posterolateral corners of carapace.

SIZE.—Total length of holotype about 13 mm; other measurements (in mm): carapace length 3.1; rostral plate length 0.9, width 1.4; antennal scale length 0.75; telson length 1.3, width 2.5.

DISTRIBUTION.—Known only from the type-locality in the eastern Gulf of Mexico west of Tampa Bay, Florida; 54 m depth.

ETYMOLOGY.—The specific epithet is from the Latin *discus* (a flat, circular plate), alluding to the characteristic rounded edges of the rostral plate in this species.

REMARKS.—The sole representative of this new species is in poor condition. It is broken between the fifth and sixth abdominal somites, the right antennule is broken, and the

right upropod is missing. It is sufficiently intact, however, to be distinguished as a new species.

Nannosquilla disca can be distinguished from all other species in the *antillensis* group by the very broadly rounded lateral margins and anterolateral corners of the rostral plate, which conceals the antennular processes from dorsal view, and by the shape of the cornea, which is broadly expanded laterally. The species is similar to *N. yucatanica* but, in addition to differences in their eyes and rostral plates, can be distinguished from the latter by its much more prominent median projection of the false eave of the telson and by the arrangement of the submedian denticles on the posterior margin of the telson. In both species, the submedian denticles form an inverted V in posterior view. In *N. yucatanica*, the denticles forming each limb of the V are all aligned in a straight row. In *N. disca*, however, the mesialmost denticle in each limb of the V is out of alignment with the others, being higher than the apex of the V formed by the other denticles.

Nannosquilla hancocki (Manning, 1961)

FIGURES 4, 5

Lysiosquilla hancocki Manning, 1961:32–35, pl. 8; 1963:319 [listed].

Nannosquilla hancocki.—Manning, 1969:76–79, fig. 19; 1979:382 [discussion].—Camp and Manning, 1982:2.—Reaka and Manning, in press, tables 3, 6 [listed; sizes, habitats].

MATERIAL EXAMINED.—AHF 3918; holotype, 1♀, TL 21.0 mm; southeastern Caribbean Sea, off Cubagua Island [10°49'N, 64°11'W], Venezuela, 4–9 m, AHF sta A27-39; 15 Apr 1939. USNM 119154, 2♂, TL 16.1–18.3 mm, 2♀, TL 15.3–19.4 mm; Caribbean Sea, 7 mi N of Margarita Island [11°00'N, 64°00'W], Venezuela, 38–40 m, AHF sta A42-39; 21 Apr 1939.

DESCRIPTION.—Eye small, not extending beyond antennular peduncle. Cornea set obliquely on stalk, width 0.78–1.1 rostral plate length. Ocular scales fused along midline; apices rounded. Anterior margin of ophthalmic somite rounded, lacking apical spine; ventral spine present.

Antennular peduncle short, about half carapace length. Flagella short, upper with 8–10 articles, longer lower with 9–11 free articles, shorter with 4–6 free articles. Antennular processes visible as anteriorly directed spines projecting beyond sides of rostral plate, apices overreaching anterolateral corners of plate.

Antennal peduncle short, not extending beyond eye; flagellum with 7–12 articles. Antennal scale short, but extending beyond first segment of antennal peduncle.

Rostral plate pentagonal, length 0.58–0.75 width, not (in holotype) or scarcely reaching bases of eyestalks. Lateral margins of plate subparallel, slightly convex, slightly divergent anteriorly. Anterolateral corners rectangular. Anterior

margins concave, sloping to obtusely angled apex, latter projecting beyond anterolateral corners of plate.

Mandibular palp absent; 4 epipods present.

Dactylus of raptorial claw with 9–10 teeth; proximal notch on outer margin flanked by subacute proximal lobe and obtuse distal lobe. Carpus with blunt tooth at distal end of upper margin.

Basal segment of walking leg lacking distinct posteromesial lobe; lateral spine present, minute.

Sixth abdominal somite with posterolateral corners forming acute angles, spine-like, produced posteroventrally.

Telson short, length 0.55–0.73 width, dorsum smooth. Median projection of false eave prominent, narrow, with rounded apex not produced beyond submedian projections. Submedian depressions of false eave deep, wide, either sloping posterolaterally in straight line to submedian projections or forming concave curves between median and submedian projections. Apices of submedian projections obtusely rounded. Marginal armature of telson often with single, short denticle on midline and, on either side, 9–11 (usually 9) longer, fixed submedian denticles, entire row forming slightly arcuate, almost straight line in posterior view, mesialmost denticles slightly higher than remainder but not out of line with them, lateralmost denticles often much larger than remainder and set slightly out of line; one fixed submedian tooth originating anterior to and slightly mesial of outermost fixed submedian denticle, at or near same level as anus; and 5 fixed lateral teeth and denticles, second and fourth always more slender than others. Of fixed lateral teeth, fifth on margin of false eave, remainder below eave.

Basal segment of uropod with ventral, proximal tubercle; dorsal spine of basal segment slender, sharp, extending about to midlength of endopod. Inner spine of basal prolongation longer than outer. Proximal segment of exopod with 2 non-plumose stiff setae on inner distal corner and graded series of 5–6 spines on outer distal margin, distal 3 or 4 spatulate; distal 2 spines recurved, apices rounded.

SIZE.—Total length range 15.3–21.0 mm; total length of holotype 21.0 mm; other measurements of holotype (in mm): carapace length 3.1; rostral plate length 0.9, width 1.5; telson length 1.5, width 2.6.

DISTRIBUTION.—Known only from two localities in the southeastern Caribbean Sea: off Cubagua Island, Venezuela, 4–9 m depth, and off Margarita Island, Venezuela, 38–40 m depth.

REMARKS.—*Nannosquilla hancocki* is represented only by the holotype from waters off Cubagua Island and four other specimens from waters off Margarita Island, Venezuela. Previously published illustrations of the holotype (Manning, 1961, pl. 8) and one female from Margarita Island (Manning, 1969, fig. 19) show noticeable differences in the shapes of the submedian depressions of the false eave of the

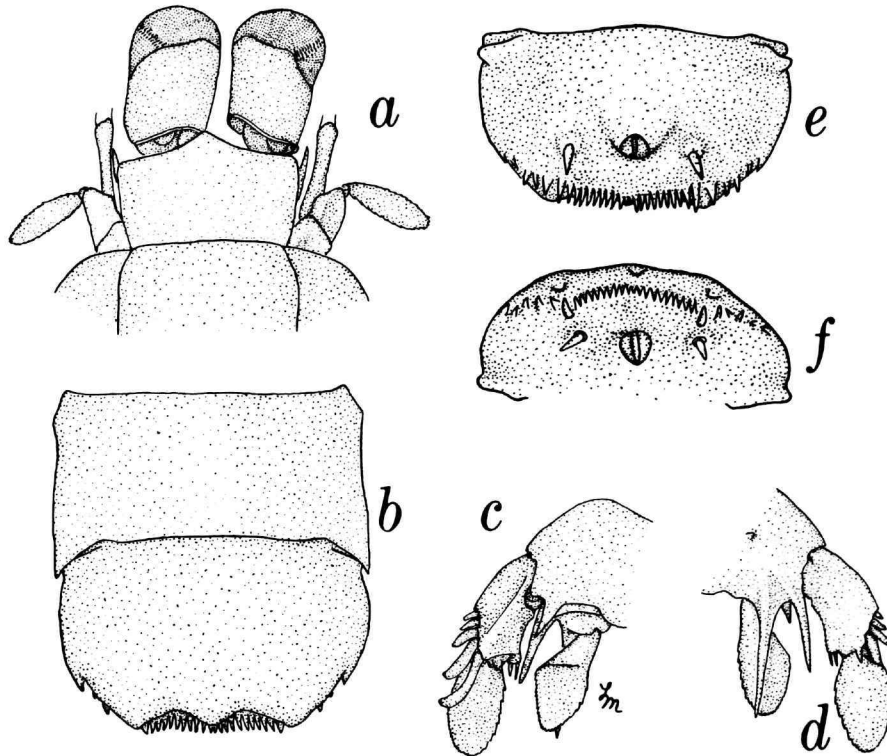


FIGURE 4.—*Nannosquilla hancocki* (Manning, 1961), female holotype, TL 21 mm: *a*, anterior part of body; *b*, sixth abdominal somite and telson; *c*, uropod; *d*, uropod, ventral view; *e*, telson, ventral view; *f*, telson, posterior view.

telson. The depressions are in the shape of concave curves on the holotype female (Figure 4*b*) and on two other specimens from off Margarita Island. However, the posterior margin of the eave on two other specimens from Margarita Island, including the female illustrated in 1969, form straight lines between the median and submedian projections (Figure 5).

The number of submedian fixed denticles on the posterior margin of the telson varies among the specimens. Three specimens from Margarita Island have a minute denticle on the midline and, on either side, nine other denticles. The remaining specimen from Margarita Island lacks the smaller denticle on the midline and has 10 on each side. The holotype has 11 denticles on each side of the midline, with the mesialmost shorter than the remainder (Figure 4*b*). In all specimens, the outermost submedian denticle on each side is larger than the others, almost appearing to be a fixed lateral tooth, and is set out of the line formed by the other denticles in posterior view (Figure 4*f*). Also, the movable submedian teeth of the telson appear to be fixed and non-articulated on all specimens, although distinct sockets are visible. The spines originate at or near the level of the anus.

Nannosquilla virginialis, new species

FIGURES 6, 7

Lysiosquilla antillensis Manning, 1961:35, 36, 39 [part, paratypes only].
Nannosquilla antillensis.—Manning, 1969:72–74 [part, paratypes only].

MATERIAL EXAMINED.—USNM 228091; holotype, 1♀, TL 20.7 mm; northeastern Caribbean Sea, off Yawsi Point, Lameshur Bay [18°14'N, 64°43.5'W], St. John, Virgin Islands, 9 m; J. Randall, L.P. Thomas, leg. 21 Dec 1958. USNM 106055; paratypes, 1♂, 1♀, TL 20.2–20.5 mm; same. UMML 32.1174; paratypes, 2♂, 1♀, TL 17.6–20.8 mm; same.

DESCRIPTION.—Eye small, appearing elongate, not overreaching antennular peduncle. Cornea subglobular, set obliquely on stalk, at most slightly expanded laterally, width about 0.46–0.68 rostral plate length. Ocular scales with bases fused medially, apices distinct, usually rounded. Anterior margin of ophthalmic somite usually produced into blunt spine, sometimes rounded; ventral spine also present.

Antennular peduncle short, about half carapace length. Flagella short, upper with 13–18 articles, longer lower with

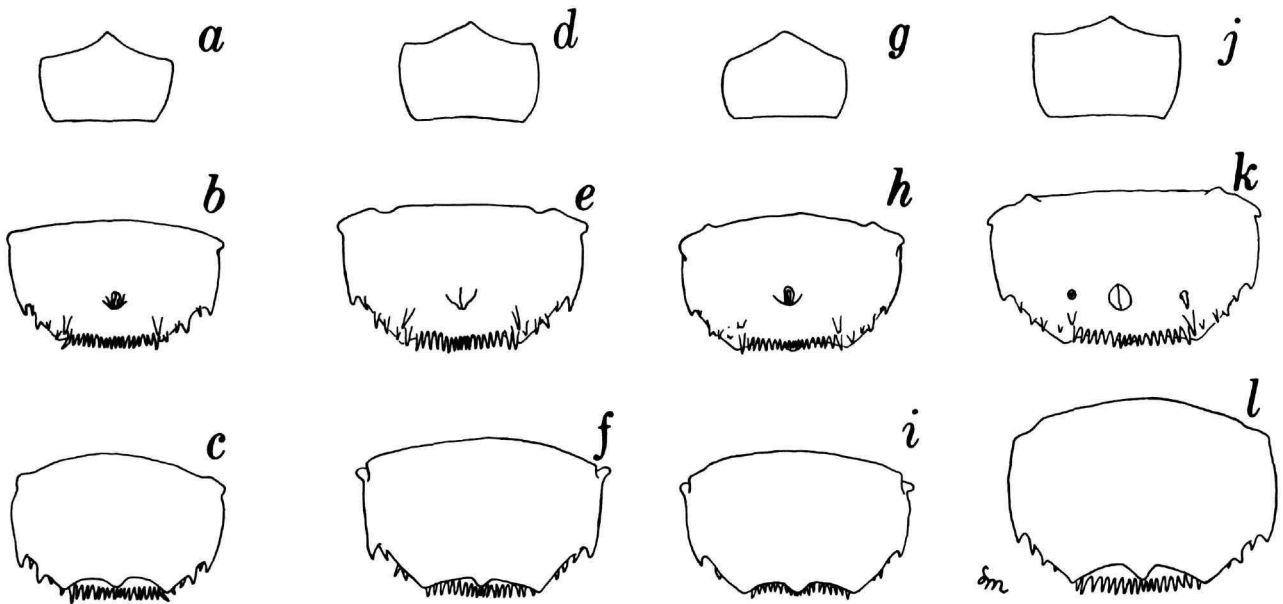


FIGURE 5.—*Nannosquilla hancocki* (Manning, 1961). Rostral plate (*a, d, g, j*), telson, ventral view (*b, e, h, k*), and telson, dorsal view (*c, f, i, l*): *a-c*, male, TL 16.1 mm; *d-f*, male, TL 18.3 mm; *g-i*, female, TL 15.3 mm; *j-l*, female, TL 19.4 mm.

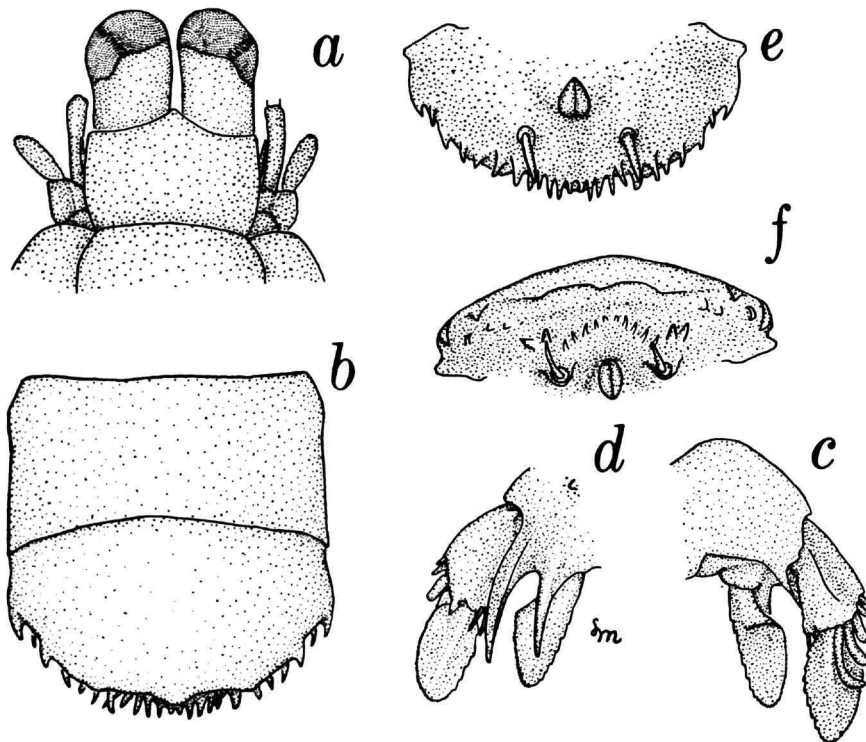


FIGURE 6.—*Nannosquilla virginalis*, new species, female holotype, TL 20.7 mm: *a*, anterior part of body; *b*, sixth abdominal somite and telson; *c*, uropod; *d*, uropod, ventral view; *e*, telson, ventral view; *f*, telson, posterior view.

14–18 free articles, shorter with 6–8 free articles. Antennular processes visible as anteriorly directed spines projecting beyond sides of rostral plate, apices usually not reaching anterolateral corners of plate.

Antennal peduncle short but overreaching eye; flagellum with 9–11 articles. Antennal scale short but usually extending about to midlength of distal segment of peduncle.

Rostral plate rectangular, length 0.64–0.71 width, overreaching bases of eyestalks. Lateral margins of plate subparallel, convex, slightly convergent anteriorly. Anterolateral corners forming slightly rounded right angles or subacute (but not sharp) angles. Anterior margins concave, gently sloping mesially to obtusely angled apex projecting beyond anterolateral corners of plate.

Mandibular palp absent; 4 epipods present.

Dactylus of raptorial claw with 7 teeth (only 1 claw present on 1 specimen); proximal notch on outer margin of dactylus flanked by subacute proximal lobe and broadly rounded distal lobe. Carpus lacking spine at distal end of upper margin.

Basal segment of walking leg lacking distinct posteromesial lobe and lateral spine.

Sixth abdominal somite with posterolateral corners forming acute or subacute angles, not produced posterovertrally.

Telson short, length 0.54–0.59 width, dorsum smooth. Median projection of false eave broad but small, not prominent, apex rounded or flattened. Submedian depressions of false eave usually deep mesially (shallow on illustrated specimen), short, about as long as lateral margin of telson, sloping laterally in straight or sinuous line to obtusely angled, prominent submedian projections or forming concave curves between median and submedian projections. Lateral

margins of false eave forming about 40° angle with midline of telson. Marginal armature of telson on each side of midline consisting of 5–8 (usually 7) submedian denticles, entire row usually forming broad, inverted V in posterior view, mesialmost denticles higher than remainder but not out of line with them; 1 movable submedian tooth originating well anterior to and slightly lateral of outermost submedian denticle; and 5–7 (usually 7) fixed lateral teeth and denticles. Of fixed teeth, seventh on false eave, remainder below eave.

Basal segment of uropod with ventral, proximal tubercle; dorsal spine of basal segment slender, sharp, not overreaching basal fourth of endopod. Outer spine of basal prolongation slightly but distinctly longer than inner. Proximal segment of exopod with 2–4 non-plumose stiff setae on inner distal corner and graded series of 5 spines on outer distal margin; distal 2 spines spatulate, penultimate spine with blunt apex, distalmost spine more curved, apex acute.

Color completely faded. Scattered chromatophores on dorsum of body. Some specimens with circular, stellate spots on posterolateral corners of carapace.

SIZE.—Total length of holotype 20.7 mm; other measurements (in mm): carapace length 3.2; rostral plate length 0.7, width 1.0; telson length 1.5, width 2.6.

DISTRIBUTION.—Known only from the type-locality in the northeastern Caribbean Sea, Lameshur Bay, St. John, U.S. Virgin Islands, 9 m depth.

ETYMOLOGY.—The specific epithet is derived from the Latin *virginalis* (of a maiden), referring to the type-locality, the Virgin Islands.

REMARKS.—Nine species of *Nannosquilla*, including the new species described here, have the outer spine of the basal prolongation of the uropod longer than or subequal

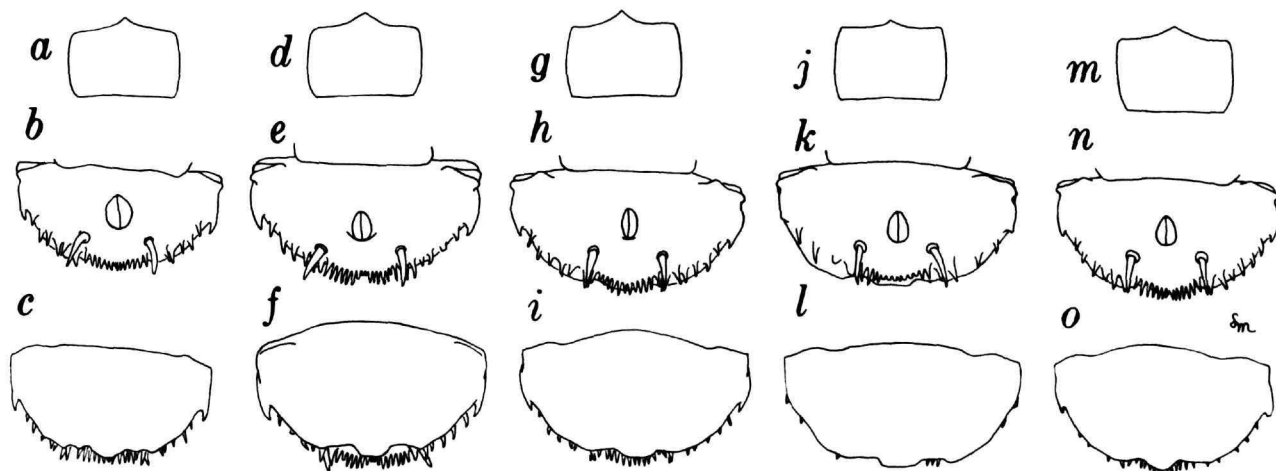


FIGURE 7.—*Nannosquilla virginalis*, new species, paratypes. Rostral plate (a,d,g,j,m), telson, ventral view (b,e,h,k,n), and telson, dorsal view (c,f,i,l,o): a–c, male, TL 17.6 mm; d–f, female, TL 20.8 mm; g–i, male, TL 20.0 mm; j–l, female, TL 20.5 mm; m–o, male, TL 20.2 mm.

to the inner spine. Two of the nine species, *N. californiensis* (Manning, 1961) and *N. antillensis*, have sharply acute, projecting anterolateral corners on the rostral plate. The series of multiple projections on the posterior margin of the false eave of its telson immediately distinguishes *N. californiensis* from *N. antillensis*. Six species have the anterolateral corners of the rostral plate well rounded. The remaining species of the nine, *N. virginalis*, usually has the anterolateral corners of the rostral plate forming a slightly rounded right angle. Although two of the six extant specimens of *N. virginalis* have subacute anterolateral corners, the corners are not so sharp as those of *N. antillensis*.

Nannosquilla virginalis also differs from *N. antillensis* in the following features: (1) the antennal peduncle extends beyond the end of the eye rather than falling short of it; (2) the rostral plate usually is shorter relative to its width; (3) the posterolateral corners of the sixth abdominal somite, although acute, do not project posteriorly in a spine-like manner; and (4) the dactylus of the raptorial claw has seven, rather than eight, teeth on the inner margin.

Differences between *N. virginalis*, *N. yucatanica*, and *N. disca*, described herein, are discussed under the latter two species.

A small amount of variation in some morphological features was noted among the six specimens of *N. virginalis*. Although apices of the ocular scales are rounded on most specimens, they are subacute on the female holotype (USNM 228091); none are flattened apically. The antennal scale extends beyond the end of the penultimate article of the antennal peduncle in five specimens, but it does not extend that far in the female holotype. The apex of the median projection of the false eave of the telson is rounded on three specimens, flattened on two, and slightly emarginate on one. Shape of the submedian depressions of the false eave can be a concave curve leading to a prominent submedian projection (three specimens, Figure 7), a sinuous line sloping posteriorly to a prominent projection (one specimen, Figure 7), a straight line sloping to a less prominent projection (one specimen, Figure 7), or even a slightly convex curve leading to a barely prominent projection (one specimen, Figure 7). The number of fixed submedian denticles on each side of the posterior margin of the telson can be five (one specimen), six (one specimen), seven (three specimens), or eight (one specimen), as figured. As seen in posterior view, the row of denticles forms an inverted V in five specimens, but the row forms an evenly curved, inverted U on the female holotype (USNM 228091). Although five specimens have seven fixed lateral teeth on each side of the posterior margin on the telson, one of the female paratypes (USNM 106055) has only five.

Color is completely faded from the specimens except for dark chromatophores. These too exhibit some variation in expression. The spots appear to be randomly scattered over the body on some specimens, but others exhibit a patterned

placement. Two specimens, a male and a female in lot UMML 32.1174, have three large, circular, stellate spots on each posterolateral corner of the carapace and four such spots (two on each side of the midline) on the dorsum of the fifth thoracic somite. Another male (USNM 106055) has a similar pattern on the fifth thoracic somite and on the left posterolateral corner of the carapace, but the right corner of the carapace has only a single large spot, not three.

Nannosquilla yucatanica, new species

FIGURE 8

Nannosquilla antillensis.—Manning, 1969:72–74 [part, specimen from waters off Yucatan only].

MATERIAL EXAMINED.—USNM 111030; holotype, 1♀, TL 14.0 mm; northwestern Caribbean Sea, 2 mi WSW Cayo Norte, Banco Chinchorro [18°35'N, 87°22'W], Yucatan, Mexico, 5–6 m; coral reef; W.A. Starck, leg.; 23 Jun 1961.

DESCRIPTION.—Eye small, appearing stout, extending about to end of antennular peduncle. Cornea subglobular, set obliquely on stalk, expanded laterally, width 0.9 rostral plate length. Ocular scales with bases fused medially, apices distinct, flattened. Anterior margin of ophthalmic somite with obtuse point; ventral spine also present.

Antennular peduncle short, about half carapace length (curved ventrally in holotype, not visible in dorsal view). Flagella short, upper with 10–12 articles, longer lower with 10–11 free articles, shorter with 4 free articles. Antennular processes visible as short, anteriorly directed spines projecting beyond sides of rostral plate, apices not overreaching anterolateral corners of plate.

Antennal peduncle short, not extending beyond eye; flagellum with 9 articles. Antennal scale short, extending about to end of basal segment of peduncle.

Rostral plate rectangular, length 0.67 width, distinctly overreaching bases of eyestalks. Lateral margins of plate subparallel, slightly convex, at most slightly divergent anteriorly. Anterolateral corners broadly rounded. Anterior margins concave, sloping mesially to obtusely pointed apex, latter projecting well beyond anterolateral corners of plate.

Mandibular palp absent; 4 epipods present.

Dactylus of raptorial claw with 8 teeth (right claw missing from holotype); proximal notch on outer margin of dactylus flanked by subacute proximal lobe and broadly rounded distal lobe. Carpus lacking spine at distal end of upper margin.

Basal segment of walking leg lacking distal posteromesial lobe and lateral spine.

Sixth abdominal somite with posterolateral corners forming acute angles, not markedly produced posteroventrally.

Telson short, length 0.60 width, dorsum smooth. Median

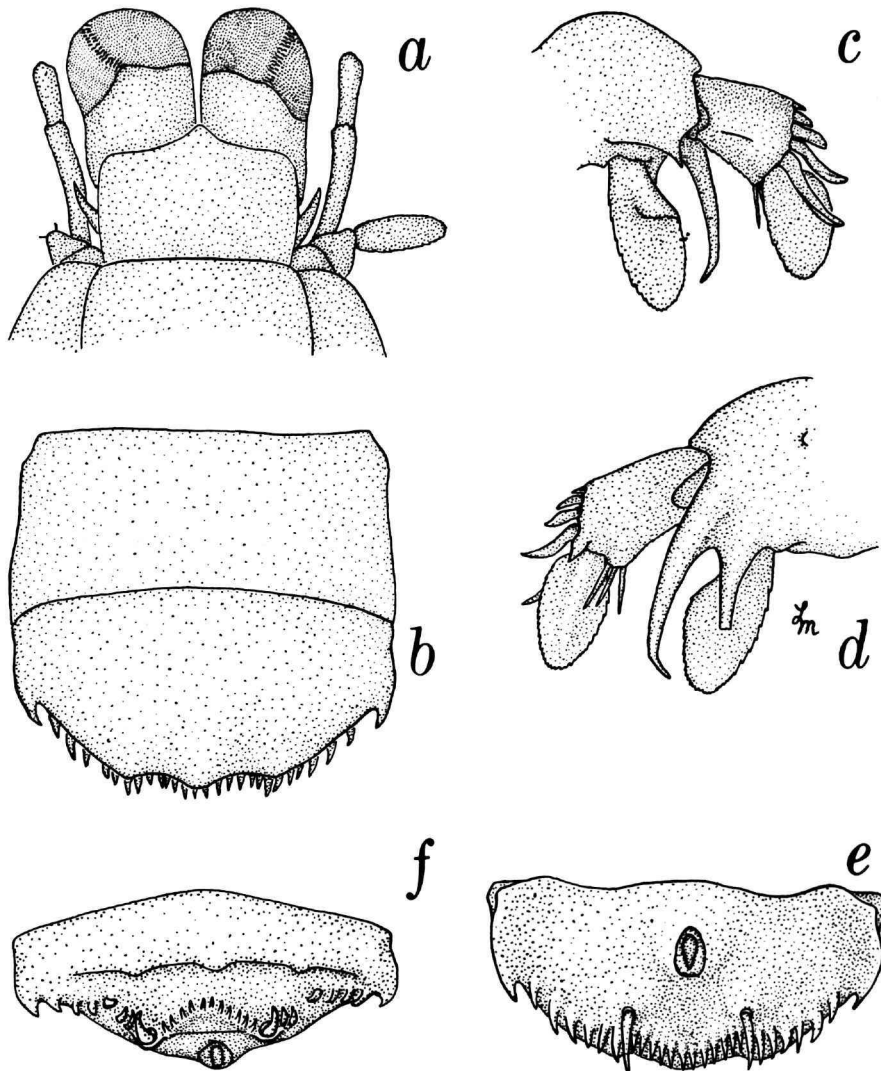


FIGURE 8.—*Nannosquilla yucatanica*, new species, female holotype, TL 14 mm: a, anterior part of body; b, sixth abdominal somite and telson; c, uropod; d, uropod, ventral view (inner spine of basal prolongation broken); e, telson, ventral view; f, telson, posterior view.

projection of false eave not prominent, wider than long, apex rounded. Submedian depressions of false eave shallow, shorter than lateral margin of telson, forming evenly concave curve toward broad submedian projections. Lateral margins of false eave forming about 45° angle with midline of telson. Marginal armature of telson on each side of midline consisting of 6 fixed submedian denticles, entire row forming inverted V in posterior view, with mesialmost denticles in line with remaining denticles on each side; 1 movable submedian tooth originating anterior to and slightly lateral of lateralmost submedian denticle; and 7 fixed lateral teeth and denticles. Of fixed lateral teeth, only lateralmost on false eave, remainder below eave; mesial 2

teeth on lower horizontal plane than others.

Basal segment of uropod with ventral, proximal tubercle; dorsal spine of basal segment slender, sharp, short (broken in Figure 8), not overreaching basal fourth of endopod. Outer spine of basal prolongation slightly but distinctly longer than inner (inner spine of right uropod broken in Figure 8). Proximal segment of exopod with 2–3 non-plumose stiff setae on inner distal corner and graded series of 5 spines on outer distal margin, distal 2 spatulate but slender and elongate, apices sharp.

Color completely faded.

SIZE.—Total length of holotype 14.0 mm; other measurements (in mm): carapace length 2.7; rostral plate length

0.8, width 1.2; telson length 1.2, width 2.0.

DISTRIBUTION.—Known only from the type-locality in the northwestern Caribbean Sea off Banco Chinchorro, Yucatan, Mexico; 5–6 m depth.

ETYMOLOGY.—The specific epithet is derived from the type-locality off the Yucatan Peninsula.

REMARKS.—*Nannosquilla yucatanica* is similar to *N. antillensis*, but can be distinguished from the latter by the extremely rounded anterolateral corners of the rostral plate, flattened rather than rounded apices of the ocular scales, posterolateral corners of the sixth abdominal somite, which are projecting and spine-like in *N. antillensis* but not projecting in *N. yucatanica*, shallow rather than deep submedian depressions of the false eave of the telson, which form a concave curve in *N. yucatanica* but are slightly sinuous in *N. antillensis*, and arrangement of the submedian fixed denticles on the posterior margin of the telson, forming an inverted V in *N. yucatanica* and a semicircle in *N. antillensis*.

Nannosquilla yucatanica differs from *N. virginialis* by having the anterolateral corners of the rostral plate well rounded rather than forming a right angle or being subacute, by the flattened rather than rounded or subacute apices of the ocular scales, by having eight rather than seven teeth on the dactylus of the raptorial claw, and by the slenderness of the uropodal spines.

Discussion

The genus *Nannosquilla* now includes more species in the West Atlantic and East Pacific than any other stomatopod genus except *Squilla*. Each species is endemic to one of these two regions. Manning (1977:165) characterized the genus as being “young and vigorous,” component species having diverged much more rapidly than those of other stomatopod genera since the breakdown of the Tethys Sea. Reaka and Manning (in press), in a study of all Atlanto–East Pacific stomatopods, hypothesized that the smaller-sized stomatopods, such as representatives of *Nannosquilla*, have undergone a more rapid rate of divergence than larger bodied forms. The apparent rapid rate of divergence within the genus since the Tethys has resulted in the appearance of several morphologically very similar species.

Species-level systematics within *Nannosquilla* is becoming increasingly complicated by the high incidence of species represented by numbers of specimens that are inadequate to allow documentation of morphological variation within each. Most species are very distinctive, but others, including some described by us in 1982 and in this paper, are less distinctive and more difficult to characterize.

Species within each of the following groups share particularly similar external appearance: (1) *N. antillensis* – *N. virginialis* – *N. yucatanica*; (2) *N. adkisoni* – *N. carolinensis* – *N. heardi* – *N. disca*; and (3) *N. baliops* – *N. whitingi*. The first group contains species from widely separated areas in

the Caribbean Sea. However, distances separating known localities of most species in the other two groups are not so great. With the exception of *N. carolinensis*, known from two localities off the Carolinas, the remaining species in the second group were collected from similar depths (35–42 m, 39 m, and 54 m, respectively) a few miles apart latitudinally off the west coast of Florida. In that area, zones of faunal similarity occur in similar depths as bands paralleling the coast (Lyons, 1979; Lyons and Collard, 1974; Florida Department of Natural Resources, unpublished data). Camp (1973) demonstrated that within the depths in question along west Florida, the stomatopod fauna does not change appreciably with latitude. Although stomatopod congeners co-occur in identical depth zones, centers of their respective abundances differ bathymetrically, corresponding with changes in benthic habitats. Similarly, *N. baliops* and *N. whitingi* were captured during different years from the same habitat at fixed sampling stations within a very small study area off Hutchinson Island, lower east Florida. Camp et al. (1977) demonstrated that the crustacean assemblages were homogeneous for short periods throughout the habitat from which *N. baliops* and *N. whitingi* were found, but composition of the assemblages changed over time because of the apparent faunistically unstable nature of that highly dynamic, zoogeographical transition area.

We may speculate about the evolutionary relationship among species within these three groups based on a consideration of the proximity of a species to its morphologically most similar congener, if we assume that the few known localities of each species are near the center of abundance of that species. Areal distances separating the only known “populations” of *N. antillensis* (Venezuela), *N. virginialis* (Virgin Islands), and *N. yucatanica* (Yucatan) are possibly great enough for allopatric speciation to have occurred among those very similar, perhaps “sister,” species, despite their having dispersing larvae like all other stomatopods. However, distances separating known “populations” of species within each of the other two groups (*N. carolinensis* excepted) may not be great enough for divergence to be explained by allopatric, or even parapatric, speciation unless back-dispersal followed, especially in respect to *N. baliops* – *N. whitingi*. There is a possibility that as more specimens become available for study, some of these closely related species from similar habitats may have to be synonymized. However, so little is known of the biology of *Nannosquilla* species that additional information may confirm their distinctness as biological species, supporting our current determinations based on subtle structural differences.

The following key to adults is offered as an aid in identifying the West Atlantic species. The large number of species, unknown extent of inherent variation, and subtle distinctions between species make construction of a reliable key difficult. The user is cautioned to refer to original descriptions and illustrations of species identified with the key before a final determination is made.

Key to Adults of Species of *Nannosquilla* from the West Atlantic

1. Inner spine of basal prolongation of uropod longer than outer 2
 Spines of basal prolongation of uropod subequal in length or outer longer than
 inner 10
2. Posterior margin of telson with 7 fixed teeth lateral to each movable submedian
 tooth *N. schmitti* (Manning, 1962)
 Posterior margin of telson with 5 or fewer fixed teeth lateral to each movable
 submedian tooth 3
3. Base of movable submedian tooth of telson situated far anterior of outermost
 submedian denticle, at level of or slightly behind anus
 *N. hancocki* (Manning, 1961)
 Base of movable submedian tooth of telson situated adjacent to outermost
 submedian denticle, far posterior of anus 4
4. Antennular processes completely covered by rostral plate, not visible in dorsal
 view *N. vasquezi* Manning, 1979
 Antennular processes visible as anteriorly directed spines projecting beyond
 sides of rostral plate 5
5. Posterior margin of telson with 11–12 fixed submedian denticles on either side
 of midline, entire row forming W in posterior view
 *N. taylori* Manning, 1969
 Posterior margin of telson with 10 or fewer (usually less than 9) fixed submedian
 denticles on either side of midline, entire row usually forming transverse
 line 6
6. Telson greatly inflated; inner spine of basal prolongation of uropod more than
 3 times length of outer spine *N. taguensis* Camp and Manning, 1982
 Telson not greatly inflated; inner spine of basal prolongation of uropod less
 than 3 times length of outer spine 7
7. Rostral plate subrectangular, lateral margins slightly convex, subparallel, anter-
 olateral corners usually rounded right angles *N. grayi* (Chace, 1958)
 Rostral plate subpentagonal, lateral margins slightly convex or broadly rounded,
 anterolateral corners usually obtuse angles 8
8. Lateral margins of rostral plate broadly rounded, widely divergent anteriorly;
 anterolateral corners of plate broadly rounded; posterolateral corners of
 sixth abdominal somite prolonged posteriorly as long, acute spines; dactylus
 of raptorial claw with 6 teeth on inner margin
 *N. dacostai* Manning, 1970
 Lateral margins of rostral plate slightly convex, not broadly rounded, slightly
 divergent anteriorly; anterolateral corners of plate slightly rounded, obtuse
 angles; posterolateral corners of sixth abdominal somite acute angles, not
 prolonged posteriorly as long, acute spines; dactylus of raptorial claw with
 11–12 teeth on inner margin 9
9. Majority of chromatophores on dorsum of body large, stellate spots in preserv-
 ative; chromatophores on ocular peduncles dense, subcircular, non-stellate
 spots *N. baliops* Camp and Manning, 1982
 Majority of chromatophores on dorsum of body and ocular peduncles small,
 dense, non-stellate spots in preservative
 *N. whitingi* Camp and Manning, 1982
10. Anterolateral corners of rostral plate acute, sharply pointed angles
 *N. antillensis* (Manning, 1961)
 Anterolateral corners of rostral plate subacute or rounded obtuse angles, not
 sharply pointed 11
11. Posterior margin of telson with 4 fixed submedian denticles on either side of
 midline between movable submedian teeth
 *N. heardi* Camp and Manning, 1982

- Posterior margin of telson with 6–7 fixed submedian denticles on either side of
midline between movable submedian teeth 12
12. Posterolateral corners of sixth abdominal somite rounded; outer spine of basal
prolongation of uropod subequal in length to inner (outer spine longer in
juveniles) *N. carolinensis* Manning, 1970
Posterolateral corners of sixth abdominal somite acute; outer spine of basal
prolongation of uropod longer than inner 13
13. Anterolateral corners of rostral plate subacute or slightly rounded right angle
. *N. virginalis*, new species
Anterolateral corners of rostral plate rounded, obtuse, not forming acute or
right angle 14
14. Lateral margins of rostral plate broadly rounded; antennular processes con-
cealed from dorsal view by wide rostral plate *N. disca*, new species
Lateral margins of rostral plate slightly convex, subparallel; antennular processes
visible in dorsal view as anteriorly directed spines projecting beyond sides of
rostral plate 15
15. Length of rostral plate about $\frac{3}{4}$ (0.77) its width; median projection on false eave
of telson narrow *N. adkisoni* Camp and Manning, 1982
Length of rostral plate about $\frac{2}{3}$ (0.67) its width; median projection on false eave
of telson broad *N. yucatanica*, new species

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