



The first two are new species, although the *Phallusia* is closely related to an East Indian species and may, when more information is available, have to be united with it; it is, however, totally unlike any species hitherto known from the West Indies. The third species (*Botryllus planus*) I have already described as a variety of another West Indian species, but important differences in the reproductive organs show it to be a totally distinct form.

Aside from the new species, the collection contains several more or less uncommon and locally distributed species, among which may be noted *Trididemnum orbiculatum*, *Corella minuta*, and *Rhodosoma pellucidum*, the last mentioned being represented by a considerable number of specimens, showing it to be common at Curaçao, although previous collecting has indicated that it was a rare and local species in the West Indies. On the other hand, the absence of species common in the shallow waters of many parts of the West Indies, such as *Styela plicata*, *Botryllus niger*, *Symplegma viride*, *Clavelina oblonga* and *Pyura momus* form *pallida* (the last named has been recorded from the island) is worthy of mention; also that only one small specimen of *Didemnum candidum*, the most abundant ascidian in many of the northern parts of the West Indian region, was collected. The simple ascidians are better represented in the collection than the compound forms. To what extent this may have been due to the smaller and inconspicuous character of many of the compound species, I cannot attempt to decide; however the collection appears to have been made with great care and diligence, and I think we may fairly conclude that the compound ascidians do not form such a large proportion of the ascidian fauna of Curaçao as they do in many localities farther north, notably at Bermuda and on both the coasts of Florida.

The published records of ascidians from Curaçao are nearly all based on Professor SLUITER'S (1898) report on the ascidians collected by the „Chazalie” Expedition, which obtained there the five species listed below. No additional species have since been reported, so far as I am aware. Three of the species (*Didemnum conchyliatum*, *Polycarpa brevipedunculata* and *Microcosmus biconvolutus*) were described as new.

*Didemnum conchyliatum* (*Leptoclinum conchyliatum* Sluiter, Mém. Soc. Zool. France, XI, p. 29, Pl. III, fig. 47, 1898).

In regard to this species I can add nothing to what is given by Prof. SLUITER.

*Phallusia nigra* (*Ascidia atra* Sluiter, Mém. Soc. Zool. France, XI, p. 7, 1898).

Numerous specimens are in the present collection.

*Polycarpa brevipedunculata* (*Styela (Polycarpa) brevipedunculata* Sluiter, Mém. Soc. Zool. France, XI, p. 15, Pl. I, fig. 12, 1898).

Were it not for a similar reason to that mentioned under *M. biconvolutus*, I should venture to regard this as a synonym of *P. obtecta* which is contained in the present collection.

*Pyura momus* form *pallida* (Heller), 1878 (*Rhabdocynthis pallida* Sluiter, Mém. Soc. Zool. France, XI, p. 25, 1898).

A species widely distributed in warm regions, easily distinguished from *P. vittata* by having needle-like calcareous spicules in the mantle and in many internal organs. Not in the present collection.

*Microcosmus biconvolutus* (Sluiter, Mém. Soc. Zool. France, XI, p. 26, Pl. II, figs. 36—38, 1898).

From the description and figures I would be inclined to regard this as hardly separable from *M. exasperatus*, which is abundantly represented in the present collection. However Professor SLUITER reports that species from other islands in the same article, yet he describes this species as distinct.

As I have recently (1921) published a monograph of the West Indian ascidians with descriptions and figures of the species, lists of synonyms, bibliography, etc., it does not seem necessary to repeat here information which has been given there in greater completeness than the limitations of the present paper will permit of. Therefore the references here given include only a few of the most important ones.

I have adhered to the same nomenclature and classification that was used in the above monograph. The *nomina conservanda* proposed by HARTMEYER, MICHAELSEN and SLUITER (see Sitzungsber. Naturf. Freunde Berlin, Ann. 1915, pp. 247—258) have not yet been authorized by an International Congress,

therefore I do not yet feel justified in adopting them when in conflict with my views on the law of priority, but they have been noted, when different, in the systematic part of this article.

While the greater part of the collection will be returned to Dr. VAN DER HORST, he has kindly allowed the American Museum to retain a set of duplicates including cotypes of the two new species.

In concluding these introductory remarks, I wish to express my thanks to Dr. VAN DER HORST and also to Doctor ROY W. MINER of the staff of the American Museum for his kindness in giving me the opportunity for carrying out this work and facilitating it in every way.

#### LIST OF SPECIMENS WITH DESCRIPTIONS OF NEW SPECIES.

As all the specimens were collected within a few weeks in April and May 1920, it has not usually seemed necessary to give the dates of collection of the specimens. In the case of several of the compound ascidians, many of them are only parts or fragments of colonies, and it is impossible to state how many separate colonies the material collected really represents.

##### Family SYNOICIDÆ.

##### *Aplidium (Amaroucium) bermudæ* (Van Name), 1902.

Six lots of specimens, comprising a total of eleven colonies, all small and poorly developed. All from the Spanish Water.

##### Family DIDEMNIDÆ.

##### *Trididemnum savignii* (Herdman), 1886.

Two small colonies, collected on different dates in Caracas Bay.

##### *Trididemnum orbiculatum* (Van Name), 1902.

One colony, measuring about 12 mm. in greatest diameter, from Caracas Bay. The specimen agrees well with cotypes from Bermuda, the only locality from which the species was previously known, and as in the case of the Bermuda specimens, only eggs but no male organs were found in the zooids. Sixteen tentacles, representing three orders, were demonstrated. The structures recently described by MICHAELSEN (Abh. Nat. Ver. Hamburg, XXI, p. 6, and Jahrb. Wiss. Anat. Hamburg, XXXVII, suppl., pp. 2 ff.) as „Seitenorgane” and apparently functioning as spicule-producing organs, are well developed in the zooids of this specimen, and form rather small but deep round or somewhat oval depressions on each side of the ventral region of the thorax, rather near the posterior end, filled with a mass of test containing minute yet well formed spicules.

##### *Didemnum candidum* Savigny, 1816.

Only one small colony of this species, so abundant and widely distributed in many parts of the West Indian region, is in the collection. It was obtained in the Spanish Water. The spicules are small and burr-like.

##### *Didemnum vanderhorsti* new species (Fig. 1).

The type colony is thin and flat and evidently grew upon some even surface. It is of nearly square outline, about 20 mm. in length and breadth, but in most parts little over 1 mm. in thickness. The edges are in some places thin, in others rounded and a little thicker than the interior of the colony; the surface is smooth and free from foreign matter. The three other colonies collected, though likewise of the flat incrusting type, are smaller, and of elongate and narrow shape, having apparently grown on narrow objects, in one case apparently the stem of a branching alga or alcyonarian which the colony has partially enveloped for a length of 24 mm. This colony reaches a thickness of fully 3 mm. at one point.

The colonies all have a more or less deep chocolate brown color, due largely to pigment in the test cells, but apparently also to a suffused brownish color in the test and tissues of the zooids. In spite of its coloration, the test remains quite transparent; the zooids are distinctly visible through it and even some of their internal characters can often be seen without removing them from it. The zooids are numerous and closely placed and can be seen to be arranged in systems of more or less complexity, but neither the limits of these systems, nor the common cloacal apertures, can be definitely distinguished.

Spicules are almost entirely (in some colonies perhaps entirely) wanting. In the type colony they are present in a few places; they are irregularly distributed and very minute, oftener under than over 0.01 mm. in diameter, and of burr-like or practically spherical form, points being often scarcely at all developed.

The zooids are small, usually considerably under 1 mm. in length in the somewhat contracted preserved condition. They present no characters unusual in the genus.

The branchial tube is well developed, with six small triangular lobes to the aperture; atrial aperture is rather small, its opening not produced into a tube and not provided with a languet. The mantle has a few slender longitudinal bands on the thorax; the abdomen is not muscular. The mantle cells do not contain pigment, and the thorax therefore appears lighter colored than the surrounding test, thus causing the zooids to be more conspicuous from the exterior of the colony than would otherwise be the case.

The zooids have a well developed muscular process extending out into the test from the contracted middle region of the body.

Tentacles apparently sixteen in number, representing three orders (4 + 4 + 8).

Dorsal languets situated on the left transverse vessels of the sac removed a little way from the median dorsal vessel.

Stigmata in four rows with at least ten in a row on each side in the first two or three rows; possibly not quite so many in the posterior row.

Stomach rounded, intestinal loop large with a more or less distinct valve-like constriction a little way beyond the stomach. Many of the zooids have both male and female organs well developed. Testis single, of large size when fully developed, situated in the rear ventral region of the abdomen; the sperm duct is coiled in six or seven turns upon its conical outer surface. The ovary, situated beside the ascending part of the intestine, consists of a small group of eggs in different stages of growth.

In character, color and general appearance this species closely resembles *Trididemnum savignii* (Herdman), so that a microscopic examination is needed to distinguish them. The absence of spicules, the unpigmented thorax, and of course the additional row of stigmata and absence of an atrial tube distinguish it readily when such an examination is made.

The four specimens in the collection were all obtained in the Spanish Water, but all on different dates and probably therefore at as many different stations, yet they show much constancy in their characters, differing from the common and widely distributed *D. candidum* in the almost complete absence of spicules and in their abundant brown pigmentation. I take pleasure in naming the species after the distinguished scientist who made the collection.

*Leptoclinum macdonaldi* (Herdman), 1886.

(Proposed nomen conservandum *Diplosoma macdonaldi*).

Six colonies, all from the Spanish Water. In the zooids of one colony the dorsal languets, which are long and very slender, and arise close alongside the median dorsal vessel, could be clearly demonstrated.

*Lissoclinum fragile* (Van Name), 1902.

Three small colonies, the largest only 9 mm. across, were obtained in Caracas Bay on May 5<sup>th</sup>, 1920. The zooids are well preserved and have not more than 7 or 8 stigmata on each side of the branchial sac in the first three rows, and only 6 or 7 in the last row. The dorsal languets are long

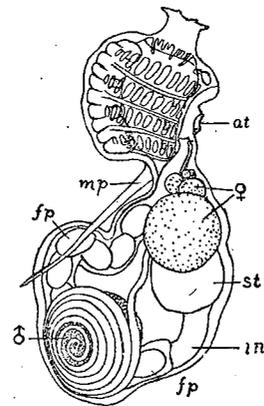


Fig. 1. *Didemnum vanderhorsti* n. sp.  $\times 60$ .

and very slender and arise from, or close alongside, the median dorsal vessel. The spicule-forming organs are small deep depressions of rounded outline, filled with minute spicules, situated near the endostyle somewhat posterior to the middle of the thorax. The atrial languet is well developed and has the end widened and rounded. Eggs, but no male organs, were found in the zooids examined.

Family POLYCITORIDÆ.

*Polycitor (Eudistoma) olivaceus* (Van Name), 1902.

Numerous specimens, all from the Spanish Water.

*Holozoa bermudensis* (Van Name), 1902.

(Proposed nomen conservandum *Distaplia bermudensis*).

Numerous specimens, all from the Spanish Water.

The colonies are all rather small, of capitate or irregular form, and in preservation are of a reddish or brownish red color. The wall of the stomach was invariably found smooth in the zooids examined.

Family PHALLUSIIDÆ.

*Phallusia nigra* Savigny, 1816.

(Proposed nomen conservandum *Ascidia nigra*).

More than fifty specimens, some of them growing in clusters of a number of individuals, were in the material sent, but I understand that these represent only a part of those which were collected, this species being abundant at Curaçao. The specimens came from both the Spanish Water and Caracas Bay; the largest measure about 105 mm. in length.

*Phallusia hygomiana* Traustedt, 1882.

(Proposed nomen conservandum *Ascidia hygomiana*).

About thirty specimens, all from the Spanish Water except seven from Caracas Bay. Largest individual 78 mm. long.

*Phallusia curvata* Traustedt, 1882.

(Proposed nomen conservandum *Ascidia curvata*).

Seven specimens, all from Caracas Bay, the largest 55 mm. long, the others all small. Three additional specimens may be of this species, but are so immature that their determination is doubtful.

*Phallusia corelloides* new species. (Figs. 2—4).

(Proposed nomen conservandum *Ascidia corelloides*).

? 1904. *Ascidia rhabdophora* Sluiter, Siboga-Exp., LVia, p. 45, Pl. IV, figs. 19—23.

? 1908. *Phallusia rhabdophora* Hartmeyer, Bronn's Tierreich, III, suppl., p. 1404.

If we may judge by the limited material available, the body is normally elongate ovate, wide and rounded behind and tapering more or less gradually toward the anterior end; it is more or less flattened from side to side, and attached by a large part of the left side. The dorsal, ventral and posterior borders of the body are rather thick and rounded. Size difficult to estimate exactly in the soft collapsed condition of the specimens; the two largest are about 19 and 16 mm. long respectively, and both about 8 to 9 mm. in their greatest dorso-ventral diameter which is posterior to the middle.

Branchial aperture not at the extreme anterior end but a little removed from it, and directed more or less dorsally and toward the right or unattached side. It is not prominent in the contracted condition. Atrial aperture on the dorsal side anterior to the middle of the body, somewhat produced and directed obliquely forward and also, as in the case of the branchial aperture, displaced and deflected more or less toward the right or free side of the body. Apertures lobed, but in the contracted condition the lobes are more or less obscure and difficult to count.

Test very transparent, nearly colorless or with a brownish tint; its substance moderately tough

and permeated by branching blood vessels. It is thick toward the anterior end, becoming somewhat thinner toward the posterior end of the body and on the area of attachment. Its surface is smooth and shiny, free from foreign matter, uneven but not greatly wrinkled or folded.

Two of the four available specimens were dissected, but much of the internal structure could be verified in the remaining specimens owing to the great transparency of the test and the thinness of the mantle.

When removed from the test, the branchial and atrial apertures are seen to have the usual eight and six lobes respectively, and the atrial aperture to be situated at the end of a short but well-formed tube.

The mantle is thin and transparent. The apertures are surrounded by numerous very slender, distinctly separated circular bands which constitute their sphincters. Aside from these, and a few weak radial bands on the tubes, muscles are almost entirely wanting on the left side of the body. On the right side there are rather narrow bands running obliquely or directly dorso-ventrally, mostly arising from the base of the branchial tube, from the median dorsal region between the tubes, and from the dorsal region posterior to the atrial tube.

They are irregular in their course, and are but little branched except on the anterior part of the body where they form a very loose irregular network. Immediately after crossing the median line on to the left side in the dorsal and ventral regions, they end quite abruptly. The transparent test and mantle, with the few irregular muscle bands, give the animal the superficial appearance of the genus *Corella*.

Tentacles few and large, apparently not over twenty in number. Larger and smaller ones alternate with some irregularity.

The dorsal tubercle is very small, and is formed by the terminal part of the neural duct gradually enlarging into a conically expanded glandular portion as it approaches the pharyngeal end. The extreme end is truncated, and bears the minute orifice, whose form is difficult to make out, but in one specimen it appears U-shaped.

The neural duct is only of moderate length, the somewhat elongate ganglion being not far removed from the dorsal tubercle.

The dorsal lamina presents some peculiarities which may have value as specific characters. It is plain-edged, the edge rolled somewhat to the right, and is provided with strong transverse buttress membranes arising from the transverse vessels. These membranes are so high that those of

the opposite vessels of the two sides unite with each other above the free edge of the dorsal lamina and a narrow sharp tooth is borne at the point of union. The dorsal lamina extends backward past the oesophageal opening on the left of the latter. In the posterior part of the sac the membranes of the right transverse vessels do not reach the dorsal lamina, but end in a sharp tooth or languet.

Branchial sac wide and truncated at the rear end, which is extended a little distance posterior to the region covered by the alimentary tract. It is not noticeably plicated. The transverse vessels are of at least three orders; the internal longitudinal vessels are only moderately numerous (about 22 to 24 on one side of the body) and are separated by from four to six stigmata in most cases. They bear stout papillæ where they cross the transverse vessels and much smaller intermediate papillæ half way between them. This is, so far as I am aware, the only species of *Phallusia* in the West Indian region having true intermediate papillæ.

Alimentary tract large, covering more than half the left side. Stomach rounded; both it and the

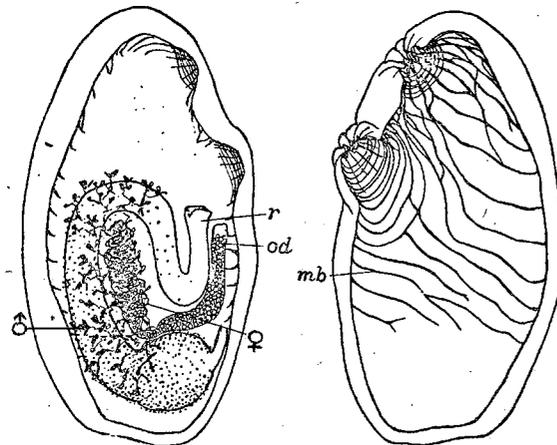


Fig. 2. *Phallusia corelloides* n. sp.  $\times 33$ .



Fig. 3. *Phallusia corelloides* n. sp.  $\times 26,7$ .

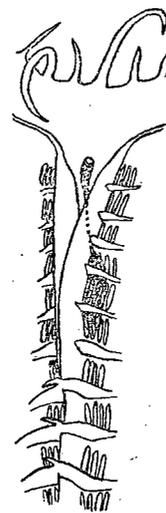


Fig. 4. *Phallusia corelloides* n. sp.  $\times 20$ .

intestine are so distended with mud that any plication of the wall, if such be present, is not noticeable. The stomach and proximal three fourths of the intestine form a rather open C-shaped loop. As the intestine again approaches the stomach, it bends more or less abruptly forward parallel to itself with a U-shaped flexure to form the rectum, which terminates in a smooth-margined, two-lipped orifice. The exposed surface of the stomach and proximal part of the intestinal loop is densely covered with minute transparent renal sacs, each containing a minute rounded concretion of a brown color, so that the stomach surface has a speckled appearance. A few of these sacs are thinly scattered over the more anterior parts of the intestinal loop.

The ovary is a tube of rather large diameter, densely convoluted into an elongate mass. It lies in the intestinal loop along the proximal (longitudinally directed) part of the intestine. From its posterior end the oviduct arises. The latter evidently serves to retain the eggs for some time, as in all the specimens it is densely packed and greatly distended with them. It runs dorsally along the dorsal border of the stomach and then bends anteriorly to accompany the rectum. The male organs were in a very poor condition in these specimens, although the other internal structures were mostly well preserved, indicating that the testes were not in a functional condition at the season the animals were collected. The male glands ramify over much of the intestinal loop, including its extreme anterior part, but not much could be made out of their details.

The specimens collected are as follows:

Caracas Bay, Curaçao, 5 May, 1920, 3 specimens, including type.

Caracas Bay, Curaçao, in coral, 13 May, 1920, 1 specimen.

I describe this as a new species with much reluctance, for I strongly suspect that it will eventually have to be united with the above mentioned species of SLUITER's collected at Damar Island, East Indies, in 45 fathoms, by the Siboga Expedition. The resemblance in the more important internal characters is striking, and so many ascidians common to the East and West Indies are now known that it seems probable that this will prove to be another instance. Yet to refer the West Indian specimens to a species known only from SLUITER's not very detailed description, based on a single specimen from a locality so remote, would not seem safe, and no other course seems open but to treat the two forms as distinct until more information becomes available.

#### Family RHODOSOMATIDÆ.

##### *Rhodosoma pellucidum* (Stimpson), 1855.

Although so far as previous collections from the West Indian region have shown, this is a rare species, the Curaçao collection contains more than thirty specimens, which in some cases grow in clusters of several individuals or with other ascidians (*Microcosmus exasperatus* and *Phallusia nigra*). The individuals range up to about 35 mm. long and generally have the test more or less rough and opaque and discolored with mud, so that it resembles in character and consistency that of *Phallusia hygomiana*. All the specimens are from the Spanish Water.

##### *Corella minuta* Traustedt, 1882.

One small individual, 6 mm. long, of this rare species was obtained at Caracas Bay, under a stone on the shore, May 3, 1920. The peribranchial cavity contained a number of individuals of a small amphipod, the male of which has very large chelæ.

#### Family BOTRYLLIDÆ.

##### *Botryllus planus* (Van Name), 1902. (Figs. 5 and 6).

1902. *Botrylloides nigrum* var. *planum* Van Name, Trans. Connecticut Acad. Sci., XI, p. 377, Pl. LIII, fig. 55; Pl. LIX, fig. 110.

1909—1911. *Botrylloides nigrum* var. *planum* Hartmeyer, in Bronn's Tierreich, III, supp., p. 1380.

1919. *Botryllus niger* (part) Michaelsen, Denk. Akad. Wiss. Wien, math.-nat. Kl., XCV, p. 105, Fig. 19.

1921. *Botryllus niger* (part) Van Name, Bull. American Mus. Nat. Hist., XLIV, pp. 399, 403, Fig. 74.

1921. *Botryllus niger* (part) Michaelsen, Wiss. Meeresunters. (neue Folge) XIV, Abt. Helgoland, p. 107.

Three small colonies or fragments of a larger colony, collected at Caracas Bay, May 5, 1920.

In discussing the structure of *B. niger*, MICHAELSEN, (1921), called attention to the fact that in my descriptions and figures of the species, I locate the ovary in front of the testis instead of behind it, as he found to be the case. This observation led me to make a reexamination of the supposed *B. niger* material available, which comprised more than twenty lots of specimens (some of the lots of several colonies each) from Bermuda, Florida and West Indian localities, with the result that I found that two species, differing in the positions of the reproductive organs, had been confused under the name *niger* in my Bermuda and West Indian monographs. The true *niger* is correctly described by MICHAELSEN as having the eggs posterior to the testes; the other species has the eggs in front of the testes as shown in my figures. The general similarity in structure and appearance in other respects is very great, and zooids having eggs and testes at the same time are to be found in but very few colonies, so that until my attention was called to the matter by Professor MICHAELSEN'S observation, I had treated them as all of one species.

For the form with the eggs in front of the testes I am here employing the name *planus*, as I described that form as a variety of *niger*, under the name *Botrylloides nigrum* var. *planum*, in an article (1902) on the Bermuda ascidians, and I can find no earlier name or description that certainly applies to it. *B. planus* appears to differ from *B. niger* in a number of minor characters, and when living material can be compared, will probably be found to present a different series of color variations, but in preservation the zooids usually turn purple, blackish or brownish as in *B. niger*, the test remaining yellowish or nearly colorless. Apparently in *B. planus* the zooids average wider and shorter, the atrial languet longer, the rows of stigmata somewhat fewer (not over 14, while *B. niger* often has 16), the colony thinner, so that the zooids are often forced to assume a position more or less nearly parallel to the surface, with the anterior end upturned, and I have in no case demonstrated more than 8 tentacles, while *niger* may have more, but these differences are often obscured or invalidated by individual variations, and are therefore difficult to make use of, especially in the poorly preserved and shrunken condition of much of the material with which the zoologist has to work.

The stomach, on the other hand, furnishes an easy method of distinguishing these species from each other, although not necessarily from other species of other regions. In the true *B. niger* the stomach has commonly 9 complete and one short incomplete glandular longitudinal folds, exclusive of the narrow somewhat oblique ridge from which the cæcum arises. The cæcum is short, enlarged toward the blind distal end, and often only moderately curved. The stomach is moreover of conspicuously conical form, its cardiac end wide and truncated (the ends of the folds forming prominent rounded projections on its border); it tapers rapidly to the pyloric end. Only on the cardiac part are the folds very prominent, for at a point a little way back from the end they decrease in height very abruptly, though they continue to the pyloric end with diminishing distinctness.

In *B. planus*, there appear to be about the same number of glandular folds in the stomach or possibly one less; the cæcum is very long and narrow, more than equaling the entire length of the stomach, and of cylindrical form, enlarged somewhat only at the distal end and usually strongly bent back in a U-shaped or C-shaped curve. The stomach is short and moreover is better described as barrel-shaped rather than conical, although there is some diminution in diameter toward the pyloric end.

Of course, if zooids with reproductive organs of both sexes can be discovered in the colony, they at once distinguish the two forms. A single large egg on each side of the body is usually present in the case of both species; in *B. niger* it is posterior or postero-dorsal to, and in *B. planus* anterior to, the testis. The latter is a compact, convex mass divided into lobules by deep clefts. In *B. niger* these lobules are usually of uniform size and not numerous, often as few as five; in *B. planus* they

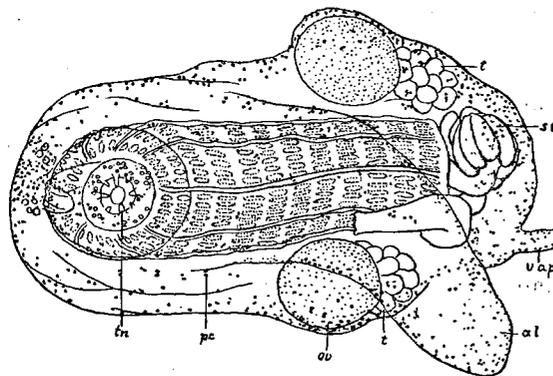


Fig. 5. *Botryllus planus*.  $\times 36$ .



Fig. 6. *Botryllus planus*.  $\times 50$ .



Fig. 7. *Botryllus niger*.  $\times 50$ .

are commonly more numerous (often more than a dozen) and are very irregular in size and shape, and in the degree of the cleavage from each other; the whole organ forms a dome-shaped or rosette-like mass.

I have specimens of *B. planus* only from Bermuda, where the type and one other colony were found on rocks along the shore; and from the west coast of Florida (Cedar Keys, collected by the U. S. Fish Commission Steamer Bache in 1887, and near East Bahia Honda Key, 11 1/2 fathoms, collected by the U. S. Fish Commission Steamer Fish Hawk, Jan. 22, 1903), in addition to the above small ones from Curaçao in the present collection.

*B. niger* is very widely distributed in the West Indian region, Bermuda being the type locality, and is reported from various warm regions of the Old World. It is a very near ally of, though apparently quite distinct from, *B. leachii* Savigny, which is common on the coasts of northwestern Europe, for which the Genus *Metrocarpa* has recently been established by CHRISTIE-LINDE (1922). *B. niger* must be transferred to that genus provided the latter is adopted into our classifications, a course which I am inclined to consider favorably. *B. niger* has recently been dealt with in detail by MICHAELSEN (1918, p. 45, Fig. 6; 1919, p. 105, Figs. 19, 20; and 1921, p. 107, Fig. 2; the last especially important in this connection, as it describes specimens from Cienfuegos, Cuba; Cartagena, Colombia; and Vera Cruz, Mexico) so that it does not appear to require further consideration here, though future collecting will perhaps establish its presence at Curaçao.

#### Family STYELIDÆ.

##### *Polyandrocarpa sabanillæ* Van Name, 1921.

1. specimen from the Spanish Water, a group of three small poorly developed individuals, is apparently of this species.

##### *Polycarpa obtecta* Traustedt, 1883.

This common and widely distributed species is represented only by about a dozen specimens, the largest only 26 mm. long, and most of them much smaller. They are from both the Spanish Water and Caracas Bay; one is from West Punt.

##### *Polycarpa circumarata* (Sluiter), 1904.

Two small and poor specimens from the Spanish Port are apparently of this species.

##### *Styela partita* (Stimpson), 1852.

One medium sized (22 mm. long) and one very small individual from the Spanish Water and perhaps another small one from Caracas Bay, too immature to be certain, are all that represent this common and widely distributed species.

#### Family PYURIDÆ.

##### *Pyura vittata* (Stimpson), 1852.

Over forty specimens, partly from Spanish Water, partly from Caracas Bay and one from West Punt, the largest about 50 mm. in greatest diameter. They vary greatly in external appearance and to some extent in some of the internal characters, but I have been unable to find a basis for separating them into more than one species.

##### *Microcosmus exasperatus* Heller, 1878.

Over forty specimens, all from the Spanish Water; the largest about 50 mm. long.

##### *Microcosmus helleri* Herdman, 1881.

Fifteen specimens, the largest about 35 mm. in greatest diameter, from the Spanish Water. Previously obtained West Indian specimens (from the vicinity of Porto Rico) were all dredged in water of at least three fathoms depth, but those from Curaçao were obtained in shallower situations.

## Family MOLGULIDÆ.

*Molgula occidentalis* Traustedt, 1883.

Fourteen specimens, the largest 43 mm. in greatest diameter; the others mostly small. All from the Spanish Water.

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