

MURICIDAE (GASTROPODA) FROM THE NORTHEAST COAST OF SOUTH AMERICA, WITH DESCRIPTIONS OF FOUR NEW SPECIES

HARVEY R. BULLIS, JR.,
Branch of Exploratory Fishing,
Bureau of Commercial Fisheries,
Pascagoula, Mississippi

The U. S. Bureau of Commercial Fisheries has conducted two exploratory trawling cruises of the M/V OREGON along the northeast coast of South America from Trinidad to the Amazon River. This work was carried out during the fall of 1957 and the late summer of 1958: on these cruises 295 shrimp trawling stations were completed at depths ranging from 6 to 400 fathoms.

Prior to this work virtually nothing was known of the biological nature of the area traversed, particularly in depths beyond the 25-fathom contour. Some 50,000 specimens collected on the cruises have greatly increased the study material available from this region. The mollusk population was found to be very rich, and the volume of material from the two trips almost equals the total material collected during the 76 other OREGON exploratory cruises in the tropical and subtropical western north Atlantic.

This paper covers the macromollusca belonging to the Muricidae. The genus *Murex* was represented at 56 localities by 11 species taken in depths ranging from 10 to 275 fathoms (living material down to 200 fathoms). Of the eleven, four are new, four are range-extension records of considerable mag-

nitude, and three have been previously reported from the area. A single species of *Trophon* was found at one locality at the upper edge of the continental slope. One species of *Typhis* was found at two localities in the 20 to 30 fathom range.

The general pattern of depth distribution for the specimens of *Murex* found during these cruises is given in Table 1. Locations of OREGON stations corresponding to the numbers given under each species record are listed in Table 2.

Holotypes and paratypes of new species described herein, as well as material pertaining to the other species discussed are deposited in the United States National Museum. Paratypes have been placed in the following collections; Museum of Comparative Zoology, Academy of Natural Sciences of Philadelphia, American Museum of Natural History, Chicago Natural History Museum, Tulane University, and the Marine Laboratory Museum, University of Miami.

I wish to acknowledge with thanks the courtesies extended to me by Dr. Harald A. Rehder, Curator of Mollusks, United States National Museum, and by Dr. William J. Clench, Curator of Mollusks, Museum of

TABLE 1.
Depth distribution records for the species of Murex collected off the northeast coast of South America. Depths with records of live specimens are denoted as 0; depths with records of dead (empty) shells only are denoted as †.

	depth in fathoms															
	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275
<i>Murex brevifrons</i>	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Murex messorius</i>	0	0	0	†	-	-	-	-	-	-	-	-	-	-	-	-
<i>Murex donmoorei</i>	0	0	0	†	-	-	-	-	-	-	-	-	-	-	-	-
<i>Murex springeri</i>	0	0	0	0	0	0	0	†	†	†	-	-	-	-	-	-
<i>Murex thompsoni</i>	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
<i>Murex pomum</i>	-	0	0	0	0	†	†	-	-	-	-	-	-	-	-	-
<i>Murex cellulosus nuceus</i>	-	-	†	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Murex consuela</i>	-	-	-	-	†	-	-	-	-	-	-	-	-	-	-	-
<i>Murex tryoni</i>	-	-	-	-	-	-	†	†	†	†	†	-	-	-	-	-
<i>Murex beaui</i>	-	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-
<i>Murex oregonia</i>	-	-	-	-	-	-	-	-	-	0	0	0	0	†	†	†

TABLE 2.

Station list and localities of collection of Murex off north eastern South America, 1957 and 1958.

OREGON Station Number	North Latitude	West Longitude	General Area	Depth in Fathoms	Date
1981	10°03'	60°01'	Off eastern Venezuela	200	11/ 3/57
1983	09°53'	59°59'	Off eastern Venezuela	125	11/ 3/57
1984	09°45'	59°45'	Off eastern Venezuela	200	11/ 3/57
1985	09°41'	59°47'	Off eastern Venezuela	150	11/ 3/57
1988	09°24'	59°41'	Off eastern Venezuela	110	11/ 4/57
1989	09°45'	59°45'	Off eastern Venezuela	150	11/ 4/57
2002	07°52'	57°22'	Off British Guiana	60	11/ 6/57
2015	07°38'	54°11'	Off Surinam	75	11/ 8/57
2022	07°15'	53°25'	Off Surinam	115	11/ 9/57
2023	07°15'	53°25'	Off French Guiana	135	11/ 9/57
2038	05°46'	53°00'	Off French Guiana	15	11/11/57
2049	04°02'	50°33'	Off Cabo Orange, Brazil	38	11/13/57
2050	04°04'	50°32'	Off Cabo Orange, Brazil	40	11/13/57
2051	04°05'	50°27'	Off Cabo Orange, Brazil	50	11/13/57
2061	02°31'	48°48'	Off Amazon River	55-60	11/15/57
2063	02°35'	48°14'	Off Amazon River	53	11/15/57
2068	02°35'	47°48'	Off Amazon River	120	11/15/57
2080	02°04'	47°00'	Off Amazon River	125	11/17/57
2084	01°45'	46°46'	Off Amazon River	275	11/18/57
2230	08°33'	58°46'	Off British Guiana	41-44	8/29/58
2232	08°31'	58°37'	Off British Guiana	48-46	8/29/58
2236	08°09'	58°23'	Off British Guiana	23	8/29/58
2254	07°07'	57°08'	Off British Guiana	20-22	9/ 1/58
2255	07°09'	57°06'	Off British Guiana	25	9/ 1/58
2267	06°58'	56°02'	Off Surinam	25	9/ 2/58
2268	06°53'	55°59'	Off Surinam	24	9/ 2/58
2269	06°49'	55°57'	Off Surinam	23	9/ 2/58
2271	06°34'	55°54'	Off Surinam	18	9/ 2/58
2272	06°30'	55°52'	Off Surinam	17	9/ 3/58
2274	06°54'	55°40'	Off Surinam	27	9/ 3/58
2275	06°50'	55°39'	Off Surinam	25	9/ 3/58
2276	06°42'	55°37'	Off Surinam	23	9/ 3/58
2284	06°48'	55°12'	Off Surinam	25	9/ 8/58
2285	07°27'	54°54'	Off Surinam	150	9/ 8/58
2286	07°26'	54°49'	Off Surinam	120	9/ 8/58
2289	07°25'	54°35'	Off Surinam	75-80	9/ 8/58
2290	07°27'	54°27'	Off Surinam	110	9/ 8/58
2291	07°27'	54°27'	Off Surinam	135	9/ 9/58
2292	07°28'	54°21'	Off Surinam	115	9/ 9/58
2293	07°27'	54°15'	Off Surinam	115	9/ 9/58
2294	07°25'	54°08'	Off Surinam	115	9/ 9/58
2295	07°27'	53°47'	Off French Guiana	125	9/ 9/58
2296	06°29'	52°30'	Off French Guiana	120	9/10/58
2303	06°04'	52°35'	Off French Guiana	30	9/11/58
2307	05°57'	52°20'	Off French Guiana	31	9/11/58
2309	05°54'	52°17'	Off French Guiana	34	9/11/58
2321	06°52'	53°18'	Off French Guiana	34	9/14/58
2322	06°50'	53°29'	Off French Guiana	34	9/14/58
2324	06°46'	54°24'	Off Surinam	24	9/15/58
2327	06°26'	54°20'	Off Surinam	17	9/15/58
2328	06°33'	54°23'	Off Surinam	21	9/15/58
2329	06°40'	54°25'	Off Surinam	27	9/15/58
2331	06°55'	55°04'	Off Surinam	30	9/16/58
2333	06°58'	55°03'	Off Surinam	31	9/16/58
2334	06°56'	54°55'	Off Surinam	31	9/17/58
2335	06°50'	55°34'	Off Surinam	28	9/17/58
2337	06°50'	55°23'	Off Surinam	29	9/17/58
2344	08°10'	58°18'	Off British Guiana	35	9/19/58

Comparative Zoology, while referring to the collections in their care. Appreciation is also due to Dr. Rehder for critical review of the manuscript and to Emily H. Vokes for numerous helpful suggestions.

MUREX (MUREX) DONMOOREI,

sp. nov.

Figures 1 and 2.

Material: Station 2051, 1 dead; 2236, 1 alive; 2254 (type locality, 45 miles north of St. Andrews Point, British Guiana, in 20 to 22 fathoms), 1 alive; 2255, 1 dead; 2268, 1 alive; 2272, 2 alive; 2274, 2 alive; 2275, 2 dead; 2284, 6 alive; 2309, 1 alive; 2321, 2 alive, 2 dead; 2322, 2 dead; 2337, 4 alive.

Holotype: height 50 mm, width without spines 22.5 mm, height of aperture 38 mm. Shell solid, heavily sculptured, with an elongate, spinose siphonal canal. Whorls 7.3, including the protoconch of one and three-quarter whorls. Primary whorl slightly eroded, posteriorly flattened. Spire moderately extended. Suture deep, irregular, made undulous by the axial ridges. Aperture ovate and extending into the siphonal canal as a narrow slit. Palatal lip a thick varix, with six stout spines and intervening raised cords, one of which forms an imbricate scale on the face of the varix. Varix incomplete, hollow, opened on the inner surface, behind which is a row of nine white rounded teeth. A single tooth persists in the upper end of the aperture, corresponding to the intruding varix of the penultimate whorl. Parietal lip slightly expanded, adhering above and erect below. Siphonal canal elongate, slightly more than half the length of the shell, and armed with three rows of spines. There are 4 spines in the first two rows and 3 in the third, all are curved slightly forward, and diminish in size anteriorly. Sculpturing on the body whorl consists of 17 distinct spiral cords that cross four or five axial intervarical ridges to form spirally elongate nodules across the ridges. On the posterior half of the canal are 13 spiral cords crossed with fine growth lines. First 3 post-nuclear whorls without varices and strongly cancellate. The varices start on the fourth whorl and are radially aligned, the lower directly behind and adjoining the upper. Ground color light tan, varices brownish. Each spiral cord marked with a dark brown line. Tip of

canal mottled yellow, and surmounted by a dark, reddish-brown spot. Operculum thin, reddish-brown, with strong concentric ridges.

Radula typical, formula $0:1:\frac{5}{1}:1:0$. U.S.N.M. 635146.

Discussion: This species was found from eastern British Guiana to eastern French Guiana. The southernmost record is a shell from off Cape Cassipore. OREGON records show a range of 17 to 50 fathoms, but the optimum depths appear to be between 25 and 35 fathoms.

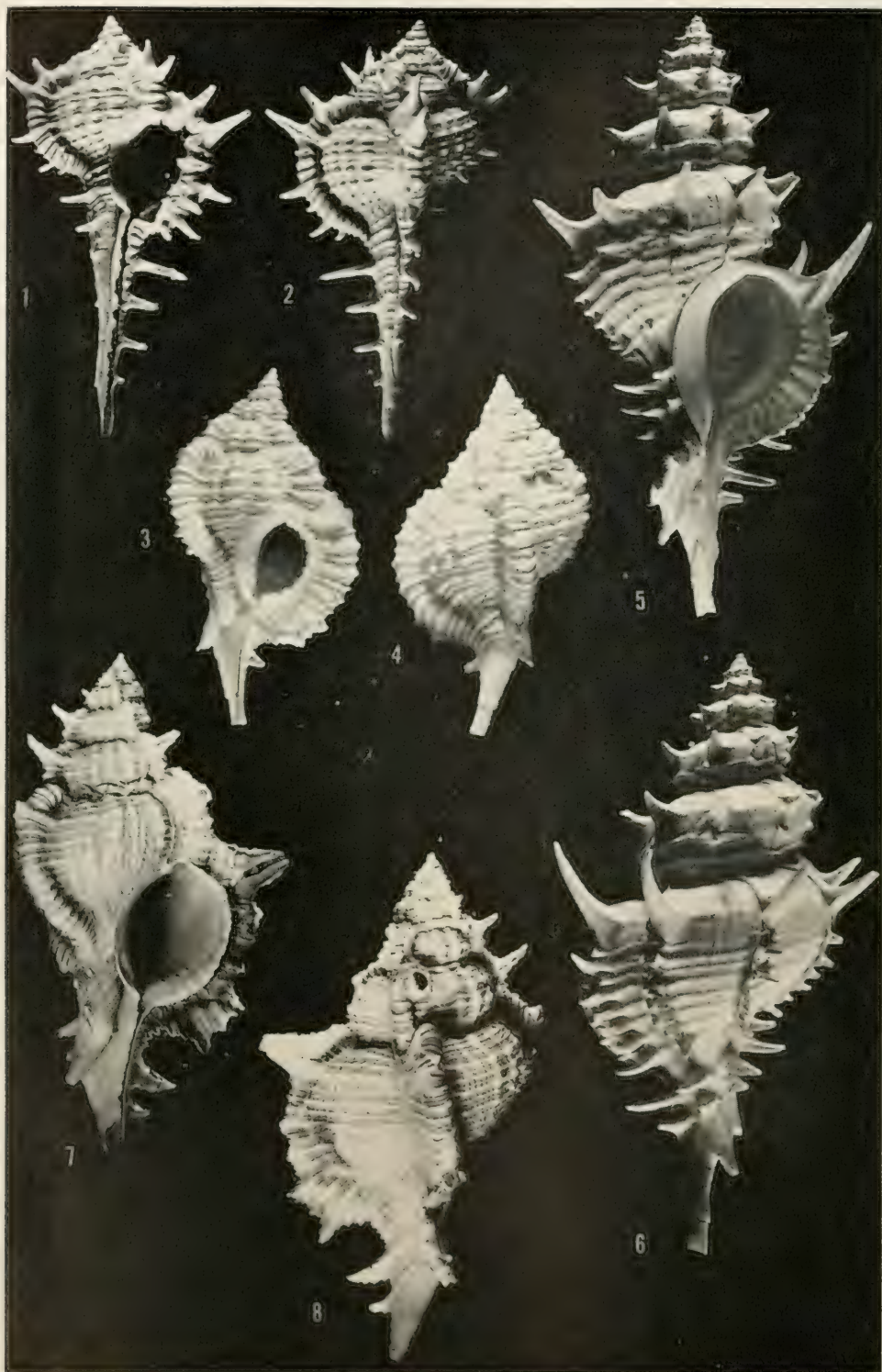
In general shape and sculpturing *M. donmoorei* could be easily confused with *M. cabritii* Bernardi. The gross sculpturing agrees closely in form and structure. Many of the paratypes of *M. donmoorei* show similarly paired pallial crenulations. The dissimilarities are less obvious but are nevertheless striking when series of both species are compared. The new species appears to be a much smaller form, although the protoconch is two to three times as large. The posterior flattening of the apical whorl is combined with a definite low-set supra-sutural cord, which differs from the tiny, unsculptured, bulbous protoconch in *M. cabritii*. The anterior canal is proportionately shorter, equal to 50 to 55 percent of the maximum length. In this respect *M. donmoorei* more closely resembles *M. elenensis* Dall (Pacific coast of Central America). In *M. cabritii* the canal varies from 60 to 64 percent of the length. The sharp brown threads that ride the spiral cords are a distinctive color feature. Radular differences are equally distinct. The rachidian in *M. cabritii* is tricuspid, not typical of the genus, whereas there are five strong cusps in *M. donmoorei*.

This species is named for Donald R. Moore, University of Miami Marine Laboratory.

MUREX (MUREX) TRYONI Hidalgo

Records: Station 2230, 3 dead; 2236, 1 dead.

These records extend the observed range from the lower Antilles (Clench and Farfante, 1945) to off French Guiana. The specimen from station 2291, measuring 50 mm, is the largest I have seen.



Figures 1-8. 1 and 2—*Murex donmoorei*, new species. Holotype. 3 and 4—*Murex thompsoni*, new species. Holotype. 5 and 6—*Murex oregonia*, new species. Holotype. 7 and 8—*Murex springeri*, new species. Holotype.

MUREX (MUREX) MESSORIUS

Sowerby

Records: Station 2230, 3 dead; 2236, 1 dead; 2269, 1 dead; 2272, 1 alive; 2276, 1 dead; 2327, 1 alive; 2328, 6 alive; 2329, 4 alive; 2334, 2 alive.

Recently Vokes (1963) has taken a firm position restricting *M. recurvirostris* (s.l.) to the Pacific coast, resurrecting *M. messorius* Sowerby for the "*recurvirostris*" of the western Atlantic exclusive of Florida, and allying it with *M. sallasi* Rehder and Abbott (Yucatan) and *M. rubidus* Baker (Florida). One must regard this as a clarification of one of the most complex species groups in this region. The present material clearly falls within this group; however, it too displays rather consistent differences from the many described species and sub-specific forms. For the present it seems prudent to refer to the entire lot from off the Guianas as *M. messorius* and await the assemblage of material that will afford synoptic treatment.

Specimens in this series reach a length of 65 mm, and the shell is noticeably more solid than in either *M. sallasi* or *M. rubidus*. The aperture is proportionately larger (about 10 percent longer and wider of the total length of the shell) than in *M. rubidus*. The coloration is a mottled brown-tan over cream.

All of the living material collected was taken from catches that contained large amounts of mud and sand, evidence of hard digging by the trawl. Most of the above records came from off the Surinam River along the 30-fathom curve.

MUREX (MUREX) CONSUELAE

Verrill

Record: Station 2063, 1 dead.

Recently Clench (1959) recorded this species (as *M. pulcher* A. Adams) from Salvador (Bahia), Brazil, a range extension of over 2000 miles from Barbados. The present record from the offings of the Amazon River is intermediate.

MUREX (MUREX) THOMPSONI,

sp. nov.

Figures 3 and 4.

Material: Station 2061, 12 alive; 2230, 1 dead; 2232, 2 alive; 2269, 1 dead; 2321 (type locality, 75 miles NNE of Pte. Mana,

French Guiana, in 34 fathoms), 4 alive, 1 dead; 2322, 7 alive; 2329, 1 dead; 2331, 23 alive; 2333, 4 alive.

Holotype: Height 35.8, width 18.9, height of aperture 22.9 mm. Shell solid and small. Whorls 7.5 including the protoconch. Spire acute, moderately extended. Suture appressed, irregular. Aperture small, oval, porcelainous white, with a well-developed tooth within the posterior margin. Aperture leading into a narrow slit on the siphonal canal. Outer lip thick, erect, and crenulate. Behind and well-separated from the crenulations are eight elongate denticulations. Parietal lip adherent above, erect below, with four parallel denticulations on the columella. Siphonal canal moderately extended, recurved, and reflected to the right. There are one and one-half bulbous, shiny, unsculptured nuclear whorls. Below these are two and one-half strongly cancellate whorls, followed by the first varical ridge. Each remaining whorl bears three heavy corrugated varices, which are axially aligned and slightly behind the superior varix. Sculpturing consists of alternate strong and light spiral cords that traverse three intervarical ridges to form prominent nodules. These persist over the varices as raised rings which can best be described as *tracheoid*. The lower half of the outer forward margin of each varix supports a low frill. On the last two varices is a short, open spine at the shoulder and another at the base of the canal. On the forward face of the varices there are numerous, fine v-shaped imbrications. Fine growth lines, present over the entire shell, are emphasized by weak ridges of light yellow periostracum. The ground color is light cream. The stronger spirals each have a light, orange-brown thread. Operculum unguiculate, thick reddish-brown, and heavily sculptured with a sub-apical nucleus. U.S.N.M. 635147.

Discussion: The type is somewhat more exotic than the rest of the series at hand but was selected for its size, condition, and apparent maturity. The only larger specimen (44 mm) is more typical but it is badly eroded and heavily encrusted with bryozoans, barnacles, and worm tubes. Generally, the body is more slender and elongate and without spines. The species characteristically shows a tendency to raise a varical web or frill as in *M. cailleti* Petit, but to a lesser

degree. This is present in all specimens down to 22 mm and absent in a series of 23 juveniles ranging from 9.5 to 19.5 mm. Ground coloration varies from whitish to mottled brown. One specimen is marked with two brown bands. The darker lines are present on all living specimens, but they appear to fade quickly on dead shells.

Murex thompsoni may be confused with small specimens of another new species, *M. springeri*. A comparison of their respective characters is given under that species. In the western Atlantic fauna *M. thompsoni* can best be compared with *M. cailleti* (and its subspecies *kugleri* Clench and Farfante), from which it differs in having a smaller aperture, a proportionately heavier varix, and a shorter, stouter siphonal canal. It is also a smaller species and occupies a much shallower depth range. The present series was taken between the Orinoco River and Maraca Island, a range of some 800 miles, in depths of 22 to 60 fathoms. The large series of juveniles came from a depth of 30 fathoms. This species is named after John R. Thompson, colleague at the Bureau of Commercial Fisheries Exploratory Fishing Base, Pascagoula, Mississippi.

MUREX (SIRATUS) BEAU

Fischer and Bernardi

Records: Station 1981, 4 alive; 1983, 6 alive; 1984, 2 dead; 1985, 7 alive; 1988, 1 alive; 1989, 2 dead; 2080, 1 alive; 2290, 9 alive; 2291, 2 alive; 2292, 1 alive; 2293, 7 alive; 2294, 1 dead; 2296, 4 alive.

These captures extend the known range of *M. beau* some 1,000 miles, from Guadeloupe Island to northeastern Brazil. The larger specimens (above 100 mm) display an almost complete absence of webbing and are very similar to those caught on grey mud bottom in the north-central Gulf of Mexico. Smaller specimens have webbed varices.

Popular belief is that extreme webbing is directly related to bottom type; numerous observations of this species do not confirm this. More likely the higher degree of varical webbing is atypical. Truly exotic specimens can be found in most of the localities over its range if large series are obtained.

MUREX (SIRATUS) SPRINGERI, sp. nov.

Figures 7 and 8.

Material: Station 2002, 1 dead; 2015, 2 dead; 2061, 24 alive; 2230, 5 dead; 2232, 1 alive; 2271, 1 alive; 2286, 1 dead; 2289 (type locality, 95 miles NNE of Surinam River entrance in 75 to 80 fathoms), 23 living and dead; 2290, 1 dead; 2322, 23 alive; 2328, 1 alive; 2329, 1 dead; 2333, 7 alive; 2344, 1 dead.

Holotype: Height 70, width 32.7, height of aperture 45 mm. Shell of medium size and solid. Whorls 9.3 including protoconch. Nucleus white and smooth; whorls 2, the first a flattened planorboid coil giving the protoconch a truncate appearance. Spire moderately extended. Suture distinct, the lower whorl applied as a thin fold, below which there is a definite canaliculate depression. Aperture milky white, ovoid, with a slight anal canal bordered on the body wall by a small rounded tooth. Aperture leads into a narrow slit on the siphonal canal. Outer lip extending well beyond the last varix, erect, faintly denticulate within, and moderately crenulated. The crenulations on the outer lip are colored brownish on the inner surface. Parietal lip adherent over most of its length, erect, and lightly denticulate just ahead of where it turns sharply into the siphonal slit. Axial sculpture of three strong varices on each whorl. Each varix supports a single strong spine at the shoulder and two shorter spines on the canal. Shoulder spines imbricate and hollowed, but with a laminated "filling" to the varix edge. This "filling" has the appearance of having been "squeezed out" of the spiral slit. On the spine and along the forward outer edge of the varix there is a substantial low frill which is strongest on the basal portion. Numerous intervarical ridges, diffused and very slight, appear between the last two varices; from three to six on earlier sections. These and the varices are crossed by raised spiral cords, the very second to sixth of which is heavier and more darkly colored. This irregular cording produces numerous small, irregularly shaped nodules which are stronger on the spire than on the body whorl. Spirals cross the varices as raised rings or extend onto the frill. Anterior canal moderately extended, rather heavy, recurved, and reflected to the right. Spiral sculpturing

crowded over and between the two spines on the canal but well separated below. Ground color cream, with a brownish band below the shoulder, most prominent on the varices. The heavier spirals are various shades of yellow-brown. The forward face of the siphonal canal is glossy white, but is heavily etched with growth lines. The specimen was collected dead. U.S.N.M. 635148.

Discussion: This species was found quite commonly from eastern British Guiana to Brazil in depths of 18 to 120 fathoms. Most of the deeper records of *M. springeri* are of dead specimens, which tend to be the largest individuals taken.

At less than 30 mm *M. springeri* may be confused with another new species, *M. thompsoni*, due to the latter's occasional tendency to carry a small shoulder spine, and rarely a spine or two on the anterior canal. A reliable way to separate these two is by nuclear characters. The first whorl of the nucleus is bulbous in *M. thompsoni* and posteriorly flattened in *M. springeri*. Neither can be confused with *M. beani* which at this shell size is very light and fragile, more elaborately frilled, and has a nucleus of one and one-half to three rounded but evenly tapering whorls.

Radular characters also appear to separate these three species. The lateral teeth of all species vary so slightly as to be of little or no diagnostic use. The differences in the characteristics of the rachidian are more of degree than of basic structure. Typically, the muricid rachidian possesses five cusps; the central is usually the longest and heaviest, the outer cusps are somewhat smaller, and the intermediary ones are very small. The basal plate varies relative to the cusps both in shape and size; however the problem of preparing uniform slide mounts makes evaluation difficult. The general specific agreement in cusp formation encouraged me to use this character here.

At a larger size, *M. springeri* resembles closely several specimens of *M. beani* that I have seen, but in addition to the radular and nuclear characters it differs in being much heavier and having a shorter siphonal canal. Both species are quite variable in shape. As in *M. beani*, which frequently lacks any sign of spines in the larger forms, several specimens of *M. springeri* lack the shoulder spine. In the large series at hand, all show the spines on the canal. The degree

of frilling is also variable, but none of the present material even approaches the magnificent frilling that is seen occasionally in *M. beani*. This species is named for Stewart Springer of the Bureau of Commercial Fisheries.

MUREX (PHYLLONOTUS) POMUM

Gmelin

Records: Station 2050, 2 alive; 2061, 4 alive; 2230, 2 dead; 2267, 2 alive; 2269, 1 dead; 2275, 1 alive; 2284, 11 alive; 2289, 1 dead; 2307, 1 alive; 2322, 5 dead, 1 alive; 2325, 1 alive; 2337, 9 alive.

Although these captures are well within the known geographic range of *M. pomum*, the present records of living specimens range from depths of 25 to 60 fathoms, and for dead shells from 22 to 80 fathoms, well beyond the bathymetric range formerly considered typical. This probably indicates salinity tolerances since the enormous river drainage along this entire coast must certainly lower salinities appreciably out to the vicinity of the 20 fathom curve.

Although the coloring of a few of these specimens resembled that of forms from the shores of United States, many were much lighter, or even whitish, with a light purplish sheen within the aperture.

Assignment of these specimens to *M. pomum* has been done with some doubt following the discussions of Abbott (1958) and Clench (loc. cit.) regarding *M. margaritensis* (s.s.) Abbott. The present material shows the same ambivalence to either name, except for the deep pink coloration of the aperture which is quite striking. However, the brown patch at the posterior siphonal notch is strong. Since my observations of the radulae indicate no discernible differences I have conservatively assigned all of the above specimens to *M. pomum*.

MUREX (CHICOREUS) BREVIFRONS

Lamarck

Records: Station 2038, 3 alive; 2049, 5 alive; 2050, 2 alive; 2272, 10 alive; 2276, 1 dead; 2303, 2 alive; 2327, 4 alive.

These extend the range of *M. brevifrons* from the Guianas to the offings of the Amazon River. Depths at the collecting sites ranged from 15 to 40 fathoms. Most of the specimens were very elaborately spined and

not at all dissimilar to *Murex argo* Clench and Farfante.

MUREX (POIRIERIA) OREGONIA,

sp. nov.

Figures 5 and 6.

Material: Station 1981, 1 alive; 2022, 2 alive; 2023 (type locality, 95 miles north of Pte. Mana, French Guiana, in 135 fathoms), 2 alive; 2084, 1 dead; 2285, 2 alive; 2286, 5 dead; 2291, 1 alive; 2292, 1 alive; 2293, 7 alive; 2294, 5 alive; 2295, 3 alive; 2296, 150 dead and living.

Holotype: Height 90.2, width 37.8 (not including spines); height of aperture 54.9 mm. Shell heavy, elongate, and strongly sculptured. Apex eroded (as are all mature specimens in the series), 8 whorls remaining. Aperture elongate, leading into an extended siphonal canal. Outer lip flared, sharp, somewhat crenulate on the edge and with 13 teeth on the inner margin; the lip supports a strong, upturned, imbricate and hollowed spine at the shoulder. Parietal wall with a raised, erect, shield-like callus. Spire turreted, with a deep, irregular suture. Spiral sculpturing of eight strong cords between the base and shoulder. Axial sculpture of nine varices supporting eight upturned imbricate spines which correspond to the cords, plus the shoulder spine, and a pair of long spines on the base of the siphonal canal. The penultimate whorl has eight varices with the sub-shoulder spines absent, but with nodules at the crossing of the cords and varices, with three cords left exposed. On the rest of the spire only two cords are exposed. The varices cross the shoulder with a step-like overlapping of the succeeding section. Growth lines in the form of undulating wrinkles are most evident on the shoulder. The eight spines below the shoulder on the last varix are imbricately doubled and not directly connected to the margin of the lip. The second varix is similar but a few of the forward spines directly receive involutions of the former lip. This is more so on the third varix and entirely the case on the fourth. Five previous anterior canals are present. Operculum dark reddish-brown, unguiculate, broadly oval with a terminal apex, and strongly sculptured with growth lines. The radula is large; the rachidian has five cusps of about equal length. The middle and outer

two cusps are slightly stouter. The laterals are triangulate and hooked. Radular formula is $0:1:\frac{5}{1}:1:0$. U.S.N.M. 635149.

Discussion: This is a striking species that forms a closely related group with *M. pazi* Crosse and *M. nuttingi* Dall, and bears some affinities to *M. atlantis* Clench and Farfante, and *M. carnicolor* Clench and Farfante: the latter to a lesser degree. It differs from all of the above in having paired siphonal spines, and in the length/whorl relationship, being from two and one-quarter to four times greater in size by whorl count. *Murex pazi* and *M. nuttingi* are more similar in shell characteristics than has been previously indicated, with the former showing a great range of sculpturing which may eventually provide a basis for a geographical subspecific distinction. Bahamian and Cuban *M. pazi*, which represent the typical Antillean species, have the intermediary sculpturing between the shoulder and siphonal canal spines greatly reduced. This is exemplified by the figure given by Clench and Farfante (1945, p. 44). Along southern Florida and extending perimetrically around the Gulf of Mexico shelf in the 100 fathom range, *M. pazi* has heavy intermediary sculpturing. *M. nuttingi* might be confused with this group but it can be differentiated by the denticulate inner surface of the pallial lip and the more elongate spines.

The large series of paratypes was collected over a depth range of 105 to 275 fathoms from positions due east of Galeota Point, Trinidad, east of the Amazon River, and at several points between, indicating a continuous range from the equator to 10° North Latitude.

The series from station 2296 (off the Maroni River) included 126 living and 24 dead examples of this species. The specimens range from 40 to 75 mm in height, and provide an excellent series for reviewing some of the juvenile characters. A few of the smallest specimens possess a complete planorboid protoconch of about two whorls that are posteriorly flattened and truncate and bear faint axial riblets on the second whorl. The original protoconch was almost certainly a fragile, deciduous structure of which no trace remains; the protoconch present is a shelly dome, secreted within and

closing off the embryological apical chamber. The coil starts in the form of a "tuck" below the following coil, creating a minute apical pit.

Under 60 mm there are no indications of parietal thickening. The callus is thin and adhering. All spines except the shoulder spines are greatly reduced, and the body appears more attenuate anteriorly. The shells are thin and fragile, marked with four to eight spirals, and have eight to nine varices on the body whorl. They resemble in a general way, *M. atlanticus* except the siphonal spines differ and they do not have a bent canal. The five smallest specimens from station 2296 all have paired siphonal spines. A 44 mm specimen from station 2291 has only a single row, as do six of the entire series at hand. Above 60 mm the spiral cording remains constant at seven or eight lines although some are irregular and faint.

MUREX (FAVARTIA) CELLULOSUS NUCEUS Mörch

Record: Station 2050, 1 dead.

This record extends the southward range of *M. cellulosus nuceus* from St. Thomas, Virgin Islands (Clench and Farfante, 1945), to northern Brazil.

TYPHIS ALATUS Sowerby 1850

Records: Station 2324, 1 alive; 2331, 2 dead.

This species has been reported from the Miocene of the Dominican Republic (type locality), the Chipola formation of Florida, the Gatun formation of Toro Cay, Panama, and from Bowden, Jamaica. Woodring (1928) points out that the entire subgenus *Talityphis* has been considered extinct in the Caribbean region.

A comparison of the present material with the Bowden species and the description and figures of the subspecies *T. a. obesus* Gabb, substantiated Woodring's suspicions as to the validity of *obesus*. The entire group of live and fossil material does not show consistent tangible differences and the present material must be relegated to *T. alatus*.

TROPHON ACTINOPHORUS Dall

Record: Station 2068, 7 alive.

These specimens extend the southward distributional record for this species from south of Barbados to Brazil.

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ABSTRACT

Eleven species of *Murex* were collected off the northeast coast of South America by the M/V OREGON. The material came from 56 localities between Trinidad and the Amazon River in depths ranging from 10 to 275 fathoms. Four of the species are considered new; *M. donmoorei*, *M. thompsoni*, *M. springeri*, and *M. oregonia*. Four species represent first records for the area. Records for live specimens are also given for *Trophon actinophorus* Doll and *Typhis alatus* Sowerby.